

TERMINATING TROUBLE INDICATOR FRAME

EQUIPMENT DESIGN REQUIREMENTS

NO. 1 CROSSBAR SYSTEM

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 the terminating trouble indicator frame in No. 1 crossbar offices.

1.02 This specification is reissued:

- (a) To provide equipment design requirements for OPR indication when calls reach vacated and unassigned numbers per SD-25284-01, Issue 38B.
- (b) To provide equipment design requirements for connection to a Centralized Status, Alarm and Control System (CSACS) per SD-25064-01, Issue 38B.
- (c) To incorporate previous addenda and remove references to number checking in text of Part 1.

CAPACITY

1.03 The terminating trouble indicator frame accommodates the equipment required to function with a maximum of 10 terminating markers, 18 terminating marker connectors, 90 terminating senders, 20 incoming link frames, 25 number group connectors, and 20 line choice connectors in one large terminating unit. The terminating trouble indicator frame may be arranged to serve two or three single-office terminating units or two multioffice terminating units where the total number of terminating markers for all units will not exceed ten in the ultimate. Under these conditions, the maximum number of marker connectors is increased from 18 to 25, incoming link frames from 20 to 40, number group connectors from 25 to 50, and

line choice connectors from 20 to 40. The maximum numbers of terminating senders, when more than one terminating marker group is served, are the same as those for one marker group.

1.04 The terminating trouble indicator frame may be equipped to serve Line Link Pulsing—Automatic Intercept Service (LLP-AIS), Line Link Pulsing—Direct Inward Dialing (LLP-DID) and the 101 ESS Direct Access (101 ESS DA) features. The terminating trouble indicator frame would then accommodate the equipment required to function with a maximum of the following:

- 6—Outgoing Sender Groups
- 6—Outgoing Sender Connectors
- 2—Translators
- 2—Translator Connectors
- 3—Direct Access Pretranslator Connectors

DESCRIPTION

1.05 The terminating trouble indicator frame is a combined maintenance and test frame used in a crossbar dial office to facilitate the location of troubles in and to check the operation of the terminating markers by:

- (a) Taking a record of the information set up in a terminating marker when it fails to complete its function in the allowed time.
- (b) Setting up a test call in a terminating marker, allowing it to complete its functions, and taking a record of the resulting translations and progress of the test call.

1.06 In addition, busy indication lamps for terminating markers, terminating marker connectors, terminating senders, incoming link frames, number group connectors, and line choice

connectors are located on the terminating trouble indicator frame. Terminating sender hold jacks and trouble lamps, terminating sender selector unit identification lamps, and various make-busy jacks are also located on this frame. The various make-busy jacks are used for making terminating markers busy to all terminating marker connectors, terminating markers busy to particular terminating marker connectors, the trouble indicator frame busy to terminating markers, and for taking out of service particular senders and senders associated with the same terminating marker connector or in the same terminating sender subgroup.

1.07 The terminating trouble indicator frame is a single-sided steel structure 11 feet 6 inches high and 2 feet 8-1/8 inches long. The frame accommodates one double-row fuse panel, having a capacity of 50 fuses, and 11 terminal strips at the top. The 11 terminal strips are arranged in three rows; four in the upper row, four in the middle row, and three in the bottom row. Seventeen 30-1/2 inch channel-type mounting plates are located beneath the terminal strips under a relay casing on the front of the frame. Ten trouble record registers are located on a mounting plate below the relay casing. A key and lamp panel assembly, arranged for three 8-1/2 inch panels, is mounted under this mounting plate. The key and lamp panel is 2 feet 6 inches high and accommodates the various keys, jacks, indicating lamps, and

designation strips required for the maximum equipment.

1.08 A ticket receptacle, which supports a writing shelf, is mounted under the key and lamp panel. Thirteen 3-1/2 inch channel-type mounting plates are located under a relay casing on the front of the frame below the writing shelf.

1.09 All connections between the terminating trouble indicator frame and associated frames are made by means of switchboard cables terminated on the 11 terminal strips at the top of the frame, with the exception of the terminating sender make-busy and hold jacks, terminating sender selector unit make-busy jacks, and associated lamps. These jacks and lamps are cabled directly to terminal strips on the associated frames and units.

1.10 The preferred location for the terminating trouble indicator frame is in the maintenance center adjacent and to the left of the terminating sender test frame.

1.11 When LLP-AIS, LLP-DID or 101 ESS-DA equipment is required, then J28854C, List 2 arrangement must be used. This arrangement provides an increased capacity for equipment on the jack lamp and key panel and on the frame fuse panel. Also required would be a relay rack mounted equipment per Table A.

TABLE A

TTI RELAY UNITS (RELAY RACK MOUNTED)

| UNITS SHALL BE EQUIPPED AS FOLLOWS: | | | | |
|-------------------------------------|----------|-------------------------|-------------------------|-------------------------------------------------------|
| UNIT | | QUANTITY TO BE PROVIDED | | TITLE OF UNIT AND DESCRIPTION OF FEATURE OR OPTION |
| J CODE | LIST NO. | ALWAYS | FOR OPTION INDICATED | |
| J28854E | 1 | 1 | | LLP and 101 ESS Control Relay Unit |
| | 2 | | 1 | 101 ESS Direct Access Equipment |
| | 3 | | 1 | LLP-DID or 101 ESS Number Series Equipment |
| J28854F | 1 | | 1 | LLP Relay Unit |
| J28854G | 1 | | 1 | LLP-AIS Relay Unit |
| J28854H | 1 | | 1 | LLP-DID Relay Unit |

2. SUPPLEMENTARY INFORMATION

816-000-000—No. 1 Crossbar System Index
 J25551—816-040-150—End Guards, Aisle Pilot Lamp
 and DPTS Supports, Fuse Record Book
 and Holder, and Spare Fuse Mountings
 J25552—816-017-150—Frame Lighting (Incandescent
 Type) and Appliance Outlets
 J85505—Central Office Lighting (Fluorescent Type)
 Floor Plan Data—Section 9.3, Sheet 5
 Section 9.9, Sheet 3

3. DRAWINGS

WE J drawings listed should be ordered by referring
 to the prefix and base number and requesting the
 highest suffix dash (—) number.

Keysheet

SD-25000-01—Crossbar System No. 1

Framework

ED-25025-59—Assembly of Fuse Panel
 ED-25260-10—Steel Panels
 ED-25506-70—Pigeon Holes and Writing Shelf
 ED-25627-50—Frame Assembly
 ED-90002-10—Flush Panels
 ED-90382-10—Key Adapters

ED-90978-01—Assembly of Relay Casings
 ED-91722-70—Assembly of Key and Lamp Panel

Equipment

J28854C-()—Terminating Trouble Indicator Frame
 J28854D-()—Terminating Trouble Indicator Frame
 Fuse Panel
 J28854E-()—LLP and 101 ESS Control Relay Unit
 J28854F-()—LLP Relay Unit
 J28854G-()—LLP-AIS Relay Unit
 J28854H-()—LLP-DID Relay Unit

Wiring and Cabling

ED-25338-10—Switchboard Cabling Details
 ED-25346-14—Methods of Running Power
 ED-25346-15—Feeders
 ED-25628-10—Frame Local Cable

4. EQUIPMENT***J28854C—AT&T Co Std—Terminating Trouble
Indicator Frame***

Equipment—J28854C-()
 Local Cable—ED-25628-10

List 2—Framework, assembly, wiring, and common
 equipment for one terminating trouble
 indicator frame.

| | WIRE | EQUIP | NOTES | | WIRE | EQUIP | NOTES |
|---------------------------------------------------------------------------|------|-------|--------------|--------------------------------------------------------------------------|------|-------|-----------|
| Framework, ED-25627-50, G1 | | 1 | | Chan Rels, Fig. 19 | 10 | 10 | |
| Key & Lp Pan Assembly, ED-91722-70, G2: | | 1 | | Line Conn Rels, Fig. 20 | 20 | 0 | G |
| Pigeon Holes & Writing Shelf, ED-25506-70, G1: | | 1 | | Line Junctor Rels, Fig. 21 | 10 | 10 | |
| Rel Casing, ED-90978-01: G3017 (Front Only) | | 1 | | Line Junctor Grp Sel Rels, Fig. 22 | 5 | 0 | H |
| G3013 (Front Only) | | 1 | | Junctor Pattern Rels, Fig. 23 | 10 | 0 | I |
| Ter Tbl Ind Ckt, SD-25284-01: | | | | Line Lk Subgrp Rels, Fig. 24 | 10 | 10 | |
| Cont Rels, Fig. 1 | 1 | 1 | | No. Grp Conn Rels, Fig. 25 | 25 | 0 | R |
| Pref Chain Cont Rels, Fig. 2 | 10 | 0 | A | H Blk Rels, Fig. 26 | 25 | 0 | J,AA |
| Test Call Trsg Keys, Fig. 5, Including ZT Wiring, Less T & W App | 1 | 1 | Q, AH, AP | Individual Line Rels, Fig. 27 | 20 | 20 | |
| No. Lp Rels, Fig. 7 Including ZT App, Less R & W App | 1 | 1 | T, AH, AP | Jump Htg Twenty Blk Rels, Fig. 28 | 5 | 5 | |
| Class-of-Call Rels, Fig. 8, Less N & T App | 1 | 1 | S, Q | Allr Step Rels, Fig. 29 | 1 | 1 | |
| Ring & Tone Cont, Incpt BB & Ovfl Rels, Fig. 9, Less S App | 1 | 1 | U | Inc Mate Fr Check Rel, Fig. 30 | 1 | 0 | K |
| Progress Rels, Fig. 10 | 1 | 1 | AP | Jump Htg Start Term. Rels, Fig. 31 | 10 | 10 | |
| Tbl Rels, Fig. 11, Less ZG App | 1 | 1 | B | Hunt Progress Rels, Twenty Blk Indication, Fig. 32 | 9 | 9 | |
| Ter Mkr Conn Fr Rels, Fig. 12 | 5 | 0 | C | Free Line Rels, Fig. 33 | 1 | 1 | |
| Ter Mkr Conn Rels, Fig. 13 | 4 | 0 | D | Allr Rels, Fig. 34 | 1 | 1 | |
| Ter Sdr Rels, Fig. 14 | 5 | 0 | E | Light & Heavy Tr Rels, Fig. 35 | 1 | 1 | |
| Inc Lk & Conn Fr Rels, Fig. 15 | 20 | 0 | F | Spl Test Keys & Progress Rec Rels, Fig. 36, Less ZZ App | 1 | 1 | V |
| Inc Trk Rels, Fig. 16 | 10 | 10 | | Physical & Theoretical Off. Indicator, Fig. 37, Including V Wiring | 1 | 0 | AI, AJ |
| NF Lead Cross-connec- tion Rel, Fig. 17 | 1 | 1 | | Inc Sec Sel Mag | 1 | 1 | |
| Line Lk Grp Rels, Fig. 18 | 1 | 1 | | Check Rel, Fig. 38 | 1 | 1 | |
| | | | | Fig. 39, Q Wiring, & Fig. E, F, G, & H | 1 | 0 | AK |
| | | | | No. Sleeve Rels, Fig. 40 & YK Option | 20 | 20 | |

| | WIRE | EQUIP | NOTES | | WIRE | EQUIP | NOTES |
|----------------------------------------------------------------------------------------------------|------|------------|-------|-----------------------------------------------------------------------|------|-------|-----------|
| PBX Block Allr Rels, Fig. 41 | 1 | 0 | AO | Ter Mkr Tbl Rls Reg, Fig. 14 | 10 | 0 | A |
| Flexible Maintenance Lead Rels, Fig. 42 | 1 | 1 | | Ter Sdr Grp MB Jk, Fig. 15 | 20 | 0 | O |
| Timing Rels, Fig. B | 1 | 1 | | Crossed Lead Detector, Fig. 16 | 10 | 0 | A |
| Twenty Blk Keys, Fig. C | 1 | As Reqd | AA | Ter Mkr MB Jk, Fig. 17 | 10 | 0 | A |
| Extra No. Rels, Fig. D | 1 | As Reqd | AA | Ter Mkr Conn MB Jk, Fig. 18 | 180 | 0 | P |
| Control Key for Incoming Trunk Test of Second Trial to Overflow Feature, Fig. 43 | 1 | 1 | AP,AQ | Conn Sdr No. Lp, Fig. 19 | 1 | 1 | |
| Line Ckt Reg & Translator Control, Fig. 45, Lamps Only | 1 | 0 | | Bat. Jk, Fig. 21 | 1 | 1 | |
| Outgoing Sender Regis- tration, Fig. 46, Lamps Only | 1 | 0 | | Sdrs Busy Alm. Without DSA Swbd Aux Sig. Fig. 22 | 12 | 0 | X,Z |
| Line Link Pulsing, Fig. 47 & 48, Lamps Only | 1 | 0 | | Sdr Load Cont, Fig. 22 | 3 | 0 | AB |
| LLP — Automatic Inter- cept Fig. 49, Lamps Only | 1 | 0 | | Cancel TI Rec of Line Tbls, Fig. 24, Less CCT Jacks | 1 | 1 | |
| LLP — Direct In Dialing Fig. 50, Lamps Only | 1 | 0 | | Cancel TI Rec of Line Troubles, Fig. 24, CCT Jacks Only | 10 | 0 | A |
| Number Series Fig. 51, Lamps Only | 1 | 0 | | Test Bat., Fig. 25 | 1 | 1 | |
| Control Relays Fig. 52A, YJ & ZU Options | 1 | 0 | | Frame Line Ckt, Fig. 26 | 3 | 0 | AN |
| Test Call Transmit Switches, Fig. 53 | 1 | 1 | | Sdrs Busy Alm. With DSA Swbd Aux Sig Fig. 27, Less X & W App | 12 | 0 | Y,Z |
| 101 ESS, Fig. 54, Lamps Only | 1 | 0 | | Ter Mkr Busy Lp, Fig. 29 | 10 | 0 | A |
| Ter Tbl Ind Misc Ckt, SD-25064-01: | | | | Inc Fr Busy Lp, Fig. 30 | 40 | 0 | AC |
| Frame Line Jack, Fig. 3 | 1 | 1 | | Line C Conn Busy Lp, Fig. 31 | 40 | 0 | AD |
| Sdrs Busy Alm. Rls Key, Fig. 5, ZL Option | 1 | 1 | AR | No. Grp Conn Busy Lp, Fig. 32 | 50 | 0 | AE |
| Spare Jk, Fig. 6 | 1 | 1 | | Term. Sdr Sel Ckt, Fig. 33 | 9 | 0 | AF, AM |
| MB Jk, Hld Jk, & Tbl Lp, Fig. 8 (FS Ter, Cent., B, DP Ter, DP NC or KP NC Sdrs) or Fig. 9 | | | | Term. Sdr Lp, Fig. 34 | 90 | 0 | AG, AM |
| (Local B or Ac KP Sdrs) | 100 | 0 | L,M | Link Alm. Lp, Fig. 37 | 40 | 0 | AL |
| Conn Lp Fig. 10 | 25 | 0 | N | Tbl Reodr Ckt, Fig. 38 | 10 | 0 | A |
| Ter Sdr Fail. to Rls Alm, Fig. 11 & A | 1 | 1 | | Sequence Ckt Alm, Fig. 41 & D | 3 | 0 | AN |
| Ter Mkr Time Alm., Fig. 12 | 1 | 1 | | Term. Mkr Alm. Rls, Fig. 42 | 1 | 1 | |
| Ter Mkr Conn Time Alm., Fig. 13 | 1 | 1 | | All Mkrs Busy Alm, Lp, Fig. 43 | 3 | 0 | AN |

| | WIRE | EQUIP | NOTES | | WIRE | EQUIP | NOTES |
|----------------------------------------------------------------------------------------------------------------------------------------|------|-------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------------|-------|
| All Mkrs Busy Lp, Fig. 44 | 3 | 0 | AN | Fig. 47 & 48, Lamps Only Misc Circuit | | 1 | |
| Term. Mkr Tbl Alm., Fig. 45 | 1 | 1 | | Per SD-25064-01: Fig. 52, Lamps | | 6 | |
| All Terms Busy Lp PBX Load Indicator, Fig. 51 | 10 | 0 | AO | Fig. 54, 55, & 60, Lamps | | 1 | |
| Connector Lamp, Fig. 52 | 6 | 0 | | Fig. 56, Lamps | | 5 | |
| DID Translator Lamp, Fig. 53 | 2 | 0 | | Fig. 59, Jacks | | Per Note AS | |
| Outgoing Sender Number Lamps, Fig. 54 | 1 | 0 | | (Max one list 4 per TTI Fr) | | | |
| False Outsender Busy Lamp, Fig. 55 | 1 | 0 | | List 5 —Equipment required in addition to lists 2 and 4, when LLP-AIS is provided, per SD-25284-01, Fig. 49, lamps only and ZZ apparatus (maximum one list 5 per TTI Fr). | | | |
| DP Outsender Group Busy Lamp, Fig. 56 | 5 | 0 | | List 6 —Equipment required in addition to list 2 and 4, when LLP-DID is provided, per SD-25284-01. | | | |
| Translator Make- Busy Jack, Fig. 57 | 2 | 0 | | | | | |
| Translator Connector Make-Busy Jack, Fig. 58 | 20 | 0 | AT | | | | |
| Outsender Connector Make-Busy Jack, Fig. 59 | 60 | 0 | AS | | | | |
| MF Outsender Group Busy Lamp, Fig. 60 | 1 | 0 | | | WIRE | EQUIP | NOTES |
| Term. Tbl Ind Fuse Alm., Fig. 61 | 2 | 0 | | Fig. 50, Lamps Only | | 1 | |
| 101 ESS Connector Lamp, Fig. 62 | 3 | 0 | | Misc Circuit | | | |
| | | | | Per SD-25064-01: Fig. 53 | | 2 | |
| | | | | Fig. 57 | | 2 | |
| | | | | Fig. 58 | | Per Note AT | |
| List 3 —Equipment required in addition to list 2, when LLP or 101 ESS direct access feature is provided, per SD-25284-01. | | | | | | | |
| | WIRE | EQUIP | NOTES | | | | |
| Figs. 45, 46, 51, & 54 Lamps Only | | 1 | | List 7 —Equipment and wiring required in addition to list 2 when calling line identification is to be provided per SD-25284-01, Fig. 55, YB option. (See Notes AV, AW, and AX.) | | | |
| Fig. 52A, YJ & ZU Option Per SD-25064-01: Fig. 62, Lamps (Max one list 3 per TTI Fr) | | 3 | | List 8 —Reserved. | | | |
| | | | | List 9 —Equipment and wiring required in addition to list 7 when calling line identification is provided with trouble ticketer and TTI recording per SD-25284-01, YD option. | | | |
| | | | | List 10 —Equipment and wiring required in addition to list 9 when calling line identification is provided with trouble ticketer and TTI recording, and 11-20 incoming link frames are required per SD-25284-01, YE option. | | | |
| | | | | List 11 —Equipment and wiring required in addition to list 1 or 2 when automatic intercept service without line link pulsing is required per SD-25284-01, Fig. 56. | | | |
| | | | | List 12 —Equipment and wiring required in addition to list 2 for connection to a Centralized | | | |

Status, Alarm and Control System (CSACS) per SD-25064-01, option ZP.

List 13—Equipment and wiring required in addition to list 2 when the terminating markers are equipped for recorded announcement feature to answer calls reaching vacated or unassigned numbers and operator intercept for calls to changed numbers or numbers with an open sleeve per SD-25284-01, Fig. 17.

Notes

- A. Equipment per each of SD-25284-01, Fig. 2 and ZT option and SD-25064-01, Fig. 14, 16, 17, 29, 38, and CCT jacks of Fig. 24 shall be provided in list 2 for each corresponding terminating marker with which the terminating trouble indicator frame is to function.
- B. ZG apparatus per SD-25284-01, Fig. 11 shall be provided in list 2 only when the number of incoming frames or incoming groups is 6, 7, 8, or 9.
- C. One terminating marker connector frame circuit per SD-25284-01, Fig. 12 shall be equipped in list 2 for each correspondingly numbered terminating marker connector frame in the terminating marker group having the greatest number of terminating marker connector frames.
- D. One terminating marker connector circuit per SD-25284-01, Fig. 13 shall be equipped in list 2 for each correspondingly numbered terminating marker connector on the terminating marker connector frame accommodating the greatest number of terminating marker connectors.
- E. One terminating sender relay circuit per SD-25284-01, Fig. 14 shall be provided in list 2 for each terminating sender connected to the terminating marker connector circuit serving the greatest number of senders.
- F. When the associated markers serve single-office or multioffice terminating units which have common incoming frames, one incoming link and connector frame relay circuit per SD-25284-01, Fig. 15 shall be equipped in list 2 for each incoming frame in the terminating marker group serving the greatest number of incoming frames. When the associated markers serve

multioffice terminating units which have incoming frames individual to each of offices A and B, one incoming frame relay circuit per SD-25284-01, Fig. 15 shall be equipped with list 2 for each incoming frame in the marker group serving the greater number of incoming frames in office A. Circuits numbered 0 to 9 shall be used for office A. Also, one incoming frame relay circuit per SD-25284-01, Fig. 15 shall be equipped in list 2 for each incoming frame in the marker group serving the greater number of incoming frames in office B. Circuits numbered 10 to 19 shall be used for office B.

- G. When the associated markers serve single-office or multioffice terminating units which have common line choice connectors, one line choice connector number circuit per SD-25284-01, Fig. 20 shall be equipped in list 1 for each line choice connector in the terminating marker group serving the greatest number of line choice connectors. When the associated markers serve multioffice terminating units which have line choice connectors individual to each of offices A and B, one line choice connector number circuit per SD-25284-01, Fig. 20 shall be equipped in list 2 for each line choice connector in the marker group serving the greater number of line choice connectors in office A. Circuits numbered 0 to 9 shall be used for offices A. Also, one line choice connector number circuit per SD-25284-01, Fig. 20 shall be equipped in list 2 for each line choice connector in the marker group serving the greater number of line choice connectors in office B. Circuits 10 to 19 shall be used for office B.
- H. Line junctor group selection relay circuits JGA to JGE per SD-25284-01, Fig. 22 shall be equipped in accordance with the number of incoming link frames or incoming groups for which the line junctor distribution is arranged as follows:

| I OR IG | CIRCUITS EQUIPPED |
|----------|------------------------|
| 2 | JGA, JGB, JGC, and JGE |
| 3 | JGA, JGB, and JGE |
| 4 thru 9 | JGA and JGE |
| 10 | None |

When two or more marker groups are served by this frame, the JGA to JGE relays shall be equipped to serve the combined junctor distribution requirements of all marker groups. Line junctor group selective relay circuit JGD is no longer required with line junctor distribution per ED-25713-10 or ED-25714-10, but wiring for this circuit shall be provided in the local cable in list 2 for possible future use.

- I. Junctor pattern relay circuits JPN and JP 0 through 8 per SD-25284-01, Fig. 23 shall be equipped in list 2 according to number of incoming frames or incoming groups for which the line junctor distribution is arranged as follows:

| NUMBER OF INCOMING | CIRCUITS EQUIPPED |
|--------------------|----------------------------|
| 2, 3, 4, 5, or 10 | None |
| 6 | JPN and JP 0 and 1 |
| 7 or 8 | JPN and JP 0, 1, 2, and 3 |
| 9 | JPN and JP 0, 1, etc, to 8 |

When two or more marker groups are served by this frame, these relays shall be equipped only for the marker group requiring the greatest number of relays.

- J. One hundreds block relay circuit per SD-25284-01, Fig. 25 shall be equipped in list 2 for each block of 100 customer numbers in the number group connector serving the greatest number of customer lines.
- K. Incoming mate frame check relay circuit per SD-25284-01, Fig. 30 shall be equipped in list 2 when the incoming frames are arranged for mate frame operation.
- L. The sender make-busy and hold jacks and trouble lamps per SD-25064-01, Fig. 8 and 9 shall be furnished in strips of 20, as required. One make-busy jack, hold jack, and trouble lamp per SD-25064-01, Fig. 8 shall be connected for each full selector, central B, dial pulse terminating, dial pulsing sender, and one make-busy jack, hold jack, and trouble lamp per SD-25064-01, Fig. 9 shall be connected for each local B or ac keypulsing sender. Space has been allocated for 90 terminating senders.

- M. One ground lead shall be run from the fuse panel to the position of the nearest hold jack per Fig. 8 or 9 of SD-25064-01. This lead shall be looped in the switchboard cable form serving the sender jack and lamp field to other hold and make-busy jacks per SD-25064-01, Fig. 8 and 9. The make-busy, hold, and trouble lamps shall be cabled directly to senders on the terminating sender and miscellaneous frames. To provide for future conversions of local B senders to full selector senders, a spare lead per B sender shall be run in the cable from the position of the B sender hold jack to the B sender, and left unconnected.
- N. One connector lamp per SD-25064-01, Fig. 10 shall be equipped in list 2 for each termination marker connector.
- O. One terminating sender group make-busy jack per SD-25064-01, Fig. 15 shall be equipped in list 2 for each terminating marker connector. When two or more marker groups are served by this frame, the group-busy jacks for other than the first marker group shall be located in the positions of the connector busy jacks as indicated on J28854C-().
- P. One terminating marker connector make-busy jack per SD-25064-01, Fig. 18 shall be equipped in list 2 for each connector per terminating marker.
- Q. Reserved.
- R. When the associated markers serve single-office terminating units, one number group connector relay circuit per SD-25284-01, Fig. 25 shall be equipped in list 2 for each number group connector in the terminating marker group serving the greatest number of number group connectors. When the associated markers serve multioffice terminating units, one number group connector relay circuit per SD-25284-01, Fig. 25 shall be equipped in list 2 for each number group serving the greater number of number group connectors in office A. Circuits numbered 0 to 12 shall be used for offices A. Also, one number group connector relay circuit per SD-25284-01, Fig. 25 shall be equipped in list 2 for each number group connector in the marker group serving the greater number of number group connectors in office B. Circuits

- numbered 13 to 24 shall be used for offices B.
- S. N apparatus per SD-25284-01, Fig. 8 shall be provided in list 2 when a sender test frame is to be used in testing the terminating senders.
- T. R apparatus per SD-25284-01, Fig. 7 shall be provided in list 2 when incoming frames are numbered above 9 or when office indication for multioffice operations is passed over the F10 lead.
- U. S apparatus per SD-25284-01, Fig. 9 shall be provided in list 2 when a 4-party ringng signal is required.
- V. One one-half ampere fuse shall be provided on the fuse bay for the +110 volt supply.
- W. A D-81762 handset is required in connection with no test calls to a particular line over the D jack per SD-25064-01, Fig. 26. This handset shall be furnished only when specified by the telephone company.
- X. Where sender group-busy indications are not required at the DSA switchboard, one senders busy alarm per SD-25064-01, Fig. 22, shall be equipped in list 2 per group per type of terminating senders in a marker group.
- Y. Where sender group-busy indications are required at the DSA switchboard, one senders busy alarm per Fig. 27 shall be equipped in list 2 per group per type of terminating senders in a marker group. X apparatus of Fig. 27 shall be furnished where sender group-busy indications are required at a local DSA switchboard and W apparatus where the indications are required at a central DSA switchboard.
- Z. Universal wiring shall be provided in list 2 for Fig. 22 and 27 of SD-25064-01.
- AA. Equip extra numbers circuit per Fig. D of SD-25284-01 for obtaining access for test purposes to lines not in the regular customer number series when the extra numbers feature is specified by the telephone company in the marker. When Fig. D is not equipped, furnish 20 block keys per Fig. C and the HB 24 hundreds blocks relay circuit SD-25284-01, Fig. 26.
- AB. One lamp and relay per SD-25064-01, Fig. 22 shall be equipped for each group of full selector terminating senders arranged for load control.
- AC. One incoming frame lamp per SD-25064-01, Fig. 30 shall be equipped in list 2 for each incoming link and connector frame.
- AD. One line choice connector lamp per SD-25064-01, Fig. 31 shall be equipped in list 2 for each line choice connector.
- AE. One number group connector lamp per SD-25064-01, Fig. 32 shall be equipped in list 2 for each number group connector.
- AF. One terminating sender selector circuit per SD-25064-01, Fig. 33 shall be provided in list 2 for each subgroup of terminating senders consisting of one or a maximum of two kinds of senders (FS, local B, central B, DP, or ac KP). Provisions are shown on the equipment drawing for any combination of these senders and shall be equipped in accordance with job requirements providing T and B apparatus for the first and second types of senders, respectively, in a subgroup.
- AG. One terminating sender lamp per SD-25064-01, Fig. 34 shall be provided in list 2 for each terminating sender.
- AH. W apparatus per SD-25284-01, Fig. 5 and 7 shall be provided in list 2 when two central offices are served by a common group of terminating markers.
- AI. Physical and theoretical office indication circuit per SD-25284-01, Fig. 37 shall be equipped in list 2 when any of the associated terminating markers are arranged for physical and theoretical office discrimination.
- AJ. V wiring per SD-25284-01, Fig. 37 shall be connected, as required, for the particular job in accordance with notes on the circuit.
- AK. Universal wiring shall be provided in list 2 for SD-25284-01, Fig. 39, E, F, G, and H. Apparatus shall be provided and wiring

- connected as required for the particular job in accordance with notes on the circuit.
- AL. One link alarm lamp circuit per SD-25064-01, Fig. 37 shall be equipped in list 2 for each terminating sender link and controller circuit.
- AM. When more than nine sender subgroups must be accommodated on the terminating trouble indicator frame, the arrangement of the sender subgroup jacks and lamps, located between the connector busy jacks and sender make-busy jacks and lamps in the left panel of Fig. 3 of J28854C-(), shall be varied as required to provide for the lamps and jacks of the additional sender subgroups as indicated in Fig. 16 of J28854C-() which covers a typical arrangement of twelve sender subgroups.
- AN. One frame line jack per SD-25064-01, Fig. 26, one sequence alarm per SD-25064-01, Fig. 41 and D, one all-markers busy alarm lamp per Fig. 43, and one all-markers busy lamp per Fig. 44 shall be provided in list 2 for each terminating marker group.
- AO. When a terminating marker group is equipped with the PBX allotter feature, lamps and relays per SD-25284-01, Fig. 41 shall be provided, also one ATB lamp per SD-25064-01, Fig. 51 for each PBX served.
- AP. Figure 43 and ZT option in Fig. 5, 7, and 10 per SD-25284-01, have been incorporated in list 2 to provide for operation with associated terminating marker equipped to set the incoming trunk for overflow on second trial failures.
- AQ. When any of the associated terminating markers are equipped for the trunk identification feature, provide ZX option in SD-25284-01, Fig. 43 or 44.
- AR. ZL option per SD-25064-01, Fig. 5, shall be connected in list 2 when LLP is required and alarm transfer is not provided.
- AS. Equip one SCB- jack per SD-25064-01, Fig. 59, in list 4, for each outgoing sender connector per terminating marker.
- AT. Equip one TCMB- jack per SD-25064-01, Fig. 58, in list 6, for each translator connector per terminating marker.
- AV. When calling line identification is not required provide YA option per SD-25284-01. When calling line identification is not required but alarm transfer is required, provide YF option per SD-25284-01.
- AW. In addition to list 7, provide YG option per SD-25284-01 for alarm transfer. When alarm transfer is not required, provide YH option per SD-25284-01.
- AX. Wiring per SD-25064-01, ZO option and SD-25284-01, YC option required in addition to list 7 without list 9 when calling line identification is provided with terminating trouble indicator recording only.

J28854D—AT&TCo Std—Terminating Trouble Indicator Fuse Panel

Equipment—J28854D-()

List 1—Assembly, wiring and equipment for one terminating trouble indicator fuse panel, per SD-25064-01, two Fig. 61.

J28854E—AT&TCo Std—Line Link Pulsing and 101 ESS Relay Unit

Equipment—J28854E-()

List 1—Assembly, wiring, and equipment for one LLP and No. 101 ESS relay unit per SD-25284-01, Fig. 45 and 46 less lamps. (See Note A.)

List 2—Equipment and wiring required in addition to list 1 when 101 ESS feature is provided per SD-25284-01, Fig. 54, less lamps.

List 3—Equipment and wiring required in addition to list 1 when the number series feature is to be provided for LLP-DID or No. 101 ESS-DA per SD-25284-01, Fig. 51 less lamps.

Note

A. Ground for this unit is provided from relay rack ground lead, designated RRO per SD-25284-01, Fig. 52A.

J28854F—AT&TCo Std—Line Link Pulsing Relay Unit

Equipment—J28854F-()

List 1—Assembly, wiring, and equipment required for one LLP relay unit per SD-25284-01, Fig. 47 and 48, less lamps. (See Note A.)

Note

A. Ground for this unit is provided from relay rack ground lead, designated RR1 per SD-25284-01, Fig. 52A.

J28854G—AT&TCo Std—Line Link Pulsing With Automatic Intercept Service Relay Unit

Equipment—J28854G-()

List 1—Assembly, wiring, and equipment required for one LLP-AIS relay unit per SD-25284-01, Fig. 49, less lamps. (See Note A.)

Note

A. Ground for this unit is provided from relay rack ground lead, designated RR2 per SD-25284-01, Fig. 52A.

J28854H—AT&TCo Std—Line Link Pulsing With Direct Inward Dialing Relay Unit

Equipment—J28854H-()

List 1—Assembly, wiring, and equipment required for one LLP-DID relay unit per SD-25284-01, Fig. 50, less lamps. (See Note A.)

Note

A. Ground for this unit is provided from relay rack ground lead, designated RR3 per SD-25284-01, Fig. 52A.

5. GENERAL NOTES**Equipment**

5.01 An unnumbered jack mounting shall be provided as shown on the equipment drawing as a receptacle for spare make-busy plugs.

5.02 Make-busy plugs (No. 322A) should be furnished as required by the telephone company.

5.03 When two terminating trouble indicator frames are provided initially on a multiunit project, the marker groups shall be assigned to the trouble indicator frames so that the number of markers served by each trouble indicator frame is as nearly even as the assignment of markers by marker groups will allow. From a maintenance viewpoint, this procedure is preferable to fully loading the first trouble indicator frame and only partially loading the second trouble indicator frame.

Wiring

5.04 Number 24 gauge type BU wire shall be used for all local cable wiring except battery and ground leads which shall be No. 22 gauge type BU wire.

5.05 The terminating trouble indicator frame shall be wired for the maximum equipment. Equipment shall be furnished, as required, for each job.

5.06 Jacks and lamp sockets shall be provided in strips, as required. Unused lamp positions shall not be equipped with lamps or lamp caps.

Cabling

5.07 The code numbers of the switchboard cables used in cabling the circuits are shown on the switchboard cabling details drawing. However, the circuits should be checked to insure that the proper codes are specified to meet the latest circuit and ultimate job requirements. The cross-connecting information on the circuits shows the particular leads to be run in the same cables.

5.08 When the terminating trouble indicator frame is to serve two terminating marker groups, one set of cables shall be run from the terminating trouble indicator frame for each group, connecting to the various frames, distributing power terminal strips and secondary distributing power strips of each group. When the frame is arranged to serve two single-office terminating units only and economies in cabling can be affected, one set of cables for both marker groups may be run from the terminating trouble indicator frame to the nearest distributing power terminal strips for the terminating marker

connectors and senders, and to the nearest secondary distributing power strips for the incoming link frames, line choice connector frames, and number group connector frames. Part of these leads shall be run from the distributing power terminal strips and secondary distributing power strips to the connecting frames in one group, part to the corresponding distributing power terminal strips and secondary distributing power strips for the second group, and then to the connecting frames.

5.09 When the terminating trouble indicator frame is to serve three groups of terminating markers with few exceptions, noted on the switchboard cable detail drawing, the cables specified for the second group shall be extended to corresponding frames in the third group. This method of cabling shall be provided to avoid cabling congestion at the terminating trouble indicator frame.

5.10 Codes J28854J through J28854Y are unassigned.

List of A&M Only and Mfr Disc. Equipment

| EQUIPMENT | RATING | DETAILS | |
|------------|-----------|---------------------|---------------------|
| | | LAST SHOWN IN ISSUE | REPLACING EQUIPMENT |
| J28854A | Mfr Disc. | 4 | J28854B |
| J28854B | Mfr Disc. | 6 | J28854C |
| J28854C,L1 | Mfr Disc. | 11 | J28854C,L2 |

The above equipment has been replaced as indicated. Where A&M Only items appear, the issue numbers shown are those of the issue in which the rating was first applied.

Bell Telephone Laboratories, Incorporated

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