BLOCK RELAY FRAME AND LINE DISTRIBUTING FRAME

CROSS-CONNECTIONS

NO. 1 CROSSBAR OFFICES

1. GENERAL

1.01 This section describes the block relay frame and line distributing frame cross-connections necessitated by the addition of new lines or by changes in the treatment or routing of calls to existing lines.

1.02 This section is reissued to add the following cross-connection features:

(a) Calling line identification for selected customers lines.

(b) Automatic intercept center (AIC) operation without line link pulsing (LLP).

1.03 *Supplementary Information:* Information concerning cross-connections is also covered in Bell System Practices as follows:

(a) Section 216-705-301 covering the method of cross-connecting subscriber line overflow registers (cross-connection type)

(b) Sections 069-120-801 and 069-140-811 covering general information regarding running of cross-connections and soldering respectively

(c) Sections 069-132-811 and 069-133-801 covering detailed requirements for making and removing wrapped connections on punched-type or wire-type terminals not having notches or perforations and general information for solderless wrapped straps and cross-connections, respectively

(d) Section 216-719-801 covering general information regarding the running of jumpers on line distributing and block relay frames

(e) Section 216-200-301 covering methods of denying and restoring service on customer lines.

2. DESCRIPTION

Block Relay Frame

2.01 *General:* A block relay frame provides the cross-connection facilities for 800-subscriber lines. The frame design provides for a maximum of four number groups per frame and for 100, 200, etc, to 800 numbers per group. If the number group extends over more than one block relay frame, interframe wiring or cabling extends the number group circuit to as many block relay frames as required. The size of a number group may vary, depending on the amount of terminating traffic delivered to the numbers, the minimum number being 100 numbers and enlarged by increments of 100, the maximum number being 2500. A number group is treated as a unit by the terminating marker and is associated with a lockout circuit so that only one terminating marker may work into one number group at a time.

2.02 The block relay frame provides two cross-connection fields (NF and NC) wherein leads associated with each telephone number are cross-connected to return pertinent information to the terminating marker. The arrangement of the NF field may vary from job to job depending upon local conditions and the description covered herein is based on a sample arrangement shown in Fig. 1 and 2.

2.03 *NF Punchings:* There are 800 NF punchings on each block relay frame. These punchings originate at the contacts of 40 twenty block relays and are numbered to agree with the numbering of the associated twenty block relays. The NF punchings appear on two terminal strips, one located at the top of the bay of terminal strips and the other located at the center of the bay just below the RF terminal strip. The units designation appears at the left of the punchings and the tens designation appears above or below the punching dependent upon whether the NF terminal strip is · the upper or lower terminal strip, respectively. The

punchings associated with numbers having units of 0 through 4 appear in the lower terminal strip whereas those having units of 5 to 9 appear in the upper terminal strip. Therefore, if a directory number is 0154, the NF punching appears in the lower terminal strip.

2.04 *HF Punchings:* These punchings identify the line choice and indicate that the line is in a hunting group. The punchings are numbered 0 through 19 vertically for a maximum office and where there are 10 or less line choices, these terminals have duplicate appearances. If 200 or more numbers are in a group, two or more sections of the HF terminal strip are strapped horizontally, thereby permitting most of the jumpers to be run vertically.

2.05 *TF Punchings:* These punchings identify the line choice and indicate that ringing shall be applied to the tip side of the line. The punchings are arranged in the same manner as the HF punchings as described in 2.04 except if XF punchings are used, the TF 10 through 19 are beside the TF 0 through 9 rather than above. The XF punchings in this case appear directly above the TF punchings. Where there are 10 line choices, the TF punchings are multipled straight across.

2.06 *XF Punchings:* These punchings, if provided, identify the line choice and are used for number checking special groups. The XF field is similar to the TF field and is multipled in the same manner.

2.07 *RF Punchings:* These punchings identify the line choice and indicate that ringing shall be applied to the ring side of the line. The RF terminal strip is similar to the HF terminal strip described in 2.04.

2.08 *OPR Punching:* This punching is used in offices arranged for machine intercept to route disconnected lines to operator. In order that these cross-connections may be run vertically, the OPR lead is multipled to two horizontal strips at the top of the HF and RF fields, respectively.

2.09 *NC Punchings:* There are 800 NC punchings on each block relay frame and are similar to the NF punchings described in 2.03. These punchings which originate at the contacts of 40 twenty block relays appear on terminal strips located in two sections, the one located immediately

above the HG terminal strip and one located below. The punchings are numbered in the same manner as the NF punchings described in 2.03.

2.10 *HG Punchings:* These terminal strips are the same as the HF strips except that there are 40 vertical punchings rather than 20. The designation 0 through 9 indicates the horizontal group of switches of the line link frame and the letters A through D indicate the frame in the choice. Therefore, cross-connection of an NC terminal to HGB9 serves to inform the marker that the called line is located in horizontal group 9 of line link frame B of the line choice. Where there are more than 100 numbers in a number group the sections of HG terminal strips are strapped horizontally in the same manner as the HF terminal strip described in 2.04.

2.11 *JF Punchings:* The JF punchings are used in connection with jump hunting as shown in Fig. 3. The JF terminals are numbered 0 to 4 vertically. Where there are only 1 or 2 number groups represented on the frame, the terminal strips are multipled to provide a greater number of cross-connecting terminals.

2.12 *JC Punchings:* The JC punchings are also used for jump hunting and are located at the right-hand side of both HG terminal strips. There are 40 JC punchings available. The terminals are numbered 0 through 18 vertically in steps of 2, allowing for 4 number groups. Where there are 1 or 2 number groups represented on the frame, the terminal strips are multipled to provide a greater number of cross-connecting terminals.

2.13 *ALF and ANF Punchings—AUX Terminal Strip:* The ALF and ANF punchings are located on the AUX terminal strip at the block relay frame. The AUX terminal strip is located at the extreme right of the NF terminal strip. The ALF and ANF punchings may be wired to the subscriber line overflow circuit of the cross-connection type.

2.14 *OFT Punchings:* These punchings appear on the upper and lower NF terminal strip at the right-hand side. On the upper terminal strip, the punchings appear in the lower row; in the lower terminal strip the punchings appear in the upper row. The OFT punchings are used in connection with terminals arranged for testing incoming overflow tone and for reorder signal.

2.15 *PT, PN, TN, PTN, PN1, TN1, PTN1 Punchings:* These punchings which are used with the physical-theoretical office arrangement appear on later type frames and are located on the NF terminal strip at the extreme right-hand side. The PT punchings are located in the lower row. The other punchings appear in the vertical rows. The numbers at the left indicate the number group. The PT punchings of each group of punchings are strapped, as for example those restricted to physical numbers. In this case, the first PT punching is strapped to the PN punching and the last PT punching is strapped to the PN1 punching. Likewise for punchings restricted to theoretical numbers, the first and last PT punchings are strapped to TN and TN1 punchings, respectively. For those restricted to nondiscriminating numbers, the first and last PT punchings are strapped to PTN and PTN1 punchings, respectively.

2.16 *HB and CN Punchings:* The HB punchings appear in a terminal block as shown in Fig. 4. The HB0-HB24 (hundred block leads) terminate at the multicontact relay terminal strip on a number group frame and are cross-connected to the terminal block at the top of the block relay frame. The terminal block has provision for terminating 25 HB leads each from a maximum of 4 number groups per block relay frame. Where the CN punchings are provided on the block relay frame, they appear in the upper row of the same terminal block as the HB punchings. The CN punchings are wired when the 100 block serves coin lines.

2.17 *TB and SH Punchings:* The TB and SH punchings appear on terminal blocks as shown in Fig. 5. The terminal blocks have six rows of punchings. The first four rows are designated SHA, SH, TBA, and TB. The last row is designated XSH. The hundred block relay served is designated at the left as HB0, HB1, etc. The TB leads 0 through 4 terminate at the multicontact relay terminal strip on the number group frame and are cross-connected to the TB 0 through 4 punchings. These punchings are multipled to other HB relays in the same number group. The associated TBA punchings are electrically the same point as the TB punchings and are used for completing the loop wiring from the first HB relay to the last HB relay. The windings of the TB0-TB4 relays are wired to the SHA terminals. The associated SH terminals extend to the contacts of the (HB) relay. On the earlier type frames, the TB and SH punchings appear on terminal blocks designated TB and SH, respectively, and are located at the top of the block relay frame.

2.18 *NFA, HFA and RFA Punchings:* The NFA, HFA and RFA punchings are located on the right side of the upper and lower NF terminal strips. They are used when it is desired to allow a customer to control the number of incoming PBX trunks by operating a key at the customers premises. With this arrangement, the NF punching of the intermediate trunk is wired to NFA punching, HFA punching is wired to HF punching and RFA punching is wired to RF punching.

2.19 *LLPHG, ESSHG Punchings:* The LLPHG and ESSHG punchings are located adjacent to the HG punchings, as shown in Fig. 2a and 6. They are used, if provided, to inform the marker of the location of the LLP line circuit or 101 ESS trunk in the line choice. The LLPHG and ESSHG punchings are isolated from the HG punchings mentioned in 2.10 by a diode arrangement, but they have the same numerical significance. For example, cross-connection of an NC terminal to LLPHG A7 serves to inform the marker that the LLP line circuit is located in horizontal group 7 of line link frame A of the line choice.

2.20 ◗*CLI NC, CLI, LI, LI NG Punchings:* These punchings are located at the right of the upper NC terminal strips as shown in Fig. 2a. They are used to mark the CLI lead to the terminating marker when selected customer lines are to be provided with calling line identification. The CLI punchings are isolated from like numbered CLI NC and LI punchings by a diode arrangement as shown in Fig. 6a.

2.21 *NCI, NFI, RFI, HGI, OFI Punchings:* These punchings are used to provide automatic intercept service without line link pulsing (AIS W/O LLP) and are located as follows: NCI—at the right of the upper and lower NC terminal strips; NFI—in the upper and lower AUX terminal strips of the block relay frames with AIS address. RFI—in the X (RF) terminal strip; HGI—in the X (HG) terminal strip; and OFI—in the MISC part of the lower NF terminal strip of the first block relay frame associated with the number group connector for AIS.◖

Line Distributing Frame

2.22 The line distributing frame (LDF) provides a means of cross-connecting sleeve and message register leads between subscriber line terminal strips which are cabled to the line link frames and subscriber number terminal strips to the block relay frame and message register rack. Groups of 800 circuits terminate on each four verticals of line distributing frame. The punchings on these strips are numbered from the bottom up. The upper portion of the frame has eight rows of horizontal terminal strips which, when all lines are individual, are wired to 800 subscriber lines. The numbering of these strips corresponds with the numbering of the line link columns. The punchings are numbered to correspond with the numbering of the hold magnet in the line link column. Terminal strips associated with extra numbered circuits are located at the end of the frame.

2.23 In offices equipped for AMA, messages registers are omitted and the LDF is limited to single-wire cross-connections between line sleeves and number sleeves. Likewise, in offices arranged for conversion to AMA, the message register jumpers are placed on a separate frame so as to facilitate their removal at the time of conversion and leave only the sleeve jumpers on the LDF. In these cases, the line and number sleeves are terminated two or more circuits deep on the terminal strips.

2.24 In AMA offices and in offices arranged for conversion to AMA, the LDF may be located at the MDF (usually limited to the office or pair of offices having block relay frames on the same floor with the MDF). In order that the LDF equipment will occupy the minimum number of MDF verticals, the number sleeves are terminated five circuits deep and the line sleeves three or five circuits deep on the vertical and horizontal terminal strips.

2.25 *Message Register Terminal Strip:* Where separate terminal strips are provided for message registers, they are located on the horizontal portions of the frame beyond the subscriber line terminal strips.

2.26 *Extra Number Terminal Strips:* These strips are located at the end of the line distributing frame.

2.27 *Miscellaneous Circuit Connections:* A number of miscellaneous circuits are wired to ALS and ANS punchings. These terminal strips are located in the horizontal portion of the frame beyond the individual subscriber line punchings. The ALS and ANS punchings are provided in pairs except for 10-party punchings. The circuits are numbered from 0 up except for 8- or 10-party punchings in which case the ANS punchings are numbered 1 through 10 but on earlier jobs were numbered 0 through 9, and are located on three rows. The punching in the rear of the third row is the ALS punching.

2.28 *LLP or ESS Line Circuits:* When LLP or ESS line circuits are provided, the LS1, NS1, and BLS punchings for LLP lines and the ANS, ALS punchings for ESS lines are located on the horizontal portion of the line distributing frame.

2.29 ▶*AIS W/O LLP:* When automatic intercept service without line link pulsing is provided, the LSI and NSI punchings required for this feature are located in the upper horizontal section of the LDF.◀

3. CROSS-CONNECTIONS

General

3.01 The service order gives the data required where lines are to be added or where changes are to be made. Table A summarizes the assignment information given on a service order for an individual line. The information in Table A is limited to the central office information and in addition to the cable pair. The assignments given in Table A comprise:

(1) The cable pair

(2) The telephone number

(3) The designation of the line choice (LCH), frame (Fr), column (Col), switch (Sw), and vertical (V) as for example 7A-60-93 in which the 7 indicates the line choice, the A indicates the frame within the line choice, the 60 indicates the column, the 9 indicates the switch (horizontal group), and the 3 indicates the vertical.

3.02 References are made below to various terminal strips, the location and description of which are covered in Part 2. Where message

rate lines are provided, the message registers may be cabled directly to the subscriber number terminal strip or to separate terminal strips and cross-connected to the subscriber line terminal strip.

3.03 In running cross-connections at the block relay frame, run only one wire to any one punching. Where there are 10 or less line choices and the punchings are multipled to take care of this condition, always run the shortest vertical lead. However, if no punching is available in a vertical row, the lead should be run criss-cross to the nearest available punching in an adjacent or nearby row in the same number group. The tips of the four adjacent pins are painted red and a red (black on earlier installations) line is stamped on the fanning strips at the break between number groups. Do not run leads criss-cross over this line.

3.04 Reference is made in the following paragraphs to subscriber lines. The cross-connection information is the same for trunks or line circuits that terminate on the line link frame.

Cross-Connections for Subscriber Lines (Other Than Terminal Hunting Groups)

3.05 *Individual Lines:* With data such as given in 3.01, it is possible to make the proper cross-connections at the line distributing frame and at the number group and block relay frames. For example, assume that telephone number 2245 is to be cut in and that the designation of the line circuit, in accordance with 3.01, is 2D-42-92. In accordance with the numbering of the terminal strips described in 2.03, the 2245 NF punching is located in the upper NF terminal strip. Since individual lines require ringing current to be supplied on the ring, cross-connect the NF punching to the RF punching determined by the line choice which in this case is line choice 2. This is done by running a lead vertically from NF punching 2245 to RF punching 2. To inform the marker that the line is located on switch 9 of frame D, run a lead vertically from NC punching 2245 located in the upper NC terminal strip to terminal punching 9 of section D of the HG terminal strip. In this case, no other connection need be made at the block relay frame. Cross-connect the S punching 2245 in the vertical line distributing frame to the 42-92 S punching in the horizontal section of line distributing frame. If the line requires a message register connection, also cross-connect the associated

M punching of this number. Where the message registers are cabled to a separate terminal strip, cross-connect to the punchings of this terminal strip. See Fig. 7 through 47, inclusive. For offices arranged for AMA, see Fig. 48 through 54, inclusive.

3.06 *Two-Party Line:* Cross-connections at the block relay frame are the same as described in 3.05 with the exception that for numbers which are to have ringing current on the tip, the associated NF punching should be connected to the TF punching determined by the line choice. At the line distributing frame, the connections at the vertical terminal strips should be the same as those described for the individual lines in 3.05. In the case of two-party message rate lines, cross-connect the M punching associated with the S punching at the vertical terminal strip to the M1 for ring on ring or to M2 for ring on tip (party 2) at the horizontal terminal strip. Also cross-connect the S punching at the vertical terminal strip associated with the ring party (party 1) to the S1 punching on the horizontal strip and the S terminal associated with the tip party to the S2 punching. The M punchings should be cross-connected to the ground terminal strip when the class of service requires it. See Fig. 7 through 47, inclusive. For offices arranged for AMA, see Fig. 48 through 54, inclusive.

3.07 *Four-Party Line:* Message rate service is not provided for four-party subscriber lines. The cross-connections are made in the same manner as described in 3.05 except at the horizontal terminal strip at the line distributing frame, the S1, S2, S3, and S4 terminals are strapped together. See Fig. 7 through 47, inclusive.

3.08 *Flat Rate Lines in Message Register Groups:*

(a) Where originating markers cancel message register test, omit M cross-connection to the G punching.

(b) Where a G punching is provided in addition to the S and M punchings on the VLDF terminal strip, the LDF cross-connections may be made as listed below:

(1) New flat rate lines in message register groups—at VLDF, connect S jumper to S punching and M jumper to G punching.

(2) Change flat rate line to message rate line—at VLDF, cut back M jumper from G punching to M punching (removing excess slack in jumper). If a strap connecting the G punching to the M punching had previously been used, remove strap.

(3) Change message rate to flat rate line—at VLDF, place a strap connecting the M punching to the G punching.

3.09 *8- or 10-Party Line:* The cross-connections are made in the same manner as described for individual lines in 3.05 with the following exceptions. All the numbers of one 8- or 10-party line appear in one number group and normally not more than two numbers of the 10-party line are assigned to the same twenty block. Cross-connect the M lead to ground unless the assigned line circuit is in a class of service that does not require this connection. Cross-connect the telephone number S punching in the line distributing frame (vertical block) to the proper punchings (ANS punchings) assigned to the 8- or 10-party line circuit. The ANS punchings are located in the horizontal portion of the line distributing frame beyond the individual subscriber lines and are now designated 1 through 10 but on earlier jobs were designated 0 through 9. Cross-connect the associated ALS punching to the specified S punching in the horizontal section of terminal strips which is wired to the required hold magnet of the line. See Fig. 6.

Terminal Hunting Cross-Connections

3.10 *Cross-Connection for PBX Lines:* The first and intermediate NF punchings are connected to the HF punchings determined by the line choice, and the last NF punching is cross-connected to the RF punching determined by the line choice. The NC punchings are cross-connected to the HG punching as described for individual lines in 3.05. Assume that the PBX has telephone numbers 2242, 3, 4, and 5, and that these numbers are assigned to line choice 6 in switch 9 of frame B, line choice 7 in switch 7 of frame A, line choice 8 in switch 5 of frame C, line choice 9 in switch 3 of frame D, respectively. The NF punchings associated with 2242, 3, and 4 (intermediate NF punchings) would be cross-connected by leads run vertically to the HF punchings determined by the line choice, namely to HF 6, 7, and 8, respectively. The last NF punching namely 2245 would be run vertically to the RF punching 9. To allow the customer to

control the number of incoming lines to a PBX, the NF punching of the intermediate line (which is to become the last trunk in the hunt group) is connected to an NFA- punching. The HFA- punching is connected to the HF terminal associated with the line to be last. The RFA- punching is cross-connected to the RF punching determined by line choice. To inform the marker of the location of the PBX lines in various line choices mentioned previously, leads would be run vertically from the NC punchings 2242, 3, 4, and 5 located in the NC terminal strip to the punchings in the HG terminal strip associated with the line choice, namely HGB9, HGA7, HGC5, and HGD3, respectively. At the line distributing frame, the S and M terminals associated with the particular telephone numbers (vertical block) would be cross-connected to the required S and M punchings in the horizontal line distributing frame in the same manner as described for individual lines in 3.05.

3.11 *One-Way Outgoing PBX Trunks:*

(a) When office is equipped for ANI:

(1) If assigned number is a regular number, place sleeve and message register cross-connections.

(2) If assigned number is an extra number, place sleeve, message register and block relay frame cross-connections.

(3) If assigned number is neither a regular nor an extra number, connect sleeve of the CSV to the sleeve of the miscellaneous number network and the M lead of the CSV to the message register block.

(b) When office is not equipped for ANI:

(1) If assigned number is a regular number, place message register cross-connection.

(2) If assigned number is an extra number, place sleeve, message register and block relay frame cross-connections.

(3) If assigned number is neither a regular nor an extra number, connect M lead of the CSV to the message register block.

3.12 *Two-Way Combination PBX Trunks:* On PBX lines (such a 9th level combination

trunks), all line distributing and block relay frame cross-connections must be placed as in 3.10. In addition, the tip strap at the line hold magnet must be cut where the ring side of the line is grounded from the PBX.

3.13 When disconnecting one-way or two-way PBX trunks per 3.11 and 3.12, where the ring side of the line is grounded from the PBX, the tip strap at the line hold magnet must be replaced.

3.14 *Adding Lines in a PBX in Which the Following Number is Available:* The cross-connections made when adding a line to a PBX are similar to those for an individual line described in 3.05 with the exceptions noted in the following sentences. Under this condition, it is assumed that the following number in the 20 block is available. To add number 2246 to the PBX as outlined in 3.10, where the last number was 2245, remove the lead from RF9 and run this lead to HF9. Then make the necessary cross-connections to add directory number 2246 in the same manner as for adding an individual line covered in 3.05. If 2247 is also to be added, then the NF2246 is run to the assigned HF punching and NF 2247 to the RF punching. Hunting cannot be done beyond 2299 in this type of connection.

3.15 *Allotted Terminal Hunting Lines:* When a PBX is allotted between two number groups, the connections are made as described in 3.10. The last NF punching in each number group is cross-connected to the RF punching determined by the line choice. Marker cross-connections should also be made.

3.16 *Adding Lines When PBX Numbers Require Jump Hunting:* Where it is required to add more lines to a PBX and telephone numbers are not available in consecutive series due to the next number already being assigned, or where a group is to be established and there are not enough consecutive numbers available in the group, jump hunting is employed to jump the progress to another relay. For example, assume the telephone numbers of a PBX extend from 2220 through 2232 and number 2233 is not available and it is desired to add four lines. In this case, the first and intermediate NF punchings (2220 through 2231) are cross-connected to the HF punchings of the line choices as described in 3.10. Disconnect the lead which extends from the NF 2232 to the RF punching

and connect this lead to the assigned JF punching of the same number group. This indicates which of the 20 blocks in the hundred block designated for jump hunting is to contain the added numbers. Where the jump hunting hundred block is in the extra numbered series, these numbers are located at the end of the line of the block relay frames. The NC punchings 2220 through 2231 are connected to HG punchings as described in 3.05 for direct lines. Disconnect the lead which extends from NC2232 to the HG punching and connect this lead to the specified JC punching. The JC punching indicates which of the terminals in the 20 block designated by the JF lead is to be the first of the added numbers. Assuming therefore that the added extra numbers are 0322, 0323, 0324, 0325, and 0326, the lead associated with NF 2232 would be connected to JF1 of the same number group. The NC punching 2232 would be connected to punching JC2. The NC punchings for the added lines would be cross-connected to the HG punchings as described in 3.05 for individual line connections. The NF punchings for the first 4 added lines would be cross-connected to the HF punchings as described in 3.14 and the last NF punching (0326) cross-connected to the RF punching of the line choice. At the line distributing frame, it would be necessary to make the cross-connections as described in 3.05 for the individual subscriber lines. The sleeve of the last line of the first terminal hunting group, (2232) should be left disconnected at the line distributing frame since the last line of the original group (2232) can no longer be used for a PBX trunk. The hundred block assigned for jump hunting in any group is reached over the HB 24 lead on the marker. Where it is required to jump hunt to a hundred block in the regular numbered series, cross-connect the HB 24 lead at the HB terminal block to the punching to which the required HB relay is wired. If this is done, all cross-connections for the NF and NC punchings associated with the added numbers should be made at the block relay frame in which the added hundred block relay appears.

> *Note:* If the extra numbered lines are not provided with message registers, cross-connect the S and M punchings of the extra numbered lines at the horizontal line distributing frame to the vertical S and M punchings of the assigned nonworking lines.

3.17 *PBX Lines to Customers Equipped for LLP-DID:* The NF cross-connections are

placed as described for PBX lines in 3.10. The NC cross-connections are cross-connected to the LLPHG punchings in accordance with the service order assignment. Assuming an assignment such as 5C-44-87, the NF punching of the line should cross-connect to HF5 (for a first or intermediate line) and the NC punching should cross-connect to LLPHG8C. At the line distributing frame, the S terminal associated with the PBX line would be cross-connected to the NS1 punching of the line circuit, DID, and the corresponding LS1 punching of the line circuit, DID, would be cross-connected to the S punching at column 44, switch 8, vertical 7. If outgoing service is to be provided, a cross-connection is placed from the M punching of the PBX line to the M punching at column 44, switch 8, vertical 7.

3.18 Line Circuits to Automatic Intercept Center—AIS with LLP: The block relay cross-connection are placed as described in 3.17. At the line distributing frame, the S terminal of the PBX line would be cross-connected to the NS1 punching of the line circuit, AIS, and the corresponding LS1 punching of the line circuit, AIS, would be cross-connected to the S punching at the assigned column, switch, and vertical.

Miscellaneous Cross-Connections

3.19 ▶Line Circuits to Automatic Intercept Center—AIS W/O LLP: To provide automatic intercept service without line link pulsing, place cross-connections as shown in Table C and as follows. At the first block relay frame associated with the number group connector for AIS, cross-connect OFI punching to OFT punching. Cross-connect the RFI- punching of each line circuit to the required RF punching and the HGI- punching of each line circuit to the required HG punching as shown on Table D. These RF and HG punchings together with the LS punchings at the LDF are determined by the line link locations of the AIS line circuits to the automatic intercept center.

3.20 Lines to be Provided with Calling Line Identification: When calling line identification is to be provided, the existing NC cross-connection for the customer directory number is removed and cross-connections placed as shown in Fig. 6a. Cross-connect NC punching of customer directory number to one of the CLI (1-5) punchings. Cross-connect the associated CLI NC (1-5) punching to the HGA (0-9), HGB (0-9), HGC (0-9), or HGD

(0-9) punching as required for the line location. Cross-connect the associated LI (1-5) punching to the LI NG- punching corresponding to the number group in which the customers line is located.◀

3.21 Trunks to 101 ESS PBX Arranged for DID: The NF punchings are cross-connected to the RF punchings as determined by the line choice. The NC punchings are cross-connected to the ESSHG punchings in accordance with the service order assignment. Assuming an assignment such as 2B-19-67 and a line number such as 2345, cross-connect the NF punching to RF2 and cross-connect the NC punching to ESSHG 6B. At the line distributing frame, the ANS terminal of the PBX line would be cross-connected to the S punching of 2345. The corresponding ALS terminal of the PBX line would be cross-connected to the S punching at column 19, switch 6, vertical 7. If outgoing service were to be provided, a cross-connection would be placed from the M punching of 2345 to the M punching at column 19, switch 6, vertical 7.

3.22 Change in Service—Retaining Same Directory Number: Where a change in the class of service is required and it is necessary to change the location of the customer's line in the line choice or change the location to a different line choice, the cross-connections at the MDF is made to the proper column and switch. Corresponding changes are made as required at the block relay frame as follows:

(a) RF, HF, or TF punchings

(b) HGA, HGB, HGC, or HGD punchings (POT Lines)

(c) LLPHGA, LLPHGB, LLPHGC, or LLPHGD punchings when the directory number is associated with LLP line circuit.

(d) ESSHGA, ESSHGB, ESSHGC, or ESSHGD punchings when the directory number is associated with a DID trunk to a 101 ESS PBX.

3.23 Lines to be Added—Split Hundreds: Ordinarily the twenty blocks run consecutively within the hundred, that is numbers ending 0 through 19 are operated by lead TB0, 20, to 39 are operated by lead TB1, etc. If the twenty block relays are assigned out of regular sequence, the marker is arranged to operate a split hundreds

relay. In addition to the cross-connections made in the terminating marker, the cross-connections must be made at the SH terminal strip at the top of the block relay frame. On earlier type frames, the cross-connections are ordinarily made so that punching 00 (wired to contacts of the HB relay) is cross-connected to punching 10 (which is wired to the TB0 relay winding), punching 01 (wired to contacts of HB relay) is cross-connected to punching 11 (which is wired to the TB1 relay, etc). On later frames, the 0 punching of the SHA strip is cross-connected to the 0 punching of the SH strip, the 1 punching of the SHA and SH strip cross-connected, etc. Assuming the PBX telephone number is 2960 and it is desired to grow over 20 lines with number 2980 unavailable, remove the strap at the SH terminal block between the TB4 relay winding punching and the punching for the hund serving 2900 at the latter num this lead to the requi
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are the same as 3.2
are used as intercon.
the PBX telephone nu.
to grow over 20 lines w
an extra numbered 2
number group may be u.
to X0419. Remove the
on the HB terminal strip
cross-connect the SH4 to
(assume XSH0). At HB t

remove the strap on SHA0 punching and cross-connect SHA0 punching to same numbered XSH punching (XSH0). Cross-connect the SHA4 to another spare XSH punching (assume XSH1) at the 2900 HB terminal strip and at the X0400 terminal strip cross-connect the SH0 punching to the same numbered XSH punching (XSH1). Additional cross-connections must be made at the terminating marker. All the connections associated with the additional lines should be run in as described in 3.16.

3.25 *Extension of Terminal Hunting for Number Checking:* Where it is desired to extend the terminal hunting for number check calls, it is ary to cross-connect the NF punching 'ch the hunting is to be extended to ling. For example, assume that PBX bers 2201 through 2210 are terminating d that 2211 through 2215 are to be lating service group of numbers. ttending from NF punching 2210 g and connect this lead to the 'ine choice. Make the necessary · numbers 2211 through 2215 In this manner, the last as this manner, the last number vice hunting group appears t, on number checking due XG relay, the indication is on and hunting is continued le NC punchings and the listributing frame are ed in 3.05 for individual . The added numbers numbers in the inward he added numbers are rminal hunting group, twenty block as the the last NF punching onnected to the XF numbered terminals as outlined in 3.16 of the terminating inals of the same

iber Checking:
ohone numbers
_ _up or number
_ting service telephone
_ is required to provide number
_ng of the originating service lines, bridge
the numbered terminals of the originating service

group to terminals consecutive with the terminals of the terminating service group. Assume that PBX telephone numbers 1200 through 1210 are a terminating service group of lines located in number group 0, and that PBX numbers 1610 through 1615 are an outward group of lines in number group 1, and it is required to include both series of numbers for number checking calls. Remove the lead extending from NF punching 1210 to the RF punching at the RF punching and jump hunt from the last terminal of the terminating service group to the extra numbered terminals in the same number group. The first extra number is part of the terminating group and should be connected to the XF rather than RF terminal. Bridge the extra numbered terminals beyond the first one to the originating service terminals as outlined in 3.24. The first extra number is connected to the line removed from 1210. Make the connections at the block relay frame and line distributing frame for bridging the extra numbers to 1610 through 1615, respectively, as described in 3.24. In this manner the last line of the terminal hunting group appears as an RF terminal, but on number checking (due to the operation of the XG relay), the indication is changed to an HF condition and hunting is continued to check on all lines. The NC punchings are cross-connected as described in 3.10.

3.27 *Bridge Connections for Night Use:* When it is desired to use a terminal hunting line as an individual line for night use, cross-connect the NC punching of the night service number to the HG punching associated with the terminal hunting line and the NF punching of the night service number to the RF punching of the line choice associated with the terminal hunting line as described in 3.05. Cross-connect the S terminal of the night service number at the vertical line distributing frame to the S terminal of the terminal hunting number at the horizontal line distributing frame. For example, assume the PBX lines are 2100 through 2109 and that the night service number is 4120. Cross-connect the NC punching 4120 to the same HG punching to which 2109 is connected and the NF punching 4120 to the RF punching of the same line choice to which 2109 is connected. Cross-connect the S terminal of 4120 at the vertical line distributing frame to the S terminal of the line circuit to which 2109 is connected at the horizontal line distributing frame. The message

register lead on the night service number should be left open.

Note: When a night listing in the regular sequence group of numbers is to be used on a PBX which is working on an allotter basis, the night listed trunk must be the last trunk in the second allotted group. If more than one trunk is used for night listing, the trunks used must be in consecutive order and the last one must be the last trunk (RF) of the regular sequence group. When it is desired to use a trunk for night listing which is in the regular sequence group of trunks nonallotted, the last trunk must be used as the night-listed trunk. If more than one trunk is used for night listing, the trunks must be in consecutive order and the last one must be the last trunk (RF) of the regular sequence group.

3.28 *Subscriber Line Overflow (Cross-Connection Type):* The subscriber line overflow circuit is provided to count the attempts to reach a line or a PBX group when it is busy. This circuit is wired to the ANF and ALF punchings located on the AUX terminal strip at the block relay frame. For example, assume line 0507 is to be checked for overflow; remove the lead between NF 0507 and the RF punching at the RF punching and connect it to the assigned ANF punching. Then run a lead from the associated ALF punching to the RF punching from which the lead was removed. At the line distributing frame, remove the lead between the S punchings at the vertical and horizontal terminal strips and cross-connect these S punchings to the specified ANS and ALS punchings as described in 3.09

3.29 *Disconnection of a Number:* A number may be disconnected by arranging the cross-connections at the block relay frame and line distributing frame as shown in Table B. Where the M lead cross-connection is not provided for at the LDF (as for some flat rate lines), disconnect the line at the main frame. Where a first or intermediate PBX line is to be temporarily disconnected, the sleeve of that line should be made busy at the VLDF.

3.30 *Number Permanently Made Busy:* To make a number permanently busy, cross-connect the S punching on the vertical line distributing

frame to a (ground) punching at the line distributing frame. Disconnect the S lead between the vertical and horizontal line distributing frame.

3.31 *Message Timing:* A number may be connected to the message timing circuit by connecting the S and M1 punchings to the S and M1 punchings of the message timing circuit. (See Fig. 58 through 60.)
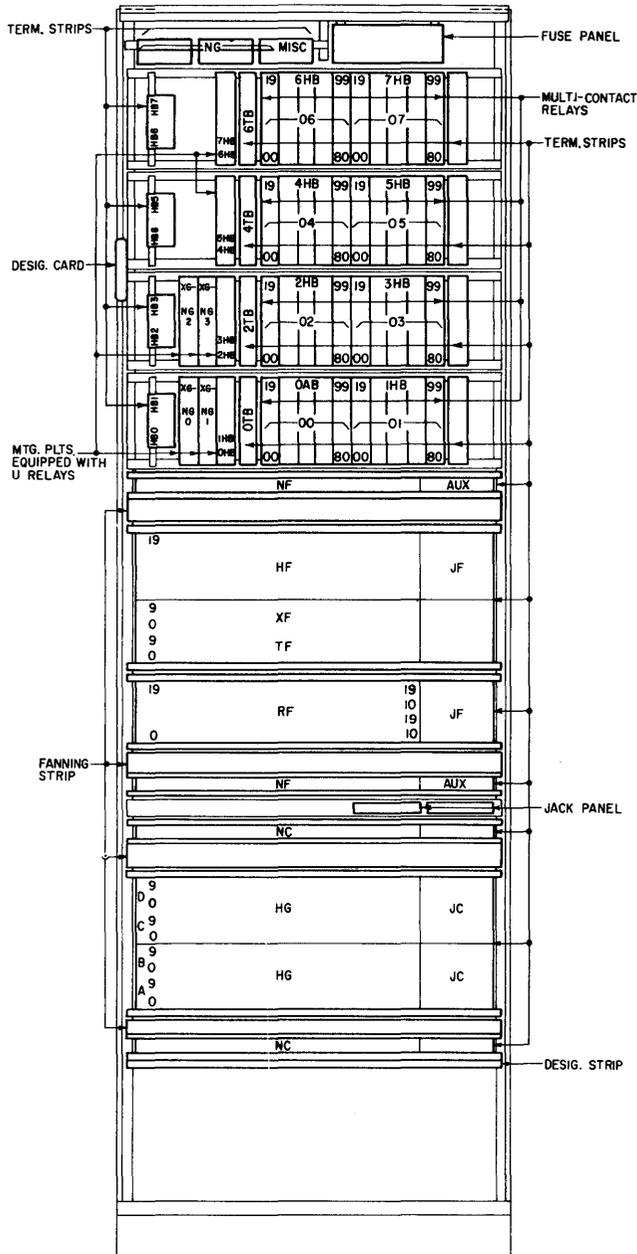
Fig. 1—Sample Block Relay Frame

TABLE A

SUMMARY OF ASSIGNMENT INFORMATION ON A SERVICE ORDER

FRAME OR CROSS-CONNECTION FIELD		CROSS CONNECTIONS (In the columns below are listed the cross connections which are always required. Additional cross connections required under certain circumstances are referred to in Notes 1 and 2.)				ASSIGNMENT INFOR-MATION REQUIRED ON SERVICE ORDER FOR PURPOSE OF THE INDICATED CROSS CONNECTIONS
		CLASS OF SERVICE	JUMPERS REQUIRED	JUMPER EXTENDS		
				FROM	TO	
Line Distributing Frame		Ind Line	One	Tel No	Col-Sw-V	Tel No Col-Sw-V See Notes 1 & 2
		2-Party and 4-Party Lines — When no Bunching Block is Employed See Note 3	1 Per Tel No	Tel No	Col-Sw-V	Tel No Col-Sw-V See Notes 1 & 2
		2-Party and 4-Party Lines — When Bunching Block is Employed	1 Per Tel No 1 Per Line	Tel No Bunching Blk	Bunching Blk Col-Sw-V	Tel No Col-Sw-V Bunching Blk See Notes 2 & 3
		8- or 10-Party Lines	1 Per Tel No 1 Per Line	Tel No 8- or 10-Pty Ckt	8- or 10-Pty Ckt Col-Sw-V	Tel No Pty Pos 8- or 10-Pty Ckt Col-Sw-V
Block Relay Frame	"F" Field	Ind Line	One	Tel No	R LCH	Tel No Line Choice (Note 4)
		2- and 4-Party Lines — Party 1 and 3	1 Per Tel No	Tel No	R LCH	Tel No Pty Pos Line Choice (Note 4)
		2- and 4-Party Lines — Party 2 and 4	1 Per Tel No	Tel No	T LCH	Tel No Pty Pos Line Choice (Note 4)
		8- or 10-Party Lines	1 Per Tel No	Tel No	R LCH	Tel No Line Choice (Note 4)
	"C" Field	All Lines	1 Per Tel No	Tel No	Fr-Sw	Frame Switch

Note 1. In offices where a message register is not permanently associated with the telephone number the register must be specifically assigned in case of message rate service, and an additional jumper is run from the telephone number to the assigned message register.

Note 2. In certain offices, when a register is not required, a jumper is run from either the telephone number or the Col-Sw-V to a ground terminal strip.

Note 3. The term "bunching block" as used in the table refers to a terminal strip separate and distinct from the line circuit (Col-Sw-V) terminal strip.

Note 4. The codes R and T used as prefixes to LCH (Line Choice) in the table designate, respectively the "R" and "T" subdivisions of the "F" field on the block relay frame. As related to individual and party lines:

The "R" subdivision is used for individual lines, for party 1 of two-party lines, for party 1 and party 3 of four-party lines, and all 8- or 10-party line stations.

The "T" subdivision is used for party 2 of a two-party line, and for party 2 and party 4 of a four-party line.

The particular subdivision in the "F" field to be used in each case may be included as a part of the assignment information on service orders, if desired, by prefixing the appropriate letter "R" or "T" to the line circuit assignment, e.g., R1A-12-54 or T3D-56-47. The matter of whether the letters "R" and "T" are so required depends on whether the local forces who run the jumpers require guidance in making this selection, other than the information which is available at other points on the service order viz the class of service and, in the case of party-line service, the party position. This latter item, party position, is indicative of the side of the line on which a party station is rung.

TABLE B

INTERCEPT FACILITIES		IF OPR PUNCHING	CROSS CONNECTIONS			
			NF	NC	NS	M
When Automatic Intercept Service is Provided	For Lines Requiring Referral	Is Provided	Cross Conn to OPR	Remains Cross Conn	Remains Cross Conn	Remains Cross Conn
	For Unassigned Lines		Remains Unconnected	Remains Unconnected	Remains Unconnected	Remains Unconnected
	For Disconnected Lines		Cross Conn to OPR	Cross Conn Removed	Cross Conn Removed	Cross Conn Removed
When Manual Intercept Service with Detection of Sleeve Holding Ground is Provided	For Lines Which Have Service Suspended Temporarily and Require Referral	Is Provided	Cross Conn to OPR	Remains Cross Conn	Remains Cross Conn	Remains Cross Conn
	For Disconnected Lines with Referral		Cross Conn to OPR	Cross Conn Removed	Cross Conn Removed	Cross Conn Removed
	For Disconnected Lines Not Requiring Referral		Cross Conn Removed	Cross Conn Removed	Cross Conn Removed	Cross Conn Removed
	For Unassigned Lines		Remains Unconnected	Remains Unconnected	Remains Unconnected	Remains Unconnected
When Manual Intercept Service Without Detection of Sleeve Holding Ground is Provided	For Lines Which Have Service Suspended Temporarily and Require Referral	Is Not Provided	Remains Cross Conn	Remains Cross Conn	Is Opened	Is Opened
	For Disconnected Lines		Cross Conn Removed	Cross Conn Removed	Cross Conn Removed	Cross Conn Removed
	For Unassigned Lines		Remains Unconnected	Remains Unconnected	Remains Unconnected	Remains Unconnected
	For Unassigned Lines Requiring Operator Intercept Service When Term. Mkr. is Arranged to Route Calls to Unassigned Lines to Machine Intercept	Is Provided	Cross Conn to OPR	Remains Unconnected	Remains Unconnected	Remains Unconnected

TABLE C

**CROSS-CONNECTIONS FOR AIS WITHOUT LLP AT LDF AND BLOCK
RELAY FRAME WITH AIS ADDRESS**

FRAME	PCHG	PCHG	CLASS OF INTERCEPT
BLOCK RELAY	NC-	NCI-0	"A" OFFICE BLANK NUMBERS
	NF-	NFI-0	
LDF	NS-	NSI-0	
BLOCK RELAY	NC-	NCI-1	"A" OFFICE TROUBLE INTERCEPT
	NF-	NFI-1	
LDF	NS-	NSI-1	
BLOCK RELAY	NC-	NCI-2	"A" OFFICE CHANGED NUMBERS
	NF-	NFI-2	
LDF	NS-	NSI-2	
BLOCK RELAY	NC-	NCI-3	"B" OFFICE BLANK NUMBERS
	NF-	NFI-3	
LDF	NS-	NSI-3	
BLOCK RELAY	NC-	NCI-4	"B" OFFICE TROUBLE INTERCEPT
	NF-	NFI-4	
LDF	NS-	NSI-4	
BLOCK RELAY	NC-	NCI-5	"B" OFFICE CHANGED NUMBERS
	NF-	NFI-5	
LDF	NS-	NSI-5	

TABLE D

**CROSS-CONNECTIONS FOR AIS WITHOUT LLP AT LDF AND BLOCK
RELAY FRAMES FOR AIS TRUNKS**

FRAME	FROM PCHG	TO PCHG	REMARKS
BLOCK RELAY	HG-	HGI-	See notes 1 & 2
BLOCK RELAY	RF-	RFI-	
LDF	LS-	LSI-	

Note 1: HG-, RF-, and LS- punching identifications include numerals which give the line link locations of each AIS trunk.

Note 2: HGI-, RFI-, and LSI- punching identifications include a numeral which corresponds to the AIS trunk number. There are a maximum of ten AIS trunks which are numbered 0 to 9.
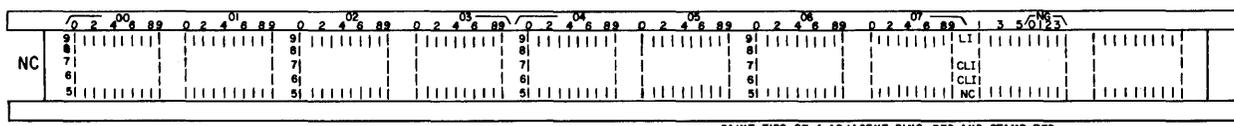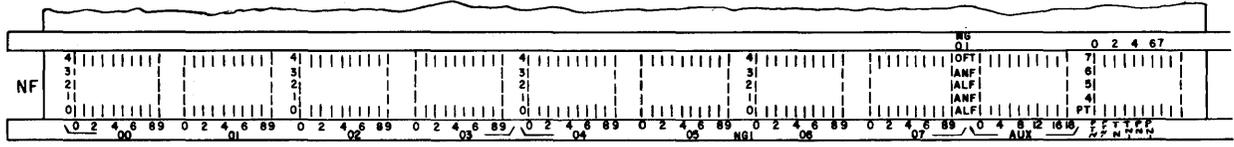
Fig. 2—Sample Cross-Connection Fields of Block Relay Frame
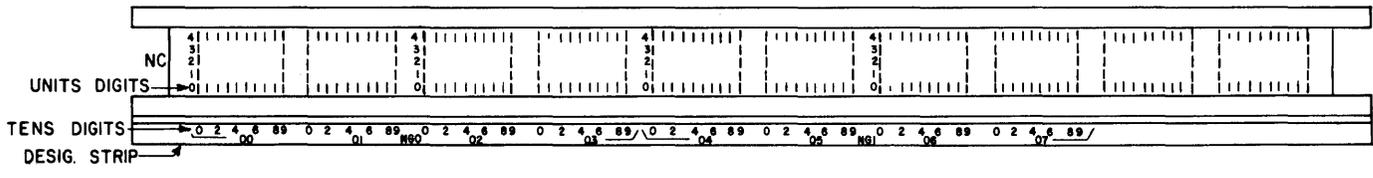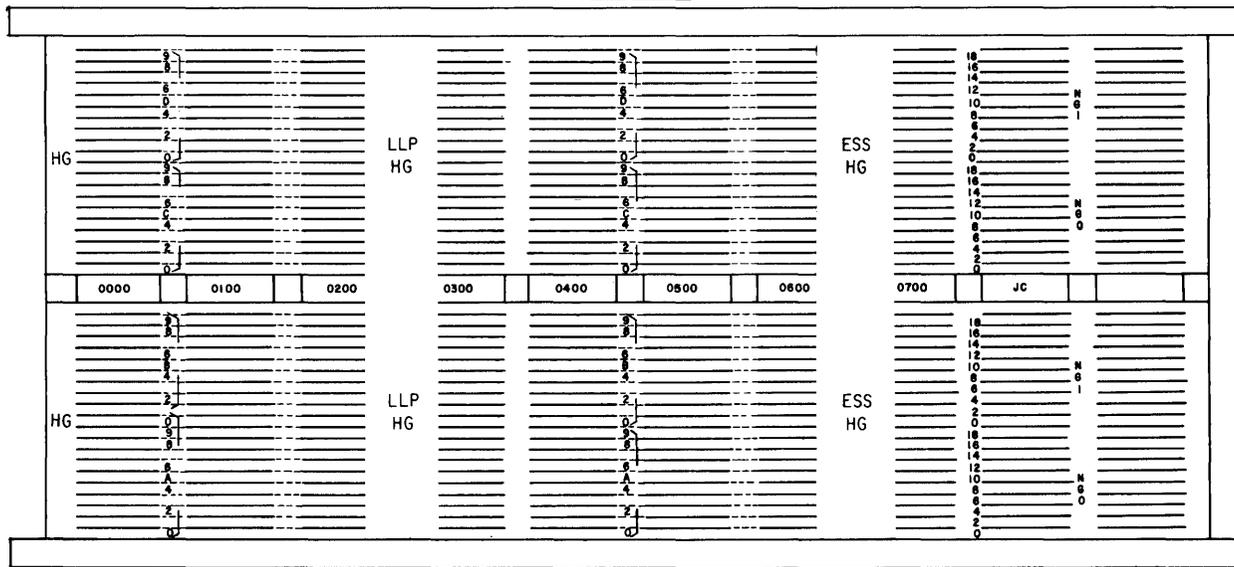
Fig. 2a—Sample Cross-Connection Fields of Block Relay Frame
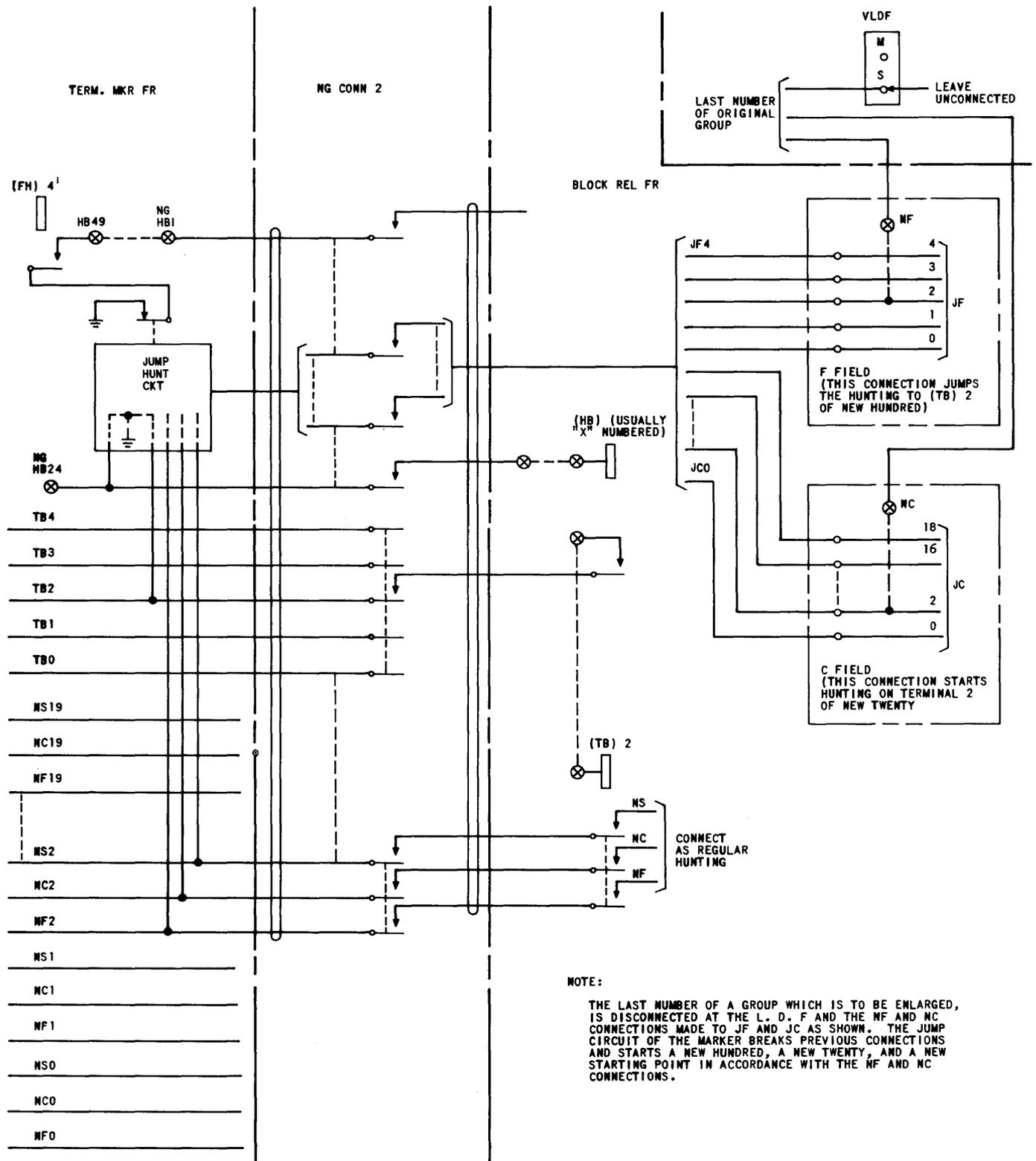
Fig. 3—Illustrating Jump Hunting

TPA 531 203
FIG. 3

Fig. 4—HB Punchings Located at Top of Frames Where HB Relays are Mounted to the Left of the TB Relays

Fig. 5—TB and SH Punchings Located to the Left of
the Twenty Block Relays
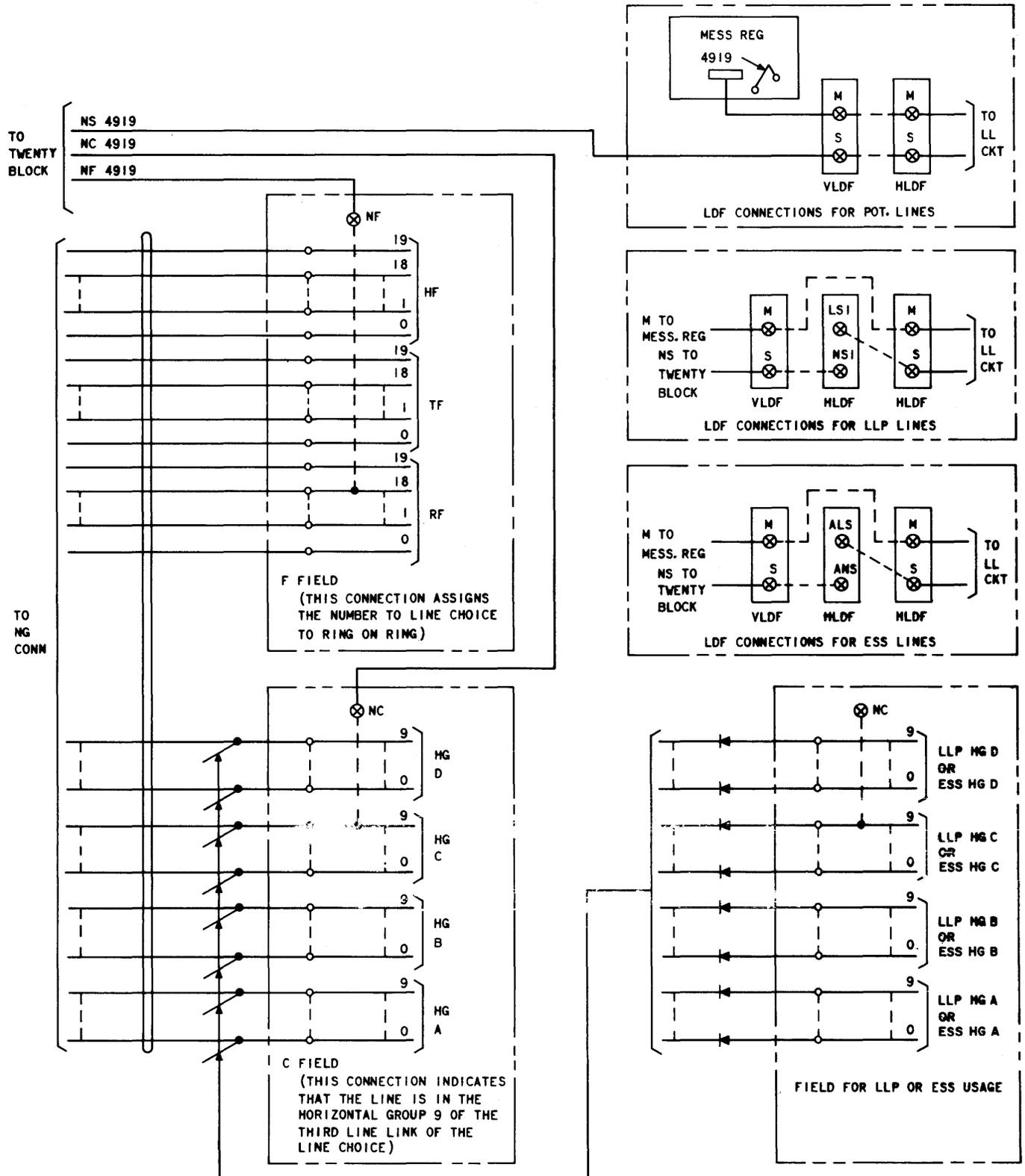
Fig. 6—Illustrating Customers Line Cross-Connections
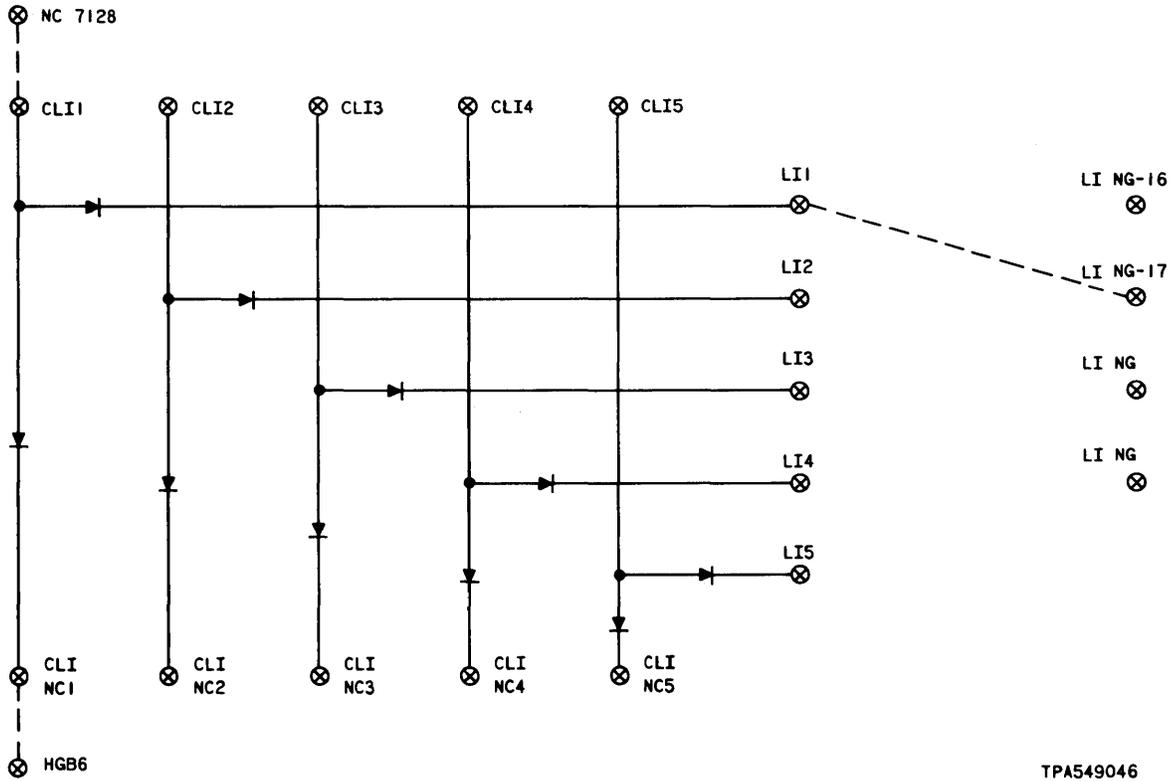
Fig. 6A—Typical Customer Line Cross-Connections Providing Calling Line Identification

TPA549046
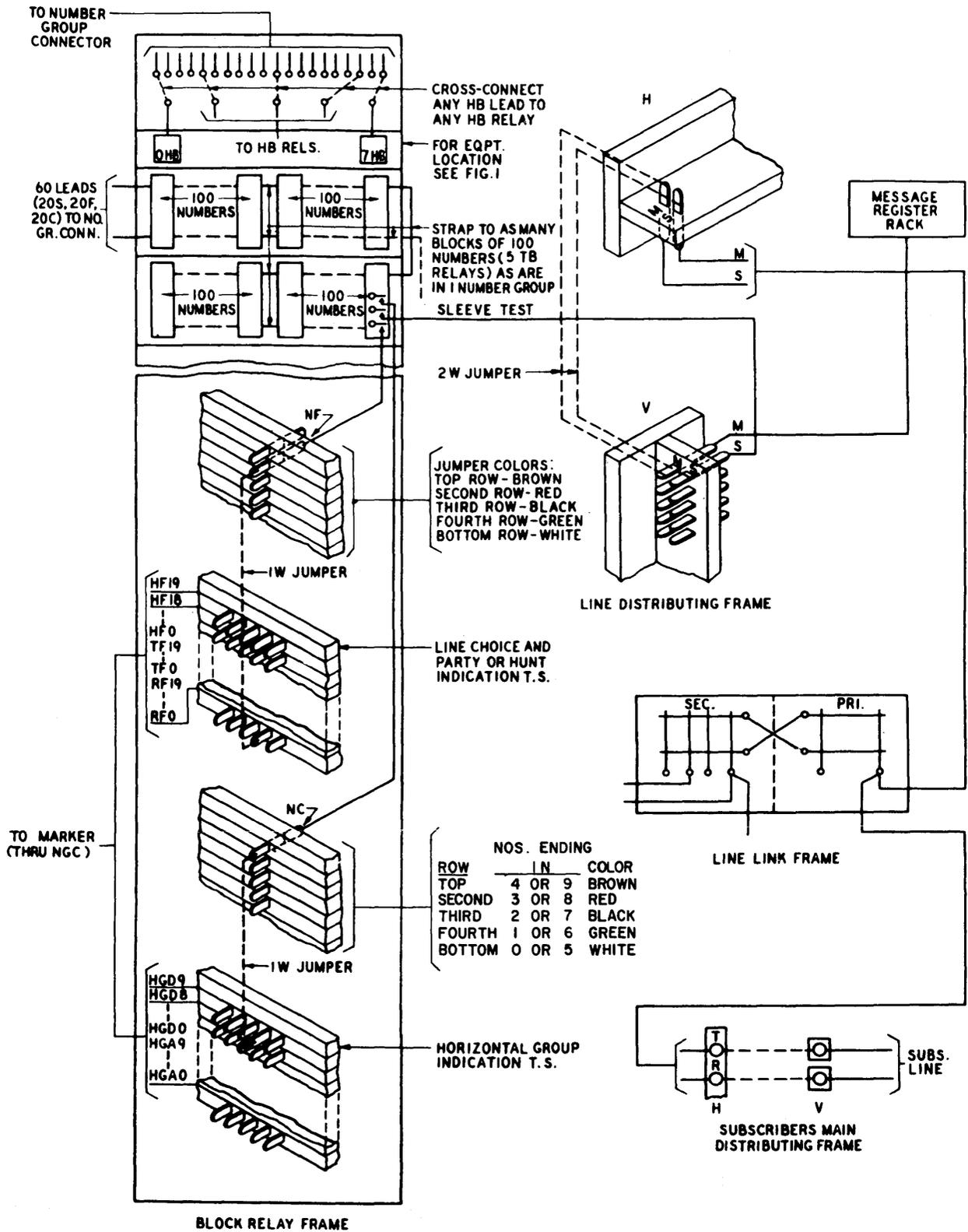
Fig. 7—Schematic of Typical Connection Between Block Relay Frame and Main Distributing Frame
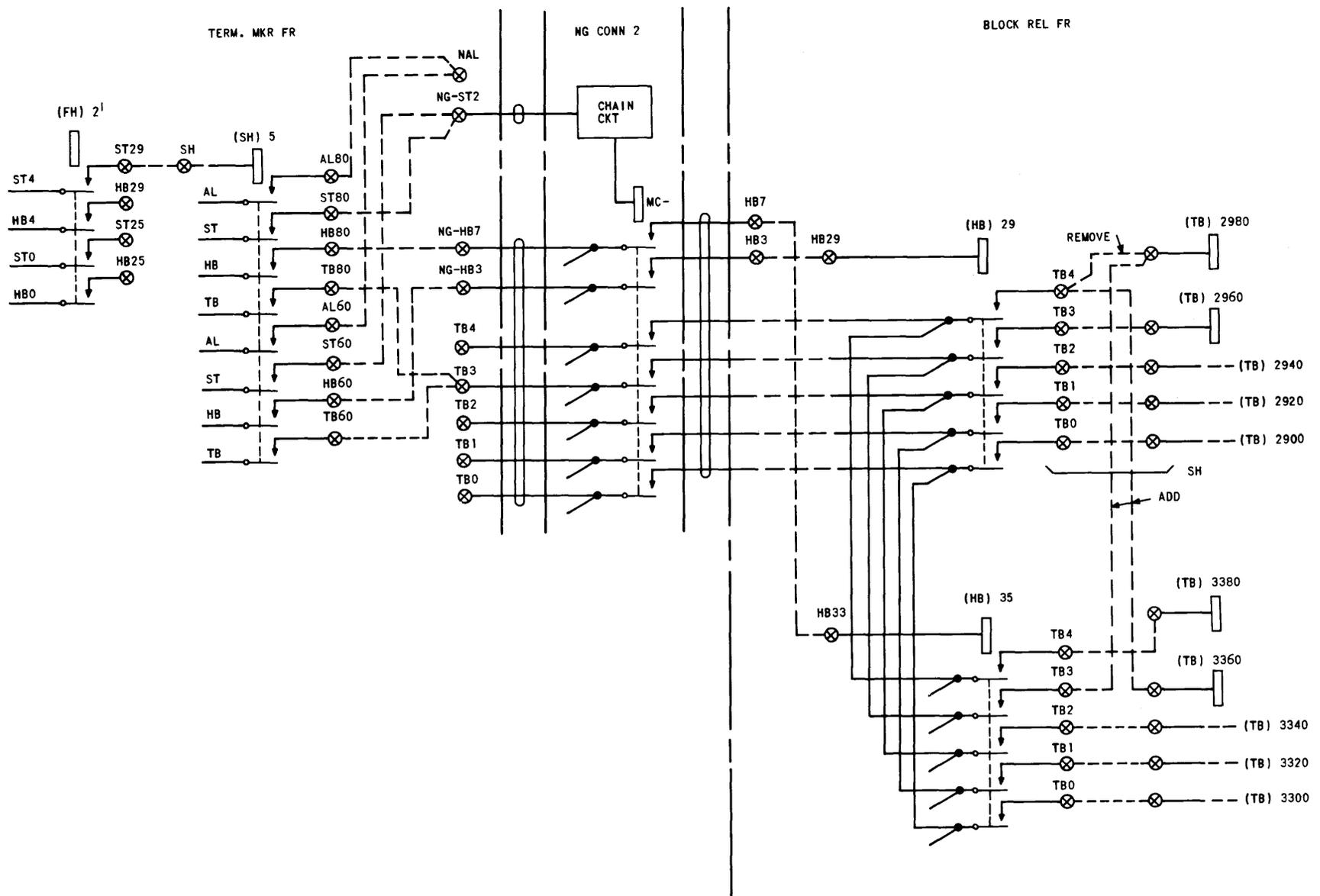
Fig. 8—Illustrating Split Hundreds for Non-Consecutive End of Blocking Hunting

TPA- 531 205
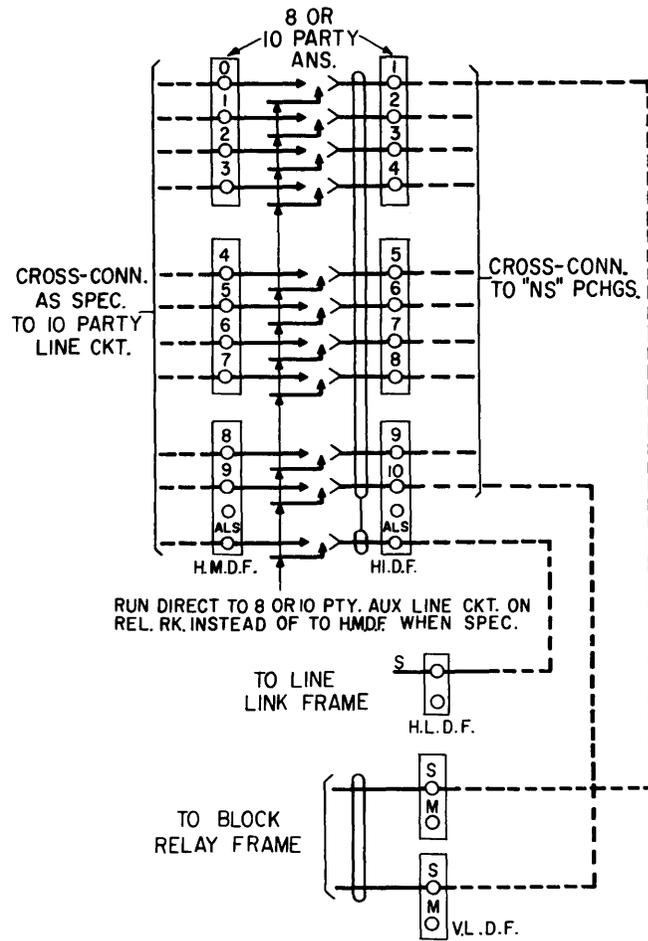
**Fig. 9—Illustrating Cross-Connections at the Line
Distributing Frame for 8- or 10-Party Lines**

CROSS CONNECTIONS AT LINE DISTRIBUTING FRAME

For Use in Offices Where the M Lead is not
Cross-Connected to the L.D.F.
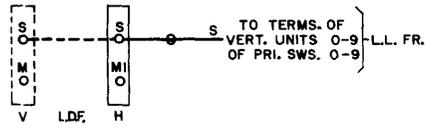
Fig. 10—For Individual, Flat Rate, or Coin Lines Not Having Message Registers or For AMA Lines
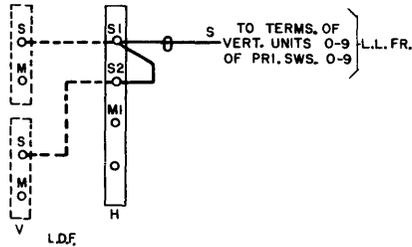
Fig. 11—For 2-Party Lines Not Having Message Registers or For AMA Lines
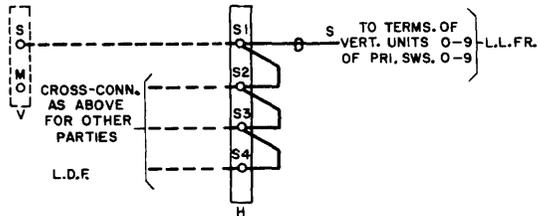
Fig. 12—For Flat Rate 4-Party Lines
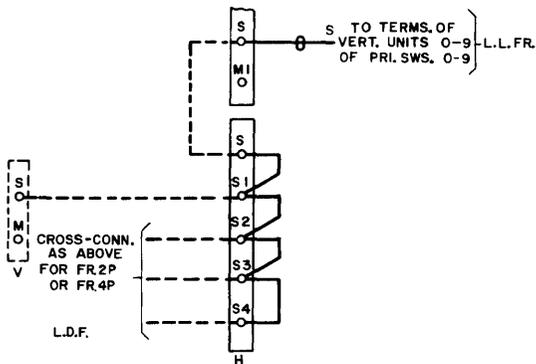
Fig. 13—For Flat Rate Party Lines in Individual Flat Rate Line Groups When Bunching Blocks are Provided

For Use in Offices Where the M Lead is not
Cross-Connected to the L.D.F. (Continued)
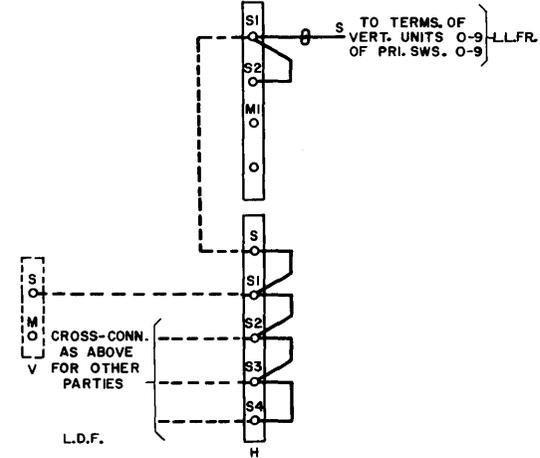
Fig. 14—For Flat Rate 4-Party Lines in 2-Party Flat Rate Line Groups When Bunching Blocks are Provided

For Use in Offices Having Line Message Registers
Cabled to Subscribers Number Terminal Strips.
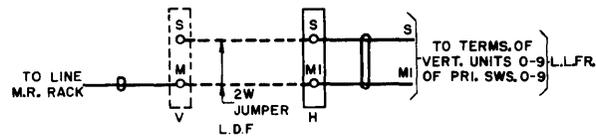
Fig. 15—For Flat Rate, Coin or Message Rate Individual Lines Having Message Registers
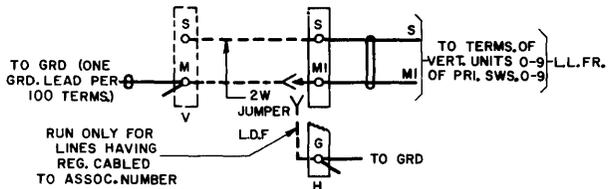
Fig. 16—For Lines Not Equipped with Message Registers in Message Rate Line Groups
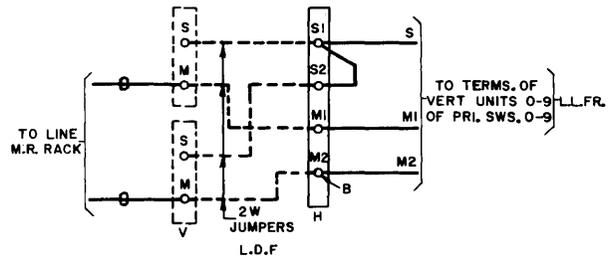
Fig. 17—For 2-Party Lines Equipped with Message Registers

For Use in Offices Having Line Message Registers
Cabled to Subscribers Number Terminal Strips.
(Continued)
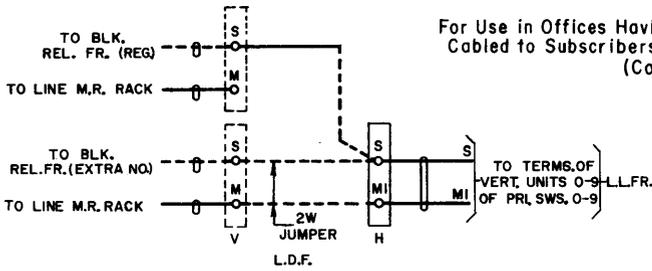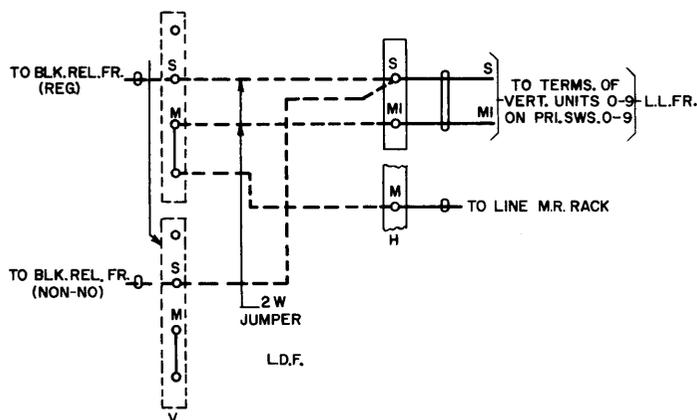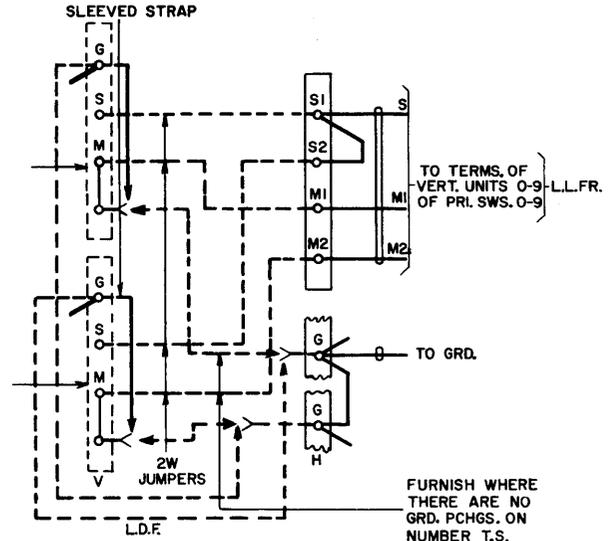
Fig. 18—For Message Rate Individual Lines Bridged to Extra Numbered Terminals Where Message Registers Are Assigned Extra Numbered Terminals
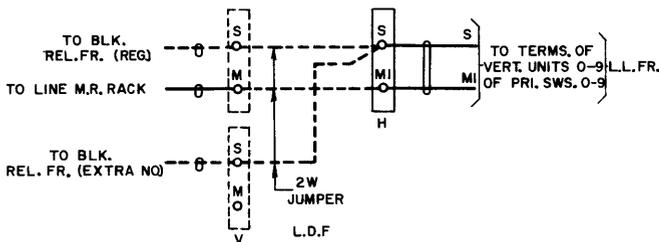
Fig. 19—For Message Rate Individual Lines Bridged to Extra Numbered Terminals—No Message Registers Assigned to Extra Numbered Terminals
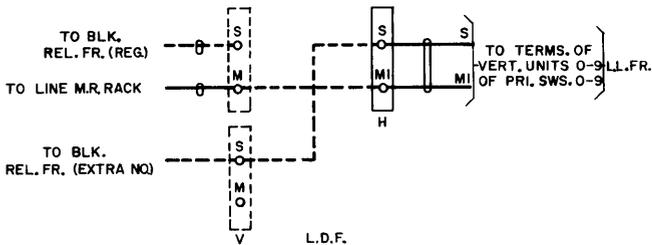
Fig. 20—For Use in Associating Message Registers of Regular Number Connected as "Number Jumped From" with Extra Numbered Terminal (Non-Bridged)
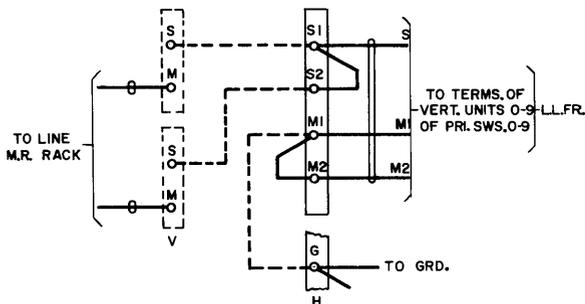
**Fig. 21—For 2-Party Lines Not Equipped with Message Registers in Message Rate 2-Party Line Group**
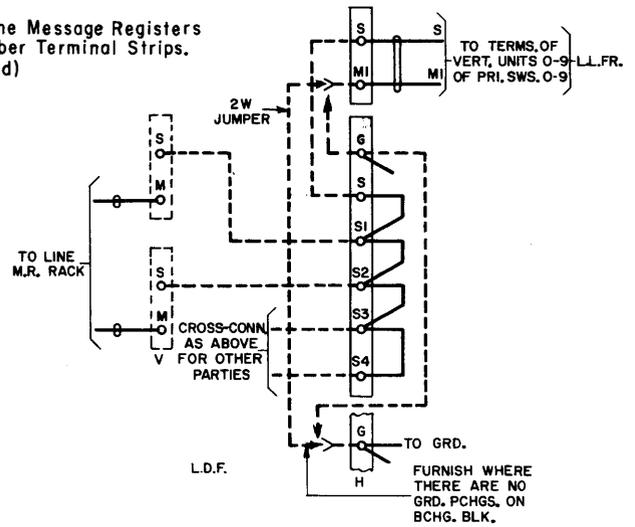
Fig. 22—For Flat Rate, 2-Party or Flat Rate 4-Party Lines in Message Rate Line Groups When Bunching Blocks are Provided
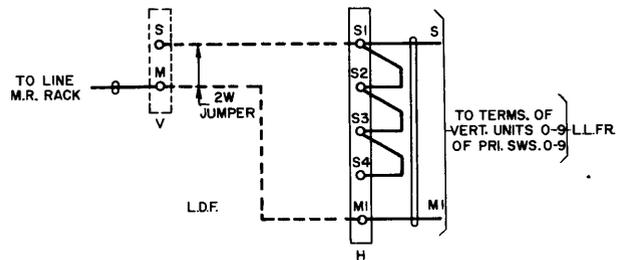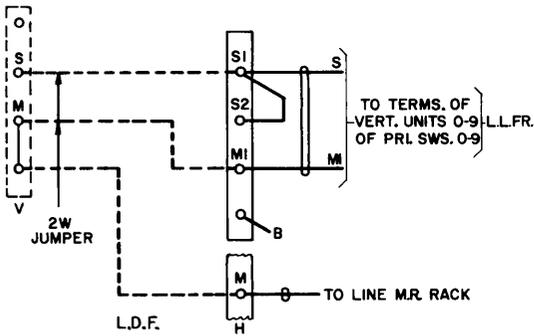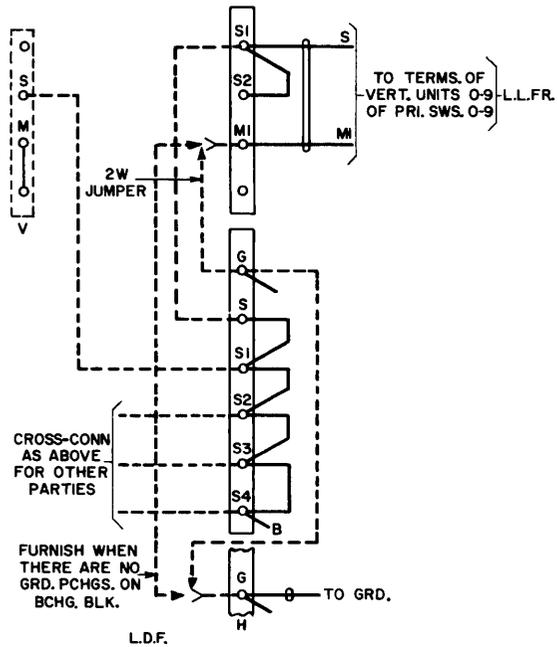
Fig. 23—For Message Rate Individual Lines in Message Rate Individual Line Group Having HLDF Terminal Strips Arranged for Flat Rate 4-Party
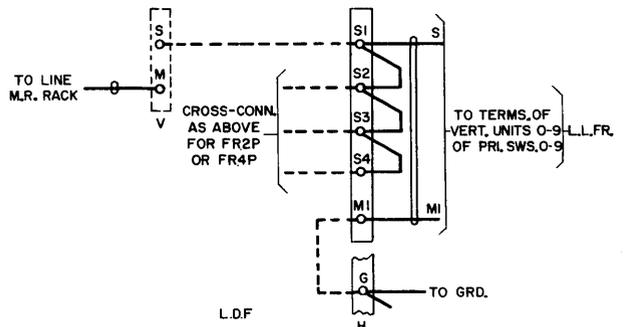
Fig. 24—For Flat Rate Lines in Message Rate Individual Line Group Having HLDF Terminal Strips Arranged for Flat Rate 4-Party

For Use in Offices Having Line Message Registers
Cabled to Subscribers Number Terminal Strips,
(Continued)
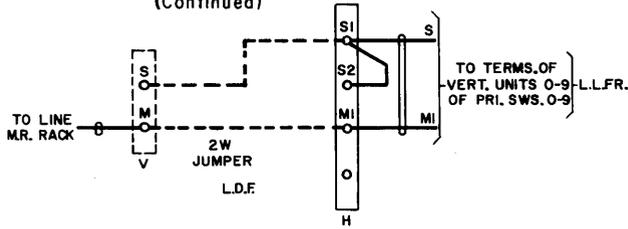
Fig. 25—For Flat Rate Lines in Message Rate Individual Line Group Having HLDF Terminal Strips Arranged for Flat Rate 2-Party
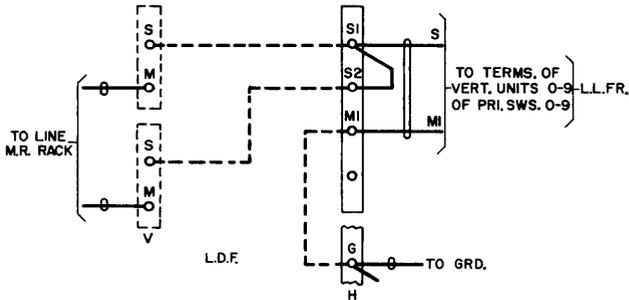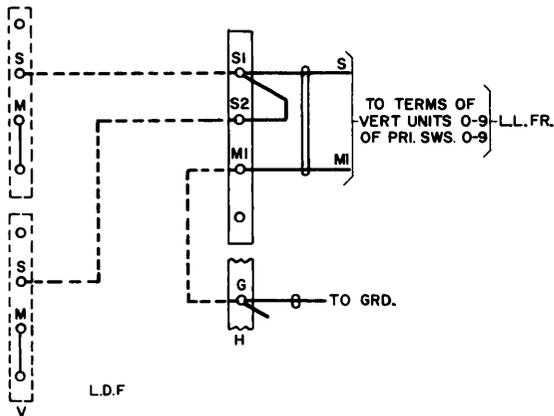

Fig. 26—For Flat Rate Individual or Flat Rate 2-Party Line in Message Rate Individual Line Group Having HLDF Terminal Strips Arranged for . Flat Rate 2-Party
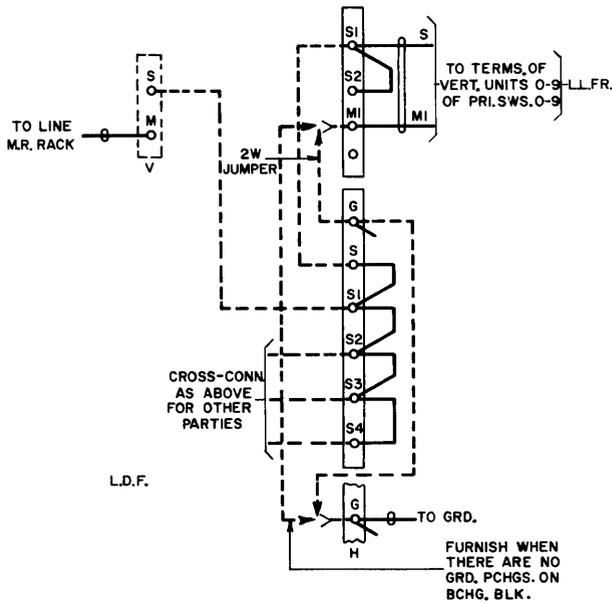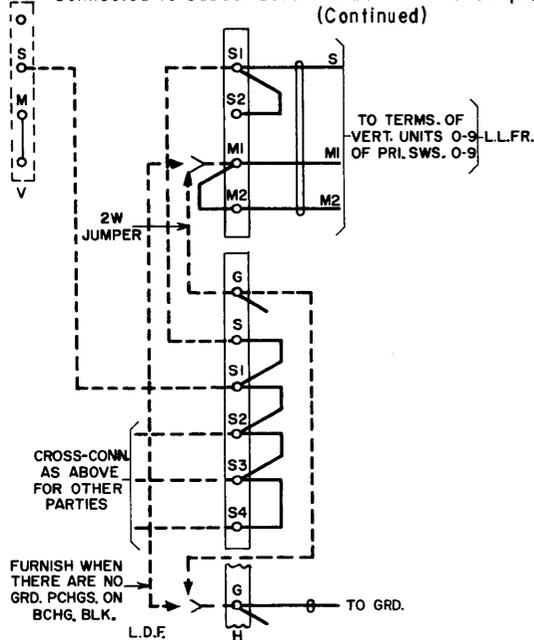

Fig. 27—For Flat Rate 4-Party Lines in Message Rate Individual Line Group Having HLDF Terminal Strips Arranged for Flat Rate 2-Party When Bunching Blocks are Provided
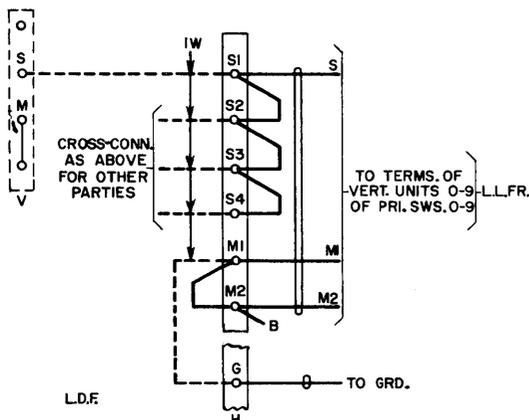
For Use in Offices Having Line Message Registers
Cabled to Subscribers Number Terminal Strips,
(Continued)
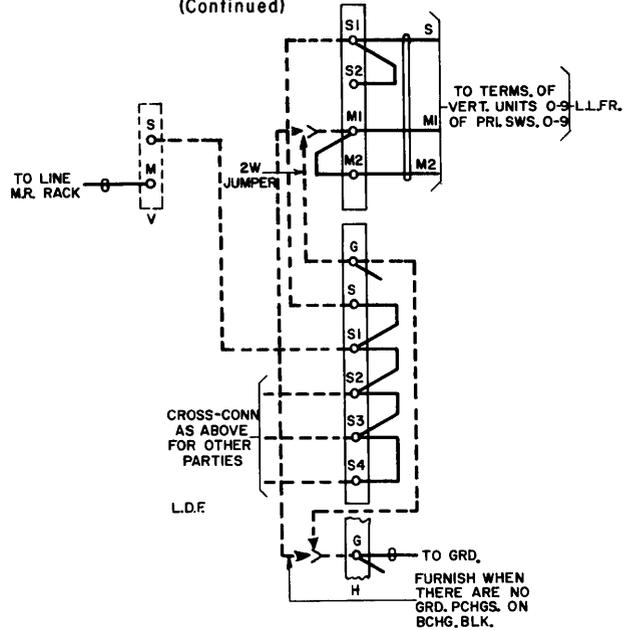
Fig. 28—For Flat Rate 4-Party Lines in Message Rate 2-Party Line Group When Bunching Blocks Are Provided
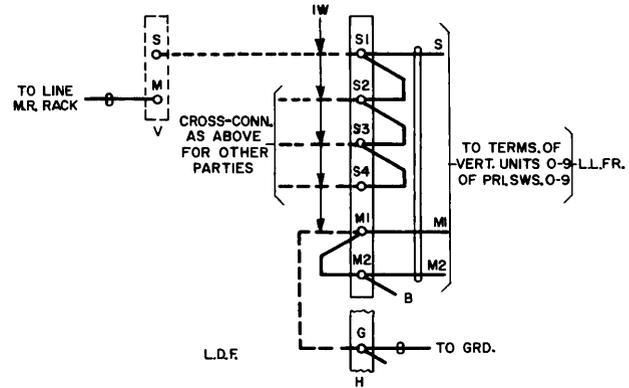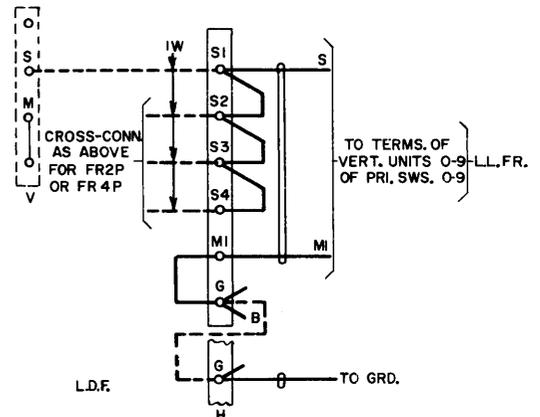

Fig. 29—For Flat Rate 4-Party Lines in Message Rate 2-Party Line Group

For Use in Offices Having Line Message Registers Cross-
Connected to Subscribers Number Terminal Strips.
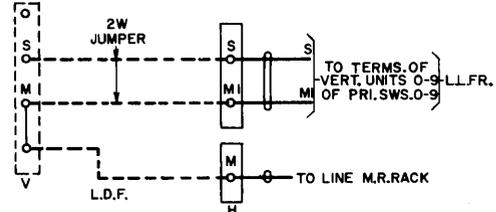
Fig. 30—For Flat Rate Coin or Message Rate Individual Lines Having Message Registers

For Use in Offices Having Line Message Registers Cross-
Connected to Subscribers Number Terminal Strips
(Continued)
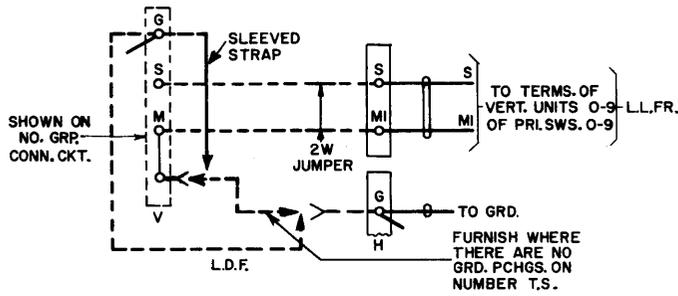
Fig. 31—For Lines Not Equipped with Message
Registers in Message Rate Line Groups
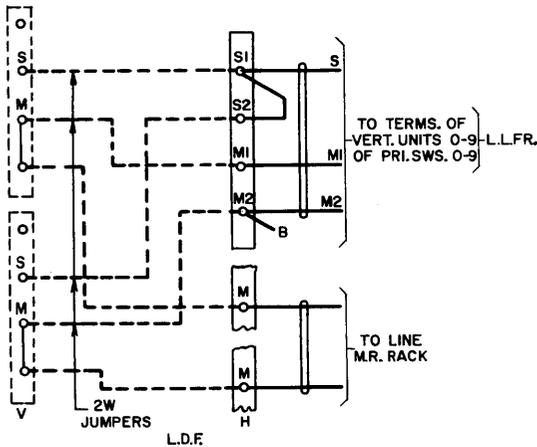
Fig. 32—For Message Rate 2-Party Lines Equipped
with Message Registers

Fig. 33—For Message Rate Individual Lines Bridged
to Extra Numbered Terminals

Fig. 34—For 2-Party Lines Not Equipped With Message
Registers in Message Rate 2-Party Line
Groups
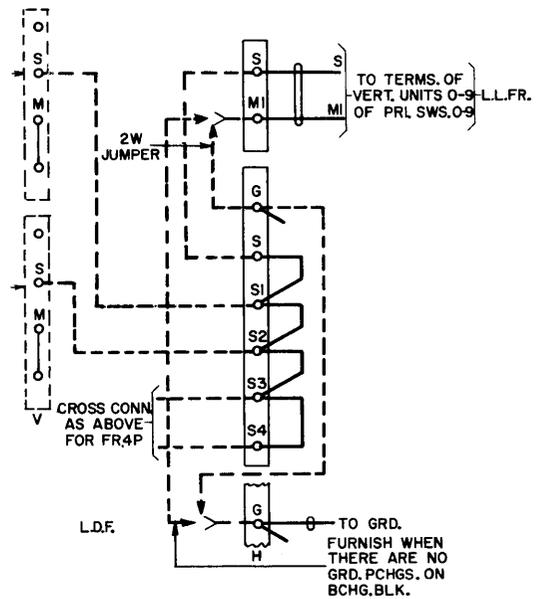
Fig. 35—For Flat Rate 2-Party or Flat Rate 4-Party
Lines in Message Rate Individual Line Groups
When Bunching Blocks Are Provided

For Use in Offices Having Line Message Registers Cross-
Connected to Subscribers Number Terminal Strips
(Continued)
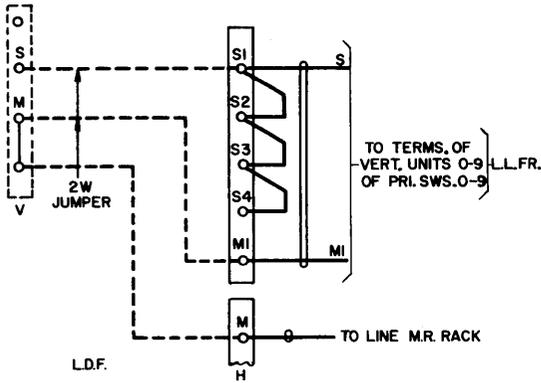
Fig. 36—For Message Rate Individual Lines in
Message Rate Individual Line Group
Having HLDF Terminal Strips Arranged
for Flat Rate 4-Party
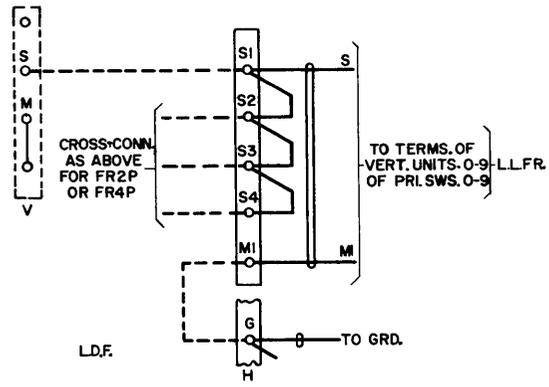
Fig. 39—For Flat Rate Individual or Flat Rate 2-Party
Lines in Message Rate Individual Line Group
Having HLDF Terminal Strips Arranged for
Flat Rate 2-Party

Fig. 37—For Flat Rate Lines in Message Rate Individual
Line Group Having HLDF Terminal Strips
Arranged for Flat Rate 4-Party

Fig. 38—For Message Rate Individual Lines in Message
Rate Individual Line Group Having HLDF
Terminal Strips Arranged for Flat Rate 2-Party

Fig. 40—For Flat Rate 4-Party Lines in Message Rate
Individual Line Group Having HLDF Terminal
Strips Arranged for Flat Rate 2-Party When
Bunching Blocks Are Provided

For Use in Offices Having Line Message Registers Cross-Connected to Subscribers Number Terminal Strips. (Continued)

Fig. 41—For Flat Rate 4-Party Lines in Message Rate 2-Party Line Group When Bunching Blocks are Provided

Fig. 42—For Flat Rate 4-Party Lines in Message Rate 2-Party Line Group

For Use in Offices Having Line Message Registers Cross-Connected to Subscribers Number Terminal Strips. (Continued)
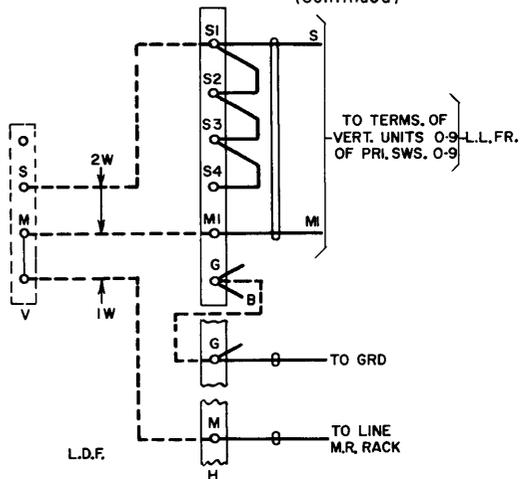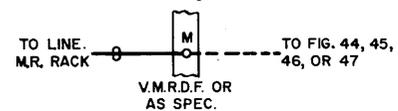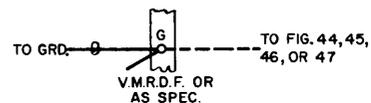

Fig. 43—For Message Rate Individual Lines in Message Rate Individual Line Group Having Terminal Strips Arranged for Large Flat Rate 4-Party Development

Fig. 44—For Flat Rate Lines in Message Rate Individual Line Group HAving Terminal Strips Arranged for Large Flat Rate 4-Party Development

For Temporary Message Register Facilities For Offices Arranged For Future A.M.A.

Fig. 45—Message Register Termination

Fig. 46—Ground Block

For Temporary Message Register Facilities
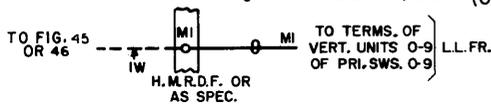For Offices Arranged For Future A.M.A. (Continued)

TO FIG. 45
OR 46 ... MI ... MI TO TERMS. OF
VERT. UNITS 0-9 L.L. FR.
OF PRI. SWS. 0-9
IW
H.M.R.D.F. OR
AS SPEC.

Fig. 47—For Lines in Groups Cabled For Message Rate Individaul Lines with Large Message Register Development

TO FIG. 45

TO FIG. 46
H.M.R.D.F. OR
AS SPEC.

TO TERMS. OF
VERT. UNITS 0-9 L.L. FR.
OF PRI. SWS. 0-9
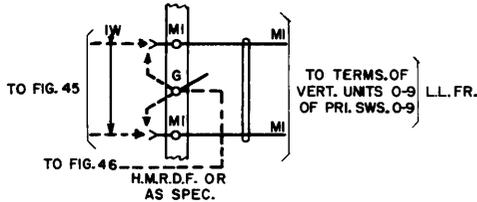
Fig. 48—For lines in Groups Cabled for Message Rate Individual Lines with Small Message Register Development

TO FIG. 45
OR 46

H.M.R.D.F. OR
AS SPEC.

TO TERMS. OF
VERT. UNITS 0-9 L.L. FR.
OF PRI. SWS. 0-9
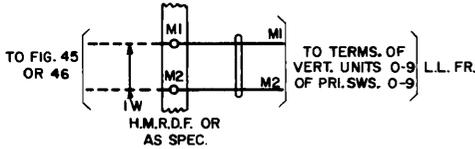
Fig. 49—For Lines in Groups Cabled for Message Rate 2-Party Lines with Large Message Register Development

TO FIG. 45

TO FIG. 46
H.M.R.D.F. OR
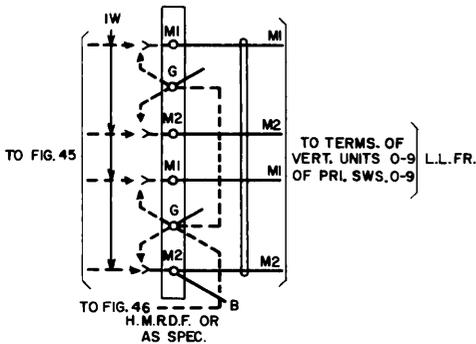AS SPEC.

TO TERMS. OF
VERT. UNITS 0-9 L.L. FR.
OF PRI. SWS. 0-9

Fig. 50—For Lines in Groups Cabled for Message Rate 2-Party Lines with Small Message Register Development

For Offices Arranged For AMA.

SHOWN ON
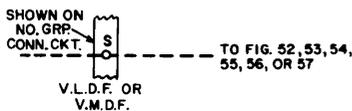NO. GRP.
CONN. CKT. S TO FIG. 52, 53, 54,
55, 56, OR 57
V.L.D.F. OR
V.M.D.F.

Fig. 51—Number Sleeve Termination

For Offices Arranged For A.M.A. (Continued)

ALS TO FIG. 54, 55
OR 56

ANS TO FIG. 51

H.L.D.F. OR
H.M.D.F.
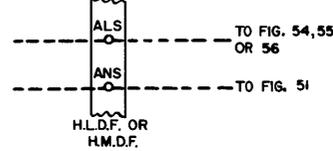
Fig. 52—Auxiliary Line Sleeve Punchings

SHOWN ON
NO. GRP.
CONN. CKT. G TO FIG. 48
H.L.D.F. OR
H.M.D.F.

Fig. 53—Permanently Busy Lines

TO FIG. 51,
52, OR 57 S S TO TERMS. OF
VERT. UNITS. 0-9 L.L. FR.
OF PRI. SWS. 0-9
IW
H.L.D.F. OR
H.M.D.F.
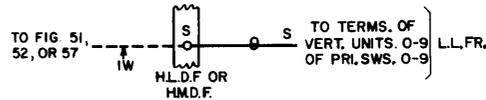
Fig. 54—Line Sleeve Termination Individual Line Arrangement

TO FIG. 51,
52, OR 57 S1

TO FIG. 51 S2
IW

S TO TERMS. OF
VERT. UNITS. 0-9 L.L. FR.
OF PRI. SWS. 0-9

H.L.D.F. OR
H.M.D.F
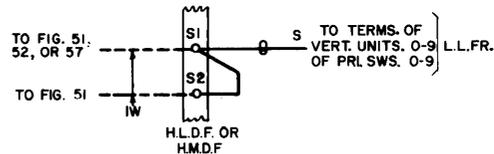
Fig. 55—Line Sleeve Termination 2-Party Line Arrangement

TO FIG. 51,
OR 52 S1

S2

TO FIG. 51 S3

S4
B
IW
H.L.D.F. OR
H.M.D.F.

S TO TERMS. OF
VERT. UNITS 0-9 L.L. FR.
OF PRI. SWS. 0-9
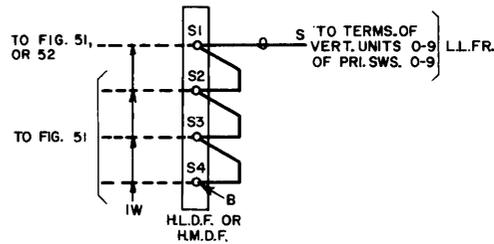
Fig. 56—Line Sleeve Termination 4-Party Line Arrangement

TO FIG. 54,
OR 55 S

S1

S2

TO FIG. 51 S3

S4
B
IW
H.L.D.F. OR
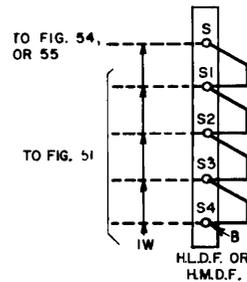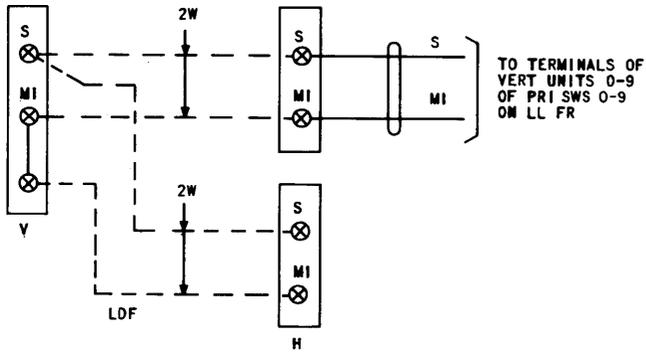H.M.D.F.

Fig. 57—Bunching Block

Fig. 58—For Message Timing Individual Line for Use in Offices Having 3-Point Terminal Strips on VLDF

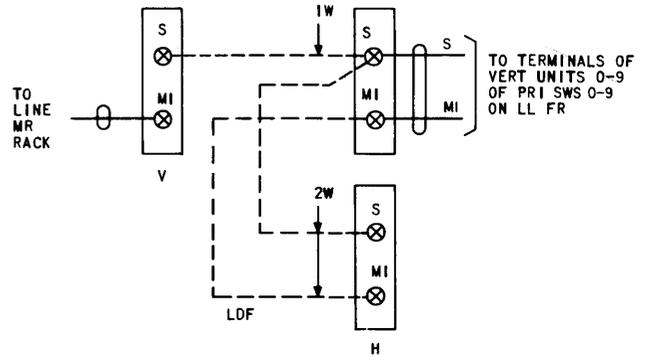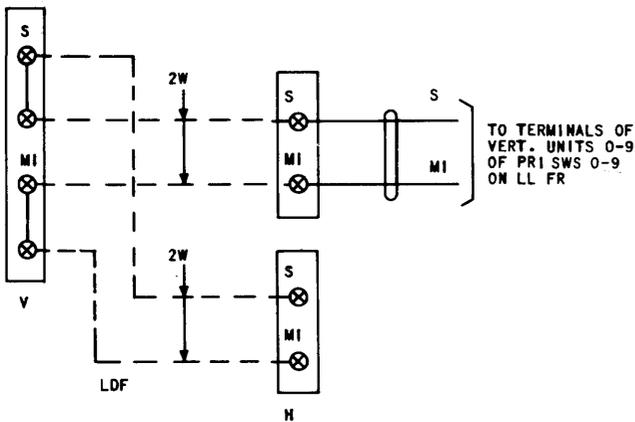**Fig. 59—For Message Timing Individual Lines for Use in Offices Having 4-Point Terminal Strips on VLDF**

Fig. 60—For Message Timing Individual Lines for Use in Offices Having Line Message Registers Cabled to Subscribers Number Terminal Strips