JOB SPECIFICATIONS CABLE "C" SECTION

CONTENTS

1. SCOPE

1.1 This section covers the composition of and the information included in the "C" Section of job cable specifications in accordance with the computer assisted cable system specification processing cable system (SPC), and Installation Contract Estimation System (ICE).

2. GENERAL

2.1 Composition of Cable Running List

2.11 Cable information will be provided on the standard cable forms, which are designed for this type of data.

2.12 The "Installer's Cable Running List" will be included as part of the recognized job cable specification of the associated order. In those instances, where the bulk cable running list consists of ten or less cables and/or runs, the bulk cable running list may form a part of the installing specification. When ordering bulk cable in the installing specification, the appropriate "A", "B" and "C" Sections will be included.

3. POWER CABLES

3.1 The power conduit and cable running list drawing, will show the cross section routing information for the power cables run per cable rack, conduit, power brackets, power ducts, etc.

4. DEAD CABLES ON CABLE RUNS

4.1 Definite information with respect to the treatment of dead cables is specified. WI items and installers notes in the cable specifications will authorize the action to be taken by the installer.

4.11 The disposition of cables made dead due to their disconnection at equipment terminations as a result of equipment removals, modifications, etc., will specify the extent to which dead cables are to be removed from cable runs.

4.12 In the case of SXS shelves, in the A & E specification appropriate installer's note summarizing the unused and/or dead cable operation is furnished.

5. COMBINING NUMBER OF CABLES

5.1 Where a number of cables for one or more circuits in a group terminate at the same position or frame, these cables could be grouped into one cable run.

5.11 Where a number of cables for one or more circuits in a group terminate at the same frame and equipment location, and the length of each cable in the group is identically the same, these cables will be grouped into one cable run.

5.12 In the cable running list associated with factory formed cable runs, one cable in a run except for short mult cables of switchboards and desks is shown.

5.13 When 10 or more runs are required for the miscellaneous multiple between frames (cable designations YJ21 etc.), and the frame terminology or number differs at each "From" and "To" end, it will then show the data as only 1 cable run by indicating only the frame symbol "FR" in the "From" and "To" columns and cross referenced to an "Installer's Note" in the "Route" column. The "Installer's Note" will provide the additional multiple information to the "FR" number or designation as would normally be required in the "From" and "To" columns which can then be manually applied to the cable tags by the installer. In addition to the "FR" number or designation, the "Installers Notes" shall highlight that the dash (-) symbol entered in the "FT" field of the installers cable tags requires that each cable run must be manually measured by the installer prior to cutting the length of cable for each applicable cable run.

5.14 When less than 10 runs are involved, each cable as a separate cable run is shown.

6. MULT OR LOOP THRU CABLES

6.1 Mult thru - a cable or combination of cables terminating all the conductors at each frame in the series thru which the cable is connected.

6.11 Loop thru - a cable or combination of cables terminating a portion of the total conductors at each frame in the series thru which the cable is connected, as Switchboard Power Cables Crossbar 1 and TDM.

7. WIRE RUN LOOSE ON CABLE RACKS

7.1 All piece part wire required to be run on cable racks (except 1A fire detection wire) will be shown in the cable running list. Piece part wire for interposition circuits run in the rear of the switchboard, regardless of the manner in which it may be run or supported, and piece part wire not run on cable racks will be ordered as miscellaneous wire in the bulk cable specification.

7.11 1A fire detection wire, fourteen gauge wire per KS-5482.01 and 20BH (red) wire used for emergency alarm and fire detection purposes will normally be ordered in the bulk cable specification.

8. ASSOCIATED A AND E SPECIFICATIONS

8.1 Cabling information for more than one (1) equipment specification on the same page of any preprinted Cable Running List form will not be provided.

9. REPETITIVE INFORMATION

9.1 Where 3 or more cable runs are terminated on the same type of frame and/or equipment location, common headings for the terminations are shown. These common headings, in all cases, will be underlined, thereby, indicating a repetitive prefix.

10. TCS 000 SPECIFICATION

10.1 When it is necessary to combine bulk and formed cables in a "000" specification, the formed cable information will be clearly identified by adding "FMD" in the "CKT REF" column of the cable running list against the wiring diagram drawing header line and the associated formed cable runs. This method will allow one to differentiate between the bulk and formed cable runs in the specification. A unique number for each

formed cable run is assigned. The sequence of the cable running list is to group all bulk cable on separate sheets followed by a grouping of all formed cable.

11. ABAM AND ABMM CABLE CONSIDERATION

11.1 Each cable run using ABAM cable codes -50, -75, -100 and -150, or ABMM cable codes - 100 and -150, will be shown in the cable running list as an individual run.

12. INTERBAY CABLING OF FOUR LEADS OR LESS

12.1 Nonshielded interbay cabling of four leads or less, regardless of lead colors, will be restricted to the following codes of piece part wire in the cable running list. These wires listed below are acceptable for abrasive and tropical moisture-proofed conditions.

12.2 For the sake of brevity, 16AM, 20BH, 22BH and 24BH piece part wires will be identified by abbreviated designations as follows:

16AM wire P-368258 (single, red-black), P-368249 (pair, black & red-black), P-368099 (triple, yellow, yellow-green & red-green)
P-384683 (quad, yellow, yellow-green, red & red-green) by "S16", "P16", "T16", "Q16" respectively.

20BH wire P-46A032 (single, red-black), P-46A038 (pair, black & red-black), P-46A040 (triple, yellow, yellow-green & red-green),
P-46B143 (quad, yellow, yellow-green, red & red-green) by "S20", "P20", "T20", "Q20" respectively.

22BH wire P-46A780 (single, red-black), P-46A785 (pair, black & red-black), P-46A791 (triple, yellow, yellow-green & red-green),
P-46B050 (quad, yellow, yellow-green, red & red-green) by "S22", "P22", "T22", "Q22" respectively.

24BH wire P-240842 (single, red-black), P-46A708 (pair, black & red-black), P-46A732 (triple, yellow, yellow-green & red-green),
P-46F853 (quad, yellow & yellow-green, red & red-green) by "S24", "P24", "T24", "Q24" respectively.

The abbreviations are merely a general reference to the specific piece part wire. In the code column of bulk cable running list, the abbreviations will be shown instead of listing the corresponding piece part numbers.

13. "NONCODED" CABLE

13.1 "Noncoded" cable refers to a cable other than "P" wire codes (shielded), piece part wire (S20, P22, etc.), and cable codes (A or M), these noncoded cables contains types such as "KS", "RG/U", "F" spec., "D" spec., etc.

14. KS WIRE

(a) KS type wire items listed on cable running lists or under summary of material will be specified individually as singles, pairs, quads, etc., as indicated on the wiring diagram drawing.

(b) Singles, as indicated on the wiring diagram drawing, will not be combined into pairs, triples, quads, etc.

(c) Pairs, as indicated on the wiring diagram drawing, will not be combined into quads, triple pairs, etc.

(d) Each single, pair, etc., will be specified on a separate line on the cable running list or summary of material with the complete description consisting of KS number, gauge, color and number of conductors for each wire item.

(e) In specifying the color, the practices concerning the proper use of the "comma" to distinguish between two or more conductors, and the "dash" to identify two or more colors of a multi-color conductor are as follows:

Single, O-R; Pair, O, O-R; Pair, BL-O, BL-G; Triple, R-BL-W, R-G-W, R-BR-W; Triple, W, G, G-W.

15. D-SPECIFICATION CABLE

15.1 Description of each D-Specification cable ordered in the cable information is furnished. This information shall consist of the number of quads, pairs, and singles, gauge and insulation. The description is listed only once for each code specified and is shown in the bulk cable specification "C" Section. It is in numerical order and shows information similar to the following:

Code	Quads	Gauge	Pairs	Gauge	Ins. of Cond.
D-	12	19	-	-	EDACL
D-	-	-	11	19	DACL

16. LOOP WIRES IN SWITCHBOARD CABLES

16.1 Where loop wires are to be run in factory formed switchboard cables this point definitely will be covered by notes in the cable specification or on cable form drawings. Loop wires will not be specified to be run in accordance with circuit drawings unless they cannot be taken care of satisfactorily by notes.

16.11 When switchboard cables, which are normally formed and connected in the factory, are ordered in bulk, wire for loop leads as required will be ordered. The wire used for loop leads will be designated as such in the bulk cable specification. Information as to quantity, piece part number, code, gauge, etc., is included.

17. FACTORY FORMED CABLE ORDERED IN A & E SPECIFICATIONS

17.1 The practice of ordering shop connected and Radio, or Broadband formed cable in the associated A & E specifications will be retained. Examples are Block Relay Frame, Message Register Frame and Microwave or type L-Carrier Multiplex specifications.

18. APPARATUS CONNECTED TO FACTORY FORMED CABLE

18.1 Manual and Toll Equipment:

(a) In the cable running list all related apparatus and equipment, such as strip mounted jacks, lamp sockets, keys, signals, jack spaces, etc., that is to be connected to the factory formed cable is listed.

(b) This practice will apply irrespective of whether the apparatus and equipment will be soldered to the formed cable by the factory or by the installer. The associated Assembly and Equipment Specification orders all other associated apparatus and equipment, such as lamps, lamp caps, etc., that will not be connected to the formed cable.

(c) In those cases where the cable must be bulked rather than formed, the associated bulk cable specification orders all the related apparatus and equipment, (such as strip mounted jacks, lamp sockets, etc.), that is to be connected to the bulk (non-formed) ends by the installer.

(d) Quantity, numbering, code number, mounting and location of white holly, (if required) for all apparatus, except in the case of subscribers' multiple, regular and multiple answering jacks, and "A" board O.G.T.'s are specified. In these cases, only the code number of the apparatus and the associated mounting and the cable group will determine the amount, numbering, etc., specified.

(e) Normally the 290A or similar type lamp socket mountings have the lower row of terminals strapped and connected to terminals on ends of the mounting frame for ground connection. When these lamp socket mountings are furnished for answering jacks or multiple line lamps which connect to an auxiliary signal circuit instead of to ground, an "Installer's Note" similar to the following will be placed in the job cable information:

"The installer shall cut the strap connections between the first lamp socket and the frame of the mounting and between the last lamp socket and the frame of the mounting."

18.11 Dial Equipment:

(a) Listed in the cable running list information are strip mounted jacks, lamp sockets, keys, and test strips which are associated with the D.S. "A" switchboard, local test desk, and O.G.T. testboard (specifications -11, -50 and -85).

(b) This practice shall apply whether the apparatus and equipment will be connected to the formed cable by the factory or by the installer. When the apparatus and equipment is to be connected to bulk (nonformed) cables by the installer, the apparatus and equipment is ordered in the associated bulk cable specification.

19. CABLING TO MULTIPLE EQUIPMENT IN SWITCHBOARDS AND DESKS

19.1 Where there are three strips of apparatus in the first appearance of the multiple and all leads terminate at the distributing frame, they will be run in one "frame to multiple" cable if practicable.

19.11 Short multiple cables shall not serve more than two strips of apparatus, except in extreme cases such as multiple on brackets or pins below the multiple shelf in small switchboards where the required cabling space is not available. In such cases, short multiple cables may serve three strips of apparatus upon the approval of the PECC Standard Practices Department.

19.12 Short multiple cables for busy signals will be run as separate cable in all cases.

20. BALANCING QUADDED SWITCHBOARD CABLES

20.1 General Requirements For Balancing Quadded Switchboard Cables

20.11 In order to reduce crosstalk, all runs of quadded cable on the line side of the phantom repeating coils, that is, between the protectors and the phantom repeating coil, will be corrected for capacity unbalance by means of a terminating plan to minimize the continuance of quad adjacencies, as covered in BSP 800-614-163.

20.12 The terminating plan is applied to all cables subject to balancing, both 2-wire and 4-wire circuits, irrespective of length. In addition to the terminating plan, 2-wire circuits in cables with a butt to butt length of over 40-0 shall have a "turnover splice" at approximately the midpoint of each cable in which the tip and ring leads of the individual pairs of each quad are transposed. Lengths specified will include 3-0 for regular slack, 3-0 for "turnover splice" for 12 to 20 quad cables or 2-0 for 1 to 10 quad cables, and 3-0 for formed ends.

20.13 All cables subject to balancing are designated by the symbol "BQ", placed in the "LDS CL SHLD" column of the cable running list. Also indicated are whether the cables are for two or four wire circuits, using symbols "2W" or "4W", i.e., BQ2W.

20.14 The "BQ" designation on all items; irrespective of length, indicates that these cables are to be connected at terminations in accordance with H-228-604.

20.15 In the cable specification under "Installer's Notes" the following is included:

"Cables designated "BQ" or "SBQ" in the "LDS CL SHLD" column of the cable running list shall be connected at terminations in accordance with H-228-604. Cables designated "SBQ" shall also have a "turnover splice" located at approximately the midpoint of each cable.

20.16 Whenever bulk cable is ordered on a requisition and the cable is subject to balancing, the requisition shall contain the designations "BQ" or "SBQ" and associated note, as the confirming appendix to the specification furnishing the installer this information may reach him too late.

20.17 Cables which may be associated with either two wire or four wire circuits shall be considered as two wire when used in offices having both two and four wire circuits.

21. CABLES TO BE BALANCED

21.1 In general, all quadded switchboard cables used for such circuits as repeating coil groups, 4 jack toll lines and composite circuits for cable toll lines which may be subject to capacity balancing will be indicated on the wiring diagram drawings. The quadded leads will be designated by a note indicating that "the leads are subject to capacity balancing per BSP 800-614-163." Balancing shall not be applied on open wire circuits except as noted herein.

21.11 When old circuit drawings rated "Obsolete" or "A and M Only" are used and leads on the line side of the phantom repeating coils are in quadded cables are not shown subject to capacity balancing per BSP 800-614-163, the drawings should be referred to the PECC Standards Engineering Department for disposition.

21.12 Ordinarily, tie line cables are not shown on wiring diagrams, however, when quadded cables are used for this purpose and they are on the line side of the phantom repeating coils and may be used for either two wire or four wire cable circuits, they are subject to capacity balancing.

21.13 Cables which may be associated with either open wire or cable circuits will be considered as cable circuits when used in combined open wire and cable offices.

22. INSTALLER'S CABLE RUNNING LIST

22.1 The Installer's Cable Running List consists of: CKT REF; FT; NO CAS; CODE; CKT NBG, CA NO, UNIQ CA NO; FROM & TO; CA DES; SF LOC DROP; EQPT LOC & FM INF; LG SCU CA; LDS CL SHLD; and ROUTE. (See Figure 1).

23. CABLING INFORMATION TITLE PAGE

23.1 The title page will be furnished as the first page of the cable running list information for each bulk and/or factory formed cable specification.

24. WIRING DIAGRAM HEADER LINE

24.1 This data will consist of the controlling wiring diagram drawing and figure numbers, option, title, and when applicable, subtitle of circuits. Also specified is the job circuit numbering, or similar type of data, in the header line for each wiring diagram figure where a cable run serves several wiring diagram figures having differing job circuit numbering.

24.11 When circuit leads are combined into a common cable or wire, a grouped heading of wiring diagram header lines may be employed by assigning and inserting an arbitrary letter, maximum 15 using A through O only, in the "CKT REF" column against each header line. The cable runs will then show the same letter or letters as the circuit for which they are to be associated with.

24.12 For broadband, microwave, and television systems, the wiring diagram drawings and figure numbers of both the "FROM" and "TO" ends of a cable are shown. The "TO" drawing and figure numbers will be shown on the same line and after the title data of the "FROM" drawing and figure.

24.13 In those cases where a running list drawing is used for interbay cable runs for standard "L" carrier bays, the "TO" data is omitted, and the running list drawing and list numbers will be shown on the next line immediately following the wiring diagram header line.

25. "CKT REF" COLUMN

25.1 Runs of cable or wire not ordered by the SPC computer output, such as reused (R), requisitioned material (RQ), Telephone Company furnished (T), surplus material (W), or factory formed cable (FMD), will be identified by these letters indicated in the "CKT REF" column.

25.11 These runs and any material designated in the Cable Running List, will be summarized and listed in the "B" Section, with the material cross-referenced by the appropriate letters R, RQ, T or W in the note column.

25.12 All such R, RQ, T or W notes will be placed under "Summary of Material Notes."

26. "FT" COLUMN

26.1 When more than 1 cable constitutes the run, the amount is the sum of all the cable involved and not the length of only 1 cable.

26.11 In the formed cable running list, when the cable run is ordered in the associated A & E specification and the stocklist breakdown provides a specific length, this length is shown in feet.

26.12 The critical overall lengths, shown in feet and inches in the "B" Section for factory formed cable information, will be rounded upward to the next foot and added in this column for the identical unique cable run.

26.13 Cables and Wire of Unusual Lengths:

(a) Each cable of a cable run using code 243A, or M, 263A, or M which exceeds 150-0 in length, and code 69A, or M, 235A, or M, 262A, or M, 283A, 505 M, 506 M, which exceeds 200' - 0" in length in the job cable specification will be an individual item.

(b) Each run of shielded wire and cable (coaxial) which exceeds 180' in length in the job cable specification will be an individual item.

(c) The following 16AM, 20, 22 and 24 gauge "BH" type wire is furnished on Standard No. 267 shipping spools in the following lengths:

16AM	Approx. Length in Feet
P-368258 (Single)	800
P-368249 (Pair)	350
P-368099 (Triple)	225
P-384683 (Quad)	175

20BH	
P-46A032 (Single)	1,250
P-46A038 (Pair)	500
P-46A040 (Triple)	400
P-46B143 (Quad)	230

22BH	Approx. Length in Feet
P-46A780 (Single)	1,500
P-46A785 (Pair)	800
P-46A791 (Triple)	400
P-46B050 (Quad)	330

24BH	
P-240842 (Single)	1,700
P-46A708 (Pair)	800
P-46A732 (Triple)	450
P-46F853 (Quad)	350

(d) Unusual Lengths of type "AM" (over 175') and "BH" wire (over 230') will be shown as an individual item.

(e) On computer processed (SPC) specifications, those items of restrictive or unusual lengths will be identified by the computer by an asterisk (*) in the note column and as point items below the appropriate main items in the "Summary of Material" section.

26.14 Piece Part Wire Formula:

(a) The piece part wire formula has been established to compute lengths of piece part wire designated S, P, T, Q, for 16AM and 20, 22 or 24 gauge "BH" wire. The formula is based on the average length of the total cable run; multiplied by the number of piece part wire runs involved. The computer will adjust the total piece part wire footage to increments of 25 feet, after adding 10%, and apply the totals to the applicable items in the "B" Section.

(b) The piece part wire formula is applicable to most cable measurement specifications for all systems, except the following:

(1) Jobs which have a combined total of less than 20 individual piece part wire runs or less than 10 individual cable runs.

(2) Jobs which contain only piece part wire runs.

(3) Job outside the realm of statistical application, such as:

(a1) Appendices to cable measurement specification.

(b1) Where piece part wire is used for the recabling of all zone alarms.

(c1) Where piece part wire is used for runs to remote parts of the building.

(d1) Where many lengths of cable are run to other floors and most of the piece part wire runs are contained on one floor.

(c) Unusual lengths of piece part wire codes shall be measured. These runs will appear with an asterisk and as point items below the appropriate main items in the "B" Section.

26.15 Slack and Test Allowances on Switchboard Cable Runs:

(a) Factory Formed Cable Runs

(1) 1-0 slack and test is allowed on all formed cable runs which are run directly over aisle and on which a "scheme" is figured as for example "Inter-to-Relays" on manual equipment.

(2) 1-6 slack and test is allowed on all formed cable runs which are run over a rack on which a "scheme" is figured. When runs of this type exceed 300' in length 2-0 slack and test is allowed. Where the cable runs are carried in part on a regular cable rack and then on miscellaneous rack 2-0 slack and test is allowed regardless of the length of the run.

(3) When cables are formed in the factory cable shop and run over miscellaneous racks 2-0 slack and test is allowed on runs where turns counterbalance. When the turns do not counterbalance, 1-0 slack and test is allowed and figured so that any cable may take the outside or longest turn.

(4) The "test" allowances, mentioned in the above paragraphs (6" in each case) are intended to take care of the installers test made prior to connecting the unformed ends of factory formed or formed and connected cables. Any additional cable required for making shop tests on such cables will be added to the specification lengths by the Factory Cabling Department and should not be included in the lengths as computed by the line organization.

(b) Secured Bulk Cable Runs

(1) 1-6 slack is allowed on all main to intercables and on interbay cable runs where the bays are in the same lineup.

(2) In existing building, 5-0 slack is allowed on all other unformed cable runs where the length of the run does not exceed 100 feet. On all other runs in excess of 100 feet 8-0 slack is allowed. In addition to the above, additional slack adjustment will be made according to the needs of a particular building as determined in the Regions.

(3) For initial installation, 3-0 slack is allowed on all other unformed cable runs where the length of the run does not exceed 100 feet. On all runs in excess of 100 feet 5-0 slack is allowed.

(c) Unsecured Bulk Cable Runs

(1) Cable measurements between frames in the same line-up will include no allowances for slack.

(2) In existing buildings, 5-0 slack is allowed on all other unformed cable runs where the length of the run does not exceed 100 feet. On all other runs in excess of 100 feet 8-0 slack is allowed. In addition to the above, additional slack adjustment will be made according to the needs of a particular building as determined in the Regions.

(3) For initial installation, 3-0 slack is allowed on all other unformed cable runs where the length of the run does not exceed 100 feet. On all runs in excess of 100 feet 5-0 slack is allowed.

27. "NOS CA" COLUMN

27.1 The number of cables related to a cable run is shown in this column. Identical codes of switchboard cable or wire may be combined into a common run (one line). When the length of minimum and maximum cable varies less than 1-0, and the data within all column captions is the same.

28. "CODE" COLUMN

28.1 The switchboard cable code (A, M or R), abbreviated piece part number designated codes, shielded wire piece parts, KS number, specific RM numbers, etc., applicable to the wiring diagram application is listed in this column.

28.11 Wire by "KS" number, specific "RM" number, piece part number, or D Specification number in the same manner as switchboard cable is also listed in this column.

28.12 RM Numbers

(a) In the formed cable running list, an "Arbitrary RM Number" in the "CODE" column is used to identify a shop formed short multiple hand made cable for the Panel System. The arbritrary RM number has no significance in the cable running list consisting of multiple runs of 22C Wire Triples.

(b) Arbitrary RM numbers, are assigned, as required, in descending numerical sequence, beginning with RM 999999, in each specification.

(c) At the end of the cable running list prior to totals page in each specification, a note is included listing the arbitrary RM numbers assigned with a complete description for each number. For example: RM 999999 denotes 22C Wire Triples.

29. "CKT NBG CA NO UNIQ CA NO" COLUMN

29.1 In this column, is shown the circuit numbering and/or cable numbers as shown on the job front equipment, relay rack and/or wiring list drawings. Each field of information is separated from the preceding by a comma.

29.11 In those cases, where specific leads are combined into a common switchboard cable or piece part wire, from a grouping of two or more wiring diagram header lines, for installation information, when applicable, the specific lead or leads associated with each cable run is shown.

29.12 In the factory formed cable running list, as the last field of information in this column, the "UNIQUE NUMBER" is added for each cable. The "Unique Number" will consist of the prefix "CA" and a numeric. For each factory formed cable, starting with the first cable on the first page of the cable running list, in this column, a unique numeric in ascending sequence commencing with "1" and up is assigned.

29.13 In those cases where the factory formed cable run consists of two or more cables, formed in with each other the same unique number is retained, for each cable in the formed cable run further identify each cable by adding a lettered suffix A to Z in alphabetical order, at the end of the unique number.

29.14 An identical "Unique Number" will be assigned for the complete factory formed cable run to multiple equipment in switchboard and desks. Examples of this practice are as follows:

(a) Frame to multiple cable and short multiple cables.

(b) Only short multiple cables.

29.15 The "Unique Number" will be the last data shown in this column, preceded by circuit numbering and cable numbers, when required. Each field of data will be separated by a comma.

29.16 For a single run of short multiple cables which are factory formed and connected, regardless of the number of cables required to make the multiple run, the numeric one (1) will be shown for ICE System requirements.

29.17 For a single run of short multiple cables which are factory formed and installer connected the number of short multiple cables will be shown for ICE System requirements.

30. "FROM" AND "TO" COLUMN

30.1 To provide installer's cable tags for all cable runs, the SPC System checks to see that data is furnished in the "FROM" and "TO" columns.

30.11 Information shown on the floor plan drawing, the approved frame name abbreviations (BSP 790-100-100 and BSP 005-101-112) and numbering data will be used for all cables terminating at distributing frames, relay racks, fuse bays, Step-by-Step frames, i.e., connector, selector, office alarm, etc., Panel frames, i.e., line finder, district selector, floor alarm frames, etc., Crossbar frames, such as office link, marker connector, office and floor alarm, etc., ESS frames, i.e., call processor, line data, trunk relay, etc. When, frame consists of multiunits, such as connectors, senders, etc., also indicate this supplementary data, i.e., CONN 0, SDR 2.

30.12 The floor level will be shown as part of the "FROM" and "TO" data when either frame, rack, etc., are on different floors. The exception to this practice is when the floor level is apparent from the cable running list data, i.e.; MDF 0101, RR 0331.12, RR 1807.6, etc., utilizing the first and second characters of the lineup number to denote floor level association.

30.13 Cabling to future frames, racks, etc., will be shown by preceding the frame name and number by the designation "FUT", i.e.,: FUT RR 101.09.

31. "CA DES" COLUMN

31.1 Cable identification shown on standard drawings (ED, H, SD, T, etc.), will be added in the "CA DES" column of the cable running list.

31.11 Identifying information will be shown such as "L" for "LINE" and "E" for "EQUIP", or "T" for "TRMTG" and "R" for "RCVG", etc., when two or more cables of the same code are formed together at one end and terminate at different points at other end, in this column.

31.12 In those cases where two different cable identifications are shown in the "CA DES" column, and each data is separated from the other by a comma (,) symbol. The first data will be applicable to the "From" column cable identification and the second data will pertain to the "To" column cable identification.

32. SF LOC DROP; EQPT LOC AND FM INF; LG SCU CA;LDS CL SHLD; AND ROUTE

32.1 "SF LOC, DROP" Column

32.11 Drop Lengths:

(a) In the "DROP" Column of the cable running list, or its preprinted equivalent, the drop lengths of all bulk ends of cable runs for installation information is shown. The drop length dimension is the length of the cable or wire from the cable line of the cable rack, or from the lip of the cable rack shield, associated with that particular cable or wire to the farthest equipment termination location in the frame or rack.

(b) The drop length dimensions will be specified for the originating and terminating cable or wire ends of the frames involved using the drop lengths shown in cabling specification forms, cable detail drawings or cable data sheets for all fixed locations. When drop lengths are not obtainable from the above sources, or the cable racks are installed at a height other than the standard level for each particular system, the drop length dimensions for the particular cable or wire will be manually computed as required.

32.12 Side of Frame Location

(a) In addition to the drop length the following letters are added, as required, to indicate the location of the cable as it comes off of the cable rack in relation to the frame and/or bay uprights, as viewed from the front of the frame and/or bay, as covered on the cable detail and/or method of cabling drawings for the equipment involved.

"L" - left upright
"R" - right upright
"C" - center upright
"M" - multiple or waterfall
"LC" - left center upright (When there are 4 uprights or 3 bays)
"RC" - right center upright
"MR" - multiple or waterfall to right bay
"ML" - multiple or waterfall to left bay
"MC" - multiple or waterfall to center bay of 3 bay assembly

(b) The appropriate letter is shown in the "DROP" column of the cable running list, or its preprinted equivalent preceding the drop length information, i.e.,: L10, R4.

(c) The appropriate lettered data will also be added in the cable running list for shop formed or formed and connected ends of cable runs.

(d) When the side of frame location on the Toll System Cable Detail and/or Method of Cabling Drawing is standard this data will be shown. In all other cases the side of frame location data will not be entered as part of the Toll System Installer's Cable Running List information.

32.13 "EQPT LOC & FM INF" Column

32.131 Equipment Location Data:

(a) Equipment terminating locations applicable to Panel, Step-by-Step, Crossbar and No. 4, A4A and 4A Toll Switching frames, etc., will be expressed in terms of terminal strip, relay, switch, numbers, i.e.: TS MISC; REL B; SW A. When used, these abbreviated terms will assume the position of the first data in the column.

(1) Where one cable terminates at more than one apparatus location (i.e.: TS A, B and C), only one (furthest) terminating apparatus location (i.e.: TS C) is shown.

(b) On multiconnections of cable end to different combination of TS, REL, SW apparatus, a dash indicator prior to standard data is added, i.e.: - TS and SW A; - REL and SW C; - TSC and JK.

(1) Where one cable terminates at different combinations of apparatus locations (i.e.: - TS A, B, C and REL D, E, F), only one furthest terminating location for each different apparatus is shown, (i.e.: TS C and REL F).

(c) Supplementary step-by-step equipment location data is denoted as follows:

(1) Shelf numbers 1 to 3 for LF units and 1 to 7 for conn shelves is used.

(2) Design "SH" for sel rept. and misc FR equipment loc using shelf letters is omitted.

(3) (JKS) for cables to univ shelves and (TS) for cables to nonuniv shelves is specified.

(4) (INC) or (OG) on all rept shelf equip is specified (to indicate that cabling enters shelf from left to right sides respectively).

(d) Equipment locations for distributing frames, relay racks, office alarm frames, floor alarm frames and fuse bays will be in accordance with the following:

(1) Horizontal side of distributing frames - Shelf and Bay, i.e.: "A7".

(2) Vertical side of distributing frames - Vertical and Terminal Strip Level, i.e.: "4P".

(3) Relay Racks, Floor Alarm Frames and Office Alarm Frames - Mounting Plate Level, using either alpha or numeric data - i.e.: N; EM; 01; 23.

NOTE: In those cases, where cable ends are terminated at TS, REL, or SW apparatus, this data is shown prior to the mounting plate level, i.e.: TS, HV.

(4) Fuse Bays - Plate or Row Prefixed by the letters "PLT" or "R", i.e.: "PLT 28" or "R3" respectively.

NOTE: For fuse panels mounted on Relay Racks - Mounting Plate Level, e.g. "N".

(e) Where one cable terminates at more than one terminal strip, mounting plate, or row of fuse, only one equipment location is shown as follows:

(1) Relay Rack - The bottom mounting plate of the unit, group of units or group of mounting plates.

(2) Fuse Bay - The lowest fuse row involved.

(3) Distributing Frame - Vertical Side - The top and bottom terminal strip location served by the cable.

(4) Distributing Frame - Horizontal Side - The first and last terminal strip location served by the cable.

NOTE: The above sequence of assignments for (1), (2) and (3), is based on switchboard cables approaching from overhead cable rack. When cabled from below, the equipment location will be expressed in terms of the plate, fuse row or terminal strip level farthest from the point of entry of the switchboard cable.

(f) Where one cable is spread over two or more switchboard positions or sections, the first and last position or section numbers served by the cable is shown.

(g) For a "Wired Only" condition, the indicator FUT will be entered prior to the standard "EQPT LOC" data to denote no connection of the cable end.

32.14 Form Information Data:

(a) To aid installation in properly identifying the associated "FROM" and "TO" frame or relay rack and cable end respectively, ends of factory formed cable are identified.

(b) Factory formed and equipped cable ends are identified by a slash symbol (/) followed by the apparatus description, i.e., /PLUG,/CONN,/ JK, etc.

(c) In those cases, when the end of the formed cable is terminated to both jack and lamps, or similar type condition, only 1 apparatus description will be shown, i.e.: JK.

(d) Factory formed and unequipped cable ends are shown by a slash symbol (/) followed by the letter F and supplemented by the form or figure number from the standard drawing, i.e.:/F 5001;/F2.

(e) When the form and/or figure number is not shown as part of the standard form drawing information, a slash (/) followed by the letter is shown for installation information, i.e.: /F-.

(f) The above formed cable data will always appear as the last entry in this column and will always be preceded by a slash indicator; i.e.: /JK; /F 5001. The "EQPT LOC" data will always precede the "FM INF" data. The slash indicator (/) will be clearly shown from the top to the bottom horizontal lines of the field.

→ 32.15 "LG SCU CA" Column

→ 32.151 Not Used.

32.16 "LDS CL SHLD" Column

32.161 The lead designation of "critical leads" is shown only when limitations such as length, size, separation, are required and specified on wiring diagram drawings, cable connecting drawings, etc.

32.162 The class or shield designation is shown when limitations applicable to circuit function requires that cable or wires identified by these designations receive special routing, i.e.,: separations of cables of differing designations, by both the line engineering and the installation organizations.

32.17 "ROUTE" Column

32.171 Installer's Notes:

(a) Any one run or group of runs which require additional information, will be referenced by a letter "Installer's Note" in the "Route" column. Lettering shall be from "A" up, omitting I and O.

(b) References to Installers Notes, when required, will be shown in the "Route" column prior to the "Routing" data.

(c) Notes affecting cabling will be included as part of the cable information and not as part of the equipment specification.

32.18 Cable Routing:

(a) The cross sections through which miscellaneous cables are to be routed, will be indicated on the Cable Running List.

(b) Routing information will be omitted for all piece part, KS and RM number wire (except shielded wire), which do not run beyond two consecutive floors. Exceptions shall be items listed as critical leads, such as part of the marker multiple requiring separate paths, or conditions where it is considered by the engineering organization a distinct aid to the measurement or installing operation.

(c) Coordinate System:

(1) The routing information shown will consist of the designation of the frame line cable rack serving the frame from which the cable originates, the designation of the cross aisle path (transverse rack), and the designation of the frame line cable rack serving the frame on which the cable terminates, i.e. 1B, 2, 1H. When a cable runs between frames served by the same lettered frame line rack, the routing will be limited to the lettered designation, i.e.: 1F or 2J.

(2) When a cable must follow a zig-zag route, each frame line rack and cross aisle rack will be indicated in order, i.e.: 1B, 1, 1D, 4, 1H.

(3) Any of the above examples may require the addition of miscellaneous sections when routed through a section not controlled by the coordinates. Intersections controlled by coordinates will not be shown in the cable specification routing column.

(d) Path System - Dial Office:

(1) The Path System consists of identifying cable racks on the job cabling plan by cross-section number designations as well as the path designations.

(2) On jobs on which the "path" system of routing cables is used (not to be confused with the "Coordinate System"), the cable information will show cables routed through their respective miscellaneous sections for the purpose of preparing the data for the "Miscellaneous Section Table" on the cabling plan drawings. After the data for the above table has been tabulated the cross section number will be deleted from the information leaving only the "path" designation for routing purposes.

(3) The following "General Note for the Installer" will be included in the "first" bulk cable specification on each order on which the "path" system of routing cables is used.

"Miscellaneous cable racks at right angles to rows of frames have been designated with "Path" letters as shown on the cabling plan drawings. The "paths" and cross sections listed indicate the particular route to be followed."

(e) Limited Routing:

(1) In general, the limited routing plan is designed to eliminate routing for only miscellaneous bulk cable runs in Crossbar No. 5, or Toll and Toll Terminal combined with Crossbar No. 5, offices employing the path or coordinate cable run system.

(2) Routing of miscellaneous bulk type cable runs is not required in the above offices if the following conditions prevail:

(a1) The cable runs does not pass through a cable hole in floor or partition.

(b1) The cable run is run over the shortest route possible using only one cross aisle cable rack.

(c1) The cable run is confined to one frame aisle cable rack.

(d1) The cable run does not require controlled routing for engineering purposes.

(3) When "Limited Routing" is used, the following "General Note for the Installer" will appear in each cabling specification when applicable.

"The running list of this specification contains limited routing information. Cables running between frames located in separate frame lines shall be routed over the cross aisle cable racks so that their distribution over the racks is reasonably equal. Backtracking, which would require longer cable than that shown in the specification, shall be done only with the specific approval of the engineer.

Cables terminated on the Distributing Frame shall be run on the cross aisle rack nearest the Distributing Frame termination so as to avoid congestion of the cable rack over the Distributing Frame."

"The frame aisle cable rack serving the number group frames shall be used as a distributing rack feeding the spur cross aisle racks."

"The separation of cables terminating at odd and even markers and transverters is covered in the notes on the cabling plans in the standard manner."

"When specific routing is required due to engineering control, this routing is shown in the cable running list to be included on the cable tags and complied with by the installer."

(4) Complete routing is specified for:

(a1) Factory formed cable runs.

(b1) Major bulk cable runs.

(c1) Miscellaneous bulk cable runs which do not meet the specified restrictions.

(f) Cable or Wire Runs in Excess of Three Floors:

(1) Where power or switchboard cable or wire runs exceed three floors (4 or more), the total number of floors involved will be indicated in the "Route" column. A cable or wire run, from the 2nd floor to the 7th floor, would be shown after the routing information as "#6".

(2) When this condition exists, a note is added under "General Notes to the Installer" as follows:

"In the cable running list, under the "Route" column for cable or wire runs which exceed three floors, the number of floors involved are shown after the routing information, with the "number of floors" preceded by a "#" designation."

33. "UNUSED" COLUMNS

32.1 In those columns of the cable running list where specific data is not required, a dash symbol (-) is added as an ICE indicator.

→ Arrowed lines indicate new or changed information.

Engineering Planning Manager
Common Installation Engineering

ATTACHMENT
Figure 1 on Page 16.

Reason for Reissue:
Various changes.
To add Figure 1.

EFG 351 (05)
EFG COMB. 14.23
WESTERN ELECTRIC COMPANY, INC.
SYSTEMS EQUIPMENT ENGINEERING

INSTALLERS CABLE RUNNING LIST SECTION C

ORDER NO.	SPEC NO.	APPX NO.	REFER ENGR QUES TO	DEPT NO.	A & E SPEC NO.	REFER SPEC QUES TO	DEPT NO.	PAGE	LP
76004AF	003		GL RIPPE	708220	730	EE TOCHIHARA	708212	20	

RUN NO.	CKT. REF.	FT.	NO. CAS.	CODE	CKT NBG, CA NO, UNIQ CA NO.	FROM	CA. DES	SF LOC. DROP	EQPT LOC & FM INF	TO	LG SCU CA	SF LOC. DROP	EQPT LOC & FM INF	LDS, CLASS, SHLD	ROUTE
7 A				T32523-11		FIG 3 (MOD)	JK ACCESS								
7 001		-	1	S22		ACTT-1		12	PLT 27	RR 102.1		R12	R-22		SEE INST NOTE A
7 002		-	1	S20		ACTT-1		12	PLT 27	RR 102.1		R12	R-22		SEE INST NOTE A
8 A				T32523-11		FIG HA (MOD)	JK ACCESS (ALM F LEAD MULT)								
8 001		-	1	S22		ACTT-1		12	PLT 27	RR 120.1		R10	PLT 35		
9 A				T32523-11		FIG 8 (MOD), 9 (MOD)									
9 001		205	1	74A		SEL 303		L19	SH MN	RR ACTT-1		12	PLT 27		NOTE B,G3,G1,J3, V1,CA HL 2A,C1
10 A				T31653-15		FIG 13 (MOD)	CONN TST		LINE (T1,R1,S1 LEADS)						
10 001		155	1	97A	1-3	RR 202.8		R10	PLT 41	RR ACTT-1		15	PLT 3		NUTS C,L1,L2,1C3 CA HL 2E,1C3

ORDER NO.	SPEC NO.	APPX NO.	REFER ENGR QUES TO	DEPT NO.	A & E SPEC NO.	REFER SPEC QUES TO	DEPT NO.	PAGE	LP
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FIG. 1 INSTALLER'S CABLE RUNNING LIST