SWITCHING SYSTEMS MANAGEMENT

GENERAL

ADMINISTRATION

MAIN DISTRIBUTING FRAME ADMINISTRATION

(INCLUDES SHORT JUMPER ASSIGNMENT)

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1. INTRODUCTION

GENERAL

1.01 This section describes the various types of main distributing frames (MDFs) used in the central office and describes the procedures for administering these frames. Due to increased congestion on the MDF in recent years only preferential assignment (short jumper concept), developed to reduce MDF congestion, will be considered in this section.

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 The title for each figure includes a number(s) in parentheses which identifies the paragraph(s) in which the figure is referenced.

1.04 The MDF provides a means of interconnecting subscriber lines to central office equipment, thus achieving a method of flexible assignment that can result in good load balance for maximum utilization of office equipment. The trend to large, more complex central offices and to the growing use of the newer modular (Electronic Switching System [ESS] and Common System Main Interconnecting [COSMIC]) frames makes preferential assignment desirable in most cases and mandatory in others.

1.05 Both initially and during subsequent additions, the layout of cables and line equipment should be planned for utilization of the short jumper concept of administration. Dependent upon the type of MDF (nature and size of the community being served), and the number and type of switching machines being served, a varying amount of interdepartmental planning will be required. It is recommended that an interdepartmental committee be established to assure that all detailed work operations are successfully completed. This committee should be comprised of members from assignment, network maintenance, and network administration. Committee meetings should be held at least as frequently as quarterly. The primary functions of this committee will be as follows:

- Review service order and cable transfer activity related to possible future congestion.
- Review load balance requirements as they relate to future cable transfer activity and service order activity.
- Insure that adequate equipment is available to maintain the short jumper concept.
- Review line equipment transfer requirements.
- Review tie pair application requirements.
- Review upper and lower trough congestion.

1.06 The remainder of Part 1 of this section provides a brief description of the common types of MDFs now in use in central offices. Part 2 discusses manual line assignment by preferential assignment procedures. Part 3 introduces a new concept for advanced wiring of central office equipment. Part 4 describes the various mechanized assignment methods available. Part 5 provides references to documents that can be consulted if more details are desired. Part 6 contains a glossary of terms used in this section.

DESCRIPTION OF MAIN DISTRIBUTING FRAMES

A. Conventional Frame

1.07 The conventional main distributing frame is a steel framework containing two major components:

- The vertical side for terminating outside plant cable pairs
- The horizontal side for terminating central office equipment (line equipment) or telephone numbers.

1.08 The framework on the horizontal side is used to support the jumper wires that interconnect the cable pair terminations and the line equipment terminations. It is along these wire "shelves" that jumper buildup can occur. If not properly administered, these jumper piles will reach proportions that prevent removal of disconnected wires due to the weight of the wires above. In extreme cases no new wires can be added due to insufficient space remaining. Conventional MDFs may extend in a line for up to several hundred feet, or may be "L" shaped, having a bend somewhere along the length. Bends are particularly susceptible to severe wire congestion.

1.09 When cable pairs are terminated on the MDF, protection devices are used to prevent stray voltages from entering central office equipment. In some offices having conventional MDFs, the outside cables are terminated on a separate protector frame, then cross connected to the MDF with tie cables.

1.10 A conventional MDF has from 14 to 18 horizontal shelves. Each shelf can accommodate up to 6000 jumper pairs without presenting any problems to maintenance personnel. Total capacity of a shelf is about twice this number, but frames become virtually unmanageable if jumper buildup is allowed to exceed 6000 pairs at any point along the shelf.

1.11 To meet new equipment and building standards, a low profile conventional distributing frame (LPCDF) has been developed. This frame is similar to the standard conventional frame except that it has only 10 horizontal shelves. The shelves on this frame should be limited to 6000 pairs of jumper wires also.

B. ESS Modular Frame

1.12 The ESS modular MDF is a single-sided frame designed to achieve maintenance cost savings. It is subject to severe jumper congestion, however, if not rigorously managed using preferential assignment. The frame consists of a series of vertical sections separated by vertical wire troughs. Cable pairs are terminated on every other vertical and line equipment is terminated on the adjacent verticals.

1.13 Jumpers cannot be run across the midpoint of any vertical. Jumpers terminating on the left half of one vertical should cross connect to the right half of the adjacent vertical. If no line equipment is available in the adjacent half vertical, then a "long jumper" is routed via an upper or lower horizontal wire trough to some other half vertical. Figure 1 depicts an ESS modular MDF and defines short and long jumpers.

1.14 The vertical troughs on the ESS modular frame can accommodate as many jumpers as necessary to cross connect equipment and cable pair terminations. The horizontal troughs, however, are limited to approximately 11,000 jumpers at any one point. The severity of this restriction becomes apparent when compared with the 60,000 jumpers permitted by the 10 horizontal shelves of the low profile conventional frame and the 84,000 to 108,000 jumpers that can be readily handled by the standard conventional frame. The restricted capacity of the ESS modular MDF horizontal wire troughs makes preferential assignment mandatory.

C. COSMIC Frame

1.15 The COSMIC frame is a single-sided modular frame somewhat similar to the ESS modular MDF. Design configuration of the ESS modular MDF, which limited a short jumper "target zone" to about 600 possible line equipment terminations, has been improved in the COSMIC frame. The COSMIC frame provides up to 20,000 possible line equipment connections within a short jumper "target zone" for any particular cable pair.

1.16 The COSMIC frame is composed of a series of modules. Each module contains 11 horizontal shelves giving access to vertical wire troughs which in turn provide access to upper and lower horizontal wire troughs as on the ESS modular MDF. Each module can terminate about 10,000 cable pairs or line equipments. Cable pairs are terminated on even numbered modules and line equipment on odd numbered modules. Jumpers can be routed in either direction along a horizontal shelf to the adjacent vertical trough and then to the adjacent module without entering the horizontal "express" wire troughs. Figure 2 depicts a section of COSMIC frame and defines short and long jumpers.

1.17 The express troughs on the COSMIC frame have approximately the same wire capacity as those on the ESS modular MDF. Wire congestion is greatly reduced, however, due to the 20,000 line equipment terminals, provided by adjacent modules, that can be accessed with a short jumper. Preferential assignment is, nevertheless, necessary in order to avoid wire congestion.

2. MANUAL METHOD OF ASSIGNMENT

2.01 The objective of preferential assignment is to reduce the number of long jumpers to the extent possible consistent with good load balance. This is achieved by restricting line assignments to designated ***zones*** whenever possible. For preferential assignment to be successful, sufficient line equipments must be available in each zone

for each class of service, to permit assignments to be made within a given zone if possible.

2.02 Preferential assignment, in general, is most effective for plain old telephone service (POTS) customers. Cross connections for off-premises outside extensions, private branch exchanges (PBXs), centrex, and multiline hunt groups frequently result in long jumpers, although every assignment should be attempted first with short jumpers. Assignment for POTS customers will normally be made by the assignment office. Assignment is from lists of available line equipment supplied by network administration. More complex types of service are generally referred to network administration for assignment.

2.03 In making line assignments, load balance takes precedence over short jumper considerations. These objectives are not mutually exclusive and can normally be jointly accomplished. In making line equipment transfers (LETs) in order to improve load balance, elimination of long jumpers should be considered in making the new assignments. LETs can also be initiated specifically to reduce the number of long jumpers if wire buildup exceeds specified limits.

2.04 The concept of zones in making short jumper assignments is used for all types of frames. Zones are established using some type of natural boundary on conventional frames as discussed in 2.05 through 2.33 of this section. The zones on the ESS modular MDF are the two half verticals on either side of a vertical wire trough. On the COSMIC frame, a zone consists of any even numbered module and the first odd numbered module on either side of it. Thus, on the COSMIC frame, zone boundaries overlap, since any odd numbered vertical would be a home zone for two even numbered verticals. On all frames, any cross connection that lies wholly within one zone is a short jumper.

CONVENTIONAL MAIN DISTRIBUTING FRAME

A. Zone Size

2.05 The number of zones to establish on a conventional frame should be the minimum required to control jumper buildup on the horizontal shelves. There is no recommended maximum zone size. If two zones will reduce pile up significantly, a 2-zone division will suffice. In particular, a 2-zone division of a bent frame, with the bend as the zone boundary, may reduce congestion at the bend to a manageable level (Fig. 3).

2.06 Minimum zone size ordinarily should not be less than 8000 lines, or 25 verticals, except for a zone at the growth end of a frame to which blocked-in additions are expected.

B. Zone Boundaries

2.07 In establishing zone boundaries on a conventional MDF, a prime consideration is the physical frame configuration. The following natural separations should be considered, more or less in the order listed, as possible horizontal side zone boundaries:

- Ends of a frame
- Bends in a frame
- Mezzanines
- Switching machine boundaries
- Nearly vertical lines on a frame across which horizontal side termination density changes abruptly.

2.08 Vertical side zone boundary locations are frame ends, bends, and mezzanines. The remaining boundaries are determined by cable pair ratio as indicated in 2.09. Fifty pair compliments should not be split between zones.

C. Cable Pair Ratio

2.09 Determine the horizontal zone sizes and the vertical zone boundaries as follows:

- Survey the horizontal side of the frame, and establish the approximate size and location of zones.
- Establish a subscriber cable pair ratio to subscriber line equipment on the MDF.

$$\frac{\text{Total Exchange Cable Pairs}}{\text{Total Line Equipment}} = \text{Cable Pair Ratio}$$

- Multiply line equipment in each zone established above by the cable pair ratio. This is the approximate number of cable pairs to be assigned to each zone.
- The cable pair ratio for all zones on the vertical side should be as near as possible to the ratio for the wire center as determined above.
- Final selection of zone boundaries on the horizontal side of the frame should be drawn so that line groups (line finder groups, horizontal groups, etc) are not split.

2.10 Once zones have been established, line equipment records and cable records must be updated to indicate the zone to which each cable termination and line equipment termination has been assigned. Use capital letters to designate zones, starting with A.

D. Alternate Choice Zones

2.11 Alternate choice zones are used in making line assignments when a home zone connection is not available. Generally, jumper congestion is greatest at the frame midpoint. For this reason, the first alternate choice zone should be selected away from the frame midpoint. The same reasoning also applies to bends in the frame. The example below uses a frame without a bend to illustrate the procedure.

HOME ZONE	A	B	C	D	E
First Alternate Choice Zone	B	A	B	E	D
Second Alternate Choice Zone	C	C	D	C	C
Third Alternate Choice Zone	D	D	A	B	B
Fourth Alternate Choice Zone	E	E	E	A	A

MDF Layout A B C D E

2.12 Using the five zone bent frame in the example of 2.28 the alternate choice zones are as follows:

HOME ZONE	A	B	C	D	E
First Alternate Choice Zone	B	A	B	E	D
Second Alternate Choice Zone	C	C	A	C	C
Third Alternate Choice Zone	D	D	D	B	B
Fourth Alternate Choice Zone	E	E	E	A	A

MDF Layout A B C turn
D
E

2.13 The following is an example of the preferential assignment zone selection sequence for a frame without a bend, but with a mezzanine, divided into three zones. The preference order shown assumes that it is more desirable to run a jumper between levels than horizontally.

HOME ZONE	AU	AL	BU	BL	CU	CL
First Alternate Choice Zone	AL	AU	BL	BU	CL	CO
Second Alternate Choice Zone	BU	BL	AU	AL	BU	BL
Third Alternate Choice Zone	BL	BU	AL	AU	BL	BU
Fourth Alternate Choice Zone	CU	CL	CU	CL	AU	AL
Fifth Alternate Choice Zone	CL	CU	CL	CU	AL	AU

MDF Layout A B C Upper Mezzanine = U
A B C Lower Mezzanine = L

2.14 Zone assignments for offices having supplemental MDFs and/or dual appearances of cable pairs and/or line equipment may be handled as follows.

(a) Continue the same lettering sequence for the supplemental MDF. For example, if the last zone is "E" for the main MDF, the first zone on the supplemental MDF will be "F."

(b) Where line equipment and/or cable pairs have dual appearances on one or more MDFs, list both zones in cable and line equipment records. For example, the same line equipment in zones "A" and "E" will be entered as A-E.

(c) Tie pairs should be considered when making line assignments. For example, if a cable pair is on a two zone supplemental MDF in zone "G," the next zone sequence could be "F." If there is no available line equipment in zone "F," the zone on the primary main frame where the tie pairs terminate will be the next choice.

E. Special Considerations for Bent Frames

2.15 If, due to a bend, zone boundaries on an MDF are forced so that the cable pair ratio on one side of the bend is not equal to the cable pair ratio on the other side, it will not be possible to maintain main station fill balance without assigning jumpers that will run around the bend. In the example shown in Fig. 4, 71 percent of the cable pairs are terminated on the old part of the frame, but only 57.7 percent of the line equipments terminate there. Over a period of time it can be expected that the network administrator will release 57.7 percent of available equipment for assignment on the old portion of the frame. However, requests for service originating on this portion of the frame would be about 71 percent. If the network administrator is to preserve main station fill balance, 13.3 percent

$$(71\% - 57.7\% = 13.3\%)$$

of the jumpers must run from the vertical side of the old part of the frame to the horizontal side of the growth end of the frame.

2.16 Several methods may be employed to minimize jumper congestion at the bend that zoning in itself will not solve (as in the example of 2.15).

(a) Tie pairs can be installed making line equipment terminations available on either side of the bend. In the example above 6920 tie pairs would be required.

$$(0.133 \times 52{,}000 = 6920 \text{ tie pairs})$$

The tie pairs should be spread over all zones and not concentrated only between zones "C" and "D." In using tie pairs an increase in the number of jumpers required will cause an increase in running costs. In the example given 13.3 percent of the connections made would require two jumpers instead of one.

(b) Cable pairs can be reterminated or multipled so as to eliminate the inequality in cable pair ratios on different parts of the frame. In the example above it would be necessary to reterminate or multiple 8950 cable pairs

$$(0.133 \times 67{,}600 = 8950 \text{ cable pairs})$$

from the old end of the frame to the growth end.

(c) Line equipment can be reterminated or multipled from the growth end to the old end of the frame. In the example this would effect 6920 line equipment terminations as determined in (a) above.

F. Considerations Due to Uneven Spread of Class of Service

2.17 Excessive long jumpers may occur on a frame even when cable pair ratios are equal if class of service is not distributed equally between zones. Figure 5 illustrates such a problem. In the example shown, in order to maintain main station fill balance, twice the normal number at long jumpers are required.

2.18 The example assumes two zones, each having 20,000 line equipments and 30,000 cable pairs. TOUCH-TONE® has been provided in zone "B" only, and represents half of the zone "B" equipments (10,000). Since one fourth of all equipment is for TOUCH-TONE, it can be assumed that one fourth of the requests for service will be for TOUCH-TONE. If, on any given day, 200 requests for service are received, and are evenly divided between the two zones, then approximately 75 in each zone will be for rotary equipment and 25 will be for TOUCH-TONE. The 25 TOUCH-TONE requests in zone "A" will require long jumpers to zone "B." In addition, to maintain main station fill balance 25 of the 75 requests for rotary service in zone "B" must be served by rotary equipment in zone "A." Of the 200 total requests for service, 25 or 12.5 percent require long jumpers to receive the service requested; but to maintain main station fill balance 50 long jumpers, 25 percent of the total jumpers run, are required. This is twice the number needed to just serve the customer.

G. Procedure for Zoning

2.19 The network administrator and the maintenance supervisor will zone the frame. The maintenance supervisor then prepares Form E-6132, Short Jumper Assignment Zone Makeup. (See Fig. 6.) A zone map is prepared by the maintenance supervisor to include the following:

- Zone lettering system
- Type of switching machines
- Bends and other physical characteristics
- Multiframes
- Growth end of frame.

A zone selection chart showing alternate choices will also be prepared by the maintenance supervisor. See 2.13, 2.14, and 2.15 for samples of zone selection charts.

2.20 Upon receipt of Form E-6132 and the zone map, the network administrator will post the zones on the line equipment records. When rearrangements to the MDF occur, the network administrator shall assist the maintenance supervisor in updating the Form E-6132. Periodic reviews of the form should be made and updates performed as necessary. However, rearrangements to zone boundaries must be avoided if at all possible. As the frame grows, new zones can be added leaving existing zones intact.

H. Preferential Assignment

2.21 The network administrator will issue assignment availability lists to the plant assignment office indicating line equipment that is available for use. The list is by class of service and will be divided by zone (Fig. 7). The plant assignment office will make line equipment assignment for most service orders using the list and assigning the equipment in the same zone as the customer's cable pairs terminate if possible. If this is not possible , the first alternate choice zone, or second, etc, if necessary, would be chosen. The zone selection chart would be utilized for this purpose.

2.22 In areas where the business office assigns telephone numbers, a telephone number availability list will be issued for their use. Because of a possible violation of the short jumper concept, advance wiring, described in Part 3, cannot be used if the business office assigns telephone numbers.

2.23 It is essential that the plant assignment office have a sufficient supply of available line equipment in order for preferential assignment to be effective. The network administrator will determine the quantity to be made available consistent with office loading plans.

2.24 Line equipment for complex service orders are assigned by the network administrator considering rules of spread and the preferential assignment techniques described 2.21. When line equipment transfers are issued preferential assignment

of the new or "to" line equipment must be adhered to. This may be accomplished as follows.

(a) Network administration will prepare the transfer with the telephone number and "from" line equipment entries, then route the transfer to the service center for cable and pair location.

(b) Plant assignment will enter the home zone information for each line involved and return the transfer to the network administrator.

(c) The network administrator will enter the new or "to" line equipment using short jumper policies. The transfer is then processed in the normal manner.

I. Control Procedures

2.25 The objective of short jumper assignment is to have a maximum number of assignments in the home zone. If it becomes evident that too many long jumpers are being assigned, Form E-6133, Short Jumper Assignment Control (Fig. 8) may be used to determine the percentage of long jumpers.

2.26 Form E-6133 can be used as a periodic sampling device to determine the effectiveness of preferential assignment.

J. Examples of Zoning

2.27 An L-shaped frame with 52,000 line equipments and a total of 67,600 cable pairs is used to illustrate the method of zone sizing (Fig. 3).

(a) The maintenance supervisor and the network administrator decide that two zones are sufficient and the bend is the zone boundary. The zone division is as follows.

(b) The cable pair ratio for the wire center is developed as shown in 2.09, eg,

$67{,}600 \div 52{,}000 = 1.3$

(c) However because of the decision to have only two zones, the vertical side zone boundary is at the bend and is not determined by the cable pair ratio. The cable pair ratio for the two zones do not agree:

$48{,}000 \div 30{,}000 = 1.6$ and

$19{,}600 \div 22{,}000 = 0.891$

Since it is more important to have the zone boundary at the bend, inequality of the cable pair ratios is unavoidable.

2.28 The same L-shaped frame is used to illustrate how more than two zones are established (Fig. 4).

(a) The maintenance supervisor and the network administrator decide to have as many zones as there are different switching machines on the frame. The zone division is as follows:

ZONE	NUMBER OF LINE EQUIPMENT	NUMBER OF CABLE PAIRS
A	30,000	48,000
	BEND IN FRAME	
B	22,000	19,600
Total	52,000	67,600

MACHINE	NNX CODES	NO. OF LINE EQUIPMENTS	ZONE
SXS	561	12,000	A
	562		
MG0, 1XB	661	9,600	B
Most of MG1, 1XB	662	8,400	C
Remainder of MG1, 1XB	662	1,000	D
MG0, 5XB	761	13,000	D
	762		
CGO, 1 ESS	861	8,000	E
	862		

Note: The bend in the frame takes priority over the machine boundary in determining the boundary between zones C and D. The 1000 equipments of marker group 1 of the No. 1 crossbar machine around the bend are

not made a separate zone, but are included with the 13,000 equipments of marker group 0 of the No. 5 crossbar machine to form zone D.

(b) Next a cable pair ratio is determined for each half of the frame. As shown in 2.27 these two ratios are 1.6 and 0.891, respectively.

(c) Multiply the line equipments in each zone by the appropriate cable pair ratio. This is the approximate number of subscriber cable pairs assigned to each zone as shown below.

ZONE	FACTORS	PRODUCT
A	1.6 × 12,000	= 19,200
B	1.6 × 9,600	= 15,360
C	1.6 × 8,400	= 13,440
Subtotal		48,000
	BEND IN FRAME	
D	0.891 × 14,000	= 12,473
E	0.891 × 8,000	= 7,127
Subtotal		19,600
Total		67,600

(d) Finally, assume that all cables are in 50-pair compliments; round the cable pair numbers as follows:

ZONE	NO. OF ROUNDED CABLE PAIRS	
A	19,200	
B	15,350	
C	13,450	
Subtotal		48,000
D	12,450	
E	7,150	
Subtotal		19,600
Total		67,600

ESS MODULAR MAIN DISTRIBUTING FRAME

2.29 The ESS modular frame was designed for use with the No. 1 ESS and relies heavily on the machine capabilities. The limited trough capacity for long jumpers makes preferential assignment a necessity. Even with preferential assignment, the use of the ESS MDF is restricted to an all ESS subscriber frame. Trunk and special transmission equipment not suited to preferential assignment should be terminated on a separate intermediate distributing frame (IDF). The IDF provides for the cross connection of trunks and trunk auxiliaries to the MDF via tie cables. This allows multipled access of trunks to outside plant pairs and minimizes long jumpers. In cases where more than three IDF modules would be required, the ESS modular MDF should not be used.

2.30 Not all jumpers on a subscriber frame can be preferentially assigned. In general, only two categories of cross connections are suitable for short jumper assignment. These are POTS and jumpers involving tie pairs. The success of preferential assignment is dependent upon proper administration and engineering layout of the frame.

2.31 Subscriber cable pairs are terminated on a protector frame and brought over to the ***odd*** numbered verticals by tie cable. They are terminated on the rear of the MDF in a pattern

designed to give a horizontal distribution spread across the frame. Line equipment numbers (LENs) are cabled from the equipment frames to the rear of the ***even*** numbered verticals. The LENs are spread across the verticals in a pattern designed to ensure that the majority of cross connections will be short jumpers.

2.32 Manual preferential assignment procedures for the ESS modular MDF are essentially the same as for the conventional MDF except that the zones are fixed by design and are quite small. Manual preferential assignment, while not recommended on the ESS modular MDF, is accomplished as follows:

(a) Service assigned to a cable pair that terminates on the left side of a cable vertical must be assigned to a LEN on the right side of the left adjacent LEN vertical.

(b) Conversely, service assigned to a cable pair that terminates on the right half of a cable vertical must be assigned to an LEN on the left half of the right adjacent LEN vertical.

(c) When no LEN is available in the home zone, a LEN will be selected in a vertical as near the cable vertical as possible. The search will be to the LEN verticals adjacent to the home zone LEN vertical first. Then the search will move progressively outward in both directions until a suitable connection is found. Preferential assignment is enhanced if the network administrator supplies a sufficient number of line equipment to the plant assignment office. Conversely, timely, and adequate advance notice by the plant assignment office of a shortage will also enhance preferential assignment.

2.33 There will be instances when long jumper cross connections cannot be avoided such as off premises outside extensions, large PBXs, centrex, etc. If the short jumper concepts for POTS are adhered to, the use of long jumpers where necessary will not be a problem.

2.34 In order to assign cross connections on the ESS modular MDF, the following information must be available to the assigner.

- Vertical and side location of all subscriber cable pairs terminated on the modular MDF.
- Vertical and side location of all tie cables terminated on the modular MDF.
- Vertical and side location of all LENs terminated on the modular MDF.
- Telephone numbers available for assignment.

2.35 The assignment office will request from the network administrator spare LENs by class of service, NNX, and MDF vertical (zone). These available LENs will be posted on Line Equipment Available For Assignment Form (Fig. 7). LEN available lists will be updated as necessary.

2.36 A frequent source of long jumpers is line and station transfers or cable transfers. When making such transfers, the assignment office should attempt to make the transfer to a pair within the same half vertical to avoid long jumpers. When it is necessary to assign a long jumper, a notation LJ should be entered on the transfer form. A copy of this form should then be forwarded to the network administrator so that the long jumper notation can be entered on the line equipment records.

2.37 Network administration will, as necessary, issue LETs to maintain office balance or for other reasons. Precaution must be taken to avoid the creation of excessive quantities of long jumpers as a result of LETs. The following procedures should be followed in making LETs.

(a) Network administration will prepare LET forms, posting the old LEN and the equipment vertical and side termination locations. When deloading, the first attempt should be to write transfers on equipment having long jumpers. This will accomplish a dual objective of improving load balance and reducing long jumpers. For example, if the network administrator has determined that a business subscriber should be removed from an overloaded group, and there are several business subscribers in the group, the circuit with a long jumper would be the one selected first.

(b) The equipment transfer list is forwarded to the maintenance supervisor to enter the cable pair and vertical and side location for each circuit. The transfer list is then returned to the network administrator. Based on the data supplied by the maintenance supervisor, the

network administrator will select the new "TO" equipment using the procedure described in 2.32. If long jumpers result, these should be noted on the line equipment record.

COSMIC FRAME

2.38 The installation of a COSMIC frame is engineered using a program called Program for Assigning Cables and Equipment (PACE), that distributes the loop cable, tie and equipment terminations in an optimal manner for preferential assignment. PACE also generates a line equipment directory which contains the module and shelf number of each line equipment. The network administration personnel will post this information to the line equipment record. If long jumpers were required in making a connection, this will be noted on the assignment list by plant assignment personnel and posted on the line equipment record by network administration personnel.

2.39 For each line equipment module on the COSMIC frame, the network administrator will provide a separate list of available line equipment for each major class of service such as business, residence, etc (Fig. 7). Line equipment entered on the assignment list should be selected on the basis of standard load balance and class-of-service balance procedures. Line equipment for each type of service should be available on each module where required.

2.40 Complex orders such as multiline hunting groups, PBX, series completion, and centrex require special assignment consideration. Line equipment for these types of complex orders ***should not*** be selected from the normal assignment lists. These orders should be assigned by the network administrator giving due consideration to short jumpers within the confines of maintaining proper load balance.

2.41 In assigning cable pairs to line equipment, the home zone is the line equipment module immediately on either side of the cable module. Since all modules are numbered consecutively starting with zero, the home zone module would be either one number higher, or lower than the cable module number. If no line equipment is available in either home zone module, then the next higher or lower odd numbered module will be searched. This system will be continued until suitable line equipment has been found.

2.42 Cross loading is the use of line equipment with features that are not identical to the features requested by the customer. Cross loading is done when line equipments with specific features are in excess of immediate needs. Common examples are the assignment of customers with dial pulse equipment to TOUCH-TONE line equipment, or the assignment of essential service equipment to nonessential service customers. Where local policies permit, cross loading may be used to maintain a short jumper concept.

2.43 A frequent source of long jumpers is line and station transfers or cable transfers. When making such transfers, the assignment office should attempt to make the transfer to a pair within the same 100 pair complement to avoid long jumpers. When it is necessary to assign a long jumper, a notation LJ should be entered on the transfer form. A copy of this form should then be forwarded to the network administrator so that the long jumper notation can be entered on the line equipment records.

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(b) The equipment transfer list is forwarded to the maintenance supervisor to enter the cable pair and module and shelf location for each circuit. The transfer list is then returned to the network administrator. Based on the data supplied by the maintenance supervisor, the network administrator will select the new "TO" equipment using the procedure described in 2.41.

If long jumpers result, these should be noted on the line equipment record.

3. ADVANCE WIRING

INTRODUCTION

3.01 A procedure has been developed for advanced wiring (AW) of electromechanical central office equipment. In using this plan, a telephone number and line equipment are verified as vacant and wired by frame personnel before being assigned to a service order. Advance wiring cannot be done where telephone numbers are preassigned by the business office.

3.02 Network administration will enter a list of telephone numbers and line equipment available for assignment on pressure-sensitive labels on Advance Wiring List, Form E-6542 (Fig. 9). Note that the MDF zone should be shown on the form. This information should be added manually at the top of the form as shown. The list is sent to network maintenance for verification that both the telephone numbers and line equipment are vacant. After wiring the telephone numbers and line equipment, network maintenance notes any discrepancies on the list in the appropriate column and returns the list to network administration. Network administration then forwards the list to the assignment office. A flow chart depicting movement of the advance wiring list is shown in Fig. 10.

3.03 Demand for service may make it feasible to use AW for single-line business, message rate, TOUCH-TONE, etc, as well as for individual flat-rate residential service. AW is expected to relieve some or all of the following problems.

- Incomplete service orders because equipment assigned was found to be working.
- Delay in completion of service orders due to heavy work load on network maintenance personnel.
- Idle time during nonrush hours.
- The necessity to clear discrepancies during rush hours
- Lost installation time waiting for discrepancies to be cleared.
- Transposition of numerals in transferring numbers from availability lists to service orders.
- Accidental dual assignment of telephone numbers and line equipment.
- The need for purging records to remove discrepancies.

3.04 The following should be represented during any planning to implement AW:

- Network administration
- Network maintenance, including the frame supervisor
- Assignment office, including the service order supervisor.

3.05 Some of the details to be included in the planning are the following:

- Procedures for flow of information, ie, telephone, mail, hand-carry, etc.
- Time frame and quantity of AWs to be processed. This will be dependent on volume of service order activity and availability of equipment.
- Time limit for clearing discrepancies.

NETWORK ADMINISTRATION RESPONSIBILITIES

3.06 Upon receipt of a request from the assignment office, network administration will prepare AW lists on Form E-6548 and make two photocopies. A separate list is required for each type of service. One copy is sent to network maintenance for verification of entries and wiring. The other copy is kept on file. For maximum effectiveness, an adequate supply of lists must be made available. Network administration will determine the quantity to be made available, however, consistant with loading plans.

3.07 When a list is returned by network maintenance, network administration will resolve any discrepancies noted, notify network maintenance of any changes requiring record correction, and forward the original list to the assignment office. No disassociation of the telephone

number from its assigned line equipment must be made without concurrence of network administration. Upon receipt of disconnect orders, network administration will disassociate the telephone number and line equipment.

NETWORK MAINTENANCE RESPONSIBILITIES

3.08 Upon receipt of a Form E-6548 from network administration, network maintenance personnel will verify that the telephone number and line equipment are vacant. If a discrepancy is found that cannot be corrected by frame personnel, it will be noted on the right side of Form E-6548. If the line equipment or telephone number is working, the associated equipment must also be noted. The clearing of these discrepancies is a joint responsibility with network administration and should be done periodically. As soon as verification is complete, a copy of the form will be made. One copy is returned to network administration. The telephone number and line equipment will then be wired as time permits.

ASSIGNMENT OFFICE RESPONSIBILITIES

3.09 The assignment office will submit requests to network administration for the quantity of AW equipment needed. Upon receipt of the Advanced Wiring Lists from network administration, the assignment office will make a copy and then file the form by office for use at the cable assignment positions.

3.10 In offices receiving single-copy memorandum orders from the business office, the assignment office will, after selecting a proper AW, peel the label from Form E-6548. The clerk will then separate the telephone number at the perforation and press it onto the memorandum order in the telephone number space. The remaining line equipment portion of the label will be pressed into the line equipment space in the assignment (ASGM) section of the order.

3.11 In offices assigning on multicopy forms, the label is applied to the top copy which is then turned back, and the information is handwritten on the remaining copies.

3.12 When all labels have been used from the form, it will be returned to network administration as notification of completion of the sheet. The copy that was made upon receipt will be filed for a minimum of three months. This will provide information for billing discrepancies and for audit purposes.

3.13 When an order containing an AW is canceled for any reason, the assignment office will be responsible for notifying network administration in accordance with local procedures. The AW will be removed by network maintenance per the canceled order.

3.14 All AW service orders sent to network maintenance must have a clearly noted AW typed on the service order to identify the order as having been advance wired.

3.15 For single listings of telephone numbers or line equipment that is not wired in advance of the service order Form E-6549, Central Office Equipment Assignment for Telephone Numbers or Line Equipment is provided (Fig. 11). These listings will be used for line and station transfers for splitting party lines, or for service orders or troubles where AW cannot be utilized. The same general instructions and flow of information as for Form E-6548 will apply to Form E-6549.

4. MECHANIZED ASSIGNMENT

4.01 Mechanized assignment systems are computer based systems which have been developed as an aid in assigning terminals for jumper wires and in maintaining records of existing jumpers on the MDF. There are presently four mechanized systems that have been developed by Bell Telephone Laboratories for general use by all operating telephone companies (OTCs).

- Simplified Modular Frame Assignment System (SMFAS)—ESS
- Simplified Modular Frame Assignment System (SMFAS)—COSMIC
- Computer System for Main Frame Operations (COSMOS)
- Business Information System Customer Service/Facility Assignment and Control System (BISCUS/FACS).

4.02 Inadequate administration and poor record keeping are major contributors to congestion on the MDF. Large central offices are becoming

increasingly difficult to manage using manual procedures. Any central office with more than 40,000 cable pairs or central offices using modular frames (ESS or COSMIC) should consider the use of mechanized assignments. Offices, regardless of size, which are having record keeping problems should consider mechanized assignment.

SMFAS

4.03 SMFAS-ESS and SMFAS-COMIC are essentially the same except in specific programming details. For the purposes of this discussion they will be combined. SMFAS provides a simple MDF administration system. It is designed to implement preferential assignment on modular frames and does not keep an extensive data base of frame cross connections. It is most suitable for administering a single multimodule distributing frame which is experiencing jumper congestion despite relatively accurate records. SMFAS is implemented on a commercial time-sharing computer, does not require an extensive data base, is inexpensive to implement and train for, and installation can be completed in a matter of a few weeks. SMFAS will not administer a conventional type of MDF.

4.04 Although SMFAS will modify some of the network administrator's procedures for the assignment of line equipment and telephone numbers, the basic responsibilities remain the same. For example the network administrator will:

- Manually select and input to SMFAS, the line equipment and telephone numbers that are available for assignment.
- Generate and input to SMFAS load-balance CCS usage data by concentrator or horizontal group.
- Determine, review, and update SMFAS operating parameters.
- Process LETs.

4.05 SMFAS-ESS administers a maximum of two MDF lineups and all standard No. 1 ESS line to junctor concentration ratios for both 2:1 and 4:1 line switch frame concentration ratios. It accommodates a maximum of three No. 1 ESS control groups serving 50,000 working lines or less. SMFAS-ESS also administers installations that use patterned split-concentrator line-equipment spreads to the half concentrator.

4.06 SMFAS-COSMIC administers a maximum of three MDF lineups as well as all standard No. 1 ESS line-to-junctor concentration ratio for both 2:1 and 4:1 line-switch-frame concentration ratios. It accommodates a maximum of three No. 1 ESS control groups, two No. 5 crossbar marker groups, or a combination of these up to 50,000 working lines. SMFAS-COSMIC assigns interframe tie pairs when one end of the pair terminates on the COSMIC frame. It also assigns intra-COSMIC and inter-COSMIC tie pairs that run on the COSMIC tie pair distributing frame. The SMFAS-COSMIC assignment system is compatible with the PACE program, which provides standardized layout methods.

COSMOS

4.07 COSMOS is designed for larger wire centers experiencing serious MDF wire congestion and management difficulties. It provides short jumper assignment consistent with dynamic load balance objectives, maintains accurate facility records, and supplies management report information. COSMOS operates on a variety of distributing frames in a wire center and is capable of administering several wire centers. It has a total capacity of 200,000 lines. COSMOS utilizes a dedicated minicomputer. Preparation of the data base and conversion to a COSMOS operation is a lengthy process (14 to 18 months).

4.08 In a wire center utilizing COSMOS, the network administrator will establish, review, and update office parameters which manage the COSMOS line assignment algorithm. This will permit COSMOS to operate in a manner that is consistent with the responsibilities and objectives of the network switching machines. The network administrator will determine the status of telephone numbers in the COSMOS inventory and change number status when properly aged. COSMOS will automatically change the status of a number when an assignment, disconnect, or other change occurs. It also provides dates of disconnects and previous customer's class of service to assist the network administrator in determining proper aging. The network administrator will generate and input data required for the line assignment algorithm, ie, line hundred call seconds (CCS) usage measurement data.

4.09 COSMOS will automatically assign line equipment for POTS customers, ie, for single and multiparty service requiring only one cable pair, one telephone number, and one line equipment. COSMOS will minimize jumper length while maintaining load balance, class of service balance, and an entity main-station fill objective. It will also provide a semiautomatic procedure for selecting line equipment for multiline hunting group, PBX, and centrex services, consistent with "rules of spread." COSMOS will improve the MDF work effort by supplying location information that will reduce terminal search time. It does this by providing circuit configurations from the data base, by reusing dedicated inside plant (DIP), and by outputting work lists to allocate jobs more efficiently and to expedite cross-connection work. Since COSMOS constantly monitors the cross-connection situation on the frames, it will alert the frame force when the acceptable wire-congestion level is exceeded. The network administrator can then take remedial action through the initiation of short jumper LETs.

4.10 COSMOS also maintains load balance by computing a load factor for every concentrator. These load factors are based on actual usage measurements when available and on estimated usage values based on the class of service of each new line assigned. In addition, COSMOS can assign tie pairs, bridge lifters, message registers, and telephone numbers.

BISCUS/FACS

4.11 BISCUS/FACS interfaces with the OTCs mechanized service order system using AT&Ts standard universal service order/universal service order code (USO/USOC) inputs and outputs to provide one composite system from customer service to facility assignment and control. BISCUS/FACS will assign not only central office facilities, but outside plant as well. It will administer conventional, ESS modular, and the COSMIC main distributing frame. BISCUS/FACS requires a general purpose, high performance, multiprocessor computer. It has a capacity of from 500,000 to 1,500,000 main stations, and any number of central offices whose total main stations do not exceed the system's total capacity.

4.12 For the network administrator BISCUS/FACS will:

- Provide a mechanized central office facility (COF) data base of:

  Line equipment

  Telephone numbers

  Auxiliary relays

  Miscellaneous COF equipment

  Load balance history.

- Provide assignment controls:

  Parameters

  Tables

  Preferences

  Restrictions

  Notifiers

  Reports.

- Provide real-time assignment of COF for customer service orders.

The network administrator will access the system through cathode display terminals, automatic send and receive TTYs, and the system support group.

4.13 BISCUS/FACS uses central office work orders (CW0s) to establish and maintain COF as follows:

- ***Inventory Update:*** All activities initiated by the network administrator that affect line equipment, telephone numbers, or other inventoried items will be updated in the BISCUS/FACS data base by a CW0.

- ***Control Parameters:*** These consist of numerical fill levels expressed as a percentage of equipped line equipment, and other COF which the network administrator wishes to

have working. They also consist of CCS values for specific loading components expressed as a percentage of engineered capacity.

- ***Assignment Tables:*** These are required for estimated CCS values for each traffic class of service by traffic unit. They are used to develop current estimated usage as an assignment criteria.

- ***Preferences:*** These provide the network administrator with the ability to prefer a specified level in the assignment hierarchy by class of service, service feature, and originating traffic areas.

- ***Restrictions:*** There are three types of restrictions:

  (1) Where service order assignment is completely prohibited.

  (2) Where service order assignment is prohibited for specific line modifiers or service features.

  (3) Where service order assignment is prohibited for a specific class of service.

4.14 BISCUS/FACS uses facility work orders (FW0s) to change an assigned facility either while a service order is pending or after a customer has service. The network administrator may, for example, use an FW0 where, by design, a complex service order is to be manually assigned.

4.15 The network administrator can obtain a number of reports from BISCUS/FACS such as the following:

- ***Traffic Statistics Report:*** This is a summarization of statistics for network originating and terminating equipment. It is used in the overall administration of a switching machine.

- ***Load Balance Analysis Report:*** This provides both detailed and summary scores for a 5-week period for each load unit in a switching machine. It is used to analyze balance conditions.

- ***Service Observing Loop Assignment Report:*** This provides a printout of service observing loop assignments required for dial line observations so as to connect assigned line equipment to the proper class of service observing loops.

- ***Input Accuracy Report:*** This provides a summary of input error statistics for input terminals, departmental work locations, districts or divisions, and the system administrator. It is used to identify problem areas requiring corrective action.

- ***Held and Unassigned Order List:*** Provides a list of all facility requests which are held or unassignable because of a shortage of central office and/or outside plant facilities.

5. REFERENCES

5.01 The following documents can be referenced for more detailed information concerning main frames and mechanized assignments.

(a) Main Frame Descriptions:

- Bell System Practices Section 201-220-101, Conventional Distributing Frames Description.

- Bell System Practices Section 201-221-101, ESS-Type Modular Distributing Frames Description.

- Bell System Practices Section 201-222-101, Common Systems Main Interconnecting Frame (COSMIC) Description.

(b) Manual Assignments:

- Bell System Practices Section 680-830-010, Short Jumper Assignment.

- Bell System Practices Section 680-535-009, Short Jumper Assignment for Modular Main Distributing Frames No. 1 ESS.

- Bell System Practices Section 680-830-012, COSMIC Frame Manual Assignment Procedures.

(c) Mechanized Assignment Systems:

- GL 73-08-109, BISCUS/FACS Preliminary Planning

- GL 74-11-036/EL-3237/PL-2872, Topical Index Code 1Z5.3 dated November 8, 1974, Simplified Modular Frame Assignment System (SMFAS)

  GL 76-04-031/EL-3237/PL-2872, Topical Index Code 1Z5.3 dated April 5, 1976, Simplified Modular Frame Assignment System for ESS (SMFAS/ESS)

  GL 76-07-062/EL-4401, Topical Index code 1Z5.3, Computer System for Main Frame Operations (COSMOS) dated July 9, 1976

  GL 76-07-059, Topical Index Code 1Z5.3, Operations Support Systems—Computer System for Main Frame Operations (COSMOS) Enhancements for Version 5.0

- Dial Facilities Management Practices, Division D, Section 7a, Computer System for Main Frame Operations (COSMOS), System Description.

6. GLOSSARY OF TERMS

6.01 Certain terms and acronyms used in this section may not be familiar to the reader. Terms and acronyms are defined in the listing which follows.

ABBREVIATION	TITLE
A & M	Additions and Modifications
ASGM	Assignment
AW	Advance Wiring
BISCUS/FACS	Business Information System Customer Service/Facility Assignment and Control System
CCS	Hundred call seconds, a unit of measure in determining loading on a switching machine. One call which lasts 100 seconds equals one CCS.
CGO	Control Group Zero
COF	Central Office Facilities
COSMIC Frame	Common Systems Main Interconnecting Frame
COSMOS	Computer Systems for Main Frame Operations
CWO	Central Office Work Order
DIP	Dedicated Inside Plant, a left in jumper when a customer line has been disconnected, in the hope that it can be reused.
ESS	Electronic Switching System
Express Trough	Channels at the top and bottom of modular frames that are used for running long jumper wires when connections are not available in the local zone.
FWO	Facility Work Order
Home Zone	The zone in which the cable pair to be connected is located.
IDF	Intermediate Distributing Frame, the IDF provides for cross connection of trunks and trunk auxiliaries to the MDF via tie cables.
LEN	Line Equipment Number
LET	Line Equipment Transfer
LJ	Long Jumper
LPCDF	Low Profile Conventional Distributing Frame
MDF	Main Distributing Frame, the point of interface between the outside plant and the central office.
MG0 or MG1	Marker Group Zero or Marker Group One
OTC	Operating Telephone Company
PACE	Program for Assigning Cables and Equipment
PBX	Private Branch Exchange
POTS	Plan Old Telephone Service

Preferential Assignment	A procedure for assigning line equipment to cable pairs that will result in the utilization of a maximum number of short jumpers.
SMFAS	Simplified Modular Frame Assignment System
SXS	Step-by-Step
TTY	Teletypewriter
USO	Universal Service Order
USOC	Universal Service Order Code
1 ESS	No. 1 Electronic Switching System
1XB	No. 1 Crossbar
5XB	No. 5 Crossbar

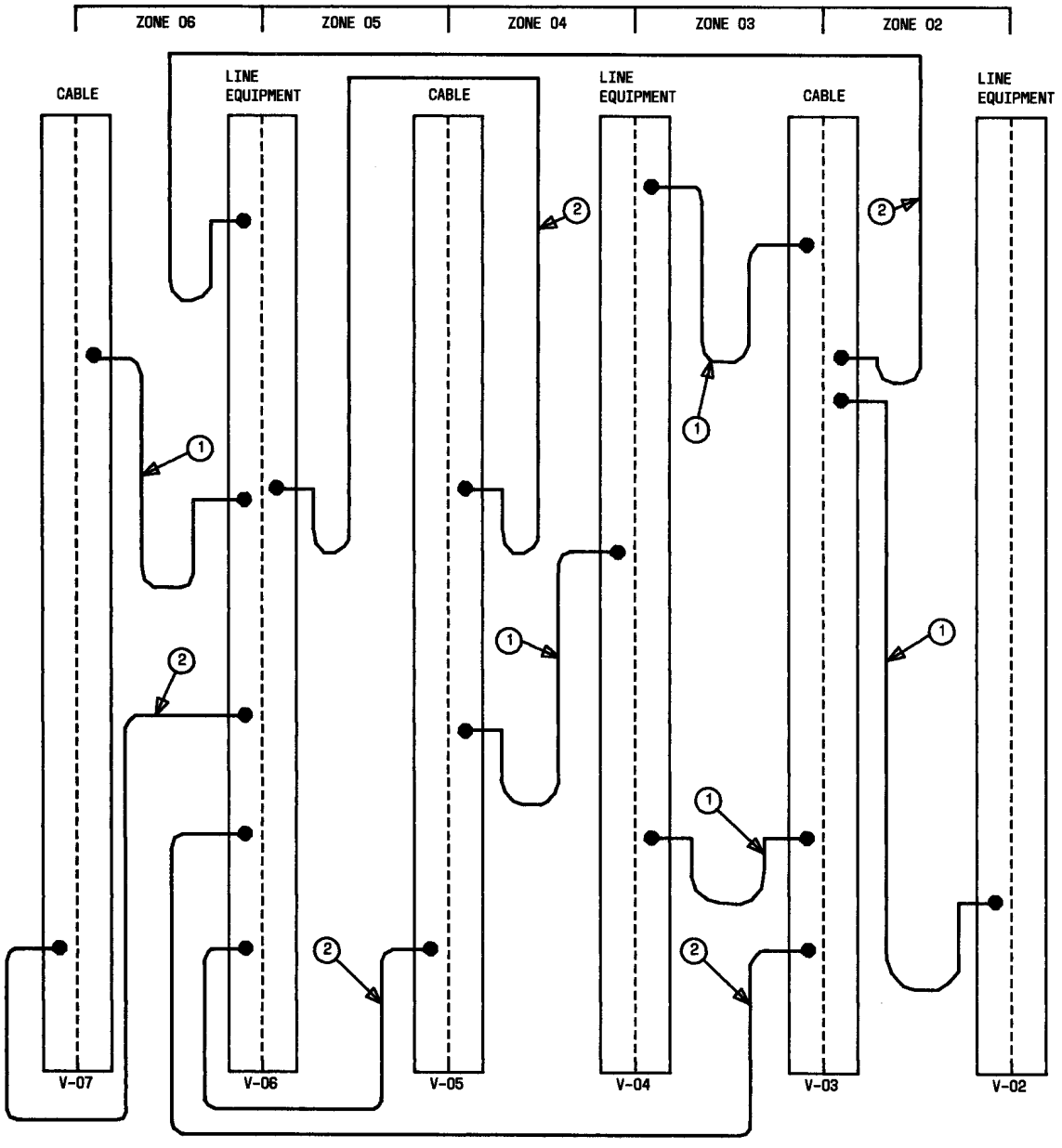
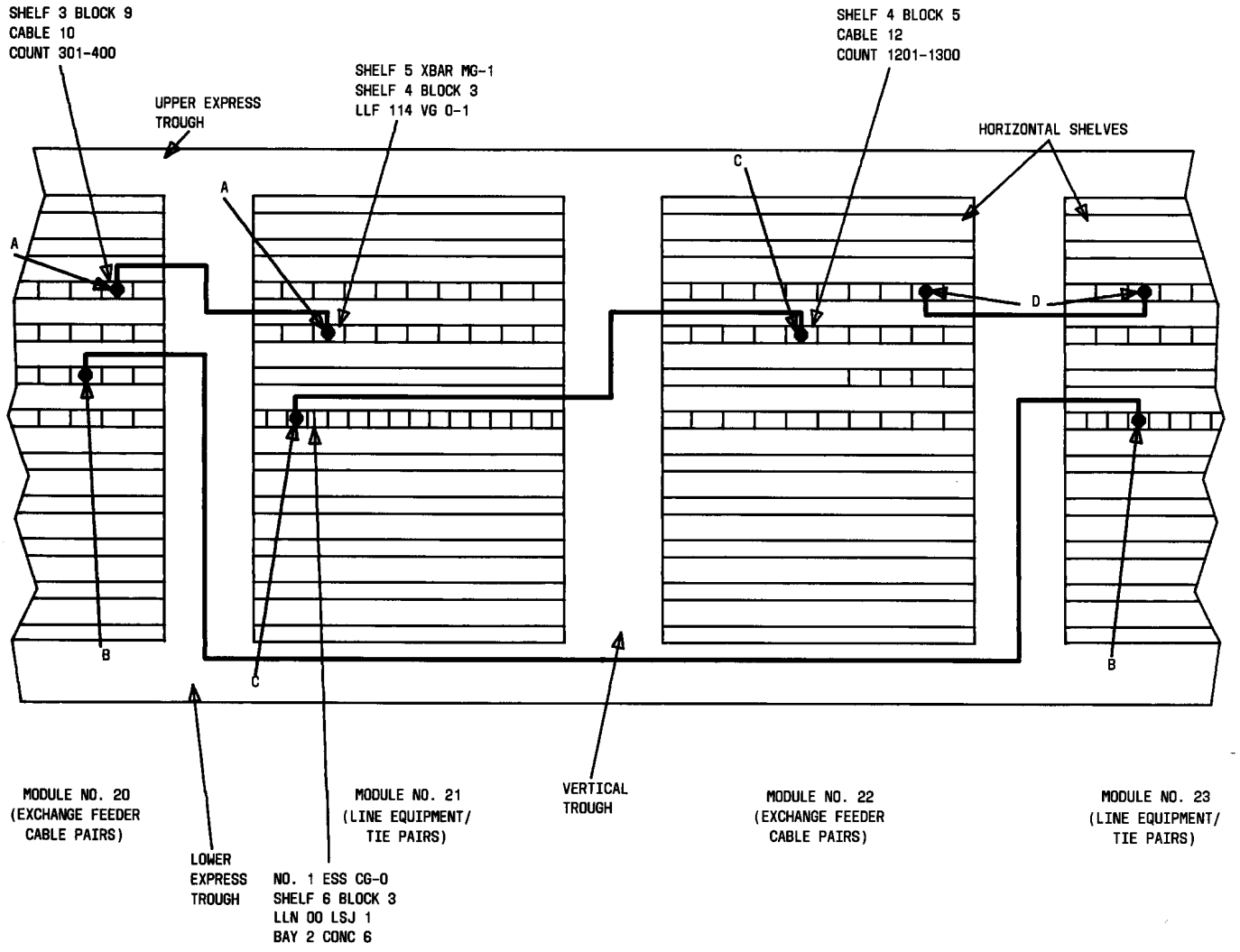


Fig. 1—Cross Connections on an ESS Modular Main Distributing Frame (1.13)



SEGMENT OF COSMIC MDF LINEUP

NOTES: A, C, AND D ARE SHORT JUMPERS (DO NOT ENTER EITHER EXPRESS TROUGH),
B IS A LONG JUMBER (UTILIZES AN EXPRESS TROUGH).

Fig. 2—Cross Connections on a COSMIC Frame (1.16)

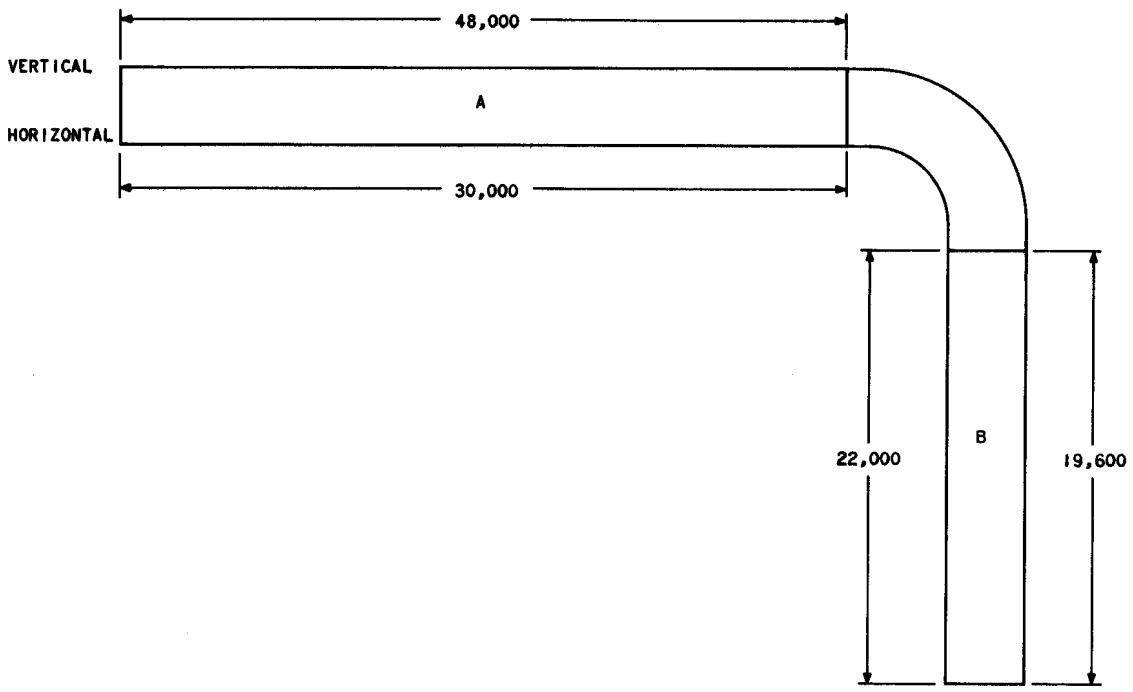


Fig. 3—L-Shaped Frame With Two Zones (2.05, 2.27)

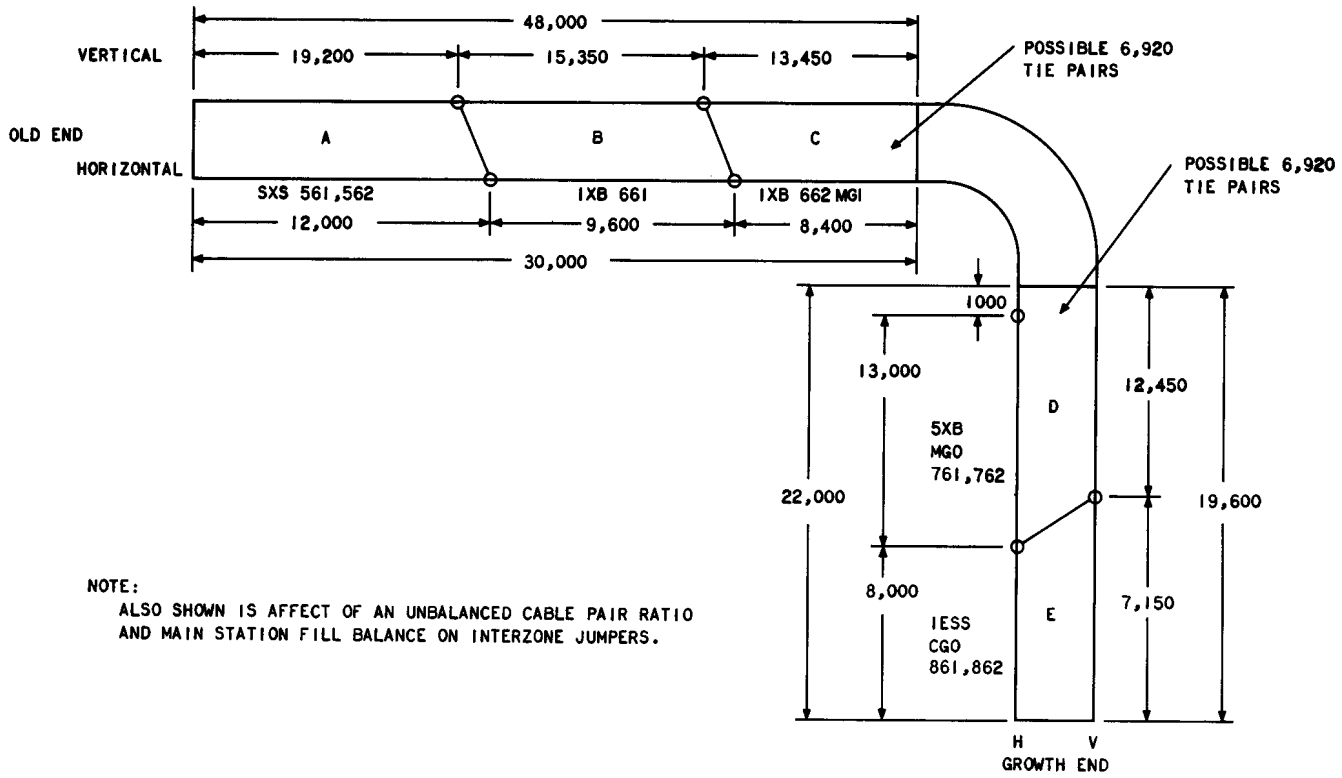
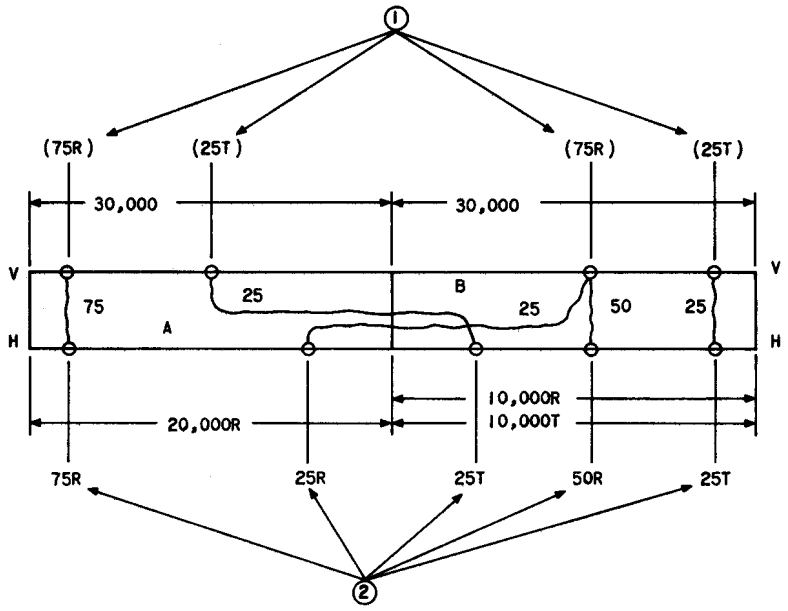


Fig. 4—L-Shaped Frame With Five Zones (2.15, 2.28)



NOTES:

① ROTARY (R) AND TOUCH-TONE (T) SERVICE ORDER REQUESTS ( )

② LOCATION ON FRAME OF SERVICE PROVIDED

Fig. 5—Interzone Jumpers Caused by Class-of-Service Unbalance (2.17)

FORM E-6132

SHORT JUMPER ASSIGNMENT
ZONE MAKEUP

4-72

OFFICE Essex DATE 9-1-74 ZONE A PREPARED BY C. Loy

CABLE LOCATION FROM V 1 TO V 15				LINE EQUIPMENT FROM SHELF AND V C-5 TO G-27		TELEPHONE NUMBER FROM SHELF AND V ___ TO ___	
FROM		TO		FROM	TO	FROM	TO
CABLE	PAIR	CABLE	PAIR				
20	1		900	LG1	LG50		
28	1		900				
30	1		900				
32	1		1500				
21	1		900				
26	1		900				
34	1		1500				
36	1		1200				
38	1		600				
44	1		900				
47	1		300				
48	1		600				
53	1		600				

TOTAL PAIRS 12,700 TOTAL LINES 10,000 TOTAL TEL. NO ___

Fig. 6—Selected Central Office Facilities (2.19)

E-6133
4-72

SHORT JUMPER ASSIGNMENT CONTROL

OFFICE ESSEX PREPARED BY J. THOMPSON

DATE MAY 71	HOME ZONE	1ST ALTERNATE	2ND ALTERNATE	ALL OTHER ZONES	REMARKS
5/3	42	5	2	2	
5/4	45	1	5	3	
5/5	50	3	2	2	
5/6	44	2	1	1	
5/7	60	5	5	2	
5/10	45	3	2	7	
5/11	70	8	2	2	
5/12	60	4	2	4	
5/13	50	3	3	2	
5/14	55	2	2	1	
5/17	52	3	1	1	
5/18	47	4	3	2	
5/19	70	1	4	2	
5/20	10	20	10	5	PLT ASGNMT WAITING
5/21	15	10	15	6	FOR NEW LINE
					ASSIGNMENTS,
5/24	10	20	10	10	ZONES A1, A2
5/25	70	5	5	2	
5/26	60	5	2	1	
5/27	50	2	1	—	
5/28	60	3	—	—	
5/31	70	3	1	1	
TOTAL	1035	112	78	56	

• TOTAL ORDERS QUALIFIED FOR SHORT JUMPER ASSIGNMENT 1281

• PERCENT ASSIGNED

- HOME ZONE 81 %
- 1ST ALTERNATE-CHOICE ZONE 9 %
- 2ND ALTERNATE-CHOICE ZONE 6 %
- ALL OTHER ZONES 4 %

$$1281 \overline{)1035} \quad 81$$

1035
112
78
56
1281

Fig. 7—List of Line Equipment Available for Assignment (2.21, 2.35, 2.39)

LIST OF LINE EQUIPMENT–AVAILABLE FOR ASSIGNMENT

WIRE CENTER _____ LIST NUMBER: _____

ENTITY TYPE _____

ENTITY NUMBER _____ DATE : _____

NNX(S) _____ BY : _____

CLASS OF SERVICE _____ TELEPHONE : _____

MDF LOCATION		LINE EQUIPMENT				LINE EQUIPMENT FEATURES				SERVICE ORDER NUMBER	ASSIGNED TELEPHONE NUMBER	DUE DATE	LONG JPR
ZONE	VERT	LLN	LSF BAY CON VG	SW	LVL	DP OR TT	ESL	SLV	GRD START				
VERT	SIDE	LLF LFG CH	BNK QC	HG LVL COL	VF TER SW V								
MOD	SHLF												

Fig. 8—Short Jumper Assignment Results (2.25)

BSP 680-500-014

Form E-6548
(9-75)

CENTRAL OFFICE EQUIPMENT ASSIGNMENTS

ADVANCE WIRING LIST

Central Office 32X List No. 101 Class Ser. IFR By DOT Date 6-24-75

Recd. CO Date 6-25-75 Recd. Asgm. Date 6-26-75 (MDF Zone)

Tel. No.	Line Eqpt.
324-2862	AW 126-74
324-3105	AW 164-56
	AW
	AW
	AW
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	AW
	AW
	AW
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	AW
	AW
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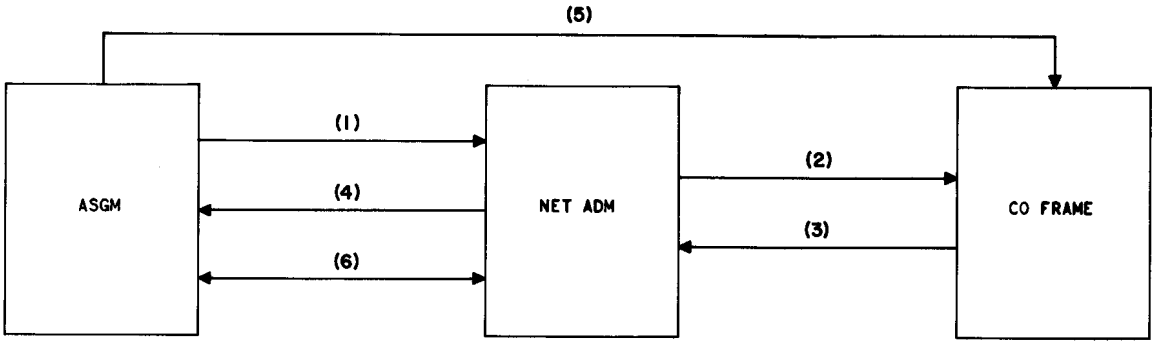
	AW

Discrepancies Found

Fig. 9—Pressure Sensitive Labels for Advance Wiring Assignment (3.02)



STEP PROCEDURE:

(1) ASSIGNMENT REQUESTS AW LISTS FROM NETWORK ADMINISTRATOR.

(2) NETWORK ADMINISTRATOR SENDS A PHOTOCOPY LIST OF AWS TO THE FRAME.

(3) FRAME VERIFIES VACANCY, CLEARS OR NOTES DISCREPANCIES, AND NOTIFIES THE NETWORK ADMINISTRATOR.

(4) NETWORK ADMINISTRATOR PURIFIES THE AW LIST AND FORWARDS TO THE ASSIGNMENT OFFICE.

(5) ASSIGNMENT SENDS SERVICE ORDERS WITH AW EQUIPMENT TO FRAME.

(6) ASSIGNMENT OFFICE AND NETWORK ADMINISTRATOR ARE RESPONSIBLE FOR CLEARING REMAINING DISCREPANCIES.

Fig. 10—Flowchart for Advance Wiring List (3.02)

BSP 680-500-014

Form E-6549
(9-75)

CENTRAL OFFICE EQUIPMENT ASSIGNMENTS
for
TELEPHONE NUMBERS or LINE EQUIPMENT

Central Office 32X List No. 1001 Class Ser. IFR By DOT Date 6-24-75

Recd. CO 6-25-75 Recd. Asgm. Date 6-26-75 (MDF Zone)

322-4905	322-9060
322-7025	327-4878
	327-5191

Discrepancies Found

Fig. 11—Pressure Sensitive Labels for Non-Advance Wiring Assignment (3.15)