SUBSCRIBER OR AUXILIARY SUBSCRIBER SENDER LINK 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 manufacture and installation of the subscriber or auxiliary subscriber sender link frame in No. 1 crossbar offices. This specification also covers the sender link emergency controller unit, sender selector unit, and the traffic release control unit.

1.02 This specification is reissued:

(a) To provide information for a modular-type fuse panel.

(b) J27550F is changed and J27550L is added.

(c) To update reference information.

CAPACITY

1.03 The subscriber sender link frame has a capacity of 50 primary-secondary links, 100 district junctors in the primary bay, and 100 subscriber senders in the secondary bay.

1.04 Unless otherwise indicated, reference to subscriber sender link frame shall include auxiliary subscriber sender link frame throughout this specification. An auxiliary subscriber sender link frame is always used in conjunction with an auxiliary district frame. A maximum of four auxiliary district frames may be added to an existing entity to permit a capacity increase of 20 percent with respect to district junctors.

DESCRIPTION

1.05 The principal function of the subscriber sender link frame is to associate a calling line and a subscriber district junctor with an idle subscriber sender. It also serves to connect dialing operator and interoffice district junctors with subscriber senders.

1.06 The subscriber sender link frame is a single-sided steel structure 11 feet 6 inches high and 5 feet 4-1/4 inches long consisting of two bays, each of which has a nominal width of 30-1/2 inches. Looking at the front of the frame, the right or primary bay contains ten 200-point crossbar switches each two of which provide connections to 20 district junctors. The secondary bay contains five 200-point crossbar switches which provide connections to 100 subscriber senders. The secondary bay also accommodates the controller circuit, sender subgroup busy circuit, sender subgroup connector circuits, and the district junctor test connector switch.

1.07 Space is provided on the primary bay of the regular subscriber sender link frame for two additional district link primary switches to permit increasing the district junctor capacity of a frame group to a maximum of 120 district junctors. Auxiliary district junctor frames provide the added district junctors and the associated primary district link switches are distributed among the regular subscriber sender link frames as required. On auxiliary subscriber sender link frames no district link primary switches are ever required. On these frames, some of the space mentioned above is used to mount a special terminal strip.

1.08 The subscriber sender link frame has a capacity of 50 primary-secondary links having access to 100 districts in the primary bay and 100 subscriber senders multipled in the secondary bay. The frame is always located at the left of the

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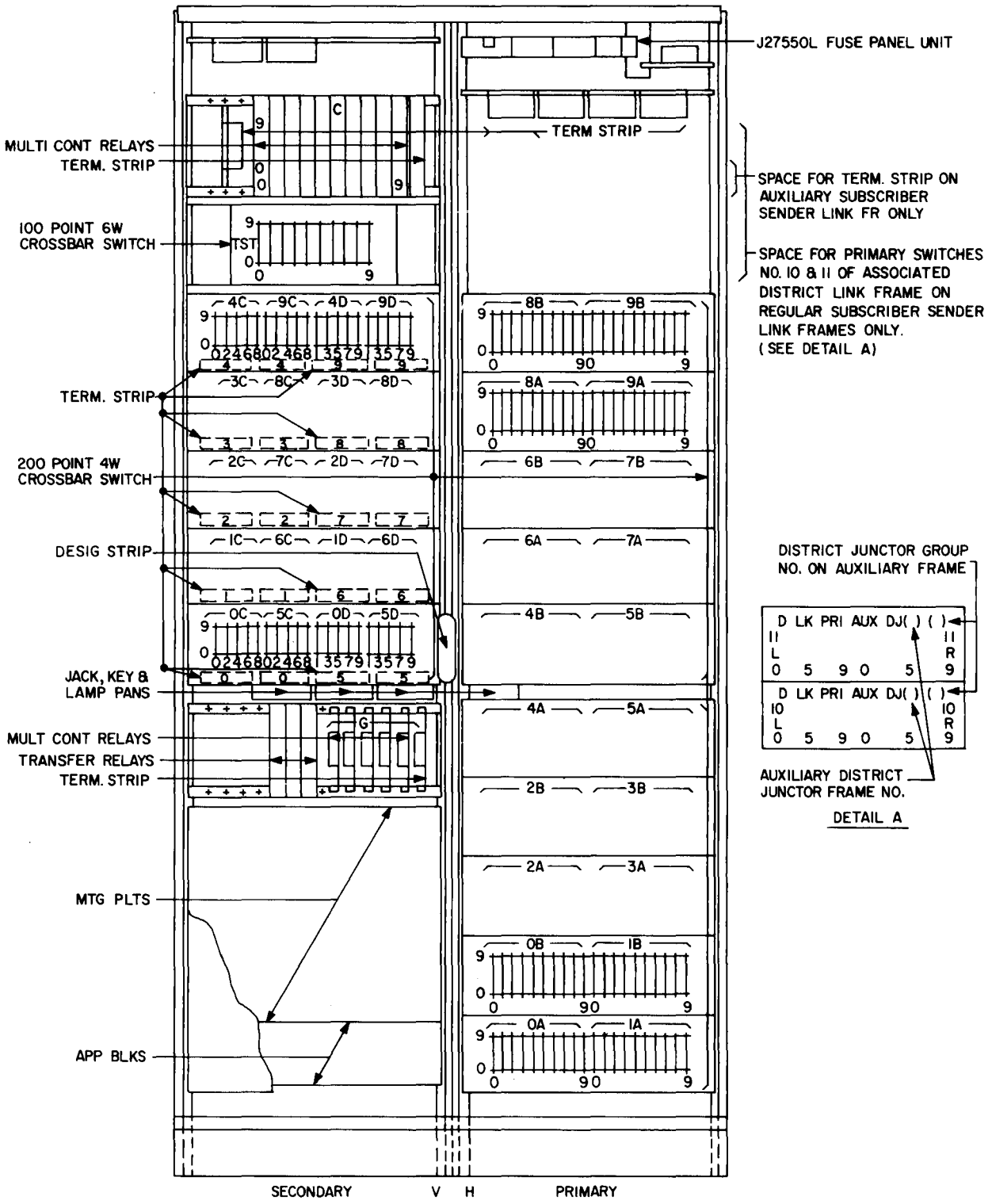

Fig. 1—Subscriber or Auxiliary Subscriber Sender Link Frame

associated district junctor frame, the frame local cable being provided with five extensions which connect directly to the adjacent district junctor units. The wiring and equipment are arranged so that the five associated district junctor units may be subscriber, dialing, or interoffice units. Keypulsing district junctors are limited to the top unit position. When the latter is furnished, the upper pair of primary switches on the subscriber sender link frame is omitted since keypulsing districts are cabled to a keypulsing sender link frame for sender access. With this exception, the frame is fully equipped with switches and control equipment.

1.09 Auxiliary subscriber sender link frames differ from regular subscriber sender link frames in the following respects:

(a) An auxiliary district junctor frame is always located on its right and no district link frame is provided as part of the frame group.

(b) Each group of ten district junctors on an auxiliary district junctor frame is associated with a different regular frame group.

(c) When auxiliary subscriber sender link frames are added the district link primary switches required are mounted in space provided on the primary bays of the associated regular subscriber sender link frames. No district link primary switches are mounted on auxiliary subscriber sender link frames.

(d) Each auxiliary subscriber sender link frame requires an additional terminal strip in the primary bay of the frame to provide flexibility in the cross-connection of the increased number of frame indication leads between sender groups and C relays.

1.10 The leads from the district junctors terminate on verticals of the primary switches. Two verticals are required per district junctor. Vertical 0 of switches 0 and 1 is used for district junctor 0 of group zero and district junctors 1 through 9 are connected to verticals 1 through 9. Verticals 10 through 19 are used for district junctors 0 through 9 of group one. Switches 2 and 3 are used for district junctor groups 2 and 3, and this order of assignment is followed for the 100 district junctors associated with a subscriber sender link frame.

1.11 Ten links are provided from the horizontal multiple of each pair of primary switches to the verticals of the secondary switches. These links are slipped so as to provide paths from each district junctor group to each sender subgroup on the secondary switches. The primary-secondary slip is such that switch and level numbers on primary switches represent vertical and switch numbers on the secondary switches. The sender multiple on the horizontal terminals of secondary switches utilizes two sets of terminals per sender circuit. The two sets of terminals associated with a subgroup of ten senders are located on the two halves of the secondary switches. This is done to facilitate strapping where less than ten sender subgroups are equipped and some or all of subgroups 0 through 4 are multipled to subgroups 5 through 9.

1.12 One ***emergency controller unit*** is provided per marker group and is multipled to all frames with facilities for switching any frame from its own controller circuit to the emergency controller circuit. This unit is mounted on the miscellaneous frame. The emergency controller unit per J27550G may not be used in existing offices having sender link frames per J27550A. Sender link frames per J27550F will, however, work with an emergency controller unit per J27550B or J27550E in existing offices and, of course, with emergency controller unit per J27550G.

1.13 Provision is made to light a lamp on each subscriber sender link frame to indicate that the emergency controller unit is in use. A second lamp furnished on each frame lights only on the frame involved in the transfer. A multiple of this lamp at the controller trouble indicator frame, or in a lamp cabinet when the controller trouble indicator frame is not furnished, provides a central point at which the specific frame using the emergency controller may be identified. This multiple is optional when the controller trouble indicator frame is not provided.

1.14 One ***sender selector unit*** is required for each subgroup of ten or less senders. These units are located on the miscellaneous frame where they are distributed over three bays to minimize service hazards. Sender selector unit per J27550H may be used where sender groups are added in existing offices having sender link frame per J27550A, as well as in new offices having sender link frames per J27550F.

1.15 One ***subscriber sender link traffic release control unit*** is required per marker group to insure traffic release during periods of heavy sender traffic. This feature provides automatic dismissal of the calling line link and controller circuit if undue delay is encountered in sender subgroup selection. The line link frame may then seize the same or a different sender link frame. The load control unit is mounted on a miscellaneous frame.

1.16 One ***line link controller release unit*** is required per marker group to give an indication to the line link controllers during periods of heavy sender load. This indication permits the line link controllers to give terminating traffic preference over originating traffic. The control unit is operated in conjuction with the subscriber sender link traffic release control unit and is located on a miscellaneous frame.

1.17 ***TOUCH-TONE® Calling:*** In offices arranged for partial conversion to TOUCH-TONE calling, the sender subgroups consist of conventional rotary-dial type senders and TOUCH-TONE type senders. When the sender link frame TOUCH-TONE control circuit receives a request from the line link TOUCH-TONE control unit for a rotary dial or TOUCH-TONE sender, the sender link frame TOUCH-TONE control circuit causes the sender link to attempt seizure of an idle sender of the desired type through the sender selector unit of the selected sender subgroup. If all senders of the desired type are busy, the sender link frame TOUCH-TONE control circuit seizes an idle overflow sender in the same subgroup. Overflow senders are capable of handling rotary-dial or TOUCH-TONE type calls.

1.18 Offices which are partially arranged for coin service improvements (dial-tone-first) feature, operate similar to offices which are arranged for partial conversion to TOUCH-TONE calling as described in 1.17.

1.19 ***Common Hold Jack:*** The common hold jack circuit may be provided at the sender make-busy frame or at the controller trouble indicator frame. When a plug is inserted into the common hold jack at one of these points, the first sender link frame to encounter a trouble condition will block and give a major alarm. As soon as one frame has blocked, all other frames will be freed from the effect of the common hold jack. However, facilities are provided for holding the blocked frame by means of its individual hold jack and putting all other frames under control of the common hold jack.

1.20 ***Manually operated 217A transfer switches*** per Fig. 5 of SD-25554-01 were rated Mfr Disc. on Issue 19-D, replaced by type AJ relays under the control of a jack and MB plug, as shown in circuit Fig. 23. Should a 217A transfer switch on an existing frame require replacement and a new or spare switch is not available, type AJ relays shall be substituted for all four switches, the local cable leads to the relay contacts being reformed and battery, ground, and jack wiring added as required.

FLOOR PLAN ARRANGEMENT

1.21 The regular subscriber sender link frame is always associated with a district junctor frame and a district link frame. These three frames are treated as a unit on the floor plan, their design requiring that they be adjacent in the same line with the district junctor frame in the center, the sender link frame on the left, and the district link frame on the right.

1.22 The auxiliary subscriber sender link frame is always associated with an auxiliary district junctor frame only. The two frames are treated as a unit in the floor plan. The required district link primary switches are located in spaces provided on the associated regular subscriber sender link frames.

2. SUPPLEMENTARY INFORMATION

816-000-000—Numerical Index Crossbar System
800-600-000—Checking List—General Equipment Requirements
J20150—816-015-150—Switchboard Power Cable
J25551—816-040-150—End Guard, Aisle Pilot Lamp, Support, DPTS Supports, Record Books and Holders, Spare Fuse Mountings, and Print Display Boards
Floor Plan Data—Section 9.1, Sheet 4

3. DRAWINGS

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

Keysheet

SD-25000-01—Crossbar System No. 1

Circuits

SD-25031-01—No. 1 District Link and Connector Circuit
SD-25056-01—No. 1 Miscellaneous Circuit for Subscriber Sender Link Frame
SD-25158-01—No. 1 Automatic District Junctor Test Circuit for Testing Subscribers District Junctors and Coin Control Circuits
SD-25204-01—No. 1 Miscellaneous Circuit for District Junctor Frame
SD-25210-01—No. 1 Coin District Junctor Circuit With or Without Overtime Collection
SD-25323-01—No. 1 District Junctor Circuit for Use With Noncoin Lines
SD-25554-01—No. 1 Subscriber Sender Link and Controller Circuit
SD-25620-01—No. 1 District Junctor Circuit for Use In Offices Arranged for Automatic Message Accounting or for Flat Rate Lines
SD-25620-02—No. 1 District Junctor Circuit—Message Rate Service Arranged for Conversion to Automatic Message Accounting
SD-25868-01—No. 1 District Junctor Circuit for Use With Step-by-Step Systems

Equipment

ED-25212-10—Designation Cards
ED-25652-01—No. 1 and No. 15 Subscriber Sender Link Frame Wiring of Sender Multiple
ED-26746-10—Miscellaneous Frame Equipment
ED-90527-( )—Lamp Signal Cabinet
J27550F—Subscriber or Auxiliary Subscriber Sender Link Frame
J27550G—Subscriber Sender Link Emergency Controller Unit
J27550H—Subscriber Sender Selector Unit
J27550J—Subscriber Sender Link Traffic Release Control Unit
J27550K—Line Link Controller Release Unit
J27550L—Fuse Panel Unit

Wiring and Cabling

ED-25154-10—Link Frame Switchboard Cabling Plan and Details
ED-25346-16—Method of Running Power Feeders
ED-25652-10—Sender Multiple

4. EQUIPMENT

ED-90527-( )—Lamp Signal Cabinet

Group 1—Cabinet, 40-lamp capacity (see 5.11)
Group 2—Cabinet, 70-lamp capacity (see 5.11)

J27550F—AT&TCo Std—Subscriber or Auxiliary Subscriber Sender Link Frame

Equipment—J27550F-( )

List 1—Framework, assembly, wiring, and common equipment for one subscriber or auxiliary subscriber sender link frame.

	WIRE	EQUIP	NOTES
Framework, ED-25024-30, Gr 2		1	
Unit Casing, ED-90978-57: G3017		1	
Jack, Key, & Lamp Panel, ED-25021-53			
Gr 2		2	
Gr 8		1	
Gr 10		1	
Multicontact Rel Meg, ED-25022-01:			
Item 4		2	
Sub Sdr Lk & Cont Ckt, SD-25554-01:			
Pri Sw Ckt, Fig. 1	0	0	
Sec Sw Ckt, Fig. 2	5	5	
Dist Gr Ckt, Fig. 4	0	0	B,K
Transfer Key Ckt, Fig. 23	2	2	
Sdr Gr-Bsy Ckt, Fig. 6	1	1	
Sdr Gr Conn Ckt, Fig. 7 & D, E, or F	10	10	K
Controller Ckt, Fig. 8	1	1	
Em Fr Lamp Ckt, Fig. 10	1	1	
Dist Gr Test Ckt & Tbl Ind Conn Ckt, Fig. 13	1	1	
Dist Gr Ckt, Fig. 14	0	0	B,K
Sub Sdr Lk Fr Misc Ckt, SD-25056-01:			
Fig. 2,4,6,7	1	1	
Fig. 8	1	0	
Dist Jctr Fr Misc Ckt, SD-25204-01:			
Fig. 12 & 13	1	0	
CH Interrupter Cont Prot Eqpt, SD-25020-01, Fig. 6, SD-25210-01, Fig. 6, SD-25323-01, Fig. 6 or SD-25323-02, Fig. 6 or SD-25620-01, Fig. 5, SD-25620-02, Fig. 5, or SD-25868-01, Fig. 3	2	2	
SD-26201-01, Fig. 5	4	4	
RL Interrupter Cont Prot Eqpt, SD-25620-01: Fig. 3 or SD-25620-02: Fig. 3	2	2	

List 2—Wiring and equipment per SD-25554-01, Fig. 1 and 4 required in addition to list 1 when district junctor group 6-7 consists of subscriber district junctors.

List 3—Wiring and equipment per SD-25554-01, Fig. 1 and 4 required in addition to list 1 when district junctor group 8-9 consists of subscriber district junctors.

List 4—Wiring and equipment per SD-25554-01, Fig. 1 and 14 required in addition to list 1 when district junctor group 6-7 consists of dialing or interoffice district junctors.

List 5—Wiring and equipment per SD-25554-01, Fig. 1 and 14 required in addition to list 1 when district junctor group 8-9 consists of dialing or interoffice district junctors.

List 7—Wiring and equipment for one district junctor test connector per SD-25158-01, Fig. 1 required in addition to list 1 on frames serving subscriber district junctors (see Note C).

List 8—Wiring and equipment per SD-25554-01, Fig. 1 and 4 required in addition to list 1 when district junctor group 0-1 consists of subscriber district junctors.

List 9—Wiring and equipment per SD-25554-01, Fig. 1 and 4 required in addition to list 1 when district junctor group 2-3 consists of subscriber district junctors.

List 10—Wiring and equipment per SD-25554-01, Fig. 1 and 4 required in addition to list 1 when district junctor group 4-5 consists of subscriber district junctors.

List 11—Wiring and equipment per SD-25554-01, Fig. 1 and 14 required in addition to list 1 when district junctor group 0-1 consists of dialing or interoffice district junctors.

List 12—Wiring and equipment per SD-25554-01, Fig. 1 and 14 required in addition to list 1 when district junctor group 2-3 consists of dialing or interoffice district junctors.

List 13—Wiring and equipment per SD-25554-01, Fig. 1 and 14 required in addition to list 1 when district junctor group 4-5 consists of dialing or interoffice district junctors.

List 14—Equipment and wiring per SD-25554-01, Fig. 23, option ZQ and Fig. 25 required in addition to list 1 to serve one sender link frame when partial conversion to TOUCH-TONE calling and/or coin service improvements (dial-tone-first) feature is required.

List 15—Wiring and equipment per SD-25031-01, Fig. 1, with option ZF required in addition

to list 1 for each subgroup of ten district junctors added to increase the regular district frame capacity above 100 district junctors. (See Notes L and M.)

Notes

A. Wiring and equipment for primary switch and district group circuits are covered in lists 2 through 5 and 8 through 13 which shall be furnished as indicated in the lists. The appropriate lists shall be furnished for all equipped or reserved district junctor groups. They shall be omitted only for district junctor group 8-9 when equipped with or reserved for keypulsing district junctors.

B. Subscriber district group circuit SD-25554-01, Fig. 4 is included in lists 8, 9, 10, 2, and 3 for groups 0-1, 2-3, 4-5, 6-7, and 8-9, respectively, and will normally be required in bottom up order. Dialing or interoffice district group circuit SD-25554-01, Fig. 14 is included in lists 11, 12, 13, 4, and 5 for groups 0-1, 2-3, 4-5, 6-7, and 8-9, respectively, and will normally be required in top down order.

C. District junctor test connector circuit SD-25158-01, Fig. 1 shall be wired as follows: T, R, S, M1, and M2 leads to subscriber district junctors are included in the local cable arms to the district junctor frame. District junctor groups 0 through 9 are connected to levels 0 through 9, respectively, of the connector switch with district junctors 0 through 9 of each group connected to verticals 0 through 9, respectively, of the particular level. The battery and ground leads are wired to the fuse panel at the top of the frame. All other leads are included in the local cable to the miscellaneous terminal strip for cabling to the district junctor test frame.

D. Equipment for district junctor frame miscellaneous circuit SD-25204-01 is located on the district junctor frame. The F lead for this circuit shall be run from miscellaneous punching 118 in the local cable arm to the bottom district junctor unit.

E. The CH interrupter contact protection equipment shall be wired universally for the district junctor circuits listed and shall be located as shown on the subscriber sender link frame equipment drawing. The four leads involved shall be included in the frame local cable to the bottom district junctor unit where they shall be connected in all cases. The RL interrupter contact protection equipment shall be universally wired for the district junctor circuits listed and shall be located as shown on the subscriber sender link frame equipment drawing. The four leads involved shall be included in the frame local cable to the bottom district junctor unit where they shall be connected in all cases except where the unit accommodates dialing or interoffice district junctors.

F. Sender subgroup preference is established for each of the 5 groups of 20 districts by cross connecting its G lead to one of the SG leads representing the 10 sender subgroups accessible to it. Leads G0 through G4 terminate, respectively, on miscellaneous punchings 0 through 4, and leads SG0 through SG9, on miscellaneous punchings 10 through 19. The initial cross-connections shall be as follows:

CONNECT PREFERRED	FIRST ALTERNATE		SECOND ALTERNATE
0 thru 10	11	or	19
1 thru 12	13	or	11
2 thru 14	15	or	13
3 thru 16	17	or	15
4 thru 18	19	or	17

The preferred cross-connections shall be assigned on all frames and analyzed in conjunction with the district junctor and sender multiple layouts to determine whether, on any line link frames, successive calls following preferred routes should be served by the same sender subgroup. Such conditions shall be eliminated by reassigning the sender subgroup preference cross-connection for only the lower numbered of the two preferred district groups on each of the line link frames involved. The second alternate cross-connection shall be used only for specific instances where the first alternate cross-connection is found, on reanalysis, to be ineffective or to introduce similar conditions on other line link frames. There will be instances where a change made for the benefit of one line link frame will eliminate a similar condition on another, in which case no change shall be made specifically for the second frame. The SGT punching (5) shall also be cross connected to one of punchings

10 through 19 to give the test circuit preference in choosing one of the sender subgroups. There is no restriction as to which sender subgroup shall be so preferred.

G. A cross-connection is required to establish district junctor preference within district junctor groups of ten. This involves the DP lead, miscellaneous punching 65, and one of five D leads, punchings 60 through 64. Punching 65 shall be cross connected initially to punching 60.

H. On frames utilizing alternate sender subgroup preference cross-connections for any of the district junctor groups, a red lamp cap shall be furnished for the EF lamp, indicating that the emergency controller is not to be exercised with such frames.

I. Class-of-service cross-connections shall be made on the DIST JCTR GRP terminal strips at the top of the frame for each group of district junctors. In the case of subscriber district junctors, these cross-connections indicate to the sender the same class of service for test calls as are given under service conditions. For dialing or interoffice district junctors, they indicate to the sender the class of serivce asssigned to such circuits.

J. When partial conversion to TOUCH-TONE calling and/or coin service improvements (dial-tone-first) operation is provided, change D off-normal contacts on secondary sender link switches equipped with A or P apparatus to P-458016, except on those secondary switch verticals associated with operator or interoffice dialing junctors.

K. In Fig. 4, 7, and 14, ZR wiring shall be used for regular and ZS wiring shall be used for auxiliary subscriber sender link frames. All auxiliary subscriber sender link frames require an additional terminal strip for flexibility of cross connecting frame indication leads between C relays and sender groups.

L. A maximum of two lists 15 can be provided per regular district frame. The added district link primary switches are mounted in space provided on the primary bay of the regular subscriber sender link frame. Wiring required for the added primary switches between the district link bay and the regular subscriber sender link bay shall be made by switchboard cable.

M. When district link primary switch No. 11 is required on existing installations it will be necessary to relocate terminal strips on frame J27550F per ED-25024-30, Issue 27.

J27550G—AT&TCo Std—Subscriber Sender Link Emergency Controller Unit

Equipment—J27550G-( )

List 1—Framework, assembly, wiring, and equipment for one subscriber sender link emergency controller unit.

	WIRE	EQUIP	NOTES
Framework, ED-25028-50, Gr 11		1	
Unit Casing, ED-90978-57, G2010		1	
TS Mtg Det, ED-25020-01, Item 1		1	
Cable Bracket, P423735		1	
Sub Sdr Lk & Cont Ckt, SD-25554-01:			
Controller Ckt, Fig. 8	1	1	
Aux Rel Ckt, Fig. 12	1	1	

Notes

A. The HD jack, AR and HR keys, and DC, CF, and AL lamps are mounted on a jack panel on the miscellaneous frame with the emergency controller unit as shown on ED-26746-10.

B. Sender subgroup preference cross-connections are required in the emergency controller unit. Each of the G0 through G4 leads is cross connected to one of the SG0 through SG9 leads. Punchings 200 through 204 and 210 through 219, respectively, are involved. The initial cross-connections shall be as follows:

CONNECT	TO
200	210
201	212
202	214
203	216
204	218

The SGT punching 205 shall also be cross connected to one of punchings 210 through 219. There is no restriction as to which sender subgroup shall be preferred.

C. A cross-connection is required to establish district junctor preference within district junctor groups of ten. This involves the DP lead, punching 225, and one of five D leads, punchings 220 through 224. Punching 225 shall initially be cross-connected to punching 220.

D. The controller unit casing door shall be stamped, as shown on the equipment drawing, with the numbers of the subscriber sender link frames having corresponding sender subgroup preference cross-connections. The emergency controller should be exercised only with such frames.

J27550H—AT&TCo Std—Subscriber Sender Selector Unit

Equipment—J27550H-( )

List 1—Framework, assembly, wiring, and common equipment for one subscriber sender selector unit.

	WIRE	EQUIP	NOTES
Framework, ED-25028-50, Gr 9		1	
TS Mtg Det, ED-25020-01, Item 1		1	
Cable Bracket, ED-25020-01, Item 12		1	
Sdr Sel Ckt, SD-25554-01, Fig. 9 and Option YC	1	1	
Sdr Rels Ckt, SD-25554-01, Fig. A, B, or C	10	1	

List 2—Equipment per SD-25554-01, Fig. B or C required in addition to list 1 to equip sender relay circuits 1 through 9 (see Notes B and C).

List 3—Equipment and wiring per SD-25554-01, Fig. 26 and options ZZ, ZQ, and YE in Fig. 9 required in addition to lists 1 and 2 when partial conversion to TOUCH-TONE calling and/or coin service improvements (dial-tone-first) operation is required.

List 4—A&M Only—Equipment per SD-25554-01, option YB required in addition to list 1 when the load register is arranged to register from 1 through 6 subgroups busy only (omit option YC).

List 5—A&M Only—Equipment per SD-25554-01, option YD required in addition to list 3 when the load register is arranged to register from 1 through 6 subgroups busy only (omit option YE).

Notes

A. This unit shall be mounted on a miscellaneous bay following the arrangement shown on ED-26746-10.

B. The sender relay circuits shall be equipped from 0 up, and only for the number of senders assigned to the associated sender subgroup. Additional circuits would represent the unequipped senders as idle.

C. Circuits 0 shall be wired per Fig. A; circuits 1 through 8 shall be wired universally per Fig. B and C; and circuit 9 shall be wired per Fig. C. This permits any of circuits 1 through 9 to be equipped as the last of a subgroup.

J27550J—AT&TCo Std—Subscriber Sender Link Traffic Release Control Unit

Equipment J27550J-( )

List 1—Assembly and wiring for one subscriber sender link traffic release control unit per SD-25554-01, Fig. 16 and 17, with equipment per Fig. 16 arranged to serve nine or less subscriber sender link frames.

List 2—Equipment per SD-25554-01, Fig. 17 required in addition to list 1 for operation with ten or more subscriber sender link frames.

List 3—Equipment and wiring per SD-25554-01, Fig. 17, option ZS only, required in addition to lists 1 and 2 when auxiliary subscriber sender link frame as provided.

Note

A. This unit shall be mounted on a miscellaneous frame as shown on ED-26746-10.

J27550K—AT&TCo Std—Line Link Controller Release Unit

Equipment—J27550K-( )

List 1—Assembly, equipment, and wiring for one line link controller release unit per SD-25554-01, Fig. 24 to serve a maximum of 160 line link controllers.

Note

A. This unit shall be mounted on a miscellaneous frame as shown on ED-26746-10.

J27550L—AT&TCo Std—Fuse Panel Unit

Equipment—J27550L-( )

List 1—Assembly, wiring, and equipment for one fuse panel unit per SD-25056-01, Fig. 8 for use on the subscriber sender link frame or on the auxiliary subscriber sender link frame.

5. GENERAL NOTES

Sender Multiple

5.01 Each subscriber sender link frame will accommodate a maximum of 100 subscriber senders arranged in 10 subgroups of 10 senders each.

5.02 While there will be a general relationship between the number of sender link frames and sender subgroups required on a job, these quantities will vary widely from job to job. The fundamental requirements of the sender multiple for any specific case are that:

(a) Each sender link frame has access to the greatest possible number of sender subgroups.

(b) Sender access be approximately equal for all subgroups.

(c) The multiple conforms as closely as possible to the standard pattern.

Condition (a) requires that where there are ten or less subgroups, each will have at least one appearance on each sender link frame and that where there are more than ten subgroups, no two appearances of any subgroup will be on the same sender link frame. Condition (b) requires the broadest possible distribution of the appearances of each sender subgroup, and where there are less than ten subgroups, requires that the distribution of the appearances of each subgroup over all sender link frames be as even as possible. Condition (c) insures uniformity and provides for growth along definite lines.

5.03 Each sender subgroup requires the following cabling between link frame appearances:

Sender multiple on crossbar switch	
Link lockout LL relay chains	
Sender subgroup busy multiple GB lead	On terminal strip with crossbar switch
Reserve test multiple GT and RT leads	
Sender connector multiple on C multicontact relay	

The first four items listed above are cabled together and the fifth item is cabled separately as they terminate on different parts of the link frame. The LL relay chain includes the TC, MB, BC, and TB checking leads when all the sender link frames sharing the same sender multiple are per J27550F and the associated sender selector units are per J27550H. When all or part of the frames are per J27550A, these leads shall be omitted. Sufficient punchings are provided on the terminal strips between the secondary switches to accommodate four sets of GB, GT, and RT leads. This permits a maximum of 24 appearances of the same sender subgroup. As nearly an equal number as possible of appearances should be assigned to each set of these leads.

5.04 The sender multiple arrangements to be employed on a specific job depend on the quantities of senders and sender link frames involved.

Each job will fall into one of the five categories listed below, the fundamental plans for which are shown on ED-25652-01. The requirements regulating specific applications of these plans are also covered on this drawing.

SENDERS	IN SUBGROUPS	ON SENDER LINK FRAMES
15 to less	3	2
16 thru 50	5	2 or more
51 or more	6 or more	corr no. or more*
51 thru 100	6 thru 10	smaller no.*
101 or more	11 or more	smaller no.*

* As related to the number of sender subgroups.

5.05 The number of sender subgroups required will normally be equal to or slightly greater than the number of subscriber sender link frames. One sender subgroup is introduced into the multiple on each frame and is assigned preferably to switch subgroup 4. This switch subgroup is used as the entering point for the sender cables because of the manner in which the successive appearances are slipped between frames and because of its favorable location for the termination of the temporary multiple cabling provided for growth which can largely be restricted to one switch subgroup per frame.

5.06 The diagonal slip of successive cabled sender subgroup appearances occupies switch subgroups in the order 4, 3, 2, 1, 0, 9, 8, 7, 6, 5 on consecutive frames. The multiple for a specific sender subgroup may include several partial diagonals and, when required, additional appearances obtained by switch strapping. Exceptions to this arrangement arise in the case of 11 or more sender subgroups on a smaller number of sender link frames. As the office grows and less than ten appearances per subgroup are required, end switch appearances are removed from the diagonals in the order 5, 6, etc, and interconnected in horizontal multiples as indicated on ED-25652-01.

5.07 As stated in 5.03, each sender subgroup multiple involves two sets of cables, one interconnecting the switches and one interconnecting the associated C multicontact relays. Each crossbar switch accommodates two switch subgroups. On the smaller jobs, the switch subgroup appearances may be classed as cabled appearances and strapped appearances, the latter having reference to those duplicate appearances of cabled appearances on the same switch, obtained by switch strapping. The C relay multiple associated with a sender subgroup consists of several sections, one following the cabled switch subgroup appearances and one of similar pattern for strapped switch subgroup appearances.

CABLED APPEARANCES ON SWITCH SUBGROUPS	MAY HAVE STRAPPED APPEARANCES ON SWITCH SUBGROUPS
4	9
3	8
2	7
1	6
0	5

5.08 Senders are assigned to subgroups as follows:

(a) Where 15 or less senders are required, they are divided as equally as possible among 3 subgroups.

(b) Where from 16 through 25 senders are required, they are divided as equally as possible among 5 subgroups.

(c) Where 26 through 50 senders are required, they are divided into 5 subgroups, the minimum number of which contains more than 5 senders, but no one of which contains more than approximately 25 percent of the total, that is, a job requiring 30 senders would have subgroups of 8, 7, 5, 5, 5. This is done in preference to equal distribution to minimize the number of excess sender frames required.

(d) Where 51 or more senders are required, they are divided into subgroups of 10 with a minimum of 5 senders in partial subgroups, that is, a job requiring 63 senders would have 5 subgroups of 10, one (next-last) of 8 and one (last) of 5. The requirement that partial subgroups contain a minimum of 5 senders applies to initial installations and is not followed on additions if it entails unwarranted expense in rearrangement of the existing multiple.

5.09 Senders in partial subgroups are assigned to the subgroup in the order 0 up. This is reflected in their assignment to switch levels and

in the equipment of the associated sender selector unit. The unequipped levels of a partially equipped switch subgroup are not connected to equipped levels.

5.10 The senders on one sender frame are normally assigned to one subgroup. This requirement together with those of 5.08 results in the provision of 3 sender frames where 15 or less senders are involved or 5 sender frames where 16 through 25 senders are involved. One sender frame is required for the first five senders in each subgroup and another for the second five. This is done for cabling and maintenance reasons and is discussed in greater detail in the sender specification. For similar reasons, a separate marker connector is generally provided for each sender subgroup, as discussed in the specification covering the connector.

Miscellaneous Equipment

5.11 In offices in which the controller trouble indicator frame is not provided, a lamp signal cabinet per ED-90527-( ), Group 1 or 2 and OS required may be furnished for indicating which subscriber sender link frame is using the emergency controller. It shall be equipped and cabled per SD-25554-01, Fig. 20. The lamp circuits shall be furnished for the planned capacity of the associated DPTS groups. The lamp caps for equipped lamps shall agree in color with those of the EF lamps on the associated subscriber sender link frames (see J27550F, Note H). The cabinet shall be located as specified by the telephone company.

5.12 As covered in J27550F, Notes F and G and J27550G, Notes B and C cross-connections are provided on the link frame and emergency controller for sender subgroup and district preference. It is anticipated that these cross-connections will be changed periodically on a specific job, to alter points of maximum wear in the equipment. In making such changes, the requirements of J27550F, Note F should be closely observed and related changes in the items covered in J27550F, Note H, in J27550G, Note D and in 5.11 should be made. Also, the striping on the sender multiple designation cards on the link frames, indicating the preferred sender subgroups, should be changed.

Wiring and Cabling

5.13 Number 24 gauge type BU wire shall be used for all local cable wiring except battery and ground leads which shall be No. 22 gauge type BU wire. Strapping shall conform with practices covered in the general requirement specifications.

5.14 To minimize possible service reaction, the cables from the sender frames and related control leads shall be distributed by subgroups over as many subscriber sender link frames as possible. The sender and associated control lead cables for a given subgroup shall enter at the same sender link frame.

5.15 About half of the sender multiple cabling on the last link frame is used to interconnect partial diagonal multiples with other partial mutliples terminating at switch subgroups 4 on the lower-numbered link frames as shown on ED-25652-01. The cabling is classified as temporary. Growth will result in the extension of these partial diagonals from the last frame into the additional frames, involving the replacement of the temporary cables. To facilitate their removal, both ends shall be sewn in forms separate from those containing permanent cabling, as indicated on the switchboard cable detail drawing.

5.16 The adaptation of the C relay multiple to growth involves the extension of the contacts of the C4 relay to a terminal strip where permanent and temporary cables may be so connected as to permit changes in the temporary cables without disturbing permanent connections. Growth in the smaller installations will require a limited amount of revision in C relay multiple on relays other than the C4. To permit such changes, slack shall be provided in the skinners of all switchboard cable terminations at C relays.

Chain Leads

5.17 Where all the sender link frames in the originating marker group are per J27550F and working with sender selector units per J27550H, the LL- relay chain between the various appearances of each sender subgroup will include the TC, BC, MB, and TB checking leads. These leads shall be cabled from the sender selector unit to the first sender link frame and between sender link frames in accordance with Fig. 56 and 57 of SD-25554-01. The TC and MB leaders are required to be connected

at the first appearance and the BC and TB at the last. All four leads are multipled to each appearance and terminated on punchings on terminal strips between the secondary switches. The LL relay contacts are also terminated on punchings at each appearance. The TC and MB leads (punchings 28 and 30) should be strapped to 3T and 6T (punchings 9 and 20) of the LL relay at the first appearance and the BC and TB leads (punchings 29 and 31) to 3B and 5T (punchings 4 and 21), respectively, of the LL relay at the last appearance. For regular cabling, that is, where there are direct cable connections between succeeding appearances, the chain leads shall be extended to succeeding appearances over the TC1, BC1, and MB1 leads. In this case, the leads shall be run direct between terminal strip punchings representing the LL relay contacts as shown on SD-25554-01, Fig. 56 and 57. This is similar to the method previously used for the A and B leads in the earlier offices. Where there is no direct cabling between succeeding appearances, the chain leads shall be extended over the multiple of the TC2, BC2, and MB2 leads. The multiple of the TC2, BC2, and MB2 leads shall be connected as required at the various appearances to permit extending the chain leads.

5.18 Additional strapping is required to associate each appearance with one of the sets of GB, GT, and RT leads, plus the TGB lead when partial conversion to TOUCH-TONE calling and/or coin service improvements (dial-tone-first) operation is required from the sender selector unit. Four of these sets of leads are run from the sender selector unit, multipled to all appearances, and terminated on terminal strip punchings at each appearance. As far as possible, the appearances of the sender subgroup shall be evenly distributed over the available sets of leads, putting not more than six appearances on each set of leads.

5.19 In offices where sender link frames per J27550F share the same sender multiple with sender link frames per J27550A, the TC, BC, MB, and TB checking leads are not used. In this case, the LL- relay chain leads and the GB-, GT-, and RT-, leads for all frames shall be handled in accordance with Fig. 60 and 61 of SD-25554-01. The new frames under this arrangement are cabled and strapped in the same manner as the old frames and no change in the existing method of cabling is required.

Frame Indication Leads

5.20 On regular subscriber sender link frame the frame indication leads from even- and odd-numbered link frames, respectively, shall be cabled to grouping terminal strips located on the end guards at either end of the lineup. One 20- or 40-conductor switchboard cable per frame shall be employed to provide for a capacity of 10 or 20 sender subgroups. Flexibility in the form of cross-connections is provided on each frame, permitting association of any ten sender subgroups with any ten switch subgroups. The frame indication cabling is consequently not affected by sender multiple revisions due to additions.

5.21 On auxiliary subscriber sender link frames the requirements for the increased number of frame indication leads is met by the use of a special terminal strip located on the primary bay of the frame.

5.22 From the grouping terminal strips containing the even-numbered frame indication leads, a 252CL switchboard cable shall be run to the first of the sender frames serving each link subgroup. This cable shall contain the F0, F2, F4, F6, F8, F00, and F10 leads. From the grouping terminal strips containing the odd-numbered frame indication leads, a 252CL switchboard cable shall be run to the last of the sender frames serving each link subgroup. This cable shall contain the F1, F3, F5, F7, F9, F00, and F10 leads. A switchboard cable containing F0 through F9, F00 and F10, and other leads will be run between the sender frames mounting senders in the same link subgroup. Initial frame indication cables shall not be rerun upon the addition of a new "last" frame for a link subgroup.

List of A&M Only and Mfr Disc. Equipment

EQUIPMENT	RATING	DETAILS LAST SHOWN IN ISSUE	REPLACING EQUIPMENT
J27550A	Mfr Disc.	4	J27550F
J27550B	Mfr Disc.	4	J27550G
J27550C	Mfr Disc.	4	J27550H
J27550D	Mfr Disc.	4	J27550J
J27550E	Mfr Disc.	4	J27500G
J27550F,L6	Mfr Disc.	6	—
J27550H,L4	A&M Only		
& L5	A&M Only		

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

Bell Telephone Laboratories, Incorporated

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