U S WEST
Communications
Technical Publication

CENTRAL OFFICE
DRAWING STANDARDS

77353
Issue C
September 1990

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NOTICE

These standards have been prepared to provide Drafting Suppliers, Equipment Engineering Suppliers and U S WEST Communications personnel with the requirements for preparing and maintaining manually Drafted Central Office Records. This publication has been revised entirely.

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INTRODUCTION

CONTENTS

1.00 GENERAL

1.01 These standards have been prepared to provide Drafting Suppliers, Equipment Engineering Suppliers and U S WEST Communications personnel with the requirements for preparing and maintaining manually Drafted Central Office Records. This publication has been revised entirely.

1.02 On any specific order where the occasion warrants, waivers to the instructions in this Publication may be used. Requests to exclude jobs or portions of jobs from the drafting Quality Control (QC) Audits shall be channeled through the Records Group drafting QC organization. The variances requested in the waiver must be customer originated, authorized and documented in a letter to QC. The customer, as defined herein, shall be U S WEST Communications; QC shall reject or implement the request.

1.03 Those orders selected for audit having such variances should then be audited within the parameters of the local documentation. That portion of the order not applicable to the waiver, shall be audited as specified in this Publication.

2.00 PURPOSE

2.01 Central Office Drawing Standards (Office Record Drawings) is a set of rules and instructions required to be followed by Drafting Suppliers and Equipment Engineering Suppliers which reflects as accurately as possible U S WEST Communications' requirements in the preparation of manually drafted office record drawings. The material in this publication is based on current standards developed or adopted by U S WEST Communications. Issuance of this publication as the Central Office Record Drawing Standard is authorized by the Records Group Quality Control organization.

3.00 CONTENT

3.01 Sections II and III of this publication consist of the conventional practices common to all drawings adhering insofar as practicable, to standards of the American National Standards Institute (ANSI) and American Drafting Standards Manual Y14. The remaining sections contain engineering and drafting requirements for the preparation and maintenance of drawings associated with Central Office Records. Central Office Records are defined as the records prepared and maintained by the Regional Central Office Records Center which indicate types, quantity, features and location of the telephone equipment within telephone company central offices. The applicable section and part must be consulted for requirements peculiar to a specific type of Central Office Record Drawing.

4.00 TERMINOLOGY

4.01 The term SHALL or REQUIREMENT used throughout this publication indicates mandatory practices.

4.02 The terms MAY or RECOMMENDED indicates optional requirements or recommendations. These terms are used when the choice to observe or disregard the practice is present. The choice may be determined by convenience, completeness of engineering, job conditions or local practices.

5.00 RESPONSIBILITY

5.01 It is intended that the documents prepared in accordance with this publication be compatible with the engineering standards established in U S WEST Communications Technical Publication 77351, "Central Office Telecommunications Equipment Engineering Standards for U S WEST Communications" (PUB 77351).

GENERAL REQUIREMENTS

CONTENTS

1.00 GENERAL

1.01 This section covers drafting facilities used and the general requirements for the preparation, revision and maintenance of manual central office drawings.

1.02 The requirements and procedures covered herein shall be followed in conjunction with the standards and techniques specified in the associated sections of this publication, and shall apply to all new and revised drawings.

2.00 BASIC REQUIREMENTS

2.01 A drawing serves two important functions: to provide accurate and complete information to be utilized by engineering, manufacturing, installation and maintenance groups; and to be used as the reproducible to provide the necessary microfilm or paper copies to the above mentioned users. In this section, the emphasis is placed on the requirements and recommendations resulting from tests, studies and experience dealing with materials and methods best suited for preparing and maintaining drawings to provide a good reproducible. To produce optimum quality drawings, it is essential to adhere to the requirements, standards and techniques covered in this publication, as well as, meet the following basic requirements:

A. Prepare and maintain the drawing so that all the information shown on the drawing consisting of both linework and lettering is of equal opacity, uniformity and legibility.

B. Prepare and maintain the drawing so that a maximum and uniform contrast exists between the drawing background and the information shown on the drawing.

3.00 DRAFTING FURNITURE, EQUIPMENT AND SUPPLIES

3.01 Only approved facilities and supplies shall be used in the preparation and maintenance of drawings.

4.00 DRAWING MATERIAL

4.01 Film, cloth and paper are the materials available for producing the finished drawing. Each have properties particularly suited for the type of drawing prepared, and the various methods used for producing microfilm or paper copies of the drawing. In selecting one of these materials, careful consideration shall be given to the state of drawing permanence, since the material used is one of the primary factors affecting the quality of the initial issue and any subsequent revision of the drawing.

4.02 Coated Polyester Film is recommended over all other media for the preparation of all permanent type drawings, and shall especially be used for those drawings subject to microfilming. The properties of coated film offer higher dimensional stability, greater tear, wrinkle and wear resistance, and ease in making revisions. For drawings subject to microfilming, in addition to the above characteristics which contribute to producing better quality drawings, the use of film material is recommended because of its high transparency, uniformly dull finished surface and noncurl properties.

4.03 Use of cloth is prohibited and is not authorized for the preparation of new or redrawn drawings.

4.04 The preliminary, or first issue floor plans, are permanent drawings and should be drafted on coated polyester film (mylar) or Computer Output Microfilm (COM).

4.05 Central Office Record Drawings can be generated via a COM device. In these cases, the drawing is produced directly on 35mm microfilm from a computer tape.

5.00 DRAWING PREPARATION

5.01 In conjunction with the selection of drawing material, the other important primary factors which affect the quality of a drawing are: the degree of contrast between the drawing background; and the information shown on the drawing, the method (e.g., Pencil, Ink, Typing) by which the information is entered on the drawing background, and the detailed composition of the information on the drawing.

5.02 Linework - the linework on all manually drafted new and redrawn drawings subject to microfilming shall be prepared in ink. When applied with the approved drawing pens, ink produces high quality linework, which is of consistent width, with sharp clearly defined edges, and has a high degree of opacity. Its uniform density is also resistant to smudging and wear. All of these characteristics contribute toward producing drawings that are more superior than drawings prepared in pencil. For specifics concerning linework on drawings, see Section III, Part A, Paragraph 2.00.

5.03 Lettering - Generally the use of mechanical lettering devices or machines is the recommended method for placing all alpha and numeric characters on manually drafted new and redrawn drawings subject to microfilming. This method produces characters of uniform size, shape and density, with consistent spacing, and fully legible. Exceptions to this method are certain characters of special size and form which must be placed on the drawing in ink by a freehand method. For specifics concerning lettering on drawings, see Section III, Part B.

5.04 Penciled Drawings - Since superior quality drawings can be produced using ink linework, preparation of drawings in pencil is not authorized.

6.00 DRAWING REVISIONS

6.01 Completely legible microfilm or paper print copies of revised drawings cannot be assured unless all existing conditions causing illegibilities are rectified. In addition to legibility of information, the most important maintenance factor is the comparison of the drawing information with respect to form and contrast. The objective should be to maintain an overall balanced condition in the information on the drawing, as well as the contrast between the information and drawing background. This can best be achieved by maintaining the drawing using the predominant method employed for existing linework and lettering on the drawing. This method of maintenance in conjunction with upgrading the illegible areas, provide the optimum conditions on the drawing for obtaining a legible drawing copy.

7.00 DRAWINGS - CLEANLINESS

7.01 Obtaining legible microfilm or paper print copy of the drawing becomes increasingly difficult as the degree of drawing background discoloration approaches the density of the linework or lettering. Revisions, handling and normal aging processes contribute toward reducing the contrast between drawing background and information. Although that these factors cannot be completely eliminated, steps can be taken to minimize the loss of contrast. In order to realize the best results in maintaining maximum contrast, the following preventative measures shall be followed:

A. Drafting equipment and instruments such as drawing boards, straight edges, triangles, scales and all other drafting tools that come in contact with the drawing shall be kept clean.

B. Sliding straight edges and triangles across the surface of the drawing shall be minimized. When moving these tools, raise them slightly to avoid unnecessary contact with the drawing. Excessive sliding action causes smudges and scratches on the drawing surface.

C. Allow only the drafting tool actually being used to come in contact with the drawing surface and keep all other tools in the storage facilities provided. Avoid placing reference books or documents on the drawing.

D. Handle the drawing by the edges, outside the borders. Avoid resting hands or bare forearms and elbows on the drawing. When working on the upper portion of large size drawings, cover the lower portion with clean paper to prevent body contact with this portion of the drawing. Normal body oils, commercial skin conditioners or excessive handling cause conditions on the drawing which result in poor adhesion of linework and lettering.

E. Spread the drawing board cover over the drawing to provide protection when the drawing is not being used.

F. Practice good housekeeping habits in the general drafting area.

8.00 DRAWINGS - CARE AND HANDLING

8.01 Finished drawings represent costly engineering and drafting efforts. Precautions shall be exercised to prevent creasing, scratching, tearing, puncturing or any other physical damage to the drawing. These physical deficiencies interfere with obtaining legible drawing copy.

8.02 Do not allow the drawing to extend beyond the working surface of the drafting table or temporary storage facility. Use only drafting tape to fasten the drawing to the drawing table.

8.03 Drawings delivered from one location to another should be properly packaged and protected against damage. Generally, drawings should be packaged in roll form, except when it is necessary or more convenient to place them in a flat package. Rolled or flat packaged drawings shall be placed in suitable protective containers.

A. All rolled drawings shall be wrapped around drawing mailing tubes before placing in the transporting container. This tube, which the drawing is rolled into shall be 1-1/4 inches or larger in diameter. Sufficient length to accommodate the largest size drawing without the drawing extending beyond the ends of this tube is also required.

B. For large size drawings, the quantity rolled .on the tube shall not exceed 25 sheets. Smaller sizes should be placed at the bottom of the stack of drawings that are wrapped around the tube.

C. If drawings are to be transported flat, they shall be placed between adequate protective covers of sufficient size to accommodate the largest size drawing without exposing the drawing edges. The covers should be secured to prevent the drawings from shifting between the covers.

PREPARATION

CONTENTS

1.00 GENERAL

1.01 This part covers the standards for linework drafted on drawings, general requirements for preparing and maintaining drawing surfaces, as well as techniques in the use and maintenance of the tools employed to produce linework.

1.02 The standards and requirements covered herein apply to all types of drawings. The application of the standard lineweights to the particular drawing types is covered in the associated sections and parts of this publication dealing with the specific standards for these drawings.

2.00 LINEWORK - BASIC REQUIREMENTS

2.01 Linework on drawings serves to depict various forms of information. Most often, lines of different weights must be used to convey or interpret the language of the information. Consequently, adherence to the following requirements and standards is necessary to provide uniform means of interpretation and produce the quality of linework to assure legibility on the subsequent copies of the drawing.

2.02 All linework shall be of equal opacity. All linework of the same width shall be uniform throughout the drawing, and there shall be a distinct contrast in the thicknesses of different types of lines.

2.03 The various lineweights are used on office record plan type drawings where it is necessary to distinguish between equipment frames, auxiliary hardware or fixtures and building features in the office. The standard lineweights used on drawings are thin, medium, thick and extra thick. Therefore, the following are the approximate widths that are standard for lineweights.

LINEWEIGHT	APPROXIMATE WIDTH
THIN	.012 - .014 inches
MEDIUM	.020 - .023 inches
THICK	.032 - .036 inches
EXTRA THICK (FOR FILL IN)	.040 - .043 inches

2.04 Ink Linework - On drawings drafted in ink, the standard lineweights are achieved by using pen point sizes as follows:

LINEWEIGHT	PEN POINT SIZE DESIGNATION
THIN	No. 0, or 0.3 (mm)
MEDIUM	No. 2, or 0.5 (mm)
THICK	No. 3, or 0.8 (mm)
EXTRA THICK (FOR FILL IN)	No. 4, or 1.0 (mm)

2.05 Minimum Space Between Lines - The space between parallel lines on a drawing shall not be less than .05 inches, or 1/20 of an inch. It is especially important to meet this requirement on drawings that are subject to microfilming (lines spaced less than .05 inches apart appear as a single line on the microfilm and also on the copies made from the microfilm).

2.06 On drawings prepared to a reduced scale size, it may not be possible in all cases to maintain the scale between two adjacent lines and also meet the minimum space requirement between the lines (.05 inches). In these cases, it will be necessary to deviate from the scale in drawing the separation between the lines, to provide the space required. Any dimensional information shown relating to these lines shall reflect the requirement of the design and not the deviation from the scale measured on the drawing layout.

2.07 Legibility Requirements - In order to produce legible information on microfilm or paper copies of a drawing, all linework on the original must be well balanced. This means each line shall be of uniform width clearly defined with clean sharp edges, and all lines shall be equally, uniformly and sufficiently opaque. On revisions to existing drawings, added lines, with respect to lineweights and opacity, shall be consistent with the existing linework on the drawing.

3.00 LINEWORK DRAFTING TECHNIQUES

3.01 Drafting Surface Preservation - when a drawing is prepared, preserving the drafting surface is important. When drawing lines, care shall be taken not to cut through or emboss the drafting surface. Cutting into the surface will impair the ultimate usefulness of that particular area of the drawing. Embossed linework engraves the drafting surface, and when erased, causes a residual image to be retained in the drafting surface.

3.02 Inking - For the best results, use only the approved inks, inking instruments and accessories.

A. Prior to inking drawing pencil lines on any drawing media, the lines creates a poor surface for good ink adhesion. Where a pencil layout is necessary, the recommended procedure is to prepare the layout on a medium which can be used as an underlay to trace the layout directly in ink on the drawing. If it is absolutely necessary to draw the pencil layout directly in the drafting surface, use grade 3H or 4H graphite leads to limit the amount of graphite deposited. Ink adheres very poorly to graphite and pounce, (see Paragraph 5.00).

B. Adhere to the specific filling instructions provided by the manufacturer and packaged with each technical pen.

C. Use the approved bow compasses for inking of circles and radii. These instruments are designed to accept the approved point sections used in the technical pens.

D. Extreme care shall be exercised not to puncture the drafting surface with the needle of the compass.

E. Maintenance of pen point sections used with the bow compass are the same as prescribed for the technical pen.

3.04 Pencil - Graphite leads and plastic leads are the approved materials for producing pencil work on drawings. These are available in various grades of hardness in wood case pencils and leads for mechanical drawing pencils. A grade of lead shall be used which is hard enough to prevent smudging but sufficiently soft to produce uniformly dense black lines. It shall also be possible to erase the linework without leaving a residual image on the drawing.

> NOTE:
>
> Use only the approved plastic leads for coated polyester film, and only the approved graphite leads for cloth and paper.

A. Leads shall be sharpened in such a manner that the point will not cut into the drafting surface. Needle points or burrs shall be removed by stroking the point on a piece of scrap paper. Leads shall not be sharpened to a flat or chisel type point.

B. The approved mechanical pencil designed to hold drawing leads provides for cleaner and simpler methods of maintaining a uniformly tapered lead point to draw lines. It is also considered a more efficient drawing tool than wood cased pencils.

C. Where the majority of the linework consists of mostly a THIN lineweight with lines that are unusually long, these lines can be efficiently drawn with an approved mechanical drawing pencil designed to accommodate ribbonshaped (flat) graphite leads of various grades.

D. To obtain optimum results, draw pencil lines in the following manner:

1. Hold the pencil at a consistent angle and do not rotate the wrist to avoid cutting into the drafting surface.

2. Use a single stroke to draw the line and exert only sufficient pressure to produce a solid black line without embossing the drafting surface.

3. Rotate the pencil slowly while drawing a long line to maintain uniformity of the lineweight throughout the stroke.

4. Use lead of the proper grade to obtain the required line density with a single stroke. Retracing the line produces smudging, possible embossing or an inconsistent linewidth.

4.00 DRAWING MEDIA

4.01 Coated Polyester Film is approved to prepare drawings using inks, plastic leads and typewriters approved for this material.

A. It is transparent white material consisting of a clear polyester film base, with a coated matte surface on one or both sides. The matte is the drafting surface. In general, job drawings shall be prepared on single matte tracing material. However, at the discretion of the user, double matte tracing material may be utilized provided the standard requirements for microfilming are maintained.

B. The material is waterproof, exceptionally strong, highly resistant to curling, tearing, wrinkling, heat and aging, and has dimensional stability.

C. On material with the matte only on one side, the uncoated film side is highly glazed and will not accept ink, graphite, plastic lead or typing. The glazed side will accept letterpress, offset or lithograph printing processes.

4.02 Cloth is approved to update permanent drawings using ink; however, this material is not authorized for preparing new permanent drawings subject to microfilming. Approved cloth is blue tinted material with a dull surface on one side and a glazed surface on the other side. The dull side is the drafting surface.

4.03 Paper is approved to prepare layouts, engineering, sketches, etc., and is available in the following types:

A. Bond - This is a white transparent bond paper with excellent strength and can be erased with little damage to the surface. Either side is suitable for accepting graphite leads, typing, or letterpress or offset printing processes.

B. Vellum - This is a white transparent rag content paper with higher transparency, greater durability and erasability than bond type paper. Either side is suitable for accepting graphite leads, drawing inks, typing, letterpress or offset printing processes.

5.00 DRAFTING SURFACE PREPARATION

5.01 A minimum preparation of the drafting surface is required to obtain optimum conditions for acceptance of linework. In all cases the surface must be clean. Additional surface preparation depends upon the drawing media, and whether ink or pencil is used. Adherence to the methods of preparation specified herein is important in both originating a high quality drawing and maintaining that state of quality for the life of the drawing.

5.02 New and Redrawn Drawings - Regardless of the drawing media used, all drafting surfaces may be wiped clean with a lint-free cloth or pad.

5.03 Coated Polyester Film - On existing drawings, clean the surface with the approved art-gum or vinyl eraser.

5.04 Cloth-Ink - On existing drawings, clean and surface with the approved art-gum or soft rubber eraser.

5.05 Cloth-Pencil - On existing drawings, clean the surface with the approved art-gum or soft rubber eraser.

5.06 Paper - This material is not authorized for use in preparing new permanent type drawings. On any existing drawings which are to be revised, clean the surface with the approved art-gum or soft rubber eraser.

5.07 Inking Over Pencil Lines - On all drawing materials, pounce shall not be used over preliminary graphite pencil layouts on the drawing prior to inking the lines. Pencil layouts directly on drawings should be avoided. For alternate recommendations, see Paragraph 3.00.

5.08 Pounce - The use of pounce is not authorized on approved drawing media.

6.00 ERASURES

6.01 Using only the approved materials and the proper techniques to remove information are important to preserve the drafting surface and maintain a good quality drawing. Specific materials are approved for the removal of information on the various types of drawing media.

6.02 The following are the procedures to be followed for erasures made on all drawings:

A. Exert only enough pressure to remove the information. Too much pressure causes an excessive loss of drafting surface. Rubbing at a fast rate will burnish the drafting surface.

B. The information shall be thoroughly erased, leaving a clean surface.

C. An erasing shield may be used to protect adjacent information.

D. After erasing, the same area should be cleaned on the rear to remove impressions which have been transferred to the underside.

E. Use a brush to remove eraser particles from the drawing.

F. Where an electric erasing machine is used, care must be taken to limit the pressure applied to avoid damage to the drawing.

6.03 The following are the erasers to be used for the removal of information from the various drawing media.

A. Coated Polyester Film

1. Matte Side - Use a vinyl eraser moistened with water. Do not use an electric erasing machine.

2. Glossy Side - Use a felt eraser or cloth moistened with approved chemical agent to remove preprinted information on linework.

B. Cloth-Ink - Use a soft rubber eraser.

C. Cloth-Pencil - Use a soft rubber eraser.

D. Paper - Use a soft rubber eraser.

7.00 REPRODUCED DRAWINGS

7.01 When a drawing is old and worn, or damaged, or cannot produce legible copy, or extensive revisions are required, it may be more practical to obtain a wash-off reproduction of the original rather than redraw. The original may be a pencil or ink drawing.

7.02 The wash-off reproduction is a coated polyester film, with the reproduced information having ink like characteristics.

7.03 To obtain a wash-off reproduction, the usual procedure is to furnish the printer with the original drawing, and as required, a marked print to indicate the information that is to be rearranged or is not to be reproduced.

7.04 The treatment of a wash-off reproduction as a drawing medium is the same as for coated polyester film.

8.00 DAMAGED DRAWINGS

8.01 Torn or punctured drawings shall be redrawn, or reproduced, or repaired. If the damage to the drawing is the source of illegible information on the microfilm or paper copy, then the drawing shall be redrawn or reproduced.

8.02 Drawing repairs, if properly made, at best have a short life insofar as maintaining the drawing in a condition which produced legible microfilm or paper copy. After exposure to frequent handling due to revisions, interfiling with other drawings, processing through reproduction equipment, or any combination of these factors, the edges of the mending tape lift become frayed or soiled. Heat or age may cause a discoloration in the mending tape adhesive. On patched areas, dust or dirt accumulates in the segments between the patch and cutout area of the drawing. All of these conditions are sources of illegibilities on copies of the drawing, which shall be considered when repairs to a drawing are contemplated.

8.03 If a damaged drawing is to be repaired, the procedures are as follows:

A. Never make a repair that interferes with information on the drawing causing the information to become illegible.

B. Carefully clean all surfaces to be mended.

C. In using the permanent mending tape, smooth out the tape to remove all air pockets from between the tape and the patched portion of the drawing.

8.04 When repairing small holes, punctures or torn edges, patches are not necessary. Apply permanent mending tape to the underside of the drawings in the torn area.

8.05 When a drawing is damaged to the extent that a patch is required, the procedures to use shall be as follows:

A. Patching material shall be the same material as the drawing being repaired. Patches should be cut square or rectangular, and without any irregular edges.

B. Place an approved protective material on the drawing board surface. Place the patching material with the drafting surface face down on the protective material, and anchor the patching material with drafting tape.

C. Place the drawing to be repaired with the drafting surface down. Locate the damaged area directly over the patching material with the drafting surface face down on the protective material, and anchor the patching material with drafting tape.

D. Cut out the damaged area and patch simultaneously to insure a completely matching patch. Ensure there is little or no visible opening at the matching edges.

E. Carefully lift out the cutout of the damaged drawing without distributing the patch cutout underneath.

F. Secure the patching piece in place by using permanent mending tape. Place the tape along the cut edges so that the tape width is equally divided between the patch and drawing proper.

LETTERING STANDARDS AND TECHNIQUES

CONTENTS

FIGURES

1.00 GENERAL

1.01 This part covers the standards for lettering on drawings, and techniques in the use and maintenance of the tools employed to produce lettering.

1.02 The lettering standards and requirements covered herein are generally applicable to all types of drawings. Where special lettering practices apply to certain drawings, they will be covered in the associated sections and parts of this publication.

2.00 BASIC REQUIREMENTS

2.01 A drawing does not always include a pictorial image represented by linework; however, all drawings do include lettered information. To a certain degree, poor linework may not be a hindrance in the interpretation of the pictorial image of microfilm or paper copies of the drawing. On the other hand, poor lettering on either type of drawing copy will often result in questions or complaints by the users of the drawings concerning the lettered information. Therefore, the basic requirement for lettering on a drawing is that it produces fully legible information on the various forms of copies made from the original drawing. In order to meet this requirement, all letters, numerals and special characters shown on the original drawing must be clearly defined, uniformly shaped, properly spaced, and sufficiently opaque.

3.00 COMPOSITION

3.01 Attempt to achieve a unidirectional presentation of the information. In general, the information should be left to right reading with the lettering shown in a plane parallel with the upper or bottom edge of the drawing. Avoid a placement that necessitates rotating the drawing to make it readable.

3.02 If dimensions or other data have to be shown in a plane other than parallel with the lower edge of the drawing, the lettering placement in all planes should be such, that the information is readable as the drawing is rotated clockwise. Avoid showing reverse reading information, or placement of information in two planes so that the lettering in one plane is upside-down with respect to the lettering in the other plane, see Figure 1. An exception to the latter condition is product marketing information, which must be shown as it appears on the product, regardless of its drawing orientation.

4.00 METHODS

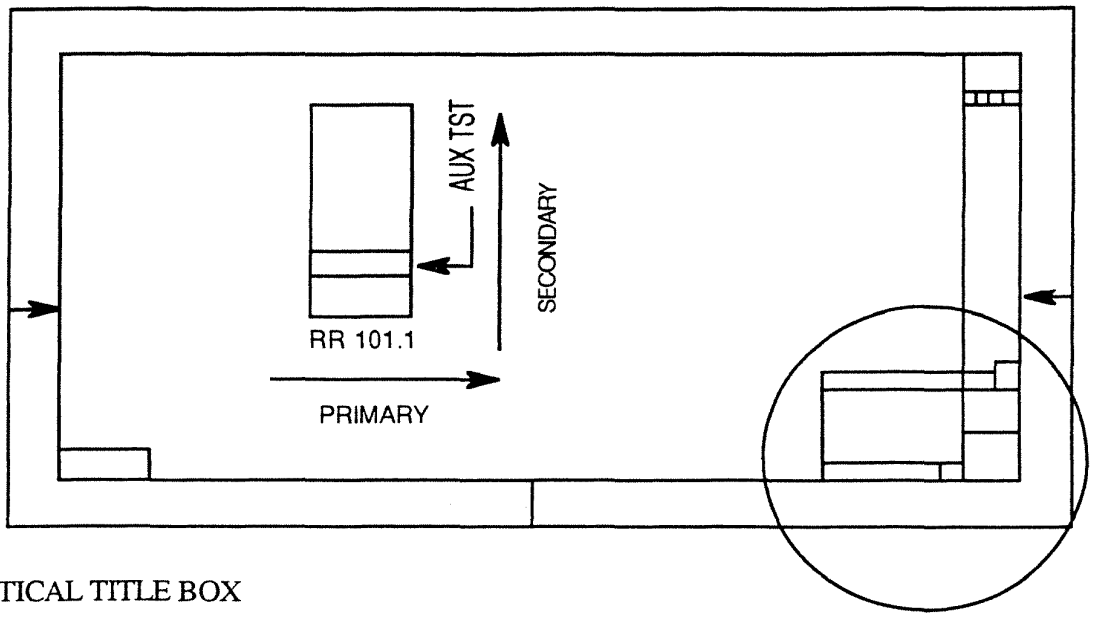
4.01 Typewriter and template are the two methods which may be employed for lettering on drafted drawings.

4.02 Typewriter lettering is required where the majority of the information is shown in 1/8 inch high characters. Lettering by typewriter produces characters of uniform size, shape and density, with consistent spacing and legibility. Typewriter lettering is required on all new and redrawn drawings subject to microfilming.

4.03 The accepted practice within U S WEST Communications is to microfilm all drafted drawings, and to use the microfilm in lieu of the original drawing as the medium to produce additional microfilm or paper copy. Typewriter lettering should be the method of lettering on any drawings from which copies are made for work or reference purposes.

4.04 Template lettering is used where it is necessary to produce characters greater than 1/8 inch high. Template lettering 1/8 inch high is used on certain types of drawings and in these cases, the requirements for template lettering will be covered in the specific standards for the drawings.

HORIZONTAL TITLE BOX



VERTICAL TITLE BOX

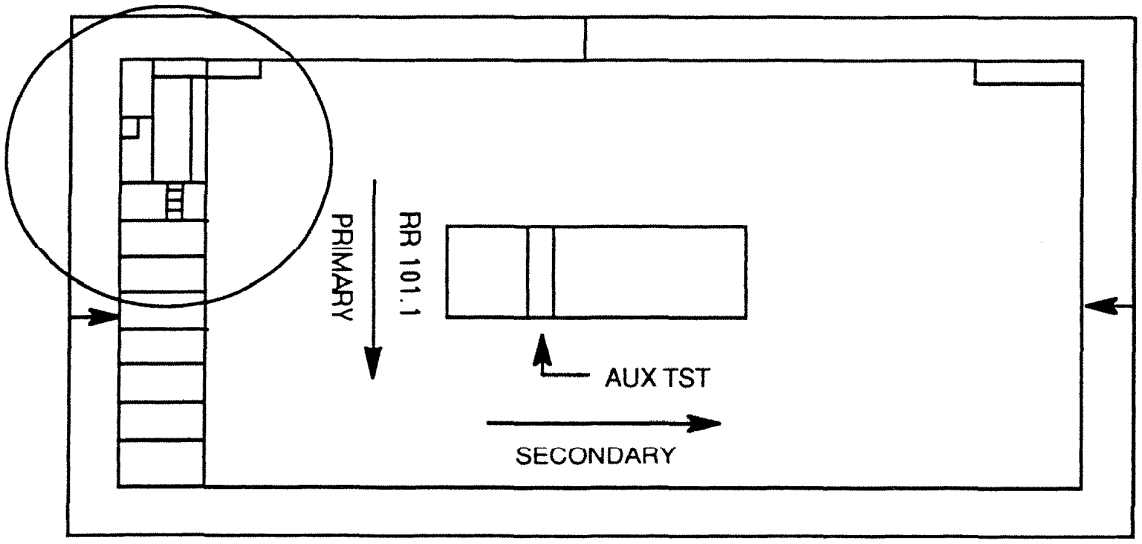


FIGURE 1
LETTERING PLACEMENT

5.00 STYLE

5.01 The standard style of lettering shown on drawings shall be upper case Gothic. All lettering on new and redrawn drawings shall conform to this style.

5.02 Vertical lettering should be used on all new and redrawn drawings. Figure 2 illustrates the typewriter lettering and Figure 3 illustrates the template lettering of the vertical form in the Gothic style. Freehand lettering is not used.

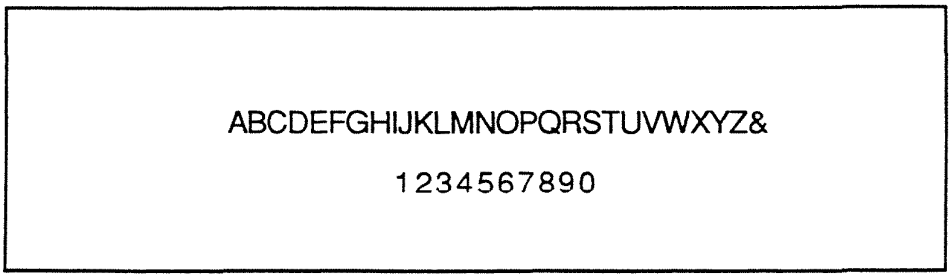


FIGURE 2
TYPEWRITER LETTERING

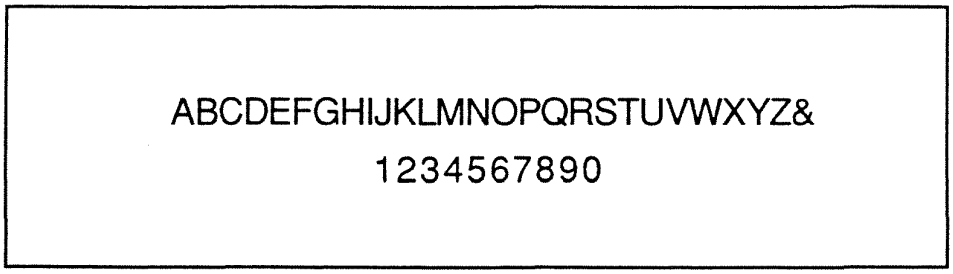


FIGURE 3
TEMPLATE VERTICAL LETTERING

5.03 Lower case letters are not to be used on drawings. Lower case letters are employed in special cases, and when required, their use will be covered in the specific standards for the drawings on which the lower case characters are applicable.

5.04 Lettering shall not be underlined.

6.00 SIZE

6.01 The size of lettering on all new and redrawn drawings shall be a minimum of 0.125 (1/8) inch high. The standard size of lettering for the majority of information shown on drawings should be 1/8 inch high. Lettering shall have a uniform line thickness throughout a drawing sheet.

6.02 The standard 1/8 inch high lettering, shall be utilized throughout all Office Record Drawing with the following exceptions:

A. Drawing numbers (in Drawing Number Boxes) and replaced, superseded, or voided information (above title box) shall be 3/16 inch standard height.

B. Issue numbers (in Issue Box within the title box) shall be lettered freehand in pencil 7/16 inch high.

6.03 The size of lettering greater than 1/8 inch high for other categories of information peculiar to certain types of drawings will be covered in the specific standards for the drawings.

6.04 Where 1/8 inch and 3/16 inch size characters are presently utilized on drafted Job Office Record Drawings, the comparable character sizes on COM generated drawings shall be the same or similar size characters respectively as indicated.

7.00 SPACING

7.01 Spacing between characters in the same line, between successive lines of lettering, and between characters and adjacent linework, are all equally important as character form and size in producing legible information on drawings.

7.02 Spacing between adjacent characters in words or between a series of adjacent characters in the same line, depends upon height of characters and the shape of characters.

A. The approved typewriters for typing 1/8 inch characters on drawings are designed to produce the required character spacing based upon the typewriter lettering standard of ten characters per inch.

B. With template lettering, there is no prescribed uniform distance for spacing characters. As a general standard, 1/8 inch high vertical lettering should be spaced to produce approximately nine characters per inch. The general rule for all size lettering is to arrange the spacing so that the drawing background areas between characters are approximately equal. This arrangement makes the character spacing appear to be uniform. Figure 4 illustrates lettering with uniform spacing and the recommended adjusted spacing.

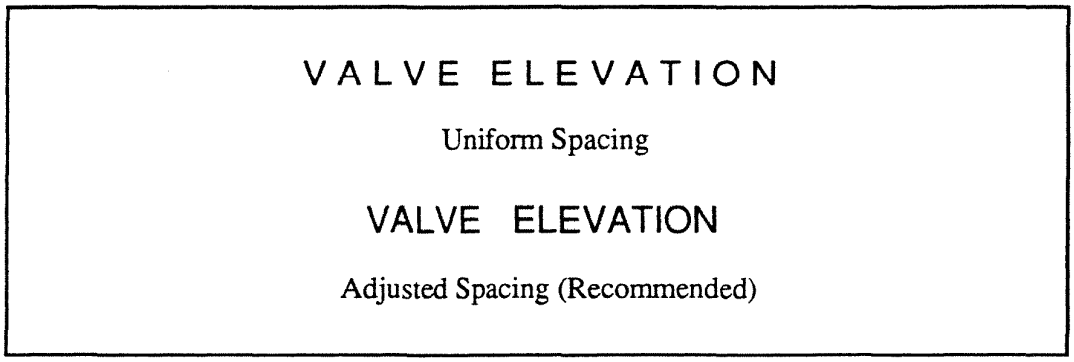


FIGURE 4
SPACING OF TEMPLATE

7.03 Spacing between words or a word and a numeral

A. Typewriter lettering - The standard space is equivalent to a single strike on the keyboard space bar.

B. Template lettering - The standard space should be approximately equivalent to the width of the upper case letter "O".

7.04 Spacing between sentences

A. Typewriter lettering - The standard space is equivalent to two strikes on the keyboard space bar.

B. Template lettering - The standard space would be approximately equivalent to twice the width of the upper case letter "O".

7.05 Spacing between consecutive lines of lettering shall be equivalent to one-half the height of the lettered characters.

7.06 Spacing between paragraphs or notes initially shall be equivalent to twice the height of the lettering in the paragraphs or notes.

A. When the above requirement is followed, one additional line of lettering may be added to an existing paragraph or note, thus, requiring expansion without making any space adjustment between the expanded information and the next succeeding paragraph or note.

7.07 Spacing tabular or stocklist information shall be a minimum of one-half the height of the lettered characters.

8.00 COMPRESSED OR CONDENSED LETTERING

8.01 Deviating from the standard lettering requirements of this part is not usually an acceptable procedure and should be avoided. Compressed spacing or condensed characters causes congested lettering and generally results in illegible information on copies of the drawing. Preprinted drawing forms, with dedicated areas for specific information, have been standardized and reflect the standard placement of the information to be shown. Occasionally, the standard placement is changed, and the existing preprinted format will not accommodate the change under standard lettering requirements. Usually, these changes will only affect new and redrawn drawings. When this condition occurs, and it appears that the affected preprinted drawing forms will not be available for preparing new and redrawn drawings, interim instructions will be issued covering any deviations from the lettering standards that may be necessary to implement the change.

9.00 FRACTIONS

9.01 When using the single line method, all the characters in the fraction are shown on the same line with the numerator and denominator separated by a slash (/) symbol, per Figure 5.

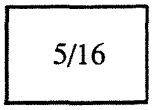


FIGURE 5
FRACTIONS - SINGLE LINE METHOD

9.02 When the fraction is preceded by an integer, to assure that the integer will not be confused as being part of the numerator, the integer and fraction shall be separated by a hyphen (-) symbol, per Figure 6.

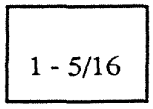


FIGURE 6
FRACTIONS - SINGLE LINE METHOD WITH INTEGER

9.03 When using the double line method, the fraction is shown with the numerator above the denominator and with a horizontal division line separating both, per Figure 7.

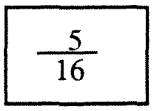


FIGURE 7
FRACTIONS - DOUBLE LINE METHOD

9.04 When the fraction is preceded by an integer, a hyphen symbol is not required between the integer and fraction. However, the fraction division line should be positioned midway in respect to the height of the character(s) in the integer, per Figure 8.

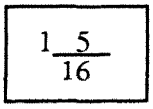


FIGURE 8
FRACTIONS - DOUBLE LINE METHOD WITH INTEGER

9.05 The single or double line method can be used for showing fractions that appear in dimensions of views of pictorial layouts. The single line method is recommended, since it provides for the efficient utilization of the drawing area, and its use is especially essential where lettering and linework may be congested.

9.06 The single line method shall be used for showing fractions in headings, notes and tables regardless of the style and method of lettering. This is to maintain uniform spacing between consecutive lines of lettering in notes, or to avoid using more than a single line to accommodate a fraction in headings or tables.

9.07 In all cases, the single line method in required with typed lettering, primarily because the fraction division line required in the double line method cannot be produced by the machines approved for typewriter lettering on drawings.

10.00 TEMPLATES AND PEN POINTS

10.01 The lettering templates and preferred pen point size combinations are listed in the following table. In general, the template selected for a specific practice requirement should have a character height comparable to the standard lettering sizes previously specified in this section. These are designated "STD" under character height in the table, per Figure 9.

CHARACTER HEIGHT - INCHES	TEMPLATE SIZE DESIGNATION	PEN POINT SIZE DESIGNATION
STD - 1/8 inch	120C	No. 0, or 0.3 (mm)
STD - 3/16 inch	175C	No. 2, or 0.5 (mm)

FIGURE 9
TEMPLATES AND PEN POINTS

10.02 The template scriber which holds pen points and is used with lettering templates should be adjusted so that the pen glides lightly across the drawing surface. With this adjustment, ink will flow freely and produce uniformly shaped and opaque characters.

11.00 TYPEWRITERS

11.01 The machines approved for typewriter lettering on drawings are the open-end carriage type and are suitable for lettering on standard drawing forms.

11.02 The standard style type used is Gothic (or approved equivalent) and the height of the upper case characters is 1/8 inch.

11.03 Only the upper case shall be used for letters. When required, use of lower case letters will be specified.

11.04 The fixed font type machine is fully electric. It has a set of replaceable individual type bars grouped in a basket arrangement. Each type bar usually consists of two characters.

A. The horizontal spacing is designed to automatically produce 10 characters per inch.

B. The vertical spacing automatically produces 5.28 lines per inch for consecutive lines of lettering. Manual adjustment for each line is required to produce 4 lines per inch for tabular type information.

11.05 The interchangeable font type machine is electromechanical and utilizes replaceable single unit font assemblies having the entire type face on each unit. Various fonts can be used; each with different style and size of type face. Only approved fonts that produce 1/8 inch high Gothic style lettering should be used. Fonts should be adjusted for use on a specific machine and should not be interchanged between machines.

A. The horizontal spacing is designed to produce 10 characters per inch. This feature is adjustable, and the character per inch setting should be at 10.

B. The vertical spacing automatically produces 4 lines per inch for tabular type information. Manual adjustment for each line is required to allow 1/16 inch minimum spacing between consecutive lines of lettering.

12.00 DRAWING SURFACE PREPARATION AND MAINTENANCE FOR LETTERING

12.01 The preparation and maintenance of the drawing surface are equally important for lettering and for linework. Lettering can be produced using the typewriter, ink or pencil. The characteristics of typewriter lettering are approximately the same as ink lettering, and for purposes of drawing preparation and maintenance, the requirements for ink shall apply to typewriter lettering.

12.02 For accessing the specific drawings (i.e., forms and symbols) it is necessary to utilize the existing library information located in the Equipment Engineering Center. Also, additional information is provided by the Records Group.

DRAWING FORM REQUIREMENTS

CONTENTS

1.00 GENERAL

1.01 The standards covered herein shall apply to U S WEST Communications primary drawing forms controlled by dimensional and type size requirements. They are referred to in this part as "primary drawings," that are used in the procurement of preprinted drawing forms for general usage.

2.00 REQUIREMENTS FOR STANDARDIZATION

2.01 The test of any drawing is that it is suitable for interpretation by the user. The essential requirements are to establish and use standard drawing forms.

3.00 DRAWING FORM CONTROL AND DESIGNATIONS

3.01 Drawing formats shall be approved by the Engineering Standards Organization. All preprinted drawing forms are identified by the designation TF-XXX-XXX or DA-XXX-XXX and date of issue.

3.02 The drawing forms fall into two categories: (1) formats that are universally applicable to any equipment system; and (2) formats that are only used for a specific equipment system. Use of both categories is administered by the Engineering Services Records Group.

4.00 PRIMARY DRAWING FORMAT CONTENT AND PREPARATION

4.01 The linework and lettering shown shall only be comprised of the following applicable items:

A. Drawing border lines

B. Information required in the margin between the border lines and the edges of the form

C. Linework outline of revision note or issue number column and associated heading information

D. Linework outlines of drawing identification information boxes - i.e., title, drawing number, rating and size (with size designation shown)

E. Note headings

F. Linework for tabular formats

G. Tabular main heading and column heading designations

H. Tabular line or item number designations

5.00 PREPRINTED DRAWING FORMS

5.01 Preprinted drawing forms shall be in accordance with the primary drawing provided by the Engineering Standards Organization. Printing requirements for forms used by U S WEST Communications shall be provided by the Engineering Standards Organization and administered by the Engineering Services Records Group.

5.02 Generally, when revised drawing standards affect preprinted formats, existing stocks of the affected preprinted form shall be used until depleted. Usually, the form shall be used as printed, unless specific directives are issued by the Engineering Standards Organization to update the form to reflect the latest standards.

5.03 When preprinted forms are revised, the users shall be notified of the description of change and the action to be taken with respect to existing stock.

6.00 FORM SIZE DESIGNATIONS

6.01 The method used to designate drawing form size utilizes the letter "S" preceded by a numerical or alphanumerical designation. The numeral indicates the approximate overall sheet area in square feet, and it is approximate because the actual calculated area is round-off to the next higher whole number.

6.02 The dimensions listed are in inches and are the actual sizes to the outer edges of the drawing sheet. The length also represents the normal base line of the form. The drawing title, number and size designation boxes shall appear at the extreme right along the bottom drawing border line paralleling the base line. Preprinted forms are available for use in the preparation of new and redrawn drawings in the following sizes:

SIZE DESIGNATION	LENGTH	WIDTH
6S	34	22
X8S	39	27
12S	49	33

6.03 Conversion of an existing drawing from a discontinued size format to an active size format shall be effected when the original is replaced on a redraw basis.

7.00 MICROFILMING CENTERING ARROWS

7.01 All drawings subject to microfilming require some means of orienting the drawing on the microfilm camera copyboard in order to center the drawing image within the frame of film. This means is provided by showing three or more arrows about the perimeter of the drawing. The requirements covered herein shall apply to those existing drawings subject to microfilm which may not have had the arrows shown when the drawing was originated.

7.02 Placement of arrows on the drawing sheet shall conform to the following:

A. When the sheet length is greater than the sheet width, an arrow shall be placed in the bottom and two side margins.

B. When the sheet length is smaller than the sheet width, an arrow shall be placed in the top, bottom and left-side margins. No arrow will appear in the right-side margin.

C. The arrows take precedence over any other information or linework that appears outside the drawing border lines and coincides with the location of the arrow.

7.03 Arrows shall be shown in the margin between the drawing border line and the edge of the drawing sheet. The direction of the arrowhead shall be toward the center of the drawing form and the leader line shall be extended to the edge of the form. The arrowhead shall be solid and should conform with Figure 1.

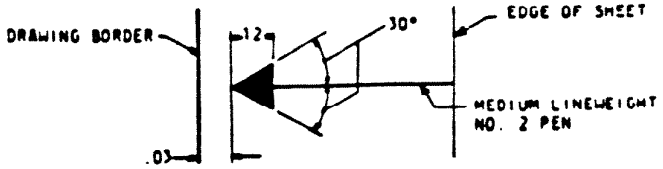
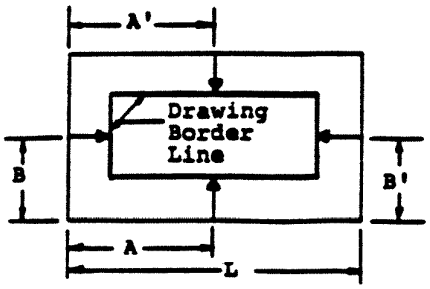


FIGURE 1
MICROFILM CENTERING ARROW

7.04 For drawings with sheet lengths of 49 inches or less, the arrows should be located at the midpoints of the horizontal and vertical edges of the drawing form.

A. Figure 2 reflects the requirements and location for showing arrows on the preferred standard size drawing formats. All dimensions are in inches.



FORM SIZE	L	A	A'	B	B'
6S	34	17	-	11	11
X8S	39	19.5	-	13.5	13.5
12S	49	24.5	-	16.5	16.5

FIGURE 2
LOCATION OF MICROFILM CENTERING ARROWS

8.00 TABULAR FORMATS

8.01 A tabular format is an arrangement of information bounded by linework. This excludes drawing number boxes, revision notes and title box information. Tabular formats are usually comprised of a number of vertically and horizontally divided fields separated by linework. Placement and arrangement of tabular formats on drawings depends primarily upon growth requirements and related drawing information. Certain tabular formats are standardized by application, and in these cases, the tabular format will be preprinted on the applicable drawing form.

8.02 The following requirements shall be followed where they apply:

A. Drawing border lines, revision column border or title box outline may be used as a portion of the table outline.

B. Tables may be shown adjacent to one another without any spacing between the table outlines. When shown in this manner, the adjacent table outlines shall coincide, and the division line between the two tables shall be shown with a thick lineweight.

C. Tables subject to expansion in one or two directions shall not be shown with the table outline on the growing sides.

D. Spacing of vertically divided fields depends entirely upon the specific character count in the content of each field. However, the minimum space between the lettering and the adjacent vertical line shall be equivalent to one character space.

E. Spacing of horizontally divided fields depends upon the size of lettering and the number of lines of information entered between the horizontal lines. For lists of horizontal 1/8 inch high lettered information, the spacing of horizontal linework is 1/4 inch and multiples thereof. For other conditions, see Section III, Part B, Paragraph 7.00.

8.03 Standard Lineweights - Figure 3 only depicts the lineweights for various lines used in tabular formats, and not an actual table format. Each format depends upon the drawing application and information requirements.

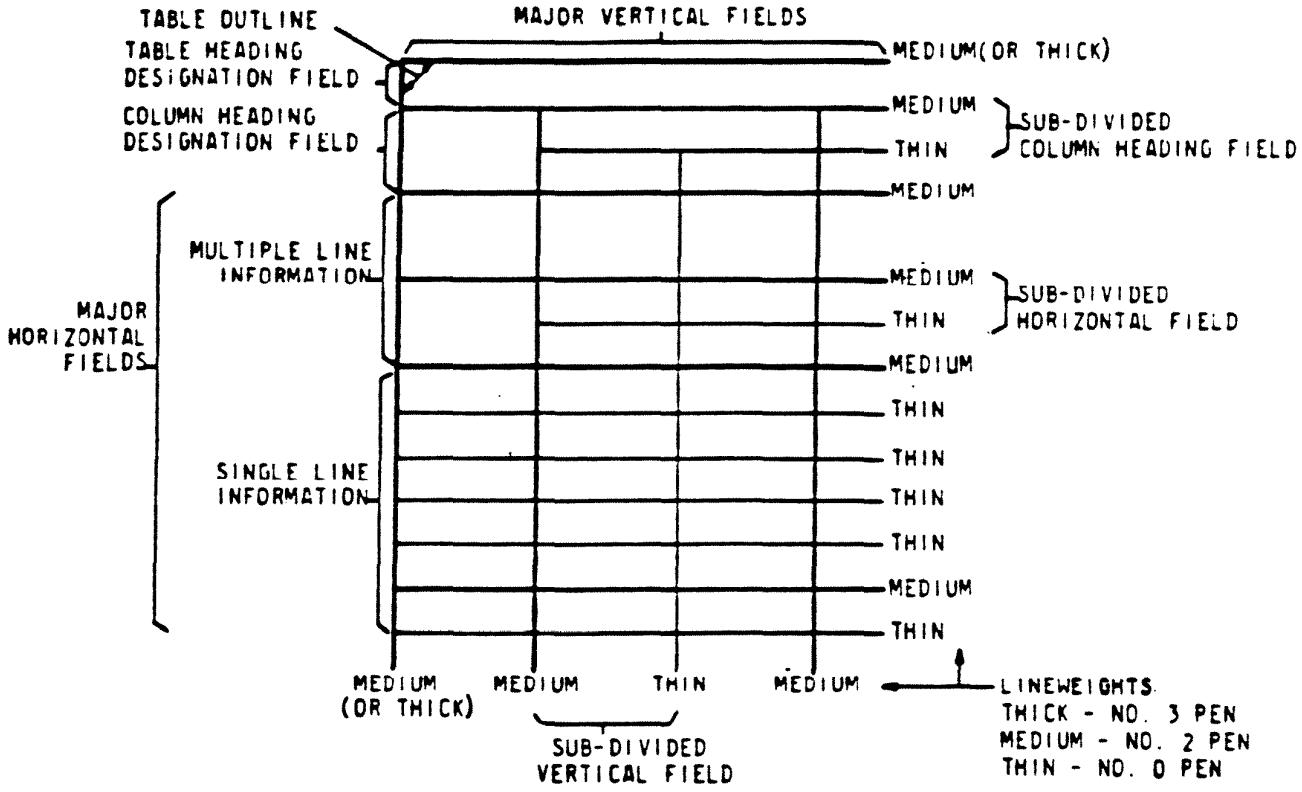


FIGURE 3
TABULAR FORMAT LINEWEIGHTS

EDITORIAL STANDARDS

CONTENTS

1.00 GENERAL

1.01 This part covers editorial standards used on engineering drawings.

1.02 In the preparation of drawings, various questions arise, for example: where shall a note reference be placed; or when shall a number be shown as an Arabic symbol or spelled out as a word. The following Drawing editing rules shall apply to all drawings.

1.03 The use of the term Drawing Notes in this section indicates notes appearing under the heading NOTES, ENGINEERING NOTES, etc. The term does not refer to notations appearing in the body of the drawing.

2.00 ABBREVIATIONS AND LETTER SYMBOLS

2.01 It is preferable that abbreviations be used only when there is insufficient space to accommodate the full word and in issue column revision notes relating to a particular issue of a drawing. There are some words, however, which through usage and familiarity are preferred in an abbreviated form. For example NO. shall always be used in place of "number". Other abbreviations in this category are FIG., CAD, and APP.

2.02 A period shall be placed only if shown in the Primary List of Abbreviations, Bellcore Practice 751-410-101.

2.03 The same abbreviation shall be used for both singular and plural forms of a word, for example:

CIRCUIT, CIRCUITS - CKT
FIGURE, FIGURES - FIG. 1, 2, AND 3 not FIGS. 1, 2, AND 3
PARAGRAPH, PARAGRAPHS - PAR.

2.04 Group or List - In drawing notes and tables, the words group or list may be abbreviated G or L, respectively, for example:

G4; L12;L1

3.00 QUOTATION MARKS

3.01 Quotation marks around designations shall not be used except when the lack of such marks will cause confusion or when the letter "A" is involved, for example:

"A" BAT. not A BAT.
Y OPTION not "Y" OPTION
D3 WIRE not "D3" WIRE

4.00 COMMA

4.01 The comma shall be used as a mark of separation to make clear the group of words, phrases, and clauses in a sentence or in tabular listing or drawing title entries.

4.02 When a note contains a sequence of three or more items, the comma shall be used as illustrated in the following:

NUTS, BOLTS, AND WASHERS
22GA, TYPE C, EG, OR BU WIRE

5.00 PERIOD

5.01 A period shall be placed at the end of each Drawing Note and after all abbreviations appearing in the body of the drawing requiring a period.

6.00 CONTRACTIONS

6.01 Contractions such as DON'T, DOESN'T, etc., shall not be used on drawings; instead, the forms DO NOT, DOES NOT, etc., shall be used.

7.00 IMPERATIVE FORM - DRAWING NOTES

7.01 All drawing notes conveying engineering or manufacturing requirements shall be stated in the imperative form. The form using the word shall is preferred.

8.00 DASH, HYPHEN OR ASTERISK

8.01 When listing the various types of standard drawings such as Manufacturers Wiring, Schematic, Equipment Diagrams, etc., or job drawings, in the body of job office record drawings, the dash, hyphen or asterisk between the alphanumeric shall be omitted.

9.00 PERCENT SIGN

9.01 The word PERCENT and not the sign % shall be used in Drawing Notes. When the sign is used in the body of a drawing it shall be shown as %, for example 65 ± 2%.

10.00 X SYMBOL

10.01 Do not use the symbol "X" in place of the word "by" when measurements appear in Drawing Notes, for example:

8-INCH BY 12-FOOT BOARD not 8-INCH X 12-FOOT BOARD
25mm BY 50mm not 25mm X 50mm

11.00 # SYMBOL

11.01 The # symbol shall not be used to indicate number or pounds. When indication of the word NUMBER is necessary, the abbreviation NO. shall be used; when indication of the word POUND(S) is necessary, the abbreviation LB or letter symbol lb shall be used.

12.00 INCH OR FOOT INDICATION

12.01 Foot or inch units of measurement shall be indicated on drawings in accordance with the following rules:

A. The inch mark (") and the foot mark (') shall not be used in Drawing Notes.

B. When a dimension in inches is referred to in a Drawing Note, the words INCH or INCHES shall be used (even though the drawing is covered by an all-dimensions-in-inches note).

C. When a Drawing Note contains a dimension in feet and inches, the dimension shall be given as follows:

7 FEET 6 INCHES

13.00 NUMBERS - WRITTEN FORM

13.01 Quantities, other than measurable, up to and including ten should be spelled out in drawing notes, for example:

THE KIT INCLUDES TWO SCREWDRIVERS AND THREE WRENCHES

13.02 When a series contains a quantity that is higher than ten, all are expressed in digit form, for example:

3 TRUNK GROUPS, 80 TRUNKS PER GROUP
THE KIT INCLUDES 2 SCREWDRIVERS, 3 WRENCHES, AND 15 FITTINGS

13.03 All quantities both above and below ten should be spelled out in drawing notes when they immediately precede units of measurement, for example:

NINETY SIX 3 AMPERE TUBES
SIX 115 VOLT SYNCHROS
TWO 110V TRANSFORMERS

13.04 When quantities of measurements occur at the beginning of the sentence, it is recommended that these figures are spelled out, or the sentence rewritten to avoid it beginning with a number. In either case, however, mixed usage of quantities or measurements should be avoided on the same document, for example:

SIXTY Hz MOTORS SHALL BE USED
THE EQUIPMENT SHALL INCLUDE 60 Hz MOTORS
60 Hz MOTORS SHALL BE USED

14.00 NUMBERS - DIGIT FORM

14.01 Numbers used with a measurable quantity are always in digit form including the digit one, for example:

3 FEET 5 INCHES
5 AMPERES
1 INCH
A 10-1/2 HP MOTOR
THE 120 VOLT 60-HERTZ SOURCE
9 SECONDS

14.02 Numbers that are parts of compound expressions should be expressed in digits, for example:

5-STEP PROCESS
2-WAY CONTROL

14.03 Compound fractions are written in digit form with an interior hyphen and a slant. In a compound modifier, there is no hyphen between the last digit and the unit of measurement, for example:

2-15/16 INCHES, 2-5/8 INCH WIDTH

14.04 When the numeral 1 occurs in a Drawing Note, notation, or in the description of a stock list item, the unit of measurement shall also be specified, for example:

1-INCH PIPE not 1 PIPE
1-INCH SPOTFACE not 1 SPOTFACE

NOTE:
This rule shall be followed even when the drawing is covered by an all-dimensions-in-inches note.

14.05 When values are less than 1 in Drawings Notes, the unit of measure shall always be in the singular, for example:

0.01 INCH
0.14 VOLT
0.02 AMPERE
0.015 OHM

14.06 Four digits should be written in close form (1520) unless they are part of a series where some numbers contain more than four digits, for example:

7,543
19,678
300
8,123

15.00 UNDERSCORING

15.01 Do not underscore on drawings.

16.00 TEMPERATURE UNITS

16.01 When temperatures indicated in Celsius (centigrade) and Fahrenheit units, Celsius units shall precede Fahrenheit units, for example: 20° (68° F).

16.02 Tolerances shall be stated in the following manner: 20 ± 5° C (not 20°C ± 5° C).

17.00 COMPONENT VALUES

17.01 Values of resistors, capacitors, and inductors shall be indicated as follows:

A. Resistance values shall be expressed as follows:

1. Ohms - Resistance up to and including 999 ohms shall be expressed in ohms, for example, 500 (ohms).

2. Ohms or Kilohms - Resistance between 1,000 and 99,999 ohms may be expressed in ohms (: : 1/L: : 2/) or kilohms (k: : 1/L: : 2/), depending on which form of expression requires the fewest number of characters, excluding commas. A kilohm is equivalent to 1000 ohms, thus, 3,455 ohms shall be indicated as 3.455 while 3,000 ohms shall be indicated as 3k: : 1/L: : 2/.

3. Kilohms - Resistance between 100,000 and 999,999 ohms shall be expressed as kilohms. For example, 560,000 ohms shall be expressed as 560k: :1/L: : 2/.

4. Megohms - Resistance between 1,000,000 and 9,999,999 ohms shall be expressed as megohms. A megohm is equivalent to 1,000,000 ohms, thus, 1,500,000 ohms shall be indicated at 1.5M: : 1/L: : 2/.

B. Capacitance up to and including 9,999 picofarads shall be expressed in picofarads, for example, 7,530pF (picofarads). Capacitance of 10,000 picofarads and above shall be expressed as microfarads. A microfarad is equivalent to 1,000,000 picofarads, thus, 92,000 picofarads shall be expressed as .092uF (microfarads).

C. In specifying values of inductance, the unit of measure shall be used which will require indication of the fewest number of ciphers. For example, 2uH (microhenries) is preferable to .002mH (millihenries) and 5mH (millihenries) is preferable to either .005H (henries) of 5,000uH.

D. To eliminate the need for repeating symbols such as, M: :1/L: : 2/, uF, or V when a symbol is generally applicable throughout a drawing, use of a general note such as the following recommended:

UNLESS OTHERWISE SPECIFIED RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES IN MICROFARADS, VALUES PRECEDED BY THE SYMBOL + (PLUS) OR - (MINUS) ARE IN VOLTS.

18.00 TOLERANCE LIMIT INDICATION IN NUMBERED NOTES

18.01 To avoid irregular spacing of lines, when tolerance or size limits are included in a note, the basic dimensions and limits shall be shown in a line illustrated in the following samples:

A. .742 + .005 - .002
not
.742 + .005
- .002

B. .748 - .740
not
.748
.740

19.00 EXPRESSIONS

19.01 Use the following methods of expression in Drawing Notes.

ON DRAWING, ON PAGE, ON SHEET
IN FIGURE, IN PHOTOGRAPH, IN SPECIFICATION,
IN TABLE OR LIST, IN ISSUE, IN SECTION

20.00 CORPORATE NAMES

20.01 Only approved short forms of corporate names and approved abbreviations should appear on drawings.

20.02 Bell Communications Research Incorporated - The approved short form is Bellcore.

20.03 U S WEST Communications - The approved short form is USWC.

METRIC REQUIREMENTS FOR CENTRAL OFFICE RECORDS

CONTENTS

1.00 GENERAL

1.01 This part defines the requirements and techniques for showing metric dimensions on office record drawings.

2.00 METRIC APPLICATIONS

2.01 If the building and the equipment are both designed in metric, then the office record drawings shall show metric units exclusively - "hard metric" notation.

2.02 If the building and equipment are designed in U. S. Customary dimensions, except for a few pieces in metric, then the original metric shall also be shown some place on the office record drawing as convenient: in the table of frame lengths; dual dimensioning; etc. Such exceptions shall be identified with a pound sign (#) following the dimension indications at the location, and covered with a note, i.e.: # DESIGNED IN METRIC. A similar rule shall apply in the case of a few U. S. Customary dimensioned units in an otherwise metric office.

2.03 In the case of Paragraphs 2.01 and 2.02, the office record drawings are considered to be metric drawings.

3.00 UNITS OF LINEAR MEASURE

3.01 U. S. Customary Units shall be expressed in feet and inches, with less than an inch represented by a fraction, ordinarily in units no smaller than sixteenths, i.e.: 1/16 = about .06 inch.

3.02 Metric dimensions shall ordinarily be expressed in whole millimeters, abbreviated mm (lower case), i.e.: mm-about 0.4 inch. Where lower case letters are not available capitals may be used.

3.03 Internal to equipment, as for modifications, higher accuracy may be necessary. Externally, the given accuracy is specified only because of the possibility of repetitive use; such as, for a long lineup of frames where a small inaccuracy could conceivably cause problems due to the cumulative error effect.

4.00 DUAL DIMENSIONING CONVENTIONS

4.01 The recommended method of showing dual dimensioning on office record drawings is with the use of square brackets with the millimeters first, and with the two dimensions either on the same line or one above the other; i.e.: 137 [0-5-3/8].

A. The notation can be used either at the location of the equipment on the drawing or in tabular form, as in Figure 1. On large drawings, such as for office records, the former is preferable for reasons of minimizing printing, convenience to the users, and to eliminate the errors involved in table look-up. Where there is insufficient room for both dimensions in the body of the drawing, show one of the measurements, preferably millimeters, in the body of the drawing and show the full dual notation in the table.

762 [2-6]
152 [0-6]
3670 [12-1-1/2]

FIGURE 1
METRIC CONVERSION

B. Unit names (inches, etc.) are not shown in the body of a dual dimensioned drawing.

C. On office record drawings using "soft metric" notation the square bracket should be used for dual dimensioning and should not be used for approximate dimensions. The recommended international standard for the latter purpose is the parenthesis.

4.02 Tables of frame lengths, etc., on dual dimensioned drawings shall show dual notation, as illustrated in Figure 2.

D	6929 [22-8-13/16]	
C	4909 [16-1-1/4]	
B	65 [0-2-9/16]	E
A	89 [0-3-1/2]	S
SYM	LENGTH	SUF

FIGURE 2
LENGTH OF FRAME
SPACE, END GUARD

4.03 Use of Decimals, Symbols, and Commas on Metric Office Record Drawings.

A. If either the feet or the whole inches are zero the zero shall be shown; i.e.: [0-0-3/8]

B. If a decimal is used for a number less than one, a zero shall be used before the decimal point: 0.32.

C. The comma is widely used in other countries as the decimal point. Consequently, its customary use in this country to separate the digits of a number into groups of threes, can cause confusion. The procedure on metric drawings, if necessary to separate digits into groups of threes, counting from the decimal point left to right, shall be by the use of a space. In the case of only four or five digits on either side of the decimal point it is recommended that the space should not be used except in tables for uniformity, i.e.: .234 567.

D. It is recommended that on metric drawings "M" for thousands and "C" for hundreds, etc., should not be used because the symbols could be confused for metric prefixes.

5.00 METRIC IDENTIFICATION

5.01 Office records having metric dimensioning should be identified near the title box with 10mm bold lettering:

METRIC

(See Note _____)

5.02 On "hard metric" drawings the note referred to above should be similar to the following:

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN MILLIMETERS.

A. On such drawings, any exceptions not designed in metric, should show the foot and inch symbols unless dual dimensioning is used.

5.03 On "soft metric" drawings the note should be similar to the following:

DUAL DIMENSIONING IS USED, WITH THE MILLIMETERS SHOWN UNENCLOSED AND WITH THE EQUIVALENT FEET AND INCHES, ADJACENT IF FEASIBLE, SHOWN IN SQUARE BRACKETS.

5.04 If a conversion table is included on the drawing, a note similar to the following should be used:

FOR METRIC DIMENSIONS AND EQUIVALENT NOT GIVEN IN THE BODY OF THE DRAWING SEE THE CONVERSION TABLE.

6.00 SCALE

6.01 A recommended way of showing a scale for a dual-dimensioned drawing is shown in Figure 3.

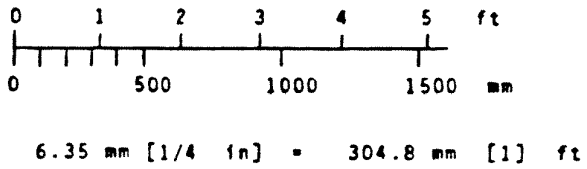


FIGURE 3
TYPICAL METRIC SCALE

7.00 METRIC CONVERSIONS

7.01 Metric conversions can be made by using a computer program, calculator or conversion charts given in Paragraph 9.00.

7.02 Tolerancing, if needed, is covered in Central Office Telecommunications Equipment Engineering Standards for U S WEST Communications.

7.03 Nominal given dimensions are treated as entirely accurate even though actual building dimensions may vary by several inches. Building dimensions on architect's drawings may be given down to eights of an inch, and equipment dimensions on manufacturing drawings down to sixteenths.

7.04 Round off where the accuracy of the dimension being used is specifically defined, and it is necessary to similarly specify the accuracy of the results of a calculation. This would not be a normal circumstance on office record drawings.

8.00 NOTES AND SYMBOLS ON METRIC DRAWINGS

A. UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN MILLIMETERS.

B. DUAL DIMENSIONING IS USED, WITH THE MILLIMETERS SHOWN UNENCLOSED AND WITH THE EQUIVALENT FEET AND INCHES, ADJACENT IF FEASIBLE, SHOWN IN SQUARE BRACKETS.

C. FOR METRIC DIMENSIONS AND EQUIVALENTS NOT GIVEN IN THE BODY OF THE DRAWING SEE THE CONVERSION TABLE.

D. # DESIGNED IN METRIC

9.00 CONVERSION DATA

9.01 Metric Units:

M X 10 = dm (decimeter)	mm 10 = cm
M X 100 = cm (centimeter)	mm 100 = dm
M X 1000 = mm (millimeter)	mm 1000 = M (meter)

9.02 Conversion equivalents

A. Linear Metric Formulas:

in x 25.4 = mm	ft x 304.8 = mm
in x 2.54 = cm	ft x 30.48 = cm
in x .254 = dm	ft x 3.048 = dm
in x .0254 = M	ft x .3048 = M

B. Millimeters as decimal parts of an inch:

1mm = .039 in	10mm = .394 in	18mm = .709 in
2mm = .079 in	11mm = .433 in	19mm = .748 in
3mm = .118 in	12mm = .472 in	20mm = .787 in
4mm = .157 in	13mm = .512 in	21mm = .827 in
5mm = .197 in	14mm = .551 in	22mm = .866 in
6mm = .236 in	15mm = .591 in	23mm = .906 in
7mm = .276 in	16mm = .630 in	24mm = .945 in
8mm = .315 in	17mm = .669 in	25mm = .984 in
9mm = .354 in		

C. Fractions of an inch and their decimal equivalents:

1/64	=	.016	17/64	=	.266
1/32	=	.031	9/32	=	.281
3/64	=	.047	19/64	=	.297
1/16	=	.062	5/16	=	.312
5/64	=	.078	21/64	=	.328
3/32	=	.094	11/32	=	.344
7/64	=	.109	23/64	=	.359
1/8	=	.125	3/8	=	.375
9/64	=	.141	25/64	=	.391
5/32	=	.156	3/32	=	.406
11/64	=	.172	27/64	=	.422
3/16	=	.188	7/16	=	.438
13/64	=	.203	29/64	=	.453
7/32	=	.219	15/32	=	.469
15/64	=	.234	31/64	=	.484
1/4	=	.250	1/2	=	.5

33/64	= .516	49/64	= .766
17/32	= .531	25/32	= .781
35/64	= .547	51/64	= .797
9/16	= .562	13/16	= .812
37/64	= .578	53/64	= .828
19/32	= .594	27/32	= .844
39/64	= .609	55/64	= .859
5/8	= .625	7/8	= .875
41/64	= .641	57/64	= .891
21/32	= .656	29/32	= .906
43/64	= .672	59/64	= .922
11/16	= .688	15/16	= .938
45/64	= .703	61/64	= .953
23/32	= .719	31/32	= .969
47/64	= .734	63/64	= .984
3/4	= .750		

COMMON ROUTINES

CONTENTS

CONTENTS

1.00 GENERAL

1.01 This part outlines the general requirements for originating and maintaining Office Record Drawings. Requirements are identified by the use of the words "Shall" or "Required". The words "May" or "Recommend" are used for optional conditions.

1.02 Office Record Drawings are those job drawings which in total contain all information pertinent to Central Office Equipment (COE). The information includes identification, location, description, application, assignment, function and other supporting data depending upon specific needs. The requirements covered herein are those commonly applicable to all Office Record Drawings.

1.03 Each job drawing is a separate and distinct document. Notes, symbols, sketches, etc., shall be shown on the same drawing and not cross referenced to other job drawings, except when required for:

A. Cross referencing to job drawings in the same series for continuation and growth

B. Specific conditions as covered in other parts of this publication

C. Sketches common to more than one drawing

D. Class designations relating equipment location to wiring list item

1.04 Job Office Record Drawings generated via Computer Output Microfilm (COM), in general, shall utilize the existing requirements as outlined in the various parts of this publication and U S WEST Communications Technical Publication 77351.

2.00 ISSUE NOTES

2.01 Job drawing Issue Notes provide either: (1) a record of additions, deletions, and changes in circuit, equipment, or other types of office information depicted on job drawings, combined with the authority used for this activity; or (2) the authority only. These two Issue Note information types are labeled Descriptive and Basic, respectively.

2.02 Basic Issue Note (See Figure 1). All job drawings shall contain at a minimum, the basic Issue Note whose elements which are:

A. U S WEST Communications Authorization information:

1. BVAPP Order Number

2. Project Number, or Spec Number when required

3. Estimate Number, when required

4. Order Letter Date

B. Engineering Company Authority:

1. Engineering Company Order and Specification Number including SA (Supplementary Authorization) or CN (Change Notice) Numbers shall not be shown.

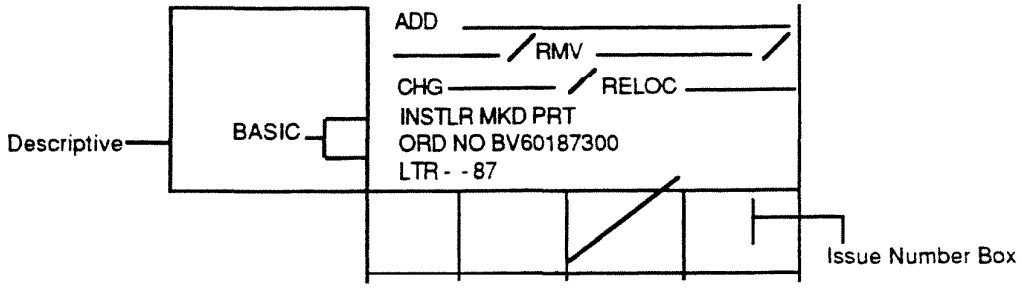


FIGURE 1
ISSUE NOTE

2.03 Descriptive Issue Note - A Descriptive Issue Note contains all the elements of the Basic Issue Note plus additional descriptive information which is peculiar to a given type of job drawing. Action words such as add, change, remove, etc., shall be shown in Issue Notes as required, (preferably preceding the item affected). Separate the various actions by a slant.

A. Since the abbreviation of the word "change" is the same as the abbreviation for the word "charge" a distinction between the two must be made when both occur in the same action. In such cases, the word "change" shall always be abbreviated and the word "charge" shall always be spelled out in full.

B. If the phrase "SEE JOB SPEC FOR DETAILS" (or similar) is authorized by a part in this publication for use in an Issue Note, and if repeated appearances of the above phrase on a particular drawing results in the use of an undesirably extensive amount of Issue Note space, then it is permissible to substitute a symbol, such as "D", for the phrase. An explanatory note similar to the following will then be required under "NOTES".

D Indicates "SEE JOB SPEC FOR DETAILS"

C. This authorization to use the symbol instead of the phrase is strictly restricted to the special circumstances defined above, and shall not be interpreted to permit extensive replacement of full descriptive Issue Notes with the more abbreviated notation.

2.04 In no case shall Issue Notes be physically altered or relocated on any drawing. Rather, it will be necessary to retain the issue notes on the drawing as is and redraw or refurbish the tracing with use of the procedures in Paragraph 29.00 herein for "superseded drawings".

2.05 In no case shall the Issue Note read only "Changed Per Engineer's or Telephone Company's Marked Print".

2.06 Only one order number shall be shown in each specific issue of the drawing. However, on those common base drawings associated with routing for Carrier, Microwave, Broad Band, etc., all order numbers shall be shown. The order number shall be the final information item in the Issue Note column prior to the issue number box.

2.07 On all changes per an Installer's marked print, only the notation "INSTALLER'S MARKED PRINT" shall appear in the body of the Issue Note plus the basic Issue Note.

2.08 Often, Engineers associate the drawing changes with a project, control, or estimate number. Prefix this number with "PROJ NO.", "SPEC NO." or "EST NO." and show this information to the right of, or directly above the order or reference number authorizing the changes.

2.09 When previously introduced errors are detected in job office record drawings, they shall be corrected accordingly on a "Record Only" basis, as follows:

A. Record Only Changes without other changes; in all such cases, only the notation "FOR RECORD ONLY" shall appear in the body of the Issue Note plus the basic Issue Note.

B. Record Only Changes along with other changes; either a basic or a descriptive Issue Note shall be written for the regular portion of the change. Neither the detailing for the "record only" change nor the notation "FOR RECORD ONLY" shall appear in the Issue Note.

2.10 For specific Issue Note requirements, see the respective parts in this publication or as indicated in Paragraph 2.12.

2.11 When various types of drawing records are placed on a common tracing form, the Issue Note requirements for each type of record shall be applied as specified in the relevant parts of this publication.

2.12 Issue Note requirements are as follows for Job Drawings which are not covered in the various parts of this publication:

A. ASSIGNMENT TYPE DRAWING - A basic Issue Note is required.

B. APPLICATION, BLOCK AND TRAFFIC SCHEMATICS - A descriptive Issue Note is required.

EXAMPLE: Add BLK G-2/RMV BLK F1/ CHG BLK D-1 to 5.

C. BUS BAR PLAN - A descriptive Issue Note is required. The Issue Note shall record:

1. Bus bar additions, removals and or changes by showing:

quantity
detail number
location

2. Sketches, sections or views added or changed.

   EXAMPLE: ADD THREE D3 AT 48V BAT B, ONE D8 BAT CHARGE AT P BD 0101.3, VIEW B-5/RMV ONE D14 AT 48V BAT A/CHG D15 CUT, VIEW A-A.

3. A basic Issue Note will suffice for all other drawing changes not covered above.

D. BUS DUCT LAYOUT - A descriptive Issue Note is required.

1. The Issue Note shall specify the quantity, type, and location of duct section, tap box, or plug-in unit added or removed.

2. On "add" items, if the drawings show arbitrary run and section identification numbers such as A1, A2, B1, B2, etc., this identification shall be substituted in place of the type and location information.

   EXAMPLE: ADD TWO L102 SECT, ONE PLUG-IN NEAR 48V G3/RMV ONE L110 SECT NEAR COL 32.

   ADD SECT B1, B2, ONE L153 PLUG-IN AT B2/RMV ONE L110 SECT NEAR COL 32.

3. A basic Issue Note will suffice for all other drawing changes not covered above.

E. CABLE HOLE SHEATHING - A basic Issue Note is required.

F. CONNECTING TYPE DRAWINGS - A basic Issue Note is required.

G. DISTRIBUTING TERMINAL ASSEMBLY (DTA) - A basic Issue Note is required.

H. POWER DRAWING DETAILS - A basic Issue Note is required.

I. REGISTER RACKS (ASSIGNMENT TYPE) - A basic Issue Note is required.

J. RINGING TONE FRAME RINGING FUSE ASSIGNMENT - A descriptive note is required. The Issue Note text shall include action words (CHG, ADD or RMV) and indicate the item affected (FS POS, etc.) The Issue Note shall also list the page number of the affected pages.

K. RINGING TONE FRAME SPLITTING RESISTOR ASSIGNMENTS - A descriptive note is required. The Issue Note text shall include action words (CHG, ADD or RMV) and indicate the item affected. The Issue Note shall also list the page number of the affected pages.

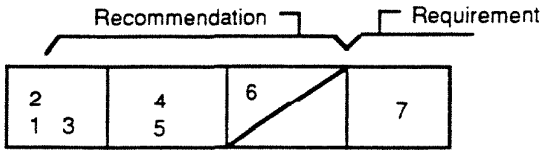
L. TUBE COOLING AND DEHYDRATOR DRAWING - A basic Issue Note is required.

2.13 Multisheet Drawing Issue Note - Issue Notes for multisheet drawings shall be shown on one of the sheets only. Drawings using the nonbanding format shall have the Issue Notes on the first sheet. Drawings using the banding (CRS) format shall have the Issue Notes on the last sheet. When superseding a multisheet drawing, the Issue Note on the superseding drawing shall reflect the sheet numbers of the sheets redrawn and those deleted.

2.14 Retraced or Reproduced Drawings - When a retraced or reproduced drawing is issued to supersede a drawing, it is no longer necessary to recopy the Issue Notes since the superseded drawing is retained on microfilm.

2.15 Dates on Issues - Regardless of the date of final approval by the originator, the date shown on any issue shall be the date when the tracing leaves the drafting room. These dates shall be located directly above the approval signatures in the issue column. On retraced drawings, show the date of the original drawing at the top of the issue column in the same position as for new drawings.

2.16 Format and Approvals on Drawings - Approval initials shall be placed in the blocks provided for the purpose in the issue column in accordance with the recommendations given in Figure 2. It is also recommended that the height of the approval boxes be 1/2 an inch and the width of the issue column be divided into four (4) equal parts. The minimum approval shall be at the drafter or equivalent level.



1, 2 Drafter - Typist

3 Drafting Checker

4 Job Originator (Detail Engineer)

5 Engineering Supplier

6 Insert "/" except when additional approvals are required

7 Issue Number

FIGURE 2
DRAWING APPROVAL FORMAT

2.17 Issue Note for Duplicate Job Drawings Authorization - If the same drawing change is authorized by two job drawing authorizations, the Issue Note for higher issue shall read "CHG MADE ON PREV ISS." The above will apply where either descriptive or basic Issue Notes are employed.

2.18 Issue Note for Canceled Job Drawing Authorization - If a change authorized by a job drawing authorization is not made, the Issue Note shall read "CANCELED". The above will apply where either descriptive or basic Issue Notes are employed.

3.00 ISSUE NUMBERS

3.01 An issue number of "1" shall be assigned to an original drawing. For each subsequent change, the issue shall be raised by one.

3.02 In addition to showing the inked or typed issue number in the issue column/issue number box, the issue number shall also be shown in pencil in the issue box in the drawing title area.

3.03 On multisheet drawings, show the inked or typed issue number on the first sheet in the issue column/issue number box, and in pencil in the issue box in the title area. On subsequent sheets, show the issue number in pencil in the issue box in the title area only.

3.04 On new or redrawn single and multisheet drawings, the designation "ISSUE" shall be shown in the issue box in the drawing title area using a minimum 1/8" lettering.

3.05 All sheets of a multisheet central office record drawing must have the same issue number.

3.06 On new or redrawn second and subsequent sheets of a multisheet job drawing using drawing forms having a preprinted sheet issue column, the column and heading shall be removed from the form.

3.07 On existing second and subsequent sheets of a multisheet job drawing having a sheet issue column, the issue number shall continue to be shown in both the sheet issue column and in the issue box in the title area.

4.00 TITLE BOX REQUIREMENTS

4.01 On all Central Office Records, it is a requirement for the Equipment Engineer or Detail Engineer to show the U S WEST Base Drawing Number and Title Box information.

4.02 Indicate the type of record such as "WIRING LIST" , "EQUIPMENT", "FLOOR PLAN", etc., in the first line of the title.

4.03 The name of the equipment shall be shown in the title box. Abbreviations should be used only when shown on the associated drawing aids, or at the Engineer's discretion when the full text information is too lengthy to be shown. Acronyms should not be used on a stand alone basis, but may be used as an adjunct: TERM DA AUTO SWG (TDAS).

4.04 Show the equipment designation, i.e.; Relay Rack Bays, Frames, Sections, etc. in the title space as applicable. The numbering shall include the ultimate equipment when known, both present and future, for which the drawing is designed.

4.05 Show the floor number in the title space.

4.06 Display the name of the U S WEST Communications Central Office for which the base number was reserved.

4.07 Typical locations for office designations and locations are shown in Exhibits 1, 2 and 3.

A. The office designation is shown in the lower left hand corner of the title box, or as shown in Exhibit 3. On common drawings (MDF, IDF, Fuse Bays, PRTD's, Power Equipment, etc.) for large buildings containing more than one office, bureau, or exchange, it may be advantageous for cabling reasons to provide more than one office designation. However, the designations shall conform with that information which is specified by the Equipment Engineer.

B. The location as indicated by Town and State is shown in the lower right corner of the title box, or as shown in Exhibit 3. The following is a list of states and approved abbreviations

Arizona	AZ
Colorado	CO
Idaho	ID
Iowa	IA
Minnesota	MN
Montana	MT
Nebraska	NE
New Mexico	NM
North Dakota	ND
Oregon	OR
South Dakota	SD
Utah	UT
Washington	WA
Wyoming	WY

C. Include the street address in the location information only when specifically requested.

D. When the Common Language Location Identification (CLLI™) Codes are required on job drawings, this information shall be shown in the upper left hand corner of the Title Box-Horizontal Format (see Exhibit 1). In many cases the upper left hand corner of the Title Box presently shows the job drawing number in this area, which, will be necessary to remove to allow for the addition of the CLLI™ Code. CLLI™ Codes are listed in Bellcore Practices 795-134-100 through 795-139-100.

NOTE:

Basically the CLLI™ is an abbreviation of a location, which consists of three elements:

1. Town or City
2. State, Province or Country
3. Place within the town or city, may be a building, utility access hole, pole, repeater hut or any other entity that requires identification.

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4.08 The first sheet of a multisheet drawing requires a title as covered in Paragraphs 4.01 through 4.07.

4.09 The second and subsequent sheets of a multisheet job drawing require a title consisting of the following:

A. Type of Record (i.e., Wiring List, Floor Plan, etc.).

B. Name and Designation of Equipment as covered in Paragraphs 4.03 and 4.04.

C. Office, as covered in Paragraph 4.07, Item A.

D. The Town and State as covered in Paragraph 4.07, Item B.

E. U S WEST, floor location, street address, and CLLI™ are not required on second and subsequent sheets of a job drawing.

4.10 Sheet numbers shall be shown in the sheet box in the following manner:

Sheet 1 of 3*	on first sheet
Sheet 2	on second sheet
Sheet 3	on third sheet, etc.

* Last sheet number of the drawing

4.11 The following are typical recommended titles on drawings.

A. RELAY RACK EQUIPMENT
A5 CHANNEL BANK
RN 633.22 TO .36
6TH FLOOR

B. CABLING, CABLE RACK &
AUXILIARY FRAMING PLAN
2ND FLOOR

C. RELAY RACK EQUIPMENT
TEST BAYS
RR 4 TO 6 (FUT 7)
OA FLOOR

D. CIRCUIT
POWER DISTRIBUTING
N1 CARRIER 100 LINE
1ST FLOOR

CLLI™ is a Trademark of Bell Communications Research, Inc.

E. WIRING LIST & EQUIPMENT
IDENTIFIER FRAME (ANI)
FRAMES 0 TO 3
2ND FLOOR

F. CABLE DUCT PLAN
POWER EQUIPMENT
1ST FLOOR

4.12 Title Box information is taken from the drafting authorization (Records Group Issue Request Form RG47-0011). The form also serves as the source document for ORI information.

4.13 Required definitive and explicit information can be provided only through proper completion of the drafting authorization every time a request is written. It is extremely important that frame numbers, relay rack numbers, switchboard position numbers, distribution frame (horizontal and vertical) numbers, and other similar numbering identification be in the correct field on all drafting authorizations.

5.00 LOCATION OF DRAWING NUMBER ON TRACINGS

5.01 The drawing number shall be placed on the drawing in the main drawing number box in the title area in the lower right hand corner, and the supplementary number box in the lower left corner, of each sheet of a manually prepared drawing. The first character shall be placed approximately 1/8" from the left side of the box to allow room for suffixes. Dash numbers for office record drawings shall be assigned in accordance with PUB 77351.

6.00 NAMES OF COMPANIES

6.01 The name appearing in the title box shall be U S WEST .

7.00 NOTES

7.01 All notes shall be designated "NOTES" and the notes shall be numbered from one up, regardless of the intended user, on new and redrawn drawings.

7.02 Each note or symbol shall be numbered individually.

7.03 Only those notes and/or symbols that apply in the body of the drawing, shall be documented in the notes column. When notes and/or symbols no longer apply within the body of a drawing, they shall be removed from the notes column. When an entire note is removed, the number of the note removed shall remain followed by the term "Unassigned". If the note is last, it may be removed in its entirety.

7.04 Standard wording for commonly used notes are generally shown on the DA (drafting aid) and also at the end of the various parts of this publication. The engineer may modify the given wordings or create new notes as required for job conditions.

7.05 Notes added to a drawing shall not contain references to Engineering Supplier's order number, dates, etc., but shall contain the Order Number and Letter Date from RG47-0011, see following example:

THE CENTRAL OFFICE GROUND SYSTEM WITHIN THIS OFFICE HAS BEEN SURVEYED, UPDATED AND OR CORRECTED TO COMPLY WITH THE U S WEST STANDARDS BV8H000008 DATED 3-17-86.

8.00 RESTRICTIVE NOTICE

8.01 The application of a Restrictive Notice for Office Record Drawings shall be as follows:

RESTRICTIVE NOTICE

The information on this drawing shall not be disclosed without the express written consent of U S WEST Communications.

9.00 LAYOUT OF DRAWINGS

9.01 When arranging equipment on a drawing, consideration shall be given to future space requirements in accordance with the ultimates if known.

10.00 DIMENSIONING

10.01 Dimensions applicable to specific types of office drawings shall be covered in the associated parts of this publication.

10.02 Common information for dimensioning applications, including metric notations, are covered in Section III, Part E.

10.03 When a dimension is unknown or unavailable, use the abbreviation UNKN where the dimension would appear. No explanatory note is required.

11.00 PICTORIAL LAYOUTS

11.01 In pictorial layouts that depict assembly of units, components, or the breakdown of a unit, the illustration need not be drawn to scale, but must be of a size to accommodate 1/8 inch high characters.

11.02 The minimum size of segments or of the space between the centers of vertically adjacent symbols, shall be 1/4 inch as per the examples shown in Figure 3. The 1/4 dimension indications are used here for illustration purposes only and shall not be shown on the drawings.

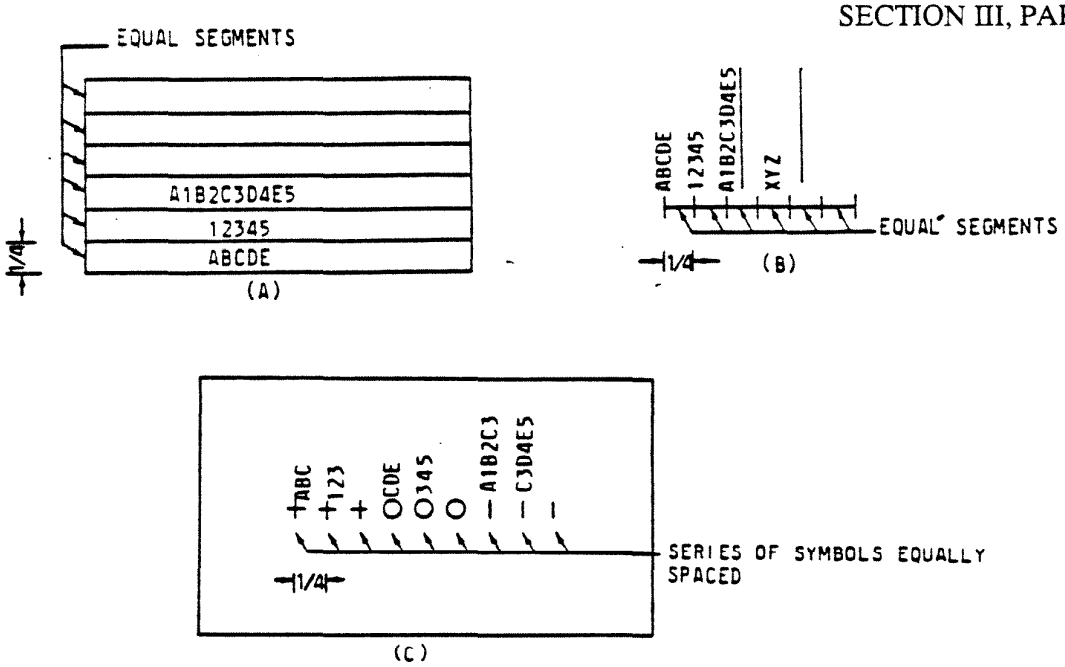


FIGURE 3
NONSCALED LAYOUTS, MINIMUM SPACING FOR ASSEMBLY
OR BREAKDOWN OF UNITS OR COMPONENTS

11.03 When a drawing does not permit the showing of all of the details required in a given area, an enlarged sketch shall be prepared. Designate the sketch to agree with its cross reference location. Sketches shall be arranged in consecutive order.

12.00 DESIGNATED OWNERSHIP

12.01 All equipment that is recorded on an office record drawing is owned by U S WEST Communications and shown in the drawing title box.

13.00 SUPPLIER EQUIPMENT RECORDS

13.01 Equipment suppliers shall record and maintain all appropriate Office Record Drawings. Procedures for listing detailed requirements. Such procedures are discussed in PUB 77351.

13.02 Engineering shall provide sufficient record information such as title, part number, model number, serial number, trademark, etc., to enable simple reorder, removal, modification or input to the records system.

13.03 Identifying information not conducive to line, table, or column application shall be covered by notes.

14.00 EQUIPMENT STAMPING - NONSTANDARD DRAWINGS

14.01 Stamping requirements for equipment on Central Office Record Drawings furnished from other than standard drawings to be provided by the Equipment Engineer.

15.00 ABBREVIATIONS

15.01 Old and obsolete abbreviations are not acceptable. The current standard abbreviations or letter symbols shall be used on all documents, newly created drawings, changes and additions, (see Bellcore Practice 751-410-101).

16.00 DEPICTING DUPLICATE INFORMATION OR EQUIPMENT

16.01 Ladders may be used as follows:

A. To indicate consecutive like information or equipment.

B. To indicate nonconsecutive like information or equipment provided the space between the ladder and adjacent lines and/or lettering meets spacing requirements specified in Section III, Parts A and B of this publication. When it is impossible to meet those criteria the information must be repeated.

16.02 Straight line arrows may be used for assignment formats when consecutive appearances of identical within tabular.

16.03 A symbol chosen from letters and numbers for equipment items, or from available characters for information items, can be used to identify duplicate appearances.

17.00 CROSS HATCHING AND LINING OUT

17.01 Cross hatching and lining out methods may be used to indicate information removed from Office Record Drawings, but should not be used indiscriminately. The preferred method is erasure.

17.02 At the time of divestiture, drawing ownership was split between the Interexchange Carrier (IXC), and the Local Exchange Company (LEC). Lining out with diagnol lines (/ / / / /) illustrates the split.

A. There will be legitimate changes made in the lined out areas. Such changes must be noted and receive the same Issue Note treatment as changes in the area not lined out.

B. When information is removed from the lined out area, the lines should also be removed. This serves to indicate availability of floor space on floor plans, shelf space on distributing frames, fuse assignments on fuse panels, etc.

18.00 EXISTING DRAWING STANDARDS

18.01 When notes, symbols, lineweights, etc., used on an existing job drawing do not agree with the latest practices, they shall nevertheless continue to be used on that drawing. However, when a change is made to the drawing, such as adding notes, symbols, lineweights, etc., the latest practices shall apply provided that no conflict is created with existing information on the drawing.

19.00 MULTISHEET DRAWINGS

19.01 Multiple sheets may be originated for Office Record Drawings to accommodate overflow of data. This is allowed when all available space on the original drawing has been utilized and cross hatching and lining out has been removed.

19.02 Exception to the rule as to the complete utilization of all available space is permitted in the following circumstances:

A. If only a part of the new information will fit into the available space and a more orderly growth or arrangement is obtained by using a second sheet for some or all of the new information.

B. If the new information pertains to circuit assignments on the vertical side of the MDF; such as for subscriber loop carrier, and it is anticipated that the available drawing space will be exceeded in the future of either horizontal or vertical information, or needed in the future for horizontal information.

19.03 Drawings which may have more than one sheet and which generally have multisheet forms available to handle expected overflow are as follows:

A. Job Wiring List

B. Fuse Bay and Plant Ringing Tone Distributing Equipment

C. Tabular Type Assignment Drawings

D. Application, Block, Traffic Schematic, and Grounding Schematic Drawings

E. Distributing Frame Drawings

19.04 Job drawings that may require multiple sheets due to overflow that are created by the number of job sketches associated with the given frames including the following:

A. Distributing frame equipment drawings.

B. Relay rack equipment drawings.

19.05 Other overflow problems caused by the ordering of added frames exceeding the capacity of the tracing forms used shall be handled by generating new job drawings. All sheets of a multisheet drawing must be of the same size.

20.00 DRAWING AIDS (DAs)

20.01 Drawing aids are office record forms which show technical information relating to particular equipment. They can be marked by engineering to show the information needed for originating or changing a Central Office Record Drawing.

20.02 The drawing aid shall be marked to reflect the actual office conditions for the current order. All nonapplicable technical information, notes, and symbols shall be removed. This may be accomplished by using any medium that provides a distinct contrast with the background material. However, it is recommended that additions are clearly marked in red and deletions marked in yellow.

21.00 TRACING FORMS (TFs)

21.01 A tracing form is a preprinted form on mylar designed to facilitate the drafting effort. The standard tracing form consists of a blank title box, issue column, table, etc., and is usually void of technical information. When using a tracing for a job drawing, all nonapplicable information shall be removed. When a note is removed, the note number shall remain followed by "UNASSIGNED", except for the last note which is removed completely.

22.00 MICROFILM REQUIREMENTS - CLASSIFICATION OF DRAWINGS

22.01 Drawings may contain classification indicators for microfilming purposes. These classifications are based on reproducibility and legibility.

23.00 REPAIR AND RETRACE OF JOB DRAWINGS

23.01 When a redraw is required, the drawing standard depicted on the original drawing shall continue to be followed on the drawing. However, on changes, if no standard exists on the original drawing, current practices outlined within this publication shall apply.

24.00 DRAWINGS MADE FROM OTHER DRAWINGS

24.01 When a drawing is made from another drawing, that fact should be recorded in a note; i.e., "MADE FROM ACE DRAWING 001 ISSUE 1" or "MADE FROM ARCHITECT'S DRAWING XXX ISSUE 7".

25.00 CONVERTED DRAWINGS

25.01 When it is necessary to convert a drawing from one drawing control system (Equipment Engineer, State Controlled, Supplier Controlled, etc.) to the Record Group's four digit standard base drawing control system, a new drawing shall be established. The issue number shall be one number higher than the issue number on the original drawing.

A. Notes shall be added as follows:

1. Add the note "PREVIOUS DRAWING NUMBER WAS _____ ". The note shall be placed above or to the left of the title box in 3/16 inch lettering.

2. Above the note in 1, add the note "DRAWING CONVERTED, SEE T-BASE-XXX" in 3/16 inch lettering. This note shall be on transparent removable tape.

B. An Issue Note shall be added to read "DRAWING CONVERTED FROM (Co. or State and Drawing No.)".

C. Add the new drawing number adjacent to the old drawing number at all appearances and in accordance with Paragraph 5.00.

26.00 RENUMBERED DRAWINGS

26.01 When the renumbering of a job drawing is authorized, the following one step procedure shall be used; but only if the old numbered drawing is properly voided:

A. Prepare an authorization change RG47-0011 in accordance with PUB 77351 and Records Group General Procedures Handbook.

B. Renumbering notes shall be added as follows:

1. In the Title Box, add the note "PREVIOUS DRAWING NUMBER was T_____-_____". The note shall be placed above or to the left of the title box in 3/16 inch lettering.

2. Above the note in 1, add the note "DRAWING RENUMBERED, SEE T_____ -_____" using 3/16 inch lettering.

C. Two Issue Notes shall be added as follows:

1. In the first Issue Note show "ADD RENUMBERING NOTE".

2. In the second Issue Note show "DRAWING RENUMBERED". Additional Issue Note information as required can be added provided the corresponding changes in the body of the drawing can be masked out so as not to appear on the first of the above two issues.

D. Place the second issue number in the issue box and cover with light adhesive masking tape. Place the first issue number onto the tape covering the issue box.

E. Drawing numbers shall be added as follows:

1. Add the new drawing number adjacent to the old drawing number at all appearances.

2. Line out all old drawing number appearances (Issue 2 and up) two lines using standard drafting procedures, or erase the old number if the space is needed.

F. Reproduction

1. Reproduction shall generate a microfilm copy of the tracing showing only the first issue information by covering the second issue information.

2. All coverings shall then be removed, revealing the renumbered tracing, and a microfilm copy shall be generated.

G. Transferring Engineering Information

1. When transferring engineering information from one drawing to another (so that the end result of the first drawing no longer exists) do NOT designate as RENUMBER on the RG47-0011 (see Paragraph 27.01, E).

27.00 VOIDED DRAWINGS

27.01 When a void drawing procedure is authorized by Issue Request Form RG47-0011, proceed as follows:

A. Add above the title "VOID (date)" in bold characters of sufficient size to attract attention such as those produced by the 175 lettering guide and a number 2 pen, or approximately 3/16 lettering.

B. The date shall be calculated by the Records Group and entered on the Issue Request Form RG47-0011.

C. The Issue Note shall show the void statement (reason) and the effective void date.

D. To void a multisheet drawing add the "VOID (date)" above the title of first sheet only.

E. To correctly transfer engineering information from one drawing to another, indicate "VOID & REPLACED BY" on the form RG47-0011 that accompanies the drawing which the engineering information is being transferred from. Any drawing that is voided will be retained for a period of three years.

27.02 A drawing is considered "Pending Void Status" until the "Effective Void Date" and can be reinstated any time prior to the "Effective Void Date". In such case, the Issue Note shall read "DWG REINSTATED (date)". After the "Effective Void Date", the drawing number cannot be used for a period of two years.

27.03 Voiding of Drawings in connection with "RETIRED IN PLACE".

A. When a job results in all remaining equipment and circuits on a wiring list being made inactive and "RETIRED IN PLACE", the wiring list should be voided. After a period of one year, voided office record tracing forms are destroyed, and are therefore not available for updating to reflect any subsequent changes.

B. The Issue Note for the job order should be the normal note for the job, and should contain an additional statement that the drawing was voided due to the equipment retired in place.

C. Where "RETIRED IN PLACE" equipment is involved on any future job, it will be necessary for the Equipment Engineer to clarify any drawing inaccuracy resulting from any unrecorded removal or modification of the equipment.

27.04 For additional information see PUB 77351, Section V, Part G.

28.00 RETENTION OF OFFICE RECORD DRAWINGS

28.01 Office Record Drawings that have been replaced, renumbered, or voided shall remain available for a period of two years from "Date of Last Issue Change", or "Effective Void Date", unless directed otherwise in writing by the originating organization.

28.02 The retained office drawings shall be in the form of the original tracing, or on a Master Microfilm Card in lieu of the original.

28.03 After the two year period, authorization shall be obtained in writing from the originator for destruction of these final records. Upon receipt of this approval , proceed in accordance with the procedures specified in the Records Group General Procedures Handbook.

28.04 See PUB 77351, Section V, Part G.

29.00 SUPERSEDED DRAWINGS

29.01 A Drawing is always superseded by a drawing of the same number. The drawing is always one issue higher than the drawing it superseded.

29.02 On the prior tracing show "SUPERSEDED BY ISSUE [NUMBER]" above the title box in the 175 lettering guide and a number 2 pen, or approximately 3/16 lettering. A copy of this drawing is retained on microfilm.

29.03 New Tracing - Show the original issue date above of the issue column; i.e., ORIGINAL ISSUE 7-11-61.

29.04 Individual sheets of a multisheet drawing which are removed per an engineering marked print will be superseded by:

A. Adding the following note in the drawing status block above the title box on the sheet(s) to be superseded; i.e., "This sheet superseded by issue [Number]."

B. Attaching a "SUPERSEDED DRAWING" label to the superseded sheet(s)

C. Returning the superseded sheet(s) and the completed drawing to the Records Group to ensure that the proper sheets are appropriately filmed for storage and distribution.

30.00 "N" ISSUES

30.01 "N" issues are non-active drawings created when extensive changes require a new arrangement be shown as "before" and "after" changes made to the office. A microfilm copy of the "N" issue is kept on file for one year. "N" issues are normally made from drawings classified as front equipment drawings.

30.02 This routine requires that two issues are drafted on the drawing. Drafting procedures for "N" issues are as follows:

A. A sepia copy of the mylar drawing is made

B. Add an "N" suffix to the drawing number using ink (all appearances). Show "'N' ISSUE MADE" in the Issue Note.

C. Show in the space provided above the Title Box "VOID (date)" in approximately 3/16 lettering using ink. The date shall be the installation completion date of the order or one year after the drafting due date, whichever is later.

D. Microfilm and store the drawing in the usual manner.

E. On the mylar drawing two Issue Notes appear. The lower issue will read "'N' ISSUE MADE". On the higher issue state in the Issue Note "'N' REMOVED FROM DWG NO" followed by the normal Issue Note. Do not show the Void date on the mylar drawing.

F. Microfilm and store the mylar drawing in the usual manner.

G. See PUB 77351, Section V, Part G.

31.00 "R" ISSUES

31.01 "R" issues are retained permanent legal records on microfilm only. "R" issues are made when a major removal occurs but does not affect the entire drawing and a reference copy is required. This provides a means of recording an extensive change permanently and is more accurate than an extensive Issue Note.

31.02 This routine requires that two issues are drafted on the drawing. Drafting procedures for "R" issues are as follows:

A. A sepia copy of the drawing is made.

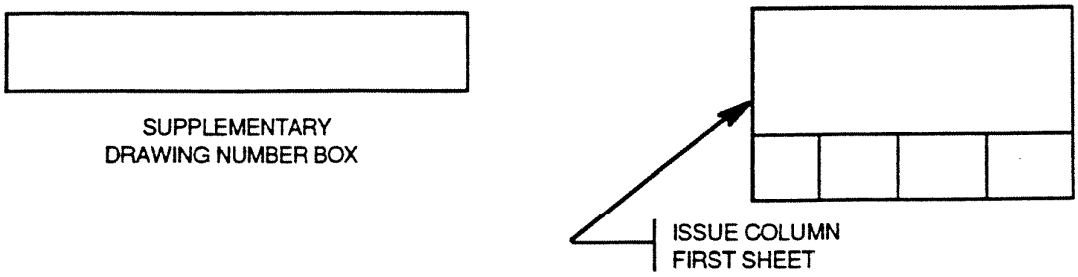
B. Add an "R" suffix to the drawing number at all appearances, using ink. Show "'R' ISSUE MADE" in the Issue Note.

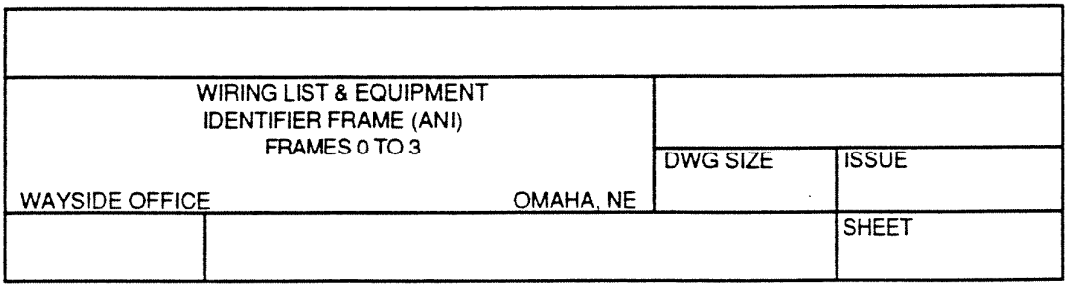
C. Microfilm and store the drawing in the usual manner.

D. On the mylar drawing two issues appear. The lower issue will read "'R' ISSUE MADE". On the higher issue state in the Issue Note "'R' REMOVED FROM DWG NO," followed by the normal Issue Note.

E. Microfilm and store the drawing in the usual manner.

F. See PUB 77351, Section V, Part G.





TITLE BOX - SUPPLEMENTARY SHEETS

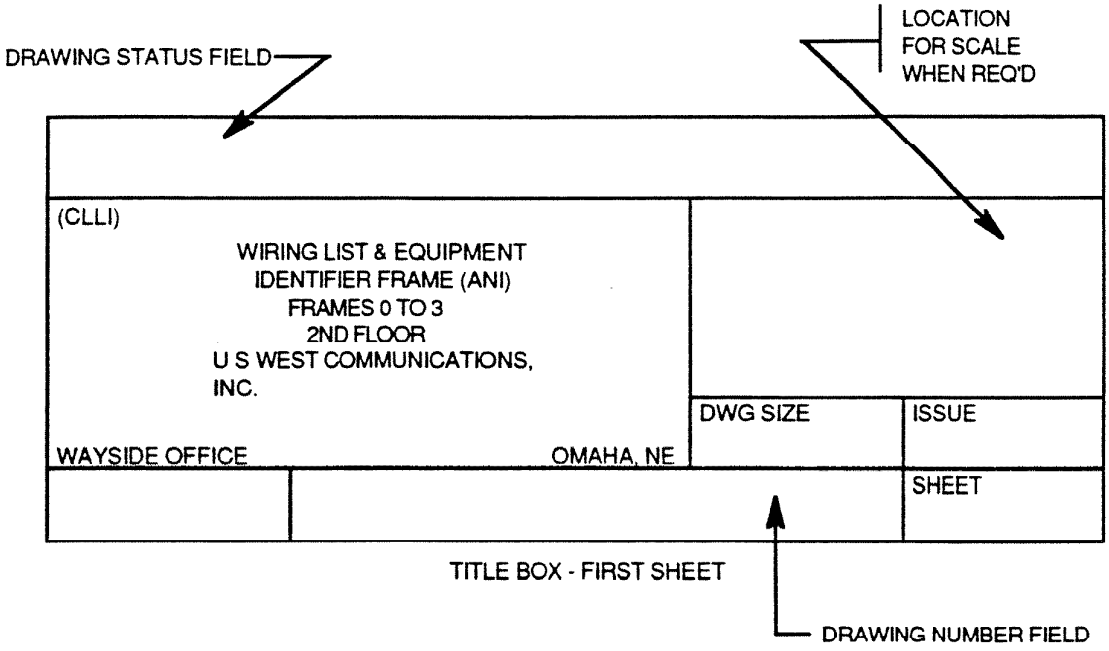


EXHIBIT 1
TITLE BOX - HORIZONTAL FORMAT

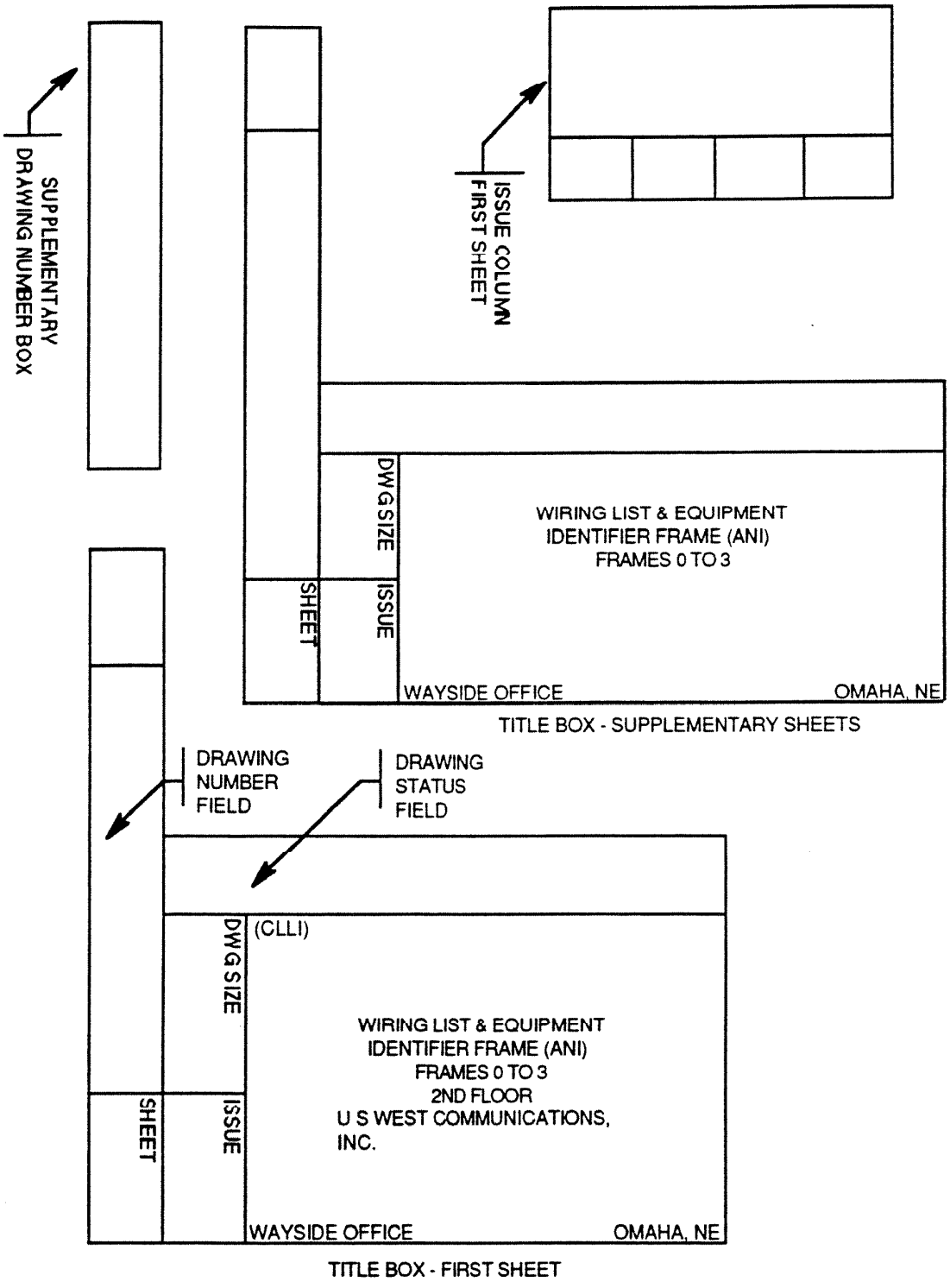


EXHIBIT 2
TITLE BOX - VERTICAL FORMAT

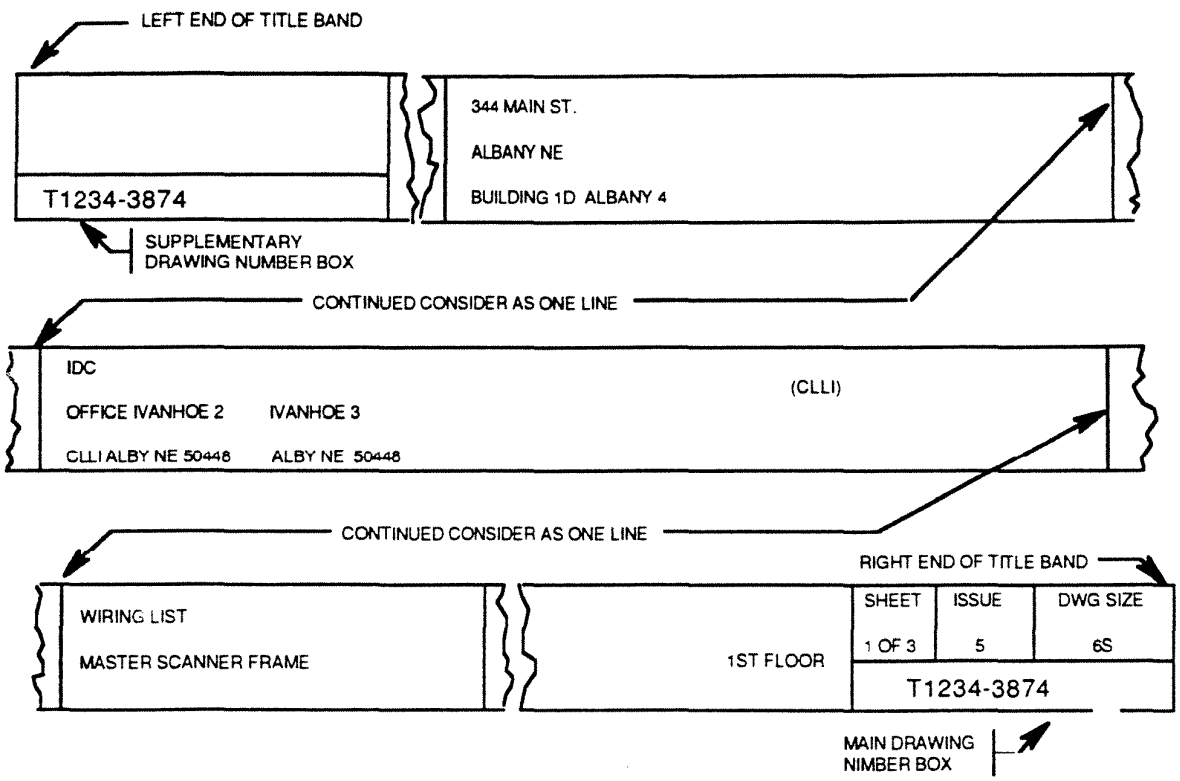


EXHIBIT 3
TITLE BOX - BAND FORMAT

DISTRIBUTING FRAME EQUIPMENT DRAWINGS

CONTENTS

1.00 GENERAL

1.01 This part covers the standards to be followed in the preparation of Distributing Frame Equipment Drawings.

1.02 The Distributing Frame Equipment Drawing shall include all information necessary to engineer and install distributing frames and associated material. In addition, it shall establish an office record of the terminal locations for circuits terminating on a particular distributing frame.

1.03 The framework assembly for the distributing frame shall be listed on the office framework record drawing. If there is no office framework record drawing, the framework assembly shall be listed in a note on the Distributing Frame Equipment Drawing.

2.00 SCALE

2.01 No scale is required. However, all configurations to be depicted on the drawing shall be drawn to accommodate 1/8 inch lettering to meet microfilm standards.

3.00 PEN SIZE

3.01 Pen size requirements for the preparation of Tabular Format Lineweights are covered in Section III, Part C.

3.02 The following indicates pen sizes that shall be used for specific conditions.

Pen Size	Application
0	Jack Positions, Brackets, Terminal Strip Division Lines in Sketches, Horizontal and Verticals
2	Outline of: Horizontals, Verticals, Jack Boxes, Jack Mountings, Terminal Strip Sketches, 33 Type Connector Blocks and Loud Speaker - Talk Back Transmitter
4	Filling in Horizontal and Vertical Locations in body of drawing and Terminal Strip Sketches

4.00 ISSUE NOTES

4.01 A descriptive Issue Note is required for Distributing Frame Equipment Drawings.

4.02 Distributing Frame terminal strips when located on horizontals shall be numbered for the shelf and bay on which they are mounted, for instance for horizontal shelf H bay 6 show TS H6. When located on verticals, the terminal strips shall be numbered for the vertical and shelf on which they are mounted; for instance, for vertical 6 shelf H show TS 6H. When reference to these terminal strips is made in an Issue Note, they shall be shown as TS H6, 6H. If the verticals are lettered rather than numbered, the terminal strip location designation on the verticals begins with an alpha, as for vertical E shelf 10 show E10.

A. When terminal strips are being added or removed, or existing strips contain a change, a descriptive Issue Note shall be provided similar to the following:

(ADD or RMV) TS B15, B20, 10J, 4N TO 7M (ADD or RMV or CHG) CKT TS A10, 8K, 10K, M5 to M9.
(Choose one of the expressions in the parenthesis.)

B. When a horizontal terminal strip (horizontally or vertically mounted) or vertical terminal strip, which takes up two terminal strip locations (i.e.: TS E3, E4) is being added or removed, or such an existing strip contains a change, it shall be referred to in the Issue Note similar to the following:

(ADD or RMV) TS E3/ (ADD or RMV or CHG) CKT, TS E3.
(Choose one of the expressions in parenthesis.)

C. When a number of adjacent horizontal or vertical terminal strips which each take up two terminal strip locations are all being either added or removed, or when such existing strips all contain change, (i.e., TS F1, F2 to F9, F10) they shall be referred to the Issue Note similar to the following:

(ADD or RMV) TS F1 to F9/ (ADD or RMV or CHG) CKT, TS F1 to F9. (Choose one of the expressions in the parenthesis.)

D. On drawings for distributing frames which use connecting blocks substitute block (BLK) for terminal strip (TS) in the Issue Note: (ADD or RMV of CHG) CKTS, BLK 3K, 5K, 7P, 9J to 12J.

5.00 CRITERIA

5.01 Prior to the preparation of Distributing Frame Equipment Drawing of a particular office, all necessary data shall be obtained, checked to verify that it is noncontradictory, and is the latest available information. This data consists of:

A. Office Base Dash Number and Issue

B. Distributing Frame Growth - Present and Ultimate

C. Number of Horizontal Shelves and Verticals or Modules

D. Sketches or Enlarged Views of Terminal Strips and Jack Boxes

E. Tables of Equipment

F. Type of Frame - Single or Double Sided

G. Typical Distributing Frame Equipment Drawings

H. Distributing Frame Equipment Drawing Aids

6.00 TYPES OF FRAMES

6.01 Basically there are three main types of frames: conventional, SPCS modular, and COSMIC (Common Systems Main Interconnecting Frame).

6.02 Conventional

A. This frame is of open ironwork construction and comes in various heights of from 7 feet to 14 feet 5 inches. Most such frames are double-sided, but single-sided frames are also available. The single-sided frames have both horizontal shelves and vertical members, or vertical members only, on the one side. The double sided frames have horizontal shelves on one side and vertical members on the other. The horizontal shelves constitute that side, or portion of a side, of a frame on which jumper wires are run horizontally even though terminal strips may be mounted in a vertical position. The frame variables specified for a particular Central Office include the height (number of shelves), length (number of verticals, present and ultimate), and direction of growth.

B. Single sided conventional distributing frames are arranged for the following:

1. Terminal strip verticals and horizontals located on the same side of the frame, with the verticals located either above or below the horizontals. The layout on the distributing frame equipment drawing shall show the specified arrangement and the numbering for the direction of growth, left or right (see Figures 1 and 2).

2. Protector and filter verticals and terminal strip vertical located on the same side of the frame, with the protector and filter verticals portion either to the right or left of the terminal strip verticals portion. The layout on the Distributing Frame Equipment Drawing shall show the specified arrangement, with the protector and filter verticals numbered in the opposite direction, (see Figure 3).

3. Test and maintenance equipment at specific locations throughout the frame, such as: jack boxes, jack mountings, and connector blocks (see Figures 1, 2, or 3). Locations are typical and may vary depending on the Manufacturer's equipment drawing used.

C. Double-Sided Conventional Distributing Frames.

1. Double sided distributing frames are arranged to mount terminal strips either horizontally or vertically on the horizontal side. On the vertical side they are arranged to mount terminal strips or protectors of jacks, or a combination of terminal strips and protectors, or a combination of terminal strips and jacks. In addition, they are arranged to mount test and maintenance equipment such as jack boxes, jack mountings, and connector blocks at specific locations throughout both sides of the frame, (see Figures 4, 5, 6 and 7).

2. When the vertical side of the frame is arranged for either protectors or jacks only, show only a single vertical on the distributing frame equipment drawing but show all of the horizontals. Indicate the numbering of the verticals below the single vertical shown, and number the horizontals opposite to the direction of growth specified for the verticals, (see Figure 4).

3. When the vertical side of the frame is arranged for terminal strips only, or a combination of terminal strips and protectors, or a combination of terminal strips and jacks, lay out the number of the verticals on the distributing frame equipment drawing in the direction of growth specified, with the horizontals laid out and numbered in the opposite direction, (see Figures 5, 6 and 7).

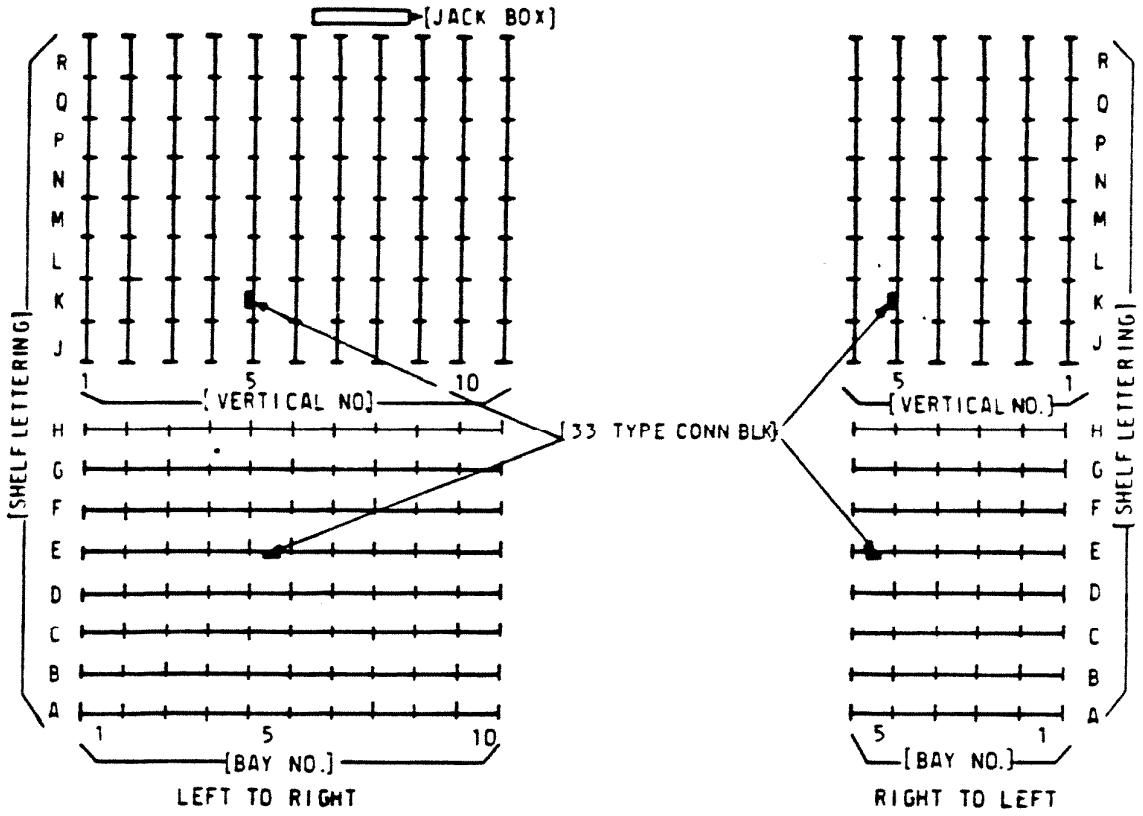


FIGURE 1
SINGLE SIDED DISTRIBUTING FRAME
VERTICALS ABOVE HORIZONTALS

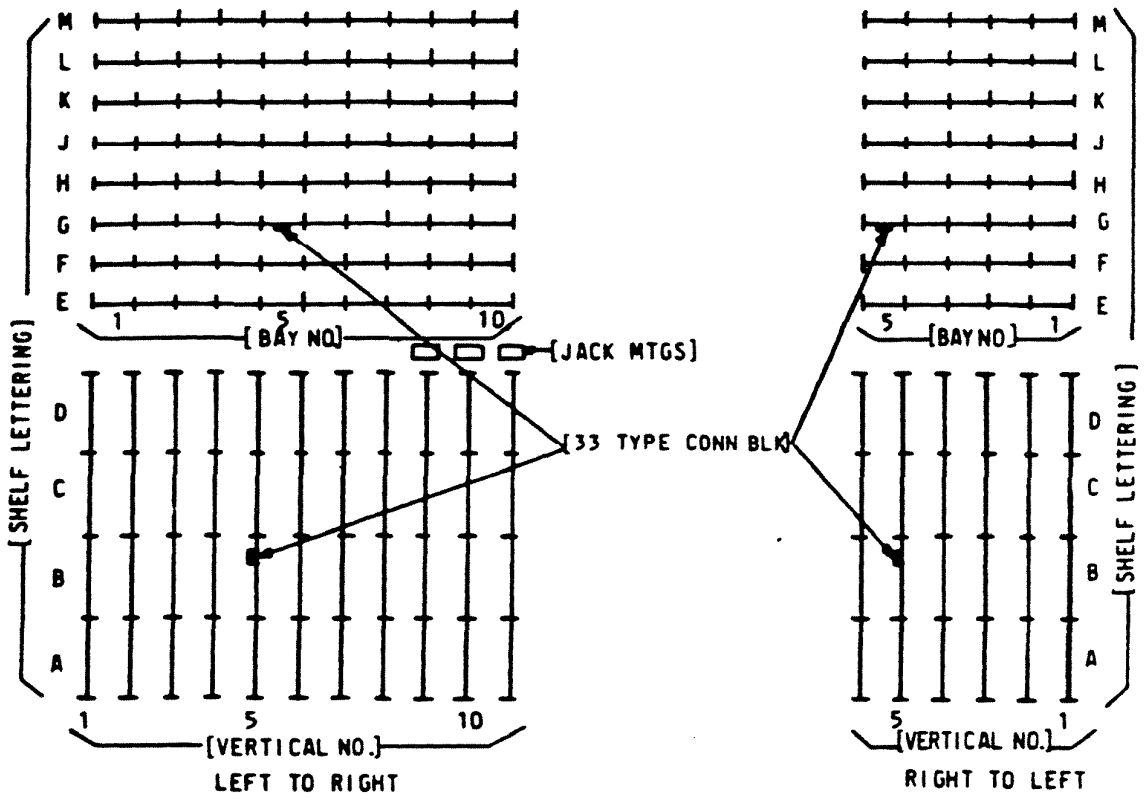


FIGURE 2
SINGLE SIDED DISTRIBUTING FRAME
VERTICALS BELOW HORIZONTALS

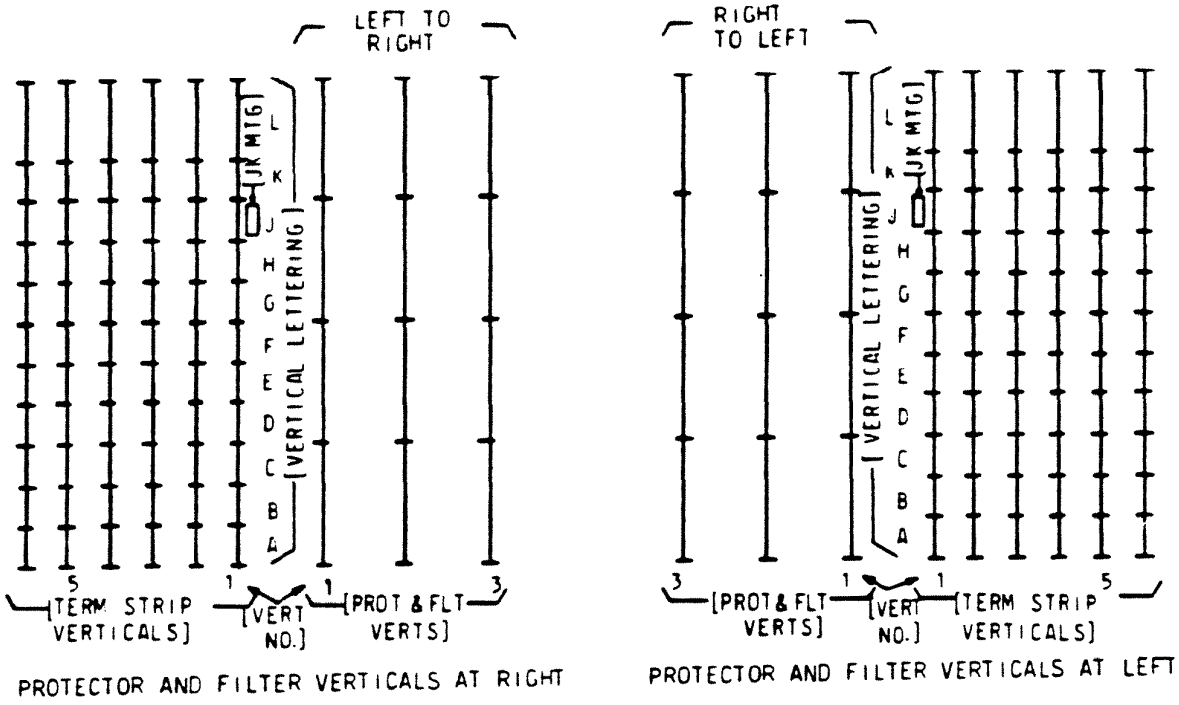


FIGURE 3
SINGLE SIDED DISTRIBUTING FRAME
VERTICALS ARRANGED FOR PROTECTORS, FILTERS AND TERMINAL STRIPS

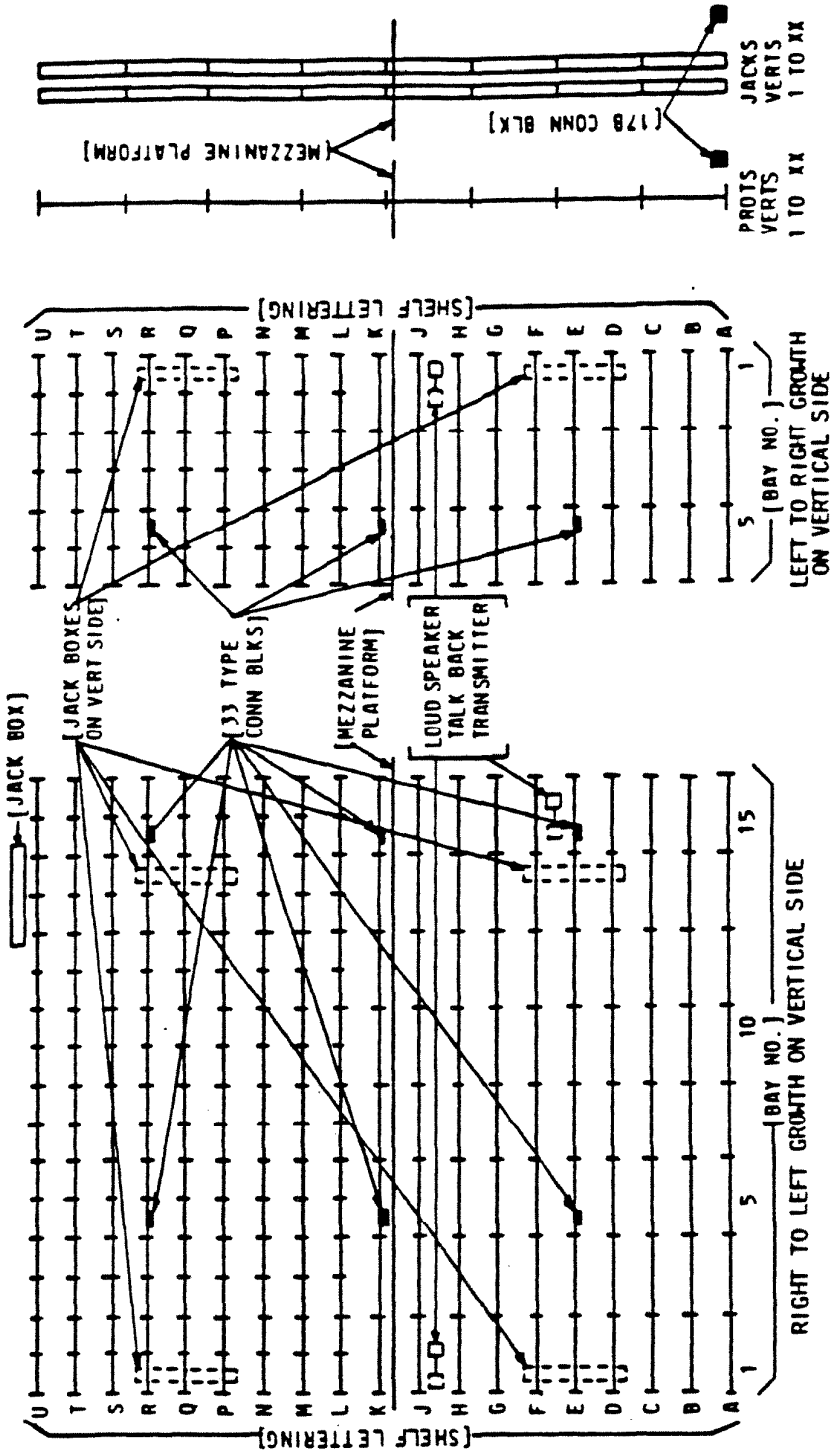


FIGURE 4
DOUBLE SIDED DISTRIBUTING FRAME
VERTICAL ARRANGED FOR PROTECTORS OR JACKS:
MEZZANINE PLATFORM ON HORIZONTAL AND VERTICAL SIDES

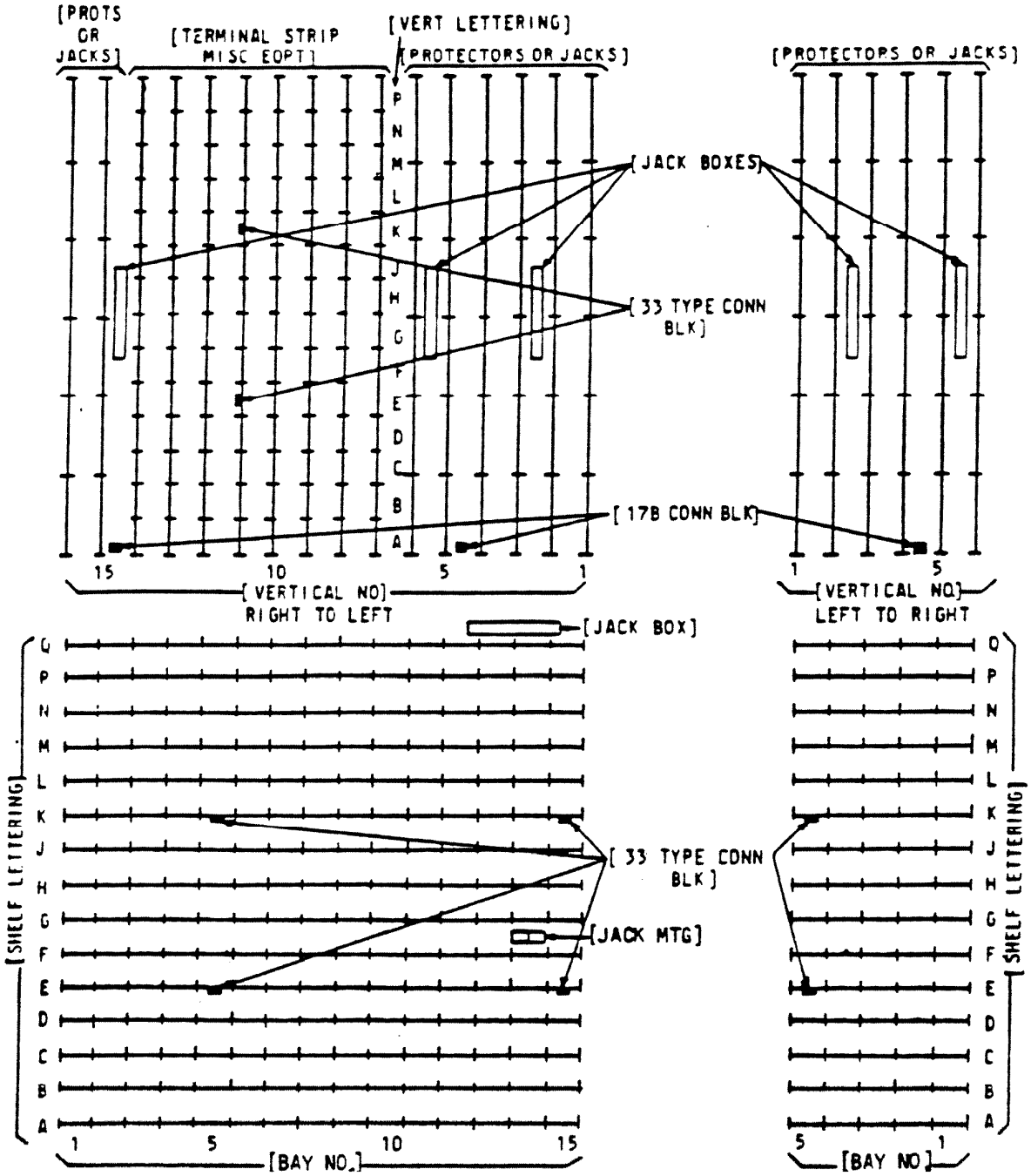


FIGURE 5
DOUBLE SIDED DISTRIBUTING FRAME
VERTICALS ARRANGED FOR MISCELLANEOUS TERMINAL STRIP EQUIPMENT
AND PROTECTORS OR MISCELLANEOUS TERMINAL STRIP EQUIPMENT AND JACKS

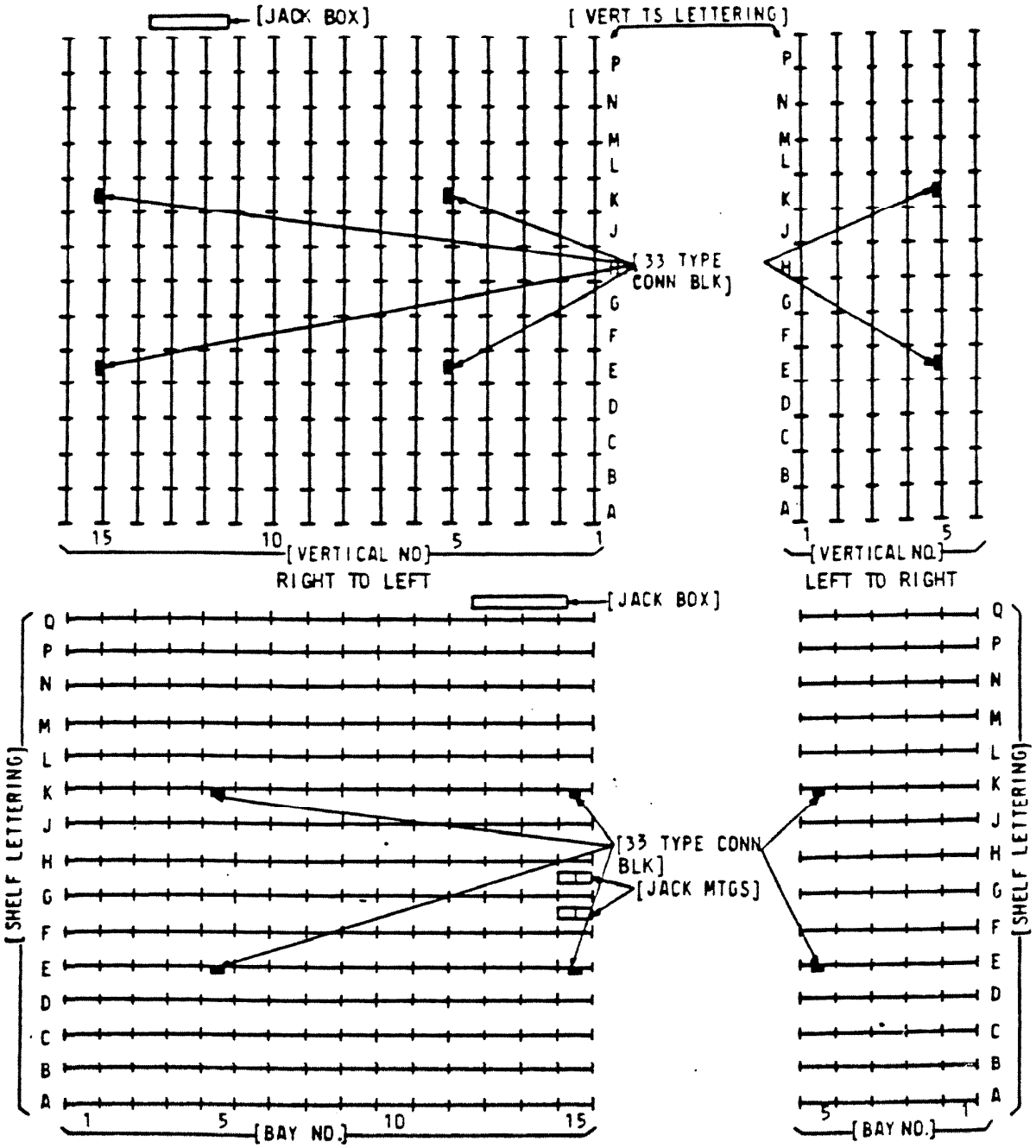


FIGURE 6
DOUBLE SIDED DISTRIBUTING FRAME
VERTICALS AND HORIZONTALS ARRANGED FOR TERMINAL STRIPS

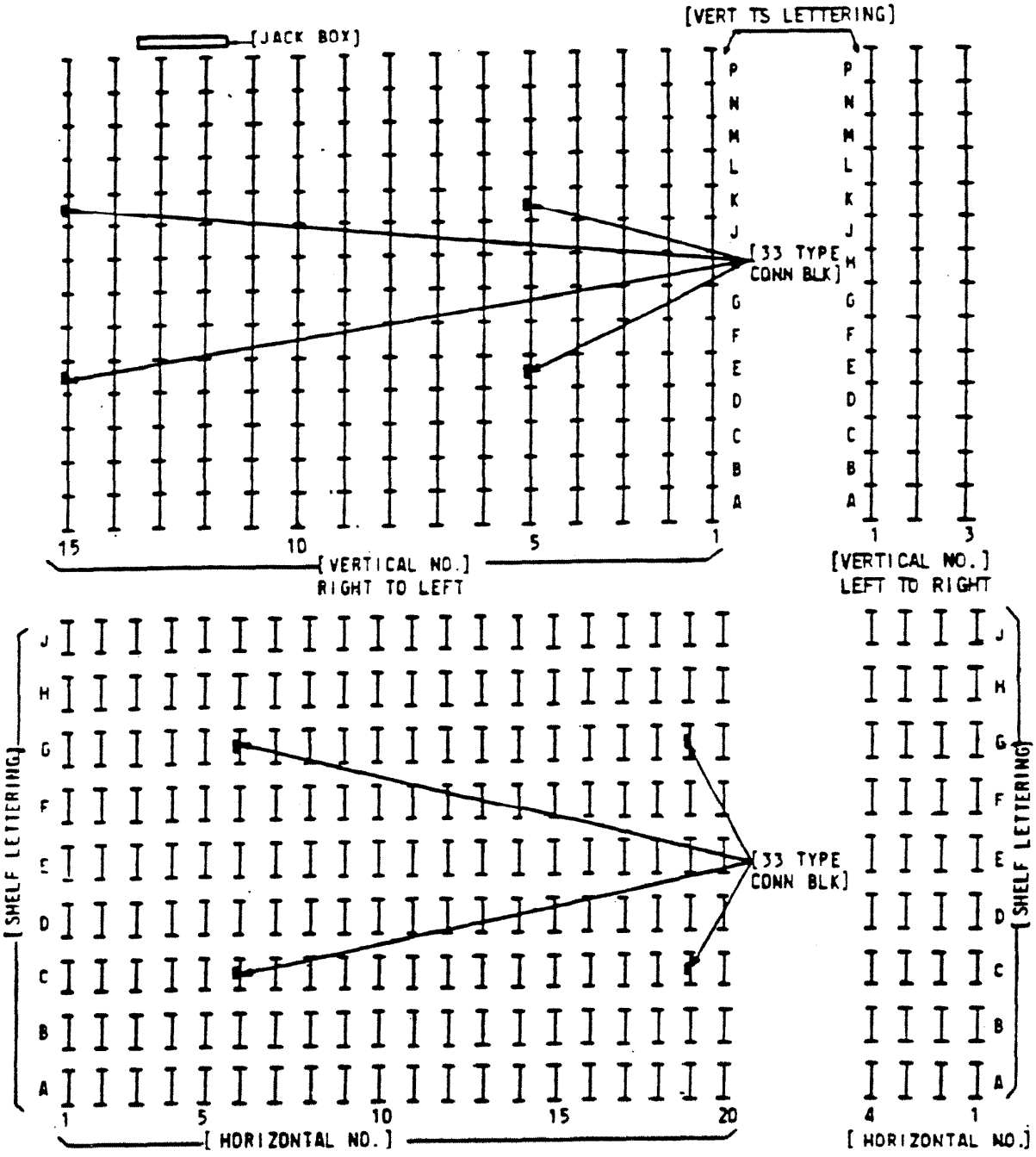


FIGURE 7
DOUBLE SIDED DISTRIBUTING FRAME
HORIZONTAL TERMINAL STRIPS MOUNTED VERTICALLY
RATIO: 4 HORIZONTAL TERMINAL STRIPS PER 3 VERTICALS OF FRAME

6.03 Modular Distributing Frame (MDF)

A. The frame is single-sided of sheet metal construction, either 7 or 8 feet high, has 6 or 10 verticals per module and does not have horizontals. It will mount connector blocks and will not mount protectors. Numbering conventions are top down.

B. For MDF applications remotely located from the protector frame there generally are transmitter panels in the sixth block position from the top on an even vertical in every other module, and test panels in the lowest block position on an even vertical in each module. A recommendation format for the equipment record for the panels is shown in Figure 8.

C. Besides applications for the MDF the frame can also be used as a TDF or IDF offices.

6.04 Common Systems Main Interconnecting Frame (COSMIC)

A. The frame consists of sheet metal construction 8 feet high, and is arranged in Framework Group Assemblies consisting of two half modules separated by a vertical cable trough. Adjacent half modules from two Framework Group Assemblies constitute a MODULE or MOD. The ultimate number of modules for a COSMIC MDF should be furnished on the initial order. A lineup begins and ends with a half module. Numbering conventions are top down.

1. COSMIC I MDF

a. The frame is single sided with horizontals arranged to mount connecting blocks. Cables terminating on the COSMIC MDF can be line equipment cables, tie cables to protect frames, or tie cables to other distributing frames. The first half module is assigned to outside plant, the next full module to line equipment, the next full module to outside plant, etc. Line equipment terminations can be Stored Program Control Switch (SPCS), #5 XBAR (T&R leads only), #1 XBAR, and SXS (only if the SXS telephone number cross connections are made at an IDF). Miscellaneous equipment cannot be terminated on the COSMIC I frame, i.e., E repeaters, dial long lines, trunks, sleeve leads for #5 XBAR, etc.

b. Frame terminations on the COSMIC I frame are arranged by computer program. The program maintains most job records and prepares the major portion of the cable running list.

c. The COSMIC I frame can also be used as a TPDF to provide interconnection between SMDF lineups, or to provide terminations for intra-lineup circuits in order to reduce long intra-lineup jumpers.

TABLE D							
DISTRIBUTING FRAME TEST/TALK EQPT							
SPEC DWG	LS/GR	POS	DESCRIPTION	CKT DWG	FIG	NBG	MULT LOCATIONS
KS-21316	8		TRMTR PNL	T2P016-12	8		MDF 0103 MODS 1, 5, 9 ETC SD1 SHLF 5 BLK 16, TPDF 0104 MODS 63 SD1 SHLF 5 BLK 16
ED6C110-10	23		PNL E/W				MDF 0103 MODS 01 UP (ODD) SD 1 SH 5 BLK 13, 14, 15, TPDF 0104 MODS 63, 65, SD1 SHLF 5 BLK 13, 14, 15
	103	A1-6	TEL 8 SP JKS	T1A129-100	HF	0,1	
		A7-9	SPARE				
	102	B1-3	INTR FR TLK LN	T2P016-12	102	0	
		B4-6	LTD FR SHLP TLK LN		102	0	
		B7-9	SPARE				
	102	C1-6	LOC FR TLK LN		102	0,1	
		C7-9	SPARE				
▼	106	D1-8	FR MTCE TEL LN		106	0,1	

FIGURE 8
MINIATURE TEST-TALK
EQUIPMENT

2. COSMIC II Frame

   a. The frame is similar to COSMIC I except that in addition to a horizontal side arranged for connecting blocks, the frame has a vertical side arranged for protectors. Another difference is that the horizontal side COSMIC II can terminate miscellaneous equipment such as trunks, repeaters, etc., as well as line equipment.

3. COSMIC Test and Talk System

   a. The COSMIC frames use the miniatured test and talk system. Corresponding office records will be kept manually. A recommended format is illustrated in Figure 8.

7.00 SPECIFIC DRAWING STANDARDS

7.01 Obstructions such as columns, vent ducts, etc., which affect the normal distributing frame growth shall be shown in the body of the distributing frame equipment drawing by a cross hatch of the affected verticals or horizontal shelves, and covered by a note similar to the following:

> NOTE:
>
> Cross hatched areas on the vertical or horizontal sides of the distributing frame indicate verticals and/or horizontal shelves not available for mounting terminal strips or other equipment due to obstructions.

It is recommended that the type of obstructions, e.g.: "COLUMN", "VENT", etc., be indicated above the cross hatch.

7.02 Terminal Strip Conventions

A. The terms "TERMINAL", "PUNCHING", OR "POINT" are arbitrarily used to designate a single terminal, and "LINE" and "ROW" a series of terminals, on a terminal strip. The meaning of these terms used herein agrees with the meaning of the same terms as used on wiring diagrams and schematics, (see Figure 9).

B. In the case of locations containing double size terminals strips the tick mark in the middle of the location indicating the single size boundary shall be removed. When any double size terminal strips are taken out the corresponding tick marks shall be restored.

7.03 Designations and Numbering on Terminal Strips

A. The identifying information shown on distributing frame equipment drawings should, in general, include standard drawing information in the form of circuit titles, and include job information in the form of circuit subgroup, numbering, etc. Lead designations are not to be shown except for special circumstances, since they are available on the circuit drawings, and since they are significant in terms of circuit considerations rather than job assignment considerations. The identifying information shown may or may not be used for stamping.

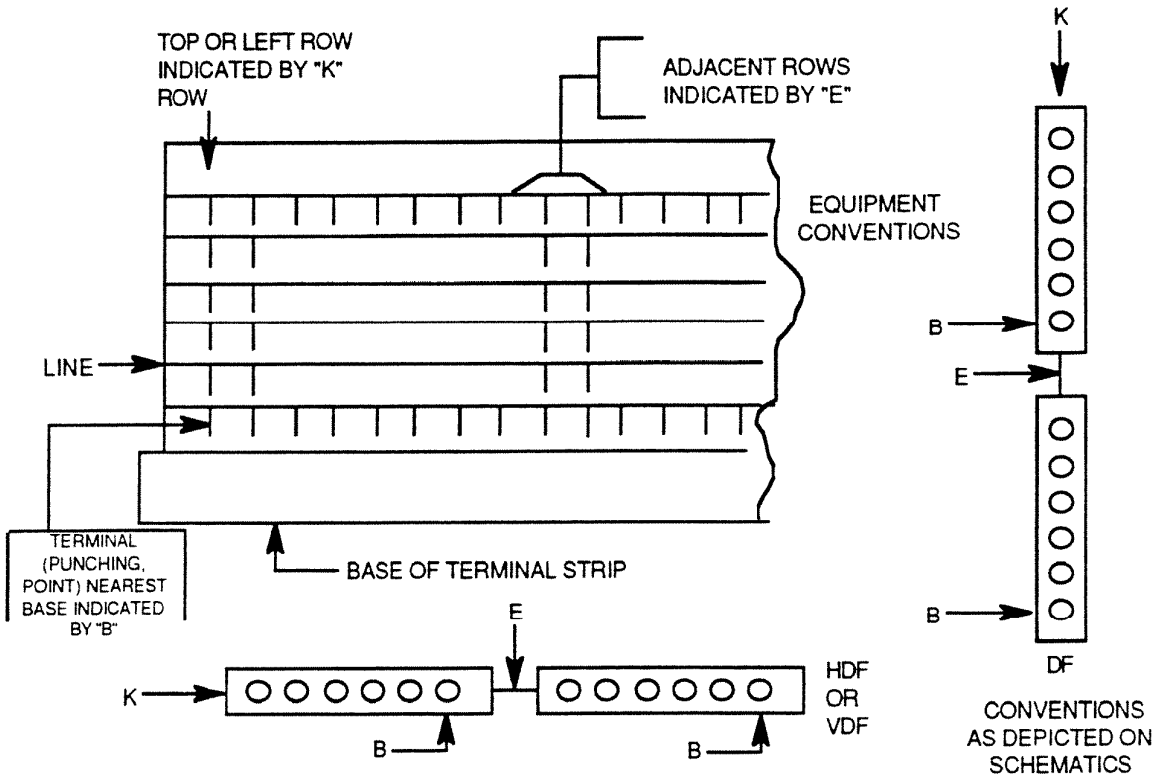


FIGURE 9
CONVENTIONS AS DEPICTED ON WIRING DIAGRAMS

B. Equipping and Numbering of Terminal Strips on Existing Distributing Frames

1. When verticals, horizontals or terminal strips are added to existing distributing frames, the numbering plan and layout already established on the equipment drawing shall be followed.

C. Equipping and Numbering of Terminal Strips on New Distributing Frames

1. The following conventions are the standards used to minimize problems in manufacturing, engineering, installation and maintenance. They shall be followed except for individual systems that specify other conventions.

2. All terminal strips on the vertical side and the individual circuits and cable pairs on each terminal strip shall be equipped and numbered from the bottom up.

3. All horizontal terminal strips shall be equipped and numbered from the bottom up and from left to right whether the frame is arranged for left to right or right to left growth.

4. All vertically mounted terminal strips on the horizontal side shall be equipped and numbered from left to right whether the growth is left to right or right to left. Individual terminal strips will be numbered from the bottom up.

5. Terminal strips on Toll Distributing Frames shall be equipped and numbered as prescribed in Manufacturer's drawings except that all references to top-bottom numbering shall be considered as bottom up.

D. Circuit Designation and Numbering Patterns

1. Group Designations are shown above horizontal terminal strips and to the left of vertical terminal strips, and are centered over adjacent terminal strips within the same group as illustrated in Figures 10 thru 13. The abbreviated circuit title constitutes the group designation except for subscriber lines, where the following are used:

   a. Hundreds number or line relay group (SXS, PBX).

   b. Line link column number (#1 XBAR).

   c. Line link frame number (#5 XBAR).

2. A supplementary designation consisting of the location or identification information such as "RR", "100L", "TTBD", "BAY", "DSK", or "PLT", shall be used to relate to the associated circuit equipment as illustrated in Figures 10 through 13.

3. Subgroup designations, if any, shall be shown centered adjacent to the assigned rows of terminals (above horizontally mounted terminal strips and to the left of vertically mounted strips). Subgroups are generally characterized by repetitive circuit numbering, e.g., BK 0(1-10), BK 1(1-10), etc. (see Figures 10 and 11). For adjacent subgroups in a consecutive series, the subgroup designations shall be shown only for first and last subgroups.

4. Circuit Numbers

   a. Circuit numbers are shown below horizontal terminal strips and to the right of vertical terminal strips (see Figures 10 thru 13).

   b. When the assignment of terminals for a single circuit is split over two terminal strips, the numbering for the circuit so split must be shown on both terminal strips (see Figure 10 [3 of 8], circuits 7, 14, 27, and 34).

   c. The numbering pattern on distributing frames for circuits arranged into subgroups shall be by subgroup, and the numbering pattern for circuits numbered consecutively shall be by terminal strip (see Figures 10 through 11). However, discontinuities will require numbering for intermediate rows.

d. Where more than one circuit is assigned to a row of terminals, and the circuit within a row is not apparent from the circuit figure (as in Figure 11 for "NA", "MISC JKS", and "OGT"), then the distributing frame drawing shall include both the first and last circuit numbers for each row for which circuit numbering is shown. If the circuit assignment within a row on the terminal strip is apparent from the circuit figure (see Figures 15 and 17), then only the first or last circuit number in a row, as applicable, shall appear at the rows for which numbering is shown. The numbering conventions are defined to apply to series of consecutive full rows. Single row assignments shall indicate both the first and last circuits of such rows, as illustrated in Figure 13. Partial rows shall indicate both the first and last circuits cabled in such a row. If the circuit numbers in a row are not consecutive, and the numbers in a row are not consecutive, then the numbers shall be shown separated by commas. These rules shall apply in the body of the drawings as well as in expanded sketches.

5. Unequipped Rows on Terminal Strips

a. In the case of partially equipped terminal strips, only that portion of the terminal strip is filled in (shown black), and given circuit designations, which are wired or for which cabling has been provided even though all or some of the circuits are not equipped at other points.

b. The number of spare rows of terminals shall be shown in brackets with the designation "SR" (see Figure 10 [3, 5, 7 of 8], and Figure 11). In addition, cover the designation [SR] in a note on the drawing as follows:

[SR] SPARE ROWS

6. Common Language Equipment Identification (CLEI™)

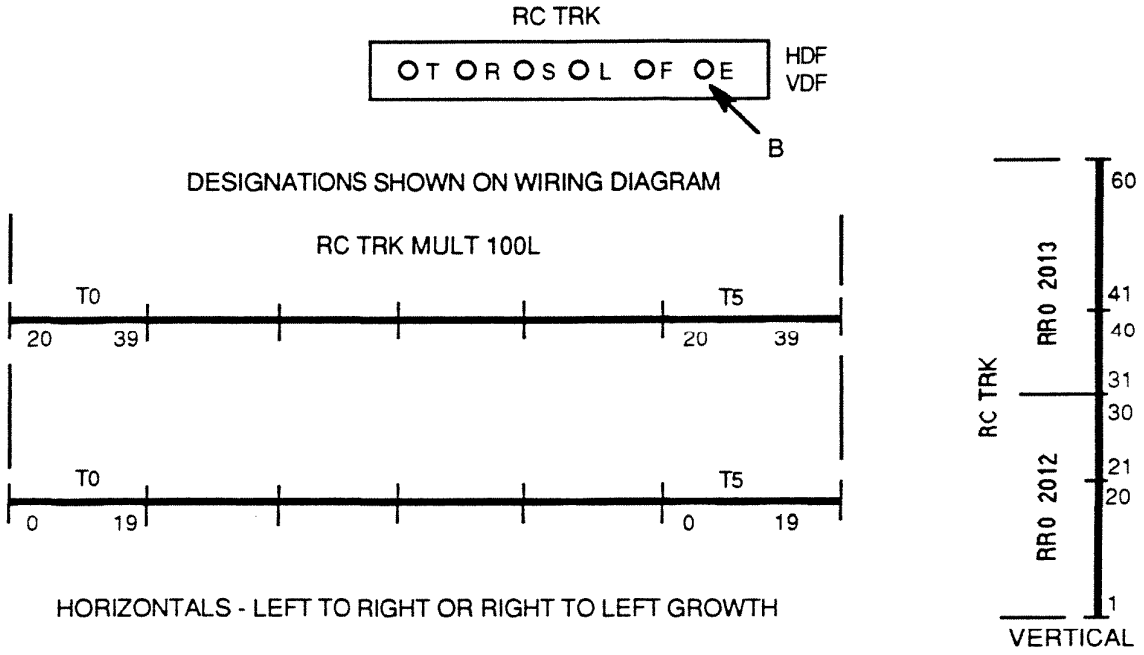
a. CLEI™ codes shall be used on distributing frame drawings if requested by the Equipment Engineer. The codes will ordinarily apply only to new entries and shall not be added to existing entries unless specifically authorized by the Equipment Engineer.

b. A basic four character CLEI™ code, when required and available, shall be recorded on the distributing frame drawing in addition to the group designation (abbreviated circuit title). The code shall be added on the same line if space permits, or directly below the group designation for horizontal terminal strips, or to the right of the group designation for vertical strips.

c. In those cases where crowded conditions in the body of the drawing do not permit placement of the CLEI™ code, additional enlarged sketches should be used to allow for the proper entry of the information.

CLEI™ is a Trademark of Bell Communications Research, Inc.

ONE ROW OF TERMINALS PER CIRCUIT;
ONE KIND OF CIRCUIT PER TERMINAL STRIP



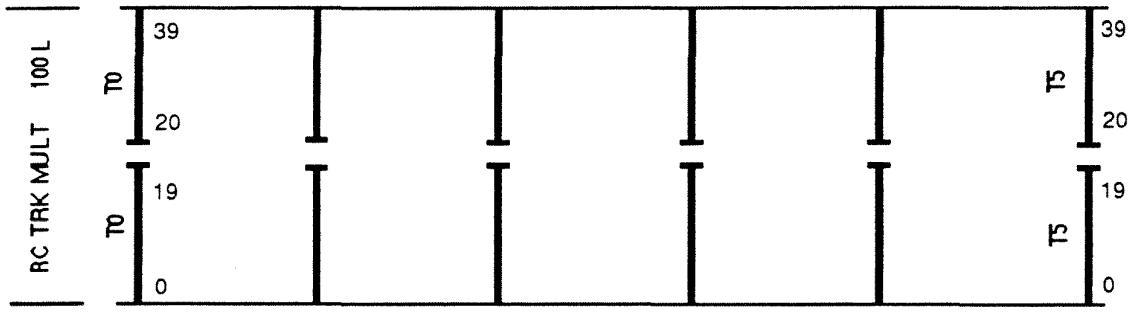


FIGURE 10
DESIGNATIONS SHOWN ON JOB DISTRIBUTING
FRAME EQUIPMENT DRAWINGS
(PAGE 1 OF 8)

TWO ROWS OF TERMINALS PER CIRCUIT;
ONE KIND OF CIRCUIT PER TERMINAL STRIP

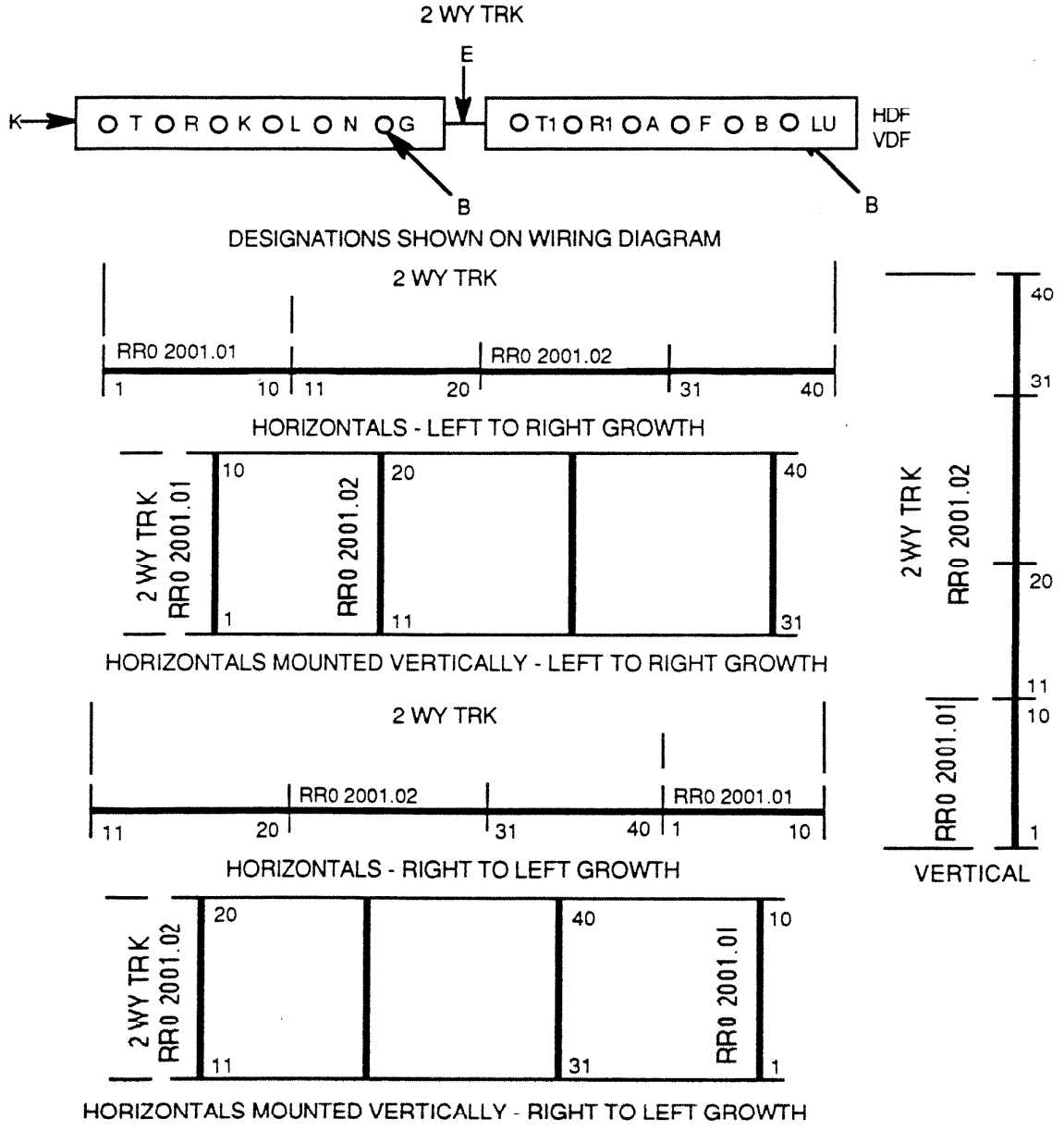


FIGURE 10
DESIGNATIONS SHOWN ON JOB DISTRIBUTING
FRAME EQUIPMENT DRAWINGS
(PAGE 2 OF 8)

THREE ROWS OF TERMINALS PER CIRCUIT;
ONE KIND OF CIRCUIT PER TERMINAL STRIP

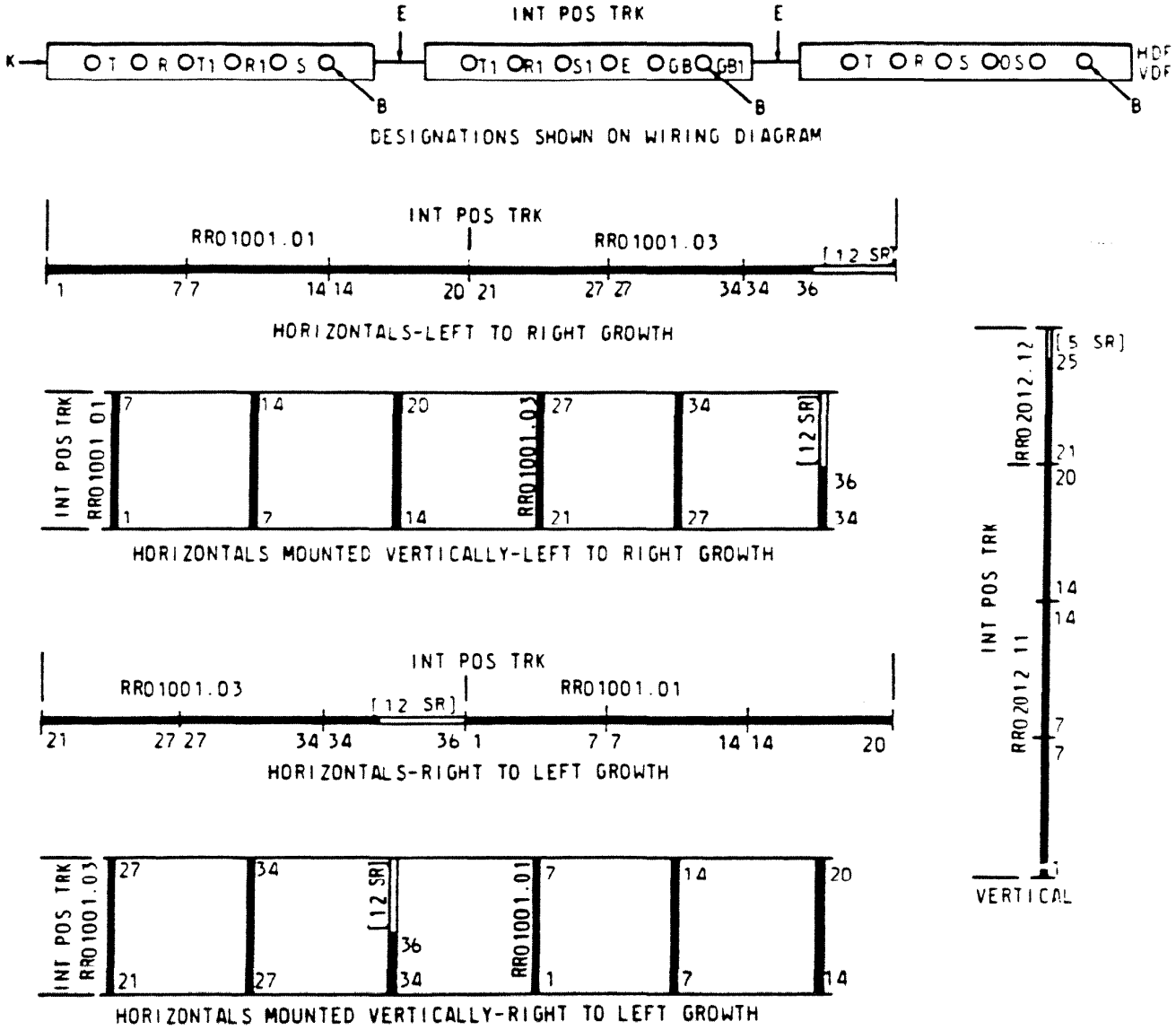


FIGURE 10
DESIGNATIONS SHOWN ON JOB DISTRIBUTING
FRAME EQUIPMENT DRAWINGS
(PAGE 3 OF 8)

THREE OR MORE ROWS OF TERMINALS PER CIRCUIT;
MORE THAN ONE SET OF TERMINAL DESIGNATIONS;
ONE KIND OF CIRCUIT PER TERMINAL STRIP

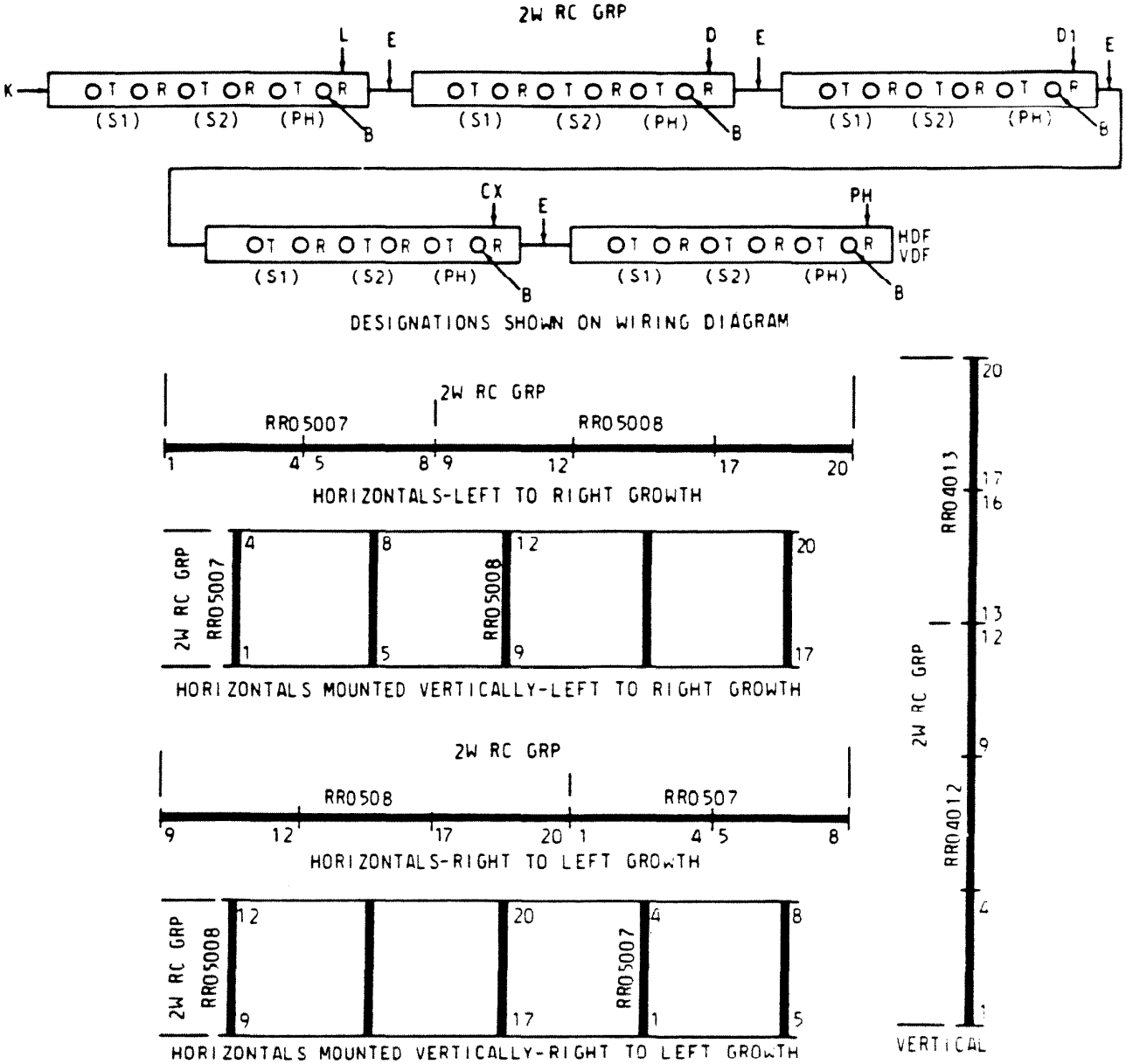


FIGURE 10
DESIGNATIONS SHOWN ON JOB DISTRIBUTING
FRAME EQUIPMENT DRAWINGS
(PAGE 4 OF 8)

TWO OR MORE ROWS OF TERMINALS
ONE KIND OF CIRCUIT PER TERMINAL STRIP

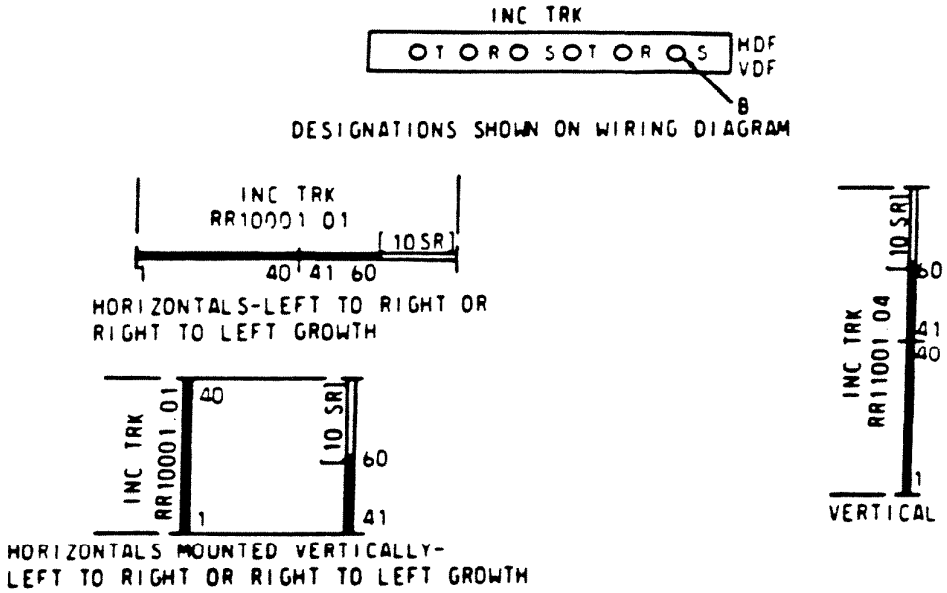


FIGURE 10
DESIGNATIONS SHOWN ON JOB DISTRIBUTING
FRAME EQUIPMENT DRAWINGS
(PAGE 5 OF 8)

TWO OR MORE CIRCUITS PER ROW OF TERMINALS;
TERMINAL ASSIGNMENT DESIGNATIONS;
ONE KIND OF CIRCUIT PER TERMINAL STRIP

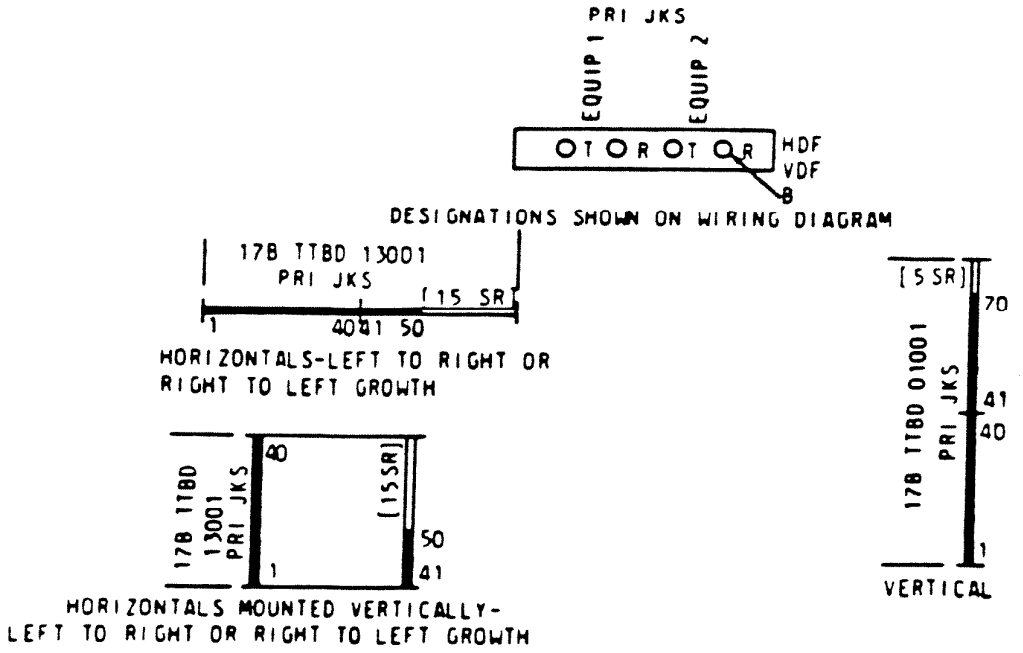


FIGURE 10
DESIGNATIONS SHOWN ON JOB DISTRIBUTING
FRAME EQUIPMENT DRAWINGS
(PAGE 6 OF 8)

TWO OR MORE CIRCUITS PER TWO ROWS OF TERMINALS
WITH ROW DESIGNATIONS; ONE KIND OF CIRCUIT PER TERMINAL STRIP

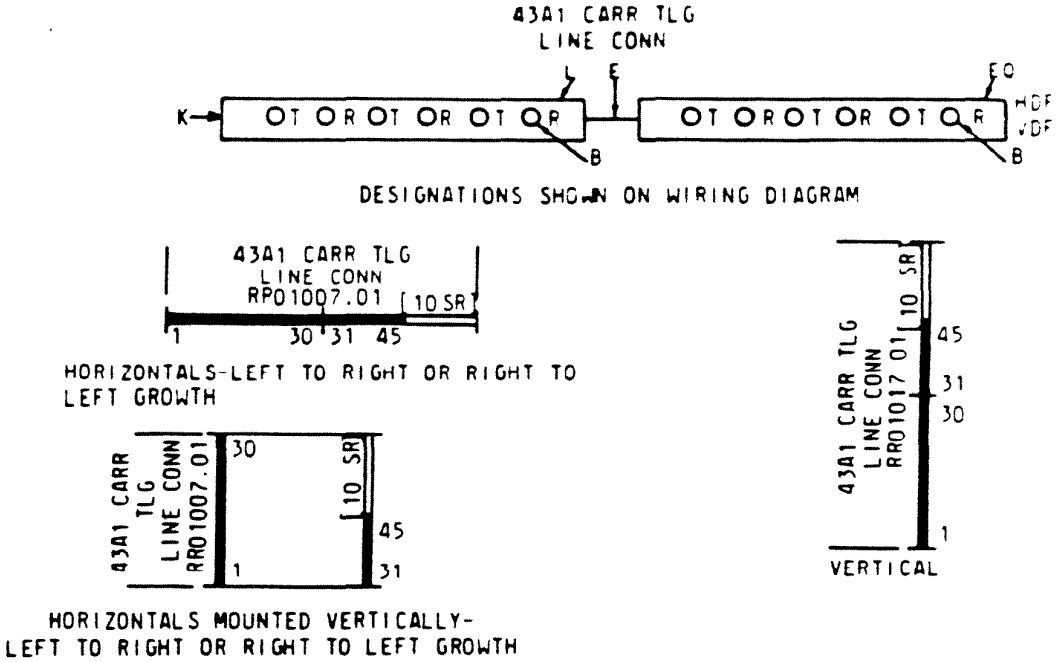
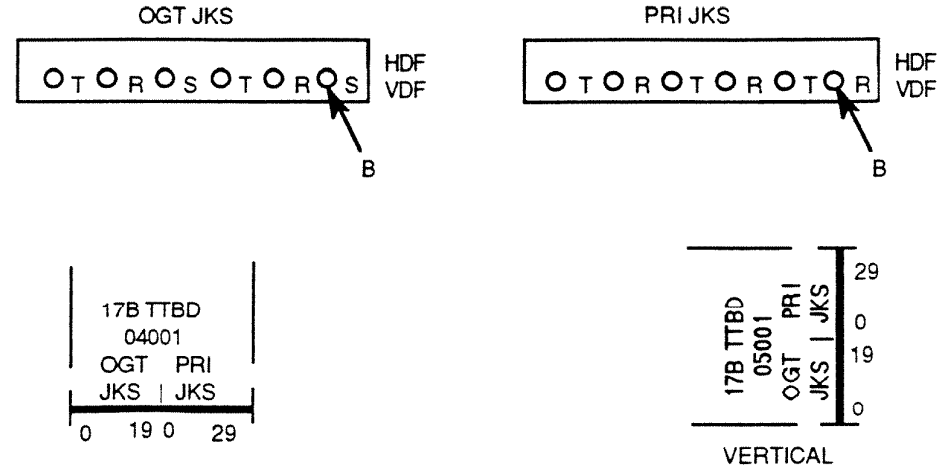
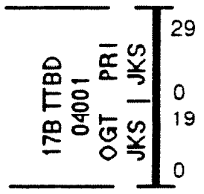


FIGURE 10
DESIGNATIONS SHOWN ON JOB DISTRIBUTING
FRAME EQUIPMENT DRAWINGS
(PAGE 7 OF 8)

TWO OR MORE CIRCUITS PER ROW OF TERMINALS;
TWO KINDS OF CIRCUITS PER TERMINAL STRIP



HORIZONTAL - LEFT TO RIGHT OR
RIGHT TO LEFT GROWTH



HORIZONTAL MOUNTED VERTICALLY

FIGURE 10
DESIGNATIONS SHOWN ON JOB DISTRIBUTING
FRAME EQUIPMENT DRAWINGS
(PAGE 8 OF 8)

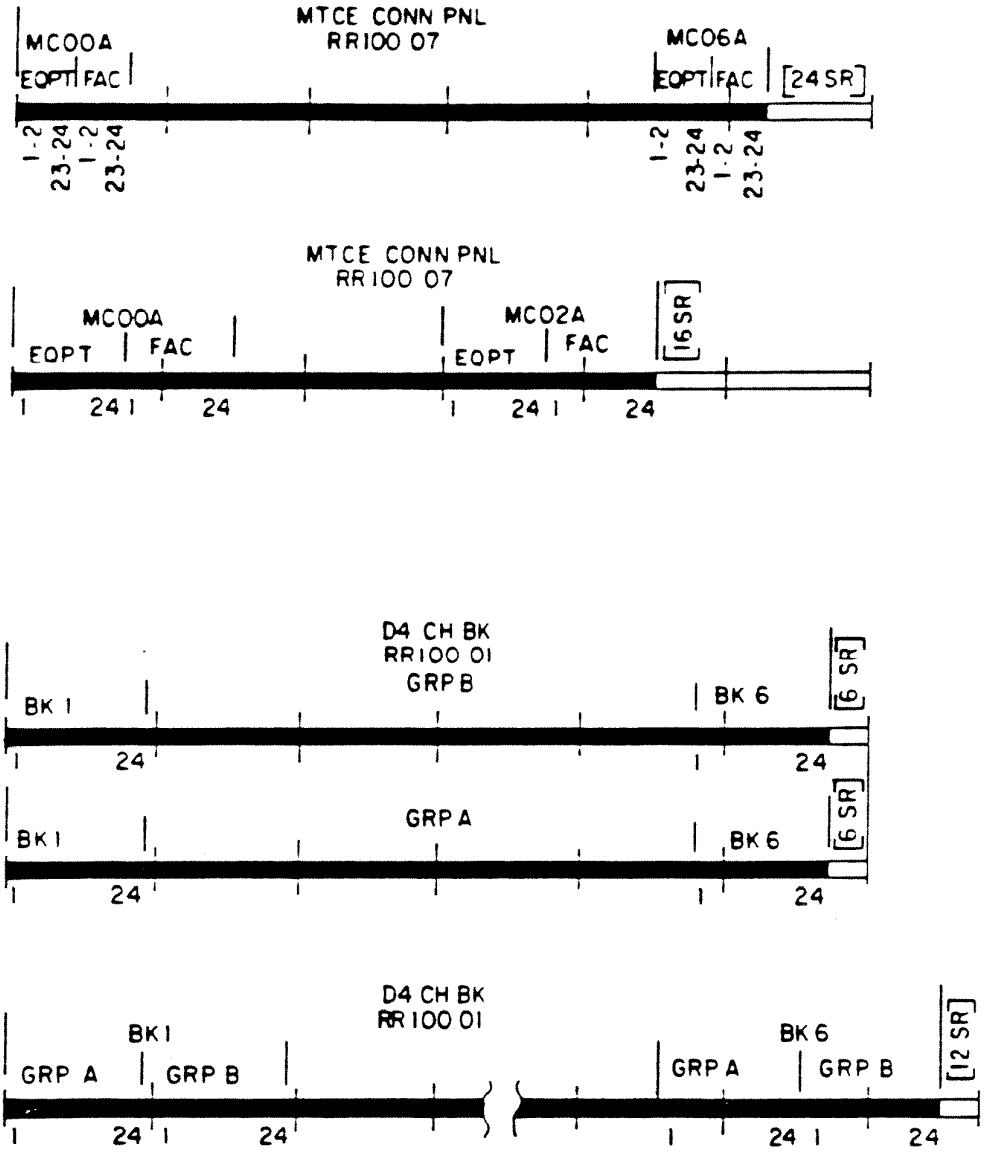


FIGURE 11
SUBGROUP DESIGNATION PATTERNS

MISC TRK CGO

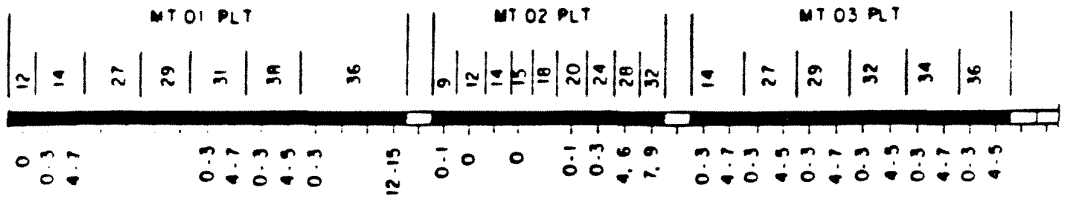


FIGURE 12
CIRCUIT NUMBERING AND SUPPLEMENTARY DESIGNATION PATTERNS

7.04 Enlarged Sketches

A. When three or more different types of circuits are terminated on the same terminal strip, an enlarged sketch of the terminal strip shall be shown on the job equipment drawing to show the exact rows of terminals assigned to each circuit of a given kind. When practical, a vacant row of terminals is to be left between different types of circuits in a sketch (see Figure 13), in order that the wiring does not obscure the functional designations. Other unused rows of terminals in a sketch shall be considered as spare rows, but need not be designated as such.

B. Designate sketches to agree with the location of the terminal strips on the frame; for example, if the terminal strip is located on shelf P in bay 3, designate the sketch P3, or if located on vertical 3 shelf P, designate the sketch 3P, as illustrated in Figure 13. If several adjacent terminal strips are included in the sketch, identify the sketch by the location of the first terminal strip involved.

C. Terminal strip sketches shall be drawn with five rows of terminals to 1-1/4 inch to accommodate 1/8 inch lettering to meet microfilm standards.

D. All sketches shall be shown beginning on sheet 2. Sheet 1 is reserved solely for displaying the mask of the terminal strip and shelving locations.

ONE, TWO OR MORE CIRCUITS PER ROW OF TERMINALS;
THREE OR MORE KINDS OF CIRCUITS PER TERMINAL STRIP

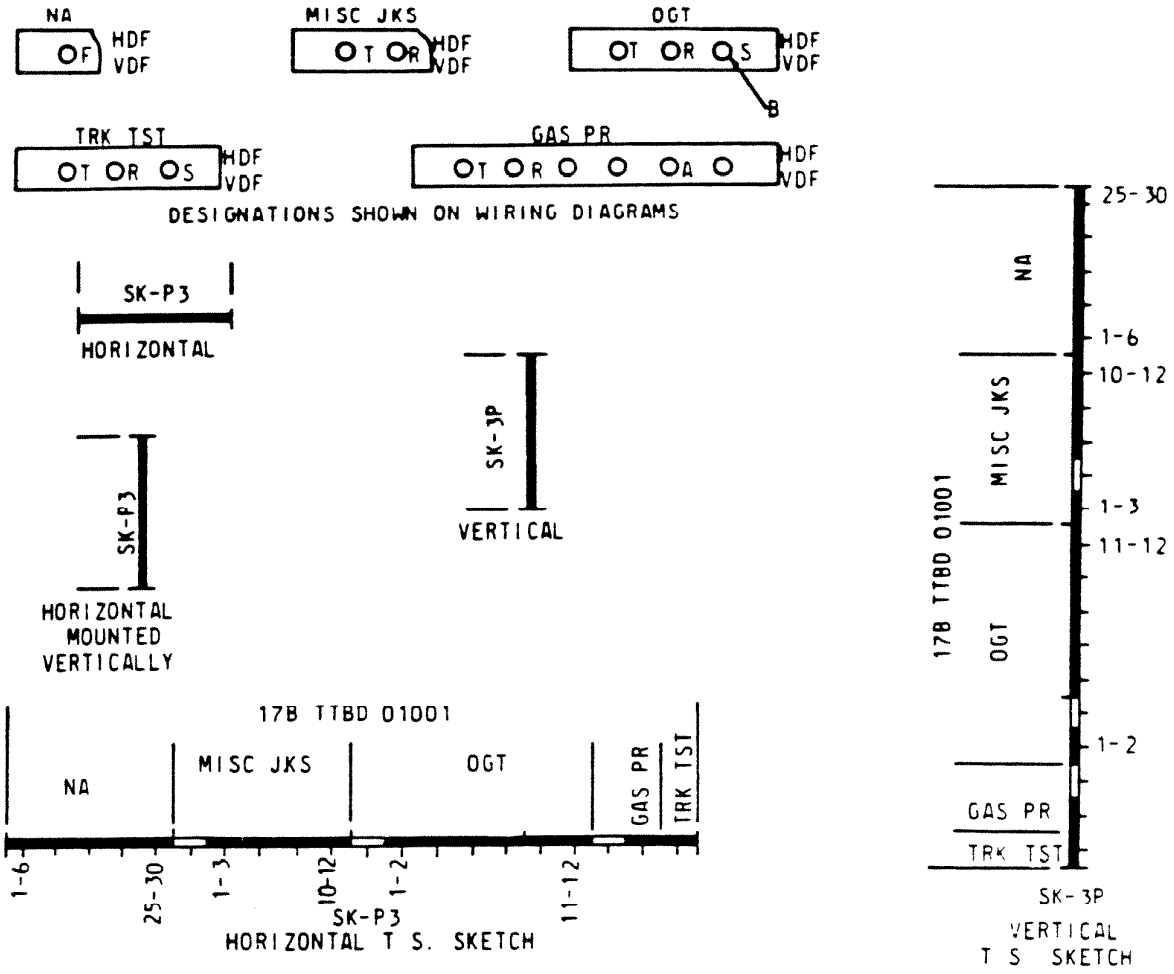


FIGURE 13
MULTIPLE CIRCUIT DESIGNATIONS SHOWN ON JOB
DISTRIBUTING FRAME EQUIPMENT DRAWINGS

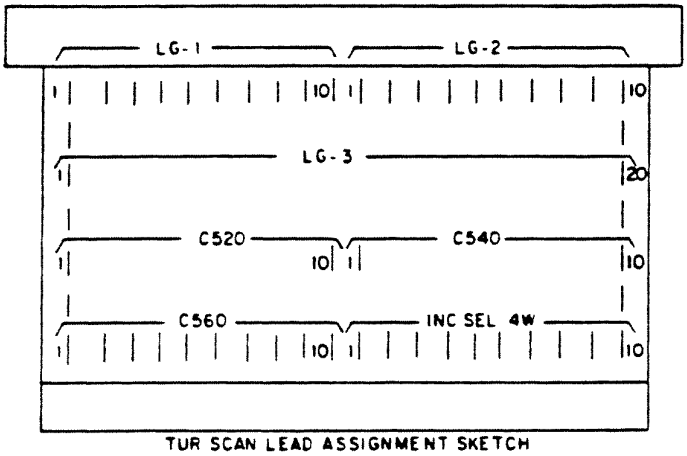
7.05 Pictorial and Tabular Representation - For unusual situations where it is necessary to specify the exact geometry of assignments of points within a terminal strip such as:

A. To accommodate the use of a connector for a portable test set.

B. Where lead assignments are too random to fit into a pattern a sketch of a terminal strip.

C. A table can be used (see Figure 14).

However, these methods shall be used only as a last resort and shall not be used where conventional techniques are adequate.



TUR SCAN LEAD ASSIGNMENT SKETCH

7	LG-1 1 10 | LG-2 1 10	INC 4W SEL 1 20 | LOC 5TH SEL 1 10
6	NA	NA
5	LG-3 1 20	INC 3W SEL: SW2 SH D 1 10 | SW 2 SH C 1 10
4	NA	NA
3	C520 1 10 | C540 1 10	CAMA TRK 1 13 | 5 SR | NA | ATS ON 12
2	NA	NA
1	C560 1 10 | INC 4W SEL 1 10	RC TRK 1 9 | ISR | 50 ROYALTON 1 DL 10
	SKETCH BX	SKETCH BY

TUR SCAN LEAD ASSIGNMENT SKETCH

FIGURE 14
PICTORIAL AND TABULAR TERMINAL STRIP ASSIGNMENT

7.06 Jack Boxes, Cord Hooks, and Jack Mountings

A. For jack boxes a single, completely detailed sketch may be shown just once when the jack box configuration is exactly the same in all of its multiple appearances on a distributing frame. The detailed jack box sketch shall be shown on the distributing frame equipment drawing on which the initial appearance of the jack box occurs. Reference to this drawing shall be made on any other distributing frame equipment drawings which contain an appearance of the jack box multiple.

1. A separate and completely detailed jack box sketch shall be shown on each distributing frame equipment drawing having an initial appearance of a jack box configuration which is not an exact duplicate of other jack box configurations on the distributing frame.

2. Show jack boxes in the body of the distributing frame equipment drawing in their relative positions above the verticals or horizontals, and detail the jack arrangements in a sketch as in Figure 15.

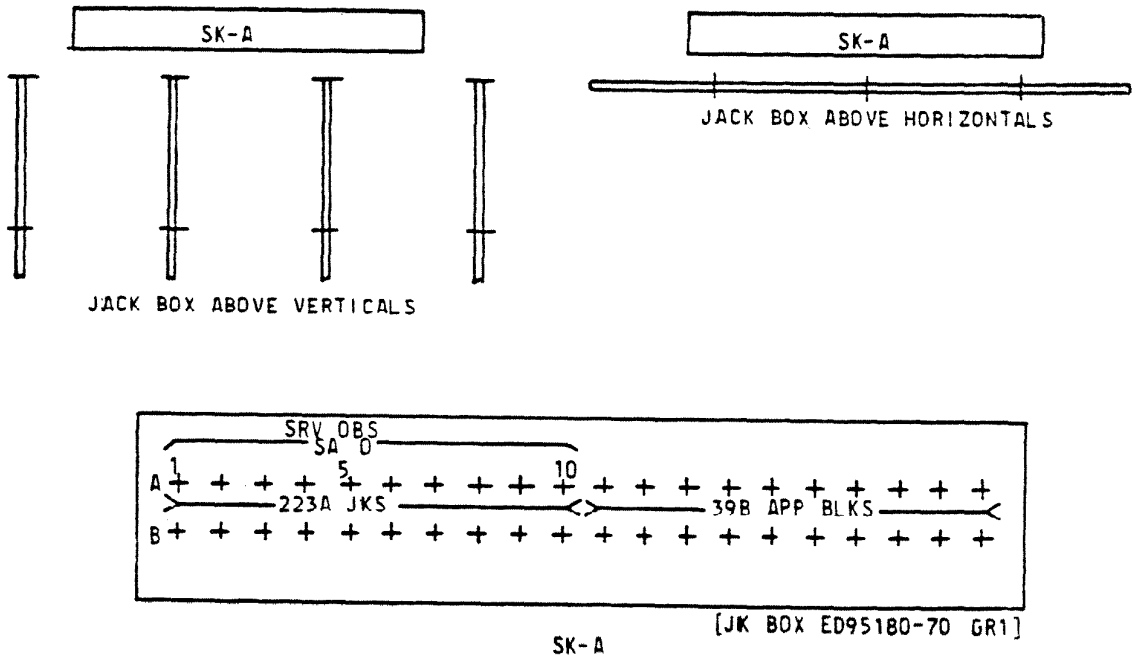


FIGURE 15
TYPICAL HORIZONTAL JACK MOUNTING ASSEMBLY

3. Show jack boxes mounted on the vertical side of MDF dotted in their relative positions on the horizontal side in the body of the distributing frame equipment drawing, and detail the jack arrangement in a sketch (see Figure 16). Cover the jack box with a note similar to the following:

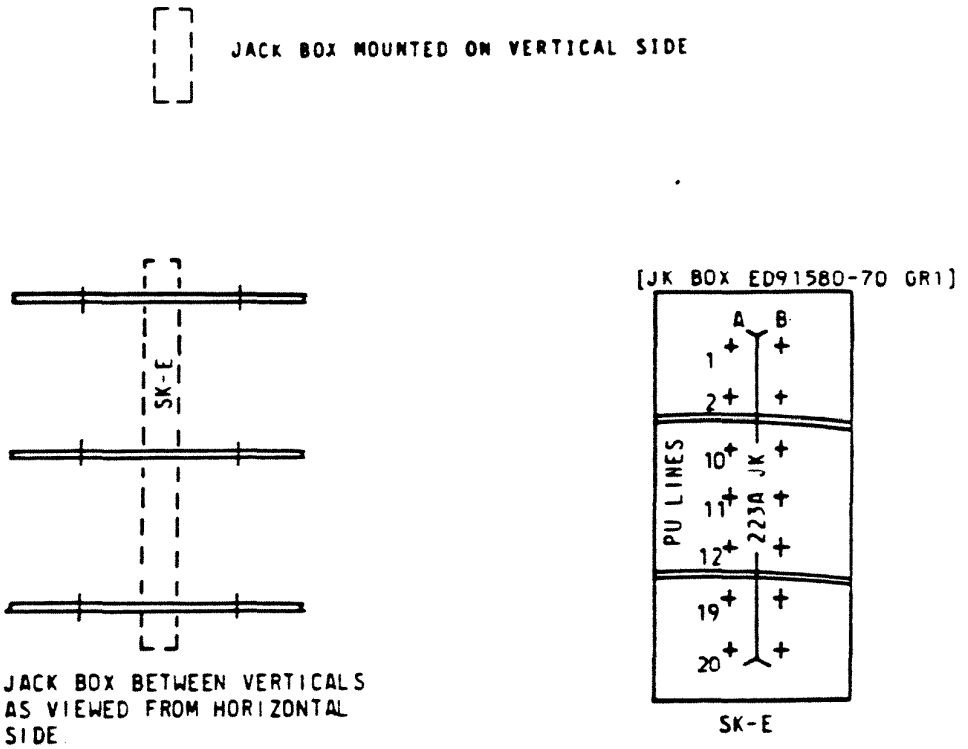


FIGURE 16
TYPICAL VERTICAL JACK MOUNTING ASSEMBLY

B. List the associated Cord Hook Assemblies and Mountings in a note similar to the following:

CORD HOOK ASSY & MTG ON VERT SIDE PER MANUFACTURER'S DRAWING NUMBER _____

CORD HOOK ASSY & MTG ON HOR SIDE PER MANUFACTURER'S DRAWING NUMBER _____

C. Show jack mountings in their relative positions on the horizontal or vertical sides in the body of the distributing frame equipment drawing and detail the jack arrangements in a sketch as illustrated in Figure 17.

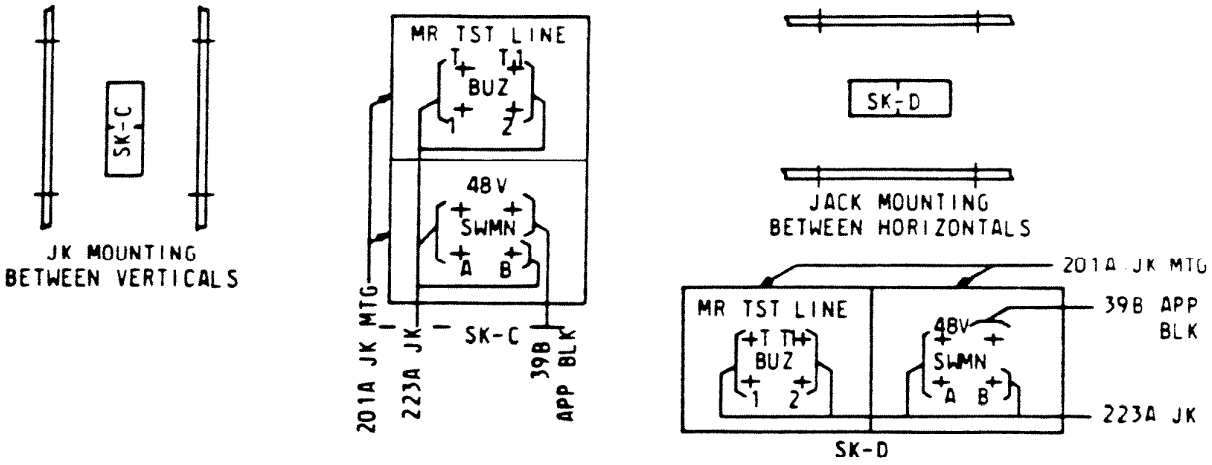


FIGURE 17
TYPICAL NON-STANDARD JACK BOX MOUNTING ARRANGEMENT

D. It is recommended that the office records for the miniaturized test and talk equipment be covered by a table similar to Figure 8.

E. When an appropriate figure is not available on the standard equipment drawing, stamping information for the group shall be furnished using a supporting Manufacturer's drawing or as instructed by the Equipment Engineer. The detailing of equipment and stamping information outlined in the job specification shall conform to the job equipment sketch using the general format of the standard drawing figure as a guide.

7.07 Terminal Strip Shields for frames on which all horizontal terminal strips are equipped with shields, show a "Location of Terminal Strip Shields" table listing the various codes of terminal strips and associated shields. If only some of the terminal strips are equipped with shields, indicate the shields right at the terminal strip location unless they are few enough to be covered in a note.

7.08 Connecting Blocks

A. The location of 17B connecting blocks mounted on vertical guard rail supports on the protector side of the MDF shall be shown in the body of the drawing with a symbol as illustrated in Figure 18.

B. Cover the 17B connecting block symbol in note similar to the following:

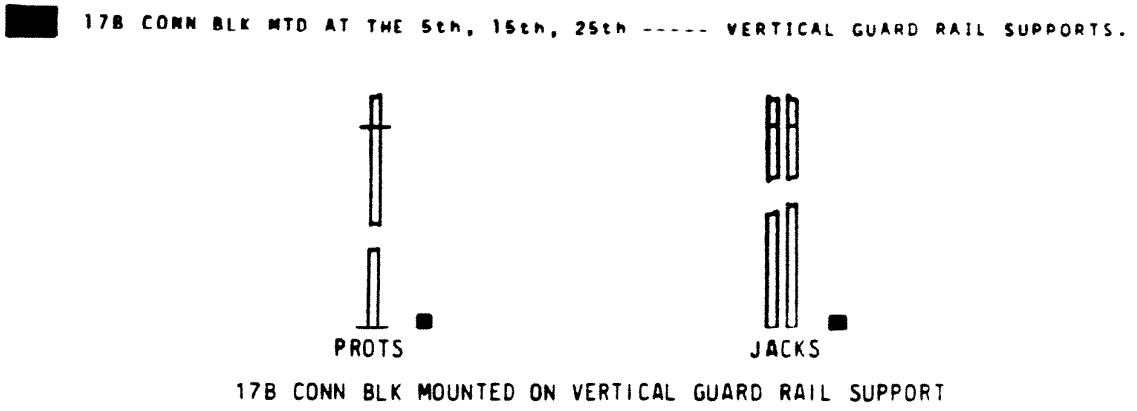


FIGURE 18
17B CONNECTING BLOCK MOUNTED ON VERTICAL GUARD RAIL SUPPORT

C. The location of 33 type connecting blocks shall be shown in the body of the drawing with a symbol as illustrated in Figure 19.

D. Cover the 33 type connection block symbols in a note similar to the following:

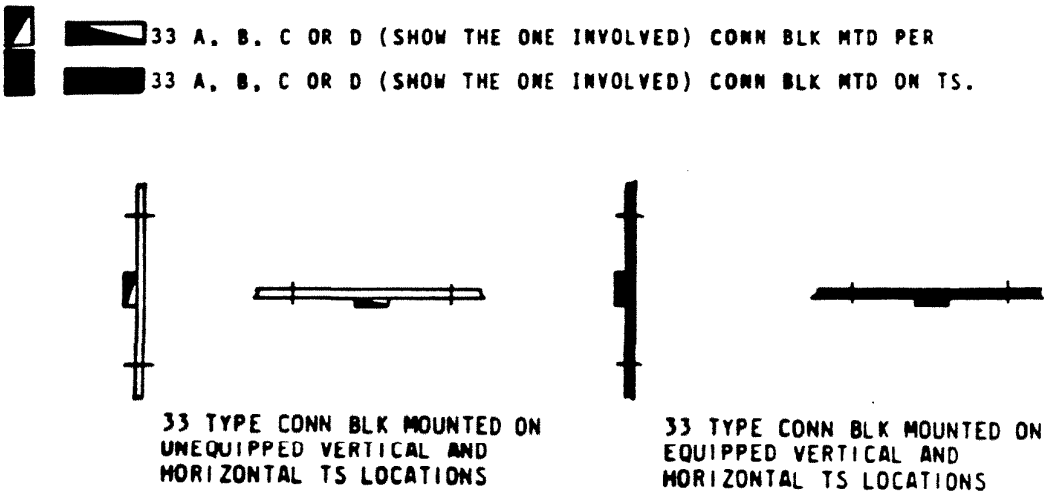


FIGURE 19
TYPICAL 33-TYPE HORIZONTAL/VERTICAL CONNECTING BLOCK MOUNTING ASSEMBLY

7.09 Loudspeaker Talk-Back Transmitter

A. The location of Loudspeaker Talk-Back Transmitters shall be shown in the body of the drawing with a symbol as in Figure 20.

B. Cover the Loudspeaker Talk-Back Transmitter symbol in a note similar to the following:

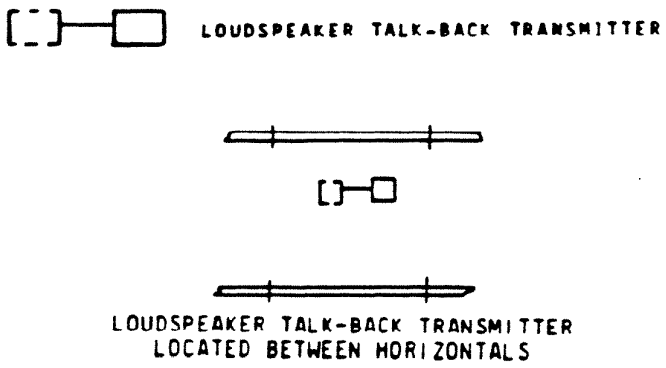


FIGURE 20
LOUDSPEAKER TALK-BACK TRANSMITTER
LOCATED BETWEEN HORIZONTALS

7.10 Location of Equipment Table

A. A Location of Equipment table similar to Figure 21 shall be shown on all distributing frame equipment drawings.

B. Circuit drawing numbers are to be shown only in the Location of Equipment table and not in the body of the distributing frame equipment drawing unless specifically requested by the Equipment Engineer. When more than one kind of circuit terminates on a terminal strip, show all the circuit drawings in the table. List circuit drawings in numerical order except on additions, where they may be shown in the next vacant spaces in the table. When a drawing is redrawn, it is recommended that the circuit drawings be rearranged in numerical sequence.

C. If available, the circuit figure which contains the distributing frame terminations shall be shown in the table.

D. The location specified in the table shall be that of the terminal strip associated with the lowest numbered circuit. If a circuit is assigned to terminal strips in nonadjacent locations, show the terminal strip location for the lowest numbered circuit in each group.

E. In those cases where the number of drawings for a single type of circuit is so considerable, as in SPCS miscellaneous trunks, that their entries in the Location of Equipment table would multiply its size and take up a considerable portion of the drawing, then it is permissible to use a general reference such as "MISC TRK" or "MT" instead of the individual circuit and figure numbers. A terminal strip location should be shown for each nonadjacent group of circuits.

F. When an existing entry contains a replaced terminal strip code and added circuits require a separate line, different only by reason of the replacing terminal strip code, the lines shall be combined using the new code to avoid duplicate listings of the circuit drawings.

G. On additions to distributing frame equipment drawings having the old type table, fill in the table for circuit drawings being added but do not fill in the Order and Specification columns. When a distributing frame equipment drawing having the old style table is redrawn, the table must be converted to the new type.

H. The Location of Equipment table shall be revised to reflect added, removed, or relocated items.

LOCATION OF EQUIPMENT							
CKT DWG	FIG	TS CODE	HOR	CKT DWG	FIG	TS CODE	VERT
T0000-290	1	P5A	H8	T0000-291	1	P6A	7H
	2	P3A	G3		2		11A
	3	P4A	L1		3		10L
	4	P5A	E1, F1, G1		4		14M
	5	P5A	B1	T00000-00	10A	P6A	22C, 19B
T62447-32	8	P4A	M2	T60652-31	7	P5A	10N
T63102-30	7	P5A	M5	T60673-30	11	P5A	10P
				T62005-30	9	P4A	7J
				T62436-30	6	P3A	17C

1-5/16 | 5/8 | 1/2 | 1-1/4 | 1-5/16 | 5/8 | 1/2 | 1-1/4

7-3/8

FIGURE 21
LOCATION OF EQUIPMENT TABLE

8.00 NOTES AND SYMBOLS

8.01 The following are some of the common notes and symbols which shall be used as required on distributing frame equipment drawings.

A. FRWK ASSY IS PER ED X X X X X - X X

GR X, X, X, FOR VERT X THRU X X

GR X, X, X, FOR VERT X X THRU X X

B. CORD HOOK ASSY & MTG ON VERT SIDE PER MANUFACTURER'S DRAWING NUMBER _____

CORD HOOK ASSY & MTG OR HOR SIDE PER MANUFACTURER'S DRAWING NUMBER _____

C. [ ] DESIGNATIONS SHOWN IN BRACKETS FOR INFORMATION ONLY AND ARE NOT TO BE STAMPED

D. [SR] SPARE ROWS

E. 17B CONN BLK AT THE 5th, 15th, 25th - - - VERTICAL GUARD RAIL SUPPORTERS

F.  33 A, B, C, OR D, (SHOW THE ONE INVOLVED) CONN BLK MTD PER MANUFACTURER'S DRAWING NUMBER

G.  33 A, B, C, OR D (SHOW THE ONE INVOLVED) CONN BLK MTD ON TS

H.  LOUDSPEAKER TALK-BACK TRANSMITTER

I.  JACK BOX MOUNTED ON VERTICAL SIDE

RELAY RACK EQUIPMENT DRAWINGS

CONTENTS

1.00 GENERAL

1.01 This part covers the standards to be followed in the preparation of relay rack type equipment drawings for all systems.

2.00 SCALE

2.01 No scale is required. However, all configurations to be depicted on the drawing shall be drawn to accommodate 1/8 inch lettering to meet microfilm standards.

3.00 PEN SIZE

3.01 The pen size requirements for the preparation of tabular format lineweights are covered in Section III, Part C, Paragraph 8.03.

3.02 The following indicates pen sizes that shall be used for the following specific conditions.

Pen Size	Application
0	Apparatus locations within Sketches, Misc Mounting Place Equipment Tables; Misc Jack Mounting Lead Lines; Position Ladder
2	Outline of: Relay Racks and Division Lines, Misc Mounting Plates; Misc Jack Mounting Equipment; Misc Sketches; Apparatus

4.00 ISSUE NOTES

4.01 A descriptive Issue Note is required for relay rack equipment drawings.

4.02 Descriptive portions of Issue Notes shall be similar to the following:

A. For relay racks added or removed:

ADD, RR ------/RMV, RR -----.

B. For units or mounting plates added to or removed from relay racks:

ADD, PLT, ---- RR ----/RMV, PLT ---- RR ----.

C. For relocated units for mounting plates within relay racks:

RELOC, PLT ---- TO PLT ---- RR ----.

D. For relocated units or mounting plates from relay rack to relay rack:

RELOC, PLT ---- RR ---- TO PLT ---- RR ----.

4.03 A basic Issue Note will suffice for other additions and removals not covered in Paragraph 4.02.

4.04 "Spare" and "Retired In Place" notations are included on the wiring list and equipment drawing.

5.00 CRITERIA

5.01 Prior to the preparation of the relay rack equipment drawing of a particular lineup, all necessary data shall be obtained and checked to verify that it is noncontradictory and is the latest available information. This data consists of:

A. Office Base Dash Number and Issue

B. Growth and Number of Relay Racks in the Lineup - Present and Ultimate

C. Type of Relay Rack - Channel Bulb Angle, Duct or Sheet Metal

D. Relay Rack Heights and Number of Mounting Plates

E. Size of Mounting Plates - Widths and Lengths

F. Sketches - Relay Rack and Equipment Arrangements

G. Jack Fields

H. Heights of Lowest Mounting Plate Above the Floor

I. Tables

J. Relay Rack Equipment Drafting Aids

K. Relay Rack Equipment Tracing Forms

5.02 Arrangement of Layout of Drawing - If growth of the relay rack lineup is left to right, the lowest numbered relay rack shall be located at the left border of the tracing. If the growth is right to left, the lowest numbered relay rack shall be located as close as possible to right side of the tracing. The relay rack numbering and growth of the lineup shall agree with the floor plan.

6.00 RELAY RACK EQUIPMENT DRAWING STANDARDS

6.01 Shop wire relay racks are covered in Paragraph 10.05.

6.02 Drawing standards specified herein shall be applied to all new relay rack equipment drawings.

6.03 Relay Rack Equipment Drawings shall be prepared utilizing either tabular or nontabular concepts. Refer to Exhibits 1 and 2 for relay rack configurations utilizing these concepts as follows:

A. Exhibit 1 - Tabular Type

B. Exhibit 2 - Nontabular Type

6.04 Numbering for the full complement of circuits, wired or equipped, on a unit shall be shown on the relay rack equipment drawings. Distinction between equipped and wired only circuits shall be indicated on the wiring list only.

7.00 NEW RELAY RACKS

7.01 All new relay racks, including those to be added in present lineups, except 701B and 711 PBX relay racks, shall be equipped from bottom-up regardless of whether the equipment comprising a particular unit or panel is numbered bottom-up or top-down. Individual units or panels shall be numbered top-down or bottom-up as prescribed on the particular equipment specification code. This will result in having some units numbered top-down until such time as they are converted or replaced by units arranged for bottom-up numbering.

7.02 Circuit numbering for single and multicircuit units or panels on Relay Rack Equipment drawings shall be shown as follows:

A. Single plate units or panels:

1. On the left side for single circuits.

2. Lowest circuit number on left side and highest number on right side for multicircuits.

B. Multiplate units or panels numbered bottom-up:

1. In the lower left corner of units or panels for single circuits.

2. Lowest circuit number in lower left corner and highest circuit number in upper right corner of units or panels for multicircuits.

C. Multiplate units or panels numbered top-down:

1. In the upper left corner of units or panels for single circuits.

2. Lowest circuit number in upper left corner and highest circuit number in lower right corner of units or panels for multicircuits.

7.03 In case of coded relay rack equipments, the arrangements of equipment and sequence of numbering shall conform in all respects to the information conveyed on the controlling Specification Code indentified within the manufacturer's equipment drawing.

7.04 On tabular and nontabular relay rack equipment drawings, indicate size of mounting plates (i.e., 1-3/4 by 19, 1-3/4 by 23 or 2 by 23) the relay rack frameworks are designed to accept.

A. On tabular relay rack equipment drawings, indicate size of mounting plates in a note similar to the following:

RELAY RACKS ARE DESIGNED FOR ----- MOUNTING PLATES UNLESS OTHERWISE INDICATED BELOW RELAY RACK CONFIGURATION.

B. On nontabular relay rack equipment drawings indicate size of mounting plates directly below the right hand corner of each relay rack configuration, and cover with a note similar to the following:

DIMENSIONS SHOWN DIRECTLY BELOW RIGHT HAND CORNER OF RELAY RACK CONFIGURATIONS INDICATE SIZE OF MOUNTING PLATES FRAMEWORK IS DESIGNED FOR.

7.05 Sketches

A. Illustrations of job equipment arrangements are called "figures" or "sketches". The term "figures" is generally used for dial systems while "sketches" is generally used for toll. The terms are used interchangeably herein.

B. As a rule, the circuit numbering shall be included in the sketches. However, when not to do so causes multiple repetitions of the same sketch, then a note may be added below the sketch, or in the "Notes" column, referring to the actual circuit numbering shown in the relay rack outline (see Exhibit 1, SK AU4, and Exhibit 2, SK 105G and SK 105DA).

C. On mounting plate sketches with a common cover, indicate equipment positions by functional designation, either centralized or for the first and last circuits of a group. Shown circuit number for the first and last circuits of a group. Unequipped positions shall be left blank.

D. On mounting plate sketches with individual covers indicate positions equipped with a resistor by a short vertical line (|) and for all other equipment show drilled (equipped or unequipped), positions with a plus (+). For a group of three or more circuits, show designations and numbering for the first and last equipped circuit position only. Undrilled positions shall be left blank.

E. "Drilled for" information shall be arranged as shown in Exhibit 1, Fig AG, and Exhibit 2, SK 105BR and 105BD.

F. Designations shown on jack mountings shall not be stamped unless instructed by the Equipment Engineer.

G. In sketches using 410 or similar type of twin jacks, the designation for the upper jack shall be shown in the upper portion of the designation strip and for the lower jack in the lower portion of the designation strip.

H. Indicate the position of pigtail resistors mounted on the rear as shown in Exhibit 2, SK 105CU. Functional designations need not be shown unless not clearly defined on the circuit drawing, or other special consideration. In such cases, the functional designations should be provided preferably in the tabular format shown in Exhibit 2, page 1 of 4 top right.

8.00 EQUIPMENT ADDED IN EXISTING RELAY RACKS

8.01 Equipment added in existing partially equipped relay racks shall be shown as equipped in the sequence established by the existing equipment. As in the case of new relay racks, the component units shall be numbered to agree with the numbering prescribed on the individual specifications coded.

8.02 When making additions to nontabular miscellaneous relay rack drawings, the format of the present drawing shall be followed.

9.00 TABULAR TYPE RELAY RACK EQUIPMENT DRAWING STANDARDS

9.01 Tabular type equipment drawings shall be used to originate miscellaneous relay rack drawing in SXS, #1 X-Bar and #5 X-Bar equipment.

9.02 The class designations shown in the Equipment of Frames table (see Exhibit 1) shall correspond with the class designations shown for the same equipment on the associated wiring list drawings.

A. Equipment shown as Class "A", etc., in the engineering specification and wiring list shall be shown as Class "A", etc., in the "Equipment of Frames" table.

B. Equipment shown as Class "A", etc., in specifications shall be shown as 48A, 50A, etc., in the Equipment of Frames table in order to identify other specifications and drawings. The numerical prefix to the equipment class designation, when shown, agrees with the second and third digits of the three digit dash number of the related wiring list drawing. The association of this class prefix with the wiring list drawing number shall be shown in a table on the Relay Rack Equipment Drawing (see Exhibit 1, Table B).

C. In the Equipment of Frames table show class designation once for any group of adjacent like units. Draw a line across the top and bottom of the group and draw stubs in class column to indicate the size of the units.

D. Class designations are not required in the Equipment of Frames table for mounting plate locations which are used for noncircuit equipment miscellaneously mounted within or on the uprights of relay rack frames. This type of equipment shall be shown in the respective locations on the frame, and explained by related figures, symbols, and job or standard notes.

E. Symbols for blank mounting plates are listed in Section 12.00. These symbols, when used shall be shown in the "class" column of the Equipment of Frames table and explained with a statement under Notes.

9.03 Miscellaneous Tabular Drawing Information

A. In the Standard Framework and Equipment Record table Column "C" show only those major lists in which framework, local cable, and common equipment are ordered. In Column "D", specify the sketch only when there is an option on the equipment drawing. Original figures or sketches shall be furnished unless otherwise specified.

B. Adapters for mounting 19 inch mounting plates on 23 inch relay rack framework shall be covered in Adapter Table "D" and shown with a symbol in the Equipment Table.

C. Mounting plates are numerically designated from the bottom up.

D. In the Equipment of Frames table indicate with a double line the normal mounting plate capacity of the frame.

E. The Assignment and Designation of Fuses, Table "A", and Fuse Panel Equipment and Stamping, Table "C", are required for #5 X-Bar equipment.

F. Stamping Information For Cord Circuit Units, Table "F", is required on SXS and #1 X-Bar equipment.

G. Miscellaneous punched type mounting plates equipped with a single type of apparatus shall be shown in the Mounting Plate Equipment, Table "E" in lieu of an illustration figure.

H. Illustrations shall be designated with the specified class designation for the equipment involved.

I. For method of preparing figures, refer to illustrations in paragraph 12.01.

10.00 NONTABULAR (PICTORIAL) TYPE RELAY RACK EQUIPMENT DRAWING STANDARDS

10.01 Repetition of Identical Equipment

A. Multiple appearances of an identical equipment item are generally identified by repetition of an assigned symbol; i.e., R, R1, R2, etc. Show the equipment in detail once, assign a symbol and designate the other locations with the same symbol. Show the office circuit numbering and the position, section or unit for each relay rack location. This type of designation can be used in the same or different relay racks.

B. In the same relay racks, ladders may be used to indicate duplication of like equipment only when the like equipment is adjacent.

10.02 Miscellaneous Nontabular Standards

A. When equipment mounted at the top of a relay rack extends beyond the top mounting plate location, the dimension it extends shall be shown.

B. Dimensions shall be shown below a relay rack configuration on the drawing when equipment mounted in the relay rack is less than one foot above the floor and the plate width of the equipment does not conform to the plate width for which the relay rack is designed or drilled. Dimensions are not required when the plate width of the equipment conforms to the drilled for plate width, i.e., 1-3/4 inch mounting plate locations AA, AB, AC, and 2 inch mounting plate locations FA, FB, FC.

C. Locations below the lowest standard drilled for position shall not be used unless so requested by the Equipment Engineer.

D. Circuit drawings shall be listed on the body of the relay rack equipment drawing only when made necessary by the Engineering requirements.

E. On duct type miscellaneous relay rack bays, the Manufacturers Schematic Diagram numbers to be stamped by the installer shall be shown on the drawing in the rectangle representing the designation card. The Manufacturers Schematic Diagram numbers need not be shown in the rectangle in the case of difficulty due to space limitations, although the numbers must still be stamped by the installer. In such cases a note similar to the following shall be added on the relay rack equipment drawing: MANUFACTURERS SCHEMATIC DIAGRAM NUMBERS FOR THE INDIVIDUAL UNITS MOUNTED IN THE BAY ARE STAMPED ON THE DESIGNATION CARD ABOVE THE BAY BY THE INSTALLER.

F. Equipment Specification Drawings

1. The framework assembly for miscellaneous relay racks shall be listed on the Office Framework Record Drawing if such a drawing exists; otherwise, that framework information shall be listed in a note on the Relay Rack Equipment Drawing.

2. Duct type framework duct covers shall be designated by Manufacturers Equipment Diagram drawing and group number on the side of the relay rack figure. Use symbols shown in Section 12.00.

G. In general, units and miscellaneous plates of equipment mount on the front flange of relay rack uprights with the front or can side of the apparatus to the front. Deviations from this mounting arrangement shall be covered in the following manner:

1. By the manufacturer's equipment specification listed for the relay rack which depicts the equipment arrangements.

2. By symbols shown opposite the equipment on the left side of the Relay Rack Configuration with an explanation of the symbols under notes as illustrated in paragraph 12.01, Items 12, 13 and 14.

H. The dimension of a left over space less than one mounting plate in width shall be indicated on the equipment drawing, as shown above SK105BE in Exhibit 2.

10.03 Sketches on Nontabular Drawings

A. Sketches shall be numbered by relay rack number supplemented by letter or letters corresponding to the mounting plate level at which the equipment is mounted, for example, SK105G. Where a sketch includes two or more mounting plates, the plate level shall correspond with the location of the lowest mounting plate in the group.

B. Circuit names, when shown on mounting plate sketches, shall not be duplicated in the body of the relay rack.

C. For miscellaneous relay rack bays in the same lineup, the equipment information shall be recorded on a separate miscellaneous relay rack equipment drawing while the corresponding wiring list information for the miscellaneous bays shall be included on the combined drawing. The miscellaneous bays shall be shown in their correct relative location on the job equipment drawing.

10.04 Noncircuit equipment mounted within or on the uprights of relay rack frames shall be shown in the pictorial in their respective locations, as on Frame 105 Plates AA, Q, U, BA and by the adjacent explanatory information. Sketches may also be used, as well as references to job notes containing explanations related to the special equipment.

A. COMMON LANGUAGE® Codes (CLC) shall be shown on Relay Rack Equipment Drawings if requested. The CLCs consist of seven characters for Standard Wired Relay Racks and eight characters for Units, Panels and Miscellaneous Equipped Mounting Plates. The codes shall complement the information normally shown on Relay Rack Equipment Drawings.

B. To minimize the redrawing of Relay Rack Equipment Drawings to accommodate the addition of the CLCs, it is recommended that the Codes, the English Names, preferably in the form of the COMMON LANGUAGE® Standard Abbreviations, and the related Equipment Specifications (with required lists or groups) be depicted on the drawings in the following manner for wired relay racks and units or panels:

1. Single Shop Wired Relay Rack - Show the English Name of the Relay Rack below its configuration. Show the seven character CLC followed by the related Equipment Specification with the required lists or groups within the Relay Rack Configuration (see Exhibit 2, Frame 101.10).

2. Double Shop Wired Relay Rack - Show the seven character CLC followed by the English Name of the Double Relay Rack, the related Equipment Specification with the required lists or groups below and bracketing both Relay Rack Configurations (see Exhibit 2, Frame 101.12, 13).

3. Single Plate Units or Panels - (1) Where space permits, show both the eight character CLC and the English Name within the Unit or Panel Configuration. Show the related Equipment Specification with the required lists or groups adjacent to the Unit or Panel alongside the left (preferred) or right upright of the Relay Rack Configuration.

10.05 Shop Wire Relay Racks on Nontabular Drawings

A. Complete Lineups of Shop Wired Bays

1. Relay Rack Equipment Drawings shall not be generated for lineups of relay racks consisting of shop wired bays which are completely detailed on their respective specification drawings. Instead, a combined wiring list and equipment drawing shall be generated. Besides containing wiring list data, the combined drawing shall show equipment information by means of the specification drawings and those associated lists or groups which order frame and unit assemblies and local cables (see Section IV, Part E).

2. If a modification sketch is required for a standard bay in a shop wired lineup, the sketch will ordinarily be placed on a miscellaneous sketches drawing. The case where a Relay Rack Equipment Drawing does exist for a lineup is covered in paragraph 10.05, B.

B. Combinations of Shop Wired and Miscellaneous Relay Rack Bays In The Same Lineup

1. When equipment information for shop wired bays is included on the wiring list (This is the rule for a new or existing lineup of shop wired bays or predominately shop wired bays).

a. Shop wired relay racks shall have both the equipment and the wiring list information recorded on a combined wiring list and equipment drawing as in Paragraph 10.05, A.

b. For miscellaneous relay rack bays in the same lineup, the corresponding wiring list information shall be included on the combined drawing while the equipment information shall be recorded on a separate miscellaneous relay rack equipment drawing (generated for the purpose if not already available). Both the miscellaneous and the shop wired bays shall be shown in their correct relative location, although no identification or other added information need be shown for the shop wired bays on the equipment drawing.

c. For cases where very few miscellaneous bays are involved, two lineups of relay rack bays may be shown on the same equipment drawing provided the above rules are observed, and also that ample room for sketches is available. This allowable exception also applies in the case of very small offices described in Paragraph 11.06.

d. Reference to the equipment drawing shall be made in a Job Equipment Drawing Reference Table on the combined drawing.

2. When equipment information for shop wired bays cannot be included on a wiring list.

   a. The equipment information for both shop wired and miscellaneous relay racks shall be recorded on a miscellaneous relay rack equipment drawing. The associated wiring list information for both types of bays shall be recorded on a miscellaneous relay rack wiring list.

   b. The equipment information for shop wired bays shows the title of the bay, the specification drawing and the list or group configuration as follows:

      (1) When the bay's specification orders a single relay rack framework, show the title of the bay below the relay rack, and the specification, with its list or group configuration, within the relay rack outline (see Exhibit 2, Frame 104 and 108).

      (2) When the bay's specification orders double relay rack framework, show the bay's title and specification, with its list or group configuration, below and bracketing both relay racks (see Exhibit 2; Frame 101).

   c. Show all drawings required for a complete view of shop wired frames if one drawing does not cover it.

   d. Should it become necessary to modify shop wired bays, the modification should be covered in the following preference.

      (1) Refer to the Standard equipment figure modified by a short concise note shown within equipment limits in relay rack.

      (2) Refer to the standard equipment figure modified by a broken sketch (see upper right corner of jack field, Exhibit 2, Page 1 of 4).

      (3) Detail out the equipment in full.

C. Complete bays of equipment ordered by list or group, shall be handled the same as standard shop-wired bays.

10.06 Common Language Equipment Identification (CLEI™) Codes

A. Common Language Equipment Identification (CLEI™) Codes shall be shown on Relay Rack Equipment Drawings if requested by the Equipment Engineer. For existing equipment records the CLEI™ code shall be added only if specifically requested. The CLEI™ code consists of seven characters for Standard Wired Relay Racks and eight characters for Units, Panels and Miscellaneously Equipped Mounting Plates. The codes shall complement the information normally shown on Relay Rack Equipment Drawings (see Exhibit 2, Page 1 of 4).

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B. To minimize the redrawing of Relay Rack Equipment Drawings to accommodate the addition to the CLEI™ codes, it is recommended that the Codes, the English Names, and the related Equipment Specifications with required lists or groups be depicted on the drawings in the following manner for wired relay racks and units or panels:

1. Single Shop Wired Relay Rack - Show the English Name of the Relay Rack below its configuration. Show the seven character CLEI™ code followed by the related Equipment Specification with the required lists or groups within the Relay Rack Configuration (see Exhibit 2, Frame 101.10).

2. Double Shop Wired Relay Rack - Show the seven character CLEI™ code followed by the English name of the Double Relay Rack, the related Equipment Specification with the required lists or groups below and bracketing both Relay Rack Configurations (see Exhibit 2, Frame 101.12, 13).

3. Single Plate Units or Panels:

   a. Where space permits, show both the eight character CLEI™ code and the English Name within the Unit or Panel Configuration. Show the related Equipment Specification with the required lists or groups adjacent to the Unit or Panel alongside the left (preferred) or right upright of the Relay Rack Configuration.

   b. Where space is insufficient to include the English Name, show only the eight character CLEI™ code within the Unit or Panel Configuration. Show the English Name, the related Equipment Specification with required lists of groups adjacent to the Unit or Panel alongside the left (preferred) or right upright of the Relay Rack Configuration (see Exhibit 2, Frame 101.11).

4. Two or three Plate Units or Panels:

   a. Where space permits, show the eight character CLEI™ code followed by the English Name, the related Equipment Specification with required lists or groups within the Unit or Panel Configuration.

   b. Where space does not permit, show the eight character CLEI™ code followed by the related Equipment Specification with required lists of groups within the Unit of Panel Configuration. Show the English Name adjacent to the Unit or Panel alongside the left (preferred) or right upright of the Relay Rack Configuration.

5. Four or more Plate Units or Panels - Show the eight character CLC followed by the English Name and the related Equipment Specifications with required lists or groups within the Unit or Panel Configuration.

6. Miscellaneous Equipped Mounting Plates - Show the eight character CLC followed by the English name of the Circuit Equipment at the top and within the Sketch Configuration of the equipment (see Exhibit 2, SK 101.11 HK).

7. Where applicable, use a hyphen to separate the CLCs from other information.

C. Title or English Name - Show standard abbreviated title as shown on the Specification Drawing.

11.00 MISCELLANEOUS FUSE PANELS ON MISCELLANEOUS RELAY RACKS

11.01 A "Miscellaneous Fuse Panel Drawing" shall be generated, if one does not exist, on a per floor basis whenever a miscellaneous fuse panel is added in a miscellaneous relay rack.

11.02 Refer to Section IV, Part C for standards to be followed in the preparation of fuse panel drawings.

11.03 A relay rack bay which contains fuse panels shall still be called a miscellaneous relay rack unless the bay is assigned to carry fuse panels only, in which case it shall be called a fuse bay.

11.04 Fuse panels shall be identified on the Relay Rack Equipment Drawing and on the Miscellaneous Fuse Panel Drawing by the relay rack bay number and mounting plate location. These sketches shall be cross referenced on the Relay Rack Equipment Drawing with a note indicating the miscellaneous fuse panel drawing number on which the sketch appears.

11.05 Fuse panel sketches on an existing Relay Rack Equipment Drawing shall be transferred to a Miscellaneous Fuse Panel Drawing when a new fuse panel is added on the relay rack configuration.

11.06 An exception to the use of a Miscellaneous Fuse Panel Drawing can be made for small equipment configurations, such as microwave radio, permitting placing of the fuse panel sketch on the Relay Rack Equipment Drawing if the need for a separate drawing is eliminated thereby. Whenever space is not available for relay rack equipment, the fuse panel sketch shall be moved to a Miscellaneous Fuse Panel Drawing.

12.00 NOTES AND SYMBOLS

12.01 The following are some of the common notes and symbols which shall be used as required on Relay Rack Equipment Drawings:

1. R, R1, ETC., MULTIPLE APPEARANCES OF LIKE EQUIPMENT.

2. "E", "R" AND "U" TYPE RELAYS ON MOUNTING PLATES NOT EQUIPPED WITH COMMON COVERS ARE EQUIPPED WITH "E", "R" AND "U" TYPE COVERS RESPECTIVELY UNLESS OTHERWISE SPECIFIED.

3. [ ] DESIGNATIONS SHOWN IN BRACKETS FOR INFORMATION ONLY AND ARE NOT TO BE STAMPED.

4. ( ) CIRCUIT NUMBERS IN PARENTHESES INDICATE CIRCUIT APPARATUS MOUNTED ON REAR AND SHALL BE STENCILED ACCORDINGLY (refer to Exhibit 2, SK 105DA).

5. THE "T" OF T&R JACKS SHALL BE TO THE LEFT AND THE "R" TO THE RIGHT UNLESS OTHERWISE SHOWN IN JACK MOUNTING SKETCHES.

6. [SBA] SPACE NOT AVAILABLE FOR MOUNTING EQUIPMENT AND MUST BE LEFT VACANT.

7. A 9A CORD HOOK.

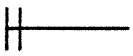
8. [A] APPARATUS BLANK IN JACK MOUNTINGS.

9. A - GR NO. MANUFACTURER'S DUCT COVER AND GROUP AS SPECIFIED.

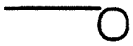
10. B - GR NO. MANUFACTURER'S DUCT COVER AND GROUP AS SPECIFIED.

11. C - GR NO. MANUFACTURER'S DUCT COVER AND GROUP AS SPECIFIED.

12.  EQUIPMENT MOUNTED ON REAR FLANGE OF RELAY RACK UP-RIGHTS WITH FRONT OR CAN SIDE OF APPARATUS TO THE FRONT.

13.  EQUIPMENT MOUNTED ON FRONT FLANGE OF RELAY RACK UP-RIGHTS WITH FRONT OR CAN SIDE OF APPARATUS TO THE REAR.

14.  EQUIPMENT MOUNTED ON REAR FLANGE OF RELAY RACK UP-RIGHTS WITH FRONT OR CAN SIDE OF APPARATUS TO THE REAR.

15.  LOCATION OF REAR COVER SUPPORTS

16.  LOCATION OF EITHER COMBINATION BAFFLE AND REAR COVER SUPPORT OR BAFFLE

17.  110-120 VOLT A.C. OUTLET.

18.  SEE TABLE "_____" FOR ADAPTERS TO BE USED FOR MOUNTING UNITS WITH 1-3/4 BY 19 INCH PLATES ON 1-3/4 BY 23 INCH FRAMEWORK.

19.  ADAPTER

20.  SPACE IS FILLED WITH 192B BLANK MOUNTING PLATE.

21.  SPACE IS NOT TO BE USED FOR ANY CIRCUIT.

22.  SPACE IS FILLED WITH 192B BLANK MOUNTING PLATE AND IS NOT TO BE USED FOR ANY CIRCUIT.

23.  SPACE IS FILLED WITH 156A BLANK MOUNTING PLATE AND IS NOT TO BE USED FOR ANY CIRCUIT.

24. RELAY RACKS ARE DESIGNED FOR_____MOUNTING PLATES UNLESS OTHERWISE INDICATED BELOW RELAY RACK CONFIGURATION.

NOTE:
Show on nontabular relay rack drawings only.

25. DIMENSIONS SHOWN DIRECTLY BELOW RIGHT HAND CORNER OF RELAY RACK CONFIGURATION INDICATES SIZE OF MOUNTING PLATE FRAMEWORK IS DESIGNED FOR.

NOTE:
Show on tabular relay rack drawings only.

26. < > SEE JOB EQUIPMENT FIGURE. NUMBERING IN THE FIGURE MAY BE TYPICAL. THE BAY LAYOUTS SHOW THE ACTUAL OFFICE NUMBERING.

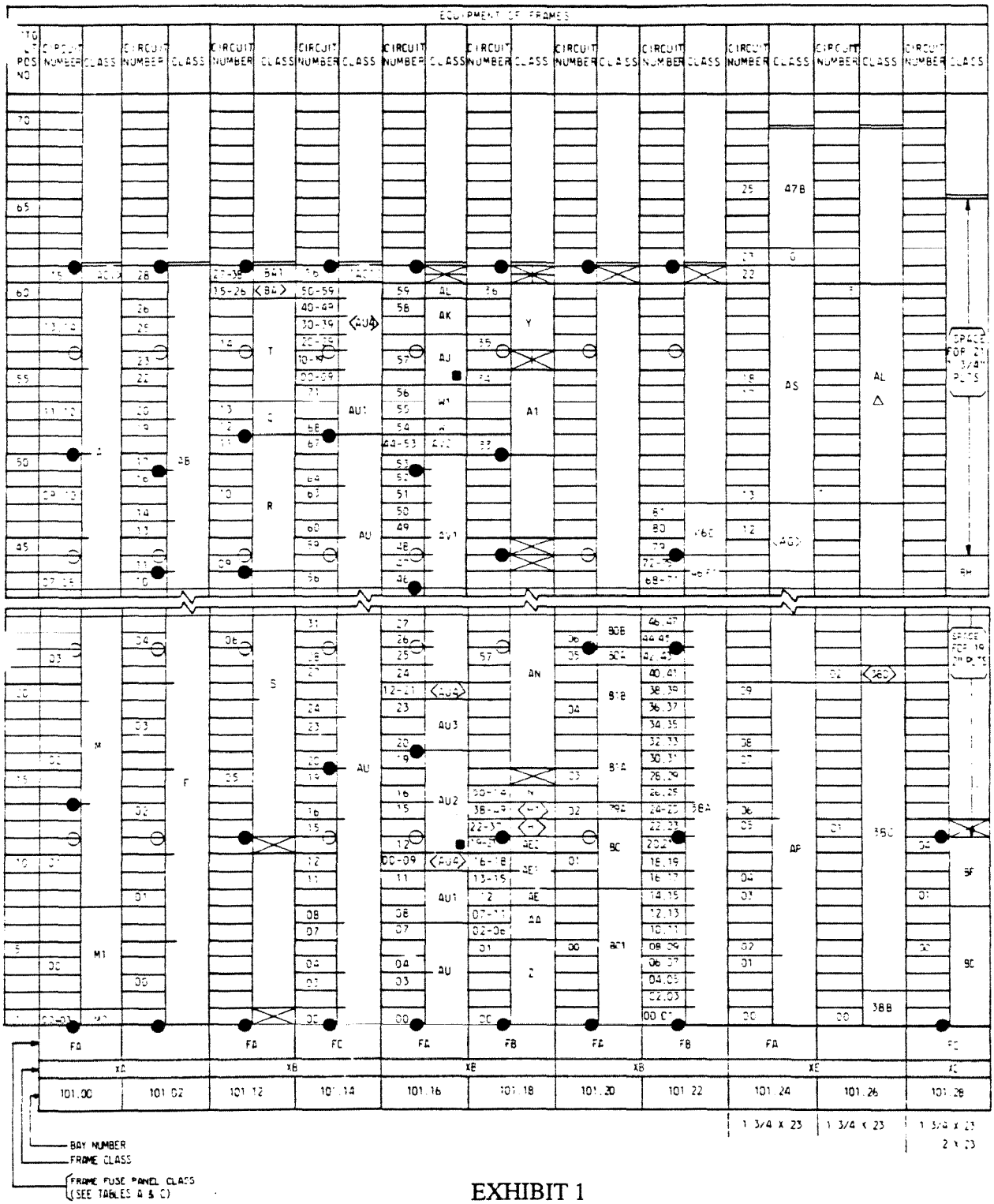


EXHIBIT 1
TABULAR TYPE RELAY RACK EQUIPMENT DRAWINGS
(PAGE 1 OF 4)

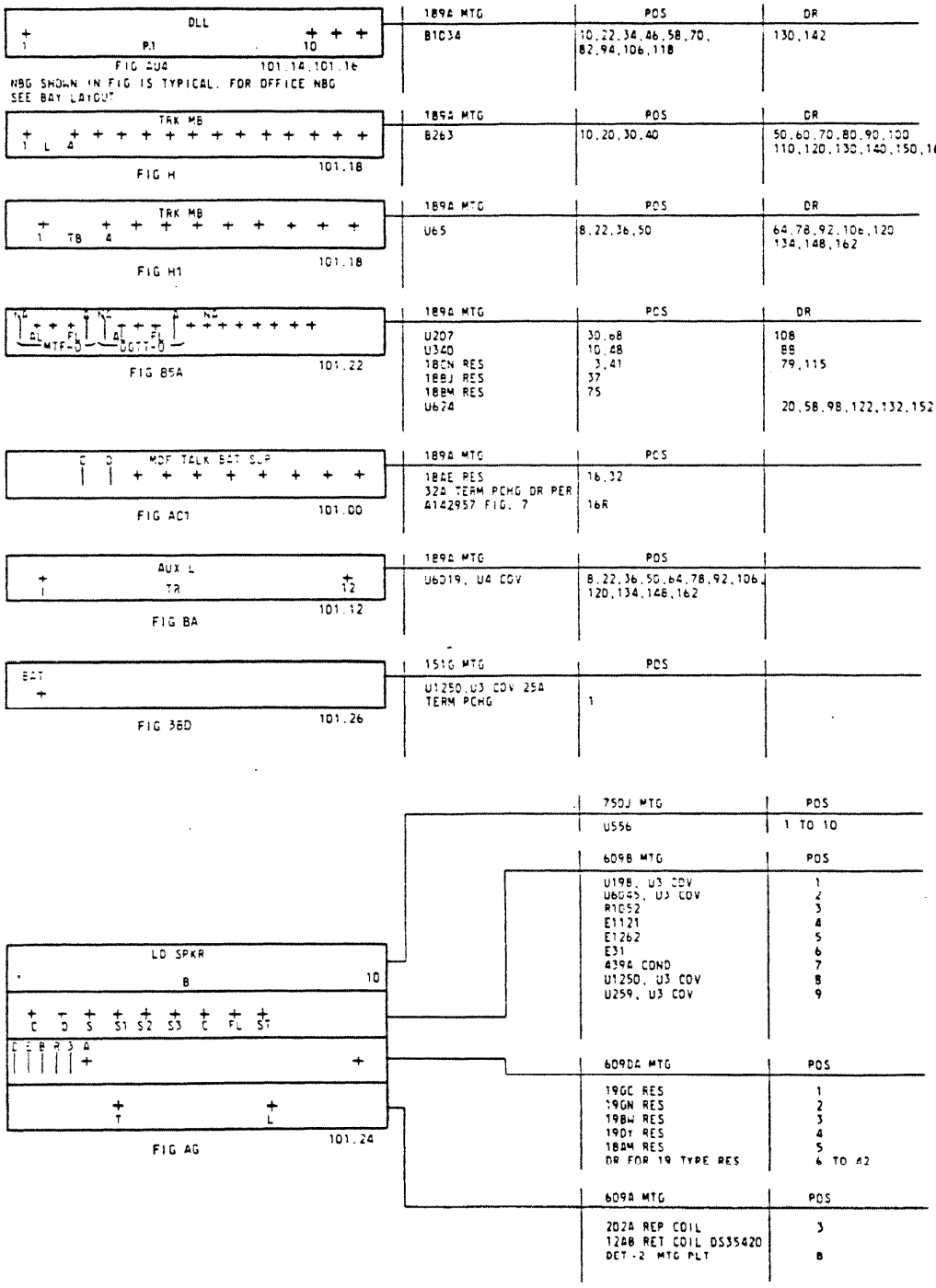


EXHIBIT 1
TABULAR TYPE RELAY RACK EQUIPMENT DRAWINGS
(PAGE 2 OF 4)

TABLE A

ASSIGNMENT & DESIGNATION OF FUSES

THE FOLLOWING ASSIGNMENT & STAMPING SHALL BE PROVIDED FOR FUSES LOCATED ON FUSE PANELS SHOWN ON STANDARD FRAME EQUIPMENT DRAWINGS

RR BAY NO.				101.00				101.12		101.14		101.16		101.18		101.20		101.22		101.24		101.28	
FUSE PANEL SK				E				E		X		E		F		E		F		E		E	
LINE	FUSE PNL NBC SK C	SK E	SK F	FUSE DESIG	CKT NO.	FUSE DESIG	CKT NO.	FUSE DESIG	CKT NO.	FUSE DESIG	CKT NO.	FUSE DESIG	CKT NO.	FUSE DESIG	CKT NO.	FUSE DESIG	CKT NO.	FUSE DESIG	CKT NO.	FUSE DESIG	CKT NO.	FUSE DESIG	CKT NO.
1	00	LEFT BAY																					
2	01																						
3	02	00	30	E	00					30		00		30		C	00	G	08		00	00	E
4	03	01	31	B	00					31		01		31		B	01	H	08		01	00	B
5	04	02	32	C	00					32		02		32			02	T	08		02	01	
6	05	03	33	A	01					33		03		33		G	03				03	02	
7	06	04	34	B	01					34		04		34		H	03				04	03	
8	07	05	35	C	01			05		35		05		35		J	03				05	04	
9	08	06	36	A	02			06		36		06		36		K	03				06	23	
10	09	07	37	B	02			07		37		07		37		L	03				07	24	
11	10	08	38	C	02			08		38		08		38		M	03				08	25	
12	11	09	39	A	03			09		39		09		39		N	03				09	26	
13	12	10	40	B	03			13		40		10		40		P	03			D	12	27	
14	13	11	41	C	03			15		41		11		41		T	03			E	12	28	
15	14	12	42		07			17		42		12		42		G	04				13		
31	30	28	58							58		28		58									
32	31	29	59							59		29		59									
33	32																						
34	33	RIGHT BAY																					
35	34																						
36	35	00	30		00			00		60	A1	00	C	109		00-09		69		00			
37	36	01	31		01			01		61	A2	00		110		10-19		70		01			
38	37	02	32		02			02		62	B	00		120		20-29		71	A	01			
39	38	03	33		03			03		63	A1	01		121		30-39		72	D	01			
40	39	04	34		04			04		64	A2	01		122		40-49		73	T	01			
41	40	05	35		05			05		65	B	01		123	A	50		74	S	02			
42	41	06	36		06			06		66		02-06		124	B1	50		75	U	02			
57	56	21	51		21			21						139-141		60							
58	57	22	52		22			22								61							
59	56	23	53		23			23				57				62							
60	59	24	54		24			24			A	58				63							
61	60	25	55		25			25			B	59				64							
62	61	26	56		26			26			B	69				65							
63	62	27	57		27			27			B	79				66							
64	63	28	58		28			28			B	89				67							
65	64	29	59					29			C	99				68							
66	65																						
67	66																						
68	67																						
69	68																						
70	69																						
ASSIGNMENT & DESIGNATIONS ON GROUND BAR OF FUSE PANEL OR GROUND TERMINALS OUTSIDE OF REGULAR FUSE NUMBERING SERIES																							
72	1	LEFT BAY														B	03	B	08				
73	2	1	6		00			D	15							C	03	C	08		23		
74	3	2	7		04											B	04	J	08				
75	4	3	8		05											C	04	K	08				
76	5	4	9		06																		
77	6	5	10																				
78	7	RIGHT BAY																					
79	8	1	6									12	B	54	P	50				WD	02		
80		2	7								A	02-37	B	135		51				G	03		
81		3	8										B	136		79					13		
82		4	9										B	137		80					13		
83		5	10										B	138		81							
84																							
85																							
COL	A	B	C	D	E	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG

EXHIBIT 1
TABULAR TYPE RELAY RACK EQUIPMENT DRAWINGS
(PAGE 3 OF 4)

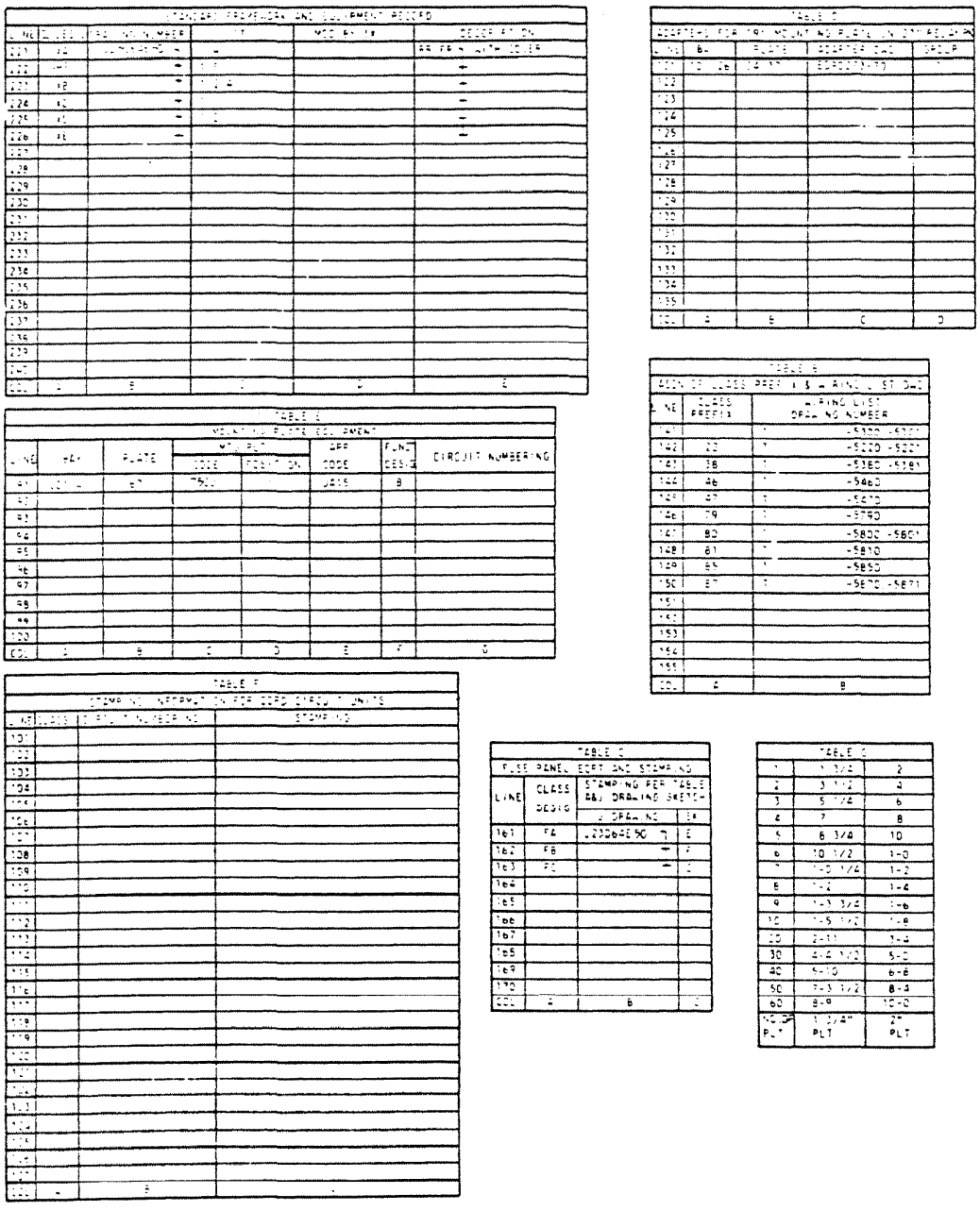


EXHIBIT 1
TABULAR TYPE RELAY RACK EQUIPMENT DRAWINGS
(PAGE 4 OF 4)

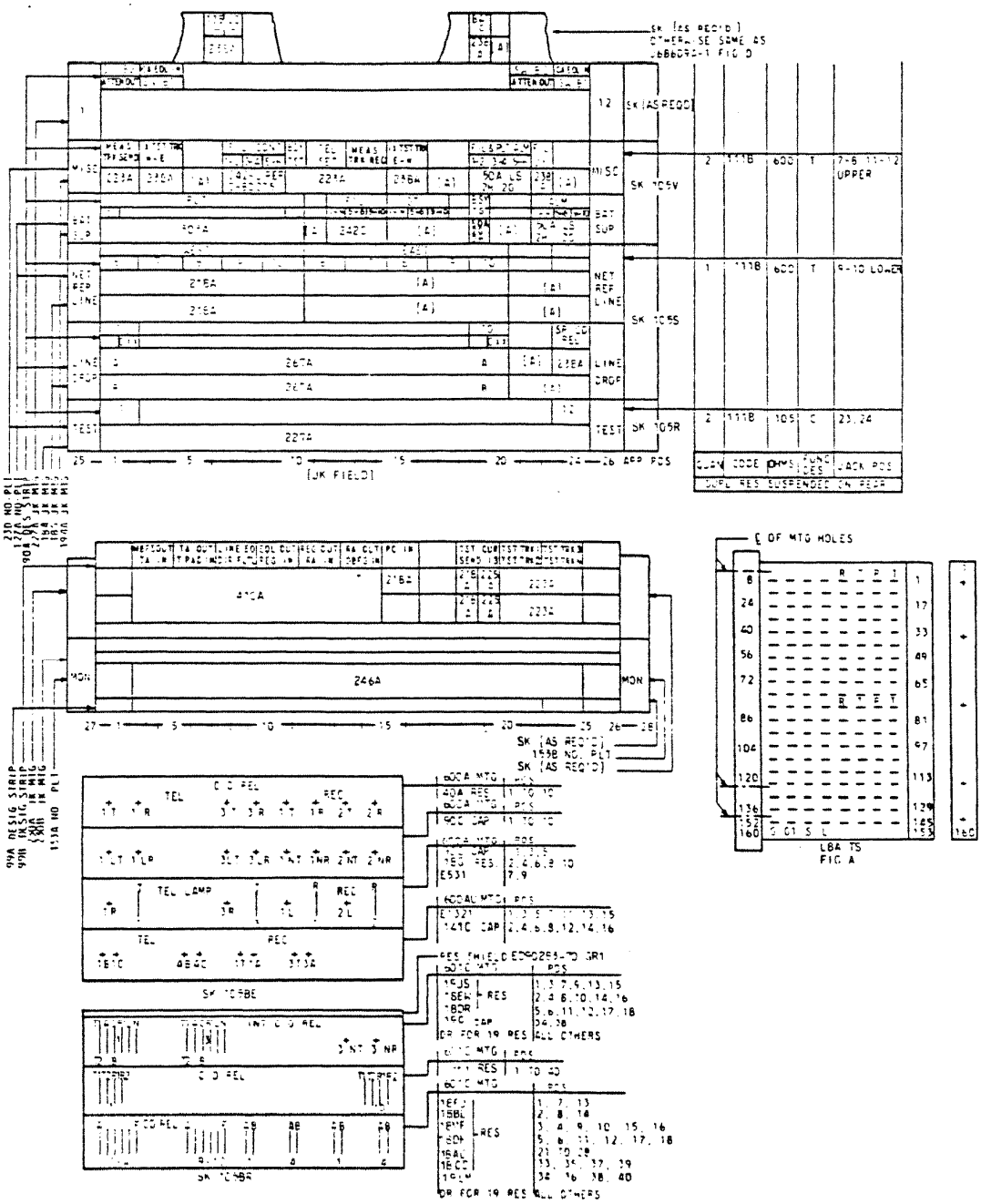


EXHIBIT 2
NONTABULAR TYPE RELAY RACK EQUIPMENT DRAWINGS
(PAGE 1 OF 4)

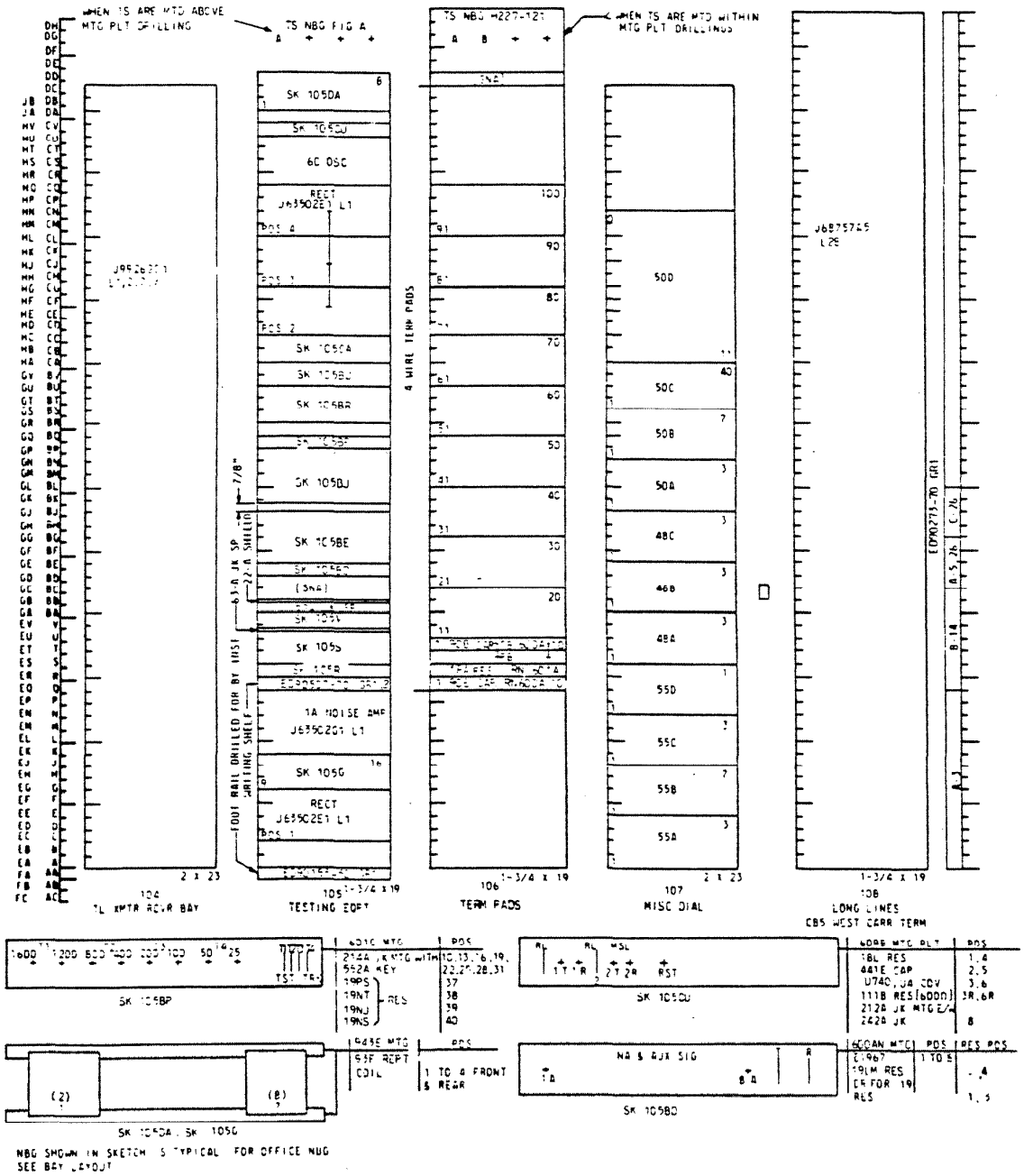


EXHIBIT 2
NONTABULAR TYPE RELAY RACK EQUIPMENT DRAWINGS
(PAGE 2 OF 4)

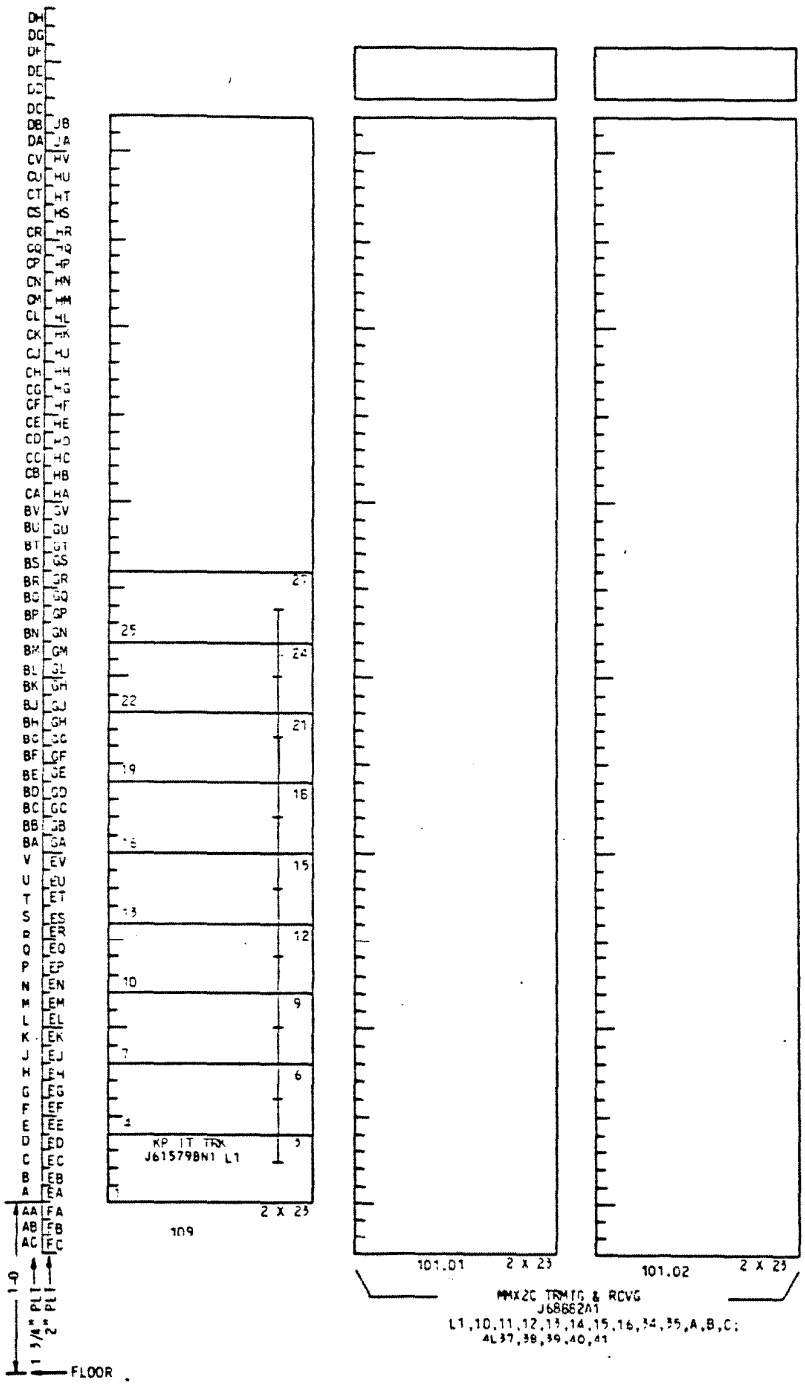


EXHIBIT 2
NONTABULAR TYPE RELAY RACK EQUIPMENT DRAWINGS
(PAGE 3 OF 4)

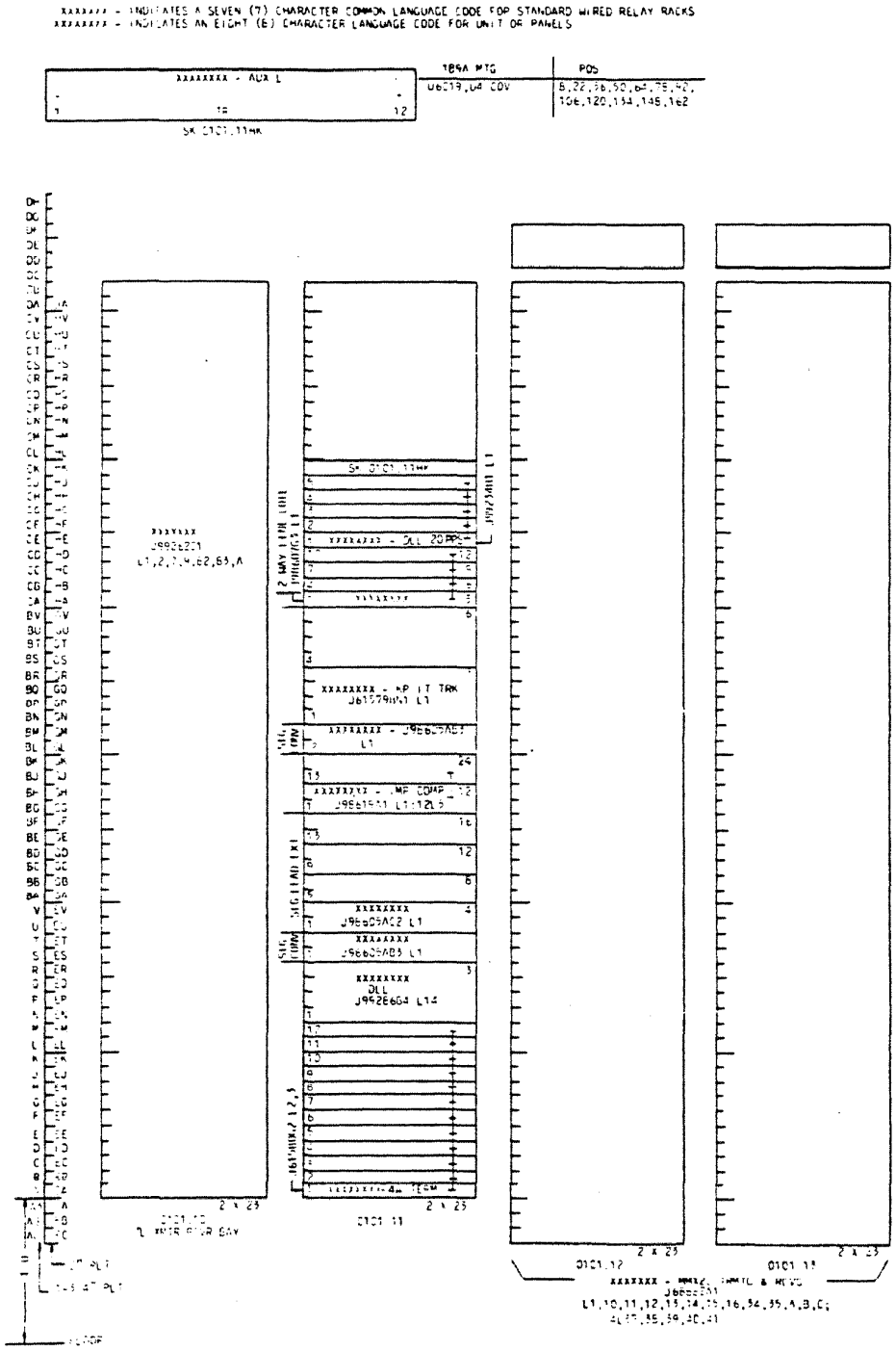


EXHIBIT 2
NONTABULAR TYPE RELAY RACK EQUIPMENT DRAWINGS
(PAGE 4 OF 4)

FUSE BAY AND POWER, RINGING AND TONE DISTRIBUTING EQUIPMENT

CONTENTS

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1.00 GENERAL

1.01 This part covers the standards to be followed in the preparation of Fuse Bay and PRTD drawings.

1.02 This type of drawing establishes an office record of fuse assignments on Fuse Bay and PRTD Equipment Drawings.

2.00 SCALE

2.01 No scale is required. However, all configurations to be depicted on the drawing shall be drawn to accommodate 1/8 inch lettering to meet microfilm standards.

3.00 PEN SIZE

3.01 The pen size requirements for the preparation of tabular format lineweights are covered in Section III, Part C, Paragraph 8.03.

3.02 The following indicates pen sizes that shall be used for the following specific conditions.

Pen Size	Application
0	Projection Lines
2	Bay Outline
3	Bus bar, Row Ref. Col. to Issue Date

4.00 ISSUE NOTES

4.01 A descriptive tabular type Issue Note is required for Fuse Bay and PRTD Equipment Drawings.

4.02 The Issue Note shall show row number, panels, fuses, lamps, heat coils and ground only circuits added, removed or changed (see Figure 1).

4.03 For record only changes and installer's marked prints, a partial descriptive Issue Note is required (see Issue 2 in Figure 1).

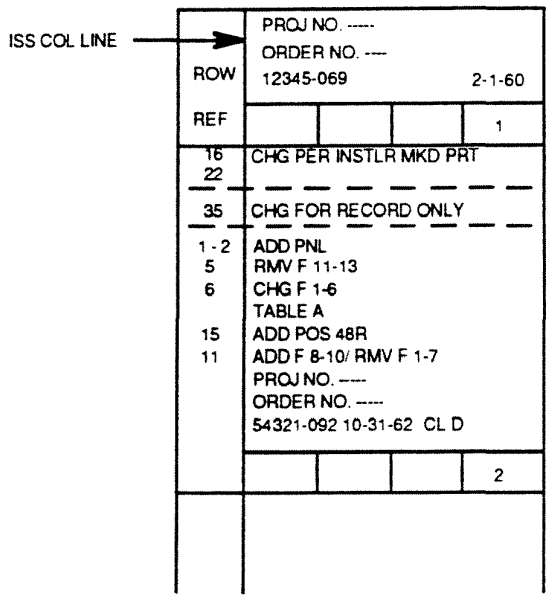

FIGURE 1
TYPICAL ISSUE NOTE

5.00 CRITERIA

5.01 Prior to the preparation of the Fuse Bay or PRTD Equipment Drawing for a particular office, all necessary data shall be obtained. The data shall be checked to verify that it is noncontradictory and that it is the latest available information. This data consists of:

A. Type of Framework

B. Circuit Requirements

C. Type and Quantity of Fusing Required

D. Split Load Requirement

E. Power Supply

F. Alarm Requirements

G. Drafting Aids

6.00 SPECIFIC DRAWING STANDARDS

6.01 Drawing standards related herein shall be applied to all new or redrawn Fuse Bay Equipment Drawings.

7.00 COMMON REQUIREMENTS

7.01 Assignments for leads which have been provided in the switchboard cable for future equipment shall be designated either [WT] or [WO] and a dummy fuse shall be installed in place of the circuit fuse.

NOTES:

1. [WT], wired terminated, shall be used for all "wired only" circuit additions; it signifies that the leads have been connected at the Fuse Bay or PRTD.

2. [WO] is a symbol which is no longer used when adding new "wired only" circuits; it signifies that the battery supply leads have not been connected to the fuse post or resistance lamp although the ground leads, if any, have been connected.

A. When a fuse or lamp panel shows only wired only circuits, the panel shall not be furnished until such time as equipped wire circuits are assigned. It shall be understood that wired only circuits [WT] are not terminated if the fuse panel, etc., is not present.

B. The word Reserved shall be used on equipment drawings to assign blocks of fuses, head coils and lamp positions for the exclusive use of U S WEST. These assignments shall be made at the specified request of the Equipment Engineer.

7.02 All new fuse panels shall be designated with the potential, polarity and amperage of fuses located on the panel.

7.03 Fuse, Lamp and Heat Coil Record Sheets

A. The chart showing fuse and lamp record sheets furnished on each order, shall not be shown on new drawings when provision has been made for the tabular Issue Note column. As soon as existing drawings have been modified to provide for the tabular Issue Note column, the chart shall be removed.

B. When additional space is required in chart for fuse record sheets, remove final billed order and reassign space for current orders.

C. The tabular Issue Note on Fuse Bay or PRTD Equipment Drawings shall be used to indicate which rows will require new or revised sheets.

D. Fuse, lamp and heat coil record sheets shall be furnished for all new and changed fuse, lamp and heat coil panels.

7.04 Fuse Bay and PRTD framework assembly information shall be recorded on the Office Framework Record Drawing. If there is no Office Framework Record Drawing, the assembly information shall be covered in a note on the Fuse Bay or PRTD Equipment Drawing.

8.00 FUSE BAY - 35 TYPE FUSES

8.01 Pictorial type drawing practices shown on Exhibit 1 shall be employed only to complete present drawings of this nontabular type.

A. Prepare redrawn 35 type fuse bays on a tabular format as shown on Exhibit 2.

B. When new 70 type fuse panels are furnished, the new panels shall be formatted in accordance with Exhibit 6.

8.02 Fuse Bays shall be equipped with fuse, heat coil, lamp, filter and combination panels from the bottom up. In general, locate talking battery panels at the bottom and panels with signal and miscellaneous voltages immediately above with voltage increasing toward the top of the bay.

A. When required, the combination panel arranged for ground terminal block, tone terminal and fuse alarm resistance mounting plates shall mount in the uppermost panel position. Quiet battery filters, when required, shall be located at the top of the bay immediately under this panel.

B. Locate lamp panels as high up in the bay as practical, above the heat coil and fuse panels.

C. Fuse, lamp and heat coil panels are numbered consecutively from the bottom up, beginning with row "1" in each bay. Reserve two numbers (odd and even) for each blank or single row panel on the bay. Quiet battery filters and combination panels, since they are located at the top of the bay, shall not be assigned row numbers. Miscellaneous fuse alarm apparatus, when required, shall be assigned plate position numbers.

> NOTE:
>
> On Tabular Fuse Bay Drawings, the odd row number, bottom of double row fuse panel, shall always be shown on the left, even rows on the right.

D. Lamp rows are numbered in continuation of the numbering of fuse and heat coil rows except on four-row lamp panels, in which case the first and third rows of lamps are numbered in continuation of the fuse and heat coil row numbering. The second and fourth rows of lamps have the same number as the first and third rows, respectively, but are supplemented by the suffix "A".

E. When the Fuse Bay is not arranged for Heavy Cabling the following note shall be added to the drawing.

> NOTE:
>
> Framework for this bay is not arranged for HEAVY CABLING. Not more than four double row fuse panels, such as 24V filament, PBX battery feeders and panels fused in excess of 1-1/3 ampere fuses, wired with 16 gauge wire shall be mounted in this bay.

F. Location of the equipment guard mounted at Panel L shall be covered under the notes.

G. When equipment guards are to be mounted, in addition to the one at Panel L, show the associated Manufacturers Equipment Diagram number and group number in panel drawing space.

8.03 Wiring Diagram Numbers and Circuit Numbering

A. Show wiring diagram numbers, the abbreviated circuit name as shown in the title box of the schematic drawing or wiring diagram, functional designation of fuses, and office circuit numbering for all circuits terminated on the Fuse Bay. Do not show wiring diagram figure number. Relay rack numbering may be shown where required to more completely describe the circuit.

B. Fuse functional designations shall be shown in accordance with the wiring diagram information to identify the individual fuses. If two or more fuses for the same potential are shown on the same wiring diagram, the fuses involved shall be individually identified by functional designations.

C. If all or a group of fuses on a panel are numbered consecutively, show only the first and last circuit numbers for circuits. When all odd or all even assignments are made, all fuse assignments in the group shall show circuit numbers.

D. To indicate duplicate information on tabular type formatted drawings, use a straight line when information is repeated for three or more consecutive appearances.

E. The word "Future", indicating reserved space, is not required for maintenance or installation and shall not be shown on the equipment drawing. The use of this routine shall be limited to assignments of fuses, heat coils and lamp positions for which demand is immediately known or for which provision of equipment on bay framework has been made. Positions may be reserved for the future addition of qualified circuits through the use of limitation lines (see Exhibit 1) or showing only the circuit name (see Exhibit 2).

8.04 Modification of Fuse Panels

A. New Fuse Panels - The code number of the No. 6 type fuse posts, i.e.: 6BFP, and capacity of the fuse shall be indicated on the Fuse Bay Equipment Drawing. The code of the fuse post shall be shown in brackets so manufacturing will stamp this information on the panel. Also, show the adjacent fuse post removed to separate these fuses from other fuses on the same fuse panel.

B. Existing Fuse Panels - The code number of the No. 6 type fuse post, i.e.: 6BFP, and the capacity of the fuse shall be indicated on the Fuse Bay Equipment Drawing.

9.00 POWER, RINGING AND TONE DISTRIBUTING FRAME

9.01 Prepare new and redrawn PRTD Equipment Drawings on a tabular format as shown on Exhibit 4. Make additions and changes on existing nontabular PRTD drawings in accordance with Exhibit 3.

> NOTE:
>
> On tabular PRTD drawings, the odd row numbering (bottom row of double row fuse panel) shall always be shown on the left, even rows on the right.

A. Lamp rows are numbered in continuation of the numbering of fuse and heat coil rows except on four row lamp panels, in which case the first and third rows of lamps are numbered in continuation of the fuse and heat coil row numbering. The second and fourth rows of lamps have the same numbering as the first and third rows respectively, but are supplemented by the suffix "A".

9.02 Fuse Panels

A. On all fuse panels, careful use shall be made of dotted lines left and right or above and below fuses to separate the fuse row, capacity, voltage, fuse code and fuse position numbers designations from other designations which are not to be stamped.

9.03 Wiring Diagram Numbers and Circuit Numbering

A. Show wiring diagram numbers, frame and relay rack number, functional designation of fuses, and office circuit numbering for all circuits terminated on the PRTD frame.

B. Fuse functional designations shall be shown in accordance with the wiring diagram information to identify the individual fuses. If two or more fuses for the same potential are shown on the same wiring diagram, the fuses involved shall be individually identified by functional designations.

C. If all or a group of fuses on a panel are numbered consecutively, show only the first and last circuit numbers for circuits. When all odd or all even assignments are made, all fuse assignments in the group shall show circuit numbers.

D. Wiring diagram numbers for trunk circuits terminated on PRTD frame are not required.

E. To indicate duplicate information on tabular type formatted drawings, use a straight line when information is repeated for three or more consecutive appearances.

F. The word "Future", indicating reserved space, is not required for maintenance or installation and shall not be shown on the equipment drawing. The use of this routine shall be limited to assignments of fuses, heat coils and lamp positions for which demand is immediately known or for which provision of equipment on bay framework has been made. Positions may be reserved for the future addition of qualified circuits through the use of limitation lines (see Exhibit 3) or showing only the circuit name (see Exhibit 4).

9.04 Nonflashing No. 35 Type Fuses

A. The code number of all nonflashing 35 type fuses shall be shown on the drawing.

B. The code number of flashing 35 type fuses shall not be shown on the drawing except code 35R fuses under the following condition:

1. Used on panels with plate battery supply circuits (130V to 160V).

2. In auxiliary "J" and "K" carrier offices.

3. On other circuits operating at voltages in excess of 89 volts functioning as nonflashing type.

9.05 Modification of Fuse Panels

A. Where 3 or 5 ampere No. 35 type fuses are to be mounted on panels equipped with No. 5 type fuse posts the posts shall be replaced by No. 6 type fuse posts and the adjacent fuse post removed to separate fuses of different capacities on the same fuse panel.

B. New Fuse Panels - The code number of the No. 6 type fuse posts, i.e.: 6BFP, and capacity of the fuse shall be indicated on the PRTD Equipment Drawing. The code of the fuse post shall be shown in brackets so the shop will not stamp this information on the panel. Also, show the adjacent fuse post removed to separate these fuses from other fuses on the same fuse panel.

C. Existing Fuse Panels - The code number of the No. 6 type fuse post, i.e.: 6BFP, and capacity of the fuse shall be indicated on the PRTD Equipment Drawing.

10.00 MODULAR FUSE BAY AND EQUIPMENT

10.01 Prepare modular fuse bay assembly and equipment drawings on a tabular format as shown in Exhibit 6. Under this formatting, horizontal limit lines shall be used to indicate the extent of repetitive information. In addition, horizontal limit lines shall also be utilized in associated columns for further subgrouping of nonrepetitive information to assist in ease of reading.

A. Fuse bays shall be equipped with fuse, heat coil, resistance lamp, filter and combination panels from bottom up. In general, locate talking and filtered battery panels at the bottom and panels with signal of miscellaneous voltages immediately above the voltages increasing toward the top of the bay. Locate lamp panels as high up in the bay as practicable above the heat coil and fuse panels. Heat coil panels shall be located in the upper section of the bay above any fuse panels.

B. Fuse panels shall be assigned row numbers from 1 to 60 starting with first two inch wide panel mounted ten inches above the floor. If a panel heat coil, lamp, filter or combination over two inches wide is used, the lower row number shall be used and the upper row number(s) shall not be shown.

C. Fuse panel and heat coil panel rows are designated top and bottom. Lamp panel rows are designated A, B and C.

10.02 Fuse, Lamp, Heat Coil or Ground Locations

A. Fuse and heat coil locations are designated by row and circuit positions such as 1B, 1T - 20B, 20T.

B. Resistance lamp positions are designated by row and circuit positions 1A, 1B, 1 to 15A, 15B, 15C, etc.

C. Ground Terminal locations are designated by fuse or lamp location to which they are adjacent, i.e: 2TL, 3BL, 3TR, 3TL, 3BR, 3BL - 20TR, 20BR, 1A, 2A, 3C.

10.03 Fuse Panels

A. Fuse panel that have spare fuse positions. When all the fuse positions on a fuse panel are not assigned initially, the following sequence of assignments shall be used.

1. The highest numbered fuse positions in a row shall be assigned first.

2. The upper row of a two row fuse panel shall be used first with the following exception. Fuses in the lower row may be assigned before the upper row is fully used as long as the corresponding upper fuse has already been assigned.

3. Rows shall be used in four row panels in the sequence 3, 4, 2, 1 (having arbitrarily considered the rows numbered 1, 2, 3, 4 from the bottom up) with the following exception:

a. Fuses in rows 4 and 1 may be assigned before rows 3 and 2 respectively are fully used as long as the corresponding positions on rows 3 and 2 have already been assigned.

10.04 Lamp Panels

A. Assignments on resistance lamp panels shall begin on Row A, Position F1A and proceed in an alphanumeric sequence through Row C Position 15C.

10.05 Wiring Diagram Numbers and Circuit Numbering

A. Show the circuit drawing number, the abbreviated title or the circuit as shown in the title box of the schematic drawing or wiring diagram, the wiring diagram figure number, the functional designation of the fuse or lamp, the office circuit numbering and the associated equipment location (bay, frame, relay rack) for all circuits terminated on the fuse bay.

B. Fuse functional designations shall be shown in accordance with the wiring diagram information to identify the individual fuses. If two or more fuses for the same potential are shown on the same wiring diagram, the fuses involved shall be identified by wiring figure and functional designation.

C. When individual fuses or resistance lamps service a given number of circuits, for example 1 to 20, some of which are equipped initially, the ultimate circuit numbering shall be shown on the drawing and the originating equipment location shall be shown.

11.00 MODULAR POWER, RINGING AND TONE DISTRIBUTING FRAME

11.01 Prepare modular PRTD frame equipment drawings on a tabular format.

A. On associated fuse panel equipment drawings, horizontal limit lines shall be used to indicate the extent of repetitive information. In addition, horizontal limit lines shall also be utilized in associated columns for further subgrouping and nonrepetitive information to assist in ease of reading.

11.02 Fuse Panels

A. Fuse locations on fuse panels are designated by rows top and bottom and position numbers. Row numbers are assigned to each two inch panel consisting of a top (T) and bottom (B) row of fuses, i.e., 1T, 1B through 24T, 24B.

B. Assignments to fuse positions shall begin at Position 1T and continue to 24T, then assignments may be made in Positions 1B through 24B. On panels having fewer than 48 fuse positions, assign fuses on the upper row before proceeding to the lower row of fuses on the panel.

11.03 Lamp Panels

A. Lamp panel rows are designated row A, B, C and D.

B. Assignment on resistance lamp panels shall begin on row A Position A1 and proceeds in an alphanumeric sequence through row D Position D20.

11.04 Wiring Diagram Numbers and Circuit Numbering

A. Show the circuit drawing number, the abbreviated title of the circuit as shown in the title box of the schematic drawing or wiring diagram, the wiring diagram figure number, the functional designation of the fuse or lamp, the office circuit numbering, potential and the associated equipment location (bay, frame, relay rack, etc.) for all circuits terminated on the PRTD.

B. Wiring diagram numbers for trunk circuits terminated on PRTD frame are not required.

C. For an individual fuse or resistance lamp serving a given number of circuits, some of which are equipped initially, the ultimate circuit numbering shall be shown on the drawing. The originating equipment location shall also be specified.

12.00 DRAIN TABLES

12.01 The current drains for 24V, 48V and 130V supplies including the power feeder and filter capacities shall be recorded on Fuse Bay, PRTD frame, Miscellaneous Fuse Panel or separate current drain drawings. Note that in this case, the miscellaneous fuse panels referred to are those which are mounted in relay racks as noted in Section IV, Part B. Fuse panels which are furnished per Manufacturers equipment specifications for which the ultimate drains are dedicated are excepted from these requirements. Tables on the equipment drawings are preferred when separate power feeders to the Fuse Bay, PRTD frame or Miscellaneous Fuse Panel are provided. The drain table shall be updated when an order affects the drain for the voltages indicated.

A. In cases where one set of power feeder leads supplies more than one Fuse Bay or PRTD frame, it may be preferable to prepare a separate drawing for the current drain data and refer to this drawing on the Fuse Bay or PRTD equipment drawings. If, however, the drain data is shown on the Fuse Bay or PRTD equipment drawings, complete data shall be shown on the drawing for the Fuse Bay or PRTD frame nearest the power fuse, with a cross reference to all drawings for Fuse Bay or PRTD frame connected to the same power feeder leads.

B. When more than one set of power feeder leads is connected to a Fuse Bay or PRTD frame, the data in the table shall be arranged to indicate the capacity and drains for the different leads. If the division of the load is not obvious from the tabular arrangement, it shall be specified in notes associated with the tables.

C. Applicable drain table values shall always be recorded in the current drain table. When a circuit drain cannot be determined from the current drain data file it shall be considered negligible. If a load on an order consists only of circuits having negligible drains, NEG shall be shown in the drain table for that order. If a load on an order consists of a combination of circuits having numerical and negligible values, the total numerical value shall be shown on the drain table with the negligible value considered zero.

D. Examples of current drains and power lead capacity tables are shown in Exhibits 5 and 6.

E. If the drain table is full, and it becomes necessary to add new data, the following procedure shall be followed:

1. Remove all existing entries except the most recent order number and the last entry in each of the TOTAL columns; these shall be relocated to the first line of the drain table.

2. The order number shall be preceded by the word "To" as illustrated in Exhibit 5, Table A.

3. A dash shall be shown in each ADDED column.

4. This change need not be shown in the Issue Note.

5. Proceed with the addition of the current order change on the second line of the drain table.

13.00 COMMON LANGUAGE EQUIPMENT IDENTIFICATION (CLEI™)

130.1 CLEI™ codes are not required on Fuse Bay or PRTD equipment drawings.

14.00 NOTES AND SYMBOLS

14.01 The following are some of the common notes and symbols which shall be used as required on Fuse Bay and PRTD equipment drawings and listed under the Note column on drawings.

1. FOR ASSEMBLY OF FRAME SEE MANUFACTURER'S DRAWING

2. FOR ACTUAL ARRANGEMENT OF LAMPS ON LAMP PANEL SEE MANUFACTURER'S DRAWING

3. PANELS OCCUPYING TWO OR MORE TWO INCH MOUNTING PLATE POSITIONS SHALL BE DESIGNATED BY THE LOWER POSITION NUMBER.

4. [ ] DESIGNATIONS SHOWN IN BRACKETS ARE FOR INFORMATION ONLY AND ARE NOT TO BE STAMPED.

5. 0 LEADS TO BE RUN BY THE INSTALLER.

6. # LEADS TO BE RUN BY THE SHOP.

7. (CA) CABLE BRACKETS ARE TO BE LOCATED ON REAR ON LEFT UPRIGHT 4-1/2 INCHES.

8. [WT] "WIRED ONLY" CIRCUIT WITH LEADS TERMINATED AND DUMMY FUSE EQUIPPED AS REQUIRED.

9. △ RESISTOR AND RESISTOR SHIELD ON REAR OF PANEL OR RESISTOR ASSEMBLY MOUNTED ON REAR OF HC PANEL PER MANUFACTURER'S DRAWING WITH LEADS CONNECTED AT FUSE POST AND EQUIPPED WITH DUMMY FUSE.

10. ◯ FUSE ALARM AND LAMP AND LAMP CAP.

11. 72A DUMMY FUSES SHALL BE FURNISHED IN ALL UNASSIGNED FUSE POSITIONS ON FUSE PANELS.

12. ◒ 42B APPARATUS BLANK.

13. FOR METHOD OF TERMINATING AND CONNECTING POWER, RINGING AND TONE LEADS SEE EQUIPMENT DRAWING _____

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14.  FUSE POST REMOVED.

15.  RESISTANCE LAMP.

16. [Y] VACANT PANEL SPACE.

17. ALL FILTER TERMINAL LUGS ARE PER EQUIPMENT SUPPLIER'S SPECIFICATION UNLESS OTHERWISE SPECIFIED.

18.  PARALLEL CABLE CONNECTORS PER EQUIPMENT SUPPLIER'S SPECIFICATION AS REQUIRED.

19.  UNASSIGNED.

20. RESISTOR AND RESISTOR SHIELD MOUNTED ON REAR OF PANEL WITH LEADS CONNECTED AT FUSE POST AND EQUIPPED WITH FUSE.

21.  DIRECTION OF MOUNTING TERMINAL.

22. POSITIONS ARE RESERVED FOR FUTURE ADDITIONS WHEN ONLY THE CIRCUIT NAME IS SHOWN.

23.  100, 119 OR SIMILAR FUSE ALARM RESISTANCE MOUNTED ON REAR OF PANELS WITH HIGHEST RESISTANCE VALUE TOWARD PANEL.

24. DESIGNATION PINS FURNISHED SHALL BE MOUNTED TO CORRESPOND WITH THE FUSE CAPACITY ASSIGNED TO A PARTICULAR FUSE POSITION.

25.  ohm RESISTANCE SUSPENDED ON REAR BETWEEN FUSE POSTS_____AND_____.

26.  WIRE SPLICE.

27.  CABLE ASSEMBLY.

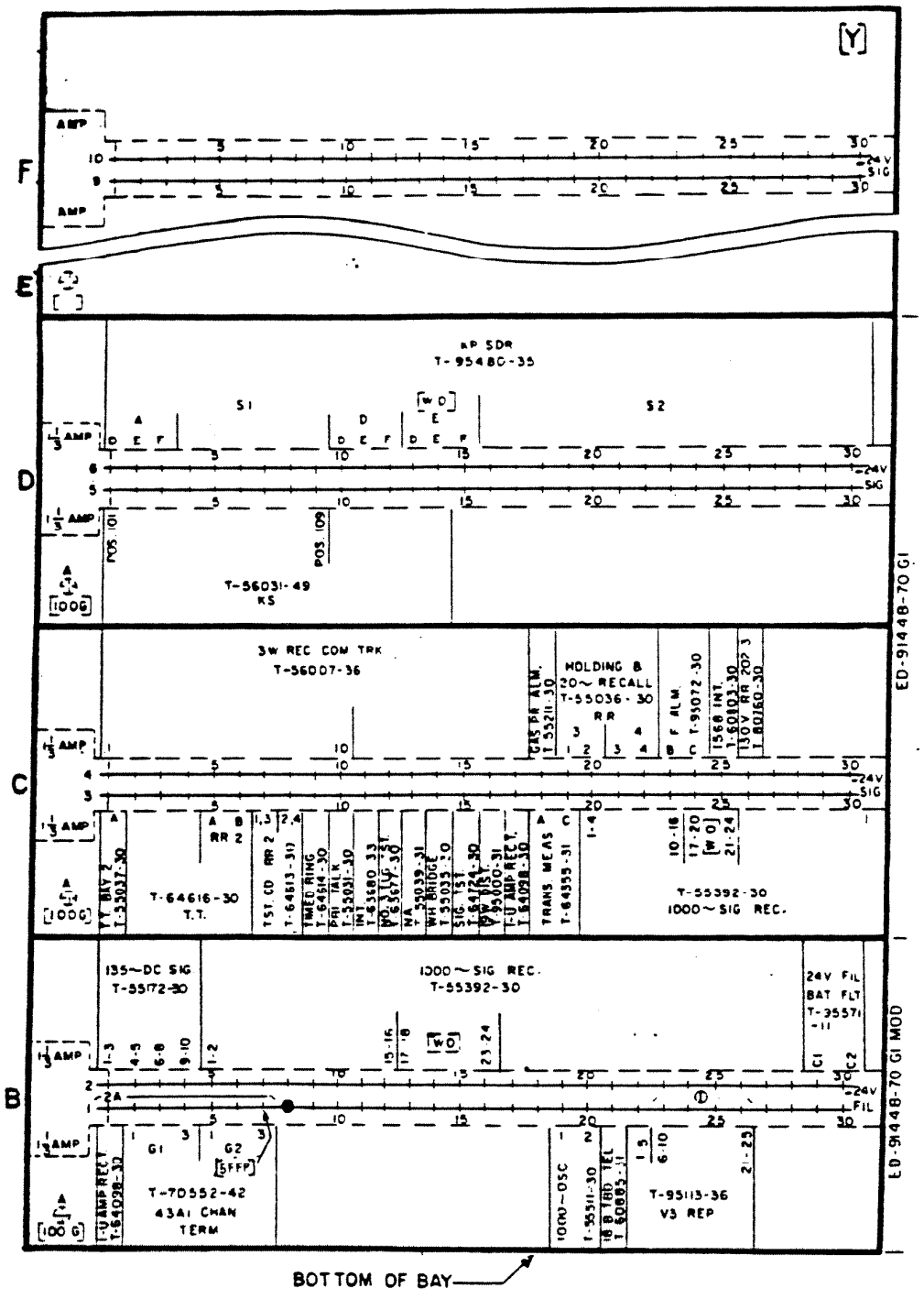

EXHIBIT 1
MISCELLANEOUS FUSE BAY EQUIPMENT
(PAGE 1 OF 4)

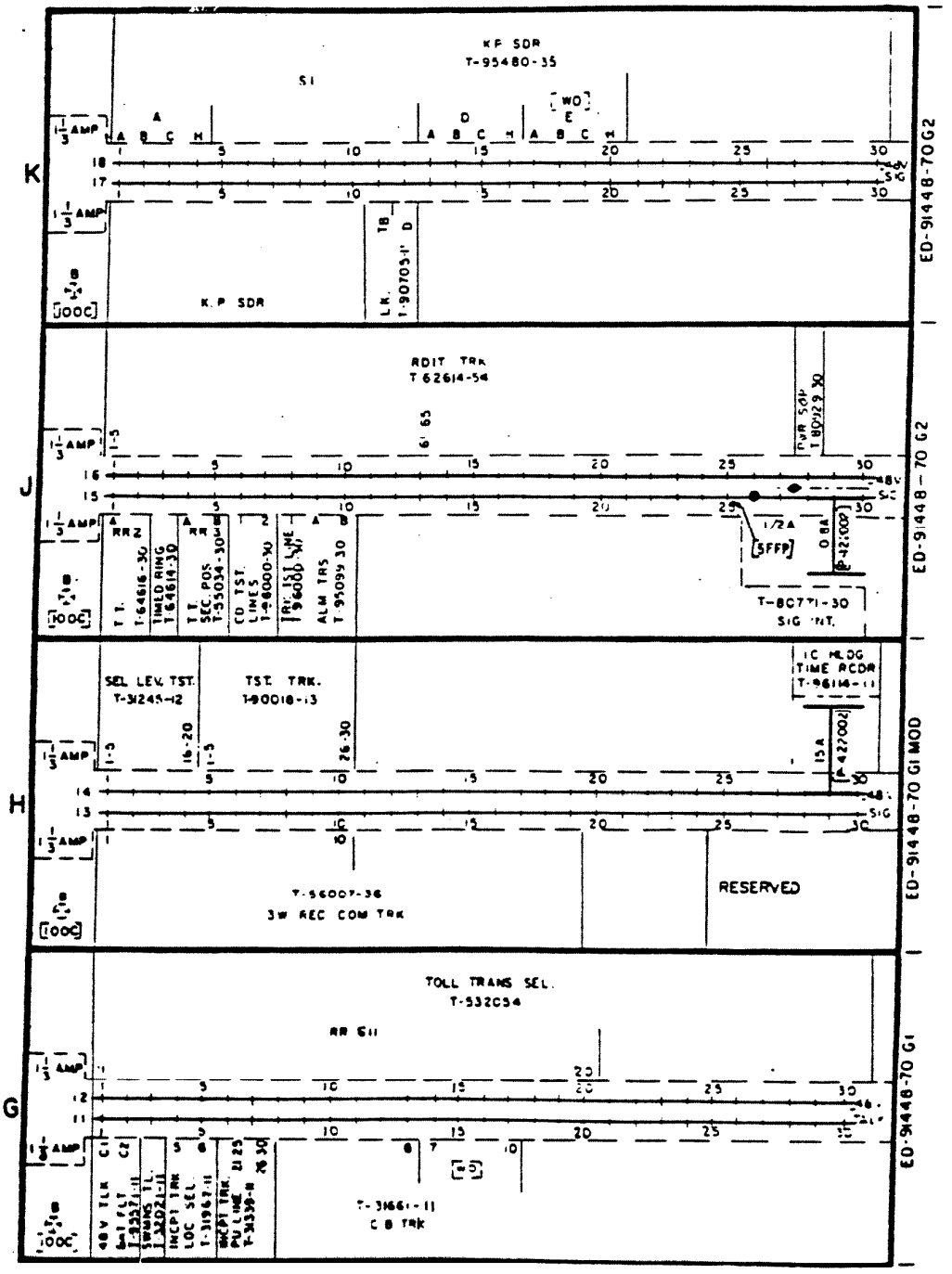

EXHIBIT 1
MISCELLANEOUS FUSE BAY EQUIPMENT
(PAGE 2 OF 4)

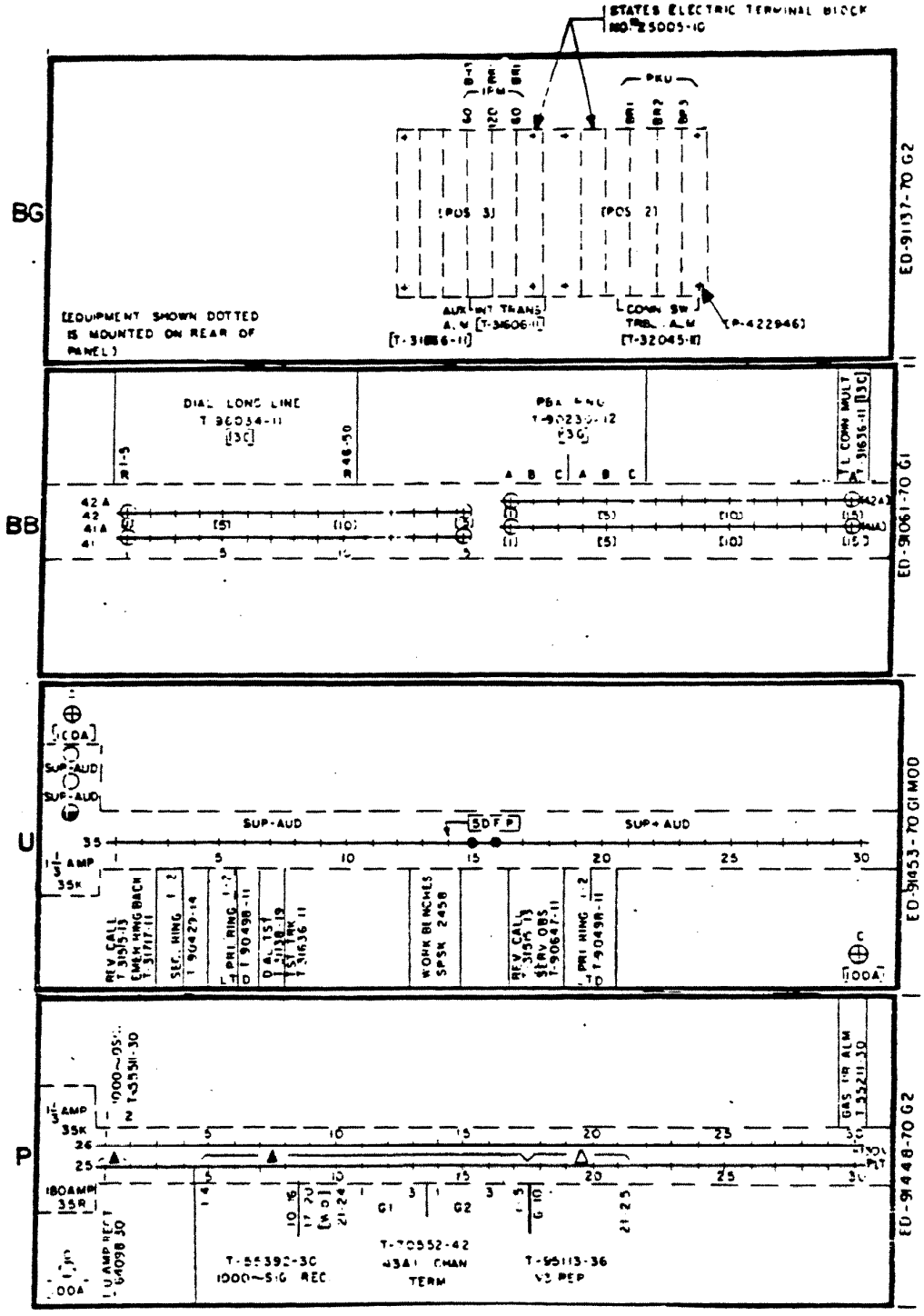

EXHIBIT 1
MISCELLANEOUS FUSE BAY EQUIPMENT
(PAGE 3 OF 4)

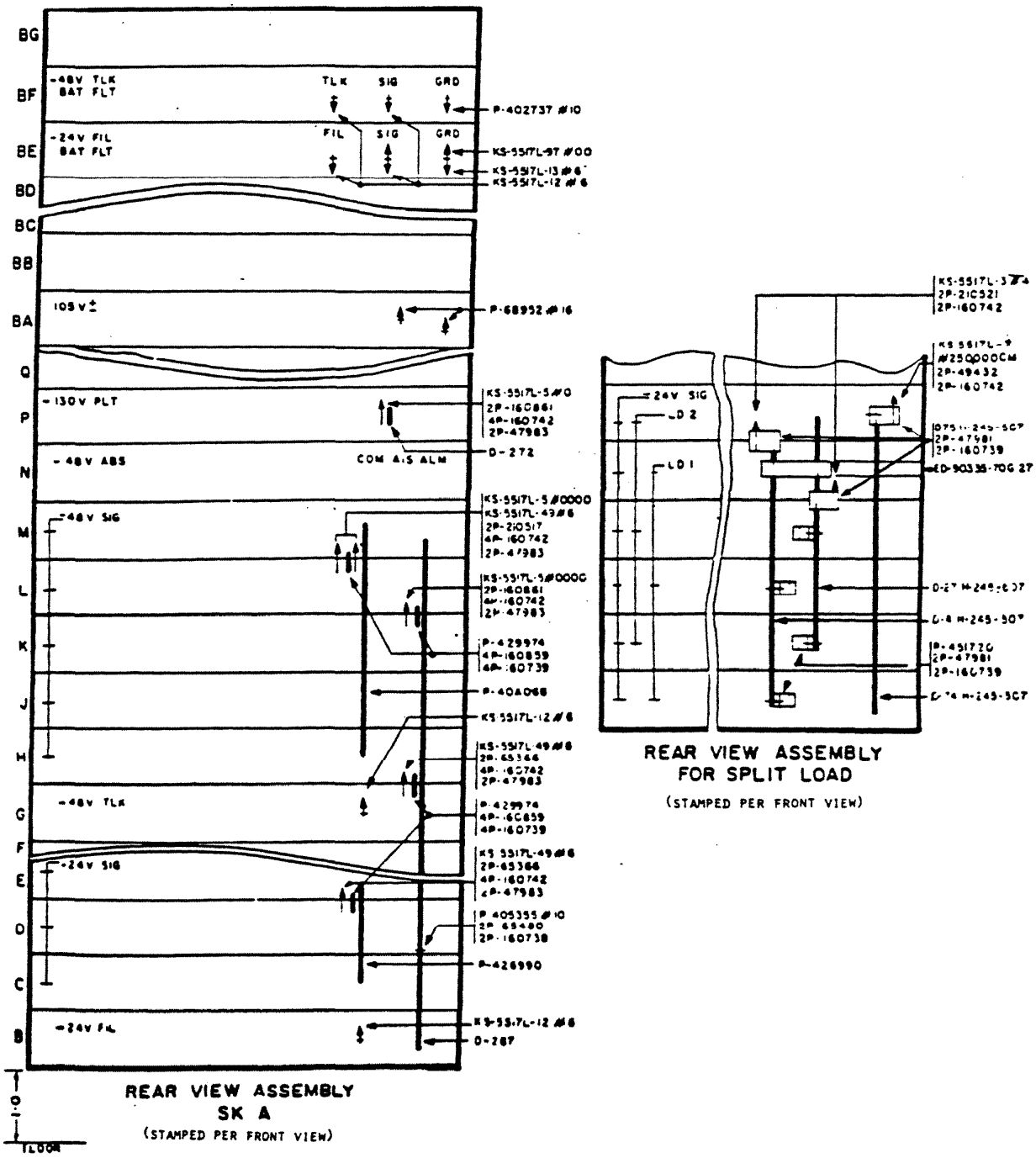

EXHIBIT 1
MISCELLANEOUS FUSE BAY EQUIPMENT
(PAGE 4 OF 4)

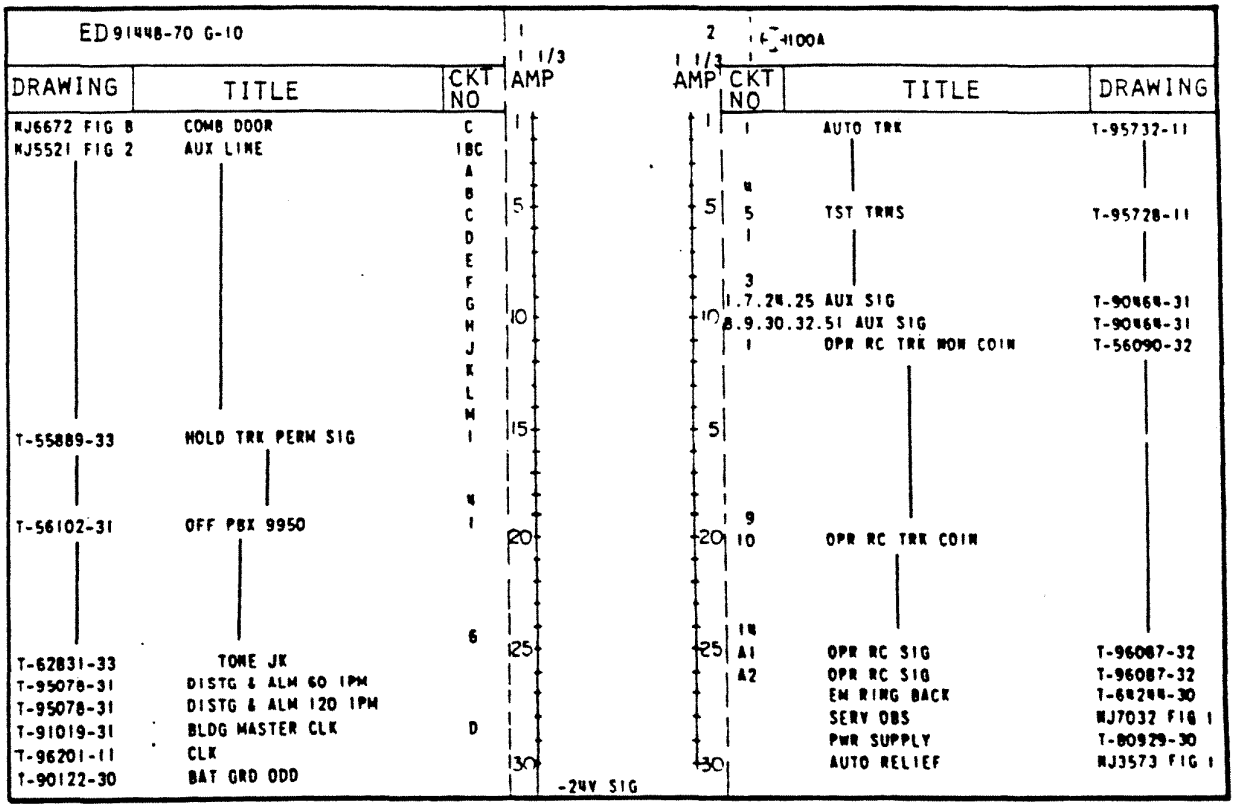

EXHIBIT 2
MISCELLANEOUS FUSE BAY EQUIPMENT TABULAR FORMAT
(PAGE 1 OF 4)

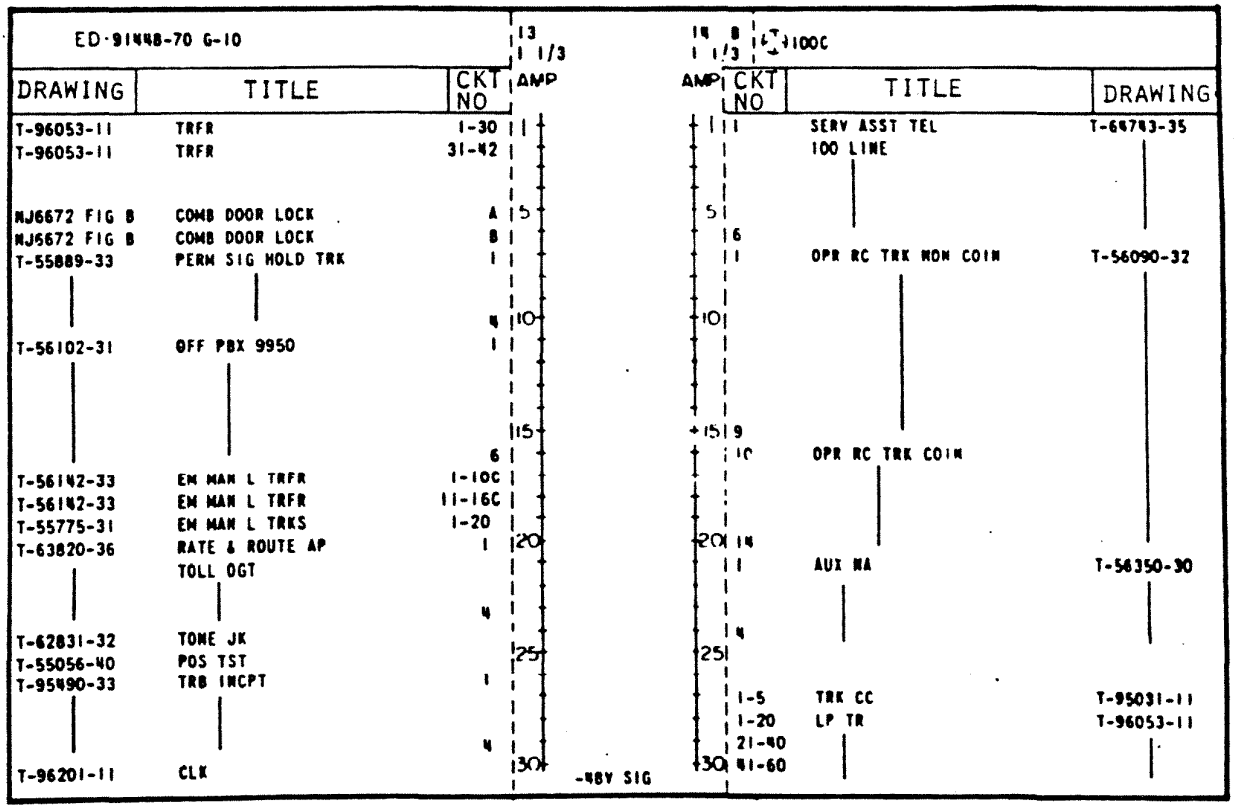

EXHIBIT 2
MISCELLANEOUS FUSE BAY EQUIPMENT TABULAR FORMAT
(PAGE 2 OF 4)

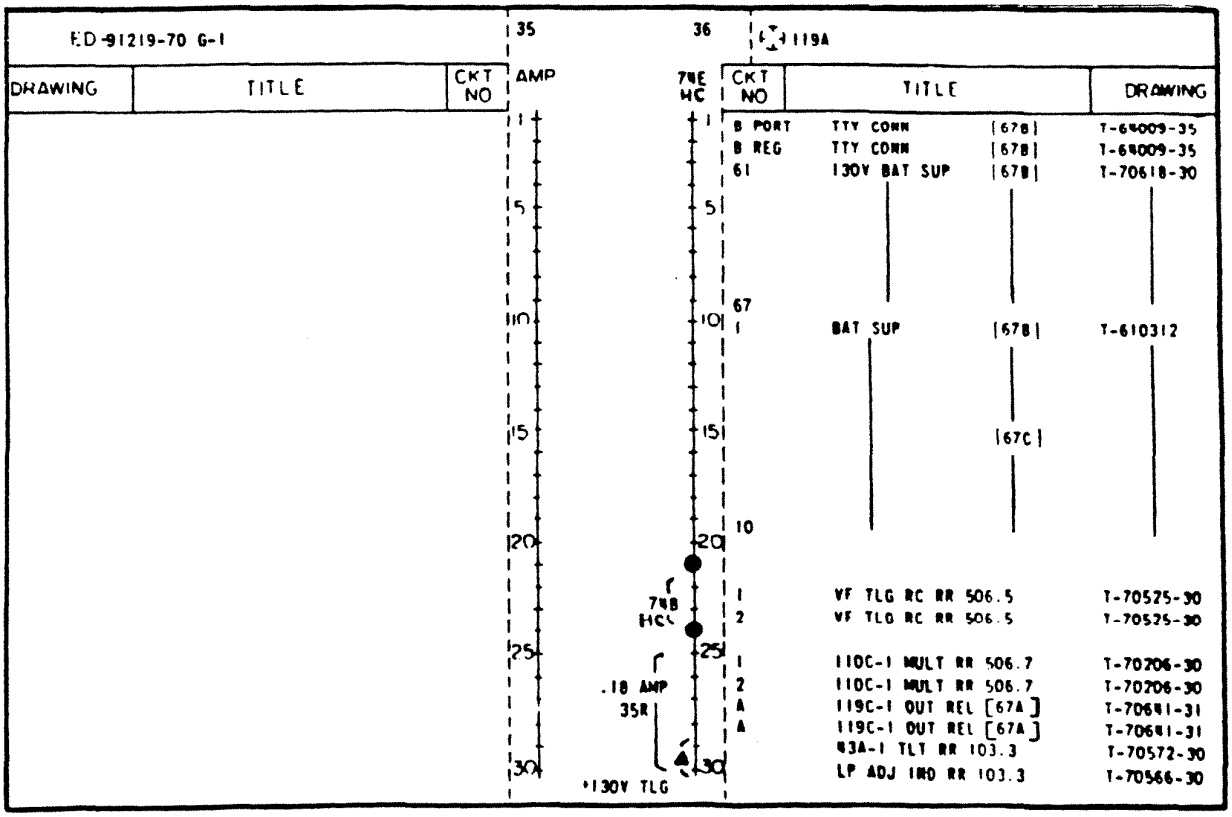

EXHIBIT 2
MISCELLANEOUS FUSE BAY
EQUIPMENT TABULAR FORMAT
(PAGE 3 OF 4)

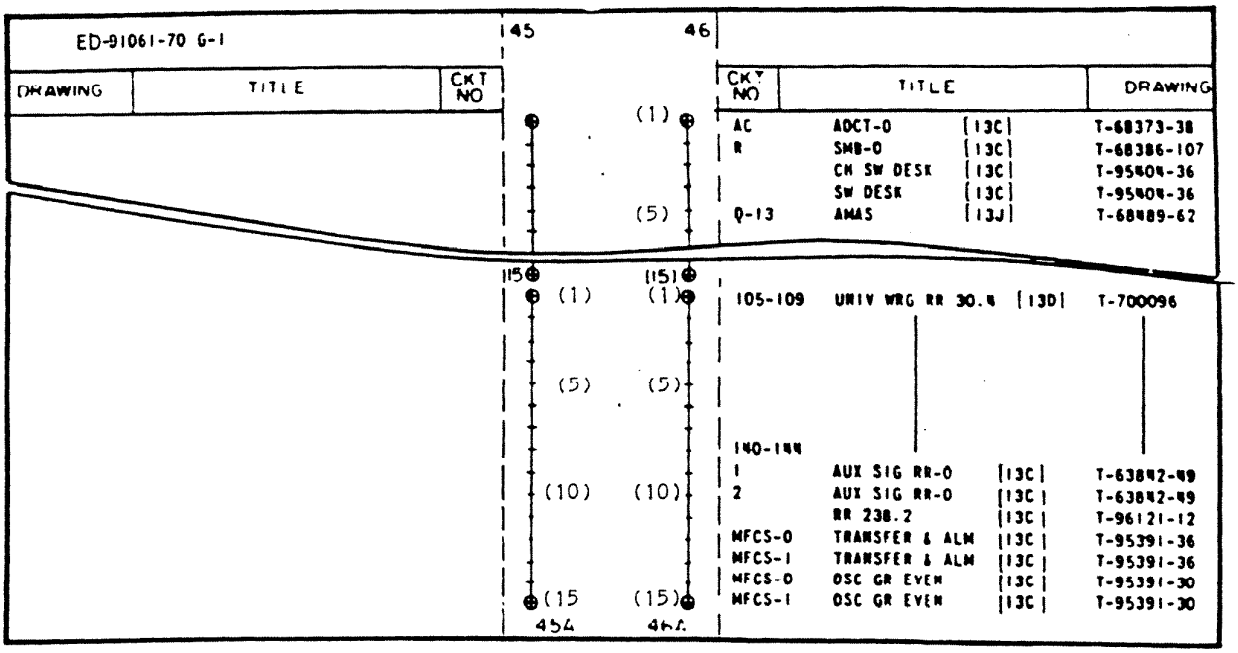

TABLE "A"

ASSIGNMENT OF FUSE ALARM (FA) EQUIPMENT T

LINE	POTENTIAL	DESIGNATION	COMPONENT	MTG PLT & POS	POS DR	POS UNDR	REMARKS
1	24V SIG	E	18 DH RES	609AY 1			PLT 66
		H	R 1107.81 COV	2			
	MR, SUP+BR-1	A	18 DH RES	3			
	BR-1	B	J20	4			
5	BR-2	A	18 DH RES	5			
	BR-2	B	J20	12			
	SUP + AUD	A	18 DH RES	13			
	SUP + AUD	B	J20	14			
15	SUP - AUD	A	18 DH RES	15			

EXHIBIT 2
MISCELLANEOUS FUSE BAY
EQUIPMENT TABULAR FORMAT
(PAGE 4 OF 4)

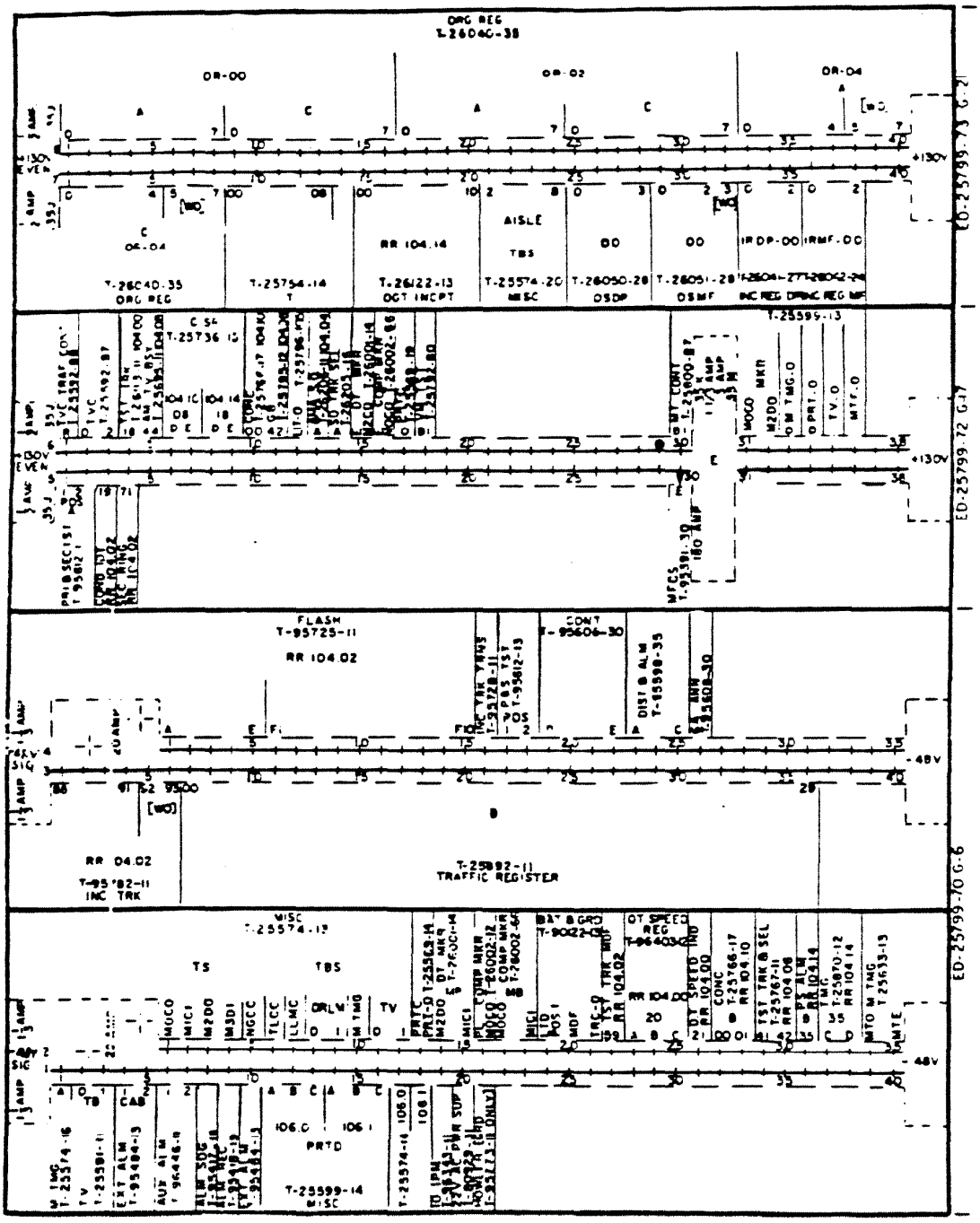

EXHIBIT 3
POWER, RINGING AND TONE DISTRIBUTING FRAME
(PAGE 1 OF 4)

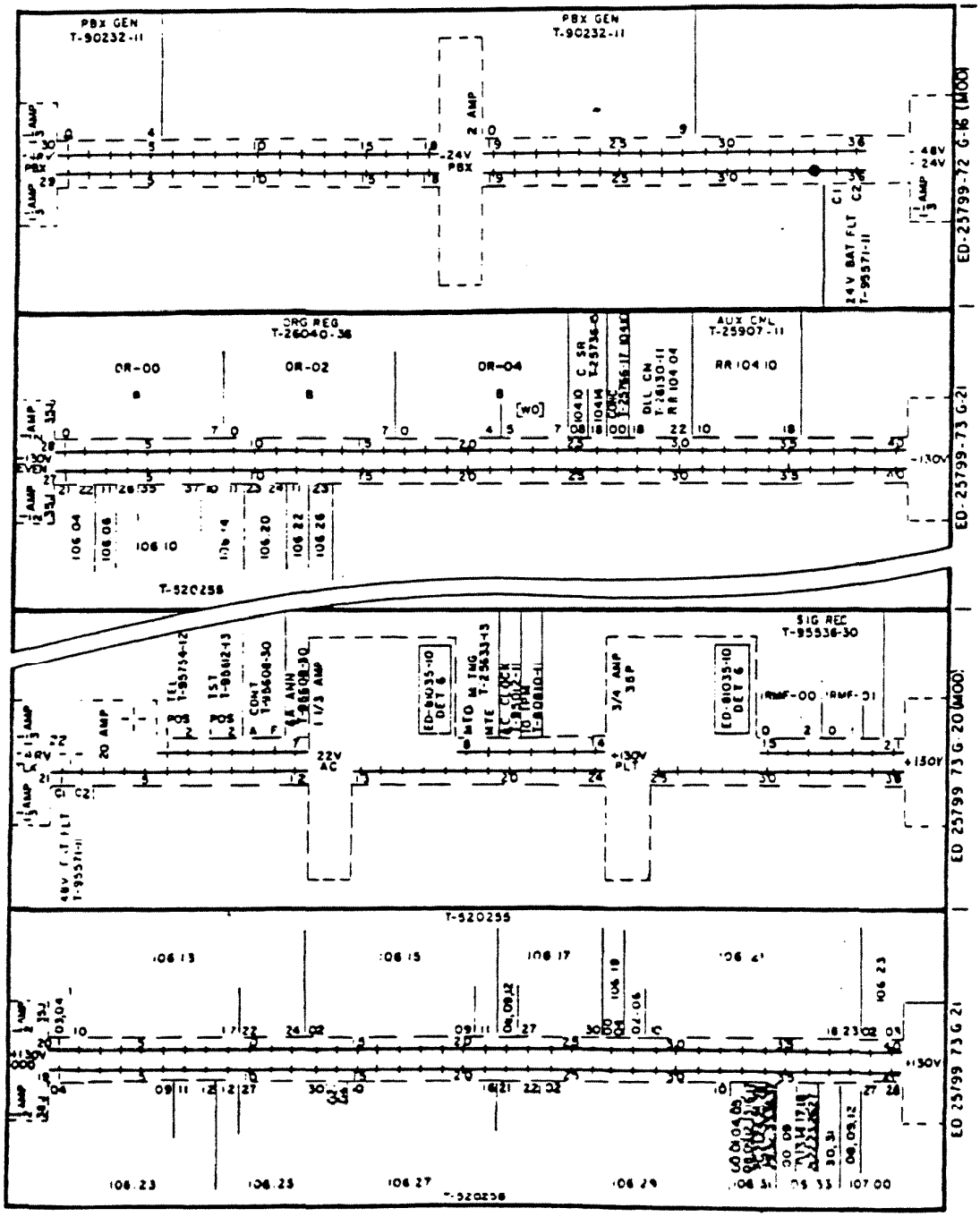

EXHIBIT 3
POWER, RINGING AND TONE
DISTRIBUTING FRAME
(PAGE 2 OF 4)

TABLE A

FUSE AND RESISTANCE LMP ASSOCIATION

LINE	FUNCT DESIG	FUSE ROW	FUSE POS	ASSOC RES LMP ROW	ASSOC RES LMP POS
1	P	5	1-2	40A	1-2
2	P	5	3	40A	5
3	R	5	4	40A	6
4	P	13	1	40A	7
5	-	13	3	40A	8
6	P	5	30	40A	9
7	P	14	30	40A	10
8	N	26	17-18	40A	3-4
9					
10					
11					
12					
62					
63					
COL	F	B	C	D	E

TABLE B

SYMBOLS FOR GRD AND BAT CONNECTIONS

Ⓐ	P-52955 TERM				
Ⓑ	NO 211	ZIERICK TERM FOR NO 10 SCR			
◯				P-205605 RMM. SCR	P-249622 LOCK WASHER
Ⓒ	NO 15738	FRANKEL RT ANGLE LUG			
Ⓓ	NO 15736	FRANKEL RT ANGLE LUG			
Ⓔ	NO 15638	FRANKEL PLUG STUD	P-119153 F.H.B.M. SCR	P-227227 WASHER	
Ⓕ	NO 15636	FRANKEL PLUG STUD	P-217986 F.H.B.M. SCR		

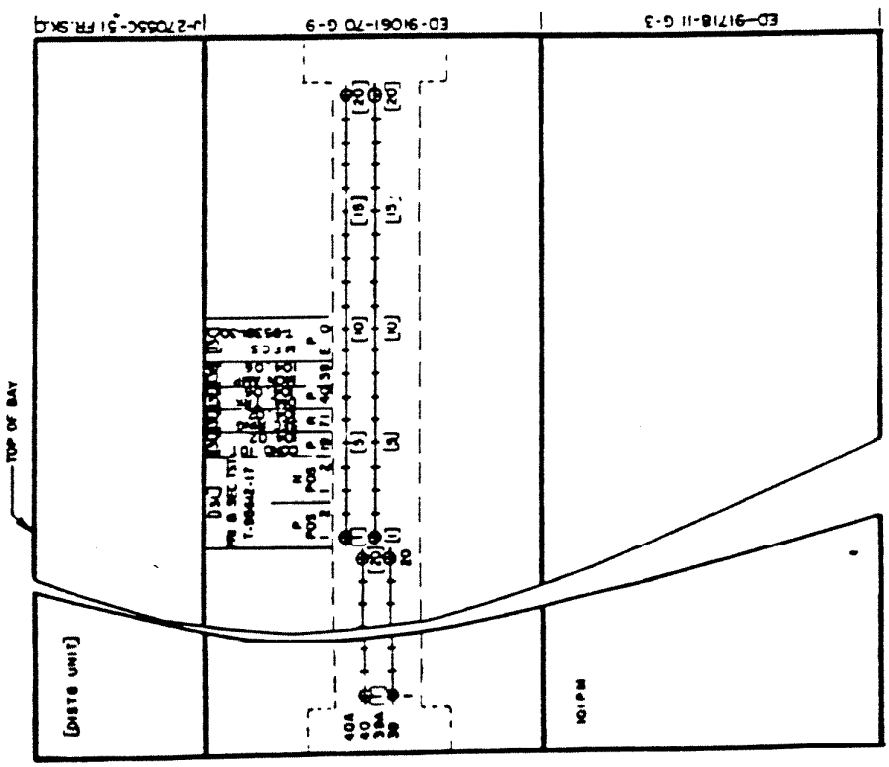

EXHIBIT 3
POWER, RINGING AND TONE
DISTRIBUTING FRAME
(PAGE 3 OF 4)

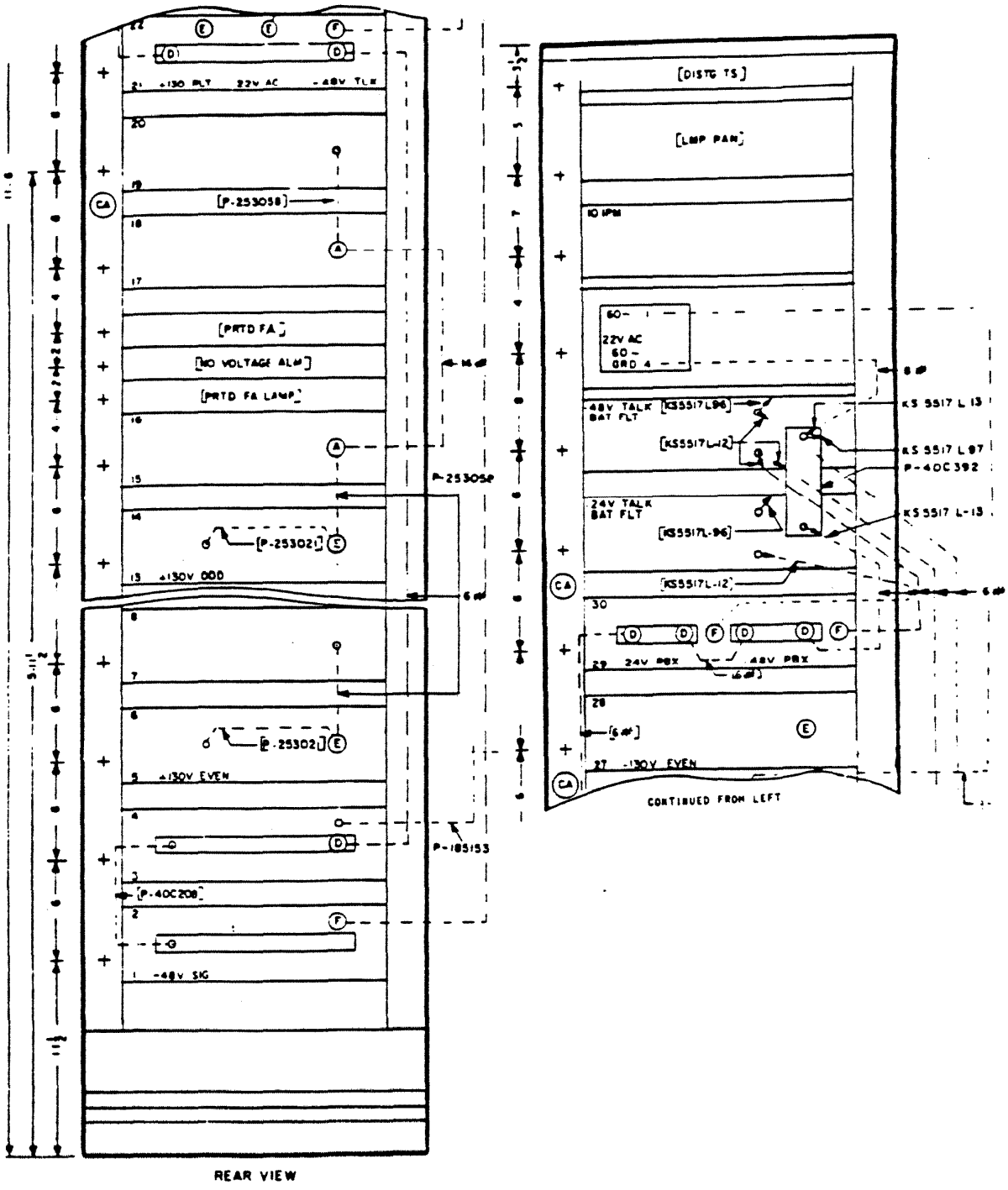

EXHIBIT 3
POWER, RINGING AND TONE
DISTRIBUTING FRAME
(PAGE 4 OF 4)

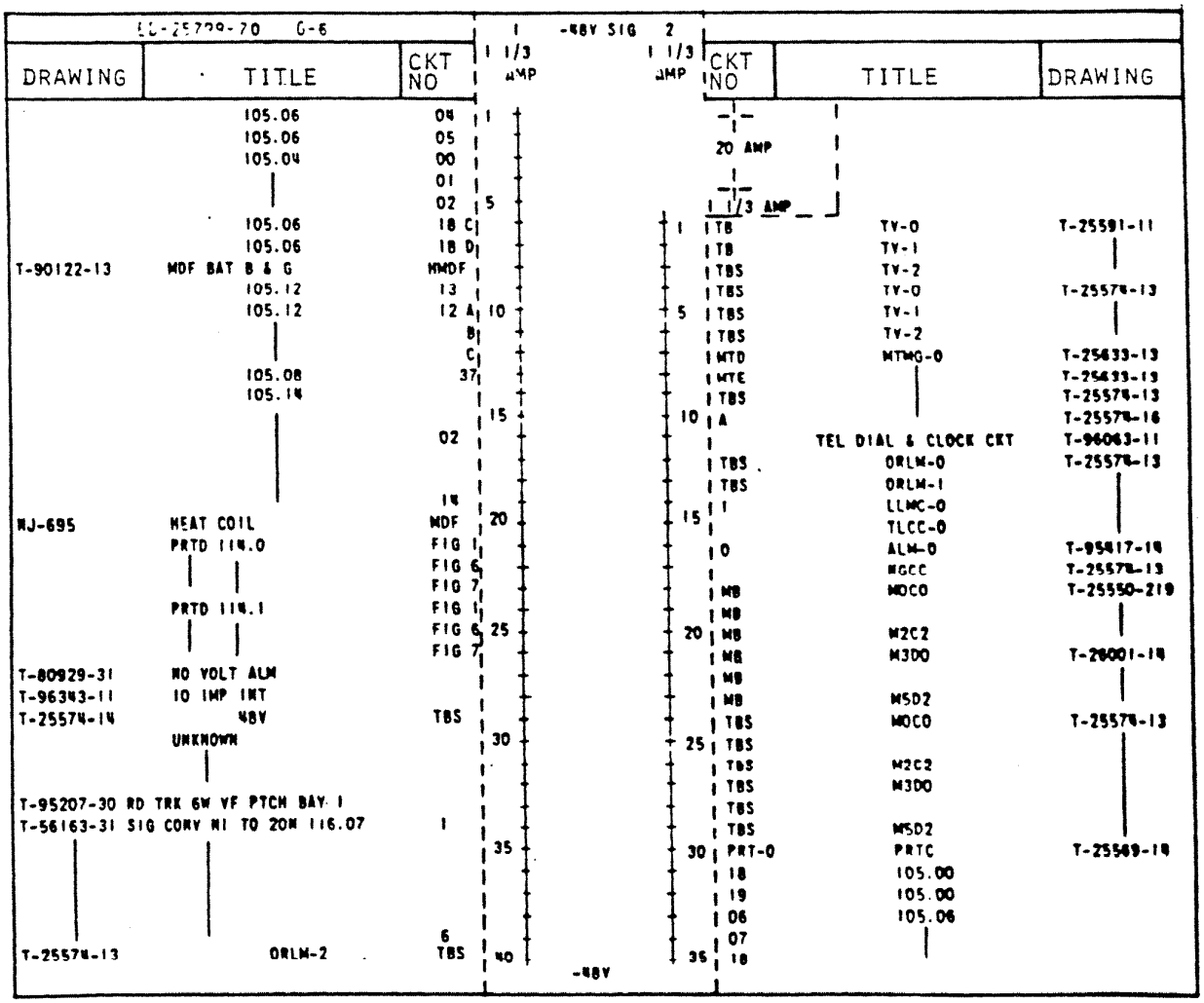

EXHIBIT 4
POWER, RINGING AND TONE DISTRIBUTING
FRAME TABULAR FORMAT
(PAGE 1 OF 6)

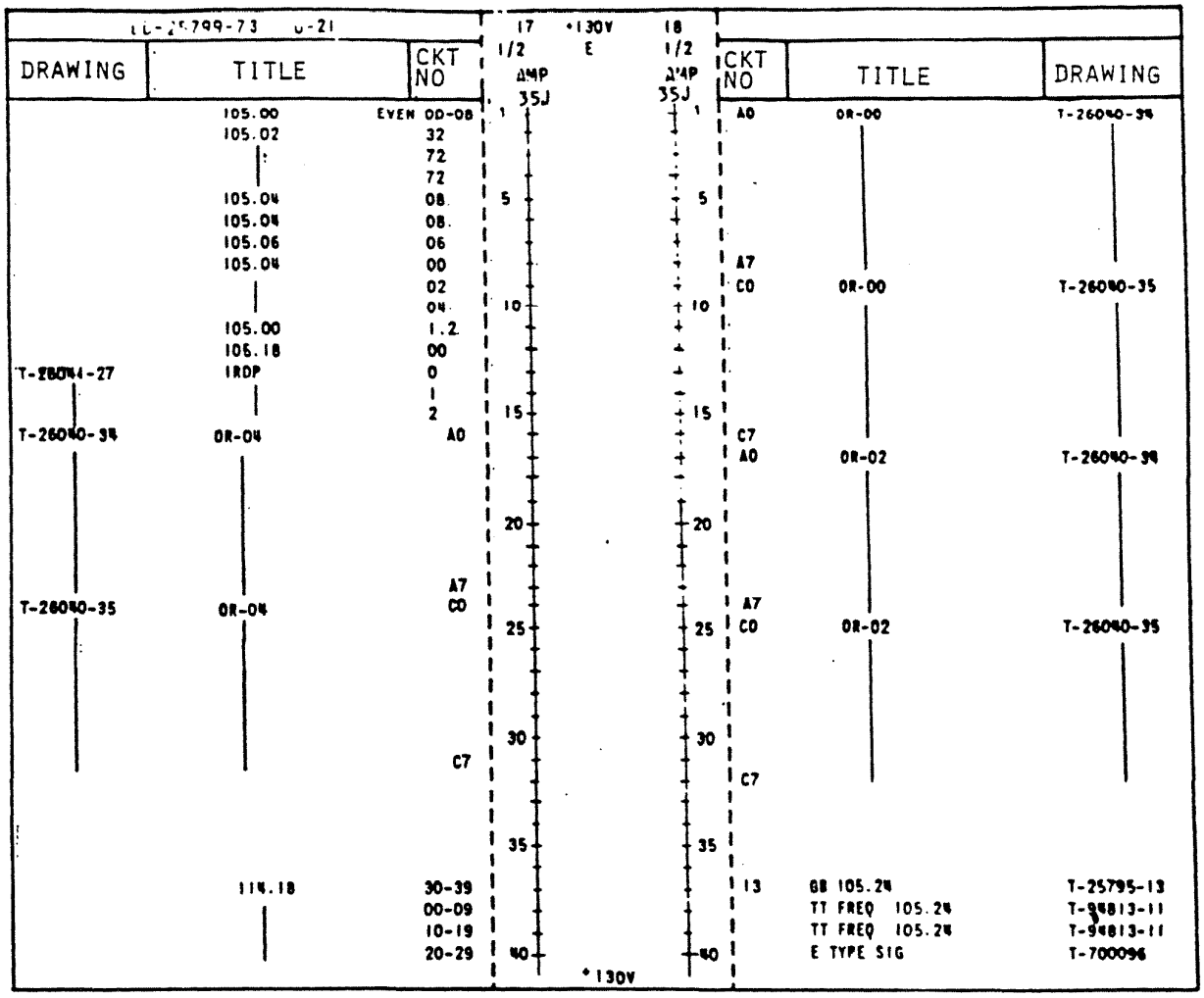

EXHIBIT 4
POWER, RINGING AND TONE DISTRIBUTING
FRAME TABULAR FORMAT
(PAGE 2 OF 6)

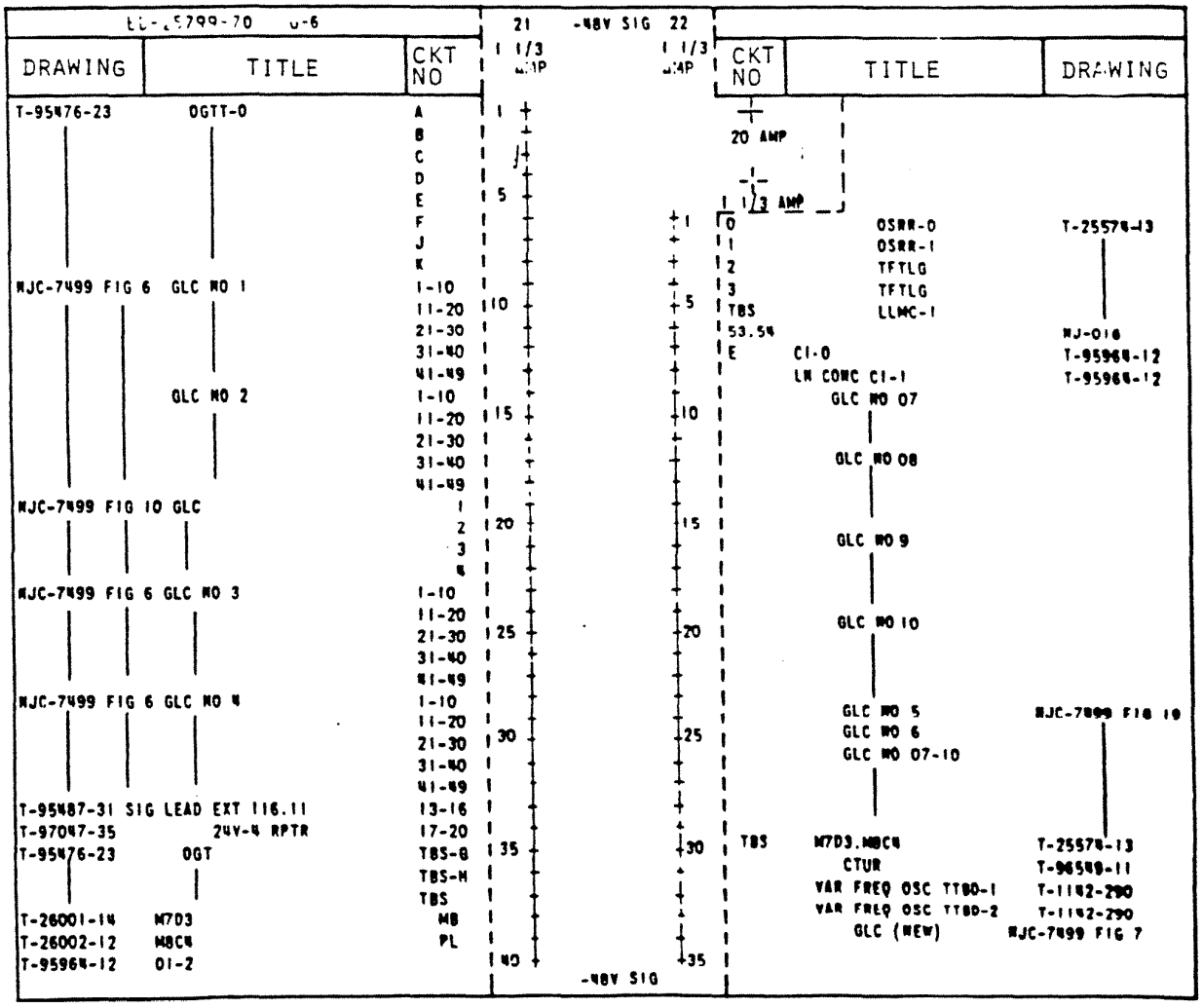

EXHIBIT 4
POWER, RINGING AND TONE DISTRIBUTING
FRAME TABULAR FORMAT
(PAGE 3 OF 6)

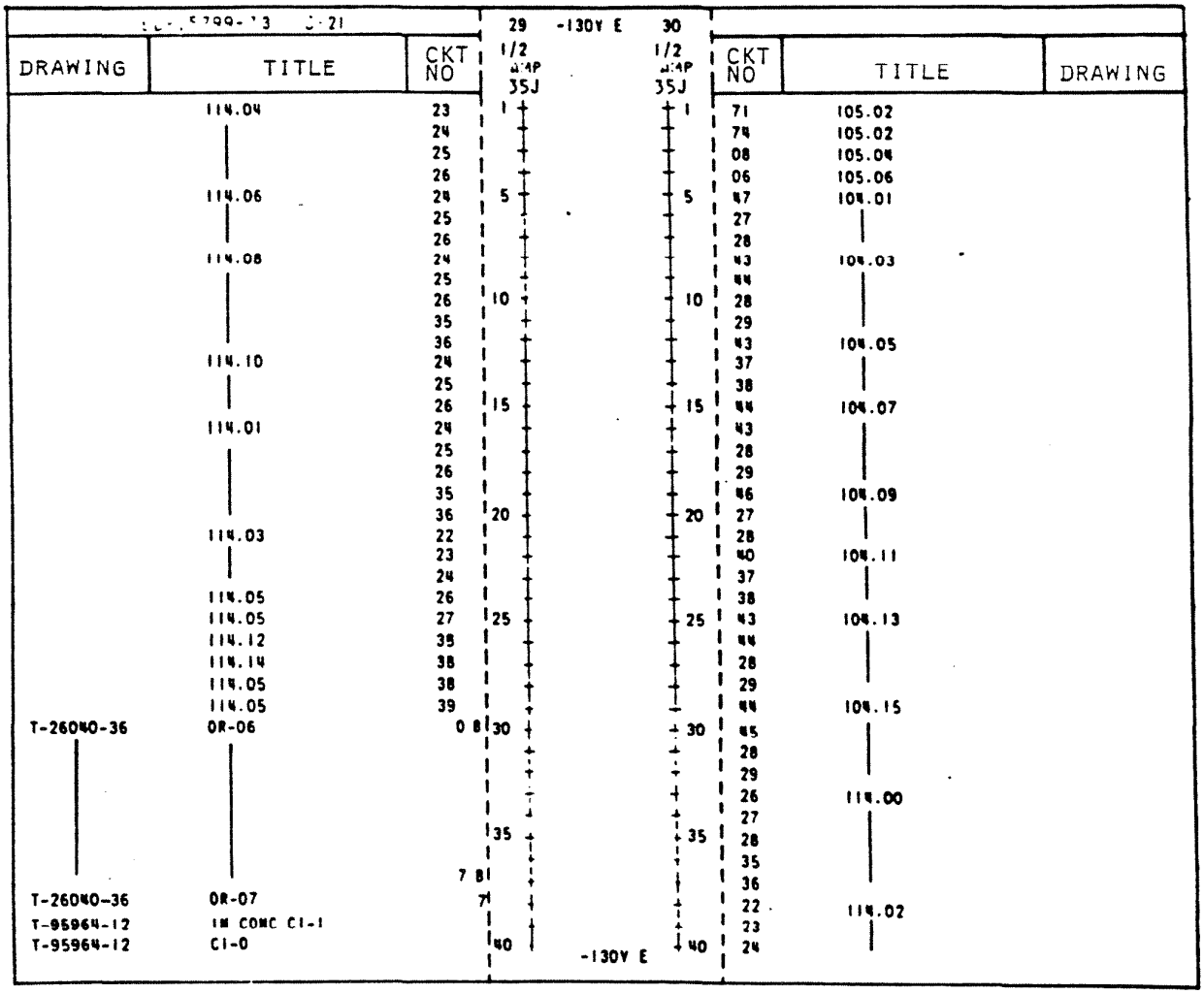

EXHIBIT 4
POWER, RINGING AND TONE DISTRIBUTING
FRAME TABULAR FORMAT
(PAGE 4 OF 6)

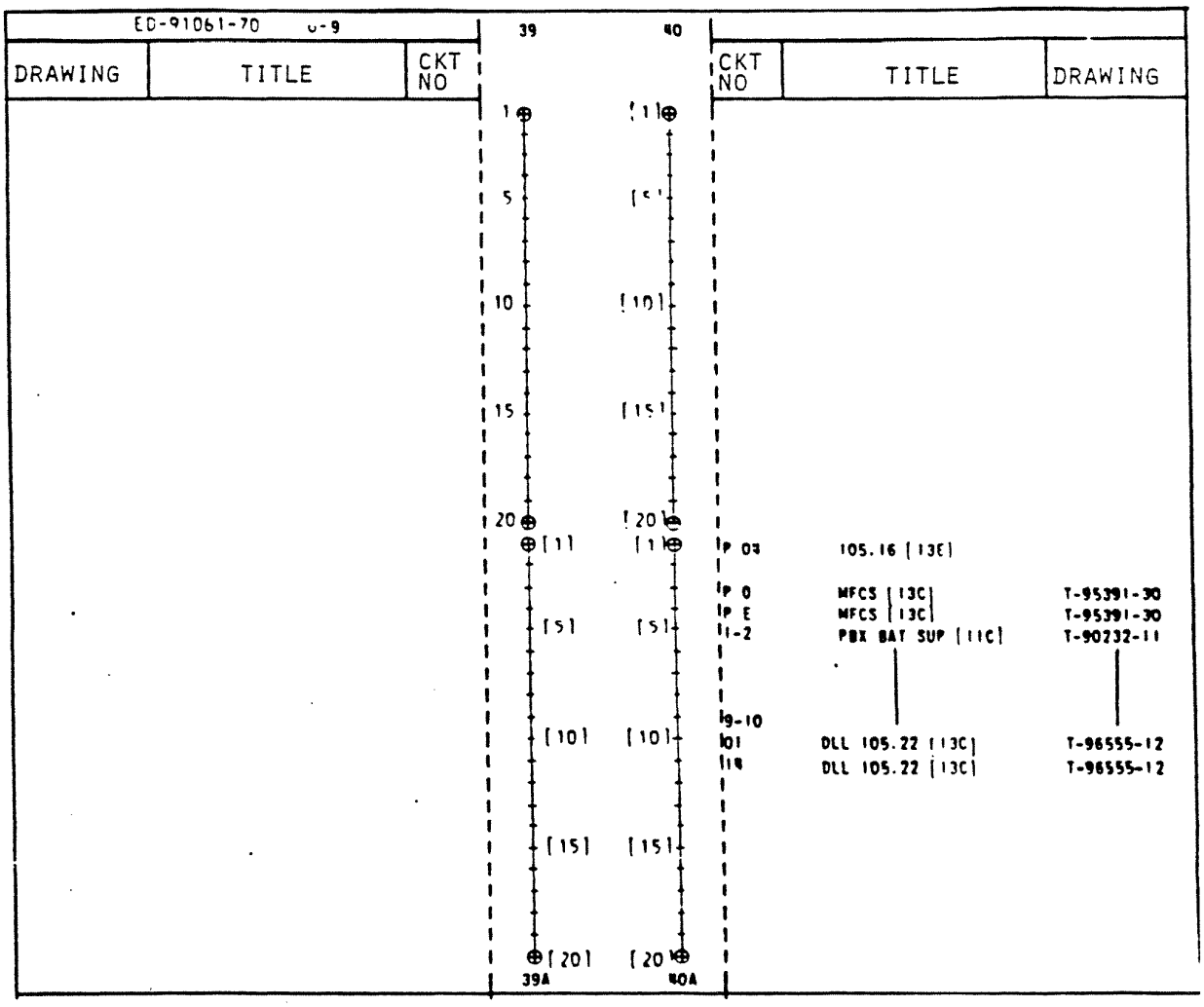

EXHIBIT 4
POWER, RINGING AND TONE DISTRIBUTING
FRAME TABULAR FORMAT
(PAGE 5 OF 6)

TABLE A				
SYMBOLS FOR GROUND AND BATTERY CONNECTIONS				
Ⓐ	P-52955 TERM.			
Ⓑ	NO.211	ZIERICK TERM. FOR NO.10 SCR		
○				
Ⓒ	NO.15738	FRANKEL RT ANGLE LUG	P-205605 RHM SCR	P-249622 LOCK WASHER
Ⓓ	NO.15736	FRANKEL RT ANGLE LUG		
Ⓔ	NO.15638	FRANKEL PLUG STUD	P-119153 FHBM SCR	P-227227 WASHER
Ⓕ	NO.15636	FRANKEL PLUG STUD	P-217986 FHBM SCR	
○				
○				

TABLE B					
FUSE AND RESISTANCE LAMP ASSOCIATION					
LINE	FUNCT DESIG	FUSE		ASSOC RES LAMP	
		ROW	POS	ROW	POS
1	P	8	24	40A	1
2	—	8	26	40A	2
3	P	8	30	40A	3
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
21					
22					
23					
24					
25					
COL	A	B	C	D	E

EXHIBIT 4
POWER, RINGING AND TONE DISTRIBUTING
FRAME TABULAR FORMAT
(PAGE 6 OF 6)

TABLE "A"

BAY & EQUIP. DWG. NO.	BAY 1 T-0000-210									
PWR. LEAD CAP	300 B.H. AMP.		100 B.H. AMP.		100 B.H. AMP.		40 B.H. AMP.		10 B.H. AMP.	
FILTER CAP	-		-		-		-		-	
VOLTAGE	-24-V SIG.		-24-V TLK.		-24-V FIL.		-48-V SIG.		-130-V PLT.	
ORDER NO.	ADDED	TOTAL	ADDED	TOTAL	ADDED	TOTAL	ADDED	TOTAL	ADDED	TOTAL
TC _____	-	195(M)	-	53.5(M)	-	37.5(M)	-	21.5(M)	-	4.1(M)
03456K	2.5	197.5	.3	53.8	-	37.5	-	21.5	.151	4.251
04567K	-	197.5	-	53.8	-	37.5	-	21.5	.151	4.251
05678	1.9	199.4	5.0	58.8	3.0	40.5	4.0	25.5	.06	4.311

NOTE: DRAINS DESIGNATED (M) ARE METER READINGS (DATE) PER TEL. CO. LETTER (DATE)

TABLE "B"

BAY & EQUIP. DWG. NO.	BAY 1 T-0000-211		BAY 2 T-0000-213		BAY 3 T-0000-215		BAYS 1-3
PWR. LEAD CAP	100 B.H. AMP.		100 B.H. AMP.		100 B.H. AMP.		300 B.H. AMP.
FILTER CAP	-		-		-		-
VOLTAGE	-24-V SIG.						
ORDER NO.	ADDED	TOTAL	ADDED	TOTAL	ADDED	TOTAL	CUM. TOT.
02345K	-	83.5	-	74.3	-	75.9	233.7
03456K	5.2	88.7	9.6	83.9	-	75.9	238.5
04567K	.5	89.2	1.3	85.2	7.6	83.5	247.9

NOTE: BAY 1 FIRST CONNECTION TO PWR. LEAD.

TABLE "C"

BAY & EQUIP. DWG. NO.	BAY 5 T-0000-211						
PWR. LEAD CAP	100 B.H. AMP.					10 B.H. AMP.	
FILTER CAP			70 AMP.				
VOLTAGE	-24-V SIG.		-24-V FIL.		-24-V SIG. & FIL.	-130-V PLT.	
ORDER NO.	ADDED	TOTAL	ADDED	TOTAL	CUM. TOTAL	ADDED	TOTAL
02345K	-	5.76	-	23.90	29.66	-	.794
03456K	.97	6.73	2.32	26.22	32.95	.217	1.011
04567K	-	6.73	2.06	28.28	34.84	.151	1.323
05678	-	6.73	2.96	31.24	41.97	.302	1.625

EXHIBIT 5
CURRENT DRAINS AND POWER LEAD
CAPACITY DRAWING
(PAGE 1 OF 2)

TABLE "D"

BAY & EQUIP. DWG. NO.	BAY-4 T-0000-217									
PWR. LEAD CAP	150 D.M. AMP. LOAD 1					150 D.M. AMP. LOAD 2				
FILTER CAP	-		112 AMP.		-	-		112 AMP.		-
VOLTAGE	- 24-V SIG.		- 24-V FIL.		- 24-V DISTRIB. CUM. TOT	- 24-V SIG.		- 24-V FIL.		- 24-V DISTRIB. CUM. TOT
ORDER NO.	ADDED	TOTAL	ADDED	TOTAL		ADDED	TOTAL	ADDED	TOTAL	
02345K	-	2.6	-	25.9	32.4	-	3.7	-	27.6	34.9
03456K	1.0	7.5	5.9	31.8	39.3	1.0	8.3	5.9	33.5	41.8
04567K	3.5	11.00	11.8	43.6	54.6	4.3	12.6	14.8	48.3	60.9
05678	.5	11.5	2.9	46.5	58.0	.5	13.1	2.9	51.2	64.3

TABLE "E"

BAY & EQUIP. DWG. NO.	BAY 400.1 T-0000-210				BAY 400.2 T-0000-212				ADD'L	BAY 400.1 T-0000-210				BAY 400.2 T-0000-212				BAY DWG. NO.
PWR. LEAD CAP	150 D.M. AMP. LOAD 1									150 D.M. AMP. LOAD 2								
FILTER CAP	-		50 AMP.		-		50 AMP.		-	-		50 AMP.		-		50 AMP.		-
VOLTAGE	- 24-V SIG.		- 24-V FIL.		- 24-V SIG.		- 24-V FIL.		- 24-V DISTRIB. CUM. TOT	- 24-V SIG.		- 24-V FIL.		- 24-V SIG.		- 24-V FIL.		- 24-V DISTRIB. CUM. TOT
ORDER NO.	ADDED	TOTAL	ADDED	TOTAL	ADDED	TOTAL	ADDED	TOTAL		ADDED	TOTAL	ADDED	TOTAL	ADDED	TOTAL	ADDED	TOTAL	
02345K	-	2.6	-	12.5	-	3.1	-	14.2	32.4	-	3.7	-	12.5	-	3.3	-	15.3	34.8
03456K	1.0	3.6	5.7	18.2	1.0	4.1	3.4	17.8	43.7	2.1	5.8	5.3	18.8	1.2	4.5	5.4	20.7	49.8
04567K	3.2	6.8	10.2	28.4	3.9	8.0	12.5	30.3	72.5	2.9	8.7	8.4	27.2	2.3	6.8	7.5	28.2	70.9
05678	.5	7.3	2.9	31.3	.5	8.5	2.9	33.2	81.3	.5	9.2	2.9	30.1	.5	7.3	2.9	31.1	77.7

EXHIBIT 5
CURRENT DRAINS AND POWER
LEAD CAPACITY DRAWING
(PAGE 2 OF 2)

FUSE PANEL EQUIPMENT

ED95173-70 GR13,3,7 FA T-31613-15 FIG 7

C [100C]	POT	POS	AMP	FUNC DESIG	CIRCUIT NO	CIRCUIT DRAWING TITLE	CIRCUIT DRAWING NUMBER	CIRCUIT DRAWING FIG	EQPT LOC
	48V SIG	1T	1-1/3	A	14,19	ROTS GR2	T30863-19	1	202.3
		2T			15,20				
		3T		B				13	
		4T			0	MFR-0	T95536-30	4	
		5T			1				
		6T			2				
		7T			3				
		8T			4				
		9T			5				
		10T			6				
		11T			7	[WT]			
		12T	1/2		8	CHG DLL INT CKT	T68483-33	1	202.4
		13T			9				
		14T			10				
		15T			11				
		16T	1-1/3			FB FA	T31613-15	11	200.0
		17T						3	
		18T				PLT 1-6,26-30,35		8	
		19T				PLT 36-44		5	
		20T	5			ZONE ALM	T96052-11	17	
		1B	1-1/3	A	1,6	ROTS GR1	T30868-19	1	202.3
		2B			2,7				
		3B			3,8				
		4B			4,9				
		5B			5,10				
		6B			11,16				
		7B			12,17				
		8B			13,18				
		9B			14,19				
		10B			15,20				
		11B		B				13	
		12B		A	1,6	ROTS GR2		1	
		13B			2,7				
		14B			3,8				
		15B			4,9				
		16B			5,10				
		17B			11,16				
		18B			12,17				
		19B			13,18				
		20B							

RR-200 FB- 0 ROW 8

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EXHIBIT 6
MODULAR FUSE BAY EQUIPMENT
(PAGE 1 OF 8)

FUSE PANEL EQUIPMENT

ED99354-70 GR 5,12,13,14,18

	POT	POS	AMP	FUNC DESIG	CIRCUIT NO.	CIRCUIT DRAWING TITLE	CIRCUIT DRAWING NUMBER	CIRCUIT DRAWING FIG	EQPT LOC
		1T	—	FA	—	FA	T95072-30	15	—
MR [100A]	MR SUP-BR1	2T	1/2		1-60	INC TRK	T95513-35	6	207.1
		3T			61-120				
		4T							
		5T	—	FA	—	FA	T95072-30	17	—
R3 [100G]	105V±	6T	1/2	A	1	TEL CO	T70610-30	3	208.3
		7T			1	CGA	T97166-30	B5	215.7
		8T			2				
		9T	—	FA	—	FA	T95072-30	12	—
E [100C]	LT1	10T	1-1/3		1	LT SUP	T96462-30	A	207.10
		11T			2				208.3
		12T							
		13T	—	FA	—	FA	T95072-30	12	—
E [100C]	-48V ABS	14T	1-1/3	AP-18		ABS			
		15T		MJ		AUD SIG	T96188-58	1	COL 29
		16T		PF				3	
	MR SUP-BR1	1B							
		2B							
		3B							
		4B							
	105V±	5B							
		6B							
		7B							
		8B							
	LT1	9B							
		10B							
		11B							
		12B							
	-48V ABS	13B							
		14B							
		15B							
		16B							

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EXHIBIT 6
MODULAR FUSE BAY EQUIPMENT
(PAGE 2 OF 8)

HEAT COIL PANEL EQUIPMENT

	POT	POS	HC	FUNC DESIG	CIRCUIT NO	CIRCUIT DRAWING TITLE	CIRCUIT DRAWING NUMBER	CIRCUIT DRAWING FIG	EQPT LOC
D [119A]		1T	74E	A	1	MR TST LP ADJ [67B]	T70561-30	3	207.00
		2T		B	1	144B-2 CPLG [67B]	T70638-31	5	207.16
		3T			2				
		4T			3				
		5T			4				
		6T			5				
		7T		BA	1	10E-1 REP [67B]	T70161-32	2	207.02
		8T			2				
		9T		BB	1				
		10T			2				
		11T		B	1	LP REP TST	T70567-30	1	207.16
		12T		C					
		13T		D					
	+130V	14T		B	2				
	TLG	15T		C					
		16T		D					
		17T		B	3				
		18T		C					
		19T		D					
		20T		B	4				
		21T		C					
		22T		D					
		23T		BF	1	10E-1 REP [67E]	T70161-32	2	207.02
		24T			2				
		25T			3				
		26T			4				
		27T			5				
		28T			6				
		29T			7				
		30T			8				

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EXHIBIT 6
MODULAR FUSE BAY EQUIPMENT
(PAGE 3 OF 8)

LAMP PANEL EQUIPMENT

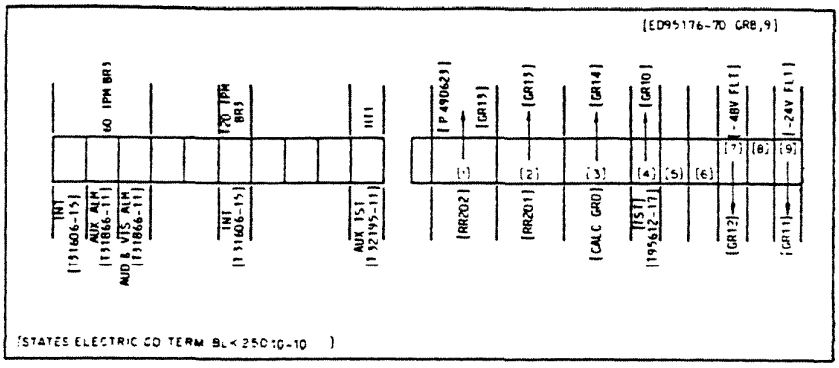
ED 95177-70 GR 1

ROW	POS	LP	FUNC DESIG	CIRCUIT NO.	CIRCUIT DRAWING TITLE	CIRCUIT DRAWING NUMBER	CIRCUIT DRAWING FIG	EQPT LOC
B	1	13C	R	1-5	DLL	T96234-12	51	210.1
	2			6-10				
	3			11-15				210.2
	4			16-20				
	5		R-	1-60	OGT	T30990-11	1	210.2
	6		⏚	1-5	MISC	T32153-11	1	210.3
	7	13D	R+	1	LTC-3	T96205-30	3	210.0
	8		R-	1				
	9							
	10							
	11							
	12							
	13							
	14							
	15							
A								
	1	13L	CR	1	JK WRG	T532089	1	210.0
	2			2				
	3		CC	1				
	4			2				
	5		N	1	PRI & SEC TST	T95612-17	7	210.1
	6			2				
	7			3	[WT]			
	8			4	[WT]			
	9		P	1				
	10			2				
	11			3	[WT]			
	12			4	[WT]			
	13	13E	AC	1	EVM TST	T95596-11	A	210.2
	14			2				
	15			3				

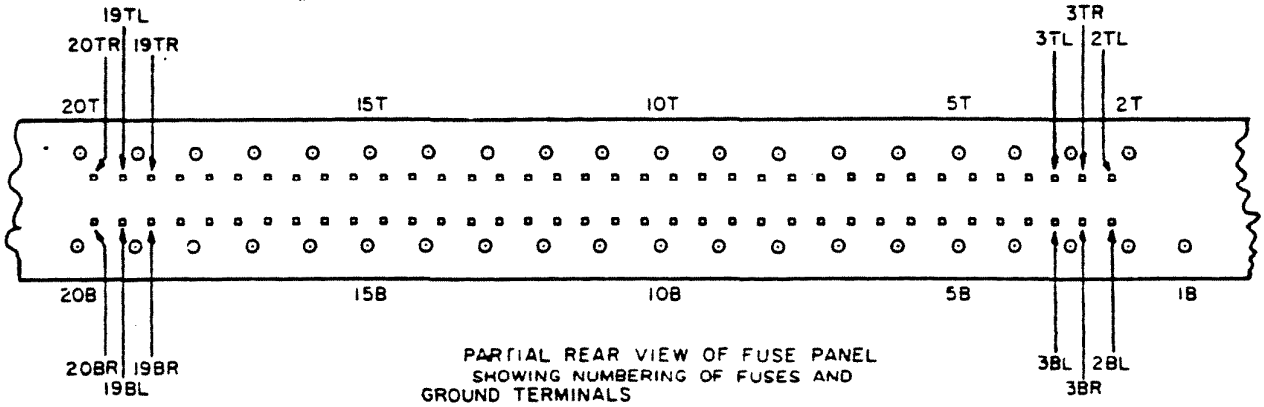
RR-200 FB-0 ROW 48

T-0001-215 MODULAR FUSE BAY EQUIPMENT

EXHIBIT 6
MODULAR FUSE BAY EQUIPMENT
(PAGE 4 OF 8)



COMBINATION PANEL
REAR VIEW
SK B



PARTIAL REAR VIEW OF FUSE PANEL
SHOWING NUMBERING OF FUSES AND
GROUND TERMINALS

SK C

EXHIBIT 6
MODULAR FUSE BAY EQUIPMENT
(PAGE 5 OF 8)

TABLE A

GROUND ONLY CIRCUIT TERMINATIONS (SEE NOTE 14)

ROW	POS	FUNC DESIG	CIRCUIT NO.	TITLE	CIRCUIT DWG	FIGURE	EQPT. LOC.
25	19TR			FA	T31613-12	1	200.0
22	31R			FA	T96444-11	12	200.0

TABLE B

BUSY HOUR AMPERE CAPACITY & DRAIN TABLE

POWER LEAD CAP	50				100				60		25			
FILTER CAP	15A				25A						10A			
VOLTAGE	-24V FIL		-24V SIG		-48V TLK		-48V SIG		-48V TLG		+130V PLT		+130V SIG	
ORDER NO.	ADDED	TOTAL	ADDED	TOTAL	ADDED	TOTAL	ADDED	TOTAL	ADDED	TOTAL	ADDED	TOTAL	ADDED	TOTAL
12345G	2.00	2.00	5.00	5.00	10.00	10.00	15.00	15.00	12.00	12.00	.125	.125	.375	.375

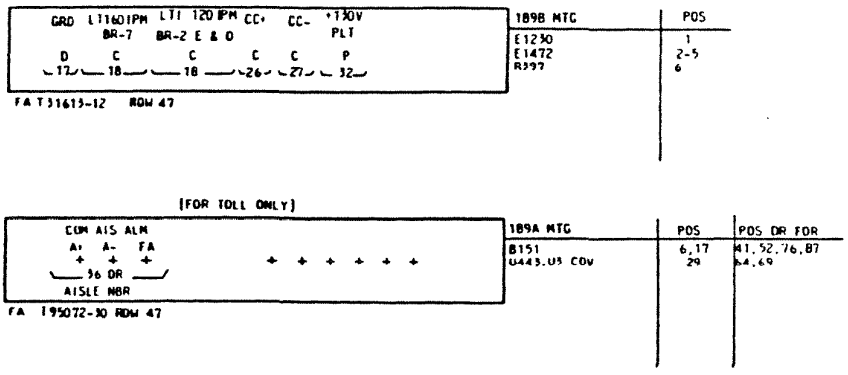
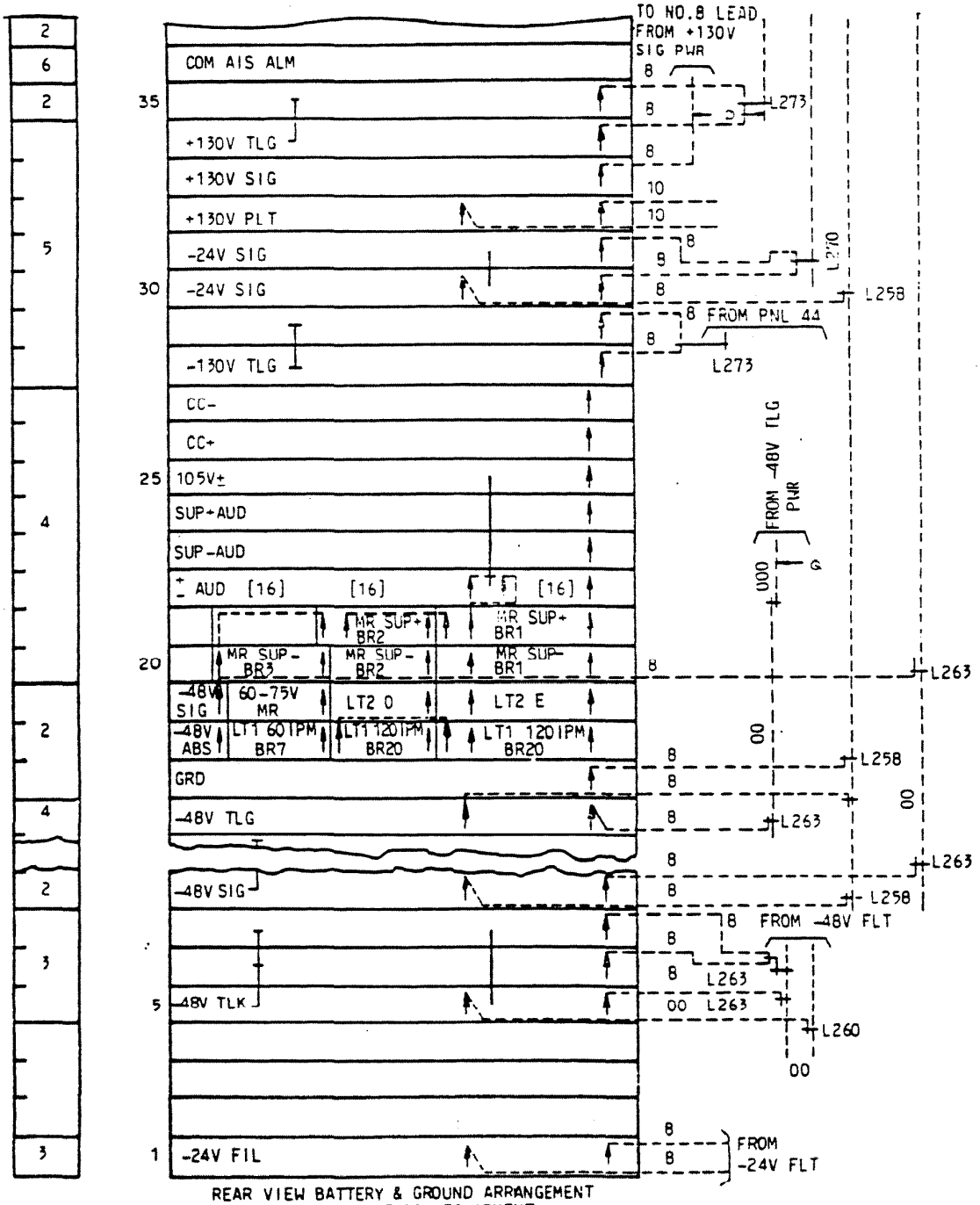


EXHIBIT 6
MODULAR FUSE BAY EQUIPMENT
(PAGE 6 OF 8)



REAR VIEW BATTERY & GROUND ARRANGEMENT
SK A MODULAR FUSE BAY EQUIPMENT

EXHIBIT 6
MODULAR FUSE BAY EQUIPMENT
(PAGE 7 OF 8)

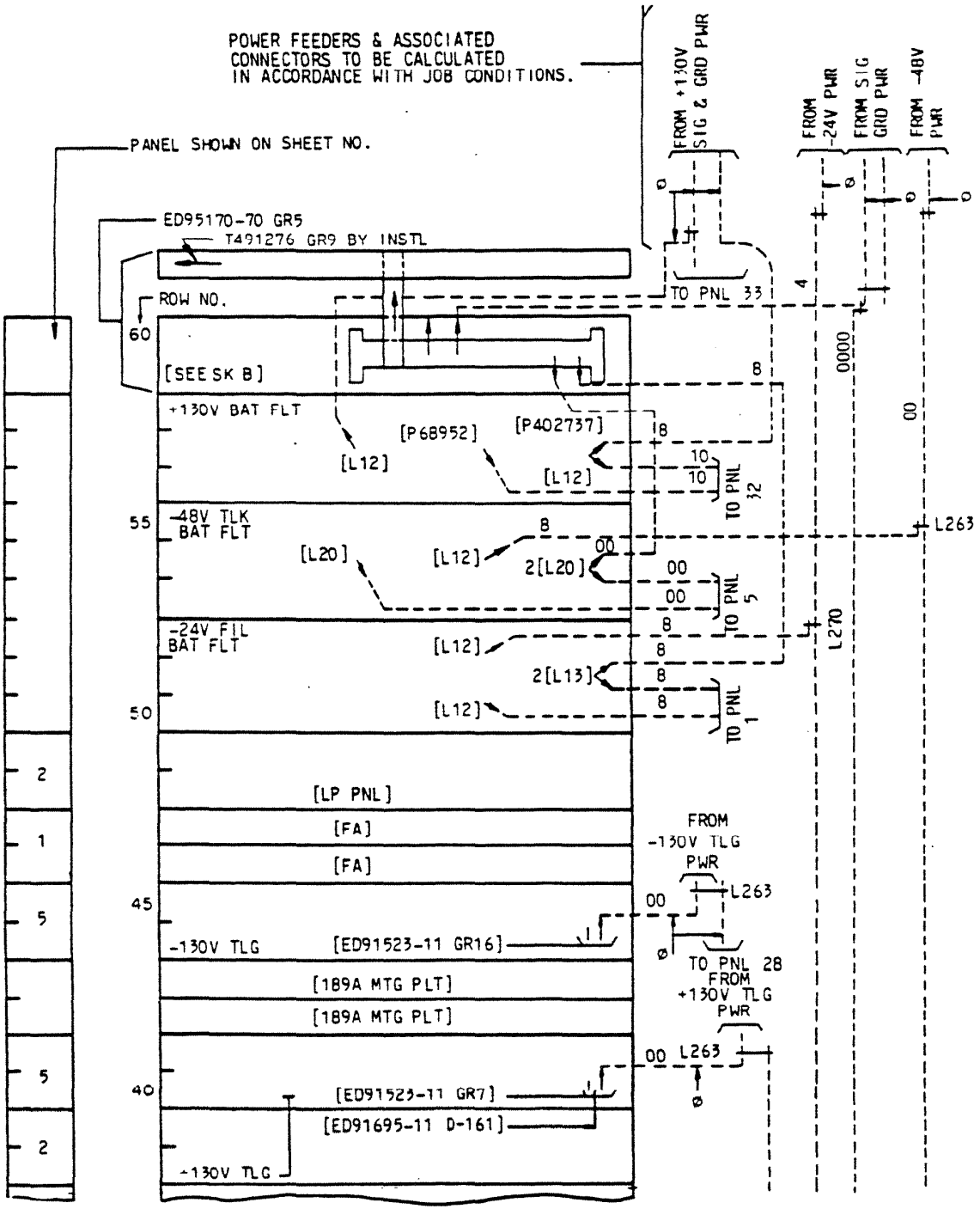


EXHIBIT 6
MODULAR FUSE BAY EQUIPMENT
(PAGE 8 OF 8)

ESTABLISHING NEW DRAIN TABLES ON EXISTING DRAWINGS
USE THE FOLLOWING TO ANSWER THE QUESTION, "IS A DRAIN TABLE REQUIRED AT THIS TIME?"

ESTABLISH DRAIN TABLES ON EXISTING DRAWINGS WHEN				
			THE DRAWING SHOWS	
			A FUSE BOARD OR PRTD	A FUSE PANEL WHICH IS MISCELLANEOUSLY MOUNTED IN A RELAY RACK
AND THE DRAWING IS	CHANGED FOR	ADDITION OF A NEW POWER FEEDER	YES	YES, ESTABLISH DRAIN TABLE FOR ALL FUSE PANELS WHICH ARE POWERED BY THE NEW FEEDER. SEE NOTE 1.
		ADDITION OF A NEW FUSE PANEL	YES	YES, ESTABLISH DRAIN TABLE FOR ALL FUSE PANELS WHICH ARE POWERED BY THE NEW FEEDER. SEE NOTE 1.
		OTHER CHANGES ON EXISTING PANELS	YES	NO BUT SEE NOTE 2.
	BEING CHANGED ON AN ESO, TCS OR RUNNING ORDER OR INSTALLER'S FINAL MARKED PRINT		NO BUT SEE NOTE 2	NO BUT SEE NOTE 2.
	A PANEL SYSTEM FUSE BOARD		NO BUT SEE NOTE 2	NOT APPLICABLE

NOTE 1: DRAIN TABLES NEED NOT BE ESTABLISHED AT THIS TIME FOR OTHER FUSE PANELS WHICH MAY BE SHOWN ON THE DRAWING AS LONG AS THEY ARE NOT POWERED FROM THE SAME FEEDER.

NOTE 2: ENGINEERING JUDGEMENT SHALL BE EXERCISED TO ASSURE RELIABILITY OF POWER SUPPLY FUSES AND FEEDERS.

NOTE 3: DRAIN TABLES NEED NOT BE ESTABLISHED FOR EQUIPMENT WHOSE REMOVAL OR RETIREMENT IS IMMINENT IF AGREEMENT TO THIS EFFECT HAS BEEN REACHED WITH THE TEL CO.

EXHIBIT 7
ESTABLISHING NEW DRAIN TABLES
ON EXISTING DRAWINGS

SWITCHBOARD EQUIPMENT DRAWINGS

CONTENTS

1.00 GENERAL

1.01 This part covers the standards to be followed in the preparation of switchboard front and rear equipment drawings for all systems.

1.02 This type of drawing establishes an office record of the arrangement of equipment in the face or rear of a switchboard.

2.00 SCALE

2.01 No scale is required. However, linework shall accommodate 1/8 inch lettering to meet microfilm standards.

3.00 PEN SIZE

3.01 The pen size requirements for the preparation of tabular format lineweights are covered in Section III, Part C, Paragraph 8.03.

3.02 The following indicates pen size that should be used for the following specific conditions:

Pen Size	Application
0	Equipment ladders, horizontal table lines
3	To separate levels of equipment and multiples of the equipment

4.00 ISSUE NOTES

4.01 Only the basic Issue Note is required for Switchboard Equipment Drawings.

5.00 CRITERIA

5.01 Prior to the preparation of the front equipment drawing for a particular switchboard, all necessary data shall be obtained. The data should be checked to verify that it is noncontradictory and that it is the latest available information. This data consists of:

A. Number of Sections

B. Number of Panels Per Section

C. Growth

D. Width of Panels

E. Jack Opening

F. Panel Mult.

G. Tables

H. Drafting Aids

6.00 ARRANGEMENT OF LAYOUT ON DRAWING

6.01 If the growth of a switchboard is from right to left, the lowest numbered panel should be located at the right side of the drawing and the panels consecutively numbered to the left.

6.02 If the switchboard grows left to right, the lowest numbered panel should be located at the left side of the drawing and the panels consecutively numbered to the right.

7.00 SPECIFIC DRAWING STANDARDS

7.01 Drawing standards related herein shall be applied to all new switchboard front equipment drawings as of the date of this Publication. However, for additions, certain standards in use prior to this time may be applied, when it is logical and economical to complete the existing drawing using these standards.

8.00 FRONT EQUIPMENT

8.01 Prepare front equipment drawings of switchboards as illustrated in Exhibits 1 and 2.

8.02 Information on jack mountings, jack spaces, lamp socket mountings, apparatus blanks, holly strips, stile casing number plates, etc., used in the preparation of front equipment drawings can be found in U S WEST Communications PUB 77351.

9.00 RECORDING SPECIFICATION CODES

9.01 The specification codes covering the design of the section or lower unit of switchboards, shall be recorded in the "table of equipment" for new lines of Nos. 11, 3CF, 3CL and Nos. 1 and 3 (92 jack) toll switchboards. The specification codes shall also be shown on additions to and rearrangements of No. 11 switchboards. The list numbers and quantity of lists shall not be shown.

10.00 SHOWING CIRCUIT NUMBERS

10.01 If number plates are not required for two or more consecutively numbered circuits, show the numbering in the location ordinarily assigned for number plates and designate "To be stamped on underside of Keyshelf (or panel) only."

11.00 REAR EQUIPMENT

11.01 The amount of equipment to be covered in a rear equipment will, in general, be determined by the space occupied, the kind of number of positional circuits and maintenance considerations. New rear equipment drawings should be modeled after the nearest corresponding standard drawings covering a similar section assembly and positional circuits.

11.02 Use plus (+) marks and vertical lines for apparatus conventions and for drilled for and unequipped mounting plate positions. Show code of mounting plate and apparatus with which it is equipped to the right of mounting plate sketches as in preparing relay rack sketches but do not show the "wired only" or "drilled for" columns used on relay rack sketches or the equipment in each "operator position" since to do so would limit the field of application of the drawing to specific positions and conditions instead of making the rear equipment drawing applicable to as many positions of the same type as possible. Number the mounting plates top down starting with one at the top. Show such numbering on the right end of the plate and enclose in brackets. Explain the use of the brackets in a note.

11.03 When small variations in the framework or equipment arrangements are required to an existing rear equipment drawing, they may be covered by framework and equipment sketches. In preparing this type of drawing, the same basic idea of making the sketch typical and thus increasing its field of application as is done in rear equipment should be followed.

12.00 NOTES AND SYMBOLS

12.01 Show only those notes in the following typical list, which are applicable to the particular drawing.

1. LIKE LETTERS AND NUMBERS DENOTE LIKE EQUIPMENT.

2. [ ] DESIGNATIONS SHOWN IN BRACKETS ARE FOR INFORMATION ONLY AND ARE NOT TO BE STAMPED.

3. WO DENOTES WIRED ONLY.

4. ⊖ = B NO. PLT (IN PILING RAIL) OR 12B NO. PLT IN KEYSHELF.

5. ⊘ = 40B, 33B, OR 42B APP BLKS.
   = 40B APP BLK FOR 34 L.S. OR 92 TYPE KEY DRS.
   = 33B APP BLK FOR 309 PLUG DRILLINGS.
   = 42B APP BLK FOR 49A L.S. AND 498 TYPE KEY DRS.

6. ● 109 PLUGS WITH 1-A CUSHIONS.

7. +33-B APPARATUS BLANKS.

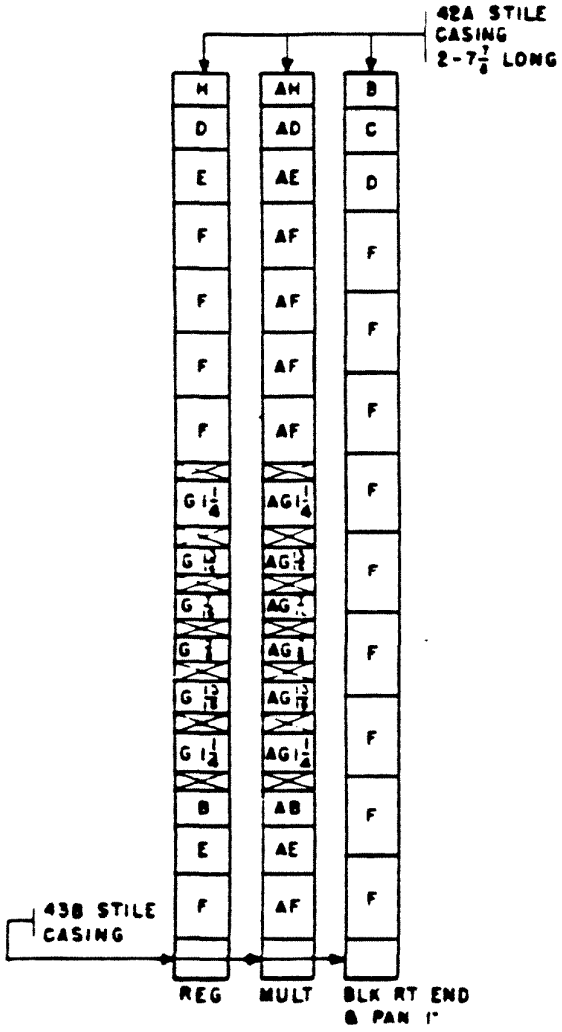
8. EQPT IN "JK SP AND MISC. EQUIP" TABLE SHALL BE INSTALLED IN ORDER SHOWN (TOP DOWN).

9. EXCEPT AS NOTED BELOW, A 12AR JACK SPACE WILL BE MOUNTED BETWEEN:

A LAMP SOCKET MTG USING 30 OR 43 L.S.		A LAMP SOCKET MTG USING 30 OR 43 L.S.
	and	
A LAMP SOCKET MTG USING 30 OR 43 L.S.		A JACK MTG.
A LAMP SOCKET MT USING 30 OR 43 L.S.		A KEY MTG ONLY WHEN KEY MTG IS DIRECTLY ABOVE LAMP MTG.

EXCEPTION: A 128F JACK SPACE SHALL BE PLACED ABOVE A 283A, 283B, 295A OR D-122491 LAMP SOCKET MOUNTING WHEN EITHER A LAMP, JACK OR KEY MOUNTING IS DIRECTLY ABOVE.

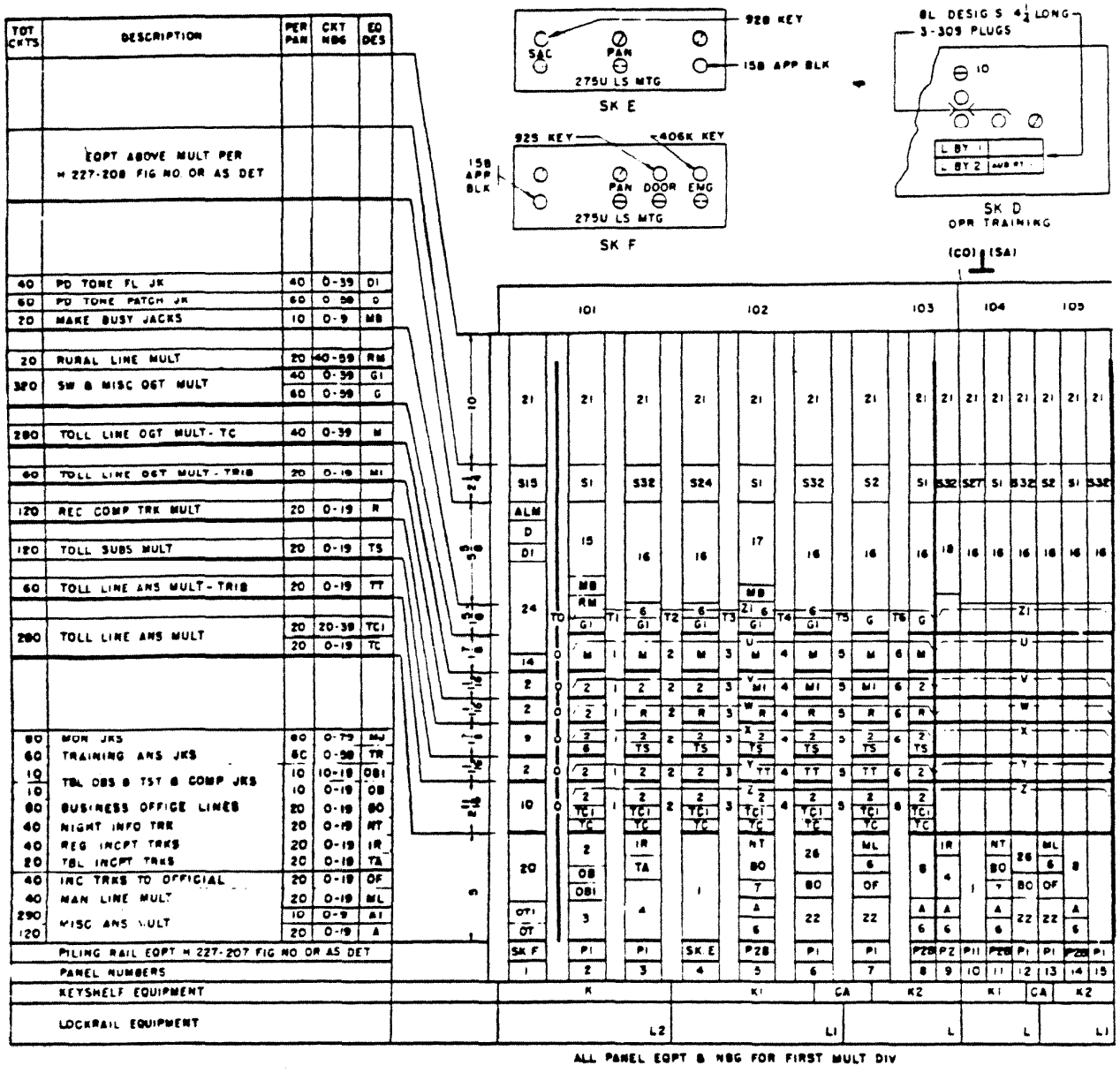
10. ⊥ 17 TYPE INDICATOR PER MANUFACTURER'S SPECIFICATIONS



NO. PLTS (NOT STRIPPED)
- B = 143B
- C = 143C
- D = 143D
- E = 143E
- F = 143F
- G = 143G (LG AS SHOWN)
- H = 143H
- X = 142B (ENG AS SPEC'D)

NO. PLTS (VERT STRIPPED)
- AB = 143AB
- AC = 143AC
- AD = 143AD
- AE = 143AE
- AF = 143AF
- AG = 143AG (LG AS SHOWN)
- AH = 143AH

EXHIBIT 1
SWITCHBOARD EQUIPMENT DRAWINGS
(PAGE 1 OF 2)



CTS FRWK & ASSEM PER ED 92091-70 G-1 MOD BY SKS A B B

END PAN RT END PER ED 92098-70 G-2

END PAN LT END PER ED 92098-70 G-3

END OF LINE DETS PER ED 92078-70 G-2

GRD BUS BAR DETS PER ED 91366-70 G-3, 19

72 CA PINS PER SECT

SECTION ASSEM UPPER UNIT	ED 92066-70 G-1				
IRON FRAME ASSEM-UPPER UNIT	ED 92067-70 G-1, 3				
ROOF EQUIPMENT	H 227-224				
POSITION NUMBERS	101	102	103	104	105
TYPE OF POSITION	HEADEND	INWARD THRU & DSA			
STANDARD SPECIFICATION	J91107J 2	J91107D 6			
SECTION ASSEM LOWER UNIT	ED 92058-70 G-5				
IRON FRAME ASSEM-LOWER UNIT	ED 92059-70 G-1				
CORDSHELF	ED 92072-70 G-10				
FUSE PANEL	ED 61615-72 G-1, 4, 25-7				
MODIFICATION					

EXHIBIT 1
SWITCHBOARD EQUIPMENT DRAWINGS
(PAGE 2 OF 2)

NO. 3CL SWITCHBOARD FRONT EQUIPMENT

This Exhibit is to be considered only to the extent that it represents the manner in which designations, number, etc., are to be shown and the scope of information required. Equipment arrangement for a particular front equipment is to be based on requirements applying to the type of equipment involved.

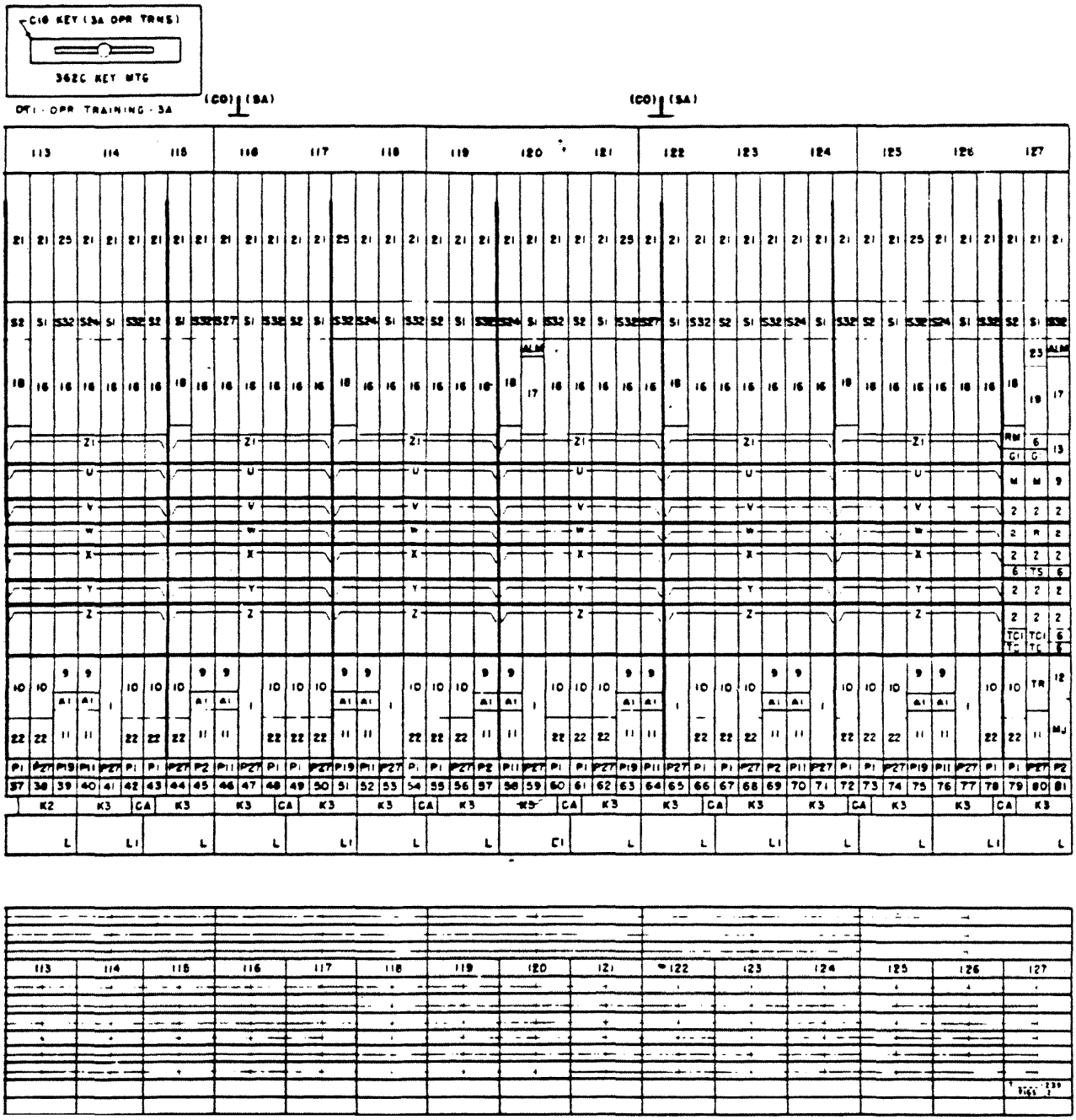


EXHIBIT 2
SWITCHBOARD EQUIPMENT - MOUNTING PLATE DESIGNATION

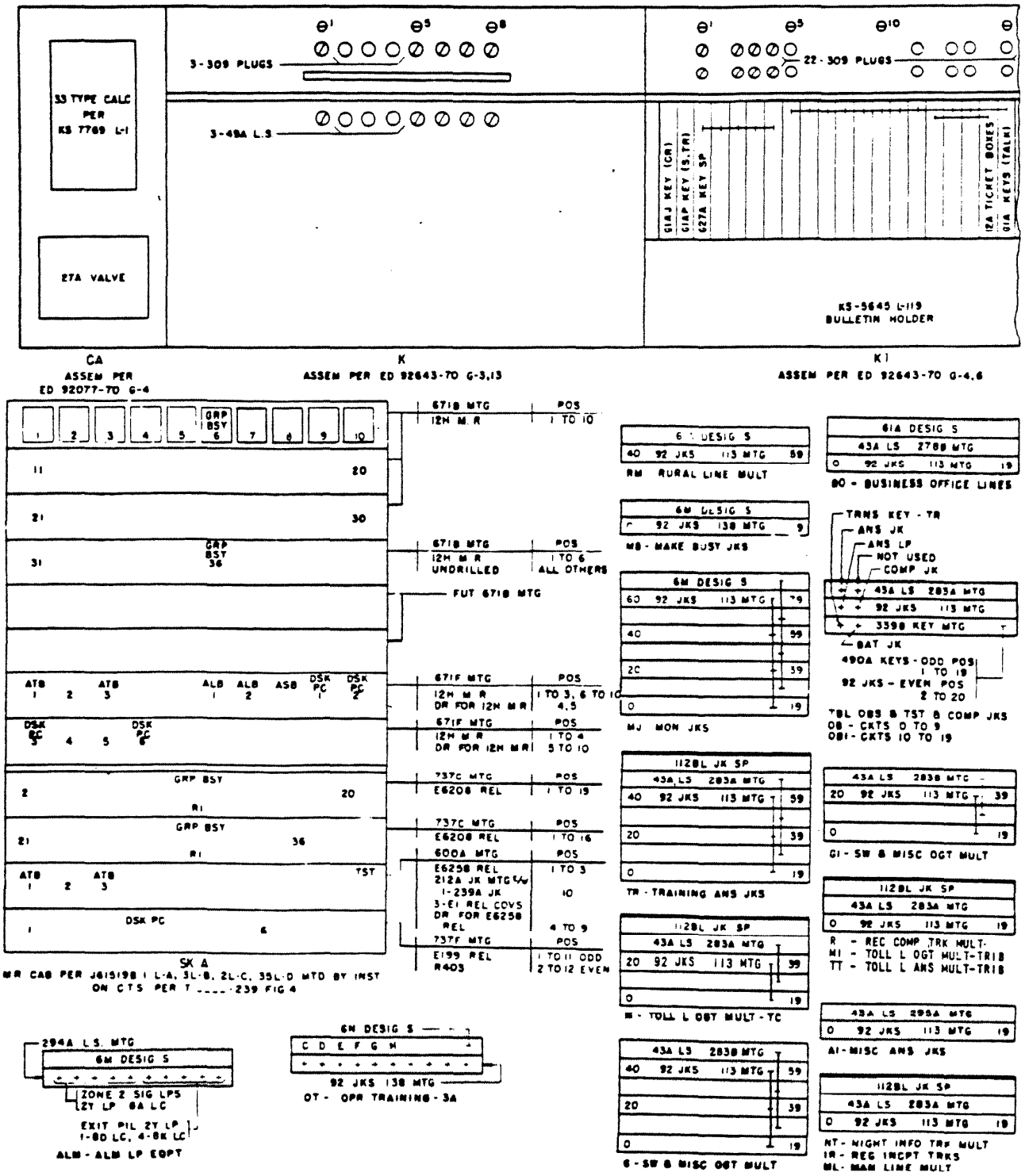
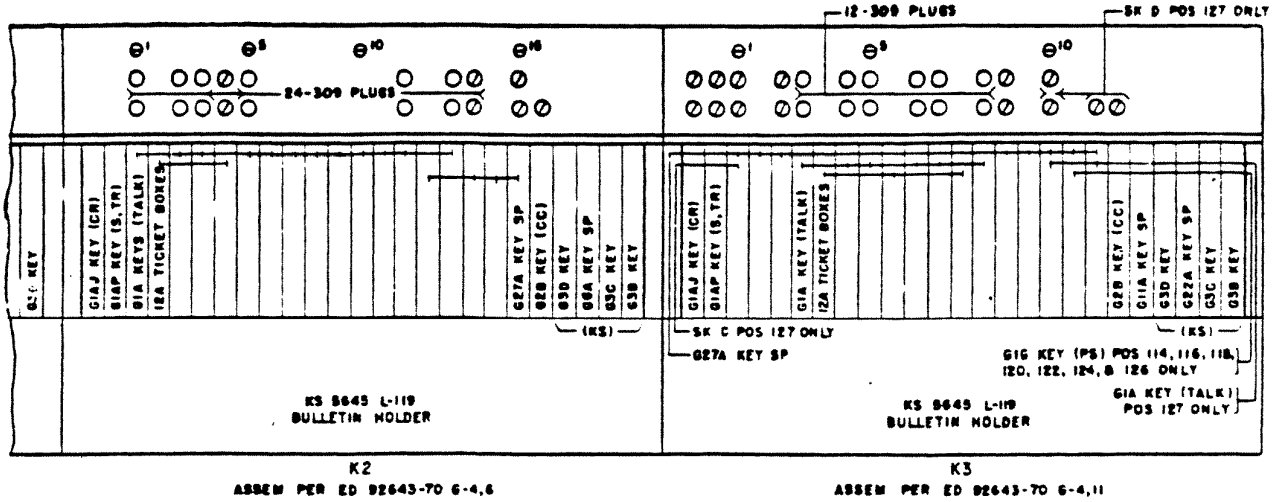
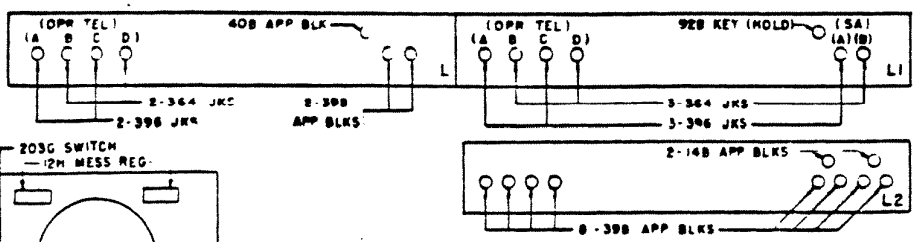
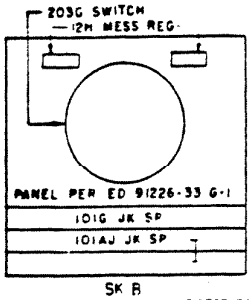


EXHIBIT 3
TYPICAL JACK MOUNTING ASSY CONFIGURATIONS







SK B
ANS RCDR CAB PER ED 90753-30, G-1 MTD BY INST ON CTS PER T_____-239 FIG 3

6M DESIG S		
40	92 JKS 113 MTG	59
20		39
0		19

B - P D TONE PATCH JKS

6M DESIG S		
20	92 JKS 113 MTG	39
0		19

B1 P D TONE FL JKS

43A LS 283A MTG		
0	92 JKS 113 MTG	19

A - MISC ANS JKS
OF - INC TRKS TO OFFICIAL
TA - TBL INCPT TRKS
TC - TOLL L ANS MULT CKTS 0 TO 19
TC1 - CKTS 20 TO 39
TS - TOLL SUBS MULT

SYM	JK SP & MISC EQPT JK SP CODE UNLESS OTHERWISE SPECIFIED
1	1 - 112BL 4 - 112AE 1 - 112K
2	1 - 112RL 1 - 112AE
3	1 - 112AE 1 - 112AG
4	2 - 112AE 1 - 112K
5	1 - 112AF
6	1 - 112AE
7	1 - 112BD
8	1 - 112BL 2 - 112AE 1 - 112K
9	1 - 112BL 2 - 112AE
10	1 - 112BL 3 - 112AE
11	1 - 112AE 1 - 112K
12	1 - 112BL 1 - 112K
13	3 - 112AE
14	1 - 112C 1 - 112AE
15	1 - 112AY 1 - 112AM
16	1 - 112AY 1 - 112K
17	1 - 112AY 1 - 112C 1 - 112T
18	1 - 112AY 1 - 112BD 1 - 112D

SYM	JK SP & MISC EQPT JK SP CODE UNLESS OTHERWISE SPECIFIED
19	1 - 112K
20	1 - 112BL 1 - 112BG
21	PANEL PER ED 92080-70 G-1
22	6M DESIG S 7A TICKET BOX
23	M 2E7-204 L-1 TRANS RED EQ -
24	ED 92530-10 G-2 PD TONE EQ
25	PANEL PER ED 92080-70 G-2 WITH 25A HAND RECEIVING VALVES
26	1 - 112BL 1 - 112AM 1 - 112C

EXHIBIT 4
NO. 3CL SWITCHBOARD FRONT EQUIPMENT

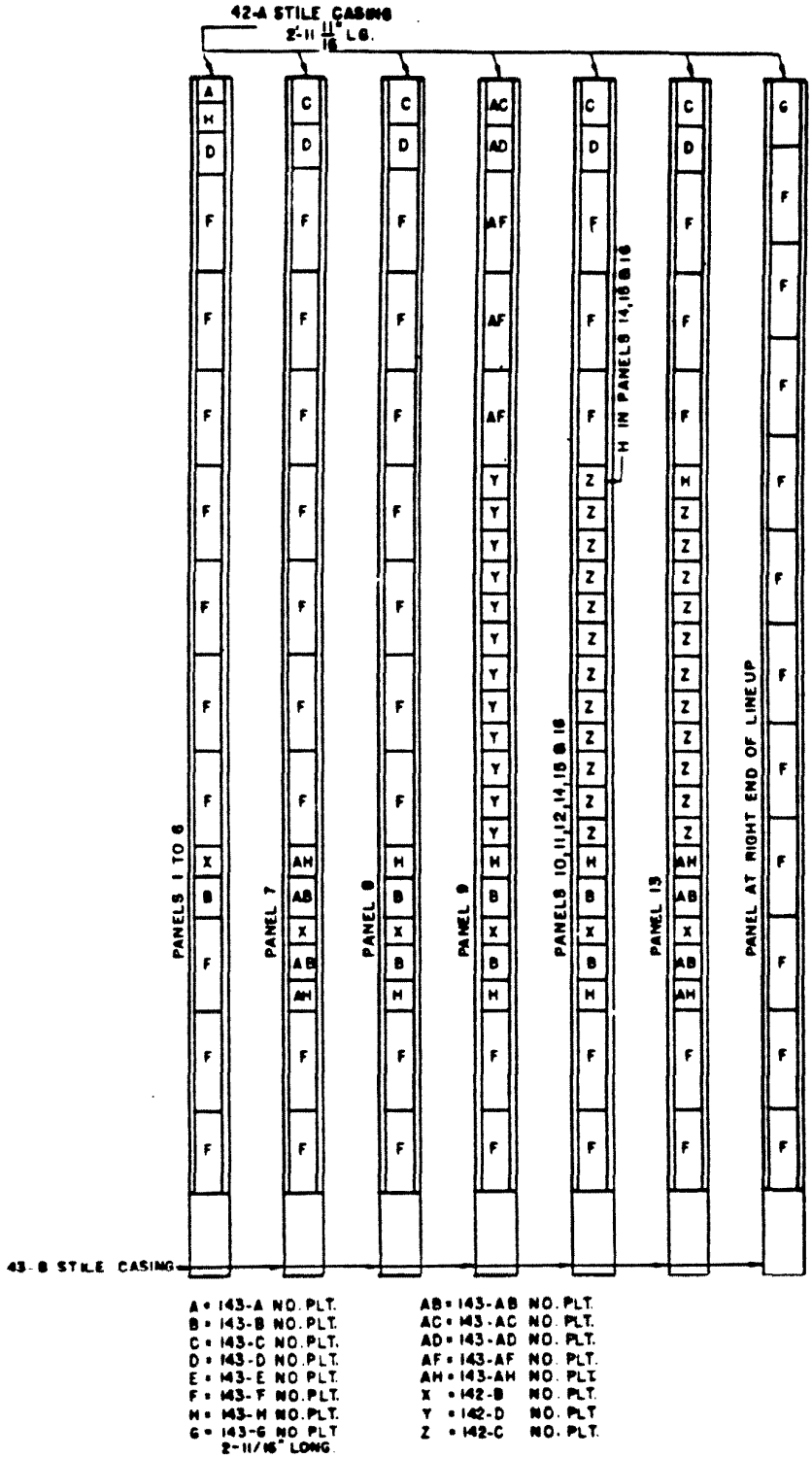


EXHIBIT 5
MISC. SWITCHBOARD EQUIPMENT DRAWING

DIAL FRONT EQUIPMENT

SYM	JK SP	WID
A	112-R 112-AG 112-C	1 9/16
B	112-AG 112-C	1 1/8
C	112-AE	13/16
D	112-AF 112-AG 112-AS	2 1/4
E	112-AE 112-AG 112-AS	2 3/16
F	112-AF 112-AE 112-AG	2 7/16
G	112-AE 112-AG	1 9/16
H	2-112-AE 112-C	2
J	112-AE 112-C	1 3/16
K	112-R 112-AA	1 7/16
L	112-AG 112-BD	1 1/4
M	112-AG 112-AS	1 3/8
N	67-A 112-AE	15/16
P	112-AE	13/16
Q	112-AE 112-AG 112-C	1 15/16
R	112-AE 2-112-AG	2 5/16
S	112-AE	13/16
U	112-AA	1
V	112-AE 112-AG 112-C	1 15/16
W	112-AE 112-AG	1 9/16
BA	112-AM	1/4
BB	112-AG	3/4
BC	112-BD	1/2
BD	112-D	7/16
BE	112-T	3/16
BF	112-C	3/8
BG	112-AS	5/8
BH	112-AP	1/8
BJ	12-AA	1
BK	12-P	2-3/4
BL	12-AC	3/4
BM	12-BC	2
BN	12-F	1-7/8
BP	12-K	1-1/2
BQ	12-L	1-31/32
BR	12-A	3
BS	112-AE	13/16

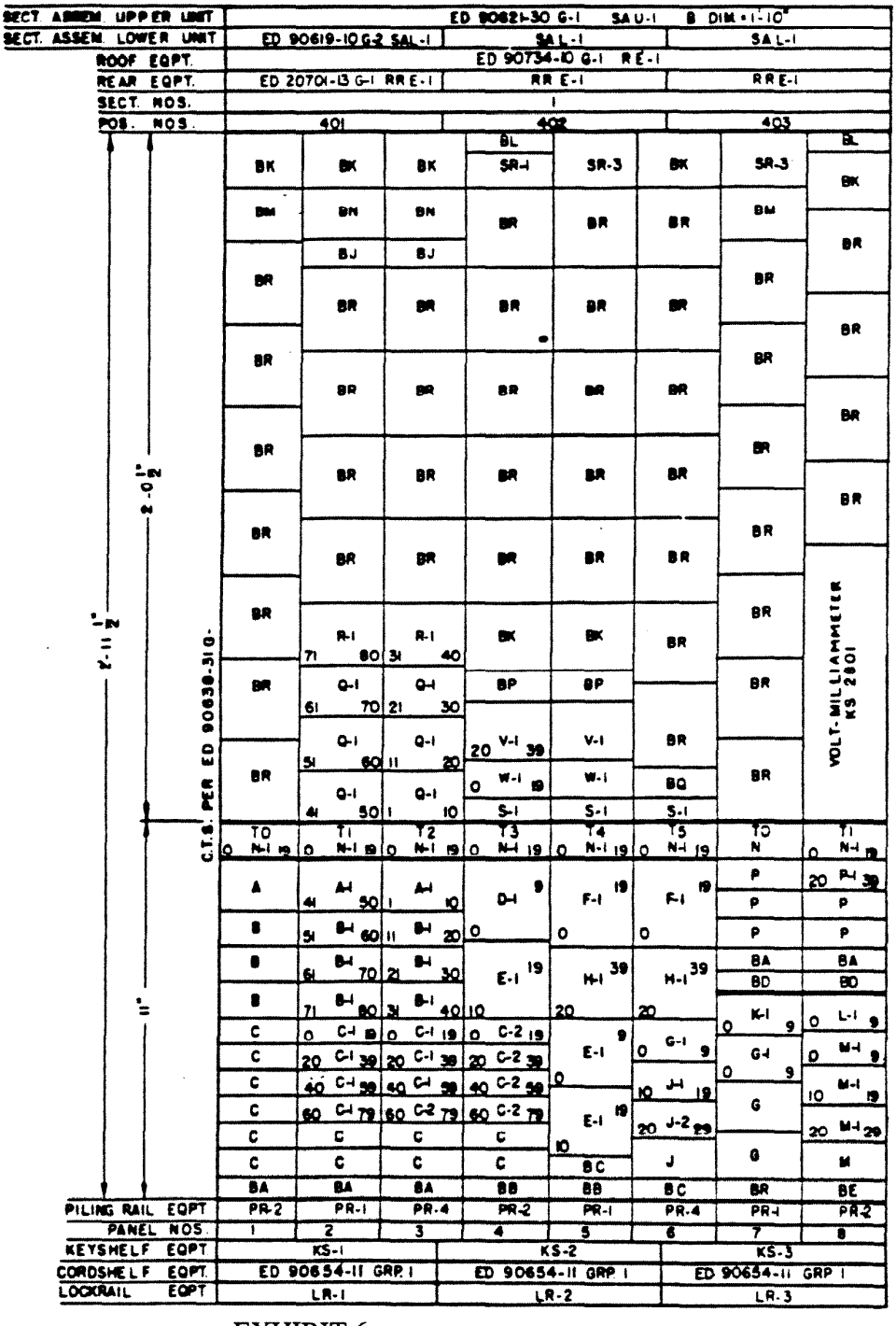


EXHIBIT 6
MISC. DIAL FRONT EQUIPMENT DESIGNATIONS
(PAGE 1 OF 4)

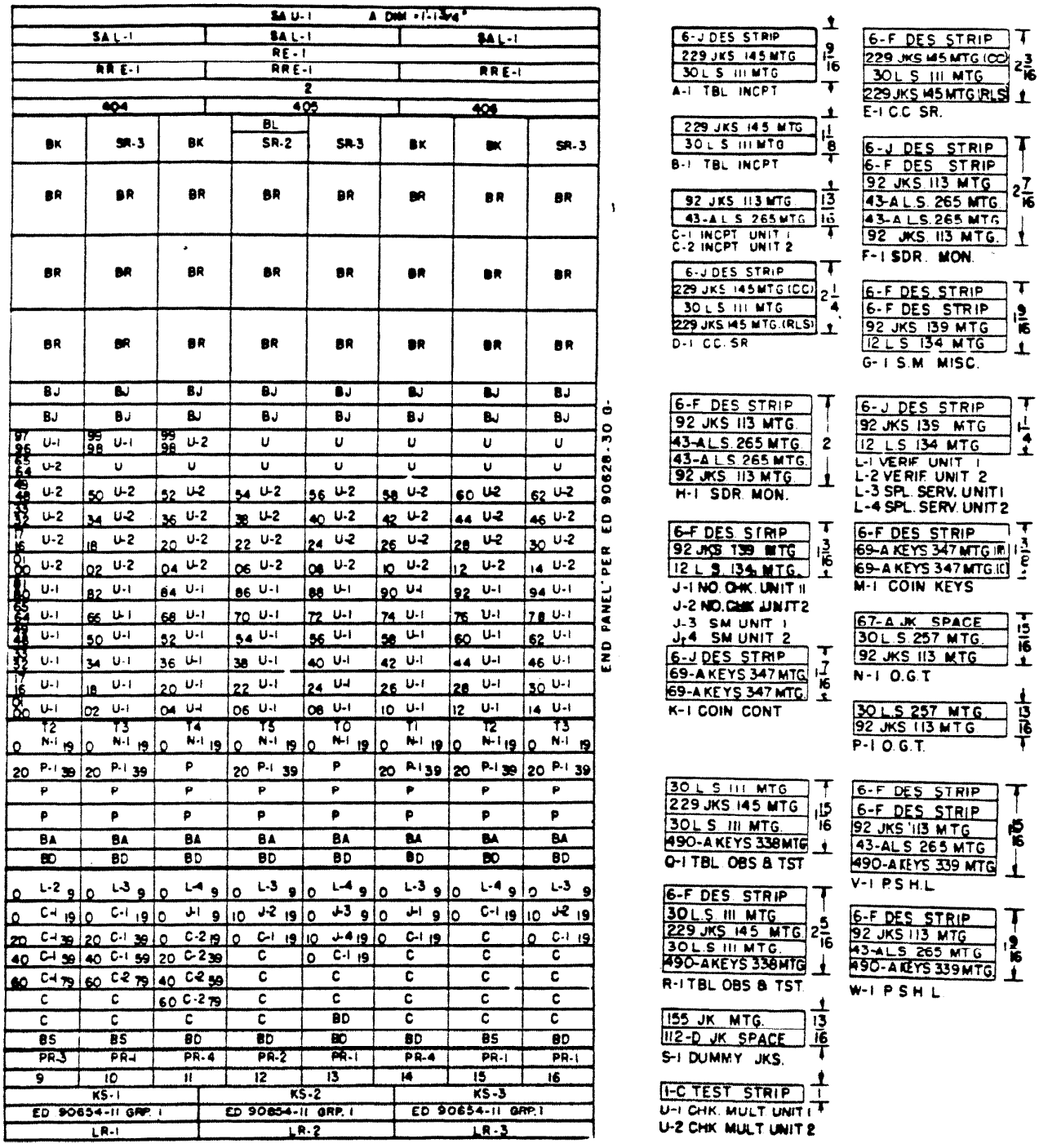


EXHIBIT 6
MISC. DIAL FRONT EQUIPMENT DESIGNATIONS
(PAGE 2 OF 4)

This Exhibit is to be considered only to the extent that it represents the manner in which designations, number, etc., are to be shown and the scope of information required. Equipment arrangement for a particular front equipment is to be based on requirements applying to the type of equipment involved.

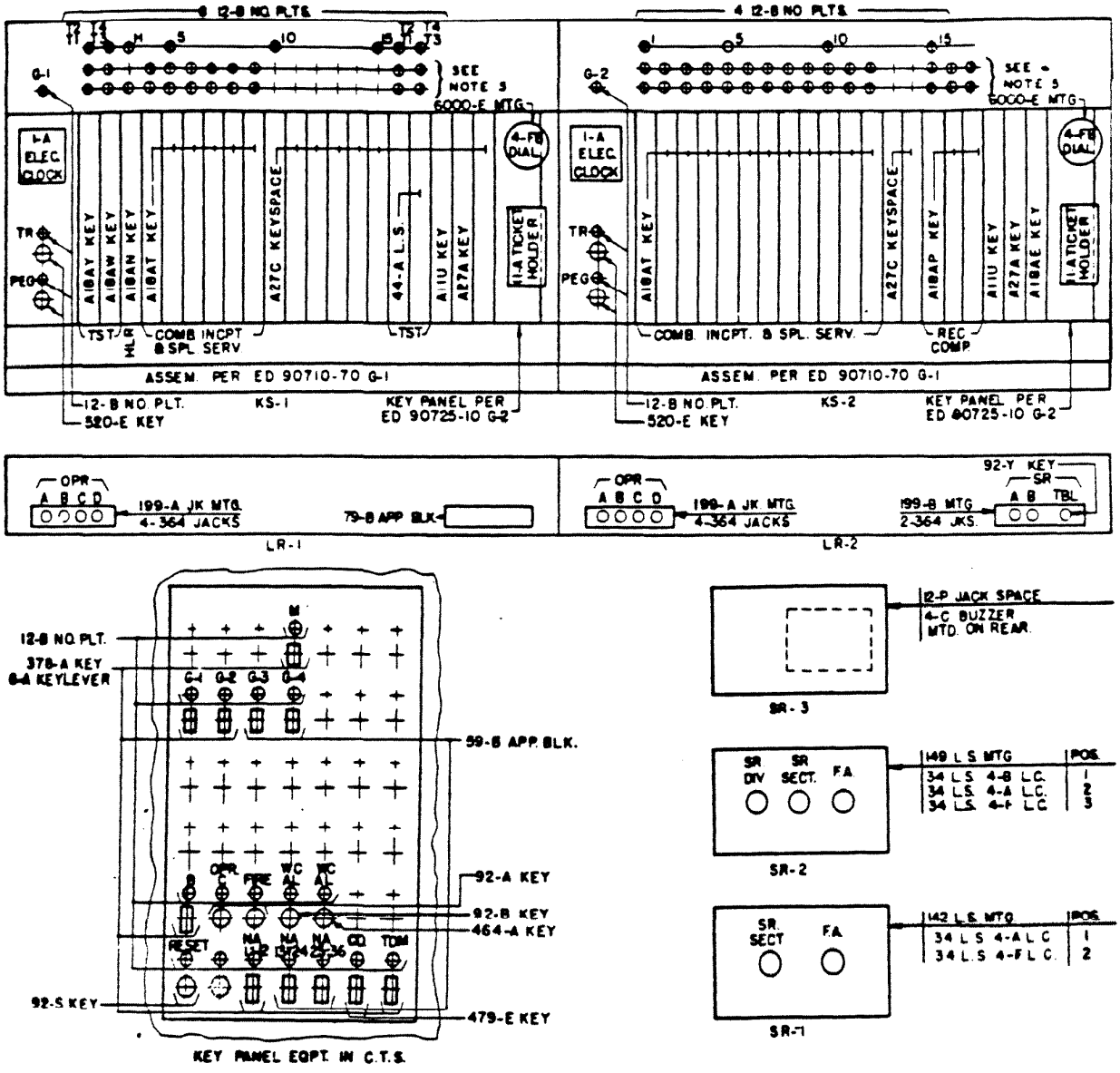


EXHIBIT 6
MISC. DIAL FRONT EQUIPMENT DESIGNATIONS
(PAGE 3 OF 4)

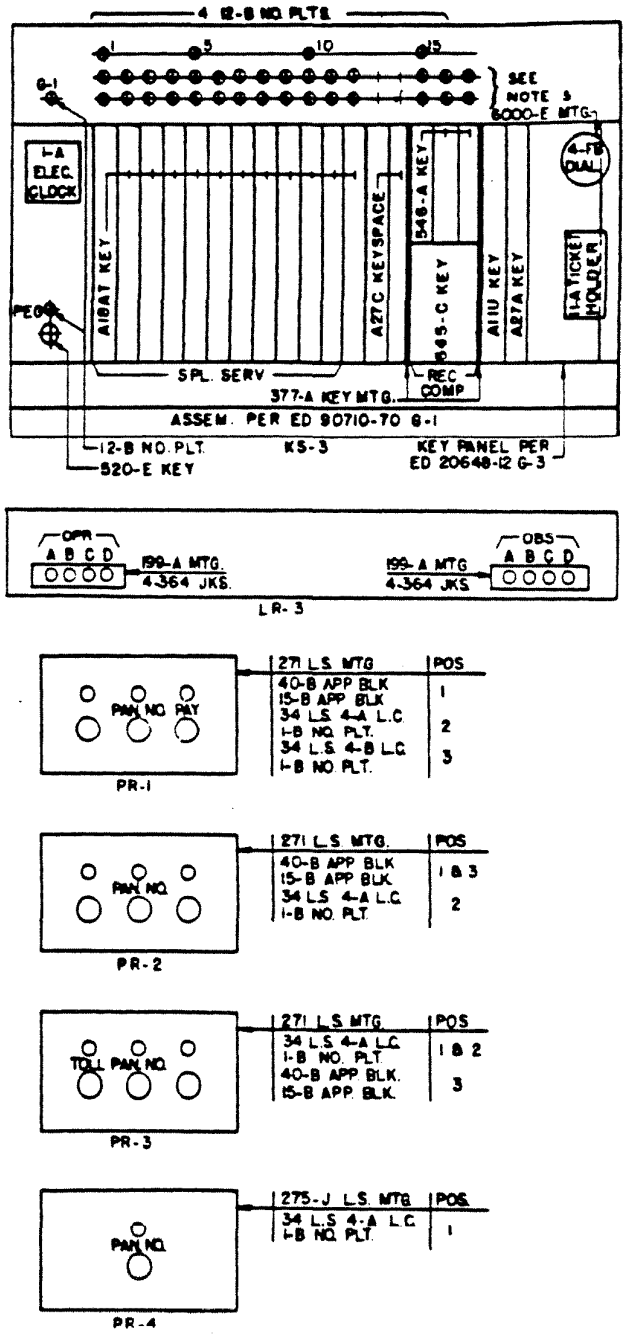


EXHIBIT 6
MISC. DIAL FRONT EQUIPMENT DESIGNATIONS
(PAGE 4 OF 4)

WIRING LIST DRAWINGS

CONTENTS

CONTENTS

PAGE

1.00 GENERAL

1.01 This part covers the standards to be followed in the preparation and maintenance of manually generated type Wiring List Drawings.

1.02 Wiring lists are tabular records (drawings) containing a list of circuit drawings for equipment at a particular location or locations. This listing may be inclusive within a single main table or within several main tables. Supporting auxiliary tables may also be used to either sustain the entries within main tables or to indicate the application of those entries for a given office condition. As with all other Central Office records (job drawings), wiring lists shall also contain titles and Issue Notes. Notes may also be used to either clarify or qualify entries within any table or to indicate special office application or condition. See Figure 1 for typical examples of wiring list tables.

1.03 In addition to the above, certain wiring lists contain listings which reflect circuit and the physical arrangement of equipment. These wiring lists are designated as follows:

A. Combined wiring list and equipment drawings (WE)

B. Power wiring list and block schematic (PC)

C. Portable and mobile test equipment (WE)

D. Wiring lists for frames, relay racks, desks, consoles, switchboards, etc. (WL)

E. Combined equipment list and wiring list drawings (EW)

F. Equipment list drawings (EL)

1.04 A multisheet Job Wiring List Drawing may be originated when required for documenting the overflow of data associated with a given quantity of equipment for which the drawing is being generated. This shall only apply when all available space on the original drawing has been utilized and all cross hatching and lining out removed.

2.00 SCALE

2.01 No scale is required. However, all configurations to be depicted on the drawing shall be drawn to accommodate 1/8 inch lettering to meet microfilm standards.

3.00 PEN SIZE

3.01 Pen size requirements for the preparation of Tabular Format Lineweights are covered in Section III, Part C, Paragraph 8.03.

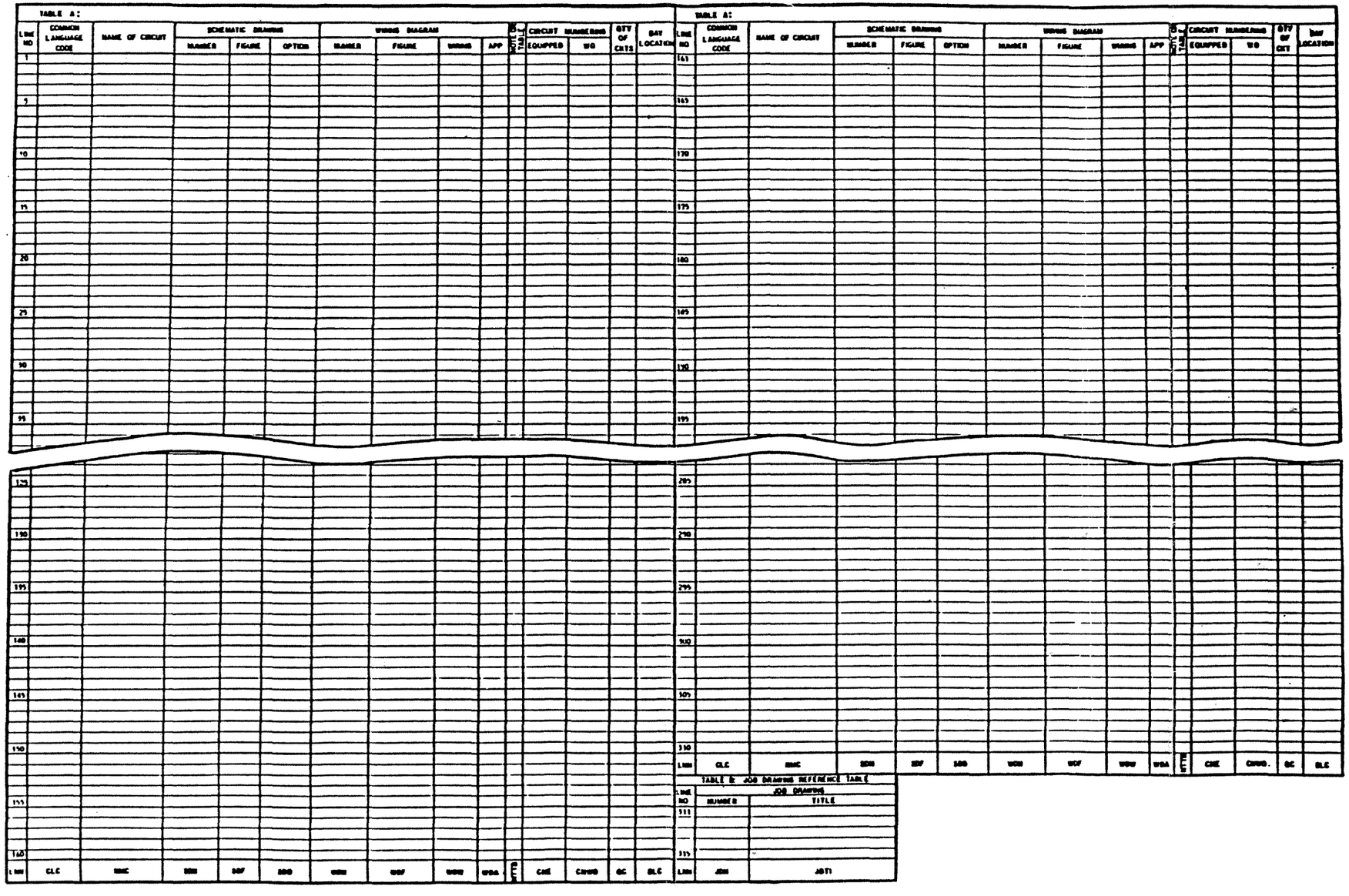


FIGURE 1
TYPICAL EQUIPMENT WIRING LIST
(PAGE 1 OF 4)

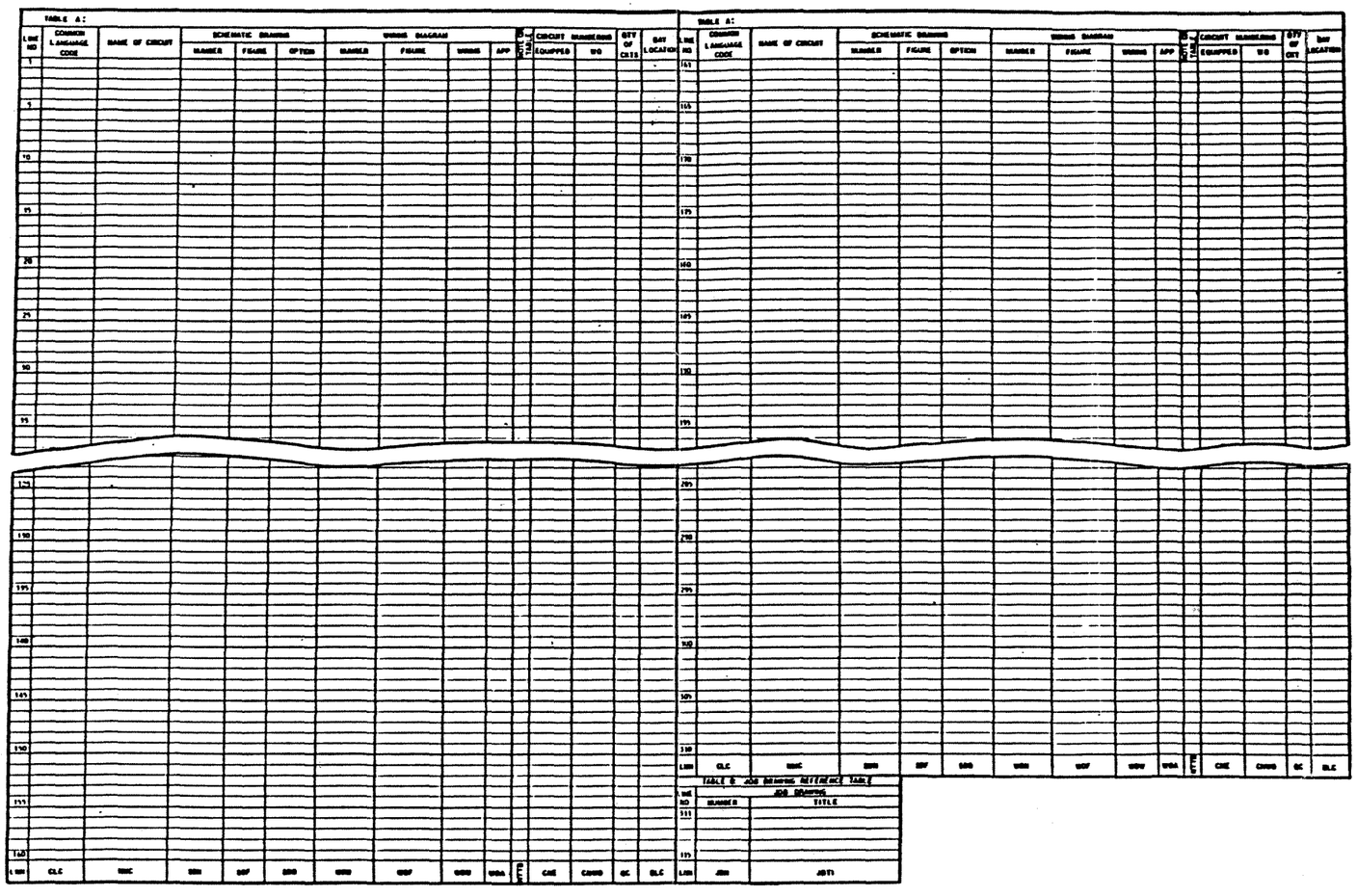


FIGURE 1
TYPICAL EQUIPMENT WIRING LIST
(PAGE 2 OF 4)

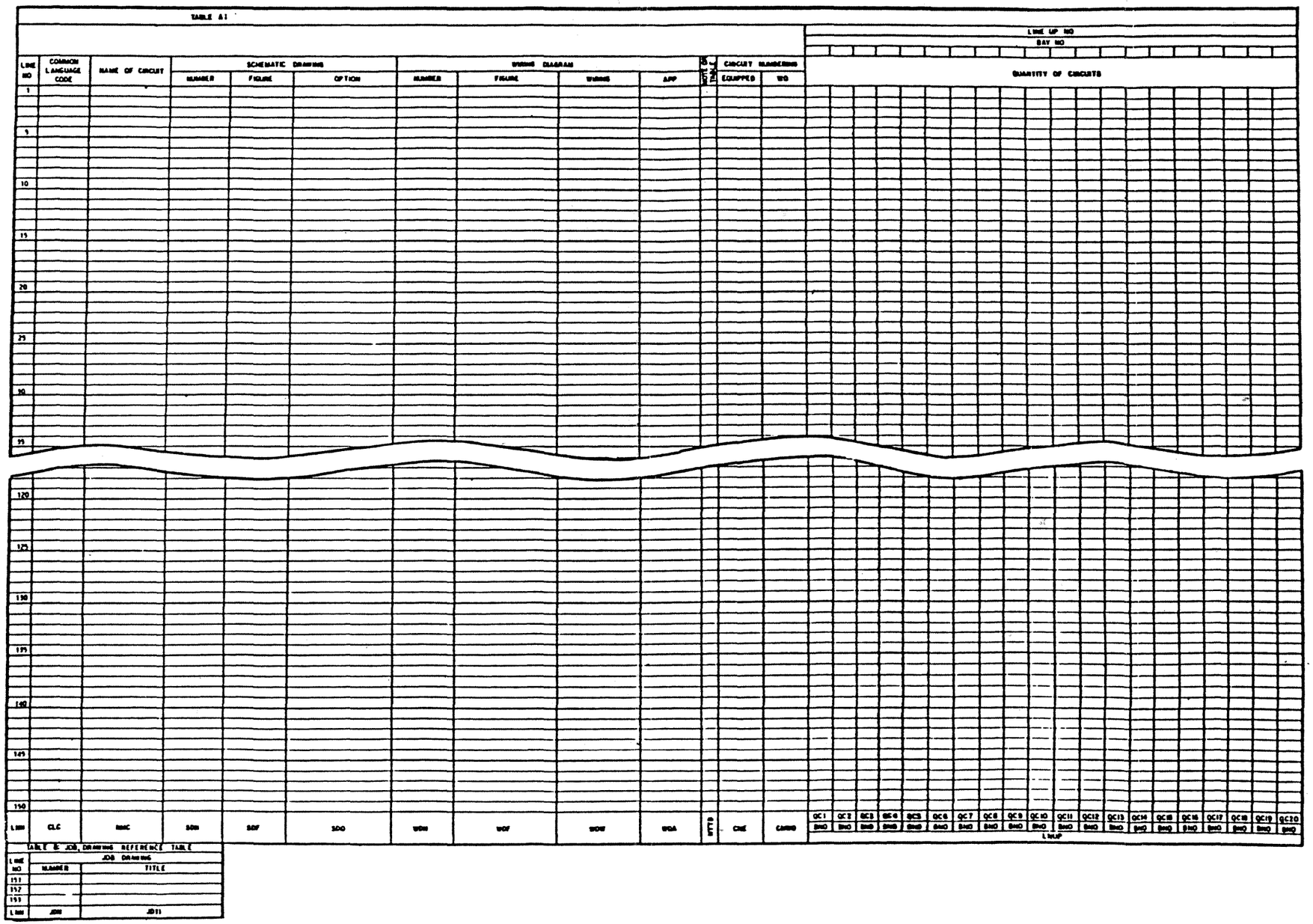


FIGURE 1
TYPICAL EQUIPMENT WIRING LIST
(PAGE 3 OF 4)

TABLE A:

LINE NO	COMMON LANGUAGE CODE	NAME OF CIRCUIT	SCHEMATIC DRAWING NUMBER	SCHEMATIC DRAWING FIGURE	SCHEMATIC DRAWING OPTION	WIRING DIAGRAM NUMBER	WIRING DIAGRAM FIGURE	WIRING DIAGRAM WIRING	WIRING DIAGRAM APP	NOTE TABLE	CIRCUIT NUMBERING EQUIPPED	CIRCUIT NUMBERING WB
1												
5												
10												
15												
20												
25												
110												
115												
120												
LNN	CLC	NNC	SDN	SDF	SDO	WDN	WDF	WDW	WDA	NTE	CNE	CNWD

LINEUP NO
BAY NO
QUANTITY OF CIRCUITS

QC 1	QC 2	QC 3	QC 4	QC 5	QC 6	QC 7	QC 8	QC 9	QC 10	QC 11	QC 12	QC 13	QC 14	QC 15	QC 16	QC 17	QC 18	QC 19	QC 20
BAY NO																			

LINUP

TABLE B:

LINE NO	COMMON LANGUAGE CODE	NAME OF CIRCUIT	SCHEMATIC DRAWING NUMBER	SCHEMATIC DRAWING FIGURE	SCHEMATIC DRAWING OPTION	WIRING DIAGRAM NUMBER	WIRING DIAGRAM FIGURE	WIRING DIAGRAM WIRING	WIRING DIAGRAM APP	NOTE TABLE	CIRCUIT NUMBERING EQUIPPED	CIRCUIT NUMBERING WB	QUANTITY OF CIRCUITS	BAY LOCATION
121														
125														
130														
135														
140														
145														
150														
157														
LNN	CLC	NNC	SDN	SDF	SDO	WDN	WDF	WDW	WDA	NTE	CNE	CNWD	QC	BLC

TABLE C: JOB DRAWING REFERENCE TABLE

LINE NO	JOB DRAWING NUMBER	JOB DRAWING TITLE
156		
160		
165		
168		
LNN	JDN	JDTI

FIGURE 1
TYPICAL EQUIPMENT WIRING LIST
(PAGE 4 OF 4)

4.00 ISSUE NOTES

4.01 Descriptive Issue Notes are only required for Wiring List Tables which contain Schematic or Wiring Diagram Information and their associated quantities. For new product documentation, Descriptive Issue Notes are only required for Equipment List Tables which contain Equipment Specifications with their Lists or Groups and associated quantities.

4.02 When the existing information on a marked print does not agree with the tracing, the originator of the change shall be contacted.

4.03 Any of the examples shown on the following page may be utilized in the same Issue Note.

CONDITION	ACTION WORD & REQUIREMENT	TYPICAL EXAMPLES OF Issue Notes
1. Removing complete lines of information or removal of bays	(Remove) Reference to line number of bays	Rmv line 22 Rmv bay 601 Rmv fr OAF
2. Removing quantity of circuits only	(Remove) Reference to line numbers, quantity of circuits and circuit numbering when known	Rmv 10 ckt, 11.14, 21-24, 29-30 Line 46 (See par. 4.05)
3. Addition of new lines or addition of complete bays	(Add) Reference to line number or bays	Add lines 21-25 Add bays 701, 706 Add fr TUR-01
4. Adding quantity of circuits only	(Add) Reference to line numbers, quantity of circuits and circuit numbering when applicable	Add 10 ckt 21-26, 31-34 Line 67 (See par. 4.05)
5. Changes in line information when conditions 1, 2, 3, 4 do not apply	(Change) Reference to line numbers and indicate change	CHG LINE 67 Fig. 6 to 7, App X to Y; Add HA WRG
6. Changes per Installers Marked Prints	Reference to Installers Marked Prints	INSTLR MKD PRT
7. Record Only Changes	Reference to record change only when it is not made in conjunction with a regular change	RCD ONLY

NOTE:

Any combination of conditions may be utilized in the same Issue Note.

4.04 When the changes are so extensive that the descriptive information cannot be abbreviated in a reasonable number of lines, describe the changes by lines, bays or frames and add the notation FOR DET SEE JOB SPEC. However, this notation does not apply to RIP equipment.

4.05 When more than one bay is associated with a line of information, also indicate the RR numbers or frame designations.

5.00 PREPARATION

5.01 Wiring List Drawings shall be prepared for all switching and transmission systems as follows:

A. All new offices

B. All new lineups on additions in an office

C. Portable and mobile test equipment

D. Office alarm systems

See Appendix 1 and 2 at the end of this part for guides in preparing wiring list drawings.

5.02 For present offices not having wiring list drawings, prepare the drawing for additional equipment or major modifications of present equipment. The portion of the equipment not affected by the particular order shall not, in general, be included; however, it may prove an overall advantage to include the existing wiring on the wiring list drawing especially if the amount is small as compared to the ultimate. For Toll equipment, prepare the drawing if the floor plan indicates that the future equipment will consist of fifteen or more positions, bays, etc., or when making a major modification involving fifteen or more positions, bays, etc. This rule does not apply if the office will be replaced in a few years.

6.00 NUMBERING

6.01 These drawings shall be numbered in accordance with the numbering plan discussed in PUB 77351.

7.00 GENERAL REQUIREMENTS

7.01 In general, wiring lists record the list of circuits, features and options, and the quantities of each equipment unit in the particular lineup.

7.02 Special or modification sketches of circuits or framework shall not be drawn on wiring list drawings even though they are for an individual job, but shall be shown on special job drawings.

7.03 Wiring lists are revised by drafting, utilizing information furnished by detail engineering, installation or the Equipment Engineer. The revised information may be transmitted on a Marked Print accompanied with an Issue Request (Form RG47-0011). The Engineering Services Records Group - General Procedures Handbook has instructions for preparing this form. The three basic operations involved when revising wiring lists are:

A. Add - Information may be added by the above means.

B. Change - Care shall be exercised to insure that a change entry is not, in reality, a remove and add. Moreover the identity of the old entry shall not be lost. Common practice is to yellow out and circle the old entry. Then indicate the replacement, in a clear area, circle and use direction arrows between the two circled entities. When past errors necessitate a change, also indicate "record only change" against such entries.

C. Remove - A remove entry shall be clearly distinguishable without loss of identity. It is required that the mortality data regarding central office equipment be retained on wiring lists. When removals are conveyed per a marked print, the engineer shall yellow-out or encircle and indicate those entries to be removed. When removals are conveyed via a drafting authorization, a complete description is required.

1. Wipe-Out - An entry may be completely removed providing the removed entry description is retained in the Issue Notes.

NOTE:
Refer to Paragraph 4.03 for the procedures regarding the retention of mortality data described in items A, B and C shown above.

7.04 The terms Wiring Only (WO), Factory Cable Only (FCO), Local Cable Only (LCO) shall be applied in accordance with the following on wiring list drawings.

A. Wiring Only (WO)

1. On Equipment Frames - Local cable and all outside of unit or bay cable is furnished.

2. On Fuse Boards and PRTD - Future circuit requiring battery or tone supply cabled to fuse position but not connected.

B. Local Cable Only (LCO)

1. On Equipment Frames - Frame and/or units and panel local cable only is furnished, no outside of bay cable is furnished.

C. Factory Cable Only (FCO)

1. On Equipment Frames - Outside of local cable or outside of unit and panel wiring is furnished.

7.05 Depicting Duplicate Information

A. Nonconsecutive like information may be indicated with a ladder provided the space between the ladder and adjacent lines and/or lettering meet spacing requirements specified in Section III, Parts A and B. When it is impossible to meet this criteria, the information must be repeated.

B. On consecutive lines of tabular information within a column, one of the following procedures shall be used:

1. Repeating the information in its entirety

2. The use of a ladder symbol

3. The use of ditto marks

7.06 Depicting Retired In Place (RIP) Information

A. Indicate circuits retired in place under the remark column and cover by a note stating "ENTIRE CIRCUIT IS RETIRED IN PLACE, CHANGE NOTICES ARE NOT TO BE APPLIED".

B. When all circuits on wiring list drawings are retired in place, the engineer shall void the drawing. Procedure is described in Section III, Part F of this publication.

7.07 Dashes, Hyphens or Asterisks - When listing drawings on the Wiring List, the Dash (-) or Asterisk (*) appearing between the prefix and the base number should be omitted.

7.08 Automatic Figures and Options - Automatic figures and options will be shown on Wiring List Drawings.

7.09 Depicting Reuse Equipment

A. Reused frame - A note shall be provided stating, "THIS IS A REUSED FRAME".

B. Features disabled on a reused frame - A note shall be provided to indicate the name of the particular feature(s) that has been disabled. The figures and options of the disabled feature(s) shall be recorded.

8.00 JOB WIRING LIST DRAWINGS - NEW PRODUCT DOCUMENTATION

8.01 Under this product documentation plan, all equipment specification drawings contain an engineering note stating, "THIS DOCUMENT CONTAINS COMPLETE ENGINEERING INFORMATION FOR THE SUBJECT EQUIPMENT. JOB INFORMATION SHALL BE RECORDED BY LIST OR GROUP".

8.02 Job wiring list drawings being prepared to record these new products shall show the Equipment Specification Drawing number with its list or groups in place of the conventional schematic, wiring diagram, figures and options similar to the Equipment List Table shown in Appendix 2.

A. A typical example of a job wiring list drawing for documenting equipment associated with the new product documentation is contained in Appendix 2.

B. When a system consists of a combination of old technology documentation and new product documentation, the following steps shall be taken in the documentation of wiring list information:

1. When new product documentation equipment is to be added to an existing old technology plan, a new Equipment List Table (Table AA) similar to the table as shown in Appendix 2 shall be added to the existing Wiring List Drawing. In addition, a "DOC Type" and "Title" change is required on the Drawing Authorization (RG47-0001) and the drawing.

2. When an old technology equipment is to be added to new product documentation, the applicable Wiring List Table(s) shall be added to the existing new product documentation Wiring List Drawing.

9.00 UNITS AND PANELS MADE FROM "A" DRAWINGS

9.01 A number of Manufacturers Equipment Diagram specifications have been released for use which order equipment assembled in accordance with "A" drawings. Manufacturers Schematic and Equipment Diagrams for all of these apparatus coded units and panels are provided except sealed units and those for which wiring diagram labels are provided.

9.02 Show on the Wiring List Drawing on the line below the connecting drawing (or as close to it as possible), the frame code, schematic and wiring diagram drawing numbers, and the quantity of units or panels furnished in the respective position of bay column. Omit reference to figures and options of the "A" drawings and "Manufacturers Schematic Diagram" drawings.

10.00 COMMON LANGUAGE® CODES (CLC)

10.01 COMMON LANGUAGE® Codes (CLC) shall be shown on job wiring list drawings if requested by the Equipment Engineer. The CLC's consist of seven characters for standard wired relay racks and bays and eight characters for standard wired units and mounting units.

10.02 On existing job wiring list drawings or new sheets added to the existing job wiring list drawings format, the CLC shall complement the information normally shown in the Name of Circuit column. Parenthesis shall not be used to enclose the codes.

10.03 To minimize the redrawing of job wiring lists to accommodate the additions of the CLC's, it is recommended that the related English Language Circuit Titles be shown in the form of the Common Language Standard Abbreviation and that:

A. The CLC followed by the related circuit title be shown on the same line; otherwise,

B. Show the CLC entry on one line followed by the related circuit title on the line directly below.

COMMON LANGUAGE® is a Registered Trademark of Bell Communications Research, Inc.

10.04 In cases where existing space limitations are so critical that accommodating the common language entry is impossible unless additional sheets are added to the drawing, then these sheets shall be added.

10.05 CLC's need not be added to existing entries on job wiring lists unless specifically requested by the Equipment Engineer.

10.06 On new job wiring list drawings the CLC shall be shown in the COMMON LANGUAGE® Code column.

10.07 Show CLC in accordance with the following procedures:

A. Standard Wired Relay Racks and Bays (seven character code) - Indicate the CLC only once against the main "Manufacturers Equipment Diagram" specification list that furnishes framework, assembly, wiring and equipment on combined wiring list and equipment drawing (without front equipment drawing). However, if a wiring list drawing does not contain the "Equipment Drawing" column, record the CLC in front equipment drawing in accordance with Section IV, Part B.

B. Standard Wired Units and Mounting Units (eight character code) - Indicate the CLC only once against the main/main connector figure that is associated with the Wired and Mounting Units respectively. To determine which is a main/main connector figure, contact the Engineer. The eighth character of the CLC properly referenced to the appropriate circuit "Manufacturers Wiring Diagram" drawing figure is by definition the main/main connector figure. However, in some cases, there is no Manufacturers Schematic Diagram drawing figure associated with the eighth character. In this case, refer to the variable features (fifth, sixth and seventh character) of the CLC.

WIRING LIST DRAWING TABLES

1. This appendix shows the format of tables generally used on Wiring List Drawings. Each wiring list drawing table format shall be added on standard drawing forms to suit job conditions. Refer to applicable paragraphs for each individual column instruction.

2. Forms used for the preparation of wiring list drawings shall be selected in accordance with the forms approved by the Engineering Standards Organization.

3. All column widths shall be in multiples of 1/10 inch to facilitate typing. (Type characters are 10 per inch.) Spaces shown in 1/10 inch are from spacing guide (10 spaces per inch) for typed tracings 1/10 inch space = .100 inch. Column spacing shown in wiring list forms shall be followed when this provides sufficient spaces. Should more space be required, widen columns as required.

4. Add column with heading "Table" (5/8 inch wide) when reference to two or more tables is required on any wiring list form; otherwise omit, the "Table" column.

5. Number lines on single sheet drawings or on the sheets of multisheet drawings and tables consecutively providing for growth when space is available.

6. Name of Circuit Column - Show the authorized abbreviation of the circuit as listed in the title box of the schematic drawing or wiring diagram. Further identification of a circuit may be made, if desirable, by showing in parenthesis the title of a specific figure on a drawing or other qualifying circuit feature information.

7. Equipment Column:

   A. In the "Number" column (Exhibit 6, Figure 5) and in the "DWG NO." column (Exhibit 7, Figure 2) show the equipment specification drawing number in which the equipment is ordered.

   B. In the "List or Group" Column:

      1. For Exhibit 6 or Exhibit 7, Figure 2, show those lists or groups of the equipment specification drawing that contain information framework, sub-assembly units and local cables being ordered.

      2. Additional lists or groups not covered in Item 1 above, need not be shown when the associated wiring diagram information is sufficient to provide a complete record of the circuit and noncircuit equipment.

      3. The list or group column is normally omitted on "Building Block" type of framework, such as #5 X-Bar Markers, where equipment specifications are surface wired and use mounting bars for framework. However, the standard Framework and Equipment Record Table (Exhibit 7, Figure 2) provided on this type of combined wiring list shall be maintained for framework in accordance with Items 1 and 2 above. Additional lists or groups for sub-assembly units need not be shown on the table when the associated wiring diagram information is sufficient to provide a complete record of the circuit and noncircuit equipment.

8. Schematic Column:

A. In the "Number" column, show only the schematic drawing numbers employed. Show the first two digits only of the suffix number, such as -01, -02, etc. Do not show -011, -021, etc., since the third digit indicates the sheet number of the drawing.

B. In the "Figure" and "Option" columns, show all (word "To" is not accepted) associated schematic drawing figures and options equipped except for cabling figures and similar data which are for "Information Only" and should not be recorded on the job wiring list drawing. Such "Information Only" items are generally enclosed in parenthesis in the Schematic - Wiring Diagram Cross Reference Tables.

> NOTE:
>
> Enter the schematic figure and option only when they actually are shown on the wiring diagram either on the Schematic - Wiring Diagram Cross Reference Table or as recorded by other means (i.e., explanatory note of SD-T Dwg Cross Reference Table or engineering note) on the wiring diagram.

1. If, on the Cross Reference Table:

   a. The schematic option applies only to schematic cabling figures (CAD) or other information type figures, then the schematic option shall not appear on the wiring list.

   b. The schematic option is on a line without an associated figure of any type, then the schematic option shall be placed on a wiring list line without an associated corresponding schematic figure.

2. If the circuit drawing figure is combined on a wiring list line with other circuit drawing figures, then the schematic option shall be grouped with existing schematic options.

9. Wiring Diagram Column:

A. In the "Number" column, indicate the wiring diagram number. When wiring diagrams in the same series are recorded on consecutive lines, the wiring diagram base number may be omitted after the first listing, with only the dash number being recorded.

B. In the "Figure" column, indicate all (word "To" is not accepted) figures furnished and connected by the Manufacturing Shop or Installer.

1. Show wired-only figures in parenthesis ( ) in the "Figure" column and when wired-only figures are shown on the same line with equipped figures. State under Notes on the wiring list drawing "Characters shown in parenthesis ( ) in the Figure column under Wiring Diagram column indicate wired-only figures." On new drawings, parenthesis ( ) shall not be shown in the "Figure" column. Wired-only figures for like circuits with like quantities shall be grouped on a separate line and parenthesis ( ) shall be used in the "Quantity" column.

2. When a wired-only figure becomes a connected figure, the parenthesis ( ) must be removed. In no way should a figure be shown as a connected figure on one line and a wired-only figure on another line for the same circuit (numbering).

C. In the "Wiring-Furn." column, indicate all optional wiring furnished by the Manufacturing Shop, even though certain options may not be required for an office.

D. In the "Wiring-Conn." column, indicate the optional wiring actually connected. All options in the "Conn." column shall be shown in the "Furn." column.

E. In the case of "Wiring" column (without "Furn" and "Conn" sub-columns), indicate all optional wiring furnished. Wiring options within parenthesis ( ) indicate wiring furnished but not connected. Options outside parenthesis ( ) indicate wiring furnished and connected. Separate all wiring options with commas.

F. In the "Apparatus" column, indicate all optional apparatus furnished.

10. Show all General Notes under the heading "Notes" column, assign number 1 thru 50 for new drawings. On existing drawings, number or letter additional notes in continuation of present notes. Notes relative to changes in wiring, termination, codes of apparatus, location of apparatus, etc., are examples of Notes.

11. Numbering of Circuits Column:

A. In the "EQPD" column, show the office numbering of the wired circuits which are equipped.

B. In the "WO" column, show the office numbering of the wired circuits which are unequipped.

C. Office circuit numbering shall be shown only for those circuits that are numbered on the equipment. Do not assign arbitrary numbers to miscellaneous circuits that are actually not numbered on the equipment. For spare circuits enter the circuits numbering and the designation spare in this column.

D. Circuit Numbering - Normally circuit numbering shall be applied in accordance with the typical wiring list example. However, office circuit numbering for shop wired bays or frames may be numbered as follows:

NOTES:

1. Automatic circuit figures and options may be listed. For example, if a bracket at Figure 1 of a wiring diagram specifies "To Fig. A or B. To Fig. A unless other specified" and since Figure B is not specified, show Figure A.

2. Where a wiring diagram shows universal wiring for two or more other wiring diagrams, list the "Universal" wiring diagram to cover the complete wiring and show only the particular wiring diagram that covers the apparatus furnished. Where one figure on a wiring diagram shows universal wiring for two or more figures, list the universal wiring and the figure covering the apparatus furnished.

3. Show all figures and options provided in the local cable even though they are not presently connected in the circuit. These figures should be recorded on a separate line with the quantity of the figures in parenthesis in the appropriate column.

1. The office circuit numbering may appear only once against that figure or figures showing the total quantity of circuits per bay. Example: Total circuits 156, circuit numbering 1 to 156, 157 to 312, etc. The individual circuit numbering need not be shown for the varying quantities of figures provided within the bay or piece of equipment, only the total circuit numbering is required, which can be accomplished by various methods of depicting duplicate information within a column.

NOTES:

1. For wiring list associated with Maintenance Alarm and Miscellaneous Office Equipment, two types of notes may be shown; Notes and General Notes. Notes - Data applying to circuit information on a particular line which is too lengthy to fit into the "Remarks" column may be shown under this heading. These notes shall be numbered 1 thru 50 and cross referenced. General Notes - Information which is general in nature, not associated with a specific circuit, may be shown under this heading. These notes shall be numbered 101 to 150 and need not be cross referenced.

2. The second method would be to assign a note, similar to example in Exhibit 5, Note 1, shown in sketch of typical Wiring List Notes.

12. "Quantity of Circuits" Column:

    A. Quantity of Circuits means quantity of figures. Show the quantity of circuits (figures) which are equipped and those which are unequipped in the appropriate column.

    B. For wiring list drawings where the quantity of equipped and unequipped circuits (figures) are to be indicated in the same column, the total quantity of equipped and unequipped circuits (figures) shall be shown in parenthesis ( ). The total quantity of equipped circuits (figures) shall be shown outside the parenthesis ( ).

    C. When the need arises to show a quantity for a multicircuit figure, where the total quantity of the figure varies from the total quantity of the circuits, show this quantity on a separate line. In the "QTY OF CKT" column, show the total quantity of figures. Show the circuit numbering in a dedicated column, "Remarks" column or note. The circuit numbering, i.e., 1-4 to 9-12, will show that each figure serves four circuits and indicates a total quantity of twelve circuits for three figures.

    D. If the drawing does not contain a dedicated circuit numbering column or "Remarks" column and engineering elects to show the number of circuits in the "QTY OF CKT" column, then the item shall be cross referenced to a note, "Quantity shown in "QTY OF CKT" column indicates number of circuit". The note shall be added to the drawing and the cross reference is not required.

    E. Instead of "QTY OF CKT", the heading "QTY OF FIG" shall be used on all wiring lists for new products not involving "New Product Documentation".

13. "Bay Location" or "RR Location" Column - Show the equipment location within the bay or relay rack itself.

14. "Remarks" Column:

    A. In general, use the "Remarks" column only when a small number of notations are require; otherwise, omit this column and make reference to any notations by means of "Notes". For spare circuits, enter the circuit numbering and the designation spare in this column.

    B. The Equipment Specification Drawing numbers shall be shown in the "Remarks" column, where individual job equipment drawings are not prepared for the equipment, as in the case of portable test sets. Show the list or group numbers in cases where the wiring diagram information is insufficient to indicate this information.

    C. When equipment is furnished, show manufacturer's name and model or type number in this column.

15. Show the "REF NO." of the job equipment drawing shown in Exhibit 7, Figure 1 in the "EQPT DWG REF NOS." column, except on step-by-step jobs where the relay rack bay number shall be shown in this column.

16. For consecutive lines of information within a column, the ladder symbol (vertical line with cross points) is more desirable than ditto marks.

    A. Do not use "-" for the word "to" except when a figure serves more than one circuit such as 1-3 to 7-9. In this instance, the inclusive circuit numbering served by one figure shall be separated by a "-".

    B. Do not use word "and" or symbol "&", use a comma instead.

17. On preprinted wiring list forms used for new job drawings, remove all that information which might give incorrect records. This includes the complete schematic and wiring diagram number, unused figures and options of schematic drawings and wiring diagrams used.

18. Do not show job sketches of special circuit or equipment requirements on strictly wiring list drawings.

19. When Feature Table "A" of an Equipment Specification Drawing refers to other equipment specification drawings (subunit specs), apply the appropriate following procedures on the job wiring list drawing (equipped with equipment drawing number and list or group columns only).

    A. When the subunit spec and list or group is part of a main equipment spec lists (subunit embedded in both Table "A" and the stocklist); record the main equipment spec list and title along with the associated wiring diagram information of the selected subunit spec list or group.

    B. When the subunit spec and list or group appears in the stocklist of the main spec only: Record the same as Item A.

    C. When the subunit spec and list or group is referred to in an engineering note or table on the main spec, but is not ordered as part of the main spec: Record the subunit spec and list or group (see Paragraph 7, Item B) and include all associated wiring diagram information.

20. Information drawing (09, etc.) shall be entered on lines preceding those which contain entries for the associated circuit wiring diagrams when it is deemed advantageous by Engineering to have a record of these information drawings.

21. Place Figure 1 on job drawings above title box when possible. Place Figure 2, 3, 4 and 5 on job drawings close to title box when possible.

22. Show Job Equipment Drawing Reference Table (Figure 1) and DPTS Tables (Figure 2, 3 and 5) on wiring list drawings only when required.

23. In the "Job Eqpt Dwg Reference Table" list job drawings such as distributing frames, relay racks and fuse bays on which equipment and wiring associated with the frame (or desk) is located. Do not list titles like "MDF" or "FB", etc., in the table. Each listing shall be complete, such as "HMDF 101", "RR 101 FB1", etc. Where a distributing frame is not numbered, the floor location may be used (Example: HMDF 3rd fl).

24. Use class designations on any wiring list where relay rack equipment is involved as illustrated in Exhibit 6, Figure 1.

25. In the "MOD by Sketch", column of Exhibit 7, Figure 2, specify the sketch only where there is an option on the equipment specification drawing. Original sketches are furnished unless otherwise specified. In Figure 2, change heading of this table to read "Standard Framework and Equipment Record" when separate framework is provided on which to mount equipment.

26. In the case where equipment is furnished, indicate the functional description of the equipment in the "NAME OF CKT" column. Indicate the manufacturer's name and model, type of catalog number in the "REMARKS" or "NOTE" columns.

    A. Equipment requiring maintenance service by U S WEST personnel - List all the equipment being ordered.

    B. Equipment not requiring maintenance service by U S WEST personnel - For other than a dedicated office record for portable and mobile test equipment, list only those major items such as completely assembled units on the wiring list drawing. It is recommended that minor items such as connectors, cords, miscellaneous tools, etc., not be shown. (For Portable and Mobile Test Equipment, see Exhibit 4).

27. Mini-computer software programs are required to be documented on either software or hardware list drawings depending on the following systems.

    A. Switching System - Record the Program Generic Identification Number and its Generic Issue Number and Specification Drawing Number for software specification information on software wiring list drawing or combined software/hardware wiring list drawing.

    B. Transmission System - Record the Program Generic Identification Number and Generic Configuration Number (e.g., D11, XG, B) under Wiring Diagram "Number" and "Figure" columns respectively of the hardware (traditional) wiring list drawing.

POS. & ASSOC. (MISC. & UNIT) EQPT.

LINE	NAME OF CKT.	SCHEMATIC NUMBER	SCHEMATIC EQUIPPED FIG.	SCHEMATIC EQUIPPED OPTION	WIRING DIAGRAM NUMBER	WIRING DIAGRAM FIG.	WIRING FURN.	WIRING CONN.	WIRING DIAGRAM APP.	NOTES	REG. OF CKT. EQPT.	REG. OF CKT. W.O.	REMARKS	EQ COM TO SWBD	CTS & P.C. CAB	100 LINE 1	2	3	4	5
1	POS	SD 64738-01	1,3	W,ZG	T 64738-44	1,K										1	1	1	1	1
			4,D	A,E,H,U,		1,2,3,D,	Y	Y	A,E,H,							1	1	1	1	1
				W,ZG		E,G			Y											
	TEL	SD 55110-01	1,4,8,D	F,N,O,Y,	T 55110-33	1,2,3,A,			A,D,H,							1	1	1	1	1
5				ZC,ZF,		D,G,J,			ZB											
				ZH		K,M,P														
		ES 223291	14			4										1				
	GRP	SD 64740-01	1		T 64740-33	1,B										1				
			1	A,Y,Z,		1,2			A								1	1	1	1
10	FA	SD 96153-01	1,3	Z	T 96153-34	1,2	2	Z	Z							1	1	1	1	1
			2	V,Y		3,4,5										1				
	POS T.S.				T 627593	1,A										1	1	1	1	1
					T 627594	1,2,4,D,E										1	1	1	1	1
					T 627558	1										1				
15					T 627716	1										1				
	CO	SD 64737-01	1	X,Z	T 64737-32	1,A	X	X			3 TO 8	1,2,9,10				6(10)	6(10)	6(10)	6(10)	6(10)
	PC	SD 62390-01	2		T 62390-36	B										1	1	1	1	1
	KS	SD 56031-01	1,3	A,D,E,G,	T 56031-49	1,2,5,A,	A,ZD	A,ZD								1	1	1	1	1
				J,P,Q,S,		E														
20				X,ZD,																
				ZH,ZI																
			1,2,A	Q,Y,		1,2,A										1	1	1	1	1
	AUX SIG	SD 55039-01	6,7		T 55039-40	1,6										(3)	1(3)	1(3)	1(3)	1(3)
	NA		3,4,5	N,S,X		5,10,										1				
25						12,19														
	RC SO	SD 95793-01	1	S	T 95793-30	1,A										1	1	1	1	1
	SA TEL	SD 64743-01	3,7,K,L		T 627312	1,2										(1)	1	(1)	(1)	1
			L			A														1
			5,K,L			3													1	
30	CALC	SD 95012-01	1		T 95012-31	7			Y							1	(1)	1	(1)	1
						3										1		1		
	GRD	ES 223291	2		T 627308	1,2										1	1	1	1	1
						3								2						

COL	A	B	C	D	E	F	G	H	J	K	L	M	N

PART OF TYPICAL WIRING LIST FOR 3CL SWBD T 0000-1150

EXHIBIT 1
PART OF TYPICAL WIRING LIST FOR 3CL SWITCHBOARD
(PAGE 1 OF 2)

UNIT EQPT. (ASSOC. WITH SWBD BUT NOT THE INDIVIDUAL POS.)

LINE	NAME OF CKT.	SCHEMATIC			WIRING DIAGRAM					NOTES	REMARKS			QUAN. OF CKT.
		NUMBER	EQUIPPED		NUMBER	FIG.	WIRING		APP.		NBG. OF CKT.		BAY LOCATION	
			FIG.	OPTION			FURN.	CONN.			EQPD	W.O.		
131	SA TEL	SD 64743-01	1,B,D,K	J,K,S,U	T 64743-38	1,B					1		120.5	1
			K,L,	J	-39	1,2,3,5,					1			1
						8								
	OPR R.C. SIG	SD 96087-01	1,1R		T 96087-32	1					1,2			2
135	22V AC (CALC SUP)	SD 80929-01	1,3,A		T 80929-30	1,3,C					1			1

MISC. EQPT. (ASSOC. WITH SWBD)

LINE	NAME OF CKT.	SCHEMATIC			WIRING DIAGRAM					NOTES	REMARKS			QUAN. OF CKT.
		NUMBER	EQUIPPED		NUMBER	FIG.	WIRING		APP.		NBG. OF CKT.		BAY LOCATION	
			FIG.	OPTION			FURN.	CONN.			EQPD	W.O.		
	REC MULT	SD 64545-01	1		T 64545-54	1,A					0 TO 19		0 TO 5 HDS	120
155	IT OGT MULT		2,2A,2D		-57	1,A					0 TO 39		0 TO 5 HDS	240
	T SW TRK MULT		2,2A,2D			1,A					0 TO 19		T1 TO T4 HDS	80
	MISC OGT MULT		2		-52	1,B					0 TO 19		TO TO T5 HDS	120
	MISC ANS JKS		1		-53	1,A	Y	Y			0 TO 9		PAN 4,7,10,13	40
	NA	SD 55039-01	2,		T 55039-40	2					1-6		120.11	1

COL	A	B	C	D	E	F	G	H	J	K	L	M	N

PART OF TYPICAL WIRING LIST FOR 3CL SWBD T 0000-1150

EXHIBIT 1
PART OF TYPICAL WIRING LIST FOR 3CL SWITCHBOARD
(PAGE 2 OF 2)

RR EQPT. (ASSOC. WITH SWBD BUT NOT THE INDIVIDUAL POS.)

LINE	NAME OF CKT.	SCHEMATIC NUMBER	SCHEMATIC EQUIPPED FIG.	SCHEMATIC EQUIPPED OPTION	WIRING DIAGRAM NUMBER	WIRING DIAGRAM FIG.	WIRING FURN	WIRING CONN.	WIRING APP.	NOTES	REMARKS NBG. OF CKT. EQPD	REMARKS NBG. OF CKT. W.O.	REMARKS RR LOCATION	QUAN. OF CKT.
1	INT POS TRK	SD 62771-01	1,A,K	A	T 62771-36	1,4,7,A					1 TO 21		120.5	21
			1			5					1-3 TO 19-21			7
			M			6					1-2,3 TO 19-20.21			14
	3W REC COM TRK	SD 56007-01	1,2,3,8,	J,X,Y,	T 56007-37	1,2,8,A,	Y	Y	J		1 TO 170		121.6.121.7,	170
5			C,F			D,E							121.8,121.9,121.10,121.11	
					-36	1,12,16,					1 TO 170			170
						17								
			1	V		14					1-5 TO 166-170			34
						15					1-25 TO 151-175			7
10			1			13					1-60 TO 121-180			3
	T SW TRK	SD 55291-01	1,6,G,	P,W,YE,YI	T 55291-50	1,D,E	W	W	P		1 TO 13		122.8	13
				YQ,ZP,ZW										
			1,10	X,Y,YU,	-51	B,D,J,L,					1 TO 13			13
				YW,ZA,ZB,		M,U,V,								
15				ZF,ZI										
					-52	1,5,11,8	ZZ	ZZ			1 TO 13			13
	T SW TRK(VERIF)		1,8,G	P,W,YE,YI	-50	1,D,E	W	W	P		14 TO 16			3
				ZP,ZQ,ZW										
			1,10	X,Y,YU,	-51	B,D,J,L,					14 TO 16			3
20				YW,ZA,ZB,		M,U,V,								
				ZF,ZI										
					-52	1,5,11,8	ZZ	ZZ			14 TO 16			3
	SIG INT	SD 80771-01			T 80771-30	3,4					(EMG) 1		120.9	1
	INT TRNS	SD 95078-01	10	A,E,Q,ZC,	T 95078-37	1,8	E	E						1
25				ZE										
				Q	-38	2,9,10,11								1
	INT DISTG(30 IPM)		3		-35	1,2					1			1
			7,9,12			4,6,7					1 TO 10 BR.1			10

COL	A	B	C	D	E	F	G	H	J	K	L	M	N

PART OF TYPICAL WIRING LIST DRAWING SHOWING RELAY RACK EQPT. ASSOC. WITH 3CL SWBD

T 0000-1151

EXHIBIT 2
PART OF TYPICAL WIRING LIST DRAWING SHOWING
RELAY RACK EQUIPMENT ASSOCIATED WITH 3CL SWITCHBOARD

RR EQPT

LINE	NAME OF CKT	SCHEMATIC NUMBER	SCHEMATIC EQUIPPED FIG.	SCHEMATIC EQUIPPED OPTION	WIRING DIAGRAM NUMBER	WIRING DIAGRAM FIG.	WIRING FURN.	WIRING CONN.	WIRING APP.	NOTES	NBG. OF CKT. EQPD.	NBG. OF CKT. W.O.	REMARKS	EQ COM TO LINE UP	601 LINE .1	.2	.3	.4	.5	.6				
1	N1 TERM (MTG)	SD 95151-01	1,3;4,5	H,AC,AD,	T 95121-32	1,3,4,5,	AE,AG	AE,AG	AR,AX,	5	1 TO 6				3	2	1							
			7,9,13	AE,AG,AR,		6,7,8,D,			ZH,ZR															
				AX,ZF,ZH,		F,H,N,K,																		
				ZK,ZP		M,Q,S,U,																		
5						W,Y,AA																		
	(JK)		1			2				5	1 TO 6				36	24	12							
	(CONN)		8		-30	1				5	1 TO 6				12	8	4							
	PWR DISTG	SD 56137-01	15,	X	T 56137-32	1											1							
	MISC JK & PAD	SD 95147-01	1		T 95147-30	1											1							
10		SD 56073-01	2			4											1							
		SD 66137-01	9			2											1							
	N1 TERM INTERCONN	SD 95121-01	1	M,P	T 95121-33	1,E	N,P,Y	N,P,Y			1 TO 6				3	2	1							
	(PTCH BAY CA)					8					1 TO 6				3	2	1							
	(NO IN SPAN ADJ)		1	T		3					1 TO 6				3	2	1							
15	(PWR TO REP)		1			7					1 TO 6				3	2	1							
	(46C CA TERM)		1		-36	1					1 TO 6					6								
	PWR DISTG	SD 56137-01	15			6,8											1							
	MISC JK & PAD	SD 95147-01	1			2,3											1							
		SD 56137-01	9			7											1							
20	TEMP CONT	SD 95121-01	12			15									1	1	1							
	(AC SUP)		12			10			AM						1	1	1							
	IMI ART LINE	SD 95121-01	1		-39	1					1 TO 6				3	2	1							
	(INPUT)		1	ZA,ZB	-43	9	ZA,ZB	ZA,ZB			1 TO 6				3	2	1							
	GROUND				T 627797	1									1	1	1							
25		ES 223291			T 622406	122												1						
	RC HYBRID	SD 95144-01	3.0	A	T 95144-34	1,8,D,				3	1 TO 9							9						
	(CAP)		3.0	Z, ZZ		6,7,8,9				3	1 TO 7							7						
	(CONN)			A,C,AA,CC	-35	1,2,3,4,	A,C,	A,C,		3	1-3 TO 7-9							3						
						5,8,9,B	AA,CC	AA,CC																
30	(GRD)					6				3	1-3 TO 7-9							3						
	43A CARR TLG	SD 70572-01	14		T 70572-33	2					1 TO 4							4						
	(INTERCONN)					8					1 TO 4							4						
	48 TERM JK	SD 59330-01	1		T 59330-32	1					1 TO 4							4						
35																								

																						.12	.13
77	E 316	SD 98122-01			T 700096	1,17				1,6	1 TO 90											90	90
78	DIST RES	SD 98122-01	7		T 98122-31	7				1,6	1 TO 90											90	90
COL	A	B	C	D	E	F	G	H	J	K	L	M	N										

PART OF TYPICAL RELAY RACK TYPE OF WIRING LIST DRAWING T 0000-1890

EXHIBIT 3
PART OF TYPICAL RELAY RACK TYPE OF WIRING LIST DRAWING

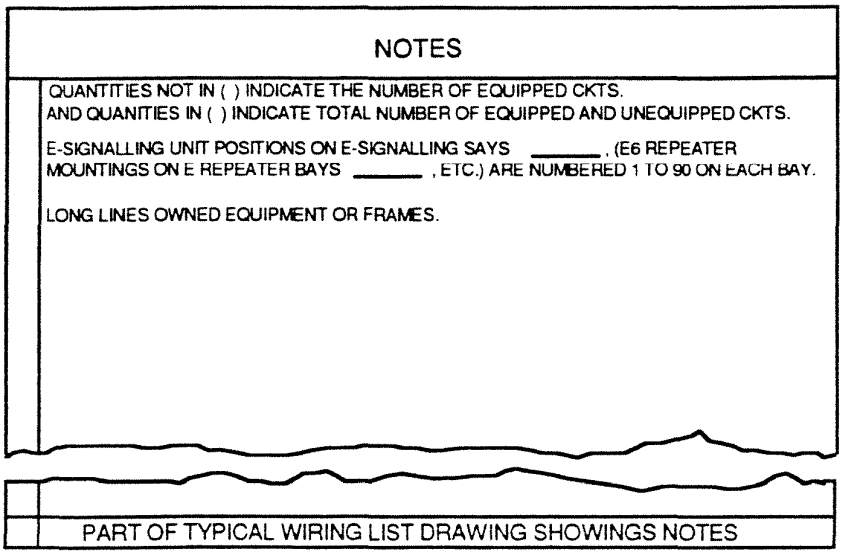
PORTABLE & MOBILE TEST EQPT.

LINE	NAME OF CKT	SCHEMATIC NUMBER	SCHEMATIC EQUIPPED FIG.	SCHEMATIC EQUIPPED OPTION	WIRING DIAGRAM NUMBER	WIRING DIAGRAM FIG.	WIRING FURN.	WIRING CONN.	WIRING APP.	NOTES	REMARKS		QUAN. OF CKT.
1	2J REPT TST	SD 95141-01	1		T 95141-30	1						J94002J-1	1
	2B SIG TST SET	SD 56134-02	1	M,N,Q,S,	T 56134-31	1,2,B,D,F	N,Z	N,Z	M,N,Q,			J64730B-2	1
				U,X,Z					X,Z				
	40B TRANS MEAS	SD 64938-01	1,2		T 64938-30	1				2	MOBILE	J64040B-2	1
5	(M.F. OSC)	SD 64913-01	4,K			2,B				2			1
	(1U AMP RECT)	SD 64098-01	1,D	X	-31	1				2		J64001U-2	1
												(MOD)	
	(2A SEND)	SD 95000-01	2,6	E	-32	1				2		J94002A-7	1
												(MOD)	
10	(PWR SUPPLY)	SD 64298-01	1	Y	T 64298-30	1,C			Y	2		J68602BA-1	1
	LOOP TST	SD 95184-01	1		T 95184-30	1						J98705T-1	1
	REPT OSC	SD 95158-01	1	B,N	T 95158-30	1			B,N			J98705J-1	1
	PORTABLE CONTROL	SD 96490-01	1		T 96490-30	1						J64717B-1	1
	SET												
15	VOLT-OHM											KS 14510 L-1	1
	MILLIAMMETER												
	5A ATTENUATOR												1
	12A TRANS MEAS												1
	CARR FREQ											KS 15538 L-1	1
20	VOLTMETER												
	VACCUM TUBE										HEWLETT-PACKARD	400G	1
	VOLTMETER												
	VOLTMETER(0-60V)										WESTON 1010 MODEL 1		1

COL	A	B	C	D	E	F	G	H	J	K	L	M	N

PART OF TYPICAL WIRING LIST DRAWING SHOWING PORT. TEST EQPT. T 0000-1470

EXHIBIT 4
PART OF TYPICAL WIRING LIST DRAWING SHOWING
PORTABLE TEST EQUIPMENT



PART OF TYPICAL WIRING LIST DRAWING SHOWINGS NOTES

EXHIBIT 5
PART OF TYPICAL WIRING LIST DRAWING SHOWING NOTES

TYPICAL DIAL WIRING LIST

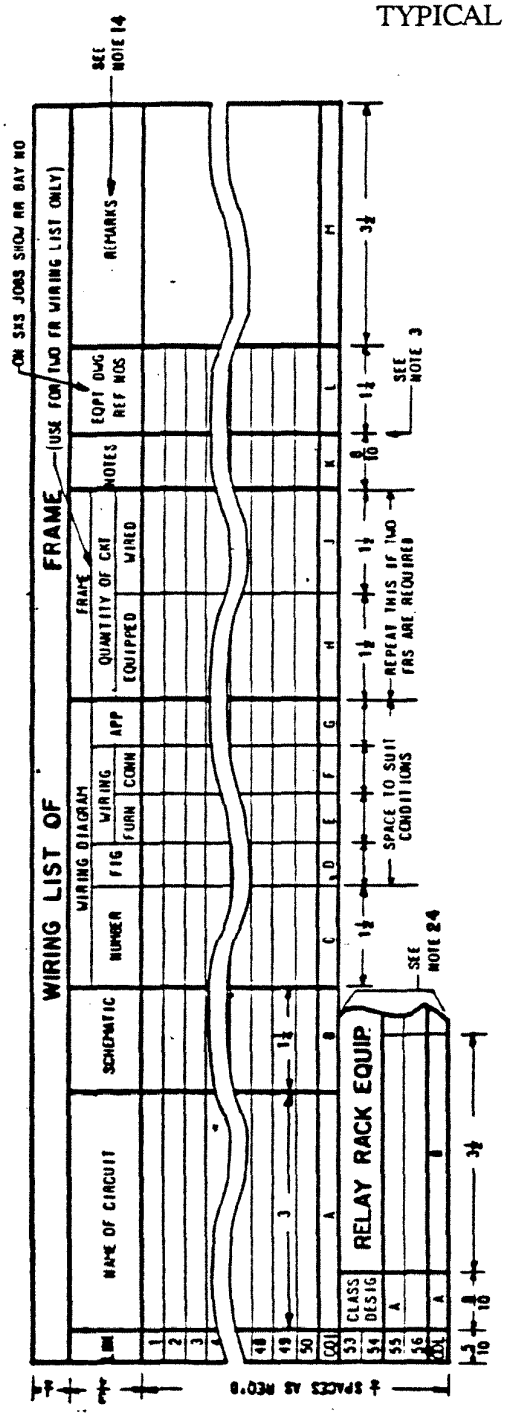


FIGURE 1
(ONE OR TWO FRAMES)

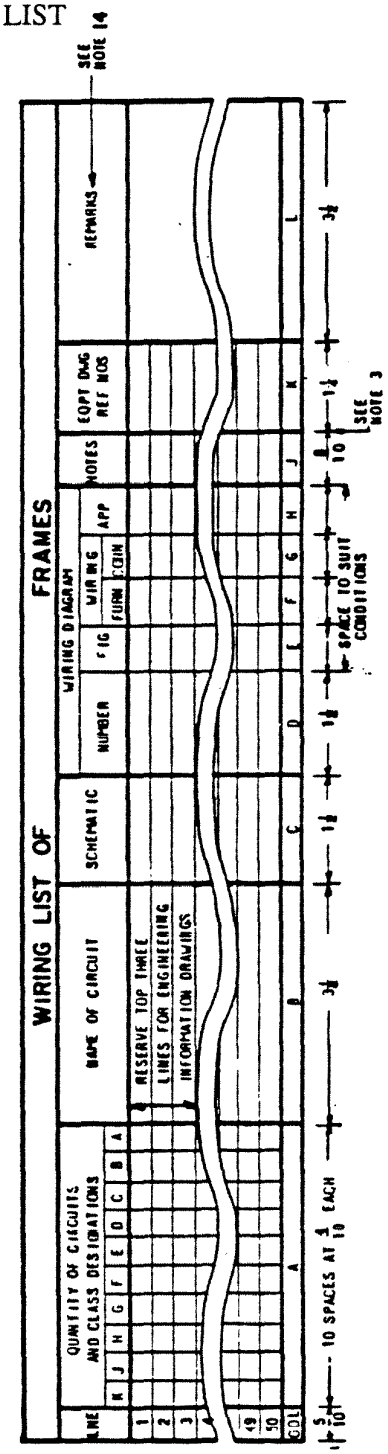


FIGURE 2
(USING CLASS DESIGNATIONS)

EXHIBIT 6
FIGURES 1 THROUGH 7D
(PAGE 1 OF 4)

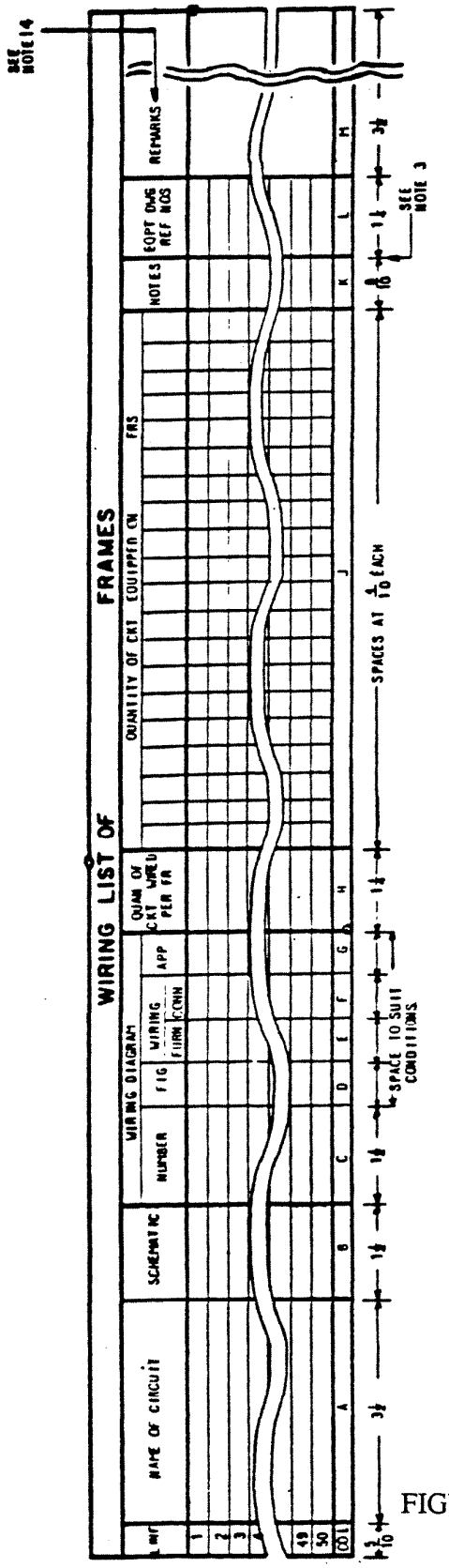


FIGURE 3
(MORE THAN TWO FRAMES)

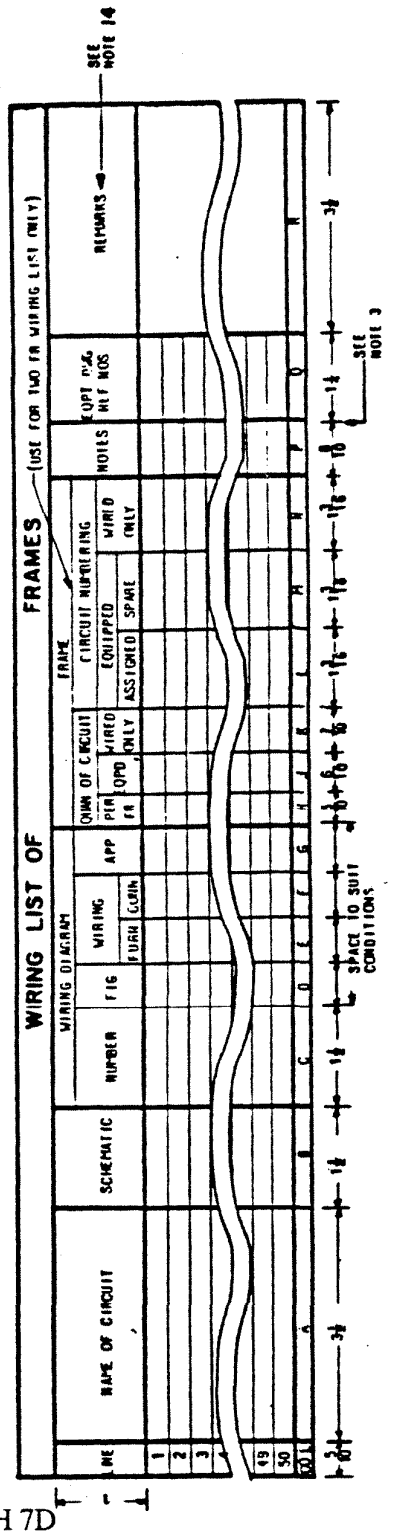


FIGURE 4
(NUMBERED AND NON-NUMBERED CIRCUITS)

EXHIBIT 6
FIGURES 1 THROUGH 7D
(PAGE 2 OF 4)

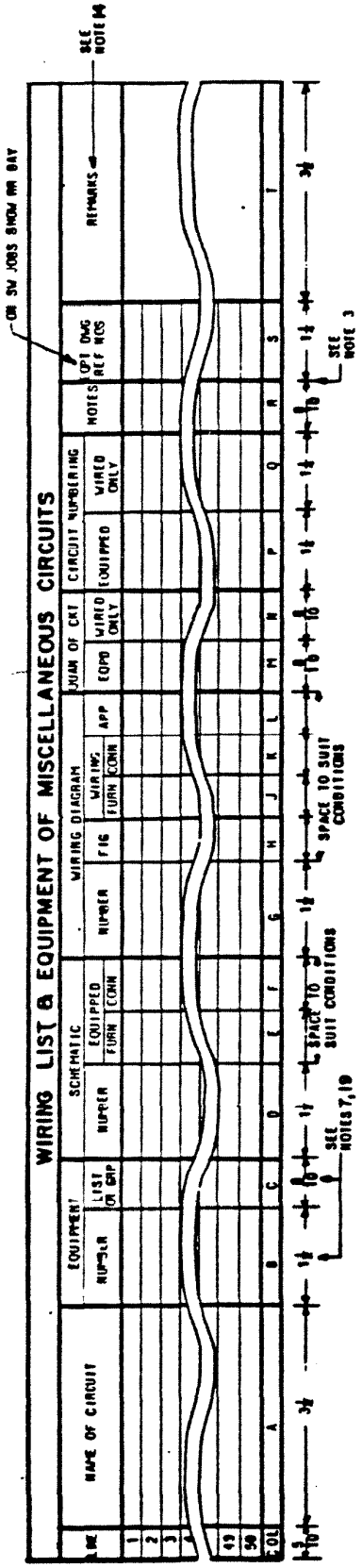


FIGURE 5
(METHOD "A" SCHEMATIC FIGURES & OPTIONS)

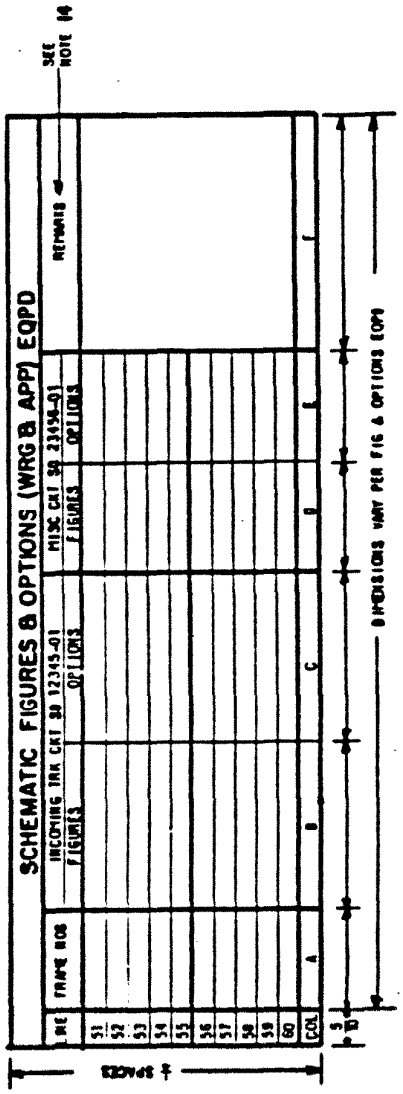


FIGURE 6
(METHOD "B" SCHEMATIC FIGURES & OPTIONS)

EXHIBIT 6
FIGURES 1 THROUGH 7D
(PAGE 3 OF 4)

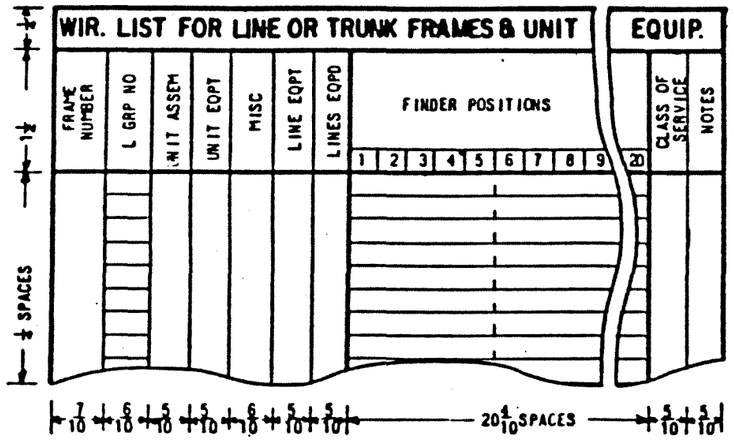


FIGURE 7-A
(LINE FINDER FRAMES)

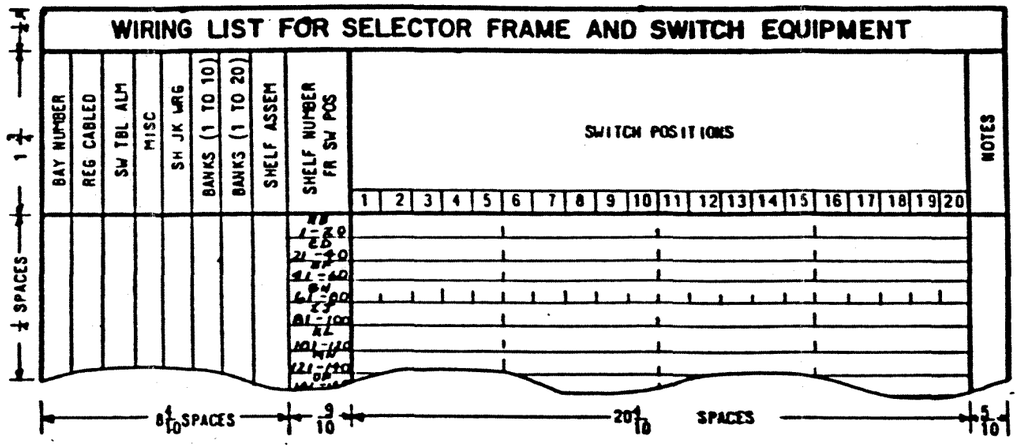


FIGURE 7-B
(SELECTOR FRAMES)

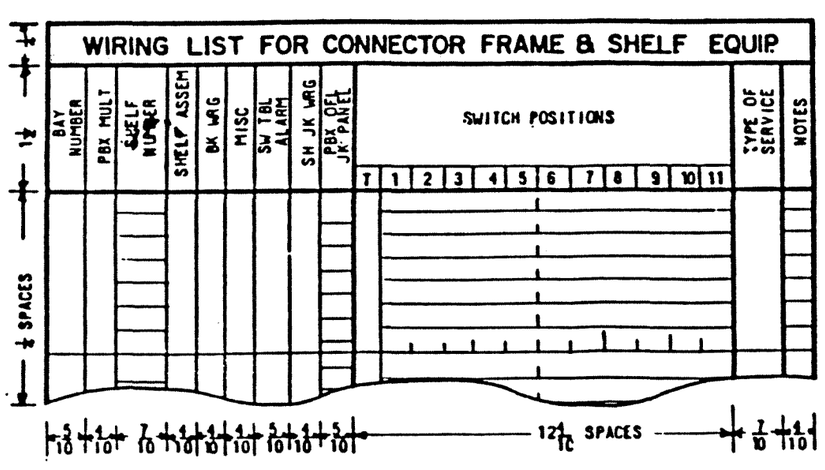


FIGURE 7-C
(CONNECTOR FRAMES)

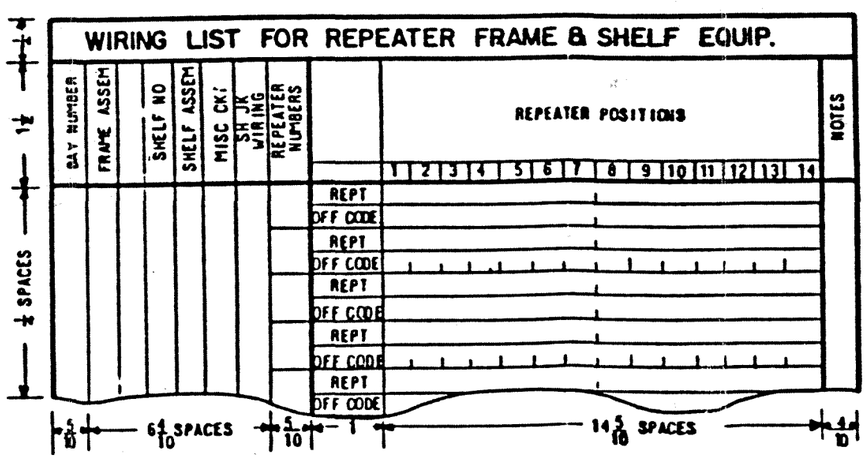


FIGURE 7-D
(REPEATER FRAMES) (SW ONLY)

EXHIBIT 6
FIGURES 1 THROUGH 7D
(PAGE 4 OF 4)

WIRING LIST DRAWING TABLES

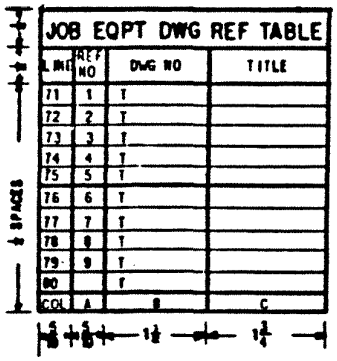


FIGURE 1
(JOB EQPT DWG REF TABLE)

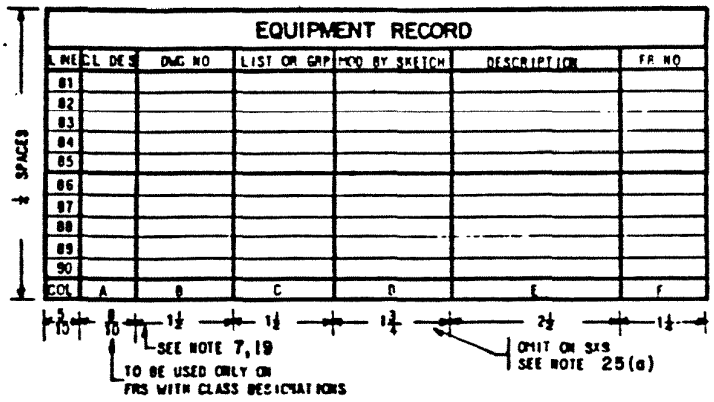


FIGURE 2
(PANEL) (SXS) (X-BAR)

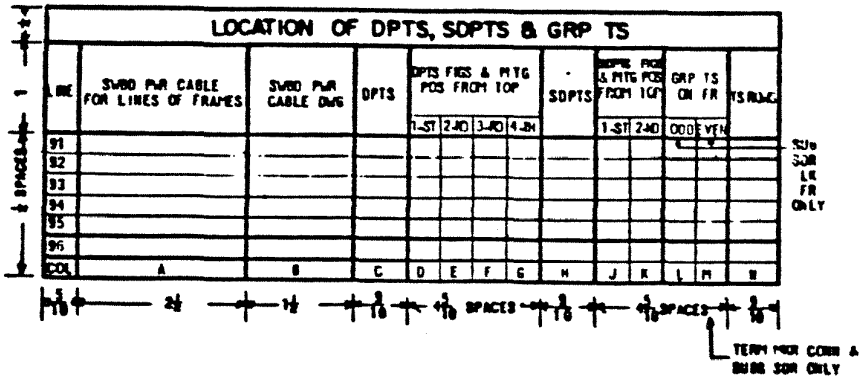


FIGURE 3
(X-BAR NO 1)

EXHIBIT 7
FIGURES 1 THROUGH 6D
(PAGE 1 OF 2)

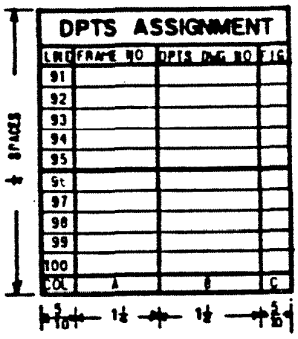


FIGURE 4
(SXS)

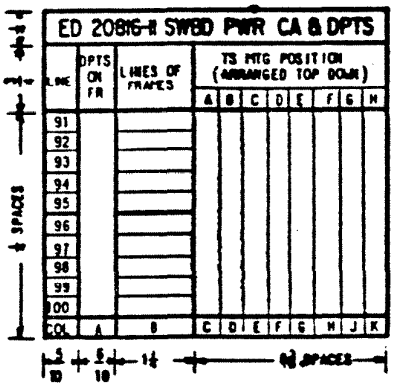


FIGURE 5
(PANEL)

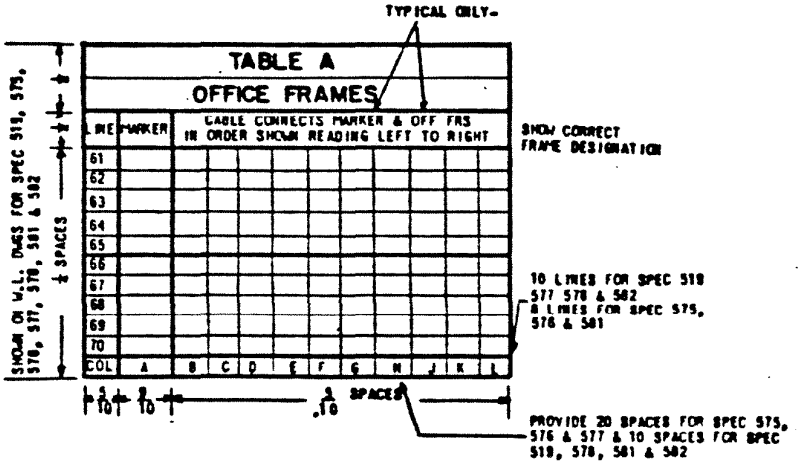


FIGURE 6
(X-BAR NO 1)

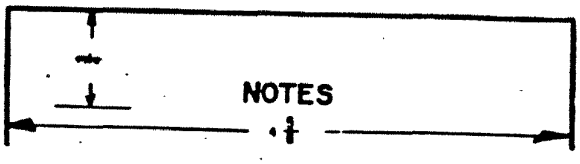


EXHIBIT 7
FIGURES 1 THROUGH 6D
(PAGE 2 OF 2)

EQUIPMENT LIST TABLE

1. Forms used for the preparation of Equipment List Table shall be in accordance with the forms approved by the Engineering Standards Organization, (see Figure 1 on the following page for the example of an Equipment List Table.)

2. Equipment Description Column - Indicate the authorized abbreviated name of equipment as listed in the title box of the Equipment Specification Drawing. If an authorized abbreviation is not shown in the title box of an Equipment Specification Drawing, use the standard abbreviation as listed in the word abbreviation catalog.

3. Equipment Drawing Number Column - List the Equipment Specification Drawing number from which the equipment is ordered.

4. Equipment Drawing List or Group Column - Indicate all lists or groups of the equipment specification drawing which are being ordered.

5. L-GR/FR-UNIT Column:

   A. Show the actual quantity of each list or group per frame or unit being ordered, or

   B. Show "MAX" in the "L-GR/FR-UNIT" column header to indicate that maximum quantities which can be ordered are shown.

6. Equipment Numbering Columns - Indicate the numbering of frame(s), unit(s) or circuit(s) being furnished in accordance with Standard Drawing requirements.

> NOTE:
>
> Circuit numbers are numerical designations used to identify each repeated appearance of a circuit or part thereof. Therefore, if circuit numbering is shown or required on equipment specification drawings then the circuit numbering shall also be documented on the wiring list drawings.

7. Frame or Unit Quantity Column - Indicate the total quantity of frame(s) or unit(s) being furnished or equipped.

8. Quantity of Circuit Column - Show the quantity of wired circuits, numerals in parenthesis ( ) indicate the total number of circuits which are equipped and unequipped.

9. Note or Table Column:

   A. Use numbers to reference applicable notes in the Note Table or under Notes on the Wiring List Drawing.

   B. Use alphas to reference other Tables on the Wiring or Equipment List Drawings.

10. For consecutive lines of information within a column, the ladder symbol is more desirable than ditto marks. Do not use the word "and" or symbol "&", use a comma instead.

LINE NO	EQUIPMENT			L-GR /FR-UNIT	EQUIPMENT NUMBERING			FRAME OR UNIT QUANTITY	QTY OF CKTS	NOTE OR TABLE
	DESCRIPTION	DRAWING NUMBER	DRAWING LIST OR GROUP		FRAME	UNIT	CIRCUIT			
1	PROC PER INT FR	JSA001A1	1.2.3.4	1	0					
2	TAPE UNIT FR	JSA002A1	1	1	0 TO					
3	TAPE UNIT FR SP EQPT	JSA002A1	A	1			0		1	
4	CALL STORE FR	JSA003A1	1.8	1	00 TO					C
5	CALL STORE UN	JSA003A1	4.5.6.A	1		0				
6	CALL STORE UN	JSA003A1	4.5.6	2		0.1				
7	CALL STORE CKT	JSA003A1	9	1			0			
8	CALL STORE CKT	JSA003A1	B	1			0			
9	PROG STORE FR	JSA003A1	1.2	1	0 TO					C
10	PROG STORE CKT	JSA003A1	3	1	0.1		0		2	
11	PROG STORE UN	JSA003A1	4.6.7.A	1		0				
12	PROG STORE UN	JSA003A1	4.6.7	2		0.1				
13	PROG STORE CKT	JSA003A	9	1			0			
14	FILE STORE FR	JSA004A1	1	1						C
15	FILE STORE DK1	JSA004A1	2	1		0				
16	FILE STORE DK2	JSA004A1	3	1			0			
17	FILE STORE DK3	JSA004A1	4	1			0			
18	FILE STORE CKT	JSA004A1	5	1			0			
19	DATA UN SEL UN	JSA004AZ1	1	1	FS	0				C
20	SUP FILE STORE FR	JSA004B1	1.2	1						
21	CENTRAL CONTROL [illegible]	JSA005A1	1.2	1	0			1		
22	CENTRAL CONTROL FR	JSA005A1	1.2.4A	1	1			1		
23	INPUT OUTPUT FR	JSA006A1	1	1	0			1		B
LNN	EDS	EDN	EDL	LGFU	ENFR	ENUN	ENC	FRUQ	QC	NTTB

FIGURE 1
TYPICAL EQUIPMENT LIST TABLE

FLOOR PLANS

CONTENTS

CONTENTS

1.00 GENERAL

1.01 This part covers the standards to be followed in the preparation of floor plan drawings for all systems.

1.02 The floor plan shall include those building construction details necessary to engineer, locate and install the Central Office Equipment.

2.00 SCALE

2.01 The scale for floor plan drawings shall be prepared 1/4 inch to 1 foot with the following variations and exceptions.

2.02 Variations

A. In order to meet microfilm standards and place lettering within the frame convention of 10, 10-1/2 and 11 inch wide guard rails, the 10, 10-1/2 and 11 inch frames shall be scaled as 12, 12-1/2 and 13 inch wide respectively. In order to maintain proper relationships, 12 inch wide guard rail frames shall be scaled as 14 inches wide.

B. Cable holes and cable slots 10 inches wide shall also be scaled as 12 inches wide. When a 10 inch wide cable hole or cable slot is adjacent to a 12 inch wide cable hole or cable slot, the 10 inch wide hole or slot shall be scaled as 12 inches and the 12 inch wide cable hole or slot as 14 inches wide.

C. The additional two inches required per the preceding two items shall be placed at the rear of the frame lineup. When a cable hole is located in a lineup, the two inches shall be added on the same side of the cable hole as the rear of the lineup. When cable holes are not located in frame lineups, the two inches may be added equidistantly at both sides of the cable hole.

D. It is recommended that sketches and enlarged views shall be drawn 3/4 inch to 1 foot scale with the exception of beam and/or ceiling insert and also plot plan sketches where it is recommended that 1/16 inch to 1 foot scale be used.

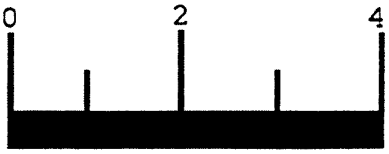
E. When the building size is less than six building bays or 2400 square feet, one building bay is approximately 20 feet by 20 feet. This condition requires that the scale be increased to 1/2 inch = 1 foot.

F. The following are the recommended drafting procedures for dimensioning on floor plans using the soft-metric conversion for International and Government Sales:

1. The recommended method of depicting the scale on the floor plan drawing is shown in Section III, Part E, Paragraph 6.00.

2.03 The scale shall be shown as illustrated by Figure 1 in the title box or in the box above the title box of the floor plan drawing.

2.04 When adding linework to this drawing, it is also required to retain a minimum space of 1/16 inch between two parallel lines where no lettering is required and between each dash of a dashed line in order to meet legibility standards.



SCALE IN FEET

FIGURE 1
METHOD OF ILLUSTRATING SCALE IN TITLE BOX OF THE DRAWING

3.00 PEN SIZE

3.01 The following information indicates the required pen sizes that produce proper lineweights for the specific applications on floor plan drawings.

Pen Size	Application
0	Tables and charts (horizontal linework), dimension and projection lines, future frames and equipment, future cable holes and cable slots, column centers
2	Present frames and equipment, present cable holes and cable slots, interior walls, partitions, doors, bean plans, sketches, skylight, drop panels
3	Demarcation and reference lines, all bracing, columns, exterior walls, building outline, north arrow

4.00 ISSUE NOTES

4.01 A basic and descriptive Issue Note is required for this drawing in accordance with the following:

A. The basic elements of an Issue Note are shown in Section III, Part F, Paragraph 2.00.

B. Cover changes in Table No. 1 as specified by the subsequent paragraphs covering Table No. 1 entries.

C. When all changes are covered in Table No. 1 associated with a particular issue, a descriptive Issue Note is not required.

4.02 A descriptive Issue Note shall be originated for changes not a part of the Table No. 1 format. The only changes of this type are building changes involving relocations, additions or removals of walls, partitions, cable sleeves, slots and cable holes. When walls are being removed and added as a result of a building addition and they may be shown completely on the plot plan sketch along with the date of the addition, they shall be excluded from the Issue Note column.

4.03 Record only changes that cannot be covered in the Table No. 1 format should be covered in the descriptive Issue Note. This would only include the types of building changes that would normally be covered in the descriptive Issue Note if they were not record only. It is not intended to include spelling corrections and other editorial type errors.

4.04 When writing descriptive notes for the items specified in the preceding paragraphs, do not generalize. A new, removed or changed location shall be properly identified and, as required, a before and after change condition shall also be clearly stated. Statements made in the Issue Note shall be specific as shown in the following example:

> Relocate partition from between Columns D4 and E4 to between Columns C3 and B3/ Add cable hole 1A2A/ Remove wall between Columns C11 and C12.

4.05 All floor-supported equipment shall be shown in Table No. 1. When shown in Table No. 1 a descriptive Issue Note is not required.

4.06 Relocations where frame numbering or frame designation is changed should be entered in Table No. 1 as "removed and added." Relocations where frame number is not changed should be covered in a descriptive Issue Note text. Changes in a frame number and/or designation should be entered in Table No. 1 as "removed and added."

The following examples are provided for illustration:

ACTION	LOCATION	TYPE
Frame is removed	Table No. 1	Remove
Frame number and/or designation is changed.	Table No. 1	Remove Old Add New
Frame is relocated and number and/or designation is changed.	Table No. 1	Remove Old Add New
Frame is relocated and number and/or designation is not changed.	Issue Note Column	Describe

5.00 CRITERIA

5.01 Prior to the preparation of the floor plan and associated equipment layout drawings of a particular office, all necessary data shall be obtained. The data shall be checked to verify that it is noncontradictory and that it is the latest available information. The data consists of:

A. Architect Plans

B. Study Plans

C. Floor Plans

D. Development Plans

E. Special Condition Views and Sketches

F. Supplier Controlled Drawings

6.00 ARRANGEMENT OF LAYOUT ON DRAWING

6.01 Arrange the building layout on the drawing in accordance with the following requirements:

A. Conform to the layout depicted on the Floor Plan, Study Plan or Development Plan. North shall be in the same relative location on both drawings. Any deviations must be approved by the Equipment Engineer.

B. Unless otherwise indicated by the Equipment Engineer, show the entire floor including all equipment and administrative areas.

C. Make allowances for tables and notes.

D. Where possible, allow for future building growth.

E. The standard size of mylar for floor plan drawing is to be 12S or COM equivalent unless otherwise specified by the Records Group. Use the following figures as guides for dimension limits. Use no more than approximately 14,000 square feet on one drawing because space must be allowed for drafting of tables, notes and sketches.

7.00 FLOOR PLAN DIVISION

7.01 Where two or more drawings are used for the same floor, a line of demarcation shall be used to indicate the location where the floor is divided. This line shall appear on all drawings of a common division.

A. When placing lines of demarcation, it is recommended that division lines be located through the column centers, at column lines or in aisles (see Figure 2).

B. It is recommended that the lines of demarcation agree on all floors of a multistoried building.

7.02 It is recommended that all information be placed on the drawing inside the line of demarcation. Certain information may be shown outside the line of demarcation and on both drawings in accordance with the following and as shown by Figure 2.

A. Identification of the line of demarcation

B. Drawing cross reference

C. Lineups, partitions, walls, columns, cable slots and cable holes split by line of demarcation. See Figure 3 for an example of a lineup that has been split. Information identifying lineup, bay, etc., shall appear on both drawings.

D. Portions of walls, dimension lines, dimensions and designations deemed necessary for clarification (see Figures 3 and 4).

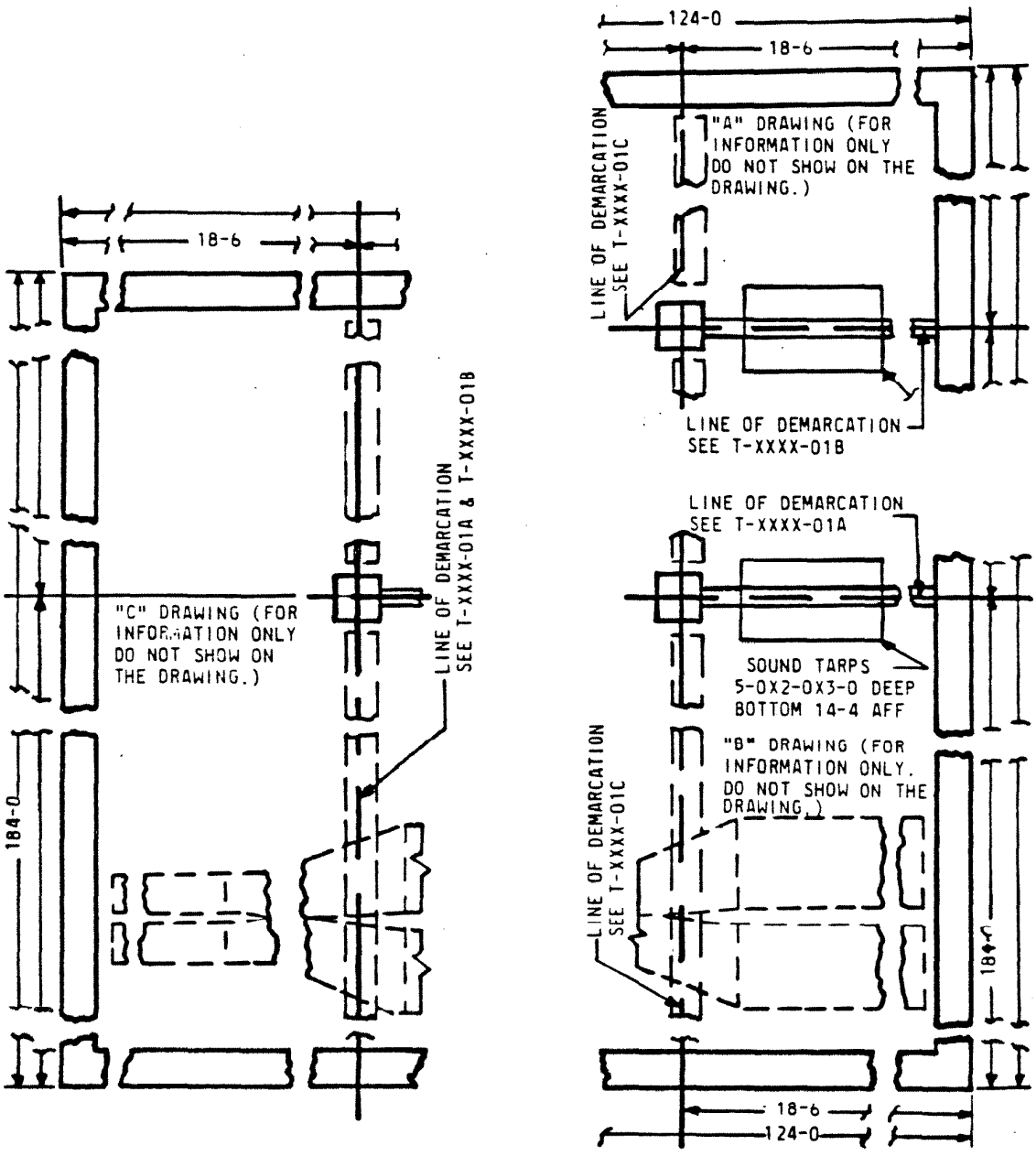


FIGURE 2
ILLUSTRATION OF A RECOMMENDED COMMON FLOOR SPLIT INTO THREE DRAWINGS - PLACEMENT OF LINES OF DEMARCATION

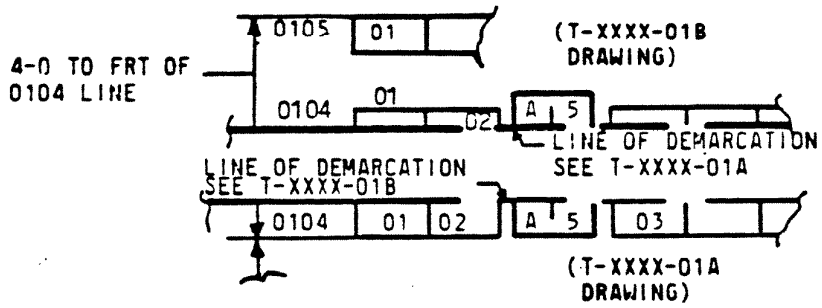


FIGURE 3
RECOMMENDED METHOD OF ILLUSTRATING A LINEUP
AND DIMENSIONS WHEN SPLIT OVER TWO DRAWINGS

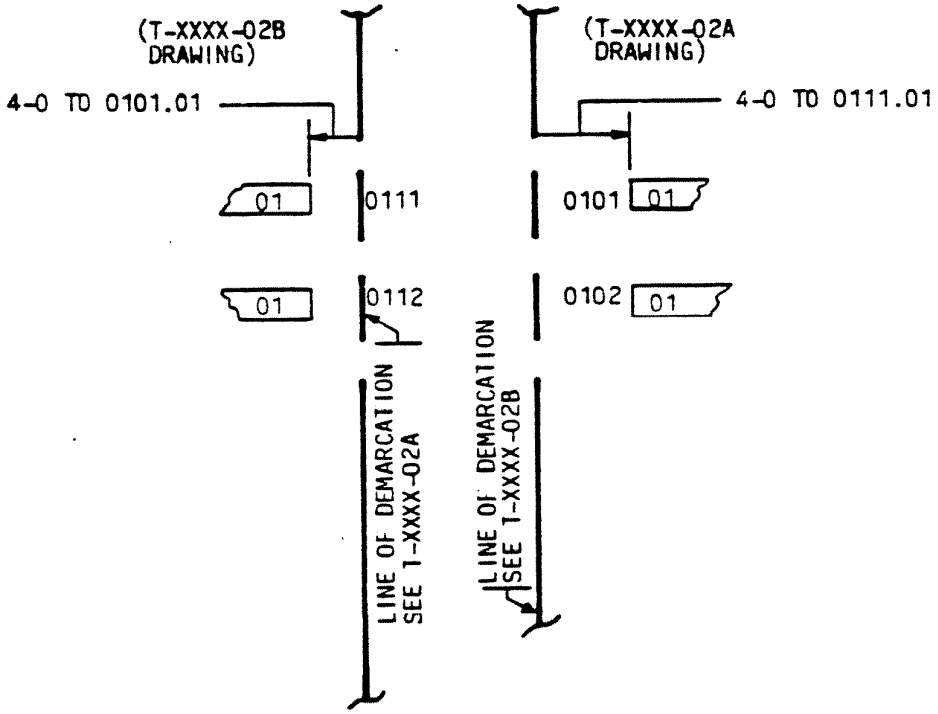


FIGURE 4
RECOMMENDED METHOD OF ILLUSTRATING DIMENSIONS AND DESIGNATIONS
WHEN A DRAWING IS SPLIT IN A MAIN AISLE

8.00 CONSTRUCTION OF LINES OF DEMARCATION

8.01 Construct a line of demarcation as shown by Figure 5.

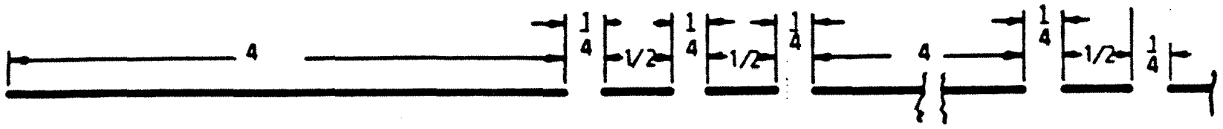


FIGURE 5
RECOMMENDED METHOD OF CONSTRUCTING A LINE OF DEMARCATION

9.00 KEY PLAN

9.01 A key plan illustrating a drawing composite of a particular floor, shall be placed on all floor plans of the floor involved, at the nongrowth end of the building near the title box.

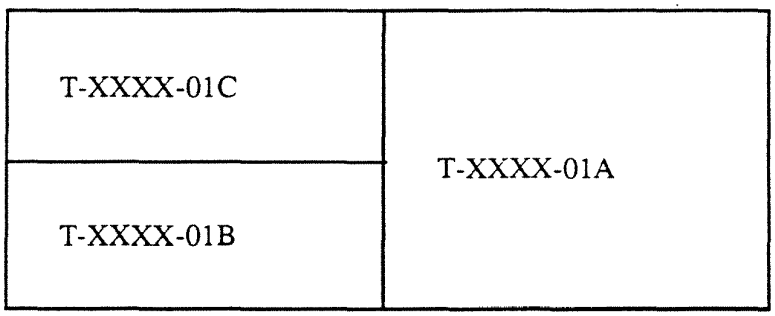


FIGURE 6
RECOMMENDED METHOD OF SHOWING A KEY PLAN

10.00 SPECIFIC DRAWING STANDARDS

10.01 Drawing standards related herein shall be applied to all new equipment to all new equipment floors, redrawn drawings, building additions and new buildings. When it is logical and economical, however, certain standards in use prior to this time may be retained.

10.02 The following are the recommended drafting procedures for dimensioning on floor plans using the soft-metric conversion:

A. A dual dimensioning system will be used on the floor plan drawings requiring dimensions. Feet and inches as well as the equivalent millimeters will be shown on the drawing including the tables and notes.

B. Feet and inch measurements will be shown using a dash "-" separator (e.g., 2-6).

C. The feet and inches will be shown in parenthesis [e.g., (2-6)1].

D. All metric dimensions other than the Scale Block, Paragraph 2.02, F, will be rounded off to the nearest even whole millimeter. For example, 29.1 to 29.9 MM will be rounded off to 30 MM and 28.1 to 28.9 MM will be rounded off to 28 MM.

E. Table No. 2 shall be enlarged to add the metric conversion in millimeters.

F. A conversion table may be used only to prevent congestion on the drawing.

11.00 BUILDING INFORMATION - ILLUSTRATING AND DIMENSIONING

11.01 Coordinate the following information with the proper pen sizes previously furnished within this part.

11.02 Walls

A. It is recommended that the length and width of buildings be shown. Also, show the thickness of finished walls and the inside dimensions of all rooms, (see Exhibit 1).

B. When the outside walls of a building are not at right angles, the specific angle shall be indicated in degrees and minutes.

C. Where outside wall lines are offset at different floors, the amount of offset with relation to first floor of the building shall be shown.

11.03 Pilasters

A. It is required to show the location, width and projection of all pilasters. However, where the pilasters are the same size, show the dimension for only one of them. Add under Notes "All pilasters are the same size as shown on pilaster between columns ___ and ___." See Exhibit 1 between Columns B1 and C1, (see Paragraph 26.00, Note 22).

11.04 Columns and Drop Panels

A. The size and location of all columns shall be shown. However, when a majority of the columns are of the same size, cover in a note on the drawing similar to the following: "All Columns are the same size as column ___ (show column number) unless otherwise shown" (see Exhibit 1, Column B2 and Paragraph 26.00, Note 3).

B. Where columns are of various sizes, a table showing the column designation and the associated size may be used (see Figure 7 and Exhibit 1).

C. It is recommended that column numbering be designated to agree with the architect's or U S WEST Communications study plans. Where architect's plans and study plans are not in agreement, follow the architect's plans.

1/2
1/4

COLUMN SCHEDULE
(SEE COLUMNS A1 AND B2)

Column No.	A	B	C	D
A1, A6, D1, D6	2-0	2-0	0-5	0-6
A2 TO 5, D2 TO 5	2-0	2-0		0-6
B1, C1, B6, C6	2-2	1-11	0-5	
B2 TO 5,C2 TO 5,D2 TO 5	2-0	2-0		

2-1/2 — 7/8

FIGURE 7
TABULAR PRESENTATION OF COLUMNS OF VARIOUS SIZES

D. All columns shall be depicted by a sketch with dimensions included and placed on the floor plan drawing similar to Exhibit 3, Sketch C. However, if the column construction is simple, (A and B Dimension Only) select a column on the drawing, show the A and B Dimension, and show the column selected in the column schedule.

E. Columns having a base molding shall be shown on the floor plan drawings with dimensions representing the size without the base molding. The thickness and height of the molding shall be furnished in a note on the drawing.

F. Regardless of building construction, it is required to locate all columns from center to center. It is also required to locate interior and exterior walls to column centers. Where construction requires, locate sides of columns to interior and exterior walls, (see Exhibit 1).

G. When drop panels are present, it is required to depict them on the floor plan drawing with equal length dash lines. It is recommended that the length of the dash be approximately 3/16 inch long with a 1/16 inch space between each dash.

11.05 Partitions

A. It is required to locate all present partitions on the body of the drawing. All present partition construction and thickness shall be covered by notes as specified by the following items.

1. Where a floor has a majority of partitions of one type, a note shall be added as such: "All partitions, not cross referenced to a note, are ceiling high partitions 8 inches thick" (see Paragraph 26.00, Note 33)

2. When a partition size and construction differ, a note shall be added for each different type, for example: "Partition shown is a clear glass and metal bank type partition 4 foot high, 3 inches thick" (see Exhibit 1, Paragraph 26.00, Note 30).

3. All planned partitions shall be shown on the drawing with an equal length dash line. A note shall be added as such: "Partitions shown are planned and are shown primarily for engineering purposes." It is recommended that the dash lines be approximately 3/8 inch in length with a 1/16 inch space between each dash (see Exhibit 1 and Paragraph 26.00, Note 29).

11.06 Doors and Windows

A. The location and width of all doors shall be shown. The doors shall be shown open a sufficient amount to indicate the swing of doors. Where there is a possibility of a door interfering with equipment, it is required to show the locating dimensions of the door (see Exhibit 1).

B. Windows shall be shown on the plan view with heavy solid lines. Add a note indicating the top of the window heights (see Exhibit 1 and Paragraph 26.00, Note 6).

11.07 Ceiling Beams, Girders and Drop Panels

A. It is required to include on each floor plan drawing, a plan of the ceiling construction, such as a beam plan, drop panels, etc., and in accordance with the type of construction, a table and a sketch similar to Exhibits 2 and 3. Where two or more drawings are used for the same floor, it is required to show only such data that is applicable to the portion of the building involved. Where building construction differs from that shown on these exhibits, show similar sketches conveying the same type of information.

11.08 Ceiling Insert, Unistrut and Beam Clamp Plans

A. It is required to include on each floor plan drawing a sketch consisting of the entire ceiling insert layout, unistrut layout or beam layout or a particular floor, as required in accordance with the type of building construction involved.

B. It is recommended that the ceiling insert layout be superimposed on the beam plan previously described, when doing so will not cause a lack of clarity. If there is a lack of clarity, then a separate sketch must be made.

C. The layout or plan, whether or not superimposed, shall be constructed on a perimeter basis. For example, the ceiling inserts are shown on the four sides of the building only. They are dimensioned on two sides only at nongrowth ends of the building. If there is a variation in the insert pattern in between the perimeters, show with dimensions all inserts that vary from the normal pattern. This procedure also applies to unistrut and beam clamp plan (see Figure 8).

D. Where two or more floor plan drawings are used for the same floor, show only that portion of the beam and ceiling plan that applies to that portion of the floor plan shown on the particular drawing.

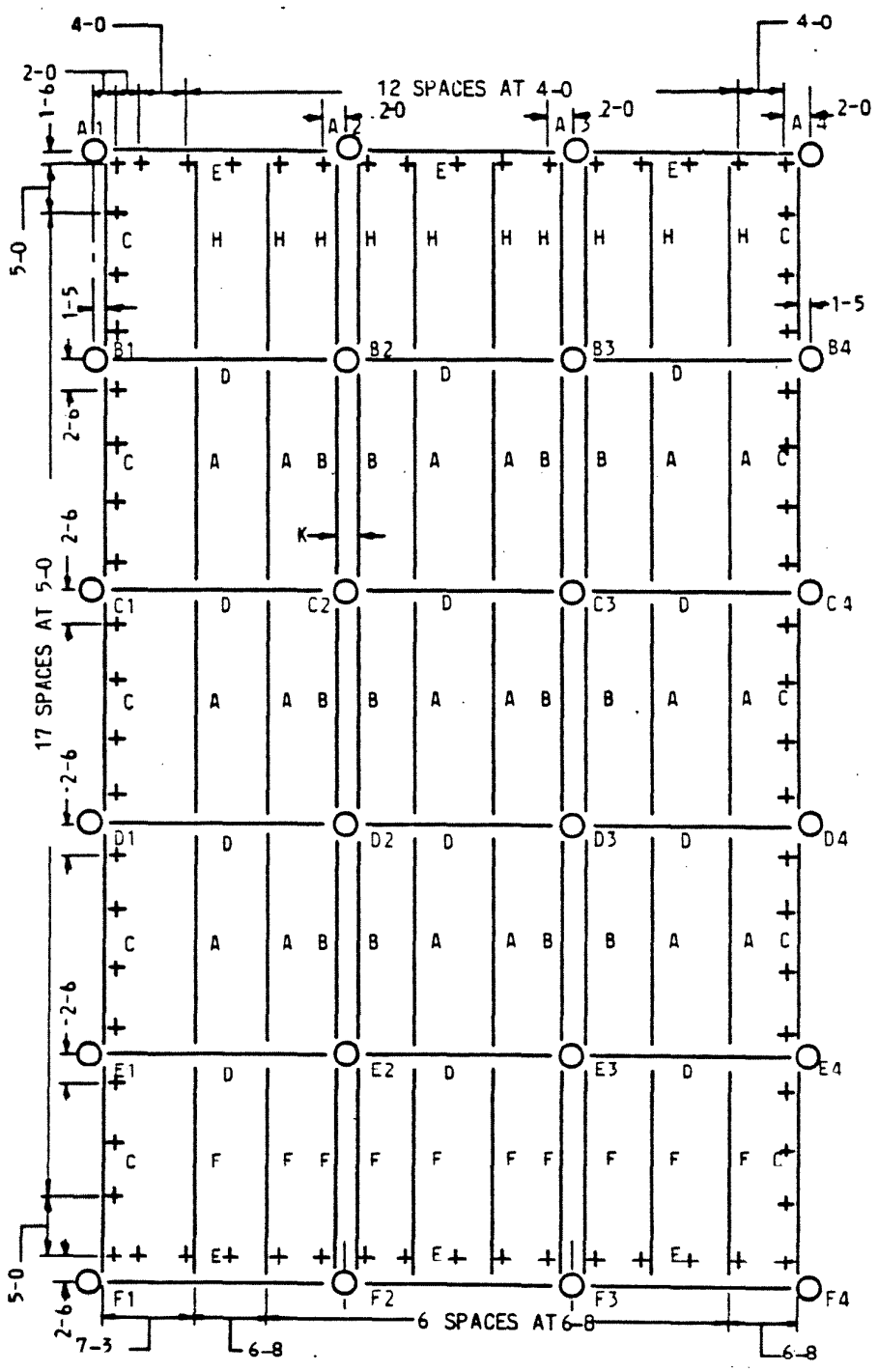


FIGURE 8
RECOMMENDED BEAM AND CEILING INSERT PLAN

11.09 Plot Plan and North Arrow

A. It is required to include on the floor plan drawing a plot plan sketch for all offices except those offices that are at locations where the property and/or building is not owned by U S WEST Communications. The plot plan sketch shall consist of the present building outline, future building growth outline and north arrow. Also, it is recommended to include on the plot plan sketch the location of the building and the perimeter of U S WEST Communications property. It is a requirement to show the location of the equipment entrance, access road, and AC service (including type, locationof service entrance and whether pole mounted or buried). When applicable, it is a requirement to show location of wave guide tower and other related information, (see Figure 9 and Figure 10).

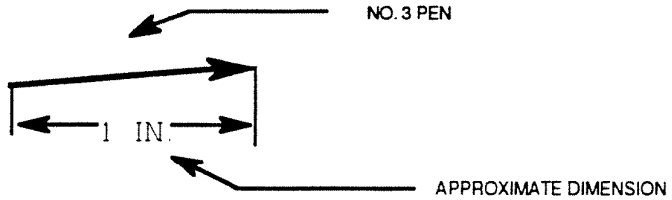


FIGURE 9
RECOMMENDED NORTH ARROW CONSTRUCTION

B. Where two or more drawings are used for the same floor level, the plot plan sketch shall be shown on one drawing only, appropriately cross referenced to the other drawing or drawings. Where multistoried floor plan drawings are involved, show the plot plan sketch on only the first floor or the floor nearest to the first level above ground. Add a note on each floor plan drawing of the building; for example: "Plot Plan for This Building is Shown on T-XXXX-01A" (see Figure10, and Paragraph 26.00 for Notes).

C. When clarity can be maintained, the plot plan sketch may be combined with the beam and/or ceiling insert plan sketch.

D. On floor plan drawings having no plot plan sketch, the north arrow shall be shown on the body of the drawing at the nongrowth end of the building.

11.10 Floor to Ceiling Heights, Ceiling Thickness, Finished Floor to Finished Floor Heights

A. Floor to ceiling heights, ceiling, thickness and finished floor to finished floor heights shall be shown similar to Exhibits 2 and 3, in accordance with the particular type of building construction involved.

B. When unistrut has been provided and has been located below either the ceiling beam or girders, the location and nomenclature of the unistrut shall be shown on the sketch.

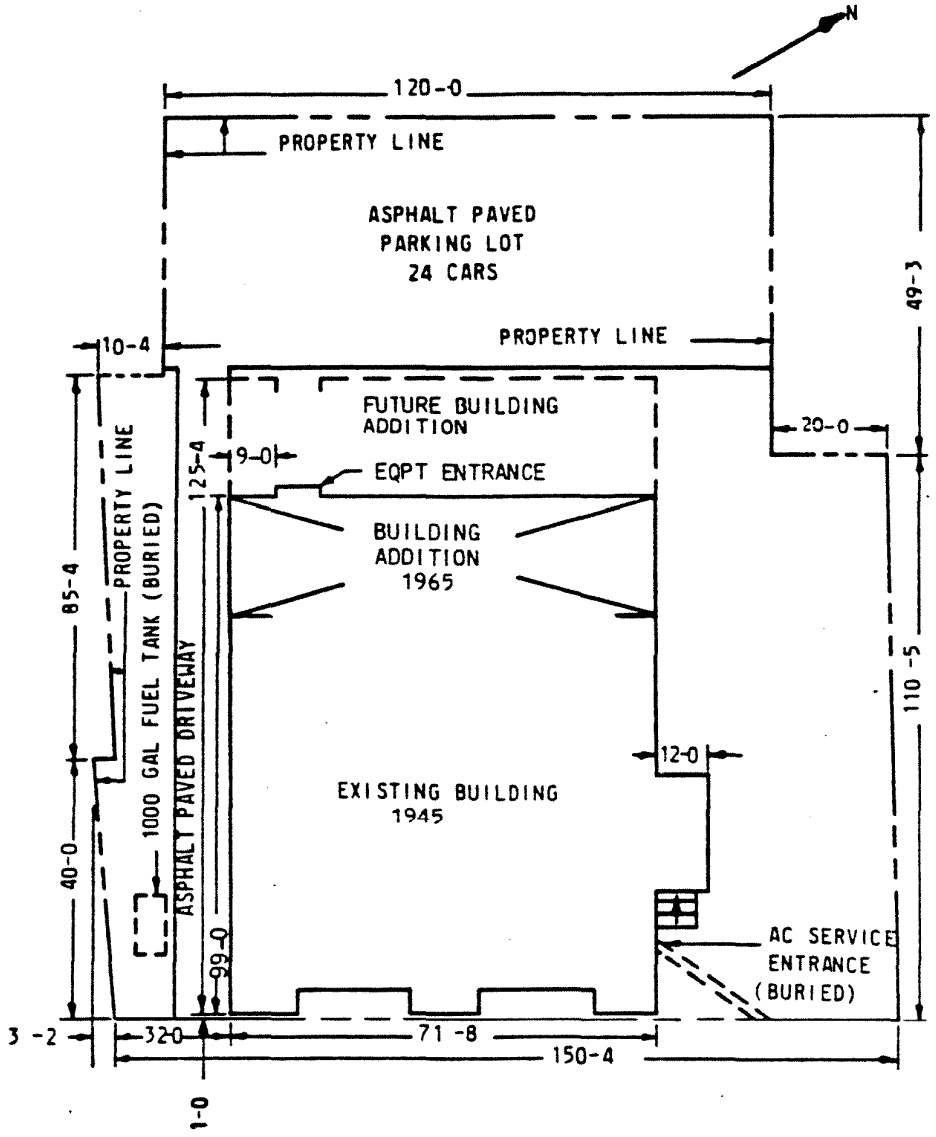


FIGURE 10
RECOMMENDED METHOD OF CONSTRUCTING A PLOT SKETCH

11.11 Skylights

A. Skylights shall be designated and the word "skylight" placed as shown in Figure 11 with equal length dash lines. The size and location shall also be shown. It is recommended that the dash lines be approximately 3/16 inch long with a 1/16 inch space between each dash, (see Figure 11).

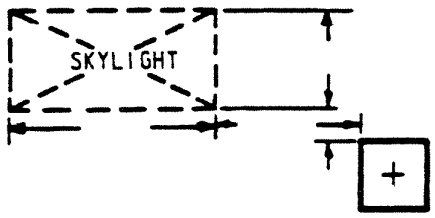


FIGURE 11
ILLUSTRATION OF THE RECOMMENDED SKYLIGHT CONVENTION
AND THE LOCATING DIMENSION REQUIREMENTS

11.12 Building Conduits and Service Pipes

A. The location and outside diameter of all building conduits and service pipes which may cause interference with equipment or cable runs shall be shown. If the pipes run horizontally under the ceiling, the center line of the pipe shall be shown with an equal length dash line and indicate the height above the floor. Exposed pipes running vertically shall be shown by a full circle. It is recommended that the length of the dash to be approximately 1/4 inch in length with a 1/16 inch space between each dash, (see Exhibit 1).

11.13 Miscellaneous Building Details

A. Radiators, (designate only one on each wall line) fire escape exits, cable and pipe ducts, gas engine vents, gas and electric sleeves, electric cut-out boxes, drains in areas and raised platforms on all floor plans shall be shown when the information is available.

B. Drinking fountains, toilet rooms and fixtures, fire apparatus, lockers, dining room tables, etc., may be shown only when shown on the U S WEST Communications study or development plan as mutually agreed necessary by representatives of the affected Equipment Engineering Center and the Detail Engineering Supplier.

11.14 Equipment Entrance Opening

A. The equipment entrance opening shall be identified on the floor plan drawing highlighted as follows: "EQUIPMENT ENTRANCE OPENING
HGT = ___ W =___."

11.15 Reference Lines With Markers

A. It has been advocated by U S WEST Communications that permanent markers be placed in the floors of their buildings to designate the points through which reference lines are to pass. Occasionally, buildings will be encountered where U S WEST Communications uses permanent markers installed in other locations than the floors, i.e., in the walls or on sides of columns.

B. Where permanent markers are indicated on the architect's plans, the reference lines shown on the drawings shall, in general, be located so as to pass through them. A minimum of two reference lines shall be shown to locate equipment. However, additional reference lines may be added as required. In addition, should this practice result in the reference lines being inconveniently located from an installation standpoint, i.e., passing through the centers of the columns, through partitioned rooms, etc., reference lines may be established in an accessible location. The Detail Engineering Supplier should advise the Equipment Engineer as to the reason for the relocation.

C. Permanent markers used for locating reference lines shall be designated with the word "MARKER."

D. For an illustration of permanent markers and reference lines, (see Exhibit 1).

11.16 Reference Lines Without Markers

A. When no permanent markers are shown on the architect's plans, reference lines shall be located as indicated on the U S WEST Communications study plan. However, should these reference lines be inconveniently located from an installation standpoint, i.e., through partioned rooms, etc., auxiliary reference lines shall be established in an accessible location. The Equipment Engineer should be advised by the Detail Engineering Supplier as to the reason for the relocation.

B. Where reference lines are not established, they shall be located from one column center. This column shall be identified on the drawing as a "Key Column." The "Key Column" shall be selected and designated in an initially equipped area, the point of intersection preferably being situated so that the reference lines will, when extended, always be accessible for use on future installations: for example, in aisles between lines of frames; passageways at ends of frames; open space in front of switchboards, etc. When it is impractical to locate them from column centers, they may be located from the inside wall, outside wall or column edge, (see Figure 12).

REFERENCE LINES

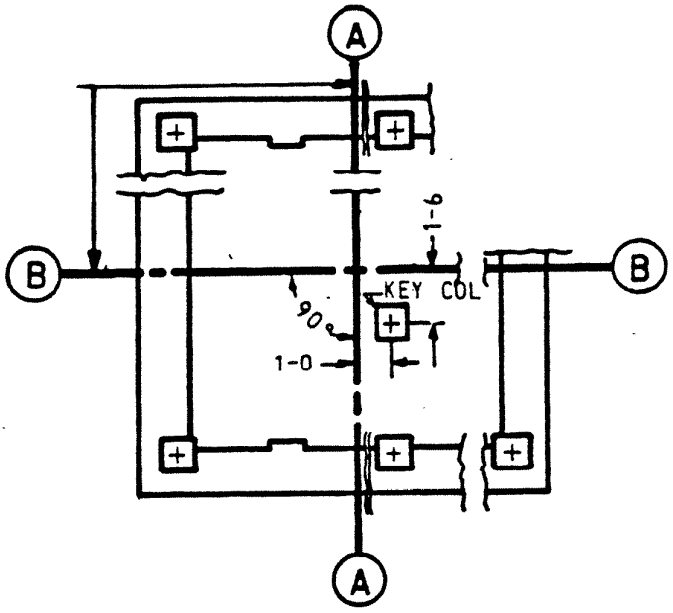


FIGURE 12
METHOD OF ILLUSTRATING AND LOCATING REFERENCE LINES WITHOUT MARKERS

11.17 Reference Lines On Different Floors - It is recommended that the reference lines on the upper floors be placed directly over those on the lower floors and be located from the same points of the building.

11.18 Auxiliary Reference Lines - On installations where two large groups of equipment are widely separated on the same floor or where equipment is located in a separate room, it is recommended that two sets of reference lines be established.

11.19 Dimensions Locating Reference Lines - Where the architect's plans or U S WEST Communications study plans show markers or reference lines dimensioned from columns or other key points, these dimensions shall be shown on the job floor plan drawings.

11.20 Designating Reference Lines

A. It is required to designate reference lines with the word, "REFERENCE LINES." It is recommended that this designation be located at a point as close to the point of their intersection as is convenient, (see Exhibit 1).

B. The letter designations shall be inscribed in 3/8 inch circles at the extremities of each reference line. The same letters shall be used at the opposite ends of each line. Reference lines on each floor shall be assigned letter designations in alphabetical order, starting with the letter A, (see Figures 13 and 14).

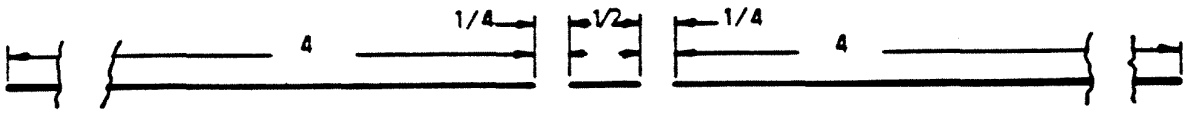


FIGURE 13
RECOMMENDED METHOD OF CONSTRUCTING A REFERENCE LINE

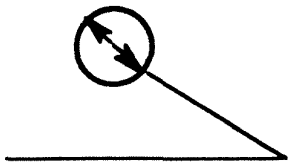


FIGURE 14
METHOD OF CONSTRUCTING A CIRCLE LOCATED AT
EXTREMITIES OF REFERENCE LINES

11.21 Building Walls Not At Right Angles - It is recommended that reference lines be established in all buildings even where the building walls are not at right angels to one another and parallel to the frame lineups. Where this is impractical, they may be established parallel to the walls. In either case, the angle between the reference lines shall be shown.

11.22 Unless there is a deviation in the floor load, floor loading information shall be shown as a "Note Only" on the floor plan drawing illustrating a plot plan sketch. When there are deviations in the floor load, show this information as a "Note" on all floor plan drawings associated with floors having a deviation from the floor load specified on the floor plan drawing with the plot plan sketch (see Paragraph 26.00, Note 23).

12.00 CABLE HOLE, CABLE SLOT AND CABLE SLEEVE

12.01 Locations in General

A. The locations shown on the study plan or architect plans shall be followed whenever possible. When relocation of these holes is desired, Detail Engineering Supplier approval shall be obtained before the relocations occur.

B. Cable holes shall be located to avoid possible interference with obstructions such as beams, girders, vent ducts, service pipes or cable runs at the ceiling below the proposed cable hole location.

C. Cable hole locations shall be at least three inches from a wall or column so that the standard sheathings can be used.

D. Cable holes through which cable runs will pass to a switchboard on a floor below shall be so located as to avoid offsets in the cable runs.

E. Auxiliary cable holes shall be located under a switchboard to avoid interference with the section framework.

F. It is recommended that the construction of partitions and walls be checked before locating cable holes, in order to avoid possible obstructions.

12.02 Cable holes shall be depicted on the floor plan drawing in accordance with the following conventions:

A. Cable holes or cable slots in the floor that are either temporarily filled, plugged or temporarily covered without sheathing and cable holes or slots in the ceiling shall be shown with a dash line. It is recommended that the dash line be 1/8 inch long with a 1/16 inch space (see Paragraph 26.00, Note 19).

B. Present cable holes or portions of cable slots in the floor that are sheathed, and cable holes or slots in the ceiling shown in the same location as the cable hole in the floor shall be shown with a solid line (see Figure 15 and also Paragraph 26.00, Note 18).

C. Whether present, future or planned, cable holes in ceilings shall be shown with a dash line, except as noted in Item B. These cable holes when present, will appear as solid lines on the floor plan drawing of the floor in which these holes have been cut. It is recommended that the dash line be approximately 1/8 inch long with 1/8 space between each dash.

D. Cable holes in ceilings that are added, removed or relocated do not have to be covered in an Issue Note since they will appear on the floor plan drawing of the floor in which these holes have been cut.

E. Cable holes and cable slots that have been located but not cut shall be shown dashed and designated "Planned." This convention shall be used for both ceiling and floor locations. It is recommended that the dash line be approximately 1/8 inch long with a 1/8 inch space between each dash (see Figure 15).

F. Present cable holes, slots and/or sleeves located under existing equipment shall be shown as a dashed line.

12.03 Cable holes and present portions of cable slots shall be designated in accordance with the following items:

A. A Cap Delta symbol " △ " shall be used in place of the term "Cable Hole."

B. The Cap Delta symbol shall be suffixed with a number corresponding to floor level where the cable hole is located.

C. The floor number shall be suffixed with the nearest column designation followed by an Alpha Suffix beginning with the cable hole or present portion of a cable slot to the left of the column (see Figure 15).

D. A definitive note shall be added on the drawing regarding the Cap Delta symbol (see Paragraph 26.00, Note 17).

E. A cable hole shall be shown tapered by placing the letter "T" before the Cap Delta symbol. Add a definitive note similar to Paragraph 26.00, Note 21 (see Figure 15).

F. As far as known, all present, future and planned cable holes shall be designated on the initial issue of the drawing. For example of designating cable holes (see Figure 15).

12.04 Placement of Designations

A. The symbol, numerical and alphabetical designations shall be shown within the convention depicting cable holes and present portions of cable slots where space permits. When the width of the cable hole or cable slot is 10 inches, this width shall be scaled as 12 inches on the drawing. Follow the procedure outlined in Paragraph 2.02, Item B. When widths are less than 10 inches, the designations shall be shown outside the cable hole. This procedure shall be followed for locations in both the floor and ceiling (see Figure 16).

B. When cable holes or present portions of cable slots are vertically aligned, the symbol, numerical and alphabetical designation for both floors shall be shown within the convention. Where space does not permit, show the designation for the cable hole in the ceiling outside the convention (see Figure 15).

12.05 It is a requirement to designate cable slots that are cut and framed, but temporarily filled or covered. This designation may be shown on the drawing in either of two methods:

A. Recommended method is to construct a sketch as exemplified by Figure 16. Add this sketch on the drawing and show only dash lines on the body of the drawing at the slot(s) locations.

B. Designating on the body of the drawing regarding title, size and location may be applied.

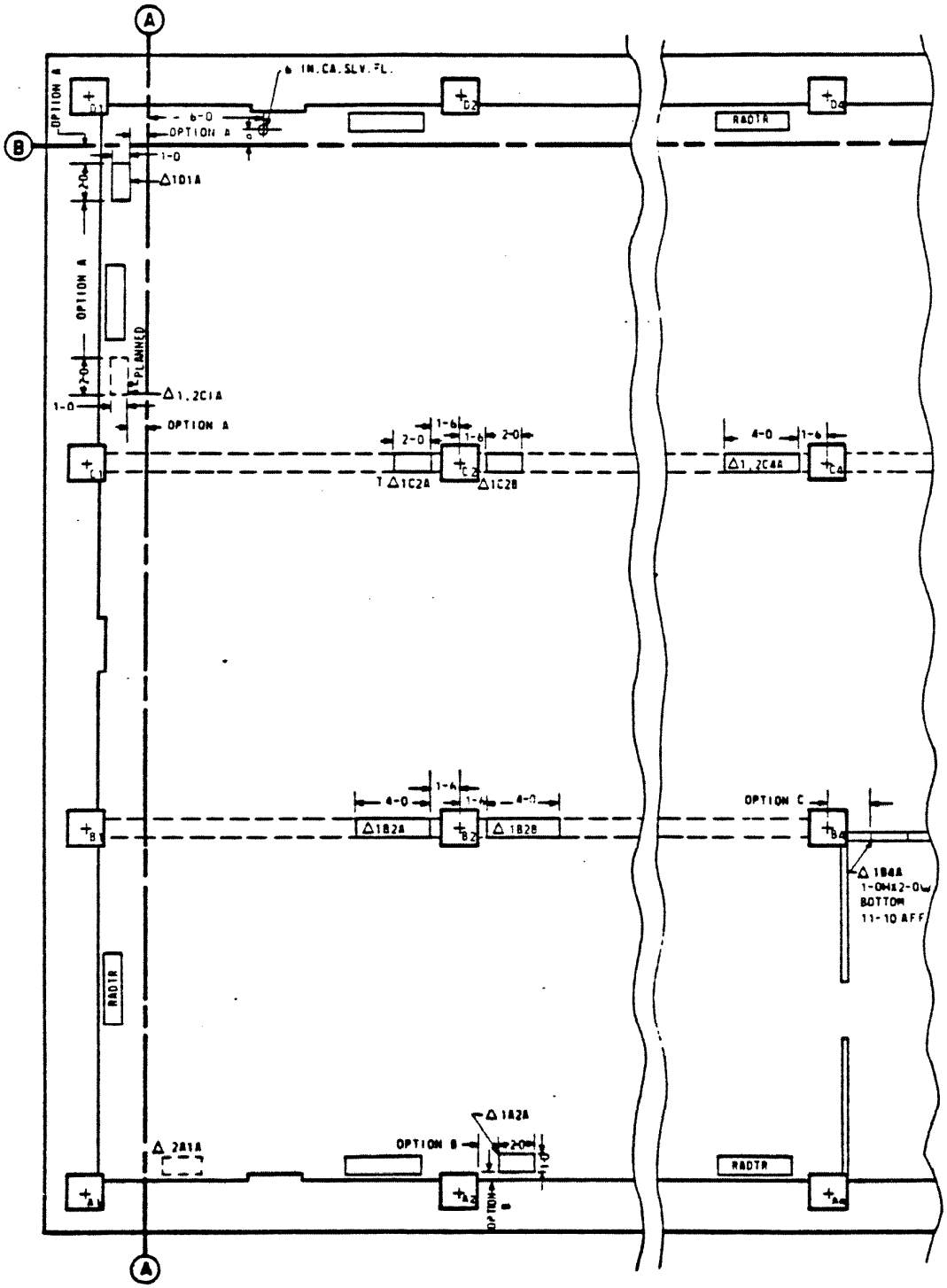
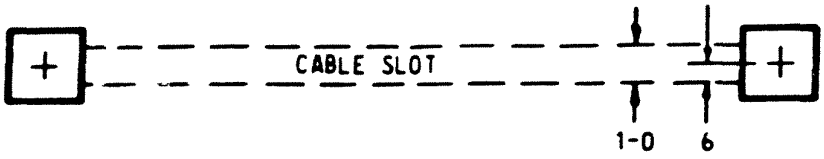


FIGURE 15
METHOD OF LOCATING AND DESIGNATING CABLE HOLES,
CABLE SLEEVES AND CABLE SLOTS



LOCATIONS OF CABLE SLOTS, BOUNDED BY COLUMNS
B1 TO B4 & C1 TO C5

FIGURE 16
RECOMMENDED METHOD OF SHOWING CABLE SLOT LOCATIONS BY SKETCH

12.06 Cable Holes or Slots in Partitions and Walls - Where space permits, the aforementioned designations (TΔ1A2A) shall be shown within the outline of walls or partitions at the location of the cable hole. Where space does not permit, designations shall be shown outside the location of the cable hole.

12.07 Cable Hole Sleeves - A solid line circle shall be shown with the following designation: "3 IN. CA SLV F1" (see Figure 15 and Exhibit 1).

12.08 Cable Hole, Cable Slot and Cable Sleeve Size Indication - Size of cable holes and cable slots may be indicated by either stating the dimension or by showing the width and length dimension at the convention. The former method of indication shall also be applied to cable sleeves (see Figure 15 and Exhibit 1).

12.09 Cable Hole, Cable Slot and Cable Sleeve Locating Procedures

A. Cable holes, cable slots and cable sleeves shall be located from reference lines or from a cable slot or hole previously located from a reference line (see Figure 15, Option A and Figure 16).

B. When it is not possible to locate from reference lines and it is not feasible to establish new reference lines, locate from either edge of columns, walls or from the center line of columns as shown by Figure 15, Options B and C respectively.

C. The locating dimensions shall be shown on the plan view of the drawing. Where a typical cable slot sketch is made, this information may be included in the sketch is made, this information may be included in the sketch covered by paragraph titled "Cable Slots Framed but Temporarily Covered or Filled." See Figure 15 and Exhibit 1 for specific applications.

D. The outline of cable holes shown on floor plan drawings shall agree with the inside dimension of the finished cable hole sheathing.

E. Vertical location for cable holes in partitions and walls shall be shown by placing the information on the body of the drawing with an arrow pointing to the cable hole stating the following: "1A2A 1-OHGT x 2-OW bottom 11-10 above finished floor line" (see Figure 15 and Exhibit 1).

F. The location of cable sleeves shall be shown by quadrisecting the circle, (see Figure 15).

13.00 FLOOR DUCTS OR FLOOR TROUGHS

13.01 Floor ducts or floor troughs, whether exposed or concealed in floors shall be shown on the floor plan drawing. When this information can be clearly distinguished, these ducts or troughs may be shown on the body of the drawing as dashed lines depicting width of duct or trough including the dimension. They shall be accurately located from either an architect plan or engineering information. Utilize the edge of the duct or trough for dimensioning purposes. It is recommended that the dash line be approximately 1/8 inch long with a 3/16 inch space between each dash. If this information cannot be clearly defined on the body of the drawing, a separate single line sketch may be used for this purpose.

13.02 When floor ducts or floor troughs are for internal use only, they too must be shown accurately located if they are placed in either present or future equipment areas.

14.00 EQUIPMENT - ILLUSTRATING AND DIMENSIONING

14.01 Each piece of equipment on the floor plan shall be dimensioned to show width and length as covered by the Equipment/Engineering Supplier's Floor Plan data book. Various assembly drawings or equipment space requirements as related in the following items and paragraphs:

A. It is recommended that dimensions be shown in even inches whenever possible. The use of fractions smaller than a 16th shall be avoided.

B. The widths of aisles and passageways between frames, racks and switchboards shall be as indicated on the Supplier's Floor Plan data sheets.

C. When the dimension of an aisle or passageway space is not being used for locating purposes, the dimension shall be considered approximate and shown in bracket symbol [ ], (see Exhibit 4, Sketch A).

D. It is recommended to keep locating dimensions and aisle space dimensions representing the widths of equipment associated with successive lines of equipment in one line as far as practicable. Follow the same practice for dimensions associated with frames and racks in the same lineup. Individual length dimensions of frames shall be shown as covered in subsequent paragraphs under title ""Requirements For Illustrating Frame Sizes, Numbers and Spaces." Dimensions at the rear of lineups shall be shown only for gaps between existing equipment in the same lineup. Overall length dimensions of existing equipment in lineups or ultimate length dimensions of lineups shall not be shown (see Exhibits 4, 5 and 6).

E. A dimension shall be shown once for each application at the nongrowth end of the building to denote maximum length of space available for a lineup of frames. This space shall allow for standard aisle widths and ladder track cantilevers. This space availability shall not be exceeded unless directed by the Equipment Engineer to do otherwise. This dimension shall be identified with a plus sign as a symbol (+) and a descriptive note, (see Exhibits 4 and Paragraph 26.00, Note 16).

14.02 All equipment shall be located from the reference lines or from some other piece of equipment deriving its location from the reference lines. Exceptions to locating from reference lines may be made in the case of small installations on which wall type distributing frames are used, since in these cases it is usually advantageous to locate all equipment from the distributing frame rather than the outside wall or a reference line. However, where there is a cable hole under a piece of equipment to be located, the locating dimensions shall be shown to the sides of the cable hole, slot and to the center line of the cable sleeve.

14.03 Frames and Racks - The locating dimensions for frames, racks, battery distributing fuse bays, fuse bays, etc., shall be shown to the end and vertical face of the floor angles. Frames and racks having sheet metal bases shall be dimensioned to end of frame and front edge of sheet metal base (guard rail). Locating dimensions shall be shown to center line of universal and unequal flange duct type framework, (see Exhibits 5, 10, Sketch B and the supplier's floor plan data book).

14.04 In general, power equipment shall be located on floor plan drawings in accordance with the Supplier's floor plan data book, standard power arrangement drawings and covered as follows:

A. Battery arrangement on battery stands need not be located or shown on the floor plan drawing.

B. Locating dimensions of motor generator sets shall be shown to the edge of the sub-base on which the machines are mounted. The outline of the sub-base should, in all cases, exclude the projecting lugs on the sides of the sub-base.

C. The following note shall be shown on the drawing when applicable. "Dimensions locating floor mounted machines are shown to the edges of the sub-base disregarding mounting lugs."

D. If a power plant and/or power bay is located in a switchboard lineup, the Engineer will follow Paragraph 14.04.

14.05 Miscellaneous Equipment - Wall or Column Mounted

A. Individual miscellaneous equipment units mounted on walls or columns shall be located on the floor plan drawings if the locating is not shown on a standard drawing that is listed in the job specification for installation purposes.

B. When two or more miscellaneous equipment units, such as code signaling sending devices, fire detection relays, audible signal alarms, call bells, etc., are mounted on the same general area on walls or columns, detailed locating and cabling layout information shall be provided. The locating dimensions and cabling layout may be shown in separate sketches on the job floor plan and cabling plan drawings respectively or combined in one sketch on either drawing. If a combined sketch is provided in one drawing, a suitable note referring to the dimensions or cabling layout shall be placed on the other drawing.

C. Emergency lighting relay distributing cabinets shall be shown and located on the body of the drawing.

15.00 CONVENTIONS, NUMBERING, DESIGNATING AND ILLUSTRATING EQUIPMENT SIZES

15.01 In general, conventions shall be shown for the first frame or rack of a particular type and the remainder shown in block form. However, where some variation exists, or where some clarification is deemed necessary, these conditions will be covered by the Supplier's Floor Plan data book and by the following items:

A. All present equipment shall be shown with solid lines and all future equipment with dashed lines.

B. See Figure 17 for conventions illustrating single and double bay framework, (not including unequal flange and universal cable duct type framework).

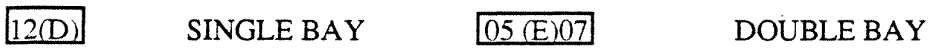


FIGURE 17
SINGLE AND DOUBLE BAY FRAMEWORK CONVENTION

C. Unequal flange cable duct frameworks are illustrated by Figure 18 and Exhibit 5, Sketch B.

D. In addition to the convention illustrated, the length of frame shall be described by adding a letter designation. This letter shall be entered with the appropriate length of frame dimension in Table No. 2 (Figure 19). An asterisk shall be added adjacent to the dimension to indicate 1-10-3/8 unequal flange cable duct type framework. Descriptive notes shall also be added (see Figures 18, 19, 21 and Paragraph 26.00, Notes 12 and 13).

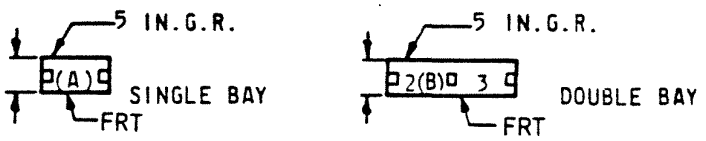


FIGURE 18
UNEQUAL FLANGE SINGLE AND DOUBLE BAY FRAMEWORKS
WITH 2 IN. AND 5 IN. GUARD RAILS

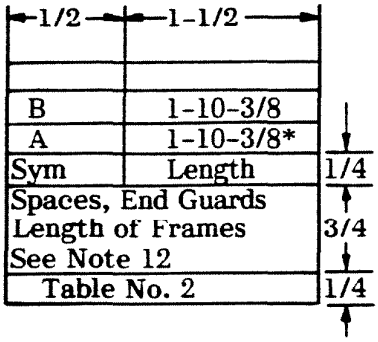


FIGURE 19
TABLE OF SPACES, END GUARDS AND LENGTH OF FRAMES
ILLUSTRATING METHOD OF DISTINGUISHING UNEQUAL
FLANGE FROM UNIVERSAL DUCT FRAMEWORK

E. Universal cable duct frameworks are illustrated by Figures 19, 20, and 21.

SINGLE BAY

FIGURE 20
UNIVERSAL DUCT SINGLE BAY FRAMEWORK

F. Top angles located to the front of duct type framework shall be covered by a Note on the floor plan drawing (see Paragraph 26.00, Note 14). Those top angles located to the rear of duct type framework shall be depicted on the floor plan drawing in a Table, as shown in Figure 21.

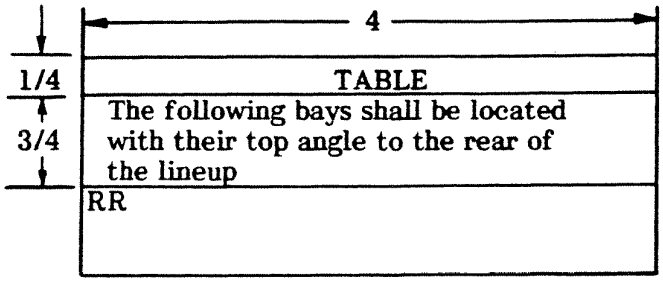


FIGURE 21
TABLE LOCATING TOP ANGLES TO THE REAR ON SPECIFIED FRAMES

G. For convention illustrating mezzanine platform at distributing frames, see Figure 22.

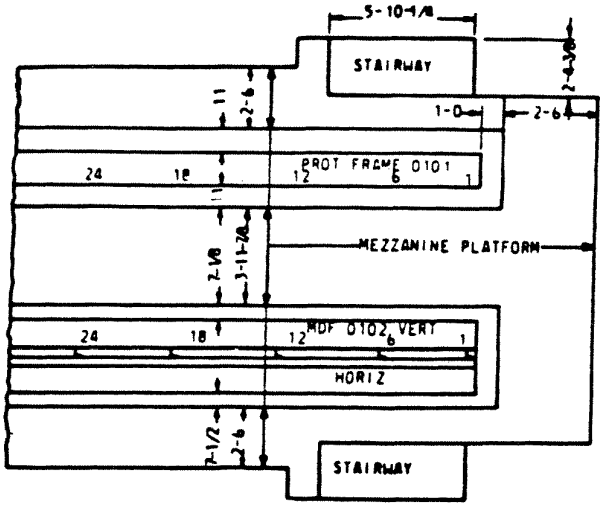


FIGURE 22
METHOD OF ILLUSTRATING A MEZZANINE PLATFORM
AT PROTECTOR AND MAIN DISTRIBUTING FRAME

H. In Electronic Switching Offices, the respective control groups shall be indicated by preceding the frame designations with the appropriate alphanumeric in parenthesis. An explanatory note shall be added on the drawing (see Exhibit 6 and Paragraph 26.00, Note 25).

I. Appropriate length of frame lettering shall also be applied to power board, rectifier, etc., lineups.

16.00 EQUIPMENT NUMBERING PLANS

16.01 The following numbering system shall be applied to equipment racks, relay racks, fuse bay frames, distributing frames, power boards, rectifiers, cabinets, etc., in accordance with the following:

Lineup numbers for all floors shall consist of four numbers beginning with the number 0101. Reading from left to right, the first two digits signify the floor number:

1ST FL-01

The second two digits signify the first lineup on the floor:

FL Line No.

01 01.

These lineup numbers can be assigned on a particular floor per the following examples:

1st Floor 0101.	To 10099.	Or Higher
2nd Floor 0201.	To 02199.	Or Higher
10th Floor 1001.	To 10199.	Or Higher

NOTES:

1. When lineups are expected to exceed 99, the first lineup shall be numbered 01001.

2. The above numbers do not include the particular relay rack number. Add relay rack numbers as follows:

   First Floor 1st Lineup 1st Rel. Rk.

   01 01 .01

   Consequently, the first lineup on the first floor can be numbered 0101.01 to 0101.99. Consider bays separated by a column, desks or other frames as being in the same lineup.

16.02 Fuse bays and battery distribution fuse bays shall be designated as such and numbered in accordance with the relay rack number for the position it occupies in a lineup.

16.03 In cases where a second building is added adjacent to an existing building and existing lineups will be extended to the second building, complete the lineups with the existing numbering system. Four digit lineup numbers shall be assigned to new lineups in new areas in an existing building, and also to the new lineups in the added building. If the future lineups in the new area of the existing building have been preassigned three digit lineup numbers, they shall be converted to four digit lineup numbers by adding the appropriate prefix digit in accordance with the preceding information.

16.04 When it is necessary to add a lineup in a location where a lineup number has not been reserved, and a number cannot be assigned in proper numerical sequence because of present adjacent lineups, a letter suffix beginning with the letter A shall be added to the lowest numbered adjacent lineup, as shown in the following:

A. Existing adjacent lineup numbered 0105 and 0106 assign 1015A as a new lineup number.

B. Existing adjacent lineup numbered 108 and 109 assign 108A as the lineup number.

16.05 In those offices where the floors are completely underground, the following shall apply:

A. 1st level below surface, ultimates 0001.01 to 00199.99 and Higher

FL	Lineup	Rel. Rk.
00	01	.01 identifies RR 0001.01.

B. 2nd level below surface, 0A01.01 to 0A199.99

FL	Lineup	Rel. Rk.
00	01	.01 identifies RR 0A01.01.

C. 3rd level below surface, 0B01.01 to 0B199.99

16.06 In new #5 X-Bar Offices, TRK relay rack lineups shall be assigned four digit lineup numbers in agreement with the four digit lineup numbers which are subsequently described. However, retain all the odd numbered bays in a lineup on one side of the aisle and all the even bays in a lineup on the opposite side of the aisle as presently applied.

16.07 Power Board Numbering

A. Each lineup of Power Boards shall be given a lineup and frame number in accordance with the system of numbering of relay racks as related in previous paragraphs. Refer to the following example. Power Boards, however, shall not be assigned the same lineup number as a relay rack lineup, except when Power Boards are integrated in a lineup with a RR/Switch Frame.

B. When Power Boards are integrated, they can then be assigned the same lineup number as the respective RR/Switch lineup number and assume the bay or position number in accordance with its location in the lineup as a RR/Switch frame bay would be assigned if it were in that location. The following number arrangement shall apply to all office regardless of system:

Power Board bay 0101.01; 01 1st floor; 0101
1st floor and 1st lineup; 0101.01 1st floor,
1st lineup, 1st bay

C. Power and Lighting distribution service cabinets shall also adhere to the numbering system outlined in the preceding paragraph as follows:

1st Unit	1st Floor
01.	0101.

EXAMPLE: Pwr Distn Srv Cab 0101; 1st Fl 1st Unit.
Pwr Distn Srv Cab 0102: 1st Fl 2nd Unit.

16.08 Rectifier bays, whether located in a power board lineup as a separate rectifier lineup or as isolated bays, shall be assigned lineup and bay numbers. These numbers shall be assigned utilizing the same system applied to power board lineups and as covered by the following items. Rectifier bays, however, shall not be assigned the same lineup number as a relay rack lineup.

A. When rectifiers are located in the same lineup as power boards, they shall retain a common lineup number and the proper bay number in accordance with their location in the line.

B. When rectifiers are located in their own lineup, a separate lineup number shall be assigned, preferably the next available, after power board lineups have been assigned.

EXAMPLE: Power Board line 0101.01 signifying first floor, first lineup and first bay. Rectifier line 0102.01, signifying first floor, second lineup and first bay.

C. When rectifiers are located randomly on an isolated basis, lineup and bay numbers shall be assigned in accordance with the sequence described by the preceding item.

EXAMPLE: Pwr Bd Line 0101.01 to 10
Rectifier bay 0102.01
Rectifier bay 0103.01
Rectifier bays 0104.01 to 03

D. When rectifier bays are in line and motor generator sets are located in between the rectifier bays, a common lineup number shall be assigned to these rectifier bays.

E. When the new smaller rectifier bays are added in existing as well as new offices, these rectifiers are arranged to go back-to-back with older (deeper) single sided lineups. The engineer will provide lineup numbering in accordance with Paragraph 16.04 for their arrangement.

16.09 Switchboards shall be numbered in accordance with the previously related information per the following:

1st Line of Switchboard	1st Floor
01	01 01

EXAMPLE: 0101 denotes First Floor First Line of Switchboard
0102 denotes First Floor Second Line of Switchboard

16.10 Distributing frames shall be numbered in accordance with the following illustration:

Distributing Frame Numbering

For Floor	1st Bldg					2nd Bldg.			
1	MDF	0101	IDF	0102	TDF	0103	MDF	0104	Etc.
2	CDF	0201	TDF	0202	TRDF	0203	IDF	0204	Etc.
10	CDF	1001	TDF	1002	ADF	1003	IDF	1004	Etc.

If MDF is designated unit -1, etc., on 1st floor, the designation can be changed to "MDF 1014" to correspond with consecutive numbering of other distributing frames on the same floor (see Exhibit 7, Sketches A through D).

17.00 AISLE NUMBERS

17.01 For the purpose of designating numbers, it is necessary to define and establish the type of aisle that requires a number assignment. The following describes those aisles that shall be assigned a number. Subsequent paragraphs will provide instructions regarding the numbers and sequencing of numbers to be assigned.

A. All aisles parallel to and at the front of the facing lineups.

B. All aisles parallel to and at the front of a single lineup, regardless of what else the line faces.

C. Aisles at Distributing Frames when Distributing Frame is parallel to and opposite either the front or rear of the lineup of frames.

17.02 Aisle numbers shall be initiated and arranged as specified in the floor plan data book for each particular type of office.

17.03 Four digit aisle numbers shall be assigned at all times for all types of offices, regardless of floor plan data information. The fourth digit is added by assigning two numbers to the floor designation. The floor designation numbers, however, shall not be shown on the designation cards that are located on the end guards as follows:

EXAMPLE:

1st Floor	Aisle One
01	01

18.00 EQUIPMENT - DESIGNATION

18.01 The type of equipment shall be shown on the floor plan drawing as covered in the Equipment and/or Engineering Supplier Floor Plan data book.

18.02 It is recommended that such information as radio route identification, radio channel numbers, "L" carrier tube designation, designation of Multiplex bays (T of R and T1, T2, T3, etc.), and when applicable, the association of radio equipment with 100A-200A switching shall also be shown on the floor plan drawing. Show this information on the body of the drawing, at the front and/or rear of the frame or lineup as space permits. However, where space does not permit, place this information in tabular form on the respective floor plan where the frames are shown.

18.03 Front of Lineup

A. The front of all lineups shall be indicated. This may be done with a note or a combination of a note and designation as follows:

Add the note: Unless otherwise shown, the front of lineups are indicated by the locating dimension arrows that have been placed to the front of the lineups (see Paragraph 26.00, Note 25).

B. When all the fronts of lineups are not clearly indicated by the dimension arrows, those lineups that are not indicated shall have their fronts indicated by the designation "Front" and an arrowhead symbol located in the main and/or end aisles.

18.04 Arbitrary letter symbols, excluding I and O, depicting length of frame dimensions shall be used as follows: (A), (B), (C), --- (AA), (BB), (AC), ---, etc. Where possible, the smallest width frame on the drawing shall use the (A) with the next larger sizes using (B), (C), ---, etc. The symbols shall be shown in parenthesis. In single bays, when viewing the drawing, the symbol shall be located to the right of and centered with the frame number. Double bays shall contain both bay numbers and the frame size symbol. Reference to the symbols shall appear in tabular form (see Exhibits D, E and F). When the only frame or last frame of a particular dimension is being removed from the office, it is not necessary to remove the associated letter and dimension from Table No. 2 unless the space is required in the table for other information that is not otherwise available.

18.05 Frame Designation or Name

A. The frame designation or name shall be shown outside the frame convention at the front side of the frame. When a group of identical type frames, either single or double duct type framework, dial type frames or single or double bay relay rack are in the same lineup or grouping, the frame designation need only be shown once, centered approximately in the middle of the lineup or grouping. Coordinate these procedures with those covered in paragraphs listed under the title "Requirements for Illustrating Frame Sizes, Numbers and Spaces" (see Exhibits 4 and 5).

B. In order to insure clarity, certain large dial type frames consisting of three or more frameworks, such as ITI and TCI frames in 4A toll offices, shall have the frame name or designation, including the length of frame symbol shown within the frame convention of the first and last frame of a type in the same lineup or group. This procedure can only be applied after detail dimensioning the first frame complex of each type as covered in subsequent paragraph under "Requirements for Illustrating Frame Sizes, Numbers and Spaces" (see Exhibits 4, 5 and 6).

C. For identification purposes, a relay rack with four or more fuse panels shall be designated as a fuse bay while a relay rack bay with less than four fuse panels shall be designated as a relay rack.

18.06 Key cabinets, whether mounted on desks, walls or columns, shall be identified with the designation KC, suffixed by a numeral (or numerals) to indicate floor level and letters A, B, C, etc., to differentiate between cabinets on the same floor. For example, KC-01A, KD-01B, KC-02A, KC-02B, KC-03A, KC-03B for a 1, 2 or 3 floor building identity.

19.00 ILLUSTRATING FRAME SIZES, NUMBERS AND SPACES

19.01 When illustrating a lineup of present frames, a frame number shall be shown and the letter signifying frame length at the first and last frame (see Exhibit 5).

19.02 When a lineup extends six or more present frames of the same size, the number of frames numbered 5, 10, 15, 20 and 25, etc., shall be added as required in accordance with the length of the lineup in addition to the first and last frame requirement. Frame sizes are not required for the intermediate numbered frames as long as they are of the same length (see Exhibit 5, Sketch A).

19.03 A Lineup of present double bay frameworks shall generally adhere to preceding instructions for single bay frameworks except intermediate numbered frames shall be 9-10, 19-20 as required in accordance with the length of the lineup (see Exhibit 5, Sketch A).

19.04 In a #5 X-Bar Office, single bay framework lineups shall be numbered as follows:

Even lineups 00, 10, 20, 30, etc.

Odd lineups 01, 11, 21, 31, etc.

Double bay framework lineups shall be numbered as follows:

00-02, 20-22, 40-42, etc.

19.05 When a lineup consists of present frames of different lengths, the instructions related in the previous paragraphs for each size frame shall be applied (see Exhibits 4 and 5).

19.06 A lineup consisting of frames of different lengths with spaces for future frames shall adhere to all the previously stated instructions. In addition, show the first and last future frames and their number and length symbols. It is required that the future frames in between be indicated with dotted lines. Add a dimension for the future space (see Exhibit 5, lineups 0110 and 0111).

19.07 Future lineups shall be illustrated by the instructions previously stated for future frames in a present lineup. However, when not reasonably sure of the frames ultimately required, only dotted lines representing the ultimate length of lineup, with no further detail other than location and lineup number, shall be shown (see Exhibit 5, lineups 0143 and 0144).

19.08 The predominant width of frames, front to rear dimension, shall be shown in a note. Deviations from this common width shall be shown on the body of the drawing (see Paragraph 26.00, Note 8 and Exhibits 4, 5 and 6).

19.09 SPCS, switching or dial type frames, shall also be governed by the preceding instructions. However, frames of this type consisting of two or more frameworks shall detail dimension on the first frame of a type. This detail shall include individual dimensions of each component framework and an overall dimension of the entire frame. Subsequent frames shall only show the designation, frame number and overall length symbol in accordance with previous instructions (see Exhibits 4 and 6).

19.10 End guards are uniquely identified for SPCS frames only in accordance with Exhibit 6 unless otherwise specified by Equipment and/or Engineering Supplier.

19.11 If mostly identical, the standard space between frames shall not be shown on the body of the drawing, but entered as a note (see Paragraph 26.00, Note 4).

19.12 Those spaces between frames that deviate from the standard 1/8, 1/16 inch spacing between frames due to cable build up on the upright, etc., shall be assigned a letter signifying the dimension in Table No. 2. This letter shall be placed on the body of the drawing. This procedure shall also be followed for spaces between end guards and end bays, and followed for spaces between end guards and end bays and for end guard sizes, when end guards are shown on the plan view, such as in electronic switching offices (see Exhibits 4, 5 and 6).

19.13 In order to clarify the application of the various dimensions shown in Table No. 2, an S letter suffix to the dimension for a space between frames and an E letter suffix to the dimension showing an end guard size shall be shown. A descriptive note shall be added (see Exhibits 4, 5, 6 and Paragraph 26.00, Note 24).

19.14 Frame clearances at columns, for those frames located in column lines, may be specified as a note when the distance is mostly identical. Deviations must be shown on body of drawing (see Paragraph 26.00, Note 10).

19.15 Present and future verticals of distribution frames shall be numbered and designated in accordance with the following items (see Exhibit 1, Sketch K):

A. It is recommended that common system distributing frames be numbered by showing a number for the first and last vertical and intermediately in multiples of six verticals. Frames having a three vertical to four horizontal ratio shall include a horizontal number corresponding to the location of the vertical number shown (see Exhibit 7, Sketches B, C and D).

B. SPCS type distributing frames shall be numbered and lettered by the appropriate modules. The numbering and length of the first, last and alternate intermediate modules shall be identified (see Exhibit 7, Sketch A and Exhibit 6).

19.16 Where Miscellaneous Toll Relay Racks are installed with switching equipment, the aisle number and odd or even numbering shall be used for the Relay Rack number.

20.00 <u>LOCATING AND ILLUSTRATING FIRE DETECTION ZONES</u>

20.01 When required by the Building Engineer, Equipment Engineer or the Detail Engineer, fire detection zones shall be located and numbered on the floor plan drawing in tabular form. The table shall be added on the floor plan drawing as shown in Figure 23. Zone locations shall be identified by column boundaries, and include lineup and frame numbers when clarification is necessary to clearly delineate zones.

	← 1 →	← 3 →	← 2-1/4 →
	1-4	A3 TO A6, B3 TO B6, C3 TO C6, D3 TO D6	0145 TO 0150
	1-3	C1, C2, C3 & D1, D2, D3	0112 TO 0117
	1-2	B1, B2, B3 & C1, C2, C3	0106 TO 0111
1/4	1-1	A1, A2, A3 & B1, B2, B3	0101 TO 0105
1/2	**Zone No.**	**Area Bounded by Columns**	**Including Lineup and/or Frame Nos.**
1/4	TABLE NO. 4		

FIGURE 23
TABLE FOR ILLUSTRATING FIRE DETECTION ZONE LOCATIONS

21.00 <u>TABULAR PRESENTATION OF EQUIPMENT ON END GUARDS OR IN MAIN AISLES</u>

21.01 DPTS, SDPTS, Group T.S., fuse holders, aisle pilots, plug holders, cord hooks, pin straighteners and other equipment that mounts on end guards or must be shown in the main aisle, excluding main aisle pilots, shall be shown in tabular form, associated with the location where it mounts (see Figure 24).

21.02 Existing Table No. 3 formats showed GRP T.S. in the column where the asterisk is now shown. This format may be retained until such time that both grouping and alarm T.S. must be shown, then the existing table shall be made to conform to Figure 24.

21.03 For all offices formerly affected by CRMS, Table No. 3 in Figure 24 is no longer required on floor plan drawings, since the equipment is uniquely coded as symbolic notations on the body of the drawings with accompanying corresponding notes.

				1/2	1-3/4	1/2	2-1/2
					KS5534L5	1	1 to 12(0134 LINE)
			A				In Main Aisle Near Bay 0110.01
			G				Location Cable Rack Near Fut Bay 0105.01
1/4					(11A)		0101.01
1/2	Sec	Pri	*	Hldr (Plug 50A)	F. Hldr (Type)	Aisle Pilot Mtg	Location
1/4							
1/4	EQUIPMENT MTD ON END GUARD OR IN MAIN AISLE						
1/4	(* G-GROUPING T.S. * A-ALARM T.S.) TABLE NO. 3						

FIGURE 24
EQUIPMENT MOUNTED ON END GUARDS AND/OR IN MAIN AISLE

21.04 For offices that are digitized, equipment may be shown either in the body of the drawing as coded in Exhibit 9, or in Table No. 3 (Figure 25), depending upon the congestion of the drawing.

EXCEPTION: For SPCS offices only, the aisle pilots mounted in the end guards will be shown in Table No. 3 as shown below in Figure 25.

TABLE NO. 3			
Equipment			Location
Main Aisle Pilot	Aisle Pilot	Aisle No.	
	1	0100	End Gd C
	2	0101	End Gd A, B
	2	0102	End Gd A, B

FIGURE 25
TYPICAL EQUIPMENT AISLE PILOT DESIGNATIONS

22.00 TABLE OF EQUIPMENT ADDED ON FLOOR PLAN DRAWINGS

22.01 After the initial installation, the floor plan drawings should reflect a full history of all "added", "removed", "relocated" and "retired in place" floor mounted equipment. Relocations that invoke a change in the numbering of a bay or frame should be considered as "removed" and "added". This history is recorded in tabular format on the floor plan drawing. The table is referred to as Table No. 1 and shall be shown on each new floor plan drawing to cover the above listed changes. The drafting organization has the responsibility for completing Table No. 1 on floor plan drawings. The Detail Engineering Supplier shall forward sufficient information to enable the drafting organization to fulfill this responsibility in a complete and accurate manner (see Figure 26).

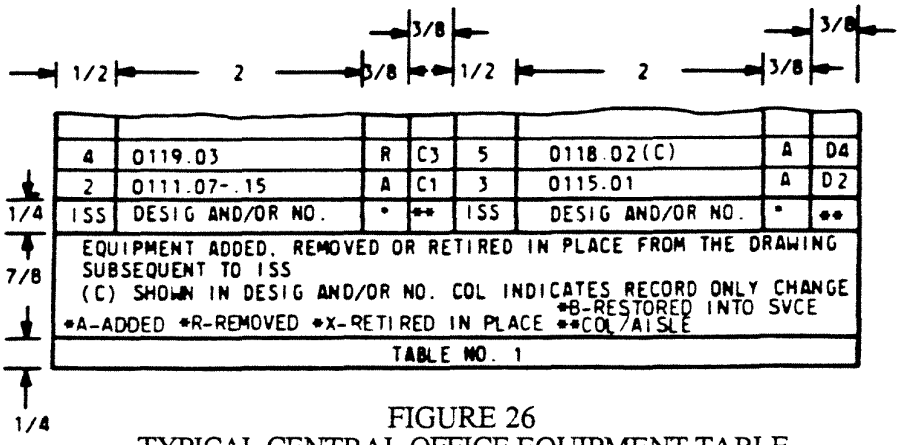


FIGURE 26
TYPICAL CENTRAL OFFICE EQUIPMENT TABLE

22.02 Initial installations, however, may be comprised of one or more orders. When there is only one order associated with an initial installation, no record of the frames is shown in Table No. 1. These practices are also followed when there is more than one order associated with an initial installation and the order associated with Issue 1 furnishes the largest number of frames. When, however, there is more than one order associated with the initial installation and the largest number of frames is furnished on an order that is not associated with Issue 1, the following practices shall be applied.

A. Select the issue assigned to one of the initial installation orders, that orders the greatest number of frames and consider this issue as a designated Issue 1. All frames furnished on this designated Issue 1 order need not be recorded in Table No. 1.

B. The issue of the selected order shall be shown in the base of Table No. 1 with a numeral one enclosed in parenthesis adjacent to the selected order issue. This is to show that this issue is the designated Issue 1 in accordance with the following example: "Equipment added, removed or retired in place from this drawing subsequent to Issue 3(1)."

C. Frames furnished on the other orders associated with the initial installation not designated Issue 1, as described in the preceding paragraph, shall be recorded in Table No. 1.

D. If there are several orders on an initial installation and the higher numbered issue is designated Issue 1 as shown in the preceding example Issue 3(1), frames associated with the lower number issues shall be recorded in Table No. 1 and the following information shall be shown in the base of Table No. 1.

> Equipment added, removed or retired in place from this drawing subsequent to Issue 3(1). Issues 1 and 2 added frames as they appear in the table.

E. In order to accommodate the preceding practices, the base of Table No. 1 has been modified in accordance with Figure 27. This new table base shall only be applied on new offices or large building additions requiring a new Table No. 1 and when a designated Issue 1 is required.

22.03 Entries shall be placed in Table No. 1 by beginning at the left and then continuing by completing both sides as equally as possible per issue with information required for each order.

22.04 Except as noted in the following Paragraph 22.05 for all issues added to existing floor plan drawings, Table No. 1 shall be modified to apply the new format shown in Figure 26. See Figure 28 for an example of a modified table applying the new format to an existing table.

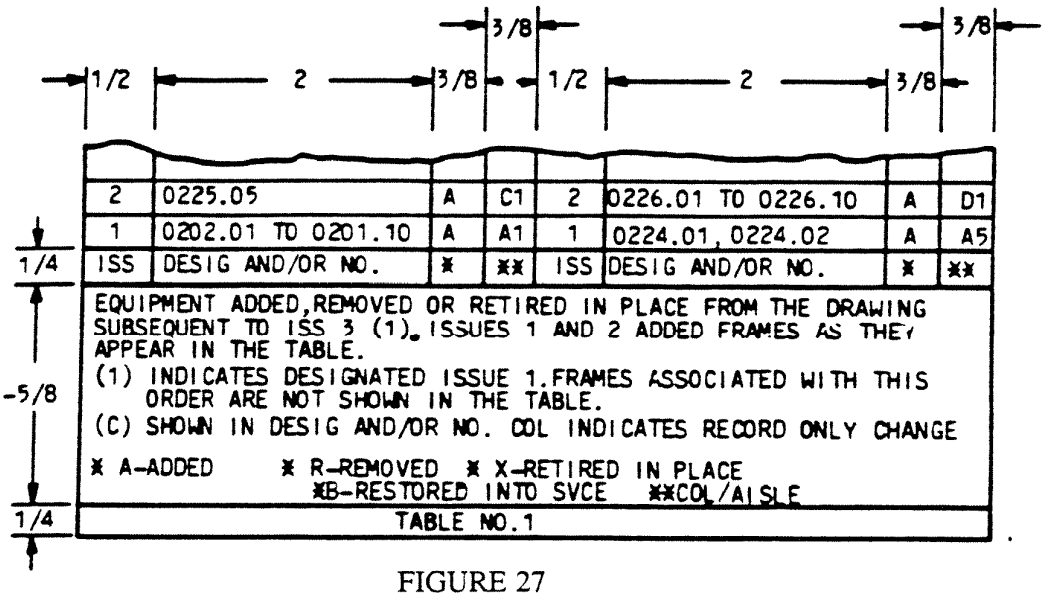


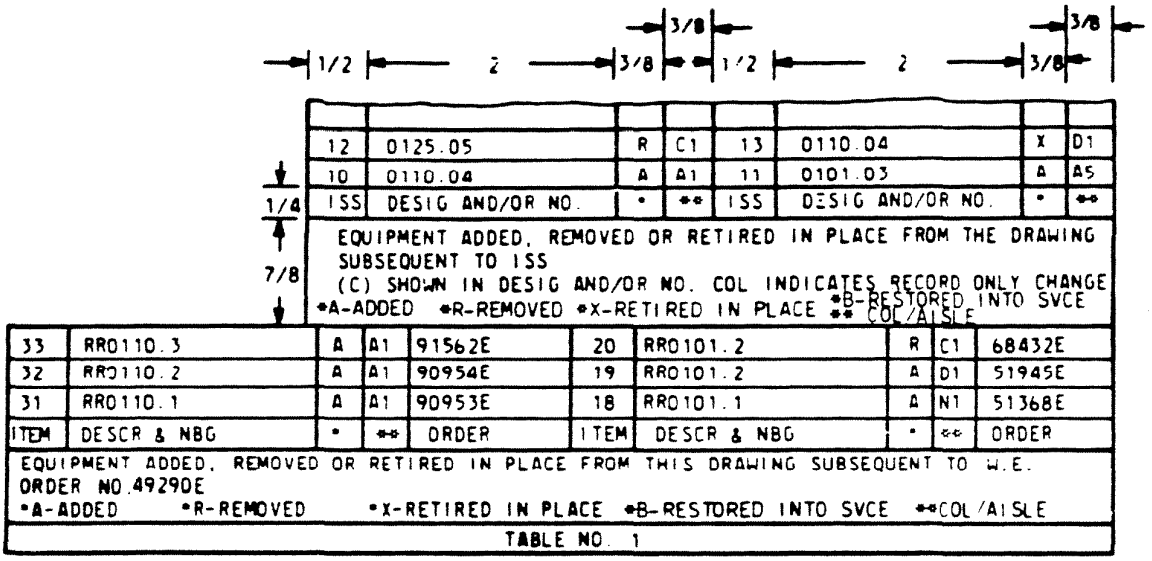
FIGURE 27
BASE OF TABLE NO. 1 MODIFIED TO
DESCRIBE DESIGNATED ISSUE 1

22.05 The modification of Table No. 1, as specified and exemplified by the preceding Paragraphs (22.04), may not be applied if the lines of the existing table were previously drawn and there is space remaining within these lines for additional information. It is also not required to show the order number if the issue number appears in the existing table.

A. If the existing Table No. 1 format still retains the item number column and there are previously drawn lines with space as described in the preceding paragraph, it is not required to apply the new format if the following modification is made to the table. On the line above the last entry, the designation "issue" shall be added in the item number column and all other vertical lines shall be deleted within this line. Entries into these modified tables are not required to include the order number.

B. When the line spaces have been filled, and the existing table must be extended, the extension for both types of modified tables shall conform to the new format shown in Figures 26 and 28.

C. Before completing the table in the existing old format, careful consideration shall be given to the possible use of the space that would be made available by an immediate conversion to the new format.



12	0125.05	R	C1	13	0110.04	X	D1		
10	0110.04	A	A1	11	0101.03	A	A5		
ISS	DESIG AND/OR NO.	*	**	ISS	DESIG AND/OR NO.	*	**		
33	RR0110.3	A	A1	91562E	20	RR0101.2	R	C1	68432E
32	RR0110.2	A	A1	90954E	19	RR0101.2	A	D1	51945E
31	RR0110.1	A	A1	90953E	18	RR0101.1	A	N1	51368E
ITEM	DESCR & NBG	*	**	ORDER	ITEM	DESCR & NBG	*	**	ORDER

FIGURE 28
MODIFICATION OF TABLE NO. 1 TO CONVERT TO ISSUE AND ENGINEERING ORDER, AUTHORITY OR PROJECT NO. ENTRY.

22.06 When frames of equipment are retired in place, identify this equipment in Table No. 1 as illustrated in Figure 28. Show this information on the body of the drawing by lining out the frame designation and adding the letters RIP. Add a note stating that RIP denotes Frame of Equipment Retired in Place, (see Paragraph 26.00, Note 32 and Figure 29).

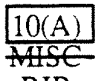


FIGURE 29
FRAME OF EQUIPMENT RETIRED IN PLACE

23.00 EMERGENCY LIGHTING EQUIPMENT LOCATION

23.01 Emergency lighting equipment shall be shown on floor plan drawings only when either of the following two conditions prevail:

A. Emergency lighting equipment shall be shown on the floor plan drawing when there is no lighting drawing being originated to record the area of the floor where the emergency lights are located.

B. Emergency lighting equipment shall also be shown on the floor plan drawing when the emergency lights are considered part of the building construction and are furnished and installed by the building contractor.

24.00 SYMBOLS

24.01 When symbology is appropriate, the symbols shown herein shall be used to depict fire apparatus, electrical equipment, etc., at all times regardless of the symbol shown on the engineering input drawings (Study Plans, Development Plans, Architect's Plans, etc.). Discrepancies resulting from engineering marked prints that have symbology deviating from symbols shown herein require resolution between the Drafting Supplier and the Detail Engineering Supplier.

24.02 Symbols for equipment commonly required on floor plan drawing are shown in Exhibit I. Symbols used should be uniform in size and shape to accommodate 1/8 inch lettering on 1/4 inch = 1 foot scale.

24.03 Symbols as such need not be applied to cabinets, control panels, annunciators when there is only one of a kind on each floor. In these cases, show the rectangle or square actual size in accordance with scale used on the drawing and label the item on the body of the drawing; In Pyr-A-Larm system, for example, use Figure 30.

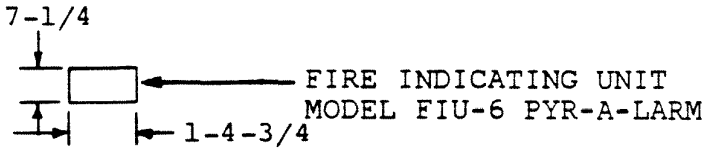


FIGURE 30
EXAMPLE IDENTIFYING ONE OF A KIND CABINET
ON EACH CENTRAL OFFICE FLOOR

25.00 NOTES

25.01 Show only those notes numbered 1 and up as required that are applicable to the particular floor plan drawing, (see Paragraph 26.00 for typical notes).

A. Note 1 shall always consist of the following type of information.

EXAMPLE: Made from U S WEST Communications development plan No. ____, Issue ____, Date ____ and Architect's Plan No. ____, Issue ____, and Date ____.

B. When applicable, Note 2 shall consist of the following type information "Plot plan for this building is shown on T-XXXX-XXX" (see Paragraph 26.00, Note 34).

26.00 NOTES AND SYMBOLS

1. DIMENSIONS OF CABLE HOLES ARE TO BE INSIDE OF THE FINISHED CABLE HOLE SHEATHING.

2. DIMENSIONS IN SYMBOL BRACKETS [ ] SHALL NOT BE USED BY THE INSTALLER FOR THE LOCATING PURPOSES.

3. ALL COLUMNS ARE THE SAME SIZE AS COLUMN --- UNLESS OTHERWISE SHOWN.

4. CLEARANCE BETWEEN ENDS OF FRAMES TO BE ---" UNLESS OTHERWISE SHOWN.

6. TOPS OF WINDOWS ARE ---" ABOVE FLOOR UNLESS OTHERWISE SPECIFIED.

7. DIMENSIONS LOCATING FLOOR MOUNTED MACHINES ARE SHOWN TO THE EDGES OF THE SUB-BASE DISREGARDING MOUNTING LUGS.

8. WIDTHS OF FRAMES ARE ---" INCLUDING GUARD RAILS UNLESS OTHERWISE SHOWN.

9. THE ENTIRE FLOOR AND SIDE WALLS HAVE BEEN WATERPROOFED. THIS WATERPROOFING SHALL NOT BE PUNCTURED FOR ANCHORING EQUIPMENT UNLESS AUTHORIZED BY THE EQUIPMENT ENGINEER.

10. ALL FRAME CLEARANCES AT COLUMNS ARE ---" UNLESS OTHERWISE SPECIFIED.

11. ALL INTERNAL END GUARDS ARE 2 INCHES, E.G., AND END GUARD DESIGNATED A@W - D@W (UNDERSCORED ALPHA) ARE 4 INCHES, E.G., FOR SPCS TYPE EQUIPMENT.

12. ASTERISK (*) SYMBOL IN TABLE NO. 2 DENOTES 1-10-3/8 UNEQUAL FLANGE UPRIGHT CABLE DUCT TYPE FRAMEWORK.

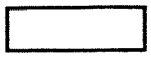
13. G.R. DENOTES GUARD RAIL OPPOSITE REMOVABLE GUARD RAIL COVER IN UNEQUAL FLANGE UPRIGHT CABLE DUCT TYPE FRAMEWORK ASSEMBLY, SIZE (2 OR 5) AS INDICATED.

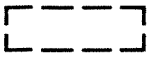
14. DUCT TYPE FRAMEWORK PROVIDED WITH THEIR TOP ANGLE TO THE FRONT OF THE LINEUP EXCEPT AS DETAILED IN TABLE _____.

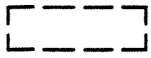
15. NUMBERS SHOWN IN [ ] BRACKETS ARE LINEUP NUMBERS AND MAY BE USED WHEN A TYPE OF FRAME REQUIRING A LINEUP NUMBER IS ADDED.

16. + SYMBOL SHOWN AFTER A DIMENSION INDICATES THIS DIMENSION IS THE MAXIMUM FLOOR SPACE AVAILABLE FOR A LINEUP OF FRAMES.

17. △1A3A INDICATES A CABLE HOLE DESIGNATION. THE CAP DELTA SYMBOL △ REPRESENTS THE TERM CABLE HOLE. THE FIRST NUMBER INDICATES THE FLOOR, THE LETTER AND NUMBER INDICATES COLUMN AND LAST LETTER INDICATES THE FIRST CABLE HOLE NEAR THE COLUMN.

18.  PRESENT CABLE HOLES OR PORTIONS OF CABLE SLOTS IN THE FLOOR THAT ARE SHEATHED AND CABLE HOLES OR SLOTS IN THE CEILING SHOWN IN THE SAME LOCATION AS THE CABLE HOLES OR SLOTS IN THE FLOOR.

19.  CABLE HOLES OR CABLE SLOTS IN THE FLOOR THAT ARE EITHER TEMPORARILY FILLED, PLUGGED OR TEMPORARILY FILLED, PLUGGED OR TEMPORARILY COVERED WITHOUT SHEATHING AND CABLE HOLES OR SLOTS IN THE CEILING.

20.  CABLE HOLE THAT HAS BEEN LOCATED BUT NOT CUT.

21. T△1A2A INDICATES A CABLE HOLE DESIGNATION. THE CAP DELTA SYMBOL △ REPRESENTS THE TERM CABLE HOLE. THE T PRECEDING THE CAP DELTA SYMBOL INDICATES TAPERED CABLE HOLE. THE FIRST NUMBER INDICATES THE FLOOR, THE LETTER AND NUMBER INDICATES COLUMN AND THE LAST LETTER INDICATES THE FIRST CABLE HOLE NEAR THE COLUMN.

22. ALL PILASTERS ARE THE SAME SIZE AS SHOWN ON PILASTER BETWEEN COLUMNS _____ AND _____.

23. FLOOR LOADING FOR ALL FLOORS IN THIS BUILDING IS 150 LBS. PER SQUARE FOOT.

24. IN TABLE NO. 2 AN S LETTER SUFFIX TO A DIMENSION INDICATES A SPACE BETWEEN FRAMES OR BETWEEN FRAME AND END GUARD WHILE THE E LETTER SUFFIX TO A DIMENSION INDICATES AN END GUARD SIZE.

25. AN ALPHANUMERIC IN ( ) PRECEDING THE FRAME DESIGNATION INDICATES THE CONTROL GROUP NUMBER. THE LETTER SIGNIFIES THE TYPE OF OFFICE AND THE NUMBER THE RESPECTIVE CONTROL GROUP PRESENT. (O FOR THE FIRST, 1 FOR THE SECOND, ETC. - SPCS OFFICES ONLY).

26. ALL 10 INCH AND/OR 10-1/2 INCH WIDE GUARD RAIL FRAMES ARE SCALED AS 12 INCH AND/OR 12-1/2 INCH WIDE RESPECTIVELY. 12 INCH WIDE GUARD RAIL FRAMES ARE SCALED AS 14 INCHES WIDE.

27. ALL 10 INCH WIDE CABLE HOLES ARE SCALED AS 12 INCHES WIDE. ALL 12 INCH WIDE CABLE HOLES ARE SCALED AS 14 INCHES WIDE.

28. LETTERS SHOWN WITHIN PARENTHESIS INSIDE THE CONVENTION OF THE FRAME AND LETTERS SUBSTITUTED FOR DIMENSIONS ARE LISTED IN TABLE NO. 2 WITH THEIR CORRESPONDING SUBSTITUTED DIMENSION.

29. PARTITIONS SHOWN BY DASHED LINES ARE PLANNED AND ARE SHOWN PRIMARILY FOR ENGINEERING PURPOSES.

30. PARTITIONS SHOWN BY DASHED LINES ARE PLANNED AND ARE SHOWN PRIMARILY FOR ENGINEERING PURPOSES.

31. 0-1-5/8L INDICATES LOCATING DIMENSION FOR FRAME FROM COMMON REFERENCE POINT. SPACE BETWEEN UPRIGHT AND END GUARD IS ACTUALLY 2 INCHES.

32. RIP RETIRED IN PLACE.

33. ALL PARTITIONS NOT CROSS REFERENCED TO A NOTE ARE CEILING HIGH PARTITIONS _____ INCHES THICK.

34. PLOT PLAN FOR THIS BUILDING IS SHOWN ON T-XXXX-XXX.

35. UNLESS OTHERWISE SHOWN, THE FRONT OF THE LINEUPS ARE INDICATED BY THE LOCATING DIMENSION ARROWS THAT HAVE BEEN PLACED IN THE FRONT OF THE LINEUPS.

36. ALPHAS H, M AND C WITHIN THE SYMBOL BRACKETS [ ] ARE PART OF THE FRAME DESIGNATIONS IN SPCS OFFICES (EX. [H]UT, [M]UT).

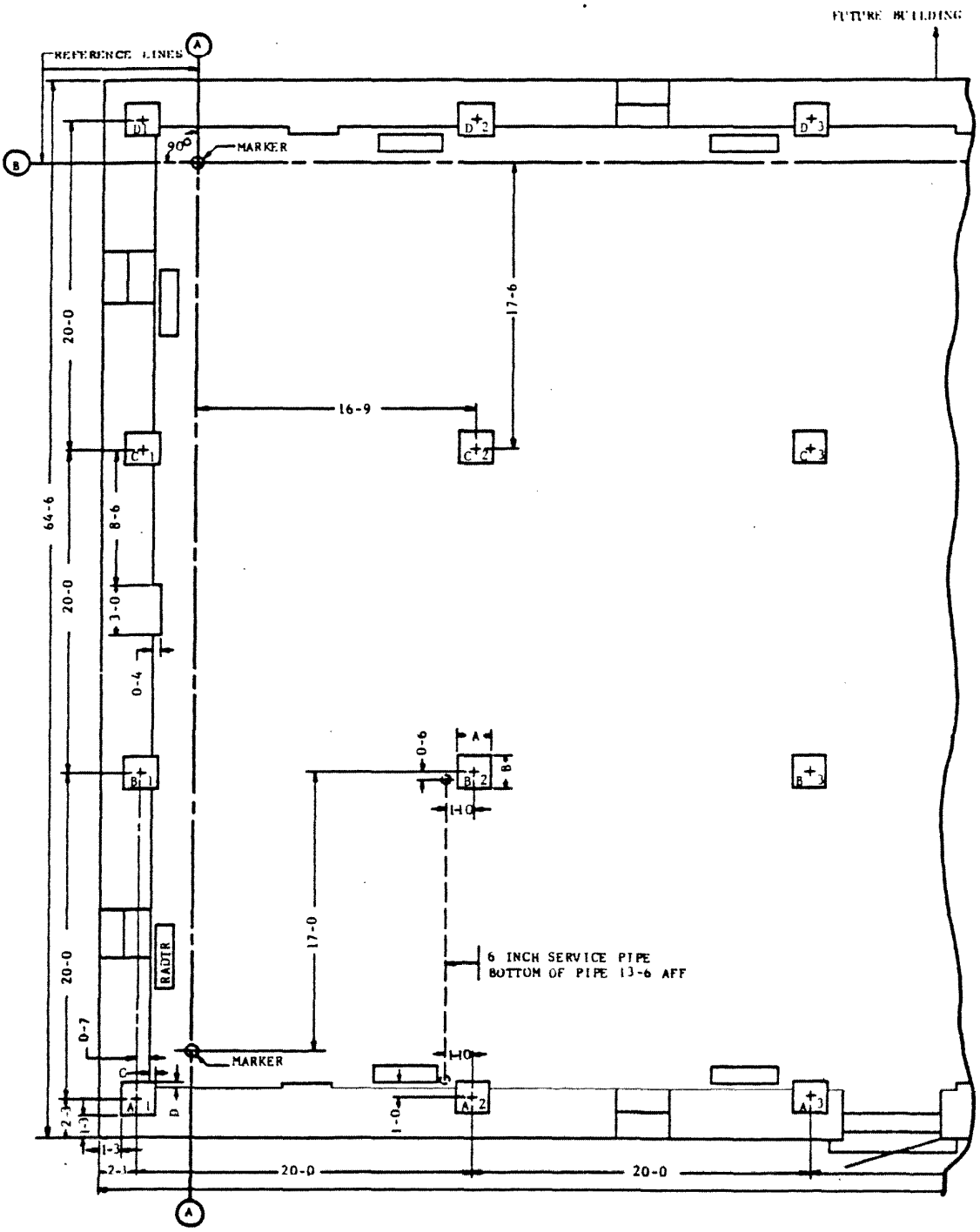


EXHIBIT 1
FLOOR MARKER AND REFERENCE LINE
(PAGE 1 OF 2)

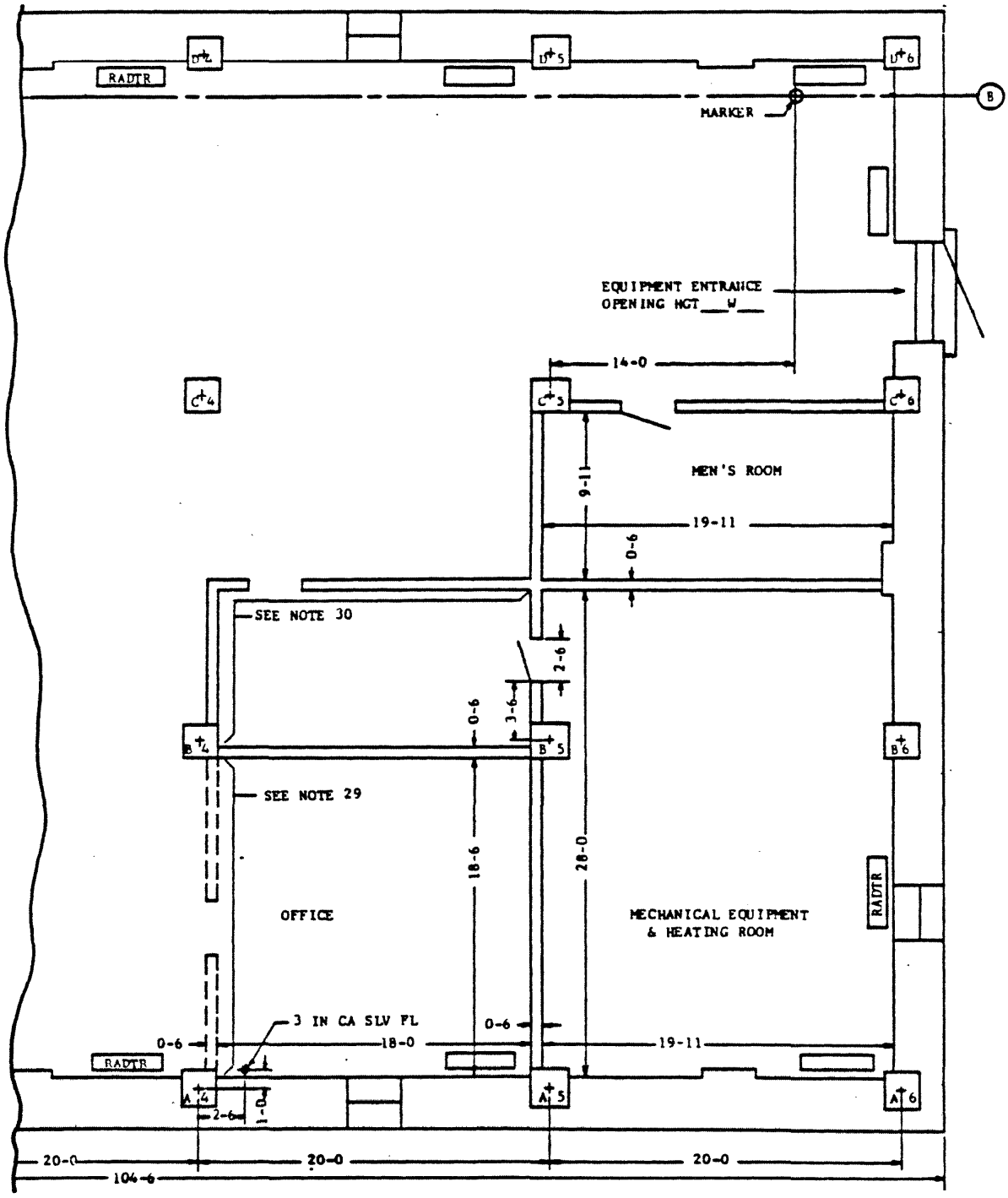
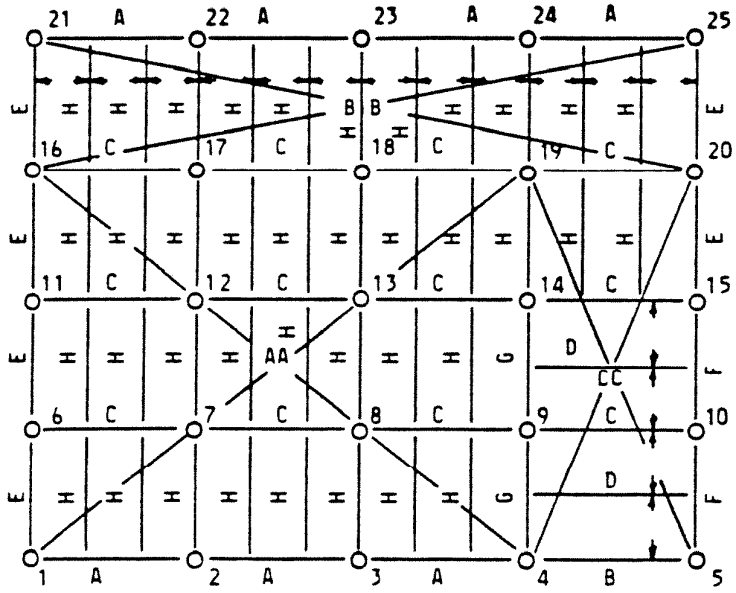
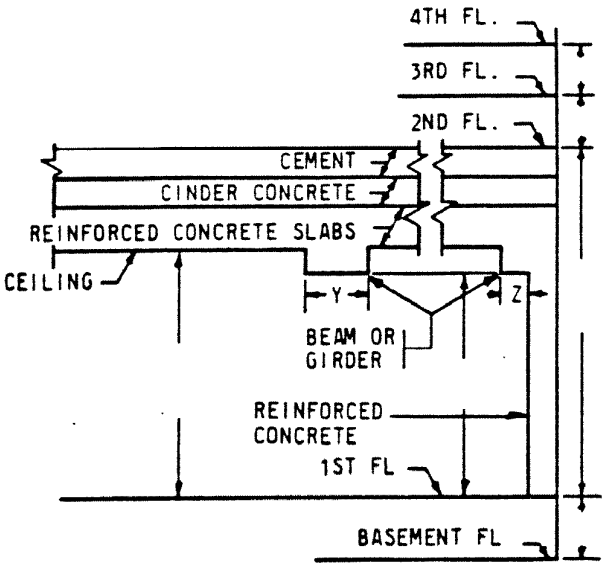


EXHIBIT 1
FLOOR MARKER AND REFERENCE LINE
(PAGE 2 OF 2)



CEILING BEAM PLAN
SKETCH A

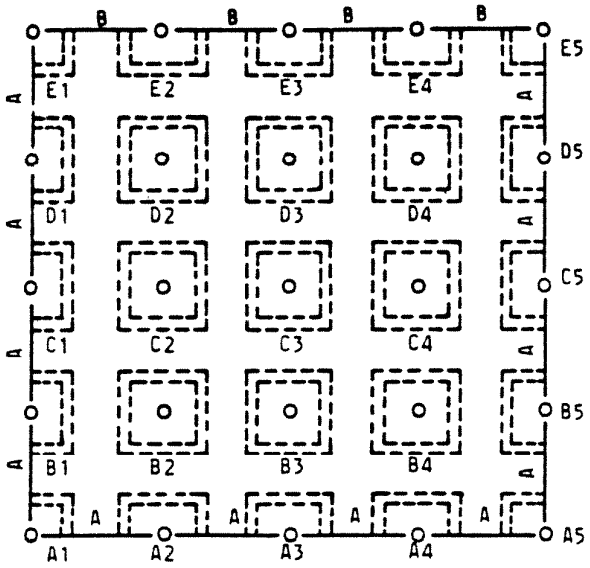
TABLE OF CEILING HEIGHTS	
SYM	HEIGHTS
AA	0-0
BB	0-0
CC	0-0



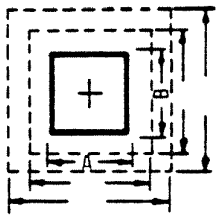
SKETCH B

TABLE OF DIMENSIONS FOR BEAMS & GIRDERS SEE SKETCHES A & B				
SYM	X	Y	Z	
A	-'-		-'-	
B	-'-		-'-	
C	-'-	-'-		
D	-'-	-'-		
E	-'-		-'-	
F	-'-		-'-	
G	-'-	-'-		
H	-'-	-'-		

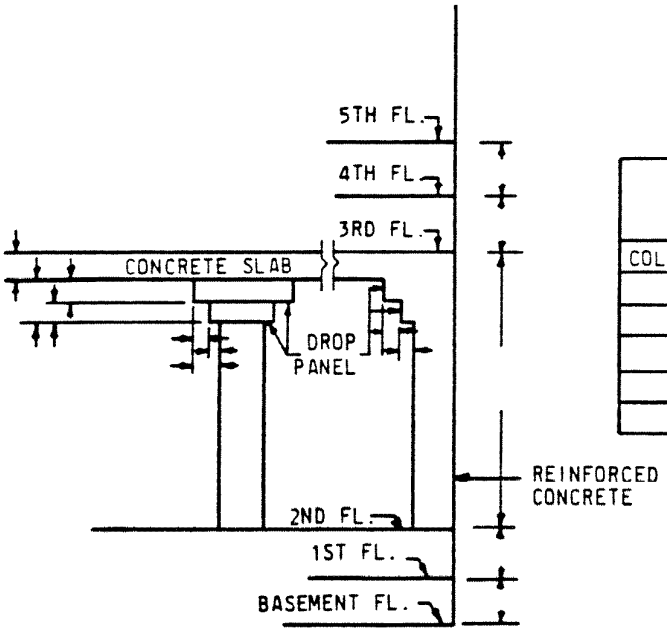
EXHIBIT 2
CEILING, BEAM, GIRDER SCHEDULE
AND DETAIL OF FLOOR CONSTRUCTION



BEAM PLAN
SKETCH A



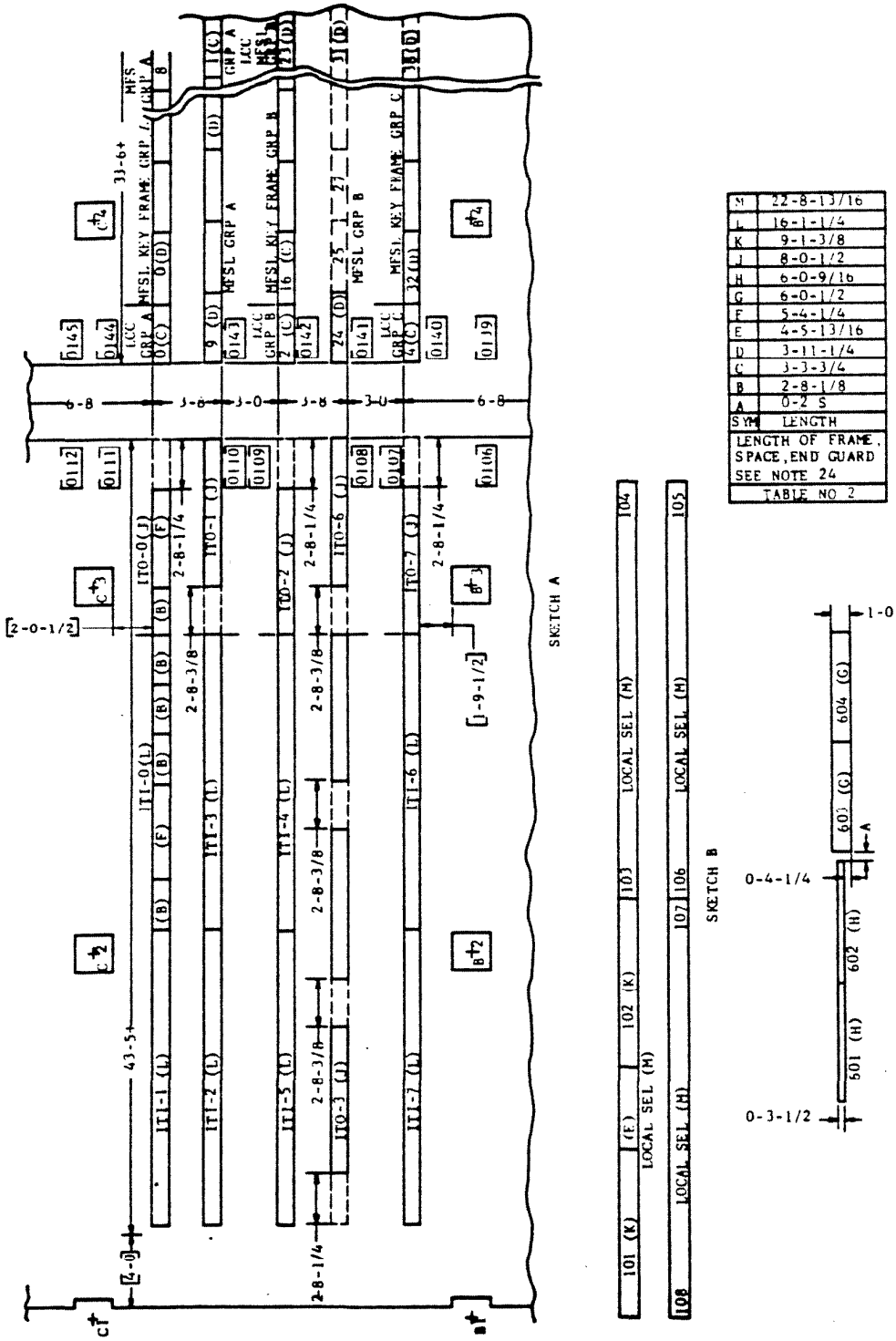
SKETCH C



SKETCH B

COLUMN SCHEDULE (SEE COLUMN)				
COLUMN NO	A	B	C	D

EXHIBIT 3
CEILING, BEAM, COLUMN SCHEDULE, DROP PANEL
AND DETAIL OF FLOOR CONSTRUCTION

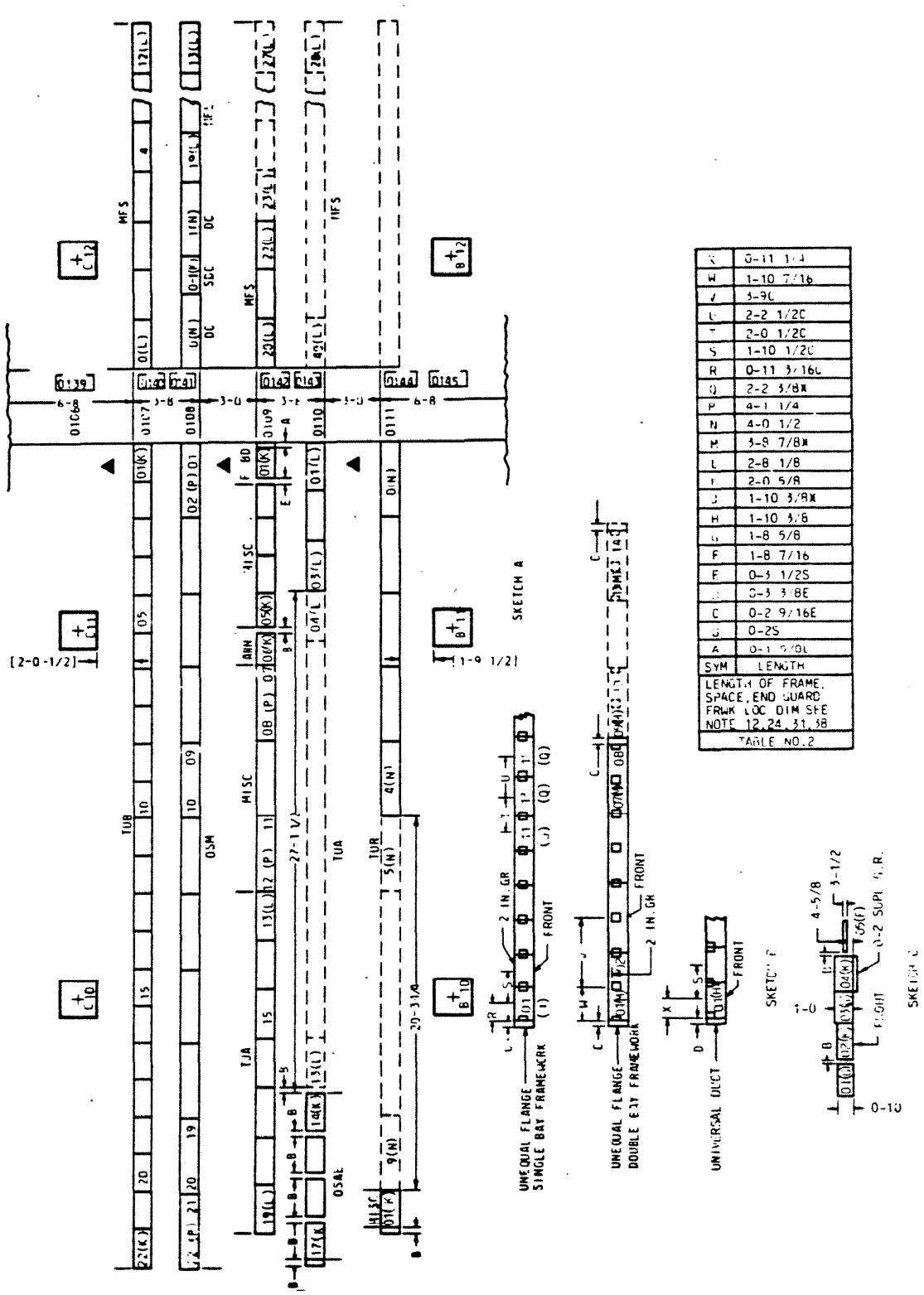


SYM	LENGTH
M	22-8-13/16
F	16-1-1/4
K	9-1-3/8
L	8-0-1/2
H	6-0-9/16
G	6-0-1/2
F	5-4-1/4
E	4-5-13/16
D	3-11-1/4
C	3-3-3/4
B	2-8-1/8
A	0-2 5

LENGTH OF FRAME, SPACE, END GUARD SEE NOTE 24

TABLE NO 2

EXHIBIT 4
CONVENTIONS, DESIGNATIONS AND
DIMENSIONS FOR DIAL TYPE FRAMES



SYM	LENGTH
A	0-1 9/16
B	0-2 5/8
C	0-2 9/16E
D	0-3 3/8E
E	0-3 1/2S
F	1-8 7/16
G	1-8 5/8
H	1-10 3/8
J	1-10 3/8X
L	2-0 5/8
M	2-8 1/8
N	3-8 7/8X
P	4-0 1/2
R	4-1 1/4
S	0-2 1/2C
T	2-0 1/2C
U	2-2 1/2C
V	3-9C
W	1-10 7/16
X	0-11 1/4

LENGTH OF FRAME, SPACE, END GUARD FRWK LOC DIM SEE NOTE 12,24,31,38

TABLE NO.2

EXHIBIT 5
TYPICAL UNIVERSAL AND UNEQUAL FLANGE DUCT TYPE
(SINGLE AND DOUBLE BAY) CONFIGURATION

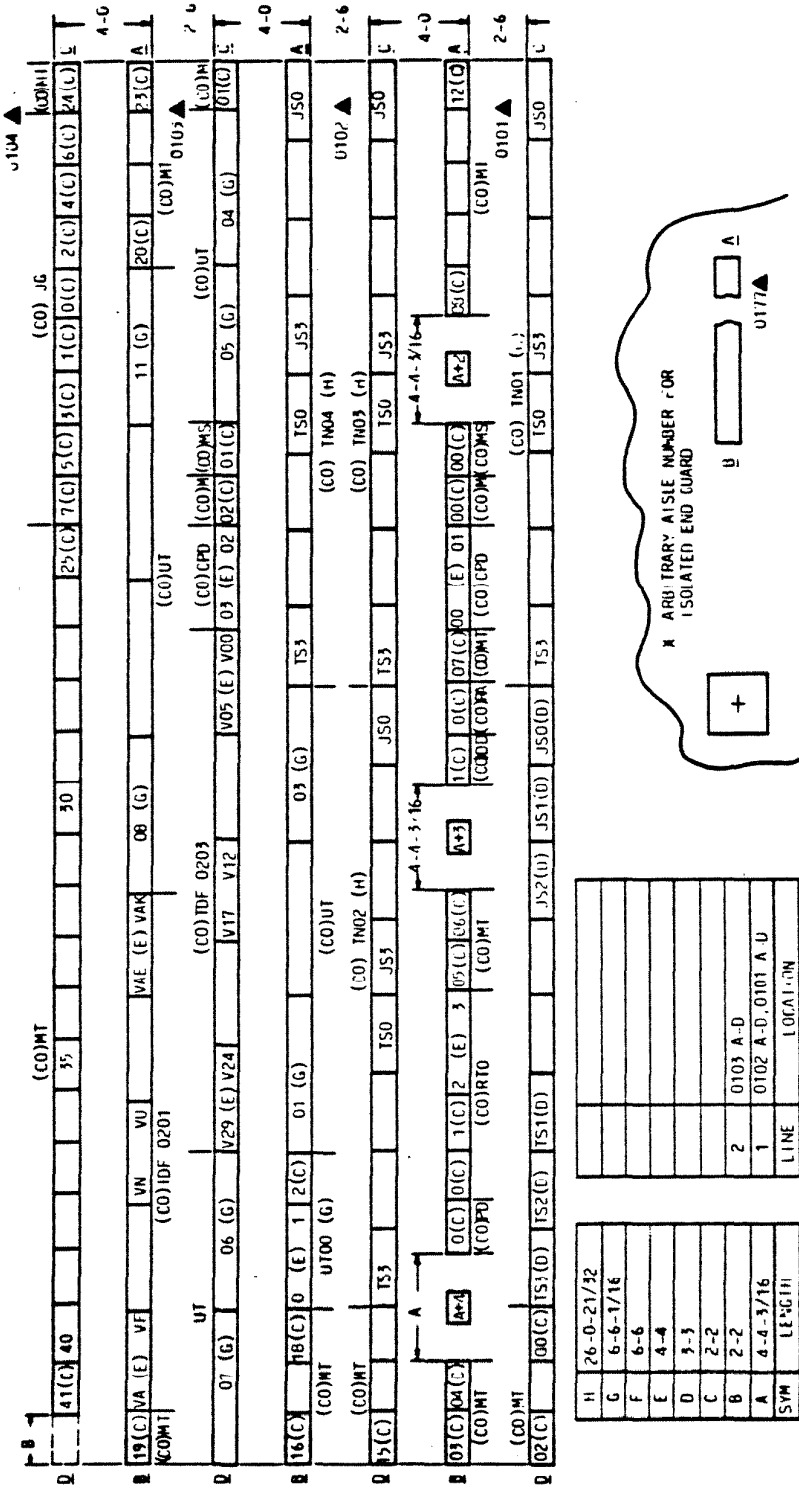


EXHIBIT 6
CONVENTIONS, DESIGNATIONS AND DIMENSIONING
STANDARDS FOR SPCS TYPE FRAMES

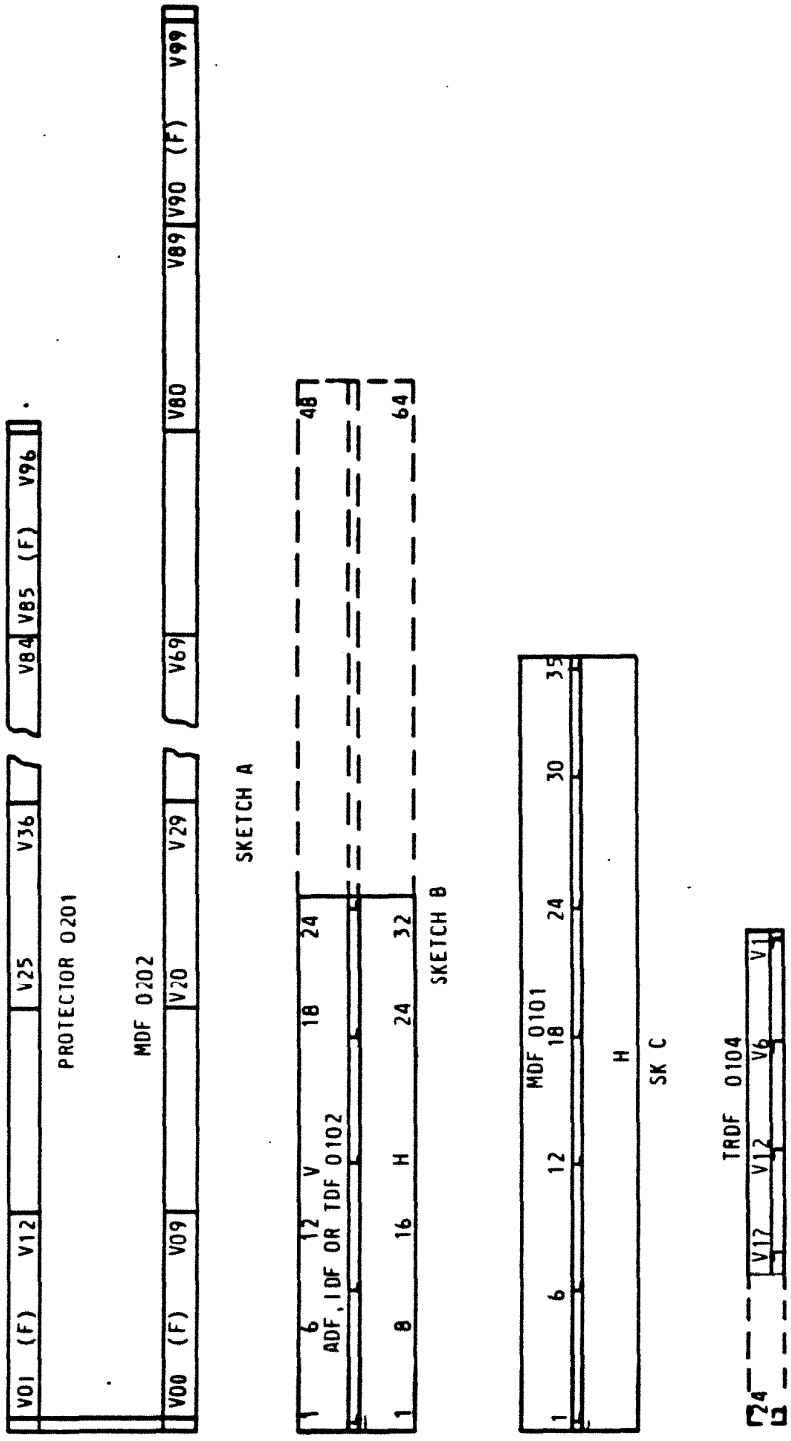


EXHIBIT 7
METHOD OF DESIGNATING AND NUMBERING VARIOUS TYPES OF DISTRIBUTING FRAMES ON FLOOR PLAN DRAWING

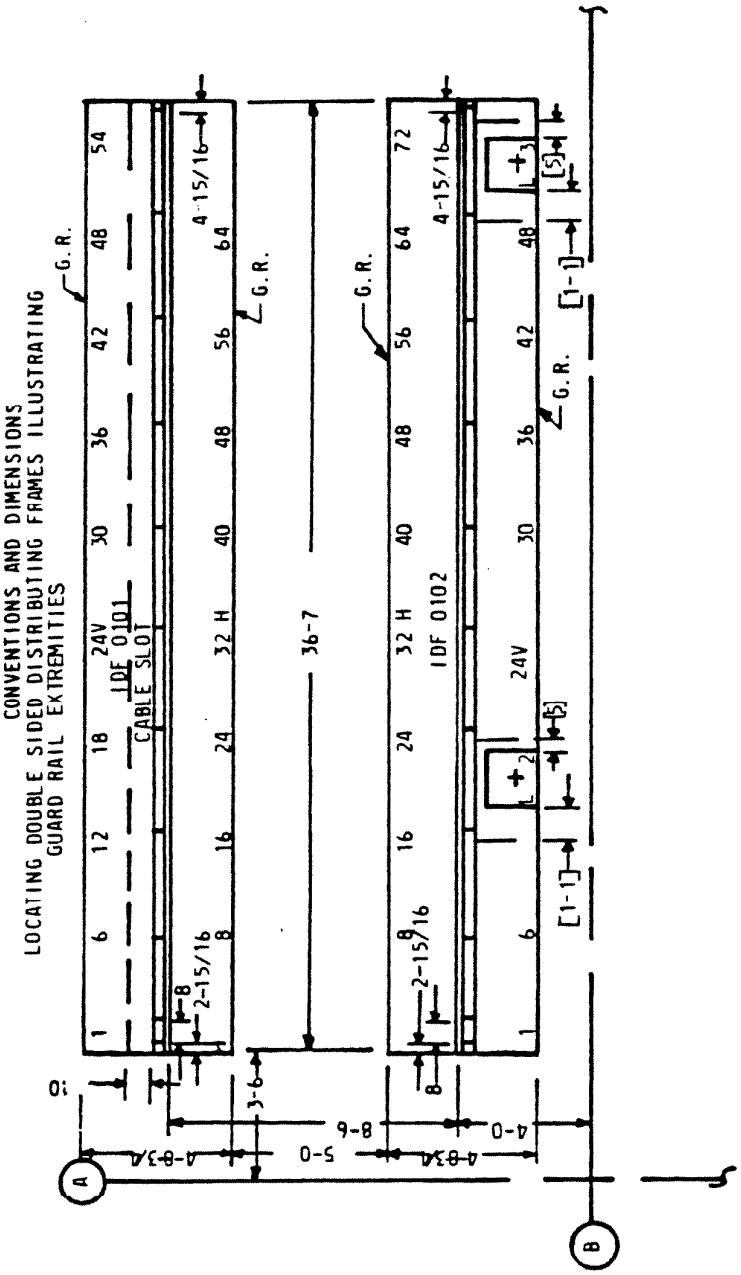
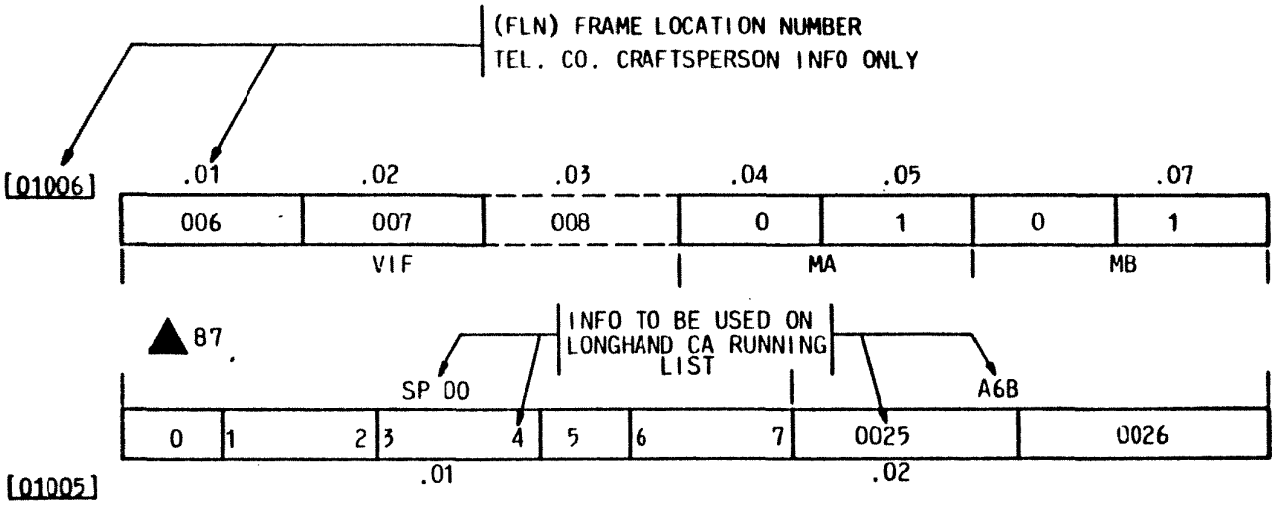


EXHIBIT 8
CONVENTIONS AND DIMENSIONS LOCATING DOUBLE SIDED
DISTRIBUTING FRAMES ILLUSTRATING
GUARD RAIL EXTREMITIES



NOTE: THE ABOVE EXAMPLE IS TO DEPICT "FLN" NUMBERING ONLY AND IS NOT INTENDED TO OVERRIDE. FLOOR PLAN DATA BOOK PRACTICES REGARDING FRAME LOCATION, SIZE AND METHOD OF ILLUSTRATING FRAMEWORKS.

EXHIBIT 9
FRAME LOCATION NUMBER AND FRAME FUNCTION CODE

FRAME AND AISLE LIGHTING PLAN

CONTENTS

1.00 GENERAL

1.01 This part covers the standards to be followed in the preparation of Central Office Frame and Aisle Lighting Drawings.

1.02 This drawing shall include all information necessary to engineer and install frame and aisle lighting in telephone COE areas and shall not include information associated with dedicated and protected AC supplies to frame mounted telephone equipment.

2.00 SCALE

2.01 The frame and aisle lighting drawing is a layout type drawing and need not be drawn to any scale. Frame equipment and building details are generally drawn to match the scale of the floor plan drawing; however, if a scale is used, it shall not be shown in the title box.

3.00 PEN SIZES

3.01 The following information indicates pen sizes that produce proper lineweights for the specific applications on frame and aisle lighting drawings. Lineweights established when a copy of the floor plan was used to prepare these drawings may continue to be utilized as stated in Section III, Part F. However, it is expected that any new or redrawn drawing will reflect the following pen size applications.

Pen Size	Application
0	Auxiliary framing, Table and Charts (All Lines), Future and Present equipment, Building Outline, Columns
2	Lighting equipment location, Conduit, Trolley duct,
3	Line of demarcation

4.00 ISSUE NOTES

4.01 Only a basic Issue Note is required for this drawing. For the elements of a basic Issue Note see Section III, Part F, Paragraph 4.00.

5.00 CRITERIA

5.01 See Section V, Part A, Paragraph 5.01.

5.02 See Section V, Part A, Paragraph 6.01.

6.00 FRAME AND AISLE LIGHTING DIVISION

6.01 See Section V, Part A, Paragraph 7.01.

6.02 It is recommended that the lighting drawings be divided to agree with the corresponding floor plans.

7.00 CONSTRUCTION OF LINE DEMARCATION

7.01 See Section V, Part A, Paragraph 8.01.

8.00 KEY PLAN

8.01 A key plan illustrating a drawing composite of a particular floor, shall be placed on all Frame and Aisle lighting drawings of the floor involved (see Section V, Part A, Paragraph 9.01).

9.00 SPECIFIC DRAWING STANDARDS

9.01 New and changed drawing standards related herein, shall be applied to all new equipment lineups, new drawings and redrawn tracings.

9.02 The general format of the Frame and Aisle lighting drawing shall follow the associated floor plan equipment layout.

9.03 The drawing shall show the location of lighting fixtures, frame appliance outlets, trolley type appliance outlets, trolley ducts, emergency lighting equipment, cabinets, associated wiring information, busway, raceway and conduit runs, all of which are installed in the telephone equipment area.

9.04 For orders involving metric conversion, it is recommended to place a note on the Frame and Aisle Lighting drawing to indicate that dimensioning of any type is never included on the drawing.

10.00 BUILDING INFORMATION - ILLUSTRATING

10.01 Walls - The building wall lines of the equipment area shall be shown but not dimensioned. Administrative areas outside of the equipment areas need not be shown. However, where a reproduction of the floor plan master was used to prepare the Frame and Aisle lighting drawing, the administrative areas may be left in.

10.02 Columns and Pilasters - The outline of columns and pilasters within the equipment area shall be shown and designated to agree with the floor plan.

10.03 Partitions, Doors and Windows - Partitions, doors and window openings shall be shown within the equipment area.

10.04 Ventilating Ducts - Cable Holes and Slots - Ventilating ducts and cable holes and slots shall not be shown.

10.05 Miscellaneous Building Details - As a general rule, the following building details shall not be shown.

A. Beams, girders and drop panels

B. Ceiling inserts and unistruts

C. Skylights, radiators, drinking fountain, fire apparatus, lockers

D. Soldering iron furnaces, cable and pipe ducts, service pipes, floor ducts or troughs and building conduit

10.06 However, when any of the above building details interfere with the installation of lighting, or were already present on the reproduced master floor plan, they may be shown.

10.07 The designation of each circuit in the outlet box shall be indicated. AC and emergency circuits outlet box locations shall be shown with the exceptions stated in the following paragraphs:

A. Emergency lighting equipment shall be shown on the floor plan drawing when there is no lighting drawing being originated to record the area of the floor where the emergency lights are located.

B. Emergency lighting equipment shall also be shown on the floor plan drawing when the emergency lights are considered part of the building construction and are furnished and installed by the building contractor.

C. When the necessary lighting equipment has been shown on the floor plan drawing as specified in the preceding Paragraph B, it shall not be duplicated on the lighting drawing. If a reproduced floor plan is used and already shows emergency lighting, it may be left in.

11.00 EQUIPMENT - ILLUSTRATING

11.01 Each lineup of equipment and distributing frame shall be shown in block form in agreement with the floor plan.

11.02 The location and block size of frames, relay rack bay, fuse bays, etc., shall agree with the corresponding convention on the floor plan, with the following exceptions:

A. The duct location on duct type framework shall not be shown unless reproduced from the floor plan master.

B. Show present equipment with solid lines and future equipment with dashed lines.

C. Writing shelves shall not be shown.

11.03 Equipment numbering and designating shall agree with those on the floor plan with the following exceptions:

A. It is recommended that the lineup and bay number for a fuse bay and relay rack type bay be shown within the block symbol of the respective bay whenever possible; designations shall not be shown for relay rack type bays.

B. It is recommended that the designation and frame number for dial frames be shown within the block symbol of the bay when possible. When this is not possible due to lack of space, the designation may be shown outside the block form.

12.00 SYSTEM STANDARD DRAWINGS

12.01 Systems or equipment installations requiring specific lighting arrangements are expected to be accompanied with information from Engineering Standard drawings which cover the application of lighting requirements.

12.02 Under some circumstances it may be necessary, due to job conditions, to use discontinued equipment assembly and stocklist drawings. The lighting fixtures on these older drawings are represented as follows:

A. A horizontal line approximately 1/2 inch long represents a 40 watt fixture (2 feet long).

B. A horizontal line approximately 1 inch long represents an 80 or 160 watt fixture (4 feet long).

13.00 STANDARD STOCK LIST AND ASSEMBLY DRAWINGS

13.01 Standard Lighting Drawings are prepared with the equipment arranged by groups on a stock list basis. This is accomplished by the use of a combination of key references on stock list drawings, and assembly figures on assembly drawings. Occasionally, when space permits, the stock list and assembly figures are combined on one drawing or on drawings in the same series.

13.02 Through an arrangement of cross references between the assembly figures on the assembly drawings and key references on the stocklist drawings, groups from the latter are selected to cover the requirements for lights, receptacles, trolley type appliance outlets, etc., for new installations or additions.

14.00 CENTRAL OFFICE LIGHTING

14.01 The plan view of the drawing shall indicate what circuits are assigned to the lighting fixtures, frame appliance outlets, trolley ducts and emergency lighting equipment. The circuit numbers shall be shown in parenthesis: (A9), (A10), etc., adjacent to the connected equipment. See Exhibit 1, Paragraph 18.00, Note 22; and Exhibit 2 (SPCS).

14.02 Each Systems Standard lighting drawing is expected to show a typical arrangement which should be used as a guide in making up the job drawing. Job layouts shall consist of a figure showing the Frame and Aisle Lighting arrangement on a floor plan basis similar to Exhibits 1 and 2. In addition, a sketch shall be shown defining the details of the most common job applications similar to Exhibit 1, Sketch A, and Exhibit 2, Sketch A. Designations in these Sketches apply to equipment in Exhibit 1 when not indicated in Figure 1. Designations in Figure 1 show variations from Sketch A and C.

14.03 Designations composed of combinations of a numeral (first) and a letter (second) indicate the group and stock list of a Manufacturer's drawing respectively (see Exhibit 1).

14.04 Notes

A. See Paragraph 18.00, for standard notes that apply to job drawings. Those notes that are applicable shall be included on the office record drawing. When the "J" Drawing Symbol differs from the symbol shown on Paragraph 18.00 identifying the same equipment, the symbol shown on Paragraph 18.00 shall be used.

B. A note recording the Architect's Electrical Plan number with date and/or Engineering Specification shall be added.

14.05 When sketches or figures are required to show a condition not covered by a group on a standard drawing, their reference on the job drawing shall be shown as: $\frac{\quad}{3X}$ with a Note, as covered in Paragraph 14.03.

14.06 AC Circuit Assignments and Table No. 2

A. In offices not utilizing relays and step down transformers, the AC circuit assignments shall be recorded in a table similar to Exhibit 1, Table No. 2. This table shall show the AC Source Cabinet circuit numbers, number of lamps by type and total wattage drain. Trolley Duct and Receptacle assignments shall also be shown; however, it is not required to show the number of receptacles.

B. An electrical service which can have more than a five second interruption but requires an auxiliary power source is considered essential service. This source is usually obtained from the Power Distributing Service Cabinet backed by the engine driven alternators. When lighting and receptacle circuits from a cabinet are made essential, this condition is recorded on the Central Office Frame and Lighting drawing as follows:

1. In Table No. 2, place the letter E as a prefix to the power supply description, (see Exhibit 1, Sketch C).

2. Add the explanatory symbol note describing essential service with the Letter E as shown on Paragraph 18.00, Note 16.

C. The AC Circuit Assignment Table shall be placed on the same drawing where the Lighting Distributing Cabinet is physically located where the circuits are applied.

D. The AC Circuits that are not located on the same drawing as the AC Circuit Table shall be cross referenced to the drawing where the AC Circuit Table appears; see the following example:

"See T-XXXX-XX-XXXX Table No. 2 for AC Circuits XX to XX."

E. In offices utilizing relays and step-down transformers, the AC circuit assignments shall be recorded in a table similar to Exhibit 2, Sketch B. This table shall show color coding and phases per Ckt. No., Relay Box and Relay Numbers. It shall also show the number of lamps and total wattage per circuit. It is a requirement to show appliance outlets and Trolley Duct circuit assignments. It is not a requirement to show unassigned circuits, Relay Box and Relay Numbers by the designation "space" located in the Total Watts column with the following exceptions:

1. It is not required to show those circuits in the table that have not and will not ever be utilized for Frame and Aisle lighting.

2. The Relay Box Number shall only be shown when there is more than one relay box in an office.

14.07 The location of the low type auxiliary framing bars shall be indicated outside the equipment area as shown on Exhibit 1, applying the symbol shown on Paragraph 18.00, Note 3. When unistrut has been used in a building, it shall be shown within the equipment area as shown on Exhibit 2, applying the symbol shown on Paragraph 18.00, Note 5. It should be noted, however, that both the auxiliary framing and unistrut symbols may be shown either at top or bottom of the drawing; both within and without the equipment area as space permits and the layout dictates. It is only a requirement to show the auxiliary framing both at the top and bottom of the drawing when there is some deviation from the pattern that requires clarification.

15.00 EMERGENCY LIGHTING

15.01 The location of all emergency lighting fixtures shall be shown.

15.02 The ceiling source outlet or distribution cabinet and conduit shall be shown when the emergency light fixtures are connected by means of exposed conduit.

15.03 The extension of emergency lighting in existing offices shall conform to National Electrical Code practices.

15.04 The emergency circuit assignments shall be recorded in a table similar to Exhibit 1, Table 1. This table shall indicate the source, circuit number, number of lights and their location.

16.00 SYMBOLS

16.01 See Paragraph 18.00 for standard symbols for regular and emergency lighting.

16.02 Symbols used shall be uniform and of a size and shape to accommodate 1/8-inch lettering.

17.00 AC SURFACE DUCT

17.01 It is recommended that surface duct be added on the lighting drawing as a sketch as typified on Exhibit 2, Sketch C. This sketch need only contain sufficient geographic orientation to illustrate originating and terminating ends. This includes the intermediate supply terminating locations. When a surface duct arrangement becomes excessively large and complex, it then may be shown on a separate drawing.

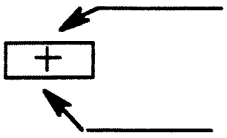
18.00 NOTES AND SYMBOLS

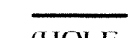
18.01 Use of the following common notes and symbols required:

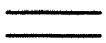
1. LIGHTING OR RECEPTACLE CONDUIT RUNS
2. EQUIPMENT LOCATION AND ASSOCIATED SUPPORTING MATERIAL
3. LOW TYPE AUXILIARY FRAMING CHANNEL
4. ARMORED CABLE ON OVERHEAD RUNS
5. UNISTRUT
   (ADD DIMENSION)
   (ADD ALPHANUMERIC GROUP)
6. WIREMOLD, BUSWAY, OR SURFACE DUCT
7. APPLIANCE OUTLETS ON ANGLE GUARD RAIL FRAMES
8. EXPOSED EMERGENCY LIGHTING CONDUIT RUN
9. PRINT DISPLAY BOARD
10. [L1 - A1] LOW INTENSITY CONTACTOR NUMBER
11. (L) LOW INTENSITY LIGHTING CEILING JUNCTION BOX WITH BLANK COVER PAINTED BLUE
12. (C) 120V AC CEILING SOURCE OUTLET
13. (◎) 277V AC CEILING SOURCE OUTLET
14. (E) EMERGENCY LIGHTING SOURCE OF SUPPLY

15.  EMERGENCY LIGHTING FIXTURE

16. E ESSENTIAL SERVICE - ENGINE BACKED POWER SOURCE FOR LOADS TOLERATING MORE THAN A FIVE SECOND INTERRUPTION

17.  (ADD ALPHANUMERIC GROUP)
APPEARANCE OF APPLIANCE OUTLET GROUP, OR REMOTE HEAD SET JACK (ADD WITHIN CONVENTION WHEREVER SPACE ALLOWS)

18. 
(HOLE LOCATION NO.)
UNISTRUT USED FOR SUPPORT OR WIREMOLD, FOR 1'-0" OVER FRAME CABLE RACK

19. 
(HOLE LOCATION NO.)
UNISTRUT USED FOR SUPPORT OF WIREMOLD AND LIGHTING UNISTRUT SUPPORT

20. (HOLE LOCATION NO.)
UNISTRUT USED FOR LIGHTING FIXTURE SUPPORT ONLY

21.  SWITCH AND RISER EQUIPMENT WHEN ACCOMPANIED BY THE LETTER S AND A NUMERIC

22. ( ) A-C SERVICE CIRCUIT NUMBER

23. T3, LD2, RA32, ETC., CORRESPOND TO CATALOGUE NUMBERS FOR APPROVED COMMERCIAL FITTINGS

24. ALL CONDUITS ARE 1/2 INCH ELECTRICAL METALLIC TUBING (EMT) UNLESS OTHERWISE SPECIFIED

25. ALL CONDUITS ARE SUPPORTED TO UNISTRUT PER (ADD STANDARD DRAWING)

26. ALL CONDUIT FITTINGS ARE THE THREADLESS TYPE (KONDU) UNLESS OTHERWISE SHOWN

27.  DEPICTS AN UNEQUAL FLANGE DUCT TYPE BAY NOT HAVING A KNOCK OUT FOR APPLIANCE OUTLET IN THE GUARD RAIL

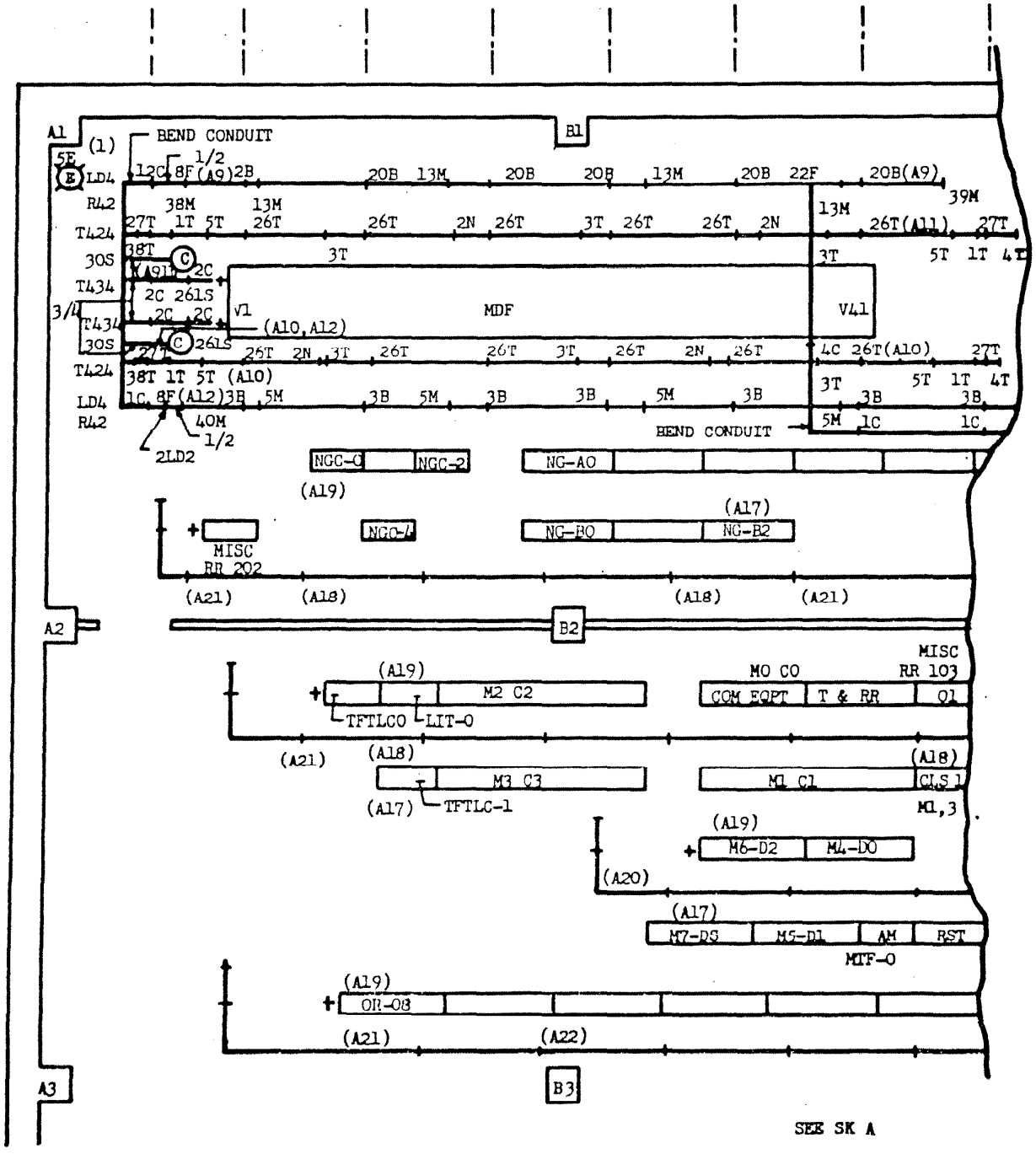


EXHIBIT 1
TYPICAL FRAME AND LIGHTING DESIGNATIONS
(PAGE 1 OF 4)

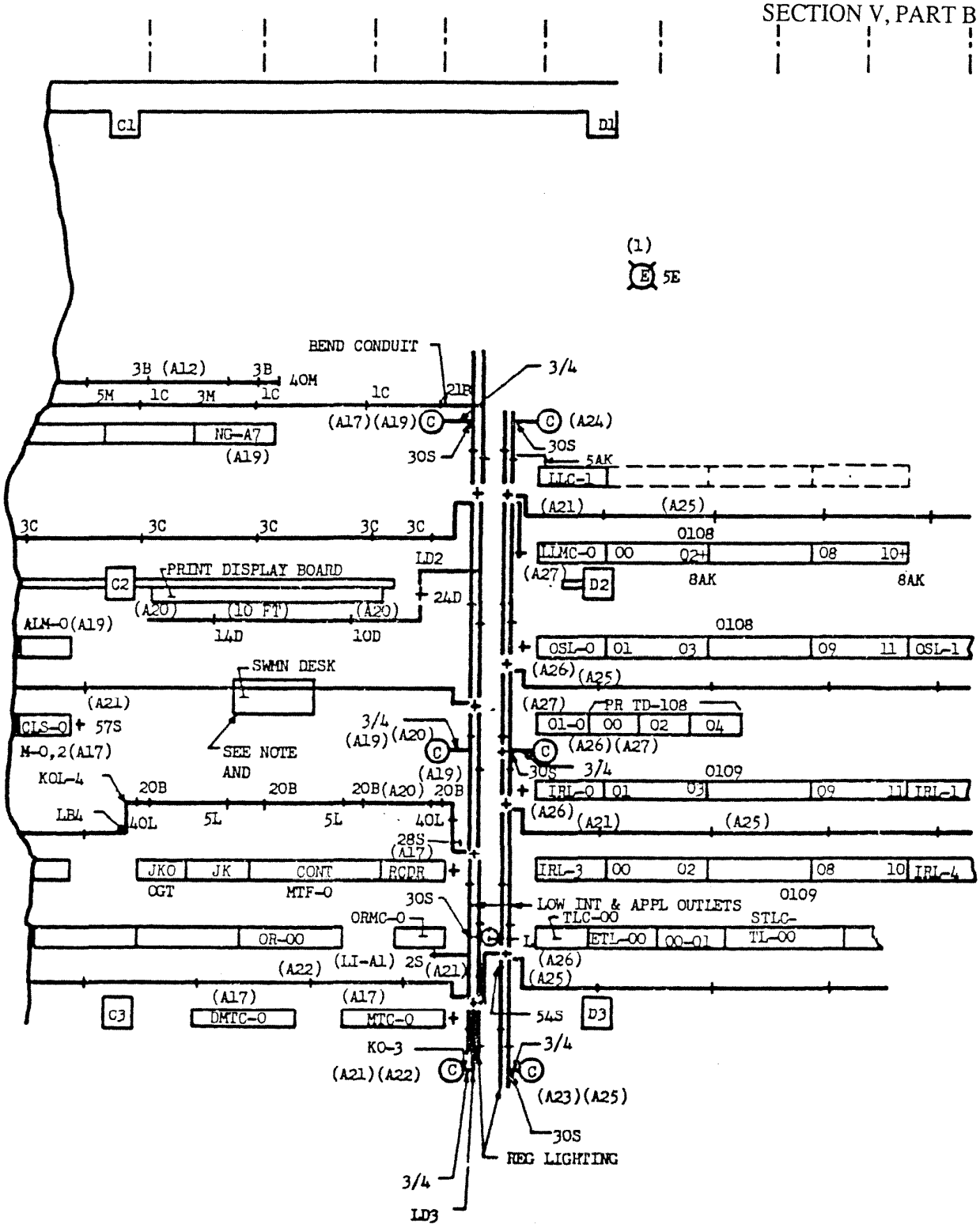
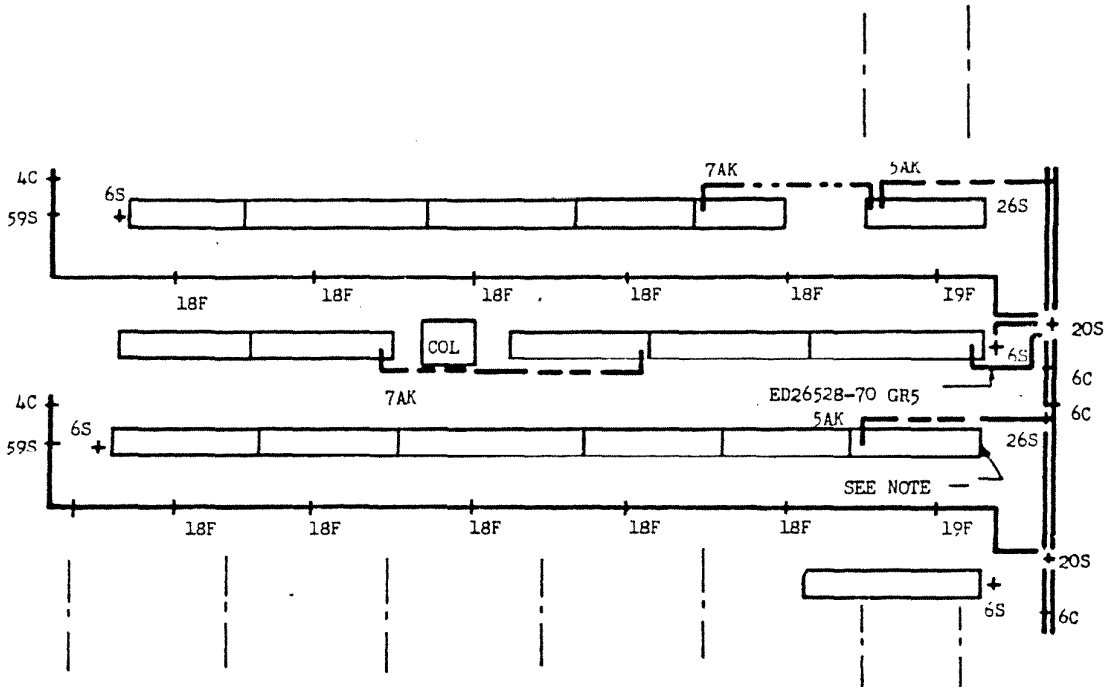


EXHIBIT 1
TYPICAL FRAME AND LIGHTING DESIGNATIONS
(PAGE 2 OF 4)



UNLESS OTHERWISE SPECIFIED
FITTINGS, SWITCHES, LIGHTING UNITS, ETC
SHALL BE AS SHOWN (SEE NOTE 28,56,76 & 77)
SK A

1AD
2AD
1AJ

METHOD OF SHOWING TWO APPLIANCE OUTLETS OR REMOTE HEAD SET JACK ON AN UNEQUAL FLANGE DUCT TYPE BAY

SKETCH B

METHOD OF SHOWING AN UNEQUAL FLANGE DUCT TYPE BAY NOT HAVING AN APPLIANCE OUTLET IN THE GUARD RAIL

SKETCH D

EXHIBIT 1
TYPICAL FRAME AND LIGHTING DESIGNATIONS
(PAGE 3 OF 4)

TABLE NO. 1

EMERGENCY LTG CKTS KS-5189 03 L-2 RELAY LOCATION----		
CKT NO.	NO OF LTS	LOCATION
1	3	TERM. ROOM MDF ROOM

TABLE NO. 2

FRAME & AISLE LTG AND RECEPTACLE CKTS LTG DIST CAB NO. 0101 120/230V AC 60CY 3PH 4W LOCATION				
CKT NO.	NO. OF LAMPS 20W	40W	TOTAL WATTS	
A9		16	640	
A10	TROLLEY DUCT		HMDF	
A11	TROLLEY DUCT		VMDF	
A12		12	480	
A13	RESERVED			
A14	APPL OUTLETS			
A15	APPL OUTLETS			
A16	RESERVED			
A17	APPL OUTLETS			
A18		11	560	
A19	APPL OUTLETS			
A20	2	18	760	
A21	LOW INTENSITY 4	12	560	
A22		11	560	
A23				
A24	RESERVED			
A25		10	400	
A26	SEE NOTE -			
A27	SEE NOTE -			

TABLE NO. 2

FRAME & AISLE LTG AND RECEPTACLE CKTS LTG DIST CAB NO. 0102 E 120/230V AC 60 CY 3 PH 4W LOCATION

SKETCH C

METHOD OF DEPICTING ESSENTIAL SERVICE IN TABLE NO. 2 BY ADDING THE LETTER E AS A PREFIX TO THE POWER SUPPLY DESCRIPTION.

EXHIBIT 1
TYPICAL FRAME AND LIGHTING DESIGNATIONS
(PAGE 4 OF 4)

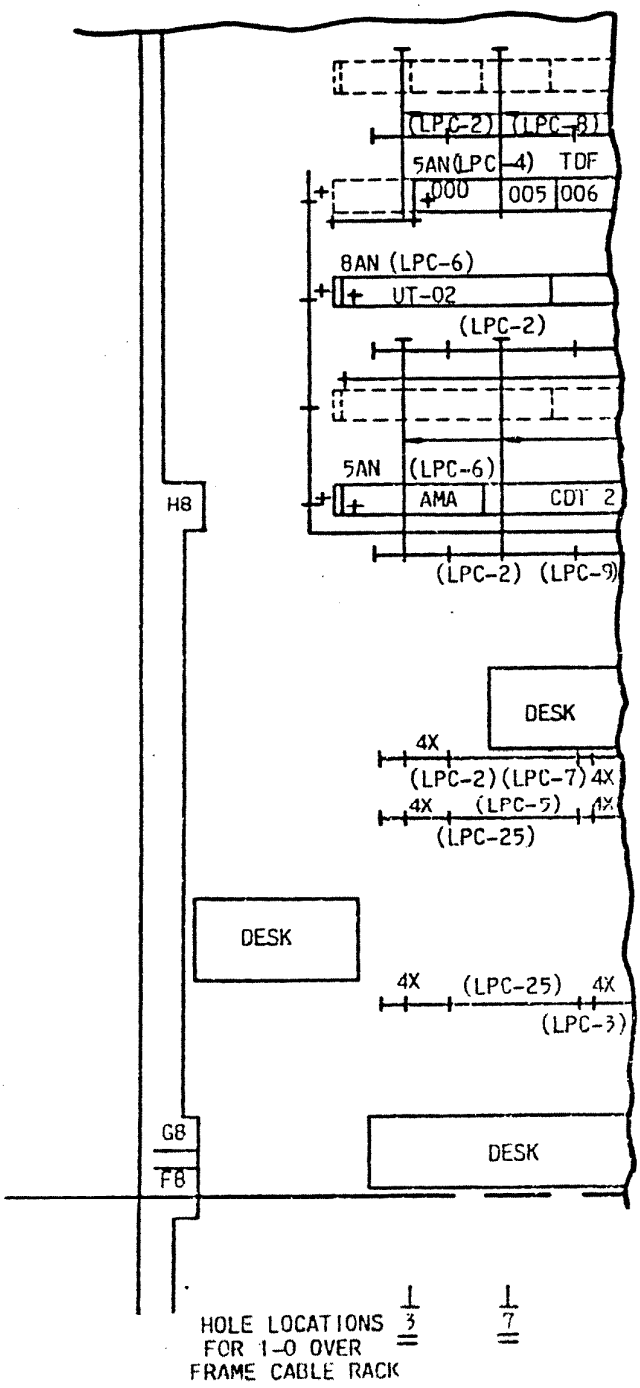


EXHIBIT 2
TYPICAL CONDUIT AND FITTINGS DESIGNATIONS
(PAGE 1 OF 6)

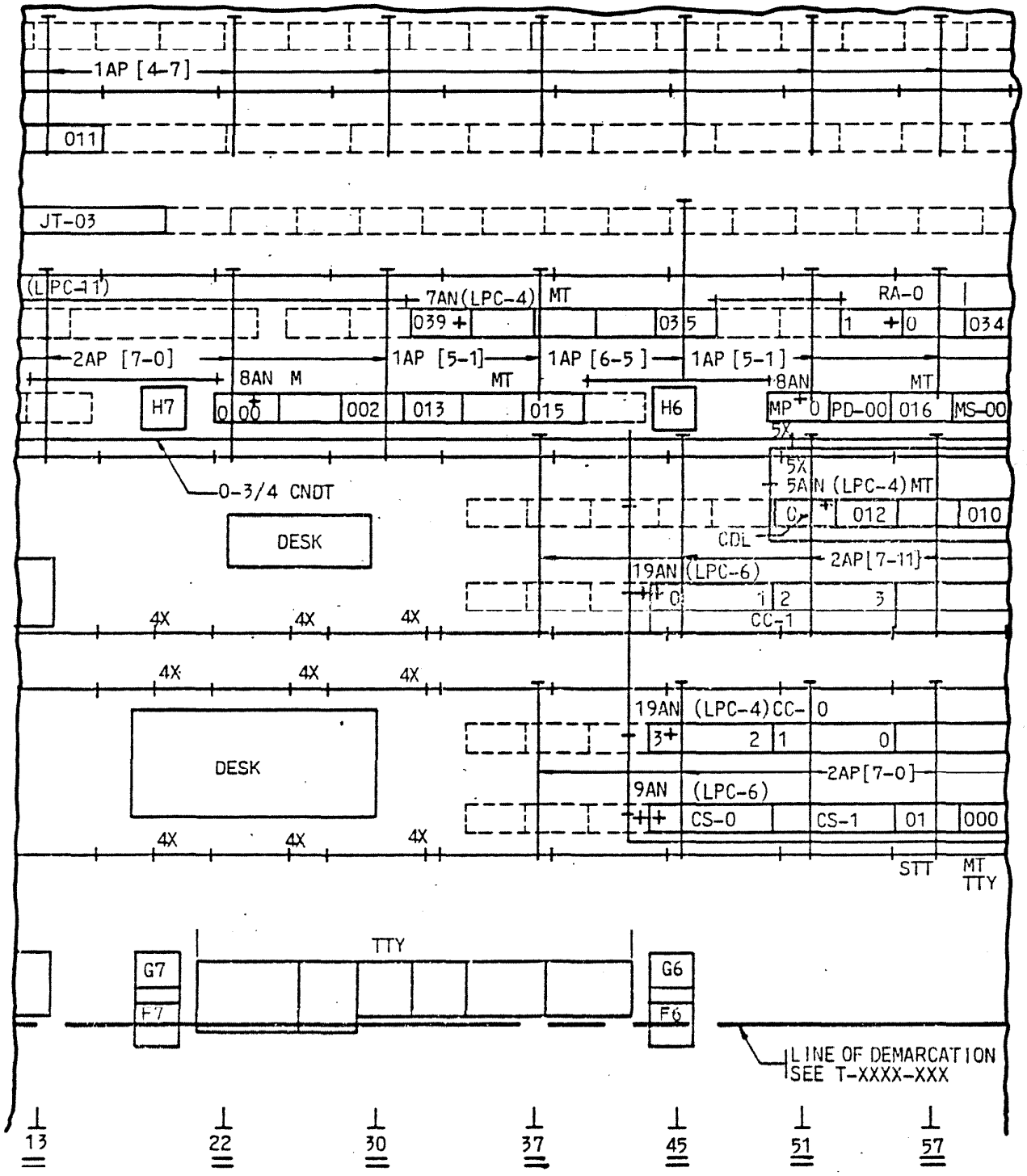


EXHIBIT 2
TYPICAL CONDUIT AND FITTINGS DESIGNATIONS
(PAGE 2 OF 6)

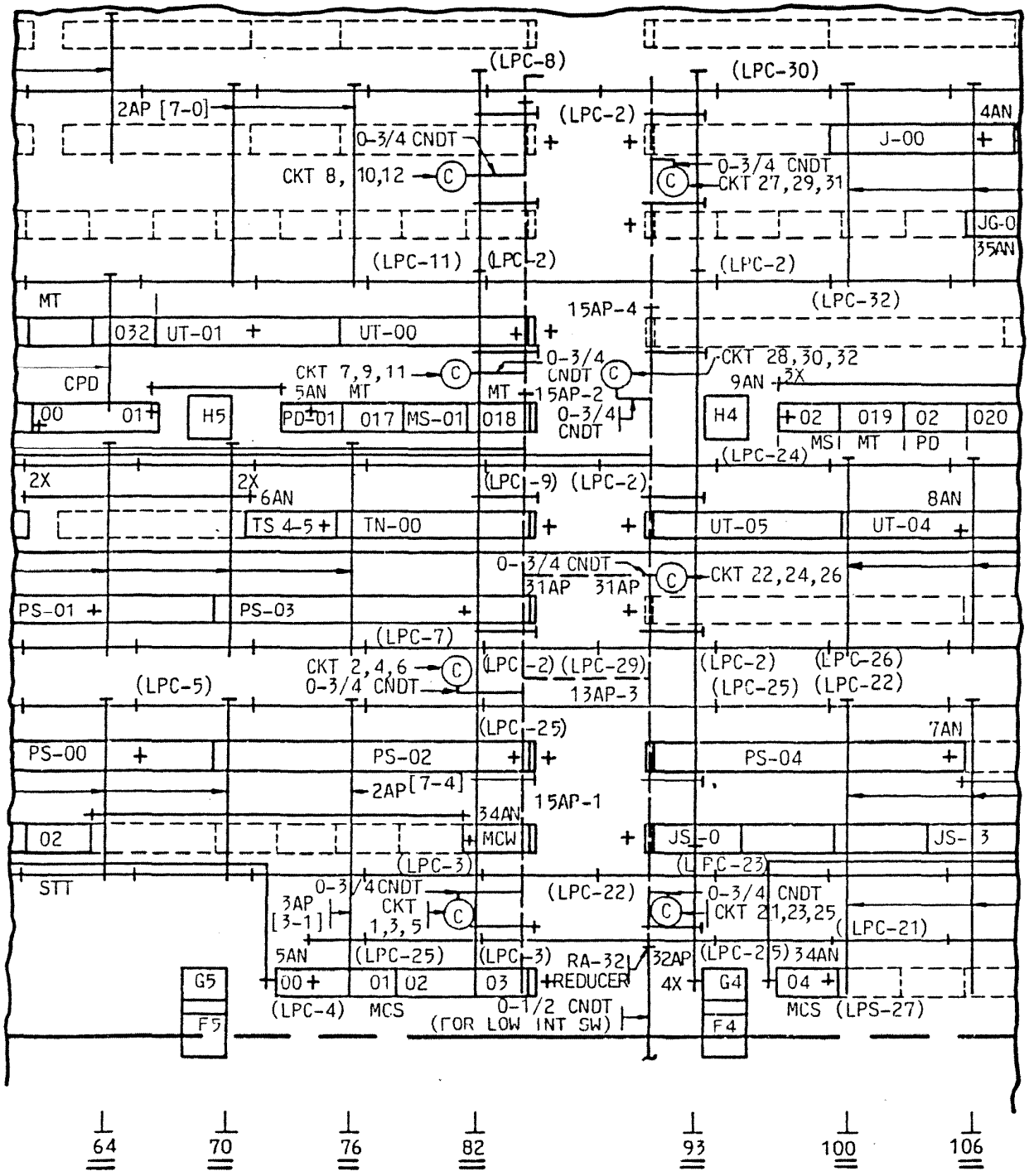


EXHIBIT 2
TYPICAL CONDUIT AND FITTINGS DESIGNATIONS
(PAGE 3 OF 6)

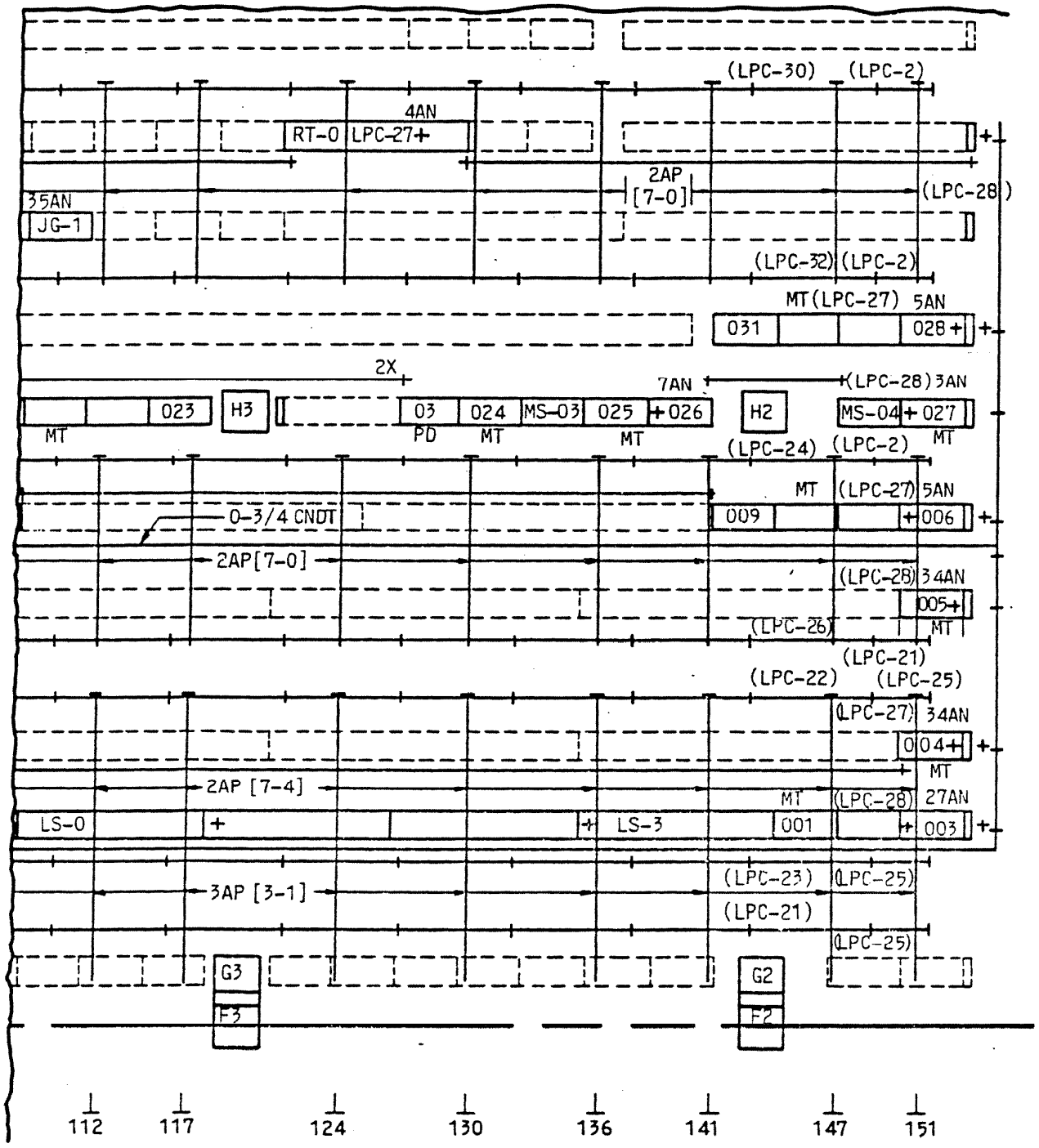
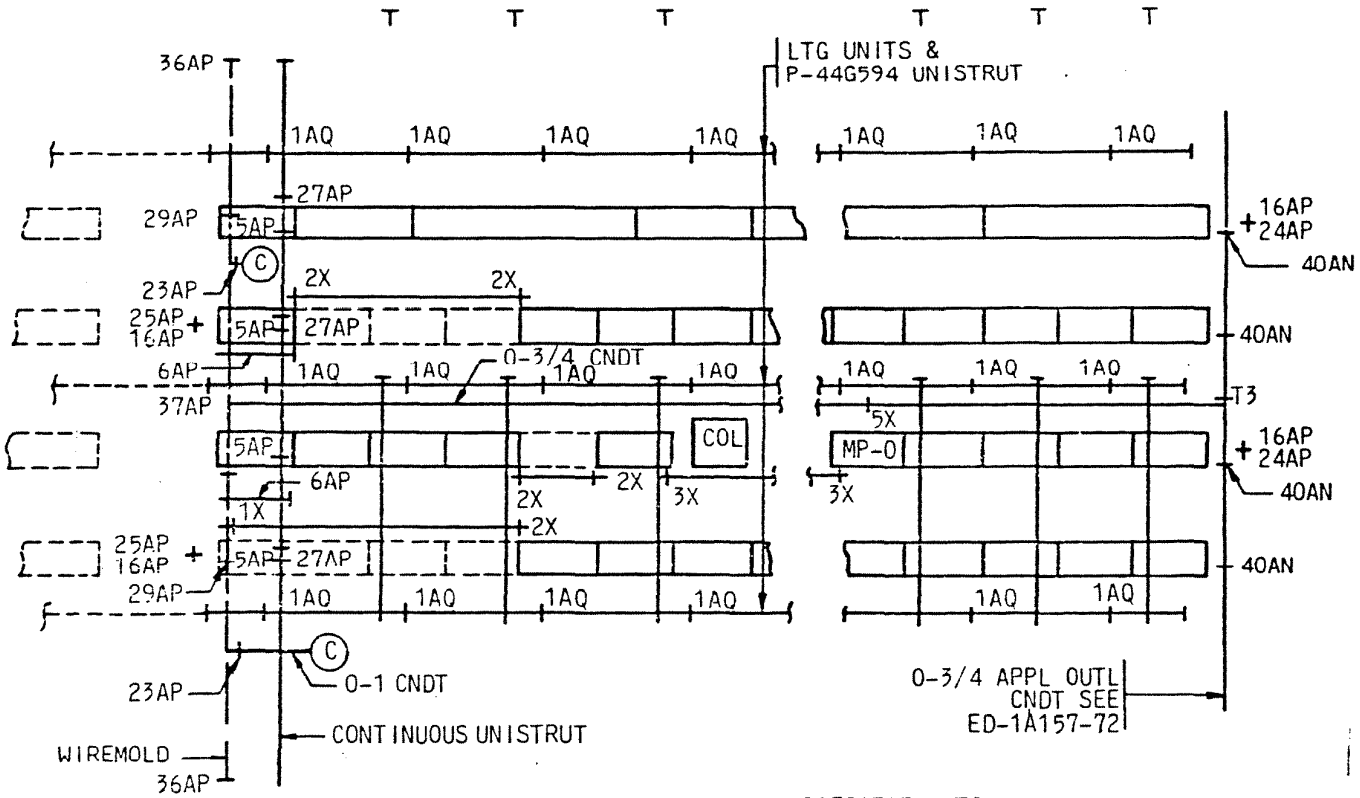


EXHIBIT 2
TYPICAL CONDUIT AND FITTINGS DESIGNATIONS
(PAGE 4 OF 6)



UNLESS OTHERWISE SPECIFIED LTG
UNITS FITTINGS & CONDUIT SHALL
BE AS SHOWN
SK.A

EXHIBIT 2
TYPICAL CONDUIT AND FITTINGS DESIGNATIONS
(PAGE 5 OF 6)

* LOW INTENSITY LIGHTING

7/8	FRAME & AISLE LTG & RECEPTACLE CKT POWER DIST SERVICE CAB 0101 120/209V AC 60 CY 3PH 4W LOCATION NEAR COL E6 ON T-XXXX-XXX						
3/4	COLOR CODE & PHASE	CIRCUIT NO. 7/16	ASSIGNED TO		NO. OF LAMPS 40W	TOTAL WATTS	
			RELAY BOX	RELAY NO.			
1/4	BLK A	LPC-1	15AP-1	1		SPARE	
	RED B	LPC-2	13AP-3	1	26	1040	*
	BL C	LPC-3	15AP-1	2	30	1200	
	BLK A	LPC-4	APPLIANCE OUTLETS				
	RED B	LPC-5	15AP-1	3	26	1040	
	BL C	LPC-6	APPLIANCE OUTLETS				
	BLK A	LPC-7	15AP-2	1	26	1040	
	RED B	LPC-8	"	2	28	1120	
	BL C	LPC-9	"	3	28	1120	
	BLK A	LPC-10	"	4		SPARE	
	RED B	LPC-11	"	5	26	1040	
	BL C	LPC-12	"	6		SPARE	
	BLK A	LPC-21	13AP-3	2	18	720	
	RED B	LPC-22	"	3	18	720	
	BL C	LPC-23	15AP-1	4	20	800	
	BLK A	LPC-24	15AP-2	7	20	800	
	RED B	LPC-25	15AP-1	5	22	880	*
	BL C	LPC-26	13AP-3	4	18	720	
	BLK A	LPC-27	APPLIANCE OUTLETS				
	RED B	LPC-28	APPLIANCE OUTLETS				
	BL C	LPC-29	13AP-3	RTS TRANSFORMER			
	BLK A	LPC-30	15AP-4	1	20	800	
	RED B	LPC-31	"	2		SPARE	
	BL C	LPC-32	"	3	18	720	
			15AP-1	6		SPARE	
			"	7		"	
			13AP-3	6		"	
			"	7		"	
			15AP-4	4		"	
			"	5		"	
			"	6		"	
			"	7		"	
	3/4	7/8	1-1/8	5/8	5/8	5/8	

SKETCH B

EXHIBIT 2
TYPICAL CONDUIT AND FITTINGS DESIGNATIONS\
(PAGE 6 OF 6)

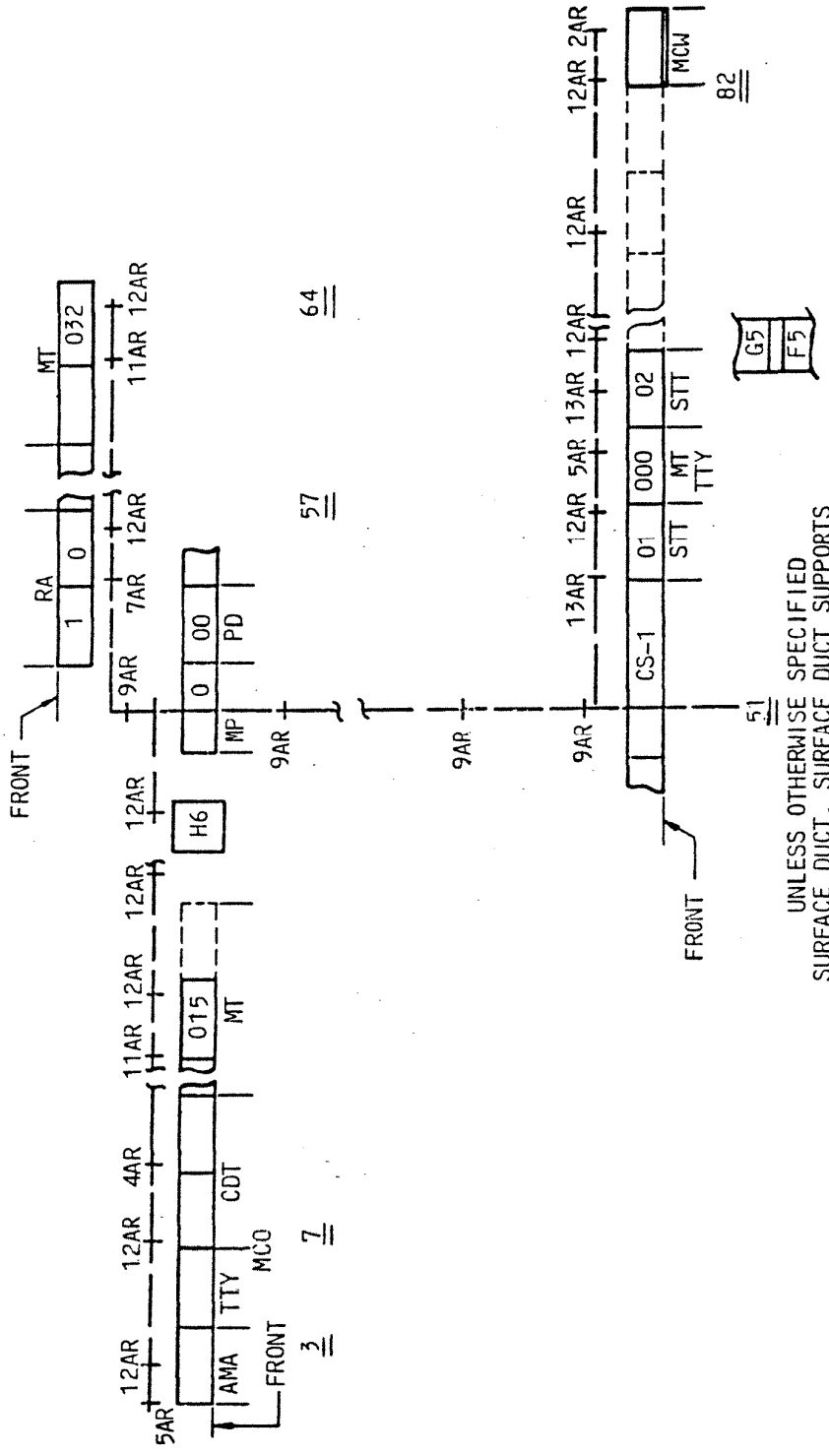


EXHIBIT 3
TYPICAL SURFACE DUCT AND SUPPORTS DESIGNATIONS

1.00 GENERAL

1.01 This part covers the standards to be followed in preparing Central Office cabling, cable rack and auxiliary framing plan drawings for all systems.

1.02 The cabling, cable rack and auxiliary framing plan drawing shall include all information necessary to engineer and install cable rack and associated material in addition to providing a means of routing and recording routes for cable runs in a central office.

2.00 SCALE

2.01 See Section V, Part A, Paragraph 2.01.

2.02 When adding linework to this drawing, sufficient space shall be provided for any 1/8 inch lettering that may be needed. It is also necessary to retain minimum space of 1/16 inch between two parallel lines where no lettering is required and between each dash of a dashed line.

2.03 For soft metric dimensioning procedure, see Section III, Part E, Paragraphs 5.03 and 6.01.

3.00 PEN SIZES

3.01 The following information indicates pen sizes that produce proper lineweights for the specific application on the cabling, cable rack and auxiliary framing plan for both single and double line conventions.

SINGLE LINE CONVENTION (APPLICABLE TO ALL SYSTEMS)

Pen Size	Application
0	Tables and charts (all linework), dimension and projection lines, miscellaneous cross sections, all frames and equipment, all frames and equipment, all cable holes, cable slots, partitions, columns, building outline, vent ducts, auxiliary framing, hanger rods, ceiling insert, drop panels
2	Power cable and supports, conduits, floor troughs, pipes, sketches, square "D" duct, Unistrut, miscellaneous symbols
3	Demarcation line, present and future cable racks, Ground Bar
4	Earthquake bracing

DOUBLE LINE CONVENTION (APPLICABLE TO ALL SYSTEMS)

Pen Size	Application
0	Tables and charts (all linework), dimension and projection lines, miscellaneous cross sections, future cable racks, blocked cable rack, all frames and equipment, future and present cable holes, slots, partitions, columns, building outline, vent ducts, auxiliary framing, hanger rods, ceiling inserts, beam clamps, drop panels
2	Power cable and supports, conduits, floor troughs, sketches, square "D" duct, Unistrut, miscellaneous symbols, pipes
3	Present cable rack, fabrications, demarcation line, Ground Bar
4	Earthquake bracing

3.02 When a copy of the associated floor plan is used as the primary standard for preparing the Cabling and Cable Rack Plan, the conventions and pen sizes depicted on the drawing may be retained. It is expected that new or redrawn drawings shall reflect the lineweights as listed above.

4.00 ISSUE NOTES

4.01 Only a basic Issue Note is required for this drawing. For the elements of a basic Issue Note see Section III, Part F, Paragraph 2.02.

5.00 CRITERIA

5.01 Prior to the preparation of the cabling, cable rack and auxiliary framing plan drawing, obtain all the necessary data, architect plans, floor plan, special condition views and sketches and consider this data in accordance with the following:

A. Make certain that the data is noncontradictory and is the latest available information.

B. Check the locations of all frames, relay racks, switchboards, cable holes and slots, etc., with respect to walls, columns, partitions and with respect to one another to determine whether proper clearances have been allowed. Also verify that standard locations and arrangements have been followed.

C. Obtain information as to the ultimate number of units to be installed in the building to insure that sufficient space will be reserved for the future cable runs and frames.

D. Detail Engineering Suppliers shall coordinate the auxiliary framing and cable rack requirements with the locations and amount of lighting fixtures required.

E. Detail Engineering Suppliers shall coordinate auxiliary framing and cable rack arrangements so that hanger rods will not pass through cable racks.

F. Detail Engineering Suppliers shall investigate the arrangements of the frames and equipment on the floor plan to determine whether some revision of the arrangement could be made that would result in a more economical cabling layout. However, any proposed revision must not interfere with the proper maintenance of the equipment and any other pertinent factors. All affected parties shall be consulted before a change is made.

G. Detail Engineering Suppliers shall contact the Equipment Engineer for critical leads for the particular system involved and make a study to determine that lengths have not been exceeded. If lengths have been exceeded, make the necessary corrections such as rearranging the equipment, changing the gauge of cables or whatever is necessary, as specified by the Equipment Engineer.

H. The Engineer shall also review the locations, number and size of cable holes and cable slots available. Consult with the affected groups when changes are contemplated.

6.00 ARRANGEMENT OF LAYOUT ON DRAWING

6.01 Additional consideration shall be given to superimposing the cable rack layout on the floor plan drawing in such offices as PBX, Community Dial, Carrier Huts and offices consisting of desk type equipment. However, clarity of information and drawing standards previously furnished regarding spacing of lines, spacing of 1/8 inch lettering and numbering must be maintained. When these requirements cannot be maintained, then place the floor and cable rack arrangements as separate layouts on a common tracing or as separate layouts on separate tracings.

7.00 CABLING AND CABLE RACK PLAN DIVISION

7.01 Any divisions required for this drawing shall, where possible, conform to those established for the floor plan drawing. Use lines of demarcation referred to in Section V, Part A, Paragraph 7.01.

8.00 CONSTRUCTION OF LINES OF DEMARCATION

8.01 See Section V, Part A, Paragraph 8.01.

9.00 KEY PLAN

9.01 A key plan illustrating a drawing composite of a particular floor, when required, shall be placed on all cabling, cable rack and auxiliary framing plans of the floor involved (see Section V, Part A, Paragraph 9.01).

10.00 SPECIFIC DRAWING STANDARDS

10.01 New or changed drawing standards related herein shall be applied to all new equipment floors, redrawn drawings, building additions and new buildings. However, certain standards in use prior to this time may be retained when it is logical and economical to extend and complete existing lines and/or areas and also when reproduced drawings are used.

10.02 Recommended drafting procedures for dimensioning on a cable rack drawing utilizing the soft-metric conversion is illustrated in Section V, Part A, Paragraph 10.02.

11.00 BUILDING INFORMATION - ILLUSTRATING

11.01 Coordinate the following information with the proper pen sizes previously furnished within this part, (see Exhibits 1 to 3).

11.02 Walls - Show only the interior wall of the entire building in accordance with the information previously furnished under Paragraph 6.00.

11.03 Pilasters, Columns, Present Partitions and Doors - Show on the body of the drawing with a solid line pilasters, columns (including the letter and number designation), present partitions and doors (include swing of door when necessary to establish clearances).

11.04 Drop Panels and skylights - Show drop panels and skylights on the body of the drawing with equal length dash lines. It is recommended that these dash lines be approximately 3/16 inch to length with a 1/16 inch space between each dash. When showing a skylight, clearly identify it by name (skylight). It is also recommended that unusually low beams be shown on this drawing, utilizing the same dash line recommended for drop panels and skylights.

11.05 Ventilating Ducts

A. Ventilating ducts shall be shown on the body of the drawing with equal length dash lines and designated appropriately VSD or VRD. Add a note similar to Paragraph 27.00, Note 56. In addition, the dimension from the bottom of the duct to the finished floor shall be shown in brackets. Add a note similar to Paragraph 27.00, Note 50. It is recommended that these dash lines be approximately 3/8 inch in length with a 1/8 inch space between each dash.

B. When the placement of ventilating ducts on the cabling and cable rack drawing would congest the information and result in a product that is not legible, it is permissible to originate a separate central office record drawing to depict the vent duct information. It is recommended that this drawing depict only the vent duct information, columns and a single line depicting the interior wall line of the outside wall of the building. When it is necessary for clarification, it is permissible to add additional information such as frame lineups and/or ceiling insert and auxiliary framing information. When auxiliary framing is combined with vent duct on a separate drawing, use a "0" weight pen for vent ducts and a "2" weight pen for framing.

C. When a combined vent duct and auxiliary framing drawing is made, it is not necessary to duplicate this information on the cabling and cable rack plan drawings.

11.06 Building Conduits and Service Pipes - Show the center line of all building conduits and service pipes with equal length dash lines only when they may cause interference with cable runs. Show vertical pipes with a dashed line circle. It is recommended that the length of the dash line be approximately 1/4 inch in length with a 1/16 inch space between each dash. When shown, properly identify them by their respective names on the body of the drawing.

11.07 Other Conduits - The conduits referred to under this title are those conduits that are furnished as conveyances of Switchboard Equipment cable and wire. These conduits can be exposed or concealed. The following items provide information regarding how they are depicted on this drawing.

A. Exposed conduits shall be shown with a solid line representing the center line. They shall also be identified by its diameter and name. When applicable, show the method used to terminate the ends of the conduit by standard application drawing. When a complex arrangement is to be applied, a sketch may be added to obtain clarity.

B. Concealed conduits shall be shown with equal length dash lines representing the center line. Designate them by size and name. Also indicate whether they are located in the floor or ceiling. When necessary to show terminating ends, show the standard application drawing. If more clarity is required, a sketch showing the arrangement shall be placed on the drawing. It is recommended that the dash lines be approximately 1/4 inch in length with a 1/16 inch space between each dash.

11.08 Ceiling Inserts, Beam Clamps, Expansion Shields and Unistrut - Generally, a detailed sketch illustrating and locating the applicable ceiling insert, beam clamp, expansion shield or unistrut arrangement is shown on the floor plan drawing. The following items provide information concerning the placement of this information on this drawing.

A. It is only necessary to show the appropriate symbol along the four sides of each room or floor. Although locating dimensions are not required, the symbol shall be placed at its location as accurately as possible. Add a descriptive note (see Paragraph 27.03, Notes 1 and 2).

B. When a cabling and cable rack plan has been split over two or more drawings, it is recommended that inserts be shown on the four sides of each drawing.

C. Prior to this time, no standard symbol has been established for beam clamps; when they are being supplemented on an existing drawing, continue to use the existing symbol. When no symbol has been previously established, use a square symbol and locate on the four sides of each room or floor. Add a descriptive note (see Paragraph 27.03, Note 3).

D. When unistruts are used, show the appropriate "T" symbol at the terminating ends along the two sides of the room or floor where they are added. Add a descriptive note (see Paragraph 27.03, Note 4).

E. When complicated arrangements are involved, show all applicable symbols necessary to establish their location over the entire floor.

11.09 Miscellaneous building details that are pertinent and necessary to the cable and cable rack layout shall be shown on the body of the drawing with a light solid line identified by its name or appropriate symbol. When a symbol is used, include a definitive note.

12.00 CABLE HOLE, CABLE SLOT AND CABLE SLEEVES

12.01 All information concerning locations of cable holes are established and shown on the floor plan drawing and shall be used for this drawing. However, do not show any locating dimensions on this drawing.

12.02 Depict cable holes, cable slots and cable sleeves on the cabling and cable rack plan drawing in accordance with the following conventions.

A. Cable holes and cable slots in the floor that are framed by either temporarily filled, plugged or temporarily covered without cable hole sheathing are considered future and are shown with a dashed line. It is recommended that the dash lines be approximately 1/8 inch long with a 1/16 inch space between each dash.

B. Cable holes, cable slots or portions of cable slots that are framed and sheathed shall be shown with a solid line.

C. All cable holes in the ceiling of the floor the drawing is made for shall be shown with equal length dash lines. It is recommended that the dash line be approximately 1/8 inch long with a 1/8 inch space between each dash.

D. All cable holes planned but not cut shall also be shown with equal length dash lines. Also, identify these holes with the word "planned" at the proposed location of the hole. It is recommended that the dash lines be approximately 1/8 inch long with a 1/16 inch space between each dash.

E. The standard general drafting practice of showing hidden lines as a dash line shall also be shown to the cable hole convention covered in item B. For example, convert that portion of a cable slot convention that is located beneath a present cable rack from a solid line to an equal length dash line.

12.03 Designate all present and future cable holes cut and framed in the floor and ceiling and sheathed portions of cable slots located in the floor in accordance with the following:

A. Use the same designations shown on the floor plan drawing.

B. Add a definitive note explaining the method used for designating cable holes (see Paragraph 27.03, Note 5).

C. Add notes illustrating the applicable conventions as shown on Paragraph 27.03, Notes 6 through 8.

D. Where possible, place cable hole designations immediately adjacent to the cable hole convention (see Paragraph 27.03, Notes 5 through 8).

12.04 Cable Holes or Slots in Partitions and Walls - Where space permits, show the designations within the outline of the wall or partition.

12.05 Cable Hole Sleeves - Show with a solid line circle and designate similar to the following:

"3 IN. CA SLV"

12.06 Cable Hole and Cable Slot Size Indication - Cable hole or cable slot size need not be indicated on the cabling, cable rack and auxiliary framing plan drawing.

12.07 Cable Hole Modifications

A. Steel Cable Hole Covers

1. When ordering new cable hole cover assemblies, Engineering, in addition to following existing procedures, shall add a -S suffix to the cable hole designation to indicate that the cable hole cover is made of steel (1A3A-S).

2. When an existing cable hole is reopened and closed, Engineering shall refer to the Cabling and Cable Rack Plan for a -S symbol as part of the existing cable hole designation. If the -S symbol is present, no further action other than the usual routine is necessary.

B. Sliding Type Ceiling Plates

1. All new ceiling cable holes require sliding type ceiling plates.

2. Modification of existing ceiling cable holes is at the discretion of the Equipment Engineer.

3. When a sliding type ceiling cover is provided, Engineering, in addition to following existing ordering procedures, shall add an M prefix to the cable hole designation to indicate that the cable hole is equipped with a sliding type ceiling cover (M△1A3A).

C. Examples of Cable Hole Designations

1.	M △ 1A3A	Sliding Type Ceiling Cover
2.	MT△ 1A3A	Sliding Type Ceiling Cover and Tapered Cable Hole
3.	M △ 1A3A-S	Sliding Type Ceiling Cover and Steel Cable Hole Cover
4.	MT△ 1A3A-S	Sliding Type ceiling Cover, Tapered Cable Hole Steel Cable Hole Cover.

D. The above examples shall be accompanied by an appropriate explanatory note similar to Note 5 in Paragraph 27.03 of this part.

13.00 FLOOR DUCTS OR FLOOR TROUGHS

13.01 Floor ducts or floor troughs, whether exposed or concealed, shall be shown on the body of the drawing with equal length dash lines depicting the center line of the duct or trough if they are used as carriers of supplier furnished cables. Those used only for engineering purposes are shown on the Central Office floor plan drawing record only.

14.00 EQUIPMENT - ILLUSTRATING

14.01 All frames, relay racks, etc., shall be shown with solid lines whether present or future.

14.02 When using 1/4 inch scale on the drawing, scale 10, 10-1/2, 11 and 12 inch wide guard rail frames as 12, 12-1/2, 13 and 14 inches wide respectively. Add the required two inches at the rear of the frame lineups.

14.03 Scale 10, 11 and 12 inch wide cable holes or cable slot 12, 13 and 14 inches wide respectively. When a cable hole or cable slot is located in a frame lineup, add the two inches on the same side of the cable hole as the rear of the lineup. When cable holes or cable slots are not located in frame lineups, the two inches may be added equidistantly at both sides of the cable or cable slot.

14.04 When the floor plan reproduction process has been used to provide the original for preparing a cable rack drawing, the conventions on the floor plan shall be retained.

15.00 CONVENTIONS, DESIGNATIONS AND NUMBERING

15.01 In general, conventions depicting frames and relay racks shall be the same as those established for the floor plan drawing essentially in block form. When frames are shown detailed and numbered, then also show this information on this drawing, (see Exhibits 3 and 4).

15.02 Generally, designations are not required when frame and lineup numbering provide sufficient identification for cable routing purposes. However, when required, place the designations, preferably at the front of the lineup unless otherwise noted. Use standard abbreviations and identify specific designations in accordance with the following items (see Exhibits 3 and 4).

A. Designate all distributing frames, if possible, within the frame convention.

B. Designate dial type frames within the frame convention on a first and last frame basis except where some condition requires additional designations to maintain clarity.

C. In electronic switching offices, indicate the respective control groups by preceding the frame designations with the appropriate alphanumeric in parenthesis. Add an explanatory note on the drawing (see Paragraph 27.03, Note 51).

15.03 Numbering, as well as designations of frames, shall also adhere to those utilized for the floor plan drawing. This includes the placement of this information on a first and last frame basis, showing frame numbers for frames numbered 5, 10, 15, 20, etc. However, when other information occupies the space required for this information (for example, cable racks over last frame in lineup) place the needed information as close as possible to the standard locations, (see Exhibits 3 and 4).

15.04 In offices where main aisles are crowded with information, lineup numbers may be added as outside aisles or outside the line of the building, wherever the space permits easy identification between the lines of frames and their lineup numbers, (see Exhibit 3).

15.05 In offices with specific systems on floors containing only switch type frames, lineup numbers may be omitted from the drawing until such time that a frame or frames requiring lineup numbers are added. When they are added, add the information either at the individual frame (if only one or two frames) or in the aisle that space permits, preferably main aisle.

16.00 CABLING AND CABLE RACK - GENERAL

16.01 In general, cables are run on three basic types of cable rack in a central office: ladder type, bar type and compartment type (SPCS and similar applications).

16.02 In addition to the three previously mentioned commonly used cable racks, there are also three other cable racks in use. They are as follows:

A. A special cable rack utilized for lightly loaded cross-aisle cable runs between adjacent lineups. This rack may also be used to span the space where one lineup of frames is omitted or where adjacent lineups of frames are separated by columns. However, the unsupported span of the auxiliary framing shall not exceed eight feet.

B. Power feeder cable rack and supports used for certain power cables at gaps in the lineup or at main and end aisles. Add a note similar to Paragraph 27.03, Note 49.

C. Specialized troughs used for the installation of fiber cables are designated by encircled numbers which reference specific types of fiber cableway components (i.e., elbows, t-joints, and straight runs).

D. Essentially, the contour and location of all cable runs is shown on this drawing. For the purpose of this text, the term "Cable Run" is intended to mean both a particular run of cable, a group of cable or certain classifications of cables on a cable rack.

16.03 In addition to the foregoing requirements, the subsequent information should also be considered prior to the placement of cable racks on the drawing.

A. Location of the cable rack whether on the wiring side or the equipment side of the frame, or over aisle

B. Width of the cable rack

16.04 Classified cable runs covered herein are those cable runs that are restrictive in an electrical sense. That is, they must be separated from other types of cables either by a space between the conflicting leads or cables on a common cable rack or by running the leads or cables on separate cable racks. Essentially, classified runs are required for "L", "N", "ON" "ANI", etc. When cable runs are classified, they are designated accordingly on the drawing. Add a note similar to Exhibit A, Notes 48 or 49. Subsequent paragraphs will typify how this information is portrayed on the drawing.

16.05 In general, certain power leads such as unfused leads from batteries to power boards, must be kept on separate cable racks independent of switchboard cables. Although certain leads will not require separation, it is still desirable to run these power leads on separate cable racks when there are sufficient numbers of leads to merit this separation, and sufficient amount of space for the separate cable racks.

16.07 In addition to the separation of power cables, there is a major form of power distribution called the power equalizer. This power equalizer consists of a cabling network and generally eliminates the use of the Battery Distribution Fuse B board. This power equalizer comprises basically a group of main power feeder cables that supply power from the Battery Controller Board to a Main Aisle Feeder cable (including ground path cables). The point where these cables meet and join through cable connectors on cable rack is referred to as the equalizing center.

C. Hanger rods or frame supports

D. Rolling ladders

E. Fluorescent Lighting Fixtures

17.00 CABLING AND CABLE RACK - ILLUSTRATING

17.01 Essentially, all cable racks, their contour and location, including vertical offsets are shown on this drawing. The following paragraphs and items relate how and where this information is shown.

17.02 There are two basic methods of depicting Ladder, Bar and Compartment type cable racks on the drawing. They are as follows:

A. The single line cable rack convention is the preferred practice and should be used for All new isolated areas, floors and offices except as specified by items B, C and D under this main paragraph. This convention consists of showing a single solid line along the center line of a cable rack to represent the "over frame", "over aisle" and "cross-aisle" cable racks. Future cable racks are represented by a single dashed line. When using this convention, add an explanatory note similar to Paragraph 27.03, Note 9. For an illustration of this convention see Figure 1.

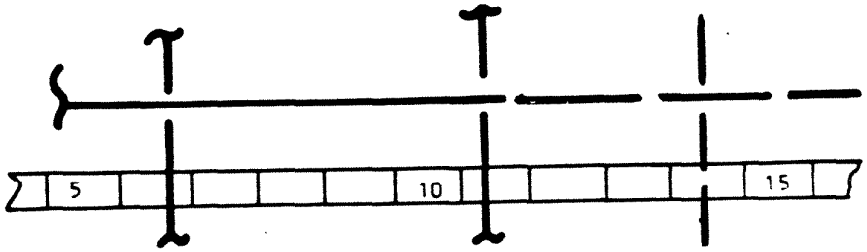


FIGURE 1
SINGLE LINE CABLE RACK CONVENTION
(PRESENT AND FUTURE CABLE RACKS)

B. The double line cable rack convention may be used for greater clarity in having variable cable rack widths and elevations at particular locations. This convention may also be used for greater clarity in SPCS offices and power areas in accordance with subsequent paragraphs. This convention consists of showing two heavy lines spaced to conform to the cable rack widths in accordance with the scale of the drawing. Future cable racks are depicted in the same way except that the weight of the lines are much lighter. When using the double line convention, add an explanatory note similar to Paragraph 27.03, Note 10 (see Figure 2 and Exhibit 3).

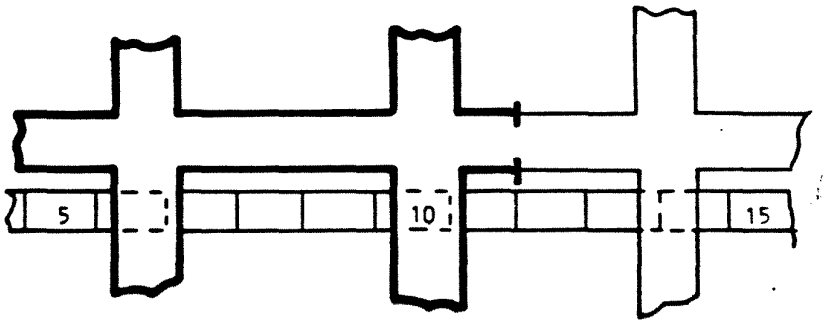


FIGURE 2
DOUBLE LINE CABLE RACK CONVENTION
(PRESENT AND FUTURE CABLE RACKS)

C. In SPCS, VF Transmission, and Broadbank type offices which use compartment type racks mounted on the framework, single and double line conventions as depicted invarious figures shall be used. All cross-aisle cable racks shall be shown as single line. Special power runs, etc., shall, where possible, use the single line convention unless a definite clarification is required.

D. Double line convention may also be applied on single line drawings for specific cable runs and specific cable rack sections to expand complicated fabrications and/or levels (see Exhibits 2, 3 and 4, and Figure 4).

17.03 When showing either the single or double line convention, follow the general drafting practice of showing hidden lines as dashed lines. For example, lines depicting frame outlines are shown dashed for that portion shown underneath a cable rack.

A. An exception for showing hidden lines as dashed lines for depicting frame outline is SPCS type framework underneath over-frame cable rack. The only time these SPCS type frameworks are shown dashed is when a bar or ladder type cable rack is run above this equipment.

17.04 The width and type of cable racks shall be indicated on all cabling plan drawings. When cable racks of the same width and type predominate, cover this information with a note such as; "ALL OVER AISLE CABLE RACKS ARE 1' - 8" WIDE BAR TYPE AND ALL AISLE CABLE RACKS ARE 1' - 10" WIDE BAR TYPE, UNLESS OTHERWISE SPECIFIED". When a change in construction occurs in a run, the line of demarcation must be indicated. When cable racks vary in width or type, this information shall be shown adjacent to the rack as 1-8B for bar type or 1-8L for ladder type. The 1-8 modified ladder type cable rack assembly shall be designated 1-8LM. Add applicable definitive notes as shown on Paragraph 27.03, Notes 11 through 16.

17.05 Conventions representing changes in the course of a cable run shall be shown on the drawing in accordance with the following:

A. Exhibit 1 illustrates the conventions to be used when cable racks are depicted on the drawing with double lines.

B. Part of the convention is the number in brackets of the fabrication (identifier). These numbers and brackets, when used, require a descriptive note similar to Paragraph 27.03, Note 17.

C. Common type Cable Rack Fabrications need not be identified by number on the body of the drawing. Instead, add a note similar to Paragraph 27.03, Note 18.

D. Exhibit 2 illustrates the conventions to be used when cable racks are depicted on the drawing with a single line.

E. Generally, the same rule regarding the placement of fabrication numbers on the drawing for the double line convention shall also apply to the single line convention.

F. As near as possible to the fabrication number, add the required radii at all inside and all outside turns where the required radius exceeds six inches. This radius need not be shown where a drawing number or figure number on a drawing is specified detailing the method of fabricating the turn.

G. Special cable rack fabrications not shown in the Equipment Suppliers' Practices, such as Equipment drawing or view numbers shall be shown at the convention. Also, show an arrow cross referenced to a note. Add a note similar to Paragraph 27.03, Note 19 to insure proper identification.

17.06 Where possible, the use of special turns, spirals, offsets and fans in cable runs is avoided. In general, spirals and "double-turns" are used in cable runs to eliminate side or hanging runs and objectionable goosenecks, facilitate proper installation sequence, and conserve space in congested areas. Exhibit 5 of this part illustrates application of spiral and compound turns. The following items provide more detailed information concerning the application of spirals and fans in the cable run and designations on the drawing.

A. Use spirals or compound turns in preference to "goosenecks", or side of hanging switchboard cable runs over 20' - 0" in length. Side of hanging power cable runs should be avoided.

B. Use 180° spirals in preference to two 90° spirals and double-turns in preference to 90° spirals and turns.

C. Do not locate spirals in operating rooms without the specific approval of the Equipment Engineer.

D. Where spirals are required in wide cable runs and located against building walls or in maintenance aisles, space may be conserved and the appearance of the run improved if, where practicable, the cable rack is divided into two smaller racks and two spirals used rather than one.

E. Conventions for showing spirals on the office drawing are shown by Exhibits 1 and 2.

17.07 Classified cable rack runs described in a previous paragraph shall be shown on the body of the drawing in accordance with the following examples. Also see Exhibits 3 and 4.

A. In offices with "L" Carrier classified cable racks, show class identity on the body of the drawing as illustrated by Figures 3 and 4 and Exhibit 3. Add a note similar to Paragraph 27.03, Note 20.

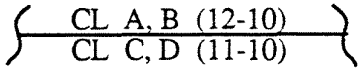


FIGURE 3
DESIGNATING CABLE RACK
(SINGLE LINE CABLE RACK CONVENTIONS)

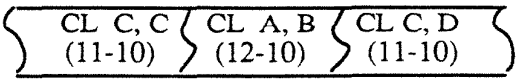


FIGURE 4
DESIGNATING CABLE RACK
(DOUBLE LINE CABLE RACK CONVENTIONS)

B. In offices with "N" Carrier classified cable racks, show on the body of the drawing as illustrated by Figures 5 and 6. Also add a descriptive note similar to Paragraph 27.03, Note 21.

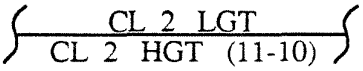


FIGURE 5
DESIGNATING CABLE RACK
(SINGLE LINE CABLE RACK CONVENTIONS)

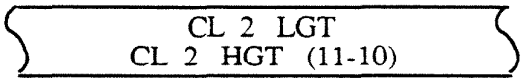


FIGURE 6
DESIGNATING CABLE RACK
(DOUBLE LINE CABLE RACK CONVENTIONS)

C. In offices with "ANI" Equipment, designate segregated cable racks as follows:

Cable Racks with Primary Cables - ANI PRI CA only
Cable Racks with Secondary Cables - ANI SEC CA only

D. In offices with "T" Carrier, it may be desirable to identify those cable rack carrier input and output leads as shown below. This information may be necessary should subsequent installations add equipment requiring segregation, (see Exhibit 4).

"'T' Carrier Input and Output"

17.08 When separate power runs are utilized in an office, it may be desirable to show designations on the rack similar to the following, (see Exhibit 3).

"PWR 1-8L" or "ETS PWR 1-8L"

17.09 In offices where there are equalizing centers, apply the following information. Also see Exhibits 3 and 4.

A. Designate and number equalizing centers EQL CTR 0101. The 0101 indicates the first floor (01) and the first center (01). If it were located on the 3rd floor, it would be numbered 0301, third floor (03) 1st center (01).

17.10 As previously stated, all cable rack locations shall be shown on the drawing. This includes all horizontal, when available, and vertical locations as covered by the following items.

A. Show locating dimensions for cable racks parallel to a frame or rack from the center line (or side) of the cable rack to either the sheet metal guard rails, to the base angle of open guard rail frames, to the cable duct upright of duct type frame work, or to the edge of columns as shown by Figures 7, 8, 9, 10 and Exhibits 3 and 4. Add a note similar to Paragraph 27.03, Note 22.

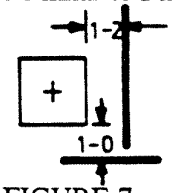


FIGURE 7
LOCATING CABLE RACKS FROM EDGE OF COLUMN

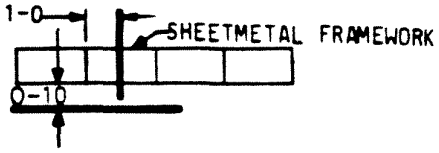


FIGURE 8
LOCATING CABLE RACK FROM GUARD RAIL TO CENTER LINE OF CABLE RACK

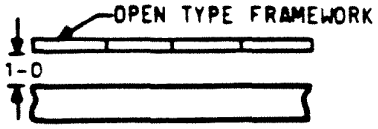


FIGURE 9
LOCATING CABLE RACK FROM BASE ANGLE OF OPEN GUARD RAIL FRAMES TO THE EDGE OF THE CABLE RACK

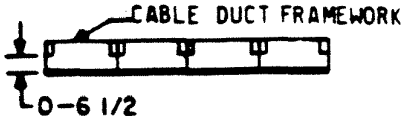


FIGURE 10
LOCATING CABLE RACK FROM THE CABLE DUCT UPRIGHT OF A CABLE DUCT BAY TO THE CENTER LINE OF THE CABLE RACK

B. Show locating dimensions for cable racks at right angles to and crossing above a line of frames from the end of the frames which it passes over, from the edge of a column or from another cross-aisle cable rack previously located, (see Figure 21 and Exhibits 3 and 4).

C. When cable racks are to be run between floors, locate and show the locating dimension of the cable rack at the cable hole or cable slot only.

D. Locating dimensions for main and end aisle cable racks shall be shown in the same manner as specified for the cross-aisle cable racks.

17.11 In combination Step-by-Step and Toll Offices where toll relay racks are placed in the same lineup with step-by-step frames, it is permissible to continue the frame cable rack over the toll relay rack in a straight line unless duct type framework is used.

17.12 Show locating dimensions for cable racks parallel to power frames in accordance with standard cabling and cable rack layout drawing for the applicable type power plant. Cable racks at right angles to and crossing above power frames, battery stands, etc., shall be dimensioned from the end of the power units over which it passes or from permanent building construction such as columns, walls, etc.

17.13 The following items provide locating information with respect to cable rack locations above the floor.

A. When locating cable racks with respect to the floor, base the dimensions on the distance from floor line to the cable line of the cable rack. Indicate these dimensions in parentheses at conspicuous points alongside of (or within) the cable runs. In no case should cable runs be located from the ceiling or underside of beams or girders (see Paragraph 27.03, Note 25).

17.14 Vertical offsets must be located. These locations are shown to the end of the horizontal section of cable rack. Add an explanatory note similar to Paragraph 27.03, Note 26. Also see Exhibits 3 and 4.

17.15 When two or more miscellaneous equipment units such as code signal sending device, fire detection relay, audible signaling alarm, call bell, etc., are grouped in the same general area on walls or columns provide a cabling layout and dimensional information in separate sketch on the office cabling and cable rack plan drawing if not shown on the office floor plan drawing. When this information is to be combined on this drawing, a suitable note referring to the layout shall be placed on the floor plan drawing.

17.16 When a supporting "Manufacturers" drawing provides a fixed dimension for locating a cable rack, the reference to the "Manufacturers" drawing and appropriate figure may be shown on the cabling and cable rack plan drawing in place of a numeric locating dimension. This reference may be shown on the body of the drawing or as a note provided it properly identifies the point or area of application.

18.00 CROSS SECTIONS AND CROSS SECTIONAL VIEWS

18.01 The following paragraphs cover cross sections and cross sectional views. They contain such information as when and where cross sections are expanded into cross sectional views and also how they are depicted on the drawing.

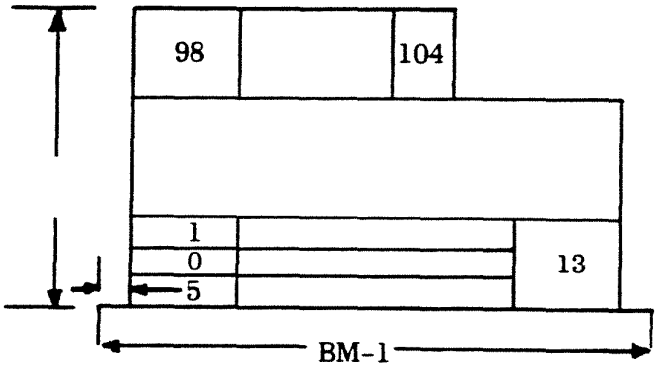
18.02 Occasionally, regular cable runs are encountered and on occasion, detailed cross sections showing the arrangement of cables at a specific point on the cable rack have been made. New applications of regular runs and detailed cross sections are rare. When necessary, apply as follows:

A. The detailed cross sections of regular runs referred to in the previous paragraph shall show the ultimate height of the cables on the rack, the cross section designation and title of run, the width of the cable rack, code of cables, locating dimension of first cable, if other than standard (3/4"), and the grouping and sequence of numbering of the cables. An example of a cross section is shown by Figure 11.

B. In the case of runs involving 100 circuit cables, the cable numbers shall be shown and circuit numbers omitted as shown in Figure 11.

C. The letters used in designating these cross sectional views (BM-1 in Figure 11) shall be assigned in accordance with their similarity to the title of the run. The following are examples of this designating procedure.

Inter to Answering Jack Run	- AJ
Protector Frame to Main Distribution Frame Run	- PM
Block Relay to Line Distributing Frame Run	- BR



BM-1
INTER TO B-MULT CODE 84 CL

FIGURE 11
CROSS SECTIONAL VIEW OF CABLES ON
REGULAR CABLE RACK RUN

D. When more than one cross sectional view is required for a common regular cable run, take the view in the same direction and number a common designation 1 and up for each view. For example, BM-1 (1st view) BM-2 (2nd view), etc.

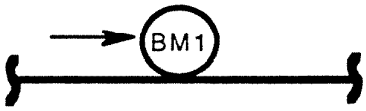
E. Only sufficient detailed numbering as is required to show the general sequence shall be shown. When the arrangement of the cables is irregular, the numbering of all the cables shall be shown in detail. Number cables in cross section on major dial systems runs in accordance with the following:

Run	Nbg. of Cas.
MDF to Prot.	A to H & Vert. No.
LDF to BR	A to H & BR Fr. No.
LL to DF	LL Fr. No. & Hd. No.
MR to DF	MR Fr. No. & Hd. No. (100% MR)
MR to DF	MR Fr. No. & Ca. No. 1 up (less than 100% MR)
MDF to FIDF	LF Fr. No. & Ca. No. 1 up
MDF to HIDF	Hd. No. &
IDF to Final	Fin. Fr. No. & Hd. No.
IDF to Conn.	Conn. Fr. No. & Hd. No.
IDF to LR	LR Fr. No. & Ca. No. 1 up

F. Ultimate cables shall be shown in full except on inter to answering jack runs on manual equipment where the present cables shall be shown in full and the ultimate dashed.

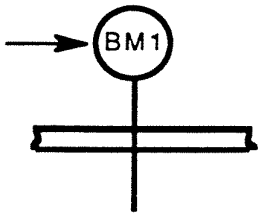
G. Wherever possible, the cross sectional views of regular runs shall be included on the plan view drawing with which they are associated.

H. Designate the detailed cross sectional views on the body of the drawing at the point or points on the cable rack where the view was taken as shown in Figures 12 and 13. Also add an explanatory note similar to Paragraph 27.03, Notes 27 or 28.

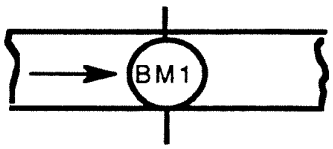


Note: Arrow indicates direction view is taken

FIGURE 12
DETAILED CROSS SECTIONAL
(UTILIZING SINGLE LINE CABLE RACK CONVENTION)



Narrow Cable Rack



Wide Cable Rack

Note: Convention for Narrow and Wide Cable Racks
Arrow indicates direction view is taken

FIGURE 13
DETAILED CROSS SECTIONAL
VIEW DOUBLE LINE CABLE RACK

I. Other special views, such as views of cables on distributing frame cross arms, in cable holes at fuse bays, etc., are made only when standard cabling plan drawings do not show the arrangement and it is absolutely necessary to provide this illustration.

19.00 RECORDING CABLE QUANTITIES AND PILEUPS

19.01 There are and have been several methods of recording cable quantities or pileups on cable racks. They are covered in subsequent paragraphs.

19.02 The coordinate plan, as described by the following items, for identifying cable run intersections in order to record cable quantities shall be used on all new jobs where the arrangement of frames and associated cable racks will permit application of this system.

A. Each "overframe" and "over aisle" cable rack carrying miscellaneous cable shall be lettered alphabetically using all letters of the alphabet except "I", "O", "P", "X" and "Z". Each lettered coordinate shall be prefixed by the floor number and assigned so that the proper designations are reserved for all future "overframe" or "frame aisle" cable racks. Coordinate numbers for "cross-aisle" cable racks shall be reserved on the basis of 1 per inch (or 4 scale feet) starting at the base wall. On the cabling plan drawing, only the numbers actually applying to paths should be shown, for example, 2, 6, 9, etc. These coordinate designations shall be shown immediately outside of the building lines shown on the cabling plan drawing, (see Exhibits 3 and 4).

B. Cable rack intersections are to be identified in terms of the coordinates, i.e., (2A-1), (3B-5), etc., but these designations will not be shown at the particular intersections on the cable plan drawing, (see Exhibits 3 and 4).

C. Designate miscellaneous cable sections which are not shown in a regularly designated coordinate path (such as cable runs to cable holes, or to desks, or short spur racks between frames) with the letter "X" prefixed by the floor number and suffixed numerals 1 and up as required. These cross section designations shall be shown in circles with a line across the cable rack to indicate the point of application. Miscellaneous cross sections shall not be shown in detail, (see Figures 14 and 15). Add a note similar to Paragraph 27.03, Note 28. Also see Exhibits 3 and 4.

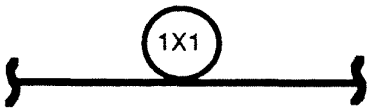
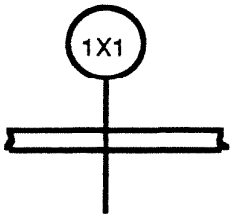
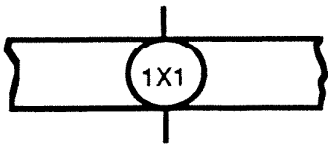


FIGURE 14
CROSS-SECTIONAL VIEW
MISCELLANEOUS CABLE RUN
(SINGLE LINE CABLE RACK CONVENTION)



Narrow Cable Rack



Wide Cable Rack

FIGURE 15
CROSS-SECTIONAL VIEW
MISCELLANEOUS CABLE RUN
(DOUBLE LINE CABLE RACK CONVENTION)

D. Detailed cross sectional views of power wire or cable runs generally will not be required. However, those runs specifically assigned to power wire shall have cross section designations assigned to them.

E. Designate power wire cross sections which consist of power wires only with the letters "PW" preceded by the floor number and supplemented by numerals assigned consecutively from 1 up. Floor number should be omitted when located in the basement, (see Exhibit 3). Add a note similar to Paragraph 27.03, Note 29.

F. For combined switchboard and power wire cross sections, assign designations as prescribed for miscellaneous switchboard cable runs.

19.03 When the coordinate system has not been used, miscellaneous cross sections shall be used and are designated by a single letter followed by a single digit number. All letters of the alphabet except "I", "O", "Z" may be used. The letters shall be preceded by the floor number to avoid the possibility of duplicating cross sections on different drawings and to simplify the job of locating particular cross section.

A. These cross sections are shown on the body of the drawing similar to Figures 14 and 15 for straight sections of cable rack.

B. Figures 16 and 17 illustrate method of designating "T" intersections.

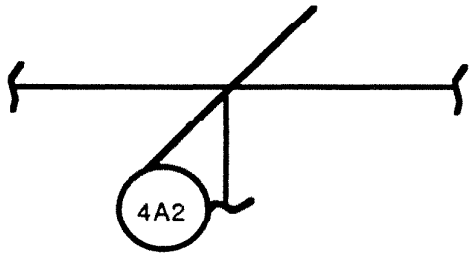
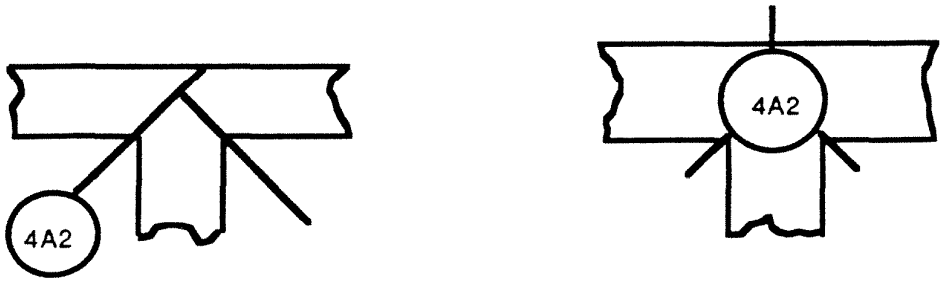


FIGURE 16
"T" INTERSECTIONS
(SINGLE LINE CABLE RACK CONVENTION)



Narrow Cable Rack Wide Cable Rack

FIGURE 17
"T" INTERSECTIONS
(DOUBLE LINE CABLE RACK CONVENTION)

C. Figures 17 and 18 illustrate method of illustrating "X" intersections.

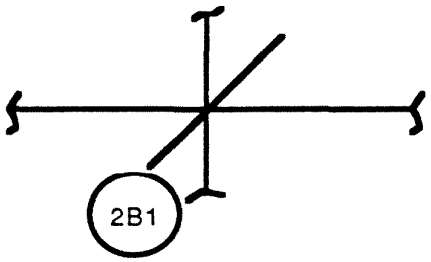
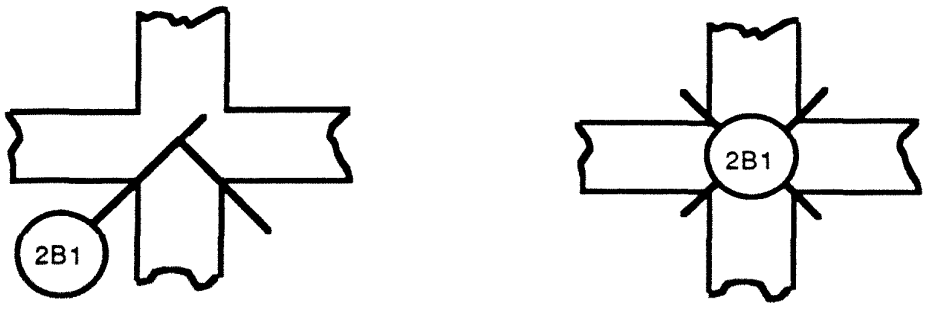


FIGURE18
"X" INTERSECTIONS
(SINGLE LINE CABLE RACK CONVENTION)



Narrow Cable Racks Wide Cable Racks

FIGURE 19
"X" INTERSECTIONS FOR NARROW AND WIDE CABLE RACKS
(UTILIZING DOUBLE LINE CABLE RACK CONVENTION)

20.00 TABULAR FORMATS FOR RECORDING CABLE COUNTS

20.01 Regardless whether the coordinate system, miscellaneous system or any other system has been established in an office, tabular formats shall be originated or maintained to record cable counts at various intersections and point on the cable racks. Essentially, the ultimate cable pileup dimensions to be used include power cable and cables shown in detail on miscellaneous or semiregular cable runs. The capacity and number of cables is in terms of cables having less than 90 conductors.

20.02 Figure 20 illustrates a miscellaneous section table to be used for offices containing Broadband and Microwave equipment.

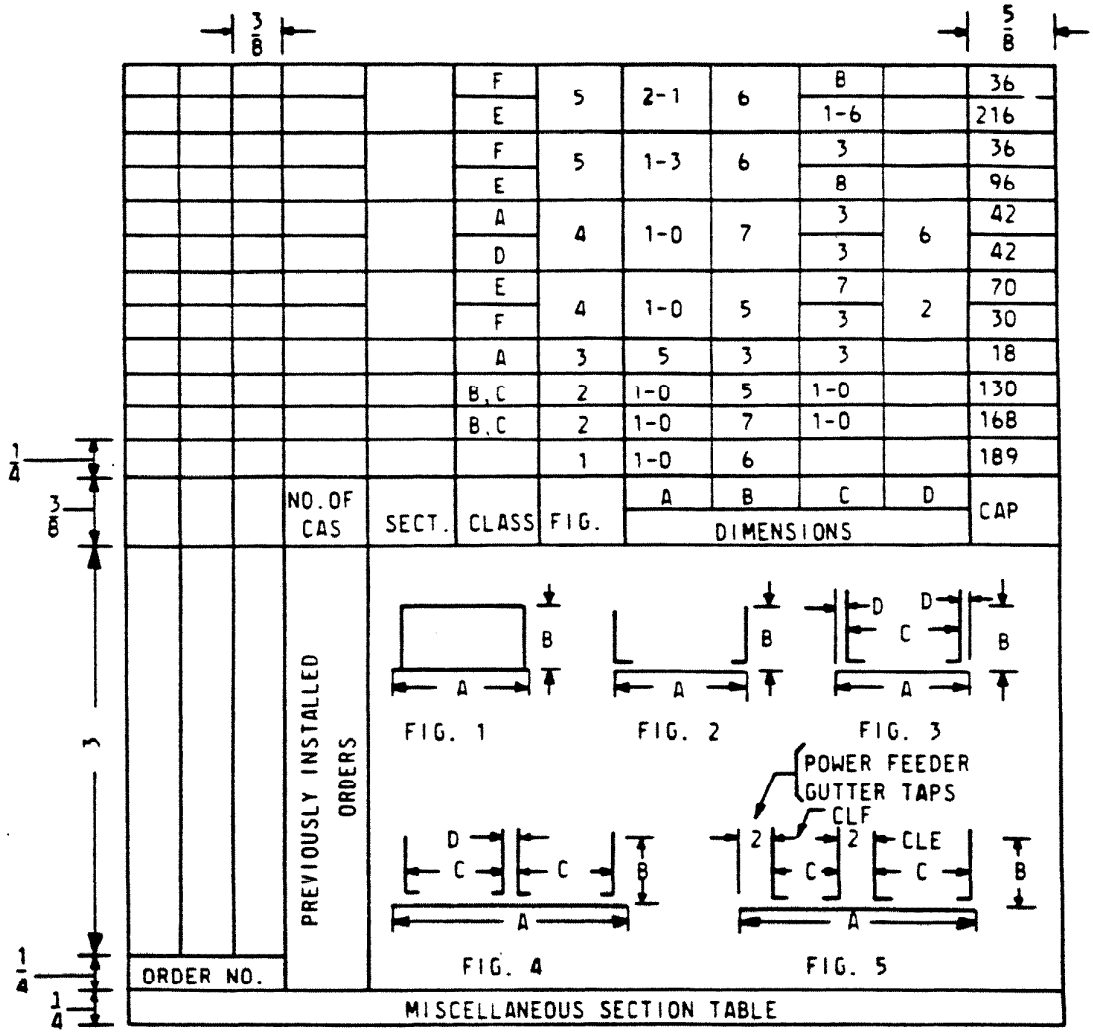


FIGURE 20
TYPICAL MISCELLANEOUS SECTION

20.03 Figure 21 illustrates a portion of Table A on a tabular drawing recording the number of cables and capacities at horizontal and vertical coordinates. This drawing is originated on an entire floor basis for each floor of the office containing Toll Transmission Equipment. Utilize the appropriate form drawing.

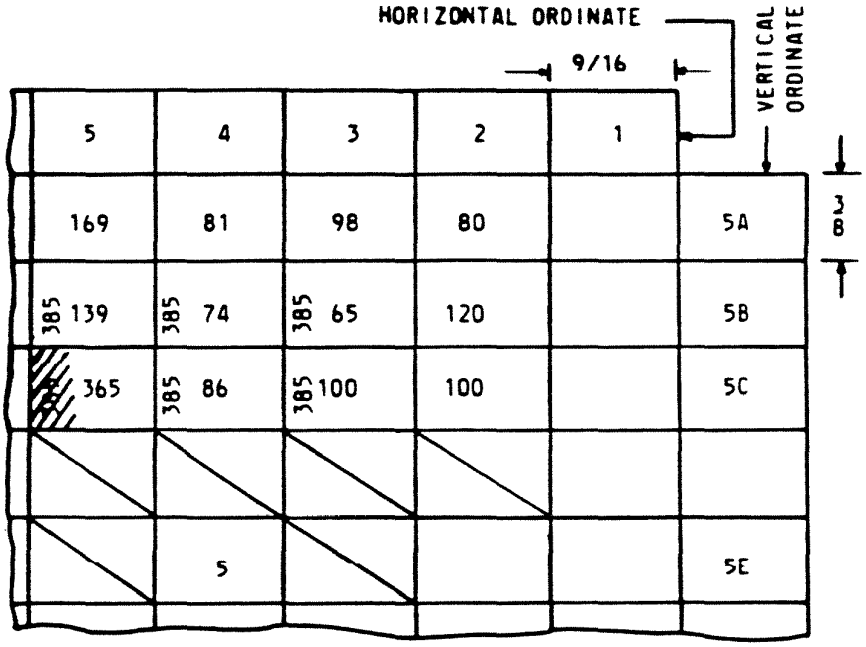


FIGURE 21
TYPICAL TABLE A

C. Figure 22 illustrates a portion of Table B also shown on the tabular drawing originated for Toll Transmission Office. This table records the miscellaneous sections on cable runs to cable holes, desks, etc., not reflected in the coordinate system.

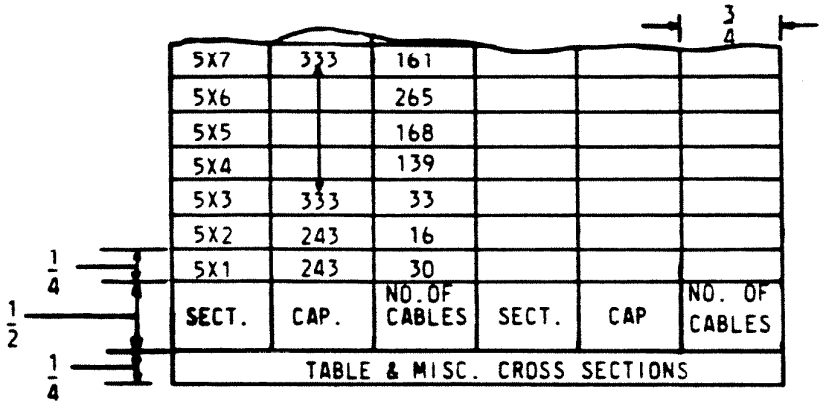


FIGURE 22
TYPICAL TABLE B

20.05 Figure 23 illustrates the method of recording cable count and ultimates for all other systems where this information is recorded.

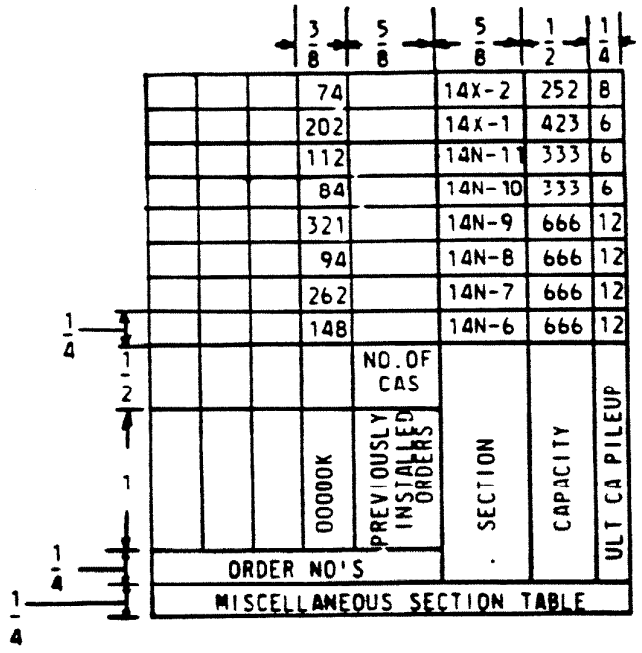


FIGURE 23
MISCELLANEOUS SECTION TABLE

20.06 It shall be noted in Figures 20 and 23, the column headed "Previously Installed Order" is intended to be used to condense into one column the total number of cables installed on several orders when it becomes necessary, due to space limitations, to reuse the columns headed "Order Numbers" for additional orders. This column may also be adjusted to show the number of cables added on miscellaneous orders or small additions where the number of cables added in each section represents a cross section of less than two square inches of cable rather than to use a separate "Order Number" column for this purpose.

20.07 Include the power cross sections and combined switchboard and power cross sections in the "miscellaneous section table" (Figures 20, 22, 23) with the miscellaneous switchboard cable cross sections.

20.08 In those cases where two or more cable plans are required on each floor, consolidate the miscellaneous section table to be on only one cable plan. On the associated cable plan(s) in a note, cross reference the location of the table information.

21.00 CABLE PATHS FOR MAJOR EQUIPMENT

21.01 Sometimes it is necessary to maintain maximum utility of a basic cabling scheme. In order to insure this utility, it is essential to record the cable routing of the scheme on the cabling and cable rack plan drawing. Generally, this information will be limited to designating specific paths to be used for cabling between major equipment units or areas. When areas, define in terms of columns bounding the particular building bays involved and place this information in a tabular format as shown by Figure 24. Also add a note in accordance with the following:

A. When routing cables between equipment or areas shown in the cable routing table, primary consideration shall be given to the cable racks indicated.

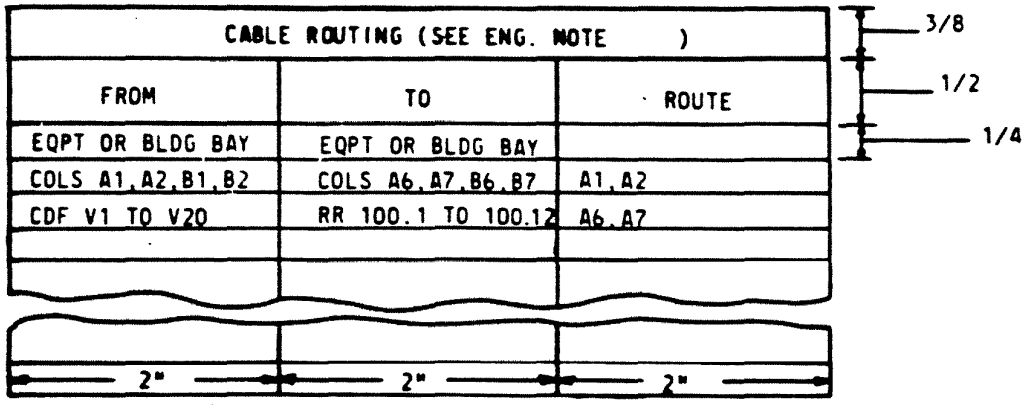


FIGURE 24
CABLE ROUTING TABLE

22.00 SPLICES ON CABLE RACK

22.01 Where certain conditions prevail, it is sometimes necessary to place splices in cable runs. For example: When a particular circuit is to be terminated in more than one lineup of switchboards, the cable from this circuit may be spliced into runs to the other terminating points of the same circuit when an appreciable saving of cable is effected, a complicated cabling layout avoided, or the space in the frame will not permit the installation of another run. The following items relate the procedure to follow and the method of recording this information on the drawing.

22.02 Design the cable run to allow for the additional width and pileup resulting from the splices. The type of splice to be used whether "T" or "Y" will be dependent upon conditions on the job involved. Give preference to "Y" splices where cabling conditions will permit.

22.03 Confine splices to horizontal portions of runs where they will not result in increasing the length of the cable runs or introduce poor installing conditions. Avoid locating splices in congested areas to permit easy access for the installer.

22.04 Indicate on the body of the drawing that portion of a cable rack allocated to splicing similar to Figure 25.

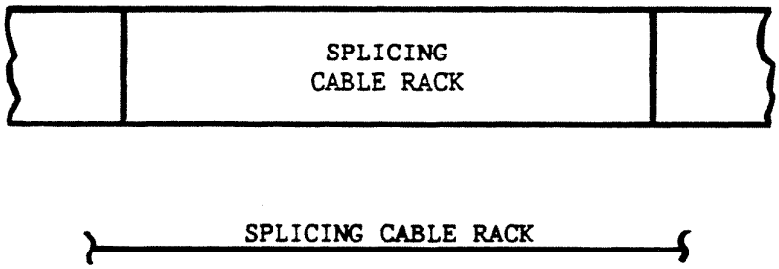


FIGURE 25
TYPICAL CABLE RACK SPLICE

23.00 CABLE CLEARANCES AND PILEUPS ILLUSTRATING

23.01 When marked prints are received from the installer indicating the cable pileup at high points on particular cable rack runs, show the information on the office cabling plan drawings adjacent to the point involved. Cable clearances between top of pileup and obstructions (beam, vent, duct, etc.), may also be indicated on the drawing at the points involved as illustrated by Figure 26. Add the appropriate descriptive note (see Paragraph 27.03, Notes 30 and 55).

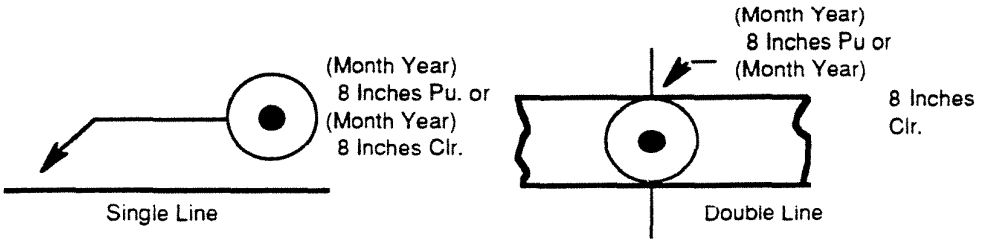


FIGURE 26
TYPICAL CABLE PILEUP (PU)
(SINGLE AND DOUBLE LINE CONVENTIONS)

23.02 Fire protection requirements provides for a minimum clearance of 3 inches from the cable hole to the cable pileup in order to place the appropriate amount of fire protection material in this cable hole. It is necessary to show the maximum cable pileup through a cable hole. For example, a 2-0 X 1-0 cable hole has a 9 inch maximum pileup. See Figure 27 and Paragraph 27.03, Note 70 for the information to be shown on the cable rack plan.

23.03 If all cable holes are one size on the associated cable rack plan, a note similar to Paragraph 27.03, Note 71 would be required to indicate that all cable holes on this drawing have an inch maximum pileup. All others will be designated as shown in Figure 27 and Paragraph 27.03, Note 70.

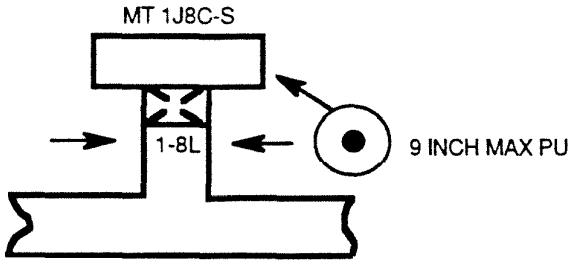
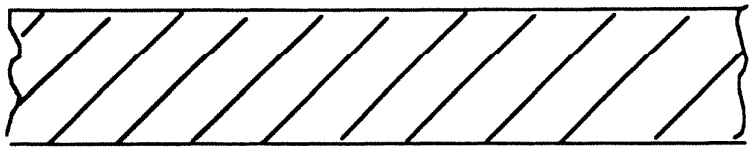


FIGURE 27
TYPICAL SPECIAL CONDITION PILEUP NOTE

23.04 In order to indicate that a cable rack is blocked, add the appropriate symbol (either single or double line cable rack convention) as shown by Figure 28 at the point of blockage. Also add an explanatory note similar to Paragraph 27.03, Note 31.

SINGLE LINE



DOUBLE LINE

FIGURE 28
TYPICAL BLOCKED CABLE RACK
(SINGLE AND DOUBLE LINE CONVENTIONS)

24.00 AUXILIARY FRAMING

24.01 The paragraphs under this title relate the specific drawing standards covering the placement of auxiliary framing information on this drawing.

24.02 Low type auxiliary framing shall be indicated on the drawing with intermittent long and short dash lines. The framing (channels) shall be shown in the actual location that they will be placed, based on the requirements of job specification. Add descriptive notes as required covering the information related by the following items:

A. Convention (intermittent long and short dash lines)

B. A dimension for the height of the bottom of the primary or regular channels (channels placed perpendicular to the frame lineups) above the finished floor line.

C. The placement of supplementary or secondary channels (channels placed parallel to frame lineups) see Paragraph 27.03, Note 35.

24.03 High type auxiliary framing shall be indicated on the drawing with dash lines of equal length. The framing (channels) shall be shown in the actual locations that they will be placed in accordance with the job specification. It is recommended that the dash line be approximately 1/2 inch in length with a 1/8 inch space between each dash. Add descriptive notes, as required, covering the information related by the following items:

A. Convention (dash lines of equal length)

B. A dimension for the height of the bottom of the primary or regular channels (channels placed perpendicular to the frame lineups) above the finished floor line.

C. The placement of height above the finished floor of supplementary or secondary channels (channels placed parallel to the frame lineups) see Paragraph 27.03, Note 36).

24.04 When all or some primary low type auxiliary framing channels are not located directly under the ceiling inserts, locating dimensions shall be shown for all primary low or high type framing when supported perpendicularly to ceiling unistrut. These dimensions shall begin from a fixed location, such as a column center, edge of column or from a ceiling insert, beam clamp or unistrut, and shall be shown between all primary framing as required, (see Exhibits 3 and 4).

24.05 Unistrut

A. It is recommended that secondary unistrut, low and high type auxiliary framing locating dimensions be shown only when deviating from insert lines and the placement must be extremely accurate for a specific purpose.

24.06 Information has been previously furnished herein regarding the placement of ceiling inserts, beam clamps, expansion shields and unistruts including their respective drawing symbols. The following paragraphs provide information for the placement and symbolizing of hanger rods and hanger rod extensions to these devices (see Exhibits 3 and 4 and Paragraph 27.03, Notes 37 through 41).

A. When a hanger rod is to be placed or hung from a ceiling insert or expansion shield, show the appropriate insert or expansion shield with a superimposed hanger rod symbol at its actual location on the body of the drawing. Add a descriptive note as shown on Paragraph 27.03, Notes 38 and 39.

B. When a hanger rod extension is placed on the beam clamp hanger rod and/or when auxiliary framing is supported from the beam clamp hanger rod, show the appropriate beam clamp symbol with a superimposed hanger rod symbol at its actual location on the body of the drawing. Add a descriptive note as shown on Paragraph 27.03, Note 40.

C. When a hanger rod is placed or hung from unistrut, show only the hanger rod symbol at its actual location on the body of the drawing. Add a descriptive note as shown on Paragraph 27.03, Note 37.

24.07 When placing hanger rods between auxiliary framing of two different heights, (high type to low type) show the appropriate symbol at the actual location of the rod on the body of the drawing. Add a descriptive note as shown on Paragraph 27.03, Note 41.

24.08 When placing hanger rods from auxiliary framing to cable racks, show the appropriate symbol at its actual location on the body of the drawing. Add a descriptive note as shown in Paragraph 27.03, Note 42.

24.09 When auxiliary framing is supported by stanchions, show and locate the stanchions on the body of the drawing. Add the applicable descriptive note as shown on Paragraph 27.03, Note 43 or Note 44.

24.10 Bracing should not be shown except in offices where earthquake and disaster bracing or hardening is required. When either has been provided, show all the bracing, restrainers, etc., using the symbols under the corresponding note shown on Paragraph 27.03, Notes 45, and 58 through 67.

24.11 The ends of channels which are to be supported from walls rather than from the ceiling should be extended to the wall line and designated with the appropriate drawing and group number.

24.12 Originally, auxiliary framing construction consisted of the use of flat bars. Presently, auxiliary framing construction consists of the use of channels. Consequently, there are existing offices where auxiliary framing of both constructions are or will be utilized. The procedures for distinguishing the respective areas where each construction is located are covered by the following items.

A. The line of demarcation between bar and channel framing will be shown on the office drawing by means of a symbol (C) indicating that the area within a line joining the "C" corners consists of channel framing (see example). In small isolated areas where the present bars may be designated "B" if the framing is extended with channels, a "C" shall be shown adjacent to the "B".

EXAMPLE:

⌜C C⌝

⌞C C⌟

B. The entire area in which channel framing may be installed shall be delineated on the first addition of channel framing on the particular drawing involved.

C. The note on the cabling plan and the battery and power layouts covering the height of framing in new offices having only channel framing, shall read "indicates low (or high) type channel auxiliary framing, etc." On offices having both bar and channel type framing, add a note similar to the following: "Low (or high) type channel auxiliary framing " above the floor shall be installed in areas bounded by symbols (C). In isolated areas, the letter "B" or "C" on the symbol for auxiliary framing indicates bar or channel respectively."

25.00 ROLLING LADDER INFORMATION ON CABLE PLANS

25.01 Rolling ladder information should be shown on the cabling plans. This will permit the use of cable plan coordinates for the ladder locating information, (see Paragraph 27.03, Note 46). The information should be shown as follows:

A. A table shall be shown located adjacent to the Miscellaneous Section Table. Construct the table as illustrated by Figures 29 and 30.

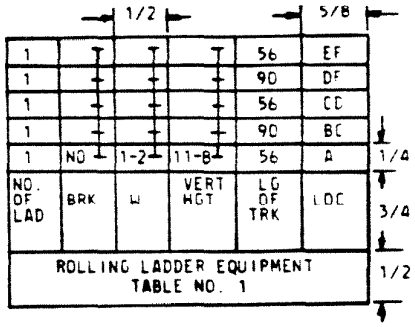


FIGURE 29
CONSTRUCTING ROLLING LADDER
TABLE USING CABLING PLAN COORDINATES

B. Figure 29 illustrates the coordinate method of constructing a rolling Ladder Track Table. Essentially, line numbers are to be identified in terms of the coordinates, i.e., A, B, B-C, C-D, etc. Should a condition arise where two ladders are installed in the same aisle, line numbers such as C-D (C) and C-D (D) should be shown.

C. Where information covering the direction of the ladder slant is required, this shall be covered under "Notes".

D. When ladders of more than 12 steps are ordered, a note should be added indicating the location and number of steps.

E. Where the coordinate plan is not in use, the table should reflect ladder track locations in terms of frames of bays. Construct the table as illustrated by Figure 30.

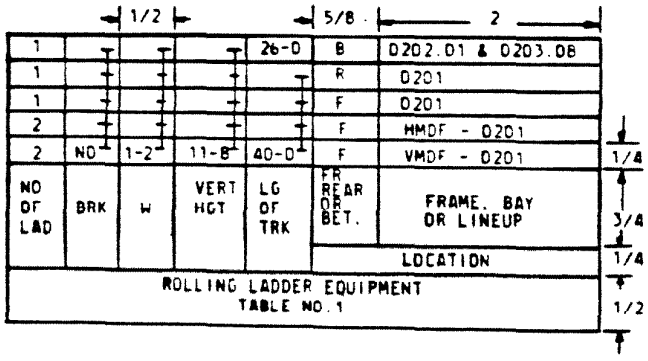


FIGURE 30
CONSTRUCTING ROLLING LADDER TABLE NOT
USING CABLING AND CABLE RACK PLAN COORDINATES

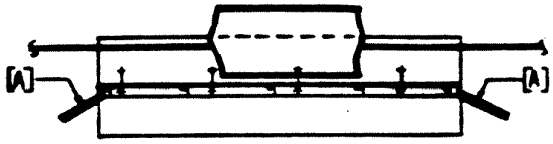


FIGURE 31
DISTRIBUTING FRAME BRACES

26.00 EARTHQUAKE AND DISASTER BRACING

26.01 These paragraphs provide specific drawing standards for central offices requiring earthquake and disaster bracing and hardening. When this feature is to be provided, show all the bracing, restrainers, etc., using applicable symbols, notes and configurations shown in Paragraph 27.03, Notes 45 and 58 to 67 and Exhibits 2, 3, 8 and 9.

26.02 Distribution frame end braces shall be designated per Figure 31.

26.03 Braces for cable racks to distributing frame verticals shall be designated per Figure 31. "0" pen size shall be used for this symbol.

26.04 Designating piece part numbers and details for braces.

A. Brace piece part numbers in use on a specific job drawing shall be shown in a table per Figure 32 and assigned an arbitrary alpha code. The alpha code shall be used within brackets [ ] per Paragraph 27.03, Note 58.

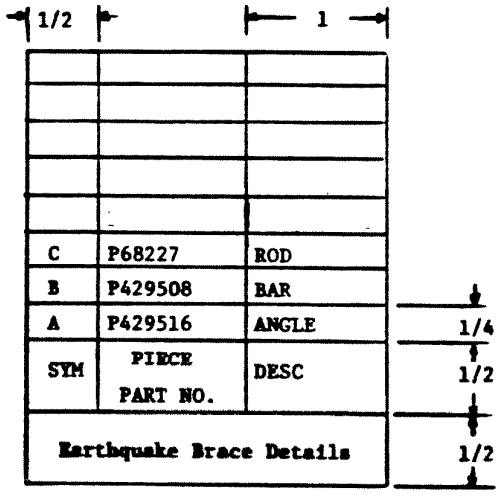


FIGURE 32
TABLE FOR BRACE PIECE PART NUMBER OR DETAIL CODE

(Omit alpha symbols I and O)

B. The code designation will be required only at the first and last braces of an identical series.

C. On job drawings with 2 or 3 levels of auxiliary framing, supplement the brace piece part alpha symbol with the designations -H, -M and - L (High, Middle and Low) on the body of the drawing to indicate the relative location of the specific brace. When more than one brace occurs at a given location, show only one brace symbol per Paragraph 27.03, Note 59 with alpha symbols as required, (see Figure 33).

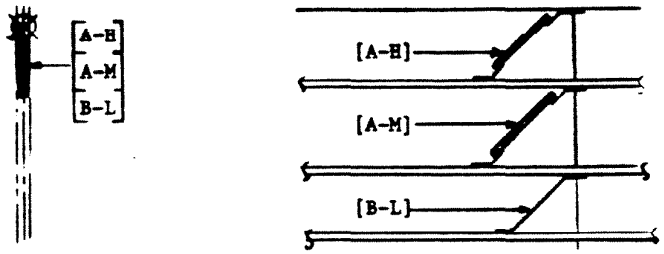


FIGURE 33
BRACE PIECE PARTS WITH 3 LEVELS OF AUXILIARY FRAMING

D. A specific area of multilevel auxiliary framing shall be consistent in the use of -H, -M and -L symbols in order to depict a location where 2 or 3 levels of auxiliary framing occur but only one brace is installed. See Figure 34.

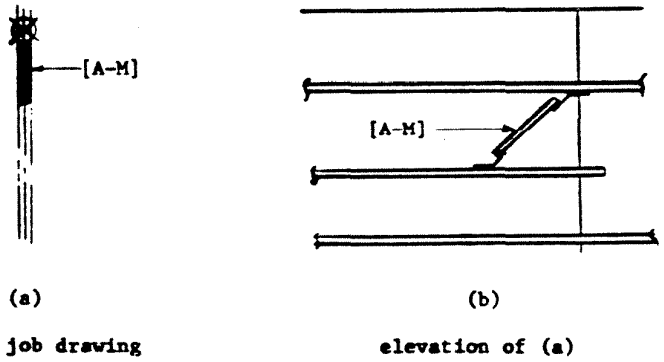


FIGURE 34
1 BRACE PIECE PART WITH 3 LEVELS OF AUXILIARY FRAMING

E. Use only -H and -L symbols when two levels of auxiliary framing are to be installed.

F. Symbols or methods for indicating brace piece part numbers shall be determined on a job basis when more than three levels of auxiliary framing are to be installed. It is recommended that an elevation sketch of the office be shown on the Cable Rack Plan.

G. The procedures described in Paragraph 26.04 C, D and E may be applied where multilevel cable racks have common support and brace locations. See Figure 35.

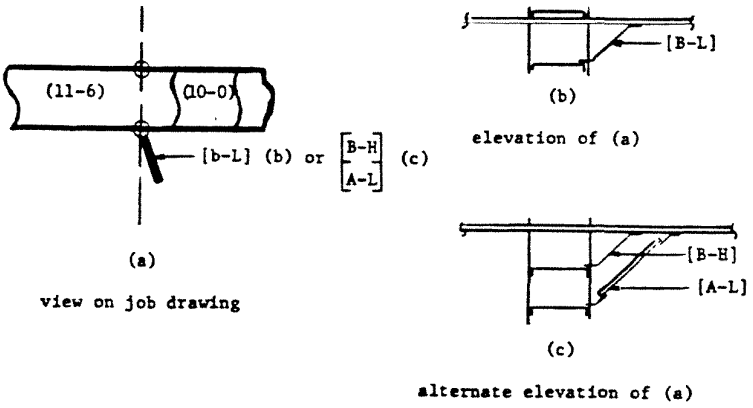


FIGURE 35
BRACE PIECE PARTS WITH 2 LEVELS OF CABLE RACK

H. When two or more drawings are used for a specific equipment area, the alpha codes assigned to brace piece part numbers shall be coordinated.

26.05 The information regarding depiction of earthquake braces, per Paragraph 26.04, shall apply to all new or redrawn auxiliary framing and/or cable rack plans. Consideration shall be given for application to an existing drawing where practical and sufficient space exists for the table per Figure 32. Practices currently in use on a specific drawing may continue to be used where growth and/or space is limited.

26.06 In situations where only one piece part number is used for a specific type of brace, such as small offices or above an operating room, the use of Paragraph 27.03, Notes 59 and/or 65 or 66 may be elected as an alternate to the Figure 32 table and associated Paragraph 26.04. Specify the piece part number and type (angle, bar, or rod). Paragraph 27.03, Note 59 shall be shown on the job drawing modified to omit the code designation bracket [ ] in this situation.

26.07 The description required for cable rack support and bracing fabrication shall be made in the Earthquake Brace Details Table per Figure 32 with a corresponding cross reference per Figure 36.

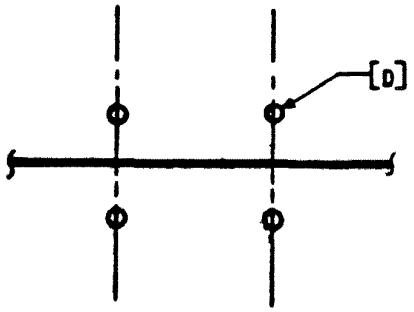


FIGURE 36
APPLICATION FOR BRACE PIECE PARTS WITH
SINGLE LINE CONVENTION CABLE RACK

27.00 NOTES AND SYMBOLS

27.01 Symbols used on the cabling and cable rack plan have also been indicated in the previous text. Those symbols covering equipment shown on the floor plan drawing shall be used on this drawing. All symbols used shall be placed under explanatory notes whether similar or dissimilar to those used on the floor plan drawing.

27.02 Show only those notes that are applicable to the particular cabling and cable rack plan drawing.

27.03 Other miscellaneous items and/or apparatus which mounts or projects into cabling area, shall be shown by an appropriate symbol at the actual location on the body of the drawing where they are placed to identify future obstructions to additions and revisions. For example, items such as inductors, filters, wave guides, etc., shall be symbolized on the office drawing.

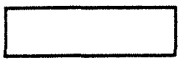
1.  CEILING INSERT

2.  EXPANSION SHIELD

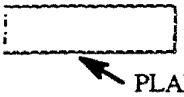
3.  BEAM CLAMP

4.  UNISTRUT P-

5. MT△1A3A-S INDICATES A CABLE HOLE DESIGNATION. THE CAP DELTA SYMBOL REPRESENTS THE TERM CABLE HOLE. THE M PRECEDING THE CAP DELTA SYMBOL INDICATES A SLIDING TYPE CEILING COVER. THE T PRECEDING THE CAP DELTA SYMBOL INDICATES TAPERED CABLE HOLE. THE FIRST NUMBER INDICATES THE FLOOR AND THE LETTER AND NUMBER INDICATES THE COLUMN AND THE LAST LETTER INDICATES THE COLUMN AND THE LAST LETTER INDICATES THE FIRST CABLE HOLE NEAR THE COLUMN. THE -S SYMBOL INDICATES STEEL COVER.

6.  PRESENT CABLE HOLES OR PORTIONS OF CABLE SLOTS IN FLOOR AND CEILING AT SAME LOCATION THAT ARE SHEATHED.

7.  CABLE HOLE AND CABLE SLOTS IN CEILING AND FLOOR THAT ARE EITHER TEMPORARILY FILLED, PLUGGED, OR TEMPORARILY COVERED WITHOUT SHEATHING.

8. 

CABLE HOLE THAT HAS BEEN LOCATED BUT NOT CUT AND FRAMED. HOWEVER, SPACE MUST BE RESERVED.

9. HEAVY SOLID LINES INDICATE CENTER LINES OF PRESENT CABLE RACKS. DASH LINES INDICATE CENTER LINES OF FUTURE CABLE RACKS. (SINGLE LINE CONVENTION).

10. HEAVILY OUTLINED RUNS ARE PRESENT RUNS, LIGHTLY OUTLINED RUNS ARE FUTURE. (DOUBLE LINE CONVENTION).

11. UNLESS OTHERWISE INDICATED:

    ALL OVER FRAME CABLE RACKS ARE TYPE ' " WIDE;

    ALL CROSS-AISLE CABLE RACKS ARE TYPE ' " WIDE.

12. ALL BAR TYPE OVER AISLE CABLE RACKS ARE AND ALL BAR TYPE CROSS-AISLE CABLE RACKS ARE FROM FLOOR LINE TO CABLE LINE TO CABLE RACKS.

13. "L" SHOWN ON CABLE RACK REFERS TO LADDER TYPE CABLE RACK, I.E., 1-0L, 1-3L.

14. "B" SHOWN ON CABLE RACK REFERS TO BAR TYPE CABLE RACK, I.,E., 1-8B, 1-10B.

15. NUMERICAL PREFIX SHOWN ADJACENT TO CABLE RACK HEIGHT INDICATES WIDTH OF CABLE RACK, I.E., 1-3L, 1-8B.

16. ALL CABLE RACKS OVER EQUIPMENT IN POWER AREA ARE LADDER TYPE.

17. ALPHANUMERIC IN BRACKETS ARE CABLE RACK FABRICATION DESIGNATIONS THAT CORRESPOND TO THE EQUIPMENT SUPPLIER'S DRAWING OR APPLICABLE PRACTICE NUMBER.

18. SOME CABLE FABRICATIONS ARE NOT DESIGNATED. THESE INCLUDE THE FOLLOWING CONFIGURATIONS:

    CLOSING END OF CABLE RACK
    90% TURN IN SAME PLANE
    "T" INTERSECTION IN SAME LEVEL
    "T" INTERSECTION NOT AT SAME LEVEL
    "T" INTERSECTION IN SAME PLANE
    "T" INTERSECTION NOT IN SAME PLANE

19. SPECIAL CABLE RACK FABRICATIONS ARE INDICATED BY H DRAWINGS, ED DRAWING OR VIEW NUMBERS LISTED ADJACENT TO THE CABLE RACK CONVENTION.

20. CABLE RACK DESIGNATED CL A, B, C, ETC., SHALL BE STAMPED PER ED _____ AND HAVE CABLE BRACKETS AND SCREENS PER ED_____ CABLES SHALL BE SEPARATED PER ED _____.

21. CABLE RACK DESIGNATED CL2LGT OR CL2HGT SHALL BE RESTRICTED TO THESE TYPES OF N AND ON CARRIER CABLES. FOR SEPARATION AND STAMPING SEE ED.

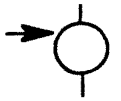
22. DIMENSIONS SHOWN TO CENTERLINE (OR SIDE) OF CABLE RUNS ARE LOCATING DIMENSIONS OF CABLE RACKS.

23. ALL OVER AISLE CABLE RACKS ARE CENTERED BETWEEN FRAME LINEUPS UNLESS OTHERWISE SHOWN.

24. ALL OVER AISLE CABLE OF OVERFRAME CABLE RACKS SHALL BE LOCATED 9-11/16 INCHES IN FRONT OF REAR GUARD RAIL UNLESS OTHERWISE SPECIFIED.

25. DIMENSIONS SHOWN IN PARENTHESES ( ) INDICATE VERTICAL HEIGHT OF CABLE RACK FROM FLOOR TO LINE TO CABLE LINE OF CABLE RACK.

26. DIMENSIONS LOCATING VERTICAL OFFSETS ARE SHOWN TO THE END OF HORIZONTAL SECTION OF RACK.

27.  REGULAR DETAILED CROSS SECTIONS. ARROW INDICATES DIRECTION IN WHICH CROSS SECTION IS TAKEN.

28.  MISCELLANEOUS CROSS SECTIONS SHOWN IN THE MISCELLANEOUS SECTION CHART.

29. THE CAPACITY SPECIFIED FOR CROSS SECTIONS PRECEDED BY THE LETTER "P" REPRESENTS THE POWER CABLES CONVERTED INTO TERMS OF SWITCHBOARD CABLES.

30.  (MONTH YEAR)
8 INCH PU. HEIGHT OF CABLE PILEUP AT HIGH POINTS ON CABLE RUNS.

31.  CABLE RACK BLOCKED.

32. THE MARKER MULTIPLE CABLES SHALL BE RUN ON "CABLE PATHS" AS FOLLOWS:

(NO. 1 CROSSBAR®)

TO FR.	OM EVEN	ODD
OMC	PATH	PATH
D	PATH	PATH
O	PATH	PATH
	TM	
NG	PATH	PATH
LC	PATH	PATH
I	PATH	PATH
TMC	PATH	PATH
	TSL	
	1ST MULT	LAST MULT
TO	APPEAR	APPEAR
TS	PATH	PATH

No. 1 CROSSBAR® is a Registered Trademark of AT&T Technologies, Inc.

33. MARKER AND TRANSVERTER MULTIPLE CABLES SHALL BE RUN IN ACCORDANCE WITH REQUIREMENTS OF MANUFACTURER'S DRAWING ON CROSS-AISLE PATHS AS FOLLOWS:

(NO. 5 CROSSBAR® ONLY)

EVEN NUMBERED FRAMES, PATHS - - -, CABLE HOLES - - -

ODD NUMBERED FRAMES, PATHS - - -, CABLE HOLES - - -

(NOTE - REFERENCE TO CABLE HOLES SHALL BE USED IF REQUIRED)

34. THE MARKER MULTIPLE CABLES SHALL BE RUN ON "CABLE PATHS" AS FOLLOWS:

TO FR.	OM EVEN	ODD
T	PATH	PATH
O	PATH	PATH
MC	PATH	PATH

35. ——— — ——— LOW TYPE AUXILIARY FRAMING. BOTTOM OF REGULAR CHANNELS IS ' " ABOVE FLOOR. PLACE SUPPLEMENTARY CHANNELS ABOVE REGULAR CHANNELS UNLESS OTHERWISE INDICATED.

36. ——— ——— ——— HIGH TYPE AUXILIARY FRAMING. BOTTOM OF PRIMARY CHANNELS IS ' " ABOVE FLOOR UNLESS OTHERWISE INDICATED.

37.  HANGER ROD FOR SUPPORTING AUXILIARY FRAMING FROM UNISTRUT.

38.  HANGER ROD FOR SUPPORTING AUXILIARY FRAMING FROM A CEILING INSERT.

39.  HANGER ROD FOR SUPPORTING AUXILIARY FRAMING FROM AN EXPANSION SHIELD.

40.  HANGER ROD EXTENSION AND/OR AUXILIARY FRAMING SUPPORTED FROM A BEAM CLAMP.

41.  HANGER ROD BETWEEN TWO DIFFERENT LEVELS OF AUXILIARY FRAMING (HIGH TYPE TO LOW TYPE SHOWN).

42.  CABLE RACK SUPPORTED FROM AUXILIARY FRAMING WITH HANGER RODS.

NO. 5 CROSSBAR® is a Registered Trademark of AT&T Technologies, Inc.

D. Where possible, place cable hole designations immediately adjacent to the cable hole convention (see Paragraph 27.03, Notes 5 through 8).

12.04 Cable Holes or Slots in Partitions and Walls - Where space permits, show the designations within the outline of the wall or partition.

12.05 Cable Hole Sleeves - Show with a solid line circle and designate similar to the following:

"3 IN. CA SLV"

12.06 Cable Hole and Cable Slot Size Indication - Cable hole or cable slot size need not be indicated on the cabling, cable rack and auxiliary framing plan drawing.

12.07 Cable Hole Modifications

A. Steel Cable Hole Covers

1. When ordering new cable hole cover assemblies, Engineering, in addition to following existing procedures, shall add a -S suffix to the cable hole designation to indicate that the cable hole cover is made of steel (1A3A-S).

2. When an existing cable hole is reopened and closed, Engineering shall refer to the Cabling and Cable Rack Plan for a -S symbol as part of the existing cable hole designation. If the -S symbol is present, no further action other than the usual routine is necessary.

B. Sliding Type Ceiling Plates

1. All new ceiling cable holes require sliding type ceiling plates.

2. Modification of existing ceiling cable holes is at the discretion of the Equipment Engineer.

3. When a sliding type ceiling cover is provided, Engineering, in addition to following existing ordering procedures, shall add an M prefix to the cable hole designation to indicate that the cable hole is equipped with a sliding type ceiling cover (M△1A3A).

C. Examples of Cable Hole Designations

1.	M △ 1A3A	Sliding Type Ceiling Cover
2.	MT△ 1A3A	Sliding Type Ceiling Cover and Tapered Cable Hole
3.	M △ 1A3A-S	Sliding Type Ceiling Cover and Steel Cable Hole Cover
4.	MT△ 1A3A-S	Sliding Type ceiling Cover, Tapered Cable Hole Steel Cable Hole Cover.

D. The above examples shall be accompanied by an appropriate explanatory note similar to Note 5 in Paragraph 27.03 of this part.

13.00 FLOOR DUCTS OR FLOOR TROUGHS

13.01 Floor ducts or floor troughs, whether exposed or concealed, shall be shown on the body of the drawing with equal length dash lines depicting the center line of the duct or trough if they are used as carriers of supplier furnished cables. Those used only for engineering purposes are shown on the Central Office floor plan drawing record only.

14.00 EQUIPMENT - ILLUSTRATING

14.01 All frames, relay racks, etc., shall be shown with solid lines whether present or future.

14.02 When using 1/4 inch scale on the drawing, scale 10, 10-1/2, 11 and 12 inch wide guard rail frames as 12, 12-1/2, 13 and 14 inches wide respectively. Add the required two inches at the rear of the frame lineups.

14.03 Scale 10, 11 and 12 inch wide cable holes or cable slot 12, 13 and 14 inches wide respectively. When a cable hole or cable slot is located in a frame lineup, add the two inches on the same side of the cable hole as the rear of the lineup. When cable holes or cable slots are not located in frame lineups, the two inches may be added equidistantly at both sides of the cable or cable slot.

14.04 When the floor plan reproduction process has been used to provide the original for preparing a cable rack drawing, the conventions on the floor plan shall be retained.

15.00 CONVENTIONS, DESIGNATIONS AND NUMBERING

15.01 In general, conventions depicting frames and relay racks shall be the same as those established for the floor plan drawing essentially in block form. When frames are shown detailed and numbered, then also show this information on this drawing, (see Exhibits 3 and 4).

15.02 Generally, designations are not required when frame and lineup numbering provide sufficient identification for cable routing purposes. However, when required, place the designations, preferably at the front of the lineup unless otherwise noted. Use standard abbreviations and identify specific designations in accordance with the following items (see Exhibits 3 and 4).

A. Designate all distributing frames, if possible, within the frame convention.

B. Designate dial type frames within the frame convention on a first and last frame basis except where some condition requires additional designations to maintain clarity.

C. In electronic switching offices, indicate the respective control groups by preceding the frame designations with the appropriate alphanumeric in parenthesis. Add an explanatory note on the drawing (see Paragraph 27.03, Note 51).

15.03 Numbering, as well as designations of frames, shall also adhere to those utilized for the floor plan drawing. This includes the placement of this information on a first and last frame basis, showing frame numbers for frames numbered 5, 10, 15, 20, etc. However, when other information occupies the space required for this information (for example, cable racks over last frame in lineup) place the needed information as close as possible to the standard locations, (see Exhibits 3 and 4).

15.04 In offices where main aisles are crowded with information, lineup numbers may be added as outside aisles or outside the line of the building, wherever the space permits easy identification between the lines of frames and their lineup numbers, (see Exhibit 3).

15.05 In offices with specific systems on floors containing only switch type frames, lineup numbers may be omitted from the drawing until such time that a frame or frames requiring lineup numbers are added. When they are added, add the information either at the individual frame (if only one or two frames) or in the aisle that space permits, preferably main aisle.

16.00 CABLING AND CABLE RACK - GENERAL

16.01 In general, cables are run on three basic types of cable rack in a central office: ladder type, bar type and compartment type (SPCS and similar applications).

16.02 In addition to the three previously mentioned commonly used cable racks, there are also three other cable racks in use. They are as follows:

A. A special cable rack utilized for lightly loaded cross-aisle cable runs between adjacent lineups. This rack may also be used to span the space where one lineup of frames is omitted or where adjacent lineups of frames are separated by columns. However, the unsupported span of the auxiliary framing shall not exceed eight feet.

B. Power feeder cable rack and supports used for certain power cables at gaps in the lineup or at main and end aisles. Add a note similar to Paragraph 27.03, Note 49.

C. Specialized troughs used for the installation of fiber cables are designated by encircled numbers which reference specific types of fiber cableway components (i.e., elbows, t-joints, and straight runs).

D. Essentially, the contour and location of all cable runs is shown on this drawing. For the purpose of this text, the term "Cable Run" is intended to mean both a particular run of cable, a group of cable or certain classifications of cables on a cable rack.

16.03 In addition to the foregoing requirements, the subsequent information should also be considered prior to the placement of cable racks on the drawing.

A. Location of the cable rack whether on the wiring side or the equipment side of the frame, or over aisle

B. Width of the cable rack

16.04 Classified cable runs covered herein are those cable runs that are restrictive in an electrical sense. That is, they must be separated from other types of cables either by a space between the conflicting leads or cables on a common cable rack or by running the leads or cables on separate cable racks. Essentially, classified runs are required for "L", "N", "ON" "ANI", etc. When cable runs are classified, they are designated accordingly on the drawing. Add a note similar to Exhibit A, Notes 48 or 49. Subsequent paragraphs will typify how this information is portrayed on the drawing.

16.05 In general, certain power leads such as unfused leads from batteries to power boards, must be kept on separate cable racks independent of switchboard cables. Although certain leads will not require separation, it is still desirable to run these power leads on separate cable racks when there are sufficient numbers of leads to merit this separation, and sufficient amount of space for the separate cable racks.

16.07 In addition to the separation of power cables, there is a major form of power distribution called the power equalizer. This power equalizer consists of a cabling network and generally eliminates the use of the Battery Distribution Fuse B board. This power equalizer comprises basically a group of main power feeder cables that supply power from the Battery Controller Board to a Main Aisle Feeder cable (including ground path cables). The point where these cables meet and join through cable connectors on cable rack is referred to as the equalizing center.

C. Hanger rods or frame supports

D. Rolling ladders

E.. Fluorescent Lighting Fixtures

17.00 CABLING AND CABLE RACK - ILLUSTRATING

17.01 Essentially, all cable racks, their contour and location, including vertical offsets are shown on this drawing. The following paragraphs and items relate how and where this information is shown.

17.02 There are two basic methods of depicting Ladder, Bar and Compartment type cable racks on the drawing. They are as follows:

A. The single line cable rack convention is the preferred practice and should be used for All new isolated areas, floors and offices except as specified by items B, C and D under this main paragraph. This convention consists of showing a single solid line along the center line of a cable rack to represent the "over frame", "over aisle" and "cross-aisle" cable racks. Future cable racks are represented by a single dashed line. When using this convention, add an explanatory note similar to Paragraph 27.03, Note 9. For an illustration of this convention see Figure 1.

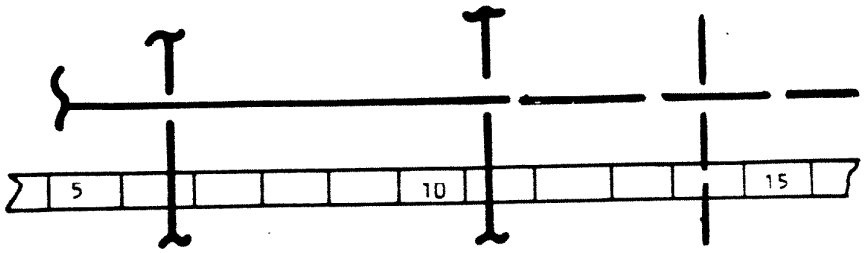


FIGURE 1
SINGLE LINE CABLE RACK CONVENTION
(PRESENT AND FUTURE CABLE RACKS)

B. The double line cable rack convention may be used for greater clarity in having variable cable rack widths and elevations at particular locations. This convention may also be used for greater clarity in SPCS offices and power areas in accordance with subsequent paragraphs. This convention consists of showing two heavy lines spaced to conform to the cable rack widths in accordance with the scale of the drawing. Future cable racks are depicted in the same way except that the weight of the lines are much lighter. When using the double line convention, add an explanatory note similar to Paragraph 27.03, Note 10 (see Figure 2 and Exhibit 3).

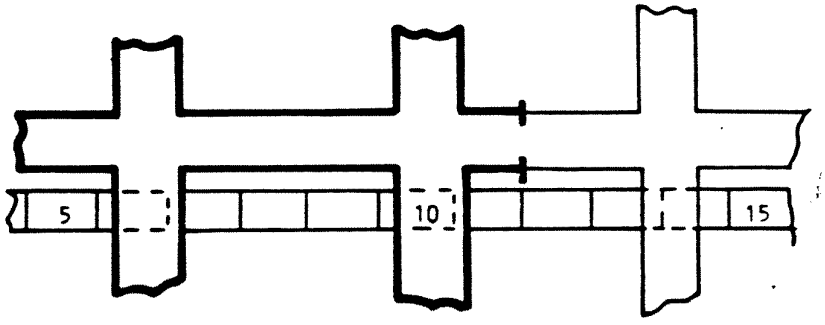


FIGURE 2
DOUBLE LINE CABLE RACK CONVENTION
(PRESENT AND FUTURE CABLE RACKS)

C. In SPCS, VF Transmission, and Broadbank type offices which use compartment type racks mounted on the framework, single and double line conventions as depicted invarious figures shall be used. All cross-aisle cable racks shall be shown as single line. Special power runs, etc., shall, where possible, use the single line convention unless a definite clarification is required.

D. Double line convention may also be applied on single line drawings for specific cable runs and specific cable rack sections to expand complicated fabrications and/or levels (see Exhibits 2, 3 and 4, and Figure 4).

17.03 When showing either the single or double line convention, follow the general drafting practice of showing hidden lines as dashed lines. For example, lines depicting frame outlines are shown dashed for that portion shown underneath a cable rack.

A. An exception for showing hidden lines as dashed lines for depicting frame outline is SPCS type framework underneath over-frame cable rack. The only time these SPCS type frameworks are shown dashed is when a bar or ladder type cable rack is run above this equipment.

17.04 The width and type of cable racks shall be indicated on all cabling plan drawings. When cable racks of the same width and type predominate, cover this information with a note such as; "ALL OVER AISLE CABLE RACKS ARE 1' - 8" WIDE BAR TYPE AND ALL AISLE CABLE RACKS ARE 1' - 10" WIDE BAR TYPE, UNLESS OTHERWISE SPECIFIED". When a change in construction occurs in a run, the line of demarcation must be indicated. When cable racks vary in width or type, this information shall be shown adjacent to the rack as 1-8B for bar type or 1-8L for ladder type. The 1-8 modified ladder type cable rack assembly shall be designated 1-8LM. Add applicable definitive notes as shown on Paragraph 27.03, Notes 11 through 16.

17.05 Conventions representing changes in the course of a cable run shall be shown on the drawing in accordance with the following:

A. Exhibit 1 illustrates the conventions to be used when cable racks are depicted on the drawing with double lines.

B. Part of the convention is the number in brackets of the fabrication (identifier). These numbers and brackets, when used, require a descriptive note similar to Paragraph 27.03, Note 17.

C. Common type Cable Rack Fabrications need not be identified by number on the body of the drawing. Instead, add a note similar to Paragraph 27.03, Note 18.

D. Exhibit 2 illustrates the conventions to be used when cable racks are depicted on the drawing with a single line.

E. Generally, the same rule regarding the placement of fabrication numbers on the drawing for the double line convention shall also apply to the single line convention.

F. As near as possible to the fabrication number, add the required radii at all inside and all outside turns where the required radius exceeds six inches. This radius need not be shown where a drawing number or figure number on a drawing is specified detailing the method of fabricating the turn.

G. Special cable rack fabrications not shown in the Equipment Suppliers' Practices, such as Equipment drawing or view numbers shall be shown at the convention. Also, show an arrow cross referenced to a note. Add a note similar to Paragraph 27.03, Note 19 to insure proper identification.

17.06 Where possible, the use of special turns, spirals, offsets and fans in cable runs is avoided. In general, spirals and "double-turns" are used in cable runs to eliminate side or hanging runs and objectionable goosenecks, facilitate proper installation sequence, and conserve space in congested areas. Exhibit 5 of this part illustrates application of spiral and compound turns. The following items provide more detailed information concerning the application of spirals and fans in the cable run and designations on the drawing.

A. Use spirals or compound turns in preference to "goosenecks", or side of hanging switchboard cable runs over 20' - 0" in length. Side of hanging power cable runs should be avoided.

B. Use 180° spirals in preference to two 90° spirals and double-turns in preference to 90° spirals and turns.

C. Do not locate spirals in operating rooms without the specific approval of the Equipment Engineer.

D. Where spirals are required in wide cable runs and located against building walls or in maintenance aisles, space may be conserved and the appearance of the run improved if, where practicable, the cable rack is divided into two smaller racks and two spirals used rather than one.

E. Conventions for showing spirals on the office drawing are shown by Exhibits 1 and 2.

17.07 Classified cable rack runs described in a previous paragraph shall be shown on the body of the drawing in accordance with the following examples. Also see Exhibits 3 and 4.

A. In offices with "L" Carrier classified cable racks, show class identity on the body of the drawing as illustrated by Figures 3 and 4 and Exhibit 3. Add a note similar to Paragraph 27.03, Note 20.

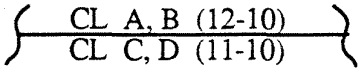


FIGURE 3
DESIGNATING CABLE RACK
(SINGLE LINE CABLE RACK CONVENTIONS)

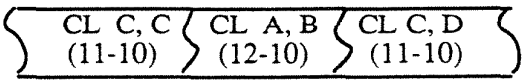


FIGURE 4
DESIGNATING CABLE RACK
(DOUBLE LINE CABLE RACK CONVENTIONS)

B. In offices with "N" Carrier classified cable racks, show on the body of the drawing as illustrated by Figures 5 and 6. Also add a descriptive note similar to Paragraph 27.03, Note 21.

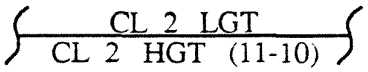


FIGURE 5
DESIGNATING CABLE RACK
(SINGLE LINE CABLE RACK CONVENTIONS)

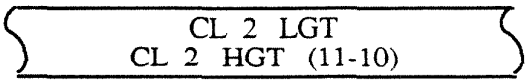


FIGURE 6
DESIGNATING CABLE RACK
(DOUBLE LINE CABLE RACK CONVENTIONS)

C. In offices with "ANI" Equipment, designate segregated cable racks as follows:

Cable Racks with Primary Cables - ANI PRI CA only
Cable Racks with Secondary Cables - ANI SEC CA only

D. In offices with "T" Carrier, it may be desirable to identify those cable rack carrier input and output leads as shown below. This information may be necessary should subsequent installations add equipment requiring segregation, (see Exhibit 4).

"'T' Carrier Input and Output"

17.08 When separate power runs are utilized in an office, it may be desirable to show designations on the rack similar to the following, (see Exhibit 3).

"PWR 1-8L" or "ETS PWR 1-8L"

17.09 In offices where there are equalizing centers, apply the following information. Also see Exhibits 3 and 4.

A. Designate and number equalizing centers EQL CTR 0101. The 0101 indicates the first floor (01) and the first center (01). If it were located on the 3rd floor, it would be numbered 0301, third floor (03) 1st center (01).

17.10 As previously stated, all cable rack locations shall be shown on the drawing. This includes all horizontal, when available, and vertical locations as covered by the following items.

A. Show locating dimensions for cable racks parallel to a frame or rack from the center line (or side) of the cable rack to either the sheet metal guard rails, to the base angle of open guard rail frames, to the cable duct upright of duct type frame work, or to the edge of columns as shown by Figures 7, 8, 9, 10 and Exhibits 3 and 4. Add a note similar to Paragraph 27.03, Note 22.

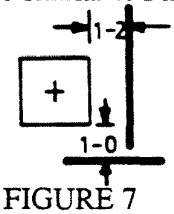


FIGURE 7
LOCATING CABLE RACKS FROM EDGE OF COLUMN

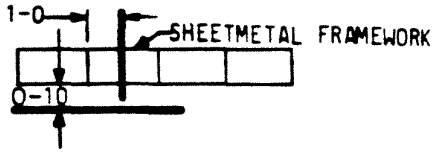


FIGURE 8
LOCATING CABLE RACK FROM GUARD RAIL TO CENTER LINE OF CABLE RACK

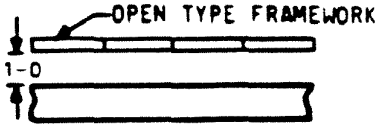


FIGURE 9
LOCATING CABLE RACK FROM BASE ANGLE OF OPEN GUARD RAIL FRAMES TO THE EDGE OF THE CABLE RACK

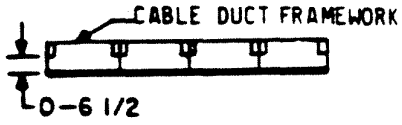


FIGURE 10
LOCATING CABLE RACK FROM THE CABLE DUCT UPRIGHT OF A CABLE DUCT BAY TO THE CENTER LINE OF THE CABLE RACK

B. Show locating dimensions for cable racks at right angles to and crossing above a line of frames from the end of the frames which it passes over, from the edge of a column or from another cross-aisle cable rack previously located, (see Figure 21 and Exhibits 3 and 4).

C. When cable racks are to be run between floors, locate and show the locating dimension of the cable rack at the cable hole or cable slot only.

D. Locating dimensions for main and end aisle cable racks shall be shown in the same manner as specified for the cross-aisle cable racks.

17.11 In combination Step-by-Step and Toll Offices where toll relay racks are placed in the same lineup with step-by-step frames, it is permissible to continue the frame cable rack over the toll relay rack in a straight line unless duct type framework is used.

17.12 Show locating dimensions for cable racks parallel to power frames in accordance with standard cabling and cable rack layout drawing for the applicable type power plant. Cable racks at right angles to and crossing above power frames, battery stands, etc., shall be dimensioned from the end of the power units over which it passes or from permanent building construction such as columns, walls, etc.

17.13 The following items provide locating information with respect to cable rack locations above the floor.

A. When locating cable racks with respect to the floor, base the dimensions on the distance from floor line to the cable line of the cable rack. Indicate these dimensions in parentheses at conspicuous points alongside of (or within) the cable runs. In no case should cable runs be located from the ceiling or underside of beams or girders (see Paragraph 27.03, Note 25).

17.14 Vertical offsets must be located. These locations are shown to the end of the horizontal section of cable rack. Add an explanatory note similar to Paragraph 27.03, Note 26. Also see Exhibits 3 and 4.

17.15 When two or more miscellaneous equipment units such as code signal sending device, fire detection relay, audible signaling alarm, call bell, etc., are grouped in the same general area on walls or columns provide a cabling layout and dimensional information in separate sketch on the office cabling and cable rack plan drawing if not shown on the office floor plan drawing. When this information is to be combined on this drawing, a suitable note referring to the layout shall be placed on the floor plan drawing.

17.16 When a supporting "Manufacturers" drawing provides a fixed dimension for locating a cable rack, the reference to the "Manufacturers" drawing and appropriate figure may be shown on the cabling and cable rack plan drawing in place of a numeric locating dimension. This reference may be shown on the body of the drawing or as a note provided it properly identifies the point or area of application.

18.00 CROSS SECTIONS AND CROSS SECTIONAL VIEWS

18.01 The following paragraphs cover cross sections and cross sectional views. They contain such information as when and where cross sections are expanded into cross sectional views and also how they are depicted on the drawing.

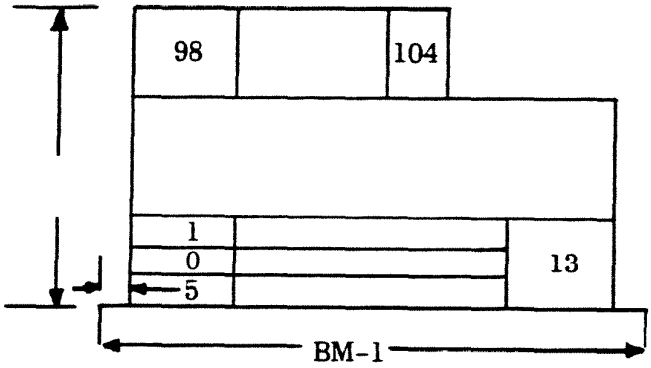
18.02 Occasionally, regular cable runs are encountered and on occasion, detailed cross sections showing the arrangement of cables at a specific point on the cable rack have been made. New applications of regular runs and detailed cross sections are rare. When necessary, apply as follows:

A. The detailed cross sections of regular runs referred to in the previous paragraph shall show the ultimate height of the cables on the rack, the cross section designation and title of run, the width of the cable rack, code of cables, locating dimension of first cable, if other than standard (3/4"), and the grouping and sequence of numbering of the cables. An example of a cross section is shown by Figure 11.

B. In the case of runs involving 100 circuit cables, the cable numbers shall be shown and circuit numbers omitted as shown in Figure 11.

C. The letters used in designating these cross sectional views (BM-1 in Figure 11) shall be assigned in accordance with their similarity to the title of the run. The following are examples of this designating procedure.

Inter to Answering Jack Run	- AJ
Protector Frame to Main Distribution Frame Run	- PM
Block Relay to Line Distributing Frame Run	- BR



BM-1
INTER TO B-MULT CODE 84 CL

FIGURE 11
CROSS SECTIONAL VIEW OF CABLES ON
REGULAR CABLE RACK RUN

D. When more than one cross sectional view is required for a common regular cable run, take the view in the same direction and number a common designation 1 and up for each view. For example, BM-1 (1st view) BM-2 (2nd view), etc.

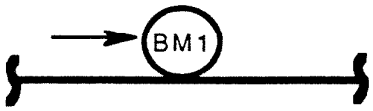
E. Only sufficient detailed numbering as is required to show the general sequence shall be shown. When the arrangement of the cables is irregular, the numbering of all the cables shall be shown in detail. Number cables in cross section on major dial systems runs in accordance with the following:

Run	Nbg. of Cas.
MDF to Prot.	A to H & Vert. No.
LDF to BR	A to H & BR Fr. No.
LL to DF	LL Fr. No. & Hd. No.
MR to DF	MR Fr. No. & Hd. No. (100% MR)
MR to DF	MR Fr. No. & Ca. No. 1 up (less than 100% MR)
MDF to FIDF	LF Fr. No. & Ca. No. 1 up
MDF to HIDF	Hd. No. &
IDF to Final	Fin. Fr. No. & Hd. No.
IDF to Conn.	Conn. Fr. No. & Hd. No.
IDF to LR	LR Fr. No. & Ca. No. 1 up

F. Ultimate cables shall be shown in full except on inter to answering jack runs on manual equipment where the present cables shall be shown in full and the ultimate dashed.

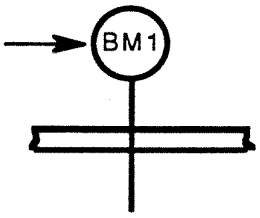
G. Wherever possible, the cross sectional views of regular runs shall be included on the plan view drawing with which they are associated.

H. Designate the detailed cross sectional views on the body of the drawing at the point or points on the cable rack where the view was taken as shown in Figures 12 and 13. Also add an explanatory note similar to Paragraph 27.03, Notes 27 or 28.

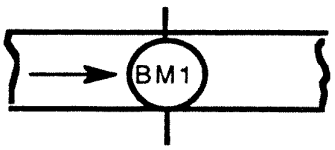


Note: Arrow indicates direction view is taken

FIGURE 12
DETAILED CROSS SECTIONAL
(UTILIZING SINGLE LINE CABLE RACK CONVENTION)



Narrow Cable Rack



Wide Cable Rack

Note: Convention for Narrow and Wide Cable Racks
Arrow indicates direction view is taken

FIGURE 13
DETAILED CROSS SECTIONAL
VIEW DOUBLE LINE CABLE RACK

I. Other special views, such as views of cables on distributing frame cross arms, in cable holes at fuse bays, etc., are made only when standard cabling plan drawings do not show the arrangement and it is absolutely necessary to provide this illustration.

19.00 RECORDING CABLE QUANTITIES AND PILEUPS

19.01 There are and have been several methods of recording cable quantities or pileups on cable racks. They are covered in subsequent paragraphs.

19.02 The coordinate plan, as described by the following items, for identifying cable run intersections in order to record cable quantities shall be used on all new jobs where the arrangement of frames and associated cable racks will permit application of this system.

A. Each "overframe" and "over aisle" cable rack carrying miscellaneous cable shall be lettered alphabetically using all letters of the alphabet except "I", "O", "P", "X" and "Z". Each lettered coordinate shall be prefixed by the floor number and assigned so that the proper designations are reserved for all future "overframe" or "frame aisle" cable racks. Coordinate numbers for "cross-aisle" cable racks shall be reserved on the basis of 1 per inch (or 4 scale feet) starting at the base wall. On the cabling plan drawing, only the numbers actually applying to paths should be shown, for example, 2, 6, 9, etc. These coordinate designations shall be shown immediately outside of the building lines shown on the cabling plan drawing, (see Exhibits 3 and 4).

B. Cable rack intersections are to be identified in terms of the coordinates, i.e., (2A-1), (3B-5), etc., but these designations will not be shown at the particular intersections on the cable plan drawing, (see Exhibits 3 and 4).

C. Designate miscellaneous cable sections which are not shown in a regularly designated coordinate path (such as cable runs to cable holes, or to desks, or short spur racks between frames) with the letter "X" prefixed by the floor number and suffixed numerals 1 and up as required. These cross section designations shall be shown in circles with a line across the cable rack to indicate the point of application. Miscellaneous cross sections shall not be shown in detail, (see Figures 14 and 15). Add a note similar to Paragraph 27.03, Note 28. Also see Exhibits 3 and 4.

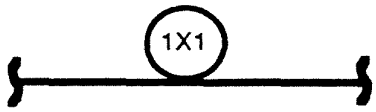
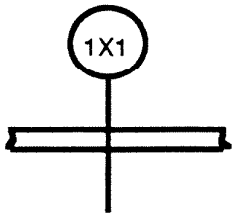
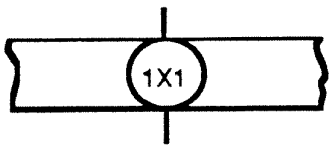


FIGURE 14
CROSS-SECTIONAL VIEW
MISCELLANEOUS CABLE RUN
(SINGLE LINE CABLE RACK CONVENTION)



Narrow Cable Rack



Wide Cable Rack

FIGURE 15
CROSS-SECTIONAL VIEW
MISCELLANEOUS CABLE RUN
(DOUBLE LINE CABLE RACK CONVENTION)

D. Detailed cross sectional views of power wire or cable runs generally will not be required. However, those runs specifically assigned to power wire shall have cross section designations assigned to them.

E. Designate power wire cross sections which consist of power wires only with the letters "PW" preceded by the floor number and supplemented by numerals assigned consecutively from 1 up. Floor number should be omitted when located in the basement, (see Exhibit 3). Add a note similar to Paragraph 27.03, Note 29.

F. For combined switchboard and power wire cross sections, assign designations as prescribed for miscellaneous switchboard cable runs.

19.03 When the coordinate system has not been used, miscellaneous cross sections shall be used and are designated by a single letter followed by a single digit number. All letters of the alphabet except "I", "O", "Z" may be used. The letters shall be preceded by the floor number to avoid the possibility of duplicating cross sections on different drawings and to simplify the job of locating particular cross section.

A. These cross sections are shown on the body of the drawing similar to Figures 14 and 15 for straight sections of cable rack.

B. Figures 16 and 17 illustrate method of designating "T" intersections.

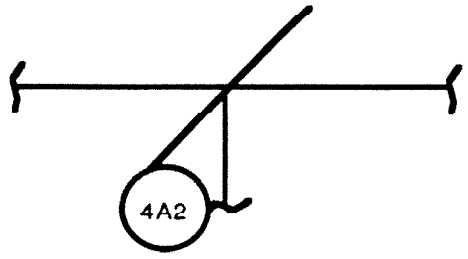
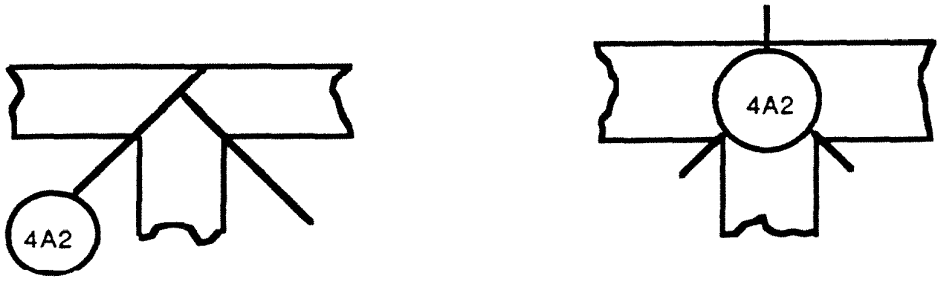


FIGURE 16
"T" INTERSECTIONS
(SINGLE LINE CABLE RACK CONVENTION)



Narrow Cable Rack Wide Cable Rack

FIGURE 17
"T" INTERSECTIONS
(DOUBLE LINE CABLE RACK CONVENTION)

C. Figures 17 and 18 illustrate method of illustrating "X" intersections.

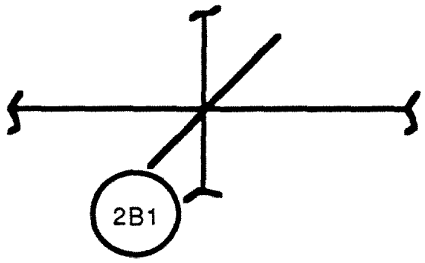
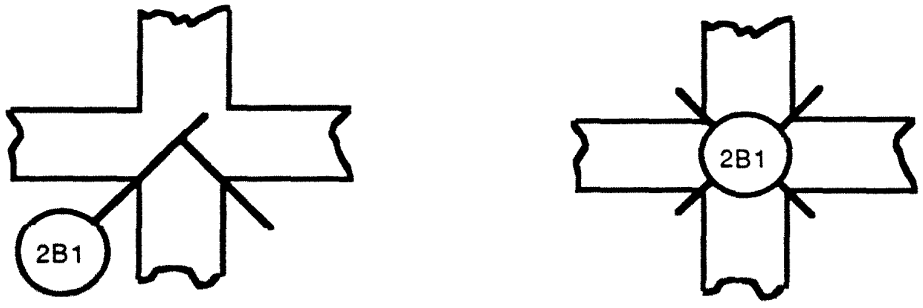


FIGURE18
"X" INTERSECTIONS
(SINGLE LINE CABLE RACK CONVENTION)



Narrow Cable Racks Wide Cable Racks

FIGURE 19
"X" INTERSECTIONS FOR NARROW AND WIDE CABLE RACKS
(UTILIZING DOUBLE LINE CABLE RACK CONVENTION)

20.00 TABULAR FORMATS FOR RECORDING CABLE COUNTS

20.01 Regardless whether the coordinate system, miscellaneous system or any other system has been established in an office, tabular formats shall be originated or maintained to record cable counts at various intersections and point on the cable racks. Essentially, the ultimate cable pileup dimensions to be used include power cable and cables shown in detail on miscellaneous or semiregular cable runs. The capacity and number of cables is in terms of cables having less than 90 conductors.

20.02 Figure 20 illustrates a miscellaneous section table to be used for offices containing Broadband and Microwave equipment.

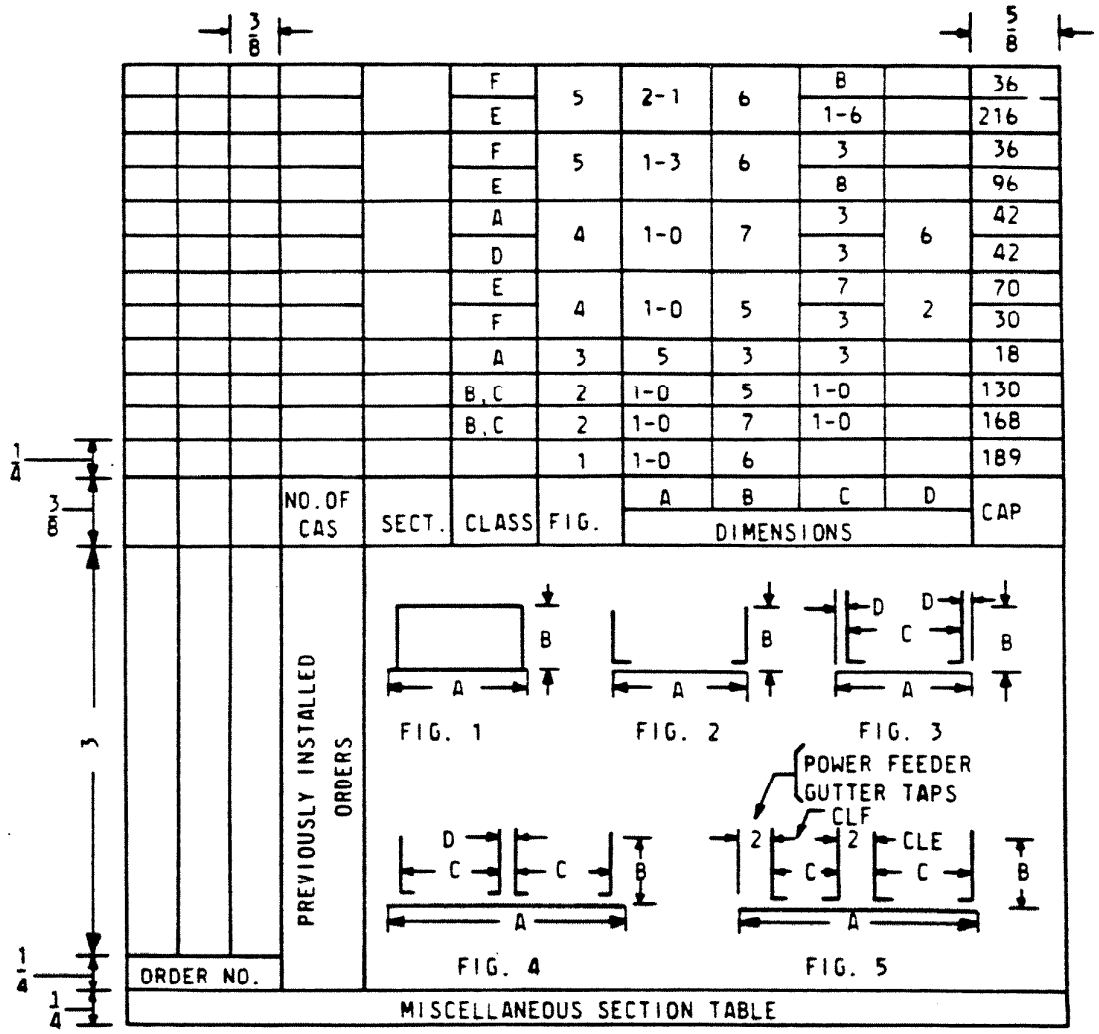


FIGURE 20
TYPICAL MISCELLANEOUS SECTION

20.03 Figure 21 illustrates a portion of Table A on a tabular drawing recording the number of cables and capacities at horizontal and vertical coordinates. This drawing is originated on an entire floor basis for each floor of the office containing Toll Transmission Equipment. Utilize the appropriate form drawing.

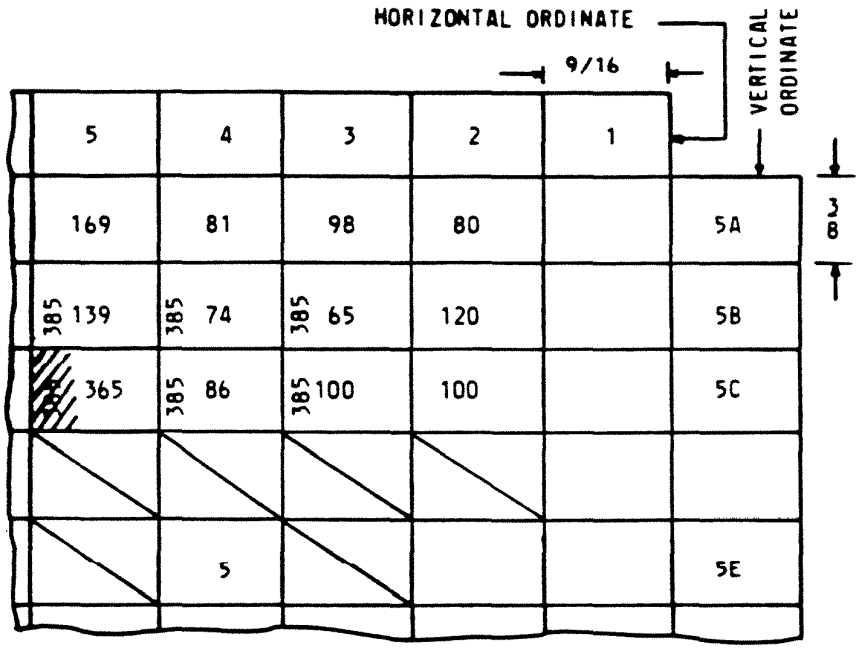


FIGURE 21
TYPICAL TABLE A

C. Figure 22 illustrates a portion of Table B also shown on the tabular drawing originated for Toll Transmission Office. This table records the miscellaneous sections on cable runs to cable holes, desks, etc., not reflected in the coordinate system.

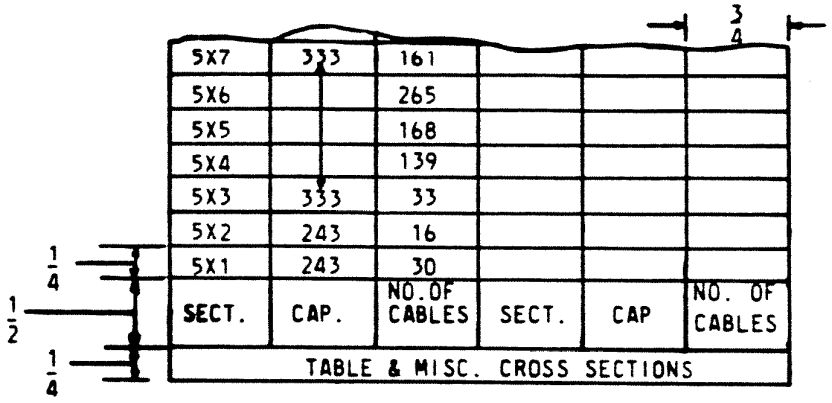


FIGURE 22
TYPICAL TABLE B

20.05 Figure 23 illustrates the method of recording cable count and ultimates for all other systems where this information is recorded.

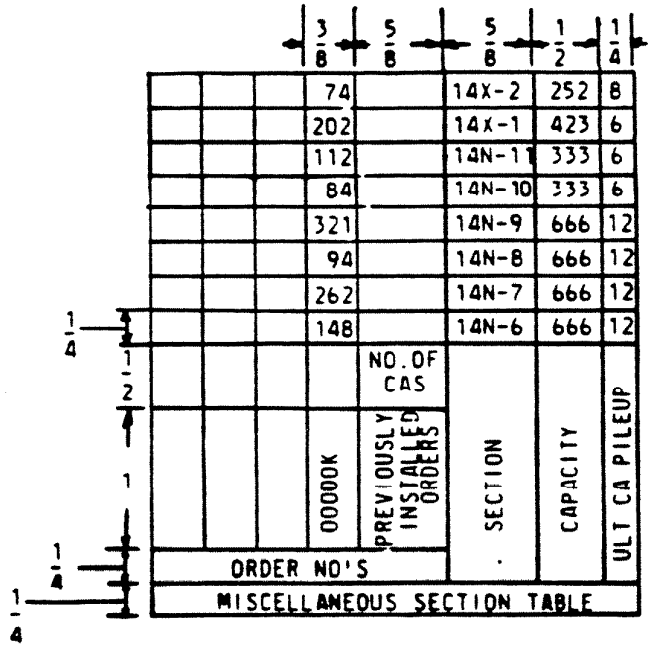


FIGURE 23
MISCELLANEOUS SECTION TABLE

20.06 It shall be noted in Figures 20 and 23, the column headed "Previously Installed Order" is intended to be used to condense into one column the total number of cables installed on several orders when it becomes necessary, due to space limitations, to reuse the columns headed "Order Numbers" for additional orders. This column may also be adjusted to show the number of cables added on miscellaneous orders or small additions where the number of cables added in each section represents a cross section of less than two square inches of cable rather than to use a separate "Order Number" column for this purpose.

20.07 Include the power cross sections and combined switchboard and power cross sections in the "miscellaneous section table" (Figures 20, 22, 23) with the miscellaneous switchboard cable cross sections.

20.08 In those cases where two or more cable plans are required on each floor, consolidate the miscellaneous section table to be on only one cable plan. On the associated cable plan(s) in a note, cross reference the location of the table information.

21.00 CABLE PATHS FOR MAJOR EQUIPMENT

21.01 Sometimes it is necessary to maintain maximum utility of a basic cabling scheme. In order to insure this utility, it is essential to record the cable routing of the scheme on the cabling and cable rack plan drawing. Generally, this information will be limited to designating specific paths to be used for cabling between major equipment units or areas. When areas, define in terms of columns bounding the particular building bays involved and place this information in a tabular format as shown by Figure 24. Also add a note in accordance with the following:

A. When routing cables between equipment or areas shown in the cable routing table, primary consideration shall be given to the cable racks indicated.

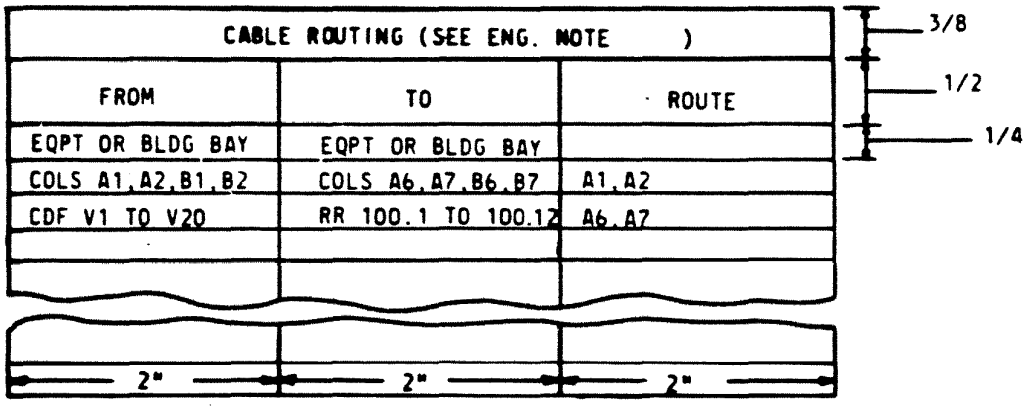


FIGURE 24
CABLE ROUTING TABLE

22.00 SPLICES ON CABLE RACK

22.01 Where certain conditions prevail, it is sometimes necessary to place splices in cable runs. For example: When a particular circuit is to be terminated in more than one lineup of switchboards, the cable from this circuit may be spliced into runs to the other terminating points of the same circuit when an appreciable saving of cable is effected, a complicated cabling layout avoided, or the space in the frame will not permit the installation of another run. The following items relate the procedure to follow and the method of recording this information on the drawing.

22.02 Design the cable run to allow for the additional width and pileup resulting from the splices. The type of splice to be used whether "T" or "Y" will be dependent upon conditions on the job involved. Give preference to "Y" splices where cabling conditions will permit.

22.03 Confine splices to horizontal portions of runs where they will not result in increasing the length of the cable runs or introduce poor installing conditions. Avoid locating splices in congested areas to permit easy access for the installer.

22.04 Indicate on the body of the drawing that portion of a cable rack allocated to splicing similar to Figure 25.

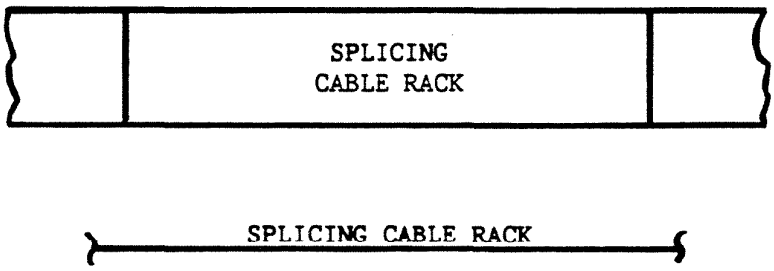


FIGURE 25
TYPICAL CABLE RACK SPLICE

23.00 CABLE CLEARANCES AND PILEUPS ILLUSTRATING

23.01 When marked prints are received from the installer indicating the cable pileup at high points on particular cable rack runs, show the information on the office cabling plan drawings adjacent to the point involved. Cable clearances between top of pileup and obstructions (beam, vent, duct, etc.), may also be indicated on the drawing at the points involved as illustrated by Figure 26. Add the appropriate descriptive note (see Paragraph 27.03, Notes 30 and 55).

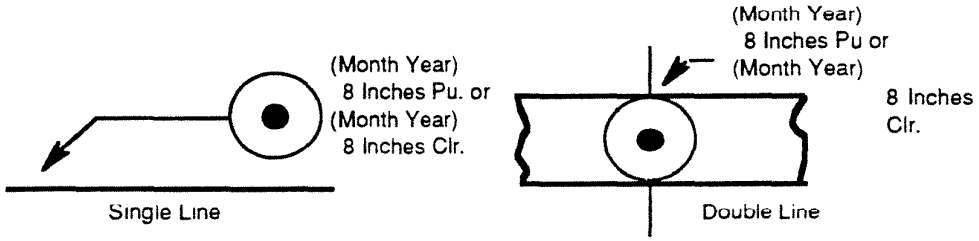


FIGURE 26
TYPICAL CABLE PILEUP (PU)
(SINGLE AND DOUBLE LINE CONVENTIONS)

23.02 Fire protection requirements provides for a minimum clearance of 3 inches from the cable hole to the cable pileup in order to place the appropriate amount of fire protection material in this cable hole. It is necessary to show the maximum cable pileup through a cable hole. For example, a 2-0 X 1-0 cable hole has a 9 inch maximum pileup. See Figure 27 and Paragraph 27.03, Note 70 for the information to be shown on the cable rack plan.

23.03 If all cable holes are one size on the associated cable rack plan, a note similar to Paragraph 27.03, Note 71 would be required to indicate that all cable holes on this drawing have an inch maximum pileup. All others will be designated as shown in Figure 27 and Paragraph 27.03, Note 70.

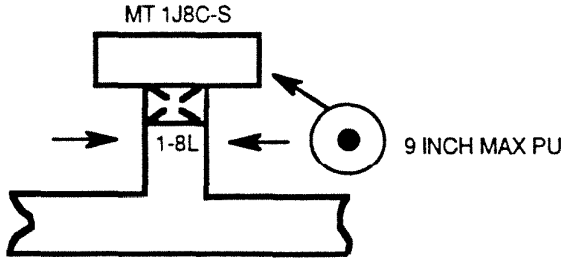
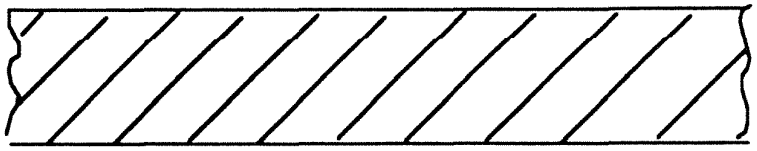


FIGURE 27
TYPICAL SPECIAL CONDITION PILEUP NOTE

23.04 In order to indicate that a cable rack is blocked, add the appropriate symbol (either single or double line cable rack convention) as shown by Figure 28 at the point of blockage. Also add an explanatory note similar to Paragraph 27.03, Note 31.

SINGLE LINE



DOUBLE LINE

FIGURE 28
TYPICAL BLOCKED CABLE RACK
(SINGLE AND DOUBLE LINE CONVENTIONS)

24.00 AUXILIARY FRAMING

24.01 The paragraphs under this title relate the specific drawing standards covering the placement of auxiliary framing information on this drawing.

24.02 Low type auxiliary framing shall be indicated on the drawing with intermittent long and short dash lines. The framing (channels) shall be shown in the actual location that they will be placed, based on the requirements of job specification. Add descriptive notes as required covering the information related by the following items:

A. Convention (intermittent long and short dash lines)

B. A dimension for the height of the bottom of the primary or regular channels (channels placed perpendicular to the frame lineups) above the finished floor line.

C. The placement of supplementary or secondary channels (channels placed parallel to frame lineups) see Paragraph 27.03, Note 35.

24.03 High type auxiliary framing shall be indicated on the drawing with dash lines of equal length. The framing (channels) shall be shown in the actual locations that they will be placed in accordance with the job specification. It is recommended that the dash line be approximately 1/2 inch in length with a 1/8 inch space between each dash. Add descriptive notes, as required, covering the information related by the following items:

A. Convention (dash lines of equal length)

B. A dimension for the height of the bottom of the primary or regular channels (channels placed perpendicular to the frame lineups) above the finished floor line.

C. The placement of height above the finished floor of supplementary or secondary channels (channels placed parallel to the frame lineups) see Paragraph 27.03, Note 36).

24.04 When all or some primary low type auxiliary framing channels are not located directly under the ceiling inserts, locating dimensions shall be shown for all primary low or high type framing when supported perpendicularly to ceiling unistrut. These dimensions shall begin from a fixed location, such as a column center, edge of column or from a ceiling insert, beam clamp or unistrut, and shall be shown between all primary framing as required, (see Exhibits 3 and 4).

24.05 Unistrut

A. It is recommended that secondary unistrut, low and high type auxiliary framing locating dimensions be shown only when deviating from insert lines and the placement must be extremely accurate for a specific purpose.

24.06 Information has been previously furnished herein regarding the placement of ceiling inserts, beam clamps, expansion shields and unistruts including their respective drawing symbols. The following paragraphs provide information for the placement and symbolizing of hanger rods and hanger rod extensions to these devices (see Exhibits 3 and 4 and Paragraph 27.03, Notes 37 through 41).

A. When a hanger rod is to be placed or hung from a ceiling insert or expansion shield, show the appropriate insert or expansion shield with a superimposed hanger rod symbol at its actual location on the body of the drawing. Add a descriptive note as shown on Paragraph 27.03, Notes 38 and 39.

B. When a hanger rod extension is placed on the beam clamp hanger rod and/or when auxiliary framing is supported from the beam clamp hanger rod, show the appropriate beam clamp symbol with a superimposed hanger rod symbol at its actual location on the body of the drawing. Add a descriptive note as shown on Paragraph 27.03, Note 40.

C. When a hanger rod is placed or hung from unistrut, show only the hanger rod symbol at its actual location on the body of the drawing. Add a descriptive note as shown on Paragraph 27.03, Note 37.

24.07 When placing hanger rods between auxiliary framing of two different heights, (high type to low type) show the appropriate symbol at the actual location of the rod on the body of the drawing. Add a descriptive note as shown on Paragraph 27.03, Note 41.

24.08 When placing hanger rods from auxiliary framing to cable racks, show the appropriate symbol at its actual location on the body of the drawing. Add a descriptive note as shown in Paragraph 27.03, Note 42.

24.09 When auxiliary framing is supported by stanchions, show and locate the stanchions on the body of the drawing. Add the applicable descriptive note as shown on Paragraph 27.03, Note 43 or Note 44.

24.10 Bracing should not be shown except in offices where earthquake and disaster bracing or hardening is required. When either has been provided, show all the bracing, restrainers, etc., using the symbols under the corresponding note shown on Paragraph 27.03, Notes 45, and 58 through 67.

24.11 The ends of channels which are to be supported from walls rather than from the ceiling should be extended to the wall line and designated with the appropriate drawing and group number.

24.12 Originally, auxiliary framing construction consisted of the use of flat bars. Presently, auxiliary framing construction consists of the use of channels. Consequently, there are existing offices where auxiliary framing of both constructions are or will be utilized. The procedures for distinguishing the respective areas where each construction is located are covered by the following items.

A. The line of demarcation between bar and channel framing will be shown on the office drawing by means of a symbol (C) indicating that the area within a line joining the "C" corners consists of channel framing (see example). In small isolated areas where the present bars may be designated "B" if the framing is extended with channels, a "C" shall be shown adjacent to the "B".

EXAMPLE:

⌜C C⌝

⌞C C⌟

B. The entire area in which channel framing may be installed shall be delineated on the first addition of channel framing on the particular drawing involved.

C. The note on the cabling plan and the battery and power layouts covering the height of framing in new offices having only channel framing, shall read "indicates low (or high) type channel auxiliary framing, etc." On offices having both bar and channel type framing, add a note similar to the following: "Low (or high) type channel auxiliary framing " above the floor shall be installed in areas bounded by symbols (C). In isolated areas, the letter "B" or "C" on the symbol for auxiliary framing indicates bar or channel respectively."

25.00 ROLLING LADDER INFORMATION ON CABLE PLANS

25.01 Rolling ladder information should be shown on the cabling plans. This will permit the use of cable plan coordinates for the ladder locating information, (see Paragraph 27.03, Note 46). The information should be shown as follows:

A. A table shall be shown located adjacent to the Miscellaneous Section Table. Construct the table as illustrated by Figures 29 and 30.

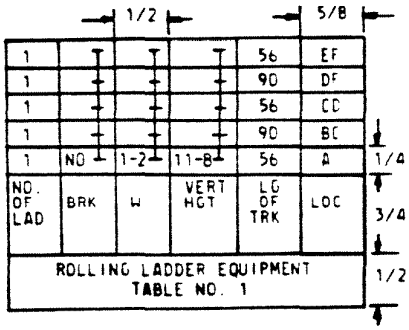


FIGURE 29
CONSTRUCTING ROLLING LADDER
TABLE USING CABLING PLAN COORDINATES

B. Figure 29 illustrates the coordinate method of constructing a rolling Ladder Track Table. Essentially, line numbers are to be identified in terms of the coordinates, i.e., A, B, B-C, C-D, etc. Should a condition arise where two ladders are installed in the same aisle, line numbers such as C-D (C) and C-D (D) should be shown.

C. Where information covering the direction of the ladder slant is required, this shall be covered under "Notes".

D. When ladders of more than 12 steps are ordered, a note should be added indicating the location and number of steps.

E. Where the coordinate plan is not in use, the table should reflect ladder track locations in terms of frames of bays. Construct the table as illustrated by Figure 30.

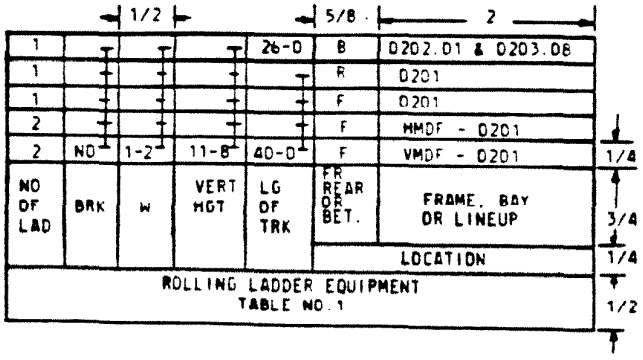


FIGURE 30
CONSTRUCTING ROLLING LADDER TABLE NOT
USING CABLING AND CABLE RACK PLAN COORDINATES

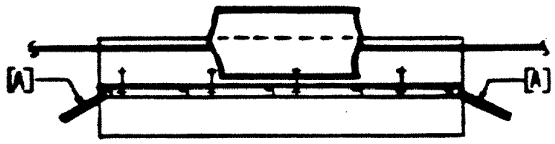


FIGURE 31
DISTRIBUTING FRAME BRACES

26.00 EARTHQUAKE AND DISASTER BRACING

26.01 These paragraphs provide specific drawing standards for central offices requiring earthquake and disaster bracing and hardening. When this feature is to be provided, show all the bracing, restrainers, etc., using applicable symbols, notes and configurations shown in Paragraph 27.03, Notes 45 and 58 to 67 and Exhibits 2, 3, 8 and 9.

26.02 Distribution frame end braces shall be designated per Figure 31.

26.03 Braces for cable racks to distributing frame verticals shall be designated per Figure 31. "0" pen size shall be used for this symbol.

26.04 Designating piece part numbers and details for braces.

A. Brace piece part numbers in use on a specific job drawing shall be shown in a table per Figure 32 and assigned an arbitrary alpha code. The alpha code shall be used within brackets [ ] per Paragraph 27.03, Note 58.

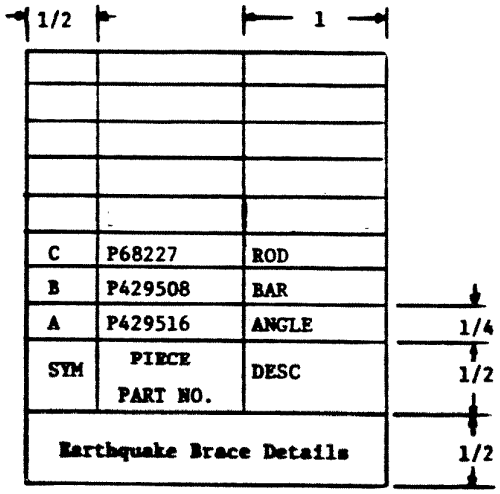


FIGURE 32
TABLE FOR BRACE PIECE PART NUMBER OR DETAIL CODE

(Omit alpha symbols I and O)

B. The code designation will be required only at the first and last braces of an identical series.

C. On job drawings with 2 or 3 levels of auxiliary framing, supplement the brace piece part alpha symbol with the designations -H, -M and - L (High, Middle and Low) on the body of the drawing to indicate the relative location of the specific brace. When more than one brace occurs at a given location, show only one brace symbol per Paragraph 27.03, Note 59 with alpha symbols as required, (see Figure 33).

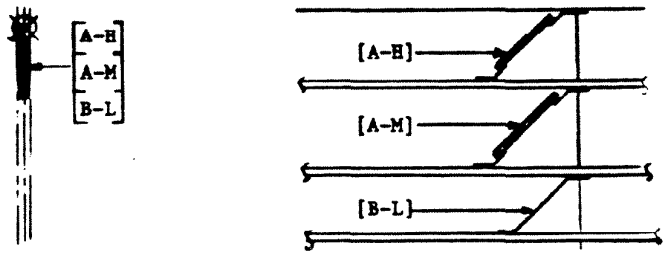


FIGURE 33
BRACE PIECE PARTS WITH 3 LEVELS OF AUXILIARY FRAMING

D. A specific area of multilevel auxiliary framing shall be consistent in the use of -H, -M and -L symbols in order to depict a location where 2 or 3 levels of auxiliary framing occur but only one brace is installed. See Figure 34.

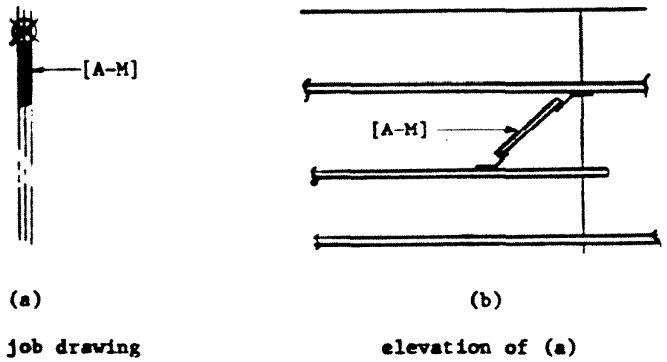


FIGURE 34
1 BRACE PIECE PART WITH 3 LEVELS OF AUXILIARY FRAMING

E. Use only -H and -L symbols when two levels of auxiliary framing are to be installed.

F. Symbols or methods for indicating brace piece part numbers shall be determined on a job basis when more than three levels of auxiliary framing are to be installed. It is recommended that an elevation sketch of the office be shown on the Cable Rack Plan.

G. The procedures described in Paragraph 26.04 C, D and E may be applied where multilevel cable racks have common support and brace locations. See Figure 35.

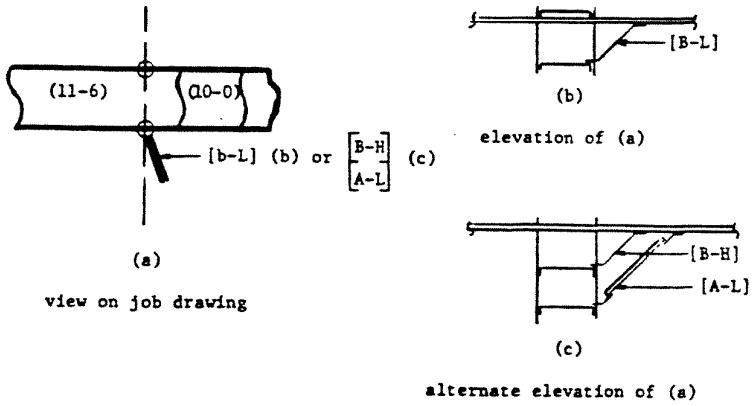


FIGURE 35
BRACE PIECE PARTS WITH 2 LEVELS OF CABLE RACK

H. When two or more drawings are used for a specific equipment area, the alpha codes assigned to brace piece part numbers shall be coordinated.

26.05 The information regarding depiction of earthquake braces, per Paragraph 26.04, shall apply to all new or redrawn auxiliary framing and/or cable rack plans. Consideration shall be given for application to an existing drawing where practical and sufficient space exists for the table per Figure 32. Practices currently in use on a specific drawing may continue to be used where growth and/or space is limited.

26.06 In situations where only one piece part number is used for a specific type of brace, such as small offices or above an operating room, the use of Paragraph 27.03, Notes 59 and/or 65 or 66 may be elected as an alternate to the Figure 32 table and associated Paragraph 26.04. Specify the piece part number and type (angle, bar, or rod). Paragraph 27.03, Note 59 shall be shown on the job drawing modified to omit the code designation bracket [ ] in this situation.

26.07 The description required for cable rack support and bracing fabrication shall be made in the Earthquake Brace Details Table per Figure 32 with a corresponding cross reference per Figure 36.

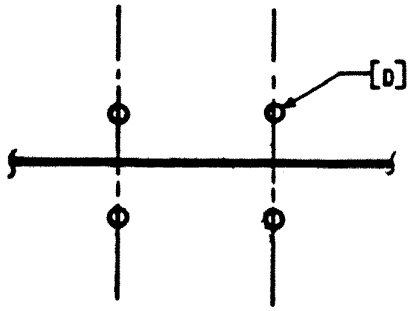


FIGURE 36
APPLICATION FOR BRACE PIECE PARTS WITH
SINGLE LINE CONVENTION CABLE RACK

27.00 NOTES AND SYMBOLS

27.01 Symbols used on the cabling and cable rack plan have also been indicated in the previous text. Those symbols covering equipment shown on the floor plan drawing shall be used on this drawing. All symbols used shall be placed under explanatory notes whether similar or dissimilar to those used on the floor plan drawing.

27.02 Show only those notes that are applicable to the particular cabling and cable rack plan drawing.

27.03 Other miscellaneous items and/or apparatus which mounts or projects into cabling area, shall be shown by an appropriate symbol at the actual location on the body of the drawing where they are placed to identify future obstructions to additions and revisions. For example, items such as inductors, filters, wave guides, etc., shall be symbolized on the office drawing.

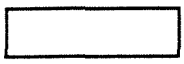
1.  CEILING INSERT

2.  EXPANSION SHIELD

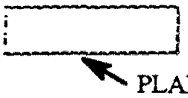
3.  BEAM CLAMP

4.  UNISTRUT P-

5. MT△1A3A-S INDICATES A CABLE HOLE DESIGNATION. THE CAP DELTA SYMBOL REPRESENTS THE TERM CABLE HOLE. THE M PRECEDING THE CAP DELTA SYMBOL INDICATES A SLIDING TYPE CEILING COVER. THE T PRECEDING THE CAP DELTA SYMBOL INDICATES TAPERED CABLE HOLE. THE FIRST NUMBER INDICATES THE FLOOR AND THE LETTER AND NUMBER INDICATES THE COLUMN AND THE LAST LETTER INDICATES THE COLUMN AND THE LAST LETTER INDICATES THE FIRST CABLE HOLE NEAR THE COLUMN. THE -S SYMBOL INDICATES STEEL COVER.

6.  PRESENT CABLE HOLES OR PORTIONS OF CABLE SLOTS IN FLOOR AND CEILING AT SAME LOCATION THAT ARE SHEATHED.

7.  CABLE HOLE AND CABLE SLOTS IN CEILING AND FLOOR THAT ARE EITHER TEMPORARILY FILLED, PLUGGED, OR TEMPORARILY COVERED WITHOUT SHEATHING.

8. 

CABLE HOLE THAT HAS BEEN LOCATED BUT NOT CUT AND FRAMED. HOWEVER, SPACE MUST BE RESERVED.

9. HEAVY SOLID LINES INDICATE CENTER LINES OF PRESENT CABLE RACKS. DASH LINES INDICATE CENTER LINES OF FUTURE CABLE RACKS. (SINGLE LINE CONVENTION).

10. HEAVILY OUTLINED RUNS ARE PRESENT RUNS, LIGHTLY OUTLINED RUNS ARE FUTURE. (DOUBLE LINE CONVENTION).

11. UNLESS OTHERWISE INDICATED:

    ALL OVER FRAME CABLE RACKS ARE TYPE ' " WIDE;

    ALL CROSS-AISLE CABLE RACKS ARE TYPE ' " WIDE.

12. ALL BAR TYPE OVER AISLE CABLE RACKS ARE AND ALL BAR TYPE CROSS-AISLE CABLE RACKS ARE FROM FLOOR LINE TO CABLE LINE TO CABLE RACKS.

13. "L" SHOWN ON CABLE RACK REFERS TO LADDER TYPE CABLE RACK, I.E., 1-0L, 1-3L.

14. "B" SHOWN ON CABLE RACK REFERS TO BAR TYPE CABLE RACK, I.,E., 1-8B, 1-10B.

15. NUMERICAL PREFIX SHOWN ADJACENT TO CABLE RACK HEIGHT INDICATES WIDTH OF CABLE RACK, I.E., 1-3L, 1-8B.

16. ALL CABLE RACKS OVER EQUIPMENT IN POWER AREA ARE LADDER TYPE.

17. ⌐ ALPHANUMERIC IN BRACKETS ARE CABLE RACK FABRICATION
    ⌊ DESIGNATIONS THAT CORRESPOND TO THE EQUIPMENT SUPPLIER'S DRAWING OR APPLICABLE PRACTICE NUMBER.

18. SOME CABLE FABRICATIONS ARE NOT DESIGNATED. THESE INCLUDE THE FOLLOWING CONFIGURATIONS:

    CLOSING END OF CABLE RACK
    90% TURN IN SAME PLANE
    "T" INTERSECTION IN SAME LEVEL
    "T" INTERSECTION NOT AT SAME LEVEL
    "T" INTERSECTION IN SAME PLANE
    "T" INTERSECTION NOT IN SAME PLANE

19. SPECIAL CABLE RACK FABRICATIONS ARE INDICATED BY H DRAWINGS, ED DRAWING OR VIEW NUMBERS LISTED ADJACENT TO THE CABLE RACK CONVENTION.

20. CABLE RACK DESIGNATED CL A, B, C, ETC., SHALL BE STAMPED PER ED _____ AND HAVE CABLE BRACKETS AND SCREENS PER ED_____ CABLES SHALL BE SEPARATED PER ED _____.

21. CABLE RACK DESIGNATED CL2LGT OR CL2HGT SHALL BE RESTRICTED TO THESE TYPES OF N AND ON CARRIER CABLES. FOR SEPARATION AND STAMPING SEE ED.

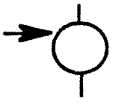
22. DIMENSIONS SHOWN TO CENTERLINE (OR SIDE) OF CABLE RUNS ARE LOCATING DIMENSIONS OF CABLE RACKS.

23. ALL OVER AISLE CABLE RACKS ARE CENTERED BETWEEN FRAME LINEUPS UNLESS OTHERWISE SHOWN.

24. ALL OVER AISLE CABLE OF OVERFRAME CABLE RACKS SHALL BE LOCATED 9-11/16 INCHES IN FRONT OF REAR GUARD RAIL UNLESS OTHERWISE SPECIFIED.

25. DIMENSIONS SHOWN IN PARENTHESES ( ) INDICATE VERTICAL HEIGHT OF CABLE RACK FROM FLOOR TO LINE TO CABLE LINE OF CABLE RACK.

26. DIMENSIONS LOCATING VERTICAL OFFSETS ARE SHOWN TO THE END OF HORIZONTAL SECTION OF RACK.

27.  REGULAR DETAILED CROSS SECTIONS. ARROW INDICATES DIRECTION IN WHICH CROSS SECTION IS TAKEN.

28.  MISCELLANEOUS CROSS SECTIONS SHOWN IN THE MISCELLANEOUS SECTION CHART.

29. THE CAPACITY SPECIFIED FOR CROSS SECTIONS PRECEDED BY THE LETTER "P" REPRESENTS THE POWER CABLES CONVERTED INTO TERMS OF SWITCHBOARD CABLES.

30.  (MONTH YEAR)
8 INCH PU. HEIGHT OF CABLE PILEUP AT HIGH POINTS ON CABLE RUNS.

31.  CABLE RACK BLOCKED.

32. THE MARKER MULTIPLE CABLES SHALL BE RUN ON "CABLE PATHS" AS FOLLOWS:

(NO. 1 CROSSBAR®)

TO FR.	OM EVEN	ODD
OMC	PATH	PATH
D	PATH	PATH
O	PATH	PATH
	TM	
NG	PATH	PATH
LC	PATH	PATH
I	PATH	PATH
TMC	PATH	PATH
	TSL	
	1ST MULT	LAST MULT
TO	APPEAR	APPEAR
TS	PATH	PATH

No. 1 CROSSBAR® is a Registered Trademark of AT&T Technologies, Inc.

33. MARKER AND TRANSVERTER MULTIPLE CABLES SHALL BE RUN IN ACCORDANCE WITH REQUIREMENTS OF MANUFACTURER'S DRAWING ON CROSS-AISLE PATHS AS FOLLOWS:

(NO. 5 CROSSBAR® ONLY)

EVEN NUMBERED FRAMES, PATHS - - -, CABLE HOLES - - -

ODD NUMBERED FRAMES, PATHS - - -, CABLE HOLES - - -

(NOTE - REFERENCE TO CABLE HOLES SHALL BE USED IF REQUIRED)

34. THE MARKER MULTIPLE CABLES SHALL BE RUN ON "CABLE PATHS" AS FOLLOWS:

TO FR.	OM EVEN	ODD
T	PATH	PATH
O	PATH	PATH
MC	PATH	PATH

35. ——— — ——— LOW TYPE AUXILIARY FRAMING. BOTTOM OF REGULAR CHANNELS IS ' " ABOVE FLOOR. PLACE SUPPLEMENTARY CHANNELS ABOVE REGULAR CHANNELS UNLESS OTHERWISE INDICATED.

36. ——— ——— ——— HIGH TYPE AUXILIARY FRAMING. BOTTOM OF PRIMARY CHANNELS IS ' " ABOVE FLOOR UNLESS OTHERWISE INDICATED.

37.  HANGER ROD FOR SUPPORTING AUXILIARY FRAMING FROM UNISTRUT.

38.  HANGER ROD FOR SUPPORTING AUXILIARY FRAMING FROM A CEILING INSERT.

39.  HANGER ROD FOR SUPPORTING AUXILIARY FRAMING FROM AN EXPANSION SHIELD.

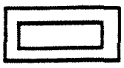
40.  HANGER ROD EXTENSION AND/OR AUXILIARY FRAMING SUPPORTED FROM A BEAM CLAMP.

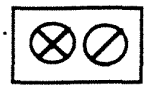
41.  HANGER ROD BETWEEN TWO DIFFERENT LEVELS OF AUXILIARY FRAMING (HIGH TYPE TO LOW TYPE SHOWN).

42.  CABLE RACK SUPPORTED FROM AUXILIARY FRAMING WITH HANGER RODS.

NO. 5 CROSSBAR® is a Registered Trademark of AT&T Technologies, Inc.

43.  ROUND STANCHION PER APPLICABLE SUPPLIER INSTALLATION OR PRACTICE NUMBER.

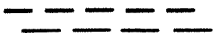
44.  RECTANGULAR STANCHION PER SUPPLIER INSTALLATION OR PRACTICE NUMBER.

45.  LOCATION OF 3" - 5 LB. CHANNEL BOLTED TO CEILING FOR FASTENING OF EARTHQUAKE PROTECTION BRACES.

46. FRAME AISLE CABLE RACKS HAVE BEEN DESIGNATED WITH COORDINATES THAT ALSO REPRESENT THE LADDER TRACK LINE. THE NUMBER SHOWN WITH LETTERS REPRESENTS THE FLOOR. CROSS-AISLE CABLE RACKS HAVE BEEN DESIGNATED WITH COORDINATE NUMBERS.

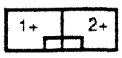
47. CABLE RACKS DESIGNATED FOR "ANI PRI CAS" SHALL BE USED FOR ANI PRIMARY CABLES ONLY. NO OTHER CABLES SHALL BE RUN ON THESE RACKS.

48. CABLE RACK DESIGNATED FOR "ANI SEC CAS" SHALL BE USED FOR SECONDARY LEADS FROM THE IDENTIFIER FRAMES AND THE NUMBER NETWORK FRAMES. NO OTHER CABLES SHALL BE RUN ON THESE RACKS.

49. POWER CABLE SUPPORT. 

50. DIMENSIONS SHOWN IN BRACKETS < > INDICATE VERTICAL HEIGHT FROM FLOOR LINE TO UNDERSIDE OF VENT DUCT.

51. AN ALPHANUMERIC IN PARENTHESES ( ) PRECEDING THE FRAME DESIGNATION INDICATES THE CONTROL GROUP NUMBER. THE LETTER SIGNIFIES THE TYPE OF OFFICE THE NUMBER THE RESPECTIVE CONTROL GROUP PRESENT. (O FOR THE FIRST, 1 FOR THE SECOND, ETC., - SPCS OFFICES ONLY).

52. 

1+ (OR +2) DENOTES (CODE) INDUCTOR MOUNTED ABOVE AUXILIARY FRAMING.

53.  RESTRAINER.

WAVEGUIDE RESTRAINER PER MANUFACTURER'S NUMBER (FIG., GRP)
OF WAVEGUIDE ' " ABOVE FLOOR.

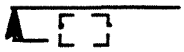
54. SYMBOLS FOR CODED AND NONCODED MISCELLANEOUS EQUIPMENT, APPARATUS, AND HARDWARE ARE CONVERTED IN EXHIBIT 9 OF THIS PART.

55. 
(MONTH YEAR)
9 INCH CIR CLEARANCE BETWEEN TOP OF CABLE PILEUP AND OBSTRUCTION.

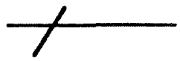
56. VSD VENTILATING SUPPLY DUCT
VRD VENTILATING RETURN DUCT

57. ALL LADDER TYPE OVER FRAME CABLE RACKS ARE _____ AND ALL LADDER TYPE CROSS-AISLE CABLE RACKS ARE _____ FROM FLOOR LINE TO CABLE LINE OF CABLE RACKS.

58. [A] EARTHQUAKE BRACE PIECE PART OF DETAIL SYMBOL AS SHOWN IN TABLE OF EARTHQUAKE BRACE DETAILS. -H, -M OR -L FOLLOWING SYMBOL DESIGNATES HIGH, MIDDLE OR LOW LOCATION OR BRACE RELATIVE TO MULTILEVEL AUXILIARY FRAMING OR CABLE RACKS.

59.  AUXILIARY FRAMING AND CABLE RACK BRACING PER.

60.  CEILING INSERT WITH AUXILIARY FRAMING BRACE SECURED WITH STUD BOLT.

61.  EXPANSION SHIELD WITH AUXILIARY FRAMING BRACE SECURED WITH STUD BOLT.

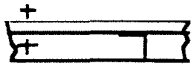
62.  BEAM CLAMP WITH AUXILIARY FRAMING BRACE SECURED WITH STUD BOLT.

63.  UNISTRUT WITH AUXILIARY FRAMING BRACE SECURED WITH STUD BOLT.

64.  3" - 5 LB. CHANNEL WITH AUXILIARY FRAMING BRACE SECURED WITH U-BOLT.

65. ALL AUXILIARY FRAMING EARTHQUAKE BRACE ARE P- _____ .

66. ALL CABLE RACK EARTHQUAKE BRACES ARE P- _____ _____ .

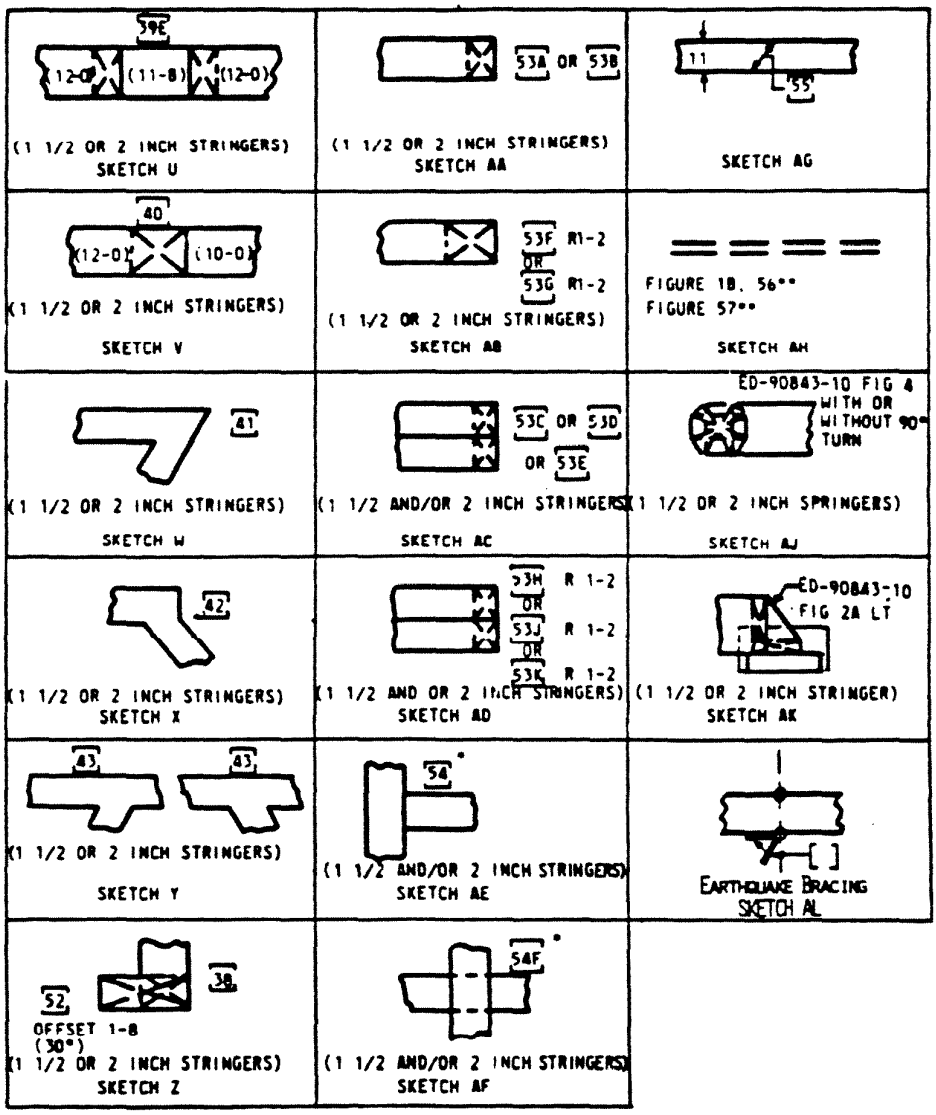
67.  EARTHQUAKE BRACE.

68.  NUMBERS SHOWN IN SEMI-CIRCLES ARE AUXILIARY FRAMING SUPPORTING FIGURES THAT CORRESPOND TO THE SUPPLIER PRACTICE OR INSTALLATION NUMBER.

69. AREA ENCLOSED BY D HAS BEEN DIGITIZED AND CABLES ROUTED ON THESE CABLE RACKS SHOULD BE PROCESSED THROUGH AN AUTOMATED CABLE ROUTING AND MEASURING SYSTEM.

70.  INCH MAX PU MAXIMUM CABLE PILEUP THROUGH A CABLE HOLE.

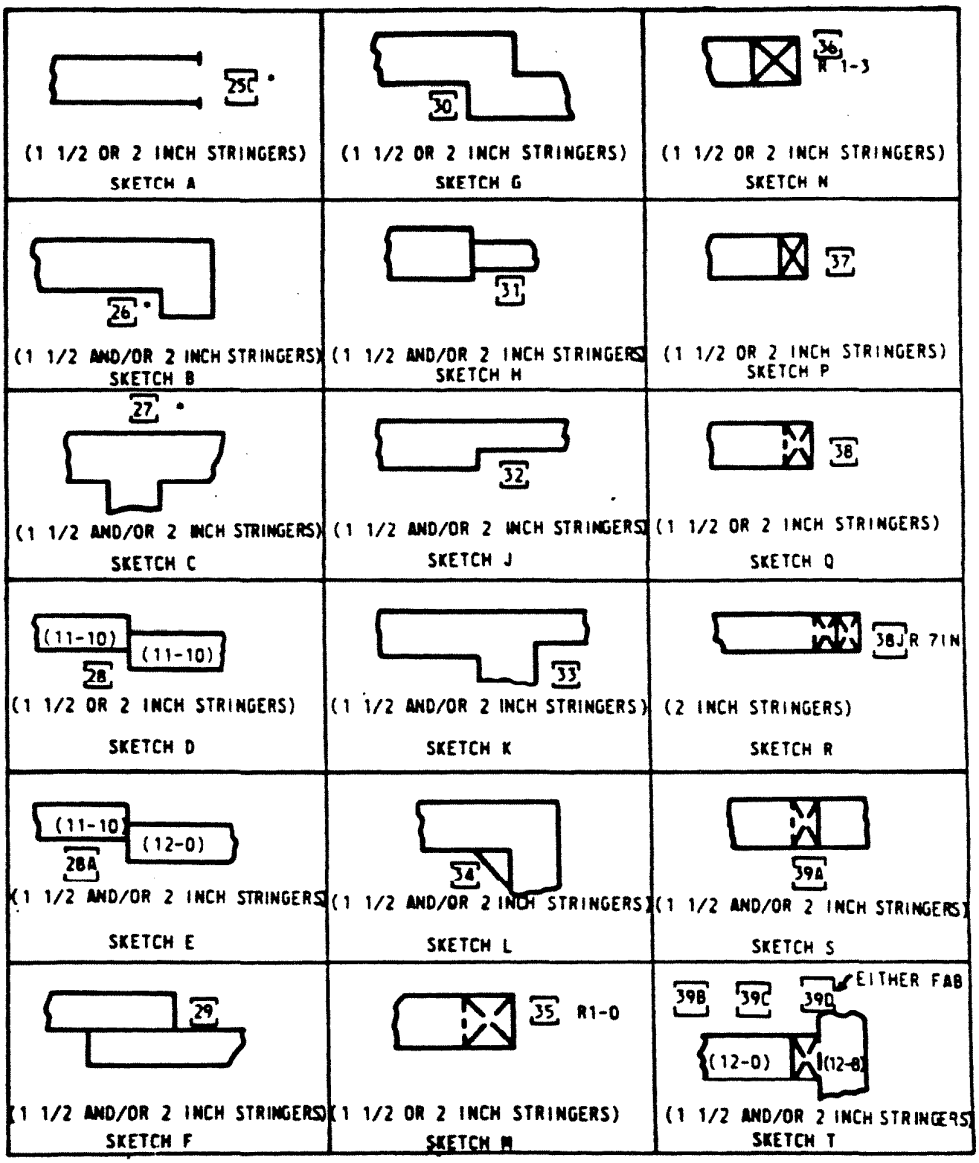
71. ALL CABLE HOLES ON THIS DRAWING HAVE A _____ INCH MAXIMUM PILEUP, UNLESS OTHERWISE SHOWN.



* DENOTES FIGURE 18 AND 56 ILLUSTRATES CABLE RACK AND METHOD OF SUPPORT. FIGURE 57 ILLUSTRATES CABLE BRACKET. UTILIZE SAME CONVENTION AND ADD MANUFACTURING NOTE DESCRIBING THE APPLICABLE FIGURE. WHEN BOTH ARE USED ON THE SAME DRAWING, IDENTIFY EACH ON THE BODY OF THE DRAWING BY CROSS REFERENCING TO THE PROPER NOTE. THIS CONVENTION ALSO APPLIES TO SINGLE LINE CONVENTION DRAWINGS.

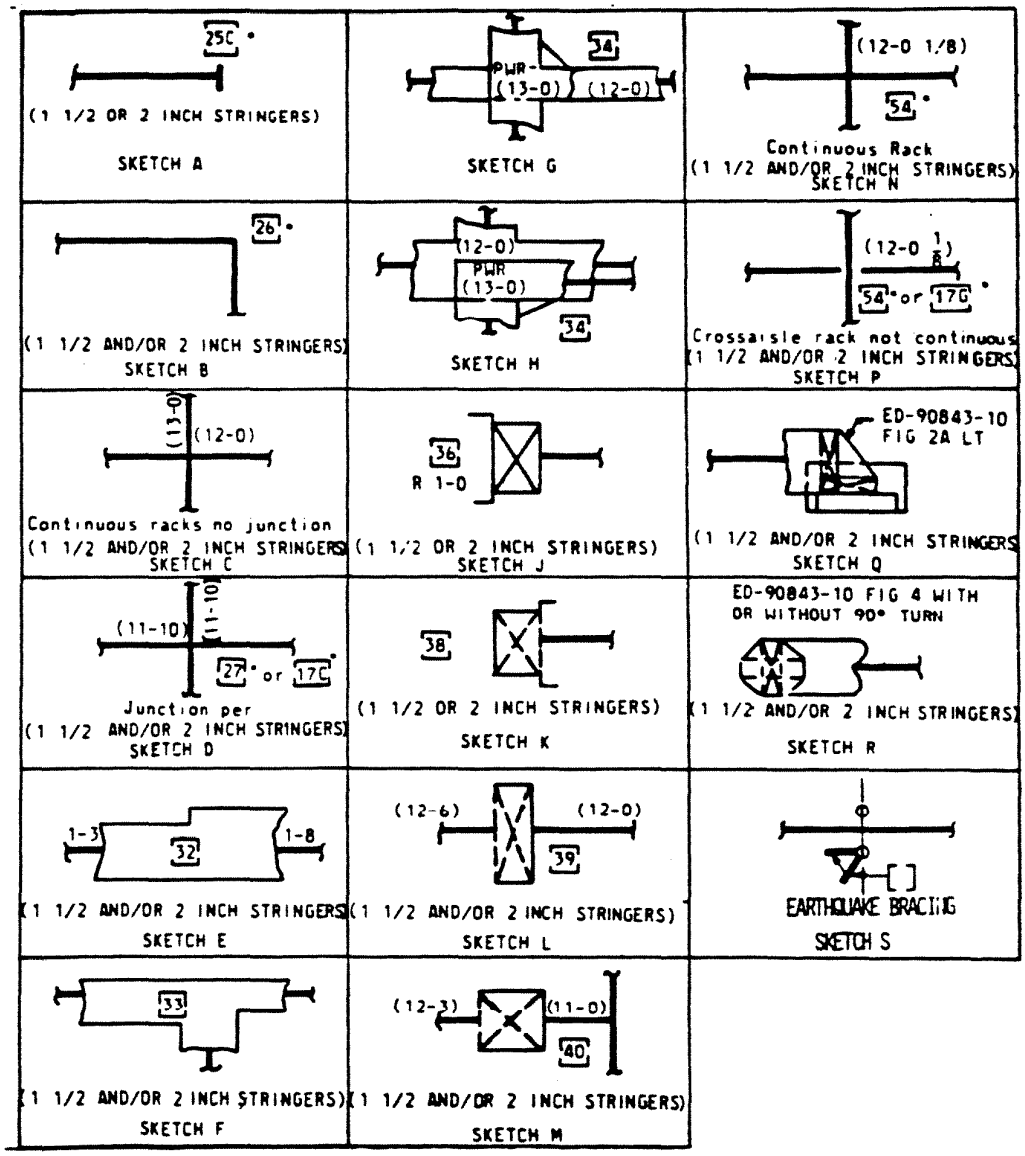
Note: Number in brackets correspond to the applicable supplier practice or installation number.

EXHIBIT 1
TYPICAL DOUBLE LINE CABLE RACK CONVENTIONS
(PAGE 1 OF 2)



Note: Number in brackets correspond to the applicable supplier practice or installation number.

EXHIBIT 1
TYPICAL DOUBLE LINE CABLE RACK CONVENTIONS
(PAGE 2 OF 2)



* DENOTES COMMON TYPE FABRICATIONS THAT NEED NOT BE SHOWN ON THE BODY OF THE DRAWING. THIS INFORMATION SHALL BE SHOWN ON THE DRAWING AS A MANUFACTURING NOTE.

Note: Numbers in brackets correspond to the stocklist of material drawing.

EXHIBIT 2
TYPICAL SINGLE LINE CABLING AND
AUXILIARY FRAMING CONVENTIONS

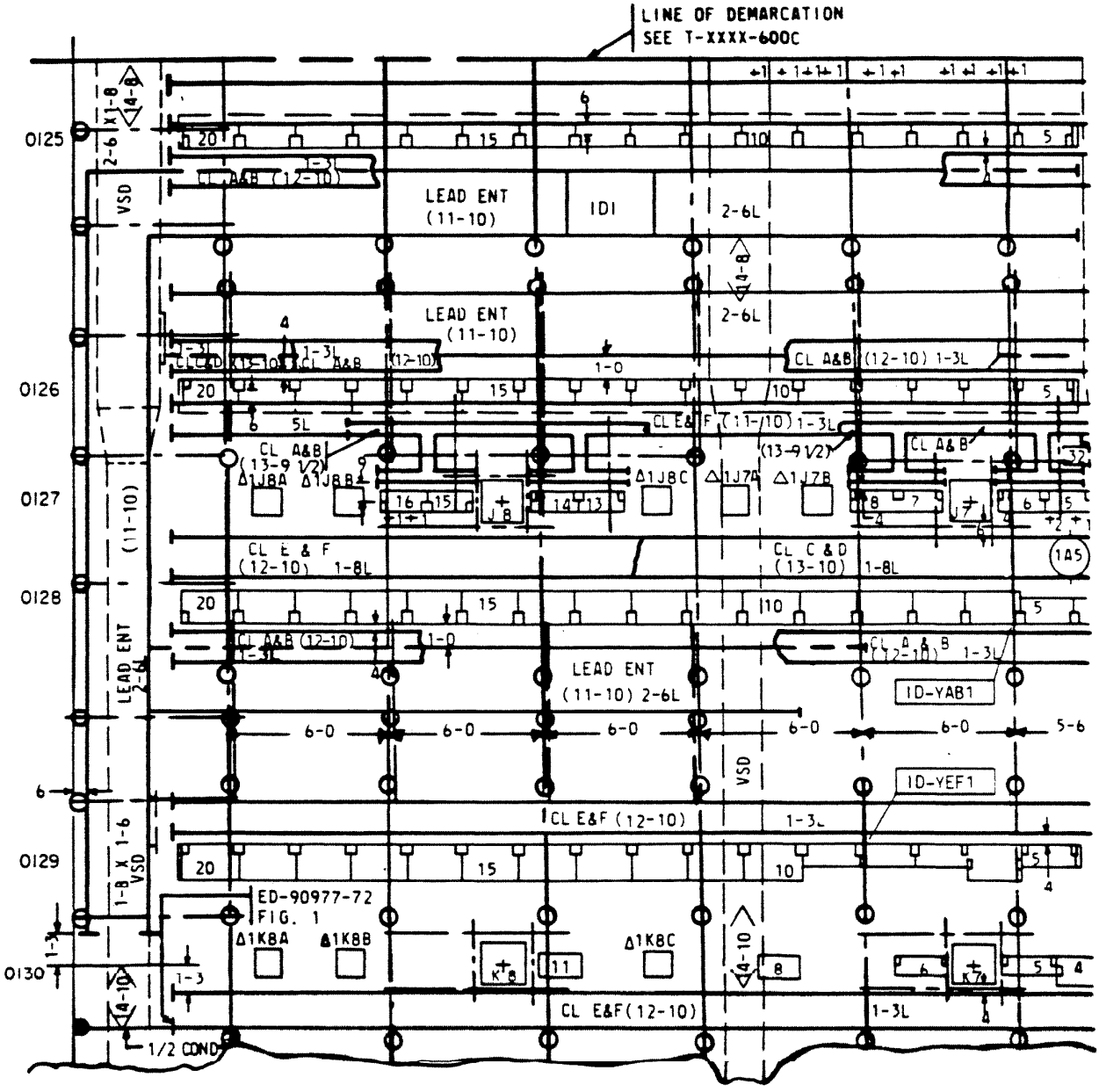


EXHIBIT 3
TYPICAL CABLE RACK PLAN LAYOUT
(PAGE 1 OF 4)

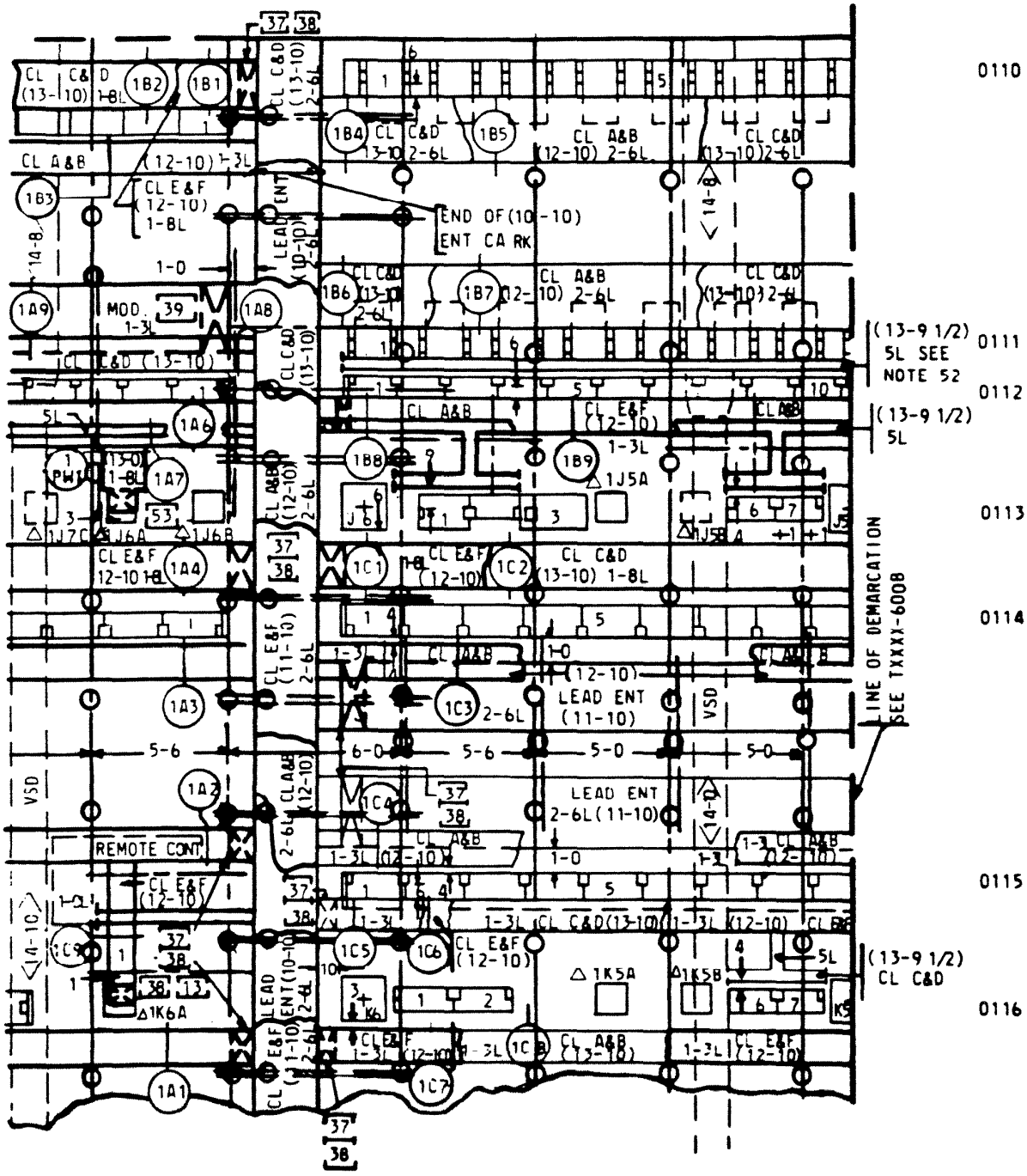


EXHIBIT 3
TYPICAL CABLE RACK PLAN LAYOUT
(PAGE 2 OF 4)

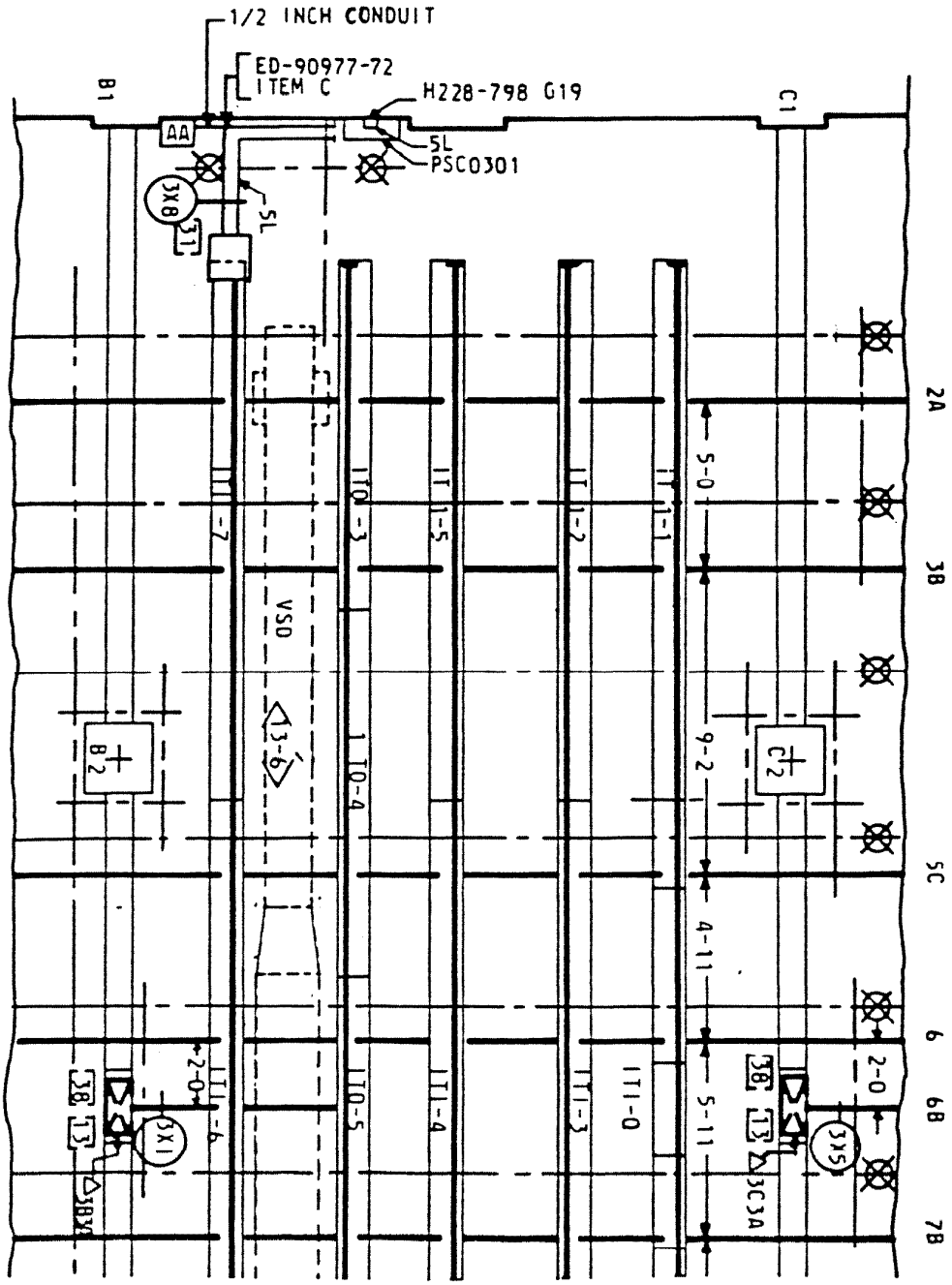


EXHIBIT 3
TYPICAL CABLE RACK PLAN LAYOUT
(PAGE 3 OF 4)

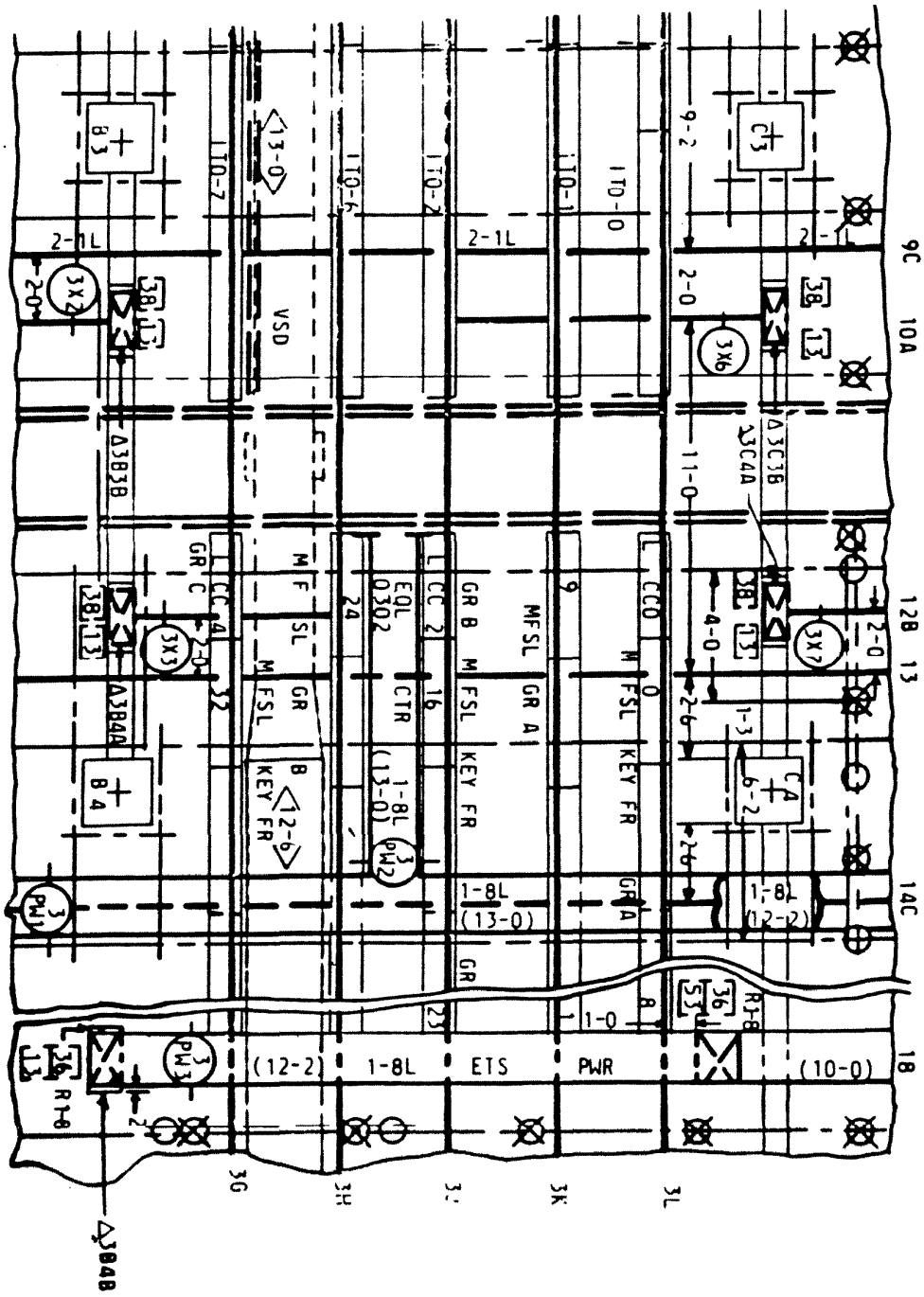


EXHIBIT 3
TYPICAL CABLE RACK PLAN LAYOUT
(PAGE 4 OF 4)

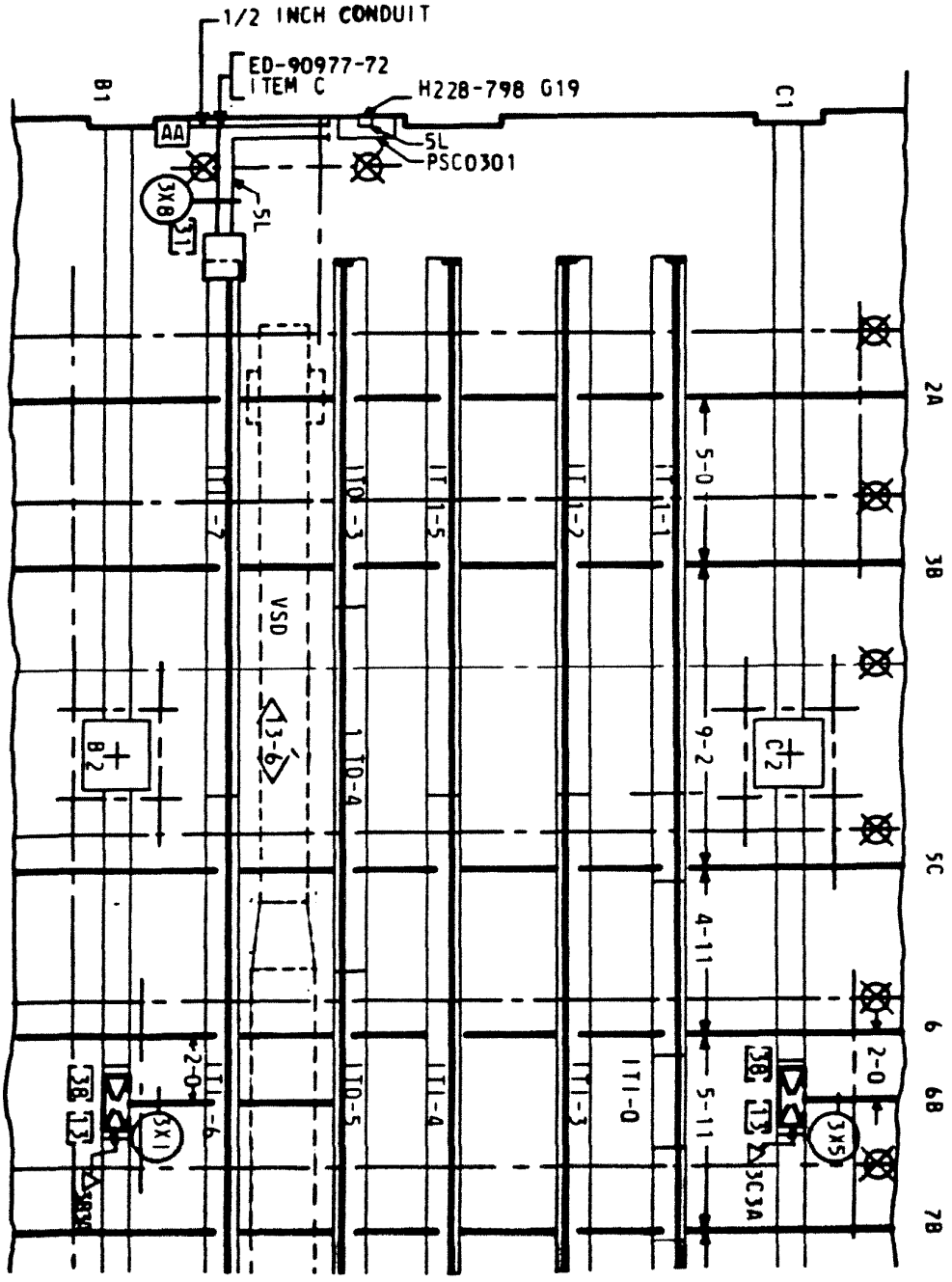


EXHIBIT 4
APPLICATION OF SPIRALS AND COMPOUND
TURNS IN CABLE RUNS
(PAGE 1 OF 2)

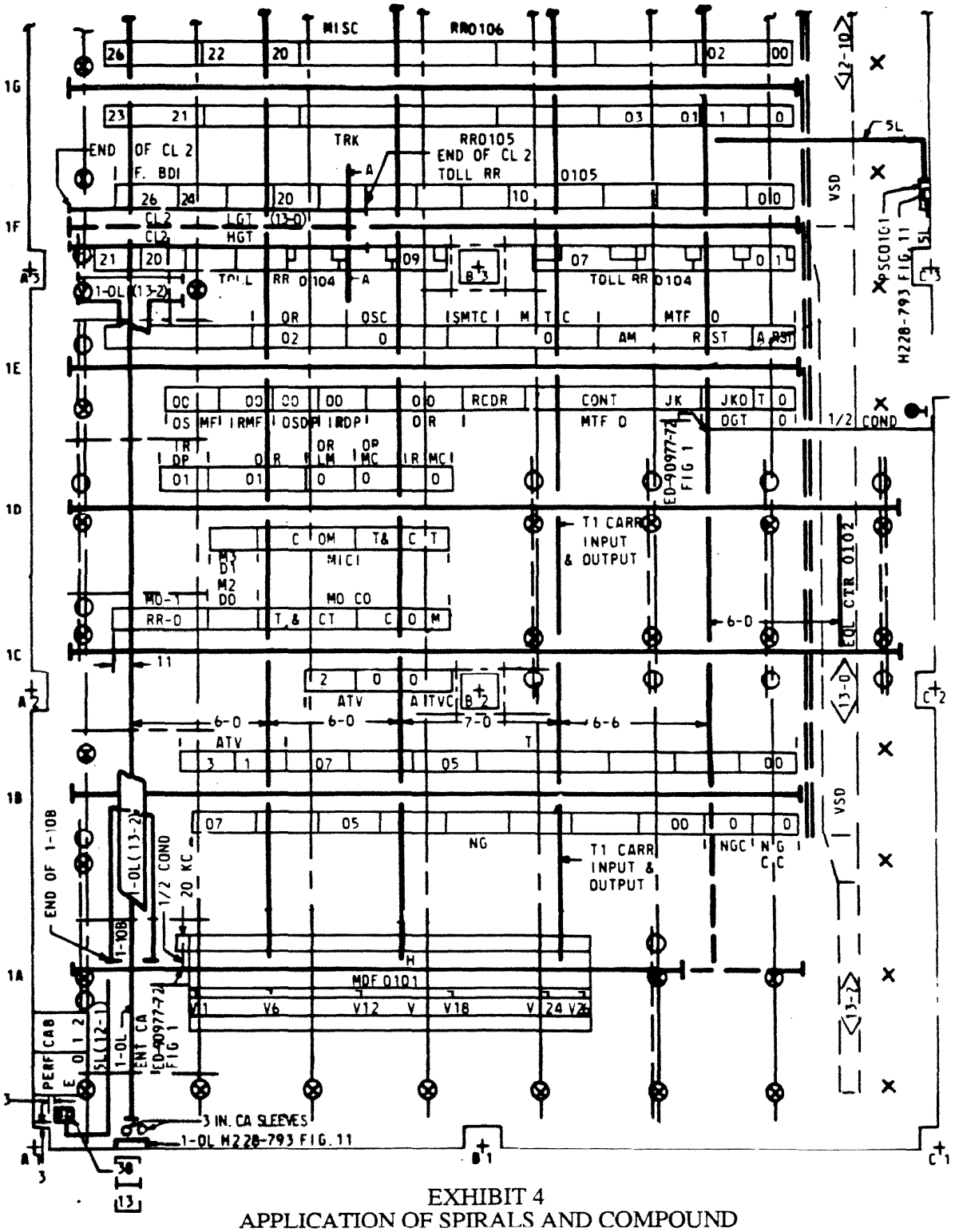
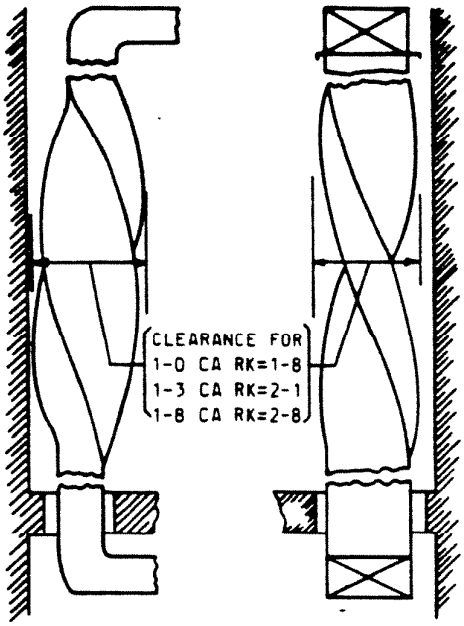
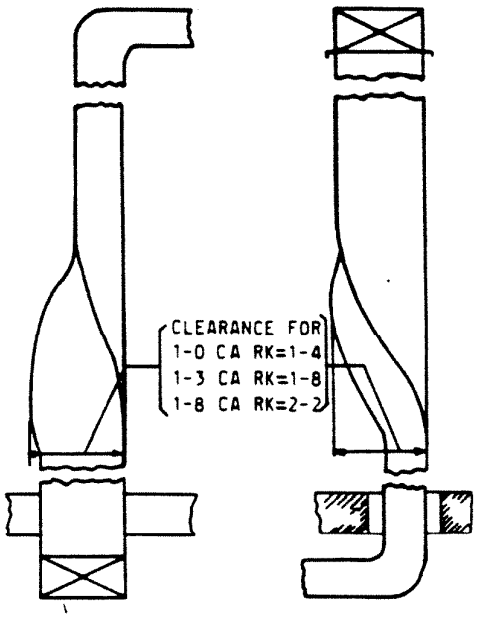


EXHIBIT 4
APPLICATION OF SPIRALS AND COMPOUND
TURNS IN CABLE RUNS
(PAGE 2 OF 2)



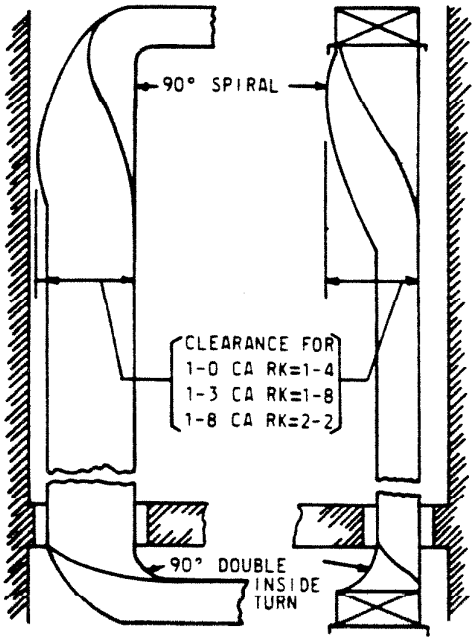
VERTICAL CABLE RUN THRU
CABLE HOLE USING 180° SPIRAL.

SKETCH A



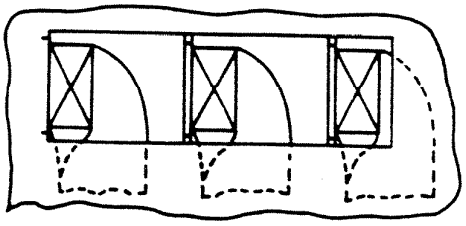
VERTICAL CABLE RUN THRU
CABLE SLOT USING 90° SPIRAL.

SKETCH B

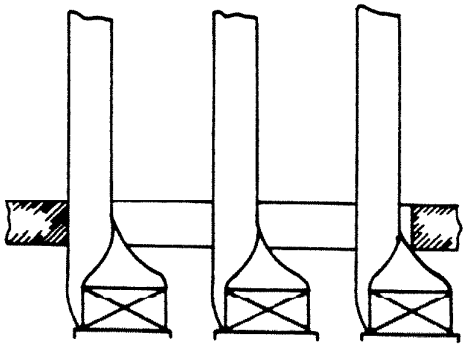


VERTICAL CABLE RUN THRU
CABLE HOLE ADJACENT TO WALL
USING 90° SPIRAL & DOUBLE
INSIDE TURN.

SKETCH C



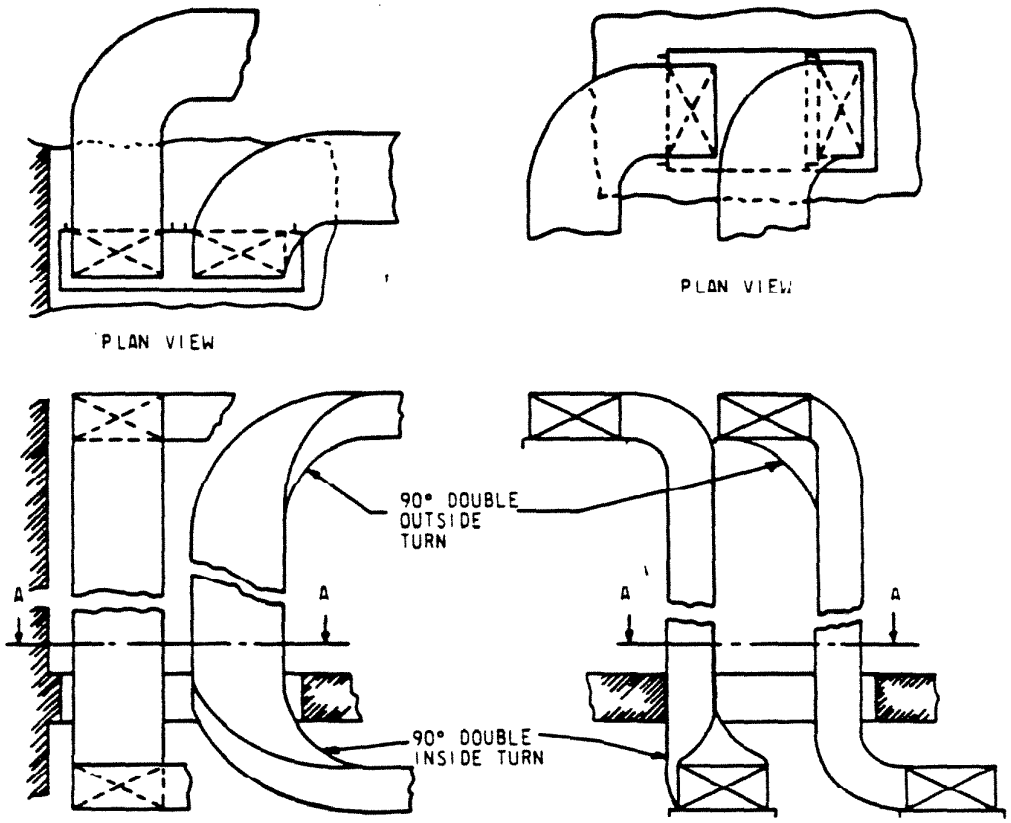
PLAN VIEW

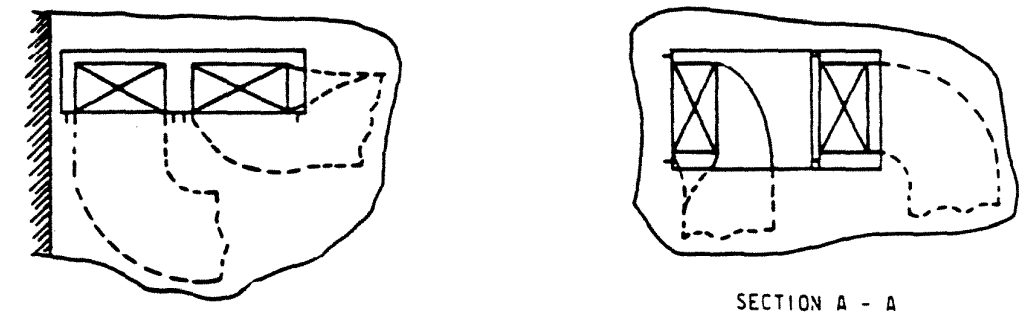


ELEVATION
SEVERAL CABLE RUNS TURNING UP
THRU CABLE HOLE USING 90° DOUBLE INSIDE TURN

SKETCH D

EXHIBIT 5
CAPACITY OF LADDER TYPE CABLE RACKS IN TERMS
OF CABLES PER LAYER
(PAGE 1 OF 2)





VERTICAL CABLE RUNS THRU NARROW CABLE HOLE OR SLOT USING 90° DOUBLE INSIDE AND OUTSIDE TURNS.

SKETCH E

VERTICAL CABLE RUNS THRU CABLE HOLE USING 90° DOUBLE INSIDE AND OUTSIDE TURNS.

SKETCH F

EXHIBIT 5
CAPACITY OF LADDER TYPE CABLE RACKS IN TERMS OF CABLES PER LAYER
(PAGE 2 OF 2)

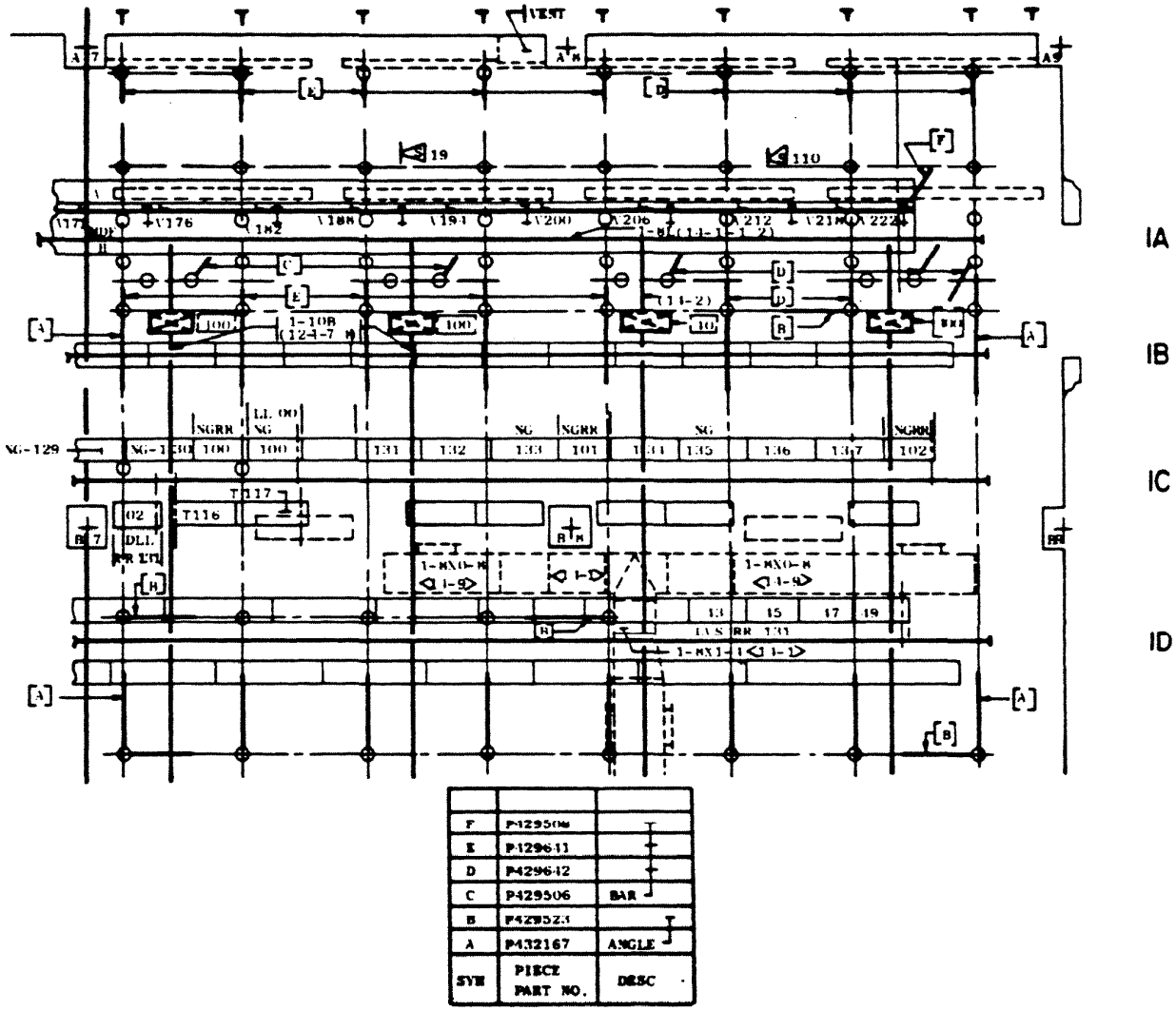
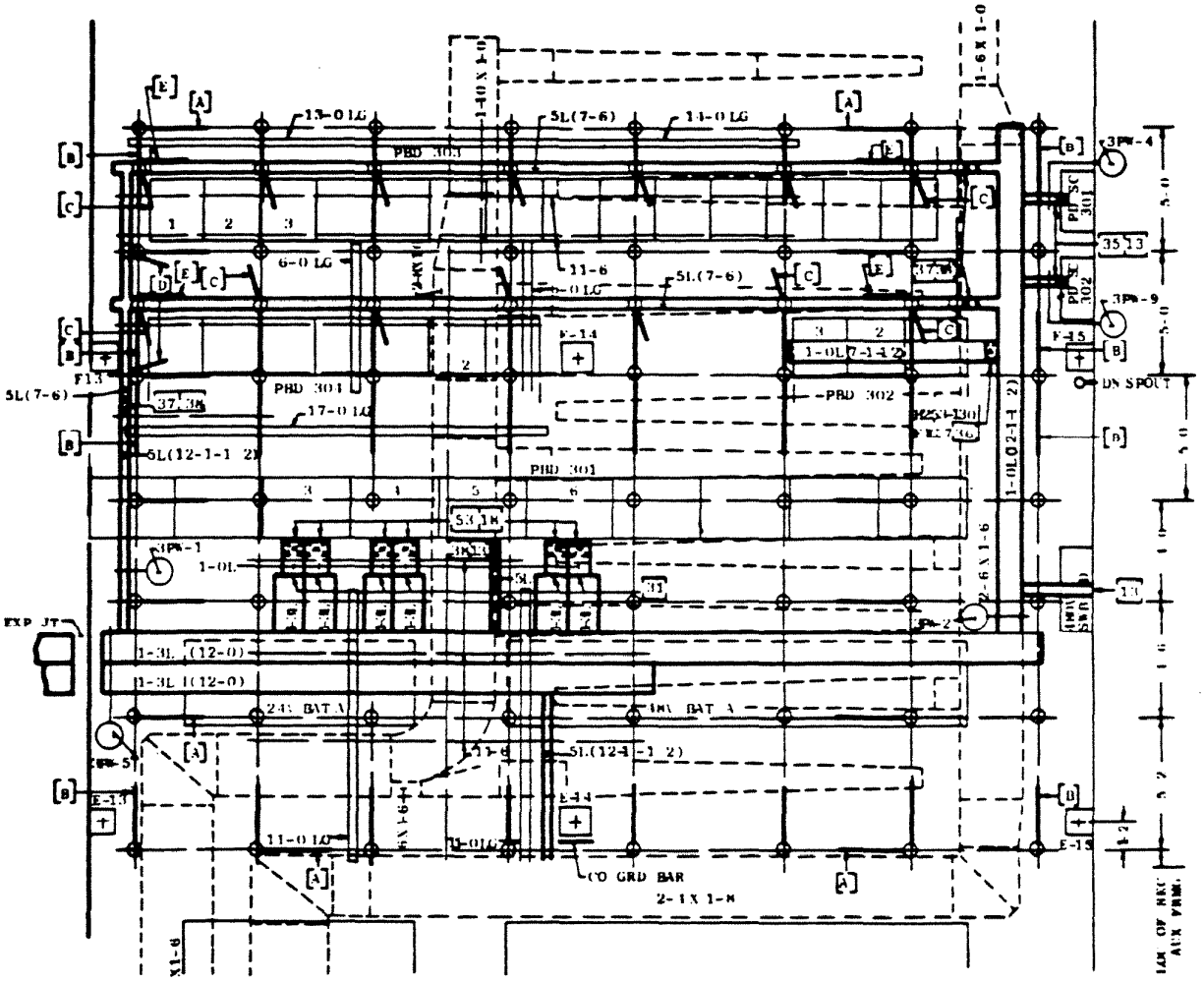


EXHIBIT 6
TYPICAL EARTHQUAKE BRACING DETAILS



E	P432167	
D	P432169	
C	P432168	
B	P429523	
A	P429522	ANGLE
SYM	PIECE PART NO.	DESC
EARTHQUAKE BRACE DETAILS		

EXHIBIT 7
EARTHQUAKE BRACE DETAILS

The coded symbols shown herein shall be used on floor plans and cable and cable racking plans, when they apply , for equipment being wired and/or cabled. The noncoded symbols shall be used as they apply, on the same drawings, but not for noncabled or nonwired items.

The following guide may be useful when entering coded symbols on the affected drawing.

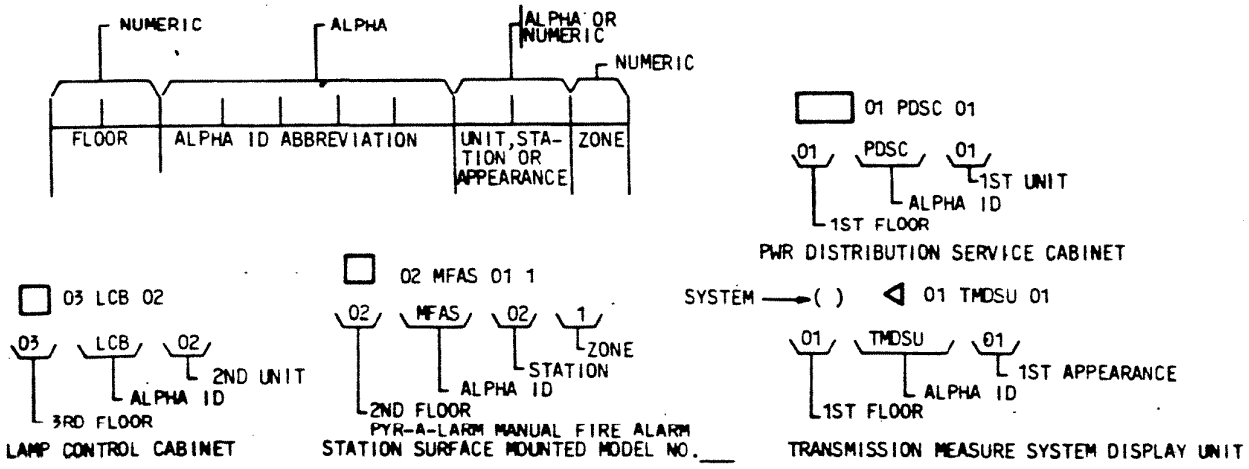


EXHIBIT 8
CODED AND NONCODED SYMBOLS FOR MISCELLANEOUS EQUIPMENT, APPARATUS AND HARDWARE
(PAGE 1 OF 9)

Central Office Drawing Coded Symbol Entry (Body of Drawing)	Central Office Drawing Coded Symbol Descriptive Note (Note Column of Drawing)	
○ ___STNBL___	1. ○ ___STNBL___	6" Vibrating Soft Tone Bell
□ ___STABX___	2. □ ___STABX___	Station Boxes
○ ___GNG___	3. ○ ___GNG___	6", 8" and 10" Single Stroke Gongs
□ ___FDRLC___	4. □ ___FDRLC___	Fire Detection Rel Casing
□ ___AARCF___	5. □ ___AARCF___	Audible Alarm Rel Casing (for Inc. Emer Alarm from Distant Off.)
□ ___AARCT___	6. □ ___AARCT___	Alarm Rel Casing (for Outgoing Emer Alarm to Distant Off.)
○ ___STGNG___	7. ○ ___STGNG___	6" Single Stoke Soft Tone Gong
□ ___SBSET___	8. □ ___SBSET___	Subscriber Sets
□ ___SKEY___	9. □ ___SKEY___	Silencing Key for Bell In Operating Room
◁ ___VSHN___	10. ◁ ___VSHN___	24 or 48V Vibrating Horn
□ ___ZARC___	11. □ ___ZARC___	Zone Alarm Rel Casing
□ ___CSSD___	12. □ ___CSSD___	Code Signal Sending Device (without Remote Control)
□ ___CSSDR___	13. □ ___CSSDR ___	Code Signal Sending Device (with Remote Control)

EXHIBIT 8
CODED AND NONCODED SYMBOLS FOR MISCELLANEOUS EQUIPMENT, APPARATUS AND HARDWARE
(PAGE 2 OF 9)

Central Office Drawing Coded Symbol Entry (Body of Drawing)	Central Office Drawing Coded Symbol Descriptive Note (Note Column of Drawing)	
☐ ___MFAS___	14. ☐ ___MFAS___	Pyr-A-Larm Manual Fire Alarm Station Surface Mounted Model No. _____
☐ ___MFASR___	15. ☐ ___MFASR___	Pyr-A-Larm Manual Fire Alarm Station Surface Mounted Model No. _____ with Terminal Resistance
☐ ___MFAF___	16. ☐ ___MFAF___	Pyr-A-Larm Manual Fire Alarm Station Semi-Flush Mounted Model No. _____
☐ ___MFAFR___	17. ☐ ___MFAFR___	Pyr-A-Larm Manual Fire Alarm Station Semi-Flush Mounted Model No. _____ with Terminal Resistance
☐ ___RALP___	18. ☐ ___RALP___	Pyr-A-Larm Remote Alarm Lamp Model No. _____
◪ ___PABL___	19. ☐ ___PABL___	Pyr-A-Larm Polarized Alarm Bell Model No. _____
◁ ___VEHN___	20. ◁ ___VEHN___	Pyr-A-Larm Vibrating Electric Horn Model No. _____
◁ ___VEHND___	21. ◁ ___VEHND___	Pyr-A-Larm Vibrating Electric Horn Double Projection Model No. _____

EXHIBIT 8
CODED AND NONCODED SYMBOLS FOR MISCELLANEOUS EQUIPMENT, APPARATUS AND HARDWARE
(PAGE 3 OF 9)

Central Office Drawing Coded Symbol Entry (Body of Drawing)	Central Office Drawing Coded Symbol Descriptive Note (Note Column of Drawing)	
○ ___IFD___	22. ○ ___IFD___	Pyr-A-Larm Ionization Fire Detector Model No. _____
○ ___IFDR___	23. ○ ___IFDR___	Pyr-A-Larm Ionization Fire Detector Model No. _____ with Terminal Resistance
○ ___TFD___	24. ○ ___TFD___	Pyr-A-Larm Thermal Fire Detector Model No. _____
○ ___TFDR___	25. ○ ___TFDR___	Pyr-A-Larm Thermal Fire Detector Model No. _____ with Terminal Resistance
○ ___FDR___	26. ○ ___FDR___	Pyr-A-Larm Flame Detector Model No. _____
○ ___FDRR___	27. ○ ___FDRR___	Pyr-A-Larm Flame Detector Fire Detector Model No. _____
○ ___TFDP___	28. ○ ___TFDP___	Pyr-A-Larm Thermal Plug-In Fire Detector Model No. _____
○ ___TFDPR___	29. ○ ___TFDPR___	Pyr-A-Larm Thermal Plug-In Fire Detector Model No. _____ with Terminal Resistance

EXHIBIT 8
CODED AND NONCODED SYMBOLS FOR MISCELLANEOUS EQUIPMENT, APPARATUS AND HARDWARE
(PAGE 4 OF 9)

Central Office Drawing Coded Symbol Entry (Body of Drawing)	Central Office Drawing Coded Symbol Descriptive Note (Note Column of Drawing)	
○ ___IFDC___	30. ○ ___IFDC___	Pyr-A-Larm Ionization Detector Recessed Ceiling Fixture Model No. _____
○ ___IFDCR___	31. ○ ___IFDCR___	Pyr-A-Larm Ionization Detector Recessed Ceiling Fixture Model No. _____ with Terminal Resistance
○ ___FDRR___	32. ○ ___FDRR___	Pyr-A-Larm Flame Detector Recessed Ceiling Fixture Model No. _____
○ ___FDRRR___	33. ○ ___FDRRR___	Pyr-A-Larm Flame Detector Recessed Ceiling Fixture Model No. _____ with Terminal Resistance
○ ___ADDR___	34. ○ ___ADDR___	Pyr-A-Larm Air Duct Detector Model No. _____
○ ___ADDRR___	35. ○ ___ADDRR___	Pyr-A-Larm Air Duct Detector Model No. _____ with Terminal Resistance
□ ___CLBL___	36. □ ___CLBL___	Call Bell
CS	37. CS	Cord Support (Step-By-Step Only) [Non-coded Symbol for Noncabled Eqpt]
9A	38. 9A	9A Cord Hook [Non-coded Symbol for Noncabled Eqpt]

EXHIBIT 8
CODED AND NONCODED SYMBOLS FOR MISCELLANEOUS EQUIPMENT, APPARATUS AND HARDWARE
(PAGE 5 OF 9)

Central Office Drawing Coded Symbol Entry (Body of Drawing)		Central Office Drawing Coded Symbol Descriptive Note (Note Column of Drawing)		
□	___DRMOT___	39. □	___DRMOT___	Drive Motors (Panel Only)
○	___EMLS___	40. ○	___EMLS___	Emergency Lighting Source of Supply
○	___EMLF___	41. ○	___EMLF___	Emergency Lighting Fixture
○	___DCRCL___	42. ○	___DCRCL___	DC Receptacle E/W Stamped Cover Place
□	___ODSTA___	43. □	___ODSTA___	Outside Door Station
□	___DTSTR___	44. □	___DTSTR___	Dial Tester
○	___CSOLT___	45. ○	___CSOLT___	120V AC Ceiling Source Outlet
○	___CSOLT___	46. ○	___CSOLT___	277V AC Ceiling Source Outlet
○	___EXPLP___	47. ○	___EXPLP___	Exit Pilot Lamps
○	___MCPLP___	48. ○	___MCPLP___	Main Cross Aisle Pilot Lamps
○	___OFPLP___	49. ○	___OFPLP___	Other Floor Pilot Lamps
○	___ACKLP___	50. ○	___ACKLP___	Alarm Control Key and Lamp
○	___ECKLP___	51. ○	___ECKLP___	Extension Cut-Off Key and Lamp
▲		52. ▲		Aisle Number (Except Panel) [Noncoded Symbol for Noncabled Eqpt]
□	___ALAMM___	53. □	___ALAMM___	Audible Signal Alarm Mtg

EXHIBIT 8
CODED AND NONCODED SYMBOLS FOR MISCELLANEOUS EQUIPMENT, APPARATUS AND HARDWARE
(PAGE 6 OF 9)

Central Office Drawing Coded Symbol Entry (Body of Drawing)	Central Office Drawing Coded Symbol Descriptive Note (Note Column of Drawing)	
☐ ___LCB___	54. ☐ ___LCB___	Lamp Control Cabinet
◁ ___LSPK___	55. ◁ ___LSPK___	Loud Speaker
☐ ___TMPAF___	56. ☐ ___TMPAF___	Transmission Measuring Projector Mounted on Auxiliary Framing. (Show Symbol in Approximate Location in which Projector is to be Mounted and Point Toward Screen to be Shown)
☐ ___ORAAK___	57. ☐ ___ORAAK___	Operating Room Audible Alarm Signal and Cut-Off Key
☐ ___EASK___	58. ☐ ___EASK___	Eqpt Alarm Switching Key
☐ ___SASK___	59. ☐ ___SASK___	Service Alarm Switching Key
○ ___TNBL___	60. ○ ___TNBL___	Tone Bell
☐ ___LCAT___	61. ☐ ___LCAT___	Lamp Cabinet Alarm Transfer
☐ ___FACAB___	62. ☐ ___FACAB___	Floor Alarm Cabinet
☐ ___AGRKY___	63. ☐ ___AGRKY___	Alarm Grouping Key
☐ ___LDPNL___	64. ☐ ___LDPNL___	Lamp Display Panel
( ) ◁ ___TMSDU___	65.( ) ◁ ___TMSDU___ FL SYSTEM APPEARANCE	Transmission Measuring System Display Unit (Small End is Direction Display Unit is Facing).

EXHIBIT 8
CODED AND NONCODED SYMBOLS FOR MISCELLANEOUS EQUIPMENT, APPARATUS AND HARDWARE
(PAGE 7 OF 9)

Central Office Drawing Coded Symbol Entry (Body of Drawing)	Central Office Drawing Coded Symbol Descriptive Note (Note Column of Drawing)		
○ ___RAPLP___	66. ○	___RAPLP___	Room or Area Pilot
□ ___RATSP___	67. □	___RATSP___	Room or Area Term. Strip
□ ___ASALM___	68. □	___ASALM___ GROUP	Audible Signal Alarm (NJ01046)
□ ___FDKY___	69. □	___FDKY___	Fire Drill Key
○ ___FIRBL___	70. ○	___FIRBL___	Fire Bell
□ ___ITCBC___	71. □	___ITCBC___	Basic Intercom Sta
□ ___ITCMA___	72. □	___ITCMA___	I.C. Master Sta A
□ ___ITCMB___	73. □	___ITCMB___	I.C. Master Sta B
□ ___ITCOD___	74. □	___ITCOD___	I.C. Outside Door Sta
◁ ___ITCPS___	75. ◁	___ITCPS___	I.C. Paging Sta
□ ___ITCST___	76. □	___ITCST___	I.C. Master Sta Slave Transfer
◁ ___LSPK___	77. ◁	___LSPK___	I.C. Loudspeaker
FEMB ___FEMB___	78. FEMB	___FEMB___	Fire Extinguisher and 30A Bracket [Noncabled Symbol For Noncabled Eqpt]
GLV ___GLV___	79. GLV	___GLV___	Gloves [Noncoded Symbol for Noncabled Eqpt]
○ ___ACO___	80. ○	___ACO___	SPCS AC Outlet (2A)
□ ___FPL___	81. □	___FPL___	Filter Panel Per (ED or J) _____

EXHIBIT 8
CODED AND NONCODED SYMBOLS FOR MISCELLANEOUS EQUIPMENT, APPARATUS AND HARDWARE
(PAGE 8 OF 9)

Central Office Drawing Coded Symbol Entry (Body of Drawing)	Central Office Drawing Coded Symbol Descriptive Note (Note Column of Drawing)	
___MXPL___	82. ___MXPL___	Main Exit Pilot Lamp
___ATSTP___	83. ___ATSTP___	Aisle Term Strip
___ALPLP___	84. ___ALPLP___	Aisle Pilot Lamp
	85.	Stanchion Per Ed ___ [Noncoded Symbol for Noncabled Eqpt]
	86.	Yoke Per Ed _____ [Noncoded Symbol for Noncabled Eqpt]
___PBCA___	87. ___PBCA___	PBX ALM Cabinet

EXHIBIT 8
CODED AND NONCODED SYMBOLS FOR MISCELLANEOUS EQUIPMENT, APPARATUS AND HARDWARE
(PAGE 9 OF 9)

FLOOR GROUND SCHEMATIC DRAWING

CONTENTS

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1.00 GENERAL

1.01 This part covers the standards to be followed in preparing Ground Schematic Drawings involving building and framework grounding for all systems except for electro-mechanical systems.

1.02 These drawings shall include all information necessary to engineer and install building and framework grounding in a Central Office.

2.00 SCALE

2.01 Generally scale shall be 1/4 inch to 1 foot for all pertinent building information such as building outlines, walls, partitions, etc. It shall also be applied to relay racks, frames and equipment. Where possible, show grounding material to 1/4 inch to 1 foot scale.

2.02 When adding linework to this drawing, it is necessary to provide sufficient space for 1/8 inch lettering that may be required. It is also necessary to retain a minimum space of 1/16 inch, between two parallel lines where no lettering is required and between each dash of a dash line.

2.03 When scale is not possible, show grounding information in proper proportion to all other information on the drawing and also adhere to the requirements specified in Paragraph 2.02. Do not show scale in the title box of this drawing.

3.00 PEN SIZE

3.01 The following information indicates pen sizes that produce proper lineweights for the specific applications of this drawing.

Pen Size	Application
0	Tables and Charts, Present and Future Equipment, Building Outline, Columns, Partitions, Skylight
2	Sketches
3	Ground Bars, Ground Leads and Connectors (Solid Line), Frame Junction Pipe (Dash Line of Equal Lengths), Line of Demarcation

4.00 ISSUE NOTES

4.01 Only a basic Issue Note is required for this drawing. For the elements on a basic Issue Note, see Section III, Part F of this publication.

5.00 CRITERIA

5.01 Prior to the preparation of the Floor Ground Schematic Drawings for a particular office, all necessary data shall be obtained. The data should be checked to verify that it is noncontradictory and that it is the latest available information. Typical data is as follows:

A. Architect Plans

B. Floor Plan

C. Special Condition Views and Sketches

5.02 Essentially, the floor ground schematic drawing consists of the vertical ground riser and the horizontal ground network.

5.03 It is a requirement to show the vertical ground riser sketch from the water pipe connection between the water meter and ground electrode (normally obtained from the architect plans) to the Central Office ground bar connections on each floor. This sketch shall appear on one of the floor ground schematic drawings on a separate drawing with a reference on the other floor ground schematic drawings.

5.04 The vertical ground riser may consist of 750,000 cm cable as shown by Exhibit 1. The construction and ground terminations shall be shown on the associated floor ground schematic drawing showing the column that Central Office ground bar is mounted on.

5.05 Horizontal ground network provides the grounding from the Central Office ground bar to the system framework ground.

6.00 FLOOR GROUND SCHEMATIC

6.01 This schematic will contain a sketch(s) or a complete floor layout in accordance with the requirements by the Standard Application drawings and by the following items:

A. Vertical ground riser will always be shown on one of the floor ground schematic drawings on a separate drawing in accordance with Paragraph 5.03.

B. Show a sketch of the Horizontal Ground Network for new and existing systems in building, (see Exhibit 1 and 2).

C. Where Relay Racks serve other than Dial Equipment but are located in the same lineup with Dial Equipment, a separate sketch of the ground network of these frames may be prepared or this network can be combined with the sketch described in Item B, (see Exhibit 3).

D. Exhibit 3 illustrates an office utilizing 48 Volt Equalization Centers. In offices where this method of distribution is not used, make a similar sketch. However, show the Ground Leads for each lineup connected to a Main Aisle Calculated Ground Lead. Also, identify the Main Aisle Leads as to its size and point of origin (Power Plant or BDFB).

E. More than one Horizontal Ground Network Sketch may be placed on the Floor Ground Schematic Drawing provided each sketch is of a different floor and does not exceed the parameters established by the following items:

1. Prepare a sketch of the horizontal ground network for one or more relay rack frames serving other than Dial Equipment for each floor of the central office. Sketch shall appear on cable rack plan drawing (see Paragraph 6.03). However, each sketch shall not exceed an area equivalent to the space occupied by five lineups of frames, two building bays in length. If exceeded, a floor ground schematic drawing shall be established.

6.02 When a separate Floor Ground Schematic Drawing (described in Paragraph 7.00) is originated for every floor in a building, then a separate cross sectional sketch of the Vertical Riser through all floors of the building is required, in accordance with Paragraph 5.03.

6.03 Cable and Cable Rack Plan

A. When an Office or Floor Ground Schematic Drawing does not exist and the criteria related in the preceding paragraphs does not apply, the Grounding Sketch shall be placed on the Cabling and Cable Rack Plan Drawing of the particular floor involved as indicated in preceding paragraphs.

B. The title in the title box of the Cabling and Cable Rack Plan Drawing shall be changed to include grounding.

7.00 FLOOR GROUND SCHEMATIC DRAWING

7.01 As previously stated, the Floor Ground Schematic Drawing is originated to show the ground network of Relay Rack Frames serving other than Dial Equipment when the area to be shown exceeds the equivalency of five lineups, two building bays in length. This criteria shall apply to future areas when it is definitely known that this area will ultimately be occupied with Relay Rack Frames serving other than Dial Equipment.

7.02 Floor Grounding Schematic Drawing will always be established for all initial SPCS, minicomputers, Traffic Service Position System (TSPS), and AIS offices for a new or existing building. Sketches provided on a cable rack plan will not be initiated for any of the above offices. See Exhibits 9 and 10 for grounding drawing applications. Exhibit 9 refers to all SPCS, TSPS and AIS offices while Exhibit 10 refers to minicomputer office.

7.03 For Arrangement of Layout of the Drawing see Section V, Part A, Paragraph 6.01.

A. Areas where equipment can never be located shall be excluded from the drawing.

7.04 Floor Ground Schematic Division - When more than one Floor Ground Schematic Drawing is required for one floor, conform to the divisions established for the Floor Plan Drawing. Use lines of demarcation to illustrate the divisions as follows:

A. When placing lines of demarcation, locate the division through column centers, at column lines or in aisles.

B. Where possible, the location of the lines of demarcation shall agree on all floors of a multistoried building.

7.05 Construction of Lines of Demarcation - Construct a line of demarcation as shown by Figure 1.

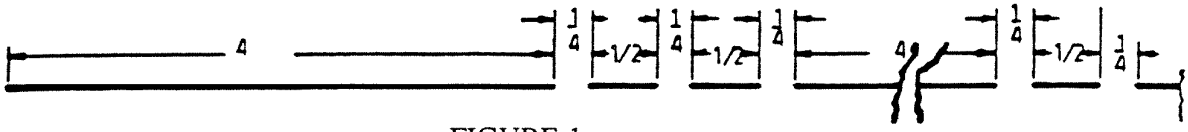


FIGURE 1
TYPICAL LINE OF DEMARCATION

7.06 Key Plan - A Key Plan, illustrating a drawing composite of a particular floor, shall be placed on all Floor Ground Schematic Drawings of the floor involved (see Section V, Part A, Paragraph 9.01).

8.00 SPECIFIC DRAWING STANDARDS

8.01 New or revised drawing standards related herein, shall be applied to all new equipment floors, redrawn drawings, building additions and new buildings. However, certain standards in use prior to this time may be retained when it is logical and economical to extend and complete existing lines and/or areas.

9.00 BUILDING INFORMATION - ILLUSTRATING

9.01 Walls - Show the interior wall only of the entire building in accordance with information previously furnished under paragraph title "Arrangement of Layout on the Drawing".

9.02 Pilasters, Columns, Present Partitions - Show on the body of the drawing with a light solid line pilasters, columns (include the letter and number designation) and present partitions.

9.03 Drop Panels and Skylights - Do not show drop panels. Show Skylights on the body of the drawing with light equal length dash lines. It is recommended that the dash lines be approximately 1/8 inch long with a 1/16 inch space between each dash. When showing a Skylight, clearly identify it by name (Skylight).

9.04 Ventilating ducts, building conduits, service, conduits used by Equipment Supplier cables and wire, ceiling inserts, unistructs, beam clamps, expansion shields, miscellaneous building details shall not be shown on this drawing.

9.05 Cable holes, cable slots, cable sleeves, floor ducts, floor troughs are also not to be shown on this drawing.

10.00 CONVENTIONS, NUMBERING, DESIGNATING AND ILLUSTRATING EQUIPMENT

10.01 Conventions depicting frames and relay racks are basically the same as those used on the Floor Plan Drawing. Essentially, they are shown in block form. The following items provide more details covering the similarities and differences between conventions used on this drawing and those used on the Floor Plan Drawing. Also see Exhibits 2, 3, 4, 9 and 10.

A. Show present and future equipment with light solid lines.

B. Do not show any dimensions on this drawing for equipment.

C. Cable duct frameworks shall not be detailed to show the cable ducts and writing shelves.

D. Future frames are to be shown in Blank Block Form omitting frame uprights for the entire lineup. However, if the Floor Plan has shown specific frame sizes, designations and numbering, then lines must be added to depict the frame uprights.

E. In order to show Ground Bars and Frame Junction Pipes in their approximate location over frame lineups and still provide space for 1/8 inch numbering within the frame convention, it will be necessary to scale 10, 11 and 12 inch wide guard rail frames as 12, 13, and 14 inches wide respectively. Add the two inches at the rear of the lineups.

F. Block out dial type frames with a light solid line. Do not show frame uprights.

10.02 Designations are generally not required because frame numbering is usually sufficient identification. The following items provide some additional information regarding equipment designations. Also see Exhibits 2, 3, 4, 9 and 10.

A. Use standard abbreviations if absolutely necessary to designate equipment not identified by lineup and frame numbers.

B. When illustrating other than Dial Equipment in a Dial Office, do not designate dial type frames.

C. Designate the various type distributing and protector frames in accordance with the floor plan designation.

10.03 The numbering and lineups and frames applied to this drawing is the same as that used on the Floor Plan Drawing and as specified by the following items. Also see Exhibits 2, 3, 4, 9 and 10.

A. Number the lineups. Number the first and last frame in each lineup. Where lineups are six frames or longer in length, it is recommended to show the numbers of frames numbered 5, 10, 15, 20, etc. When it is definitely known the type of frames that ultimately will be provided, apply the preceding number procedure to future frames. If the type is not known, block out the ultimate lineup length without any numbering shown, (see Exhibits 3, 4 and 9).

B. Where frame lineups are numbered in accordance with even numbered bays, on one side of an aisle and odd numbered bays on the other side of an aisle, in addition to numbering the first and last frame, it is recommended to add the number of every 5th frame in the lineup (see Exhibit 3).

11.00 GROUND INFORMATION

11.01 Show ground bars, ground leads, ground connections and terminations with a solid heavy line (see Exhibits 1, 2, 3, 4, 9 and 10).

11.02 All ground leads parallel to frame lineups shall be shown at the rear of a lineup. When applicable, add an explanatory note similar to the following:

A. Ground Leads shown parallel to and at the rear of frame lineups are so located for drawing clarity purposes. They shall be located and supported in the office in accordance with standard arrangements.

11.03 Ground leads perpendicular to lineups shall be located as close as possible to the actual location of the cross-aisle cable rack they are being supported from (see Exhibits 3, 4, 9 and 10).

11.04 1 inch Frame Junction Pipes shall be designated with a dashed heavy line, (see Exhibits 3 and 4).

11.05 Ground bars and 1 inch Frame Junction Pipes shall be shown over Frame Lineups in their approximate actual location. However, sufficient space must be allowed for 1/8 inch lettering (see Exhibits 3, 4 and Paragraph 12.00).

11.06 Ground Terminations, Ground Connections, Ground Lead Sizes shall be assigned letters starting with A and up, excluding I and O, for each type of size cross referenced and defined by a tabular method. See Exhibits 5, 9, 10, and Paragraph 12.00, for examples of tabular construction.

11.07 Letter symbols shall be located at the front of lineups and adjacent to the convention they refer to in accordance with the illustrations on the Exhibits.

11.08 Main Aisle locations shall be numbered and identified with the prefix "MA" on the body of the drawing at the end of the aisle they number and at the nongrowth end of the building. Apply numbers by beginning with the nongrowth end and number 1 and up (see Exhibits 2, 4, and Paragraph 12.00).

11.09 All practices and conventions previously related herein shall be covered on the respective drawings with notes as illustrated by Exhibits 9, 10, and Paragraph 12.00.

A. The following are the recommended drafting procedures for dimensioning on grounding drawings using the soft metric conversion for International and Government Sales:

1. For orders involving metric conversions, those depicting dimension such as Note 2 in Paragraph 12.00, shall read "24 mm by 6 mm (1" by 1/4" ground bars)." Notes 4 and 5 in Paragraph 12.00 shall also be changed accordingly.

2. All metric dimensions, will be rounded off to the nearest even whole millimeter. For example, 29.1 to 29.9 mm will be rounded off to 30 mm while 28.1 to 28.9 mm will be rounded off to 28 mm.

11.10 Any items without a convention shall be identified on the body of the drawing or cross reference to a note defining the particular item as shown on the Exhibits.

11.11 Stored program control framework grounds utilizing a standard manufacturer's drawing for grounding shall not be shown in detail; however, a note on the Floor Grounding Schematic Drawing shall be added to refer to this standard drawing, (see Exhibit 9).

11.12 Framework grounding for power board equipment need only show the ground lead from the Central Office ground bar to the first framework in a power board lineup or refer to the Job Drawing that depicts the multiple power board framework ground runs.

11.13 A sectionalized view of the Central Office ground bar is required in accordance with Exhibit 9.

11.14 An exploded view of the SPCS ground window bar is required and all ground leads with termination shall be shown per Paragraph 10.01, Item F (see Exhibit 9).

11.15 The ground multiple between the PD frames for a SPCS system will be shown in accordance with Exhibit 9.

11.16 Framework grounding for minicomputers shall be shown in accordance with Exhibit 10 since a standard grounding drawing doesn't exist for this equipment.

A. If the grounding connections for the minicomputer framework are similar, a sketch shall be shown on the drawing showing this typical grounding arrangement while any different type of grounding framework connection shall be shown in detail on the text of the drawing. The drawing shall also show the framework outline of all minicomputer equipment and the main aisle grounding leads. A note shall be referenced to this sketch and shall state as follows:

UNLESS OTHERWISE SHOWN, ALL MINICOMPUTER FRAMEWORK GROUNDS ARE DETAILED AS SHOWN ON THIS SKETCH.

12.00 NOTES AND SYMBOLS

12.01 Table No. 1 and Notes providing explanatory information covering conventions and symbols applied on Exhibits 1, 2, and 3.

SYM	TERMINATION OR SIZE OF LEAD	FIGURE	GROUP
Q	Manufacturer's Number		
P	Manufacturer's Number		
N	Manufacturer's Number	G-9	9
M	Manufacturer's Number	1	3
L	Manufacturer's Number		
K	Manufacturer's Number		
J	Manufacturer's Number		
H	Manufacturer's Number		
G	Manufacturer's Number	1,1A	16
F	Manufacturer's Number	1 & A	1
E	NO. 6		
D	NO. 0		
C	NO. 00		
B	350,000 CM		
A	750,000 CM		

TABLE NUMBER 1

1. LETTERS REFER TO SIZE OF GROUND LEAD, PARALLEL CONNECTORS OR TERMINATIONS AS DEFINED BY TABLE NO. 1.

2. SOLID HEAVY LINES NOT IDENTIFIED BY A LETTER ARE 1 INCH BY 1/4 INCH GROUND BARS UNLESS OTHERWISE INDICATED.

3. LOCATION OF TERMINATION AS SPECIFIED.

4. 1 INCH FRAME JUNCTION PIPE.

5. 2 INCH BY 1/4 INCH GROUND BAR AND NAME PLATE STAMPED AS SHOWN. SEE LETTER SYMBOL G SHOWN IN TABLE NO. 1.

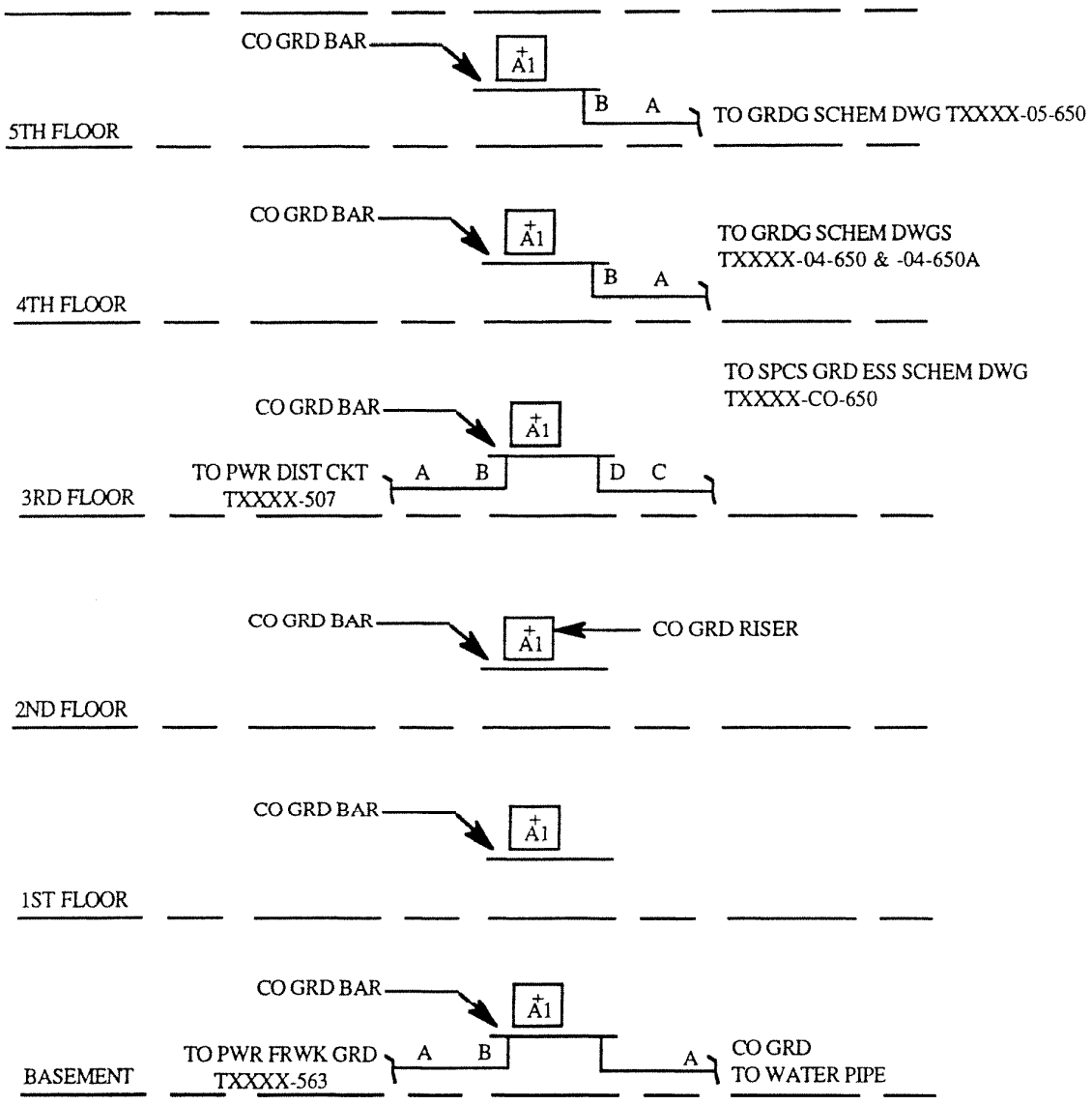
6.  PARALLEL CONNECTOR AS SHOWN BY LETTER SYMBOL AND TABLE NO. 1.

7.  TERMINATION OF LEAD AT GROUND BAR OR FRAME JUNCTION PIPE AS INDICATED BY LETTER SYMBOL AND TABLE NO. 1.

8. FRAMES SHOWN IN SOLID LINE BLOCK FORM NOT NUMBERED ARE DIAL TYPE SWITCH FRAMES OR SPACE AVAILABLE FOR FUTURE FRAMES WHOSE TYPE HAS NOT YET BEEN DETERMINED.

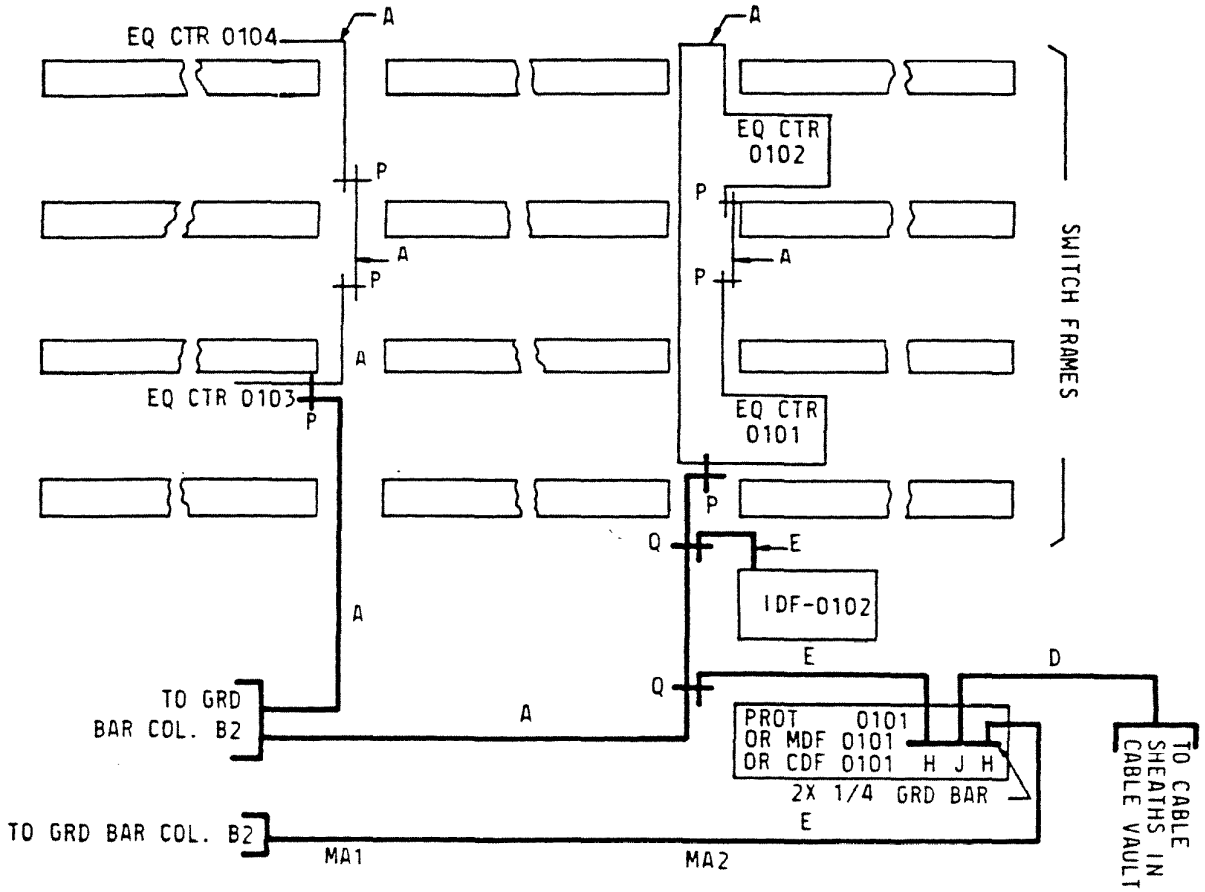
9. FRAMES SHOWN IN BROKEN LINE BLOCK FORM NOT NUMBERED INDICATES SPACE AVAILABLE FOR FUTURE FRAMES WHOSE TYPE HAS NOT YET BEEN DETERMINED.

10. MA 1 AND MA 2 MAIN AISLE NUMBERS ESTABLISHED FOR THE PURPOSE OF IDENTIFYING THE LOCATION OF LEAD TERMINATIONS OF THE GROUND CABLE TAGS.



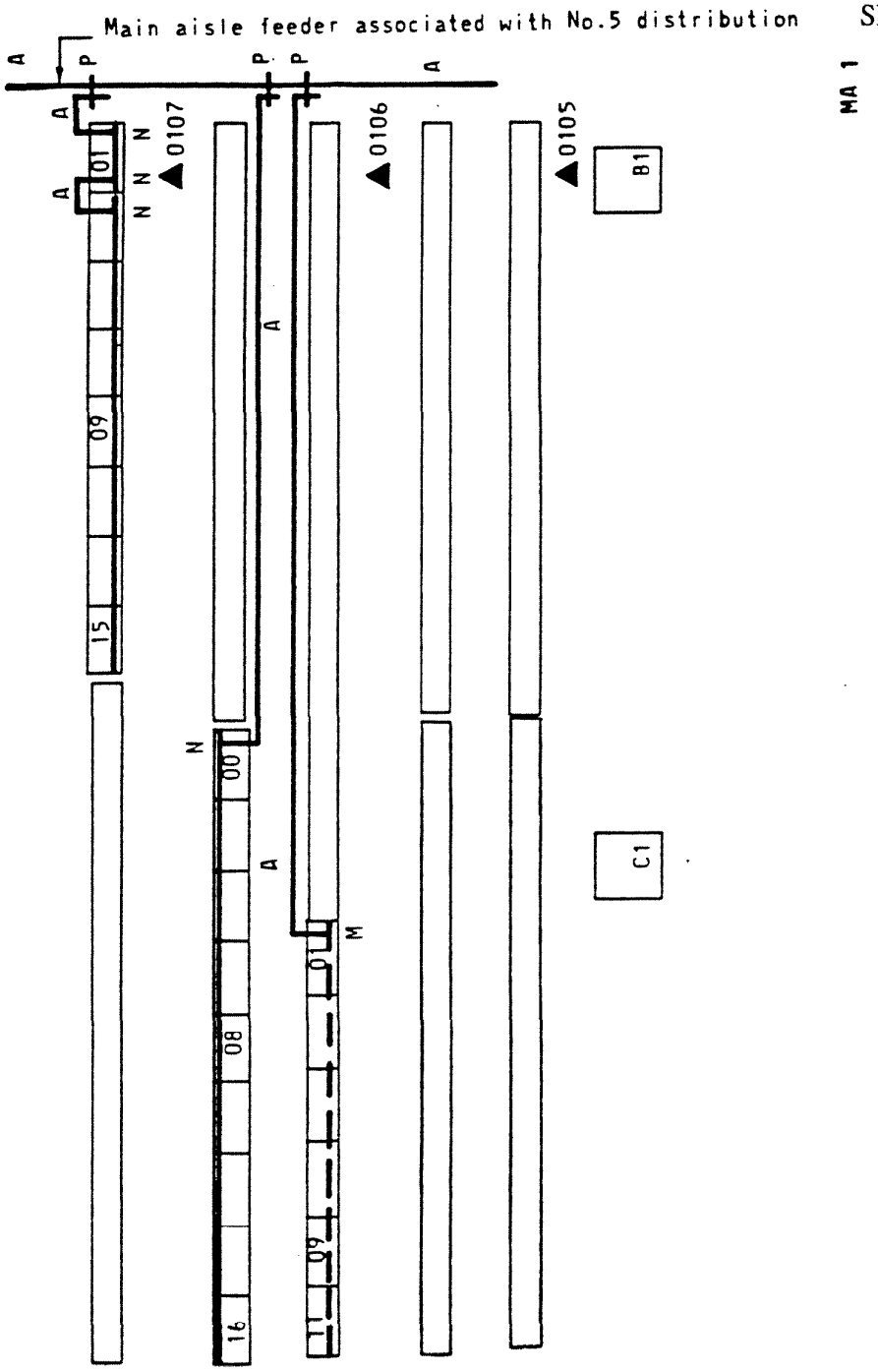
Note: See Paragraph 12.00 for Explanatory Notes covering Symbols.

EXHIBIT 1
VERTICAL GROUND RISER ARRANGEMENT ALL CONVENTIONS



Note: See Paragraph 12.00 for Explanatory Notes covering Symbols.

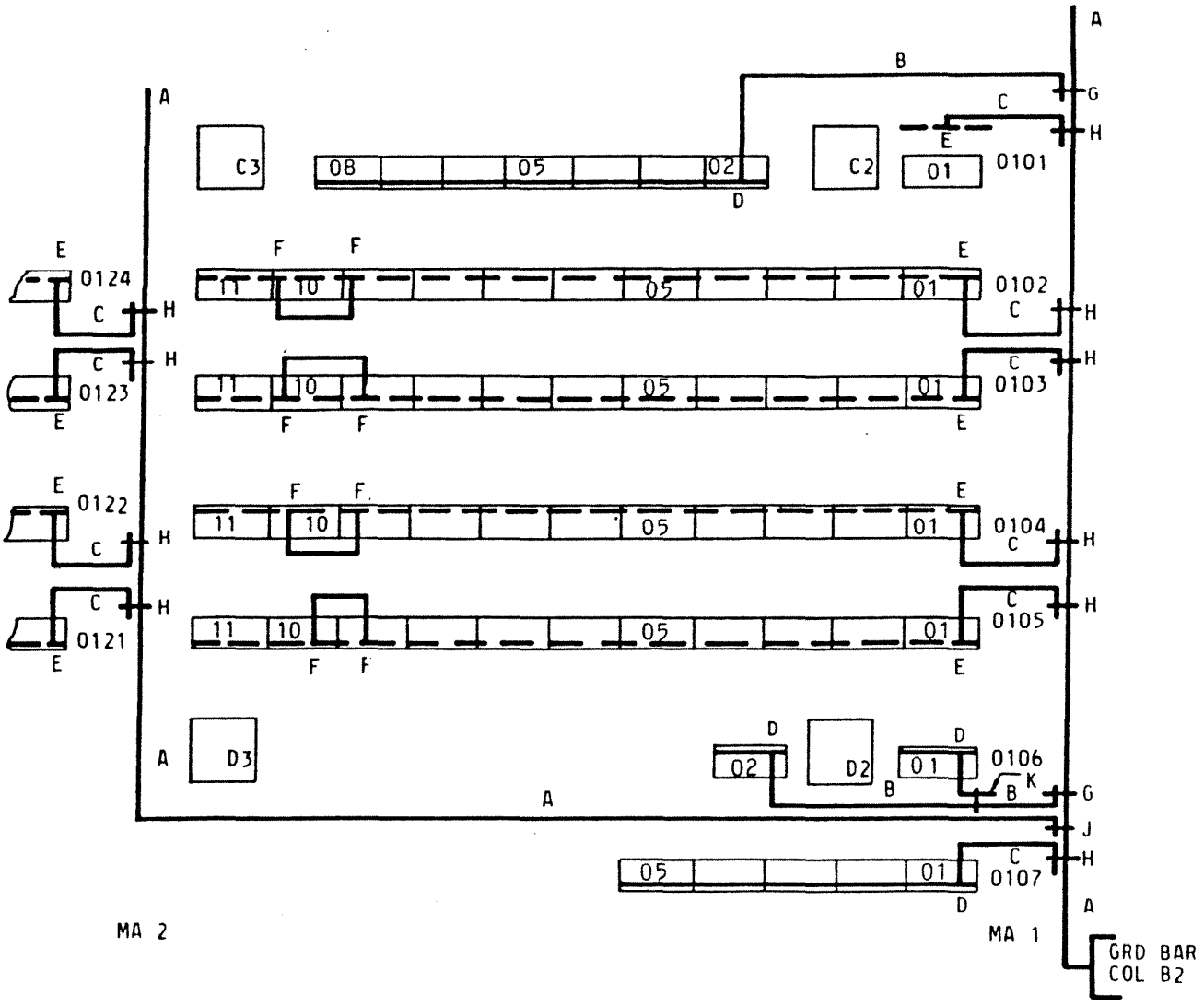
EXHIBIT 2
CONNECTION TO VERTICAL GROUND RISER
ARRANGEMENT AT COL B2



Note: See Paragraph 12.00 for Explanatory Notes covering Symbols.

EXHIBIT 3
FRAMES SERVING OTHER THAN DIAL EQUIPMENT IN SAME AREA
WITH NO. 5 CROSSBAR® UTILIZING 48 VOLT EQUALIZATION CENTER
METHOD OF DISTRIBUTION

No. 5 Crossbar® is a Registered Trademark of AT&T Technologies, Inc.



Note: See Exhibit 5 for Explanatory Notes Covering Symbols.

EXHIBIT 4
PARTIAL NEW TOLL AREA GROUNDING ARRANGEMENT

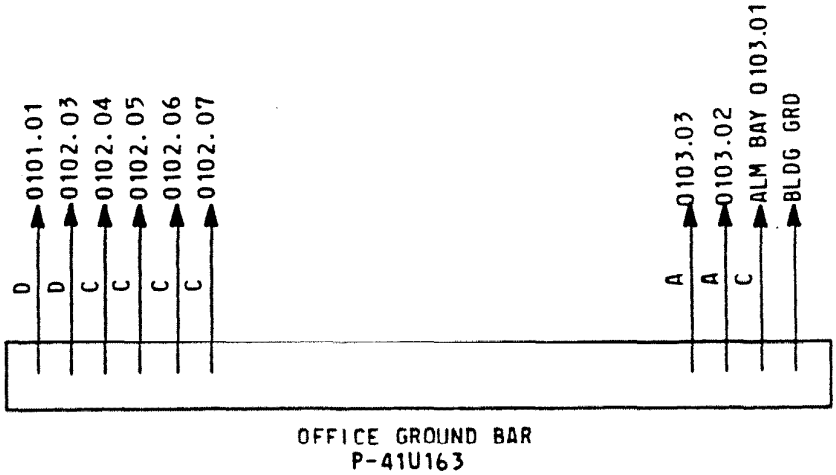
K	Manufacturer's Number		
J	Manufacturer's Number		
H	Manufacturer's Number		
G	Manufacturer's Number		
F	Manufacturer's Number		2
E	Manufacturer's Number		3
D	Manufacturer's Number	G9	9
C	NO. 6		
B	350,000 CM		
A	750,000 CM		
SYM	TERMINATION OR SIZE OF LEAD	FIGURE	GROUP
TABLE NUMBER 1			

Note: See Exhibit 4 for Symbol Usage.

EXHIBIT 5
TABLE NO. 1 PROVIDING EXPLANATORY
INFORMATION TO SYMBOLS

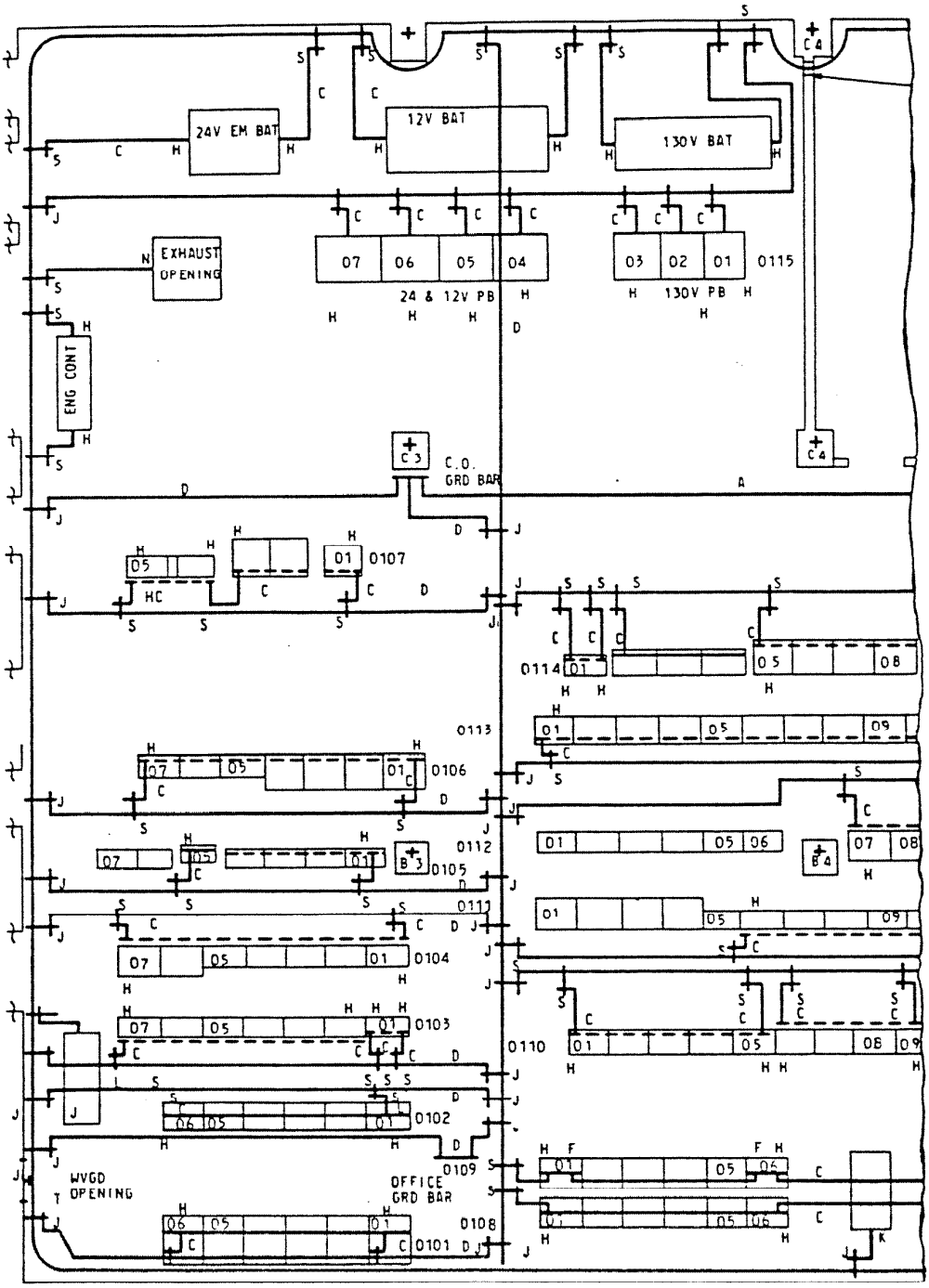
SYM	TERMINATION OR SIZE OF LEAD	FIGURE	GROUP
V	KS5537L105		
U	KS5537L164		
T		20	20
S		7	7
R		55	30,25,55
Q		52	52
P		56	56
N		25	25&25A
M		23	23
L		22	22
K		57	57
J		6	6
H	ED82138-31	28&28A	28
G	ED3C014-51		2
F	T491276		9
E	ED3C014-51		3
D	NO.2		
C	NO.6		
B	350,000 CM		
A	750,000 CM		

TABLE NO. 1



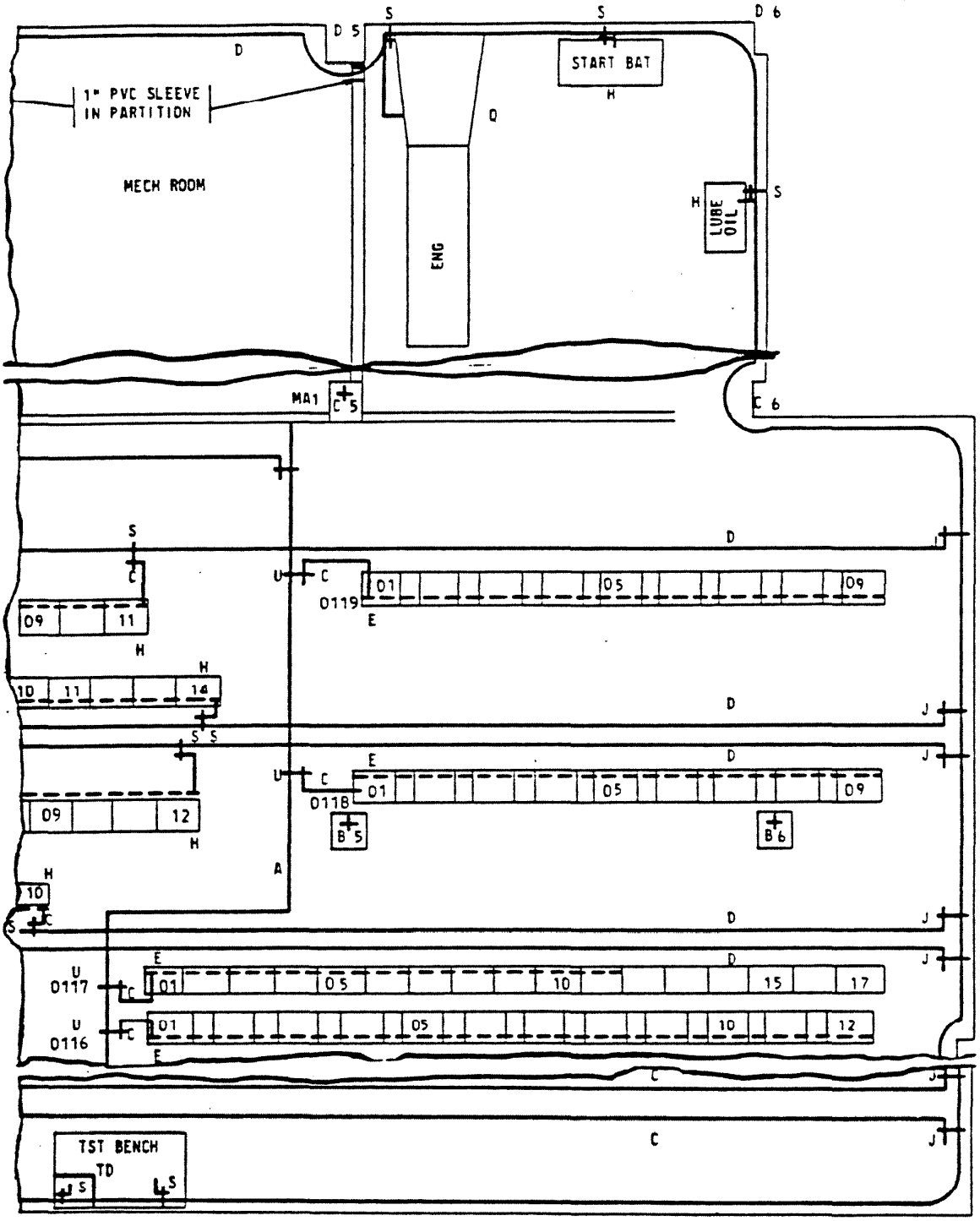
Note: See Paragraph 12.00 for Explanatory Notes covering Symbols.

EXHIBIT 6
TABLE NO. 1 AND NOTES PROVIDING EXPLANATORY INFORMATION COVERING CONVENTIONS AND SYMBOLS APPLIED ON EXHIBIT 7



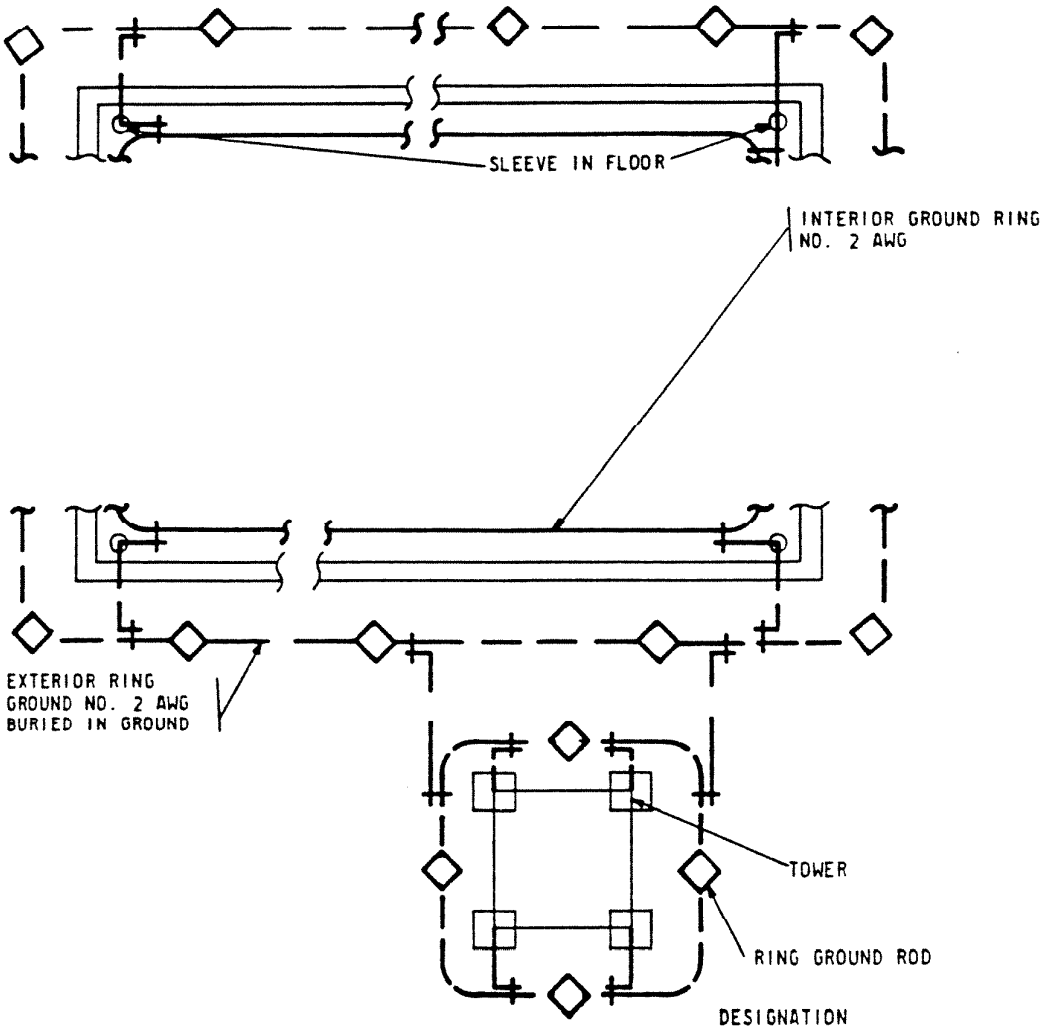
Note: See Paragraph 12.00 and Exhibit 6 for Explanatory Notes covering Symbols.

EXHIBIT 7
RADIO AREA INTERIOR RING GROUND ARRANGEMENT
(PAGE 1 OF 2)



Note: See Paragraph 12.00 and Exhibit 6 for Explanatory Notes covering Symbols.

EXHIBIT 7
RADIO AREA INTERIOR RING GROUND ARRANGEMENT
(PAGE 2 OF 2)



NOTES

1. ◇ RING GROUND ROD.

2. —— —— CONSTRUCTION OF EXTERIOR RING GROUND.

1/2 1/4 1/2 1/4

Note: See Exhibit 6 for Content, and Paragraph 12.00 for Explanatory Notes Covering Symbols.

EXHIBIT 8
PARTIAL RADIO AREA EXTERIOR RING GROUND ARRANGEMENT

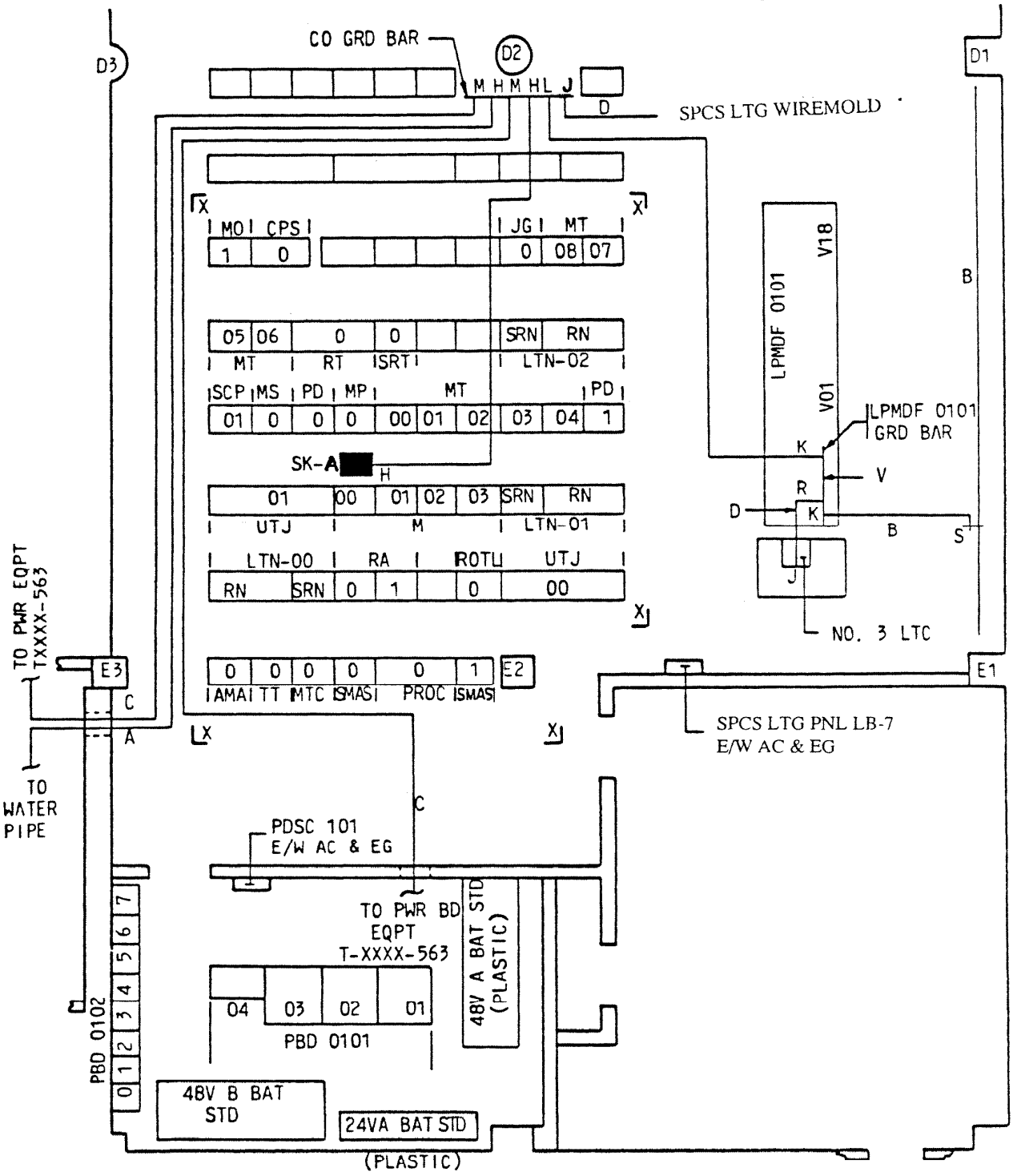


EXHIBIT 9
TYPICAL SPCS FLOOR GROUND SCHEMATIC DRAWING
(PAGE 1 OF 5)

NOTES LISTED BELOW REFER TO EXHIBIT 9 SKETCHES

1. LETTERS ADJACENT TO OR WITH ARROWS DIRECTED AT A SYMBOL ON THE DRAWING REFERS TO SIZE OF CABLE, CONNECTOR, TERMINATIONS PER STANDARD DRAWINGS, ETC., AS DEFINED IN TABLE NO. 1

2. [redacted] DENOTES GROUND WINDOW.

3. FRAMES SHOWN IN SOLID LINE BLOCK FORM AND NOT NUMBERED ARE FRAMES OR SPACE AVAILABLE FOR FUTURE FRAMES WHOSE TYPE HAS NOT YET BEEN DETERMINED.

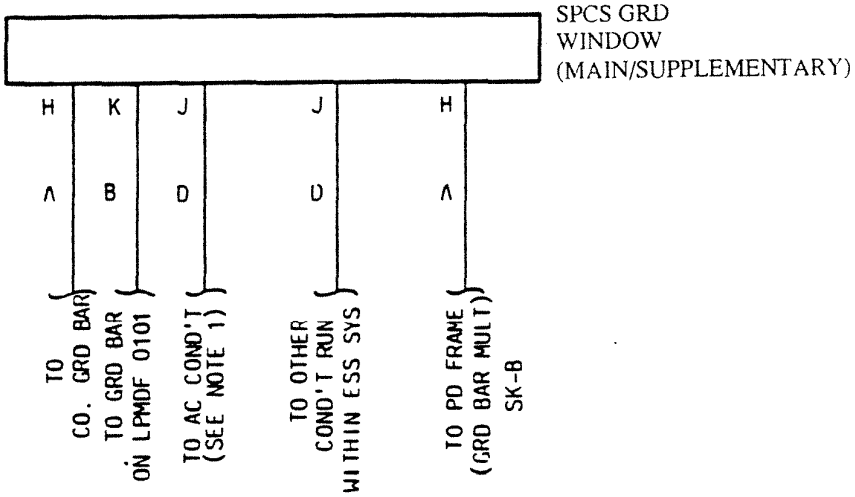
4. FOR VERTICAL GROUND RISER ARRANGEMENT, SEE T-650.

5. REFER TO DRAWING NUMBER _____FOR TYPICAL SYSTEM GROUNDING ARRANGEMENT.

   TYPICAL GRDG ARGT FOR: SHOW MANUFACTURER AND SWITCH IDENTIFICATION
   SHOW MANUFACTURER'S DRAWING NUMBER

6. FRWK GRDG ARRANGEMENT -DRAWING NUMBER _____FIG_____
   FOR EQUPT ENCLOSED WITHIN THE BRACKETS: [X

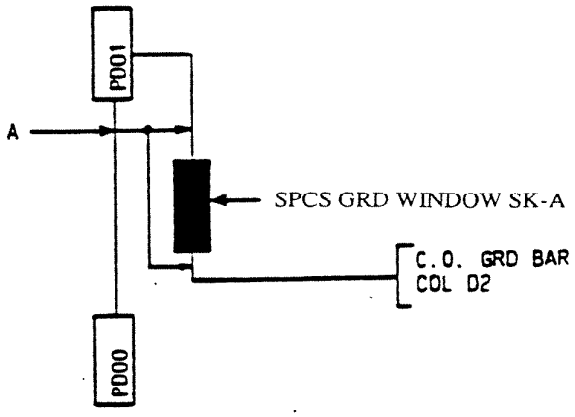
EXHIBIT 9
TYPICAL SPCS FLOOR GROUND SCHEMATIC DRAWING
(PAGE 2 OF 5)



Notes: All Conventions and Symbols are Covered in Table No. 1.

All AC Conduit Must Run Within Three Feet of and be Bonded to the SPCS Ground Window.

EXHIBIT 9
TYPICAL SPCS FLOOR GROUND SCHEMATIC DRAWING
(PAGE 3 OF 5)



SK B
PB MULT

NOTE: All Conventions and Symbols are Covered in Table No. 1.

EXHIBIT 9
TYPICAL SPCS FLOOR GROUND SCHEMATIC DRAWING
(PAGE 4 OF 5)

SYM	TERMINATION OR SIZE OF LEAD	FIG	GR	NOTE
Y	ED97729-11		2	
X	P33A184 COPPER GRD BAR			
W	ED90026-50		3	
V	ED90026-50		11	
U	KS21500 L8			
T	KS21500 L1			
S	KS21500 L7			
R	KS15977 L302			
Q	ED97729-11		24	
P	KS21500 L2			
N	KS21500 L11			
M	KS15977 L63			
L	KS15977 L73			
K	KS15977 L311			
J	KS15977 L325			
H	KS15977 L307			
G	ED97729-11		61	
F	ED97729-11		72	
E	NO.6 BARE			
D	NO.6 INS			
C	NO.2 INS			
B	NO.0 INS			
A	750,000CM			

TABLE NO.1

EXHIBIT 9
TYPICAL SPCS FLOOR GROUND SCHEMATIC DRAWING
(PAGE 5 OF 5)

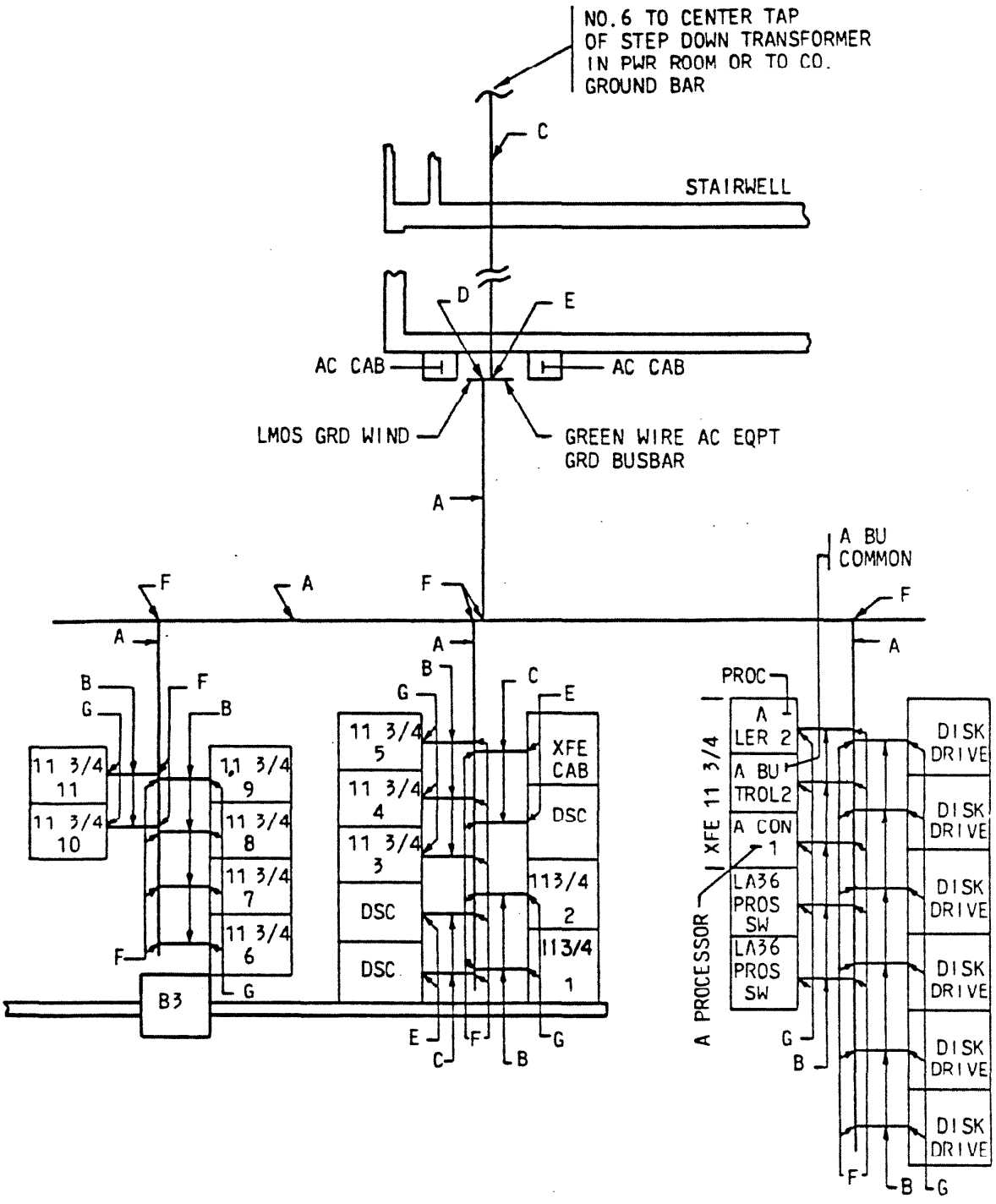


EXHIBIT 10
TYPICAL MINICOMPUTER FLOOR
SCHEMATIC GROUNDING PLAN DRAWING
(PAGE 1 OF 2)

G	KS15977 L53		
F	KS21500 L11		
E	KS15977 L325		
D	KS15977 L63		
C	NO.6 INS		
B	NO.4 INS		
A	NO.2 INS		
SYM	TERMINATION OR SIZE OF LEAD	FIG	GR
TABLE NO.1			

Note: Table No. 1 Covers Conventions and Symbols in Exhibit 10.

EXHIBIT 10
TYPICAL MINICOMPUTER FLOOR
SCHEMATIC GROUNDING PLAN DRAWING
(PAGE 2 OF 2)

1.00 GENERAL

1.01 This part covers the standards to be followed in the preparation of Central Office indoor and outdoor waveguide drawings.

1.02 The indoor and outdoor waveguide drawing shall include all information necessary to engineer and install waveguides and all associated material from terminating points within a building to the terminating points outside the building.

2.00 SCALE

2.01 Generally scale shall be 1/4 inch = 1 foot for all pertinent building information such as building outlines, wall partitions, etc. It shall also be applied to Relay Rack, Frames and Equipment. Where possible, show waveguide 1/4 inch = 1 foot scale. When not possible, show waveguide information in proper proportion to all other information on the drawing also adhering to requirements specified in the following paragraphs. Do not show scale in title box of this drawing.

2.02 When adding linework to this drawing, it is necessary to provide sufficient space for 1/8 inch lettering that may be required. It is also necessary to retain a minimum space of 1/16 inch between two parallel lines where no lettering is required and between each dash of a dash line.

2.03 It is not necessary that the views and sketches convention be shown to exact scale. However, layout the conventions to a size that will readily accept 1/8 inch numbering and/or lettering to meet microfilm standards and still present a balanced appearance on the drawing.

3.00 PEN SIZE

3.01 The following information indicates pen sizes that produce proper lineweights for the specific application on the indoor and outdoor waveguide drawings for both single line and conventional isometric views.

Pen Size	Application
0	Present and Future Equipment, Building Projection Lines, Tables and Charts (horizontal lines except every 5th line)
2	Waveguide Conventional Isometric and Single Line Isometric Convention, Miscellaneous Symbols, Sketches, Details, Elevations and Views (Vertical lines and every 5th horizontal line)

4.00 ISSUE NOTES

4.01 A descriptive Issue Note is required for indoor and outdoor waveguide plans.

4.02 Descriptive portions of Issue Notes shall be similar to the following:

A. For entire runs added or removed.

ADD, RCVG RUN RR 10.1/RMV, TRMTG RUN RR 11.1.

B. For components changed.

CHG, RR 10.1 RCVG RUN CPNT SYM 33 TO CPNT SYM 35.

C. For site plans added, removed or changed:

ADD SITE PLAN
RMV SITE PLAN
CHG SITE PLAN

5.00 CRITERIA

5.01 Prior to the preparation of the waveguide drawing of a particular office, all necessary data shall be obtained. The data shall be checked to verify that it is noncontradictory and that it is the latest available information. This data consists of:

A. Architect Plans

B. Floor Plan

C. Cabling and Cable Rack Plan

D. Special Condition Views and Sketches

5.02 Essentially, there are two types of waveguide drawings that can be applied to Central Offices. One is the indoor waveguide drawing and the other is the outdoor waveguide drawing. It is possible to have either or both drawings utilized for a Central Office. The following paragraphs provide the required information for their selection and application.

6.00 INDOOR WAVEGUIDE DRAWINGS

6.01 In general, an indoor waveguide drawing shall be originated for each Central Office where a waveguide is internally provided.

A. In small offices such as Penthouses, 355A Dial, PBX, SXS, TD2 and Carrier Huts where Floor, Cabling, Cable Rack, Auxiliary Framing, Grounding and Lighting Plan layouts are combined on a common tracing, it is permissible to place the indoor and outdoor waveguide runs as sketches on this drawing. However, each sketch shall not exceed an area equivalent to the space occupied by two lineups of frames one building bay in length. Where this area is exceeded, a separate waveguide drawing shall be originated.

B. In offices other than those described by Item A, always originate a waveguide drawing in accordance with the information covered by subsequent paragraphs. More than one waveguide sketch may be placed on the waveguide drawing provided each sketch does not exceed the parameters established in Item A.

6.02 Arrangement of Layout of Drawing - The indoor waveguide drawing illustrates waveguide runs between the radio bays and weather seal panel. The waveguide drawing may contain singular or multiple number of sketches in accordance with the requirements specified by the following items.

A. Assignment of Waveguide Weather Seal Panel as viewed from the inside of the building

B. Waveguide Connections to Radio Bays

C. Material Tables

D. Partial Floor Plan

E. Equipment Bays

F. Interbay Waveguide Runs

7.00 OUTDOOR WAVEGUIDE DRAWINGS

7.01 The outdoor waveguide drawing is originated to show the outdoor waveguide arrangement when the area to be shown exceeds the equivalency of one building bay in length. This criteria shall also apply to future areas when it is definitely known that the area will ultimately be occupied with an outdoor waveguide.

7.02 Arrangement of Layout on the Drawing

A. The outdoor waveguide drawing illustrates waveguide runs between the waveguide weather seal panel and the antenna. The drawing may contain a singular or multiple number of sketches in accordance with requirements specified by the following items:

1. Antenna Platform Layout including direction of signal

2. Weather Seal Panel and/or Hatch Plate

3. Elevation of Tower

4. Site Plan

5. Layout of Waveguide Support Plates

6. Material Tables similar to Table A on Exhibits 1, 2 and 3

B. Show only that portion of the building on the drawing necessary to properly locate the radio area.

C. In general, with respect to the north direction, show the portion of the building to be shown on this drawing to agree with the floor plan drawing.

D. Make allowances for tables and notes and where possible, allow for future growth.

8.00 WAVEGUIDE RESTRAINER OR SUPPORTS

8.01 Show waveguide restrainer or supports for both indoor and outdoor waveguide runs on their respective waveguide drawing.

9.00 BUILDING INFORMATION - ILLUSTRATING

9.01 Coordinate the following information with the proper pen sizes previously covered within this part.

9.02 Walls - Show the interior wall only of the entire building in accordance with the information previously furnished under this paragraph titled "Arrangement of Layout on the Drawing".

9.03 Pilasters, Columns, Present Partitions and Doors - Show on the body of the drawing with a light solid line, pilasters, columns (including the letter and number designation), present partitions and doors. Do not show the swing of doors.

9.04 Skylights - Show skylights with equal length dash lines. Indicate the size and location. Show the designation "skylight". It is recommended that the dash lines be approximately 3/16 inch long with a 1/16 inch space between each dash, (see Floor Plan Section V, Part A).

9.05 Ventilating ducts, building conduits, service conduits used by Equipment Suppliers' cables and wire, ceiling inserts, unistruts, beam clamps, expansion shields, miscellaneous building details shall not be shown on this drawing.

9.06 Cable holes, cable slots, cable sleeves, floor ducts, floor troughs shall not be shown on this drawing.

10.00 CONVENTIONS, NUMBERING, DESIGNATING AND ILLUSTRATING EQUIPMENT

10.01 Conventions depicting frames and relay racks are basically the same as those used on the Floor Plan Drawing. Essentially, they are shown in block form. The following items provide more details covering the similarities and differences between conventions used on this drawing and those used on the Floor Plan Drawing. Also see Exhibits 1, 2 and 3.

A. Show present and future equipment with light solid lines.

B. Frames and equipment bay designations are not required on this drawing.

C. Number the lineups. Number the first and last frame in each lineup. Where lineups are six frames or longer in length, show the numbers of frames numbered 5, 10, 15, 20, etc. When it is definitely known the type of frames that ultimately will be provided, apply the preceding numbering procedure to future frames. If the type is not known, block out the ultimate lineup length without any numbering shown.

11.00 WAVEGUIDE DEPICTION ON INDOOR AND OUTDOOR WAVEGUIDE DRAWINGS

11.01 The single line isometric rather than the conventional isometric view shall be used to depict straight sections waveguide runs. A perpendicular line in the plan of the wide dimension of the section shall be used to illustrate each section in waveguide run, (see Exhibits 1, 2 and 3). However, it is recommended that the following items be shown in conventional isometric for orientation purposes.

A. Beginning and end of each run

B. Where many waveguides are grouped together and depiction by a single line could cause confusion

C. Complicated turns

D. Twist sections

11.02 It is recommended that all 90 degree turns be shown by a single line with a perpendicular line placed at each end of the section in the plane of the wide dimension.

11.03 Flexible waveguide sections shall be shown by the conventional isometric view if a change in elevation or direction causes confusion.

11.04 Table A as shown in Exhibits 1, 2 and 3 shall be used to provide a description of the waveguide sections.

11.05 The following are the recommended drafting procedures for dimensioning on all waveguide drawings using the soft-metric conversion for International and Government Sales:

A. A dual dimensioning system will be used on drawings requiring dimensions. Feet and inches as well as the equivalent millimeters will be shown on the drawing including the tables and notes.

B. Foot (') and inch (") marks will be used with all U.S. standard dimensions (e.g., 2' 6") instead of showing a dash "0" separator (e.g., 2-6).

C. All metric dimensions shall be rounded off to the nearest even whole millimeter. For example, 29.1 to 29.9 mm will be rounded off to 30 mm and 28.1 to 28.9 mm will be rounded off to 28 mm.

D. It is recommended that the tables in Exhibits 1 and 3 be changed to include metric dimensions in millimeters as well as feet-inches dimension. The drawing would be too congested to show both dimensions, metric and feet-inches, in accordance with Exhibit 2.

11.06 It is recommended that the lengths of straight sections be placed on the body of the drawing in parenthesis after the symbol for each section. This will eliminate the need for the "length" column in Table A and will also eliminate the repetition of entries on the table of sections having the same drawing and group number.

12.00 DEPICTING WAVEGUIDE COMPONENTS, SYMBOLS AND WEATHER SEALS

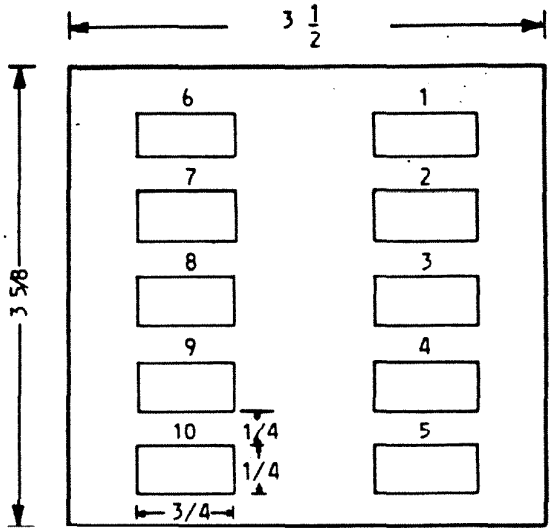
12.01 Start waveguide run at a convenient point in run. After the completion of the waveguide run, subdivide the run into components. Assign numbers to the waveguide components starting with 1 and up to the isometric single line view.

12.02 Number symbols shall be located adjacent to the components they refer to in accordance with the illustrations on the Exhibits 1 and 3.

12.03 List components and number symbols associated with manufacturer's drawings for waveguide run in Table A, (see Exhibits 1 and 3).

12.04 Any singular items without a convention shall be identified on the body of the drawing. Any repetitive items shall be cross referenced to a note defining the respective item.

12.05 Weather seal panel should illustrate in tabular form the position, designation, relay rack direction, type of equipment TD-2, TD-3, etc ., and polarization, (see Figure 1).



WEATHER SEAL PANEL

TABLE B					
ASSIGNMENT OF WEATHER SEAL OPENING					
POS	RR	DESIG	DIRECTION	TYPE	PO AR
1	11,6	REC	RECKON PASS	TD-3	HOR
2	11,6	TRSG	RECKON PASS		VERT
3	10,6	REC	SALISBURY MT.		VERT
4	10,6	TRSG	SALISBURY MT.		HOR
5			FUT		
6			"		
7			"		
8			"		
9			"		
10			"		

3/8 | 3/8 | 3/8 | 3/8

5/8 — 3/4 — 3/4 — 1-3/4 — 1 — 1

FIGURE 1
ASSIGNMENT OF WEATHER SEAL OPENING

12.06 Show a sketch of restrainer or supports of the waveguide run on the waveguide or cabling plan drawing, (see Figure 2).

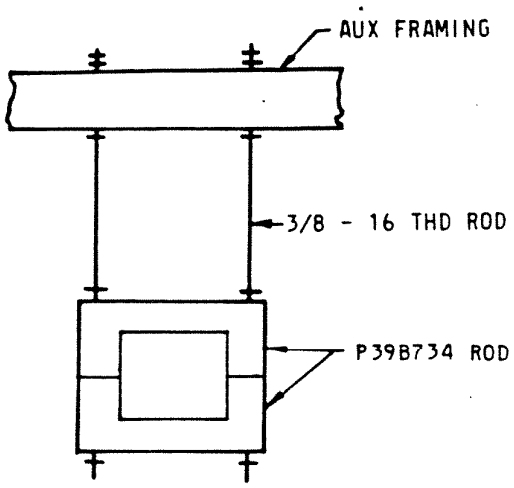


FIGURE 2
RIGID WAVEGUIDE RESTRAINER

13.00 DEPICTING ANTENNA PLATFORM, TOWER ELEVATION AND SITE PLAN

13.01 It is recommended that in an outdoor waveguide drawing, the following additional information be added where applicable.

A. Antenna platform indicates platform, direction of antenna, antenna orientation azimuth angles and true north, (see Figure 3).

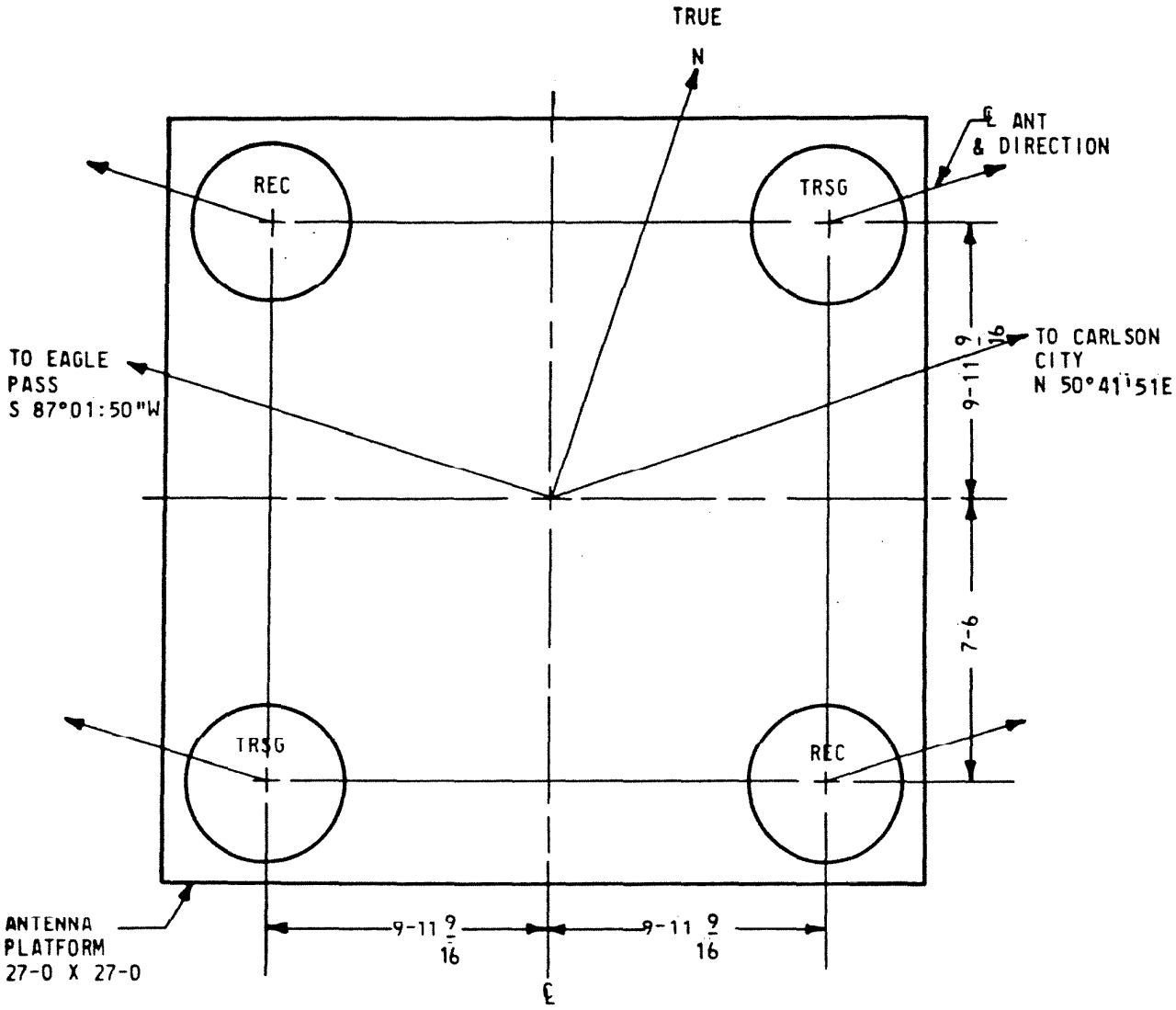
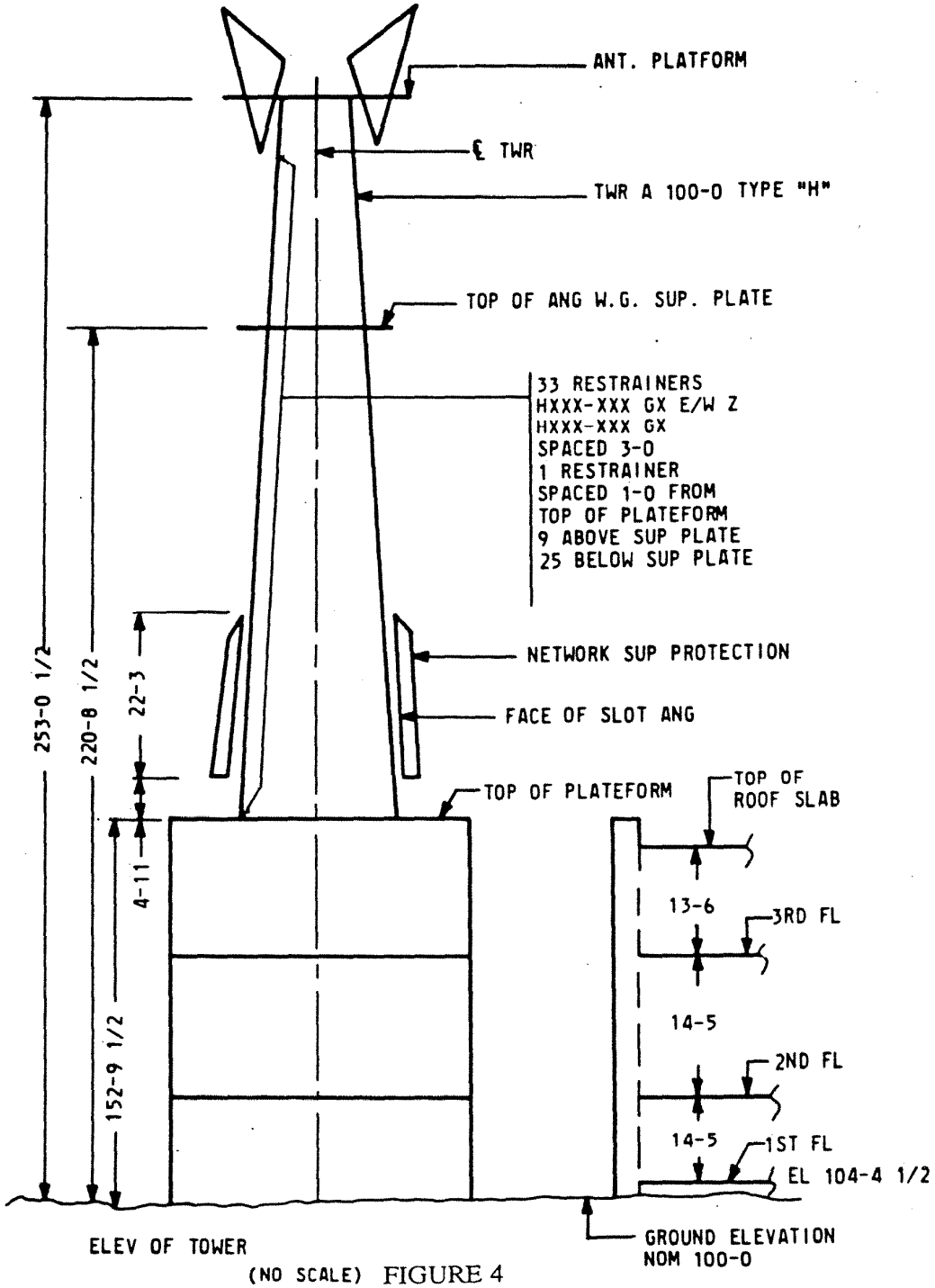


FIGURE 3
ANTENNA PLATFORM LAYOUT

B. A sketch of the elevation of the tower in single line convention, combined with the outdoor waveguide run detailing the waveguide restrainers associated with the run, (see Figure 4).



(NO SCALE) FIGURE 4
ELEVATION OF TOWER

C. A Site Plan depicting the location of the building, ground elevation, roads, true N, direction of antenna, (see Figure 5).

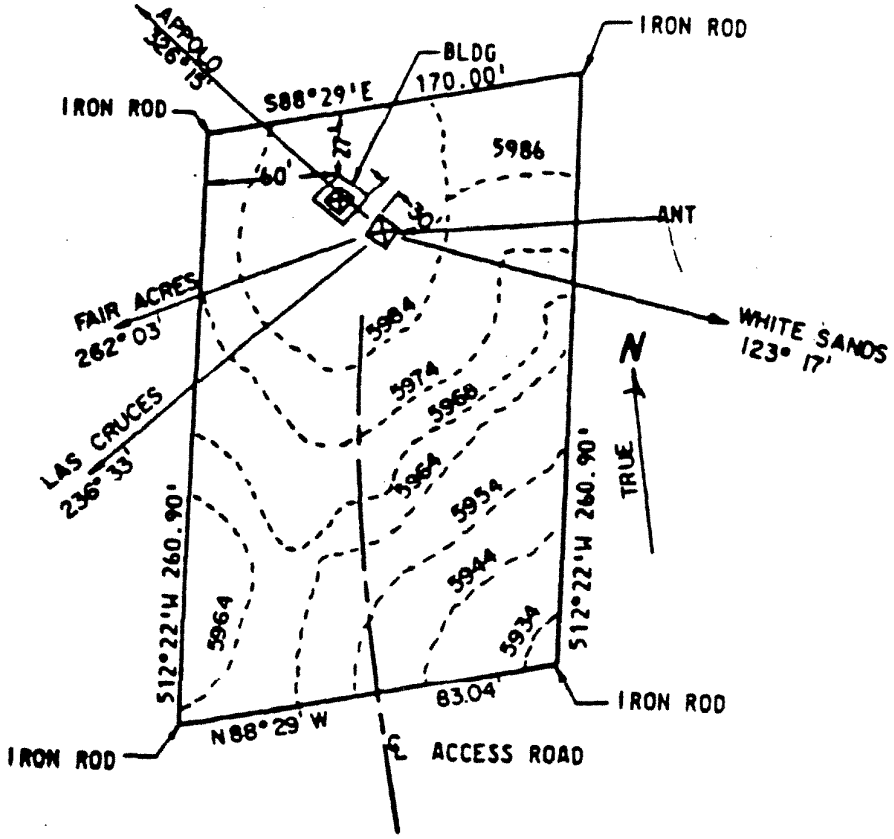


FIGURE 5
SITE PLAN (If required)

D. Support plates depicting all waveguide runs, their origin and designation, (see Figure 6).

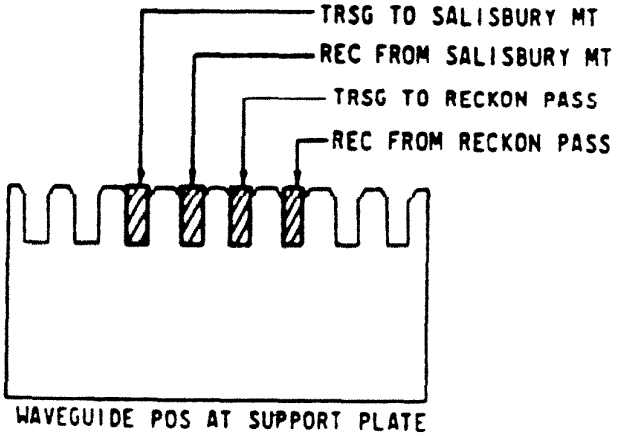
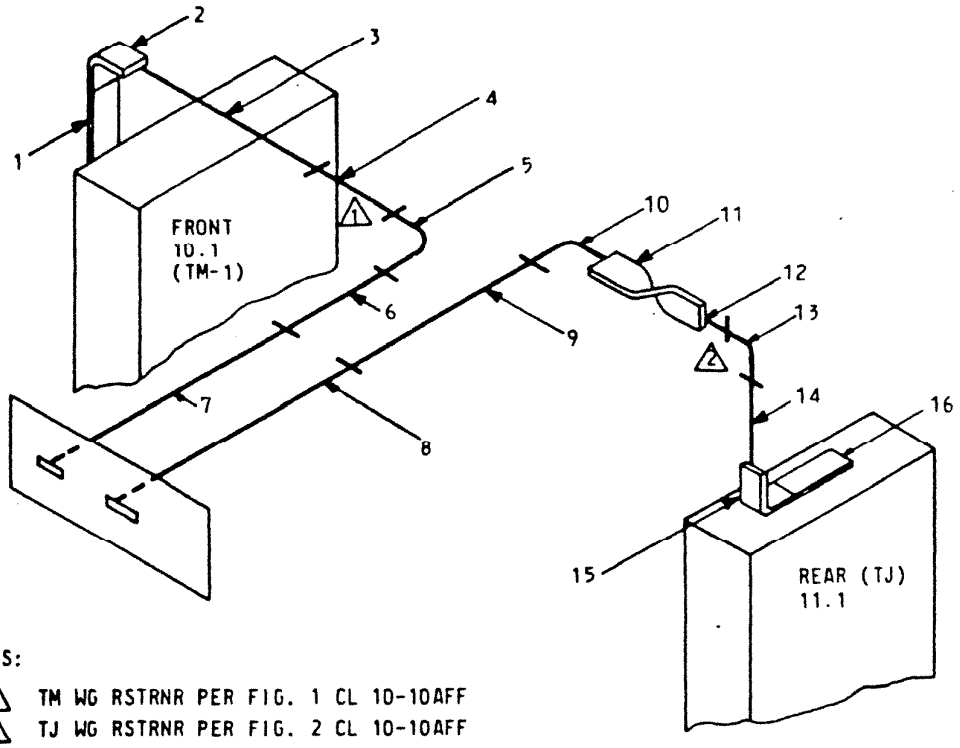


FIGURE 6
SUPPORT PLATES

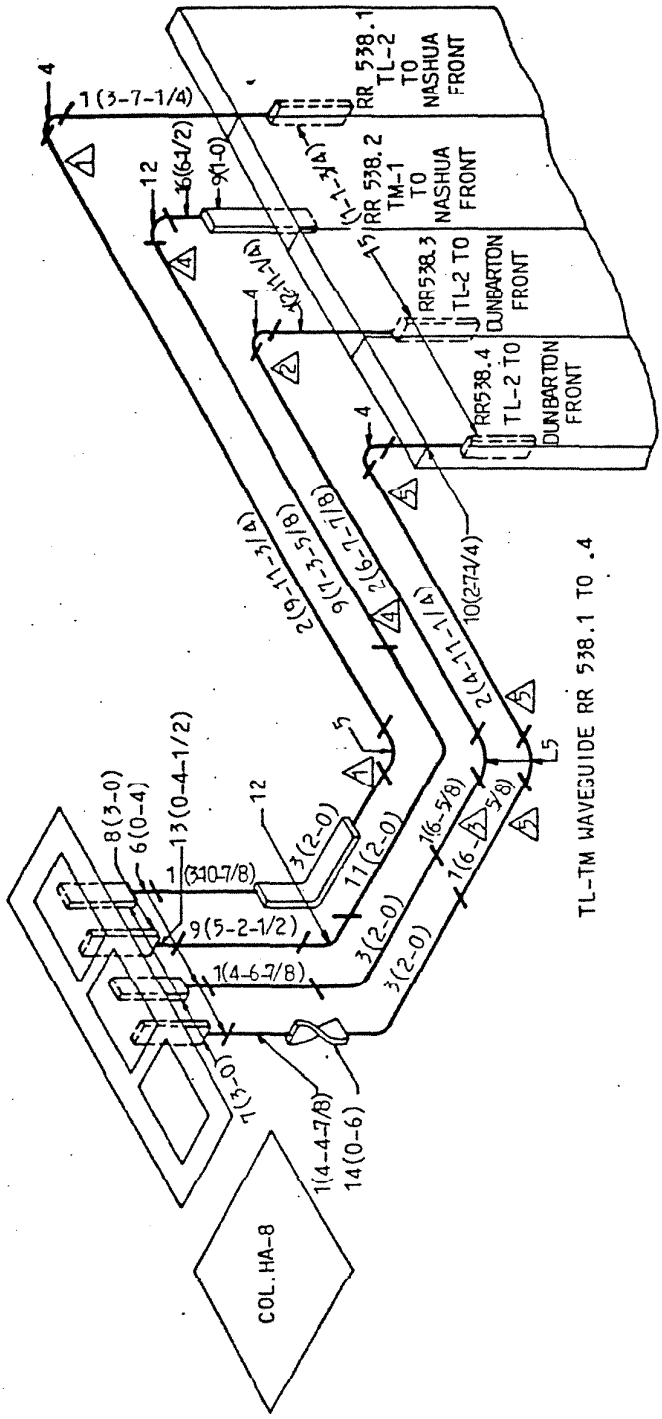


NOTES:

1. TM WG RSTRNR PER FIG. 1 CL 10-10AFF
2. TJ WG RSTRNR PER FIG. 2 CL 10-10AFF

TABLE A		
SYM	DESCRIPTION	LENGTH
1	ED59586-10 DET 1 RIGID	1-9-1/4
2	1B-90° - BEND	
3	KS16532 L4 FLEX	1-5
4	ED59586-10 DET 1 RIGID	1-1-3/4
5	2A-90° E BEND	
6	2A PRESSURE WINDOW	0-4-1/2
7	ED59568-30 GR3 RIGID	1-10-1/2
8	ED50018-50 GR6 RIGID	1-7-1/4
9	1A PRESSURE WINDOW	0-4
10	KS16399 L5 90° H BEND	
11	KS16385 L9 FLEX	1-8
12	ED50024-50 GR2 RIGID	0-6-3/8
13	KS16399 L5 90° H BEND	
14	ED50024-50 GR2 RIGID	1-0
15	KS16399 L4 90° E BEND	
16	ED59586-10 DET 2 RIGID	0-6-1/2

EXHIBIT 1
WAVEGUIDE ASSIGNMENT TABLE



Note: See Page 13 for explanatory notes covering symbols

EXHIBIT 2
INDOOR WAVEGUIDE ARRANGEMENT
(PAGE 1 OF 2)

TABLE A	
SYM	DESCRIPTION
1	ED50024-20 GR1 RIGID
2	ED50024-20 GR6 RIGID
3	KS16385 L11 FLEX
4	KS16399 L4 90° E BEND
5	KS16399 L4 90° H BEND
6	1A PRESSURE WINDOW
7	ED50018-50 GR6 (FURN BY IDC)
8	ED59568-30 GR3 (FURN BY IDC)
9	ED59586-10 D2 RIGID
10	ED50024-20 GR2 RIGID WG
11	KS16532 L7 FLEX
12	2A 90° H BEND
13	2A PRESSURE WINDOW
14	KS16400 L1 90° TWIST
15	ED3C053-30 GR1 COUPLER
16	ED3C054-30 GR1 COUPLER

1/4 1/4 1/4 3/4 4

NOTES

1. TL WG RSTRNR PER SK.1 ℄10-10 AFF.
2. TL WG RSTRNR PER SK.2 10-2 & 10-0.
3. PER SK.1 G10-2 AFF.
4. TM WG RSTRNR PER SK.3 ℄10-6 AFF.
5. TL WG RSTRNR PER SK.4 ℄9-10,10-2 & 10-10 AFF.

Note: See Table A above for explanatory descriptions covering symbols

EXHIBIT 2
INDOOR WAVEGUIDE ARRANGEMENT
(PAGE 2 OF 2)

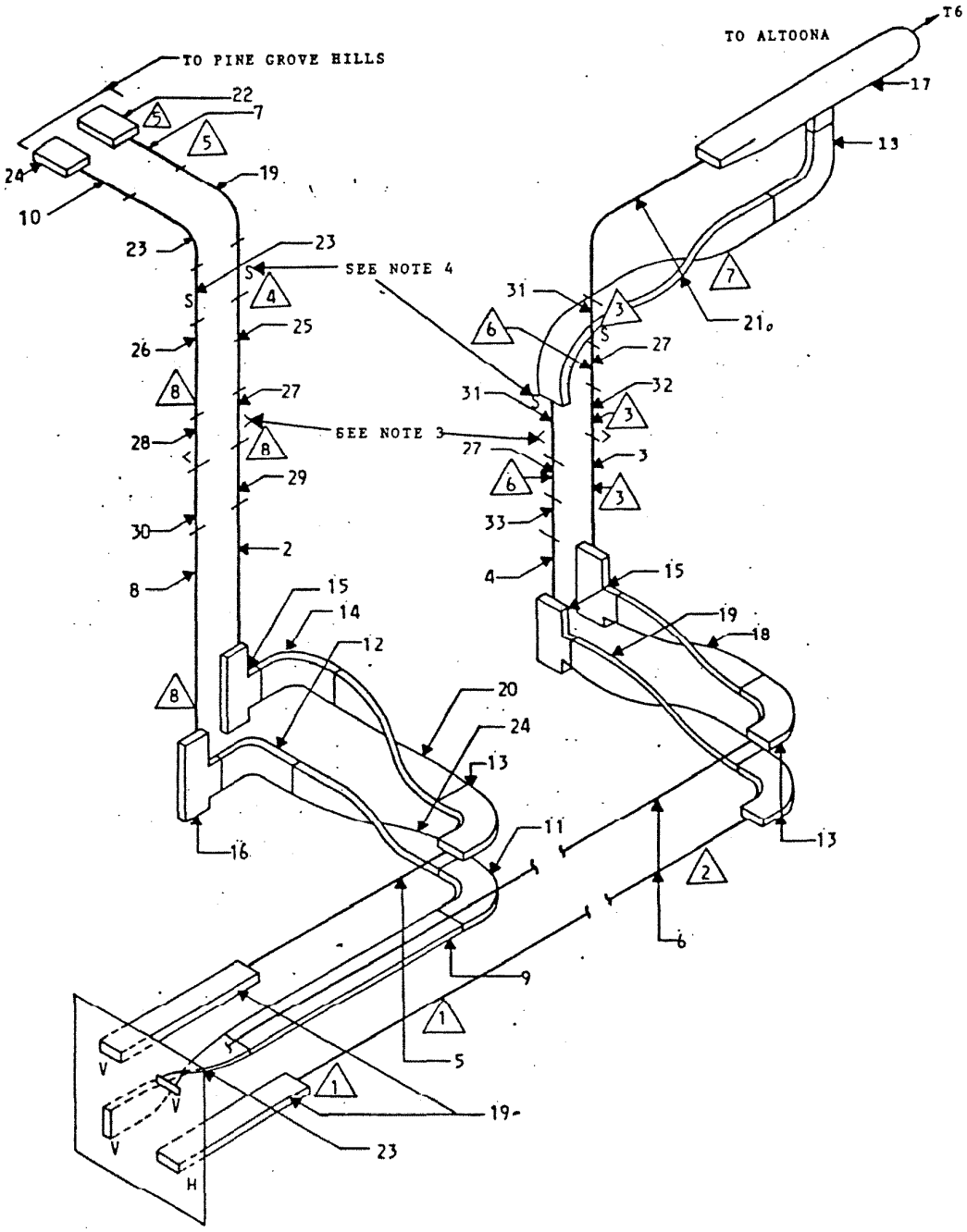


EXHIBIT 3
OUTDOOR WAVEGUIDE ARRANGEMENT
(PAGE 1 OF 2)

TABLE A		
SYM	DESCRIPTION	LENGTH
1	ED50018-50 GR5 RIGID	10-0
2	ED50018-50 GR6 RIGID	9-4-1/2
3	"	8-0-1/2
4	"	8-5-1/2
5	"	7-5-1/2
6	"	4-4-1/2
7	"	5-6-1/2
8	"	9-0-1/2
9	"	7-5
10	"	5-6
11	ED59569-70 GR2 90° H BEND	
12	ED59567-70 GR2 90° E BEND	
13	ED50023-50 GR5 90° H BEND	
14	ED50023-50 GR1 90° E BEND	
15	1410A NETWORK	
16	1417A NETWORK	
17	1405A NETWORK	
18	KS16499 L3 FLEX	2-6
19	KS16499 L6 FLEX	3-0
20	KS16499 L7 FLEX	3-6
21	KS16499 L18 FLEX	7-0
22	KS16499 L8 FLEX	4-0
23	KS16600 L1 FLEX	3-0
24	KS16600 L4 FLEX	4-0
25	ED50018-50 GR5 RIGID	3-6-3/8
26	ED59568-30 GR3 RIGID	3-7-5/8
27	WFB90-12 (GABRIEL ELECT)	1-0
28	WFB159-12	1-0
29	ED50018-50 GR5 RIGID	5-1 3/4
30	ED59568-30 GR3 RIGID	3-6 7/8

1/4

3/4 — 4" — 1-0 1/4

NOTES:

1. 1 Number refer to length and assembly of WG as defined by Table A.
2. ⚠1 WG RSTRNR per HXXX-XXX CL 10-0AFF and 10-11 3/4 AFF.
3. < > Flange from which WG is supported from tower.
4. S Point of WG support on Antenna Deck.

Note: See Table A above for explanatory descriptions covering symbols.

EXHIBIT 3
OUTDOOR WAVEGUIDE ARRANGEMENT
(PAGE 2 OF 2)

CRITICAL LEAD LIMITATIONS AND CABLING BALANCE

CONTENTS

INDOOR AND OUTDOOR WAVEGUIDE PLAN

CONTENTS

1.00 GENERAL

1.01 This part covers the standards to be followed in the preparation of the following:

A. Critical Lead Drawings associated with number No. 4 Type Toll Crossbar® Offices.

B. Critical Lead and Cable Balancing Drawings associated with "L4" Carrier Repeater and "L" Multiplex Systems.

C. Exhibital tabular recording of Critical Lead information associated with other type Central Offices as covered herein.

1.02 The Critical Lead Drawing shall include, as required, a record of all information pertinent to maximum allowable critical lengths concerning resistance and/or time delay limits for proper circuit operation. When associated with "L4" Carrier Repeater "L" multiplex, the Critical Lead Drawings incorporates cable balancing information.

2.00 SCALE

2.01 No scale is required for this drawing. However, when applying linework, it is necessary to provide sufficient space for 1/8 inch lettering that may be needed. It is also necessary to retain a minimum space of 1/16 inch between two parallel lines where no lettering is required and between each dash of dashed lines.

3.00 PEN SIZE

3.01 The following information indicates Pen Sizes that produce proper lineweights for the specific applications on this drawing.

Pen Size	Application
0	Charts (Horizontal Lines Except Every 5th Line)
2	Charts (Vertical Lines and Every 5th Horizontal Line)
3	Vertical Lines to Bisect Tables and Charts

4.00 ISSUE NOTES

4.01 Only the basic Issue Note is required for this drawing. For the elements of a basic Issue Note, see Section III, Part F, Paragraph 2.00.

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5.00 CRITERIA

5.01 Prior to the preparation of Critical Lead Drawings or the Supplemental Tabular Record for a particular office, all necessary data shall be obtained. This data should be checked to verify that it is noncontradictory and that it is the latest available information. Typical data is as follows:

A. Traffic Order or Specification

B. Floor Plan

C. Cabling and Cable Rack Plan (Initial Basic Arrangement)

D. Wiring List or Circuit Record System

5.02 Essentially, this part will cover the preparation of Critical Lead Drawing information as a complete drawing and also as supplemental information to be placed on another Central Office Record Drawing. Subsequent paragraphs will provide detailed information governing their application.

5.03 The Critical Lead Drawings associated with No. 4 Type Toll Crossbar® Offices shall always be originated. All calculations required for these drawings shall be based on the ultimate number of frames that the office will require.

5.04 Although No. 4 Type Critical Lead Drawings are originated and calculated for ultimate number of frames required, the lengths associated with them must be reviewed on every order for possible new equipment design and/or equipment rearrangements not included in the original calculations.

5.05 In offices with "L4" Carrier Repeater and "L" Multiplex Systems, originate a separate Central Office Record Drawing establishing a record of critical lengths and cable balancing information regardless of the size of the drawing required.

5.06 Records of Critical Lead lengths (with all types of central office equipment) shall be created when those lengths are compensated for by the use of "heavier-than-normal-gauge" cable. When required, add a tabular record of the exceeded critical lengths and the appropriate gauges of cable on the Floor Plan drawing for each floor of equipment requiring a critical lead record in accordance with the preceding and subsequent information. When it is deemed necessary because of future needs, it is recommended that this table also be originated for all critical lengths in this category when critical lengths have not been exceeded, (see Figure 1).

5.07 This tabular record shall also be established when the ultimates for certain critical lengths cannot be ascertained and an interim calculation is made. When this is the case, add the Critical Lead run in the table as illustrated by Figure 1 with the present calculation. Also add a notation under the remarks column similar to the following:

"THIS RUN MUST BE RECALCULATED WHEN FRAME _____ IS ADDED."

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1-5/8	1-5/8	3/4	3/4	3/4	1/2	3/4	3/4	1/2	2-1/2
OM-0	OSL(VIA TLC)	SSO-9	25.00	875	24	22 88	800	24	WHEN OSL-15 IS ADDED, RECALCULATE THE CRITICAL LENGTH
OM-1	RRD103.01 (VIA MDF)	T,R,S, S1	14 00	4 89	24	11.73	410	24	CARRIER GROUP ALARM
TS-1	TM-3(VIA MC)	-	2 86	100	24	2 67	150	22	
0-3	OM-2	-	7 436	260	24	7.12	400	22	
MDF 0101 V1	L-1	T,R,S	17 16	600	24	.12 46	700	22	
BR-5	L-7(VIA LDF)	-	4.576	160	24	4.536	90 110	24 22	RUN CONSISTS OF 24GA BR-5 TO LDF 0102 22GA LDF 0102 V5 TO V7
FROM	TO	LEAD DESIG	MAX R IN OHM	MAX STD LG IN FT	STD GA	ACTUAL R IN CHM	ACTUAL LG IN FT.	GA USED	REMARKS

3/4 1/4

TABLE NO.6 CRITICAL LENGTHS - GUAGE OF CABLE REQUIRED

FIGURE 1
CRITICAL LEAD LENGTH TABLE

5.08 The previously mentioned tabular record is intended to supplement, not replace, information of this type that is placed on other Central Office Records.

5.09 In essence, SPCS Critical lengths are based on a time-distance factor. When this time factor is violated by too long a cable length, the corrective action is to reassign, reroute the cables and/or rearrange equipment and frames in accordance with the applicable technical publication. When necessary, the information is recorded on the appropriate circuit record.

5.10 When critical lengths in SPCS type offices can be corrected with heavier gauge cable, add a table similar to that shown in Figure 1 on the Floor Plan Drawing. Show only those critical lengths that have been exceeded or that will require future recalculation because ultimates cannot be ascertained at the time the original calculation is made.

5.11 When needed, additional information such as cable codes, options, vintages of equipment, etc., may be placed in the column of the table titled "Remarks".

6.00 SPECIFIC DRAWING STANDARDS

6.01 New or changed Drawing Standards shall be applied to all new and redrawn Critical Lead Drawings.

6.02 The Critical Lead Drawing associated with 4A Toll Crossbar® Offices shall be comprised of the following tables when office conditions warrant their use. The letters shown in brackets correspond to the tables used on the associated drawing aid. The letter assignments were rearranged basically for the clarity of this instruction. However, it is recommended that they be retained and also applied to the Central Office Critical Lead Record Drawing. All succeeding instructions and illustrations utilize our letter assignments rather than those shown on the aid with the exception of those that have not been changed as indicated by the absence of a letter in brackets.

A. Table A - Composite Critical Lead Table for all leads other than those that are part of electronic translation

B. Table B [D] - Composite Critical Lead Table for all leads that are a part of electronic translation

C. Table C [E] - Supplemental Table for Sender Link Multiple

D. Table D [G] - Supplemental Table for Outgoing Link Multiple

E. Table E [J] - Supplemental Table for Decoder Connector Multiple

F. Table F [L] - Supplemental Table for Link Controller Multiple

G. Table G [K] - Supplemental Table for Marker Multiple

H. Table H [M] - Supplemental Table for Incoming Sender Multiple

I. Table J - Supplemental Table for Sender Link Multiple for Link Cont. and Conn.

J. Table K [F] - Supplemental Table for Incoming Link Multiple

K. Table L [H] - Supplemental Table for Block Relay Multiple

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6.03 The preceding tables shall be completed in accordance with the associated Drafting Aid or tracing form and the information related herein. Also see Exhibit 1.

6.04 As previously stated, Table A is a composite table recording Critical Lead information for all Critical Runs in the office other than those associated with electronic translation.

6.05 Tables C through L are supplemental tables that serve as work sheets as well as permanent records. They are comprised of various computations that are made as a part of or as an entire Critical Run. The selected completed information is then included in Table A.

6.06 Table A will always be required to some extent on the No. 4 Toll Crossbar® Central Office Critical Lead Record Drawing. The exact extent is determined by the following information. Also see Exhibit 1.

A. Eliminate all information shown on the Drafting Aid, except that information that is presently required or definitely needed for future records.

B. In some cases, Critical Lead Runs are identical in so far as their general component parts are concerned. When this is so, select the longest run and retain this Critical Lead Run as a permanent record representative of all similar runs in this category. Examples of these representative Critical Lead Runs are shown on Exhibit 1 for the Marker to Incoming Link and also for the Marker to Outgoing Link Runs.

C. However, when a Critical Lead Run in the category described by the preceding item is exceeded and the gauge of cable must be changed, then one run may not be representative. It is then necessary to record as many runs as required to clearly illustrate the gauges or cable required for all Critical Lead Runs involved in the particular category.

D. It should be noted that the use of the term "Representative Run" referred to in the preceding two items is applicable to each train in the office. That is, there must be at least one representative run for the intertoll train and at least one representative run for the toll completing train.

E. Eliminate all office features that are not required from the Critical Lead Central Office Record Drawing.

6.07 Tables C through L shall always appear on the No. 4 Toll Crossbar® Central Office Critical Lead Record Drawing. However, it is not necessary to retain as a permanent record all the information that is possible to compute and record in all of these tables. As a general rule, compute all the information that is required for an ultimate office and provide sufficient computations as permanent records to enable an accurate supplemental calculation or recalculation at a future date.

6.08 Specifically, Tables C, E, F, G and L should be completed in their entirety and always retained as a permanent record. Tables D, H and J shall be computed and retained in accordance with the information specified in the preceding paragraph.

6.09 Table B pertains to Electronic Translation and shall be completed in its entirety only when the requirement specified on the associated aid is exceeded. When the requirement is not exceeded, complete and retain as a permanent record only that portion of Table B shown on Exhibit 1.

6.10 As previously related under the paragraph titled Criteria, the Critical Lead and cable balancing information associated with "L" Multiplex and "L4" Carrier Repeater shall be shown on a separate Critical Lead Central Office Record Drawing in tabular form.

6.11 When required, "L" Multiplex Equipment shall be shown in Table A, (see Exhibit 2 for a typical table).

6.12 When "L4" Carrier Repeater Information is required, show this information in Table B located on the same Critical Lead Drawing recording the "L" Multiplex Equipment (Table A). See Exhibit 3.

6.13 Obtain the cable information associated with interconnection and Cable Requirement Drawing and complete the tables required in accordance with the previously mentioned Exhibits and as covered by the following paragraphs.

6.14 The "L" Multiplex Table A is a composite table incorporating all types of multiplex and all issue changes. The following provides general rules governing the format. Also see Exhibit 2.

A. Distinguish different issue changes by drawing a line completely across the drawing directly under the information pertaining to the respective issue.

B. All other lines shall be added as required to separate and identify the specific differences of information properly cross referenced.

C. Where related information is common, show only once in the middle of a block. In addition, where certain information is common but is part of different lines of information, a ladder may be drawn for that portion of information that is common to all lines of information.

6.15 The "L4" Carrier Repeater Table B is also a composite table incorporating various types of repeaters and all issue changes. Rules of formatting shall be the same as those related in the previous paragraph for Table A. Also see Exhibit 3.

FEET	R 26GA	R 24GA	R 22GA	R 20GA	R 19GA
5	.204	0.143	0.089	0.0565	0.4494
10	.4080	0.286	0.178	0.113	0.08988
15	.6120	0.43	0.27	0.17	0.13
20	.8160	0.57	0.36	0.23	0.18
25	1.02	0.72	0.45	0.28	0.22
30	1.23	0.86	0.53	0.34	0.27
35	1.43	1.00	0.62	0.40	0.31
40	1.64	1.14	0.71	0.45	0.36
45	1.84	1.29	0.80	0.51	0.40
50	2.04	1.43	0.89	0.57	0.45
55	2.25	1.57	0.98	0.62	0.49
60	2.45	1.72	1.07	0.68	0.54
65	2.66	1.86	1.16	0.73	0.58
70	2.86	2.00	1.25	0.79	0.63
75	3.06	2.15	1.34	0.85	0.67
80	3.27	2.29	1.42	0.90	0.72
85	3.47	2.43	1.51	0.96	0.76
90	3.68	2.57	1.60	1.02	0.81
95	3.88	2.72	1.69	1.07	0.85
100	4.08	2.86	1.78	1.13	0.90
105	4.29	3.00	1.87	1.19	0.94
110	4.49	3.15	1.96	1.24	0.99
115	4.70	3.29	2.05	1.30	1.03
120	4.90	3.43	2.14	1.37	1.08
125	5.10	3.58	2.23	1.42	1.12
130	5.31	3.72	2.31	1.49	1.17
135	5.51	3.86	2.40	1.54	1.21
140	5.72	4.00	2.49	1.59	1.26
145	5.92	4.15	2.58	1.65	1.30
150	6.12	4.29	2.67	1.71	1.35
155	6.33	4.43	2.76	1.76	1.39
160	6.53	4.58	2.85	1.82	1.44
165	6.74	4.72	2.94	1.87	1.48
170	6.94	4.86	3.03	1.93	1.53
175	7.14	5.00	3.12	1.99	1.57

FIGURE 2
CRITICAL LEAD RESISTANCE TABLE
(PAGE 1 OF 3)

FEET	R 26GA	R 24GA	R 22GA	R 20GA	R 19GA
180	7.35	5.15	3.20	2.04	1.62
185	7.55	5.29	3.29	2.10	1.66
190	7.76	5.43	3.38	2.16	1.71
195	7.96	5.58	3.47	2.21	1.75
200	8.16	5.72	3.56	2.27	1.80
205	8.37	5.86	3.65	2.33	1.84
210	8.57	6.00	3.74	2.38	1.89
215	8.78	6.15	3.83	2.44	1.93
220	8.98	6.29	3.92	2.50	1.98
225	9.18	6.44	4.00	2.55	2.02
230	9.39	6.58	4.09	2.61	2.07
235	9.59	6.72	4.18	2.67	2.11
240	9.80	6.86	4.27	2.72	2.16
245	10.00	7.00	4.36	2.78	2.20
250	10.20	7.15	4.45	2.84	2.25
255	10.41	7.29	4.54	2.89	2.29
260	10.61	7.44	4.63	2.95	2.34
265	10.82	7.58	4.72	3.00	2.38
270	11.02	7.72	4.81	3.06	2.43
275	11.22	7.86	4.90	3.12	2.47
280	11.43	8.00	4.98	3.17	2.52
285	11.63	8.15	5.07	3.23	2.56
290	11.84	8.29	5.16	3.29	2.61
295	12.04	8.44	5.25	3.34	2.65
300	12.24	8.58	5.34	3.40	2.70
305	12.45	8.72	5.43	3.46	2.74
310	12.65	8.86	5.52	3.51	2.79
315	12.86	9.00	5.61	3.57	2.83
320	13.06	9.15	5.70	3.63	2.88
325	13.26	9.29	5.79	3.68	2.92
330	13.47	9.44	5.87	3.74	2.97
335	13.67	9.58	5.96	3.80	3.01
340	13.88	9.72	6.05	3.85	3.06
345	14.08	9.86	6.14	3.91	3.10
350	14.28	10.00	6.23	3.97	3.15

FIGURE 2
CRITICAL LEAD RESISTANCE TABLE
(PAGE 2 OF 3)

FEET	R 26GA	R 24GA	R 22GA	R 20GA	R 19GA
355	14.49	10.16	6.32	4.03	3.20
360	14.69	10.30	6.41	4.09	3.25
365	14.90	10.44	6.50	4.14	3.30
370	15.10	10.59	6.59	4.20	3.34
375	15.30	10.73	6.68	4.26	3.39
380	15.51	10.87	6.77	4.31	3.43
385	15.71	11.02	6.86	4.37	3.48
390	15.92	11.16	6.95	4.42	3.52
395	16.12	11.30	7.04	4.47	3.55
400	16.32	11.44	7.12	4.52	3.60
405	16.53	11.59	7.21	4.60	3.66
410	16.73	11.73	7.30	4.65	3.70
415	16.94	11.87	7.39	4.70	3.75
420	17.14	12.02	7.48	4.76	3.79
425	17.34	12.16	7.57	4.81	3.84
430	17.55	12.30	7.66	4.88	3.88
435	17.75	12.45	7.75	4.93	3.93
440	17.96	12.59	7.84	4.98	3.97
445	18.16	12.73	7.93	5.04	4.01
450	18.36	12.87	8.00	5.09	4.05
455	18.57	13.02	8.09	5.16	4.10
460	18.77	13.16	8.18	5.21	4.15
465	18.98	13.31	8.27	5.27	4.19
470	19.18	13.46	8.36	5.33	4.24
475	19.38	13.60	8.45	5.39	4.28
480	19.59	13.74	8.54	5.43	4.33
485	19.79	13.89	8.63	5.49	4.38
490	20.00	14.03	8.72	5.55	4.42
495	20.20	14.17	8.81	5.60	4.46
500	20.40	14.30	8.90	5.65	4.50

FIGURE 2
CRITICAL LEAD RESISTANCE TABLE
(PAGE 3 OF 3)

TABLE A COMPUTED													
LINE	RUN	TITLE			LEAD DESIG	CA DESIG	FROM FRAME	FROM FLOOR	FROM LOC	TO FRAME	TO FLOOR	TO LOC
009	2A1	MKR	INTOL	MULT 4	LS,SS		MIT-0	7		ITI-0	7	
010		TO					ITB			ITI(MULT)		TABLE K
011		INC										
012		LK										
017	2B1	MKR	TOLL COMPL	MULT 4	LS,SS		MTC-0	7		TCI-0	7	
018		TO					TCI			TCI(MULT)		TABLE K
019		INC										
020		LK										
027		MKR	INTOL	MULT 4	LS,SS		MIT-0	7		ITO-10		
		TO				D6	ITO			ITO(MULT)		TABLE D
		OG										
		LK										
035	2D2	MKR	TOLL COMPL	MULT 4	LS,SS		MTC-0	7		TCO-10		
036		TO				D6	TCO			TCO(MULT)		TABLE D
037		OG										
038		LK										
047	2F	MKR TO INC LK VIA DC AND SL (NON-CAMA)	INTOL	MFSL	SMC,SMI		MIT-0	7		DC-0	7	
048							DC			DC (MULT)		TABLE E
049							DC(LAST)	7	DC 13	MFSL 127	6	
050							MFSL			MFSL(MULT)		TABLE C
051							MFSL 127	6		TDF 0601	6	V1
052							ITI-10	7		TDF 0601	6	V1
065	2L1	INC LK, MKR, TST (NON-CAMA)			SMI,SMC		TOTAL LINES 047 & 048 & 052)					
066							ADDIT-0	5		TDF 06	6	V1
067							ADDIT-0	5		DC-0	6	
068	2M	MKR TO OG LK VIA BLK REL ADF AND ASGN PATCH	INTOL		SM	TBD	MIT-0	7		ITB-0	7	
069							ITB			ITB (MULT)		TABLE L
070							ITB-0	7		ADF 0602	6	V1
071							RR0577.03	5	PTCH JK	"	"	"
072							RR0577.03	5	PTCH JK	"	"	"
073							ITO-10			"	"	V5
097	2U	TBL RCD AND MKR MULT	INTOL		BW		TRCD-0	7		MIT-0	7	
098							MIT			MIT (MULT)		TABLE G
099	2V		TOLL COMPL				TRCD-0	7		MTC-0	7	
100							MTC			MTC(MULT)		TABLE G
COL	A	B			C	D	E	F	G	H	J	K

EXHIBIT 1
TYPICAL NO. 4 CROSSBAR® EQUIPMENT DESIGNATIONS
(PAGE 1 OF 6)

No. 4 Crossbar® is a Registered Trademark of AT&T Technologies, Inc.

LEAD LIMITATIONS

CABLE GUAGE	RUN LENGTH	CALC RES	TOTAL RUN	LENGTH MAX	LENGTH ACTUAL	RESISTANCE MAX	RESISTANCE ACTUAL	REMARKS
24	44	1.28		350	249	10.0	7.14	LONGEST RUN SHOWN MULTS 1,2 AND 3 ALSO DO NOT EXCEED CRITICAL LENGTH.
"	205	5.86						
24	106	3.07		350	311	10.0	8.93	LONGEST RUN SHOWN MULTS 1,2 AND 3 ALSO DO NOT EXCEED CRITICAL LENGTH.
"	205	5.86						
24	127	3.68		350	327	10.0	9.40	LONGEST RUN SHOWN MULTS 1,2 AND 3 ALSO DO NOT EXCEED CRITICAL LENGTH.
"	200	5.72						
24	84	2.4		350	294	10.0	8.4	LONGEST RUN SHOWN MULTS 1,2 AND 3 ALSO DO NOT EXCEED CRITICAL LENGTH.
"	210	6.0						
24	84	2.37		1400	1095	40.0	27.53	
22	362	6.6						
24	95	2.72						
"	209	5.97						
"	215	6.15						
"	130	3.72						
24	576	16.47		1400	906	40.0	25.91	
"	180	5.15						
"	150	4.29						
"	50	1.43		1400	805	40.0	19.57	
"	140	4.00						
"	125	3.58						
22	160	2.85						
22	160	2.85						
24	170	4.86						
22	85	1.51		230	2.56	6.5	6.41	
24	171	4.9						
22	60	1.07		230	231	6.5	5.97	
24	171	4.9						
L	M	N	P	R	S	T	U	V

EXHIBIT 1
TYPICAL NO. 4 CROSSBAR® EQUIPMENT DESIGNATIONS
(PAGE 2 OF 6)

No. 4 Crossbar® is a Registered Trademark of AT&T Technologies, Inc.

TABLE A (CONTINUED)

LINE	RUN	TITLE		LEAD DESIG	CA DESIG	FROM FRAME	FROM FLOOR	FROM LOC	TO FRAME	TO FLOOR	TO LOC
258	2BT	LINK CONT CONN NON-CAMA		HA 0,1,2		LCC	7		LCC (MULT)		TABLE J
259				HB 0,1,2		LCC-14	"		MFSL	7	GR H
260						MFSL	"	GR H	MFSL (MULT.)		TABLE C
284	3M1	INC SDR TST NON-CAMA	MULT 1	KT,KR KT1,KR1	A28	MFS-0	7		ISRT-0	7	
285						MFS	"		MFS(MULT)		TABLE H
286	3M2		MULT 2		A28	MFS-33	"		ISRT-0	7	
287						MFS	"		MFS(MULT)		TABLE H
288	3M3		MULT 3		A28	MFS-66	"		ISRT-0	7	
289						MFS	"		MFS(MULT)		TABLE H
290	3M4		MULT 4		A28	MFS-99	"		ISRT-0	7	
291						MFS	"		MFS(MULT)		TABLE H
292	3M5		MULT 5		A28						
293											
294	3M6		MULT 6		A28						
295											
434	D	ETS REQUIREMENTS TABLE B									
435	D1	MKR CONN TO DR CONN	NON-CAMA	MU-9		MC-0	7		DC-0	7	
436						DC	7		DC(MULT)		TABLE E
437											
438											
439											
440											
441	D4	DREG TO MKR	INTOL	TC0-29		DREG-0	7		MIT-0	7	
442						MIT	"		MIT(MULT)		TABLE G
443	D5			TB 0,1,2 4,7		DREG-0	"		MIT-0	7	
444						MIT	"		MIT(MULT)		TABLE G
445	D6		TOLL COMPL	TC 0-29		DREG-4	"		MTC-0	7	
446						MTC	"		MTC(MULT)		TABLE G
447	D7			TB 0,1,2, 4,7		DREG-4	"		MTC-0	7	
448						MTC	"		MTC(MULT)		TABLE G
449	D	DREG TO DR CHAN		TCG	R21	DREG-4	"		DCH-0	7	
COL	A	B		C	D	E	F	G	H	J	K

EXHIBIT 1
TYPICAL NO. 4 CROSSBAR® EQUIPMENT DESIGNATIONS
(PAGE 3 OF 6)

No. 4 Crossbar® is a Registered Trademark of AT&T Technologies, Inc.

COMPUTED LEAD LIMITATIONS

CABLE GUAGE	RUN LENGTH	CALC R	TOTAL RUN	LENGTH MAX	LENGTH ACTUAL	RESISTANCE MAX	RESISTANCE ACTUAL	REMARKS
24	188	5.37						LCC MULT CALCULATED FOR ULTIMATE LONGEST LENGTH RECALCULATE IF THERE ARE ANY CHANGES TO FRAME LAYOUT.
"	60	1.72						
"	209	5.97		700	457	20.0	13.06	
24	50	1.43		.560	547	16.0	15 65	WHEN MFS FRAME 129 IS ADDED RUN NEW CABLE AND CALCULATE MULTIPLE.
"	497	14.22						
"	75	2.15		560	547	16.0	15.65	
"	472	13.50						
"	100	2.86		560	552	16.0	15.79	
"	452	12.93						
"	125	3.58		560	549	16.0	15.70	
"	424	12.12						
				560				
				560				
24	60	1.72		350	422	10.0	8.32	
22	362	6.6						
24	60	1.72		1050	231	30.0	66	
"	171	4.89						
"	60	1.72		1400	231	40.0	66	
"	171	4.89						
"	80	2.29		1050	251	30.0	7.18	
"	171	4.89						
"	80	2.29		1400	251	40.0	7.18	
"	171	4.89						
"	55	1.57		350	55	10.0	1.57	
L	M	N	O	R	S	T	U	V

EXHIBIT 1
TYPICAL NO. 4 CROSSBAR® EQUIPMENT DESIGNATIONS
(PAGE 4 OF 6)

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TABLE C (SENDER LINK MULTIPLE)

LEGEND — SWITCHBOARD CABLE ARRANGEMENT
(K) KEY FRAME INTRA BAY CABLE UNLESS OTHERWISE INDICATED INCLUDE 15 FT LEFT UPRIGHT FOR CABLE ENTRANCE IN FRAME.

FRAME TYPE	GROUP	SENDER LINK GROUP ARRANGEMENT								LONGEST COMPUTED KEY FRAME MULT (TRANSFER TO RUN TABLE A)		
		FRAME	CA	FRAME	CA	FRAME	CA	FRAME	CA	FRAME	FT	RES
MF	A	(K) 0	●	(K) 1	●	(K) 2	●	(K) 3	●	(K) MULTIPLE	32	.92
		4	●	5	●	6	●	7	●			
		8	●	9	●	10	●	11	●		142	4.1
		12	●	13	●	14	●	15	●	TOTAL	176	5.02
	B	(K) 16	●	(K) 17	●	(K) 18	●	(K) 19	●	(K) MULTIPLE	32	.92
		20	●	21	●	22	●	23	●			
		24	●	25	●	26	●	27	●		150	4.29
		28	●	29	●	30	●	31	●	TOTAL	182	5.21
	(H)	(K)112	●	(K)113	●	(K)114	●	(K)115	●	(K) MULTIPLE	32	.92
		116	●	117	●	118	●	119	●			
		120	●	121	●	122	●	123	●		177	5.05
		124	●	125	●	126	●	127	●		209	5.97

TABLE D (OUTGOING LINK MULTIPLE)
(CA ENTRANCE TO FRAME 3FT DROP CTR UPRIGHT BASIC FRAME)

ITO MULTIPLE						TCO MULTIPLE					
MULT	FROM	TO	CA LG IN FT	TOTAL MATE SET CA LENGTH	RES	MULT	FROM	TO	CA LG IN FT	TOTAL MATE SET CA LENGTH	RES
1	0	1	15			1	0	1	15		
	1	2	15				1	2	15		
	2	3	20				2	3	20		
	3	4	15				3	4	15		
	4	5	15				4	5	15		
	5	6	20				5	6	15		
	6	7	15				6	7	20		
	7	8	15				7	8	15		
	8	9	20	150	4.29		8	9	15	145	4.15
	PR FR MULT		40	190	5.43		PR FR MULT		40	185	5.29
2	10	11	15			2	10	11	15		
	PR FR MULT		40	190	5.43		PR FR MULT		40	190	5.43
3	20	21	15			3	20	21	15		
	PR FR MULT		40	200	5.72		PR FR MULT		40	195	5.58
4	30	31	15			4	30	31	15		
	31	32	15				31	32	15		
	38	39	20	160	4.58		38	39	15	170	4.86
	PR FR MULT		40	200	5.72		PR FR MULT		40	2.10	6.00
BET MULTS	9	10	30			BET MULTS	9	10	30	90	2.57
	19	20	30				19	20	30		
	29	30	30	90	2.57		29	30	30		
	GRAND TOTAL			870	24.87					870	24.87

TABLE E
DECODED CONNECTOR MULTIPLE

DC MULTIPLE			SDC MULTIPLE		
FROM	TO	CA LG IN FT	FROM	TO	CA LG IN FT
0	1	25	0,1	2,3	37
1	2	31	2,3	4,5	39
2	3	25	4,5	6,7	25
3	4	33	6,7	8,9	29
4	5	25	8,9	10,11	35
5	6	35	10,11	12,13	35
6	7	25			
7	8	38			
8	9	25			
9	10	"	TOTAL LENGTH		200
10	11	"	TOTAL RES		5.72
11	12	"	GUAGE		24
12	13	"			
TOTAL LENGTH		362			
TOTAL RES		6.6			
GUAGE		22			

TABLE F
LINK CONTROLLER MULTIPLE

ASSOC SDR LK GROUP	FROM FRAME	TO FRAME	TOTAL CABLE LG IN FT	GUAGE	RES
A	0	1	62	24	1.78
B	2	3	38	"	1.08
C	4	5	38	"	1.08
D	6	7	62	"	1.78
E	8	9	38	"	1.08
F	10	11	62	"	1.78
G	12	13	38	"	1.08
H	14	15	46	"	1.32
J	16	17	38	"	1.06
K	18	19	38	"	1.08
L	20	21	62	"	1.78
M	22	23	46	"	1.32

TABLE G
MARKER MULTIPLE

MIT		CA LG	MTC		CA LG
FROM	TO	IN FT	FROM	TO	IN FT
0	1	19	0	1	19
1	2	"	1	2	"
2	3	"	2	3	"
3	4	"	3	4	"
4	5	"	4	5	"
5	6	"	5	6	"
6	7	"	6	7	"
7	8	"	7	8	"
8	9	"	8	9	"
TOTAL LENGTH		171	TOTAL LENGTH		171
TOTAL RES		4.89	TOTAL RES		4.89

EXHIBIT 1
TYPICAL NO. 4 CROSSBAR® EQUIPMENT DESIGNATIONS
(PAGE 5 OF 6)

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TABLE H CONTINUED

3RD MULTIPLE			4TH MULTIPLE			4TH MULTIPLE			4TH MULTIPLE		
MFS	MFS	FT	MFS	MFS	FT	MFS	MFS	FT	MFS	MFS	FT
86	87	14	99	100	14	113	114	14	127	128	14
87	88	"	100	101	"	114	115	20			
88	89	"	101	102	"	115	116	14			
89	90	"	102	103	20	116	117	"			
90	91	"	103	104	14	117	118	"			
91	92	"	104	105	"	118	119	"			
92	93	"	105	106	"	119	120	"			
93	94	"	106	107	"	120	121	"			
94	95	20	107	108	"	121	122	"			
95	96	14	108	109	"	122	123	"			
96	97	"	109	110	"	123	124	"			
97	98	"	110	111	20	124	125	"			
			111	112	14	125	126	"			
			112	113	14	126	127	"			
TOTAL FT		852							TOTAL FT		424
TOTAL RES		1293							TOTAL RES		12.12

TABLE J
SDR LINK MULTIPLE FOR LCC (CONT AND CONN)

GROUP A MF SDR LKS			GROUP B MF SDR LKS			GROUP C MF SDR LKS			GROUP D MF SDR LKS			GROUP E MF SDR LKS			GROUP F MF SDR LKS			GROUP G MF SDR LKS			GROUP H MF SDR LKS			GROUP M MF SDR LKS		
FROM	TO	FT	FROM	TO	FT	FROM	TO	FT	FROM	TO	FT	FROM	TO	FT	FROM	TO	FT	FROM	TO	FT	FROM	TO	FT	FROM	TO	FT
0	2	16	16	18	16	32	34	16	48	50	16	64	66	16	80	82	16	96	98	16	112	114	16			
2	4	32	18	20	32	34	36	16	50	52	16	66	68	16	82	84	27	98	100	"	114	116	58			
4	6	16	20	22	16	36	38	27	52	54	32	68	70	32	84	86	16	100	102	"	116	118	16			
6	8	"	22	24	"	38	40	16	54	56	16	70	72	16	86	88	16	102	104	32	118	120	"			
8	10	"	24	26	"	40	42	16	56	58	"	72	74	"	88	90	27	104	106	32	120	122	"			
10	12	"	26	28	32	42	44	32	58	60	"	74	76	"	90	92	16	106	108	16	122	124	"			
12	14	32	28	30	27	44	46	16	60	62	32	76	78	32	92	94	16	108	110	32	124	126	50			
TOTAL		144	TOTAL		155	TOTAL		139	TOTAL		144	TOTAL		144	TOTAL		134	TOTAL		160	TOTAL		188			

TABLE K (INCOMING LINK MULTIPLE)
(CABLE ENTRANCE TO 3FT DROP LEFT UPRIGHT BASIC FRAME)

ITI MULTIPLE						TCI MULTIPLE					
MULT	FROM	TO	CA LG IN FT	TOTAL MATE SET CA LENGTH	TOTAL MATE SET RES	MULT	FROM	TO	CA LG IN FT	TOTAL MATE SET CA LENGTH	TOTAL MATE SET RES
1	0	1	15			1	0	1	15		
	1	2	"				1	2	"		
	2	3	"				2	3	"		
	3	4	23				3	4	22		
	4	5	15				4	5	15		
	5	6	15				5	6	15		
	6	7	23				6	7	21		
	7	8	15				7	8	15		
	8	9	24	155	4.43		8	9	22	155	4.43
	PR FR MULT		45	200	5.72		PR FR MULT		45	200	5.72
2	10	11	15			2	10	11	15		
	PR FR MULT		45	170	4.86		PR FR MULT		45	170	4.86
3	20	21	18			3	20	21	18		
	PR FR MULT		45	180	5.15		PR FR MULT		45	180	5.15
4	30	31	23			4	30	31	23		
	31	32	15				31	32	15		
	38	39	21	180	5.15		38	39	21	180	5.15
	PR FR MULT		45	205	5.86		PR FR MULT		45	205	5.86
BET MULTS	9	10	30			BET MULTS	9	10	30		
	19	20	30				19	20	30		
	29	30	30	90	2.58		29	30	30	90	2.58
	GRAND TOTAL			860	24.59		GRAND TOTAL			845	24.16

TABLE L
BLOCK RELAY MULTIPLE

1TB			TCB		
FROM	TO	CA LG IN FT	FROM	TO	CA LG IN FT
0	1	14	0	1	14
1	2	"	1	2	"
2	3	"	2	3	"
3	4	21	3	4	21
4	5	14	4	5	14
5	6	"	5	6	"
6	7	"	6	7	"
7	8	21	7	8	21
8	9	14	8	9	14
TOT LG MS		140	TOT LG MS		140
TOT RES MS		4.0	TOT RES MS		4.0
TOT LG SM		140	TOT LG SM		140
TOT RES SM		4.0	TOT RES SM		4.0

EXHIBIT 1
TYPICAL NO. 4 CROSSBAR® EQUIPMENT DESIGNATIONS
(PAGE 6 OF 6)

No. 4 Crossbar® is a Registered Trademark of AT&T Technologies, Inc.

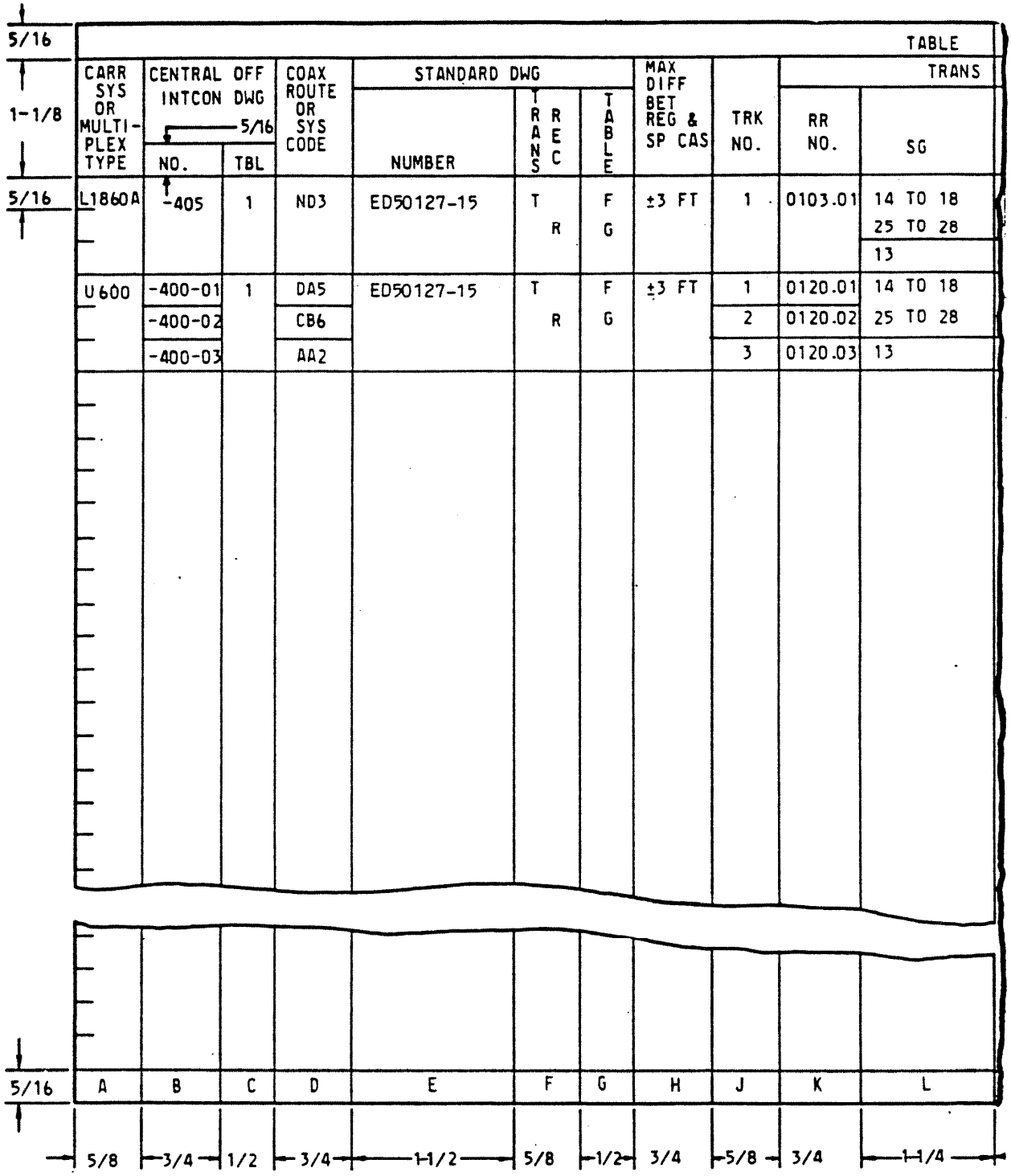
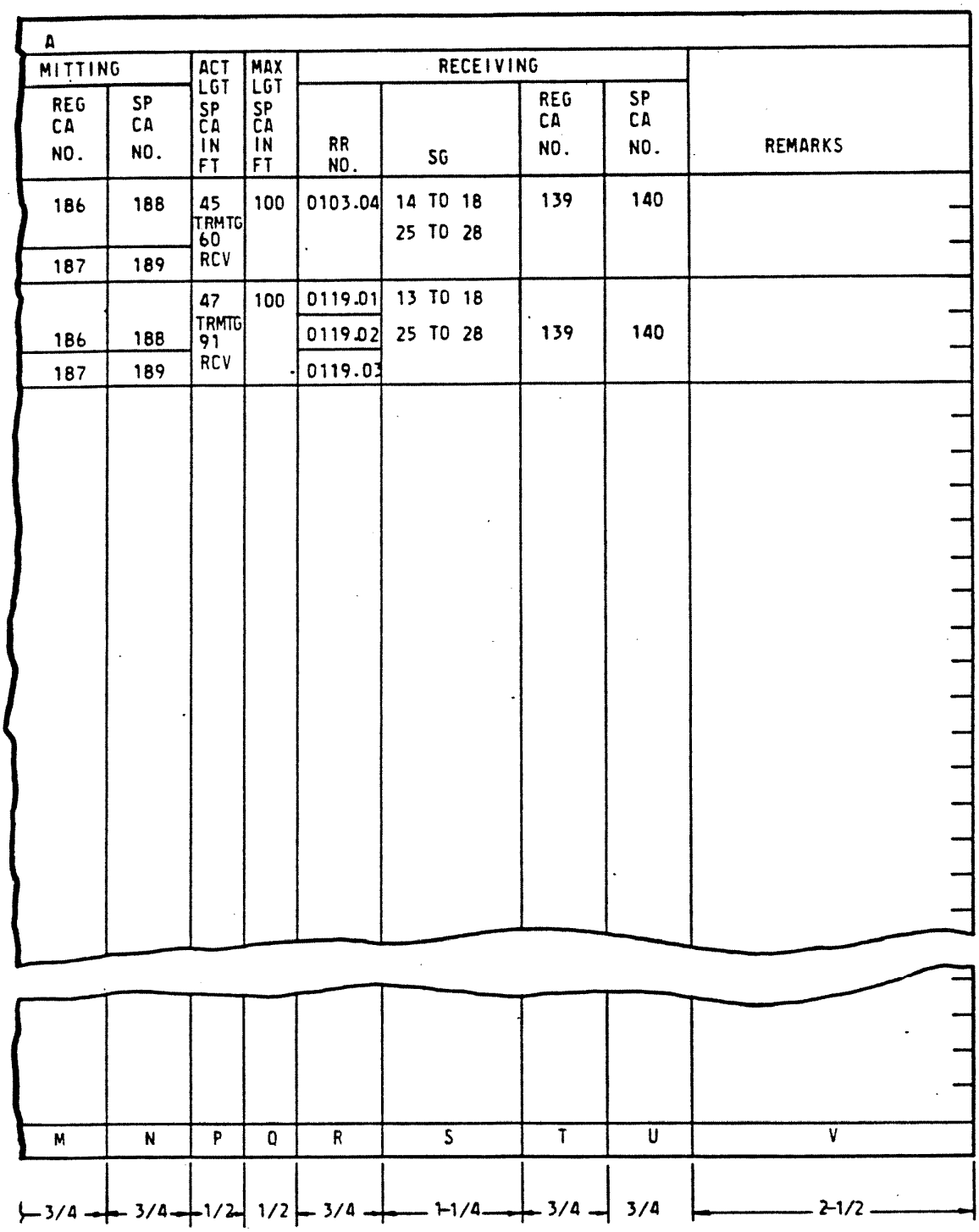


EXHIBIT 2
"L" MULTIPLEX DESIGNATIONS
(PAGE 1 OF 2)



A								
MITTING		ACT LGT SP CA IN FT	MAX LGT SP CA IN FT	RECEIVING				
REG CA NO.	SP CA NO.			RR NO.	SG	REG CA NO.	SP CA NO.	REMARKS
186	188	45 TRMTG 60 RCV	100	0103.04	14 TO 18 25 TO 28	139	140	
187	189							
186	188	47 TRMTG 91 RCV	100	0119.01 0119.02	13 TO 18 25 TO 28	139	140	
187	189			0119.03				
M	N	P	Q	R	S	T	U	V
3/4	3/4	1/2	1/2	3/4	1-1/4	3/4	3/4	2-1/2

EXHIBIT 2
"L" MULTIPLEX DESIGNATIONS
(PAGE 2 OF 2)

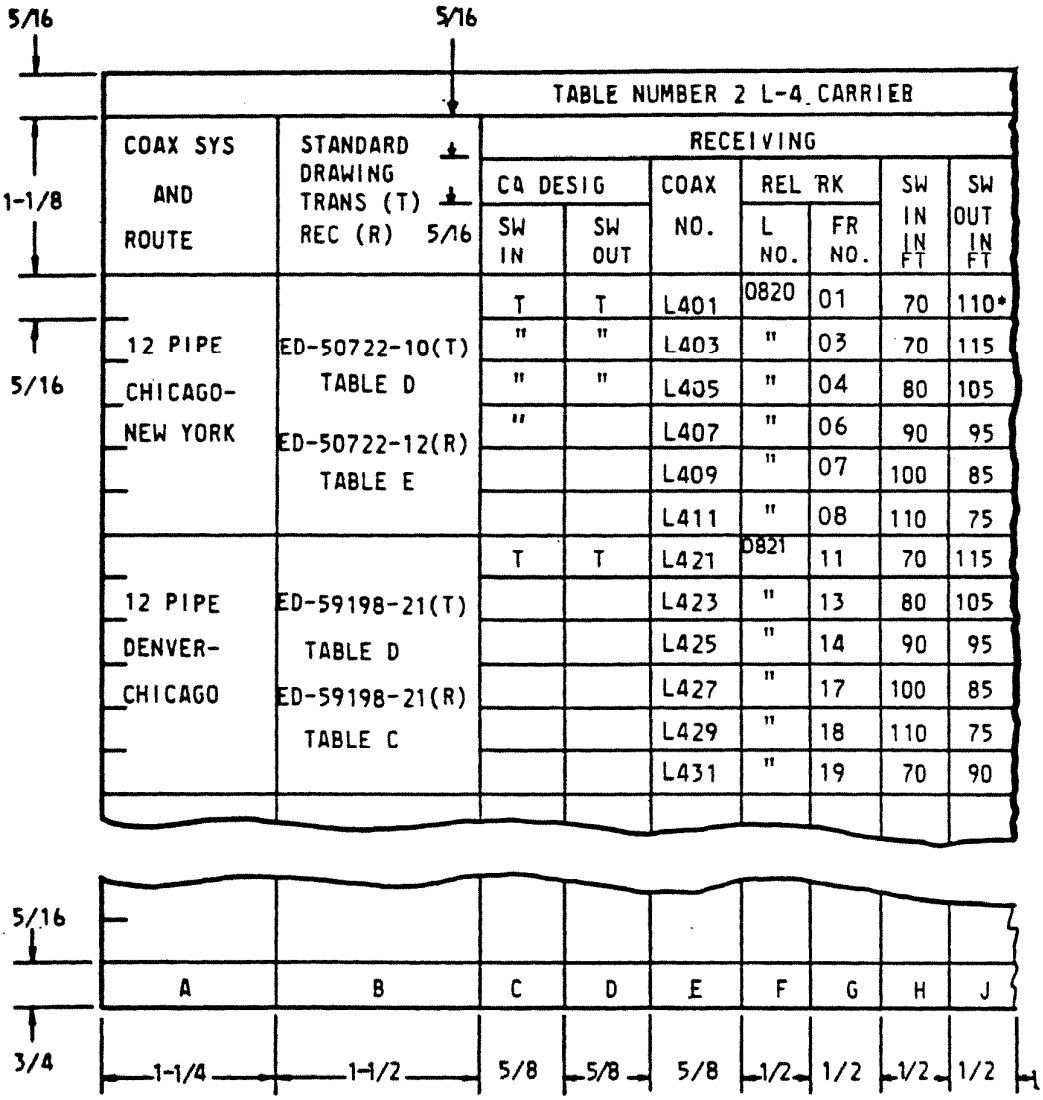


TABLE NUMBER 2 L-4 CARRIER

COAX SYS AND ROUTE	STANDARD DRAWING TRANS (T) REC (R) 5/16	RECEIVING						
		CA DESIG		COAX NO.	REL RK		SW IN IN FT	SW OUT IN FT
		SW IN	SW OUT		L NO.	FR NO.		
12 PIPE CHICAGO-NEW YORK	ED-50722-10(T) TABLE D / ED-50722-12(R) TABLE E	T	T	L401	0820	01	70	110*
		"	"	L403	"	03	70	115
		"	"	L405	"	04	80	105
		"		L407	"	06	90	95
				L409	"	07	100	85
				L411	"	08	110	75
12 PIPE DENVER-CHICAGO	ED-59198-21(T) TABLE D / ED-59198-21(R) TABLE C	T	T	L421	0821	11	70	115
				L423	"	13	80	105
				L425	"	14	90	95
				L427	"	17	100	85
				L429	"	18	110	75
				L431	"	19	70	90

A	B	C	D	E	F	G	H	J
1-1/4	1-1/2	5/8	5/8	5/8	1/2	1/2	1/2	1/2

EXHIBIT 3
"L4" CARRIER REPEATER DESIGNATIONS
(PAGE 1 OF 2)

CRITICAL LEAD REQUIREMENTS

TRANSMITTING							
CA DESIG		COAX NO.	REL RK		SW IN IN FT	SW OUT IN FT	REMARKS
SW IN	SW OUT		L NO.	FR NO.			
DB 68	T	L402	0820	02	80	100*	*THESE RUNS DECREASE BY 10 FT WITH EACH REG ADDED. CONT CONN RR 0820.16 COAX NOS L409 THRU L412 FUT
T		L404	"	"	80		
T		L406	"	05	90		
T		L408	"	"	100		
		L410	"	08	110		
		L412	"	"	120		
T		L4222	0821	12	80		CONT CONN RR 0821.16 COAX NOS L423 THRU L430 FUTURE COAX NO 432 (STB) COAX NO 431 (SP)
		L424	"	"	90		
		L426	"	15	100		
		L428	"	"	110		
		L430	"	19	120		
		L432	"	"	80	80	

K	L	M	N	P	Q	R	S
5/8	5/8	5/8	1/2	1/2	1/2	1/2	2-1/2

EXHIBIT 3
"L4" CARRIER REPEATER DESIGNATIONS
(PAGE 2 OF 2)

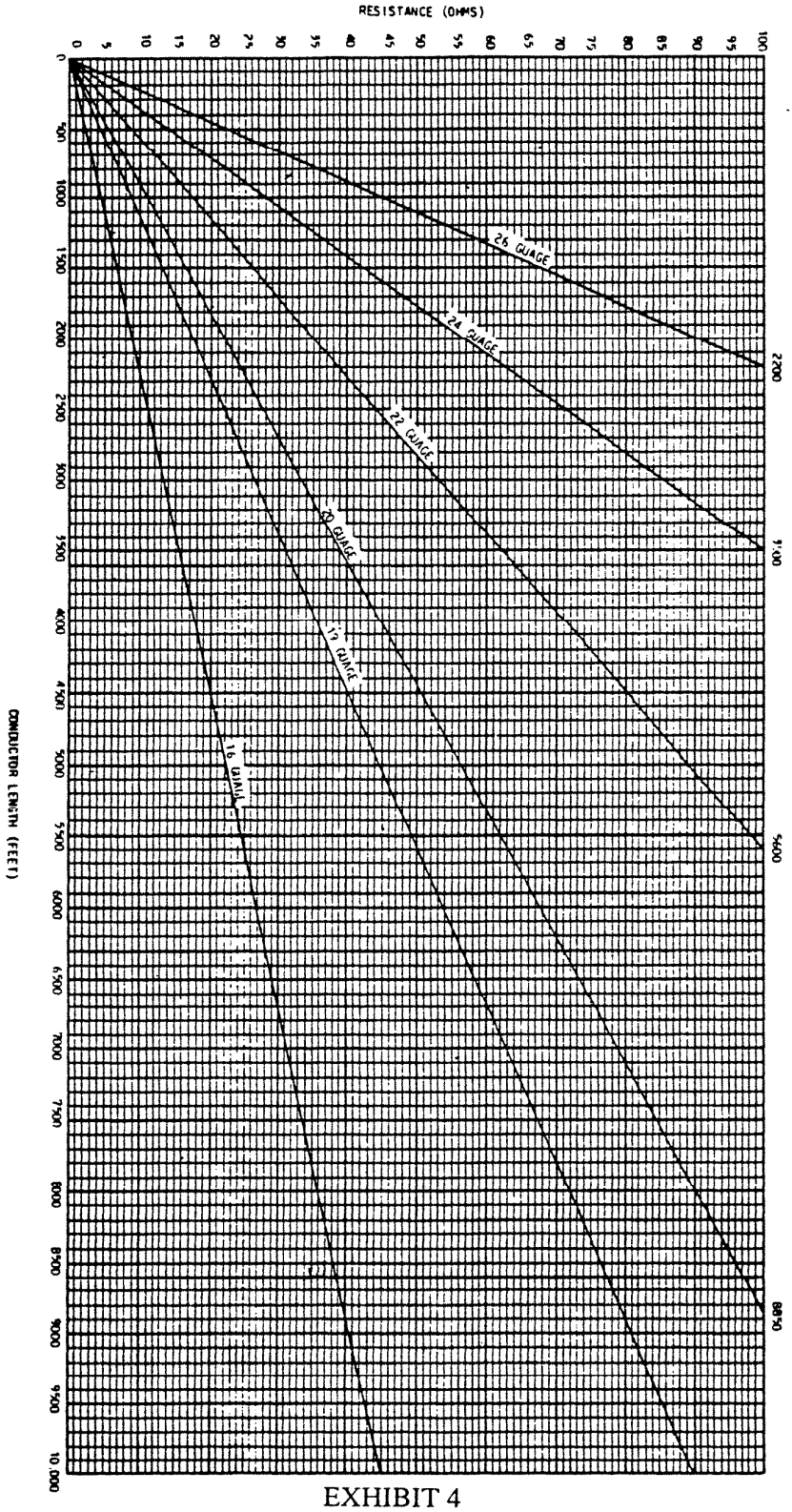


EXHIBIT 4
CRITICAL LENGTH GRAPH

VIEW IN SWITCHBOARD AND FORMED CABLE RECORD

CONTENTS

1.00 GENERAL

1.01 This part covers the standards to be followed in the preparation of Formed Cable Record Drawing for specific Central Office application.

1.02 This drawing shall include detailed information necessary to engineer and install formed cables.

2.00 SCALE

2.01 Linework on this drawing shall provide sufficient space for any 1/8 inch lettering that may be added. It is also necessary to provide a minimum space of 1/16 inch between two parallel lines where no lettering is required and between each dash of a dashed line.

3.00 PEN SIZE

3.01 The following information indicates pen sizes that produce lineweights for the specific application on this drawing.

Pen Size	Application
0	Table (horizontal lines except every 5th line), future cables, dimension lines, multi-separation lines, section and pins.
2	Table (vertical lines and every 5th horizontal line), present cables on pins.

4.00 ISSUE NOTES

4.01 Only a basic Issue Note is required for this drawing. For the elements of a basic Issue Note, see Section III, Part F, Paragraph 2.00.

5.00 CRITERIA

5.01 This drawing is to be originated to establish an informational record of test board, V3 repeater and signaling bay, respective assembly drawings, method of cabling drawings, cable brackets, GRD bar, end guards, junction material and any other necessary data. The following items provide additional information pertaining to when and when not to originate this drawing. Subsequent paragraphs will provide more detailed information covering how and what is to be shown on this drawing. However, for the purposes of this text, all references to switchboard shall also be applied to similarly constructed desks.

5.02 Cable codes and Formed Cable Drawing information shall be determined. This information shall be complete and noncontradictory.

5.03 Proper cable code information may be obtained from the cabling plan and/or wiring diagram of the particular equipment involved from the Cable Form Indices book.

6.00 SPECIFIC DRAWING STANDARDS

6.01 When the arrangement of formed cables installed on relay rack bays cannot be readily determined from cross sections on cable racks, or views on standard method of cabling drawing, and a definite arrangement is required on the vertical upright, a view showing the location of the cables on the bracket and the sequence of numbering shall be shown, (see Exhibit 1).

TABLE D

CABLING PLANS FOR TST & PTCH BOARDS ETC

	R.R.	NO.	CA PLAN	FIG
12A	18B TTBD	0101.01	ED64356-10	1
		0101.02	ED64356-10	2
	17B TTBD	0101.03	ED61580-11	2,2C
	NO. 9 TLG.	0101.04 TO 0101.06	ED71179-10	1
13C	TST BD	0101.08		
	V5 RPTR	0103.04, 0103.05	ED63725-10	1
14S				
COL	A	B	C	D

NOTES

1. FACTORY FORMED, ONE END ONLY
2. IN THE 18B TOLL TESTBOARD ALL CABLES SHALL BE FORMED SIDE BY SIDE ON THE FORMING BOARD

EXHIBIT 1
VIEW IN SWITCHBOARD AND FORMED CABLE RECORD

OFFICE FRAMEWORK RECORD

CONTENTS

1.00 GENERAL

1.01 This part covers the standards to be followed in the preparation of a Framework Record Drawing for specific Central Office application.

1.02 This drawing shall establish a record of basic framework information, excluding "J" - coded framework items, for distributing frames, equipment racks, relay racks and frames used by engineering and installation in a Central Office.

2.00 SCALE

2.01 No scale is required. However, when adding linework to this drawing, it is necessary to provide sufficient space for 1/8 inch lettering that may be required. It is also necessary to retain a minimum space of 1/16 inch, between two parallel lines where no lettering is required and between each dash of a dashed line.

3.00 PEN SIZE

3.01 The following information indicates pen sizes that produce proper lineweights for the specific application on the office framework record drawing.

Pen Size	Application
0	Chart (horizontal lines except every 5th line)
2	Chart (vertical lines and every 5th horizontal line)
3	Chart (border and title block)

4.00 ISSUE NOTES

4.01 Only a basic Issue Note is required for this drawing. For elements of a basic Issue Note, see Section III, Part F, Paragraph 2.00.

5.00 CRITERIA

5.01 The Office Framework Drawing shall be originated in accordance with the following items:

A. In new offices, new floors and building additions where Transmission Products are added, originate an office framework record drawing except as noted in items B, C, D. Include all common system distributing frame information, (see Exhibit 1).

B. In carrier huts containing 355 dial PBX, SXS, TD2 a Framework Record Drawing need not be originated. The framework information, however, shall be recorded in tabular form and placed on the respective Floor Plan Drawing, (see Figure 1).

C. In offices where the preponderance of equipment is Dial and/or Electronic also containing some Transmission Product, an office Framework Record Drawing is only required if the amount of growth of the Transmission Product is sufficient to justify a separate drawing. In all other cases place a Framework Record Table for only the Transmission Product framework and the common system distributing frame or frames on the respective Floor Plan drawing, (see Figure 1).

Manufacturer's Assembly Drawing	1	Manufacturing Cabling Drawing	RR0102.01,0102.02
Manufacturer's Assembly Drawing	7	Manufacturing Cabling Drawing	RR0101.01,0101.02
Manufacturer's Assembly Drawing	8	Manufacturing Cabling Drawing	SWITCH FRAMES 1 TO 3
Manufacturer's Assembly Drawing	1, 5, 6, 50, 51, 55, 56	Manufacturing Cabling Drawing	CDF0202 VERTICALS 1 TO 11
ASSEMBLY DRAWING NO.	LIST OR GROUP	METHOD OF CABLING DWG.	DESCRIPTION

FRAMEWORK AND EQUIPMENT RECORD

TABLE NO. 5

FIGURE 1
TYPICAL FRAMEWORK AND EQUIPMENT RECORD
TABLE FOR USE ON A FLOOR PLAN DRAWING

D. In offices where no Transmission Products are added, it is recommended that a note be added on the Floor Plan with the assembly and group of the common systems distributing frame.

E. In existing offices, originate office framework records in accordance with the preceding, regarding type and amounts of equipment requirement when a new order adds framework. It is not necessary to reconstruct previous framework records.

F. When an office requires hardening material, the existing format will require modification to record this information. Exhibit 1 illustrates the existing format change to show this information. The subsequent paragraphs will detail the method of recording all information on this drawing.

6.00 SPECIFIC DRAWING STANDARDS

6.01 New or revised drawing standards related herein, shall be applied to all new equipment floors, building additions and new buildings. However, where an office Framework Record Drawing exists using an old format, this format may be continued as far as it is logical and economical.

6.02 This drawing shall be comprised of Tables A through G (G only in hardened offices) titled follows:

A. Table A - Composite Framework Schedule

B. Table B - Framework Assembly

C. Table C - Method of Cabling Drawing

D. Table D - Cable Brackets and/or Designation Card Holders

E. Table E - Ground Bar

F. Table F - End Guard

G. Table G - Hardening and/or Junction Material

6.03 These tables shall be completed in accordance with the associated reference drawing and as specified in the following items. Also, see Exhibit 1.

A. Table A contains all the framework information. However, for the purpose of conserving space, parts of the information it contains has been coded. This coded information is detailed in supplementary Tables B through G.

B. The codes used are established by using the letter designation of the supplementary table along with an assigned number. The number is assigned in accordance with its order of use. For example, the table for the assembly drawing covering framework is designated with a letter B. The first framework, assembly drawing and group number, (lowest group number when more than one group is used for the same drawing) is assigned number 1. Thus, B1 becomes the first code in Table B. Code B1 is then appropriately entered in Table A under the assembly drawing column.

C. The remaining supplementary Tables C through F are coded and completed following the same procedures. Codes are assigned as follows: Bay Cabling Plan, Table C, Code: C1, C2, C3, etc.; Cable Bracket, Table D, Code: D1, D2, D3, etc.; Ground Bar Table E, Code: E1, E2, E3, etc.; End Guard, Table F, Code: F1, F2, F3, etc.; Table G Code: G1, G2, G3, etc.

D. The miscellaneous or remarks column of Table A shall contain such information as angle type guard rails, junction details, guard rail closing details and other miscellaneous framework items that does not adapt to inclusion in a separate table.

E. Information for Tables C to F should not be recorded if apparent from the method of cabling drawing.

6.04 In hardened offices, modify Table A by adding a new column G and rearrange the column letter designations for each column. In addition, add a Table G adjacent to Table F. Exhibit 1 illustrates a drawing modified to show this information.

6.05 "J" coded dial or ELECTRONIC frames are not covered on this drawing.

LINE	DESCRIPTION NUMBERING	ASSY DWG	METHOD OF CABLING	CABLE BRKT	GRD BAR	END GUARD	HDN AND JCT	REMARKS	CONT ON LINE
1	RR 1100.1,.7	B2	C1	D1	E1	F1			
	RR 1102.2 TO .6	B1	C1	D1	E2				
	RR 1101.1 TO .10	B3	C1,C2	D1	E2	F1		C1=.1 TO .4;C2=.5 TO .10	
	MDF 1105V 1 TO 26	B4	C3					GD.RL. EXT:V=1-1/2 IN.,H=5 IN.	
5	IDF 1106V 1 TO 31	B5	C4					GD.RL. EXT:V=2-1/2 IN.,H=1-1/2 IN.	
	TDF 1107V 1 TO 10	B6	C5					GD.RL. EXT:H=3-1/2 IN.	
	LF 1 TO 9	B7	C6						10
	SEL 101-4; 401-4;501-4	B9	C8						11
	CONN 1 TO 12	B11	C10						12
10	LF 10 TO 20	B8	C7						
	SEL 105-6; 301-2;505-6	B10	C9						
	CONN 13-24	B8	C11						
	RR 1112.01	B12	C12			F2			
	RR 1112.02	B13	C12			F3			
15	RR 1101.03,.04	B14	C13				G1,G2		
90									
COL	A	B	C	D	E	F	G	H	J

TABLE B
ASSY DWG

CODE	DRAWING	LIST GR
B1	ED91837-71	1
B2	"	2
B3	"	7
B4	ED91006-74	5,21
B5	ED91021-71	10,11
B6	ED30126-73	5
B7	ED30360-70	2
B8	ED31178-30	6
B9	ED30362-71	1
B10	ED31207-30	1
B11	ED30589-70	8
B12	ED63409-50	1
B13	"	6
B90		
COL	AA	AB

TABLE C
BAY CABLING PLAN

CODE	DRAWING	FIG	LEFT RIGHT
C1	ED9224-11	2	L
C2	ED9224-11		
C3	ED91236-01	1,3	
C4	ED30836-02	2	
C5	ED31236-10		
C6	ED30732-11		
C7	ED31251-11		
C8	ED30791-10		
C9	ED30791-13		
C10	ED30780-10,12		
C11	ED30780-13,14		
C12	ED92442-12		
C13	ED30085-10		
C65			
COL	AC	AD	AE

TABLE D
CABLE BRKT

CODE	DRAWING	LIST GRP
D1	ED91235-50	11
D20		
COL	AF	AG

TABLE E
GRD BAR

CODE	DRAWING	LIST, GR
E1	1491276	1,3
E2	"	2,3
E30		
COL	AH	AJ

TABLE F
END GUARD

CODE	DRAWING	LIST, GR
F1	ED91423-71	9,10
F2	ED63409-51	1
F3	"	2
F40		
COL	AK	AL

TABLE G
HARDENING AND/OR JUNCTION MAT

CODE	DRAWING	LIST, GR
G1	ED97724-10	1,6
G2	"	11B
G15		
COL	AM	AN

EXHIBIT 1
OFFICE FRAMEWORK RECORD

MEZZANINE PLATFORM

CONTENTS

1.00 GENERAL

1.01 This part covers the standards to be followed in the preparation of a mezzanine platform for specific Central Office application.

1.02 This drawing shall include detailed information necessary to engineer, manufacture and install a mezzanine platform.

2.00 SCALE

2.01 In general, use 1/4 inch = 1 foot scale to illustrate pertinent building information, protector frames, distributing frames and mezzanine platform assemblies. However, the scale shall not be shown in the title box of the drawing.

2.02 Sketches, details and views need not be drawn to scale when all the necessary dimensions are shown and the requirements specified in the subsequent paragraph are satisfied.

2.03 When adding linework to this drawing, it is necessary to provide sufficient space for 1/8 inch lettering that may be required. It is also necessary to retain a minimum space of 1/16 inch between two parallel lines where no lettering is required and between each dash of a dashed line.

3.00 PEN SIZE

3.01 The following information indicates pen sizes that produce proper lineweights for the specific applications on this drawing.

Pen Size	Application
0	Charts (horizontal lines except every 5th line), protector frames, dimension lines and future mezzanine platform assemblies (bracing, stair and platform assemblies)
2	Charts (vertical lines and every 5th horizontal line), rail assembly symbols, sketches, views and details and ladder to denote repetitive information
3	Present mezzanine platform assemblies (bracing, stair and platform assemblies)

4.00 ISSUE NOTES

4.01 Only a basic Issue Note is required for this drawing. For the elements of a basic Issue Note, see Section III, Part F, Paragraph 2.00.

5.00 CRITERIA

5.01 The Mezzanine Platform Drawing must be originated whenever a Mezzanine Platform is required.

5.02 The Equipment Engineer requests the installation of mezzanine platforms at main distributing and protector frames when frame heights require and ceiling heights permit their installation.

5.03 A typical application is a 19 shelf high distributing frame. The mezzanine platform would split the frame with nine shelves below and nine shelves above, the 10th or middle shelf would remain unoccupied. This criteria would apply to protector frames of commensurate height.

5.04 If not requested by the Equipment Engineer and frame heights appear to warrant the use of a mezzanine platform, the Equipment Engineer shall be contacted to verify that a platform is or is not required.

6.00 ARRANGEMENT OF LAYOUT ON DRAWINGS

6.01 Show only that portion of the building on the drawing necessary to properly locate the mezzanine area.

6.02 In general, with respect to the north direction, show that portion of the building to be shown on this drawing to agree with the floor plan drawing.

6.03 Make allowances for tables and notes and where possible, allow for future growth.

7.00 SPECIFIC DRAWING STANDARDS

7.01 New or changed drawing standards shall be applied to all new and redrawn platform drawings.

7.02 When it is necessary to provide information for manufacturing purposes such as stock list construction and content, details, welded parts, symbols, tables, etc., they shall be shown on the drawing in accordance with the information provided herein.

7.03 Exhibit 1 shows a typical mezzanine platform at a protector and main distributing frame. Refer to this Exhibit and the following explanatory items. Coordinate this information with the preceding information covering pen sizes.

A. Show the interior building wall line, column outlines, and that building information that would affect the mezzanine platform arrangement.

B. Show the present mezzanine platform with a heavier line than the future mezzanine platform. Add an explanatory note similar to Note 1 on Exhibit 1.

C. Show the railing with equal length dash lines. Add an explanatory note similar to Note 2 on Exhibit 1. Railing in future sections of platform are not to be shown until the sections and railing are added.

D. Establish and complete Table 1 as shown in Exhibit 1.

E. Letters A, B, C, etc., shown in Table 1, correspond to hanger rod, railing and bracing assemblies. They are assigned and located on the body of the drawing in accordance with the different groups required and at their respective points of application. Add a definitive note similar to Note 3 on Exhibit 1.

F. Numbers 1, 2, 3, etc., shown in Table 1, correspond to platform assemblies. They are assigned and located on the body of the drawing in accordance with the different groups required and at their respective centers of application. Add a definitive note similar to Note 4 on Exhibit 1.

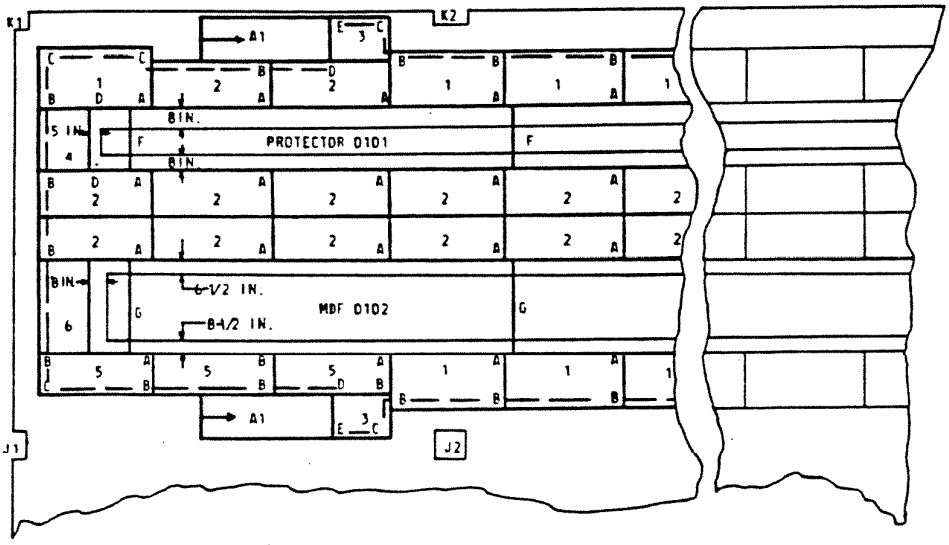
G. Alphanumerics A1, A2, etc., shown in Table Number 1, correspond to stair assemblies. They are assigned and located on the body of the drawing in accordance with the different groups required and at their respective centers of application. Add a definitive note similar to Note 5 on Exhibit 1.

H. Illustrate, with an arrow, the direction of ascent of the stairs from the floor line. Add a definitive note similar to Note 6 on Exhibit 1.

7.04 See Exhibit 1 and any applicable standard drawing for typical notes to be used as required.

8.00 ADDITIONAL RECORD

8.01 In addition to the aforementioned, a record of the platform shall be shown on the floor plan drawing. For an illustration of this record, (see Section V, Part A).



A1	ED90935-30	3	STAIR ASSEM.
6	M592-583	DET 6	
5		5	
4		4	
3		3	
2		2	
1	ED90097-31	1	PLATFORM ASSEM.
G		15	
F		13	BRACING ASSEM.
E		11	
D		6	
C		3	
B		2	RAILING ASSEM.
A	ED90936-71	1	HANGER ROD ASSEM.
DESIG	DRAWING	GR NO.	DESCRIPTION
TABLE NUMBER 1			

NOTES

1. — — — P432000 RAILING ASSEMBLY.
2. LETTERS A,B,C ETC., REFER TO HANGER ROD, RAILING AND BRACE ASSEMBLY GROUPS AS SPECIFIED IN TABLE NUMBER 1. THESE LETTERS ARE LOCATED ON THE DRAWING AT THEIR POINT OF APPLICATION.
3. NUMBERS 1,2,3,-ETC., REFER TO PLATFORM ASSEMBLY GROUPS AS SPECIFIED IN TABLE NUMBER 1. THESE NUMBERS ARE LOCATED ON THE DRAWING AT THEIR CENTERS OF APPLICATION.
4. ALPHA-NUMERICS A1, A2, ETC., REFER TO STAIR ASSEMBLY GROUPS AS SPECIFIED IN TABLE NUMBER 1. THESE ALPHA-NUMERICS ARE LOCATED ON THE DRAWING AT THEIR CENTERS OF APPLICATION.
5. ——→ THE DIRECTION THE STAIRS ASCEND FROM THE FLOOR LINE.
6. FUTURE MEZZANINE PLATFORM PARTS ARE SHOWN BY A LIGHT SOLID LINE.
7. ALL HOLES FOR HANGER RODS, ETC., NOT DRILLED IN PLATFORM ASSEMBLY SHALL BE DRILLED LOCALLY BY THE INSTALLER.
8. LOCATION DIMENSIONS OF MEZZANINE PLATFORM ARE TO THE FINISHED MOULDING LINE.

EXHIBIT 1
MEZZANINE PLATFORM

POWER WIRING LIST AND BLOCK SCHEMATIC

CONTENTS

1.00 GENERAL

1.01 This part covers the standards to be followed in the preparation of the Power Wiring List and Block Schematic Drawing. This drawing establishes a record of all the power plant circuits installed in a particular office. The engineering requirements are identified by the use of the words "shall" or "required". The words "may" or "recommended" highlight optional conditions.

2.00 DEFINITIONS

2.01 The use of the words "standard" and "job" as applied to drawings referred to in this part are considered to mean:

A. "STANDARD" - A circuit or wiring diagram drawing based upon five character ES drawings and numbered beginning with "T" followed by either a five or six character base number, or a drawing whose number begins with ST or H (or any supplier's drawings representing a standard circuit, wiring diagram, configuration, etc.). No reference to the rating of the drawing, A & M, STD, MFR, DISC., etc., is intended.

B. "JOB" - A power circuit drawing showing specific configurations in a particular office when these configurations are not shown on a standard drawing. These drawings will be numbered beginning with "T" followed by the four character base number associated with the particular office.

3.00 SCALE

3.01 Spacing of linework shall accommodate 1/8 inch lettering.

NOTE:
Scale is not required.

4.00 PEN SIZE

4.01 The pen size requirements for the preparation of tabular formats are covered in Section III, Part C, Paragraph 8.00.

4.02 The following pen sizes shall be used, (see Figure 1).

Pen Size	Application
0	Brackets Dashed block lines Highways (other than below) Lead lines
3	Block Outlines Bus Bar Conductors Modified Highway for Main Charge and Main Discharge Leads

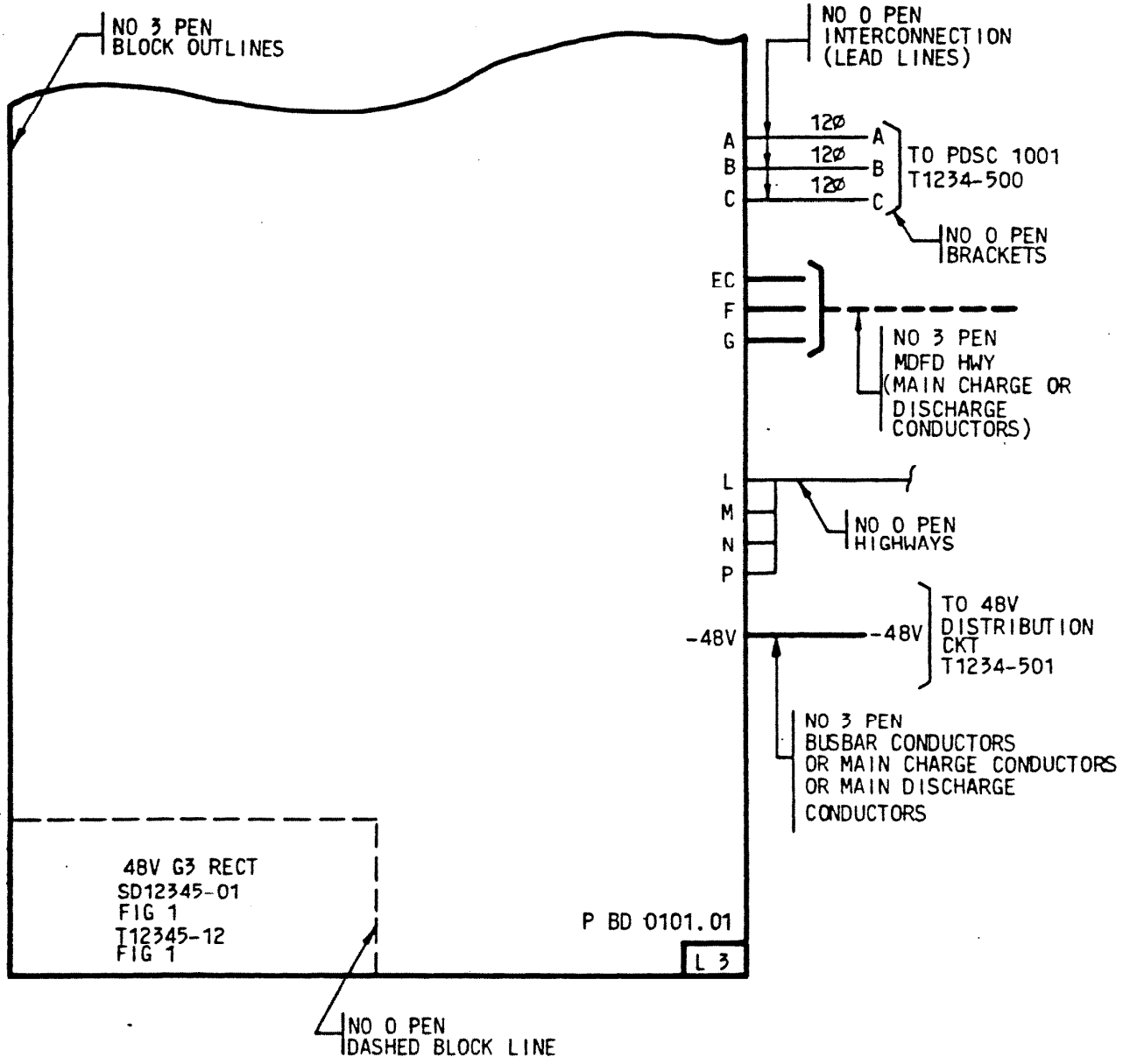


FIGURE 1
APPLICATION OF PEN SIZES

5.00 DESCRIPTIVE ISSUE NOTES

5.01 This drawing usually contains full line power circuit information shown outside of blocks as well as wiring list information shown within blocks. These are only two areas of information in which activity is to be recorded in the Issue Note.

A. Wiring List Information (Blocks)

1. When wiring list blocks are added, identify the block added by the grid coordinate designation.

   EXAMPLE: "ADD BLK K3"

2. When wiring list blocks are removed, identify the block removed by using the grid coordinate designation. Also briefly describe the block's contents or refer to the job spec for detailed information.

   EXAMPLE: "RMV BLOCK B5 FOR DET SEE JOB SPEC"
   "RMV BLOCK B5 48V G1"

3. When information within a wiring list block is changed, identify the changed block by grid coordinate designation. Also briefly describe the change or refer to the job spec for detailed information. It is required that added or removed fuse positions be shown.

   EXAMPLE: "CHG BLK D1 FOR DET SEE JOB SPEC"
   "CHG BLK D1 TO ADD FIG. 2"
   "CHG BLK F3 TO ADD FUSE 15"

B. Full Line Circuitry

1. Show the addition of new circuit information in the Issue Note. It is required that added fuse positions be shown.

NOTE:
Lines interconnecting blocks need not be referred to in Issue Notes.

EXAMPLE: "ADD FUSE 35"
"ADD SUP FB 1011.01"
"ADD FIG. 1"

2. When circuit information is removed, briefly describe the removed information.

   EXAMPLE: "RMV RR 1756.2"
   "RMV FIG. 1"
   "RMV FUSE 30"

3. When existing circuit information is being changed, briefly describe the change or identify the area of activity and refer to the job spec for complete information.

   EXAMPLE: "CHG FUSE 501, READ 500 AMP"
   "CHG FIG. A TO ADD RR 0301.02"
   "CHG FUSE 151 FOR DET SEE JOB SPEC"

C. The above Issue Notes shall be used in combination as required for any one issue.

NOTE:
It is preferred not to refer to the job spec for details unless doing so would greatly reduce the space used in the Issue Note column.

EXAMPLE: "ADD BLK K3, FUSE 35, FIG. 2/
RMV BLK B5 48V G1, FIG. 1/CHG BLK Preferred
D1 TO ADD FIG. 2"

"ADD BLK K3, FUSE 35, FIG. 2/
RMV BLK B5, FIG. 1/CHG BLK D1
FOR DET SEE JOB SPEC"

5.02 When making extensive removals from this drawing, the engineer shall consider the use of the "R" drawing routine as outlined in Section III, Part F, Paragraph 31.00 herein and U S WEST Communications PUB 77351. This routine provides a permanent record of the conditions before the removal and simplifies the Issue Note.

5.03 On older drawings without the grid coordinates for block identification, it is recommended that the coordinates be added to the drawing to facilitate preparation of future marked prints and simplify the Issue Notes. When grid coordinates are not present, the blocks shall be identified for Issue Note purposes by using the circuit name/office numbering designation shown within the block.

EXAMPLE: "CHG GEN CKT 48VG1"

5.04 For Equalizing Center Battery Distribution, the Issue Note shall list all bays and frames added or removed, or, when space in the Issue Note column would be conserved, the following note may be shown:

"FOR BAYS OR FRAMES ADDED OR REMOVED, REFER TO TABLE NO. 1 ON FLOOR PLAN."

NOTE:
Do not use this note when the only change is an update to the Drain Table.

5.05 When changes are made in accordance with installer's marked prints, the Issue Note shall read "INSTLR MKD PRINT."

5.06 Show "RCD ONLY" when "record only" changes are made on the drawing and no other changes are made on the same issue.

6.00 CRITERIA

6.01 Prior to the preparation of this drawing for a specific office, all necessary data should be obtained, checked and verified that it is noncontradictory and is the latest available information. This data consists of:

A. Study Plan

B. Floor Plan

C. Circuit Requirements

D. Future AC & DC Power Requirements

E. Equipment Specification

F. List 1 and List 2 Drains as required

7.00 SPECIFIC DRAWING STANDARDS

7.01 Polarity of DC Voltages - The polarity of all DC voltages except negative 24 volt, negative 48 volt, and positive 130 volt, shall be shown on the power wiring list and block schematic drawing. However, when similar voltages having opposite polarities are used together on one drawing, the polarity of both voltages shall always be shown.

7.02 Current Drain, Voltage Drop, Feeder Capacities - Current drains and maximum allowable feeder capacities shall be recorded as follows:

A. The current drain or power plant capacity for which the power plant is engineered shall be shown for bus bar type plants such as the 302 and 326 plants only. This information shall be recorded in a note similar to Note 13 in Paragraph 13.00.

B. When the standard power plant circuit provides for different discharge feeder voltage drops depending on the average length of cables from the power board fuses to the load distribution centers, record the battery end voltage (in volts per cell) and the corresponding discharge feeder maximum allowable voltage drop.

C. The calculated peak current carrying capacity of the discharge feeders to Battery Distributing Fuse Boards (BDFB), Battery Distributing Circuit Breaker Boards (BDCBB) and battery distributing equalization centers and a running record of the peak current drains shall be shown on the respective power wiring list and block schematic drawings. Tabular form is recommended similar to those shown in Section VII, Part B, Paragraph 5.00.

7.03 Renumbering Power WL & BS Drawings - If an existing drawing which shows leads bracketed for continuation on other job drawings is renumbered, the other job drawings shall be corrected to reflect the new drawing number.

8.00 POWER WIRING LIST AND BLOCK SCHEMATIC

8.01 This drawing consists primarily of a block or blocks representing specific power circuits within the office. Interconnections between the power circuits and to other circuits in the office are represented by lines to and from blocks. Each block contains a title, the standard or job circuit drawing number, and, where applicable, the Figure number or numbers and quantity, optional wiring and apparatus, and schematic drawing cross reference information necessary to fully identify the circuits depicted.

8.02 It may also contain full line job circuitry, modifications of standard circuits, and/or equipment sketches.

8.03 The purpose of the drawing is to record all power plant circuits at a particular location or Central Office.

8.04 The block schematic format is used to show graphically the interrelationships of these circuits with each other and with other telephone equipment. This format facilitates the installation and maintenance of the power plant equipment.

8.05 Use Power Wiring List and Block Schematic Drawings for the following applications:

A. All power plants (except as noted)

B. Power distribution from standard bays

C. Power distribution via equalization centers

NOTES:

1. In very small installations a PWR WL & BS is not required. This is the case when the entire power plant is ordered from one "J" code specification involving only one or two wiring diagrams such as an integral coded rectifier and its associated wiring diagram. Power plant circuits shall be listed on the miscellaneous switchboard wiring list drawing with a reference to either the job power board drawing, if one is prepared, or the associated "J" code specification and list number.

2. When the design of the power plant provides for feeding individual switchboard equipment circuits directly and provides for a record book in which each assignment is shown, a tabular format combination wiring list and equipment drawing per Section IV, Part E may be provided in place of the PWR WL & BS drawing.

8.06 The general format to be followed in preparation of Power Wiring List and Block Schematic Drawings is illustrated in Figure 2. Uniformity of format is encouraged, however, when the layout of a particular block schematic would be improved by use of a vertical format (see Figure 3) or by changing the location of the Notes or Issue Notes column, this is permissible. If the drawing will contain power distribution circuitry, allowance for additional Issue Note space is recommended.

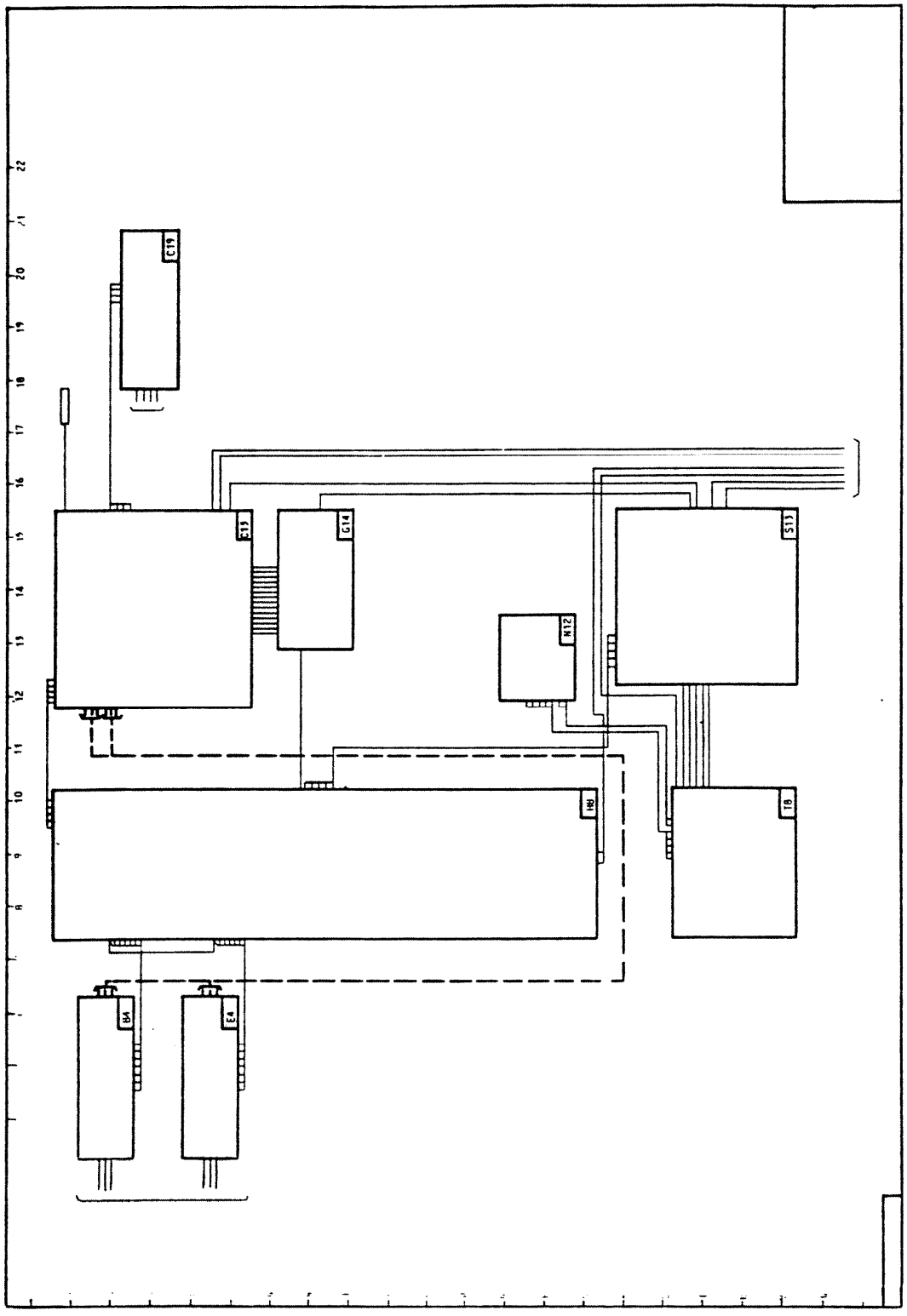


FIGURE 2
HORIZONTAL FORMAT

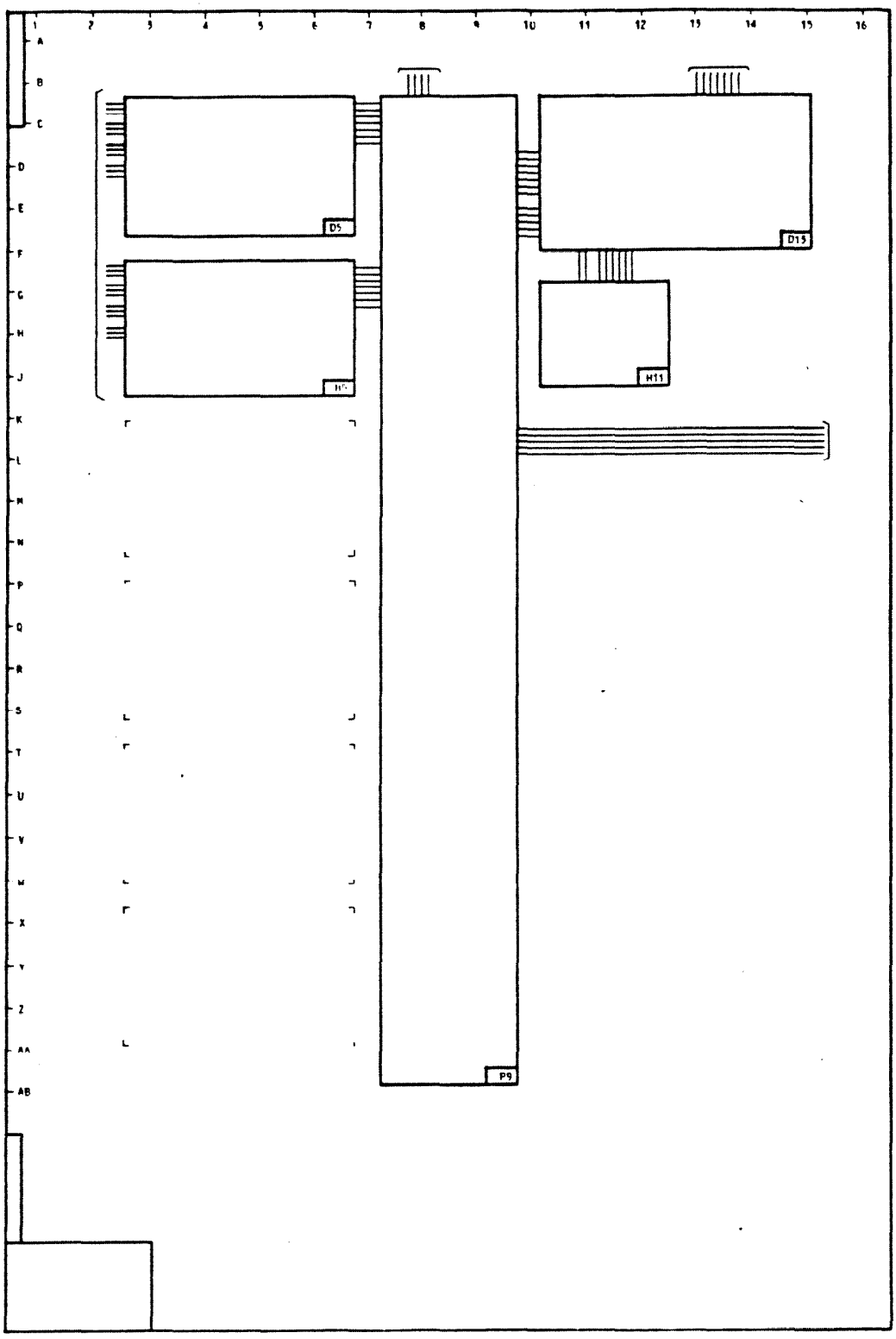


FIGURE 3
VERTICAL FORMAT

8.07 Blocks should be placed on the drawing taking into consideration:

A. Presentation of a logical layout of blocks, one which will convey pictorially the functional interrelationships of the various circuits. Where practical, the flow of power should be from left to right.

B. Interconnecting leads between blocks should be short and avoid unnecessary cross overs.

8.08 For small installations, it is recommended that one drawing be prepared for the entire power plant. For larger installations, where more than one drawing is necessary, the plant shall be divided into logical increments to be shown on separate drawings, i.e.:

A. AC Service

B. 24 Volt Charge and Discharge

C. 48 Volt Charge and Control

D. 48 Volt Discharge

E. Pos and Neg 130 Volt Charge and Discharge

F. Ringing

8.09 The AC service or DC battery distribution circuit, when located on a separate drawing, shall be considered a Power Wiring List and Block Schematic drawing if it contains, or by virtue of an anticipated future addition will contain, a block representing a standard or job power circuit.

9.00 THE BLOCK

9.01 A block represents a standard power wiring diagram, or group of wiring diagrams with a common base number, or a job power circuit. Standard drawings with different base numbers and job drawings shall be shown by different blocks. See Paragraph 9.11 for exception when the circuit is within a circuit.

9.02 Show separate blocks for each bay or location when individual figures within a given wiring diagram or job power circuit are located in separate bays or locations (e.g., column, wall, etc.).

9.03 List specific Figures and job power circuits only once per office.

9.04 Figures representing discharge fuses and associated grounds on the battery control board distribution bays of a given power plant may be grouped together into one or more blocks.

9.05 For clarity of information, please see Figure 4 when reading Paragraphs 9.06 through 9.16.

9.06 When the block represents a standard circuit, show the circuit name or authorized abbreviation as shown in the title box. When the box represents a job circuit, show the circuit name as shown in the title box. In either case, include applicable office numbering such as G1 for the first rectifier. Further identification may be made, if desired, by showing in parentheses the title of the specific figure or other qualifying circuit feature information. Standard abbreviations may be used for the circuit name.

9.07 When the block represents a job circuit, the information required is:

A. Circuit name per Paragraph 9.06

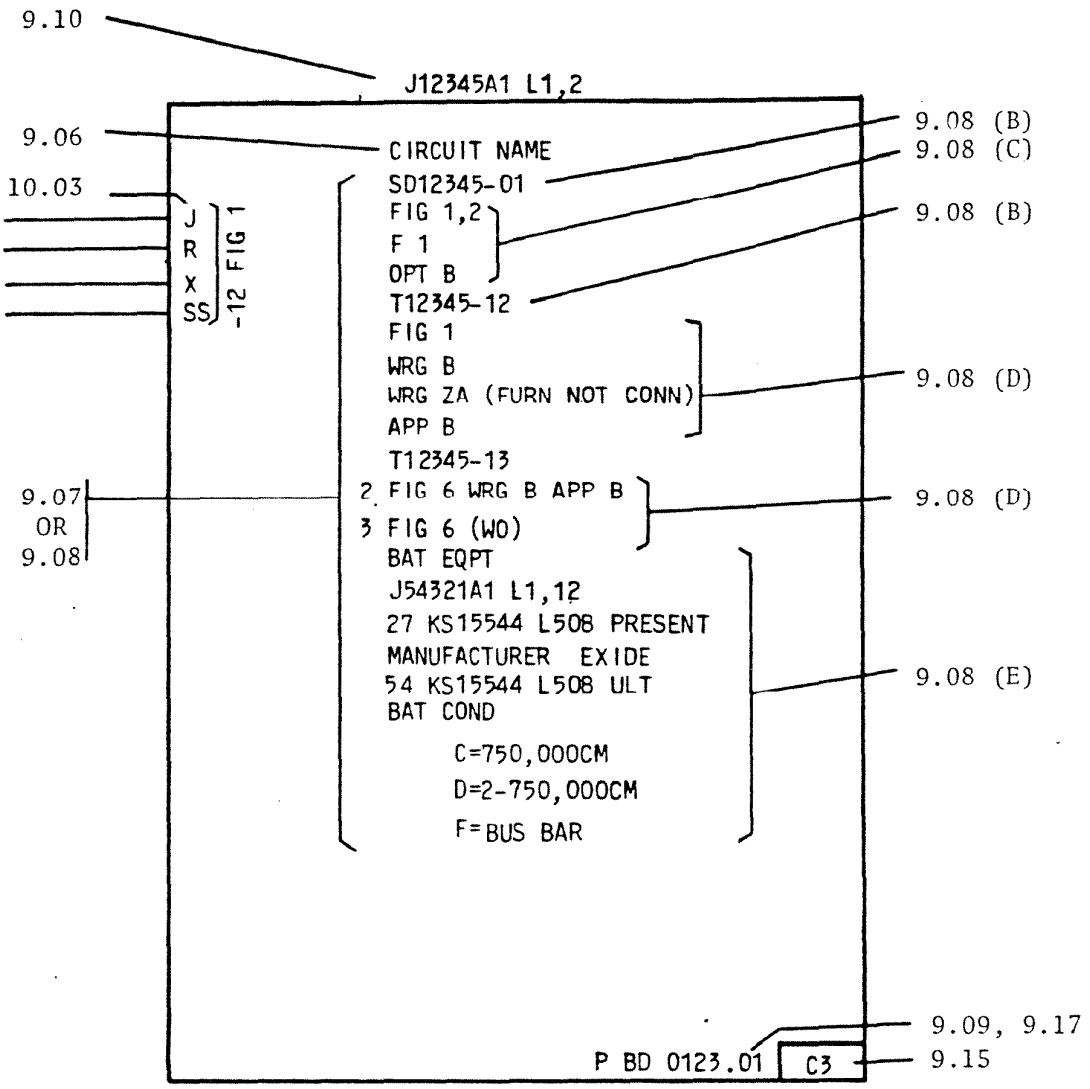
B. Job power circuit drawing number

C. Figure numbers from the job power circuit drawing, if such figure numbers exist

D. Equipment location per Paragraph 9.09

E. Connecting lead designations per Paragraph 10.03

F. Block index per Paragraph 9.15



NOTE: 9.07 ETC DENOTES PARAGRAPH NUMBER

Note: 9.07 etc., denotes paragraph number.

FIGURE 4
THE BLOCK

9.08 When the block represents a standard circuit, the information required is:

A. The circuit name per Paragraph 9.06

B. The drawing number of the standard schematic, wiring diagram or circuit

C. The schematic figure numbers, FS numbers and options, of equipped figures only

NOTE:
Quantities are not required.

D. The standard wiring diagram or circuit figures equipped and wired only together with wiring and apparatus options. The figures equipped shall be listed separately from those wired only (WO). Wiring options furnished in the local cable but not connected shall be shown in the block and designated "FURN NOT CONN." The quantity of figures shall be shown when greater than one.

E. Show the size or code of any variable apparatus or internal wiring if such apparatus or wiring is not specifically designated on the standard wiring diagram. For storage batteries and counter EMF cells, show the specification and list numbers. For rectangular batteries requiring earthquake bracing or shock mounting, show the battery manufacturer's name.

F. Equipment location per Paragraph 9.09 or Class Designation per Paragraph 9.17

G. Connecting lead designations per Paragraph 10.03

H. Block index per Paragraph 9.15

9.09 Show the power board bay number on which the circuit equipment is located in the lower right area of each block. If the equipment is not bay mounted, show the applicable location information such as the column, floor or room.

9.10 Show the equipment specification information unless a job equipment drawing is prepared, in which case the equipment specification information shall only be shown on the job equipment drawing.

9.11 Circuit within a circuit - The manufacturer's drawing numbers of any equipment shown on a standard wiring diagram as a circuit within a circuit shall be shown. This information shall be bounded by a dashed line. An example is the circuit for a component rectifier or voltage regulator, (see Figure 5). However, when the component circuit is a circuit pack, printed wiring board or integrated circuit and is identified on the equipment wiring diagram, it may be omitted.

9.12 Show wired units of equipment for which no standard wiring diagram has been provided (rectifiers, engine driven alternators, etc.) as a circuit convention. The convention will be basically a rectangular block, differing from the block normally used on a block schematic drawing, in that it represents the unit wiring as provided by the manufacturer instead of a standard wiring diagram. Therefore it is required to show and identify within the convention block, the terminals or component apparatus within or on the unit to which the external leads connect. Straps between terminals or wiring or component apparatus not provided by the manufacturer shall also be shown; the "Full Line" or the "Airline" method may be used. The unit shall be identified by showing, within the block, the code number or specification and list number or the manufacturer's name and catalog or code number. Also, the schematic drawing number and figures, if a schematic was provided, or the manufacturer's schematic and wiring diagram numbers shall be shown, (see Figure 6).

9.13 Show equipment for which the manufacturer has furnished wiring diagrams in the same block form as a schematic wiring diagram or circuit. The number and lists and the schematic drawing number as well as the circuit drawing number shall be shown in the block without figures and options.

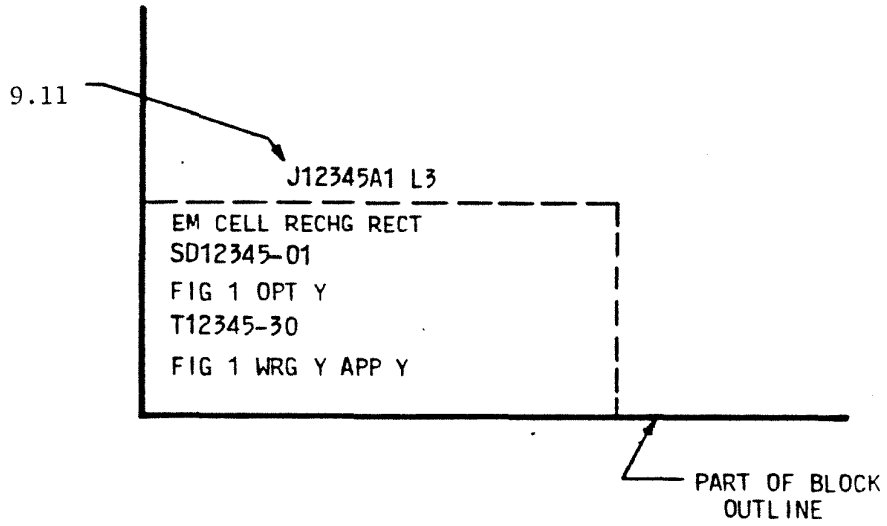


FIGURE 5
TYPICAL METHOD OF SHOWING A CIRCUIT WITHIN A CIRCUIT

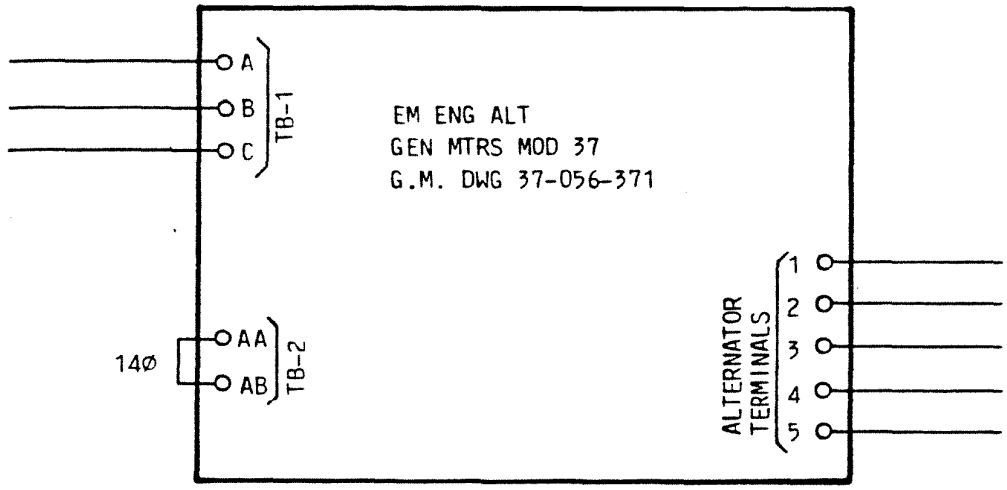


FIGURE 6
CIRCUIT CONVENTION USED FOR WIRED EQUIPMENT
HAVING NO WIRING DIAGRAM OR JOB POWER CIRCUIT DRAWING

9.14 Sketches covering minor circuit modifications may be included in the block with the affected circuit. However, where the modification is recurrent or is too complicated to be shown within the block, a Figure may be added to the associated Wiring List and Block Schematic drawing if sufficient space exists, or a job circuit drawing covering the modification may be prepared. The figure or job circuit drawing shall be drawn using either the Point to Point (Full Line) or the Airline method of presentation as covered in Section VII, Part B.

9.15 Each block on the new Power Wiring List and Block Schematic drawings will be identified by a coordinate type identification system, (see Figure 2 and 3). Letters shall be used vertically at the margin to the left of the blocks (starting with the letter "A") and shall be located 1 inch from the top with succeeding letters spaced at 1/2 inch intervals.

9.16 Class Designation

A. When power units are mounted miscellaneously in dial system relay racks, they shall be identified by a "class designation." The class designation is shown on the relay rack front equipment drawing (Section IV, Part B), in the "B" section of the specification ordering the unit (PUB 77351), and shall also be shown on the associated PWR WL & BS drawing.

B. The class designation is determined as follows:

1. All relay rack units having identical manufacturer drawing lists or groups shall be combined and assigned a class designation such as "A", "B", "C", etc. Units which are similar but not identical in the application of all their lists and options shall be assigned separate class designations such as A, A1, A2, etc. The second and third digits of the power wiring lists and block schematic drawing "dash" number shall precede the above letter designations, i.e.:

First relay rack unit on WL & BS drawing number
TXXXX-0650 - "CLASS 65A"

C. The class designation and relay rack bay number shall be shown in the lower right corner of the circuit block in place of the power board bay number (see Figure 4).

10.00 INTERCONNECTIONS

10.01 Interconnections are electrical paths from one circuit to another, representing a wired unit of equipment (see Paragraph 9.13). Represent these interconnections on the Power Wiring List and Block Schematic drawing with lines. Double cross overs of these lines shall be avoided.

10.02 Show the type and size of conductor used for interconnections when not specified on the circuit drawing. When bus bar is used, it shall be designated "BUS BAR"; the size, material and quantity of laminations need not be shown when this information is shown on the associated bus bar equipment drawing.

10.03 The termination of each interconnection at a block shall be designated with the functional letter/number designation shown on the standard wiring diagram or job circuit. When two or more figures are shown in the same block, the Figure number with which each interconnection is associated shall be shown since different standard figures may contain similarly designated leads. When two or more wiring diagrams are shown in the same block, the drawing number suffix shall also be shown.

10.04 When leads are drawn to brackets, the following information shall be shown at the bracket:

A. Lead designation(s)

B. "TO" or "FROM" - "To" shall be shown on the drawing containing the controlling drawing; "From" shall be shown on the drawing containing the noncontrolling drawing. Leads connecting from one Wiring List and Block Schematic to another shall show "TO" on one and "FROM" on the other. Wire size information, when required on such leads, shall be shown on the drawing showing "TO." The size need not be repeated on connecting drawings; however, where repeated it shall be enclosed in parentheses to signify that the size is controlled elsewhere.

C. Name of connecting drawing

D. Connecting drawing number

E. Figure number on connecting drawing

10.05 Each interconnection shall be shown by using one of the following methods:

A. Individual lead between:

1. Blocks

2. Block and Bracket:

To other Pwr WL & BS
From non-Pwr Plant circuits
Power Distribution

3. Block and Circuit Element

4. Circuit Elements

B. Highway (Group of leads) between:

1. Blocks:

Main Charge or Main Discharge
Battery Distribution
Miscellaneous

2. Block and Bracket:

To other Pwr WL & BS
Power Distribution

3. Block and Circuit Element

C. Any combination of the above methods may be used on the same drawing.

10.06 In this method, each line between blocks represents one interconnection from one circuit to another circuit, (see Figure 7).

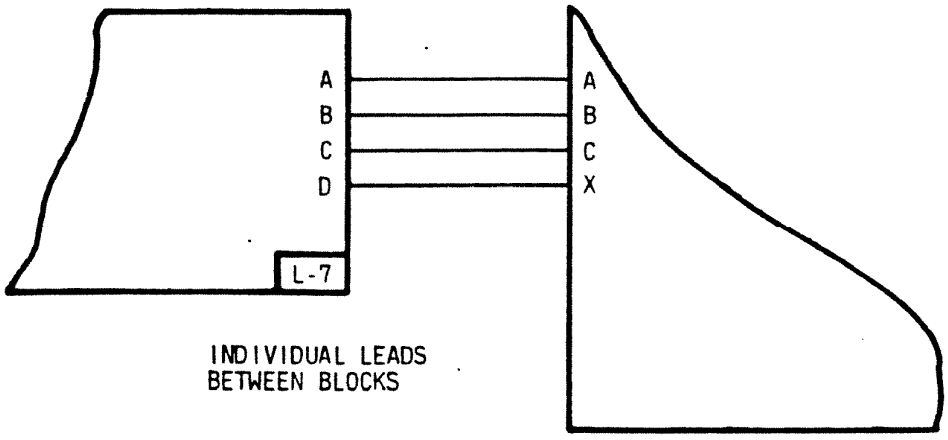


FIGURE 7
TYPICAL POWER INTERCONNECTIONS

10.07 In this method, the interconnections from any one block to another block may be grouped into single line to minimize linework in the drawing. Note that the functional designations in each block are the same. It is required that the interconnections shown by this method must have the same functional designation at each end (see Figure 8).

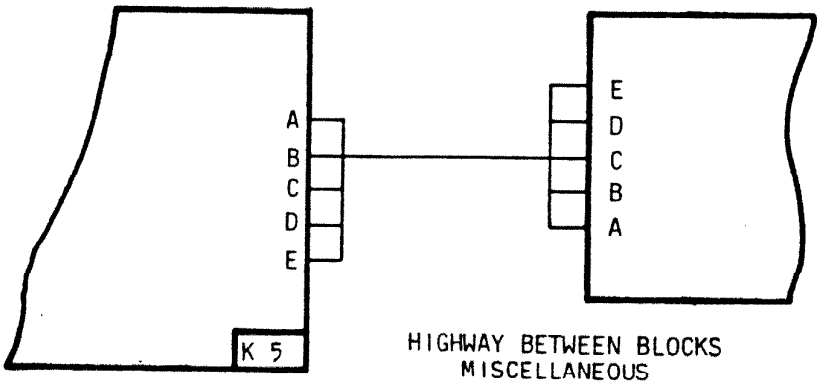


FIGURE 8
TYPICAL MISCELLANEOUS INTERCONNECTIONS

10.08 In this method, each line represents one interconnection between a power circuit and some other circuit in the Central Office. The name, drawing number, Figure and functional lead designation of thc other circuit shall be shown (see Figure 9).

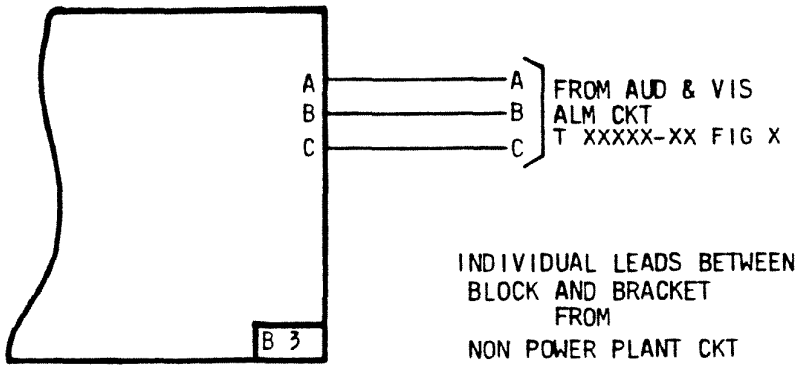


FIGURE 9
TYPICAL NON-POWER PLANT INTERCONNECTIONS

10.09 In this method, interconnections having the same functional designations in both circuits may be grouped. This method may be used to show interconnections between a power circuit and some other circuit in the Central Office. The name, drawing number, functional lead designation and Figure of the other circuit shall be shown (see Figure 10).

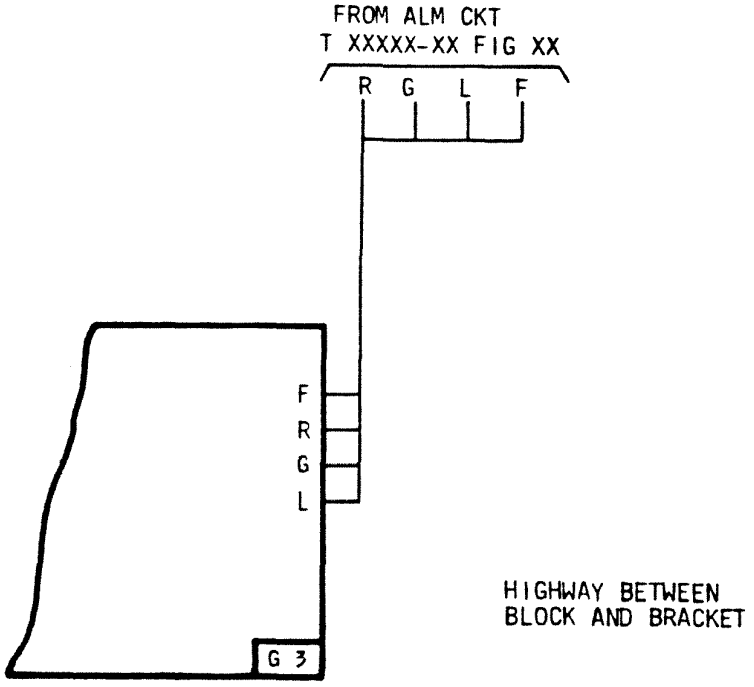


FIGURE 10
TYPICAL POWER ALARM CIRCUIT INTERCONNECTIONS

10.10 Connecting lines from one Power Wiring List and Block Schematic to another shall be arbitrarily designated with matching numbers. Either the highway or the individual lead method or a combination of both may be used (see Figure 11).

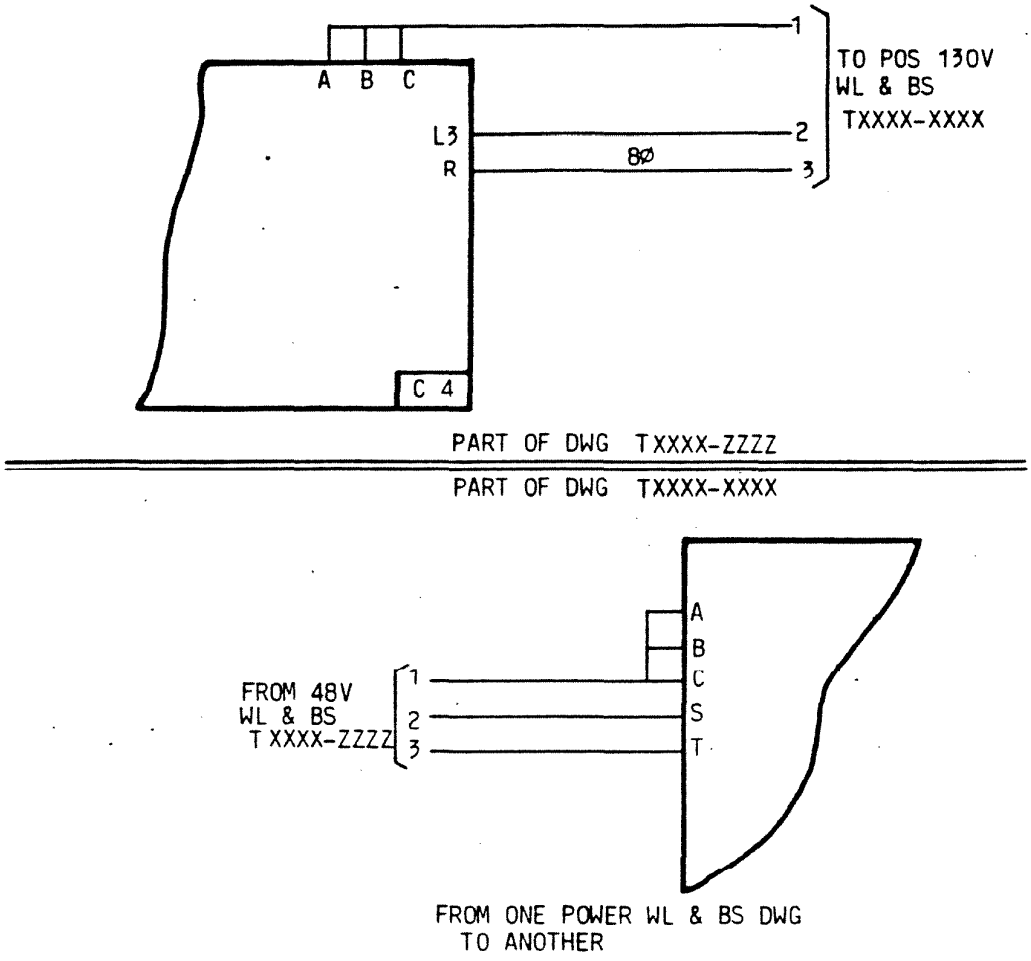


FIGURE 11
TYPICAL POWER WL & BS INTERCONNECTIONS

10.11 The main charge and the main discharge leads in a battery plant shall be shown by heavy individual lines as in Figure 12 or by a heavy dashed highway as in Figure 13. The dashed highway may be used only if the functional lead designations at each end are the same. The main buses of any power plant may be shown in a similar manner.

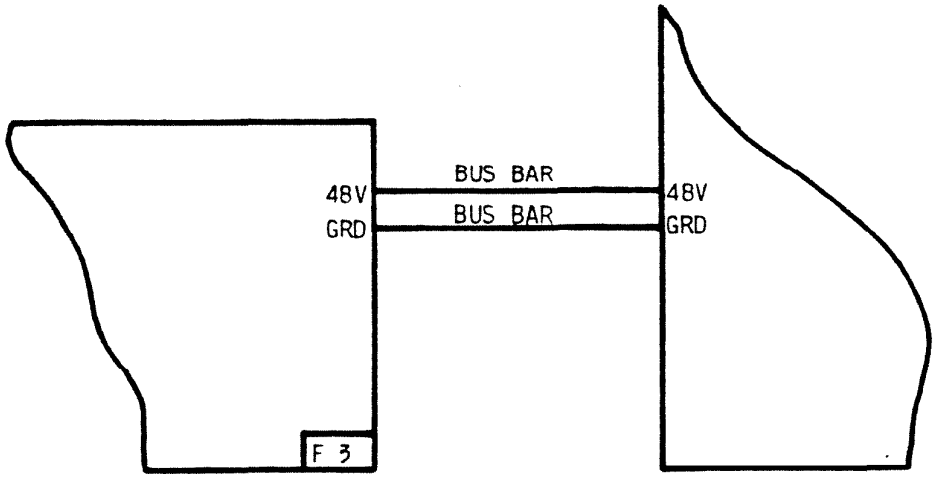


FIGURE 12
MAIN CHARGE OR MAIN DISCHARGE LEADS

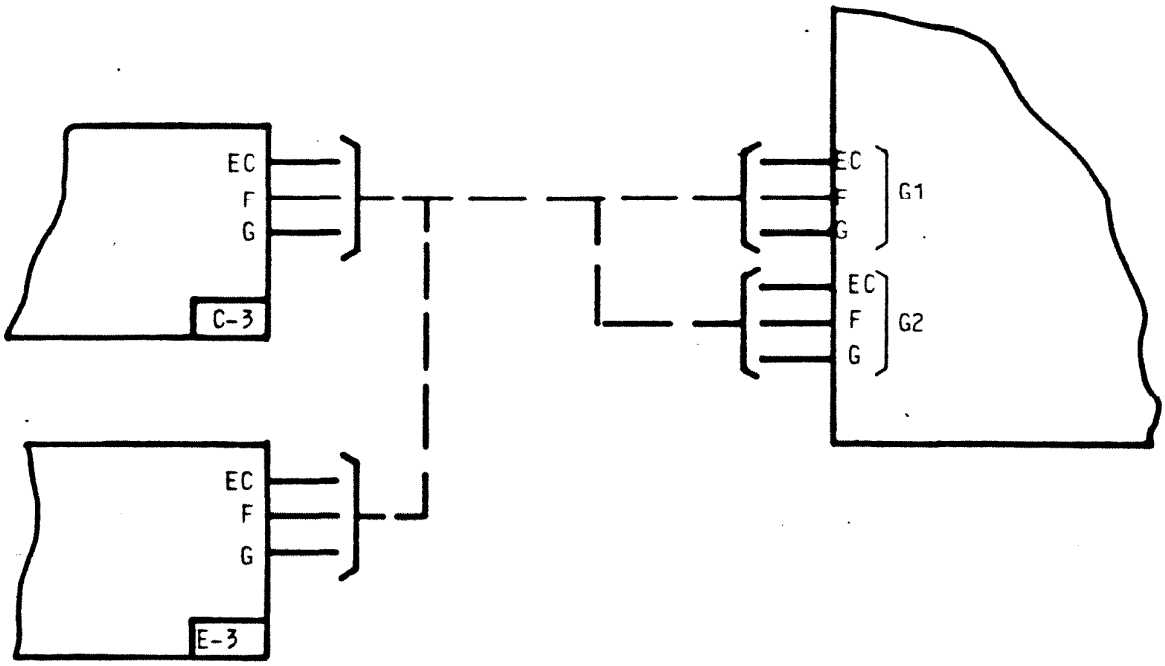


FIGURE 13
MAIN CHARGE OR DISCHARGE LEADS HIGHWAY

10.12 Power Distribution Leads to Fuse Panels mounted in Fuse Bays, Relay Rack Bays, Frames and Switchboards not represented by Standard Wiring Diagrams containing stub leads to the power supply shall terminate in a convention representing battery or ground bus bar. The functional designation shall be shown on battery supply leads, and ground leads, i.e., "POS 48V SIG, 24V SIG, POS 130V TLG," "GRD," etc. If there is insufficient room to use the abbreviation, the symbol "+" or "-" may be used. The bus bar convention shall be bracketed indicating the bay, frame or switchboard lineup number, and job equipment drawing number (see Figure 14).

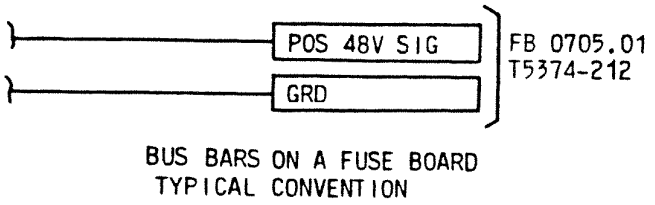


FIGURE 14
TYPICAL FUSE BOARD BUS BAR CONVENTION

10.13 Show jack and plug connected circuits with a single line between the blocks with an arrowhead at the block representing the circuit with the jack connection. For these cases, add a note on the drawing similar to the following: "Arrow interconnecting blocks signifies plug and jack connected circuits; arrowhead points to circuit containing jack" (see Figure 15).

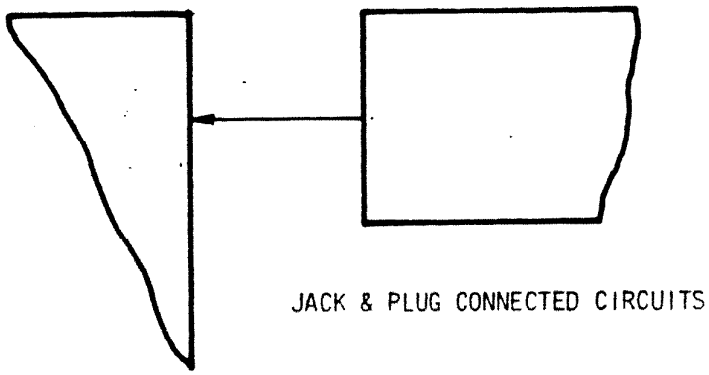


FIGURE 15
TYPICAL JACK & PLUG INTERCONNECT

10.14 Where the power plant wiring involves many circuits or figures requiring numerous blocks show the connecting information, space on the drawing may be conserved by abutting two or more blocks, (see Figure 16). A dashed line shall replace the solid line where the abutted blocks join and their outlines become common. Only blocks containing circuits and figures mounted in the same power board bay and primarily wired in local cable shall be abutted. Local cable leads shall not be shown. All installer connected leads and all leads not in local cable shall be shown connecting between, but external to the abutted blocks. Blocks are not considered to be abutted if their outlines are not common at any point. All leads connecting circuits or figures in nonabutting blocks shall be shown.

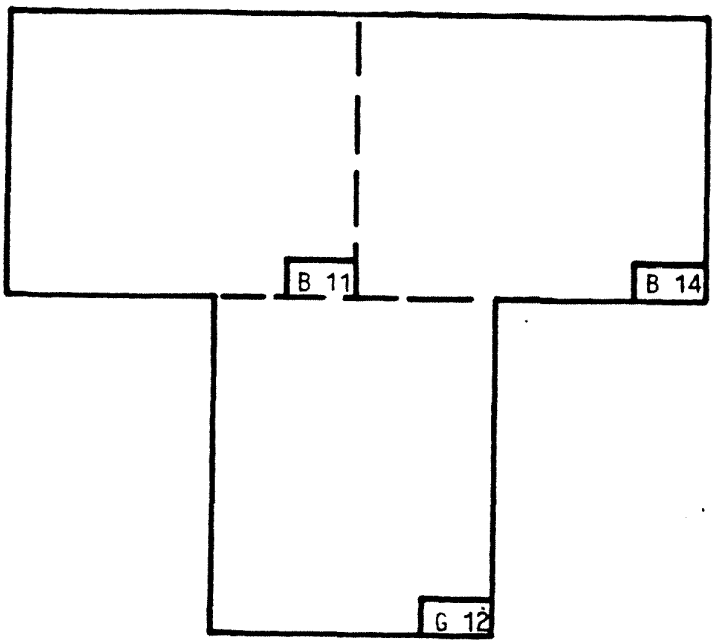


FIGURE 16
TYPICAL ABUTTED BLOCKS

10.15 The green wire ground shall be called "AC EG". A black dot shall symbolize the connection of this conductor to the enclosing framework of AC distribution equipment (see Figure 17).

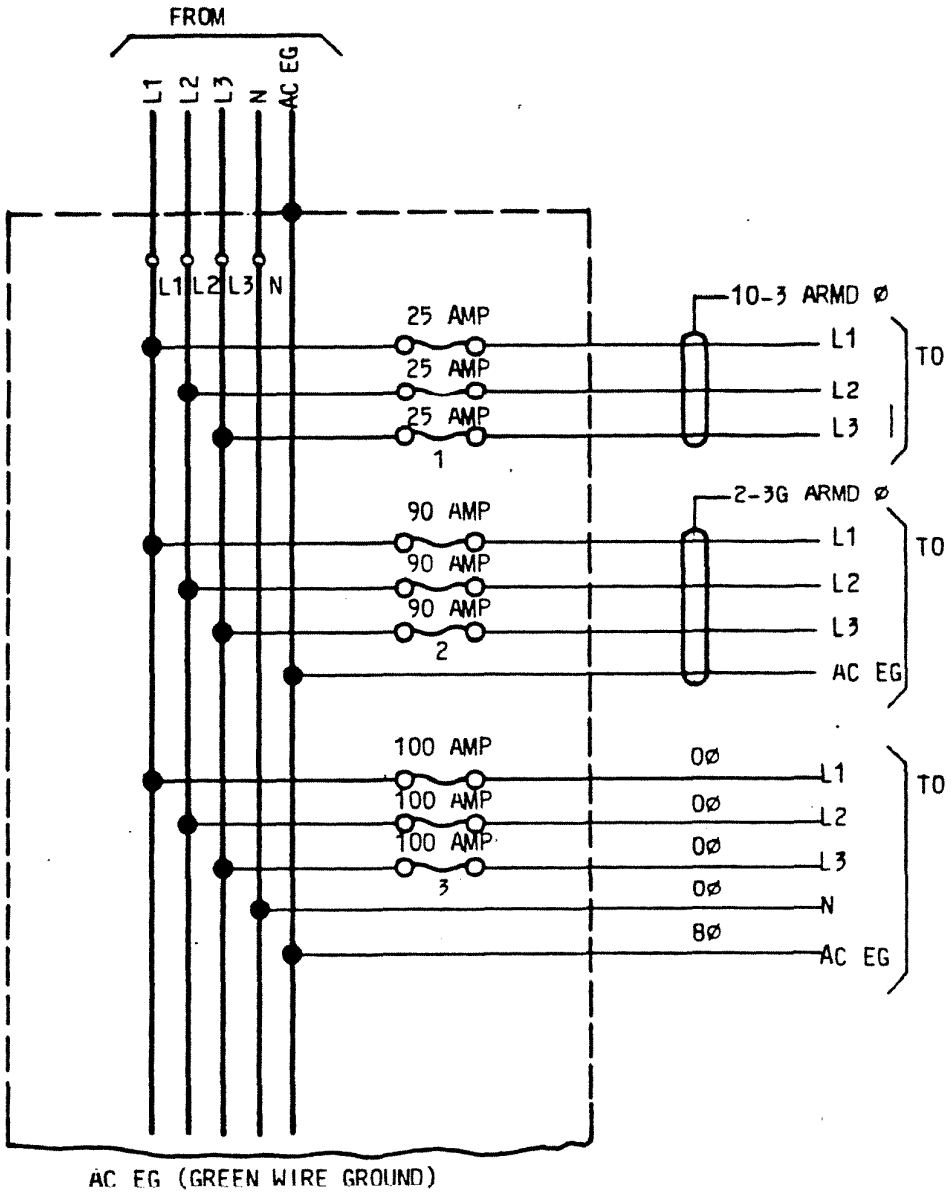


FIGURE 17
TYPICAL AC DISTRIBUTION PANEL

11.00 EXISTING POWER RECORDS

11.01 In older installations, power plant circuitry may be found on full line job power circuits, on tabular power wiring list drawings, or a combination of both. In some installations, the same power circuitry information may have been shown on both types of drawing simultaneously. The following paragraphs are intended to provide coordination between these older methods of documentation and the present Power Wiring List and Block Schematic.

11.02 Addition of New Power Plants - The Power Wiring List and Block Schematic shall be applied and used as described in the preceding paragraphs in this part. Interconnections between new plant and old shall be depicted on the Wiring List and Block Schematic as stub leads to the existing job circuit if one exists or if one does not exist, to the existing standard circuit. Each stub lead shall be identified using the lead designation shown on the standard circuit when one exists; when one does not exist, the stub lead shall be identified arbitrarily. Matching stub leads shall be added to the existing job circuit drawing.

11.03 Removal of Power Equipment - When power plant equipment is removed, the existing job power circuit and/or tabular wiring list drawings shall be changed to remove the associated circuit information. Voided job power circuit drawings shall be removed from the tabular wiring list drawing if one exists.

11.04 Modifications

A. Existing circuit drawings and tabular wiring list drawings shall either be maintained or replaced. The choice is an engineering decision and may be influenced by factors such as the extent of the modification, the expected life and growth of the power plant, the existence of standard circuits and the engineering/drafting effort required for each choice.

B. Simple modifications and additions may be incorporated into existing drawings. When this is done, methods similar to those in existence on the drawings shall be used.

C. The standard circuits of added wired equipment such as rectifiers and control bays shall be shown on a Power Wiring List type of drawing. The Power Wiring List and Block Schematic drawing is preferred; however, it is permissible to use the tabular Power Wiring List when this drawing exists. When the tabular Power Wiring List is used, existing Full Line circuit drawings shall be changed to reflect their connections to the added wired equipment. These connections shall be shown by means of stub leads using the lead designations shown on the standard circuit and bracketed to show the applicable office numbering such as G1 and the standard circuit drawing number.

NOTE:

When the Power Wiring List and Block Schematic is used, existing job power circuits shall be changed to show interconnections as described in Paragraph 10.00.

D. When establishing a Power Wiring List and Block Schematic for an existing power plant, show existing dependent connecting job power circuits as blocks on the new drawing. When this is done, the job power circuit drawing number shall be removed from the tabular power wiring list.

> NOTE:
>
> An example of a dependent connecting circuit would be an existing battery distribution circuit drawing remaining in the office when the noncoded power plant is modified to add 302 type coded power plant controls.

12.00 POWER DISTRIBUTION

12.01 Fuse and wire arrangements powering other equipment shall be shown accurately for each load. If a standard battery distribution circuit drawing exists for specific telephone equipment, it is recommended that the figures and options shown thereon be used to record the job power distribution arrangements. However, it is required that a clear record of the installation will result. An example is No. 5 Crossbar Battery Distribution Circuit used in conjunction with the Equalization Center Power Wiring List and Block Schematic. A "clear" record of the installation is one from which the fuse size, wire size and equipment assignments for each conductor can be ascertained (i.e., there can be no doubt as to which fuse and wire feeds which equipment load, etc.).

12.02 For battery distribution via Battery Distribution Fuse Board (BDFB) to Toll System equipment a combined PWR WL & BS and Equipment drawing shall be provided. (For BDFB's powering SXS dial telephone equipment a BDFB Circuit and Equipment drawing is provided instead of the WL and BS and Equipment drawing, see Section VII, Part B.)

A. Wiring list, circuit and equipment information shall be shown on one drawing for each BDFB bay unless the battery distribution arrangement is extensive and space on the drawing is inadequate. In this case, battery distribution circuit information may be shown on a separate drawing.

B. Show equipment and assembly information by means of a block outline of the bay front view. Show the standard specification drawing with lists (except fuse unit or panel lists which are shown with the fuse position information) beneath the block outline. Show the fuse panels in their proper relationship on the block outline and designate to show the fuse numbering, load designation and voltages.

C. The following information shall be shown in tabular form:

1. Maximum calculated capacity of discharge fuse and feeder combination
2. Terminal lug numbers for each cable or wire termination
3. Names and office numbering of frames and equipment being powered
4. Current drain information in terms of peak amperes
5. Ampere size of distribution fuse

D. A single block shall represent the internal circuitry of the BDFB; however, the distributing ground bar may be shown externally.

12.03 Battery distribution via equalization centers is shown in a specialized Power Wiring List and Block Schematic format. In this format although the blocks are not drawn on scale they are positioned on the drawing so that they depict the floor plan arrangement of switchboard frames and relay rack bays; lines of blocks simulate equipment lineups and aisles.

A. This specialized form shows the following:

1. The standard distribution circuit used
2. The standard figures used and their relative position
3. The equalization (connections) of discharge feeders to aisle feeders
4. The present frames and bays served
5. The future frames and bays planned
6. The extent of power feeders
7. A drain table reflecting added and cumulative peak drains
8. Discharge feeder Ampacities (capacities)

NOTE:

Because of the special presentation of information on this drawing, the following requirements applicable to all other Power Wiring List and Block Schematic do not apply.

a. Information contained within the block
b. Lead designations (for frame line feeders only)
c. Interconnecting leads between abutting blocks
d. Block cross reference identification

13.00 NOTES AND SYMBOLS

13.01 Use of the following common notes and symbols are required:

1.  SPLICE

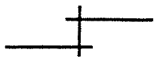
2. WO — INDICATES COMPLETE WIRING ONLY EXCEPT WHERE CIRCUIT REQUIRES SURFACE WIRING

3. LEADS 14 OR LARGER TO BE PER MANUFACTURER'S DRAWING UNLESS OTHERWISE SPECIFIED

4. WIRING FURNISHED WITH STANDARD EQUIPMENT

5. : :1/. : :2/ — LEADS TO BE RUN BY INSTALLER AS SHOWN ON THIS DRAWING

6. FOR LEADS NOT DESIGNATED WITH A : : 1/ . : : 2/, SEE CIRCUIT FOR SIZE AND TERMINATION

7.  PARALLEL CABLE CONNECTORS

8. 14-2 ARMD, 10-3G ARMD, ETC., DENOTES SIZE OF ARMORED CABLE, "G" DENOTES AC EG CONDUCTOR

9. WIRE SIZE ENCLOSED IN PARENTHESES ( ) INDICATES SIZE IS CONTROLLED ELSEWHERE

10.  CABLE

11. [ ] — INDICATES DESIGNATIONS SHOWN FOR INFORMATION ONLY AND NOT TO BE STAMPED

12.  END TO END CABLE CONNECTOR

13. THIS PLANT IS ENGINEERED FOR AN ULTIMATE CAPACITY OF _____ AMPERES

14. LEADS DESIGNATED ALUM ARE ALUMINUM

15. BAY NUMBER REFERENCES IN BLOCKS ARE BAYS IN WHICH EQUIPMENT INVOLVED IS LOCATED

POWER CIRCUIT

CONTENTS

1.00 GENERAL

1.01 This part covers the standards to be followed in the preparation of Job Power Circuit drawings.

1.02 The Power Circuit drawing establishes a record of the power circuit arrangements within a telephone Central Office.

1.03 When the circuit information is not extensive it may be included on the Power Wiring List and Block Schematic drawing rather than originating a Power Circuit drawing.

2.00 SCALE

2.01 Spacing of linework shall accommodate 1/8 inch lettering.

NOTE:
Scale is not required.

3.00 PEN SIZE

3.01 The pen size requirements for the preparation of tabular formats are covered in Section III, Part C.

3.02 The following pen sizes shall be used:

Pen Size	Application
0	Brackets Circuits Conventions Dashed Lines Lines Representing Circuit Wiring except Bus Bars
3	Bus Bars

4.00 ISSUE NOTES

4.01 Show descriptive Issue Notes for Power Circuit drawings.

4.02 The addition of new circuits shall be shown in the Issue Note.

EXAMPLE: (1) - ADD FUSE 35
(2) - ADD FIG 2

4.03 When existing circuits are changed, the Issue Note shall describe the change.

EXAMPLE: CHG FS 15 Was 500 AMP

4.04 When circuits are removed, describe the removed information.

EXAMPLE: (1) - RMV RR 1756.02
(2) - RMV FIG 1
(3) - RMV FUSE 30

5.00 DRAWING STANDARDS

5.01 A Power Circuit drawing shows one or more of the following conditions:

A. Job detailed power feeder arrangements (power distribution)

B. Standard power circuit modifications which are too large to be shown completely on the associated WL & BS drawing

C. Power circuitry not shown on standard drawings

5.02 Polarity of DC Voltages - The polarity of all DC voltages except negative 24 volt, negative 48 volt and positive 130 volt, shall be shown in all cases. However, when voltages and opposite polarities are shown on the same drawing, the polarity of both voltages shall always be shown. The polarity of all batteries shown in power circuits shall be shown on the battery terminals.

5.03 Current Drain and Feeder Capacities - When battery distribution fuses or circuit breakers (DC power distribution fuses or circuit breakers which are not located on the power board) are shown, the following shall also be shown in tabular forms:

A. The calculated peak current carrying capacity of the discharge fuse/feeder combination serving as the source of power

B. A running record of the peak current drains

C. See Figure 1 for several typical drain tables. If the drain table is full and it becomes necessary to add new data, the following procedures shall be followed:

1. Remove all existing entries except the most recent order number and the last entry in each of the "TOTAL" columns; these shall be relocated to the first line of the drain table

2. The order number shall be shown preceded by the word "TO", (see Figure 1, Table F)

3. A dash shall be shown in each "ADDED" column

4. This change need not be shown in the Issue Note

5. Proceed with the addition of the current order change on the second line of the drain table

TABLE A

LINE NO	DSC FDR DESIG	DSC FDR AMP CAP	DSC FDR AMP TOT PEAK	FUSE DRN	FUSE STP FUSE POS NO	FUSE STP CAP
1	+130V SIG LD A	65 AMP	35.0 AMP	10.0	171	
				5.5	172	
				15.5	173	
				4.0	174	
5					175	
6					176	
7						
8						
9						

TABLE C SUMMARY OF CURRENT DRAIN DATA

		MAX (1)	INT (2)	CUMULATIVE TOTAL DRAIN FOR EQPT ADDED, ORDER NO (3) 22785XX					
48V SIG LD 1	BAT	245	157						
	GRD	255	148						
48V SIG LD 2	BAT	255	41	55					
	GRD	255	50	64					
24V SIG LD 1	BAT	380	275						
	GRD	380	275						
24V SIG LD 2	BAT	400	260	280					
	GRD	435	260	285					

(1) MAX PEAK DRAIN LEADS CAN CARRY WITHOUT EXCEEDING ALLOWABLE VOLTAGE DROP OR CURRENT LIMITATION ON FUSE.

(2) PEAK DRAIN OF ALL FRAMES INSTALLED ON INITIAL ORDER.

(3) PEAK DRAIN OF INITIAL PLUS ADDITIONAL FRAMES INSTALLED PER INDICATED ORDER NUMBER

83974XX	17	68			6	80
83886XX	51	51	13	13	74	74
ORDER NO	ADD	TOT	ADD	TOT	ADD	TOT
MAXIMUM PEAK DRAIN	400 AMP 48V SIG A		160 AMP GRD A & B		400 AMP 48V SIG B	
EQL CTR 2.1 LINES 0200-0209						
TABLE F						

FIGURE 1
TYPICAL DRAIN TABLES

5.04 Renumbering the Power Circuit - If an existing power circuit is renumbered, the WL & BS and any other job drawings have connected leads (drawing numbers shown at bracketed stub leads) shall be changed to show the new number.

5.05 Drawing Format - Because of the varied nature of the information to be shown on the Power Circuit, no specific format is required. However, the initial layout shall allow space for growth as anticipated.

5.06 Lines shall be used to represent wires and other electrical conductors. The type and size of wire shall be shown when not specified on the Power Wiring List and Block Schematic (Section III, Part A) or other drawing. When bus bar is used, it shall be shown by a heavy line; the size, material and quantity of laminations need not be shown since this information will be specified elsewhere. The "Full Line" (see Figure 2) method of presentation shall normally be used, however, the "Airline" (see Figure 3) method may be used at the discretion of the originator of the drawing. Other methods may also be used depending upon the application; see "Modifications of standard circuits" and "Power circuitry not shown on standard drawings" in Paragraphs 8.00 and 9.00.

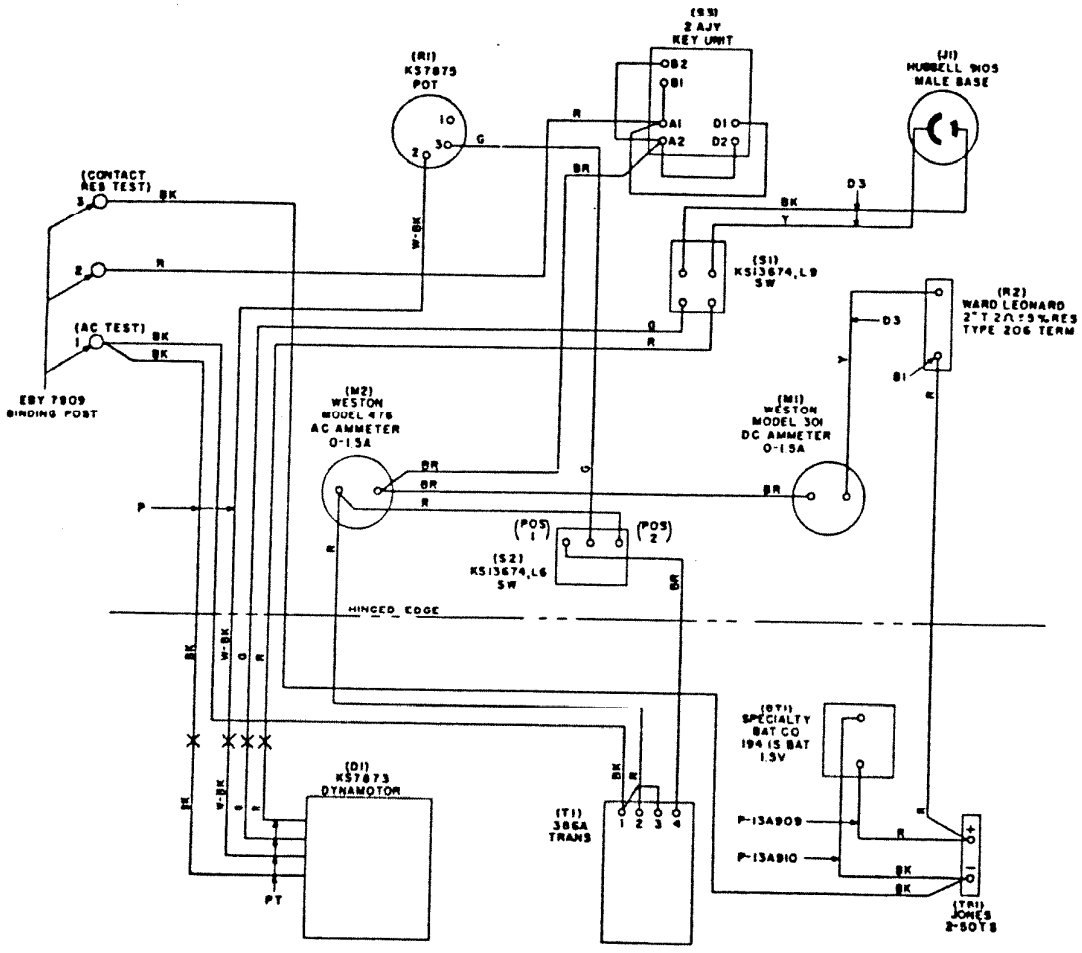


FIGURE 2
TYPICAL POINT-TO-POINT (FULL LINE) METHOD WIRING DIAGRAM

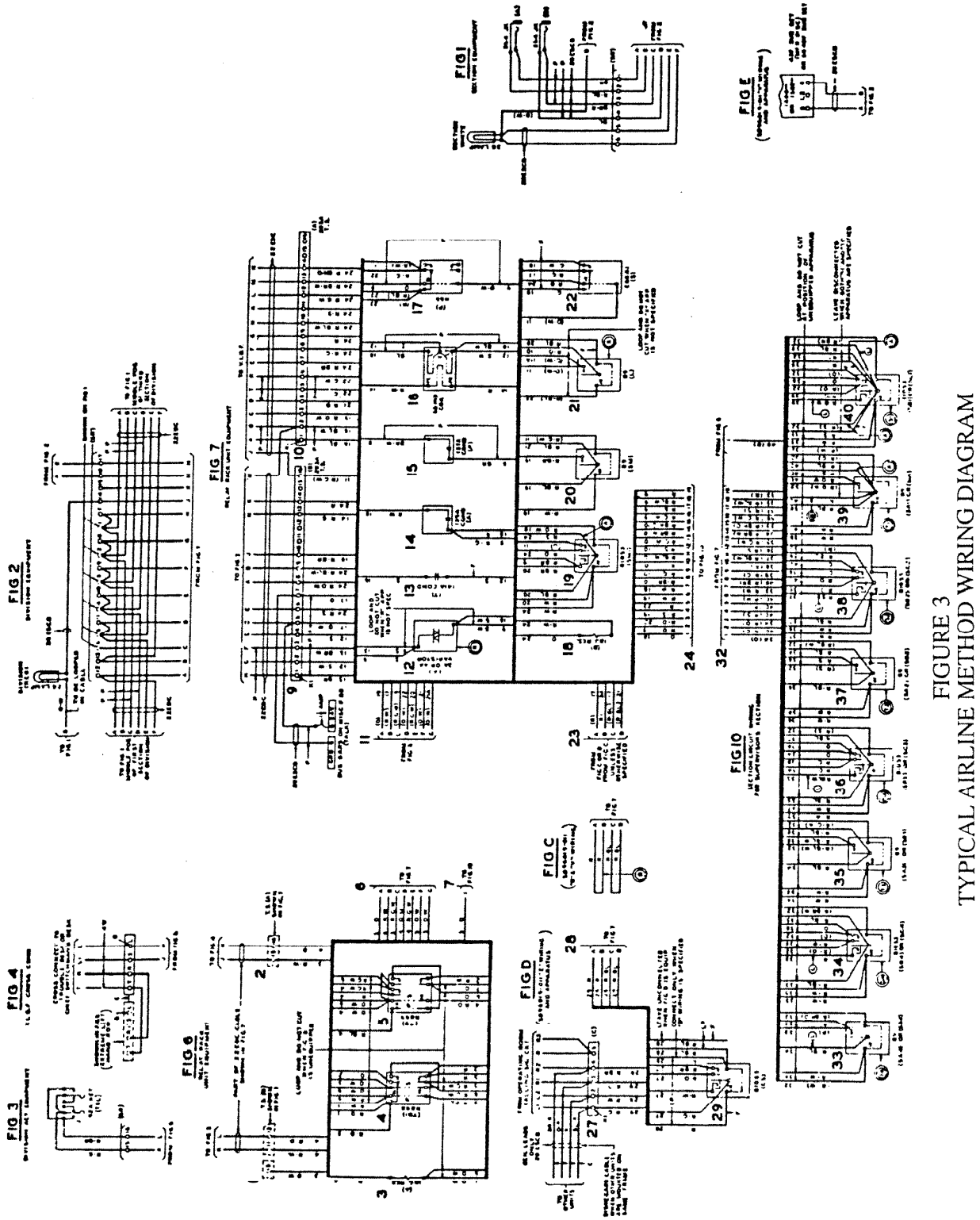


FIGURE 3
TYPICAL AIRLINE METHOD WIRING DIAGRAM

FIGURE 3
TYPICAL AIRLINE METHOD WIRING DIAGRAM

5.07 Connections to other Power Circuits shall be noted by the use of brackets (see Figure 4) showing:

A. Lead Designation/s

B. "TO" or "FROM" - shall be shown at the bracket. Use of the word "TO" signifies that the lead size, type, etc., is specified (controlled) on that drawing. Use of the word "FROM" signifies that the lead is "controlled" on the connecting drawing. For any one lead, control shall exist on only one Power Circuit. If it is necessary to show the lead size, etc., on a noncontrolling drawing, the information shall be enclosed in parenthesis ( ) to signify that the size is controlled elsewhere.

C. Name of connecting Power Circuit

D. Connecting drawing number

5.08 Related equipment sketches may be shown on power circuit drawings when one of the following conditions apply:

A. No space is available on the related power board front equipment drawing.

B. When the related equipment stands alone, not in a lineup with other bays which require a front equipment drawing.

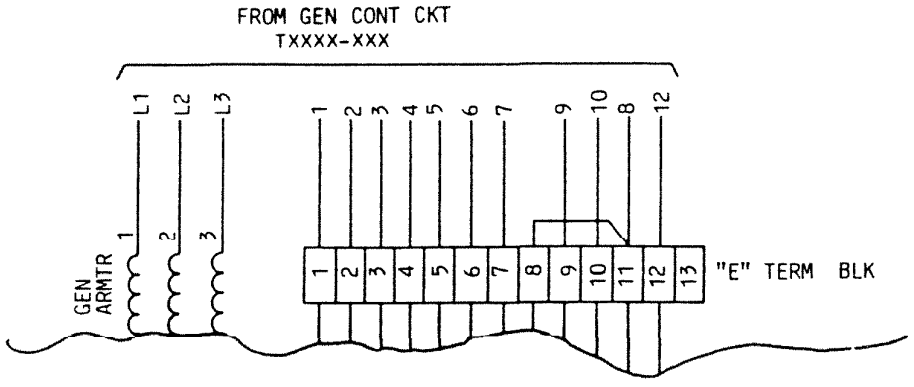


FIGURE 4
TYPICAL LEADS CONNECTED FROM ONE POWER CIRCUIT TO ANOTHER

6.00 POWER DISTRIBUTION

6.01 AC Distribution - See Figures 5 and 6

A. The metallic enclosure around AC power distribution apparatus, service cabinets PDSC, and bus ducts shall be represented by a dashed line.

B. The bonding of the AC Equipment Ground (AC EG) conductor, otherwise known as the green wire ground, to metallic enclosures shall be indicated by a black dot at the intersection of the main feeder with the dashed line representing the enclosure.

C. Phase, Neutral and Ground conductors shall be represented as solid lines and shall be identified (such as L1, L2, L3, N, etc.) in accordance with their connection to the power source. Wire size and type shall be shown as required.

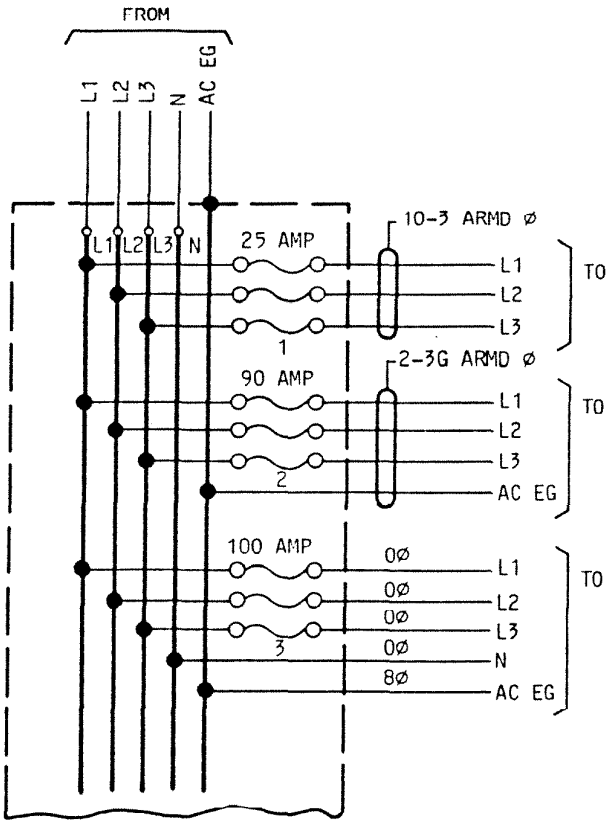


FIGURE 5
TYPICAL AC DISTRIBUTION CIRCUIT WITH AC EG (GREEN WIRE GROUND)

D. The ampere size of fuses, the fuse type (when other than 250 V nonindicating cartridge) the office circuit numbering, bay location and assigned circuit shall be shown (see Figure 6B).

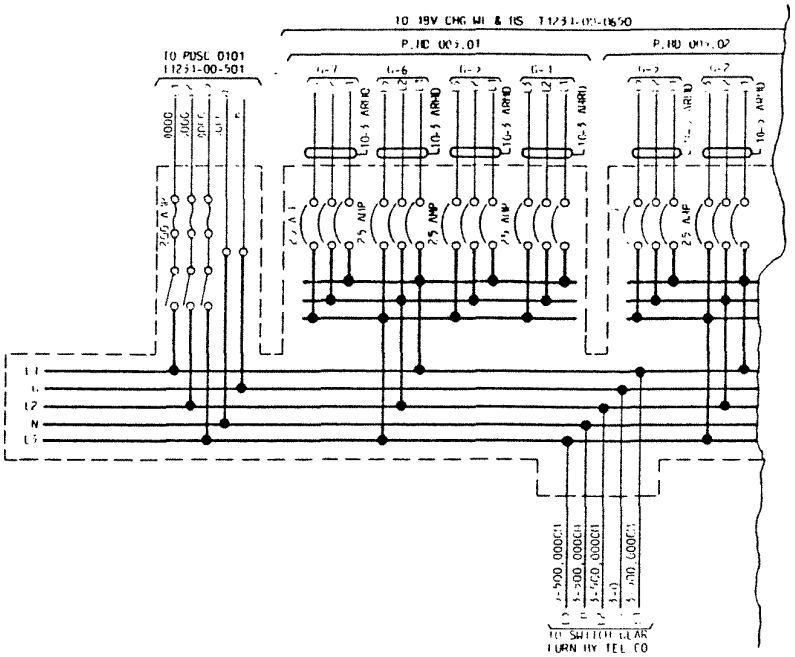


FIGURE 6A
TYPICAL AC BUS DUCT CIRCUIT

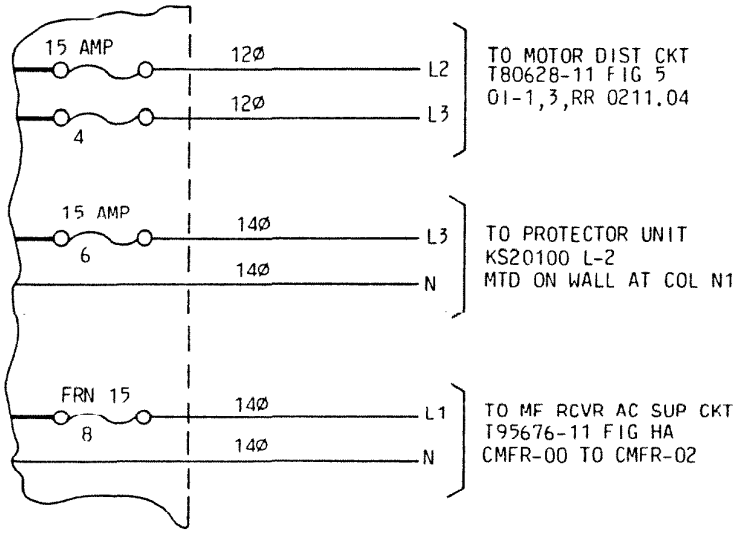


FIGURE 6B
TYPICAL AC CIRCUIT DISTRIBUTION
FUSES TO TELEPHONE EQUIPMENT

E. Circuit Breakers, their ampere rating and office circuit numbering shall be shown, (see Figure 8).

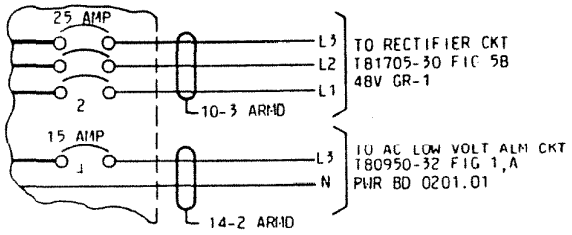


FIGURE 7
TYPICAL AC DISTRIBUTION CIRCUIT
BREAKERS FOR TELEPHONE EQUIPMENT

F. Assignment of fuse positions or circuit breakers to equipment shall designate the applicable neutral, ground and phase number leads to be used, (see Figures 6 and 7).

6.02 DC Distribution - Direct current leads are designated "charge", "discharge", "signal", "talk", etc., to provide a readily recognizable classification of leads which require specific treatment to minimize electrical interference. The applicable designations shall be shown on power circuit drawings in order to assure the proper treatment of these leads. Also, the battery and ground lead arrangements provided for each load shall be shown and shall include:

A. Amperage rating

B. Position identification of protective device

C. Identification of equipment being powered

D. Wire size and type

E. Tap feeder arrangements

F. Split load identification (Load A, Load B, etc.)

G. The information below shall be shown by recording the appropriate standard battery distribution drawing number and figure, if such a standard drawing exists.

6.03 Battery distribution via BDFB serving equipment shall be shown on a circuit and equipment drawing.

A. Show equipment and assembly information by means of a block outline of the bay front view. Show the standard specification drawing with lists (except fuse unit or panel lists which are shown with the fuse position information) beneath the block outline. Show the fuse panels in their proper relationship on the block outline and designate to show the fuse numbering, load designation, and voltages.

B. The following information shall be shown in tabular form:

1. Maximum calculated ampere capacity of discharge fuse and feeder combination

2. Current drain information in terms of peak amperes

3. Fuse position assignment information:

a. Position

b. Amperage rating

c. Functional Designation and office circuit number of frame being powered

d. Wire sizes and terminal lugs for battery and ground leads

e. The standard battery distribution circuit and applicable figure number or other information

7.00 JOB MODIFICATION FIGURES

7.01 Modifications of standard circuits shall be drawn using the methods and conventions used on the drawing of the circuit being modified. When the Simplified Airline method is used, a functional schematic type figure as well as the modified wiring diagram figure shall also be provided. When Full Line, Airline (not simplified) or any other method which permits tracing the circuit through relay contacts, etc., is used, this separate schematic figure is not necessary.

7.02 Circuit Description (CD) information shall be provided on the drawing. Applicable documentation such as drawing or sketch number shall be recorded in a note. Also the issue of the standard wiring diagram current at the time of modification shall be noted (see Figures 8 and 9).

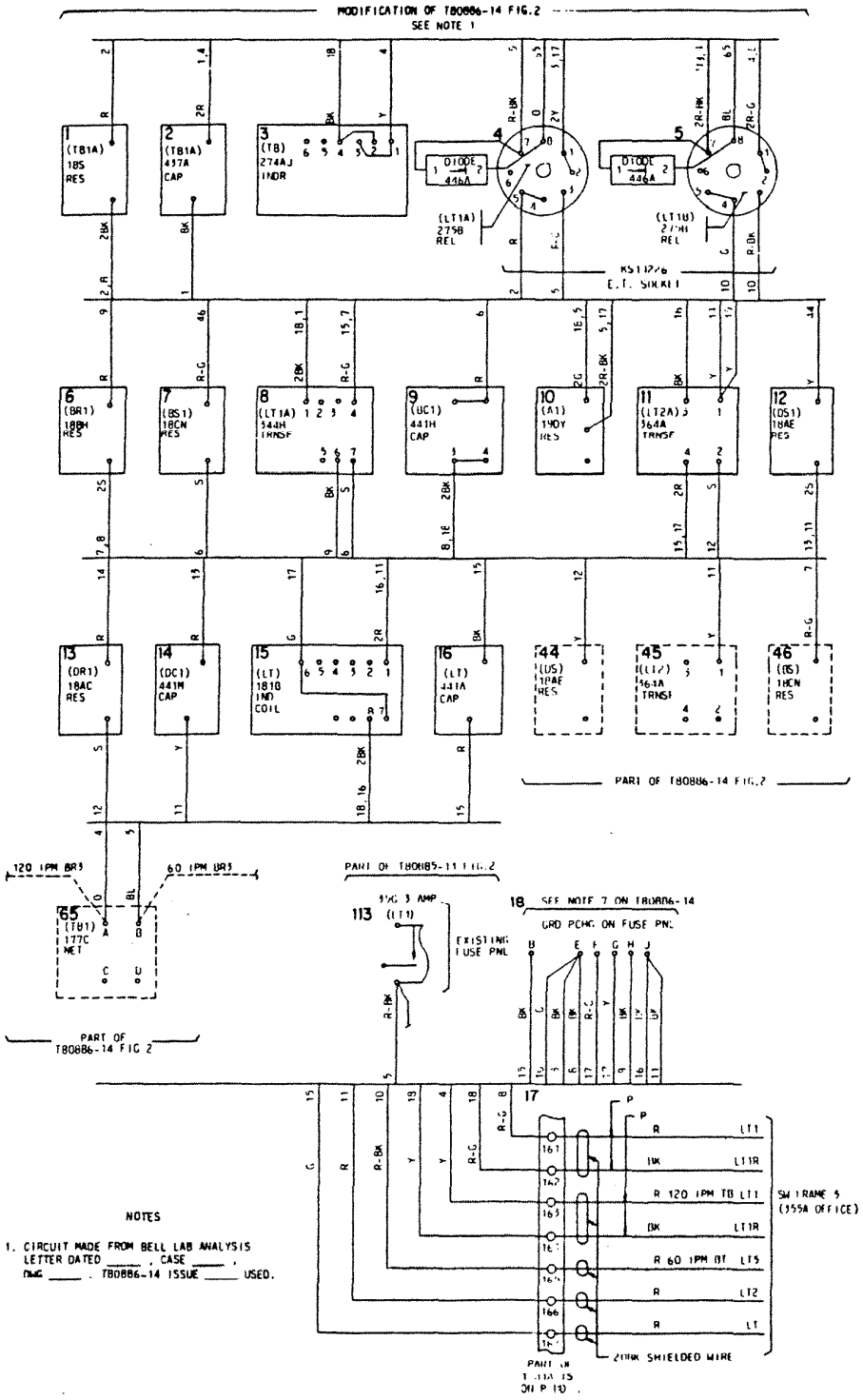


FIGURE 8
TYPICAL POWER CIRCUIT SIMPLIFIED AIRLINE METHOD

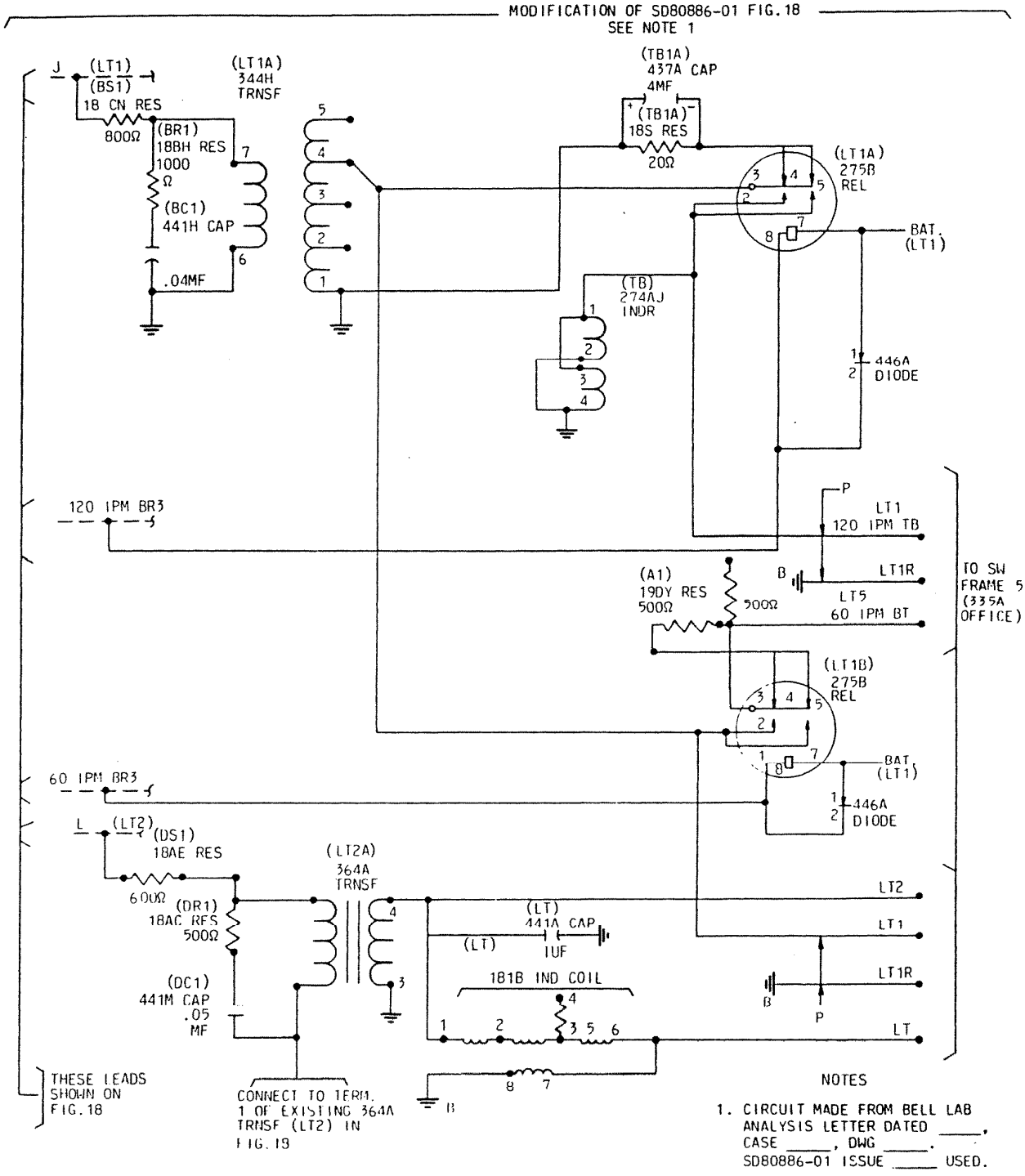


FIGURE 9
TYPICAL POWER CIRCUIT FUNCTIONAL SCHEMATIC

8.00 POWER CIRCUITRY NOT SHOWN ON STANDARD DRAWINGS

8.01 All power circuits to be installed in a telephone office shall be shown on the office record drawings. When these circuits are not shown on standard drawings and space on the WL & BS drawing is insufficient, they shall be recorded on a Power Circuit drawing using one or more of the following methods:

A. Show wired units of equipment for which no standard wiring diagram has been provided (rectifiers, engine driven alternators, etc.) as a circuit convention. The convention will be basically a rectangular block, differing from the block used on a block schematic drawing in that it represents the unit wiring as provided by the manufacturer instead of a standard wiring diagram. It is, therefore, required to show and identify within the convention block, the terminals or component apparatus within or on the unit, to which external leads connect.

B. The unit shall be identified by showing within the block the code number or specification and list number or the manufacturer's name and catalog or code number.

C. The manufacturer's schematic drawing number and figures, if a schematic was provided, or the manufacturer's schematic and wiring diagram numbers shall be shown, (see Figure 10).

D. Straps between terminals, installer's wiring of component apparatus and all other installer wired interconnections shall be shown.

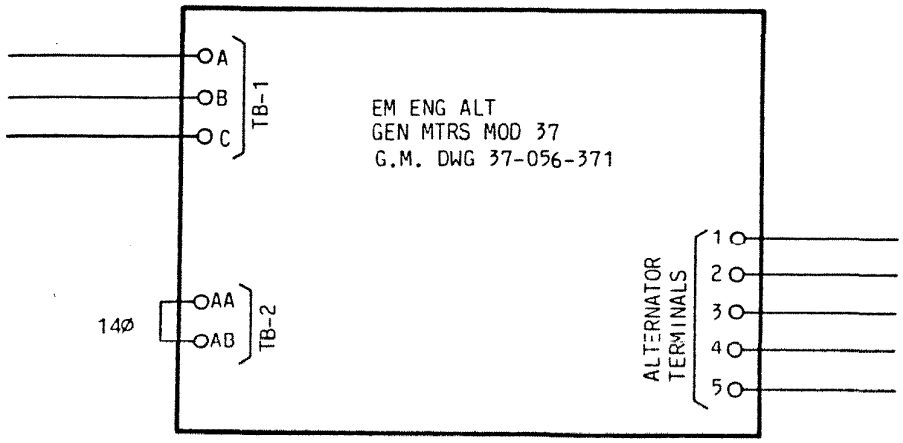
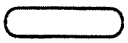


FIGURE 10
CIRCUIT CONVENTION USED FOR WIRED
EQUIPMENT HAVING NO STANDARD WIRING DIAGRAM

E. When the circuit is engineered in detail without being based on a specific drawing it shall fully identify the component apparatus and wiring. In addition, where the circuitry cannot be traced through relays, etc., because the contacts are not depicted, a functional schematic type figure using circuit symbols shall be shown.

9.00 NOTES AND SYMBOLS

9.01 Use the following common notes and symbols as required:

1.  SPLICE
2. LEADS ARE TO BE 14 OR LARGER UNLESS OTHERWISE SPECIFIED
3. —— – —— WIRING FURNISHED WITH EQUIPMENT
4. : : 1/ . : : 2/ LEADS TO BE RUN BY INSTALLER AS SHOWN ON THIS DRAWING
5. FOR LEAD NOT DESIGNATED WITH A : : 1/ . : : 2/ SEE CONNECTING CIRCUIT FOR SIZE AND TERMINATION
6.  PARALLEL CABLE CONNECTOR
7. 14-2 ARMD, 10-3G ARMD, ETC., DENOTES ARMORED CABLE. "G" DENOTES AC EQUIPMENT GROUND CONDUCTOR
8. WIRE SIZE ENCLOSED IN PARENTHESIS ( ) INDICATES SIZE IS CONTROLLED ELSEWHERE
9.  CABLE
10. [ ] INDICATES DESIGNATIONS SHOWN FOR INFORMATION ONLY AND NOT TO BE STAMPED
11. ———— END TO END CABLE CONNECTOR
12. P-PAIR

POWER BOARD - FRONT AND REAR EQUIPMENT DRAWINGS

CONTENTS

1.00 GENERAL

1.01 This part covers the engineering and standards to be followed in the preparation of Job Power Board - Front and Rear Equipment Drawings.

1.02 The Job Power Board - Front and Rear Equipment Drawings established office records of the power equipments and their arrangements on the front and rear of a power board in a particular Central Office.

2.00 SCALE

2.01 A scale of one and one half inches to the foot shall be utilized when depicting Power Board Bays on the Front Equipment Drawings.

2.02 A scale of two inches to the foot shall be utilized when depicting Power Board Bays on the Rear Equipment Drawings.

2.03 No scale is required for all other configurations to be depicted on the Front and/or Rear Equipment Drawings. However, they shall be drawn in such a manner as to accommodate 1/8 inch lettering to meet microfilm standards.

3.00 PEN SIZE

3.01 The pen size requirements for the preparation of Tabular Format Lineweights are covered in Section III, Part C of this publication.

3.02 Pen sizes that shall be used for specific applications are as follows:

Pen Size	Application
0	Apparatus locations within sketches, Miscellaneous mounting plate equipment tables, Leader and Dimension lines, Position ladders, Bus Bars, Details, Brackets, Symbols and View outlines
2	Power Bay and Cabinet outlines, Division lines for Units and Miscellaneous Plates within Bays and Cabinets, Fuses and Fuse Conventions, Sketch and Figure outlines
3	Section lines

4.00 ISSUE NOTES

4.01 Descriptive Issue Notes are required on Power Board - Front and Rear Equipment Drawings.

4.02 On Job Power Board - Front Equipment Drawings, panels of equipment, mounting plates, standard coded bays, bays and cabinets that are added, removed and changed and/or renumbered shall be documented in an Issue Note similar to the following:

EXAMPLE: ADD PBD 0101.02, PNL C&D IN PBD 0101.01, FS54/RMV FS3 IN PDSC 0101/CHG FS55 to 30 AMP/RNBR FS 100-105 TO 10-15/CHG PNL B PBD 0101.01/CHG PBD 0102.02 READ MANUFACTURER'S DRAWING

4.03 On Job Power Board - Rear Equipment Drawings, Bus Bars that are added, removed and/or changed (show the quantity, detail number and location) including sketches, sections and/or views added or changed (excluding terminal lugs) shall be documented in an Issue Note similar to the following:

EXAMPLE: ADD ONE D41, 42 PBD 0101.03/RMV ONE D6 PBD 0101.01/CHG SK 0101.01A, D31 CUT

4.04 A basic Issue Note will suffice for other drawing changes not covered in Subparagraphs 4.02 and 4.03.

5.00 CRITERIA

5.01 Prior to the preparation of power board front and rear equipment drawings of a particular power board lineup, all necessary data shall be obtained, checked to verify that it is noncontradictory and is the latest available information. This data consists of:

A. Office Drawing Base and Dash Numbers

B. Architect's Plans

C. Development Plan

D. Study Plan

E. Floor Plan of the Central Office

F. Distribution Requirements - Both Present and Future

G. Growth and Number of Power Board Bays in Lineup - Both Present and Future

H. Type of Power Board

I. Power Board Bay Heights, Widths and Number of Panel Spaces Per Bay

J. Size of Mounting Plates and Panels - Widths and Heights

K. Power Board Equipment Arrangements, Figures, Sketches and Views

L. Tabular Formats for Power Board Drawings

M. Power Board Job Specification Aids (SFM's, SFP's, SFC's, SFMV's, SFV's)

N. Power Board Equipment Drawing Aids (DA's)

O. Power Board Reference Aids (RA's)

P. Power Board Computer Documents Aids (PCDA's)

Q. Outside Supplies Equipment, Wiring and Schematic drawings, when required

5.02 Job Power Board Front and Rear Equipment drawings shall include the job condition information necessary to engineer and install the power boards and associated materials.

5.03 Power Boards shall be numbered on front and rear equipment drawings in the same manner as they appear on the floor plans and covered in Section V, Part A of this publication.

A. If the growth of a power board lineup is from left to right, as viewed from the front of the lineup, the lowest bay in the lineup shall be located at the left border of the front equipment drawing with the remaining bays shown and numbered consecutively to the right. If the growth of a power board lineup is from right to left, as viewed from the front of the lineup, the lowest bay in the lineup shall be located as near as possible to the right side of the Job front equipment drawing with the remaining bays shown and numbered consecutively to the left. The same applies to the layout of bays on a Job rear equipment drawing but with the growth of the power board lineup as viewed from the rear. See Exhibits 1 and 2 for typical arrangements of power board drawings.

5.04 Job Power Board Front Equipment Drawings shall not be generated for:

A. Lineups of power board bays consisting entirely of standard coded power bays which are completely detailed on their respective specification drawings.

B. Standard coded (shop wired) power bays which are completely detailed on their respective specification drawings and not located in a lineup.

C. Under conditions A and B, a Job Power Wiring List and Block Schematic drawing shall be prepared for documenting wiring list data and equipment information by means of the specification drawings, lists and/or groups that order framework, unit assemblies and local cables. See Section VII, Part A of this publication for the preparation of Job Wiring Lists and Block Schematic drawings.

5.05 Complete power bays of equipment ordered by lists and/or groups shall be handled in the same manner as the standard coded power bays as in Paragraph 5.04.

5.06 Job Power Board Front Equipment drawings shall be prepared for:

A. Miscellaneous job engineered power bays that are either in or not in power board lineups

B. Supplier power bays that are either in or not in power board lineups

C. Combinations of miscellaneous job engineered and standard coded power bays in the same power board lineups

D. Under conditions A, B and C, the miscellaneous job engineered power bays shall be depicted in detail in a manner similar to Exhibits 4 through 7. The standard coded power bays under condition C shall be depicted in bay outline in a manner similar to Exhibit 3. Only the associated wiring list information for both types of bays shall be recorded on the Job Wiring List and Block Schematic drawings. See Section VII, Part A of this publication for the preparation of Job Wiring List and Block Schematic drawings.

5.07 A Job Power Board Front Equipment Drawing shall be prepared when one or more miscellaneous (job engineered) power bays are being added to an existing lineup of standard coded power bays for which a Job Power Board Front Equipment Drawing does not exist. Only the miscellaneous job engineered power bays being added including a cross reference note to the existence of the standard coded power bays in the lineup shall be documented on this drawing.

5.08 Job Power Board Rear Equipment Drawings shall be prepared for all power board bays having piece parted or job detailed bus bars for battery and ground furnished on a job basis and placed on the rear of the power board by either the shop or installer. For small power plants where the amount of information to be shown on a rear equipment drawing is small, the information may be shown as a sketch on the front equipment drawing rather than creating a rear equipment drawing.

6.00 SPECIFIC DRAWING STANDARDS

6.01 Drawing standards related herin shall be applied to all new power board front and rear equipment drawings. However, drawing standards that were in use on drawings may still be used, when it is logical and economically feasible to complete the existing drawings.

7.00 FRONT EQUIPMENT

7.01 The Job front equipment drawing shall show the names and specification drawing numbers with associated lists or groups for all standard panels used in the power board assembly except for standard fuse and blank panels located on battery control board distribution bays, in which case the names of the panels shall be omitted.

7.02 When standard coded bays with optional equipment arrangements are being furnished, the bay names with their associated specification drawings with lists or groups shall be shown beneath the power bays similar to Exhibits 4, 5 and 6. Bay aprons, enclosures and/or covers, end panels and/or end covers (when furnished as part of the standard coded bay) shall be designated by name only and shown on the job front equipment drawing as follows:

A. Bay aprons in associated bay configurations

B. End enclosures, end covers and/or end panels shown on either the right or left or both ends of a bay or lineup configuration, whichever is applicable

C. Enclosures and/or covers shown with FR for front or RE for rear

7.03 When miscellaneous job engineered bays are being furnished, the bay names with their associated framework drawings and lists or groups shall be shown beneath the power bays similar to Exhibit 7. Bay aprons, enclosures and/or covers, end panels and/or end covers when furnished on a miscellaneous basis shall be designated by name with their associated drawings with lists and/or groups, details and/or piece parts and shown on the job front equipment drawing as follows:

A. Bay aprons in associated bay configurations

B. End enclosures, end covers and/or end panels shown on either the right or left or both ends of a bay or lineup configuration, whichever is applicable

C. Enclosures and/or covers shown with FR for front or RE for rear or both FR and RE, whichever is applicable, in associated bay configurations

7.04 All panels on the power boards, except trim panels, aprons, enclosures, covers, end panels and/or end covers shall be designated alphabetically, left to right and from top down starting with the letter A in each bay. In the event an existing panel is being replaced by two or more panels in the same space, the new panels shall be designated alphabetically by retaining the existing panels's letter designation and suffixing it with another letter.

EXAMPLE: Panel [C], is replaced by three new panels; the three new panels are designated [CA], [CB], [CC]

Locate the designations in the upper right hand corner of the panel enclosed in brackets to signify they are not to be stamped on the panel and cover with a note similar to the following:

[A]; [AA]; [AB]; [AC] --- ETC.; SHOWN IN UPPER RIGHT HAND CORNER OF PANEL INDICATES PANEL POSITION IN BAY.

7.05 Panels located by mounting space designations shown on standard drawings shall show the designation of the lowest space occupied, within brackets in the upper left corner of the panel. A note shall then be included on the drawing similar to the following:

[BA]; [CB]; [EA] --- ETC.; SHOWN IN UPPER LEFT HAND CORNER OF PANEL INDICATES DESIGNATION OF LOWEST MOUNTING SPACE POSITION OCCUPIED BY PANEL IN BAY.

7.06 Apparatus furnished as part of a coded bay or panel shall not be shown on the front equipment drawing except in those cases where it is necessary to show the apparatus to clearly indicate job stamping information.

7.07 When standard coded (shop assembled or shop wired) panels are modified, the modification should be covered in the following preference.

A. Refer to the standard equipment figure modified by a short concise note shown within equipment limits in power bay (see Exhibit 7)

B. Refer to the standard equipment figure modified by a broken sketch (see Exhibit 7)

C. Detail out the equipment in full

7.08 When it is necessary to show apparatus mounted on panels on job drawings, show a brief description of the apparatus, sufficient to readily identify the corresponding items in the job specification summary of material. The description, detail, piece part, panel coded numbers and stamping information shall be shown within the panel boundaries unless it is advisable, due to congestion, to show them outside. All information shown on power panels shall be enclosed in brackets except the job stamping information.

8.00 TABULAR FORMAT FOR DEPICTING POWER BAYS

8.01 Power distribution and/or control and distribution bays may be completely depicted by means of a tabular format when the following conditions are met:

A. The bays must be completely detailed on manufacturer specification drawings except for the job arrangement of panels and job stamping information.

B. The fuse or circuit breaker panels can be located in the bay by use of panel position numbers shown on the specification drawing.

C. Individual fuses and circuit breakers can be located by means of position numbers or letters shown on the standard panels.

8.02 When the tabular format is used, equipment specification information shall be shown on the associated Power Wiring List and Block Schematic or Wiring List drawings.

A. Depending on the number of Power Distribution Bays involved and the availability of space on the job drawings, the tabular format may be shown:

1. by itself on a Job Power Board Front Equipment Drawing or;

2. on the associated Job Power Wiring List and Block Schematic Drawing or;

3. on the associated Job Power Wiring List Drawing.

B. See Exhibit 9 for a typical tabular format.

9.00 JOB STAMPING INFORMATION

9.01 Job stamping information shall be shown on Job Power Board Front Equipment Drawings. The stamping designations that are shown on standard drawings shall not be duplicated on the job drawing except when necessary to associate them with the job stamping. Alpha and numerical designations shall be shown in their approximate locations within the bay or unit configurations in the body of the drawing. Where there is insufficient space in the configurations to show the designation information, it shall be shown either in an enlarged sketch of the affected area or in tabular form. For examples, see sketches and tables in Exhibits 4 through 9.

9.02 For identification purposes, job discharge fuses shall be numbered. The sequence of numbering shall provide a unique number for each fuse associated with a plant. The numbers may be reserved for possible future fuses within the sequence numbering to ensure sequential assignments in relation to physical location.

9.03 Discharge fuses requiring separate alarm fuses shall be associated by designating both the main fuse and alarm fuse with identical numbers. When the alarm fuse is located adjacent to the associated circuit fuse, the identifying number is not required for the alarm fuse.

9.04 In the same power board, ladders may be used to indicate duplication of like equipment only when the like equipment is adjacent.

9.05 When two or more drawings are required to fully depict a power board lineup, it is recommended they be assigned consecutive dash numbers. When this occurs, cross referencing notes shall be utilized between the drawings.

10.00 DIMENSIONING OF BAYS AND PANELS

10.01 The overall height and width of each bay shall be designated in feet and inches and shown on the front equipment drawing only.

10.02 On Job Power Board Front Equipment Drawings, dimensions are required to indicate the unequipped space that is available for the mounting of equipment in each bay. These dimensions shall be shown in brackets following the piece part or comcode numbers of the blank panels in a bay and/or following the bracketed work [SPACE] in the unequipped areas of a bay (see Exhibits 4 through 8).

10.03 For examples of typical Power Board Front Equipment drawings (see Exhibits 4 to 9).

11.00 REAR EQUIPMENT

11.01 The job rear equipment drawing shall show all apparatus and bus bar details furnished on a job basis, or as part of a coded bay on the panel that is modified or relocated, with full lines.

11.02 The job rear equipment drawing shall not show the apparatus and bus bar details furnished with coded bays or panels except to show modifications or connections to bus bar details or apparatus furnished on a job basis.

11.03 Apparatus or bus bar details furnished as part of coded bays or panels that must be shown, without modification, for the purpose of association with job furnished bus bar details or apparatus shall be shown by dot-dash lines.

11.04 When piece parts or details are to be cut or drilled by the installer, the required length and hole size and location shall be shown on the job drawing. Also, the necessary material required for assembly shall also be shown.

11.05 Bus bar connections to switch, fuse or shunt, studs, etc., are based on the dimension shown on the power data sheets, i.e., the dimension from the rear of the panel to the face of the connecting bus bar has been determined in proportion to the length of the studs and the thickness of washer, clamp and contact nuts. When it is necessary to deviate from these dimensions, sketches giving sufficient information for the shop or installer to assemble the bus bar in the desired position, shall be shown on the drawings.

11.06 Stamping information shown on the job front equipment drawing need not be duplicated on the job rear equipment drawing, excepting panel positions which shall be repeated for identification purposes. The designation will be stamped on both the front and rear of the panels by the shop or installer in accordance with standard requirements. Since job rear stamping is done in accordance with information shown in the front view, information such as power plant number, terminals and figure numbers need not be enclosed in brackets if so explained in a drawing note.

11.07 Detailed bus bar and terminal assembly information need not be shown on the rear equipment drawing if reference can be made to assembly figures on standard drawings.

11.08 For an example of a typical Job Power Board Rear Equipment Drawing (see Exhibit 10).

12.00 FIGURES, SKETCHES, SECTIONS AND VIEWS

12.01 Figures shall be used on equipment drawings to shown equipment, stamping or assembly information for panels which are not normally shown as part of a numerically designated bay. Figures are to be designated numerically from "1" up. Following are examples where figure designations shall be used:

A. Assembly view of unit type spare fuse panels

B. Punching designation list for ringing power board

12.02 Sketches shall be used on equipment drawings to show stamping, drilling or assembly information for portions of bay assemblies or equipment arrangements. Reference to the sketches shall be made in the affected area of the drawing. Sketches involving a power board panel are to be designated by combining the power board bay number and affected panel letter designation. Sketches not involving a power board panel shall be designated alphabetically from "A" up.

12.03 Sections shall be used on equipment drawings to show a detailed view as it appears from a cutting plane perpendicular to a panel, bay or equipment assembly.

12.04 Views shall be used on equipment drawings to show a panel, bay or equipment assembly as it appears from a plane external to the panel, bay or equipment assembly, when amplification of detail is required. When applicable, designate the view to indicated the affected bay number.

13.00 FUTURE EQUIPMENT

13.01 Future equipment shall not be shown on job power board front and/or rear equipment drawings. However, space should be allowed on the drawing for the addition of future equipment where conditions or information indicates equipment will be added in the future.

14.00 DRAWING FORMS

14.01 Engineering requires preparation and maintenance of drawing formats for standard power plants depicting power board configurations that may be utilized to facilitate the job engineering and drafting of front and/or rear equipment drawings. These drawing formats are made available in job specifications aid forms (SFM's, SFP's and SFC's) and drafting aids (DA drawings). When these formats are used, they shall be marked to reflect actual office conditions for the current order with all nonapplicable information, notes and symbols deleted.

15.00 METRIC MEASUREMENTS

15.01 Where a requirement exists that metric measurments for an office and/or equipment be used on Power Board Drawings, see Section III, Part E of this publication which defines the requirements metric dimensions.

16.00 NOTES AND SYMBOLS

16.01 The following are some of the common notes and symbols which shall be used as required on Job Power Board Drawings.

1. [ ] DESIGNATIONS SHOWN IN BRACKETS ARE FOR INFORMATION ONLY AND ARE TO BE STAMPED

2. [A]; [AA]; [AB]; [AC] - - - ETC.; SHOWN IN UPPER RIGHT HAND CORNER OF PANEL INDICATES PANEL POSITION IN BAY

3. [BA]; [CB]; [EA]; - - - ETC.; SHOWN IN UPPER LEFT HAND CORNER OF PANEL INDICATES DESIGNATION OF LOWEST MOUNTING SPACE POSITION OCCUPIED BY PANEL IN BAY

4. [N-N], DIMENSION IN BRACKETS INDICATES AVAILABLE MOUNTING SPACE

5. FUSES ON DISCHARGE FUSE PANELS ARE ASSIGNED AND STAMPED IN ACCORDANCE WITH TABLE A. BLANK SPACES IN TABLE A INDICATES UNEQUIPPED FUSE POSITIONS ON PANELS

6. CM___, TJ___, ETC.; DENOTES BUS BAR JOINTS AS SHOWN ON MANUFACTURER'S DRAWING NUMBER _____.

7. ASSOCIATED DRAWINGS;

   T _____PWR BD WL & BS

   T_____PWR BD REAR EQPT BAYS

   T_____PWR BD DETS

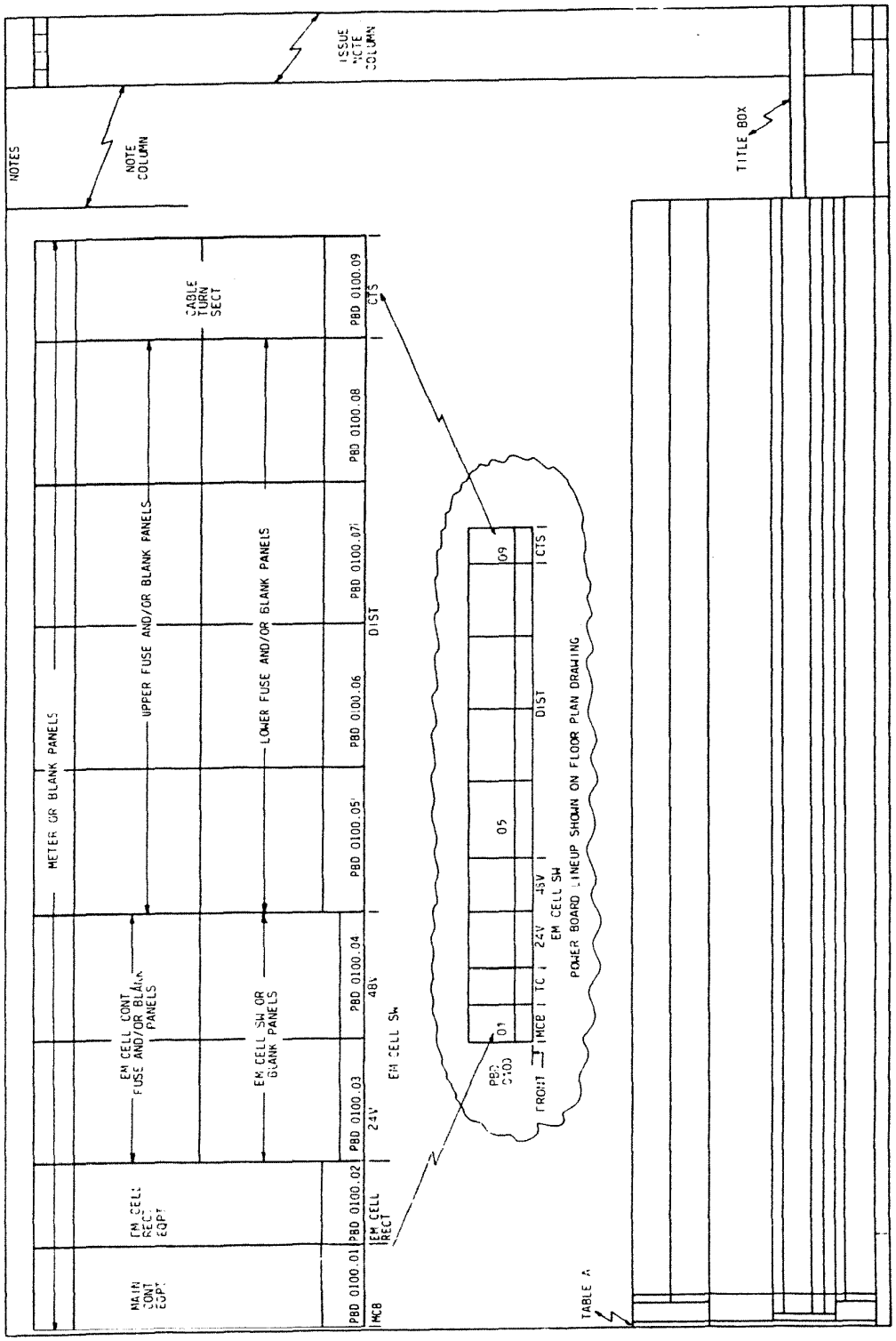


EXHIBIT 1
TYPICAL ARRANGEMENT POWER BOARD FRONT EQUIPMENT DRAWING

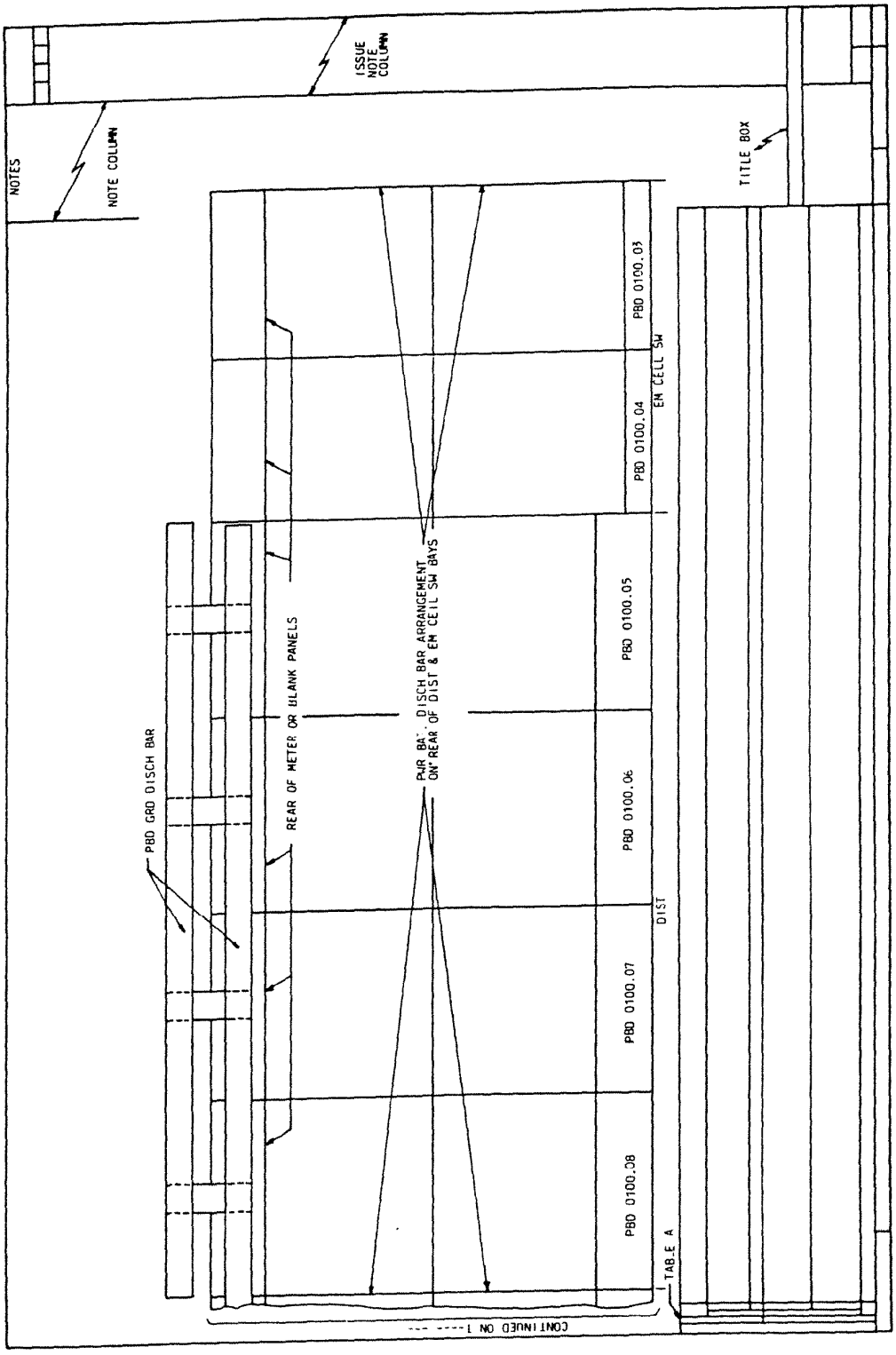


EXHIBIT 2
TYPICAL ARRANGEMENT POWER BOARD REAR EQUIPMENT DRAWING

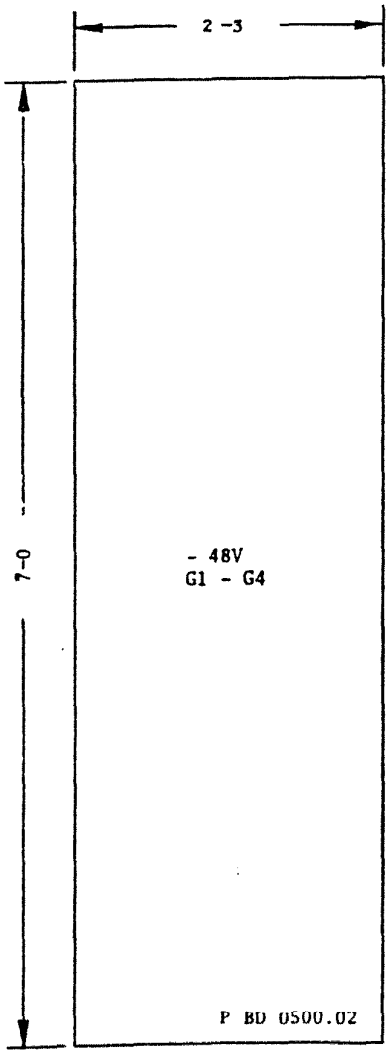
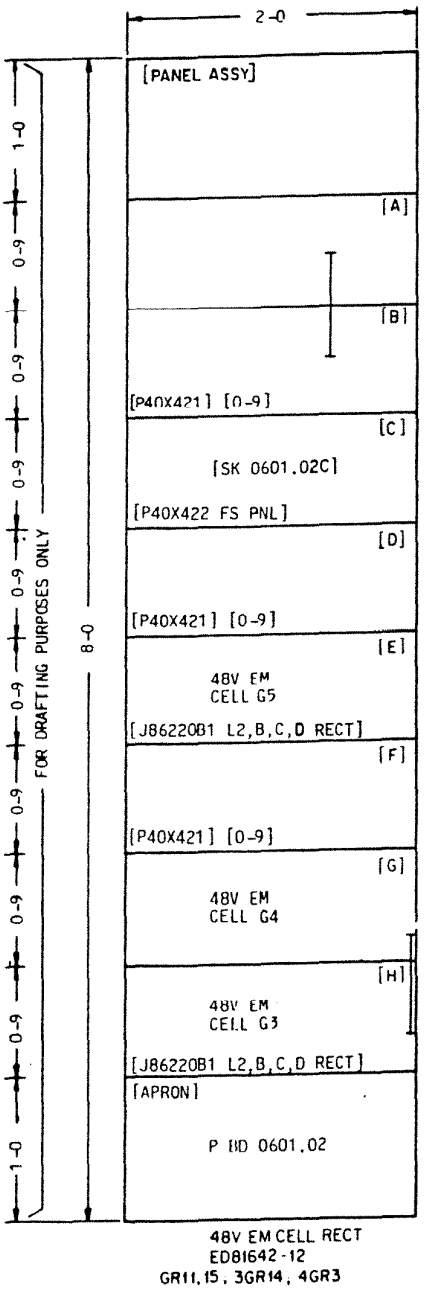


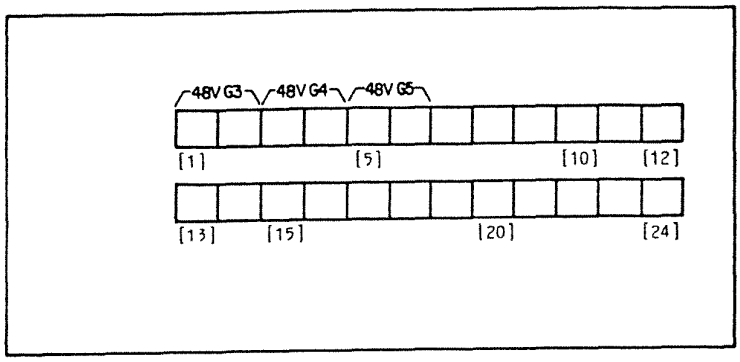
EXHIBIT 3
TYPICAL STANDARD CODED BAY CONFIGURATION
WITH STANDARD EQUIPMENT ARRANGEMENT



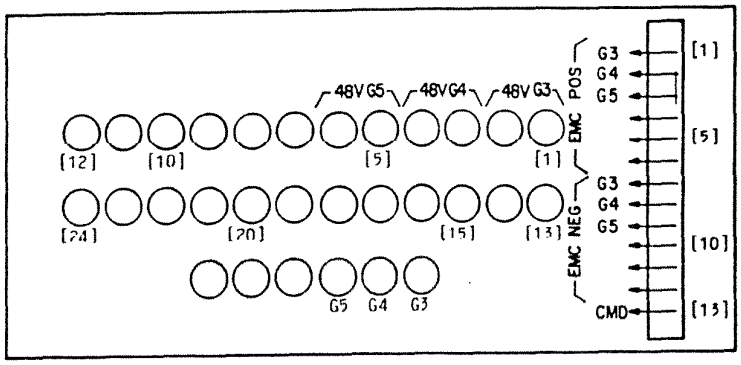
48V EM CELL RECT
ED81642-12
GR11,15, 3GR14, 4GR3

NOTES

1. [ ] DESIGNATIONS SHOWN IN BRACKETS ARE FOR INFORMATION ONLY AND ARE NOT TO BE STAMPED.
2. [A];[AA];[AB];[AC];---ETC.; SHOWN IN UPPER RIGHT HAND CORNER OF PANEL INDICATES PANEL POSITION IN BAY.
3. [N-N] DIMENSION IN BRACKETS INDICATES AVAILABLE MOUNTING SPACE.



FRONT VIEW
FUSE PNL STAMPING



REAR VIEW
FUSE PNL STAMPING
SK 0601.02C

EXHIBIT 4
TYPICAL FRONT VIEW CONFIGURATION OF A STANDARD CODED BAY WITH OPTIONAL EQUIPMENT ARRANGEMENTS

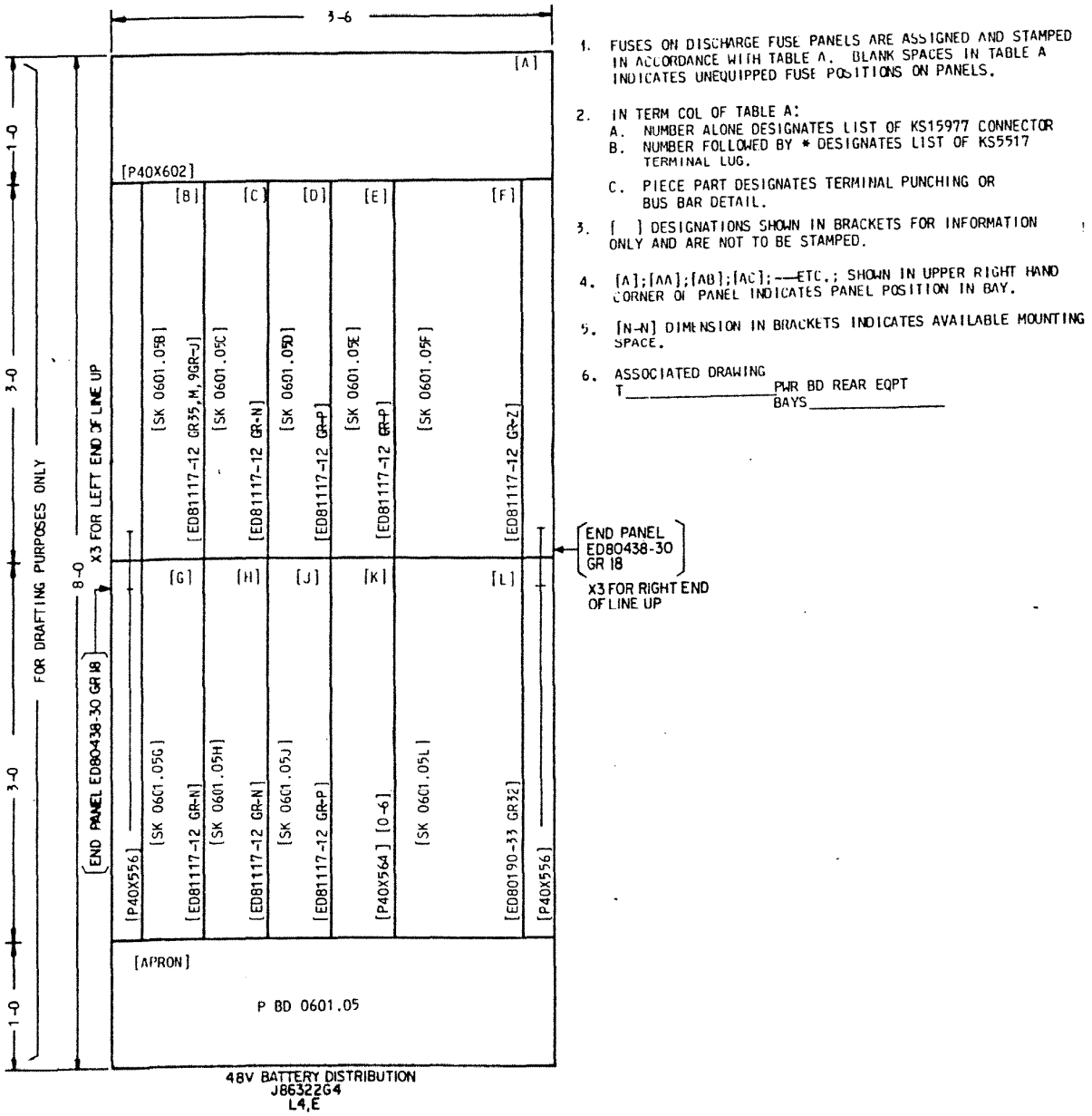


EXHIBIT 5
TYPICAL FRONT VIEW CONFIGURATION OF BATTERY DISTRIBUTION BAY WITH MISCELLANEOUS FUSE PANEL ARRANGEMENTS
(PAGE 1 OF 2)

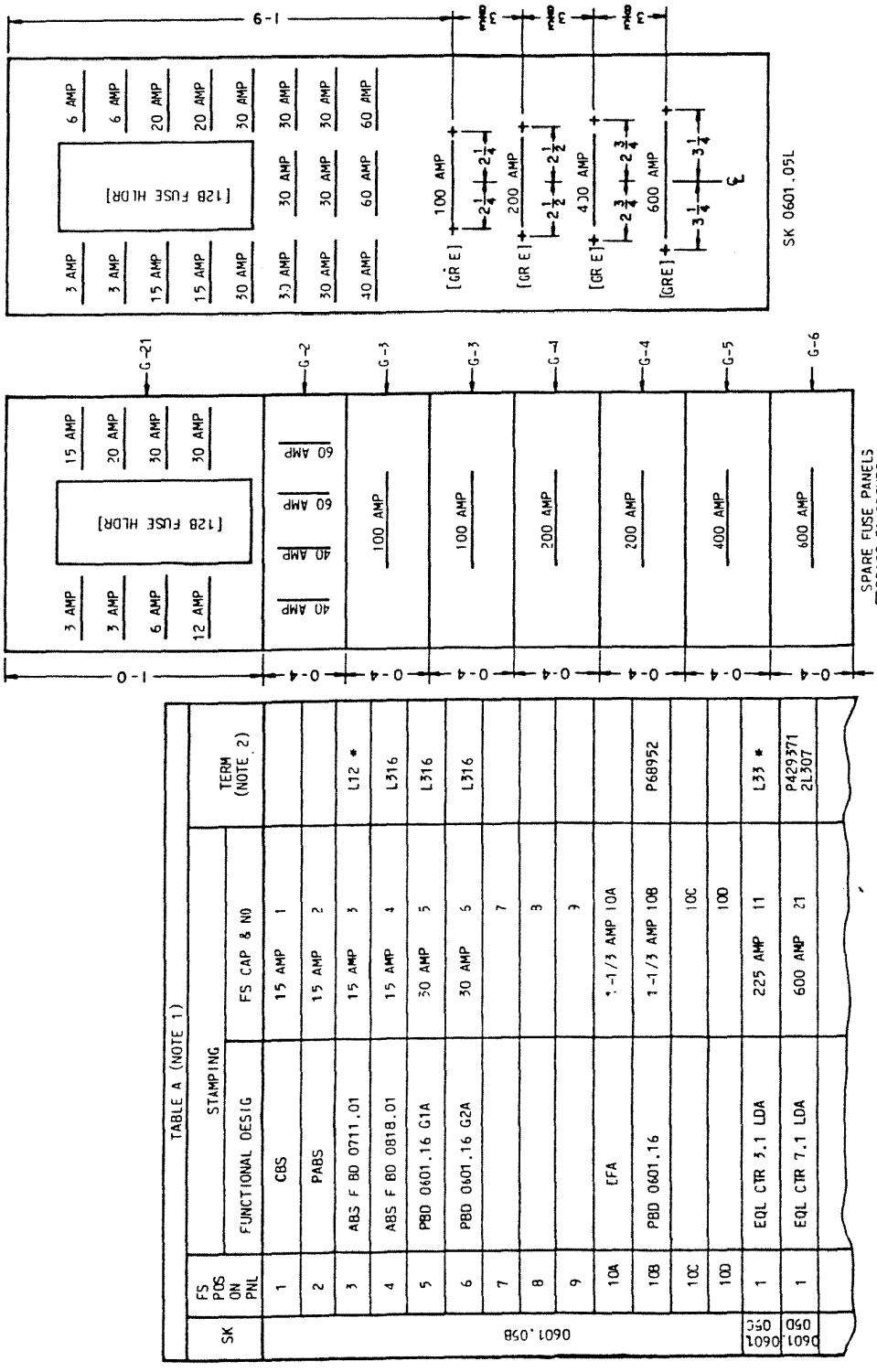


EXHIBIT 5
TYPICAL FRONT VIEW CONFIGURATION OF BATTERY DISTRIBUTION BAY WITH MISCELLANEOUS FUSE PANEL ARRANGEMENTS
(PAGE 2 OF 2)

TABLE A (NOTE 1)

SK	FS POS ON PNL	STAMPING: FUNCTIONAL DESIG	STAMPING: FS CAP & NO	TERM (NOTE 2)
0601.058	1	CBS	15 AMP 1	
	2	PABS	15 AMP 2	
	3	ABS F BD 0711.01	15 AMP 3	L12 *
	4	ABS F BD 0818.01	15 AMP 4	L316
	5	PBD 0601.16 G1A	30 AMP 5	L316
	6	PBD 0601.16 G2A	30 AMP 6	L316
	7		7	
	8		8	
	9		9	
	10A	EFA	1-1/3 AMP 10A	
	10B	PBD 0601.16	1-1/3 AMP 10B	P68952
	10C		10C	
	10D		10D	
0601-0900	1	EQL CTR 3.1 LDA	225 AMP 11	L33 *
0601-0900	1	EQL CTR 7.1 LDA	600 AMP 21	P429371 21307

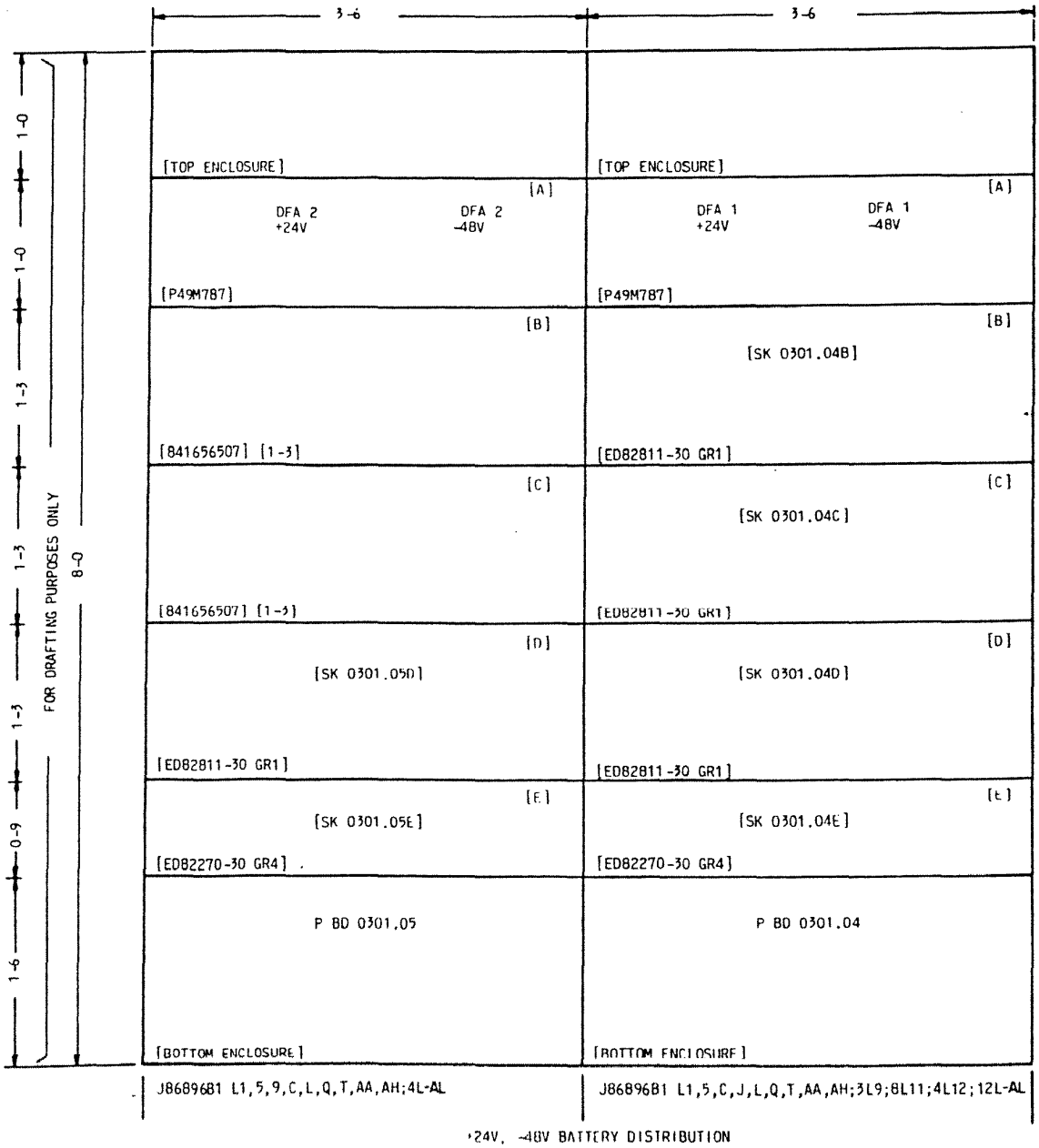


EXHIBIT 6
TYPICAL B.D.F.B. CONFIGURATION
(FRONT VIEW)
(PAGE 1 OF 2)

NOTES

1. FUSES ON DISCHARGE FUSE PANELS ARE ASSIGNED AND STAMPED IN ACCORDANCE WITH TABLE A. BLANK SPACES IN TABLE A INDICATES UNEQUIPPED FUSE POSITIONS ON PANELS.

2. IN BATTERY TERM AND GROUND TERM COLUMNS OF TABLE A:

   A. NUMBER ALONE DESIGNATES CATALOG NUMBER OF T & B COMPRESSIONS CONNECTOR

   B. LIST NUMBER ALONE DESIGNATES LIST OF CONNECTOR

   C. PIECE PART DESIGNATES TERMINAL PUNCHING

3. [ ] DESIGNATIONS SHOWN IN BRACKETS ARE FOR INFORMATION ONLY AND ARE NOT TO BE STAMPED.

4. FOR LEAD TERMINATING MATERIAL REFER TO _____(LIST MANUFACTURER'S DRAWING)

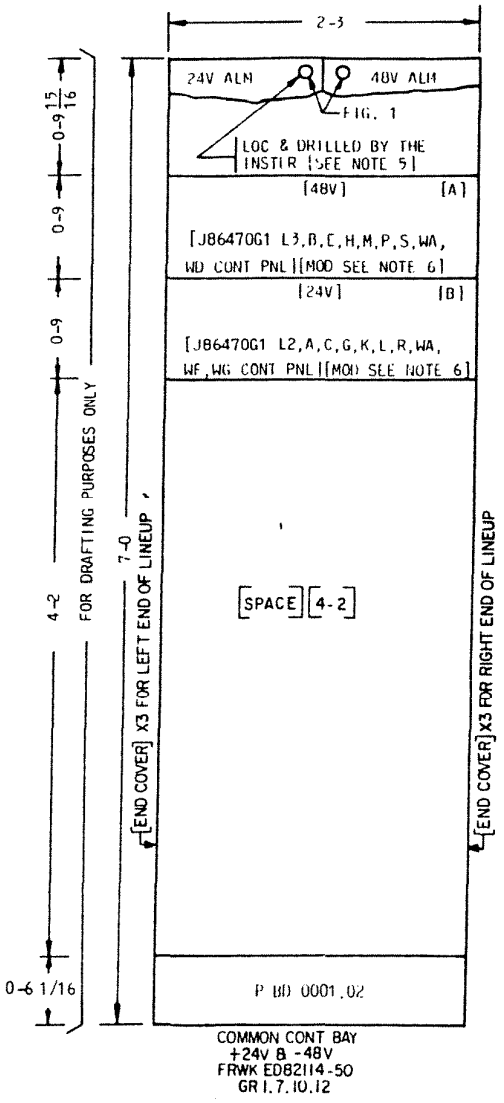
5. [A]; [AA]; [AB]; [AC] - - - ETC., SHOWN IN UPPER RIGHT HAND CORNER OF PANEL INDICATES PANEL POSITION IN BAY.

6. [N-N] DIMENSIONS IN BRACKETS INDICATES AVAILABLE MOUNTING SPACE.

TABLE A (NOTE 1)

SK	POS NO ON PNL	STAMPING		CKT BRKR FS BLK LIST NO	GRD BAR POS NO	BATTERY TERM (NOTE 2)	GROUND TERM (NOTE 2)
		FUNC DESIG	FS CAP & NO				
0301.04E	1	+130V G1B PBD 0105.03	30 AMP 11.1	-	1A	256-30695-263	P40E979
	2	+130V G2B PBD 0105.03	30 AMP 11.2	-	2A	256-30695-263	P40E979
	3	-130V G1A PBD 0105.03	30 AMP 11.3	-	3A	256-30695-263	P40E979
	4	-130V G2A PBD 0105.03	30 AMP 11.4	-	4A	256-30695-263	P40E979
	5	504B BAT A PBD 0103.01	30 AMP 11.5	-	-	256-30695-263	TS
	6	504B BAT B PBD 0103.01	30 AMP 11.6	-	-	256-30695-263	-
	7	504B BAT C PBD 0103.01	30 AMP 11.7	-	-	256-30695-263	-
	8	CBS + 130V PBD 0105.03	1 AMP 11.8	-	5A	256-30695-263	256-30695-253
	9	MP-0	20 AMP 11.9	-	6A	L316	L53
	10						
0301.04D	1	+24V PD00	400 AMP 12.1	12	1B	2L307	2L307
	2	+24V PD01	400 AMP 12.2	11	2B	2L307	2L307
	3	+48V PD00	400 AMP 12.3	11	-	2L306	-
	4	-48V PD01	400 AMP 12.4	11	-	2L306	-
0301.04C	1	+24V PD02	400 AMP 13.1	12	5B	2L307	2L307
	2	+24V PD03	400 AMP 13.2	12	4B	2L307	2L307
	3	-48V PD02	400 AMP 13.3	11	-	2L306	-
	4	-48V PD03	400 AMP 13.4	11	-	2L306	-

EXHIBIT 6
TYPICAL B.D.F.B. CONFIGURATION
(PAGE 2 OF 2)



NOTES

1. [ ] DESIGNATIONS SHOWN IN BRACKETS ARE FOR INFORMATION ONLY AND ARE NOT TO BE STAMPED.
2. DISREGARD THE P-210649 SCREW PROVIDED WITH THE CABINET ASSEMBLY AND REPLACE WITH 840059596 SCREW.
3. DISREGARD THE 31-431 LENS CAP PROVIDED WITH THE RIGHT FRONT DOOR ASSEMBLY.
4. DISREGARD THE MOUNTING SCREW PROVIDED WITH 67C LAMP SOCKET AND REPLACE WITH 840058275 SCREW.
5. THE INSTALLER SHALL DRILL THE LEFT FRONT DOOR ASSEMBLY AND THE CABINET ASSEMBLY FOR MOUNTING OF 24V ALARM LAMPS AS SHOWN PER FIG. 1 AND SECTIONAL VIEW A-A.
6. THE J86470G1 L2 & L3 CONTROL PANELS ARE MODIFIED TO OMIT THE 80C AMP AMMETERS, SHUNTS AND ASSOCIATED MOUNTING MATERIAL AND MODIFIED TO ADD 1500 AMP -48V & +24V METER WITH 25.0 MV DEFLECTION & 3000 AMP SHUNT. THE SPECIAL METERS ARE LOCATED IN THE SAME POSITION AS THE 800 AMP METERS THAT ARE BEING REMOVED. THE METERS ARE WESTON MODEL 741 WESTON INSTRUMENT CO., MOUNTING OF SHUNTS ARE SHOWN ON T_____.
7. MODIFY FRAMEWORK BY DRILLING CLEAR HOLES.
8. [A];[AA];[AB];[AC];---ETC; SHOWN IN UPPER RIGHT HAND CORNER OF PANEL INDICATES PANEL POSITION IN BAY.
9. [N-N] NUMBERS IN BRACKETS INDICATES HEIGHT OF AVAILABLE MOUNTING SPACE.
10. ASSOCIATED DRAWING
    T_____ REAR EQPT
    T_____ DETAILS

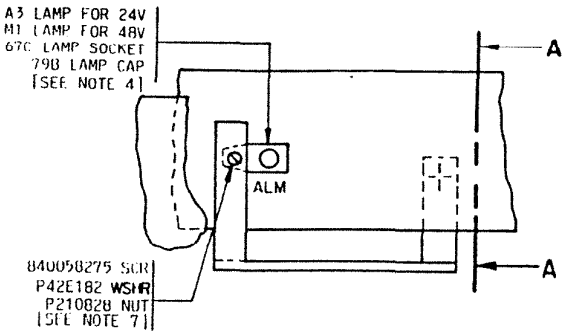
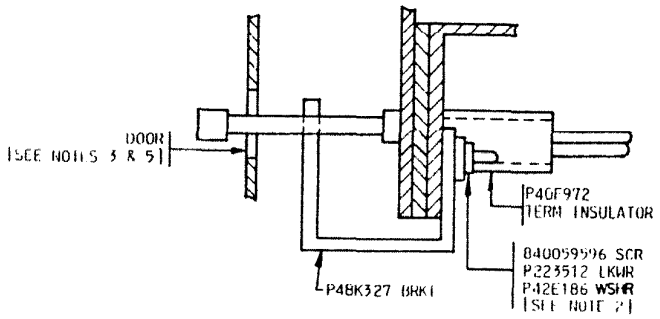
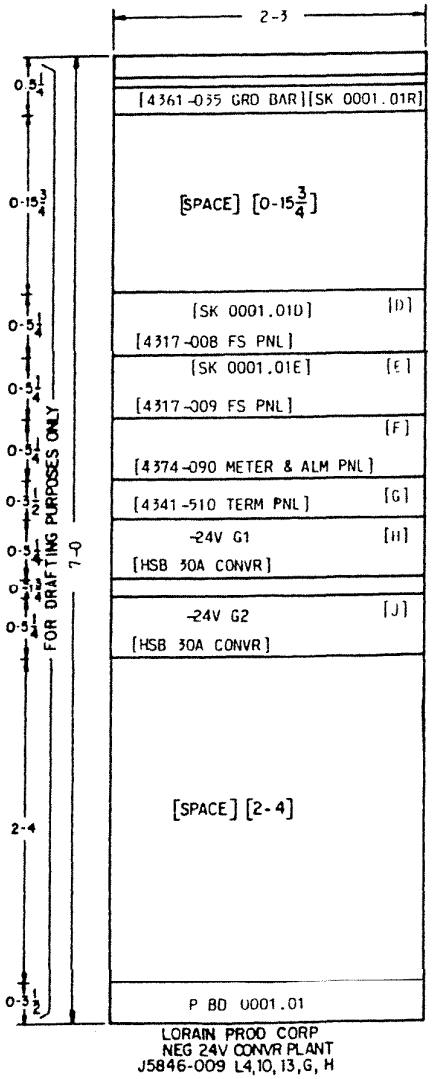


FIG. 1



SECT A-A

EXHIBIT 7
TYPICAL FRONT VIEW CONFIGURATION OF A MISCELLANEOUS BAY WITH EQUIPMENT MODIFICATION



LORAIN PROD CORP
NEG 24V CONVR PLANT
J5846-009 L4,10,13,G,H

NOTES

1. [ ] DESIGNATIONS SHOWN IN BRACKETS ARE FOR INFORMATION ONLY AND ARE NOT TO BE STAMPED.
2. [A];[AA];[AB];[AC];---ETC., SHOWN IN UPPER RIGHT HAND CORNER OF PANEL INDICATES PANEL POSITION IN BAY.
3. FUSES ON DISCHARGE FUSE PANELS ARE ASSIGNED AND STAMPED IN ACCORDANCE WITH TABLE A. BLANK SPACES IN TABLE A INDICATES UNEQUIPPED FUSE POSITIONS ON PANELS.
4. FUSE PANELS PER LORAIN PROD CORP MOD 4317-008 & -009 ARE EQUIPPED WITH DISCH TERMINALS FOR NO 14 TO 0 CABLE.
5. GROUND BAR PER LORAIN PROD CORP MOD 4361-035 IS EQUIPPED WITH TERM STRIP AND TERM LUGS POS 21 TO 28 FOR NO 14 TO 6 CABLE & TERM LUG POS 31 FOR NO 2-0 CABLE.

TABLE A [NOTES 3,4]

SK	FS POS ON PNL	STAMPING	
		FUNC DESIG	FS CAP & NO
0001.01E	1	F BD 0711.01	15 AMP 1
	2	F BD 0712.01	15 AMP 2
	3		
	4		
	5		
	6		
	7		
	8		
0001.01D	1		
	2		
	3		
	4		
	5		
	6		
	7		
	8		

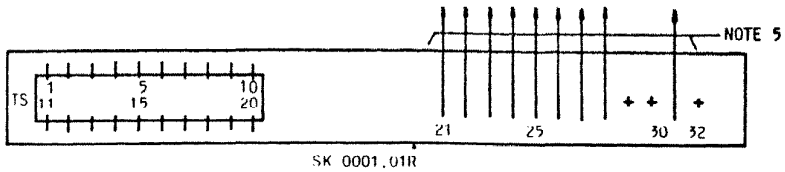


EXHIBIT 8
TYPICAL FRONT VIEW CONFIGURATION

TABLE A

BAY NO	PNL DWG GRP NO	PNL POS IN BAY	FS POS ON PNL	STAMPING		CKT BRKR FS BLK LIST NO	GRD BAR POS NO	BATTERY TERM MATL	GROUND TERM MATL
				FUNC DESIG	CAP & NO				
0001.02	ED82811-30 GR1	2	1	+24V PD00	400 AMP 121	12	1B	2KS15977 L307	2KS15977 L307
			2	+24V PD01	300 AMP 122	11	2B	2KS15977 L307	2KS15977 L307
			3	-48V PD00	300 AMP 123	11	-	2KS15977 L306	-
			4	-48V PD01	300 AMP 124	11	-	2KS15977 L306	-
0001.02	ED82811-30 GR1	3	1	+24V PD02	400 AMP 131	12	3B	2KS15977 L307	2KS15977 L307
			2	+24V PD03	400 AMP 132	12	4B	2KS15977 L307	2KS15977 L307
			3	-48V PD02	300 AMP 133	11	-	2KS15977 L306	-
			4	-48V PD03	300 AMP 134	11	-	2KS15977 L306	-
0001.02	P49MB39 BLANK PANEL	1							
0001.02	841656507 BLANK PANEL	4							

NOTES

1. REFER TO PWR WL & BS T- FOR EQUIPMENT SPECIFICATION INFORMATION.

EXHIBIT 9
TYPICAL TABULAR FORMAT FOR POWER DISTRIBUTION BAYS FOR WHICH NO POWER BOARD DRAWING HAS BEEN PREPARED

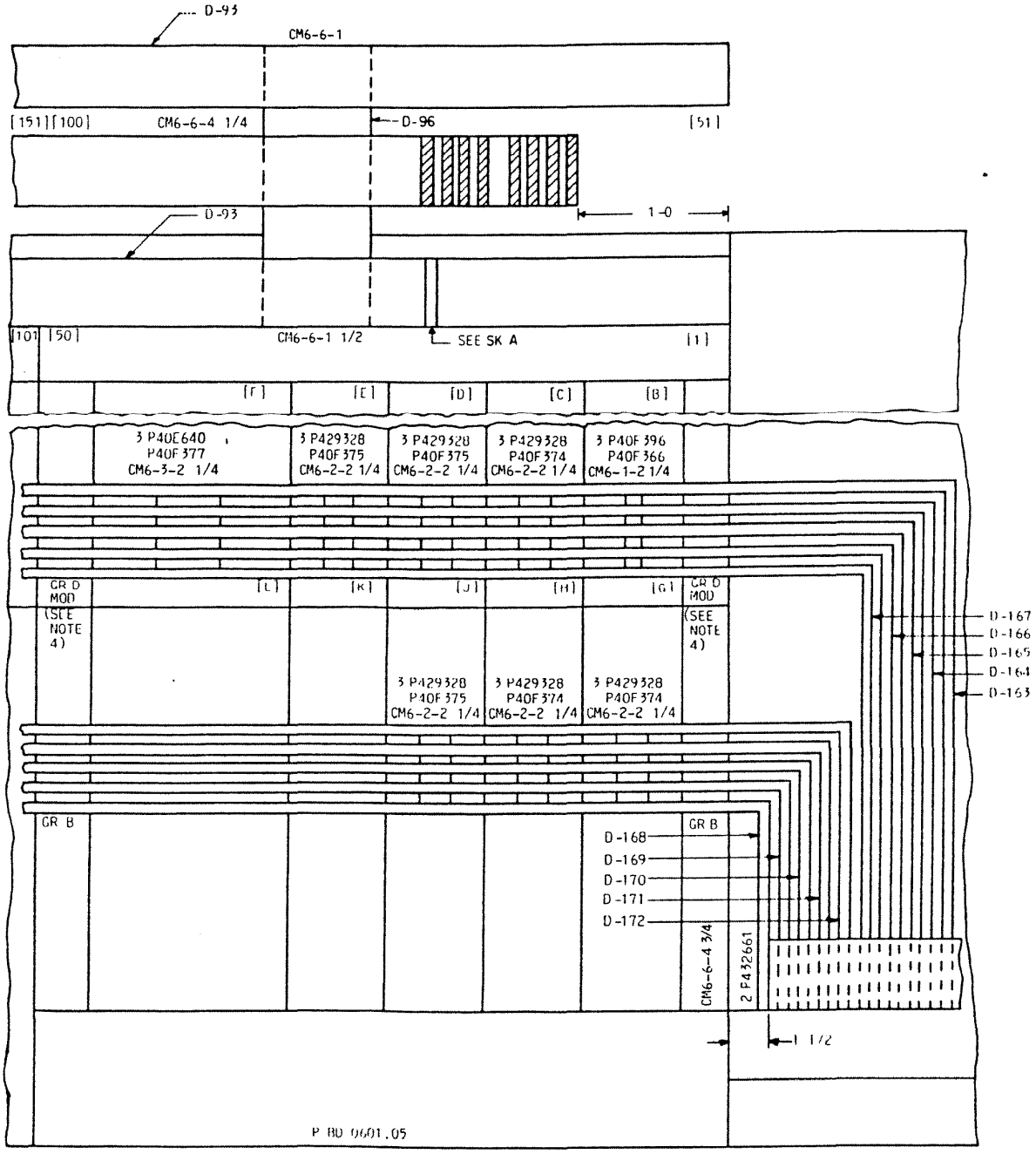


EXHIBIT 10
TYPICAL REAR VIEW OF BATTERY DISTRIBUTION BAY
(PAGE 1 OF 2)

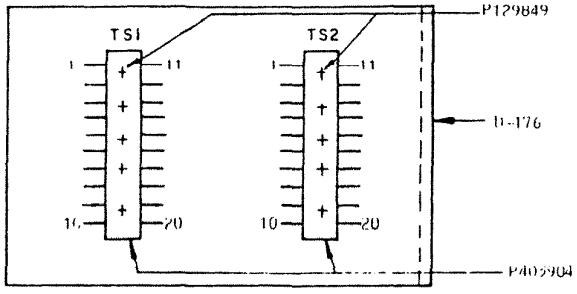
TABLE B (NOTE 5) TERM STRIP ON GRD BAR		
POS	LEAD DESIGNATION	
	TERM STRIP 1	TERM STRIP 2
1		
2		
3		
4		
5		

NOTES

1. DESIGNATION IN BRACKETS [ ], FIGURE PIECE PART, TERMINAL LUG AND DETAIL NUMBERS AND BUS BAR JOINT SYMBOLS SHALL NOT BE STAMPED.
2. LM_ _ _ _, TJ_ _ _ _ ETC. DENTOTE BUS BAR JOINTS AS SHOWN ON H569-136.
3. UNLESS OTHERWISE INDICATED FIGURE NUMBERS AND GROUP NUMBERS REFER TO ED81986-10.
4. MODIFICATION OF ED81986-10 GR-D CONSISTS OF REPLACING P40K899 WITH P41X306.
5. NUMBER SHOWN IN BRACKETS BELOW GROUND BARS INDICATE POSITION NUMBERS. POSITION NUMBERS AND FUNCTIONAL DESIGNATION SHALL BE STAMPED IN ACCORDANCE WITH TABLES A AND B.
6. D-_ _ _ DENOTES POWER DETAILS SHOWN ON JOB DETAIL DRAWING T-_ _ _-_ _ _
7. ASSOCIATED DRAWINGS

T_____	POWER BD FRONT EQPT BAYS_____
T_____	OVERHEAD BUS BAR LAYOUT
J86322P3	EM CELL SW BAY

TABLE A DISCHG GRD TERM MATL (NOTE 5)			
POS	LEAD DESIGNATION		TERMINAL & MTG MATL
	FRONT	REAR	
1			
2			
3			
4			
5			
6			
7			



SEE TABLE B
FOR A

EXHIBIT 10
TYPICAL REAR VIEW OF BATTERY DISTRIBUTION BAY
(PAGE 2 OF 2)

POWER CONDUIT AND CABLE RUNNING LIST DRAWINGS

CONTENTS

1.00 GENERAL

1.01 This part covers the standards to be followed in the preparation of the Power Conduit and Cable Running List Drawing for all systems.

1.02 This drawing establishes an office record of the AC and DC Power Cables serving the Central Office Power Plant and communication equipment.

2.00 SCALE

2.01 No scale is required on the power conduit and cable running list drawing. Linework shall accommodate 1/8 inch lettering to meet microfilm standards.

3.00 PEN SIZE

3.01 The pen size requirements for the preparation of tabular format lineweights are covered in Section III, Part C.

3.02 The following indicates pen sizes that should be used for the Conduit Plan:

Pen Size	Application
0	Building outline and equipment
3	Conduit

4.00 ISSUE NOTES

4.01 A descriptive Issue Note is required for the Power Conduit and Cable Running List Drawing. A basic Issue Note is required only on a Conduit Plan Drawing.

4.02 Descriptive Issue Notes shall specify the action taken such as add, remove or change.

EXAMPLE: ADD D6/RMV B4/CHG
B1 COL F READ 28.8/

4.03 A run being removed shall be lined out in its entirety on the drawing. Only the run numbers shall be referred to in the Issue Note. Lined out runs shall not be eradicated from a completely filled in drawing to allow for the addition of new runs. In this case, a new drawing for the new runs shall be created. In this case, a new drawing for the new runs shall be created. However, lined out runs may be eradicated if the creation of a new drawing cannot be justified in the foreseeable life of the office.

4.04 In the case where a run must be eradicated, the significant information shall be retained in the Issue Note.

EXAMPLE: RMV B5 24V SIG & GRD FB 0314.1/

5.00 CONDUIT AND CABLE RUNNING LIST DRAWING

5.01 Prepare a running list form for the power conduit, wire and cables for new power plants and subsequent additions. The running list shall include all leads run by the installer in conduit, armored cable and on cable rack. Exceptions are local wiring in power boards in a continuous power board lineup. Leads shall be considered local wiring whether run on cable supports or on a section of cable rack local to the power board. Exceptions to this are AC service leads from a power distributing service cabinet located in the power board lineup and leads to the ringing machines. These leads shall be listed on the conduit and cable running list regardless of the termination of the AC service leads or location of the ringing machines. Drop leads to bay fuse panels and ground bus bars, tapped or overhead power distribution leads shall not be listed on the conduit and cable running list drawing.

6.02 Instructions for preparing a Power Conduit and Cable Running List Drawing are outlined in Appendix.

6.00 CONDUIT PLANS

6.01 Scale used for the drawing shall be 3/4 inch to the foot or more dependent on the size of the building, general layout of the power equipment and amount of detail to be shown. No other apparatus or equipment, to which conduits will be terminated, shall be shown on the conduit plan drawing.

6.02 When two floors, in plan view, are shown on a conduit plan drawing, the conduit plan of the lower floor shall be represented by dot and dash lines and the conduit plan of the upper floor shall be represented by solid lines.

6.03 Conduit runs shall be designated at each end, or intermediate points for clarification, with the run identification number shown on the power conduit and cable running list drawing.

6.04 All conduits shall be shown located at their respective points of termination at apparatus or equipment. Conduits shall be located in alignment with their associated terminals shown on assembly drawings.

6.05 Conduit terminations shall be located from building walls, column centerlines and building reference lines (reference lines and column centerlines preferred). Conduit terminations shall not be located from apparatus, or equipment, except on conduit plan sketch drawings where this practiced may be applied.

6.06 When a large number of conduits terminate at one particular place, a separate enlarged view or sketch shall be shown in order to indicate the relative location of each conduit more clearly. The power apparatus shown in the sketch should be shown in the same relative position as shown on the body of the drawing. When conduits are equipped with fittings, the minimum distance between centers shown on the power data sheets are to be followed.

6.07 Do not show the termination of power leads that are run on cable racks on the conduit plan drawing.

6.08 Exposed conduit runs shall be run parallel with or perpendicular to the walls of the building as far as possible. Conduit shall not be extended over apparatus or equipment in a position that will interfere with maintenance of the apparatus or equipment.

PREPARING POWER CONDUIT AND CABLE RUNNING LIST DRAWINGS

NOTE:

The following instructions apply to all new drawings and all new runs being added to existing drawings. For column assignments and suggested format for Power Conduit Running List Drawings see Exhibit 1.

Title	Column		Required Information
Run	A		Alphanumeric, i.e., A1 to A9 through ZZ1 to ZZ9, designations for identifying each run. A previously used run shall not be reused for a new run.
Conduit	B & C		Conduit Size and Length. Flexible steel conduit shall have the size dimension suffixed "FS", i.e., 3-1/2 FS. Cover the "FS" designation in a note similar to the following: In Col-B, FS Denotes Flexible Steel Conduit
Cable	D		The length of Lead and/or Cables. The length shall be computed length plus slack allowances, if any, as specified in the supplier's specifications.
Cable	E	1)	Quantity and Size of Leads or Code of Coded Cables
			or
		2)	Quantity, Size, Number of Conductors and Color Code or each Conductor of Cables ordered per _____. On drawings without a "KS" column (Col-F) suffix the color code(s) with a letter within parenthesis to indicate cables ordered per "KS", i.e., Cover the letter symbol in a note similar to the following:

Title	Column	Required Information

In Col-E, Cables suffixed with a letter within parenthesis indicates KS Specification of Power Wire as follows:

(A) KSXXXXX Standard
(B) KSXXXXX Solid

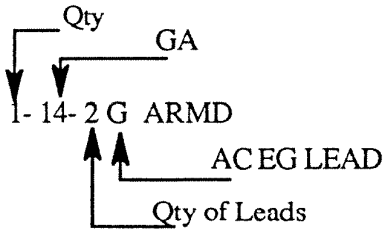
On drawings with a "KS" column (Col-F) use a letter without parenthesis to indicate cables ordered per KS. Cover the letter symbol in a note similar to the following:

A KSXXXXX Standard
B KSXXXXX Solid

or

3) Quantity of Armored Cables, the Gauge and Quantity of Leads in each cable, except an AC equipment ground lead. When an AC equipment ground is required, its presence shall be noted by using the letter "G" as a suffix.

Example:



Cover the "G" designation in a note similar to the following:

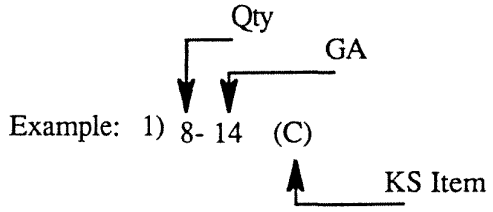
> In Col-E Armored Cable Leads with a Suffix "G" indicates an AC Equipment Ground Lead enclosed.

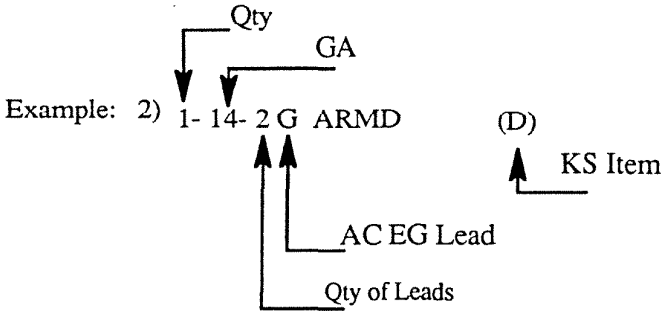
or

4) Quantity, piece part number, size and type of piece parted leads. Do not show quantities of conductors for leads run as pairs, triples of quads.

When leads and/or cables are ordered as KS items and there is no KS column (Col-F) on the drawing, suffix the quantity and size with a letter within parenthesis.

Title	Column	Required Information





Cover the letter within parenthesis designation in a note similar to the following:

(A) KSXXXXX Standard
(B) KSXXXXX Solid
(C) KSXXX-XX
(D) KSXXXXX

KS F

A letter designation when leads and/or cables are ordered as KS items. Cover the letter designation in a note similar to the following:

In Col F, a letter designation indicates KS Specification of Power Wire as follows:

A KSXXXXX Stranded
B KSXXXXX Solid
C KSXXXX-XX
D KSXXXXX

Title	Column		Required Information
From to	G, H & J K, L & M	1)	Bay Number, Panel Number as required and the apparatus or equipment on which the run originates and terminates. Leads that originate or terminate on a power board shall show the power board, bay number and panel designation. The power board and bay number shall be separated by a decimal point, i.e., 0101.02. Show only the power board and bay number for leads that do not originate or terminate on a specific panel.
		2)	The methods of supporting and terminating conduit runs shall be specified by the use of notes. In a note list, the manufacturer's drawings and figure numbers show the material and assembly information for the desired method. Itemize each listed drawing with a letter, i.e., A, B, C, etc., for reference purposes. In another note and in a similar manner, list the manufacturer's drawings and groups for conduit terminations. Cross reference the desired support and termination information to the run by listing the proper note number and letter combinations after the run. Due to limited space in the note column, the cable run sections column may also be used for this purpose.
		3)	Conduit runs requiring pull boxes shall be listed from origin to pull box on one line and pull box to termination on another line of the drawing. The approximate location of the pull box shall be indicated by listing a reference point, i.e., near column E2 , etc., after the words pull box in the from or to column for that run.

Title	Column	Required Information
		4) A single conduit run that branches at a fitting to more than one termination shall be shown as two or more runs; one run for each termination. The first run shall show the following information on separate lines on the drawing. (a) Wire or cable from origin to first termination (b) Conduit from origin to fitting from which the conduit branches originate (c) First branch conduit to first termination The second run shall list: (a) Wire or cable from the same origin as the first run to the second termination (b) The second branch conduit from the same fitting listed in the first run to the second termination The approximate location of the fitting shall be indicated. Successive conduit branches shall repeat the form used for the second branch. Intermediate conduit fittings, when required in the main or branch run, shall not be listed. Provide any other necessary information in the form of notes. Identify affected runs by listing the proper note numbers against the runs.
For	N	Type of potential, current or function such as: positive or negative 48VBAT., 130VPLATE, GRD, DC PWR ALM, 208V 3PH, Cont Leads _____ etc.
Cable Run Sections	P	The routing, when required, for leads and cables that are run on cable racks.
Notes	Q	Note numbers, when required, for notes that apply to the particular run.

The following are some of the common notes which may be used on the power circuit and cable running list drawings:

1. LEAD LENGTHS SPECIFIED ALLOW FOR NORMAL SLACK ALLOWANCE.
2. UNLESS OTHERWISE SPECIFIED ALL WIRES OR CABLES SHALL BE CONSIDERED AS RUN ON CABLE RACK.

3. EQPT ON HOUSE SERVICE BOARD & ENGINE ALTERNATOR EQPT FURNISHED AND INSTALLED BY THE IDC.

4. FOR ARRANGEMENT OF CABLES OF EQUALIZER CENTER AND LOOP LEADS BETWEEN MAIN AISLE FEEDER CABLES AND FUSE CABINET OR FRAME LINEUP GROUND BUS BAR SEE
T_____ - _____.

5. T2, T322, R42, 4SSL, ETC., INDICATES CONDUIT FITTINGS.

6. INTRABAY & INTERBAY LEADS WITHIN THE POWER BOARD TO BE RUN BY THE INSTALLER ARE NOT SHOWN ON THIS DRAWING.

7. IN COL-B, FS DENOTES FLEXIBLE STEEL CONDUIT.

8. IN COL-E, ARMORED CABLE LEADS WITH A SUFFIX G INDICATES AN AC EQUIPMENT GROUND LEAD ENCLOSED.

9. IN COL-E, CABLES SUFFIXED WITH A LETTER WITHIN PARENTHESIS INDICATES KS SPECIFICATION OF POWER WIRE AS FOLLOWS

NOTE:
This is to be used on drawings without KS column (Col-F)

(A) KSXXXXX STRANDED
(B) KSXXXXX SOLID
(C) KSXXXX-XX
(D) _____

10. IN COL-F, A LETTER DESIGNATION INDICATES KS SPECIFICATION OF POWER WIRE AS FOLLOWS:

NOTE:
This is to be used on drawings with KS column (Col-F)

(A) KSXXXXX STRANDED
(B) KSXXXXX SOLID
(C) KSXXXX-XX
(D) KS _____

11. CONDUIT SHALL BE SUPPORTED BY THE FOLLOWING METHOD:

    (A) ED _____

    (B) _____ (Applicable Standard Company Practice, if known)

12. TERMINATE CONDUIT PER:

    (A) ED _____

    (B) ED _____

    (C) ED _____

13. WHEN THIS NOTE IS REFERRED TO, LEADS SHALL BE CONSIDERED AS UNFUSED BATTERY AND ACCOMPANYING GROUND LEADS AND SHALL NOT BE RUN ON CABLE RACK WITH ANY OTHER CONDUCTORS.

CABLE AND CONDUIT LIST

LINE	RU	CONDUIT SIZE	CONDUIT LG	CABLE LG	CABLE NO & SIZE	FROM KS	FROM BAY	FROM EQUIPMENT	TO BAY	TO EQUIPMENT	FOR	CABLE RUN SECTIONS
1	A1			125	1-2-2 BK&W	A	0402.01	415A PWR PLT	0475.02	ABC NO. 8	+140V&GRD LD A	4PW14,4PW10,4PW11
	A2			60	1-6-2 BK&W	A	0462.01	ABC 5	0441.13	48V CONV G1A	+140V&GRD LD A	1PW2,4
	A3			35	1-500,000CM	C		24V BAT. A CELL 1	0101.01	CHG GRD BUS	CHG GRD	
	A4			47	1-300,000CM	C		24V BAT. A CELL 12	0101.01	CHG FS	BAT. CHG	
	A5			90	6-350,000CM	C	0504.05	48V P BD		48V BAT. B	BAT. & GRD CHG	
	A6			90	4-500,000CM	C	0504.05				BAT & GRD DISCH	
	A7			60	2-500,000CM	C	0503.01	CONT BAY		+130V BAT. CHG GR1A	CHG DISCH	SPW19
	A8			47	1-14-3 ARMD	D		PDSC 0502	0504.05	48V RECT G1	AC SPV	SPW24
	A9			57	1-14-3 ARMD	D		PDSC 0503	0504.05	48V RECT G2		
10	B1	3-1/2	110	130	3-500,000CM 1-0000	C		SUBSTATION 1A	0502.01	AC CKT BRKR CAB	48V SPM & GRD	
	B2			190	6-750,000CM	C	0704.04	F & GRD BAR		PD-0 6TH FL	+24V & GRD	CA HOLE BET. COL E10&E9 6PW2
	B3			75	1-450M		0101.01	MISC TS	0201.01	MISC TS	ALM	1PW3
15	B4			167	4-750,000CM	C	0101.07	F & GRD BAR	0205.01	BDFB	48V LD A & GRD	1PW24,28,CA HOLE N COL F9, 2PW1
	B5			177	3-500,000CM	C	0101.07	F	0205.01	BDFB	48V LD B	
	B6			203	3-750,000CM	C	0501.03	F & GRD BAR		EOL CTR 0601	48V & GRD	SPW12,13,15,16 18,6PW2,3
20	B7			100	1-14-3 ARMD	D	0101.12	D STARTER RNG M		PDSC 0101	208V 3PH	1PW2,8
	B8			55	1-14-3 ARMD	D	0101.12	D		SW RNG MT TBL	AC MOT CONT	
	B9			35	1-14-3 ARMD	D	0101.12	D		MOT RNG MT TBL	208V 3PH	
	C1			40	8-14	C	0101.13	A TRF SW T2,RPT B COIL LT1&4,RP COIL MT3		TONE ALT LT,MT RNG GEN 1 & 2	LT & MT TONE	
25	C2			40	18-14	C	0101.12	B TRF SW T1		INTERRUPTERS RNG GEN 1 & 2	SUP +AUD,MR SUP+ BR3,TRP+,MR SUP+ BR2,MR SUP+ BR1, SUP -AUD,MR SUP- BR3,MR SUP- BR1	
30	C3			265	1P246310 16BK		0101.13	G F	0643.01	F BD	+105V	1PW28,1F7, 6A7
	C5	3/4FS	40	45	4-12	C		PDSC 0501	0506.01	-130V RECT 1,2	208V 1PH	5PW7,10,14
	C6	DUCT		150	2-14	C	1128.09	130V PWR BAY	1113.07	IF SW TRMTG CHAN 2	130V PLT & GRD	
	C7			25	2-8	C	0001.07	F F & GRD BAR		PULL BOX COL D3	48V & GRD	
35	C8	1-1/2	35	40	2-0	C		PULL BOX COL		EM LTG REL		NOTE 7C,E
	M3			43	2-350,000CM	C	0129.05	+125V ORIG BA		BAT STANDING	BAT. & GRD	
	M4			40	1-0000	C	0116.01	24V P BD	0116.02	BDCBB	GRD	
115	M5			50	1-8-2 ARMD	D	0116.03	BDCBB	0112.12	RR	24V & GRD	
	M6			50	2-10	C	0116.03		0111.13			
	M7			50	1-6-2 ARMD	D	0116.03		0113.13			
	M8			95	2-6, 2-8	C	0116.03		0111.11	TR		
	M9			85	2-6, 2-8	C	0116.03		0112.11			
120	P1			70	2-12	C		FIRM AC CAB.	0122.04	TRMTR CHAN 12S	+230V & COM	
	P2			70	2-12	C			0122.06	RCVR CHAN 22 S		
	P3			60	2-12	C			0121.04	TRMTR CHAN 12N		
	P4			73	1-8	C	0116.01	24V P BD		OFF. GRD	GRD	
	P5			55	1-12-3 ARMD	D	0115.01	AC CAB.	0116.01	-24V G1 RECT	208V 3PH	
125	P6			55	1-12-3 ARMD	D	0115.01		0116.01	-24V G2 RECT		
	P7		30	55	2-12	C	0116.04	24V P BD		MAIN JCT BOX	AC ENG CONT	
	P8			60	2-14	C	0116.04		0115.10	FP	24V SIG & GRD	
	P9			60	2-8	C	-166.04		0115.11		24V ABS & GRD	
	Q1	3-1/2	60	65	4-350,000CM	C		ENG CONT CAB.		600 SRV CAB.F1	DW1SIDE PWR	
	Q2	3-1/2	60	65	4-350,000CM	C						
	Q3	3/4	40	45	4-12	C	0115.01	AC CAB.		DEHYDRATOR	AC SUP	
	Q4			95	1-10-3GARMD	D	0115.01			AC BLOWER		
	Q5	3/4	80	85	1-6	C		DEHYDRATOR		OFF. GRD BAR	GRD	
	Q6			60	2-14	C	0116.04	24V P BD	0115.12	LSPK	24V SIG & GRD	
135	Q7	1-1/2	50	55	3-4	C	0115.01	AC CAB.		SUPL LD BK	208V 3PH	
	Q8	1/2	50	125	1-6	C		SUPL LD BK		OFF. GRD BAR	FRAK GRD	
	Q9			120	2-14	C		PDSC 0101	0101.02	POS TRP RECT	208V 1PH	
	R1	1/2	20					T322 OF BUR E				NOTE 7B, 9A
140												
COL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q

EXHIBIT 1
POWER CONDUIT AND CABLE RUNNING LIST DRAWING