INCOMING TRUNK FRAMES
FOR USE WITH 100-TRUNK CAPACITY INCOMING LINK FRAMES
EQUIPMENT DESIGN REQUIREMENTS
NO. 1 CROSSBAR SYSTEM

CONTENTS PAGE

1. GENERAL

Scope

1.01 This specification, together with the supplementary information listed herein, covers the equipment design requirements for the framework, equipment, and circuits to be used in the engineering, manufacture, and installation of incoming trunk frames and units for use with the 100 trunk capacity incoming link frame in No. 1 crossbar offices. Equipment included in this specification may be ordered by specifying the code and list and group numbers covered in part 5.

1.02 This specification is reissued:

(a) To add reference to note D under J27751M Lists 23 and 24. In accordance with SD-25436-01, Issue 13D, the change provides wiring for TOUCH-TONE frequency test of subscriber stations when required.

(b) To add equipment information required in incoming trunks SD-25295-01, Issue 19D and SD-25302-01, Issue 26D, to reduce false disconnects caused by speech simulated disconnect signals in SF signaling units, (talk-offs).

(c) To bring it in conformity with other Plant Series sections.

Capacity

1.03 The incoming trunk frame mounts five units of incoming trunks. Each incoming trunk unit will mount 20 single mounting plate trunks and provides terminal strip punchings for 20 trunks. Certain trunks, however, require two mounting plates. Therefore, although each unit has terminal strip capacity for 20 incoming trunks, it will mount from 10 to 20 incomings depending on the mounting plate requirements of the individual trunks. Where each unit does not mount its full complement of 20 trunks, a supplementary incoming trunk frame shall be provided and the remaining trunks located on the supplementary frame and cabled to the terminal strips of the unit on the regular incoming trunk frame. The capacity of the supplementary frame is the same as that of the regular incoming trunk frame.

Description

1.04 Incoming trunks may be divided into three general types, full selector, "B" switchboard and dial pulsing, as determined by the type of terminating sender required. They furnish a means of completing calls from subscribers or operators to subscribers in the crossbar office. Where required, they furnish transmission and supervision for the called subscriber and ring the called subscriber bell. Number checking incomings enable the toll operator

to verify the calling party on toll calls. Other incomings are provided to gain access to subscriber lines or message registers for testing purposes.

1.05 Incoming trunks obtain access to terminating senders through the terminating sender link frame for the purpose of controlling the completion of the call in the crossbar office. The terminating sender link frame is arranged to connect trunks either to full selector or "B" senders or to full selector or dial pulsing senders. In addition, incoming trunks are connected to an incoming link frame through which a call may be completed to the line link frame on which the particular called line appears. The incoming link frame and the terminating sender link frame each have facilities for association with 100 incoming trunks. The incoming trunk frame with a nominal capacity of 100 trunks is located between the associated incoming link frame and terminating sender link frame to keep the length of connecting leads as short as possible.

1.06 Trunks requiring access to either full selector or "B" senders may be located on the same incoming trunk frame in groups of 10. No group of 10 trunks shall, however, include incomings requiring access to full selector senders and those requiring "B" senders. Similarly, trunks requiring access to either full selector or dial pulsing senders may be located on the same frame but no group of 10 shall include incomings requiring access to full selector senders and those requiring dial pulsing senders.

1.07 Full selector incoming trunks serve traffic originating in a panel or crossbar office. This type of trunk also includes interoffice trunks originating at a key pulsing DSA switchboard or a key pulsing toll board, number checking trunks from a key pulsing toll board, and trunks from sender tandem as well as trunks from key indicator or key pulsing manual tandem and key indicator manual local offices.

1.08 "B" switchboard incoming trunks require the assistance of the dial system "B" board operator for the completion of calls. They may originate in manual offices, at manual tandem or at DSA and toll switchboards not equipped for key pulsing. Other incoming trunks which may require the assistance of the DSB operator are those from the local test desk (or central test bureau) and from the line message register rack. These trunks are used to gain access to subscriber lines or message registers for testing purposes.

1.09 Dial pulsing incoming trunks serve traffic originating at a dialing "A" switchboard, local test desk or line message register rack. These trunks may be arranged for initial "B" switchboard operation with wiring for conversion to dial pulsing.

1.10 Key pulsing incoming trunks which serve traffic originating at a DSA switchboard require access to key pulsing senders in order to register the number set up on the operator's keyset and to full selector senders to control the completion of a call. These trunks are therefore wired in local cable to the terminating sender link frame for access to full selector senders and in switchboard cable to the key pulsing sender link frame for access to crossbar key pulsing senders. Key pulsing incoming trunks arranged to operate with panel key pulsing senders obtain access to these senders through relay rack mounted sender selectors.

1.11 The incoming trunks from tandem may be provided with local or toll grade transmission.

1.12 The trunks from DSA switchboard and test desk may be furnished with or without the "no test" feature which permits the establishment of a connection to a given line over a busy condition.

1.13 The toll switching trunks may be arranged for either automatic start or controlled start ringing. The controlled start ringing trunks may be used for either delayed outward or inward service. The automatic start ringing trunks are intended for use only on inward service.

1.14 A-C key pulsing incoming trunks are arranged to permit the completion of calls from switchboards using a-c key pulsing as a means of signaling to the local crossbar office. The incoming trunks which have been provided with this feature are in general, the regular incoming trunks from toll or central "A" switchboard. Where not arranged for it initially, they may be converted for it in the field provided

means for obtaining access to a-c key pulsing senders is available. These incoming trunks will gain access to a-c key pulsing senders through the terminating sender link frame. Usually it will be necessary to use a terminating sender link frame arranged for four classes of senders.

Incoming Trunk Frame

1.15 The incoming trunk frame, which has a nominal capacity of 100 incoming trunks, is a single sided, 2 bay structure, 6'-4-3/4" long and 11'-6" high, and is located between the associated terminating sender link frame and incoming link frame. This arrangement facilitates maintenance and keeps the length of connecting leads between the incoming trunks and adjacent link frames to a minimum. Both link frames include these leads in their local cables and provide local cable extensions to be connected at the incoming trunk unit terminal strips after the frames have been placed in position on the floor.

1.16 The supplementary incoming trunk frame uses the same frame and unit assemblies as the regular incoming trunk frame. Its capacity is therefore the same as that of the regular frame. Since it mounts incomings which are

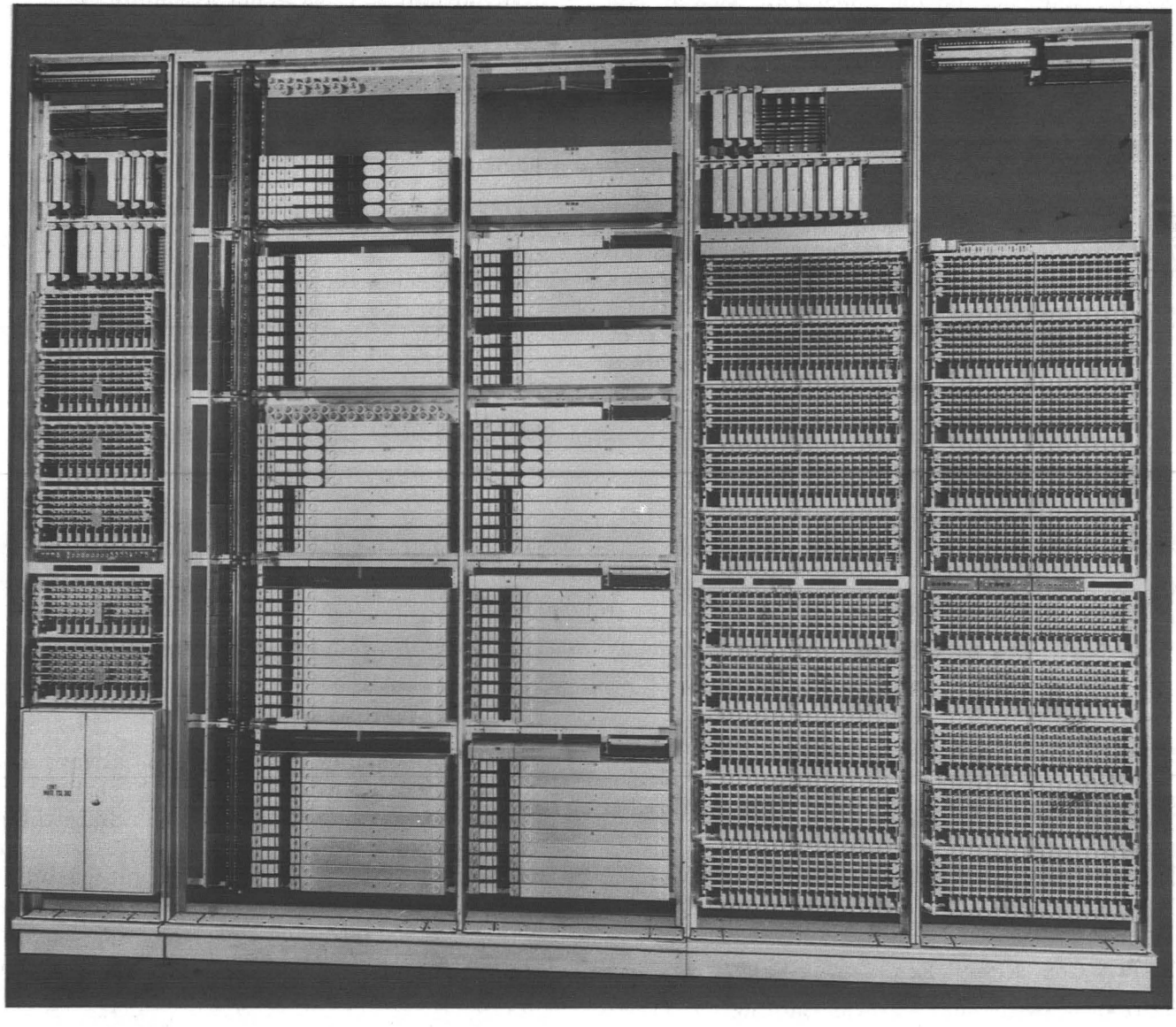

Fig. 1 – Terminating Sender Link, Incoming Trunk, and Incoming Link Frames

associated with a number of regular incoming trunk frames, all leads to the supplementary frame are in switchboard cable.

Incoming Trunk Unit

1.17 Each incoming trunk is mounted on one or two 30-1/2" mounting plates, a strip cover being provided over the "U" and "Y" relays. A total of 20 single plate trunks may be mounted on one unit. The unit is 6'-4-1/4" long and 2'-1-1/8" high and has provision for two sets of ten 30-1/2" mounting plates side by side. The 10 trunks on the lower half of the unit on the regular incoming trunk frame are associated with an even numbered incoming link primary switch and those on the upper half with an odd numbered primary switch. The incomings on a given unit on the supplementary frame may, because of terminal strip limitations, be associated with not more than three different incoming link primary switches.

1.18 The unit mounts a terminal strip on the left hand side to which leads from the terminating sender link frame are soldered and a terminal strip on the right for incoming link frame leads. The unit also mounts a fuse panel, jack and lamp panel, and a mounting plate of relays common to the unit and accommodates a resistance lamp mounting for 20 lamps when required.

Subdivision of Equipment

ED-25048-01 — Incoming Trunk Frame Assembly

ED-91393-01 — Talking Battery Supply Frame Filter

J27751M (A&M Only) — Incoming Trunk Unit — To be equipped with Miscellaneous Incoming Trunks as Specified — 4 Party Semi-Selective Ringing

2. SUPPLEMENTARY INFORMATION

816-000-000 — No. 1 Crossbar System Index

BSP — Gen. Equip. Req. — Wiring and Cabling

BSP — Gen. Equip. Req. — Numbering and Lettering Crossbar Equipment

BSP — Gen. Equip. Req. — Auxiliary Framing

J20150 — Switchboard Power Cabling

J25552 — Frame Lighting and Appliance Outlets

Floor Plan Data — Section 9.1, Sheet 6 — Terminating Sender Link, Incoming Trunk and Incoming Link Frames

3. DRAWINGS

Keysheet

SD-25000-01 — Keysheet — No. 1 Crossbar System

Framework

ED-25020-01 — Cable Brackets

ED-25021-01 — Jack, Key, and Lamp Panels

ED-25023-01 — Frame Details

ED-25025-01 — Fuse Panel Assembly

ED-25040-01 — Unit Jack Panel

ED-25046-01 — Unit Framework Assembly

ED-25048-01 — Frame Assembly

Equipment

ED-25102-01 — Incoming Trunk Frame and Unit Equipment

ED-25102-03 — Incoming Trunk Frame — Mounting Plate Equipment

ED-25212-01 — Designation Card

Wiring and Cabling

ED-25047-01 — Unit Local Cable

ED-25151-01 — General Switchboard Cabling Practices

ED-25159-01 — Cabling Schematic and Switchboard Cable Details for Incoming Trunks

ED-25346-01 — Method of Running Power Feeders

4. FLOOR PLAN ARRANGEMENT

4.01 An incoming trunk frame is always associated with a terminating sender link frame and an incoming link frame. Since the incoming trunks must have access to both link frames, the sender link frame is placed on the left, looking at the front, of the incoming trunk frame and the incoming link frame on the right, in the same line. The supplementary incoming trunk frame should be located as near as possible to the regular incoming trunk frames with which it is associated.

5. EQUIPMENT

ED-25048-01 — Incoming Trunk Frame Assembly

Group 1 — Incoming trunk frame assembly

ED-91393-01 — Talking Battery Supply Frame Filter

Group 3 — One filter

Note

A. One talking battery supply filter shall be furnished for each incoming trunk frame and for each supplementary incoming trunk frame.

J27751M (A&M Only) — Incoming Trunk Unit — To be Equipped with Miscellaneous Incoming Trunks as Specified — 4 Party Semi-Selective Ringing

Unit Equipment — ED-25102-01
Mounting Plate Equipment — ED-25102-03
Local Cable — ED-25047-01

List 1 — Framework, assembly, wiring, and common equipment for one unit of miscellaneous incoming trunks

	WIRE	EQUIP	SEE NOTE
Framework ED-25046-01, G1	–	1	
Fuse Panel ED-25025-01, Item 5	–	1	
Jack Panel ED-25040-01, Item 1	–	1	6.17
Incoming Trunk Ckts.	As Spec	0	
Timing Ckt. SD-25038-01, Fig. 2	As Spec	As Spec	6.33
Misc. Ckt. SD-25439-01, Figs. 16 and 18	1	As Spec	6.17

List 2 — Equipment required in addition to list 1 for one timing circuit common to the unit — SD-25038-01, Fig. 2. (See note 6.33.)

List 4 — Equipment required in addition to list 1 for one incoming trunk from tandem or toll arranged for 4 party semi-selective ringing — SD-25295-01, Figs. 1 & A. (See notes 6.18, 6.20, 6.30, 6.47, and E.)

List 5 — Equipment required in addition to list 1 for one incoming trunk from toll office or central "A" switchboard arranged for 4 party semi-selective ringing — SD-25302-01, Figs. 1 & C. (See notes 6.20, 6.21, 6.33, and F.)

List 6 — Equipment required in addition to list 1 for one incoming trunk from "A" switchboard — key pulsing — arranged for 4 party semi-selective ringing — SD-25294-01, Figs. 1 & A. (See note 6.23.)

List 7 — Equipment required in addition to list 1 for one incoming trunk from "A" switchboard, arranged for "B" switchboard operation, 4 party semi-selective ringing (not arranged for conversion to dialing sender operation) — SD-25303-01, Figs. 1, A, & C. (See note B.)

List 8 — Equipment required in addition to list 1 for one incoming trunk from "A" switchboard — key pulsing — no test— (not arranged for multi-office operation) — SD-25255-01, Figs. 1, A, & C. (See notes 6.22, 6.24, & 6.27.)

List 10 — Equipment required in addition to list 1 for one incoming trunk from "A" switchboard — no test—arranged for "B" switchboard operation — (not arranged for conversion to dialing sender operation) — SD-25202-01, Figs. 1, A, & C. (See notes 6.22, 6.24, & 6.26.)

List 11 — Equipment required in addition to list 1 for one "B" switchboard number checking incoming trunk from No. 1 or No. 3 toll switchboard — SD-25256-01, Fig. 1. (See note 6.25.)

List 12 — Equipment required in addition to list 1 for one "B" switchboard incoming trunk from line message register rack for use in offices having a line distributing frame — SD-25192-01, Fig. 1. (See note 6.29.)

List 13 — Equipment required in addition to list 1 for one incoming trunk from outgoing trunk test frame — SD-25299-01.

List 14 — Equipment required in addition to list 1 for one "B" switchboard incoming trunk from "A" switchboard — through ringing — SD-25322-01, Figs. 1, 2, & A.

List 15 — Equipment required in addition to list 1 for one incoming trunk from "A" switchboard, arranged for dial pulsing sender operation, 4 party semi-selective ringing — SD-25303-01, Figs. 1, B, & C. (See note B.)

List 16 — Equipment required in addition to list 1 for one incoming trunk from "A" switchboard — no test—arranged for dial pulsing sender operation — SD-25202-01, Figs. 1, B, & C. (See notes 6.22, 6.24, & 6.26.)

List 17 — Equipment required in addition to list 1 for one incoming trunk circuit from "A" switchboard — no test—for use with panel key pulsing senders — SD-25351-01, Figs. 1 & A. (See notes 6.22 & 6.24.)

List 19 — Equipment required in addition to list 1 for one "B" switchboard incoming trunk from No. 12B or No. 14 local test desk — with or without no test feature — not arranged for access to "X" numbers — SD-25037-01, Figs. 1 & C. (See notes 6.14 & 6.24.)

List 20 — Equipment required in addition to list 1 for one "B" switchboard incoming trunk from No. 12B or No. 14 local test desk — with or without no test feature — arranged for access to "X" numbers — SD-25037-01, Figs. 1 & D. (See notes 6.14, 6.15, & 6.24.)

List 21 — Equipment required in addition to list 1 for one number checking incoming trunk from toll switchboard arranged for either "B" switchboard or full selector operation — SD-25329-01, Fig. 1. (See note 6.25.)

List 22 — Equipment required in addition to list 1 for one incoming trunk from "A" switchboard — key pulsing — no test — arranged for multi-office operation — SD-25255-01, Figs. 1, B, & C. (See notes 6.22, 6.24, & 6.27.)

List 23 — Equipment required in addition to list 1 for one "B" switchboard incoming trunk from No. 12B or No. 14 test desk — with or without the no test feature — not arranged for access to "X" numbers — SD-25436-01, Figs. 1, (include Fig. 2 for no test) A, & D. (See notes 6.14, 6.24 and D.)

List 24 — Equipment required in addition to list 1 for one "B" switchboard incoming trunk from No. 12B or No. 14 test desk — with or without the no test feature — arranged for access to "X" numbers — SD-25436-01, Figs. 1 (include Fig. 2 for no test) B, & D. (See notes 6.14, 6.15, 6.24 and D.)

List 25 — Equipment required in addition to list 1 for one dial pulsing incoming trunk from No. 14 test desk — with or without the no test feature — not arranged for access to "X" numbers — SD-25432-01, Figs. 1, (include Fig. 2 for no test) A, & D. (See notes 6.14 & 6.24.)

List 26 — Equipment required in addition to list 1 for one dial pulsing incoming trunk from No. 14 test desk — with or without the no test feature — arranged for access to "X" numbers — SD-25432-01, Figs. 1, (include Fig. 2 for no test) B, & D. (See notes 6.14 & 6.24.)

List 27 — Equipment required in addition to list 1 for one incoming trunk from line message register rack for use with either "B" switchboard or dial pulsing senders — SD-25433-01, Figs. 1 & H. (See note 6.28.)

List 28 — Equipment required in addition to list 1 for one intercepting completing incoming trunk from central "A" switchboard arranged for either "B" switchboard or full selector operation and 4 party semi-selective ringing — SD-25415-01, Figs. 1, C, and D. (See notes 6.18 & 6.47.)

List 29 — Equipment required in addition to list 1 for one incoming trunk from central "A" switchboard — no test — arranged for 4 party semi-selective ringing — SD-25420-01, Figs. 1 & C. (See notes 6.14, 6.18, 6.20, 6.24 & 6.33.)

List 30 — Equipment required in addition to list 1 for one incoming trunk from "A" switchboard, for use with panel key pulsing senders, arranged for thermistor controlled 4 party semi-selective ringing — SD-25353-01, Figs. 1, C, D, and G.

List 31 — Equipment required in addition to list 1 for one number checking incoming trunk from toll switchboard arranged for a-c key pulsing operation — SD-25329-01, Fig. 3.

List 32 — Equipment required in addition to list 1 for one intercepting completing incoming trunk from central "A" switchboard arranged for a-c key pulsing operation and 4 party semi-selective ringing — SD-25415-01, Figs. 1, C, and E. (See notes 6.18 and 6.47.)

Notes

A. When this circuit is to be arranged initially for individual and 2 party selective ringing, furnish wiring for both Figs. A and C.

B. On equipment drawing ED-25102-03, Fig. 3C shall be used for SD-25303-01, Figs. 1, A & C when no provision is to be made for conversion to dialing sender operation. Use Fig. 27F for dialing sender operation and Fig. 27C (omitting apparatus for Fig. B but including wiring for Fig. A) when initial "B" switchboard operation is required.

C. SD-25420-01 may be arranged for a-c key pulsing operation by connecting "E" wiring. For "B" switchboard or full selector operation connect "F" wiring.

D. Specify "H" wiring when TOUCH-TONE frequency test is required and remote control is not provided. Otherwise specify "J" wiring.

E. The code of the D relay is dependent on whether or not a slow disconnect trunk is or is not required, in accordance with circuit note.

F. Where it is required that SD-25302-01 function as a slow disconnect trunk, furnish "ZX" wiring and apparatus in addition to Lists 1 and 5. Furnish slow disconnect trunk in accordance with circuit note.

6. GENERAL NOTES

Equipment

6.01 The number of different types of incoming trunks which have been designed and the variation in the quantities of these trunks required make it impracticable to code separate units to care for all conditions. When job requirements for incoming trunk units are not met by the regular coded units, miscellaneous units per J27751D, or J27751M shall be made up in accordance with the particular conditions. In making up these units the design and practices of the standard units shall be followed. The fuse, jack, and terminal strip punchings associated with a given incoming shall be in line with the mounting plate. Further restrictions and requirements for incoming trunks are covered in the following paragraphs.

6.02 In general, units on the regular incoming trunk frame requiring cabling to trunks on the supplementary frame shall be located at the top of the frame.

6.03 The incoming trunks on a unit on the supplementary incoming trunk frame may be associated with a maximum of three different incoming link primary switches.

6.04 All incoming trunks which are arranged for either initial or ultimate no test operation shall be mounted on a supplementary incoming trunk frame in order that each trunk may be assigned double the usual number of individual punchings on the vertical terminal strip. Each no test trunk shall therefore be assigned two mounting plate positions on the unit on the supplementary frame, regardless of whether it is a one or two plate trunk.

6.05 No group of ten trunks shall include more than two toll number checking trunks due to their high calling rate. In addition, it is desirable to equalize switch wear on the terminating sender link primary switches due to this type of trunk. The like numbered selecting magnets on the three terminating sender link primary switches are operated in parallel and, therefore, the trunk units shall be so arranged that number checking trunks will not appear on like numbered horizontals of the primary switches on a terminating sender link frame. This limits the

number of these trunks that may be associated with a terminating sender link frame to ten.

6.06 Each incoming link primary switch accommodates ten incoming trunks. These ten trunks constitute a group. No group of ten trunks shall include incomings requiring access to both full selector senders and "B" senders or access to both full selector senders and dial pulsing senders. In addition all trunks in the group shall require the same cross connection (FS, MAN, or TOL) on the incoming link frame. In multi-office terminating units where it is necessary to give office discrimination signals to the terminating sender based on the group of ten trunks in which common or individual trunks are located, each trunk in the group shall require the same cross connection (OA, OB or OC) on the terminating sender link frame. Where the terminating equipment is arranged to include a physical and a theoretical office in the same 10,000 number series and where it is necessary to give a discrimination signal to the terminating marker based on the group of ten trunks in which restricted or unrestricted trunks are located, each trunk in the group shall require the same cross connection (IP, IT or IPT) on the incoming link frame. Where all of the ten trunks associated with the same incoming link primary switch can not, due to mounting plate limitations, be located on the unit on the regular incoming trunk frame, the trunks which cannot be accommodated shall be located on the supplementary frame and cabled to the terminal strip punchings on the regular unit.

6.07 The units on the incoming trunk frame and supplementary incoming trunk frame shall be equipped from bottom up.

6.08 The toll or central "A" board incoming trunk units will mount ten, two plate circuits. When one of these units is located on a regular incoming trunk frame, the upper five trunks shall be associated with an odd numbered incoming link primary switch and the lower five with an even numbered switch. When the unit is located on a supplementary frame, the upper and lower five trunks shall be in different groups, the group number in each case depending on the number of the associated trunk group on the regular incoming trunk frame. The incoming trunks located on a unit on the regular frame shall be numbered 0, 2, 4, 6, 8 for each group. The associated trunks on the supplementary frame shall be odd numbered. In order that the units may be identical, irrespective of their location, the stamping of the trunk and group numbers on the mounting plates, fuse panel, jack panel, and terminal strip shall be on a job basis. The local cable shall always connect to the lower of the two jacks, fuses, and sets of terminal punchings associated with each trunk. Ten jacks shall be equipped on the jack panel.

Incoming Trunks

6.09 Traffic to crossbar offices originating in other offices having varying types of equipment causes a number of different incoming trunks to be required. Certain of these incoming trunks, however, may be used for several purposes, either without change or with simple wiring and apparatus changes which may be provided for in universal wiring. These incomings are classified on the tables shown on ED-25102-03 and these tables also indicate the various equipment designations and the preferred and alternate incoming link cross connections for intercept routing and supervisory features which are to be used for each incoming trunk. Where the function of an incoming trunk may be altered by MDF changes only, with no apparatus or wiring changes on the incoming unit, the incoming will, of course, bear the same equipment designation for both functions.

6.10 SD-25022-01, SD-25292-01, or SD-25304-01 may be used as intraoffice or interoffice trunks from either panel or crossbar to crossbar offices (FS). They may be used as intraoffice or interoffice incoming trunks from manual to crossbar (DSB) and under this condition may require the addition of an auxiliary incoming trunk circuit per SD-25025-01. Where local grade transmission is satisfactory, they may be used as an incoming trunk to crossbar from manual tandem (DSB) or sender tandem (FS). The (FS) classification also includes their use as an interoffice trunk from a DSA switchboard equipped for key pulsing to crossbar. The auxiliary incoming trunks are mounted on a 10 per unit basis on the relay rack.

6.11 SD-25259-01, SD-25295-01, and SD-25305-01 are primarily tandem trunks offering toll grade transmission. They may be used for either manual (DSB-TT) or sender (FS-TT) tandem

and also for inward service from toll where the inward trunks are in a separate group on either a "B" switchboard (DSB-TT) or a key pulsing (FS-TT) basis.

When either these circuits or those discussed under paragraph 6.10 are used as incoming trunks from a manual tandem office with through supervision, a reversal shall be made in the tip and ring leads at the tandem point between the tandem board and the incoming trunk.

6.12 SD-25026-01 is a controlled start ringing toll trunk for either inward or outward service from toll which may be used on either a key pulsing (TOLL KP DR) or manual (TOLL DSB DR) basis. The (D3) and (D4) relays are not required when the trunk is incoming from No. 3 toll switchboard. SD-25302-01, SD-25307-01 and SD-25314-01 are toll or central "A" board incoming trunks which may be used for the same purposes as SD-25026-01, except that they offer reversed battery supervision as well as controlled start ringing and toll grade transmission.

6.13 With the following exceptions, the remaining incoming trunks are restricted to a single use which is self explanatory in their respective titles: SD-25037-01 and SD-25436-01 are local test desk trunks for use on a manual basis and SD-25432-01 is a local test desk trunk for use on a dial pulsing basis. All of these trunks may be arranged for regular or no test operation and with or without provision for access to "X" numbers. SD-25202-01 is a no test DSA board trunk which may be used either on a dial pulsing (DSA DP NT) or a manual (DSA DSB NT) basis. SD-25329-01 is a toll number checking trunk which may be used either on a key pulsing (TOLL FS NC) or a manual (TOLL DSB NC) basis. SD-25433-01 is a trunk from the line message register rack for testing subscriber line message registers which may be used on either a dial pulsing or manual basis, with or without provision for access to "X" numbers.

6.14 Incoming trunks from the local test desk may be mounted on the regular incoming trunk frame only when the no test feature will never be required, in which case the wiring and apparatus which is required only for this feature shall be omitted.

6.15 In order to avoid the possibility of magnetic interference, the "B" switchboard incoming trunks from the local test desk which require the "X" number feature, either initially or ultimately, shall be isolated from all other incoming trunks by at least one mounting plate space or the equivalent in non-magnetic apparatus. They need not be isolated from each other, however, and may be located together at the top or bottom of a unit, on either the regular or supplementary frame, in order to save mounting place space.

6.16 From the above considerations it follows that trunks must be grouped in accordance with the type of sender and the terminating sender and incoming link cross connections required. Where the above trunks, offering several uses, are involved in the grouping, consideration should be given to their possible future change in sender and cross connection requirements since such changes involve more than MDF or simple wiring changes on the unit.

6.17 On all incoming trunk units, except those arranged for controlled start ringing incoming trunks from toll or central "A" boards and those for miscellaneous trunks, the jack panel shall be fully equipped with 239 type jacks and a 4 x 90 terminal strip per Fig. F of ED-25102-01 shall be furnished. On trunk units arranged for controlled start ringing incoming trunks from toll or central "A" boards, ten jacks shall be equipped on each jack panel as covered in note 6.08 and a 7 x 90 terminal strip per Fig. E of ED-25102-01 shall be furnished. On miscellaneous incoming trunk units, the jack panel shall be equipped as required except that when wiring only is furnished for circuits which require jacks, the jacks shall be equipped. A 7 x 90 terminal strip per Fig. E of ED-25102-01 shall be furnished on miscellaneous incoming trunk units. The (FA) and (20A) lamps and resistances and KS-5556 fuse mounting shall be equipped only on the first and third units from the bottom of the frame. When individual frame talking battery supply filters are provided, the (FC1) and (FC2) lamps and resistances shall be equipped on the top unit only on fully equipped frames and on the bottom unit only on partially equipped frames.

6.18 On full selector or "B" switchboard incoming trunks and on tandem or automatic start ringing toll incoming trunks, the code of the (A) relay is dependent on the external circuit loop as covered in notes on these trunk circuits. For the particular loop condition, the (A) relay is located in a universally punched position which mounts either a "B" or an "S" type relay.

6.19 On incoming trunk units which are arranged to mount ten full selector or "B" switchboard trunks and ten tandem or automatic start ringing trunks from toll or central "A" boards, the full selector or "B" switchboard trunks shall be located on the bottom half of the unit and the tandem, toll or central "A" board incoming trunks on the upper half of the unit.

6.20 On incoming trunks from tandem, toll or central "A" boards, the repeating coils shall be furnished in accordance with the circuit notes for the particular trunk.

6.21 On controlled start ringing incoming trunks from toll or central "A" boards, the (CN) relay shall be provided and connected only when coin control is required. When coin control is not required, loop wiring shall be provided at the position of the (CN) relay in accordance with information on the circuit drawings.

6.22 On no-test trunks from "A" switchboards, provide the (A) retardation coil when the cord supervisory lamp is to be extinguished when connection is established to a busy line.

6.23 On key pulsing trunks from "A" switchboards, Fig. B shall be provided for SD-25024-01 or "Y" wiring and apparatus for SD-25294-01 and SD-25306-01 when the associated cords are arranged for key pulsing on both calling and answering ends. Fig. A or "Z" wiring and apparatus, respectively, shall be provided when the associated cords are arranged for key pulsing on the calling end only.

6.24 On incoming trunks from local or central "A" boards, which are arranged for no test operation, the (F2) relay shall be equipped in offices having more than nine line choice connector frames. On local test desk no test incoming trunks, the (F2) relay shall be equipped in offices having more than ten line choice connector frames. Wiring shall be provided for the (F2) relay only when the ultimate number of line choice connector frames is more than nine or ten, respectively.

6.25 On number checking incoming trunks from toll, the (NC) relays and (B) resistances for Figs. 1A, 1B and 1C shall be located on the relay rack when required and cabled to the associated toll number checking incoming trunks.

6.26 On equipment drawing ED-25102-03, Fig. 4 shall be used for SD-25202-01, Figs. 1, A & C when no provision is to be made for conversion to dialing sender operation. Use Fig. 28 for dialing sender operation and 28A (omitting apparatus for Fig. B but including wiring for Fig. A) when initial "B" switchboard operation is required.

6.27 On equipment drawing ED-25102-03, Fig. 23A shall be used for SD-25255-01, Figs. 1, A, & C when no provision is to be made for conversion to multi-office operation. Use Fig. 23B for multi-office operation and Fig. 23A (omitting apparatus for Fig. B but including wiring for Fig. A) when initial single office operation is required. When multi-office operation is required, each incoming trunk per SD-25255-01 shall be given a terminating sender link primary switch appearance corresponding to a trunk group giving an "A" office indication to the terminating sender and also an appearance in a group giving a "B" office indication. The trunk group giving the "A" indication and that giving the "B" indication must be associated with the same sender link frame in order to give the same frame indication to the marker for both.

6.28 Furnish SD-25433-01, Figs. 1, E & H for all trunks arranged for "B" switchboard operation and Figs. 1, F & H for those used with dial pulsing senders. Wiring for both Figs. E & F should be included when initial "B" switchboard operation is required with provision for conversion to operation with dial pulsing senders. Furnish Fig. A with Fig. 1 where only one terminating sender link appearance is required (ED-25102-03, Figs. 43A or 43D). Furnish Fig. C with Fig. 1 in one office and Fig. D with Fig. 1 in the second office (Figs. 43B or

43E) in multi-office terminating units having separate incoming link groups. Furnish Fig. B with Fig. 1 (Figs. 43C or 43F) in multi-office terminating units where two terminating sender link appearances for the same trunk are required. The trunk group giving the "A" indication and that giving the "B" indication must be associated with the same sender link frame in order to give the same frame indication to the marker for both.

6.29 Furnish SD-25192-01, Figs. 1, 2 & A for access to "X" numbers. Furnish Figs. 1, 3 & A in multi-office terminating units where two terminating sender link appearances are required and also access to "X" numbers. Omit (BX) relay in Fig. 3 when access to "X" numbers is not required. The trunk group giving the "A" indication and that giving the "B" indication must be associated with the same sender link frame in order to give the same frame indication to the marker for both.

6.30 A resistance lamp mounting plate per ED-25102-03, Fig. 32, shall be furnished with list 1 of all trunk units on which trunks per SD-25259-01, SD-25295-01, and SD-25305-01 are mounted.

6.31 A resistance lamp mounting plate per ED-25102-03, Fig. 33, shall be furnished with list 1 of all trunk units on which trunks per SD-25026-01 are mounted.

Miscellaneous Frame Circuit

6.32 The apparatus for the frame miscellaneous circuit SD-25439-01, Figs. 2, 3, 5, 6, 7, 9, 10, 11, 13, 14, and 15, shall be mounted on jack panels per ED-25021-01, Items 6 and 19, as shown on the frame equipment drawing. The panel per ED-25021-01, Item 19, shall be mounted on the second unit from the bottom and wired as covered later under wiring notes. The jack panel per ED-25021-01, Item 6, shall be mounted as covered on the frame equipment drawing. When only one unit is furnished on a regular or supplementary frame, this equipment shall be located on a job basis. The (FB) and (G) relays for SD-25439-01, Fig. 12, shall be located on the relay rack.

Timing Circuit

6.33 The timing circuit per SD-25038-01, Fig. 2, is required on all units mounting incoming trunks from panel, crossbar, or sender tandem and is optional for use with trunks from toll that are used for inward switching. Relay (B) of this circuit shall be associated with the ten or less trunks on the top half of the unit which require timing and relay (C) with those on the lower half of the unit. In addition, equipment per Fig. 1 of SD-25038-01 is required per incoming trunk frame mounting these trunks. The (DX) lamp and (DX) key for Fig. 1 shall be mounted with the miscellaneous frame circuit apparatus on a panel per ED-25021-01, Item 5, on the second unit from the floor. The remaining apparatus required for Fig. 1 shall be mounted on the relay rack.

Main Distributing Frame

6.34 All the incoming trunks associated with the same incoming trunk frame, with the exception of those from test desks, should be grouped together, in consecutive order, on the terminal strips on the horizontal side of the main distributing frame. Two 183B terminal strips shall be furnished at the HMDF, per incoming trunk frame. This arrangement provides four punchings per incoming trunk. While the majority of the incoming trunks require only two leads, certain of the incomings require three or four leads to the main frame and the provision of four punchings per circuit permits the location of incomings on the HMDF in consecutive order with no special job engineering. Trunks from test desks shall be cabled in 1000CL type cable from the frame on which the trunk is located and grouped on a separate terminal strip on the HMDF. This is necessary in order to provide a better grade of insulation for test desk trunks than that provided in the usual 24 gauge L type switchboard cable.

Wiring

Local Cable

6.35 ED-25047-01 shows the local cable for incoming trunk units. This local cable should be made in accordance with the types of incoming trunks in a particular unit. No frame local cable is required. All local cable wiring shall be 24 DCL except battery and ground leads

which shall be 22 DCL. 20 ESCB wire shall be used, where required, for ringing and tone leads serving two or more circuits on a unit.

6.36 The local cables for the terminating sender link and incoming link frames are provided with local cable tails which carry the leads between these frames and the incoming trunk units. The local cable arms from these frames should be soldered on the corresponding terminal strips and apparatus on the incoming trunk units by the installer after the frames are in place on the floor.

6.37 The vertically mounted terminal strip at the left of the unit is used to terminate all switchboard cable for the unit as well as the leads from the terminating sender link frame which are contained in a local cable arm from that frame. The arrangement of the terminal strip is such that individual punchings for 2 circuits are in line with the mounting plates on which these circuits are located. All miscellaneous leads are terminated on the top portion of the unit terminal strip.

6.38 The horizontally mounted terminal strip at the right of the unit is used to terminate the wiring from the incoming link frame which is brought to this strip in a local cable arm from that frame. All these leads are distributed to the respective incoming trunks through the main vertical arm of the unit local cable.

6.39 The "NN," "NT," "NC," "NH" etc., leads to the marker connector relays of the incoming link and connector circuit are common to all no test, toll number checking and test incoming trunks associated with the same incoming link and connector which require these leads. They shall be run from the incoming link frame to the incoming trunk frame in the local cable arm to the top unit only and wired to the other units on the frame by the installer as required. Since these leads are brought to the top incoming trunk unit, trunks requiring them should, as far as practicable, be assigned to a fully equipped incoming trunk frame. Where this is not practicable, the installer shall run these leads, when they are required, from the terminal strip on the incoming link frame to the highest equipped unit (where this is not the top unit) on the incoming trunk frame, superimposing the leads on the incoming link local cable. For units mounted on the supplementary frame, three sets of punchings are assigned to these common leads so that trunks on a particular unit may be associated with three incoming link frames.

6.40 The traffic register leads "PB" and "PC" for each incoming trunk requiring them are wired to individual punchings on the vertical terminal strip. These punchings shall be strapped, as required in order to associate several incoming trunks on the same unit with the same traffic register circuit. Twelve punchings common to the unit are provided on the vertical terminal strip which may be used either for paths busy or peg count register leads. The common punchings are cabled to the traffic register distributing frame and shall be strapped, as required, to the individual "PB" and "PC" punchings in order to associate the individual circuits with traffic registers. The individual "PB" and "PC" leads for incoming trunks on the supplementary incoming trunk frame shall be cabled to the associated individual punchings on the regular incoming trunk frame and grouped with other incomings located on the regular frame.

6.41 Key pulsing incoming trunks require access to key pulsing senders to register the number written up on the operator's keys. They also require full selector terminating senders to control the setting up of the call in the crossbar office. Key pulsing incoming trunks, therefore, besides being wired in local cable to the terminating sender link frame, must be wired in switchboard cable to the key pulsing sender link frame.

6.42 As indicated in paragraph 6.17, the fuse alarm lamps (FA) and (20A) are located on the first and third units from the bottom of the frame while the (FC1) and (FC2) lamps are located on either the top or bottom unit. Each unit local cable shall include an "F" lead to these lamps from miscellaneous vertical terminal strip punching 3. For each regular incoming trunk frame, the associated terminating sender link frame local cable shall carry the "F" lead from punching 3 of the bottom incoming trunk unit only to punching 237 on the terminal strip at the top of the terminating sender link frame.

It shall be picked up at this point by the switchboard power cable and carried to the floor alarm circuit through the SDPTS. The "F" lead shall be multipled from the bottom incoming trunk unit to the third and fifth units from the bottom of the frame by the installer. For supplementary frames, the "F" lead shall be run as covered later under "Switchboard Cable."

6.43 The apparatus for the miscellaneous frame circuit and timing circuit mounted on the first and second units from the floor on each regular incoming trunk frame shall be wired from the DPTS through the miscellaneous terminal strip at the top of the associated incoming link frame. The leads to the miscellaneous circuit apparatus that is mounted on the second unit from the floor shall be carried in the incoming link frame local cable arm to that unit. This arm shall be of sufficient length to reach the apparatus on the panels and shall be superimposed on the top arm of the unit local cable. The leads to any miscellaneous circuit apparatus that is mounted on the first unit from the floor shall be run by the installer superimposing the leads on the incoming link frame local cable. The miscellaneous circuit apparatus located on the supplementary incoming trunk frames shall be wired as covered under "Switchboard Cable."

Battery and Ground

6.44 Where individual frame talking battery supply filters are not provided, talking battery and ground feeders shall be brought directly to the fuse panels on the units. Where individual frame talking battery supply filters are provided, the two ground supply leads for the filters shall be wired to the (FC) ground punching on the top unit on fully equipped frames or to the bottom unit on partially equipped frames. The two fuse alarm leads shall be wired to the (FC1) and (FC2) resistances on the same fuse panel used for terminating the ground leads.

6.45 Ground feeders for the fuse panels on the units shall be terminated at the top of the fuse panel of the top unit on fully equipped frames and at the bottom of the fuse panel of the bottom unit on partially equipped frames. Copper tie bars per ED-25025-01, Item 6, shall be used to connect the battery and ground bars of fuse panels of adjacent units. Battery feeders for the fuse panels on the units shall be terminated at the KS-5556 fuse mountings which are furnished with the first and third unit fuse panels from the bottom of the frame.

6.46 Group busy indication on the DSA switchboard incoming trunks is an A&M feature. When it is provided, the 24 volt battery supply shall be obtained from the miscellaneous fuse board.

Strapping

6.47 On "B" switchboard incoming trunks and on tandem or automatic start ringing toll incoming trunks, the straps between the miscellaneous vertical terminal strip punchings shall be removed as required when return tone on overflow connections is not required.

Terminating Sender Link and Incoming Link Frame Cross-Connections

6.48 There are various cross connections to be made on the terminating sender link and incoming link frame terminal strips, per group of ten trunks, which affect the procedure of the terminating marker in completing a call. All trunks within a group of 10 require the same one of three possible cross connections on the miscellaneous terminal strip at the top of the incoming link frame, the resulting indication being passed on to the marker to secure the proper routing on intercepted calls and to establish the proper supervisory features on free calls. One CL punching is provided on the terminal strip for each incoming link primary switch (ten trunks) and three pairs of punchings designated FS, MAN and TOL, respectively. The three cross connection points are used, in general as follows:

FS — To route to the local intercepting or local trouble intercepting trunk group and to cancel supervision on calls to free lines.

MAN — To route to the local intercepting or local trouble intercepting trunk group and to give supervision on calls to free lines.

TOL — To route to the toll intercepting or toll trouble intercepting trunk group and to give supervision on calls to free lines.

Tables A, B, C and D on ED-25102-03 indicate the cross connection which should be used for each incoming trunk. In those cases where an alternate cross connection is shown as well as a preferred, the alternate may be used at the discretion of the Telephone Company in those cases in which it appears that there will be equipment and traffic advantages from associating a particular incoming with a group of ten requiring the alternate cross connection. In multi-office terminating units it may be necessary to give office signals to the terminating sender based upon the arrangement of individual or common trunks in groups of ten. These indications involve cross connections on the "A" and "B" cable well terminal strips on the terminating sender link frame. The arrangement of individual and common trunks in groups of ten and the sender link cross connection per group should be in accordance with the office signaling and office discrimination chart listed in the key sheet. When a 10,000 number series includes both a physical and a theoretical office an IP, IT or IPT cross connection per group of ten trunks may be required on the miscellaneous terminal strip at the top of the incoming link frame. One PT punching is provided for each incoming link primary switch which can be cross connected to one of three pairs of punchings designated IP, IT and IPT, respectively. These cross-connections, which control office discrimination signals to the terminating marker, should be made in accordance with the office discrimination chart listed in the key sheet and are used as follows:

IP — For trunk groups over which the completion of calls is restricted to physical office numbers only.

IT — For trunk groups over which the completion of calls is restricted to theoretical office numbers only.

IPT — For trunk groups over which the completion of calls is unrestricted.

Switchboard Cable

6.49 The switchboard cable for a given arrangement of incoming trunk frames must be engineered in accordance with the requirements of the particular job. In general, the largest practicable cables shall be used.

6.50 With several minor exceptions all incomings require cabling to the MDF for cross connection to trunks. For the majority of the incoming trunks this cabling will consist of two leads "T" & "R" per circuit. Where practicable, one cable per incoming trunk frame shall be used for the "T" & "R" leads to the MDF and fanned over the vertical terminal strips of the various units on the frame. Those incoming trunks requiring three or more leads to the MDF shall be cabled in accordance with the requirements of the individual circuits. The incoming trunks from test desks shall be cabled as covered in paragraph 6.34.

6.51 Twelve common punchings are provided on the vertical terminal strip of each unit to which the individual "PB" and "PC" leads for each incoming trunk shall be strapped as required in order to associate them with traffic register circuits. Twelve leads shall be cabled to the traffic register distributing frame from each incoming trunk frame. These shall be run in one cable to the common punchings on the top equipped unit on each incoming trunk frame, and multipled to the common punchings on the other units on the frame. These leads may be used for either paths busy or peg count registration by any incoming trunk circuit on a given incoming trunk frame. The provision of twelve leads per incoming trunk frame to the traffic register distributing frame is not intended to include the "PB" registration for manual incoming trunks per SD-25022-01, SD-25292-01, or SD-25304-01. The "PB" registration for these circuits should be obtained at the associated auxiliary incoming trunk circuits mounted on the relay rack.

6.52 Nine leads to the key pulsing sender link frame are required per key pulsing incoming trunk. Cables for these leads should be provided as required on the basis of one cable per unit containing key pulsing incomings.

6.53 Where "A" switchboard coin control is required for toll incoming trunks, one cable per incoming trunk frame, carrying one lead per toll incoming trunk and three leads per unit mounting toll incomings, shall be run to the MDF for cross connection to coin control circuits. Where trunk coin control circuits are used, one cable per incoming trunk frame, carrying two leads per toll incoming trunk requiring coin control, shall be run to the MDF.

6.54 Incoming trunks located on a supplementary frame require cabling to the unit on the regular frame with which they are associated. This cabling includes leads to the associated incoming link and terminating sender link frames, leads to the HMDF and the individual "PB" and "PC" leads. The terminating sender link, MDF, and traffic register leads must be cabled between the vertical terminal strips on the two units and the incoming link leads between horizontal terminal strips. In general, one cable from the vertical terminal strips of units on the supplementary frame and one cable from the horizontal terminal strips shall be run to each regular incoming trunk frame with which the incomings on the supplementary frame are associated.

6.55 No test incoming trunks, which are always located on the supplementary frame, require cabling to the no test connector switches. The "T," "R," "S," and "H" leads and as many of the "JC" leads per no test incoming trunk as are required, shall be run in one cable to the first bay of the miscellaneous frame mounting no test connector switches. The remainder of the "JC" leads per no test incoming shall be run as required to succeeding bays of miscellaneous frame mounting no test connector switches.

6.56 Each incoming trunk unit will require leads common to the unit to the interrupter frame. Certain of these leads are designated as "C2" wiring and must, therefore, be run in a separate cable. One cable per incoming trunk frame or supplementary frame to the interrupter frame is required and one additional cable for each lead marked "C2."

6.57 Certain units require timing equipment per SD-25038-01, Fig. 2. This figure requires two leads per incoming trunk unit to the relays per SD-25038-01, Fig. 1, located on the relay rack. These leads shall be run in one cable per incoming trunk frame or supplementary frame to the timing equipment on the relay rack. The "B" lead to the interrupter frame, common to all unit timing circuits on an incoming trunk frame shall be run in the switchboard cable with other leads to the interrupter frame.

6.58 Incoming trunks from LTD or CTB require two leads per ten trunks to the tone supply. These two leads cannot be run in the same cable so that ordinarily two cables per unit containing these trunks must be run to the tone supply. Where there are two or more units on the same frame containing these trunks, the two cables may be fanned over all units so equipped.

6.59 Incoming trunks from the line message register rack require a number of leads per trunk to the line message register rack. These leads shall be run in one cable per unit containing this trunk to the miscellaneous circuit on the line message register rack.

6.60 Toll number checking incomings per SD-25256-01 or SD-25329-01 require two leads per circuit to the MDF. When a number checking chain circuit is not required, the "CT" lead common to all the toll number checking incomings shall be run in the cable to the MDF from the incoming trunk frame on which these circuits appear and shall be placed on an unused punching associated with one of the toll number checking incomings. When a chain circuit is used, the "CT" lead shall be cabled from the MDF to the relay rack mounted chain circuit equipment and one cable, containing four leads, run to the chain circuit from the incoming trunk frame mounting toll number checking incoming trunks which are in one terminating marker group.

6.61 One 20 gauge switchboard cable per incoming trunk frame or supplementary incoming trunk frame shall be run to the miscellaneous fuse board for ringing supply. This cable shall be fanned over the vertical unit terminal strips and shall contain the ringing supply leads for all incoming trunks on the frame. In addition, two leads to the (E) jack of the miscellaneous frame circuit, which should be connected directly to the (E) jack, shall be included in this cable. One fuse per incoming trunk unit shall be furnished at the fuse board for each ringing lead required.

6.62 No switchboard power cable is required for regular incoming trunk frames since miscellaneous leads for these frames will be brought in through the associated terminating sender link and incoming link frames. However, from the supplementary incoming trunk frame, one cable shall be run for miscellaneous leads to a DPTS associated with the regular incoming

trunk frames. This cable shall be terminated directly to the apparatus on the miscellaneous circuit panels. The "F" lead for the lineup including the supplementary incoming trunk frame shall be furnished in duplicate, one lead in the regular switchboard power cable and one from the DPTS directly to the bottom unit on the supplementary frame.

List of "A&M Only" & "Mfr. Disc." Equipment

6.33 The following equipment has been replaced as indicated:

EQUIPMENT	RATING	COVERED IN ISS.	REPLACING EQUIPMENT
J27751A	Mfr. Disc.	5	—
J27751B	Mfr. Disc.	5	—
J27751C	Mfr. Disc.	5	—
J27751D	Mfr. Disc.	5	—
J27751E	Mfr. Disc.	5	—
J27751F	Mfr. Disc.	5	—
J27751G	Mfr. Disc.	5	—
J27751H	Mfr. Disc.	5	—
J27751J	Mfr. Disc.	5	—
J27751K	Mfr. Disc.	5	—
J27751L	Mfr. Disc.	5	—
J27751M, L3	Mfr. Disc.	5	—
L9	Mfr. Disc.	3	J27751M, L19 & 20
L11	A&M Only	5	J27751M, L21
L18	Mfr. Disc.	5	J27751M, L30
J27751N	Mfr. Disc.	5	—

All other J codes covered in this specification are also rated "A&M Only" to conform with the rating of this incoming trunk frame.

Bell Telephone Laboratories, Inc.

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