CENTRALIZED "A" AND "B" SWITCHBOARD EQUIPMENT ENGINEERING INFORMATION EQUIPMENT DESIGN REQUIREMENTS NO. 1 CROSSBAR SYSTEM

INDEX

1. GENERAL

Scope
Capacity
Description
Central "A" Switchboard 1.04
Central "B" Switchboard 1.05
Special Service Trunks 1.06
Intercepting & Verification Trunks 1.07
Sender Monitoring Features 1.08
Plugging-Up Lines 1.09
Miscellaneous
Emergency Lines 1.10
Dial Terminating Manual Lines 1.11
Repair Service Trunks 1.12
Interrupter and Alarms 1.13
Testing and Maintenance 1.14

2. SUPPLEMENTARY INFORMATION

3. SUMMARY OF EQUIPMENT

4. EQUIPMENT NOTES

Special Service Trunks
Outgoing Special Service Trunks 4.01
Incoming Special Service Trunks 4.02
Emergency and Manual Lines
Outgoing Emergency Lines 4.03
Incoming Emergency Lines 4.04
Dial Terminating Manual Lines 4.05
Repair Service Trunks
One Way Repair Service Trunks 4.06
Two Way Repair Service Trunks 4.07
Central "B" Sender and Position Finders
Central "B" Senders (Terminating Part) 4.08
Central "B" Senders and Position Finders (Swbd. Part) 4.09
Testing and Maintenance Features 4.10
Alarms, Registers and Interrupters
Alarms 4.11
Registers 4.12
Interrupters 4.13
Central "A" and "B" Board Trunks
Intercepted Calls 4.14
Completion of Intercepting Calls 4.15
Vacant Code Calls 4.16
Central "A" Board Outgoing Trunks 4.17
Central "A" Board Incoming Trunks 4.18
Central "B" Board Trunks 4.19
Sender Make Busy and Monitoring Features
Permanent Signal Holding Trunks 4.20
Coin Supervisory Control Trunks 4.21
Vacant Code Tone and Incpt. Trunks 4.22
Subscriber Sender Timed Release 4.23
Miscellaneous Features 4.24
Plugging Up Lines 4.25

1. GENERAL

Scope

1.01 This specification, together with the supplementary information listed herein, covers the engineering information for the equipment and circuits to be used with central "A" and "B" traffic. Detailed engineering requirements are covered in the separate specifications listed herein. The purpose of this specification is to consolidate the recommended practices and equipment requirements for centralized "A" and "B" traffic in or serving No. 1 crossbar offices.

Capacity

1.02 The capacity of equipment which was not altered by the introduction of centralized "A" and "B" traffic is listed in the several specifications in which they are covered. The capacity of equipment which was developed for use with centralized "A" and "B" traffic is shown in two separate lists depending upon the office in which they are to be used under part 3.

Description

1.03 Central "A" and "B" switchboards have been developed to serve outlying dial offices in urban areas where the amount of switchboard traffic is not sufficient to justify separate operating and building facilities. The switchboard traffic may be handled from both outlying crossbar or panel office and crossbar or panel units located in the same building. The arrangements to care for the traffic from the units in the same building are the same as for the present non-central installations. The facilities for handling traffic from or to outlying crossbar offices are described in the following paragraph. (See Fig. 1)

Central "A" Switchboard

1.04 The central "A" switchboard uses the same type of switchboard and cable turning section as the local panel and crossbar "A" switchboard. This switchboard may be arranged for use with key pulsing or dialing equipment, or arranged to work with a central "B" switchboard. The central "A" switchboard may be located in a panel office, (see J91101) or in a crossbar office. (See J91103) The type of cord circuits required for the different kinds of traffic are the same as for non-central operation. Further development will be required before number checking can be handled on a centralized basis. The sender monitoring positions will

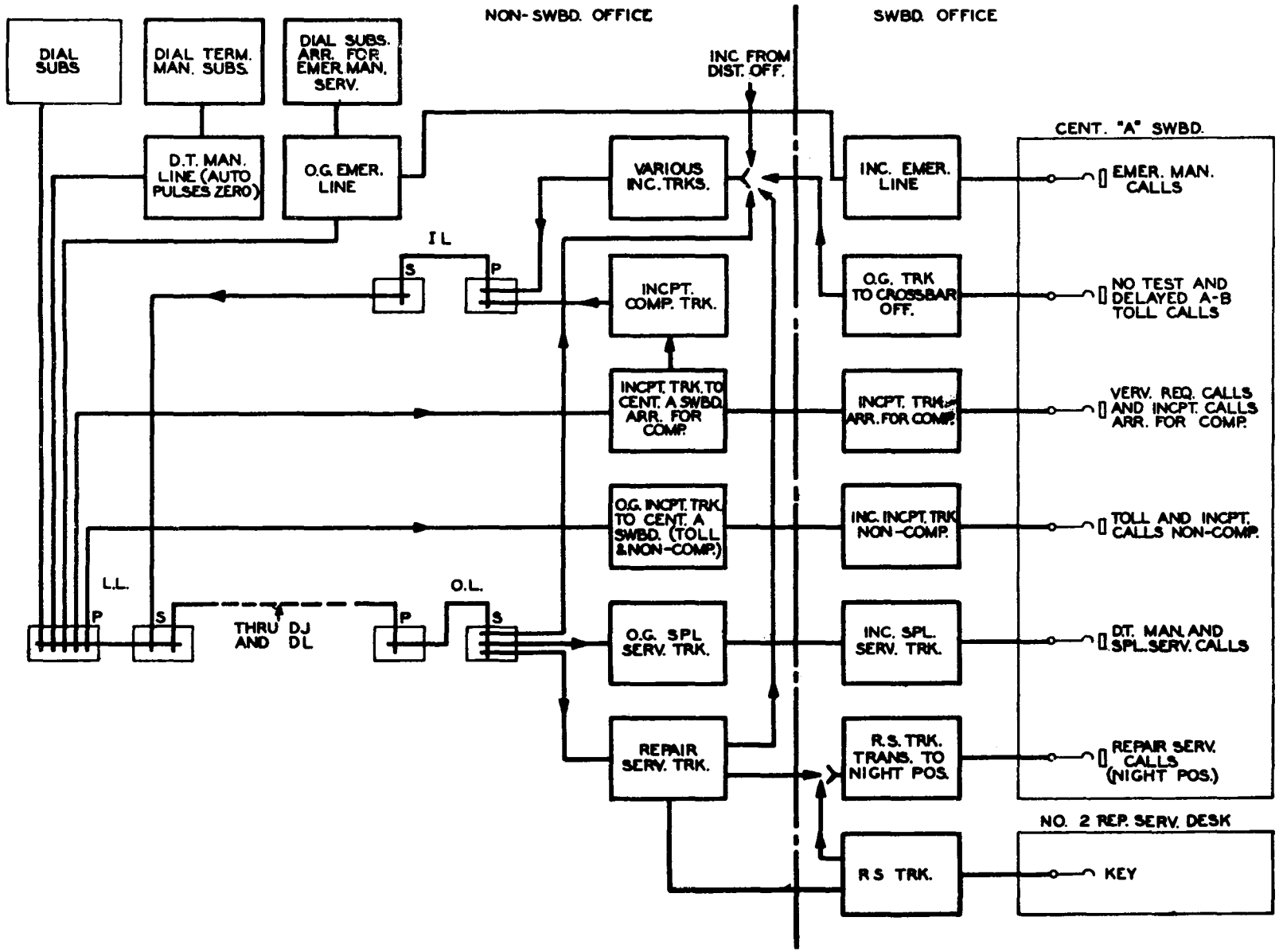

Fig. 1 - Central "A" Switchboard Calls

handle traffic only from the units in the same building with the central "A" switchboard. Sender monitoring traffic for crossbar units located in a building without switchboards will be handled as described in paragraph 1.08. A means has also been provided to collect or return coins on reverse charge and delayed calls thru the toll incoming trunks and toll calls thru the subscriber recording completing trunks, by using an outgoing coin control circuit at the terminating crossbar office and an incoming coin control circuit at the central "A" switchboard.

Central "B" Switchboards

1.05 The central "B" switchboard uses the same section and cable turning section as the local panel or crossbar "B" switchboard. (See J21301) The central "B" switchboard may or may not be located in the same building with the central "A" switchboard. The manual trunks from toll, tandem, and local offices are connected to standard crossbar incoming "B" trunks in the terminating crossbar office as though a local "B" switchboard were used. The terminating sender link and controller circuit connects these trunks to a new central "B" sender (terminating part) on the regular terminating sender frame. This sender is connected thru interoffice cable pairs to a central "B" sender (switchboard part) on a sender and position finder frame in the office with the central "B" switchboard. When the sender in the terminating crossbar office is seized, it signals its associated sender in the switchboard office and the latter hunts an idle "B" position and connects to it in the customary manner. An order tone is then sent back to the originating operator indicating that the "B" operator is ready to receive the order. The number is then keyed up in the usual manner and recorded in the central "B" sender (switchboard part). This sender then sets the central "B" sender (terminating part) by means of revertive pulses in a similar manner to that employed in setting up a number on a regular full selector terminating sender. The central "B" sender (terminating part) then completes the call thru the terminating switch equipment in the usual crossbar manner. Crossbar office central "B" board traffic is routed direct from the manual toll, tandem, or local office direct to the terminating crossbar office instead of thru the central "B" board office as done with panel central "B" board traffic. This permits reusing these trunk loops for mechanical service after conversion to dial operation. (See Fig. 2)

Special Service Trunks

1.06 Special service traffic includes A-B toll calls, revertive calls, service complaints, calls for assistance in an emergency, and calls to stations which do not answer or are persistently busy. In all of the above cases the subscriber is instructed to dial "Operator". The sender recognizes the class of subscriber and routes the call to a special service operator over the proper group of trunks so that the operator knows what class of subscriber is making the call. Two general types of centralized special service trunks, coin and non-coin, are available for routing this traffic from the outlying crossbar office to the central "A" switchboard. The outgoing end of these trunks appear on the office secondary multiple in the outlying crossbar office. The incoming end is jack ended at the central "A" switchboard in a similar manner to the non-centralized special service trunks. (See Fig.1)

Intercepting and Verification Trunks

1.07 The completion of verification and intercepting traffic may be handled with the assistance of the central "B" operator or by means of key pulsing or dialing equipment at the central "A" switchboard. Intercepted calls to vacant line terminals and to changed and disconnected numbers; verification request calls from operators and trouble intercepting calls in outlying offices are automatically concentrated at the line link frame with the present crossbar arrangement and extended thru an outgoing trunk in the non-switchboard office to an incoming trunk in the switchboard office where they are cross connected to jacks and lamps at the central "A" switchboard. Optional arrangements are provided for the completion or non-completion of intercepted calls. (See Fig. 1)

Sender Monitoring Features (See Par. 4.22 to 4.25)

1.08 Sender monitoring positions will only be required for the units in the same building with the central "A" switchboard. The sender monitoring features for the remote offices will be handled as follows:

(a) The originating senders in the outlying crossbar offices will be arranged for the automatic timed release of stuck senders.

(b) The coin supervisory circuits and the vacant code tone trunks will be under the control of the plant force at the sender make busy frame. On jobs arranged for overtime coin collection the overtime jacks of the coin supervisory circuits are extended to the distant central "A" switchboard for supervision of the coins. The vacant code tone trunks may be routed to the central "A" operator on a temporary basis.

(c) Permanent signals will appear at the sender make busy frame. Two types of permanent signal equipment will be required, one for use with coin lines and the other for use with non-coin lines.

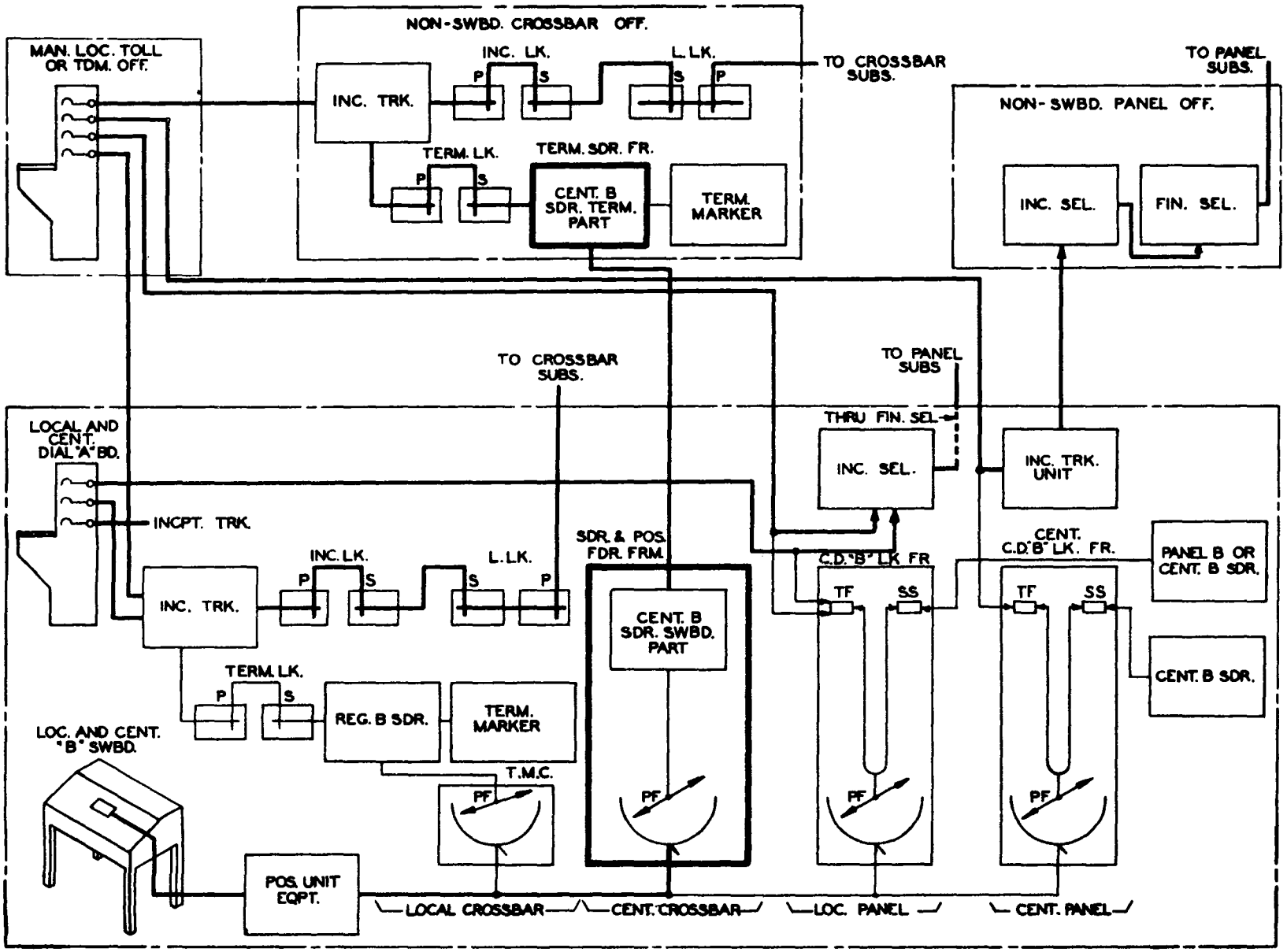

Fig. 2 - Local and Central "B" Switchboard - Manual Local, Toll, Tandem, and DSA Calls

Plugging-Up Lines (See Par. 4.26)

1.09 Subscriber lines temporarily out of service because of a trouble condition are connected to plugging-up line circuits to provide a means of access for trouble observations and test. These plugging-up lines may or may not be arranged to automatically cut thru the subscriber line to its associated line and cut-off relay if the trouble is cleared or becomes clear automatically. A plugging-up line panel is located in every office not situated in the same building with the central "A" switchboard. This is necessary to permit the maintenance force in each office to have ready access to lines "out of order" and to reduce the number of interoffice trunks to the distant central "A" switchboard. Plugging-up lines terminate in jacks on the plugging-up line panel by means of which the maintenance man can establish connection to the circuit for monitoring and talking and for testing from the local test desk.

Miscellaneous (See Pars. 4.03 to 4.09 and 4.14 to 4.17)

1.10 Emergency line equipment is required (1) to provide operators service on calls where trouble is encountered in the originating equipment, (2) to provide manual completing service when trouble is encountered in the terminating equipment (See Fig. 1)

1.11 Dial terminated manual lines are provided to complete calls originated by non-dial subscribers. This equipment directs a call through the regular originating switch equipment to the outgoing special service trunks on the office multiple which in turn is extended to incoming special service trunks at the central switchboard office. (See Fig. 1)

1.12 Repair service trunks provide a means of extending repair service calls to a remote repair service desk or central "A" switchboard for night service. There are two general types of repair service trunks, one which handles only originated calls to the repair service desk and the other which will handle two way service either from or to the repair service desk, either of these types may be transferred to the central "A" board for night service. The repair service desk and the central "A" switchboard may or may not be in the same building. (See Fig. 1)

1.13 Additional coin and time alarms as well as alarms for the manual lines, plugging-up lines, and permanent signal trunks and various interrupters are required in the non-switchboard office. No new type of alarms or interrupters are required in the office with the switchboards.

1.14 A test selection circuit and some talking paths will be required for use in testing the central "B" senders. Further development work will be required before the terminating sender test frame can be used to test the central "B" senders (terminating part).

2. SUPPLEMENTARY INFORMATION

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

J97025 - Relay Rack Framework
X-61400 - List of Equipment Design Requirement Sections (Panel Offices)

Floor Plan Data

See associated J specifications.

Keysheets

SD-21300-01 - Panel System
SD-25000-01 - Crossbar System No. 1

3. SUMMARY OF EQUIPMENT

Crossbar Office Without Switchboards

Circuit	Equipment	Fig.	Spec.	Unit Capacity or Equipment Location	Description
SD-21364-01	ED-91542-01	1	J93003AB	5	Outgoing No. 2 Rep. Serv. Trk. (One Way)
SD-21548-01	ED-91526-01	18 & 19	J91104	Non-Unit	Outgoing Coin Control
SD-21640-01	ED-25446-01	-	J27950E	Frame	Sdr. M.B. Aux. Sig. (Frame)
SD-21640-01	ED-91526-01	10	J23052	Non-Unit	Sdr. M.B. Aux. Sig. (Rel.Rk.)
SD-21697-01	ED-25446-01	-	J27950E	Frame	Sdr. M.B. Test Ckt.
SD-21698-01	ED-25446-01	-	J27950E	Frame	Sdr. M.B. Test Trk. (Frame)
SD-21698-01	ED-91526-01	20	J23052	Non-Unit	Sdr.M.B.Test Trk.(Rel.Eqpt.)
SD-21707-01	ED-25446-01	-	J27950E	Frame	Sdr. M.B. Tel. Ckt.
SD-25012-01	ED-25145-01	-	J27951B or C	1	Subscriber Sender
SD-25046-01	ED-25448-01	-	J28351	Frame	Fuse & Time Alarm (301C Pwr.)
SD-25047-01	ED-25449-01	-	J28351	Frame	Misc. & Aux. Alarm (Man. Opr. Pwr.)
SD-25047-01	ED-25450-01	-	J28351	Frame	Misc. & Aux. Alarm
SD-25053-01	ED-25185-01	-	J28050A	Frame	Misc. Ckt. Ter. Sdr. Frame

Circuit	Equipment	Fig.	Spec.	Unit Capacity or Equipment Location	Description
SD-25061-01	ED-25072-01	1	J21551C	2	Coin Supervisory Ckt. Without O.T.
SD-25061-01	ED-25072-01	2	J21551D	1	Coin Time Alarm
SD-25062-01	ED-25237-01	-	J22750	Frame	Interrupter Ckt.
SD-25076-01	ED-25446-01	-	J27950E	Frame	Misc. Ckt. Sdr. M.B. Frame
SD-25134-01	ED-25470-01	1	J23052K	10	Vacant Code Tone Trk. Without Coin Disposal Test
SD-25134-01	ED-25470-01	2	J23052L	1	Vacant Code Tone Trk. With Coin Disposal Test
SD-25134-01	ED-25470-01	3	J23052	Non-Unit	Vac. Code Time Alarm
SD-25166-01	ED-25409-01	1	J28550	Frame	Test & M.B. Jacks
SD-25218-01	ED-25475-01	1	J23052Q	5	Subs. Rec. Compl. Trk.
SD-25272-01	ED-25478-01	11	J23052	Non-Unit	Non-coin Vacant Code Tone Trunk
SD-25302-01	ED-25102-03	26	J27751D, M&N	Frame	Inc. Trk. from Cent."A" Swbd.
SD-25307-01	ED-25102-03	26	J27751D, M&N	Frame	Inc. Trk. from Cent. "A"Swbd.
SD-25314-01	ED-25102-03	26	J27751D, M&N	Frame	Inc. Trk. from Cent. "A"Swbd.
SD-25382-01	ED-25438-01	1	J28050H	1	Cent. "B" Sdr. (Ter. Part)
SD-25413-01	ED-25501-01	1	J23052Z	10	OGT to Cent. "A" Swbd.
SD-25415-01	ED-25102-03	9	J27751D, M&N	Frame	Inc. Trk. from Cent. "A"Swbd.
SD-25416-01	ED-25487-01	1	J23052AB	10	Outgoing Emergency Line
SD-25416-01	ED-25487-01	2	J23052	Non-Unit	Outgoing Emergency Line (Trns. Sw.)
SD-25418-01	ED-25463-01	1	J23052AD	10	Perm. Sig. Trk. (Coin)
SD-25418-01	ED-25462-01	1	J23052AE	10	Perm. Sig. Trk. (Non-Coin)
SD-25418-01	ED-25462-01	2	J23052	Non-Unit	Perm.Sig.Trk. (Common Eqpt.)
SD-25420-01	ED-25102-03	44	J27751D, M&N	Frame	Inc. Trk. from Cent."A"Swbd.
SD-25421-01	ED-25508-01	1	J23052AP	1	Dial Ter. Manual Lines (Common Eqpt.)
SD-25421-01	ED-25508-01	2 & 3	J23052	Non-Unit	Dial Ter. Manual Lines
SD-25437-01	ED-25451-01	1	J28550D	1	Test Selection Unit
SD-25444-01	ED-25525-01	1	J21551G	2	Coin Supervisory Ckt. with O.T. Coin Collection
SD-25463-01	ED-25539-01	1	J23052AW	2	No. 2 Repair Serv.Trk. (Off. Mult.)
SD-25463-01	ED-25539-01	2	J23052AY	1	No. 2 Repair Serv.Trk. (Inc. Sel.)
SD-25466-01	ED-25533-01	1	J23052AT	5	Non-Coin Vacant Code Intercepting Trunk
SD-25467-01	ED-25537-01	1	J23052AU	5	Coin Vacant Code Intercepting Trunk
SD-90057-01	ED-25446-01	-	J27950E	Frame	Sdr. M.B. Howler
SD-90057-01	ED-91554-01	1	J93003AT	1	Sdr. M.B. Howler
SD-90209-01	ED-91530-01	17	J23052	Non-Unit	Repair Service Trk. M.B.
SD-90587-01	ED-91576-01	1 & 3	J93005D	10	Plugging-up Line Unit (Without cut thru feature)
SD-90588-01	ED-91575-01	2	J93005	Non-Unit	Plugging-up Line Apparatus Panel
SD-90588-01	ED-91575-01	1	J93005F	1	Plugging-up Tel. Ckt.
SD-90589-01	ED-91575-01	1	J93005F	1	Plugging-up Test Trk.
SD-90594-01	ED-91575-01	1	J93005F	1	Plugging-up Panel Aux.
SD-95031-01	ED-91630-01	1	J99206C	10	Coin Control Trunk
SD-96084-01	ED-91577-01	1	J93005E	10	Plugging-up Line Unit (With cut thru feature)
SD-96085-01	ED-91575-01	1	J93005F	1	Plugging-up Timing Ckt.
SD-96209-01	ED-91597-01	1	J91104G	10	Outgoing Spl.Serv.Trk. (Non-Coin)
SD-96209-01	ED-91597-01	2-5	J91104	Non-Unit	Outgoing Spl.Serv.Trk. (Common Timing & Ringback)
SD-96210-01	ED-91598-01	1	J91104K	5	Outgoing Spl.Serv.Trk.(Coin)
SD-96210-01	ED-91598-01	2-4	J91104	Non-Unit	Outgoing Spl.Serv.Trk.(Ringback)
Central Switchboard Office (Crossbar or Panel)					
SD-21104-01	ED-91438-01	1	J21501S	Section	"B" Position

Circuit	Equipment	Fig.	Spec.	Unit Capacity or Equipment Location	Description
SD-21104-01	ED-91636-01	1	J21301W	1	"B" Position
SD-21104-01	ED-91436-01	2 or 3	J21301	Non-Unit	4 & 5 Key Grouping
SD-21134-01	ED-91384-01	1	J21301R	1	"B" Supervisor's Tel. (Panel)
SD-21134-01	ED-91438-01	1	J21301S	Section	"B" Supervisor's Tel. (Panel)
SD-21139-01	ED-91526-01	1 & 2	J91104	Non-Unit	"B" Pos. Busy & Night Alarm
SD-21543-01	ED-91596-01	1	J91104M	10	Inc. Spl. Serv. Trks. (Coin)
SD-21545-01	ED-91595-01	1	J91104L	10	Inc. Spl. Serv. Trks. (Non-Coin)
SD-25149-01	ED-91526-01	6	J91104	Non-Unit	Coin Control Keys
SD-21758-01	ED-20113-02	-	J21301L	CTS	Calls Waiting
SD-21758-01	ED-91637-01	1	J21301AA	1	Calls Waiting
SD-21904-01	ED-20888-01	1	J28003A	Frame	Sdr. & Pos. Fdr. (Panel)
SD-25078-01	ED-91438-01	1	J21301S	Section	"B" Supervisor's Tel. (Crossbar)
SD-25078-01	ED-25517-01	-	J21301U	1	"B" Supervisor's Tel. (Crossbar)
SD-25414-01	ED-25505-01	1	J23052AA	10	Intercepting Trunk with Toll Identification
SD-25414-01	ED-25505-01	2	J23052	Non-Unit	Intercepting Completing Trunk
SD-25414-01	ED-25505-01	3	J23052	Non-Unit	Intercepting Trunk
SD-25414-01	ED-25513-01	1	J23052AR	10	Intercepting Trunk Without Toll Identification
SD-25414-01	ED-25513-01	2	J23052	Non-Unit	Intercepting Completing Trunk
SD-25417-01	ED-25477-01	1	J23052AC	10	Inc. Emergency Line
SD-25417-01	ED-25477-01	2	J23052	Non-Unit	Inc. Emer. Line (Trns. Sw.)
SD-25423-01	ED-25504-01	1	J23052AF	10	Central A& B Outgoing Trunk
SD-25423-01	ED-25504-01	2	J23052	Non-Unit	Central A& B Trunk Coin Control
SD-25445-01	ED-25540-01	1	J23052BA	5	Cent. "A" Bd.Coin Supervisory Ckt. (With Coin O.T.)
SD-25446-01	ED-25535-01	1	J23052BB	5	Key Pulsing Outgoing Trunk (Coin)
SD-25446-01	ED-25535-01	2	J23052BC	5	Key Pulsing Outgoing Trunk (Non-Coin)
SD-25447-01	ED-25536-01	1	J23052BD	5	Key Pulsing Inc. Incpt. Trk.
SD-25460-01	ED-25527-01	1	J23052BE	5	Dialing Outgoing Trunk to Crossbar Office (Coin)
SD-25460-01	ED-25527-01	2	J23052BF	5	Dialing Outgoing Trunk to Crossbar Offices (Non-Coin)
SD-25462-01	ED-25538-01	1	J23052BG	5	Key Pulsing Outgoing Trunk (Panel Type) (Coin)
SD-25462-01	ED-25538-01	2	J23052BH	5	Key Pulsing Outgoing Trunk (Panel Type) (Non-Coin)
SD-25465-01	ED-25524-01	1	J23052AS	10	Vacant Code Trunk to Distant Office
SD-25476-01	ED-25549-01	1	J28052A	Frame	Sender and Position Finder Frame (Crossbar)
SD-90036-01	ED-91546-01	1	J93003AJ	5	Inc. Repair Service Trk.
SD-90042-01	ED-91549-01	1	J93003AK	5	Inc. Trk. Transfer
SD-90464-01	ED-91530-01	22	J91104	Non-Unit	Sender Load Busy Lamp Aux.
SD-90451-01	ED-91623-01	1	J91104P	10	Repair Service Trunk
SD-90595-01	ED-91545-01	1	J93003AE	5	Trunks from Manual Swbds.
SD-90615-01	ED-91553-01	1	J93003AD	10	Two Way Repair Service Trunk
SD-96053-01	ED-91530-01	7	J91104	Non-Unit	Lamp Transfer
SD-96193-01	ED-91435-01	1	J91103	Section	Combined A & B Supervisor's Tel.
SD-96193-01	ED-91530-01	14	J91104	Non-Unit	Combined A & B Supervisor's Tel.
SD-96285-01	ED-20885-01	1	J28003B	1	Cent. "B" Sdr. (Swbd. Part) (Panel)
SD-96285-01	ED-25550-01	1	J28052B	1	Cent. "B" Sdr. (Swbd. Part) (Crossbar)
SD-96285-01	ED-20888-01	1	J28003A	Frame	Sender & Position Finder Frame (Panel)
SD-96285-01	ED-25549-01	1	J28052A	Frame	Sender &Position Finder Frame (Crossbar)

4. EQUIPMENT NOTES

Special Service Trunks

4.01 Outgoing special service trunks for coin service are made up in 5 circuit relay rack units. (See J91104K) The outgoing special service trunks for non-coin service are made up in a 10 circuit relay rack unit. (See J91104G). The ringback equipment is common to five trunks and does not form a part of the unit. The ringback equipment is wired and assembled on the relay rack by the installer. Two sets are mounted on one plate which is located between the units. Common timing equipment is required in four party selective type offices. This timing equipment is located at the top of the first bay of relay racks serving the special service trunks. Separate sets of multiple leads are run by the installer to the various sets of ringback equipment. Special service trunks are cross connected to the office secondary multiple at the HMDF they also cross connect at the MDF to an interoffice trunk pair to the office with the central "A" switchboard. Test and make busy jacks are connected to each trunk.

4.02 Incoming special service trunks are made up in 10 circuit relay racks units (See J91104L or J91104M) with an answering jack and lamp per circuit located in the central "A" switchboard. These answering jacks and lamps are cross connected at the HMDF if in a crossbar office or at the IDF, DDF, or TDF if in a panel office. There are two general types of these trunks, coin and non-coin. Each type is arranged so that they can be transferred to a night position by means of a lamp transfer circuit. Each of these classes may be divided into other groups such as restricted local area, refused toll, etc., so that the operator can distinguish between calls from different groups of lines. The originated call from the dial terminating manual subscribers are also handled over these trunks.

Emergency and Manual Lines

4.03 Outgoing emergency lines are made up in 10 circuit relay rack units (See J23052AB). Emergency lines may obtain interoffice trunk conductors from some other trunk circuit for use during a period of emergency. With this arrangement it will be necessary to operate two 5 circuit transfer switches in these circuits along with one 10 circuit transfer switch in the associated incoming emergency line in the switchboard office to obtain emergency service. If spare interoffice conductors are available for use with these circuits a 10 circuit transfer switch may be furnished at the non-swbd. end only, or these conductors may be cross-connected at the M.D.F. at the time of the emergency.

4.04 Incoming emergency lines are made up in 10 circuit relay rack units (See J23052AC). These lines are cross connected to answering jacks and lamps, at the central "A" board. This cross-connection is made at the HMDF when in a crossbar office and at the IDF, TDF, or DDF when in a panel office. Subscribers which require emergency service in case the usual crossbar equipment is out of service in the outlying crossbar office will be arranged to have their signals repeated at the central "A" switchboard so that the operator may handle their calls on a manual basis. The operator can call these subscribers by inserting a cord in the answering jack associated with their line. A transfer switch per 10 circuits may be provided on a mounting plate adjacent to the relay rack unit which when operated along with transfer switches in the outgoing emergency lines, will cut in interoffice conductors normally used with some other trunk circuit.

4.05 Dial terminating manual lines are mounted on mounting plates external to the relay rack unit containing the associated common equipment (See J23052AP). These lines are divided into subgroups "A" and "B". Two pulsing circuits are provided with one serving as the preferred circuit for subgroup "A" and the other, the preferred circuit for subgroup "B". The pulsing circuits send out pulses equivalent to the dialing of zero when a call is originated on a manual line circuit. This pulsing directs the call thru the regular originating switch equipment to the outgoing special service trunks on the office frame secondary multiple and then to the central "A" operator over the incoming special service trunks described in paragraph 4.02. The other pulsing circuit is automatically used if the make busy jack or transfer key is operated.

Repair Service Trunks

4.06 One way outgoing repair service trunks per SD-21364-01, are arranged in 5 circuit units (See J93003AB). These circuits are arranged to extend originated calls from the office multiple thru the MDF to a No. 2 repair service desk in a distant building. Some of these circuits may be arranged to be transferred to a central "A" switchboard for night service at the desk and switchboard end. The repair service trunks in the non-switchboard office that are not transferred will be made busy by means of a repair service trunk make busy circuit.

4.07 Two way outgoing repair service trunks per SD-25463-01 will also be arranged in 5 circuit relay rack units and equipped as required. This circuit will permit terminating calls from the repair service desk via the incoming and line link frames as well as receiving calls from a subscriber thru the line, district, and office link frames. These circuits are arranged so that the transfer from the desk to the central "A" switchboard for night service can be done at the non-switchboard office which will permit locating the repair service desk

and central "A" switchboard in separate buildings. The making busy of these trunks which are not transferred is accomplished in the same manner as described in paragraph 4.06.

Central "B" Sender and Position Finder

4.08 The central "B" sender (terminating part) is made into a typical terminating sender unit and located on the regular terminating sender frame (See J28050H) in the terminating crossbar office. This unit is convertible to a regular full selector type terminating sender by adding a supplementary unit local cable, making minor apparatus changes and removing the switchboard cable to the HMDF when no longer required to handle "B" board traffic.

4.09 The central "B" sender (switchboard part) is made up into a single circuit sender unit and located on a sender and position finder frame (See J28003B) in the switchboard office. The sender and position finder frame is arranged to mount four central "B" sender units and four position finder switches. There are two types of these frames, the one for use in a panel office, (See J28003) is now available. The other type for use in a crossbar office is now being developed. The sender unit used on these two types of frames will be the same except for the relay casing and possibly the unit mounting details.

4.10 A test selection unit per J28550D at the outgoing trunk test frame is arranged to connect to the central "B" sender (terminating part) for test purposes. Further development work will be required before the terminating sender test circuit will be arranged to test the central "B" senders (terminating part). A talking line is provided with a jack (D) at each central "B" sender frame with a subscriber set in each office which is used to call the maintenance man in the distant building.

Floor Alarm, Traffic Register Rack and Office Interrupter Frame

4.11 The floor alarm frame in the non-switchboard crossbar office will require the following additional alarms (See J28350):

(a) Coin Alarm for Coin Supervisory Circuit

(b) Coin Alarm for Coin Vacant Code Trunks

(c) Coin Alarm for Test Trunks

(d) Coin Alarm for Coin Permanent Signal Trunks

(e) Alarm for Dial Terminating Manual Lines

(f) Time Alarm for Special Service O.G. Trunks

(g) Misc. Alarm for Plugging-up Auxiliary

(h) Misc. Alarm for Permanent Signal Trunks

No additional alarms are required in the switchboard office.

4.12 No new types of traffic registers are required in either the switchboard or non-switchboard office.

4.13 The following additional interrupters per SD-25062-01 will be required on the office interrupter frame for new or changed circuits required in the crossbar office without the switchboards. (See J22750) No additional interrupters are required in the office with the switchboards.

Fig. of SD-25062-01	Designation	
4	LB	(
5	OF	(Inc. Trk. from Cent.
6	LBT	("A" Bd.(Reg. or N.T.)
7	OFT	(
36	AS	Sender M.B. Frame Aux.
43	CN & CT	Coin Supervisory Ckt.
72	TS	Central "B" Sdr.(Term. Part)
75	OK	Test Selection Circuit
89	R & G	Special Service Trunks
90	RB & GA	Special Service Trunks (Coin Only)
91	PS	(
92	A	(
93	B	(Permanent Signal Trunk
94	C	(
95	TA	Dial Term. Manual Lines
96	T	Plugging-up Lines
97	PG	Plugging-up Lines

Central "A" and "B" Trunks

4.14 Local, toll, and trouble intercepted and vacant code intercepted calls are routed over an outgoing trunk per SD-25413-01, from the line link frame in the non-switchboard office to an incoming trunk per SD-25414-01, in the switchboard office, both of these trunks are made up in 10 circuit relay rack units (See J23052Z and J23052AA). The incoming trunks are cross connected to jacks and lamps in the central "A" board. The trouble intercept jacks may be located in a separate position of the central "A" switchboard.

4.15 The intercepting trunks described in paragraph 4.16 may be arranged to complete certain classes of intercepted calls in which case an intercepting completing trunk per SD-25415-01 (See J27751) is required in addition to SD-25413-01 and SD-25414-01 (See J23052AR). This completing trunk is located on the regular incoming trunk frame in the non-switchboard office, and will work with dial pulse or central "B" senders.

4.16 Vacant code calls may be handled in any one of the following arrangements:

(a) A "No Such Number Tone" may be given to the subscriber by means of the vacant code tone trunk SD-25134-01 (coin) or SD-25272-01 (non-coin). These circuits may be arranged to route these calls to an answering jack in the central "A" switchboard on a temporary basis.

(b) Vacant code calls may be intercepted at the office secondary multiple and routed over outgoing vacant code intercepting trunks SD-25466-01 (non-coin) or SD-25467-01 (coin) in the non-switchboard office to an incoming vacant code intercepting trunk SD-25465-01 in the switchboard office where it is in turn connected to an answering jack in the central "A" switchboard.

(c) The coin vacant code tone trunk SD-25134-01 and the coin vacant code intercepted trunk SD-25467-01 route the call to the sender make busy frame if a stuck coin condition is encountered.

4.17 Central "A" board outgoing trunks per SD-25423-01 (central "B" Sender), SD-25446-01 (Crossbar Key Pulse Sender) SD-25462-01 (Panel Key Pulse Sender) or SD-25460-01 (Dial Pulse Terminating Sender) are used to establish "No Test Calls" and delayed A-B toll calls. These circuits appear in the outgoing trunk multiple of the central "A" board where the operator gives the called number to the central "B" operator, key pulses the called number using a crossbar or a panel type key pulsing sender in her office or dials the called number to a dial pulse terminating sender in the terminating office. These circuits may collect or return coins when required thru the connecting incoming trunks described in paragraph 4.18.

4.18 Central "A" board incoming trunks per SD-25302-01, SD-25507-01, or SD-25314-01 are located on the regular incoming trunk frame, (See J27751) and receive calls from the central "A" operator over the outgoing trunks described in paragraph 4.17. A "No Test" incoming trunk per SD-25420-01 which is also located on the incoming trunk frame is used in connection with the above outgoing trunk when the operator desires to connect to a line over the busy.

4.19 The various types of "B" trunks such as, incoming from manual local, manual tandem, and manual toll offices now recommended for use with the local call distributing "B" switchboard will work with a central call distributing "B" board. The toll incoming and recording trunks may or may not be equipped to take charge of the coin. Coins may be controlled directly by the toll operator (See SD-95031-01) or they may be controlled by the central "A" operator (See SD-21548-01 and SD-21549-01) under the direction of the toll operator.

Sender Make Busy and Monitoring Features

4.20 Permanent signal holding trunks are arranged in 10 circuit relay rack units with the common equipment mounted and wired by the installer on the relay rack near the units. There are two types of permanent signal holding trunk units one for use with non-coin lines (See J23052AE) and the other for coin lines. (See J23052AD). Both types are extended to the sender make busy frame in the form of a jack and lamp instead of to the "A" switchboard in order to save interoffice cabling. This makes it possible for the attendant at the sender make busy frame to test and talk on subscriber lines on which a permanent signal has occurred and to apply a tone on the line to facilitate identification of cable pairs affected by a cable failure.

4.21 Coin supervisory trunks per SD-25061-01 appear in the sender make busy frame when a stuck coin condition is encountered. Coin supervisory trunks arranged for overtime coin collection per SD-25444-01 have the overtime jacks located in the distant central "A" switchboard and the coin jacks on the sender make busy frame.

4.22 Coin vacant code tone trunks and coin outgoing vacant code intercepting trunks appear at the sender make busy frame when a stuck coin is encountered which the central "A" operator cannot clear. Both coin and non-coin vacant code tone trunks may be arranged to appear in the central "A" switchboard on a temporary basis. Coin and non-coin vacant code intercepting trunks are extended thru an incoming vacant code intercepting trunk to an answering jack in the central "A" switchboard.

4.23 Subscriber senders should be arranged for the automatic timed release feature in order to reduce the amount of monitoring effort. This feature provides an automatic wipe-out of stuck senders due to partial dial or false start of senders. A disconnect tone is sent out to the subscriber and if the sender fails to restore the connection is directed to the sender make busy frame and appears there on a permanent signal trunk described in paragraph 4.20.

4.24 In addition to the equipment described in paragraphs 4.21, 4.22, and 4.23 the sender make busy frame contains coin station ringer test trunks, coin test trunks from the test desk, and a test circuit used to test subscriber lines which have routed to the above jacks and lamps.

4.25 Plugging-up lines are made up into 10 circuits units and mounted on a relay

rack bay framework called a plugging-up line frame (See J93005). There are two types of plugging-up lines. One type is arranged to automatically cut the subscriber line thru to the associated line and cut-off relay if the trouble is cleared with a key arranged to cancel this cut thru feature when it is not required. The other type does not have this cut thru feature and is similar in operation to plugging-up lines used with a local "A" switchboard. A common unit contains the telephone circuit, auxiliary signal circuit, and test circuits to the No. 14 test desk and mount on the same bay with the plugging-up line units. There is also an apparatus board on this bay which contains the various keys, lamps and jacks associated with the above circuits.

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