

RELAY RACK FRAMES FOR TRUNKS AND MISCELLANEOUS EQUIPMENTS EQUIPMENT DESIGN REQUIREMENTS NO. 5 CROSSBAR SYSTEM

1. GENERAL

Scope

1.01 This specification, together with the supplementary information listed herein, provides the equipment design requirements for the framework, equipment, and circuits to be used in the engineering, manufacture, and installation of relay rack frames in a No. 5 crossbar office.

1.02 This specification also describes the procedures to be followed in mounting and interconnecting relay rack mounted units and panels on these frames in the shop. Such units and panels, however, **are not included** as part of the relay rack frame codes and must be ordered separately to meet the requirements of each job.

1.03 This specification is reissued:

(a) To bring J23064 into agreement with SD-25574-01, Issue 37D, as follows:

(1) Relay rack frames J23064D, J23064F, and J23064G are arranged to provide an IRT jack when frames are equipped with CAMA trunks.

Capacity

1.04 Each bay of relay rack will mount the equivalent of 61, 2- by 23-inch mounting plates or 69, 1-3/4 by 23-inch mounting plates.

Description

1.05 The standard relay rack frame for use in a No. 5 crossbar office is a double-bay sheet metal framework. A single-bay relay rack frame is also available for use where the double-bay frame may not be suitable.

1.06 Three arrangements of double-bay frames are coded as follows:

(a) **J23064D—Arranged for Frame Covers:**

This relay rack frame is primarily designed to mount intraoffice, incoming, and similar type trunks that require association with ringing selection switches or outgoing, recording-completing, special service, and other trunks which have trunk link frame terminations. The trunks may be nonwire spring relay units or a combination of nonwire spring and wire spring relay units.

(b) **J23064E—Arranged for Frame Covers:** This relay rack frame is primarily designed for mounting trunks and lines which have line link frame appearances and do not require association with ringing selection switches. Miscellaneous, test, maintenance, and Common Systems units also may be mounted on this frame. The trunks and units may be of nonwire spring relay equipment or a combination of wire spring relay and nonwire spring relay equipment.

(c) **J23064G—Not Arranged for Frame Covers:**

This frame is primarily designed for wire spring relay introoffice, incoming, and similar trunks that require association with ringing selection switches or outgoing, recording-completing, special service, or similar trunks that require trunk link frame appearances. Nonwire spring relay trunks may also be mounted on this frame if their design is such that they do not require the protection of frame covers.

1.07 Only one single-bay relay rack frame is available and this is coded J23064F. This frame shall be used in place of one of the double-bay frames only because of space or economic limitations. The units may be of nonwire spring relay and wire spring relay equipment. Frame covers are optional for protection of U- and Y-type relays. Only units

requiring 48-volt battery may be mounted on this frame.

1.08 Only 48-volt fuse panels using 70-type fuses are equipped on relay rack frames. Each bay is equipped with 40 circuit fuses. A second panel may be added on each bay, if required, to furnish 20 additional circuit fuses for the particular bay. Fuse assignments are restricted so that fuses and associated units are located on the same bay. Those units requiring fuses in excess of 60 per bay shall be fused at the PRTD frame.

1.09 One 48-volt battery cable assembly is provided with each relay rack frame. A solderless-type connector is furnished for one end of each cable assembly for connecting to one of the 48-volt battery aisle supply cables. Alternate relay rack frames, of either size, are connected to the alternate A and B battery feeders. The frame battery cable is run within the left frame upright to the base for connection to terminals on the filter panel.

1.10 Common System units which require 24-volt battery supply shall be located on relay rack frames per J23064E. The 24-volt fuses for these units shall be located on the power, ringing, and tone distributing frame J27055C.

Talking Battery Filter Panel

1.11 A talking battery filter panel is provided in the frame base for connection between the battery cable and the fuse panel to provide a quiet battery supply. The filter panel may be equipped with one or two filters depending upon whether it is used in a single- or double-bay framework. In general, all relay equipment units may be fused on the talking battery bus bar whether or not talking battery is specified. Exceptions are units such as permanent signal and coin supervisory concentrating units, and incoming trunk test lines for No. 5 crossbar and all Common System units which include 206-, 197-, or similar type selectors and switches. Such equipment (as well as any whose schematic drawings specifically state that the particular circuit may not be fused on a bus bar providing talking battery to other equipments) shall have their signal battery fuses assigned on a fuse panel on the power, ringing, and tone distributing frame.

Provisions to Avoid Magnetic Interference

1.12 All the units designed for the No. 5 office are small in size (usually one to five mounting plates) and surface wired. Trunk units with U-, UA-, and Y-type relays having critical release requirements have been designed to avoid internal and external magnetic interference by surrounding the critical relays with noninterfering apparatus or unused space which may be a blank mounting plate or by the use in some cases of magnetic shields. As a result of this, no special precautions regarding interference have to be observed in adjusting these critical relays.

Pairing

1.13 Paired conductors are assigned in switchboard cables serving tip and ring leads from the main distributing frame, line link frame, trunk link frame, etc. All cables having tip and ring leads are terminated directly on trunk unit terminal strips. Within trunk units, surface-wired leads are not paired.

Association of Trunks and Ringing Selection Switches

1.14 All incoming and intraoffice or intermarker group trunks in a No. 5 office are arranged to connect universally to any called station regardless of the ringing code required. This is accomplished by associating each trunk with a vertical unit of a ringing selection switch whose horizontals are connected to all ringing conditions. The proper ringing voltage is applied to the proper side of the line for a particular call when the marker operates the correct select and hold magnets. Each ringing selection switch is arranged to provide ringing for ten trunk for incoming, intraoffice, intermarker group, 2-way, or reverting ringing traffic, one trunk being assigned to each switch vertical unit. A switch and its associated trunks are generally mounted adjacent on the relay rack bay to simplify interconnections. The locations to which particular trunks are assigned at the trunk link frame determine their assignments to the ringing switch. The ten trunks associated with the same level and having a B appearance on the ten trunk switches of a particular trunk link frame must connect to the same ringing selection switch. As mentioned in trunk link frame specification J27754, these ten trunks may be all of the same type or may be ten different types or any combination of types. As used herein, *trunks of a type* means

all trunk equipments providing the same circuit features. The trunk link frame specification furnishes information for assigning relay equipment units to appearances on specific trunk link frames while the following paragraphs deal with the assignment of space on the relay rack for these equipment units.

1.15 In general, trunks will be assigned to trunk link frames so that ten trunks requiring ringing will appear on the same level of the ten trunk link "trunk" switches, and the ten vertical units of the associated ringing switch will therefore all be used. However, if all of the ten trunks associated with the B appearances of a particular level do not require ringing, only the trunk units connected to that level and to the ringing selection switch shall be mounted adjacent to the switch. For this condition, no spare relay rack space need be left adjacent to the ringing switch since the unequipped ringing switch verticals will not be used.

1.16 As mentioned in the trunk link frame specification, trunks are assigned to a trunk link frame for a particular engineering interval and there may be cases in which trunks are assigned to specific appearances but are not equipped initially. In these cases, space for these trunks adjacent to the proper ringing selection switch may be reserved on the relay rack frame.

1.17 In some cases of additions, the trunk units assigned to a ringing switch may not fit the reserved space on the relay rack or a replacing unit may be of a larger size. Such trunk units may be located on a different relay rack frame and cabled directly to the assigned vertical of the ringing switch and to the trunk link frame, main distributing frame, etc, as required. In this case, it is necessary to write cross-reference information on relay rack designation cards to show the assignments of trunks to ringing switch verticals. (See 5.07.) Where equipment rearrangements require the association of existing trunks with added ringing switches, it is recommended that these trunks be moved to the location of the added switches and that the resulting space associated with the existing switch be left vacant for additions of trunks to be associated with this switch.

1.18 Relay rack frame on which units for each of two marker groups or units used in common by two marker groups are mounted,

including intermarker group trunks, require access to the master test frames in both marker groups via the RC jack for remote control testing. In order not to restrict the location of units of this type, all relay rack frames may be equipped with two RC jacks. For offices with only two marker groups these jacks are designated RC0 and RC1. Where three or more marker groups are equipped units from only two marker groups can be mounted on each frame. The RC jacks shall be designated RC0 and RC1, RC0 and RC2, RC1 and RC2, etc.

1.19 Relay rack frames for trunks associated with trunk link frames shall be laid out so that, as far as possible, the trunks on a bay or frame will be associated with the same trunk link frame. The ten trunks associated with a ringing switch automatically achieve this result. In addition, the possible two or three combinations of ten trunks and a ringing switch which may be located on one bay should also, whenever possible, be associated with the same trunk link frame. Outgoing trunks may be located on bays having ringing switch trunks in order to fill these bays efficiently. Outgoing and other types of trunks may also be located on other bays; however, in either case, an attempt should be made to group all trunk units associated with one trunk link frame on the same relay rack frame. This simplifies interconnecting switchboard cabling, the length of which should be kept to a minimum by locating the trunk relay rack frame as close as possible to its associated trunk link frame. This arrangement also permits using fewer and larger switchboard cables and allows for a maximum amount of shop-connected multiple wiring.

1.20 The practice of grouping trunks on relay rack bays by their association with trunk link frames does not apply, however, in the case of dial transfer trunks. A large number of leads multiple between dial transfer trunks assigned to the same transfer trunk link frame and between those assigned in the same transfer register link horizontal group. Therefore, in order that as much of this wiring as possible may be done in the shop, dial transfer trunks should be assigned evenly over a small number of relay rack frames (a minimum of two is recommended, see 1.21) in such a way as to take full advantage of the previously mentioned multiple requirements. This arrangement also tends to minimize the cabling between these units and their associated transfer trunk and register link frames.

1.21 For mounting Common System units using 1-3/4 inch mounting plates, adapter bars may be equipped on either or both bays of the double-bay frame, J23064E or the single-bay frame J23064F. These bars are available on a full-bay basis or partial-bay basis as required for each job.

1.22 Common System units having a maximum front-to-rear dimension of 10-1/2 inches can be mounted on this relay rack frame. Where the overall dimension is within 10-1/2 inches but apparatus mounted on the rear projects more than 4 inches, the unit shall be mounted on mounting plate studs of setting-out details in order to avoid any projection into the rear wiring aisle.

1.23 For those Common System units not arranged to operate the No. 5 Audible and Visual Alarm System or when No. 5 units must operate alarms of another system, auxiliary alarm relays must be provided as described in J99232. The relay units involved are located on the alarm frame, J28353F.

1.24 The frame covers shall be provided on relay racks having units with nonwire spring relays without strip covers but are omitted from the front and rear of all bays having Common System units only or having only units with wire spring relays and/or crossbar switches. Where only one bay of a 2-bay frame is not provided with covers, the uncovered bay shall be the left bay, and the stiles for the rear of this bay shall be omitted.

1.25 Both 4- and 6-wire ringing selection switches are available. In general, a trunk is arranged to connect to either a 4- or 6-wire ringing selection switch, but a trunk arranged to connect to a 4-wire switch may be connected to a 6-wire switch.

Service Protection

1.26 Since all equipment on a relay rack frame (either single bay or double bay) is served by only one 48-volt feeder, all the coin supervisory units (J23058B) of an office shall not be mounted on the same frame. They shall be divided as evenly as possible over two or more relay rack frames served by different 48-volt battery feeders, or located in different lineups.

AC Power at Relay Racks

1.27 Common System units, generally, and some No. 5 units requiring 120-volt ac power, are provided with a rubber-covered cord and plug cap (power cord). For relay racks mounting such units, the outlet boxes located on the frame upright shall be connected to the ac power service cabinet as shown on ED-26854-31. For relay rack units that require permanent connection to a 120-volt supply, No. 12 gauge, 2-conductor armored cable or No. 12 gauge conductors in conduit shall be run as required by the local electrical code.

Circuit Reference Numbers

1.28 Reference numbers for each circuit on the frame, regardless of the number of equipment units involved, are stamped on the left upright of each relay rack bay. (See Part 5.)

Miscellaneous Shelf for Relay Rack Frames

1.29 A shelf for mounting miscellaneous apparatus and equipment on the relay rack frames can be ordered as required. The shelf shown on ED-27714-() has 12 positions on 1-3/4 inch horizontal mounting centers. The topmost consecutively-mounted shelf on a frame requires a shelf cover.

2. SUPPLEMENTARY INFORMATION

819-000-000—No. 5 Crossbar System Index

AA128.006—List of General Equipment Requirements Sections

J23055—819-607-150—Outgoing Trunks Requiring Association With Senders

J23056—819-605-150—Trunks and Lines Associated With Line Link Frames

J23057—819-608-150—Outgoing Trunks Not Requiring Association With Senders

J23058—819-609-150—Miscellaneous Service Relay Rack Units

J23059—819-612-150—Howler and Test Trunk Units

J23060—819-753-150—Permanent Signal Equipment

J23061—819-603-150—Intraoffice Trunks

J23062—819-602-150—Incoming Trunks

J23063—819-606-150—2-way Trunks

J23065—819-604-150—Intermarker Group Trunks

J29259—819-005-150—General Outline—No. 5 Crossbar System

J29261—819-600-150—Trunk Tables—Functions and Features—No. 5 Crossbar System

J99206—AA388.032—Equipment Units—Relay Rack

Mounted—Common Systems
 J99232—819-752-150—Interrelation of Common
 Systems and No. 5 Crossbar Alarms
 Floor Plan Data—Section 11—Frame and Floor Plan
 Conventions

3. DRAWINGS

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

Keysheet

SD-25760-01—No. 5 Crossbar System
 SD-25760-02—No. 5 Crossbar System—Current Drain
 Data Sheet

Circuits

SD-25574-01—Miscellaneous Circuit
 SD-25702-01—No-test Connector Circuit
 SD-25706-01—Ringing Selection Switch Circuit
 (4-wire)
 SD-26080-01—Ringing Selection Switch Circuit
 (6-Wire)
 SD-26027-01—No-test Connector Circuit For Use
 With 4-Wire Lines

Framework

ED-26031-01—Mounting Details and Adapters—
 Crossbar System No. 5
 ED-26565-01—Rear Baffle
 ED-26566-01—Front Baffle
 ED-90273-01—Adapter Details for Mounting 19-inch
 Long Plates on 23-inch Relay Racks
 ED-91639-01—Relay Rack Unit Setting-out Details
 ED-92242-01—Application of 1-3/4 inch Plates to
 2-inch Racks—Typical
 ED-92962-01—Typical Bay Equipment Arrangement
 for Mounting Common Systems and
 Toll Equipment Units on No. 5 Relay
 Rack Frames
 ED-99210-01—Guardrail Junction—No. 5 Crossbar
 and Angle-type Frames

Equipment

ED-27714()—Miscellaneous Shelf for Relay Rack
 Frames
 ED-26485-31—AC Power Fittings For Relay Rack
 ED-25886-01—Frame Designation Cards
 J23064D-()—Double-bay Relay Rack Frame

J23064E-()—Double-bay Relay Rack Frame
 J23064F-()—Single-bay Relay Rack Frame
 J23064G-()—Double-bay Relay Rack Frame

Wiring and Cabling

ED-26026-01—Method of Running 48-volt Power
 Feeders
 ED-26589-()—Switchboard Cabling Details—
 Miscellaneous Circuit and Power,
 Ringing, and Tone Distributing Frame
 ED-26629-()—Switchboard Cable Arrangement—
 Double-bay Relay Rack
 ED-27042-01—Gauge and Insulation of Wire
 ED-81404-01—Power Systems—Lighting and AC
 Receptacles

4. Equipment

ED-26485-31—AC Power Fittings for Relay Rack

Group 3—One set of fittings for providing six ac
 power outlets (three duplex receptacles,
 3-wire grounding type) at relay rack.

Group 4—One set of fittings for providing two ac
 power outlets (one duplex receptacle,
 3-wire grounding type) at relay rack.

ED-27714-()—Miscellaneous Shelf for Relay Rack Frames

Group 1—One shelf for mounting miscellaneous
 equipment and apparatus on relay rack
 frames.

Group 2—One shelf cover. (See Note A.)

Group 3—One 911A connector and one 306A
 repeater unit wired in accordance with
 the concentrating circuit for permanent
 signal holding trunks, SD-25766-01, Fig. 56
 for range extension and unigauge cabling.

Group 4—One 911A connector and one 306A
 repeater unit wired in accordance with
 the office test frame test circuit,
 SD-27633-01, CAD 102, for range extension
 for unigauge cabling.

Group 5—One 911A connector and one 306A
 repeater unit wired in accordance with
 the master test frame voltmeter test
 circuit, SD-25792-01, CAD 4, for range
 extension for unigauge cabling.

Note

- A. The topmost consecutively-mounted shelf on a frame requires one Group 2.

J23064D—AT&T Co Std—Double-Bay Relay Rack Frame for Mounting Trunks Terminated on Trunk Link Frames (See Note A.)

Equipment—J23064D-()

- List 3**—A&M Only—Wiring and equipment for one ringing selection switch (4-wire) and mounting bracket for use with each ten trunks requiring ringing per SD-25706-01, Fig. 1. (See 5.12 and 5.13.)

- List 10**—One set of two (for left and right rear) cable brackets. (See Note D.)

- List 11**—One front baffle assembly, one rear baffle, and one set of two (for left and right rear) baffle slide assemblies. (See Note D.)

- List 13**—Wiring and equipment for one ringing selection switch (6-wire) and mounting bracket for use with each ten trunks requiring ringing per SD-26080-01, Fig. 1. (See Note F, 5.12, and 5.13.)

- List 14**—Front frame covers for one bay for each bay which is equipped with any units having nonwire spring relays without strip covers. (See Note D.)

- List 15**—Two cable brackets for each bay which is not equipped with frame covers. (See Note E.)

- List 17**—Framework, assembly, equipment, and wiring for one double-bay relay rack frame. (See Notes B and D.)

48-volt Fuse Alarm,
Fig. 4

Ground Supply,
Fig. 10

48-volt Frame Tst
Bat., Fig. 13

+130 volt Frame Tst
Bat., Fig. 15

Spare Jk, Fig. 16

Frame Line Tel Jk,
Fig. 17

Remote Control Jk,
Fig. 19

Trunk Make-busy Lamp,
Fig. 21

Incoming Trk Tst Jks,
Fig. 20

Perm Sig Alm. Lamp,
Fig. 22

Intertoll Trk Tst Jks,
Fig. 23

Talk. Bat. Filter,
Fig. 24 and X

Option

Incoming Trk Tst Jks,
Fig. 50 (For Manual
OGT Tst Ckt)

Auto Prog Trk Tst,
Fig. 64 (RCA) Jk,

Remote Control Jk

Trk Tst Jk, Fig. 70,

for Use With 4-Wire,
2-Way Intertoll Trunks

WIRE EQUIP

1 1

2 2

1 1

1 1

1 1

1 1

2 2

1 1

1 1

1 1

1 1

2 2

1 1

1 1

1 1

1 1

1 1

WIRE EQUIP

Miscellaneous Circuit,
SD-25574-01:

48-volt Bat. Supply,
Fig. 3, ZJ option

2 2

48-volt Bat. Supply,
Fig. 3 (Fusing &
Multiple Leads Only),
ZJ option

1 1

- List 19**—A&M Only—Fuse panel and 48-volt battery ground and alarm lead multiples per SD-25574-01, Fig. 3 and 10 (multiple leads only) for right bay when more than 40 (maximum 60), 48-volt fuses are required. (See Note C.)

List 20—A&M Only—Wiring and equipment required in addition to list 1 to provide 20 additional fuse holders in the left bay. (See Note C.)

List 21—One blank mounting plate located in position 2 required when the first unit equipped in the bay is a nonwire spring relay unit (other than a Common Systems unit). (See Note D.4.)

List 22—Equipment required in addition to list 17 for relay rack frames mounting toll trunks requiring toll ground or toll testboard ground, except trunks associated with No. 5D switchboards. (For associated wiring, see SD-25574-01, Fig. 165, 173, or 177.)

List 23—Fuse panel and 48-volt battery and alarm lead multiplls per SD-25574-01, Fig. 3 (multiple leads only) to provide 20 additional circuit fuses. (See Note C.)

List 24—Terminal strips RS and SM are required in addition to list 17 when left bay is equipped with one or more ringing selection switches.

List 25—Terminal strips RS and SM are required in addition to list 17 when right bay is equipped with one or more ringing selection switches.

List 26—Wiring and equipment required in addition to list 17 in accordance with SD-25574-01, Fig. 62, to provide an IRT jack when the frame is equipped with CAMA trunks.

Notes

A. This relay rack frame is primarily designed to accommodate intraoffice, incoming, and similar-type trunks that require an associated ringing selection switch; outgoing, recording-completing, special service, and similar trunks having trunk link frame terminations. This frame is arranged for nonwire spring relay or combinations of wire spring and nonwire spring relay equipments.

B. List 17 provides a sheet metal, double-bay framework equipped with a fuse alarm lamp assembly, two terminal strips, talking battery filter panel (two filters), two jack and lamp panels and one rear test post assembly all interconnected by loose wiring. Front and rear appliance outlets are located in the base of the right-hand bay. A panel of 40 circuit fuses is equipped in each bay and a second panel of four fuses is equipped in the left bay. Fuses are restricted to serve only one bay.

C. One list 23 fuse panel may be added in either bay to provide 20 additional circuit fuses in this bay. List 19 (A&M Only) provides 20 additional circuit fuses in the right bay and list 20 (A&M Only) provides 20 additional fuses in the left bay of existing frames equipped with individual type fuse blocks.

D. Each relay rack bay which is equipped with front covers shall be equipped with front and rear horizontal baffles and slides in accordance with list 11 which shall be ordered and located as follows:

1. One list 11 shall be provided on each relay rack bay at 11 feet 2 inches from the floor.
2. Provide front and rear baffles in accordance with list 11 located at the junction of two equipment units with a space of about 16 mounting plates between them, endeavoring to locate them at the following positions: 1 foot 0 inch (see Note D.4), 2 feet 10 inches, 4 feet 8 inches, 6 feet 6 inches, 8 feet 4 inches, and 10 feet 4 inches from the floor.
3. Provide cable brackets in accordance with list 10 at each location specified in Note D.2 which is not equipped with baffles.
4. When list 21 is provided, front and rear baffles in accordance with list 11 shall be provided at 1 foot 2 inches from the floor.

E. The cable brackets for list 15 shall be equipped 11 feet 2 inches from the floor.

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

1. (A&M Only)—Wiring required in addition to list 13 for offices arranged for phase I centrex service in accordance with SD-26080-01, M option.
2. Wiring required in addition to list 13 in all offices not arranged for phase I centrex service in accordance with SD-26080-01, N option.
3. (A&M Only)—Wiring required in addition to list 13 for offices arranged for line link pulsing or No. 101 ESS lines and phase I

centrex service in accordance with SD-26080-01, ZA option.

4. Wiring required in addition to list 13 when line link pulsing or No. 101 ESS is provided in offices not arranged for phase I centrex service in accordance with SD-26080-01, F option.
5. Switch multiple wiring in accordance with SD-26080-01, CAD 8, Sheet Note 1 required when Code 1+ is required.
6. Switch multiple wiring in accordance with SD-26080-01, CAD 8, Sheet Note 2 required when Code 5 GEN is required.
7. Wiring required in addition to list 13 in offices arranged for phase II centrex service in accordance with SD-26080-01, E option.
8. Wiring required in addition to list 13 in offices arranged for range extension for unigauge cabling in accordance with SD-26080-01, ZB option.
9. Wiring required in addition to list 13 in offices not arranged for marker controlled immediate ring in accordance with SD-26080-01, ZE option.
10. Wiring required in addition to list 13 in offices arranged for marker controlled immediate ring in accordance with SD-26080-01, ZF option.
11. Wiring required in addition to list 13 in offices arranged for marker controlled immediate ring with 4-party full select or 8-party semiselect in accordance with SD-26080-01, ZJ option.
12. (A&M Only)—Wiring required in addition to list 13 in offices arranged for marker controlled immediate ring, line link pulsing circuits, or No. 101 ESS lines and phase I

centrex in accordance with SD-26080-01, ZJ option.

J23064E—AT&T Co Std—Double-Bay Relay Rack Frame for Mounting Trunks and Lines Terminated on the Line Link Frame, Miscellaneous Service Trunks, and Miscellaneous Test, Maintenance, and Common System Units (See Note A.)

Equipment—J23064E-()

List 1—Framework, assembly, wiring, and equipment for one double-bay relay rack frame. (See Note B.)

	WIRE	EQUIP	SEE NOTES
Miscellaneous Ckt, SD-25574-01:			
48-volt Bat. Supply, Fig. 3, ZJ option	2	2	C
48-volt Bat. Supply, Fig. 3 (Fusing & Multiple Leads Only), ZJ option	1	1	
48-volt Fuse Alarm, Fig. 4	1	1	
Ground Supply, Fig. 10	2	2	
48-volt Frame Tst Bat., Fig. 13	1	1	
24-volt Frame Tst Bat., Fig. 14	0	1	C
+130 volt Frame Tst Bat., Fig. 15	1	1	
Spare Jk, Fig. 16	1	1	
Frame Line Tel Jk, Fig. 17	1	1	
Remote Control Jk, Fig. 19	2	2	
Talk. Bat. Filter, Fig. 24 and X Option	2	2	D
Trunk Make-busy Lamp, Fig. 21	1	1	

- List 4**—Front frame covers for one bay for each bay which is equipped with any units having nonwire spring relays without strip covers. (See Note G.)
- List 5**—One set of adapter bars for one bay of a double-bay frame for mounting units made up of 1-3/4 inch high mounting plates. (See Note E.)
- List 6**—Wiring and equipment for one no-test connector switch and mounting bracket required for each five, or fraction thereof line link frames for the first ten no-test trunks as provided per SD-25702-01, Fig. 1. (See Note G.4.)
- List 7**—One designation card and cardholder required for each relay rack bay mounting no-test connector switches.
- List 8**—One designation card and cardholder required for relay rack bay mounting permanent signal holding trunk concentrating units.
- List 9**—One set of two (for left and right rear) cable brackets. (See Note G.)
- List 10**—One front baffle assembly, one rear baffle, and one set of two (for left and right rear) baffle slide assemblies. (See Note G.)
- List 12**—Wiring and equipment for talking trunk jacks required for relay rack mounting No. 14 local test desk electronic voltmeter per SD-96074-01, Fig. 3 (jacks only).
- List 15**—Two cable brackets for each bay which is not equipped with frame covers. (See Note F.)
- List 17**—A&M Only—Fuse panel and 48-volt battery, ground, and alarm lead multiples per SD-25574-01, Fig. 3 and 10 (multiple leads only) for right bay when more than 40 (maximum 60), 48-volt fuses are required. (See Note H.)
- List 19**—A&M Only—Wiring and equipment required in addition to list 1 to provide 20 additional fuse holders in left bay. (See Note H.)
- List 20**—One blank mounting plate located in position 2 required when the first unit equipped in the bay is a nonwire spring relay unit (other than a Common Systems unit). (See Note G.5.)
- List 21**—Equipment and wiring in accordance with SD-26027-01, Fig. 1, for one no-test connector switch for use with 4-wire lines and mounting adapters for each five, or fraction thereof, 4-wire line link frames. (See Note G.4.)
- List 22**—Wiring and equipment required in addition to list 1 in accordance with SD-25574-01, Fig. 62 to provide an IRT jack when the frame is equipped with originating register TOUCH-TONE® receivers.
- List 23**—Fuse panel and 48-volt battery and alarm lead multiples per SD-25574-01, Fig. 3 (multiple leads only) to provide 20 additional circuit fuses. (See Note H.)
- List 24**—Terminal strips required in addition to list 1 for relay rack frames mounting toll trunks requiring toll ground or toll testboard ground except trunks associated with No. 5 switchboards. (For associated wiring, see SD-25574-01 Fig. 165, 173, or 177).
- List 25**—Wiring and equipment required in addition to list 1 in accordance with SD-25574-01, Fig. 23 and 70 to provide test jacks when frame is in office arranged for multilevel preemption.
- List 26**—Wiring and equipment in addition to list 6 for one no-test connector switch and mounting bracket required for each five or fraction thereof, line link frames for the second ten no-test trunks as provided per SD-25702-01, V option. (See Note G.4.)
- List 27**—Permanent signal alarm lamp per SD-25574-01, Fig. 22, required when marker group is arranged for automatic call distribution or for off-net access.
- List 28**—Wiring and equipment required in addition to list 1 in accordance with SD-25574-01, Fig. 20 and 23 when frame is equipped with line circuits for ACD.

Notes

- A. This relay rack frame is primarily designed for mounting trunks and lines associated with the line link frame, miscellaneous service trunks, and miscellaneous, test, maintenance, and Common System units. This frame is arranged to mount wire spring or nonwire spring relay units or combinations of wire spring and nonwire spring relay units.
- B. List 1 provides a sheet metal double-bay framework equipped with a fuse alarm lamp assembly, two terminal strips, talking battery filter panel (two filters), two jack and lamp panels, and rear 48-volt and 24-volt test post assemblies all interconnected by loose wiring. Front and rear appliance outlets are located

in the base of the right-hand bay. When transparent front covers are provided over the front of the frame, rear covers shall be ordered separately as covered on ED-26564-01. A panel providing 40 circuit fuses is equipped in each bay. Fuses are restricted to serve only one bay.

- C. Only the test posts on the jack panel on the front of the frame are furnished in list 1 per SD-25574-01, Fig. 14. When units requiring 24 volts are mounted on relay rack frames, order one 24-volt test post and cable bracket assembly per ED-25889-01, G10 to be installer-mounted on rear of right bay and one 238A jack (24-volt) to be installer-mounted on jack panel.
- D. All 48-volt "signal" battery leads shall be fused at the 48-volt "talk" battery bus bar on the frame fuse panel except the 48-volt signal battery leads required for units that include a 206-, 211-, or similar-type selector switch. Such battery leads shall be fused on a 48-volt "signal" battery fuse panel located on the PRTD frame.
- E. List 5 provides adapter bars for the full height of one bay of the double-bay relay rack for mounting only 1-3/4 inch high mounting plate units. When some Common System equipments use 2-inch mounting plates and some use 1-3/4 inch mounting plates, provide adapters per ED-92242-01 for the 1-3/4 inch mounting plate units, as required, and mount the 2-inch mounting plate units directly on frame. For this condition, the list 5 adapter bars shall not be provided.
- F. Each relay rack bay which does not have frame covers requires cable brackets per list 15 in positions at 11 feet 2 inches from the floor.
- G. Each relay rack bay which is equipped with front covers shall be equipped with front and

rear horizontal baffles and slides in accordance with list 10 which shall be ordered and located as follows:

1. One list 10 shall be provided on each relay rack bay 11 feet 2 inches from the floor.
 2. Provide front and rear baffles in accordance with list 10 located at the junction of two equipment units with a space of about 16 mounting plates between them, endeavoring to locate them at the following positions: 1 foot 0 inch (see Note G.5), 2 feet 10 inches, 4 feet 8 inches, 6 feet 6 inches, 8 feet 4 inches, and 10 feet 4 inches from the floor.
 3. Provide cable brackets in accordance with list 9 at each location specified in Note G.2 that is not equipped with baffles.
 4. Front and rear baffles shall not be located between adjacent no-test connector switches.
 5. When list 20 is provided, front and rear baffles in accordance with list 10 shall be provided at 1 foot 2 inches from the floor.
- H. One list 23 fuse panel may be added in either bay to provide an additional 20 circuit fuses in the bay. List 17 (A&M Only) provides 20 additional circuit fuses in the right bay and list 19 (A&M Only) provides 20 additional circuit fuses in the left bay of existing frames equipped with individual type fuse blocks.

J23064F—AT&T Co Std—Single-Bay Relay Rack Frame (See Note A.)

Equipment—J23064F-()

List 1—Framework, assembly, wiring, and equipment for one single-bay relay rack. (See Notes B, C, and D.)

	WIRE	EQUIP	SEE NOTES
Miscellaneous Ckt, SD-25574-01:			
48-volt Bat. Supply, Fig. 3, ZJ option	1	1	E
48-volt Bat. Supply, Fig. 3 (Fusing & Multiple Leads Only), ZJ option	1	1	
48-volt Fuse Alarm, Fig. 4	1	1	
Ground Supply, Fig. 10	1	1	
48-volt Frame Tst Bat., Fig. 13	1	1	
± 130 volt Frame Tst Bat., Fig. 15	1	1	
Spare Jk, Fig. 16	1	1	
Frame Line Tel Jk, Fig. 17	1	1	
Remote Control Jk, Fig. 19	1	1	
Talk. Bat. Filter, Fig. 24 and X Option	1	1	
Trunk Make-busy Lamp, Fig. 21	1	1	

List 2—A&M Only—Wiring and equipment for one ringing selection switch (4-wire) and mounting bracket for use with each ten trunks requiring ringing per SD-25706-01, Fig. 1 (See 5.12 and 5.13.)

List 3—Wiring and equipment for one test jack for incoming or incoming intertoll trunks or line circuits per SD-25574-01, Fig. 20. (See Note F.)

List 5—Wiring and equipment for one permanent signal alarm lamp for trunks from step-by-step offices or when marker group is arranged for automatic call distribution or for off-net access.

List 6—One set of two (for left and right rear) cable brackets. (See Note G.)

List 7—One front baffle assembly, one rear baffle, and one set of two (for left and right rear) baffle slide assemblies. (See Note G.)

List 9—Front frame covers required for each bay which is equipped with any units having nonwire spring relays without strip covers. (See Note G.)

List 10—One set of adapter bars for mounting units made up of 1-3/4 inch mounting

plates. (See Note I.)

List 11—Wiring and equipment for one ringing selection switch (6-wire) and mounting bracket for use with each ten trunks requiring ringing per SD-26080-01, Fig. 1. (See Note K, 5.12 and 5.13.)

List 12—Two cable brackets for a frame which is not equipped with frame covers. (See Note H.)

List 13—Wiring and equipment for a second remote control jack for each frame in offices with two marker groups per SD-25574-01, Fig. 19 (RC) jack. (See Note F.)

List 14—Wiring and equipment for remote control jack for frames in office with automatic progression trunk test frame per SD-25574-01, Fig. 64 RCA jack. (See Note F.)

List 15—A&M Only—Wiring and equipment required in addition to list 1 to provide 20 additional fuse holders. (See Note J.)

List 16—One blank mounting plate located in position 2 required when the first unit equipped in the bay is a nonwire spring relay unit (other than a Common Systems unit). (See Note G.4.)

List 17—Terminal strips required in addition to list 1 for relay rack frames mounting toll trunks requiring toll ground or toll testboard ground, except trunks associated with No. 5D switchboard. (For associated wiring, see SD-25574-01, Fig. 165, 173, or 177.)

List 18—Wiring and equipment required in addition to list 1 in accordance with SD-25574-01, Fig. 62, to provide an IRT jack when the frame is equipped with originating register TOUCH-TONE® receivers or CAMA trunks.

List 19—Fuse panel and 48-volt battery and alarm lead multiples per SD-25574-01, Fig. 3 circuit fuses. (See Note J.)

List 20—Assembly and equipment required in addition to list 1 for relay rack frames mounting position trunks for the Automatic Call Distribution System (for associated wiring, see SD-27829-01, CAD 3).

List 21—Terminal strips RS and SM are required in addition to list 1 for each frame equipped with one or more ringing selection switches.

Notes

A. This relay rack frame is designed for mounting units requiring only 48-volt operating battery. It shall only be used where the double-bay

frame cannot be used because of space or economic limitations. This frame is arranged to mount wire spring or nonwire spring relay or combinations of wire spring and nonwire spring relay equipments.

- B. List 1 provides a sheet metal framework equipped with two frame fuse panels, two frame terminal strips, talking battery filter panel, jack and lamp panel, and fuse alarm lamp assembly. When front frame covers are provided, rear covers shall be ordered separately as covered on ED-26564-01. The fuse panel of list 1 provides 40 circuit fuses.
- C. No appliance outlet is provided with this single-bay relay rack frame because the space in the base is used by a filter panel. Instead, a short length of power cable and power fittings per ED-26528-01, Group 6 are provided for interconnecting appliance outlets of frames on either side of this frame. A coverplate is used to cover the appliance outlet opening in the frame base.
- D. The local frame wiring required for interconnecting the frame terminal strips, jack and lamp panel, test posts, fuse panel, and relay unit terminal strips shall be run as loose wire.
- E. Apparatus for the following miscellaneous circuit figures, required for use with certain trunks mounted on this relay rack, need not be furnished if it is available on an adjacent relay rack:

SD-25574-01, Fig. 23—Intertoll Incoming and 2-Way, 2-Way to PBX Zero Operator, Operator Tandem, Listed Directory No., and Intercept and Conference Trunks, Preemptible Auxiliary Line Circuits, or Line Circuits for ACD Test Jacks (required on frames in offices arranged for multilevel preemption),

SD-25574-01, Fig. 50—Incoming Trunk Test Jack Circuit for Manual Outgoing Trunk Test Circuit

SD-25574-01, Fig. 70—4-Wire 2-Way Trunk Test Jack (required on frames in offices arranged for multilevel preemption)

- F. When miscellaneous circuit jacks per lists 5 and 13 are required they shall be located in the jack panel in the frame upright. If lists 5 and 13 are not provided, jacks per lists 3 and 14, if required, may be mounted in the jack panel of the frame upright. When spaces in the frame upright jack panel are filled, jacks per lists 3 and 14 shall be mounted in a jack panel per ED-25278-01, Item 3.
- G. Each relay rack bay which is equipped with front covers shall be equipped with front and rear horizontal baffles and slides in accordance with list 7 which shall be ordered and located as follows.
 1. One list 7 shall be provided on each relay rack bay 11 feet 2 inches from the floor.
 2. Provide front and rear baffles in accordance with list 7 located at the junction of two equipment units with a space of about 16 mounting plates between them, endeavoring to locate them at the following positions: 1 foot 0 inch (see Note G.4), 2 feet 10 inches, 4 feet 8 inches, 6 feet 6 inches, 8 feet 4 inches, and 10 feet 4 inches from the floor.
 3. Provide cable brackets in accordance with list 6 at each location specified in Note G.2 that is not equipped with baffles.
 4. When list 16 is provided, front and rear baffles in accordance with list 7 shall be provided at 1 foot 2 inches from the floor.
- H. Each relay rack bay which does not have frame covers requires cable brackets per list 12 in position at 11 feet 2 inches from the floor.
- I. List 10 provides adapter bars for the full height of the bay for mounting only 1-3/4 inch high mounting plate units. When some Common System equipments use 2-inch mounting plates and some use 1-3/4 inch mounting plates, provide adapters per ED-92242-01 for the 1-3/4 inch mounting plate units, as required, and mount the 2-inch mounting plate units directly on frame. For this condition, the list 10 adapter bars shall not be provided.
- J. List 19, when ordered, provides an additional 20 circuit fuses. List 15 (A&M Only) provides

20 additional circuit fuses for existing frames equipped with individual type fuse blocks.

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

1. (A&M Only)—Wiring required in addition to list 11 for offices arranged for centrex service that uses ES-26270-01 or ES-26503-01 attendant trunks in accordance with SD-26080-01, M option.
2. Wiring required in addition to list 11 in all offices without centrex service, and in all offices arranged for centrex service having neither ES-26270-01 nor ES-26503-01 attendant trunks in accordance with SD-26080-01, N option.
3. (A&M Only)—Wiring required in addition to list 11 for offices arranged for line link pulsing or No. 101 ESS lines and having centrex service using ES-26270-01 or ES-26503-01 attendant trunks in accordance with SD-26080-01, ZA option.
4. Wiring required in addition to list 11 when line link pulsing or No. 101 ESS lines is provided in offices having neither ES-26270-01 or ES-26503-01 attendant trunks in accordance with SD-26080-01, F option.
5. Switch multiple wiring in accordance with SD-26080-01, CAD 8, sheet Note 1 required when Code 1+ is required.
6. Switch multiple wiring in accordance with SD-26080-01, CAD 8, sheet Note 2 required when Code 5 GEN is required.
7. Wiring required in addition to list 11 in offices arranged for centrex service having

neither ES-26270-01 nor ES-26503-01 attendant trunks in accordance with SD-26080-01, E option.

8. Wiring required in addition to list 11 in offices arranged for range extension for unigauge cabling in accordance with SD-26080-01, ZB option.
9. Wiring required in addition to list 11 in offices not arranged for marker controlled immediate ring in accordance with SD-26080-01 ZE option.
10. Wiring required in addition to list 11 in offices arranged for marker controlled immediate ring in accordance with SD-26080-01, ZF option.
11. Wiring required in addition to list 11 in offices arranged for marker controlled immediate ring with 4-party select or 8-party semiselect in accordance with SD-26080-01, ZJ option.
12. (A&M Only)—Wiring required in addition to list 11 in offices arranged for marker controlled immediate ring, line link pulsing circuits or No. 101 ESS lines and phase I centrex in accordance with SD-26080-01, ZJ option.

***J23064G—AT&T Co Std—Double-Bay Relay Rack
Frame for Mounting Trunks Terminated
on Trunk Link Frames (See Note A.)***

Equipment—J23064G-()

***List 1—Framework, assembly, equipment, and wiring for one double-bay relay rack frame.
(See Note B.)***

Miscellaneous Circuit,
SD-25574-01:

	WIRE	EQUIP
48-volt Bat. Supply, Fig. 3		
ZJ option	2	2
48-volt Bat. Supply, Fig. 3		
(Fusing & Multiple Leads		
Only), ZJ option	2	2
48-volt Fuse Alarm, Fig. 4	1	1
Ground Supply, Fig. 10	2	2
48-volt Frame Tst Bat.,		
Fig. 13	1	1
+130 volt Frame Tst Bat.,		
Fig. 15	1	1
Spare Jk, Fig. 16	1	1
Frame Line Tel Jk, Fig. 17	1	1
Remote Control Jk, Fig. 19	2	2
Incoming Trunk Tst Jks,		
Fig. 20	1	1
Trunk Make-busy Lamp, Fig. 21	1	1
Perm Sig Alm. Lamp, Fig. 22	1	1
Intertoll Trk Tst Jks, Fig. 23	1	1
Talk. Bat. Filter, Fig. 24		
and X Option	2	2
Incoming Trk Tst Jks, Fig. 50		
(For Manual OGT Tst Ckt)	1	1
Auto. Prog Trk Tst, Fig. 64		
Remote Control Jk	1	1
Trk Tst Jk, Fig. 70 for Use		
with 4-Wire — 2-Way Intertoll		
Trk	1	1

List 2—A&M Only—Equipment and wiring to provide 20 additional fuse holders in left bay. (See Note C.)

List 3—A&M Only—Fuse panel and 48-volt battery, ground, and alarm lead multiples per SD-25574-01, Fig. 3 and 10 (multiple leads only) for right bay when more than 44, 48-volt fuses are required. (See Note C.)

List 4—Wiring and equipment for one ringing selection switch (6-wire) and mounting bracket for use with each ten trunks requiring ringing, per SD-26080-01, Fig. 1. (See Note D, 5.12, and 5.13.)

List 5—Terminal strips required in addition to list 1 for relay rack frames mounting toll trunks requiring toll ground or toll testboard ground, except trunks associated with No. 5D switchboard. (For associated wiring

see SD-25574-01, Fig. 163, 173, or 177.)

List 6—Fuse panel and 48-volt battery and alarm lead multiples per SD-25574-01, Fig. 3 (multiple leads only) to provide 20 additional circuit fuses. (See Note C.)

List 7—Assembly and equipment required in addition to list 1 for relay rack frames mounting position trunks for the Automatic Call Distribution System (for associated wiring, see SD-27829-01, CAD 3).

List 8—Terminal strips RS and SM are required in addition to list 1 when left bay is equipped with one or more ringing selection switches.

List 9—Terminal strips RS and SM are required in addition to list 1 when right bay is equipped with one or more ringing selection switches.

List 10—Wiring and equipment required in addition to list 1 in accordance with SD-25574-01, Fig. 62 to provide an IRT jack when the frame is equipped with CAMA trunks.

Notes

- A. This relay rack frame is primarily designed to mount wire spring trunks or trunks not requiring frame covers for intraoffice, incoming, and similar type trunks that require an associated ringing selection switch; outgoing, recording-completing, special service, and similar trunks having trunk link frame terminations.
- B. List 1 provides a sheet metal, double-bay framework equipped with a fuse alarm lamp assembly, two terminal strips, talking battery filter panel (two filters), two jack and lamp panels, and one rear test post assembly, all interconnected by loose wiring. Front and rear appliance outlets are located in the base of the right-hand bay. A panel providing 40 circuit fuses is equipped in each bay. Fuses are restricted to serve only one bay.
- C. One list 6 fuse panel may be added in either bay to provide 20 additional circuit fuses in this bay. List 2 (A&M Only) provides 20 additional circuit fuses in the left bay and list 3 (A&M Only) provides 20 circuit fuses in the right bay of existing frames equipped with individual type fuse blocks.

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

1. (A&M Only)—Wiring required in addition to list 4 for offices arranged for centrex service that uses ES-26270-01 or ES-26503-01 attendant trunks in accordance with SD-26080-01, M option.
2. Wiring required in addition to list 4 in all offices without centrex service, and in all offices arranged for centrex service having neither ES-26270-01 nor ES-26503-01 attendant trunks in accordance with SD-26080-01, N option.
3. (A&M Only)—Wiring required in addition to list 4 for offices arranged for line link pulsing or No. 101 ESS lines and having centrex service using ES-26270-01 or ES-26503-01 attendant trunks in accordance with SD-26080-01, ZA option.
4. Wiring required in addition to list 4 when line link pulsing or No. 101 ESS lines is provided in offices having neither ES-26270-01 nor ES-26503-01 attendant trunks in accordance with SD-26080-01, F option.
5. Switch multiple wiring in accordance with SD-26080-01, CAD 8, sheet Note 1 required when Code 1+ is required.
6. Switch multiple wiring in accordance with SD-26080-01, CAD 8, sheet Note 2 required when Code 5 GEN is required.
7. Wiring required in addition to list 4 in offices arranged for centrex service having neither ES-26270-01 nor ES-26503-01 attendant trunks in accordance with SD-26080-01, E option.
8. Wiring required in addition to list 4 in offices arranged for range extension for unigauge cabling in accordance with SD-26080-01, ZB option.
9. Wiring required in addition to list 4 in offices not arranged for marker controlled immediate ring in accordance with SD-26080-01, ZE option.
10. Wiring required in addition to list 4 in offices arranged for marker controlled

immediate ring in accordance with SD-26080-01, ZF option.

11. Wiring required in addition to list 4 in offices arranged for controlled immediate ring with 4-party select or 8-party semiselect in accordance with SD-26080-01, ZJ option.
12. (A&M Only)—Wiring required in addition to list 4 in offices arranged for marker controlled immediate ring, line link pulsing circuits or No. 101 ESS lines and phase I centrex in accordance with SD-26080-01, ZJ option.

5. GENERAL NOTES

5.01 On any relay rack bay, units shall be equipped from bottom up.

5.02 When 71-type mW reference generator equipment (J94071) is mounted on a relay rack frame, the associated mW record book (ED-95166) shall be stamped with "M.W. RECORD" in 3/4-inch black characters vertically along the right side of the front cover with the bottom of the character 1/4 inch from the right edge of the book. This book shall be stored approximately on the center of the frame base under the lower fuse panel so that the above mentioned stamping can be read from the apparatus aisle.

Stamping on Frame Uprights and Circuit Fuse Assignments.

5.03 Each relay rack bay shall be stamped to agree with the frame equipment drawings, the applicable section of the Bell System Practices, and the following specific requirements:

- (a) Except as noted in 5.03 (d) and 5.05, the number of the individual circuits on each relay rack bay shall be stamped from 00 up on the frame upright.
- (b) For all trunk units requiring only one 48-volt fuse "per trunk circuit" each fuse shall be equipped in the numbered fuse position that agrees with the circuit number stamped on the frame upright.
- (c) For units requiring more than one 48-volt fuse per circuit, the procedures outlined below shall be followed.

(1) **Trunk Link Frame Trunks:** A circuit number shall be assigned in the usual way which will also be the fuse location of the first fuse. After all circuit numbers have been assigned in the bay, any higher number or numbers shall be assigned for the additional fuses required. For example, revertive ringing trunks which require three fuses might be assigned circuit numbers 11, 31, and 32. The first figure is the circuit number stamped on the frame and the latter two are fuse location numbers only. The additional two numbers shall be stamped on the frame upright, but shall be stamped in smaller characters than the first.

(2) **Line Link Frame Trunks:** One reference number shall be assigned for each circuit without regard to the fuse requirements. All fuses "per circuit" shall be assigned adjacent positions on the frame fuse panel with each fuse stamped with its functional designation as shown on the schematic drawing. The assigned reference number shall then be stamped as an overall group number.

(d) When auxiliary trunks having separate fuses are located adjacent to associated trunks which require ringing switch appearances, the numbers of the auxiliary trunks shall be assigned after all other trunks on the bay.

(e) For 52A drives a single circuit number which will also be the 48-volt fuse number, shall be assigned regardless of the number of timers equipped. Cross-reference stamping of the relay rack location of the trunk to which each timer is assigned shall be located on the cover of each drive as shown on ED-26585-01.

(f) For more than one circuit assigned to one fuse, stamp the first and last circuit number on the fuse block with a dash in between.

(g) Where Toll and Common System units are integrated with local circuits on No. 5 crossbar relay rack frames or occupy complete bays within the No. 5 lineup, all the units regardless of type or kind shall be numbered consecutively from 00 up within each bay.

(h) **Ground Bar Stamping:** Terminals on the ground bar used to supply the units on each bay are stamped numerically from 00 up. Ground

leads shall be assigned in consecutive order from 00 up without regard to the bay circuit number or to the functional designation of the ground being assigned. Where the ground requirements exceed the available ground terminals in each bay, a maximum of two assignments per terminal is permissible.

5.04 For frames mounting nonringing switch trunks, all frame space for future additions shall be left at the top of the relay rack so that the circuit numbers of such units can be stamped in proper order. Spare space between units shall only be left for additions when specific equipments of known size will be added later.

5.05 For frames mounting ringin switch trunks, the units digit of the circuit number assigned to the trunk shall agree with the ringing switch vertical number to which the trunk unit connects, for example, the stamping on the frame upright for a 2-circuit unit assigned to switch verticals 4 and 5 shall be 04-05, 14-15, or 24-25 depending on whether the unit is associated with ringing selection switch 0, 1, or 2 on the frame.

5.06 Some ringing selection switches may not have trunk units associated with all of the vertical units; the circuit numbers corresponding to the unused switch verticals shall not be used. If at some later time trunks are reassigned to trunk link frames so that trunk units will be associated with these unused verticals, the circuit numbers corresponding to these vertical numbers shall be used for those trunk units which can be mounted on the same bay as the ringing switches. These trunk units need not be located adjacent to the switch.

5.07 When trunks are not located on the same frame as the associated ringing switches (see 1.17), cross-reference information shall be written on relay rack frame designation cards per P40C027. At the trunk location the relay rack frame, ringing switch, and vertical numbers of the associated ringing switch shall be shown for each trunk. At the ringing switch location the relay rack frame and circuit numbers of the associated trunk shall be shown for each ringing switch vertical. This information shall be written across any vacant lines on the designation cards without regard to column headings.

5.08 Each bay of a double-bay relay rack shall be stamped with a 5-digit number. The first digit shall represent the floor number, the second two the aisle number, and the last two the bay number within the aisle. Looking in from the main cross-aisle, even-numbered bays shall be located on the left side of the aisle and odd-numbered bays on the right side. This numbering shall also be followed for relay racks on one side of an aisle only and aisles having only one lineup of frames. It will be noted that on even-numbered double-bay relay racks the bay numbering will run left to right and on odd-numbered racks it will run right to left.

5.09 One frame designation card, P40C027, and designation card envelope, P40C268, shall be ordered separately for each 15 circuits. Additional cards and envelopes may sometimes be required when trunks are not located on the same frame as their associated ringing switches. One designation card, P49Y317, shall be ordered for each ED-27714(-), Group 1 shelf. Group 1 provides the designation card envelope.

Relay Rack Frame Wiring

5.10 Loose wiring shall be run on relay rack frames as follows:

- (a) All battery and ground leads shall be colored red and black, respectively.
- (b) All multiple leads between units or leads between units and frame terminal strips and leads for the frame miscellaneous circuit shall be colored green.
- (c) All leads connecting to the ringing selection switches shall be preformed loose wiring, and various colors must be used for identification at the ringing switches.

(d) The gauge and type of wire is specified by ED-27042-01.

5.11 All wiring between the two bays of a double-bay frame shall be run horizontally across the rear of the frame beneath the cable brackets at the base of the frame or through fanning rings at the top of the frame provided for that purpose.

5.12 All leads between a double-bay relay rack and the power, ringing, and tone distributing frame shall be run in one cable with the exception of shielded leads, which shall be run in a separate cable. This cable shall be terminated behind the center uprights of the frame, butted at the top of the frame, and the cable leads distributed over the two bays as shown on the switchboard cable drawing ED-26629-01. All other switchboard cables (from trunk link frame, main distributing frame, incoming register link, outgoing sender link, etc) shall be run from each relay rack bay and butted at the top right rear of the bay.

5.13 Miscellaneous circuit leads shall be cabled to all relay racks in accordance with ED-26589-01.

5.14 The RS and RSK leads from the LV relays of the trunk link circuit SD-25549-01 to a ringing selection switch shall be cabled to and terminated directly on the ringing switch select magnet terminals.

List of A&M Only and Mfr Disc. Equipment

The following 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.

EQUIPMENT	RATING	REPLACING EQUIPMENT	EQUIPMENT	RATING	REPLACING EQUIPMENT
ED-26485-31, G1, & G2	Mfr Disc. 5	ED-26485-31 G3 & G4	J23064E,L2 & L3	Mfr Disc. 4	—
J23064A	Mfr Disc. 1	J23064D, E or F	L11	Mfr Disc. 3	J23064E, L10
J23064B	Mfr Disc. 1	J23064D, E or F	L13	Mfr Disc. 4	—
J23064C	Mfr Disc. 1	J23064D, E or F	L14 & L16	Mfr Disc. 4	J23064E, L1
J23064D,L1	Mfr Disc. 3	J23064D,L17	L17 & L19	A&M Only 5	L23
L2	Mfr Disc. 4	—	L18	Mfr Disc. 5	—
L3	A&M Only 4	J23064D, L13	J23064F,L2	A&M Only 4	J23064F, L11
L4	Mfr Disc. 4	L17	L4	Mfr Disc. 3	L1
L5	Mfr Disc. 3	L17	L8	Mfr Disc. 3	L7
L6 to L9	Mfr Disc. 4	L17	L15	A&M Only 5	L18
L12	Mfr Disc. 3	L11	J23064G,L2		
L16 & L18	Mfr Disc. 4	L17	& L3	A&M Only 5	J23064G, L6
L19 & L20	A&M Only 5	L23			

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