TERMINATING MARKER 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 marker frame, the terminating marker line link pulsing frame (TM-LLP) and the terminating marker — No. 101 ESS direct access frame (TM-DA).

1.02 This specification is reissued:

(a) To provide information on apparatus and wiring requirements for improvements in matching loss measurements and to rerate number checking feature Mfr Disc. per SD-25283-01, Issue 66D and per SD-27765-01, Issue 13D.

(b) To provide information on apparatus and wiring requirements for marker speedup feature in accordance with SD-25283-01, Issue 65D and SD-25055-01, Issue 16D.

(c) To provide information on apparatus and wiring requirements for the addition of a relay rack mounted unit to be ordered with a No. 101 ESS-DA frame in accordance with SD-27765-01, Issue 18D.

(d) To incorporate previous addendum changes that provided equipment design information for calling line identification per SD-25283-01, Issue 60D and automatic intercept service without line link pulsing per SD-25283-01, Issue 62D.

Capacity

1.03 A group of terminating markers may serve a single central office or a multioffice terminating unit of two offices (see 1.10 to 1.14). Each 10,000 number series may be divided into physical and theoretical numbers when desired, in blocks of 100 numbers. Also one or more hundreds may be established as nondiscriminating to provide numbers which may be listed as both physical and theoretical. The terminating marker frame is arranged for the indicated maximum quantities of the following items:

Directory Numbers (0000 to 9999)		
Markers serving single office		10,000
Markers serving multioffice terminating unit		20,000
Extra Numbers (0000X to 2499X)		2500
These numbers may be assigned flexibly in blocks of 100 to office A and office B		
	FRS	CKTS
Incoming Link		
Single office, or multioffice with I frames in common group	20	20
Multioffice with I frames in individual groups		
Office A	10	10
Office B	10	10
(A&M Only) Multioffice with I frames in common group and AF Marker Wiring	10	10
Line Choice Connector		
Single office or multioffice with common group of line choice connectors	10	20
Multioffice with individual groups of line choice connectors		
Office A	5	10
Office B	5	10
Number Group Connector		
Single Office	7	25

	FRS	CKTS
Multioffice With a Maximum of 25 Hundred-Block Relays in Any Number Group		
Office A	3	10
Office B	3	10
Multioffice With a Maximum of 19 Hundred-Block Relays in Any Number Group		
Office A	3	12
Office B	3	12
Terminating Marker Connector	5	20
Terminating Sender Test	1	1
Terminating Trouble Indicator	1	1
Miscellaneous Items		
Split hundreds (SH) relays Any relay may be assigned to office A or office B		20
Line junctor subgroups		5
IJL channels tested simultaneously		10
Junctor patterns		9
Subscriber lines obtained at one time for test		20
Intercepting Trunk Groups		
A separate routing for local (LIN) and toll (TIN) intercepting traffic may be provided for each office name, and a separate routing for local trouble (LTI) and toll trouble (TTI) intercepting traffic for each 10,000 number series		
PBX Facilities		
Alternate number group allotter — 200 PBX lines comprising five 20-blocks in 2-number groups		
Block allotter — 50 blocks of lines assigned to a maximum of 10 PBXs, and 25 number groups. A block is ordinarily 20 lines, but may include more than one 20-block at a penalty in marker holding time		

1.04 The following limitations apply to line link pulsing with either DID or AIS:

(a) A maximum of 120 line circuits may appear in any given line choice connector. This limitation is imposed by the number of select magnets that may be operated in parallel through the line choice connector.

(b) A minimum of two outsender connectors are always provided with "A" subgroups appearing in the even numbered connectors and the "B" subgroups appearing in the odd numbered connectors. This method of assignment allows two calls to be set simultaneously in the same OS group and divides a group of senders over two connectors for service protection.

(c) Ten outsenders have a traffic capacity for up to 400 line circuits. The "B" office code may be used for the DID office code. If the "B" office is not spare or does not provide sufficient numbers, NS office codes must be used. The NS relays provide an additional five office codes for DID. They are 2 through 6.

(d) One TM-LLP frame is required per two terminating marker frames.

(e) The TM-LLP frame is arranged for operation with the No. 101 ESS direct access feature (see 1.05).

1.05 The following limitations apply to the No. 101 ESS direct access feature.

(a) A maximum of 120 line circuits may appear in a given line choice connector (same as LLP).

(b) The trunk circuit is assigned by the direct access pretranslators — one pretranslator per 101 ESS control unit.

(c) Access to a pretranslator is through a DAP connector — one DAPC per 101 ESS control unit (a maximum of three DAPC per terminating marker group).

(d) One TM-DA frame is required per five terminating marker frames when TM-LLP frames are not provided.

(e) When TM-LLP frames are required then no TM-DA frames should be provided, since the TM-LLP frame is arranged to work with the No. 101 ESS direct access feature.

(f) When an office is arranged for a terminating marker group that is limited to six markers it is necessary to add a relay rack mounted unit [J28853G-( )] to handle the sixth marker.

Description

1.06 ***The terminating marker frame*** is a 2-bay single-sided structure which accommodates the equipment and wiring for one terminating marker circuit, and one terminating marker miscellaneous circuit. The equipment consists of mounting plate mounted apparatus, multicontact relays, and terminal strips. The framework, equipment, and wiring is furnished in one shop-wired assembly.

1.07 ***The principle function*** of the terminating marker in a crossbar office is to complete regular calls from the incoming trunk to the called line in accordance with the subscriber number registered in the terminating sender. In addition, terminating marker frames TM0 and TM1 are equipped with features which permit them to complete two types of special calls: (a) no-test calls, and (b) no-hunt calls from the outgoing trunk test frame in connection with routine tests of subscriber lines, from the message register rack or from the line verification incoming trunk. These two frames also provide direct access to a maximum of 2500 non-numbered terminals for test purposes.

1.08 ***The framework*** consists of a single-sided 2-bay structure 11 feet 6 inches high, and 4 feet 2-3/4 inches long. The left bay is 1 foot 10-1/8 inches long and its bulb-angle uprights are drilled on 1-inch centers for 20-1/2 by 2-inch mounting plates. The right bay is 2 feet 2-5/8 inches long and is drilled for adapters for mounting 20-1/2 by 2-inch mounting plates, multicontact relay mounting units, and decoder-type cross-connecting terminal strips. The adjacent upright members of the two bays do not touch but are separated by a space of 2 inches.

1.09 ***Frame Equipment:*** On the left bay of the 2-bay frame in top down order there are four horizontal rows of terminal strips for the switchboard cables outgoing to other frames, a 4-inch mounting panel for various pieces of apparatus which could not readily be enclosed in relay casings and three groups of mounting plates for relays, each group enclosed in a front and rear relay casing of the sender type. At the top of the right-hand bay is the frame fuse panel, and below this, in top down order, are one 2-inch mounting plate; two multicontact relay mounting units; a group of casing enclosed mounting plates; another multicontact relay mounting unit; a 2-inch mounting for the frame miscellaneous jacks and lamps; the several terminal strips on which the terminating marker relay windings and contacts are wired for purposes of providing flexibility by means of cross-connections; a terminal strip NC used as a terminating point for the leads to the optional extra number, no-test and no-hunt equipment; and at the bottom eight mounting plates, enclosed in relay casings, which contain the NH, NT, and X number equipment on frames TM0 and TM1 only. On frames other than TM0 and TM1, this bottom space may be used for line overload control equipment in cases where individual line overload control by the plug and jack method is desired. (See 1.15.)

1.10 ***Multioffice Terminating Unit:*** A group of terminating markers, terminating marker connectors, and terminating senders may serve a single central office having 10,000 directory numbers or a multioffice terminating unit of two offices each having 10,000 numbers. Each 10,000 number series may be divided into a physical and theoretical office when desired. Information relating to the provision of facilities in switchboards, senders, incoming trunks, incoming link frames, connectors, and markers for single office or multioffice operation with or without discrimination between physical and theoretical numbers is listed in the key sheet.

1.11 ***Common Group of Incoming and Line Link Frames:*** When a marker group serves two offices, the incoming link frames will generally be placed in one group with line junctors cabled through one line junctor grouping frame to one group of line link frames. To insure satisfactory operation with respect to line junctors, the incoming trunks should be assigned so that each incoming link frame divides its traffic properly to both offices, and the lines served by each line choice should be proportioned so that each line choice will carry its share of the traffic to each of the two offices.

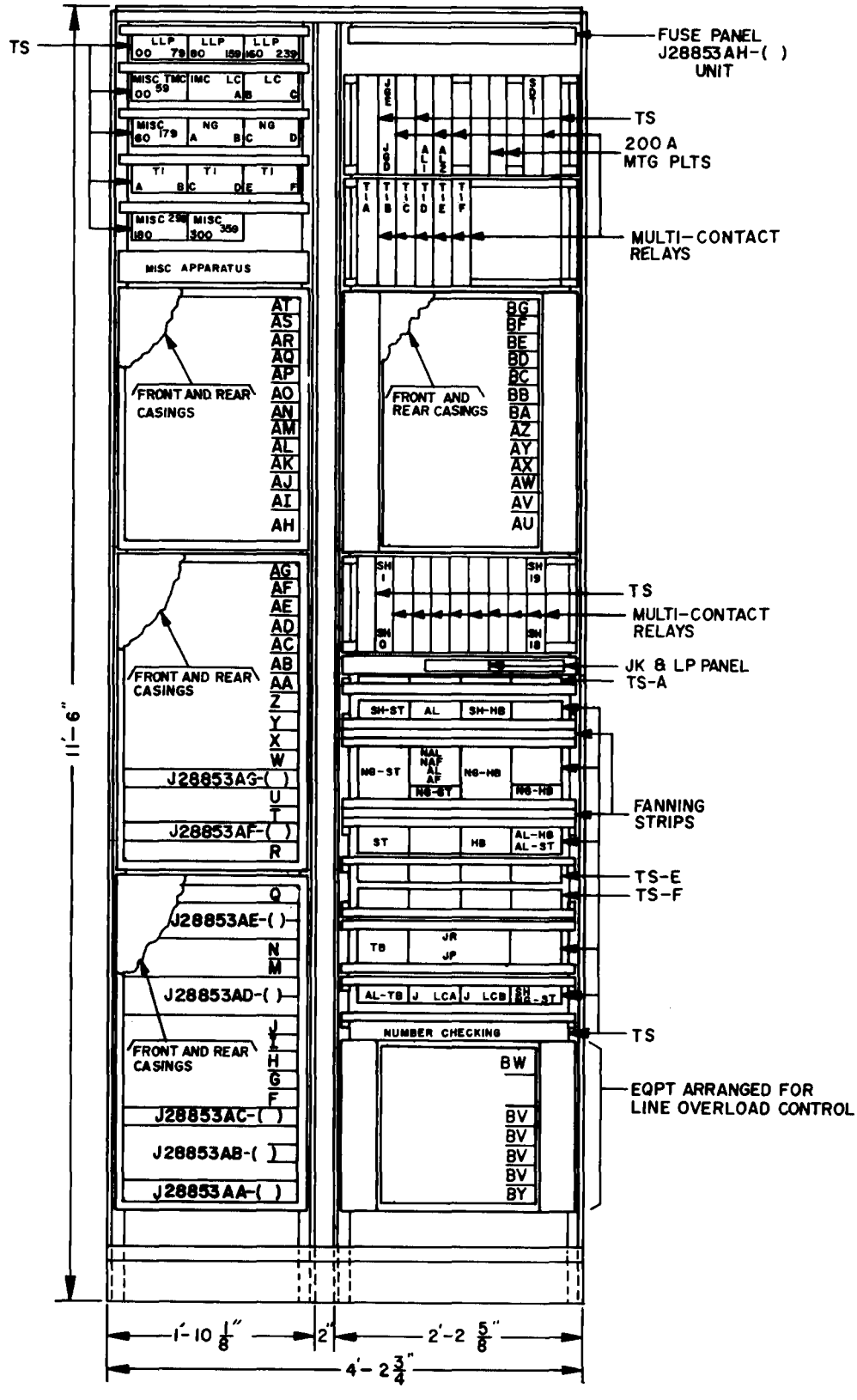

Fig. 1 — Terminating Marker Frame — Equipment Diagram — Cross-connection Field Stamped to Show One 10,000 Number Series

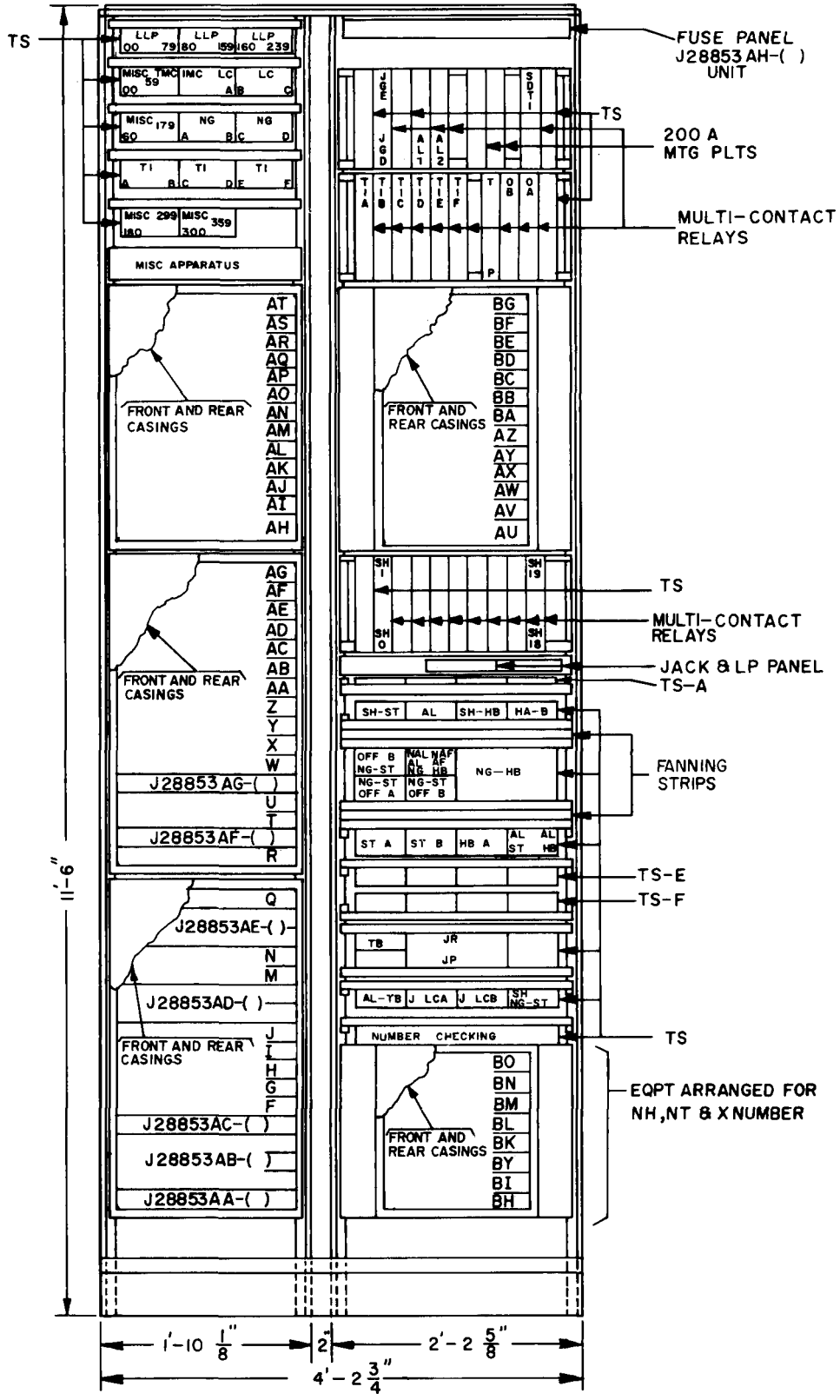

Fig. 2 — Terminating Marker Frame — Equipment Diagram — Cross-connection Field Stamped to Show Two 10,000 Number Series

1.12 ***Individual Groups of Incoming and Line Link Frames:*** Another arrangement in which the incoming link frames, line junctor grouping frame, and line link frames for each of the two offices are in a separate group may be used with certain restrictions in the use of incoming trunks. This scheme permits the use of a total of 20 incoming link frames without build-out frames (I_0 to I_9 for office A, and I_0 to I_9 for office B). Frame indications 0 to 9 are received by the marker from office A frames, and 10 to 19 from office B frames. The number of incoming frames and line choice connectors preferably should be about the same in each group because the line junctor distribution must be arranged for the size represented by the larger group. If the two groups are not the same in size, the traffic carried by the smaller group must not exceed the capacity of the junctor groups provided by the junctor distribution.

1.13 ***Office Indication:*** When a marker group serves two offices (A&B) it is necessary that the marker shall receive on each call an indication that will direct the operation of the translator for the office to which the call is being completed. The office signal is received over the 0 AB lead or the F10 lead through the terminating marker connector from the sender.

1.14 ***Physical Office and Theoretical Office Discrimination:*** The marker receives information from the incoming link frame over the IP, IT, or IPT leads that the incoming trunk may serve physical, theoretical, or both physical and theoretical office numbers and checks this against information received from the number group over leads PN, TN, or PTN. If the two sets of indications correspond, the call is completed. Otherwise the marker routes the call to the intercepting operator. In the case of a single 10,000 number series having common as well as individual trunk groups to the physical and theoretical office, discrimination can be obtained on all groups by the use of the 0 AB lead to the marker without indications from the incoming link. However, if discrimination is desired for the individual groups but not on the common groups the discriminating signal is obtained over the IP, IT, and IPT leads from the incoming link frame.

1.15 ***Line Overload Control:*** For the purpose of traffic control, arrangements are provided to permit a marker to reject calls to a certain number or numbers during overload conditions to that number. This feature, referred to as line overload control, may be obtained in either of two versions. The first and simplest plan, known as the 20-block cross-connection method, can be used only when the customer experiencing the overload has the exclusive use of the entire 20 block containing his listed number and when this 20 block is served by a split hundreds SH relay in the marker; when a make-busy plug is inserted in the normal N jack, a marker which tests the customer PBX group and finds it busy will signal any other marker which has the same number registered and which is awaiting its turn to seize the number group to give a busy signal without testing; a plug in the preemptory jack (P) causes the marker to give a busy signal without testing the line. The second method, known as the plug and jack method, permits similar treatment of individual lines by plugging up on the jack panel the listed number of the subscriber on whose line overload is occurring.

1.16 ***PBX Facilities:*** Two arrangements are available for handling calls to PBXs. (a) the alternate number group allotter, and (b) the block allotter. The first one, furnished in all terminating markers, is capable of serving all except the largest PBX and those subject to unusually heavy terminating traffic. Under this plan the lines of a PBX are limited to two number groups and to the traffic which two number groups can handle. Physically, the plan is limited to 200 lines comprising five 20 blocks in each of two number groups. Under full load conditions, the plan involves end-of-block hunting over the 20 blocks in the first number group, advancing to the second number group and end-of-block hunting therein, prior to returning a busyback signal. By using the line overload control feature described in 1.15, the effect of the increased marker holding time resulting under these conditions can be reduced.

1.17 ***PBX Block Allotter:*** This feature, furnished when specified, prevents marker delays in returning the busyback signal and provides for a PBX of 1000 lines or more with flexibility in dividing the lines over as many number groups as desired. By means of an auxiliary sleeve relay connected at the line distributing

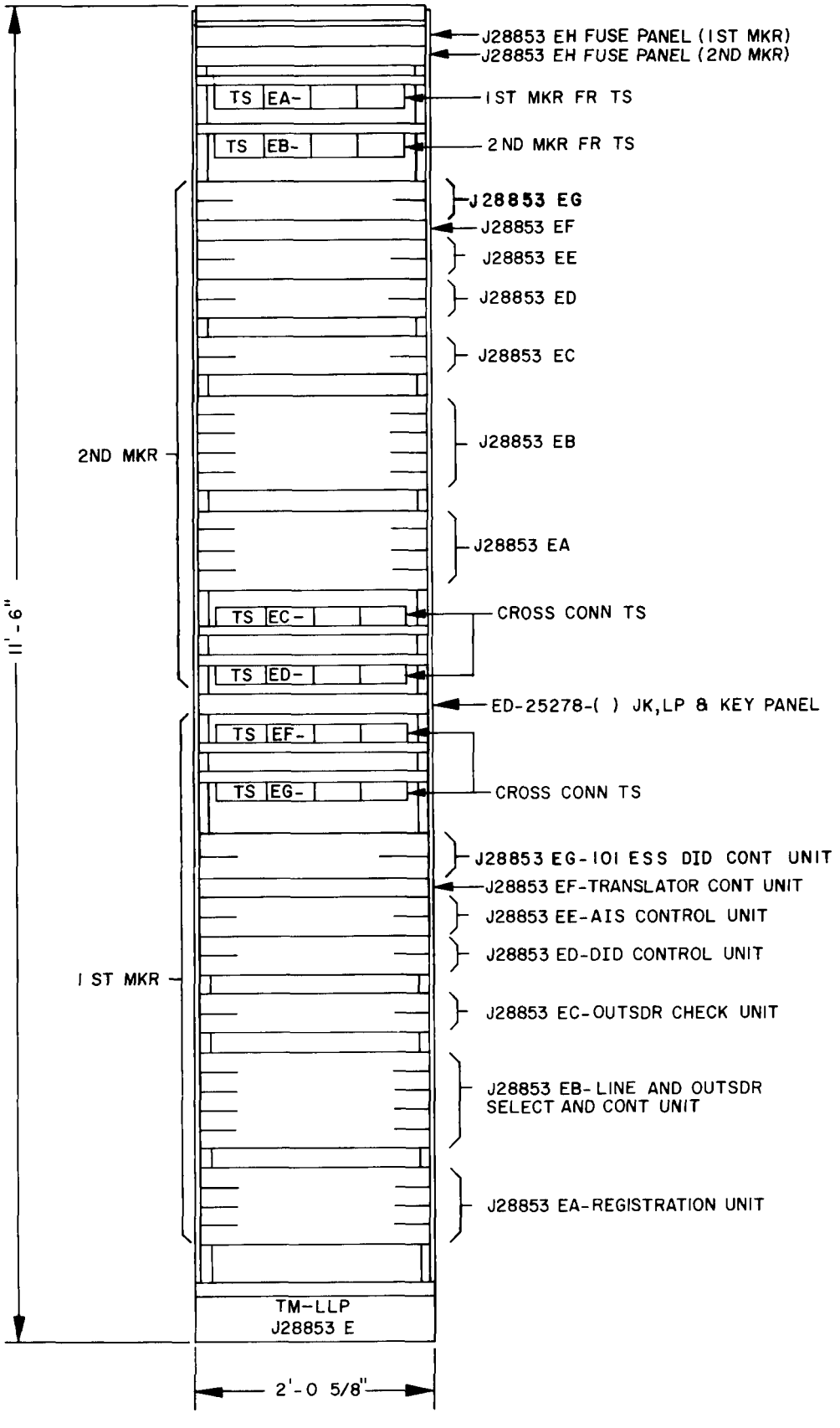

Fig. 3 — Terminating Marker — Line Link Pulsing Frame

frame to each PBX line, a block allotter recognizes when all lines in a block are busy, and directs the marker via a block register circuit to a 20 block containing at least one idle line. When all lines in the PBX are busy, the allotter causes the marker to return a busy signal at once. The limiting condition, as regards to the size of PBX, thus becomes one of incoming trunk and number group capacity rather than marker holding time.

1.18 ***The PBX block allotter equipment*** comprises three units: (a) auxiliary line unit, (b) block allotter unit, and (c) block register unit. These are 20-1/2 inch units designed to mount on the miscellaneous frame. By means of adapters the units may be mounted on the relay rack where, for example, miscellaneous frame space is not available and only a few units are involved. The auxiliary line unit ordinarily is mounted on a miscellaneous frame near the line distributing frame and the other two units are mounted on one or more miscellaneous frames near the terminating markers. The ***auxiliary line unit*** accommodates 20 sleeve relays on two mounting plates. The windings of these relays are cabled to the line distributing frame and cross-connected there to the PBX line sleeves. The contacts of the sleeve relays are chained together within the unit and cable to the block allotter unit. Unassigned sleeve relays are blocked in an operated position using a 508A armature blocking tool. The ***block allotter unit*** has a capacity of 20 blocks of PBX lines and is common to a group of terminating markers. The unit includes 20 pairs of relays representing 20 blocks of PBX lines. By means of cross-connecting terminal strips on the unit, the relays are grouped to agree with the sizes of the PBXs served, and are connected to the respective auxiliary line units. The operation of the block allotter relays indicates to the markers through the block register units which PBX blocks have idle lines. By adding supplementary block allotter units, the capacity of the system can be extended to a maximum of 50 blocks. The third unit comprising the PBX allotter feature is the ***block register unit.*** This is furnished for each terminating marker to serve a maximum of 50 blocks. It includes a route relay for each of ten PBXs maximum register relays per block and cross-connection facilities. Upon receiving a call to a PBX served by this equipment, the proper route relay is operated which causes a register relay corresponding to the allotment received from the block allotter to be operated. This closes the ST, TB, and HB leads to the number group circuit. In the ***terminating marker*** itself, the added equipment consists of a battery supply circuit for an additional lead extending to the block register unit.

1.19 The TM-LLP frame (Fig. 3) is a single 23-inch bay which accommodates the equipment and wiring for two terminating marker applique circuits and one miscellaneous circuit. The purpose of the terminating marker applique circuit is to provide the additional circuitry necessary to enable a No. 1 crossbar office to outpulse a number to a remote point via a line circuit on the line link frame, for LLP. This frame is also arranged for operation on a direct access basis with the No. 101 ESS System.

1.20 The TM-LLP frame consists of a single 23-inch bay, 11 feet 6 inches high. The lower half mounts the surface-wired units and cross-connections required for one marker and the upper half for an additional marker. Terminal strips at the top of the frame terminate incoming switchboard cable for each marker. A fuse panel is mounted at the top of the frame for each marker. The alarm circuits are multipled back to the associated marker so that a blown fuse on the TM-LLP frame takes the associated marker out of service.

1.21 The TM-DA frame, (Fig. 4), will mount the equipment for the No. 101 ESS direct access feature only. This frame is not required if the TM-LLP frame is provided.

1.22 The TM-DA frame is a single 23-inch bay frame, 11 feet 6 inches high and will accommodate direct access equipment to serve five associated terminating markers. The lower three-quarters of the frame mounts surface-wired units. The upper one-quarter of the frame mounts fuse panels and terminal strips associated with five terminating markers.

1.23 When the TM-DA frame is provided in offices that have a terminating marker group arranged for a maximum of six terminating markers, a relay rack mounted surface-wired

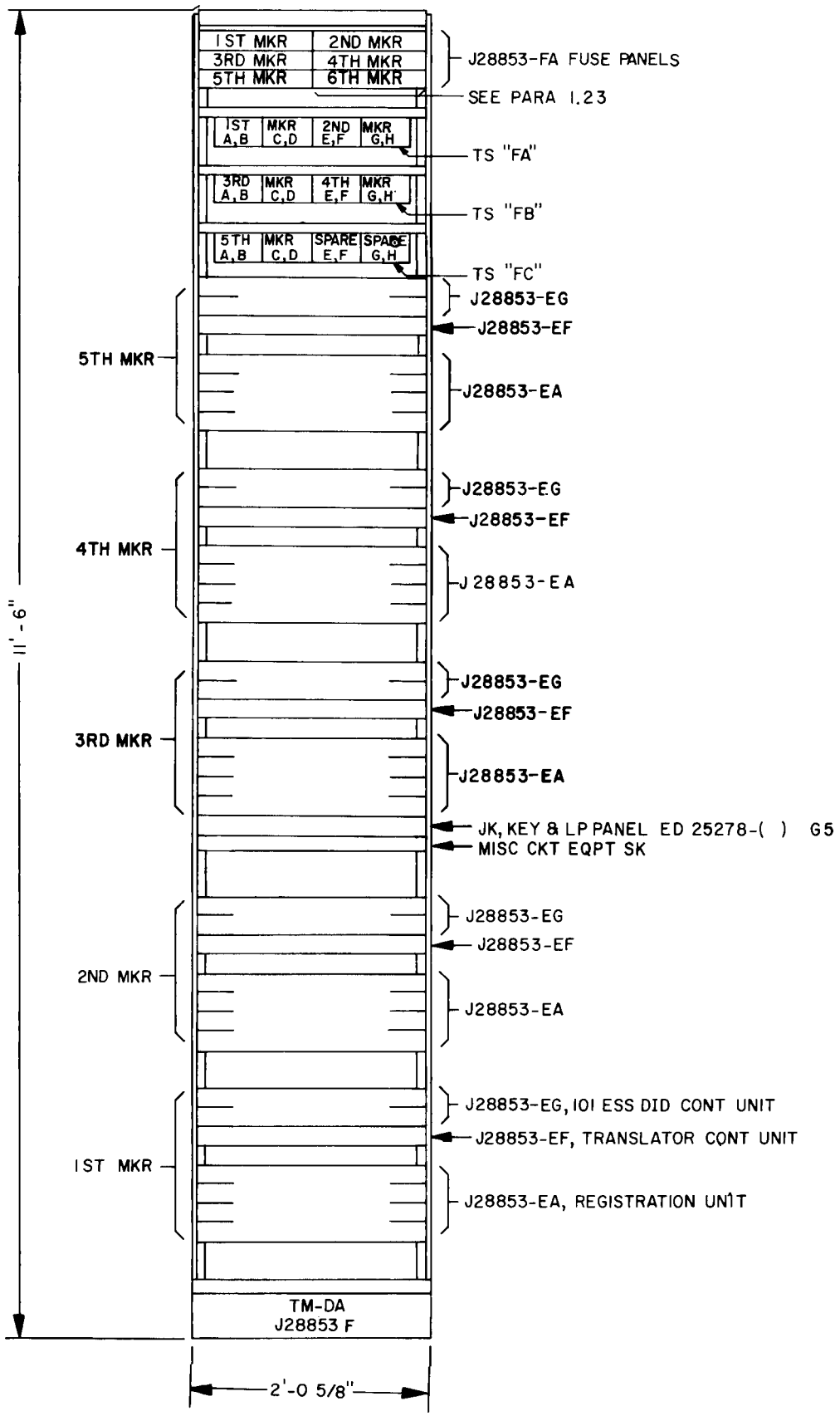

Fig. 4 — Terminating Marker — Direct Access Frame

unit should be provided in addition to the TM-DA frame for association with the sixth marker. The fusing for this relay rack mounted unit will be located on the TM-DA frame.

1.24 *The line link pulsing feature (LLP)* provides the No. 1 Crossbar System with the capability of outpulsing:

(a) With dial pulsing outsenders to a PBX (called LLP-DID).

(b) With multifrequency pulsing outsenders to an automatic intercept center (called LLP-AIS).

This outpulsing is carried over a line circuit (trunk) from the line link frame to the remote point.

1.25 *The No. 101 ESS direct access feature (DA)* provides the No. 1 Crossbar System with the capability of connecting to the No. 101 ESS System for an interchange of information. All outpulsing to the remote location is done by the No. 101 ESS System over a data link path.

SUBDIVISIONS OF EQUIPMENT DETAILED INDEX

WECo J drawings should be ordered by referring to the prefix and base number and requesting the current dash (—) number.

EQUIPMENT CODE	RATING	TITLE	EQUIPMENT DRAWING	CIRCUIT DRAWING	CKTS PER UNIT	MTG PLTS PER UNIT
ED-27607-01	AT&TCo Std	AMPLAS Comp Assys	ED-27607-( )	SD-25283-01	—	—
ED-27676-10	AT&TCo Std	TTI Conn Rel Unit (RR MTD)	ED-27676-10	SD-27765-01	—	—
ED-27724-01	AT&TCo Std	Molded Comp Assys	ED-27724-( )	SD-25283-01	—	—
ED-94823-	AT&TCo Std	Molded Comp Assys	ED-94823-( )	SD-27765-01 SD-25283-01	— —	— —
J28853A	AT&TCo Std	Term Mkr Fr	J28853A-( )	SD-25283-01 SD-25055-01	—	—
J28853B	AT&TCo Std	Twenty Aux Line Ckt Unit	J28853B-( )	SD-25921-01	20	2
J28853C	AT&TCo Std	PBX Block Allotter Unit	J28853C-( )	SD-25919-01	20	12
J28853D	AT&TCo Std	PBX Block Register Unit	J28853D-( )	SD-25920-01	1	14
J28853E	AT&TCo Std	TM-LLP Fr	J28853E-( )	SD-27765-01 SD-27819-01	—	—
J28853F	AT&TCo Std	TM-DA Fr (No. 101 ESS)	J28853F-( )	SD-27765-01 SD-27819-01	—	—
J28853G	AT&TCo Std	No. 101 ESS-DA RR MTD Unit	J28853G-( )	SD-27765-01	—	8
J28853AA	AT&TCo Std	Line Test Unit I	J28853AA-( )	SD-25283-01	—	1

EQUIPMENT CODE	RATING	TITLE	EQUIPMENT DRAWING	CIRCUIT DRAWING	CKTS PER UNIT	MTG PLTS PER UNIT
J28853AB	AT&TCo Std	Channel Test Unit	J28853AB-( )	SD-25283-01	—	3
J28853AC	AT&TCo Std	Line Test Unit II	J28853AC-( )	SD-25283-01	—	1
J28853AD	AT&TCo Std	Line Test Unit III	J28853AD-( )	SD-25283-01	—	2
J28853AE	AT&TCo Std	Line Test Unit IV	J28853AE-( )	SD-25283-01	—	2
J28853AF	AT&TCo Std	First Channel Control Unit	J28853AF-( )	SD-25283-01	—	1
J28853AG	AT&TCo Std	Second Channel Control Unit	J28853AG-( )	SD-25283-01	—	1
J28853AH	AT&TCo Std	Fuse Panel Unit	J28853AH-( )	SD-25055-01	—	1
J28853EA	AT&TCo Std	Registration Unit	J28853EA-( )	SD-27765-01	1	4
J28853EB	AT&TCo Std	Line and Outsender Selection and Control Unit	J28853EB-( )	SD-27765-01	1	5
J28853EC	AT&TCo Std	Outsender Check Unit	J28853EC-()	SD-27765-01	1	2
J28853ED	AT&TCo Std	DID Control Unit	J28853ED-( )	SD-27765-01	1	2
J28853EE	AT&TCo Std	Mkr and Outsender Control Unit for AIS	J28853EE-( )	SD-27765-01	1	2
J28853EF	AT&TCo Std	Translator Cont Unit	J28853EF-( )	SD-27765-01	1	1
J28853EG	AT&TCo Std	No. 101 ESS DID Control Unit	J28853EG-( )	SD-27765-01	1	2
J28853EH	AT&TCo Std	Fuse Panel Unit for TM-LLP Fr	J28853EH-( )	SD-27819-01	1	1
J28853FA	AT&TCo Std	Fuse Panel Unit for TM-DA Fr	J28853FA-( )	SD-27819-01	2	1

CIRCUIT SCHEMATIC INDEX

CIRCUIT DRAWING	J28853 EQUIPMENT CODE
SD-25055-01	A,AH
SD-25283-01	A,AA,AB,AC, AD,AE,AF,AG
SD-25919-01	C
SD-25920-01	D
SD-25921-01	B
SD-27765-01	E,F,G,EA,EB, EC,ED,EF, EG
SD-27819-01	E,F,EH, FA

2. SUPPLEMENTARY INFORMATION

816-000-000 — No. 1 Crossbar System Index
Floor Plan Data — Section 9.1, Sheet 22 (TM)
Section 9.1, Sheet 86 (TM-LLP)
Section 9.1, Sheet 92 (TM-DA)
SD-25000-02 — Current Drain Data Sheet

3. DRAWINGS

For additional drawings forming a part of this specification, see listings under Subdivisions of Equipment and Detailed Index.

Keysheet

SD-25000-01 — No. 1 Crossbar System

Framework and Equipment

ED-25021-53 — Jk, Ky, & Lp Panel
ED-25022-01 — MC Relay Mounting
ED-25028-52 — Unit Framework
ED-25278-30 — Jk, Ky, & Lp Panel
ED-25330-30 — TM Frame Assembly
ED-27801-10 — Auxiliary Fuse Panel
ED-90978-57, -58, -63, -64 — Relay Casing Assembly
ED-91710-70, -74 — Framework
ED-95131-10, Grp 17 — Modular Fuse Panel Assembly

Wiring and Cabling

ED-25030-01 — Unit Local Cable
ED-25130-10 — Schematic of Marker Multiple Cabling to Frame Connectors
ED-25329-10 — TM Frame Switchboard Cable Details
ED-25334-10 — TM Frame Local Cable
ED-27543-10 — Method of Running Power Feeders for Modular Fuse Panel
ED-25713-10 — Line Junctor Assignment Chart (2 to 10 Inc Lk Frs — 2 to 10 Line Choices)
ED-25714-10 — Line Junctor Assignment Chart (2 to 10 Inc Grps — 4 to 20 Line Choices)
ED-27662-10 — TM-LLP Frame Switchboard Cable Details
ED-27681-10 — TM-DA Frame Switchboard Cable Details

4. EQUIPMENT

ED-27676-10 — AT&TCo Std — Terminating Trouble Indicator Connector Relay Unit (RR MTD)

Equipment — ED-27676-( )

Group 1 — Equipment required in accordance with SD-27765-01, Fig. 13, for one terminating trouble indicator connector relay unit arranged for ten markers and equipped for one marker.

Group 2 — Equipment required in accordance with SD-27765-01, Fig. 10, for one terminating trouble indicator relay unit arranged for ten markers and equipped for one marker. Required in addition to group one for line link pulsing.

Group 3 — Equipment required in accordance with SD-27765-01, Fig. 13, in addition to group one for additional connector relays. One group 3 required for each added marker (maximum 9).

Group 4 — Equipment required in accordance with SD-27765-01, Fig. 10, in addition to group 2 for additional connector relays. One group 4 required for each added marker (maximum 9).

J28853A — AT&TCo Std — Terminating Marker Frame (See Table A)

Equipment — J28853A-( )

List 1 — Framework, assembly, wiring, and common equipment for one terminating marker frame.

	WIRE	EQUIP	NOTES
Framework, ED-25330-30, G4		1	
Jack, Key, & Lamp Panel, ED-25021-53, G1 & G8		1	
Multicontact Rel Mtg Unit, ED-25022-01:			
Item 6		2	
Item 5		1	
Misc Ckt, SD-25055-01:			
Fig. 4, 5, 6, 7, 8, 9 & 13	1	1	
Fig. 2 & 12, Universally Wired	1	0	A
Ter Marker Ckt, SD-25283-01:			
Numerical, Inc Frame, & Checking Rel Ckt			
Fig. 1 (Less B App)	1	1	B
Timing & Trouble Release Rel Ckt, Fig. 2 & AZ	1	1	5.02
Five Hundreds Selection Ckt, Fig. 3A			C,
(Less Rel)	40	4	S,X
Hundreds Selection Ckt, Fig. 4	5	5	
Twenties Selection Ckt, Fig. 5	5	5	
Additional CK Rel Ckt, Fig. 6	1	1	
NG-ST & NG-HB Leads Ckt, Fig. 7	1	1	
SH Block Rels Ckts, Fig. 9	20	0	D
Line Test Ckt, Fig. 10	1	1	
Hunting Progress & Allr Ckt, Fig. 11	1	1	
Line Grp Selection & Lockout Ckt, Fig. 12 (Less LC Rel)	1	1	E
Select Magnet Choice Ckt, Fig. 13	1	1	
Line Junctor Hold Magnet Grp Choice Ckt, Fig. 14	1	1	
Inc Lk & Junctor Rel Grp Choice Ckt, Fig. 15	1	1	
Jump Hunting Ckt, Fig. 16	1	1	
Channel Test Ckt, Fig. 17 (Less JPN JP 0-8 Rels D App & TMA Lamp), &			F, H,V
Fig. AN	1	1	5.06
AC/DC Ringing Ckt, Fig. 17A	1	0	G, 5.07
4-Party Selective Sup. Ringing Ckt, Fig. 17B	1	0	G, 5.07
Ckt For Selection Of Line Junctor Subgroup, Fig. 18	1	1	I
Ringing Cont & Spl Routes Ckt, Fig. 19 (Less E App)	1	1	J,K
Ckt per Fig. 20B			S
LCA Rel Ckt, Fig. 21	9	0	K,L
Ter Marker Make-Busy Ckt, Fig. 22	1	1	AL
Tbl Ind Conn Ckt, Fig. 24	1	1	
Ter Marker Make-busy & All Markers Busy Ckt, Fig. AJ	1	1	
LK1 Rel Ckt, Fig. AB	1	0	AJ
Busy Signal Route Rel Ckt, Fig. AH & Ckt per Fig. AG Universally Wired	1	0	AJ
Ckt for Testing For Crosses, Fig. 25	1	1	
Sender Test Conn Ckt, Fig. 26	1	0	U
Subscriber Line Overflow Register Connector Ckt, Fig. 27	1	0	AA
Busy Aux Rel Ckt, Fig. 28A	1	0	AA,BB
Off. Indication Rel Ckt, Fig. 29	1	0	Z
Plant Reg Ckt, Fig. 34 and IP Wrg	1	1	
Ckt per Fig. A, Less N App	1	0	S,X, AJ,AH
Translator Control Ckt For Two 10,000 Number Series, Fig. D with FK Option	1	0	Z,AJ
Ckt per Fig. C	1	0	Z
Ckt per Fig. H	1	0	Z

	WIRE	EQUIP	NOTES
Route Rel Ckt for Physical & Theoretical Intercept Trk Grps Fig. G	1	0	Z
Frame Indication Off. Rel Ckt Fig. F & Frame Indication Rel Ckt Fig. E Universally Wired	1	0	Z
Inc Trk Class Rel Fig. I & Fig. M Universally Wired	1	0	AE
Inc Trk Discriminating Rel Fig. JA & Fig. OA Universally Wired	1	0	AE
Inc Sec Select Magnet Control Ckt, Fig. Q & Fig. R, Less D App Universally Wired	1	0	H,AF
Inc Pri Select Magnet Battery Feed Ckt, Fig. P & Fig. AD Universally Wired	1	0	AG
Units Registration Ckt, Fig. L	1	1	
Line Overload Control Ckt, Fig. AO & AP Universally Wired	1	0	AB
Line Overload Jk Ckt, Fig. V	1	0	AB
Line Overload by 20 Block Ckt, Fig. Z	1	0	AB
Sub Sdr Load Cont Rels, Fig. AK & AL Universally Wired	1	0	AK
Ckt per Fig. AC	1	0	AB
YB & BLK Rel Ckt, Fig. AF	1	1	
Ckt for PBX Block Allotter, Fig. AT	1	0	M
Ckt for Route to Intercept Opr or to Recorder Announcement System Intercept AU & AV Universally Wired	1	0	AM

List 2 — Framework, wiring, and equipment required in addition to list 1 to arrange one terminating marker for no-test and no-hunt calls.

	WIRE	EQUIP	NOTES
Framework Details, ED-25330-30, G5		1	
Rel Casings, ED-90978-57 & -63 G2008 Front & G2008AA Rear Each		1	
Ter Marker Ckt, SD-25283-01: No-test & No-hunt Ckt, Fig. 20A (Less G & R App)	1	1	O,Q, R,W, AL
Extra Numbers Ckt, Fig. B	1	0	S,X
Five Hundreds Selection Ckt, Fig. 3A (Less Rel)	5	0	S,X
Additional SPL Relay, Fig. 30	1	0	W

List 3 — Framework, equipment, and wiring required in addition to list 1 for line overload control unit (plug and jack method) to arrange four TM frames for individual line overload control. (See Notes AC and AD.)

	WIRE	EQUIP	NOTES
Framework Details, ED-25330-30, G3		1	
Jk Panel Assem ED-25439-70, G1		1	
Ter Marker Ckt, SD-25283-01: Ckt for Ind Line Indication for Line Overload Cont, Fig. Y	4	0	AD
Jk Ckt for Ind Line Overload Cont, Fig. N	4	0	AD
Jk Ckt, Fig. U	4	0	AD

List 4 — Wiring and equipment in accordance with SD-25283-01, Fig. 31 and GS option required in addition to list 1 when the terminating marker is to be arranged to set the incoming trunk for overflow after second trial failure. (See Note AN.)

List 5 — Apparatus and wiring in accordance with SD-25283-01, Fig. 31, IL option required in addition to list 4 when the terminating marker is set to identify the incoming trunk number on first trial failures.

List 6 — Wiring and equipment required in addition to list 1 when line link pulsing or No. 101 ESS direct access or both is required, per SD-25283-01, GV option. (See Notes AD, AP, AQ, AR and AY.)

List 7 — Wiring and equipment required in addition to list 6, when LLP-AIS is required per SD-25283-01, Fig. 32 and GW option. (See Note AS.)

List 8 — Wiring and equipment required in addition to list 6 for LLP- per SD-25283-01, IF option. (See Note AT.)

List 9 — Wiring and equipment required in addition to list 6 to provide No. 101 ESS DA-DID per SD-25283-01, Fig. 33 and IH option. (See Note AU.)

List 10 — Framework, wiring, and equipment required in addition to list 1 when R apparatus of Fig. 20A is not provided and when the terminating marker is to be equipped for calling line identification per SD-25283-01, Fig. 35 and IT option. (See Notes W, AV, and AX.)

List 11 — Wiring and equipment required in addition to list 10 per SD-25283-01, IV option when trouble ticketer recording is provided.

List 12 — Wiring and equipment per SD-25283-01, Fig. 36A, JC and JF options required when automatic intercept service is provided and list 7 is not provided. (See Notes AZ and BA.)

List 13 — Wiring and equipment required in addition to list 4 for matching loss measurements when peg count of incoming first failures to match is required per SD-25283-01, KB option.

List 14 — Wiring and equipment required in addition to list 1 when matching loss measurements by peg count of incoming calls to terminal hunting lines are required per SD-25283-01, Fig. 20C and KD option. (See Note BD.)

Notes

A. Equip TM time alarm circuit per Fig. 12 of SD-25055-01 when the trouble indicator is located on a different floor than the marker; otherwise, equip Fig. 2.

B. When the terminating marker is to have access to more than ten incoming link frames in one group, or when it has access to two groups of incoming link frames, B apparatus of Fig. 1 shall be equipped in list 1.

C. The 10,000 subscriber numbers in one central office may be considered as being in 20 sets of 500 numbers, one for the lower 500 and one for the upper 500 in each thousand. The 40 Fig. 3A for which wiring is provided in list 1 correspond to the 20 sets or blocks of 500 numbers in office A and the 20 sets in office B. One Fig. 3A shall be equipped in list 1 for each such block of 500 numbers in which any number is assigned for use. The wiring common to Fig. 3A shall be run so that when a particular Fig. 3A is omitted, the common wiring is looped and not cut.

D. A minimum of two split hundreds SH relays (1 MC relay) shall be provided on each terminating marker frame. The SH relays shall be equipped in multiples of two in numerical order in accordance with the telephone company order which is based on the following requirements: (1) one SH relay is required for each 100 consecutive subscriber numbers, that is 2300 to 2399, which are split over more than one HB relay in the number group; (2) one for each 100 consecutive numbers containing any free line; and (3) one for each 100 consecutive numbers containing a PBX which is allotted.

E. One LC relay of Fig. 12 shall be provided for each line choice connector with which the terminating marker will be associated. The LC relay number corresponds to the line choice connector number except when the marker serves a multioffice terminating unit in which the line choice connectors for office A are in a separate group from those for office B. In this case relays LC 0 to 9 shall be equipped as required by the number of line choice connectors 0 to 9 for office A, and relays LC 10 to 19 shall be equipped as required by the line choice connectors 0 to 9 for office B. The multiple wiring between the LC relays shall be arranged so that it will be looped and not cut at the position of unequipped relays.

F. The junctor pattern relays JP 0 to JP 8 and JPN of Fig. 17 shall be equipped in list 1 as follows, according to the number of incoming frames or incoming groups (pairs of incoming frames for which the line junctor distribution is arranged). (See Note L.)

I OR IG	RELAYS 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

G. Figure 17A ac/dc audible ringing supply shall be equipped when the power ringing circuit per SD-80594-04, Fig. 1 or Fig. 2 is used, and Fig. 17B for ± audible ringing supply shall be equipped when the power ringing circuit SD-90504-04, Fig. 3, is used in the office.

H. When the incoming link frames to which the terminating marker is to have access are paired, D apparatus of Fig. Q or R shall be equipped in list 1.

I. The equipment of Fig. 18 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	EQUIP STEPS
2	A, B, C, and E
3	A, B, and E
4 thru 9	A and E
10	None

While Step D of Fig. 18 is not required with the new line junctor arrangements, wiring for this step shall be provided in the local cable in list 1 for possible future use. Multiple wiring between relays JGA, JGB, JGC, JGD, and JGE shall be arranged to be looped at the position of unequipped relays. (See Note M.)

J. Where 4-party ringing is required in the office unit, E apparatus of Fig. 19 shall be equipped in list 1.

K. The LCA relays per Fig. 21 shall be equipped in list 1 as follows, in accordance with the number of line choice connectors for which the line junctor distribution is arranged and whether the incoming link frames are or are not paired. (See Note L.)

1. Incoming Link Frames Not Paired

2-5LCC — No LCA Relays
6LCC — LCA 0-5
7LCC — LCA 0-6
8LCC — LCA 0-7
9LCC — LCA 0-8
10LCC — No LCA Relays

2. Incoming Link Frames Paired Into Incoming Groups

4-10LCC — No LCA Relays
12LCC — LCA 0-5
14LCC — LCA 0-6
16LCC — LCA 0-7
18LCC — LCA 0-8
20LCC — No LCA Relays

L. If it is ever required to add a terminating marker to an existing office having the line junctor distribution in accordance with line junctor distribution chart drawing ED-25079-01 or ED-25080-01, and the addition does not involve converting to the new line junctor distribution per ED-25713-01 or ED-25714-01, the added terminating marker shall be provided with pattern relays Fig. 17, LCA and LCB relays Fig. 21 and 21A, and the step equipment of Fig. 18 of SD-25283-01 to conform with the existing terminating markers.

M. The BR resistance and AG fuse of Fig. AT shall be equipped in list 1 when the marker is arranged for PBX block allotter feature.

N. One list 2 shall be equipped on each of terminating marker frames TM0 and TM1 of each terminating marker group.

O. When CLR trunks are arranged to return a ground signal on the CCT lead, G apparatus and G wiring shall be equipped in list 2. When CLR trunks are arranged to send 135-cycle signal over the CCT lead, omit G apparatus and wiring and connect E wiring.

Q. The local cables shall contain wiring for all options shown on the circuit schematics, and the wiring shall be connected as required to meet individual job specifications.

R. The wiring of outgoing leads from list 2 and of apparatus in lists 1 and 2 outside of the bottom right-hand casing to the equipment of list 2 inside the casing is run through the NC terminal strip in accordance with the circuit cross-connections. The NC terminal strip is furnished in list 1.

S. On terminating marker frames on which list 2 is not equipped, wiring per Fig. A and Fig. 20B is required, and on frames on which list 2 is equipped without the "extra number" feature, wiring per Fig. A is required. This wiring consists entirely of strapping between terminals of the NC terminal strip as shown on the various cross-connection figures. Certain of these straps are required also when R apparatus is omitted in list 2.

U. The sender test connector circuit per Fig. 26 shall be equipped in list 1 when a terminating sender test frame is furnished in the office.

V. The XP relay and the Y 0 to Y 4 resistances of Fig. 17 shall be omitted when the number of incoming link frames or incoming link groups for which the line junctor distribution is arranged is exactly 10, 5, or 2.

W. Figure 30 shall be equipped when an additional SPL relay is required.

X. A total of 2500 extra numbers may be required in blocks of 100 for each number group. They may be considered as being in five sets of 500 numbers, one for the lower 500 and one for the upper 500 in each thousand 0, 1, and the lower 500 of thousand 2. The five Fig. 3A for which wiring is provided in list 2 correspond to these five sets or blocks of 500 extra numbers. When the extra number feature is ordered by the telephone company, one Fig. 3A shall be equipped in list 2 for each block of 500 extra numbers for which block-relay equipment is specified on block-relay frames. When any Fig. 3A is equipped in list 2, the apparatus of Fig. B shall also be equipped.

Y. AF wiring (A&M Only) was used for one job requiring less than 11 incoming link frames in the ultimate for two offices, for which the incoming trunks were in individual groups and the terminating senders had not been equipped with an 0 AB lead.

Z. Figures C, D, E, F, G, H, and 29 shall be equipped in accordance with the following:

1. For one 10,000 number series, without theoretical office, provide Fig. C, E, and H.
2. For one 10,000 number series, with physical and theoretical offices, provide Fig. C, E, and G when discriminating signal is received from the incoming link and connector circuit only. Provide also Fig. 29 when discriminating signal is received from the sender over the 0 AB lead.
3. For two 10,000 number series, (office A and office B) with common group of incoming and line link frames, with no theoretical office, provide Fig. D, E, H, and 29.
4. For two 10,000 number series, (office A and office B) with common group of incoming and line link frames, with theoretical office, provide Fig. D, E, G, and 29.
5. For two 10,000 number series, (office A and office B) with individual groups of incoming and line link frames, with no theoretical office, provide Fig. D, F, and H.
6. For two 10,000 number series, (office A and office B) with individual incoming and line link frames, with theoretical office, provide Fig. D, F, G, and 29.

AA. Figure 27 and 28A shall be equipped in list 1 when a subscriber line overflow register circuit is to be connected to the marker.

AB. For the method of line overload control by 20 block, Fig. V, AP, and Z shall be equipped in list 1; for individual line overload control by plug and jack method, list 3 is required and Fig. AP shall be equipped in list 1. When no control of lines overload is specified, Fig. AC and AO shall be connected in list 1. Only one of the

above three options shall be equipped in a marker at any one time.

AC. One list 3 may be mounted on any TM frame on which list 2 is not equipped. If not otherwise specified by the telephone company the first list 3 shall be mounted on TM2, the second on TM3, and the third if required on TM4.

AD. One each of Fig. Y, N, and U shall be equipped in list 3 for each marker served by the unit. Ordinarily the first unit will serve four marker frames of a group in 0 up order, the second unit if required serving the next higher numbered frames of the same group in consecutive order, etc. The equipment and wiring is such, however, that any marker of any group may be served, if job conditions warrant the use of one unit for markers of more than one group.

AE. The incoming trunk class relays and discriminating relays per Fig. I, JA, M, and OA shall be equipped as follows depending on whether the marker is equipped to distinguish between physical and theoretical offices and whether the incoming link frames served by the marker are arranged for 100 trunks only, 160 trunks only, or whether some are arranged for 100 and others for 160 trunks:

MKR EQUIPPED FOR	INC LK FR CAPACITY	FIG. EQUIPPED
Physical	100	I
Physical	160	I
Physical	100 and 160	I
Physical & Theoretical	100	I and JA
Physical & Theoretical	160	M and OA
Physical & Theoretical	100 and 160	M and OA

AF. The incoming secondary select magnet control relays per Fig. Q and R shall be equipped as follows, depending on the capacity of the incoming link frames and whether or not these frames are paired or arranged for the ESM transfer key method of secondary select magnet control:

INCOMING LINK FRAMES	EQUIP FIG.
100 Trunk	
(1) Not paired	Q (A&M Only)
(2) Paired — Not arranged for ESM key	Q (A&M Only)
(3) Paired — Arranged for ESM key	R
160 Trunk	
(1) Not Paired	R
(2) Paired	R
100 and 160 Trunk	
(1) Not paired	Q (A&M Only)
(2) Paired	R

AG. Fig. AD is (A&M Only) and shall be equipped only when the marker is not arranged to supply battery to the incoming primary select magnets; otherwise equip Fig. P.

AH. When the associated trouble indicator is not equipped for "extra number" operation, N apparatus shall be equipped in list 1 only.

AJ. When it is required to give a busy signal instead of overflow on calls to coin lines with receiver off-hook, equip Fig. AB and AH; otherwise furnish Fig. AG (A&M Only). Provide FJ option with Fig. AH when common incoming and line link frames are used and one busy signal route will serve both office A and office B. Provide FK option in Fig. D where individual incoming and line link frames are used and it is therefore necessary to provide separate busy signal routes for office A and office B.

AK. Figure AL shall be equipped in list 1 when it is desired to cancel test of second allotment on a PBX call in connection with subscriber sender load control. Figure AK shall be connected when Fig. AL is not provided.

AL. Provide options FO and FQ for connection to the line insulation test control circuit which may be connected to the line choice connector multiple associated with the regular marker which is temporarily made busy. Access to subscriber line for line insulation test is gained through the no-test connector. Provide FP option when this feature is not required.

AM. Figure AV shall be equipped in list 1 when it is desired to provide a route to the intercept operator or to recorded announcement system intercept. Figure AU shall be equipped when Fig. AV is not provided.

AN. When list 5 is not required, provide IK option.

AO. When list 6 is required, relays per option GU shall be removed. When list 6 is not required, options GU, IA, IB, IG, and IJ are required.

AP. In addition to list 6, GX wiring is required to provide LLP-DID or No. 101 ESS DA-DID, and when not provided IB wiring is required.

AQ. In addition to list 6, IC wiring is required to provide NS office codes.

AR. In addition to list 6, IS wiring is required when office "B" is used for DID.

AS. In addition to list 6, IA wiring is required when list 7 is not required.

AT. In addition to list 6, IG wiring is required when list 8 is not required.

AU. In addition to list 6, IJ wiring is required when list 9 is not required.

AV. Provide IU and IY wiring per SD-25283-01 when terminating trouble indicator recording is provided.

AW. Reserved.

AX. Provide JG and IY wiring when calling line identification is not provided.

AY. Provided IM wiring in addition to list 2 and list 6 in markers 0 and 1 with LLP-DID or ESS No. 101 DA-DID.

AZ. Provide SD-25283-01, JB option when automatic intercept service without line link pulsing is not required.

BA. Provide SD-25283-01, JD option in addition to list 12 for special markers TM(0) and TM(1) only.

BB. Wiring required in addition to Fig. 28A when matching loss measurements by peg count of terminating attempts to busy lines are required per SD-25283-01, KA option. (See Notes AA and BC.)

BC. Wiring required per SD-25283-01, KE option in addition to KA option of Note BB when LLP-DID with two or more outgoing sender groups is required.

BD. Wiring per SD-25283-01, KC option required in addition to list 1 when list 14 is not required.

J28853B — AT&TCo Std — Twenty Auxiliary Line Circuit Units

Equipment — J28853B-( )

List 1 — Framework, assembly, wiring, and equipment for one unit equipped for 20 auxiliary line circuits. (See Notes A and B.)

	WIRE	EQUIP	NOTES
Framework Mtg Bars P-424402		2	
Aux Line Ckt SD-25921-01, Fig. 1	20	20	

Notes

A. Auxiliary line units associated with PBX block allotter equipment are mounted preferably on a miscellaneous frame located near the line distributing frame and line link frames. Battery shall be supplied from the fuse panel on the frame. Where the 15-fuse capacity or 34-fuse capacity panels, normally furnished, have insufficient capacity, a 60-fuse capacity fuse panel per ED-25025-59, Group 5, 21, 26, or 27 shall be furnished.

B. Because the number of trunks in a PBX group is subject to change, the auxiliary line unit is furnished equipped with 20 SL relays in all cases. The SL relays not assigned to a PBX trunk are blocked in an operated position using the 508A armature blocking tool.

J28853C — AT&TCo Std — PBX Block Allotter Unit

Equipment — J28853C-( )

List 1 — Framework, assembly, wiring, and common equipment for one PBX block allotter unit, arranged for ten terminating markers and a maximum of 20 blocks of PBX lines.

	WIRE	EQUIP	NOTES
Framework & TS Supports, ED-25028-52		1	B
Block Selection Ckt, SD-25919, Fig. 1	5	5	A

List 2 — Equipment, assembly, and wiring required in addition to list 1 to provide for five additional blocks.

	WIRE	EQUIP	NOTES
Block Selection Ckt, SD-25919-01, Fig. 1	5	5	

Notes

A. The block allotter unit, along with block register units, is mounted on a miscellaneous frame near the terminating markers. When a second block allotter unit is required for PBX blocks 20 to 39, it shall be mounted on a second miscellaneous frame. A third unit for PBX blocks 40 to 49 may be located on the same frame with either the first or second unit. Space shall be reserved on the frame below each list 1 for the ultimate number of list 2, that is for 10, 15, or 20 blocks.

B. Furnish unit mounting bars as follows for block allotter units arranged initially for:

5 blocks — P-424409
10 blocks — P-424410
15 blocks — P-424411
20 blocks — P-424412

J28853D — AT&TCo Std — PBX Block Register Unit

Equipment — J28853D-( )

List 1 — Framework, assembly, wiring, and common equipment for one PBX block register unit for one terminating marker arranged for ten PBXs and 50 allotted groups. (See Notes A and C.)

	WIRE	EQUIP	NOTES
Framework & TS Supports, ED-25028-52		1	B
Common Ckt, SD-25920-01, Fig. 2	1	1	
PBX Route Rel, SD-25920-01, Fig. 1	10	0	
Allotted Grp Rel, SD-25920-01, Fig. 3	10	0	

List 2 — Common equipment and wiring required in addition to list 1 to provide for ten additional allotted groups.

	WIRE	EQUIP	NOTES
Allotted Grp Rels, SD-25920-01, Fig. 3	10		0

List 3 — Equipment per SD-25920-01, Fig. 1, required in addition to list 1 for each PBX group to be served.

List 4 — Equipment per SD-25920-01, Fig. 3, required in addition to lists 1 and 2 for each allotted group.

Notes

A. The block register units are mounted on one or more miscellaneous frames located near the terminating markers. List 1 provides for ten PBXs maximum and for ten allotted groups. List 2 is supplementary to list 1 for ten additional allotted groups. Space shall be reserved on the miscellaneous frame below each list 1 for the ultimate number of list 2, that is, for 20, 30, 40, or 50 allotted groups. Furnish one list 3 for each PBX served and one list 4 for each allotted group.

B. Furnish unit mounting bars as follows for block register units arranged initially for:

10 allotted groups P-424410
20 allotted groups P-424411
30 allotted groups P-424412
40 allotted groups P-424413
50 allotted groups P-424414

C. Each miscellaneous frame with PBX block register units shall be equipped with an F remote control jack shown on SD-25920-01 and located in the miscellaneous key, jack, and lamp mounting. When PBX block register equipment is mounted on the miscellaneous relay rack, the F remote control jack shall be located in the mounting containing the test posts and telephone jacks in the same or adjacent bay.

J28853E — AT&TCo Std — Terminating Marker Line Link Pulsing Frame (See Table B)

Equipment — J28853E-( )

List 1 — Framework, assembly, wiring, and common equipment for one terminating marker line link pulsing frame arranged for two terminating markers.

	WIRE	EQUIP	NOTES
Framework, ED-91710-(70), G5			
Misc Ckt, SD-27819-01:			
Alm. Rls, Fig. 2	2	2	
FA & FA1 Relays, Fig. 1	2	0	
Fr Tst, Fr Line, RC Jks, and Tst Bat., Fig. 3	1	1	
Ckt Fusing, Fig. 4	2	0	
Terminating Marker Applique Ckt, SD-27765-01:			
Registration Relays, Fig. 1	2	0	
Line Ckt Control, Fig. 2	2	0	
Outsender Selection, Fig. 3 & J Wrg	2	0	
Outsender Control, Fig. 4	2	0	
Outsender Lead Check, Fig. 5	2	0	
Outsender Group Relays, Fig. 6	10	0	
Outsender Busy Relays, Fig. 7	4	0	
LLP Control, Fig. 8	2	0	
Marker and Outsender Control, Fig. 9	2	0	
Test Relay, Fig. 11	2	0	
Translator Control, Fig. 12	2	0	
No. 101 ESS DID Control, Fig. 14	2	0	

Notes

A. In addition, there are options involving wiring only as follows:

1. Wiring per SD-27765-01, M option for LLP-DID when only one outgoing sender group is provided.
2. Wiring per SD-27765-01, W option for LLP-AIS when there is no theoretical office in the terminating marker group.
3. Wiring per SD-27765-01, D option when LLP is provided and AIS is not provided by this circuit.
4. Wiring per SD-27765-01, C option when AIS without LLP-AIS is used with number series DID.
5. Wiring per SD-27765-01, B option when No. 101 ESS DA is required and AIS is not provided by this circuit.

J28853F — AT&TCo Std — Terminating Marker — No. 101 ESS Direct Access Frame (See Table C)

Equipment — J28853F-( )

List 1 — Framework, assembly, wiring, and common equipment for one TM-DA frame arranged to serve five terminating markers.

	WIRE	EQUIP	NOTES
Framework, ED-91710-74, G6			
Misc Ckt, SD-27819-01:			
FA & FA1 Relays, Fig. 1	5	5	
ALM. Release Key & LPS, Fig. 2	5	5	
Fr Tst, Fr Line, RC Jk & Tst Bat., Fig. 3	1	1	
Ckt Fusing, Fig. 4	5	0	
Terminating Marker Applique Ckt, SD-27765-01:			
Registration Relays, Fig. 1 & B option	5	0	
Test Relay, Fig. 11	5	0	
Translator Control, Fig. 12	5	0	
No. 101 ESS DID Control, Fig. 14	5	0	

List 2 — Equipment and wiring required in addition to list 1 for the sixth marker when marker group is arranged for a maximum of six terminating markers.

	WIRE	EQUIP	NOTES
Misc Ckt, SD-27819-01			
FA & FA1 Relays, Fig. 1	1	1	
Alm. Release Keys & Lps, Fig. 2	1	1	
Ckt Fusing, Fig. 4	1	0	

Note

A. In addition, there are options involving wiring only as follows:

1. Wiring per SD-27765-01, C option when AIS without LLP-AIS is used with number series DID.

J28853G — AT&TCo Std — No. 101 ESS Direct Access Relay Rack Mounted Unit (See Table D)

Equipment — J28853G-( )

List 1 — Assembly, equipment, and wiring required for association with the sixth terminating marker when an office is arranged for a marker group that has a maximum capacity of six terminating markers.

	WIRE	EQUIP	NOTES
Terminating Marker Applique Ckt, SD-27765-01:			
Registration Relays, Fig. 1 and B option	1	0	
Test Relay, Fig. 11	1	0	
Translator Control Fig. 12	1	0	
No. 101 ESS DID control, Fig. 14	1	0	

Note

A. The fusing for this unit is located on the TM-DA frame. Ground shall be acquired from RR ground lead.

J28853AA — AT&TCo Std — Line Test Unit — I

Equipment — J28853AA-( )

List 1 — Assembly, equipment, and wiring in accordance with SD-25283-01, Fig. BL for one line test unit.

List 2 — Equipment and wiring required per SD-25283-01, Fig. CB for subscriber line overload control.

List 3 — Equipment and wiring required per SD-25283-01, Fig. 36A for automatic intercept service with an AIS frame.

J28853AB — AT&TCo Std — Channel Test Unit

Equipment — J28853AB-( )

List 1 — Assembly, equipment, and wiring in accordance with SD-25283-01, Fig. BJ for one channel test unit.

List 2 — Equipment and wiring required per SD-25283-01, Fig. BK for busy link percent load register operation.

J28853AC — AT&TCo Std — Line Test Unit — II

Equipment — J28853AC-( )

List 1 — Assembly, equipment, and wiring in accordance with SD-25283-01, Fig. BH, BR, and BV or BX for one line test unit. (See Note A.)

Note

A. 1. Provide Fig. BV when Fig. AR is required — Standard.

2. Provide Fig. BX when Fig. AQ is required — A&M Only.

J28853AD — AT&TCo Std — Line Test Unit — III

Equipment — J38853AD-( )

List 1 — Assembly, equipment, and wiring in accordance with SD-25283-01, Fig. CC for one line test unit. (See Note A.)

List 2 — Equipment and wiring required per SD-25283-01, Fig. BZ for markers arranged for theoretical office operation.

TABLE A — TERMINATING MARKER FRAME — J28853A (FIG. 1 or 2)

COMPONENT EQUIPMENT 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	
J28853AA	1	1		Line Test Unit — I
	2		1	Subscriber Line Overload Control
	3		1	Automatic Intercept Service With AIS Frame
J28853AB	1	1		Channel Test Unit
	2		1	Busy Link Percent Load Register Operation
J28853AC	1	1		Line Test Unit — II
J28853AD	1	1		Line Test Unit — III
	2		1	Theoretical Office Operation
	3		1	Serves Incoming Link Frames With a 100 Trunk Capacity
	4		1	Serves Incoming Link Frames With 160 Trunk Capacity
J28853AE	1	1		Line Test Unit — IV
J28853AF	1	1		First Channel Control Unit
J28853AG	1	1		Second Channel Control Unit
	2		1	Not Arranged to Test Extra Numbers
J28853AH	1	1		Fuse Panel Unit

List 3 — A&M Only — Equipment required in addition to list 2 per SD-25283-01, (Fig. JA) JI apparatus when marker serves incoming link frames with a 100 trunk capacity.

List 4 — Equipment required in addition to list 2 per SD-25283-01, (Fig. 0A) JI apparatus when marker serves incoming link frames with 160 trunk capacity.

Note

A. Provide JK wiring when Fig. 9 is required.

J28853AE — AT&TCo Std — Line Test Unit — IV

Equipment — J28853AE-( )

List 1 — Assembly, equipment, and wiring in accordance with SD-25283-01, Fig. BF and BT for one line test unit.

J28853AF — AT&TCo Std — First Channel Control Unit

Equipment — J28853AF-( )

TABLE B — TERMINATING MARKER LLP FRAME — J28853E (Fig. 3)

(Equipment Units Provided as Follows)

FRAME POS NO.		J CODE	LIST NO.	QUANTITY		DESCRIPTION
1ST MKR	2ND MKR			ALWAYS REQUIRED	FOR OPTION INDICATED	
0	33+	J28853EA	1	1		Registration Unit
			2		1	Cont for DID via LLP/101ESS
			3		1	DID Test is Provided
			4		1	Reqd for Mkrs 0 & 1 With List 2
			5		1	Reqd for DID And/Or AIS via LLP
			6		1	Reqd When "B" Office Code is Used to Provide DID Indication from the Term. SDR
			7		1	Reqd When "B" Office Code is Not Used to Provide DID Indication from the Term. SDR
			8		1	When Dedicated DID Incoming Trks are Provided
			9	1		Misc Ckt, FA & FA1 Rels
5	38+	J28853EB	1	1		Line & 0 Sdr Sel & Cont
			2		1	2nd Outsender Grp Rels
			3		1-4	3 Through 6 OS Grp Rels
			4		1-2	Additional Outsdr Conn Bsy Rels
11	44+	J28853EC	1	1		Outsender Check
14	47+	J28853ED	1		1	DID Control
16	49+	J28853EE	1		1	AIS Mkr & Outsender Cont
			2		1	Number Series Office Codes are Provided Provided in TM Group
			3		1	Theoretical Office in TM Group
18	51+	J28853EF	1	1		Translator Cont
			2		1	Number Series Relays Required to Provide DID Ind from Ter Sdr
19	52+	J28853EG	1		1	No. 101 ESS-DID Cont
			2		1	LLP-DID Provided in TM
			3		1	NBR Series Rels Provided
62		J28853EH	1	1		Fuse Panel
	61		1		1	

TABLE C — TERMINATING MARKER DIRECT ACCESS FRAME

J28853F (Fig. 4)

(Equipment Units Provided as Follows)

FRAME POS. NO. PER MKR					J CODE	LIST NO.	QUANTITY		DESCRIPTION
1ST	2ND	3RD	4TH	5TH			ALWAYS REQUIRED	FOR OPTION INDICATED	
0	10	22	32	42	J28853EA	1	1		Reg Unit
						2	1		Cont for DID via LLP or No. 101 ESS
						3	1		DID Test is Provided
						4		1	Reqd for Mkrs 0 & 1 With List 2
						6		1	Reqd When "B" Office Code is Used to Provide DID Indication from the Term. Sdr
						7		1	Reqd When "B" Office Code is Not Used To Provide DID Indication from the Term. Sdr
						8		1	When Dedicated DID Incoming Trks are Provided
5	15	27	37	47	J28853EF	1	1		Translator Cont
						2		1	NBR Series Rels Reqd to Provide DID Indication
6	16	28	38	48	J28853EG	1	1		No. 101 ESS — DID Cont
						3		1	NBR Series Rels Provided
62					J28853FA	1	1		Fuse Pan — 1st TM
						2		1	2nd TM
		61				1		1	3rd TM
						2		1	4th TM
				60		1		1	5th TM
						2		1	6th TM (RR Mtd)

TABLE E — RELAY RACK MOUNTED UNIT — J28853G

(Equipment Units Provided as Follows)

UNIT		QUANTITY TO BE PROVIDED		TITLE OF UNIT AND DESCRIPTION OF FEATURE OR OPTION
J-CODE	LIST NO.	ALWAYS	FOR OPTION INDICATED	
J28853EA	1	1		Reg Unit
	2	1		Cont for DID Via LLP or No. 101 ESS
	3	1		DID Test Is Provided
	4		1	Reqd for Mkrs 0 & 1 With List 2
	6		1	Reqd When B Office Code Is Used to Provide DID Indication From Term. Sdr
	7		1	Reqd When B Office Code Is Not Used to Provide DID Indication From the Term. Sdr
	8		1	When Dedicated DID Inc Trks Are Provided
J28853EF	1	1		Translator Cont
	2		1	Nbr Series Rels Reqd to Provide DID Indication
J28853EG	1	1		No. 101 ESS — DID Cont
	3		1	Nbr Series Rels Provided

List 1 — Assembly, equipment, and wiring in accordance with SD-25283-01, Fig. BP and JL apparatus for one channel control unit. (See Notes A and B.)

Notes

A. Wiring per JL option required for paired incoming link operation.

B. Space is provided on this unit for relocating the FA1 relay of SD-25055-01 on an A&M Only basis.

J28853AG — AT&TCo Std — Second Channel Control Unit

Equipment — J28853AG-( )

List 1 — Assembly, equipment, and wiring in accordance with SD-25283-01, Fig. BN and apparatus only of Fig. 28A for one channel control unit. (See Note A.)

List 2 — Equipment and wiring required per SD-25283-01, N apparatus of Fig. XA for markers not arranged to test extra numbers.

Note

A. Wiring required per SD-25283-01, Fig. 28A for one busy auxiliary relay for subscriber line overflow registration.

J28853AH — AT&TCo Std — Fuse Panel Unit

Equipment — J28853AH-( )

List 1 — Assembly, equipment, and wiring in accordance with SD-25055-01, Fig. 14.

J28853EA — AT&TCo Std — Registration Unit

Equipment — J28853EA-( )

List 1 — Assembly, equipment, and wiring for one registration unit.

	WIRE	EQUIP	NOTES
Registration Ckt, SD-27665-01: Fig. 1 less F,G,R, and Y Option	1	1	

List 2 — Equipment and wiring in accordance with SD-27765-01, Fig. 1, R option required in addition to list 1 for DID via line link pulsing and/or No. 101 ESS.

List 3 — Equipment and wiring in accordance with SD-27765-01, Fig. 11, required in addition to list 1 and 2 when DID test circuit is provided.

List 4 — Equipment and wiring in accordance with SD-27765-01, Fig. 15, required in addition to list 2 for markers 0 and 1 only.

List 5 — Equipment and wiring in accordance with SD-27765-01, H option for DID and/or AIS via LLP.

List 6 — Equipment and wiring in accordance with SD-27765-01, Y option required in addition to list 1 when "B" office code is used to provide DID indication from the terminating sender.

List 7 — Equipment and wiring in accordance with SD-27765-01, G option, required in addition to list 1 when "B" office code is not used to provide DID indication from the terminating sender.

List 8 — Equipment and wiring in accordance with SD-27765-01, F option, required in addition to list 1, when dedicated DID incoming trunks are provided. (See Note A.)

List 9 — Equipment and wiring in accordance with SD-27819-01, Fig. 1, FA and FA1 relays required in units mounted on LLP-FR.

Notes

A. Provide E wiring per SD-27765-01, in addition to list 8 for test line indication in offices with number series — DID indication arranged for No. 101 ESS direct access without DID via LLP.

B. Wiring per SD-27765-01, B option required when No. 101 ESS DA is required and AIS is not provided by this circuit.

J28853EB — AT&TCo Std — Line and Outsender Selection and Control Unit

Equipment — J28853EB-( )

List 1 — Assembly, equipment, and wiring in accordance with SD-27765-01, Fig. 2, Fig. 3, J wiring and Fig. 4 less N option for one line and outsender selection and control unit.

List 2 — Equipment and wiring for one Fig. 6 and N option of Fig. 4 required in addition to list 1 to provide for the second outsender group. (See Note A.)

List 3 — Equipment and wiring for one Fig. 6 for each added outsender group (2, 3, 4, or 5) required in addition to lists 1 and 2.

List 4 — Equipment and wiring in accordance with SD-27765-01, Fig. 7 required in addition to lists 1 and 2 to provide outsender connector busy relay for each two or less added outsender connectors.

Note

A. Wiring per SD-27765-01, ZA option required in addition to list 2 when peg count is required for busy line calls in the terminating marker.

J28853EC — AT&TCo Std — Outsender Check Unit

Equipment — J28853EC-( )

List 1 — Assembly, equipment, and wiring in accordance with SD-27765-01, Fig. 5 for one outsender check unit.

J28853ED — AT&TCo Std — Direct Inward Dialing Control Unit

Equipment — J28853ED-( )

List 1 — Assembly, equipment, and wiring in accordance with SD-27765-01, Fig. 8 for one direct in dial control unit.

J28853EE — AT&TCo Std — Marker and Outsender Control Unit for AIS

Equipment — J28853EE-( )

List 1 — Assembly, equipment, and wiring in accordance with SD-27765-01, Fig. 9 for one marker and outsender control unit for AIS less S and T options.

List 2 — Equipment and wiring in accordance with SD-27765-01, Fig. 9, S option only required in addition to list 1, to provide additional NSS relays.

List 3 — Equipment and wiring in accordance with SD-27765-01, Fig. 9, T option only required in addition to list 1 when the theoretical office is provided in the terminating marker group.

J28853EF — AT&TCo Std — Translator Control Unit

Equipment — J28853EF-( )

List 1 — Assembly, equipment, and wiring in accordance with SD-27765-01, Fig. 12 for one translator control unit less X option.

List 2 — Equipment and wiring in accordance with SD-27765-01, Fig. 12, X option required in addition to list one to provide NS relays for DID indication from the terminating sender. (See Note A.)

Notes

A. The "B" office if available may be used as the DID code, Y wiring, or if not available, a number series (NS) office code or codes are provided. A maximum of five NS office codes may be recognized by the NS0, 1, 2, 4 relays. They are number series office codes 2 through 6.

B. Wiring required in addition to list 2 in accordance with SD-27765-01, C option when AIS without LLP-AIS is provided.

J28853EG — AT&TCo Std — No. 101 ESS DID Control Unit

Equipment — J28853EG-( )

List 1 — Assembly, wiring, and equipment per SD-27765-01, Fig. 14 and ZD option less K and Z options, and SD-94820-01, Fig. 2 for one No. 101 ESS DID control unit.

List 2 — Equipment and wiring per SD-27765-01, K option required in addition to list 1, when LLP-DID is provided in terminating marker group.

List 3 — Equipment and wiring per SD-27765-01, Z option required in addition to list 1 for DID indication provided by the number series relays.

Notes

A. Provide E wiring per SD-27765-01 for test line indication in offices with number series — DID indication arranged for No. 101 ESS direct access without DID via LLP.

C. Wiring per SD-27765-01, B option required when No. 101 ESS-DA is required and AIS is not provided by this circuit.

J28853EH — AT&TCo Std — Fuse Panel Unit for TM-LLP Frame

Equipment — J28853EH-( )

List 1 — Assembly, wiring, and equipment in accordance with SD-27819-01, Fig. 4 for one fuse panel for one marker. (See Note A.)

Note

A. Two list 1 are required when the TM-LLP frame is equipped for two markers.

J28853FA — AT&TCo Std — Fuse Panel Unit for TM-DA Frame

Equipment — J28853FA-( )

List 1 — Assembly, wiring, and equipment for one fuse panel unit arranged for two markers but equipped for one marker per SD-27819-01, Fig. 4. (See Note A.)

List 2 — Equipment required in addition to list 1 to equip one additional marker per SD-27819-01, Fig. 4. (See Note A and B.)

Note

A. The TM-DA frame will mount three fuse panel units associated with five terminating markers. (See Fig. 4.)

B. The TM-DA frame will provide fusing from the right half of the third fuse panel unit, when the sixth terminating marker is associated with a RR mounted unit for DA. (See Fig. 4.)

5. GENERAL NOTES

Equipment

5.01 A minimum of three terminating marker frames shall be equipped in any installation.

5.02 The interrupter contacts required by the terminating marker circuit shall be located on the office interrupter frame.

5.03 No designation cards are required for the terminating marker frame. The frame designation TMO, TM1, etc, is stamped as indicated on the frame equipment drawing on the base of the frame.

5.04 For terminating marker frames built prior to SD-25283-01, Issue 65D, modification of selected multicontact relays will result in a substantial decrease in marker operate time. It is recommended that field modification of these relays should be requested by the telephone company only after careful consideration of the data presented in Table D.

5.05 To extend the fuse capacity of terminating markers not equipped with modular fuse panels, an auxiliary fuse panel is provided per ED-27801-10, A&M Only.

5.06 The TMA lamp in the +110 volt supply lead of Fig. 17, SD-25283-01 shall be located on the fuse bay, and the +110 volt supply shall be obtained from the fuse panel on the fuse bay.

5.07 The TMB lamp in the "±Aud" or the "ac/dc Aud" continuous ringing supply lead of SD-25283-01. Figure 17A or 17B, respectively, shall be located on the fuse bay and the

TABLE D

RELAY DESIG	SLOW OPERATING EXISTING RELAYS			FASTER OPERATING REPLACING RELAYS			AVERAGE MILLISECOND DIFFERENTIAL	PERCENTAGE OF CALLING LOAD EFFECTED
	CODE	FIG	OPT	CODE	FIG	OPT		
OA,OB*	245	D	BC	287C	D	JQ	10.9	100%
	263		BD					
	287A		JM				9.1	
				D180441 (287A Relay with 287C Rel Core)			6	
SHO-19**	245	9	BC	287C	9	JQ	10.9	20%
	263		BD					
	287A		JM				9.1	
				D180441 (287A Relay with 287C Relay Core)			6	

*Only when office is arranged for A and B office operation.

**Only when office is arranged for split hundreds.

"±Aud" or "ac/dc Aud" ringing supply shall be obtained from the corresponding fuse panel on the fuse bay.

5.08 The positive 130-volt supply for terminating markers arranged for marker speedup shall be obtained from the miscellaneous fuse bay.

5.09 The positive 24-volt supply for terminating markers arranged for the number checking, no-test, and no-hunt features shall be obtained from the positive 24-volt supply equipment located on the miscellaneous frame.

Wiring

5.10 The wire gauge and type of insulation to be used in the manufacture and installation of the TM frame, TM-LLP frame and TM-DA frame and associated units described in this specification shall be as follows:

USE	GAUGE	TYPE
Surface	24	BW
Loose	24	BU
Cross Conn	24	BU
Local Cable	24	BU
SWBD Cable	24	BU
MC Rel Strap	20	BARE

Cross-Connections

5.11 Complete requirements for cross-connections for the terminating marker frame, including among other things size of wire, color of insulation, and description of terminal strip arrangements, are covered on the cross-connecting terminal strip equipment drawing and its associated equipment explanation.

5.12 The cross-connections required on the terminating marker frame are in two categories: first those which are set by the size of installation (that is, that can be determined from the job order) and, second, those which depend upon information furnished by the telephone company at the time of installation. There may be some advantage, particularly in the case of junctor patterns in running the cross-connections mentioned in the first category in the shop. The equipment design is such, however, that these cross-connections may be placed in the shop or in the field.

Cabling

Local Cables

5.13 Three shop-formed local cables are required for the terminating marker frame; one main local cable which is required for every frame, a small local cable interconnecting the casing enclosed equipment for the number checking, no-test, and no-hunt features and extending to the NC terminal strip, which is required on the two frames TM0 and TM1 of each office unit, and, when line overload control by the plug and jack method is required, a small unit local cable for the line overload control unit on frames other than TM0 and TM1.

5.14 ***Local Cable Supports:*** Vertical bars having an insulating finish are provided to which the vertical form of the main local cable may be tied. These bars may be moved slightly in a horizontal direction to compensate for variations in the diameter of the local cable at different points. Supports are also provided for the vertical part of the arms inside the casings. No supports are provided for horizontal arms.

5.15 The schematic of cable runs from the terminating marker frame to incoming link and terminating marker connector frames is shown on the marker multiple schematic drawing ED-25130-10 which shall be followed in running these cables.

5.16 Some of the switchboard cables from each terminating marker frame are run to the DPTS or SDPTS of other associated frames. The leads involved are continued from these points to the associated frames in switchboard power cables in accordance with the switchboard power cabling drawings for the frames.

Switchboard Power Cabling

5.17 Switchboard power cable containing the miscellaneous wiring from the DPTS shall be run along the cable rack for each row of frames in accordance with the switchboard power cabling drawing. At each frame the leads shall

be looped at the miscellaneous terminal strip and connected as required.

5.18 For use during the early operation of an office, the telephone company may order special means of handling intercepting traffic in addition to the standard intercepting facilities provided in the marker. By modifying the marker circuit and equipping apparatus in accordance with intercepting relay circuit SD-25438-01, any or all of the following options may be provided:

(a) Special routes to intercepting operator terminating in subscriber lines for calls to unequipped numbers.

(b) Special routes to intercepting operator terminating in intercepting trunk circuits or subscriber lines for calls encountering an open NS lead.

(c) Special routes to intercepting operator terminating in subscriber lines to provide temporary intercepting facilities additional to the regular local intercept.

The supplementary wiring required by this circuit shall be provided on a job basis in any manner which permits its removal at some later time when the intercepting traffic will be handled in the regular way. The marker frame mounting plate equipment drawing assigns a location for apparatus of SD-25438-01 and the cross-connecting terminal strip drawing covers the location of certain terminals for the special intercepting routes. No provision has been made on the mounting plate equipment drawing for equipping apparatus for both (b) and (c) options in single or multioffice units having physical and theoretical offices; should such an arrangement be required, recommendations should be obtained from the Bell Telephone Laboratories, Incorporated.

5.19 Codes J28853H through J28853Y and J28853EJ through J28853EY are unassigned.

Bell Telephone Laboratories, Incorporated

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