

**TRAFFIC REGISTER EQUIPMENT
USING 300-CAPACITY TRAFFIC REGISTER CABINET
EQUIPMENT DESIGN REQUIREMENTS
NO. 1 CROSSBAR AND TANDEM CROSSBAR SYSTEMS**

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, manufacturing, and installation of traffic register equipment using 14-type register in the operating room or switch room of No. 1 and tandem crossbar offices.

1.02 This section is reissued:

- (a) To incorporate material in Section 816-043-160 and 817-064-150 into one publication bearing both section numbers.
- (b) To add provision to permit operation with a traffic data recorder frame.
- (c) To modify note 212 to allow use of re-settable swiss type KS-16348 register in parallel with existing registers.
- (d) To rate Fig. 50 and 35 "Mfr Disc."

1.03 The above changes are in agreement with SD-25942-01, Issue 21D.

1.04 The equipment covered herein uses the 14-type register and the 300-capacity traffic register cabinet with pin jacks and patching cords described in J92603. It replaces traffic register equipment per J27054 and SD-25317-01 based on use of 12-type registers, for new operating rooms and originating marker groups. J27054 is continued with an "A&M Only" rating for additions to existing installations.

Capacity

1.05 One traffic register cabinet for the operating room accommodates the following:

- 300 14-type registers in groups of 10 with their associated patch cords, or
- 300 14-type registers less 10 registers for each set of 6 KS-16493, List 1 or set of 9 KS-19798, List 1 magnetic counters furnished.
- 1 patch jack field consisting of 330 pulse jacks.
- 150 supply jacks for battery to the registers.
- 2 pairs of frame line talking jacks.
- 1 pair of recorder talking line jacks.
- 24 switches for controlling relays located on the traffic register relay rack.
- 1 recorder telephone unit.
- 1.06** One traffic register relay rack for the switch room accommodates the following:
 - 300 14-type registers in groups of ten with their associated patch cords, or
 - 300 14-type registers less 30 registers for each set of eight magnetic counters furnished.
 - 1 patch jack field consisting of 330 pulse jacks.
 - 150 supply jacks for battery to the registers.
 - 2 pairs of frame line talking jacks.
 - 1 pair of recorder talking line jacks.
 - 24 switches for controlling relays located on the traffic register relay rack.
 - 1 recorder telephone unit.
 - 30 plates for relay rack units or miscellaneous relay plates.

1.07 The relay rack bay used for mounting the traffic register relay equipment has a capacity of sixty 23- by 2-inch mounting plates.

Description

1.08 Traffic register equipment provides facilities for obtaining overflow, group-busy, peg count, delay, load, dial tone speed, and group-busy time duration data on crossbar circuits. Other registers measure traffic usage as determined by the traffic usage recorder frame.

1.09 When the register portion of the equipment is located in the operating room, it is enclosed in a traffic register cabinet. In buildings not having an operating room, the registers are located in the switch room on a 23-inch bay equipped with suitable adapters for 1-1/4 by 23-inch plates. This bay of equipment is called a traffic register and relay rack.

1.10 Because of improved operating characteristics of the 14-type register, pulse help relays are not needed in most cases, and the amount of relay equipment accordingly is reduced over that required with earlier 12-type registers. In No. 1 offices, the relays occupy one and a fraction bays of relay racks which, as heretofore, are located adjacent to the traffic register distributing frame. Where the registers are placed in the switch room, the relays occupy the upper portion of a combination traffic register and relay rack bay pulse additional relay rack space as needed.

1.11 A description of the traffic register cabinet, the traffic register and relay rack, the traffic register mounting plate unit, and related equipment items, together with patching and maintenance facilities, is given in J92603.

1.12 A single-sided distributing frame is used for terminating the many leads from the connecting circuits, and for providing flexibility between these leads and the traffic registers (see 1.15 for traffic usage registers). The leads from the crossbar circuits and from the traffic register relays are terminated on the vertical portion of the distributing frame; those from the pulse jacks in the traffic register cabinets are termi-

nated on the horizontal portion. Cross-connections between the two groups of terminal strips are made with single-wire jumpers. Arranged in this manner, the patching cords in the cabinets serve primarily to extend the operating leads of the registers to the distributing frame for cross-connection to the connecting circuits. The design avoids termination of switchboard cable on the registers and simplifies installation and maintenance. If desired, the patching cords may be used for changing register assignments within a cabinet and to a limited extent between cabinets. (See 5.01.)

1.13 Battery for the operation of high-duty traffic registers is connected to the supply jacks in the patching field through contacts on battery supply relays. These relays are under control of switches located in the cabinet directly above the registers. This procedure permits the registers to be disconnected during periods when observations are not being made.

1.14 The traffic registers are numbered zero up or X00 up within a cabinet, because of a requirement that the tens and units digits be 0 to 99 or 00 to 99 to agree with the tens and units numbering of the pulse battery supply jacks. In partially equipped cabinets the register units are solid block which is located vertically at the most convenient height for reading.

1.15 *Usage and group cycle count registers associated with the traffic usage recorder* frame are segregated in blocks of 150 for photographic purposes, either in new cabinets or in spare space in existing traffic register bays. *Detector group usage registers* are located at the top of the register space. (See 5.07.) Registers associated with the traffic usage recorder circuit are cabled from the patching jack field directly to the traffic usage recorder frame at which point cross-connecting flexibility is provided. Fig. 80 on SD-25942-01 covers the case where vacated traffic registers in cabinets cabled to the traffic register distributing frame are assigned to the traffic usage recorder frame. In this case recabling of the patching jack field can be avoided by cabling the P and CC- leads from the traffic usage recorder frame to the vertical

or horizontal side of the traffic register distributing frame as specified.

1.16 Automatic photographing of traffic registers and traffic usage registers is accomplished by using camera KS-14776, L2 under control of the traffic usage recorder circuit or the traffic register camera control circuit. The camera views a field of 150 registers, usually the lower or upper half of the bay. Where the office has a traffic usage recorder frame, this circuit is used to control camera operation for traffic registers when photographed, as well as for the traffic usage registers. Where there is no traffic usage recorder in the office a traffic register camera control circuit is furnished when photographing of traffic registers is specified. The equipment for the traffic register camera control circuit is covered in J92605. The keys, lamps, and program timer are enclosed in a metal cabinet, with transparent door, which is designed for wall or column mounting. This is supplemented by a relay rack unit comprising two 2-inch mounting plates. Where the traffic usage recorder circuit is used, the camera control equipment is included in the control panel for the traffic usage recorder frame, which also is wall- or column-mounted. A variation of this panel is adapted for 23-inch relay rack mounting as covered in J92604. The control panel is located as specified by the telephone company. When traffic registers are arranged for photographing, it is necessary that manual key control of battery supply to the traffic registers be supplemented by camera control using "ZF" option on SD-25942-01. Horizontal line group load registers remain under manual control because in this case a single set of 10, 20, or 40 registers is used for all line link frames.

1.17 *The 115-volt ac outlets for camera operation* are located in the base of each cabinet arranged for cameras. Included on the mounting for the outlets is a 275A relay, which serves to control the 115-volt supply to the cameras. This relay is furnished per camera or per six register bays maximum, as required by the camera control circuit used, provision being made for independent control of traffic register

and traffic usage register bays. Bays containing both traffic registers and traffic usage registers are treated as traffic usage register bays.

1.18 The camera is supported by brackets fastened to the ends of the third and fourth register mounting plates from the top of the camera field. Two 47A brackets are required when the field consists of 14-type registers throughout. Where magnetic counters occupy the upper portion of the field, two 48A brackets and two 122A adapters are furnished. See ED-92569-01 and J92603. Because of camera overhang the lower of two cameras in a bay is inverted. The cabinet doors are removed from bays equipped with cameras. The forward projection of the camera beyond the face of 14-type registers is approximately 18 inches. Special consideration is accordingly required when applying the camera to traffic register racks located in the switch room.

1.19 To eliminate difficulties encountered in taking manual readings from traffic register bays equipped with cameras, arrangements are made for providing a multiple appearance of a select group of registers. The multiple registers may be located in a wall-supported traffic register cabinet per J92603. Circuit notes indicate which registers may be multiplied.

1.20 When a crossbar No. 1 or tandem office is part of a traffic data recording system, a traffic data converter frame is provided per J92610. A terminal strip cross-connection field is provided on the TDC frame and pulse leads from various frames requiring registration which previously cabled through the TRDF to the traffic registers are now terminated directly on the TDC frame. Traffic registers can be operated in parallel with the TDC circuit, cable being run between the TDC terminal strip and the traffic registers. The TR or TRRR will be required to mount various TR relay units and the TRDF will be required for cross-connection of leads from TR circuits to equipment frames for other than registration functions even though no traffic registers may be required.

Subdivisions of Equipment and Detailed Index

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

EQUIPMENT CODE	RATING OF UNIT	TITLE	EQUIPMENT DRAWING	CIRCUIT DRAWING
J27059B	AT&TCo Std	Subscriber Line Overflow Unit --- Cross-connection Type	J27059B-()	SD-25942-01 Fig. 5
J27059C	AT&TCo Std	Delay Register Unit	J27059C-()	SD-25942-01 Fig. 17
J27059D	AT&TCo Std	Subscriber Sender Load Register Unit Without Load Control	J27059D-()	SD-25942-01 Fig. 8 & 18
J27059E	AT&TCo Std	Horizontal Line Group Unit	J27059E-()	SD-25942-01 Fig. 19
J27059F	AT&TCo Std	Tandem Sender Load Register Unit	J27059F-()	SD-25942-01 Fig. 4 & 29
J27059G	AT&TCo Std	Number Checking Unit for Plug- and Jack-Type Subscriber Line Overflow Register Equipment	J27059G-()	SD-25381-01 Fig. 3
J27059H	AT&TCo Std	Marker Preference Unit for Plug- and Jack-Type Subscriber Line Overflow Register Equipment	J27059H-()	SD-25381-01 Fig. 1
J27059J	AT&TCo Std	Translation Unit for Jack-type Subscriber Line Overflow Register Equipment	J27059J-()	SD-25381-01 Fig. A Fig. 7

Circuit Schematic Index

CIRCUIT DRAWING	J27059 EQUIP. CODE
SD-25381-01	G, H, J
SD-25942-01	B, C, D, E, F

- J92604 (AA381.327) — Traffic Usage Recorder Frame and Traffic Usage Recorder Control Panels
- J92605 (AA381.329) — Traffic Register Camera Control Panel and Traffic Register Camera Control Unit
- J92610 (AA388.161) — Traffic Data Converter Frame

2. SUPPLEMENTARY INFORMATION

- 816-000-000 — No. 1 Crossbar System Index
- J27054 (816-044-151, 817-064-151) — Traffic Register Equipment Using 400-capacity Register Rack — No. 1 & Tandem Crossbar (A&M Only)
- J92603 (AA381.324) — Traffic Register Equipment Using 14-type Registers — Common Systems

- Floor Plan Data
 - Section 7.1, Sheet 37 — Traffic Register Cabinet
 - Section 7.1, Sheet 38 — Traffic Register and Relay Rack
 - Section 9.2, Sheet 7 — Relay Rack
 - Section 9.4, Sheet 5 — Distributing Frame

3. DRAWINGS

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

Keysheets

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

Circuits

SD-25381-01 — Overflow Register Circuit
SD-25435-01 — Crossbar Tandem
SD-25440-01 — Miscellaneous Circuit for Relay Rack Bays
SD-25942-01 — Traffic Register Circuit
SD-90122-01 — Common Systems — Test Terminal Circuit for Battery and Ground Etc. — (For Traffic Register Cabinet and Traffic Register and Relay Rack)
SD-95531-01 — Traffic Register Cabinet Circuit
SD-95532-01 — Recorder Talking Line Circuit
SD-95738-01 — Traffic Usage Recorder Circuit
SD-95797-01 — Traffic Register Camera Control Circuit

Framework

ED-91183-30 — Relay Rack Assembly
ED-91423-01 — End Guard Assembly
ED-91519-70 — Distributing Frame Assembly
ED-92566-01 — Traffic Register and Relay Rack Assembly
ED-92568-01 — Traffic Register Cabinet Assembly

Equipment

ED-26747-10 — Traffic Register Relay Rack Miscellaneous Equipment — No. 1 and Tandem
ED-26749-01 — Traffic Register Relay Rack and Distributing Frame — Tandem
ED-26823-01 — Traffic Register Distributing Frame — No. 1 Crossbar
ED-92276-01 — Traffic Register Unit
ED-92281-01 — Recorder Telephone Unit
ED-92348-01 — Direct Talking Line Unit
ED-92567-01 — Traffic Register and Relay Rack Equipment
ED-92569-01 — Traffic Register Cabinet Equipment

Cabling

ED-25341-10 — Cabling Plan for Distributing Frame
ED-92275-01 — Installation and Cabling of Traffic Register Cabinet

4. EQUIPMENT***J27059B (AT&T Co Std) — Subscriber Line Overflow Unit — Cross-connection Type***

Equipment — J27059B-()

List 1 — Assembly, equipment, and wiring per SD-25942-01, Fig. 5 for one subscriber line overflow circuit and common equipment for one additional circuit.

List 2 — Equipment and wiring per SD-25942-01, Fig. 5, for one additional subscriber line overflow circuit.

J27059C (AT&T Co Std) — Delay Register Unit

Equipment — J27059C-()

List 1 — Assembly, equipment, and wiring per SD-25942-01, Fig. 17 for one delay register circuit and common equipment for one additional circuit.

List 2 — Equipment and wiring per SD-25942-01, Fig. 17 for one additional delay register circuit.

J27059D (AT&T Co Std) — Subscriber Sender Load Register Unit Without Load Control

Equipment — J27059D-()

List 1 — Assembly, equipment, and wiring per SD-25942-01, Fig. 4 and 18 for one subscriber sender load register circuit without load control and common equipment for one additional circuit.

List 2 — Equipment and wiring per SD-25942-01, Fig. 4 and 18 for one additional subscriber sender load register circuit without load control.

Note

- A. One TDR register per SD-25942-01, "ZM" option is required for each list 1 and each list 2 when this unit is connected to the traffic data converter or does not convert to a register.

J27059E (AT&TCo Std) — Horizontal Line Group Unit

Equipment — J27059E-()

- List 1** — Assembly and common equipment for one horizontal line group unit arranged for ten circuits per SD-25942-01, Fig. 19.

- List 2** — Equipment and wiring for one H relay per SD-25942-01, Fig. 19 required in addition to list 1 for each equipped circuit.

J27059F (AT&TCo Std) — Tandem Sender Load Register Unit

Equipment — J27059F-()

- List 1** — Assembly, equipment, and wiring per SD-25942-01, Fig. 4 and 29 for one tandem load register circuit and common equipment for one additional circuit.

- List 2** — Equipment and wiring per SD-25942-01, Fig. 4 and 29 for one additional tandem sender load register circuit.

Note

- A. One TDR resistor per SD-25942-01, "ZM" option is required for each list 1 and each list 2 when this unit is connected to the traffic data converter or does not convert to a register.

J27059G (AT&TCo Std) — Number Checking Unit for Plug- and Jack-type Subscriber Line Overflow Register Equipment

Equipment — J27059G-()

- List 1** — Assembly, equipment, and wiring per SD-25381-01, Fig. 3 for one number checking circuit and common equipment for one additional circuit.

- List 2** — Equipment and wiring per SD-25381-01, Fig. 3 for one additional number-checking circuit.

J27059H (AT&TCo Std) — Marker Preference Unit for Plug- and Jack-type Subscriber Line Overflow Register Equipment

Equipment — J27059H-()

- List 1** — Assembly, equipment, and wiring per SD-25381-01, Fig. 1 for one marker preference circuit and common equipment for three additional circuits.

- List 2** — Equipment and wiring per SD-25381-01, Fig. 1 for one additional marker preference circuit.

J27059J (AT&TCo Std) — Translation Unit for Plug- and Jack-type Subscriber Line Overflow Register Equipment

Equipment — J27059J-()

- List 1** — Assembly, equipment, and wiring per SD-25381-01, Fig. A for one translation circuit arranged for ten office selection circuits per SD-25381-01, Fig. 7 (see note A).

- List 2** — Equipment and wiring per SD-25381-01, Fig. 7 for one OFF relay required for each crossbar office in the building.

Note

- A. The wiring for the OFF relays shall include only the common battery strap. The relay terminal holes shall be kept free for switchboard cable connections.

5. GENERAL NOTES

5.01 The registers are furnished in groups of ten or single-plate coded units equipped with 11 pin jacks. The operating terminals of the registers are surface-wired to ten of the pin jacks; the remaining register terminals are strapped together and connected to the eleventh or battery supply jack. Below the registers is mounted a common jack field on which are terminated the incoming switchboard cables to the

cabinet and to which the registers are connected by means of patching cords. There are 480 pin jacks in the field, 16 horizontal rows of 30 each. The bottom five rows designated S, S1, S2, S3, and S4 are used to furnish battery to the registers, either direct or through cutoff keys located above the registers. The 30 S, S1, S2, etc. jacks correspond to the 30 plates of registers that may be mounted in the five sources of battery to each plate of registers as desired. (See 5.05 and 5.06.) The 11 rows of pin jacks above the S jacks, called pulse jacks, are used for patching the individual leads of the registers to the crossbar circuits or traffic register relays. Ten rows or 300 of the pulse jacks are assigned for cabling to the horizontal portion of the TRDF. The eleventh row is available for extending P leads between cabinets if desired. When specified by the telephone company, these jacks may be cabled to jacks in the eleventh row of other cabinets. In this way a register can be connected to a P jack in another cabinet by using one of these "tie lines" plus two patching cords. For the case where the distributing frame is used for making all assignment changes, the registers normally are patched to the P jacks in regular order, registers 0 to 9, 10 to 19, etc., being patched to P jacks 0 to 9, 10 to 19, etc.

5.02 *At the traffic register distributing frame,*

all cross-connections are made with single-wire jumpers. Terminal strips with punchings two rows deep are used on the shelves for the P leads from the cabinet and terminal strips with the punchings four rows deep are used on the verticals for terminating the leads from the connecting circuits and the traffic register relays. This permits an originating unit of four equipped bays to serve a full marker group.

5.03 In the case of large groups of leads such as those from the marker route relay bays, adequate stamping can be placed on the terminal strips, but for the many small groups of leads, this is not possible and a designation card is used. This is shown on ED-26823-01. It is filled out as required and constitutes part of the job record. A copy of the record is mounted on cardboard and hung from a hook furnished at the right end of the TRDF. In tandem offices the terminal strip designation card is not needed.

5.04 In some cases the PC and PB leads of connecting circuits such as announcement trunks and switchboard and desk positions appear on the MDF. Also appearing on the MDF are several circuits connecting to the AR relays. GB leads from intertoll trunks are sometimes grouped at the MDF. This makes it necessary to furnish a tie cable between the TRDF and the HMDF. Single conductor circuits are furnished, the number of leads depending on job requirements. To provide for horizontal-to-horizontal jumpers between the tie cable and P terminals, closed distributing rings per P-1449685 shall be substituted for the V-shaped rings in the first bay on all shelves below the tie cable termination. Further directions for locating closed rings in reference to miscellaneous terminal strips are given on ED-25341-01.

5.05 Battery is supplied to the S pin jacks either directly, through battery cut-off relays under the control of switches, or through a 10-second pulsing relay for group-busy time duration registers. The S jacks are arranged in five horizontal rows of 30 each, corresponding to the 30 register mounting plates that may appear in the cabinet. The rows are designated S, S1, S2, S3, and S4. The bottom row, designated S, is used for direct battery and rows S1 and S2 for battery supplied through S1 and S2 cutoff relays and keys. Rows S3 and S4 are reserved for 3CL toll or intertoll registers. The cabinets are arranged for a uniform patching procedure whereby the battery jack on each plate of registers is patched to the correspondingly numbered S jack, either S, S1, or S2, depending on whether direct battery or S1 or S2 controlled battery is required. On this basis each cabinet has assigned to it six BS relays, three under the control of the S1 key and three under the control of the S2 key. Also assigned to each cabinet are 30 battery leads serving the S, S1, and S2 battery jacks numbered 0 to 9, 10 to 19, and 20 to 29. This number of battery leads is reduced by three for each set of eight magnetic counters located in the cabinet. This is because battery for the counters is supplied over separate leads. For toll and intertoll time duration registers, fewer S3 and S4 battery leads will suffice on the basis of confining these registers to a single cabinet and if necessary violating the rule of using the S jack bearing the number of the register mounting plate. The fuses for the

registers and for the various traffic register relay circuits are located on the miscellaneous fuse bay serving the traffic register relay rack.

5.06 The battery cutoff keys take the form of toggle switches mounted above the registers and are accessible for operation through an opening in the cabinet door. The first switch in the first cabinet, designated CLK, is assigned to the clock registers, usually one per cabinet. The second and third switches designated S1 and S2 are for register battery control. The next two switches are used or reserved for S3 and S4 controlled battery for toll and intertoll registers. Switches beyond the S4 switch are used for line link frame horizontal group registers. Additional line link frame switches, when required, are assigned in the next and succeeding cabinets. The above switches are common for the entire cabinet line-up or for an originating marker group of equipment. Other switches are assigned for the dial tone speed register circuits, preferably in the same cabinet with the D and T registers.

5.07 Magnetic counters used for marker and transverter peg count registrations and registers for detector group usage are located in the cabinet at the top of the register space. Four magnetic counters occupy a 1-3/4 inch mounting plate, and two such plates or eight counters together with two adapters per P-30A892 take the space of three register mounting plates. Wiring of magnetic counters is terminated on a terminal strip on the rear of the mounting plate and not via jacks and patching cords. Slack is provided in the wiring so the mounting plate can be moved forward for maintenance.

5.08 Recorder talking line equipment occupies a panel shown on ED-92281-01. It is mounted above the registers in the cabinet and below the registers on the traffic register and relay rack. The recorder talking line jacks are at the right of the battery control keys along with the frame line or switchman telephone jacks. There is no provision in the cabinet for signaling over the talking line. Instead, the talking line is connected directly to the telephone circuit at an operating room desk or it may be assigned a manual originating dial terminating line. When the registers are located in the switch room on the traffic register and relay rack, the

recorder talking line may be equipped with a dial.

5.09 Frame talking line jacks at the cabinet and the traffic register and relay rack are furnished per SD-95531-01, Fig. 6; at relay rack bays, miscellaneous relay rack circuit SD-25440-01, Fig. 5 is used. **Test battery supply** at the traffic register cabinet and at the traffic register and relay rack is furnished per SD-90122-01, Fig. 8, the 24-volt post not being used. Traffic register relay rack bays are treated as miscellaneous relay racks and are equipped in alternate bays using SD-25440-01, Fig. 1 and 2.

5.10 Standard 23-inch relay rack bays are used for mounting the relay equipment in buildings having an operating room. Something over one bay is required for a full No. 1 crossbar originating marker group with associated terminating equipment. A typical layout for such a case is shown on ED-26747-11. The relay equipment for a crossbar tandem office occupies but a fraction of a relay bay and is shown on ED-26749-01. Where the registers are located in the switch room, the relays are located in the upper half of the traffic register and relay rack, with any excess located on standard relay rack framework.

5.11 Relay Rack Units: The units listed in Part 1 under Subdivisions of Equipment, are equipped with terminal strips and are surface-wired. The remaining equipment as listed below is installer-wired and the equipment arrangement is shown on ED-26747-11.

CIRCUIT	FUNCTION
SD-25942-01	
Fig. 3	Bat. Cont Relay
Fig. 4	Aux Relay
Fig. 6	Mkr & TV PC Relay
Fig. 7	Magnetic Counter
Fig. 8	GB Relay
Fig. 10	"A" Bd PCC Relay
Fig. 11	CL Service & Mkr Bat. Relay
Fig. 12	CL Service & Mkr PC Relay
Fig. 13	CL Service Bat. Sup. Relay

CIRCUIT	FUNCTION
SD-25942-01 (Cont.)	
Fig. 14	CL Service PC Relay
Fig. 15	Clock Reg Relay
Fig. 22	Start Cont Relay
Fig. 24 to 28	GB Time D Relays
Fig. 4, 8, 9, 23	Tdm CAMA Sdr & Inc Reg GB
SD-25381-01	
Fig. 2, 4, & 5	Sub L OFL— Plug & JK Type — Jack Panel

5.12 *The auxiliary relay AR* per Fig. 4 of the schematic is used in three ways in No. 1 offices for OFL and for GB registers other than for central B, RP, DP, and MF terminating senders.

	AR REL TERMS
1. (OFL) CI OG Trks	P, 1, 2, 3, & "Y" option
2. (OFL) PS Trks — LOC A BD	P, 1, 2, 3, & "Z" option
3. All other applications	P, 1, 3, & "Z" option

In No. 1 offices, the AR relays are cabled uniformly to the VTRDF with four leads, namely, P, 1, 2, 3, and "Y" or "Z" option applied at the relays, as required. In this way the wiring of the relays can readily be changed if necessary. A variation of this arrangement is required for terminating sender GB registers (other than noncentral B) and for terminating sender load registers, where lead 2 from the AR relay is disconnected at the VTRDF and A and B leads from the office interrupter frame are connected to terminals 1 and 2 on the cable side. This is shown in cross-connecting circuit Fig. 59. The AR relays are numbered zero up, and office records are used to identify the wiring in place. In addition, at the TRDF, relays with "Y" option are designated CI Trks and those wired for circuit Fig. 9 are designated T. SDR. In tandem offices, the AR relays are limited to OFL registers for call indicator OG Trks. Leads 2 and 3 from the relay terminals are accordingly cabled

directly to the HMDF as shown in circuit Fig. 71. The above applies to AR relays used by themselves. When used with other relays as in subscriber and tandem sender load register circuits, they are furnished as part of a unit and wired for the particular application.

5.13 The H relays associated with the line link frame horizontal group load registers are furnished in single-plate units having a capacity of ten relays for ten line link frames in the same quarter choice A, B, C, or D. Four of these units provide for ten-full-line choices. The ten relays on each mounting plate have their front contacts multiplied together and brought out to a unit terminal strip where they are multiplied further depending on the number of the choices and whether 40, 20, or 10 registers are specified. If 40 registers are specified, the A, B, C, and D sets of P leads are cabled to the VTRDF permitting readings to be taken on four line link frames or a line choice at a time; if 20 registers are specified, the A and B sets and the C and D sets are multiplied together and 20 P leads are cabled to the VTRDF, thus permitting readings to be taken by half choices; if ten registers are specified the A, B, C, and D sets are multiplied together, 10 P leads are cabled out, and readings are limited to a quarter choice. With 40 registers there is a start key per choice; with 20 registers there is a key per half choice, and with 10 registers a key for each line link frame. The horizontal line group units are located at the top of the relay rack as an aid in terminating the switchboard cables from the line link frames. The cables cascade off the cable rack behind the units and are supported by a cable bracket furnished for this purpose.

5.14 The jack panel or panels for subscriber line overflow registers of the plug and jack type are located in the switch room on the traffic register relay rack, preferably 6 to 7 feet from the floor just above shoulder height. Because of limited space for cabling, these panels cannot be placed in the operating room in the traffic register cabinet. The associated overflow registers, however, are in the operating room or with the other registers. The 329A plugs used for setting up the subscriber number may be stored in a 50A holder in a nearby frame end guard.

5.15 When dial tone speed register circuits are furnished, the registers are assigned alternately D and T, five pairs to a mounting plate. The start switch is assigned preferably in same cabinet with associated registers.

5.16 Unequipped register mounting plate space in the cabinet and on the relay rack is equipped with blank mounting plates when cameras are used.

5.17 Group-busy time duration register facilities include a TG relay and GBT register per group or subgroup of trunks, an STA and GBS relay under the control of an S4 start switch and a lead from the clock circuit for supplying battery at 6-second intervals to the registers, also an ET register operating from the GBS relay to record the elapsed time of the group-busy test. The GBS battery supply relay serves a maximum of 120 registers. The TG relays are furnished in sets of one, two, or three for nondivided trunk groups and those having two or three subgroups. An example of the latter is an intertoll group having terminal, via, and common subgroups. The contacts and winding terminal of the TG relays are cabled to the VTRDF in sets of one, two, or three at which point the P1 to P4 leads from the contacts are cross-connected to GBT registers and the windings are cross-connected to GB leads representing groups or subgroups of trunks. The contacts of the GBS relay are cabled to the S4 battery jacks in the traffic register cabinet. The mounting plate per SKP on ED-26747-10 accommodates a test jack for the normally operated TG relays on the plate, GBS and STA relays furnished on the first plate of a group, and space for 11 TG relays. On plates other than the first plate of a group served by GBS and STA relays, there is space for 13 relays. The plate thus accommodates three or four sets of three TG relays, five or six sets of two TG relays, or 11 or 13 single TG relays. Ordinarily, a plate is limited to sets of one, two, or three, each series being numbered zero up. If desired, a 3-relay set may be used for three individual groups of trunks by assigning registers to the P0, P1, and P2 leads; or it may be used for a trunk group having two subgroups

by using the TG1 and TG2 relays and contacts P0, P1, and P3, in which case the TG3 relay and the P2 contact are available for an individual trunk group, if desired. Likewise a 2-relay set may be used for two individual trunk groups. Access to the GB leads of intertoll trunks may be obtained in either of two ways: (1) the grouping of the individual GB leads may be done at the toll IDF or at the MDF, in which case a lead per group or subgroup is brought up to the HTRDF over a tie cable for cross-connection to the windings of the TG relays, (2) the individual GB leads may be brought up to the TRDF and grouped with the aid of bunching blocks in the manner used in tandem offices for GB registers. The bunching blocks are located on HTRDF. The foregoing description is based on Fig. 25, 26, and 27 of SD-25942-01. The same general arrangement applies to Fig. 28 of SD-25942-01 used for idle trunk indicating groups, except that the RC relays are always furnished individually, no test jack is required, and bunching facilities for the OL leads are not needed. The GBT registers associated with RC relays use the same GBS relay, ST relay and key, and ET register as those associated with TG relays.

5.18 When the trunk group-busy registers are specified in tandem offices, bunching blocks per SD-25942-01, Fig. 78 are furnished for grouping the trunk PB leads.

Wiring and Cabling

5.19 The method of *cabling the traffic register cabinet* is shown on ED-92275-01. Cables from the HTRDF, the battery supply relays and D fuses are terminated on the P and S pin jacks. Other cables connect to the cutoff switches, magnetic counters, test posts, and talking lines. Ground for the cutoff switches is obtained at the TR relay rack. In terminating the cable to the magnetic counters, sufficient slack shall be allowed so the mounting unit can be moved forward to expose the wiring for maintenance.

5.20 *The cabling of the traffic register relay rack and the traffic register and relay rack* follows standard practices. *The cabling of the traffic register distributing frame* is shown on ED-25341-10.

5.21 *Resistance limits* are imposed on certain leads as covered by equipment notes on SD-25942-01.

issue numbers shown are those of the issue in which the rating was first applied.

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

The following equipment has been replaced as indicated. Where "A&M Only" items appear, the

EQUIPMENT	RATING	DETAILS LAST SHOWN IN ISSUE	REPLACING EQUIPMENT
J27059A	Mfr Disc.	1	—

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