

**OFFICE LINK AND OFFICE EXTENSION FRAMES
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 office link and office extension frames.

⌈ *This specification is applicable to the following systems and appears under the Plant Series numbers listed:*

- NO. 1 CROSSBAR SYSTEM . . . 816-430-150
- ⌋ TANDEM CROSSBAR SYSTEM .817-201-150

1.02 This specification is reissued to include List 9 of J27650C which was omitted in Issue 7 of this specification.

Capacity

1.03 The capacity of the office link and office extension frames is as follows.

Markers	8	
	JUNCTIONS	OGT
Office Link Frame	200	200 (Split Secondary Switches) or 100 (Nonsplit Secondary Switches)
Office Extension Frame		100

Description

1.04 The function of the office link and office extension frames is to interconnect office junctors with outgoing trunks under control of the marker. Since the trunks in a specific test group must be divided between two office link or office extension frames to insure uninterrupted service in case of frame failure, these frames are always furnished and operated in pairs.

1.05 The office extension frame provides extension secondary switches for one office link frame. For reasons covered in 1.17, extension

frames are required on installations utilizing 12 or more office link frames to provide a combined outgoing trunk capacity for each office link and its associated extension frame of 200. An extension frame may also be furnished for each office link frame on installations employing ten or less office link frames, either in anticipation of growth or to increase the combined outgoing trunk capacity to 300. This latter arrangement is not applicable where 12 or more link frames are involved. (See 5.21.) In tandem offices, to provide for a maximum of 6000 outgoing trunk terminations, two extension frames may be associated with each of a maximum of 20 office link frames. Each office link frame and each of its two associated extension frames provide for 100 outgoing trunks.

1.06 The office extension frame should be located adjacent to and to the right of the associated office link frame as viewed from the front. When not required initially, consideration should be given to reserving space in this location for the following reasons:

- (a) The transfer of trunks in excess of 100 from the office link frame to the associated extension frame is facilitated at the time of adding the extension frames. This cabling problem is discussed in paragraphs 5.16 to 5.21.
- (b) A shop-formed short multiple cable can be used for the interconnection of corresponding verticals of each regular secondary switch and its associated extension secondary switch.
- (c) The adjacent location is desirable from a maintenance standpoint.

1.07 The office link and office extension frames are single-sided steel structures 11 feet 6 inches high and, respectively, 5 feet 4-1/4 inches and 2 feet 8-1/8 inches long. The office link frame consists of two bays and the office

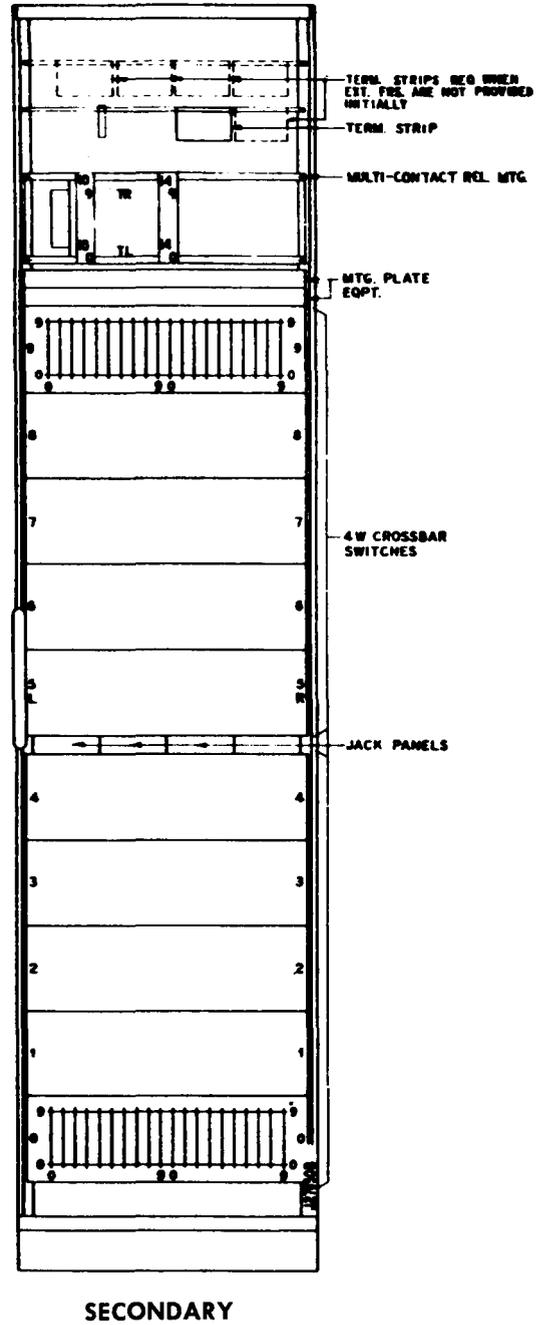
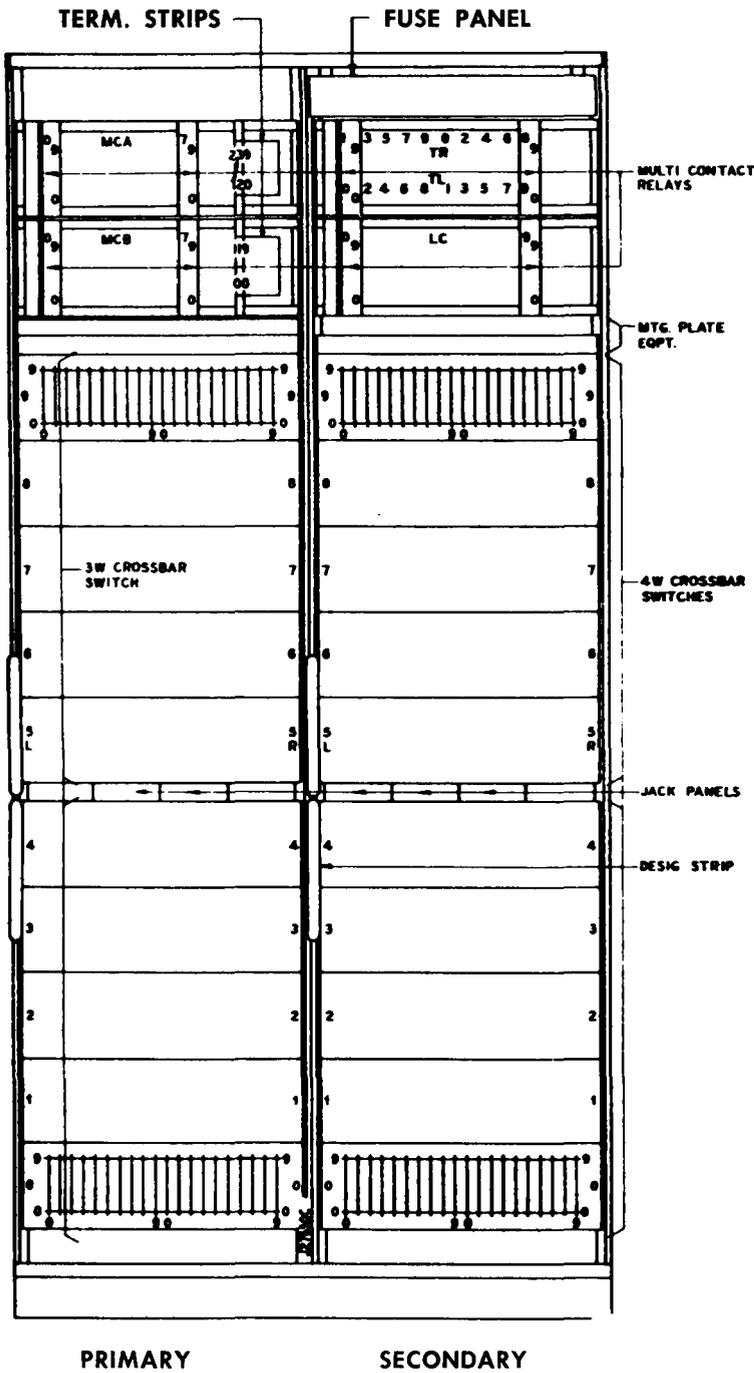


Fig. 1 - No. 1 or Tandem Office Link Frame

Fig. 2 - No. 1 or Tandem Office Extension Frame

extension frame of one bay, all of the bays being of the 30-1/2-inch type, the width being determined by the space requirements of the 200-point crossbar switch which the frames are primarily intended to accommodate.

1.08 The left or primary bay and the right or secondary bay of the office link frame obtain their names from the switches they accommodate. The primary bay contains ten primary switches, the verticals of which represent the office frame end of the office junctors. Access to the office junctors is obtained through the horizontal multiples of these switches, the multiples being split at the midpoint to provide a group of ten paths on the left half and one of ten on the right half of each switch. The secondary bay contains ten secondary switches. The office links, or interconnections between primary horizontals and secondary verticals, find their outlets on the secondary horizontals on which the outgoing trunks appear. The office links, 200 in number, are divided from the standpoint of distribution into two similar groups of 100. One group interconnects the left halves and one the right halves of the primary and secondary switches. The 0 to 9 horizontals of each left primary half-switch are connected, in the 0 to 9 left secondary half-switches, to the vertical corresponding in number to the primary switch. The right links are similarly wired.

1.09 In addition to the crossbar switches, the office link frame accommodates four rows of multicontact relays, four plates for contact protection and miscellaneous relay equipment, a fuse panel, and the required terminal strips, jacks, keys, and lamps. The multicontact relays perform a connector function. One group consisting of two rows of relays operates with the other two groups to associate the marker involved in a specific call with the test and operating leads of the office links available for that call and of the outgoing trunks on the frame which provide the desired routing to the ultimate destination of the call.

1.10 The office extension frame accommodates ten extension secondary switches which are supplementary to the corresponding switches on the associated office link frame in that their horizontals provide additional trunk outlets for the office links. The extension secondary switches and verticals, being multiplied to corresponding

regular secondary switches and verticals bear the same relationship to the primary switches and horizontals.

1.11 In addition to the crossbar switches, the office extension frame accommodates one row of multicontact relays, two plates mounting contact protection and miscellaneous relay equipment, two rows of terminal strips, and the required jacks. The multicontact relays perform a connector function, operating with other multicontact relays on the associated office link frame to connect to the marker the test leads of the outgoing trunks on the extension frame which provide the desired routing to the ultimate destination of the call.

1.12 The office link and office extension frames each constitute a fully wired shipping unit. The equipment of the office link frame is variable, insofar as the marker connector equipment is concerned, for use with a minimum of three and a maximum of eight markers. With respect to secondary switch connector equipment, a minimum of five and a maximum of ten multicontact relays are furnished to associate any marker with the required test subgroup of twenty outgoing trunks. The number of multicontact relays required corresponds to the number of test subgroups for which the frame is to be arranged. In addition to the foregoing, a small amount of equipment supplementary to the basic frame is furnished as required on even- and odd-numbered office link frames. The equipment of the office extension frame is variable only insofar as the OGT wiring and associated terminal strips, are concerned.

1.13 The 200 or less office junctors which terminate on the primary verticals of the office link frame interconnect the office link frame with the district link frames in the No. 1 office or with the trunk link frames in the tandem office. The assignment of the junctors is covered in the charts shown on drawings ED-25012-01 and ED-25016-01 and is so arranged that an equal number interconnect each office link frame with each of the district or trunk link frames. The number of office link frames serving in a common group may vary in even numbers from 2 to 20. The size of the junctor group interconnecting each office with each district or trunk link frame depends upon the size of the installation and becomes smaller as the

number of link frames increases. However, this reduction in junctor group size with growth is not directly proportional to the office size since the larger junctor groups in the smaller offices operate more efficiently. For this reason, not all of the available office link primary verticals are used to terminate office junctors in the smaller installations. The number and size of the office junctor groups on the office frames vary from 2 groups of 60 to 20 groups of 10 junctors. On jobs utilizing fewer district or trunk link frames than office link frames, not all of the assigned junctor groups per office link frame are used.

1.14 The hold magnets at the district or trunk link and office link ends of an office junctor are operated in parallel.

(a) In the early No. 1 offices, the primary hold magnets on the office link frame are arranged to obtain their battery supply from the same fuses which supply the associated secondary hold magnets on the district frames. Because of the varying association between district secondary verticals and office primary verticals, the battery distribution is made variable. The battery distributing point, a group of terminals on the office junctor grouping frame, obtains the battery supply from the district frame fuses. Each vertical hold magnet on each office frame is cabled to the distributing terminal strips, where it is strapped to the proper battery supply. Office link frame per J27650A is furnished in existing originating marker groups where the district link and office link frames are arranged in this manner.

(b) In tandem offices and in later No. 1 offices, the primary hold magnets on the office link frame are fused independently of the associated secondary hold magnets on the district link or trunk link frames. Battery supply for the hold magnets is obtained in each case at fuse panels on the respective frames. For this case, the standard office link frame per J27650C is furnished.

1.15 The office link and office extension frames in both No. 1 and tandem offices utilize 4-wire, 200-point secondary switches in all cases. The usual interoffice trunk requires three wires, namely, "T," "R," and "S1." The fourth wire designated S is required for operator trunks arranged for holding from either end and trunks connected to out-trunk repeaters or CX sets. Ac-

cordingly, it is the practice to cable the office link frames for 4-wire trunks and the extension frames for 3-wire trunks. Where desired, the telephone company shall specify that the extension frames also be cabled for 4-wire trunks.

1.16 The outgoing trunk capacity of the office link frame is variable; this variable being a manufacturing consideration with respect to secondary switch connector equipment as indicated in paragraph 1.12 and with respect to the strapping of the secondary switch horizontals, which represent the points of access to the outgoing trunks. The ten switches, strapped to provide a continuous multiple on each of the ten horizontals of each switch, have a total capacity of 100 outgoing trunks. This capacity is varied by splitting the horizontal multiples at their midpoints in accordance with job requirements. It may be increased to 200 by splitting all 100 horizontal multiples. The intermediate capacities are 120, 140, 160, and 180 outgoing trunks, respectively, effected by splitting the 0 and 1, 0 to 3, 0 to 5, and 0 to 7 horizontal multiples of all switches. The office extension frame has a fixed capacity of 100 outgoing trunks, the horizontal multiples never being split.

1.17 The items discussed in paragraphs 1.15 and 1.16 are jointly affected by a conversion that will commonly occur during the life of an office having ten or less office frames without extension frames initially and more than ten ultimately. In the ten district or trunk link — ten office link frame case, twenty office junctors interconnect each district or trunk link frame with each office link frame. Since this junctor group contains ten left and ten right junctors, each outgoing trunk on a split level is accessible through ten channels. However, where the number of frames is greater, the junctor group is smaller and the access to outgoing trunks on split levels for a given junctor group would be reduced to less than ten channels. This is considered undesirable and is avoided by the conversion of split levels to nonsplit and the addition of extension frames. The reduction of the outgoing trunk capacity of the office frames to 100 results in an excess which is transferred to the extension frames. The transferred trunks, unless otherwise specified, are converted from 4-wire to 3-wire. Where extension frames are furnished initially and the office grows beyond ten office link frames, it also is necessary to

eliminate split levels, if furnished, and thereby limit the combined outgoing trunk capacity of office link and extension frame to 200.

1.18 The marker is arranged to make a simultaneous test of a maximum of 40 outgoing trunks in attempting to locate an idle one. A group containing more than 40 trunks is sub-grouped for test purposes into test groups. The 40 trunks of a test group are distributed over the two office link frames or over the two office extension frames of a pair. A feature of the marker permits the inclusion of trunks from various outgoing trunk groups in one test group. On a specific call, all trunks to other than the desired destination in such a test group are disregarded. A specific test group normally includes all of the trunks of a specific trunk group which are assigned to one pair of office link or office extension frames.

1.19 A test group, whether the associated horizontal multiples or levels be split or non-split, includes trunks assigned to an even level and the next higher odd level on each of the ten regular or extension secondary switches on each frame of a pair. The twenty even (0, 2, 4, etc. to 38) — and twenty odd (1, 3, 5, etc. to 39) — numbered trunks of a test group are assigned respectively to the even and odd frames of the pair. The order of assignment of twenty even-numbered trunks of one test group to levels 0 and 1; for example, when used either on a split or nonsplit basis, follows:

Trunk	0	2	4	6	8	10	12	14	16	18
Switch	0	1	2	3	4	5	6	7	8	9
Level	0L	1R								
Trunk	20	22	24	26	28	30	32	34	36	38
Switch	0	1	2	3	4	5	6	7	8	9
Level	1R	0L								

The order of assignment of the associated odd-numbered trunks to corresponding levels of the associated odd frame is as follows:

Trunk	1	3	5	7	9	11	13	15	17	19
Switch	0	1	2	3	4	5	6	7	8	9
Level	0L	1R								
Trunk	21	23	25	27	29	31	33	35	37	39
Switch	0	1	2	3	4	5	6	7	8	9
Level	1R	0L								

The reference in the foregoing to left and right levels has little real significance in the nonsplit

case since the strapping on each horizontal is continuous. It reflects, however, the physical interconnections in the local cable required, for purposes clarified in the following paragraphs, between OGT sleeves and secondary switch connector relays. Only one test group can be assigned to two nonsplit levels. Two test groups can be assigned to two split levels, one as described in this paragraph and one as described in paragraph 1.21.

1.20 The test leads of an outgoing trunk test group are connected toward the markers through contacts on two secondary switch connector relays on each office frame of the pair. The designation of each relay indicates the left or right half-switch and the level on which the associated trunks appear. For the case discussed in paragraph 1.19, whether the levels be split or nonsplit, relays (TL0) and (TR1) are used with the trunk test group in question. On the even frame, relay (TL0), it will be noted, is associated with trunks 0, 22, 4, 26, etc. and relay (TR1) with trunks 20, 2, 24, 6, etc. On the odd frame, relay (TL0) is associated with trunks 1, 23, 5, 27, etc., and relay (TR1) with trunks 21, 3, 25, 7, etc.

1.21 A second test group of trunks becomes available when to continue with the foregoing example levels 0 and 1 are split. For these trunks, secondary switch connector relays (TL1) and (TR0) are used. Since one set of connections toward the markers is common to all (TL) relays on the frame and one set to all (TR) relays on the frame, the (TL1) and (TR0) relays must connect their trunks to these common leads in the same order as the (TL0) and (TR1) relays. The order of assignment of these trunks must consequently be as follows:

Trunk	0	2	4	6	8	10	12	14	16	18
Switch	0	1	2	3	4	5	6	7	8	9
Level	1L	0R								
Trunk	20	22	24	26	28	30	32	34	36	38
Switch	0	1	2	3	4	5	6	7	8	9
Level	0R	1L								
Trunk	1	3	5	7	9	11	13	15	17	19
Switch	0	1	2	3	4	5	6	7	8	9
Level	1L	0R								
Trunk	21	23	25	27	29	31	33	35	37	39
Switch	0	1	2	3	4	5	6	7	8	9
Level	0R	1L								

1.22 The various levels of all regular and extension secondary switches are treated in pairs as described for levels 0 and 1 in the foregoing, except that as previously indicated extension secondary switches are never split. The trunks of an outgoing trunk group or subgroup assigned in a test group may consist of any number of trunks from 1 to 40. As far as the marker is concerned, however, such a trunk group always consists of an even number of trunks which must be assigned in consecutive order beginning at any even number, 0, 2, 4, etc, to 38 and continuing to any odd number, 1, 3, 5, etc, to 39 as determined by the number of trunks required. When the trunk group or subgroup consists of an odd number of trunks, the additional trunk included in the test group for this particular group or subgroup is made busy by grounding its sleeve at the distributing frame. The trunk made busy may be the first, last, or any intermediate trunk.

1.23 Part of the control equipment of the office link frame is known as marker lockout and emergency control equipment. The marker lockout equipment on either frame of a pair may be used to control the assignment on a preferential basis of that pair and of the associated pair of office extension frames, when furnished, to the markers. When this equipment on one frame is in service, the same relays on the other frame serve as emergency equipment. The transfer from the marker lockout equipment on either frame to that on the other frame is automatic when trouble is encountered in the equipment in service but may also be accomplished manually.

1.24 Marker lockout control circuit per Figs. 7 and A and 16 and C of SD-25033-01 are arranged so that in offices equipped for alarm transfer, alarms occurring while the circuit is manually transferred to the alternate chain can be released from the distant point. With the earlier circuits per Figs. 7 and B and 16 and D of SD-25033-01, it was necessary that the SA keys be nonoperated prior to the transfer of the office alarms, since otherwise an alarm occurring in a lockout circuit could not be released from the distant point.

1.25 Interconnections between the office link frames and other frames are made by means of switchboard cable with the possible

exception of the multiple between regular and extension secondary switch verticals. When an office extension frame is located adjacent to its associated office link frame, this multiple consists of shop-formed local cables.

1.26 The assignment of office junctors is covered on drawing ED-25016-01 for installations with two to eight office frames and on ED-25012-01 for installations with ten to twenty office frames.

1.27 In tandem offices, a circuit is provided to identify an outgoing trunk with a stuck sender using Fig. 17, 18, and 19 of SD-25033-01 in conjunction with the trunk identification circuit SD-27077-01. Fig. 18 is mounted on the rear of each secondary switch of the office link frame and the office extension frame and provides a glow lamp and resistor matrix wired to the "S-" lead of each outgoing trunk. Fig. 17 and 19 provide relays to connect Fig. 18 to the trunk identifier circuit.

Subdivisions of Equipment

- J27650A (A&M Only) — No. 1 Office Link Frame — For Use in Offices Arranged for Office Junctor Battery Distribution
- J27650B (AT&TCo Std) — Office Extension Frame
- J27650C (AT&TCo Std) — No. 1 or Tandem Office Link Frame
- J27650AA (AT&TCo Std) — Trunk Sleeve Glo-Lamp Assembly, Equipment, and Local Cable

2. SUPPLEMENTARY INFORMATION

- 816-000-000 — No. 1 Crossbar System Index
- 817-000-000 — Tandem Crossbar System Index
- J29254 (816-009-200) — Installation of Additions to Switching Equipment
- J29255 (816-010-150, 817-018-150) — Office Junctor Redistribution Procedures for the Installation of Additions
- Floor Plan Data — Section 9.1, Sheets 5 and 16

3. DRAWINGS

Key Sheet

- SD-25000-01 — No. 1 Crossbar Office
- SD-25435-01 — Tandem Crossbar Office

Framework

- ED-25020-01 — Terminal Strip and Switch Mounting Details, and Cable Brackets

- ED-25021-01 — Assembly of Jack, Key, and Lamp Panels
- ED-25022-01 — Assembly of Multicontact Relay Mounting
- ED-25023-01 — Frame Details
- ED-25025-01 — Assembly of Fuse Panel
- ED-25041-01 — Assembly of District, Office, and Incoming Link Frames
- ED-25075-01 — Assembly of Office and Incoming Extension Frames
- ED-25553-01 — Assembly of District or Office Link Frame

Equipment

- ED-25044-01 — Office Link Frame Equipment — No. 1 Office
- ED-25194-01 — Office Extension Frame Equipment
- ED-25212-01 — Designation Cards
- ED-25554-01 — Office Link Frame Equipment — No. 1 or Tandem Office
- ED-25626-01 — Office Extension Frame — OGT Terminal Strips

Wiring and Cabling

- ED-25012-01 — Office Junctor Assignment Chart — Ten to Twenty Office Frames
- ED-25016-01 — Office Junctor Assignment Chart — Two to Eight Office Frames
- ED-25045-01 — Office Link Frame Local Cable — No. 1 Office
- ED-25130-01 — Schematic of Marker Multiple Cabling to Frame Connectors
- ED-25150-01 — General Switchboard Cabling Plan for Link Frames
- ED-25170-01 — Switchboard Cabling Details — Office Link Frames Without Office Extension Frames — No. 1 Office
- ED-25170-02 — Switchboard Cabling Details — Office Link Frames With Office Extension Frames — No. 1 Office
- ED-25195-01 — Office Extension Frame Local Cable
- ED-25201-01 — Battery Distribution to Regular Secondary and Extension Secondary Switches
- ED-25248-01 — Grounding Facilities for Busy-ing Outgoing Trunks at the MDF
- ED-25346-01 — Method of Running Power Feeders

- ED-25410-01 — Arrangement of Connections, Office Link, OGT Test, ITC Frames, and MDF
- ED-25555-01 — Office Link Frame Local Cable — No. 1 or Tandem Office
- ED-25565-01 — Switchboard Cabling Details — Office Link Frames Without Office Extension Frames — No. 1 or Tandem Office
- ED-25565-02 — Switchboard Cabling Details — Office Link Frames With Office Extension Frames — Tandem Office
- ED-25629-01 — Switchboard Cabling Details — Office Link Frame With Office Extension Frame — No. 1 or Tandem Office
- ED-25630-01 — Switchboard Cabling Details — Office Link Frame With Office Extension Frame — No. 1 Office
- ED-25631-01 — Switchboard Cabling Details — Office Link Frame With Provision for Adjacent Future Office Extension Frame — No. 1 Office
- ED-25632-01 — Switchboard Cabling Details — Office Link Frame With Provision for Adjacent Future Office Extension Frame — No. 1 or Tandem Office
- ED-25236-01 — Outgoing Trunk Test Frame — Schematic of Connections for Test and Make-busy Jacks

4. EQUIPMENT

J27650A (A&M Only) — No. 1 Office Link Frame

Equipment — ED-25044-01
 Local Cable — ED-25045-01

List 1 — Framework, assembly, wiring, and common equipment for one office link frame wired for use with eight originating markers and 200 outgoing trunks and equipped for use with three originating markers and 100 outgoing trunks (see paragraph 1.14).

	WIRE	EQUIP
Framework, ED-25041-01, G2		1
Multicontact Rel Mtg, ED-25022-01, Item 4		4
Fuse Panel, ED-25025-01, Item 4		1

	WIRE	EQUIP		EQUIP
Jack, Key, and Lamp Panel, ED-25021-01:			Marker Lockout Ckt, SD-25033-01, Fig. 6B or 6C	1
Item 2		4	Marker Connector Ckt, SD-25033-01, Fig. 6, Less (A) Res	1
Item 10		1		
Office Link and Conn Ckt, SD-25033-01:			List 3 — Equipment required in addition to list 1 on each even-numbered office link frame for marker lockout control cir- cuit per SD-25033-01, Figs. 7 and A, (TR2) and (TR3) relays, (TR) key, (F) resistance, and (CH) lamp only.	
Primary Switch Ckt, Fig. 1	10	10		
Secondary Switch Ckt, Fig. 2	10	10		
Link Conn Ckt, Fig. 3	10	10		
Left Half Secondary Switch Conn Ckt, Fig. 4, less (C) Res	10	5	List 4 — Equipment required in addition to list 1 for each increase of twenty out- going trunks beyond minimum of 100 OGT capacity of frame.	
Left Half Secondary Switch Conn Ckt, Fig. 4(C) Res Only	10	10		
Right Half Secondary Switch Conn Ckt, Fig. 5	10	5		EQUIP
Marker Conn Ckt, Fig. 6, less (A) Res	8	3	Left Half Secondary Switch Conn Ckt, SD-25033-01, Fig. 4, Less (C) Res	1
Marker Conn Ckt, Fig. 6, (A) Res Only		8	Right Half Secondary Switch Conn Ckt, SD-25033-01, Fig. 5	1
Marker Lockout Ckt for Marker 0, Fig. 6A	1	1	List 5 — Wiring required in addition to list 1 for extension of office links and sec- ondary switch fusing into one office ex- tension frame located immediately ad- jacent to the secondary bay.	
Marker Lockout Ckt for Markers 1 to 6, Fig. 6B	6	2	List 6 — Equipment required in addition to list 1 on each odd-numbered office link frame for four or more markers, SD-25033-01, Fig. 16 (TR3) relay only.	
Marker Lockout Ckt for Marker 7, Fig. 6C	1	0	List 7 — Equipment required in addition to list 1 on each even-numbered office link frame for five or more markers, SD-25033-01, Fig. 7 (TR4) relay, or on each odd-numbered office link frame for six or more markers, SD-25033-01, Fig. 16 (TR4) relay.	
Marker Lockout Control Ckt, Figs. 7 & A, less (TR2), (TR3), and (TR4) Rel, (TR) Key, (F) Res, and (CH) Lamp, or Figs. 16 & C, less (TR3) and (TR4) Rel	1	1		
Secondary Switch Make-busy Ckt, Fig. 8	10	10		
Primary Switch Make-busy Ckt, Fig. 9	10	10		
Secondary Select Magnet Conn Ckt, Fig. 10	10	10		
Miscellaneous Ckt, SD-25058-01:			Notes	
Frame Line Ckt, Fig. 2	1	1	A. Lists 2, 3, and 4 are supplementary to list 1 and shall be furnished as required to meet the job conditions.	
Frame Test Battery Ckt, Fig. 3	1	1	B. List 5 consists of ten separate and identi- cal local cables containing the T, R, and S multiples of the twenty secondary switch verticals to corresponding verticals on the associated extension secondary switches. Each of these cables shall also contain two leads for battery distribution as indicated on ED-25201-01. The design of the cables is	
Battery Test Jack Ckt, Fig. 5	1	1		
Spare Jack Ckt, Fig. 6	1	1		
Remote-control Jack Ckt, Fig. 7	1	1		
Fuse Alarm Ckt, Fig. 8	1	1		

List 2 — Equipment required in addition to list 1 for each marker in excess of three.

shown on the office link frame local cable drawing. When wiring per list 5 is required initially on office link frames for a specific job, this wiring shall be connected in the shop at the time the frame local cable is connected.

- C. The office link frame local cable shall be provided with universal wiring to permit equipping a specific frame with either Figs. 7 and A or Figs. 16 and C for use, respectively, as an even- or odd-numbered frame. The (TR4) relay of Fig. 7 is required on even-numbered office link frames when originating marker 4 is equipped. The (TR3) and (TR4) relays are required on odd-numbered office link frames when, respectively, originating markers 3 and 5 are equipped (see paragraph 1.24).

J27650B (AT&TCo Std) — Office Extension Frame

Equipment — ED-25194-01
 Local Cable — ED-25195-01

- List 1** — Framework, assembly, wiring, and common equipment for one office extension frame (see note A).

	WIRE	EQUIP
Framework, ED-25075-01, G2		1
Multicontact Rel Mtg, ED-25022-01, Item 4		1
Jack, Key, and Lamp Panel, ED-25021-01:		
Item 2		2
Item 10		1
Office Link and Conn Ckt, SD-25033-01:		
Secondary Switch Ckt, Fig. 12	10	10
Even Level Secondary Switch Conn Ckt, Fig. 14	5	5
Odd Level Secondary Switch Conn Ckt, Fig. 15	5	5
Secondary Select Magnet Conn Ckt, Fig. 11	10	10
Secondary Switch Make-busy Ckt, Fig. 13	10	10
Miscellaneous Ckt, SD-25058-01:		
Frame Test Battery Ckt, Fig. 3	1	1
Battery Test Jack Ckt, Fig. 5	1	1

- List 2** — Framework, assembly, and equipment per ED-25626-01, Figs. 1 and A, for OGT terminal strip for marker test group TL1 to be located in the position of each office extension frame when these frames are not provided initially but space is reserved for their addition adjacent to each associated office link frame (see notes B and E).

- List 3** — Equipment per ED-25626-01, Fig. 1 (OGT terminal strips and one, P-423658 mounting bar only) required in addition to list 1 for each office extension frame when these frames are added adjacent to existing office link frames which have split-level OGT cabling from the MDF terminated directly on secondary switches (see note C).

- List 4** — Wiring per SD-25033-01, Fig. 12 (T, R, and S1 leads from switch horizontals to OGT terminal strips at top of frame only) required in addition to list 1 for each office extension frame when these frames are added adjacent to existing office link frames (see note D).

- List 5** — Equipment per ED-25626-01, Fig. B, C, D, or E required in addition to list 2 for each of marker test groups TL3, TL5, TL7, or TL9 (see note B).

- List 6** — Wiring required in addition to list 1 for extension of office links and secondary switch fusing from office extension frame 0 to office extension frame 1 located immediately adjacent (see note F).

- List 7** — Equipment required in addition to list 1 to equip one office extension frame with miscellaneous jacks per SD-25058-01, Fig. 2, 6, and 7 (see note G).

- List 8** — Wiring and equipment required in addition to list 1 to identify an outgoing trunk with a stuck sender per SD-25033-01, ten Fig. 18, "ZP" option, and one Fig. 17 (tandem offices only) (see note H).

Notes

- A. When office extension frames are installed at the same time as the associated office link frames, equipment per list 1 only is required.
- B. When the extension frames are not provided initially but space is reserved adjacent to the associated office link frames, equipment per list 2 shall be located in the positions of the future extension frames to facilitate the transferring of trunks to the extension frames at such time as they are needed. At the time of the addition, the equipment per list 2 will be relocated on the extension frames.
- C. On installations where space has been reserved adjacent to office link frames for the future addition of office extension frames, but where equipment per list 2 has not been provided, equipment per list 3 shall be furnished in addition to list 1 for each office extension frame.
- D. Wiring per list 4 shall be provided in the frame local cable in addition to that per list 1 for all office extension frames which include equipment per list 3, or which will be installed where equipment per list 2 has been provided.
- E. When equipment per ED-25626-01 is provided in the position of a future office extension frame, details for closing unequipped frame spaces per ED-25528-01, G7 shall also be provided.
- F. List 6 consists of ten separate and identical local cables containing the T, R, and S multiples of the 20 secondary switch verticals on extension frame 0 to corresponding verticals on associated extension frame 1. Each of these cables shall also contain three leads for battery distribution.
- G. When office extension frames are furnished in separate lines rather than adjacent to the associated office link frames, list 7 shall be provided on alternate office extension frames starting with the second frame.
- H. List 8 provides the trunk sleeve Glo-Lamp unit assembly, equipment, and local cable shown under J27650AA. List 8 is ordered for new frames only.

J27650C (AT&TCo Std) — No. 1 or Tandem Office Link Frame

Equipment — ED-25554-01
Local Cable — ED-25555-01

List 1 — Framework, assembly, wiring, and common equipment for one office link frame wired for use with eight markers and 200 outgoing trunks and equipped for use with three markers and 100 outgoing trunks.

	WIRE	EQUIP
Framework, ED-25553-01, G1		1
Multicontact Rel Mtg, ED-25022-01, Item 4		4
Fuse Panel, ED-25025-01, Item 14		1
Jack, Key, and Lamp Panel, ED-25021-01:		
Item 2		4
Item 10		1
Office Link and Conn Ckt, SD-25033-01:		
Primary Switch Ckt, Fig. 1	10	10
Secondary Switch Ckt, Fig. 2	10	10
Link Conn Ckt, Fig. 3	10	10
Left Half Secondary Switch Conn Ckt, Fig. 4, less (C) Res	10	5
Left Half Secondary Switch Conn Ckt, Fig. 4 (C) Res Only	10	10
Right Half Secondary Switch Conn Ckt, Fig. 5	10	5
Marker Conn Ckt, Fig. 6, less (A) Res	8	3
Marker Conn Ckt, Fig. 6, (A) Res Only	8	8
Marker Lockout Ckt for Marker 0, Fig. 6A	1	1
Marker Lockout Ckt for Markers 1 to 6, Fig. 6B	6	2
Marker Lockout Ckt for Marker 7, Fig. 6C	1	0
Marker Lockout Control Ckt, Figs. 7 & A, less (TR2), (TR3), and (TR4) Rel, (TR) Key, (F) Res, and (CH) Lamp or Fig. 16 & C, Less (TR3) and (TR4) Rel	1	1
Secondary Switch Make-busy Ckt, Fig. 8	10	10
Primary Switch Make-busy Ckt, Fig. 9	10	10
Secondary Select Magnet Conn Ckt, Fig. 10	10	10

	WIRE	EQUIP
Miscellaneous Ckt, SD-25058-01:		
Frame Line Ckt, Fig. 2	1	1
Frame Test Battery Ckt, Fig. 3	1	1
Battery Test Jack Ckt, Fig. 5	1	1
Spare Jack Ckt, Fig. 6	1	1
Remote-control Jack Ckt, Fig. 7	1	1
Fuse Alarm Ckt, Fig. 8	1	1

List 2 — Equipment required in addition to list 1 for each marker in excess of three.

	EQUIP
Marker Lockout Ckt, SD-25033-01, Fig. 6B or 6C	1
Marker Conn Ckt, SD-25033-01, Fig. 6, Less (A) Res	1

List 3 — Equipment required in addition to list 1 on each even-numbered office link frame for lockout control circuit per SD-25033-01, Figs. 7 and A, (TR2) and (TR3) relays, (TR) key, (F) resistance, and (CH) lamp only.

List 4 — Equipment required in addition to list 1 for each increase of twenty outgoing trunks beyond minimum 100 OGT capacity of frame.

	EQUIP
Left Half Secondary Switch Conn Ckt, SD-25033-01, Fig. 4, Less (C) Res	1
Right Half Secondary Switch Conn Ckt, SD-25033-01, Fig. 5	1

List 5 — Wiring required in addition to list 1 for extension of office links and secondary switch fusing into one office extension frame located immediately adjacent to the secondary bay.

List 6 — Equipment required in addition to list 1 on each odd-numbered office link frame for four or more markers, SD-25033-01, Fig. 16, (TR3) relay only.

List 7 — Equipment required in addition to list 1 on each even-numbered office link frame for five or more markers, SD-25033-01, Fig. 7 (TR4) relay, or on each odd-numbered office link frame for six or more markers, SD-25033-01, Fig. 16 (TR4) relay.

List 8 — Wiring and equipment required in addition to list 1 to identify an outgoing trunk with a stuck sender per SD-25033-01, ten Fig. 18, "ZP" option, and one Fig. 17 when the office link secondary switch horizontals are not split (tandem offices only). (See note F.)

List 9 — Wiring and equipment required in addition to list 8 per SD-25033-01, ten Fig. 18, "ZO" option, and one Fig. 19 when the office line secondary switch horizontals are split (tandem offices only). (See notes E and F.)

Notes

- A. Lists 2, 3, and 4 are supplementary to list 1 and shall be furnished as required to meet the job conditions.
- B. List 5 consists of ten separate and identical local cables containing the T, R, and S multiples of the 20 secondary switch verticals to corresponding verticals on the associated extension secondary switches. Each of these cables shall also contain three leads for battery distribution. When wiring per list 5 is required initially on office link frames for a specific job, this wiring shall be connected in the shop at the time the frame local cable is connected.
- C. The office link frame local cable shall be provided with universal wiring to permit the equipping of a specific frame with either Figs. 7 & A or Figs. 16 & C for use, respectively, as an even- or odd-numbered frame. The (TR4) relay of Fig. 7 is required on even-numbered office link frames when originating marker 4 is equipped. The (TR3) and (TR4) relays are required on odd-numbered office link frames when, respectively, originating markers 3 and 5 are equipped (see paragraph 1.24).
- D. On installations where only two markers are provided, the second marker lockout relay specified per Fig. 6B, list 1, which is associated with the third marker, shall have its back contacts strapped to insure continuity of service until the third marker is installed.

- E. Wire "S(1-9)L" and "S(0-8)R" leads of "ZO" option to each split level only of SD-25033-01, Fig. 2.
- F. Lists 8 and 9 provide the trunk sleeve Glo-Lamp unit assembly, equipment, and local cable shown under J27650AA. Lists 8 and 9 are ordered for new frames only.

J27650AA (AT&TCo Std) — Trunk Sleeve Glo-Lamp Assembly, Equipment, and Local Cable

Equipment — J27650AA-()

List 1 — Assembly, local cable, and common equipment for one trunk sleeve Glo-Lamp unit per SD-25033-01, Fig. 18, "ZO" option (tandem offices only) (see note A).

List 2 — When unit is used on office link frames with split secondary switches per SD-25033-01, Fig. 18, "ZO" and "ZP" options (tandem offices only) (see note A).

Notes

A. The J27650AA unit should be specified when modifying existing office or office extension frames. For new frames, the equipment is automatically provided under J27650B, list 8 and J27650C, lists 8 and 9.

5. GENERAL NOTES

Wiring

5.01 No. 24 gauge type "C" wire shall be used for the frame local cable except battery and ground distributing leads which shall be No. 22 gauge type "C" wire.

5.02 The primary-secondary slip, as indicated in paragraph 1.08, shall be such that the switch and horizontal numbers identifying the primary end of a link represent, respectively, the vertical and switch numbers of the secondary end.

5.03 The strapping of the multicontact relays of the marker and secondary switch connector circuits shall be furnished for the full complement of relays in all cases. When these relays are only partially equipped, the straps shall be continued beyond the last unequipped position, supported at that position and insulated as illustrated in the wiring and cabling specification.

5.04 The connection between the link connector multicontact relays and the sleeves of the links shall be made at the primary switch horizontals.

5.05 The inner end of each hold magnet winding on the primary, regular secondary, and extension secondary switches shall be connected by means of strapping or surface wiring from the shank of the terminal to the hole in the lower fork of the sleeve terminal of the associated vertical. This wiring may be applied on the bench at the time the outer ends of the select and hold magnet windings are strapped for battery distribution. Where there is any choice, the use of the hold magnet terminals for the termination of local or switchboard cable is avoided; the more readily accessible vertical sleeve terminals being preferred.

5.06 Insofar as the office link frame secondary switch strapping is concerned, the conversion of a nonsplit horizontal to a split horizontal involves merely the removal of that section of strapping between the 9L and 0R verticals. The conversion of a split horizontal to a nonsplit horizontal shall be accomplished by interconnecting corresponding wiring terminals at the 9L and 0R verticals with a supplementary local cable as covered in the wiring and cabling specification.

5.07 The strapping of the secondary switch horizontals shall be continuous for those horizontals assigned regularly or temporarily for nonsplit use. The strapping of the horizontals assigned for split use shall be cut at the midpoint. This splitting of horizontals for the frames intended for a specific job may be done in the shop or by the installer.

5.08 The distribution of battery to the secondary switches varies with the application of the office link frame with respect to its use alone or with an extension frame. The shop wiring involved shall be universal, as shown on the drawing covering battery distribution to regular secondary and extension secondary switches. As shown on this drawing, the variables are applied by the installer.

5.09 All office link frames shall be arranged so that they may be used with office extension frames. This requires that the office link frame local cable include wiring to the miscellaneous terminal strips for those interconnections which cannot be conveniently cabled directly to the apparatus. This wiring, as shown on the office link and connector circuit cross-connection sheet, has been kept at a minimum.

5.10 Provision is made on the office link frame miscellaneous terminal strips for the optional interconnection of one pair of contacts or another of associated (TL) and (TR) relays to indicate to the marker whether the associated switch horizontals are split or nonsplit. The particular interconnections required in a specific case are dependent upon job requirements. Those horizontals which are cabled on a split basis, but used nonsplit, require the nonsplit condition on the (TL) and (TR) relays.

Cabling

5.11 The code numbers of the switchboard cables ordinarily used in cabling the various circuits are shown on the switchboard cabling drawing. The circuits should, however, be checked to insure that the proper codes are specified to meet the latest circuit requirements. The cross-connecting information on the circuit shows what groups of leads are to be combined in the same cables.

5.12 The schematic of connections from the markers to office link frames for initial installations and additions of both link frames and markers is shown on ED-25130-01.

5.13 Certain interconnections between office link frames and associated office extension frames are run in switchboard cable from the front of the multicontact relay terminal strips on the office link frame to the miscellaneous terminal strip at the top of the office extension frame. Leads cabled in this manner are so designated on the cross-connection sheet for the office link and connector circuit. The method of handling the cable is illustrated on the switchboard cabling detail drawings. This assists in keeping at a minimum the wiring required in the office link frame local cable to permit the use of the frame with an office extension frame.

5.14 The office link frames shall be cabled in each case for the outgoing trunk capacity specified by the telephone company. This capacity should provide the maximum number of split levels foreseen for the specific application. The straps on switch levels cabled on a split basis but used nonsplit shall not be cut at the midpoint.

5.15 The distribution of battery supply to the select and hold magnets of the secondary switches on office link frames and their associated office extension frames is covered on ED-25201-01. The voltage drop between the fuses and any associated magnet may not exceed 0.25 volt. This requirement establishes a limitation on the separation of frames; the magnets on which are fused in common. With the codes of cables specified on the switchboard cabling detail drawing, the length of the run between the miscellaneous terminal strips on the office link frame and the switches on the associated office extension frame may not exceed 100 feet, including strippers. Other limiting conditions affecting these frames are given in J20151 (816-016-150).

5.16 For installations on which space for future extension frames is reserved adjacent to the office link frames, certain preparations for the addition of the extension frames are required. The first 100 trunks on each office link frame (marker test groups TL0, TL2, TL4, TL6, and TL8) are permanently cabled. The additional trunks created by the splitting of levels, however, are cabled in such a manner as to permit their transfer to the extension frames without loss of service or temporary reassignment to other frames. These cables (for marker test groups TL1, TL3, TL5, TL7, and TL9) are terminated on the OGT terminal strips located in the position of each future extension frame. From this point, they are extended to split levels on the office link frame by a temporary switchboard cable.

5.17 At the time of installation of the extension frame, the OGT terminal strips will be relocated at the top of the extension frame and the leads for each trunk will be bridged to the extension switches by means of the extension frame local cable. After the extension frame has been placed in service, the temporary cable to split levels on the office link frame will be removed.

5.18 For those existing installations on which space for future extension frames is reserved adjacent to the office link frames and where the cables to the MDF, OGT test frame, and ITC have been terminated directly on split levels of the office link frame switches, the OGT terminal strips will be provided as part of the

office extension frame. It will be necessary to open the sheathing on the cables to the split levels (it is assumed that slack has been provided to permit the transfer of these cables to the extension frame) and bridge the leads for each trunk to punchings on the OGT terminal strips.

5.19 For installations on which space for future extension frames is not reserved adjacent to the office link frames, the addition of the extension frames requires that the transferred circuits referred to in paragraph 5.16 be recabled. Complete recabling may be avoided by extending the cables for these trunks from MDF, OGT test frame, and ITC frame to the location of the extension frames by the use of splicing. This practice requires the telephone company's approval for each specific instance where it is employed.

5.20 It should be noted, in connection with paragraph 5.19 that it may be preferable where only slight penalties in initial cable cost are involved to cable the OGT test frame or ITC frame to the MDF. This plan would eliminate

one set of cables from those involved in the transfer and should be adopted in those cases where an over-all saving is effected.

5.21 As stated in paragraph 1.06, extension frames may be used with office link frames having split secondaries to provide a combined OGT capacity of from 201 to 300. This arrangement is satisfactory only where ten or less office frames are employed. In accordance with the requirements of paragraph 1.17, split secondaries must be eliminated at the time the number of office link frames grows beyond ten. At such time, the cabling to MDF, OGT test frame, and ITC frame associated with the trunks created by the splitting of regular secondary switch levels would be removed.

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

5.22 The following equipment has been replaced as indicated:

EQUIPMENT	RATING	COVERED IN ISS.	REPLACING EQUIPMENT
J27650A	A&M Only	5	J27650C

Bell Telephone Laboratories, Inc.

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