

11

COMMON SYSTEMS
LINE VERIFICATION CIRCUIT
FOR USE AT NUMBER NETWORK FRAME
AUTOMATIC NUMBER IDENTIFICATION
CROSSBAR NO. 1 OR PANEL OFFICE

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SECTION I - GENERAL DESCRIPTION

1. GENERAL USE

This circuit is optional and auxiliary to the automatic number identification (ANI) line verification feature. This circuit provides facilities to originate ANI line verifications at the number network frame (NN) location when the MRR and NN frames are at different locations within the building. Facilities are required in any case to originate ANI line verifications at the message register rack frame (MRR) locations.

The connection of a customer's line for service in an ANI Crossbar No. 1 or Panel (BCO or GCO) Office requires (in addition to existing non-ANI cross connections) two cross connections on the NN frame. Use of this circuit for originating line verifications enables the maintenance personnel to more readily find cross-connection errors at the number network frame. That is, for separated MRR and NN frame locations, the maintenance man will be at the location where changes are required.

This circuit does not provide facilities to make complete non-ANI line verification, as can be done at the MRR location.

2. GENERAL METHOD OF OPERATION

2.1 General

In order to verify a cross-connected customer's line, a connection must be established to that line such that the ANI feature can make an identification. The identified number is displayed on indicator tubes; if this number is identical with the directory number of the line connected to, proper cross connections have been made.

2.2 Crossbar No. 1

Connection is made through the terminating end of the office to the customer's line through a MRR incoming trunk. This trunk can be used in one of two ways:

(1) With a patch cord connected at the line link frame or (2) without the line link frame patch cord, but with a plug in the ANINLP jack at the NN frame. Prior to setting up the connection either the cord at the line link frame must be connected or the plug must be inserted in the jack.

A MRR and NN location (discussed in Section 1 - "General Use") may be considered "associated" when they serve the same central offices, and nonassociated when they serve different central offices. A lockout arrangement is provided which enables only one of the associated locations to have access to the MRR trunk at any one time. This lockout eliminates interference between the associated locations. In order to lock out associated MRR access to the

MRR incoming trunk, a plug is inserted in the ST jack. Lamp ST lights to indicate connection to the trunk and that access from the MRR has been blocked. The number of the customer's line is then dialed, MF key pulsed or given to a B operator. Successful connection is indicated by the lighting of lamp T, R or H, which must correspond with the class of the subscriber's line.

Then a plug is inserted in jack ANI to seize the ANI feature and obtain an identification. Connection is first made to the line verification connector and display circuit (LVC & D). The LVC & D circuit is provided one per ANI identifier group and will accommodate a maximum of six central office. Line verification attempts from this circuit, other NN frame locations, and nonassociated MRR locations must compete for connection to the LVC & D circuit; this is necessary since for one identifier group only one line verification attempt can be made at a time. If the LVC & D circuit is busy at the time the ANI jack is used, a BYI lamp is lighted. If the LVC & D circuit is idle, a display on indicator tubes is lighted following successful identification by the ANI circuits. This display is the identified number.

Regarding the display, the office code is displayed with a single number. Therefore a translation must be made to enable comparing three digit office codes with the display. A second translation must be made for those offices having both physical and theoretical office codes. In both cases office indicator is obtained by the identifier circuit and sent to the outpulser on a single digit basis. It is this information also that the outpulser sends to this circuit. Without the physical-theoretical arrangement the assignment of digits in the identifier provides the translation key; with the physical-theoretical arrangement the office code must be obtained from a combination of the single office digit and either the numerical thousands, or from the numerical thousands and hundreds digit.

2.3 Panel

Line verifications for Panel are as described for Crossbar No. 1 except as follows:

- (a) A patch cord must in all cases be connected at the intermediate distributing frame (IDF). The ANI identification is made over this connection, and dialing, etc. is not required.
- (b) The panel MRR trunk circuits will be provided one per MRR frame location. With the message registers at a MRR frame location for more than one central office, an OF-jack must be used at the NN frame to select the central office in which a customer's line is to be verified.

(c) In combination BCO-GCO offices, an ANI jack is provided for BCO offices and an ANIG jack for GCO offices. A plug is inserted in the proper jack to seize the ANI feature.

2.4 Crossbar No. 1 and Panel

At the time the outpulser connector is seized, the LVC & D circuit energizes a 2-3.6 second timer. Should this timer time out prior to connection to an outpulser, a TO lamp is lighted at this circuit, and no further line verifications can be made in the identifier group until the connection is released through this circuit.

If for any reason the ANI circuits fail to make an identification, the outpulser lights lamp TBL. This indication may or may not be accompanied by lighted indicator tubes, depending on the trouble. For instance, if the NN frame cross connections have not been made, a TBL lamp only will be lighted. Failure by the identifier

to receive a hundreds digit would omit lighting the hundreds indicator tube but would light all the other indicator tubes and the TBL lamp.

Lamp MP only is lighted when the customer's number is actually one of the parties on a multiparty line (other than two-party). This is sufficient since for calls from such lines a CAMA operator is connected to obtain the number for charging purposes.

After the display is received, it will remain connected only for 20.7-38.7 seconds, after which time it is automatically released. The display can be released prior to the end of this interval by removing the plug from jack ANI or ANIG.

Disconnect is accomplished by removing plugs from all jacks. If repeat verifications of the same number are desired, the plug must be removed from the ANI or ANIG jack momentarily and then reinserted, with other apparatus remaining undisturbed.

SECTION II - DETAILED DESCRIPTION

1. TERMINOLOGY

In this circuit description the following abbreviations will be used for this and connecting circuits.

- (a) SD-95888-01 - Use: "NMF Verification Ckt."
- (b) SD-25433-01 - Crossbar No. 1 - Incoming Trunk Circuit From Line Message Register Rack, Use: "MRR Trunk (No. 1 XB)".
- (c) SD-21973-01 - Panel - Line Verification Trunk Circuit, Use: "MRR Trunk (Panel)".
- (d) SD-95828-01 - Common Systems - Line Verification Connector and Display Circuit, Use: "LVC & D Ckt."
- (e) SD-25352-01 - Crossbar No. 1 - Miscellaneous Circuit For Line Message Register Rack, Use: "Misc. Ckt. (No. 1 XB)".
- (f) SD-21271-01 - Panel - Miscellaneous Circuit For Line Message Register Rack, Use: "Misc. Ckt. (Panel)".

2. SEIZURE

2.1 General

Prior to making a line verification for ANI, present procedures for non-ANI must be followed. That is, the line must be cross connected and verified for service. Two cross connections must also be made for ANI at the number network and primary bus circuit. There is another connection for ANI operation, from the line distributing frame (LDF), Crossbar No. 1, or the intermediate distributing frame (IDF), panel, to the number network and primary bus circuit; however, this is done at the time ANI is installed.

The sequence charts (SCs) for the operation of this circuit are shown on SD-95828-01, Line Verification Connector and Display (LVC & D) Ckt. The SCs referred to below are on SD-95828-01.

2.2 Crossbar No. 1 - SC1

If the patch cord between the Misc. Ckt. (No. 1 XB) and the LLF (hereafter to be called the LLF patch cord) is not connected, a plug must be inserted into the ANINLP jack. If apparatus Fig. 5 is not provided the LLF patch cord must be connected. With apparatus Fig. 5 either the LLF patch cord can be used with jack ANINLP normal, or the LLF patch cord may be omitted with a plug inserted into the ANINLP jack.

For non-ANI verifications the LLF patch cord should be used since otherwise a complete check is not made. With the patch cord connected, the LDF and block relay frame cross connections are verified and the patch cord assures that the correct hold magnet in the LLF horizontal group has been operated. Without the patch cord there is no guarantee that the correct hold magnet has been operated, although the correct LLF horizontal group has been selected.

ANI line verifications can be made without the patch cord, since if a connection is not correctly made the display will show this error.

Inserting a plug into jack ST is necessary to connect this circuit for use. There is a single MRR trunk (No. 1 XB) for joint use by this circuit and the MRR Misc. Ckt. That is, line verification can be made from either this circuit or from the MRR frame, not both. If the MRR trunk is idle, lamp ST at this circuit will light. Relays in the Misc. Ckt. (No. 1 XB) connect leads for use by this circuit and lock out the MRR frame. If the MRR trunk is in use from the MRR frame, then lamp (ST) does not light.

In general a miscellaneous circuit at the message register rack will serve one incoming trunk and one central office. However, the trunk has provision for serving two offices under control of a single miscellaneous circuit. When the lines of both these offices are located at the same number network frame location (which is the usual case) no special provision is made at the number network frame or at the message register rack location. One ST jack is furnished per FS9 and one ANI NLP jack is furnished per FS12. The number network frame location and the message register rack location may bid for the same incoming trunk (or trunks if two are sewed through the miscellaneous circuit) and the mutual lockout mentioned in the preceding paragraph will prevent interference.

If it is not feasible to locate all lines at one number network frame location more than one location may be used. If it is necessary to locate the lines of the two offices served by one miscellaneous circuit at two separate number network frame locations, then FS17 and FS18 must be used at the number network frame locations in place of FS9 and FS12, and additional relays (such as FS37 in SD-25352-01) must be furnished at the message register rack location. When a plug is inserted in either ST jack of FS17, the miscellaneous circuit is seized, calls are locked out at the message register rack location, and control leads and lamp leads are transferred from the miscellaneous circuit to the number network frame location that started the call.

Verification calls should not and in fact cannot be made thru both ST jacks at the same time, because the second call will be locked out by relay controls in the miscellaneous circuit. Should such verifications be attempted, the second call will not advance and the usual lamp signals ST, BY or BYI will not light at the locked-out number network frame location because all control and lamp leads will have been transferred by the miscellaneous circuit to the location that obtained preference.

The function of FS18 is merely to make the ANI NLP jacks effective at both number network locations served.

As described in CD-25352-01 (Misc. Ckt. No. 1 XB), and assuming the ST lamp is lighted, the number of the customer's line is either dialed, MF key pulsed or given to a B operator for handling. Usage of the jacks in FS1-4, with the hand test telephone set, FS5, FS7 and FS8 and the MF key pulsing set for MF key pulsing is as described in CD-25352-01. (This apparatus is identical to and has the same designations as the apparatus in SD-25352-01). Proper connection to the required number (non-ANI) is indicated by the lighting of lamp T, R or H. These lamps also indicate the class of the line connected: T for tip, R for individual, ring party or last line of a PBX group, and H for a first or intermediate line of a PBX group.

A plug must be inserted into jack ANI for Crossbar No. 1, BCO Panel, or GCO Panel Offices; or into jack ANIG for a GCO Panel Office when the number network serves combined GCO-BCO Panel Offices, to seize the MRR trunk, which in turn seizes the LVC & D Ckt.

2.3 Panel - BCO and/or GCO - SC2

In order to make a line verification in a Panel Office a patch cord must be connected at the IDF, connecting the customer's line to the Misc. Ckt. (panel) which in turn is connected to the MRR trunk (Panel). Without FS16 (Apparatus Fig. 9), the T, R, and S leads between the IDF and the MRR trunk (through the patch cord) are not connected to this circuit. In this case the MRR frame location has message registers for a single central office. For MRR frame locations having message registers for more than one central office, a single MRR trunk (Panel) is provided and is connected to the Misc. Ckt. (Panel) for the central office in which a verification is to be made by use of OF- jacks, one assigned to each office. OF- jacks are also provided in this circuit FS16 for operation with a multi-office MRR frame location.

Therefore, with FS16 provided the appropriate OF- jack must have a plug inserted. Without FS16 no OF-jacks are provided.

As described in Par. 2.2 above, the next step in order is the insertion of a plug into jack ST. This is provided for the same reason as for No. 1 Crossbar and functions in the same manner. One difference is that leads are switched to this circuit by the MRR trunk (Panel), when the associated MRR frame location is idle.

A plug must be inserted into either jack T or R. For individual, ring party and PBX lines the R jack is used. For tip parties (on 2-party lines) the T jack is used. For parties on multiparty lines one of these jacks must be used; however, it makes no difference which one. Use of the T or R jack sends the ANI outpulser a required signal. That is, the outpulser must know whether to attempt identifying in the tip or ring field of the number network and primary bus circuit (in No. 1 Crossbar these jacks are not required, since the terminating marker, in setting up the connection, registers customer line class in the MRR trunk, which in turn signals the outpulser).

A plug can now be inserted into the ANI or ANIG jack to seize the MRR trunk, which in turn seizes the LVC & D Ckt. When this circuit is associated with a MRR frame having message registers for: (a) a single BCO or GCO Panel Office or (b) more than one central office all of which are either BCO or GCO, the ANI jack is used in common with No. 1 Crossbar (since only one line verification can be made at a time. Leads closed for panel do not interfere with leads closed for No. 1 Crossbar). However, if this circuit is associated with a multiple office MRR frame location having BCO and GCO control offices, then an ANI jack is provided for verifications in No. 1 Crossbar and BCO Panel Offices and an ANIG jack is provided for verifications in the GCO office or offices. This is necessary to accommodate the differences between BCO and GCO Panel central offices.

3. LINE VERIFICATION DISPLAYS - SC1

As shown in SC1, seizure of the LVC & D Ckt. seizes the outpulser connector, which in turn connects an outpulser. The outpulser seizes an identifier and an identification of the line (to which the MRR Trunk, Crossbar No. 1 or Panel, is connected) is made. This information is registered by the outpulser in the LVC & D Ckt., which lights indicator tubes or lamp MP in this circuit. It is to be noted that the identification is the charging information that would normally be outpulsed to CAMA. So a comparison of the display lighted at this circuit with the actual line number provides a check that the ANI sleeve cross connections have been properly made.

For individual and ring and tip parties of two party lines, the display consists of

the OF-, TH-, H-, T- and U- indicator tubes lighted, which should be the actual number of the line being verified. For PBX lines, the same type of display is lighted; however, the number displayed is the charging number assigned to the PBX group. For multiparty lines the MP lamp only is lighted.

The display remains connected for an interval of 20.7 to 38.7 seconds, after which time it is automatically disconnected by the LVC & D Ckt. The display can be released prior to the aforementioned time interval by removing the plug from jack ANI or ANIG in this circuit.

The automatic time out is provided to prevent excessive delays to verifications waiting at either another NN frame location or nonassociated MRR frame location. Only one register feature is provided in the LVC & D Ckt. which may serve a maximum of six central offices.

4. REPEAT VERIFICATIONS - SC3

These can be made by momentarily removing the plug from the ANI or ANIG jack and then reinserting it. It is to be noted that other jacks, cords, etc. must remain undisturbed.

5. DISCONNECT - NORMAL

5.1 No. 1 Crossbar - SC4 and SC6

As stated above in Par. 3, plug removal from jack ANI or ANIG (prior to time-out) releases the display and enables other verifications to be made. More important is the requirement to remove the plug from (ST), since otherwise the associated MRR frame location is locked out.

SC4 shows the entire disconnect sequence for disconnects occurring prior to the 20.7-38.7 second interval. For disconnects after this interval (normal time-out), SC6 shows release of the lamp display, and SC4, the rest of the sequence.

When the ANINLP jack is used the plug must be removed as soon as the verification has been completed. This is necessary to assure proper operation at the associated MRR frame location under the following condition: a line verification is attempted at the MRR frame for which the LLF patch cord is used. If the ANINLP jack in this circuit still has a plug inserted the MRR frame verification would be prevented from getting the expected thorough check required for non-ANI tests (See Par. 2.2).

5.2 Panel - BCO and/or GCO - SC5 and SC6

Panel is the same as discussed in Par. 5.1 above for crossbar, with the following exceptions:

(a) Jack ANIG must be provided when the number network frame serves both BCO and GCO Panel Offices.

(b) Use SC5 instead of SC4.

(c) The OF- jacks (instead of the No. 1 Crossbar ANINLP jacks) require a precaution. If a plug remains in an OF-jack, there can be no interference to verifications made at the MRR frame location. If, however, verifications are attempted at this circuit with plugs inserted into two OF- jacks and if patch cords are connected for both at the IDF, then lines in two central offices would be interconnected. One possible reaction is receipt of an incorrect display (failure to verify) despite correct cross connections.

6. CUSTOMER BUSY CONDITIONS

6.1 Crossbar No. 1

Without jack ANINLP (or when it is provided but normal with the LLF patch cord connected), customer busy at the time initial connection is made lights lamp BY at the same time lamp ST is lighted. In this case, completion of the verification should proceed when lamp BY has been extinguished. With jack ANINLP provided and in use, the terminating marker would detect the busy and cause busy tone to be connected. See CD-25352-01.

Should a customer lift his receiver off-hook during a verification, the SS buzzer (FS14) is energized.

6.2 Panel - BCO or GCO

Customer busy at the time initial connection is made would cause the BY lamp to be lighted immediately following the lighting of lamp ST. In this case, completion of the verification should proceed when lamp BY has been extinguished.

Should a customer lift his receiver off-hook during a verification, lamp SUB would be lighted.

7. LVC & D CIRCUIT BUSY

The LVC & D Ckt. may serve a maximum of six central offices, and must do so on a one-at-a-time basis. Therefore (with lamp ST lighted) this circuit may have to wait to be served, in which case lamp BYI is lighted. Lamp BYI is extinguished when this circuit has preference and is served.

As shown on SC1 and SC2 for verifications with no delay, lamp BYI is energized momentarily, and may flash.

8. SPECIAL CONDITION

8.1 Time Out-Failure to Connect To An Outpulser

Assuming the ST lamp has been lighted and that this circuit has preference in the LVC & D Ckt., then the outpulser connector is seized (by the LVC & D Ckt.) to connect to an outpulser. If an outpulser is not connected within a 2-3.6 second interval, time-out occurs lighting lamp TO. (Note: Lamp TO does not light after the 20.7 - 38.7 second display interval).

For this condition the LVC & D Ckt. is locked under control of this circuit and no verifications from other NN frame or MRR frame locations in the same identifier

group can be made. This is done to protect service calls since the one line verification appearance on the outpulser connector is in a horizontal group with ANI outgoing trunks.

8.2 Trouble

If for any reason the ANI circuits detect a trouble condition, lamp TBL is lighted and an ANI trouble ticket is printed. Depending on the trouble, there may or may not be indicator tubes (or lamp MP) lighted. Failure to make the ANI cross connections would produce a TBL lamp lighted only. For this condition, the display is available for viewing for approximately 30 seconds, or may be released earlier as for normal verifications.

SECTION III - REFERENCE DATA

			<u>Jack</u>	<u>Meaning</u>	<u>Main Function</u>
1.	<u>WORKING LIMITS</u>		KP	Key Pulse	Provides means for testing relay KP - Crossbar No. 1 Office.
	None				
2.	<u>FUNCTIONAL DESIGNATIONS</u>				
2.1	<u>Buzzer</u>	<u>Meaning</u>		<u>Main Function</u>	
	SS	Subscriber-Service	OF-	Office	Provides means for selecting the particular office with which the MRR trunk will function - Panel Office.
			R	Ring	Provides means for giving the Outpulser a ring party indication - Panel Office.
2.2	<u>Jack</u>				
	ANI	Automatic Number Identification	ST	Start	A plug inserted locks out access from the associated MRR frame.
			T	Tip	Provides means for giving the Outpulser a tip party indication - Panel Office.
	ANIG	Automatic Number Identification Ground	TRK	Trunk	Used for access to subscriber's numbers - Crossbar No. 1 Office.
			X TRK	X-Number Trunk	Used for making calls to extra numbers not in the regular subscriber number series - Crossbar No. 1 Office.
	ANINLP	Automatic Number Identification - No Line Link Patchcord			A plug inserted eliminates the need for a patchcord at the LLF - Crossbar No. 1 Office
			2.3	<u>Lamps</u>	
	B TRK	Office B Trunk	BY	Busy	Lights to indicate a line initially busy (when LLF patchcord is used).
	BX TRK	Office B, X-Number Trunk	BYI	Busy Identification	Lights to indicate the LVC & D Ckt. busy.

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<u>Lamps</u>	<u>Meaning</u>	<u>Main Function</u>	<u>Relay</u>	<u>Meaning</u>	<u>Main Function</u>
H	Hunt (PBX)	Lights to indicate that the line connected to is a first or intermediate line of a PBX group - Crossbar No. 1 Office.			terminating sender is attached and ready for key pulses - Crossbar No. 1 Office.
MP	Multiparty	Lights to indicate that the identified number is that of a multiparty line.	2.5	<u>Resistor</u>	
				A	To prevent accidental fuse operation.
R	Ring	Lights to indicate that the line connected to is a ring party, individual line, or last line of a PBX group - Crossbar No. 1 Office.	2.6	<u>Socket (Jones)</u>	
				MFP	Multi-frequency Pulsing
					Provides means for connecting to the multi-frequency supply - Crossbar No. 1 Office.
ST	Start	Lights to indicate that the associated MRR frame location is locked out.	2.7	<u>Telephone</u>	
				HTS	Hand Telephone Set
					Provides for completion of a connection to the line to be verified by dialing or by the assistance of a "B" operator - Crossbar No. 1 Office
SUB	Subscriber	Lights to indicate that a subscriber, whose line is held by the MRR trunk, is trying to originate a call - Panel Office.	2.8	<u>Indicator Tubes</u>	
T	Tip	Lights to indicate that the line connected to is a tip party - Crossbar No. 1 Office.		H	Hundred
					Lights to indicate the hundreds digit of the identified number.
TBL	Trouble	Lights to indicate that the Outpulser has timed out under a trouble condition.		OF	Office
					Lights to indicate the office code of the identified number.
TO	Time-out	Lights to indicate that the LVC & D Ckt. has timed out on failure to connect to an Outpulser.		T	Ten
					Lights to indicate the tens digit of the identified number.
				TH	Thousands
					Lights to indicate the thousands digit of the identified number.
2.4	<u>Relay</u>				
	Key Pulse	Provides for control of a lamp signal when the MF		U	Unit
					Lights to indicate the units digit of the identified number.

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3. FUNCTIONS

- 3.01 For Crossbar No. 1 (optional) - Provided ANINLP jacks to enable ANI line verifications not requiring connection of a patch cord at the LLF.
- 3.02 For panel - BCO and/or GCO - (optional) - Provides OF- jacks to select a particular office for associated multioffice MRR frames.
- 3.03 Provides an ST lamp to indicate its connection to the associated MRR trunk.
- 3.04 Provides a lock-out feature to prevent associated MRR frame interference once connected to a MRR trunk.
- 3.05 For Crossbar No. 1 - Provides facilities to originate verifications through the terminating end of the central office (Dialing, MF key pulsing or B operator).
- 3.06 Provides an ANI jack to originate line verifications, except for GCO panel offices in combined BCO-GCO panel offices.
- 3.07 Provides an ANIG jack for a GCO panel office in combined BCO-GCO panel offices
- 3.08 Provides a display to enable viewing the ANI identification.
- 3.09 Provides lamp TO to indicate time out on failure to connect to an output.
- 3.10 Provides lamp TBL to indicate troubles encountered by the ANI circuits.

3.11 Provides lamp BY to indicate customer's line initially busy when a patchcord is provided.

3.12 Provides lamp BYI to indicate LVC & D Ckt. busy.

3.13 Provides lamps T, R and H to indicate customer class of service.

4. CONNECTING CIRCUITS

4.1 Line Verification Connector and Display Circuit - SD-95828-01.

4.2 Miscellaneous Circuit for Line Message Register Rack (Crossbar No. 1) - SD-25352-01.

4.3 Line Verification Trunk Circuit (Panel) SD-21973-01.

4.4 MF Current Supply and Distributing Circuit (Crossbar No. 1) - SD-95391-01.

5. MANUFACTURING TEST REQUIREMENTS

5.1 This circuit shall perform all service functions specified in this circuit description and shall meet all the standards of the Circuit Requirement table. It also shall be able to function under the test conditions listed below.

5.2 All tests shall be performed with the test voltage between -45 to -50 volts.

6. MAKE BUSY AND TAKING EQUIPMENT OUT OF SERVICE

This circuit is not in use until a plug is inserted in either the ANINLP, OF-; or ST jack.

SECTION IV - REASONS FOR REISSUE

A. CHANGED AND ADDED FUNCTIONS

A.1 Provision is made for ANI line verifications to be originated from either of two Number Network Frame locations.

D. DESCRIPTION OF CHANGES

D.1 In FS9 and FS12, the following is added to the title: "associated miscellaneous circuit serves one or two offices and one Number Network Frame location."

D.2 In FS13, multiple straps formerly shown on leads MP, TBL, and TM are removed and the following is added to the Connecting Information: "or to Misc. Ckt. Line MSG, REG, RK -- See Note 304 on SD-95828-01."

D.3 FS17 and FS18 are added to show the arrangement used for No. 1 crossbar offices where the associated miscellaneous circuit serves two offices and two Number Network Frame locations.

D.4 In Circuit Note 102, the information pertaining to App. Figs. 1, 2, 4, and 5 under "QUANTITY" is changed to read: "One per Number Network Frame location per miscellaneous circuit for Line Message Register Rack Frame." The note previously read: "One per miscellaneous circuit for Line Message Register Rack Frame."

D.5 CAD 1 and CAD 3 are changed to include the cabling for FS17 and FS18.

D.6 Under "Supporting Information" the Equipment Design Requirement is changed to J99250. It was formerly listed in error as J99205.

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