GTE AUTOMATIC ELECTRIC
TYPE 101 DIRECTOR SYSTEM
DESCRIPTION

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1. GENERAL

1.01 This section provides descriptive information pertaining to the Type 101 Director System. For information relative to the operation of the Type 101 Director System, refer to the related section in the 240-205 series of GTE Practices.

1.02 This section has been reissued to provide a more comprehensive document incorporating the 101 Director Systems' latest equipment. Marginal arrows have been omitted because of the extent of changes made. Remove and destroy all previous issues of this section.

1.03 The 101 Director System was designed to fulfill the needs of offices requiring increased flexibility in numbering plans and trunking arrangements. As the system has been improved, its type designation has been altered to reflect the latest equipment. There are currently three types of 101 Director Systems in use, the 101-A, 101-B, and the 101-C Director Systems. The basic office features provided by all 101 Director Systems are listed in Table 1.

1.04 The latest type of system (101-C), was engineered for either of two methods of operation; a Non-Metro version which provides the basic office features, and a Metro version which provides the additional features listed in Table 2.

2. SYSTEM DESCRIPTION

2.01 When an office is equipped with the Type 101 Director System, all calls originated within that office will be processed by the system.

2.02 When the calling party lifts his handset, his associated linefinder will find his line and connect it to the director access equipment (Figure 1). The access relay circuit and the linkfinder will cause the calling party lines as well as a local first selector to be connected to the register-sender.

2.03 The register-sender receives either dial pulses or two-out-of-eight (2/8) DTMF tones (from a touch calling telephone). As the register-sender receives data from the calling telephone, it converts the data into a two-out-of-five (2/5) code, stores and extends the data to the translator.

2.04 When the translator has received sufficient data from the register-sender to determine the destination of the call, it extends routing information to the register-sender in 2/5 code, and register-sender instructions in 3/5 code.

2.05 As the register-sender receives data from the translator, it outpulses the routing digits received from the translator or transmits 2/6 coded multifrequency (MF) tones, corresponding to the routing digits received from the translator.

2.06 When the translator determines that translation is not necessary, or when the routing of the call is completed, the translator causes the access relay circuit to connect the linefinder directly to the local first selector, so that the calling telephone's dial pulses complete the routing of the call, and the register-sender can be released to handle other calls.

3. REGISTER-SENDER ACCESS EQUIPMENT

3.01 The register-sender access equipment is designed to allow the addition of a 101 Director System to existing step-by-step offices without major modification to existing switches or shelves.

3.02 The main components of the register-sender access equipment (Figure 2) are as follows:

(a) Access relay circuits which are connected between the linefinder and its associated local first selector.

(b) Crosspoint linkfinder access switch which connects the register-sender to any one of the possible access relay circuits it serves.

(c) Common linkfinder control circuit which controls the circuit operation of the connection between an idle register-sender and the access relay circuit requesting service.

3.03 The function of the access equipment is to connect a calling linefinder to an idle register-sender, and to connect that register-sender to the local first selector associated with the calling linefinder. When commanded by the register-sender, the access equipment connects the line-

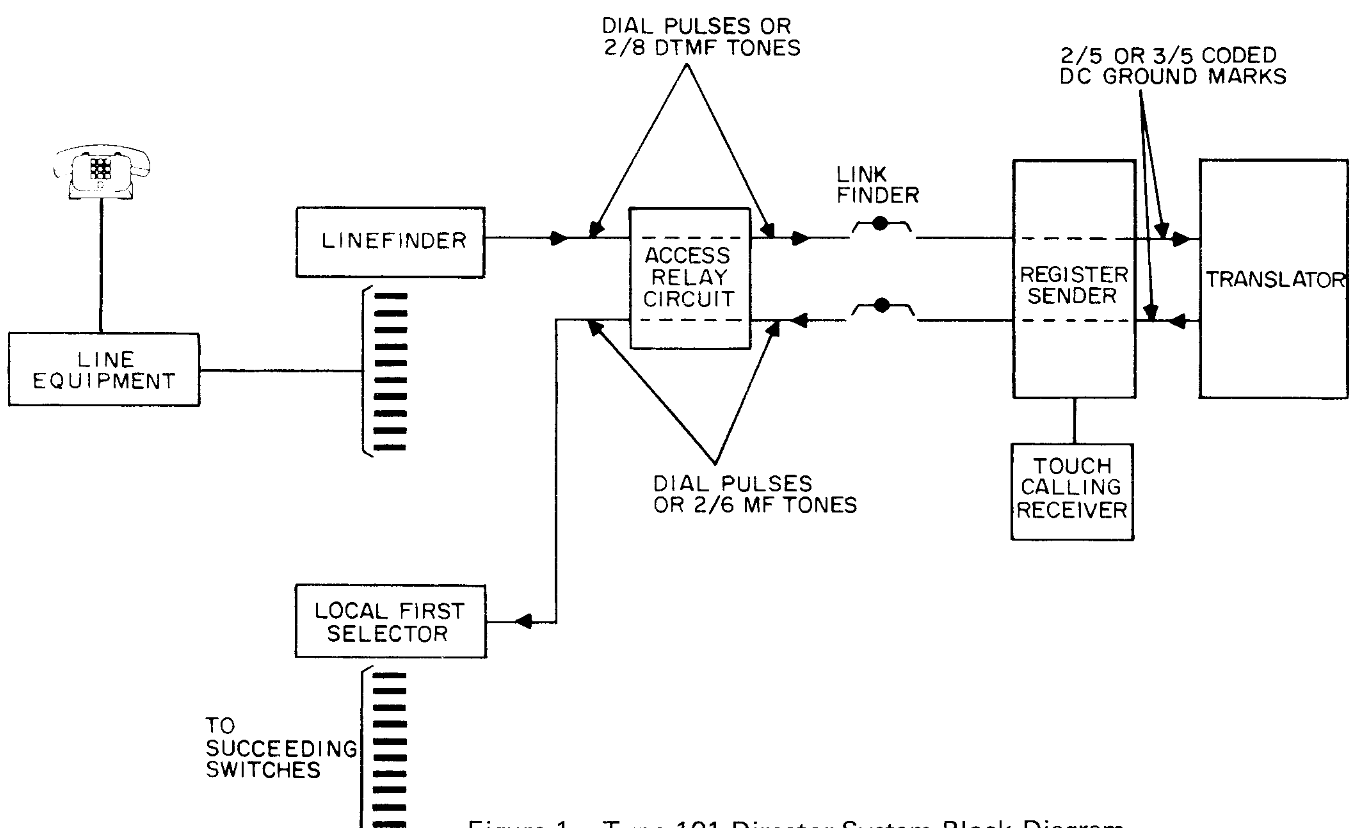

Figure 1. Type 101 Director System Block Diagram.

finder directly to the local first selector, and releases the register-sender to handle other calls.

3.04 Each access equipment shelf handles up to 100 linefinders and first selectors. Calls processed through these 100 linefinders and first selectors can be distributed to a maximum of 12 register-senders. Once a register-sender has processed a call, it cannot be assigned to process another call until every other register-sender associated with that particular access equipment shelf, has been assigned to process a call.

3.05 Each access equipment shelf measures 5 feet, 10-3/4 inches long and 3 feet, 6 inches high, and is arranged to mount on a universal Type 11 trunk board. For more detailed information on the register-sender access equipment, refer to Section 240-205-106.

3.06 An optional alarm panel (Figure 3), provides an indication of the following alarm conditions of the access equipment:

(a) Failure to mark the tens selection.

(b) Failure to mark the units selection.

(c) Failure to seize an idle register-sender.

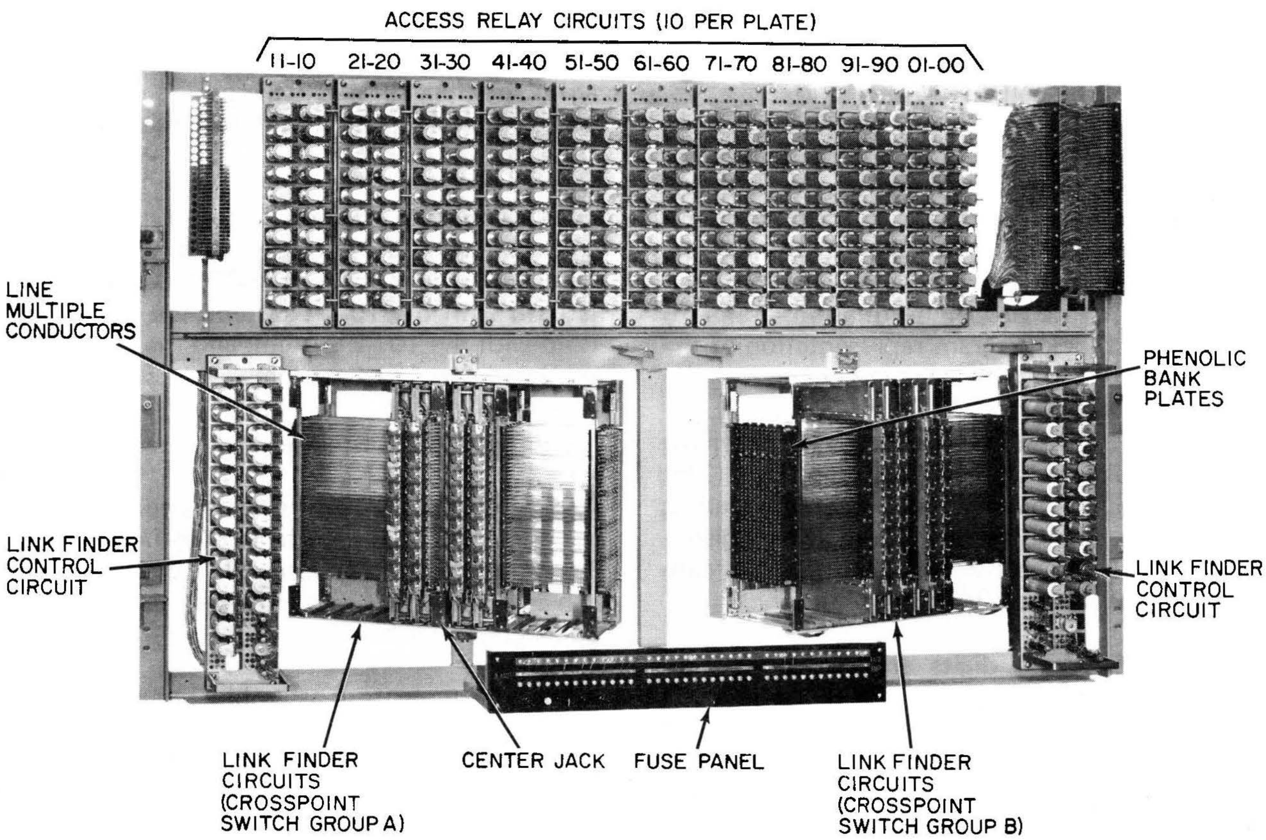

Figure 2. Register-Sender Access Equipment Shelf.

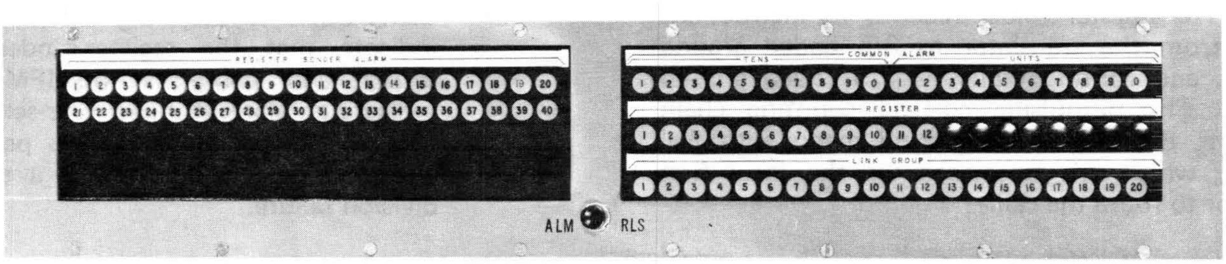

Figure 3. Alarm Panel.

(d) Failure to release from the call after seizing the register-sender.

3.07 Register-sender alarm lamps are also mounted on the alarm panel. These lamps indicate which register-senders are in an alarm or busy condition.

3.08 In the 101-A Director System, the optional alarm panel is mounted on the translator rack. In the 101-B and 101-C Director Systems, the alarm panel is mounted on the first register-sender rack.

3.09 The alarm panel shown in Figure 3 is an earlier version; later versions may vary slightly.

4. REGISTER-SENDER

4.01 The register-sender provides for registering, in coded form, the dialed or keyed digits, presenting the digit-codes to a translator, and under the control of the translator, sending the loop pulsed or multifrequency digits which will route the call to its proper destination. Refer to Figure 4 for a block diagram representation of the register-sender.

4.02 The register-sender is capable of receiving either dial pulses, or two-out-of-five (2/5) coded dc ground marks from a touch calling receiver. When dial pulses are received, the register-sender's input digit correed counting chain converts the dial pulses into 2/5 codes.

4.03 The 2/5 coded digits are stored in digit storage cards, and are examined by the translator each time the register-sender's time slot occurs. When the translator determines that enough information has been presented, it translates this information, and returns routing information and instructions to the register-sender.

4.04 The register-sender receives its instructions from the translator as 3/5 coded ground marks, and routing digits as 2/5 coded ground marks. The outpulsing correed counting chain converts the 2/5 coded ground marks into dial pulses, which are outpulsed via the local first selector to route the call.

4.05 When the translator determines that translation is not needed, or when the translator has completed routing the call, the register-sender, under instructions from the translator, will release itself from the switchtrain, and allow the calling party to directly pulse the switchtrain.

4.06 If the translator routes a call through a trunk which requires MF sending, the register-sender, under instructions from the translator, will begin sending 2/6 coded MF tones instead of dial pulses.

4.07 If during outpulsing, the register-sender encounters an all trunks busy (ATB) condition, it will release the partial switchtrain, and re-route the call per the routing commands contained in the next alternate route. This action by the register-sender is commonly referred to as crankback. If an ATB condition is encountered again, no further alternate routing can take place, and the calling party will receive 120-IPM busy tone.

4.08 There are currently three types of register-senders being used with the Type 101 Director System. The H-850215-A register-sender is used with the 101-A system, the H-850215-B is used with the 101-B system, and the H-850215-C is used with the 101-C system.

Type A Register-Sender

4.09 The H-850215-A register-sender (Figure 5) is 17-1/2 inches high and 27-1/4 inches wide. The register-sender assembly consists of two sub-assemblies secured together and electrically connected by cable.

4.10 The upper sub-assembly mounts the relays, rotary switches, capacitors and resistors used in the register-sender. Also mounted on the upper sub-assembly is a gray enameled steel plate which is not concealed by the dust cover. This steel plate mounts the following items:

(a) Lamp SUPY (white): Lights steady to indicate that the register-sender is seized, and flashes at 60 IPM to indicate an alarm if the register-sender fails to release, if there is a parity check failure, or if there is a time division failure.

(b) Lamp L1: Lights to indicate that a time division failure has caused a permanent timed ground to be marked to this register-sender.

(c) Lamp L2: Lights to indicate that a time division failure has caused a permanent timed battery to be marked to this register-sender.

(d) Key BSY: When operated, prevents this register-sender from being seized by the register-sender access equipment.

(e) Key PT: When operated, activates the register-sender pulse generator for testing purposes.

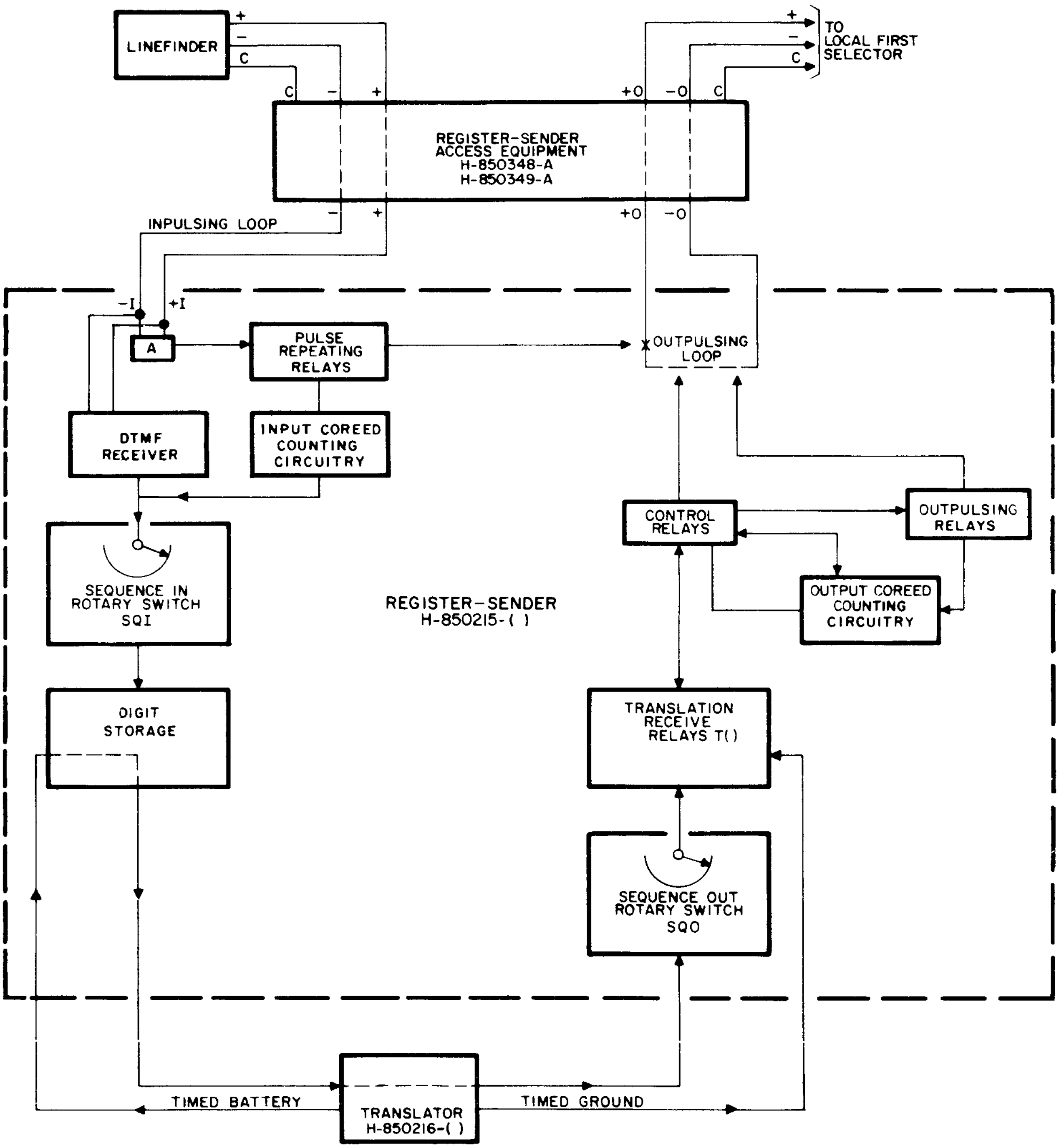

Figure 4. Register-Sender Block Diagram.

(f) Key RST: When depressed, releases the register-sender from a lock-out condition caused by a parity check failure.

(g) Test jacks SPT: Provide access for testing purposes.

4.11 The lower sub-assembly of the register-sender is a 30 position card file which contains the following items:

(a) Seven codelreed storage cards (WA-1098-A), mounted in positions 5 through 11.

(b) Four diode cards (WA-8100), mounted in positions 12, 13, 14, and 17.

(c) One pulse generator card (WA-8102), mounted in position 15.

(d) One timer card (WA-1101), mounted in position 16.

(e) Two correed counting chain modules (H-850616-B1A), mounted in positions 25 and 30.

(f) Six potentiometers (locking), designated R20, R27, R44, R45, R46, and R55. R20 and R27 are for pulse generator adjustments, and R44, R45, R46, and R55 are for time-out adjustments.

(g) Two mercury wetted plug-in pulsing relays (PM-4200-100A), mounted on the rear of the card file.

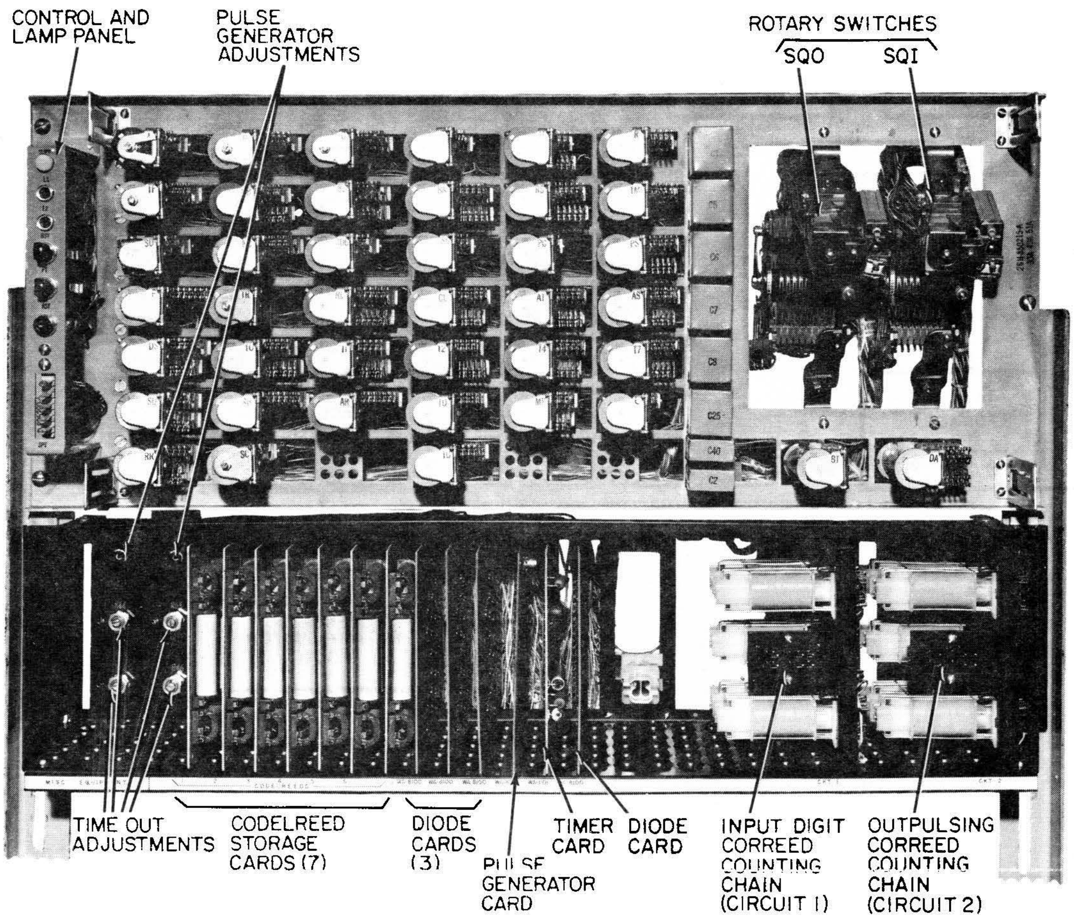

Figure 5. Register-Sender (H-850215-A).

4.12 On the rear of the A register-sender are three 10 x 10 terminal blocks which are designated A, B, and C. These terminal blocks connect the register-sender to its associated equipment, and the common highway to the translator.

Type B Register-Sender

4.13 The H-850215-B register-sender (Figure 6) is 20-7/10 inches high and 27-1/4 inches wide. The register-sender assembly consists of three sub-assemblies secured together and electrically connected by cable.

4.14 The upper sub-assembly is a gray enameled mounting strip, which is not concealed by a dust cover. This sub-assembly mounts the following items:

(a) Lamp SUPY (white): Same functions as on H-850215-A.

(b) Lamp L1: Same function as on H-850215-A.

(c) Lamp L2: Same function as on H-850215-A.

(d) Lamp READ (blue): For future use with Automatic Monitor Circuit.

(e) 0, 1, 2, 4, 7 Lamps (amber): Light to indicate the 2/5 code in digit storage when READ key is operated.

(f) BUSY Key: Same as BSY key on H-850215-A.

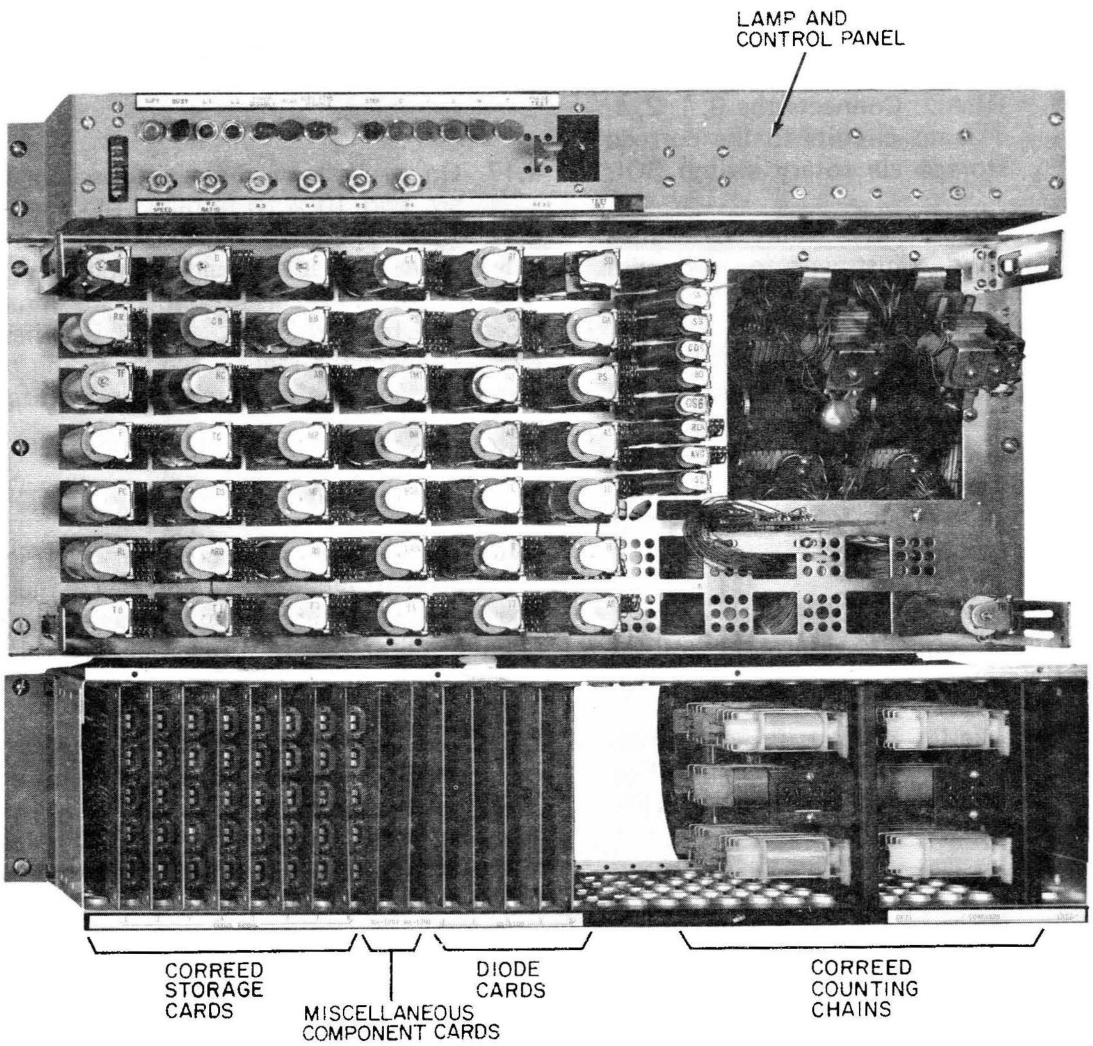

Figure 6. Register-Sender (H-850215-B).

(g) TIMER DISABLE Key: When operated, disables the register-sender timer circuit so that time-out will not occur.

(h) AUTO READ DISABLE Key: For future use with the Automatic Monitor Circuit.

(i) STEP Key: When depressed and released, steps rotary switch SQI one position to present correed storage codes to lamps 0, 1, 2, 4, 7.

(j) PULSE TEST/READ lever key: The lever key performs the following functions:

(1) PULSE TEST: Activates the pulse generator to perform pulsing tests.

(2) READ: Connects the 0, 1, 2, 4, 7 lamp circuits to the correed storage via rotary switch SQI.

(k) Potentiometer R1 (SPEED): Pulses per second adjustment for the pulse generator.

(l) Potentiometer R2 (RATIO): Percent break adjustment for the pulse generator.

(m) Potentiometers R3, R4, R5, and R6: Time-out adjustment for the timer circuit.

(n) Receptacle REG SNDR (15 points): Provides access for portable test set H-850669-A or equivalent.

(o) Test Jacks (10 points): Provide access for pulse testing and for connecting portable test set H-850669-A or equivalent.

4.15 The middle sub-assembly of the register-sender mounts the relays and the two rotary switches used in the register-sender.

4.16 The lower sub-assembly of the register-sender is a 30 position card file which contains the following items:

(a) Seven correed storage cards (WA-1206-A), mounted in positions 1 through 7.

(b) One miscellaneous component card (WA-1202-A), mounted in position 9.

(c) One miscellaneous component card (WA-1201-A), mounted in position 10.

(d) Five diode cards (WA-8100-A), mounted in positions 11 through 15.

(e) Two correed counting chain modules (H-850616-B1A), mounted in positions 24 and 29.

(f) Two mercury wetted plug-in pulsing relays (PM-4200-100A), mounted on the rear of the card file.

4.17 On the rear of the register-sender assembly are two 10 x 10 terminal blocks designated A and B. These terminal blocks connect the register-sender to its associated equipment. Also on the rear of the register-sender are three 72-pin receptacles designated A, B and C. These receptacles connect the register-sender to the translator commons and the route commons multiple highway.

Type C Register-Sender

4.18 The H-850215-C register-sender (Figure 7) is 20-7/10 inches high and 27-1/4 inches wide. The register-sender assembly consists of three sub-assemblies secured together and electrically connected by means of a cable.

4.19 The upper sub-assembly is identical to the upper assembly on the B register-sender, with the exception of a 12-pin receptacle designated TC REC. Receptacle TC REC is for testing of the touch calling receiver equipment, which in an integrated part of the C register-sender.

4.20 The middle sub-assembly is identical to the middle assembly on the B register-sender.

4.21 The lower sub-assembly is a 30 position card file which contains the following items:

(a) Touch calling (TC) input amplifier card (WA-1173-A), mounted in position 1.

(b) TC limiter amplifier card (WA-1174-A), mounted in position 3.

(c) TC channel filter card (WA-1176-A), mounted in position 4.

(d) TC timer card (WA-1177-A), mounted in position 6.

(e) Two TC detector cards (WA-1175-A), mounted in positions 7 and 8.

(f) TC output converter card (KH-840186-A30A), mounted in position 9.

(g) TC power supply card (WA-1178-A), mounted in position 10.

(h) One miscellaneous component card (WA-1231-A), mounted in position 12.

(i) Two counting chain cards (KH-840188-A30A), mounted in positions 13 and 15.

(j) One counting chain buffer card (KH-840189-A30), mounted in position 14.

(k) One miscellaneous component card (WA-1232-A), mounted in position 16.

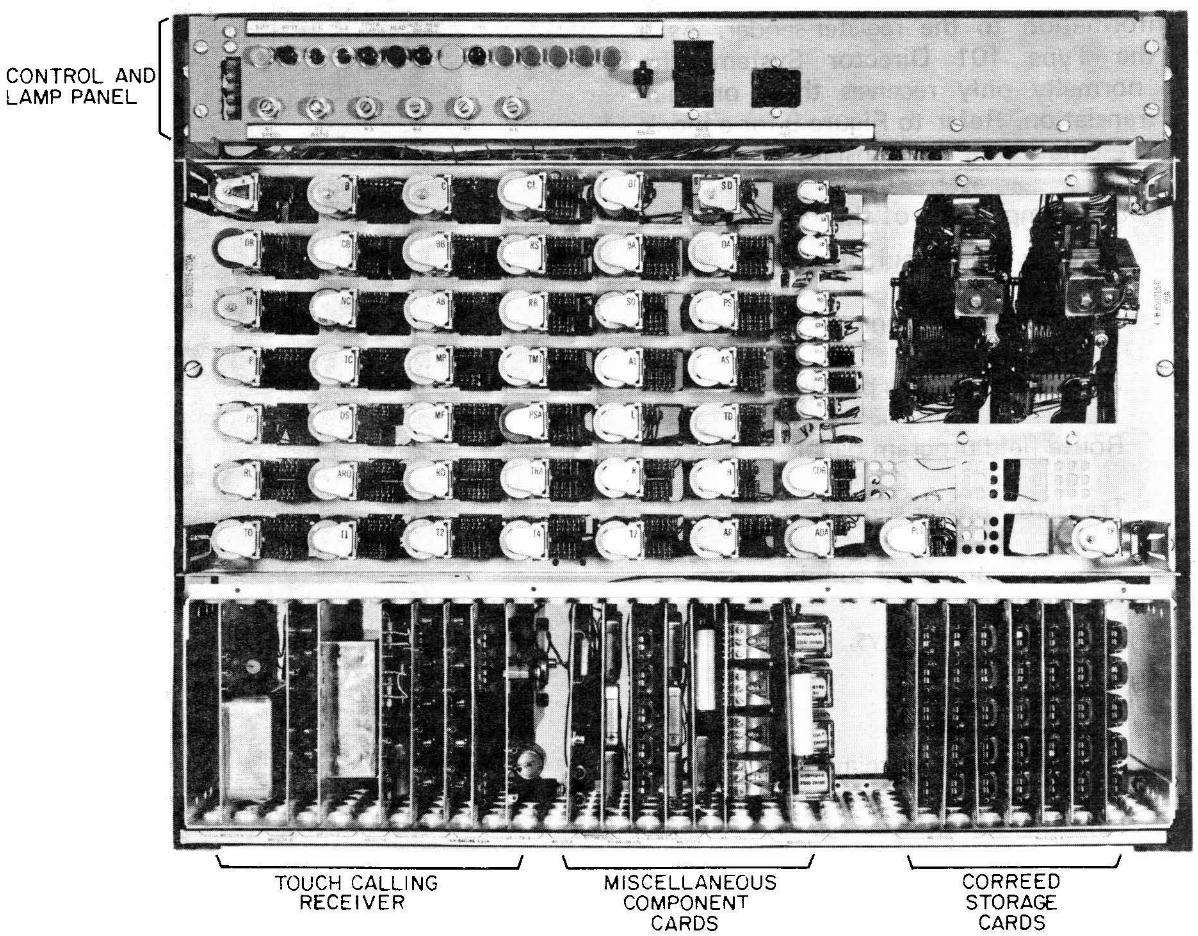

Figure 7. Register-Sender (H-850215-C).

(l) One miscellaneous component card (WA-1233-A), mounted in position 17.

(m) One miscellaneous component card (WA-1234-A), mounted in position 19.

(n) Three correed storage cards (WA-1235-A), mounted in positions 23, 24, and 25.

(o) Four correed storage cards (WA-1206-A), mounted in positions 26, 27, 28, and 29.

5. TRANSLATOR

5.01 The translator (Figure 8) is a high-speed solid-state electronic circuit using time division access to serve up to 100 register-senders and a translator monitor. The translator can receive up to six digits for translation, and provide routing and control information to the register-sender. As a part of the Type 101 Director System, the translator normally only receives three or four digits for translation. Refer to Figure 9 for a block diagram representation of the translator.

5.02 The basic components of the translator are:

(a) Time division circuitry.

(b) Translator (electronic) logic circuitry.

(c) Code field program panels.

(d) Route field program panels.

(e) Translator power supply.

(f) Time division power supply.

(g) Alternate route relays.

(h) Standby equipment.

(i) Translator transfer relays.

(j) Time division transfer relays.

Time Division Circuitry

5.03 The time division generator circuit produces timed battery and timed ground pulses (time slots) of approximately 100 microseconds duration. These pulses are sequentially applied to each register-sender and the translator monitor to activate the transfer of stored data from that unit to the translator. Each register-sender and translator monitor is allowed 80-microseconds in which to send data to and receive data from the translator. The remaining 20-microseconds of the time slot is a guard interval to prevent the transfer of false translator commands to the register-sender occupying the adjacent time slot. The time slot for a particular register occurs approximately 100 times each second.

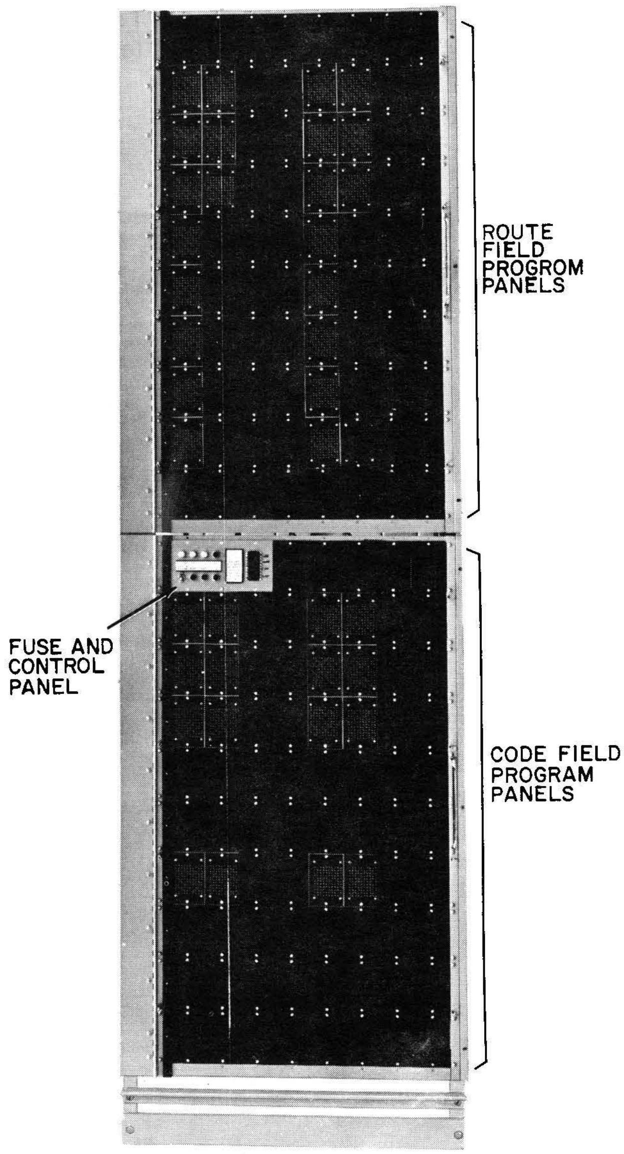

Figure 8. Translator, Front View (H-850216-A).

Translator Logic Circuitry

5.04 The translator logic circuitry consists of converters (AND gate and inverter combination), code circuits (AND gate and possibly an OR gate), route amplifiers, and route diodes. The logic circuitry receives the data from the register-sender and determines (according to the programming on the code field and route field program panels) the routing information and instructions which are to be sent to the register-sender. The amount of logic circuitry contained in the translator is determined by the needs of the office.

Code Field Program Panel

5.05 The code field program panels (Figure 8) provide the means for programming the translator logic circuitry to identify the codes received from the register-sender. The programming is accomplished by insertion of programming pins (Figure 11) into the appropriate cross section on the program panel (Figure 12). For detailed information pertaining to the programming of the translator, refer to Section 240-202-302.

Route Field Program Panel

5.06 The route field program panels (Figure 8) provide the means for programming the output codes to be sent to the register-sender. The programming is accomplished in the same manner as on the code field program panels.

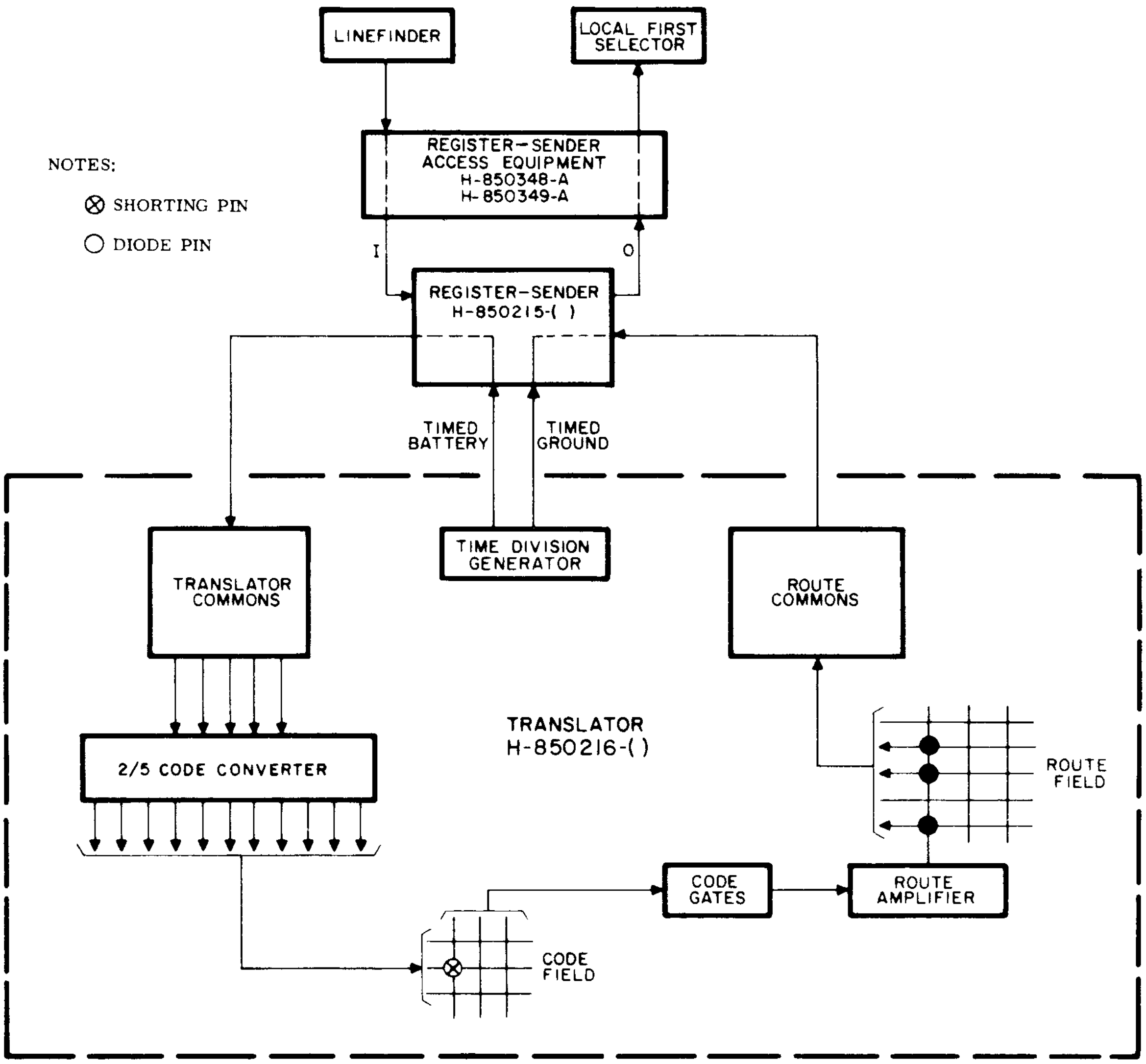

Figure 9. Translator Block Diagram.

Alternate Route Relays

5.07 Alternate route (AR) relays are provided to monitor the trunks on the selector banks. The AR relay operates from ground when at least one trunk, on its associated selector bank level, is idle. When an ATB condition exists, the associated AR relay releases and causes the call to be routed via the next alternate route instead of via the route that is busy.

Standby Equipment

5.08 Each translator is equipped with the following standby equipment:

(a) Time division circuitry (an integrated part of the primary time division circuitry).

(b) Translator logic circuitry.

(c) Code field program panels.

(d) Route field program panels.

(e) Alternate route relays.

5.09 With the exception of the time division circuitry, the standby equipment is directly connected together comprising a separate and complete (standby) translator. The standby translator logic circuitry and the standby time division circuitry each have their own separate power supplies.

5.10 Depending on the amount of translator logic circuitry and the number of route field and code field program panels used, the standby translator may be mounted on the same rack as the primary translator (if space allows). If the primary translator rack does not have enough room to mount the standby translator, the standby translator is mounted on a separate rack.

Translator Transfer Relays

5.11 When the translator monitor detects a malfunction in the primary translator logic circuitry, it causes the translator transfer relays to operate which place the standby translator into service. In the Type 101-A Director System, the translator transfer relays are mounted on the translator rack. In the Type 101-B and 101-C Director Systems, the translator transfer relays are mounted on the translator monitor rack.

Time Division Transfer Relays

5.12 When the translator monitor detects a malfunction in the primary time division circuitry, it operates the time division transfer relays (Figure 10). When operated, these relays disconnect the primary time division circuitry, and place the standby time division circuitry in service. The time division transfer relays, which are wire-spring relays with 51 break-make combinations, are mounted on the translator rack.

5.13 There are currently three types of translators being used with the 101 Director System. All three translators contain the same basic components, and perform the basic functions. The three translator types are briefly described below.

Type A Translator

5.14 The Type A translator (H-850216-A), is used with the 101-A Director System. The Type A translator is mounted on a 2 foot 6-1/2 inch wide steel rack that is either 9 feet 0 inches high or 11 feet 8 inches high.

5.15 The fuse and control panel (See Figure 8) on the Type A translator rack, mounts the following items:

(a) Lamp PARITY CHK (white), lights to indicate that the PARITY CHK switch is OFF.

(b) PARITY CHK toggle switch, when in the ON position supplies negative battery to the parity check circuit of the register-senders, and when in the OFF position disables the parity check circuits, lighting lamp PARITY CHK.

(c) Lamp PA1 (white), lights to indicate that a ground fault in the primary translator power supply has occurred, causing an alarm condition.

(d) Lamp PA2 (white), lights to indicate that a ground fault in the standby translator power supply has occurred, causing an alarm condition.

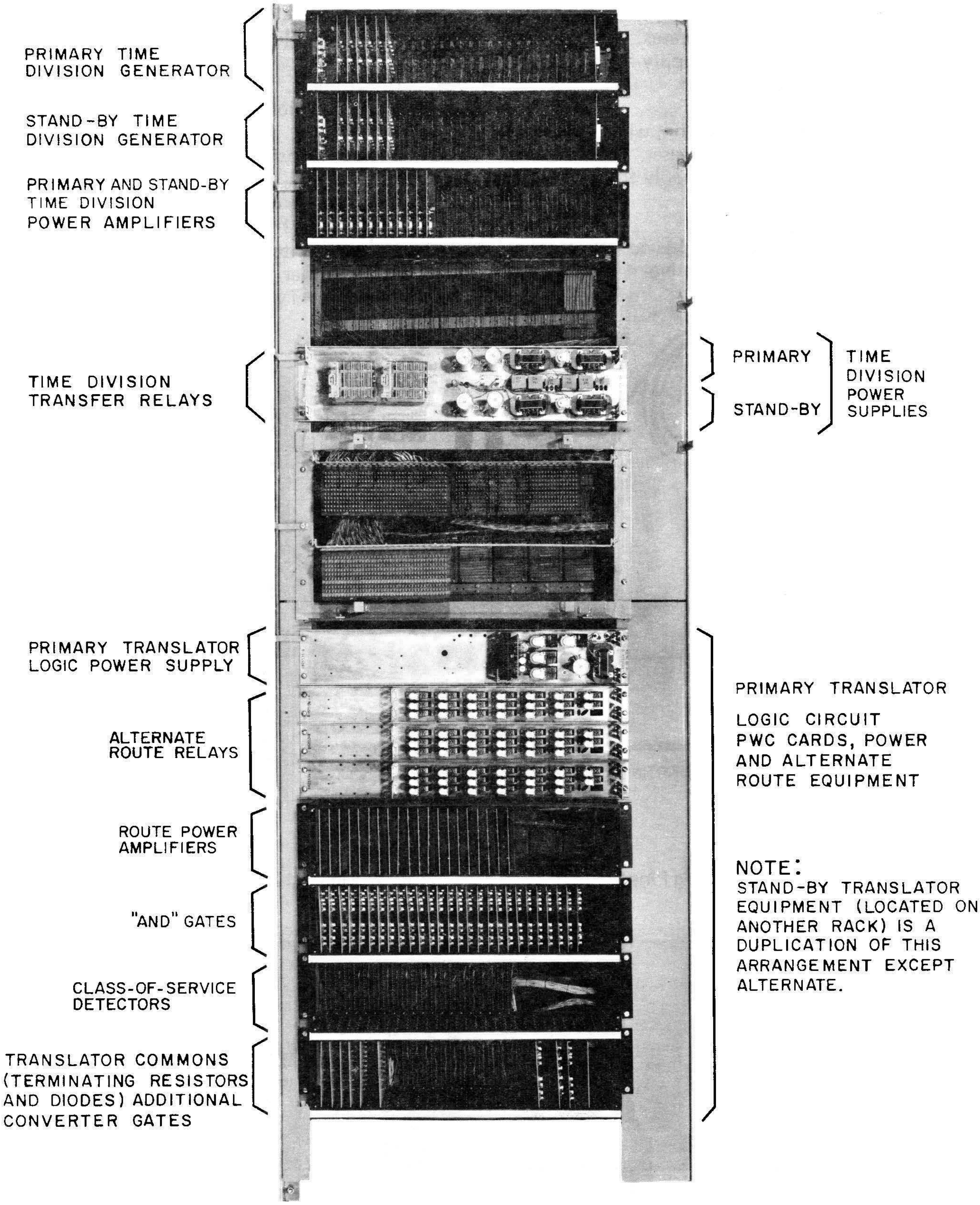

Figure 10. Translator, Rear View (H-850216-C).

(e) 1 RESET pushbutton, when depressed and released, releases the primary translator power supply from an alarm condition.

(f) 2 RESET pushbutton, when depressed and released, releases the standby translator power supply from an alarm condition.

(g) Lamp FB (red), lights to indicate that fuse No. 1, or fuse No. 4 through No. 10, has opened.

(h) Lamp FA (red), lights to indicate that fuse No. 2 or No. 3 has opened.

(i) Fuses, see Table 3 for values and functions of the fuses.

Type B Translator

5.16 The Type B translator (H-850216-B) is used with the 101-B director system. The Type B translator is mounted on a 2 foot 10-1/2 inch wide rack that is either 9 feet 0 inches or 11 feet 8 inches high. The Type B translator was designed to

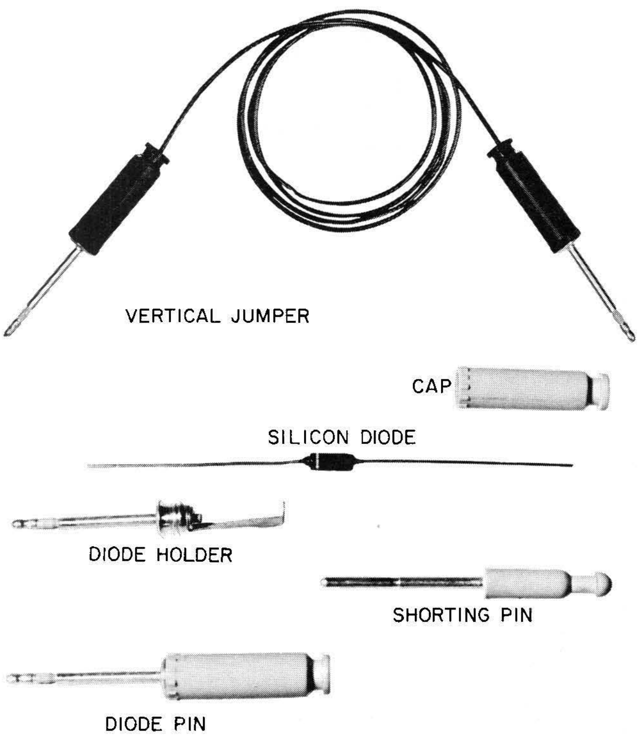

Figure 11. Programming Pins.

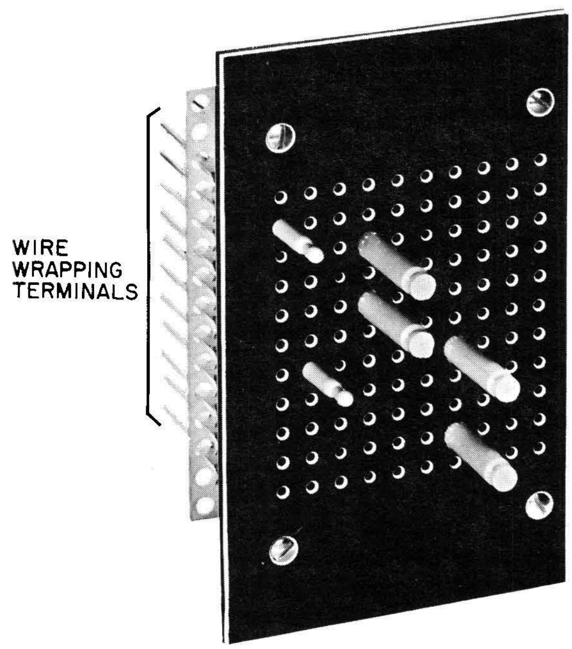

Figure 12. Program Panel.

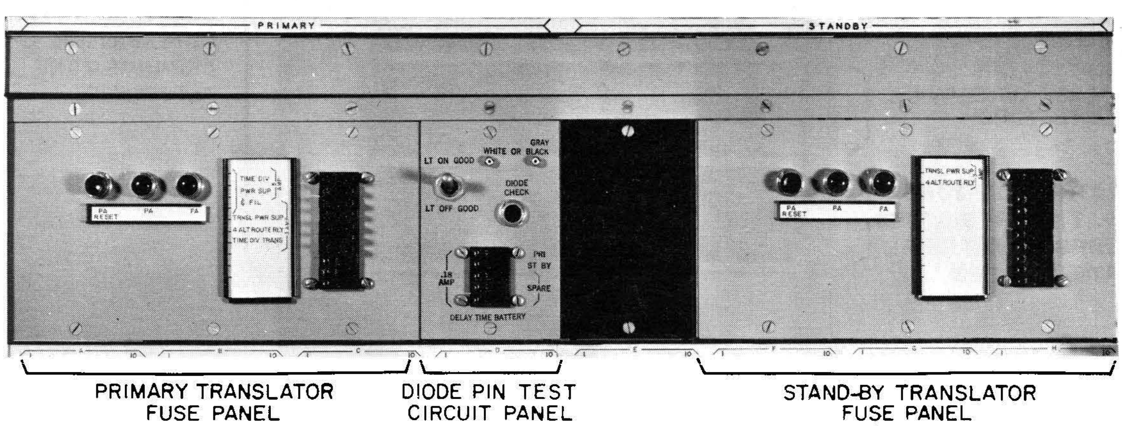

Figure 13. Fuse and Control Panel ("B" and "C" Translators).

supersede the Type A translator, and is more versatile and capable of meeting the needs of various offices.

5.17 The Type B translator is equipped with separate fuse and control panels, for the primary translator and the standby translator. Figure 13 illustrates the control panel on a combination translator rack (primary and standby translators mounted on a single rack). This control panel includes the primary translator fuse panel, the standby translator fuse panel, and a diode pin test circuit panel.

5.18 The primary translator fuse panel mounts the following items:

(a) Lamp PA (red), same as lamp PA1 on the Type A translator fuse panel.

(b) PA RESET pushbutton, same as 1 RESET pushbutton on the Type A translator fuse panel.

(c) Lamp FA (red), lights to indicate that a fuse on this panel has opened.

(d) Fuses, see Table 4 for the values and functions of the fuses.

5.19 The standby translator fuse panel mounts the following items:

(a) Lamp PA (red), same as lamp PA2 on the Type A translator fuse panel.

(b) PA RESET pushbutton, same as 2 RESET pushbutton on the Type A translator fuse panel.

(c) Lamp FA (red), same as lamp FA on the primary translator fuse panel.

(d) Fuses, see Table 5 for the values and functions of the fuses.

5.20 Mounted on the diode pin test circuit panel is a fuse strip. This fuse strip contains two .18 AMP fuses. These fuses supply negative battery to the primary and standby delay time battery circuits.

Type C Translator

5.21 The Type C translator (H-850216-C), is used with the Type 101-C Director System. The Type C translator is the most current translator, and was designed to supersede the Type B translator. The Type C translator's appearance, controls, fuses, and size are identical to the Type B translator. All changes made on the Type C translator were in condensing of the circuits, to allow more equipment to be mounted on the rack, and to give the translator greater flexibility to meet various office needs.

6. TRANSLATOR MONITOR

6.01 The translator monitor provides a means to continuously monitor the translator's performance. The monitor simulates a register-sender by sending information to the translator via the translator commons. The translator responds to the input data and returns routing information to the monitor via the route commons. The routing information returned by the translator is compared with the correct routing information, for that particular code, which is strapped to the banks of rotary switches in the monitor.

6.02 If the translated routing information is correct, the monitor will prepare to test the next routing digit. If the translated routing information is incorrect, the monitor initiates an alarm and transfers operation of the director system to the standby translator.

6.03 The translator monitor is provided an 80-microsecond time slot, as are the register-senders. If the monitor fails to receive timed battery and timed ground in its allotted time slot, it will signal an alarm and cause the director system to transfer to the standby time division circuitry.

6.04 There are currently two translator monitors being used with the 101 director system. These two monitors are briefly described in the following paragraphs.

Type A Monitor

6.05 The H-850217-A translator monitor (Figure 14) is used exclusively with the 101-A director system. The monitor mounts on the first register-sender rack in the office, in the space allocated for one register-sender. The control keys and lamps are located on the left side of the monitor; all other monitor components are located behind the dust cover. Table 6 lists the monitor lamps and controls, and their functions.

6.06 The Type A translator monitor is capable of sending a maximum of 25 different codes to the translator. Additional Type 45 rotary switches may be provided, on an optional basis, to increase the capability to a maximum of 100 codes. For more detailed information on the H-850217-A translator monitor, refer to Section 240-202-103.

Type B Monitor

6.07 The H-850217-B translator monitor (Figure 15) is used with the 101-B and the 101-C director systems. The Type B monitor is mounted on a 28-2/5 inch wide steel rack that is either 9 feet 0 inches high or 11 feet 8 inches high. This rack is of the RH mounting series.

6.08 The Type B translator monitor rack contains the following:

(a) Translator monitor common equipment; control apparatus for the translator monitor.

(b) Translator transfer relays (WS3-WS8); wire spring relays which transfer the director system to the standby translator, when a malfunction is detected in the primary translator.

(c) Translator transfer relays (WST1-WST4); wire spring relays which transfer the monitor to test the standby translator while the primary translator is in service.

(d) Common highway disconnect switches; provide for disconnecting the register-senders from the director system.

(e) Monitor lamp and control panel; refer to Table 7 for a list of the monitor lamps and controls, and their functions.

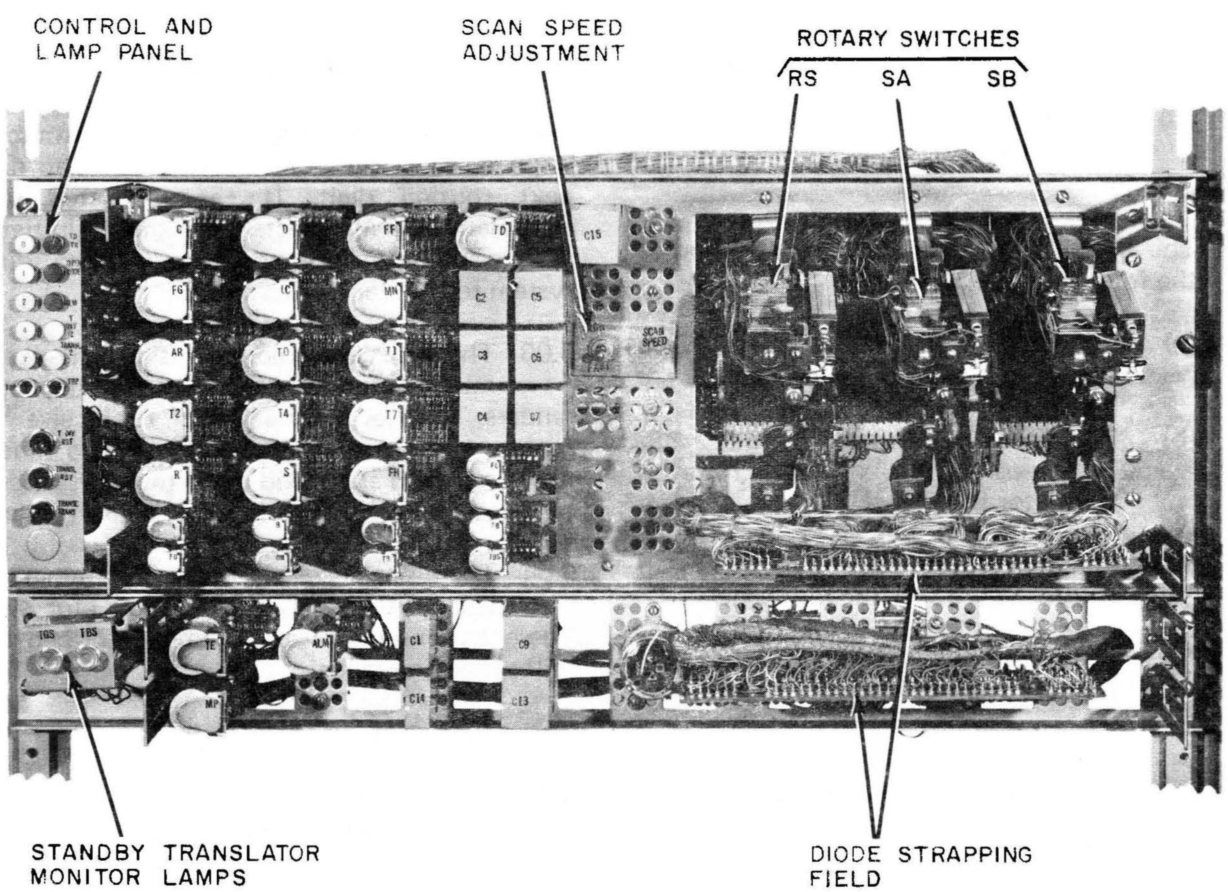

Figure 14. Translator Monitor (Type A).

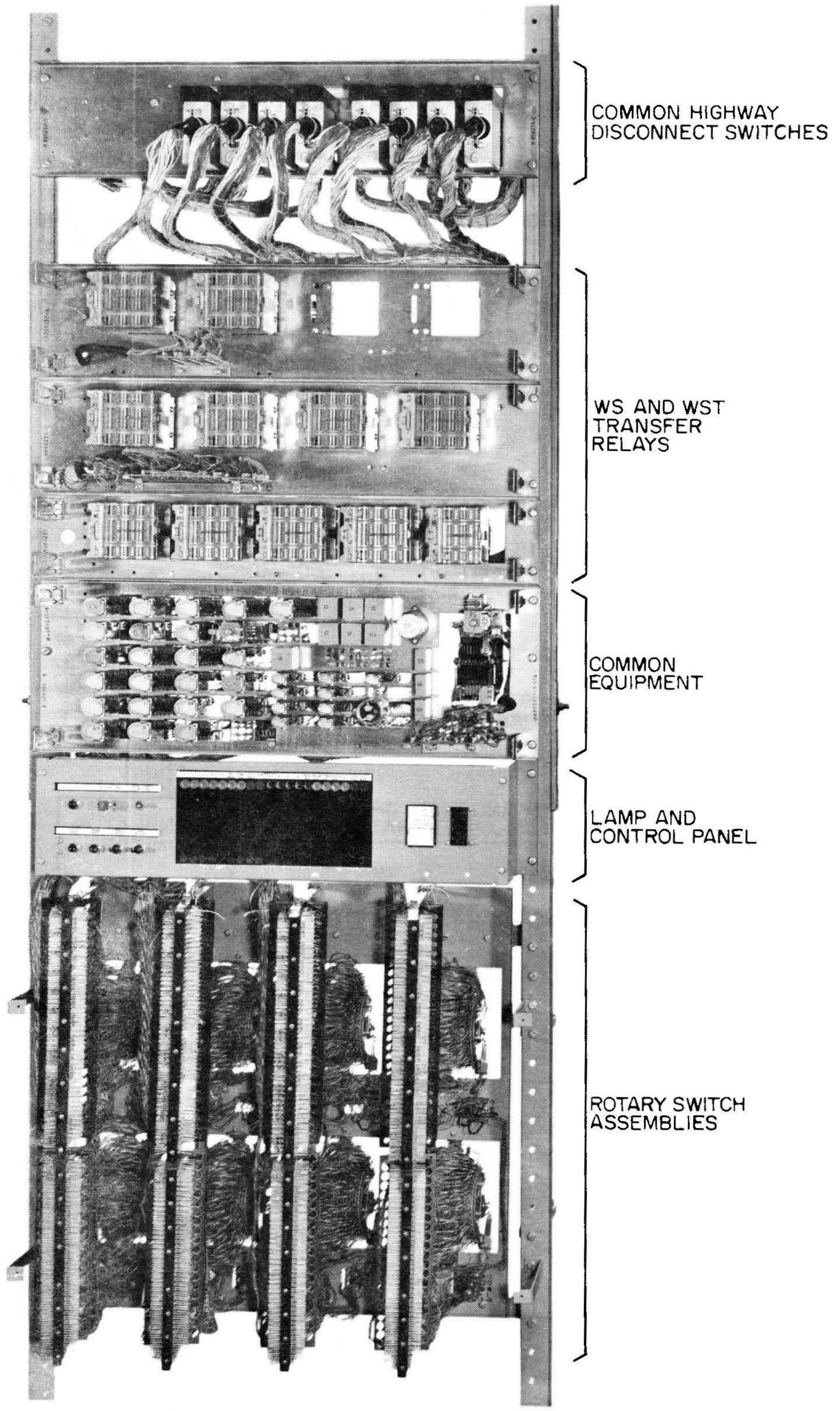

Figure 15. Translator Monitor (Type B).

6.09 The Type B monitor is initially equipped to send up to 50 codes to the translator. A maximum of 300 codes can be obtained by the addition of Type 45 rotary switch assemblies. Each additional rotary switch assembly will allow the sending of 25 additional codes.

6.10 The Type B monitor is equipped to test the standby translator, while the primary translator is still in service. Strapping options provide for programming the monitor to test the primary translator a predetermined number of times, and then test the standby translator once. For more detailed information on the H-850217-B translator monitor, refer to Section 240-202-104.

7. MULTIPLE WIRE HIGHWAYS

7.01 Two major wire highways are used to transmit information between the translator and the register-senders. All the leads on these two highways are common to each register-sender (See Figure 16). The translator commons carry information from the register-sender to the translator. The leads of the translator commons are shielded to prevent false triggering of the transistorized gates within the translator. The information carried by the translator commons is in a two-out-of-five (2/5) code. The route commons carry routing information and instructions from the translator to the register-sender. The routing information is in a 2/5 code, and the instructions are in a 3/5 code.

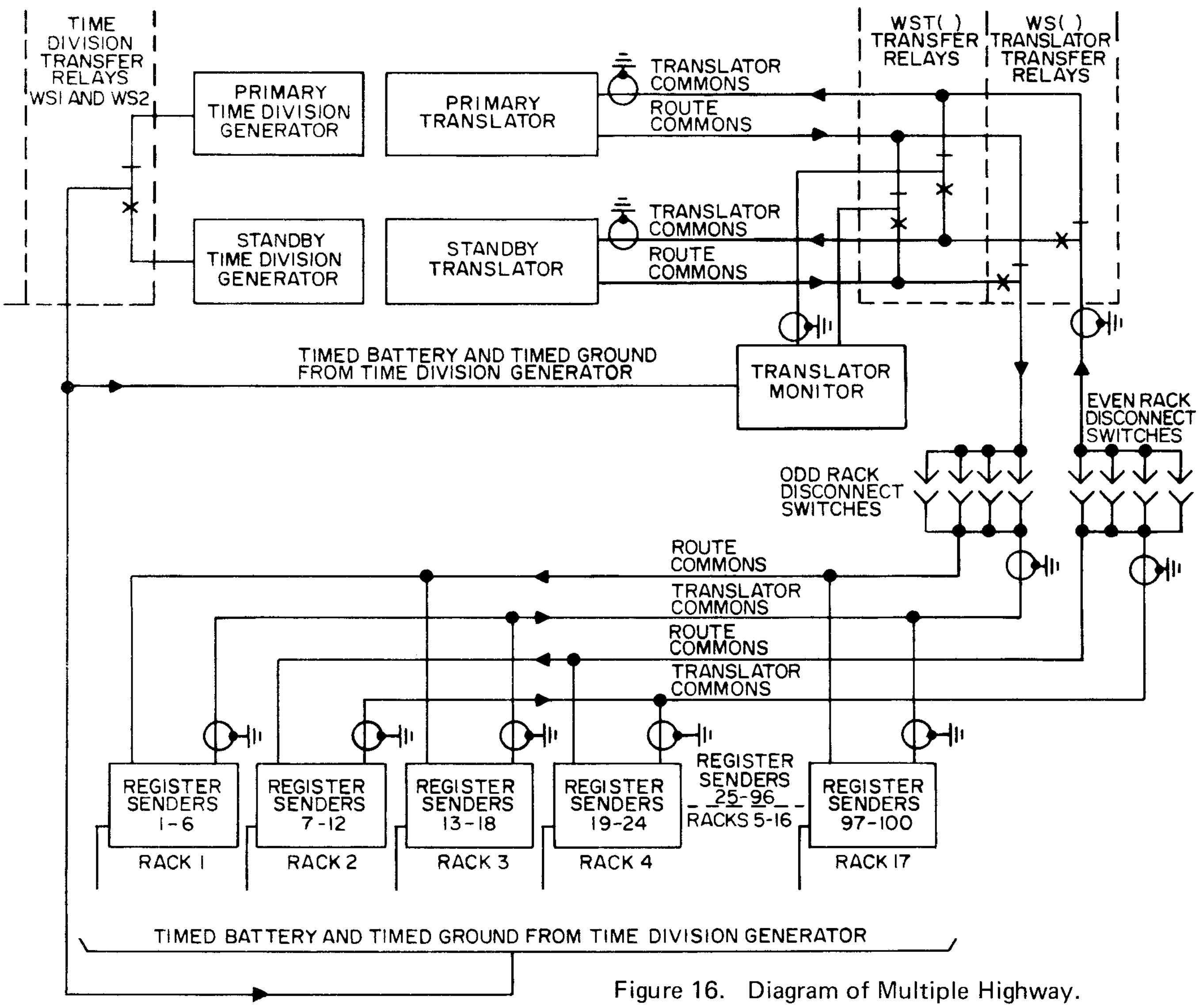

Figure 16. Diagram of Multiple Highway.

7.02 The multiple wire highways leads of each register-sender mounted on a rack are cabled together and terminate at connectors mounted at the top of the rack. Each odd numbered rack is multipled together and each even numbered rack is multipled together. The odd numbered racks and the even numbered racks multiple together and to the translator at disconnect switches mounted on the translator monitor (See Figure 15).

7.03 In the 101-B and the 101-C director systems, each register-sender has its individual disconnect switches located on the rear of the register-sender (See Figure 17).

8. TOUCH CALLING RECEIVER

8.01 When the director system is to service touch calling traffic, each register-sender must be provided with a touch calling receiver. The receiver converts the incoming tone pairs from the touch calling telephones to two-out-of-five (2/5) coded dc ground marks, corresponding to the keyed incoming digit. The tone pair conversion, to digital marks, enables proper digit storage in the same manner as for dialed digits.

8.02 If the director system is using the H-850215-A or H-850215-B register-sender, the touch calling receivers are mounted separately. Two receivers are mounted per card file (Figure 18). If the H-850215-C register-sender is used, the touch calling receiver is an integrated part of the register-sender (See Figure 7). For more detailed information on touch calling service refer to Section 945-060-040.

9. SUPERVISORY CIRCUITS

9.01 The register-sender supervisory circuits (Figure 19) are mounted on a gray enameled steel mounting base. This mounting base measures 27-3/5 inches wide and 5 inches high. Each supervisory circuit assembly contains the equipment necessary to supervise up to seven register-senders. One supervisory circuit assembly is mounted at the top of each register-sender rack.

9.02 On the front of the supervisory circuit assembly, in an area not concealed by the dust cover, are the lamps, controls, and fuses of the supervisory circuit. These items and their functions are as follows:

(a) Lamp FA (red): Lights to indicate an open fuse.

(b) Lamp EA1 (red): Used for special applications only.

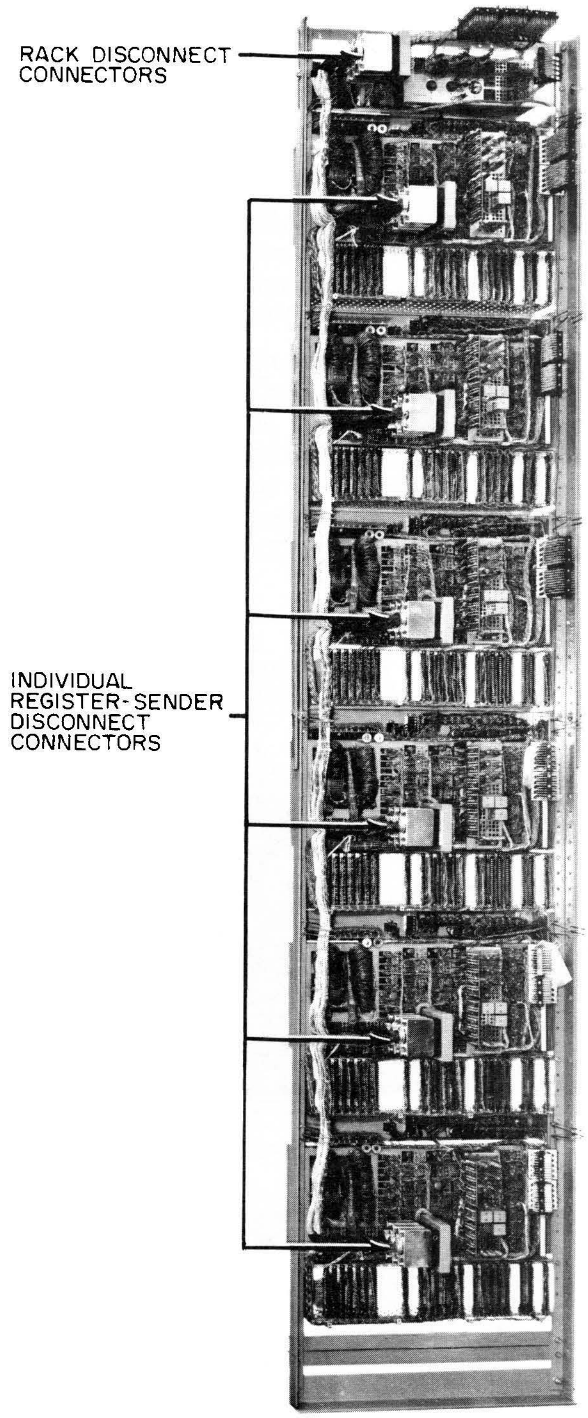

Figure 17. Type "C" Register-Sender Rack (Rear View).

(c) Lamp EA (red): On first rack only - lights to indicate that a critical number of register-senders within the office are in an alarm condition.

(d) Lamp MA (amber): Lights to indicate that a register-sender on the rack, is in an alarm condition.

(e) Switch LP CUT OFF: When operated prevents any SUPY lamps, on register-senders mounted on this rack, from lighting.

(f) Fuses: Supply fused negative battery to the register-senders, supervisory circuits, and optional lamp panel if mounted on this rack.

9.03 The supervisory circuit shown in Figure 19 illustrates 30 fuse positions. Earlier versions of the supervisory circuit assembly only had 20 fuses. The extra fuses were added to accommodate the optional alarm panel and the touch calling receiver which is an integral part of the latest register-sender (H-850215-C).

10. TEST FRAME

10.01 An optional test frame (Figure 20) is available for the Series 100 Director System. The function of this test frame is to check for proper call processing and to measure the pulse generator and MF sending parameters for all register-senders. It performs these tests by simulating all necessary conditions to check the input and output loops of the register-sender and the operation of the register-sender with customer line and TDM (time division multiplex) class of service marks. For more detailed information on the test frame, refer to Section 240-202-105.

11. COMPARISON OF SYSTEM TYPES

11.01 The original director system has been changed to meet the demands for new and improved service. These changes, primarily in the register-sender and translator, have resulted in different type designations (H-850215-A, B, and C). A comparison of the basic differences of these types is outlined in Table 8.

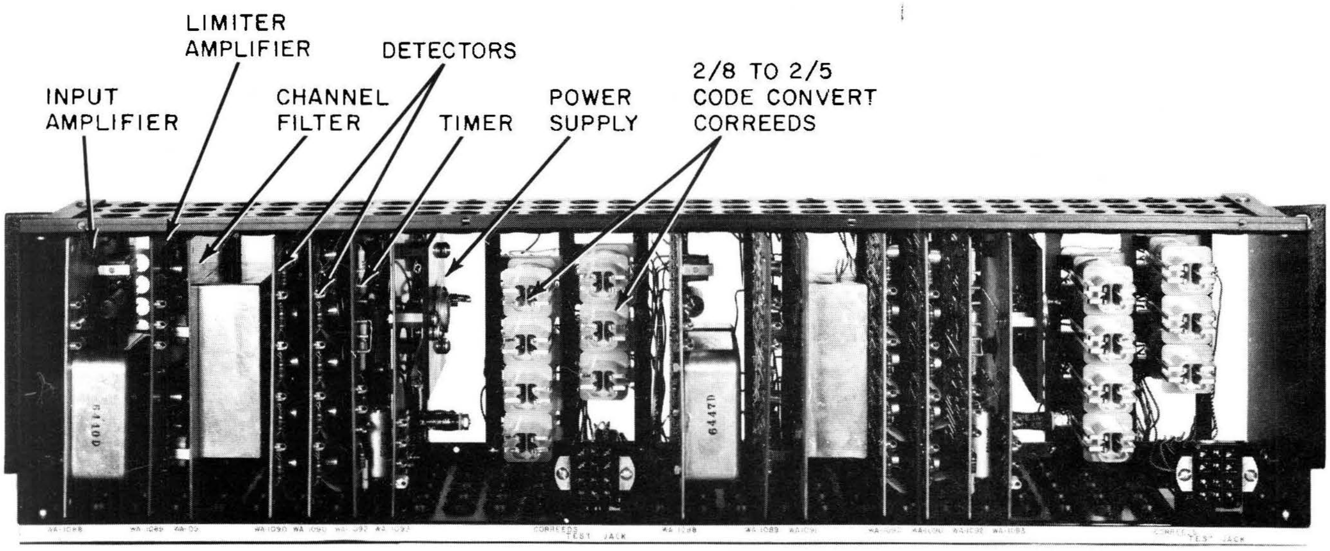

Figure 18. Card File, Two Touch Calling Receivers Mounted.

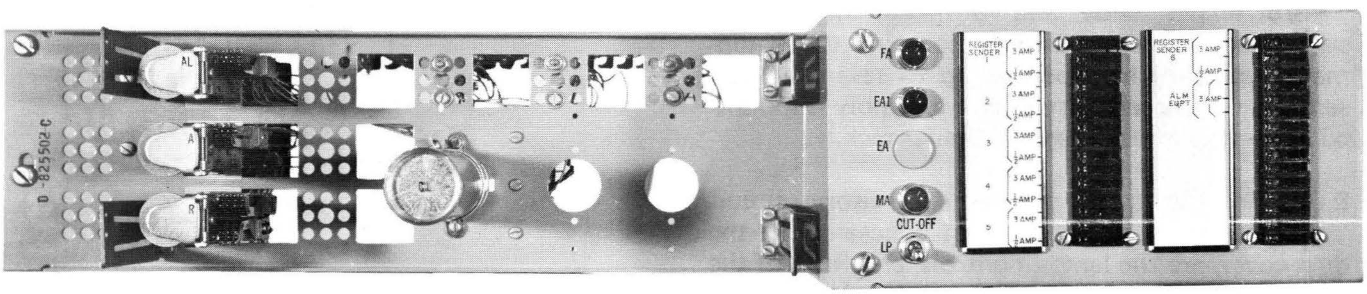

Figure 19. Supervisory Circuit Assembly.

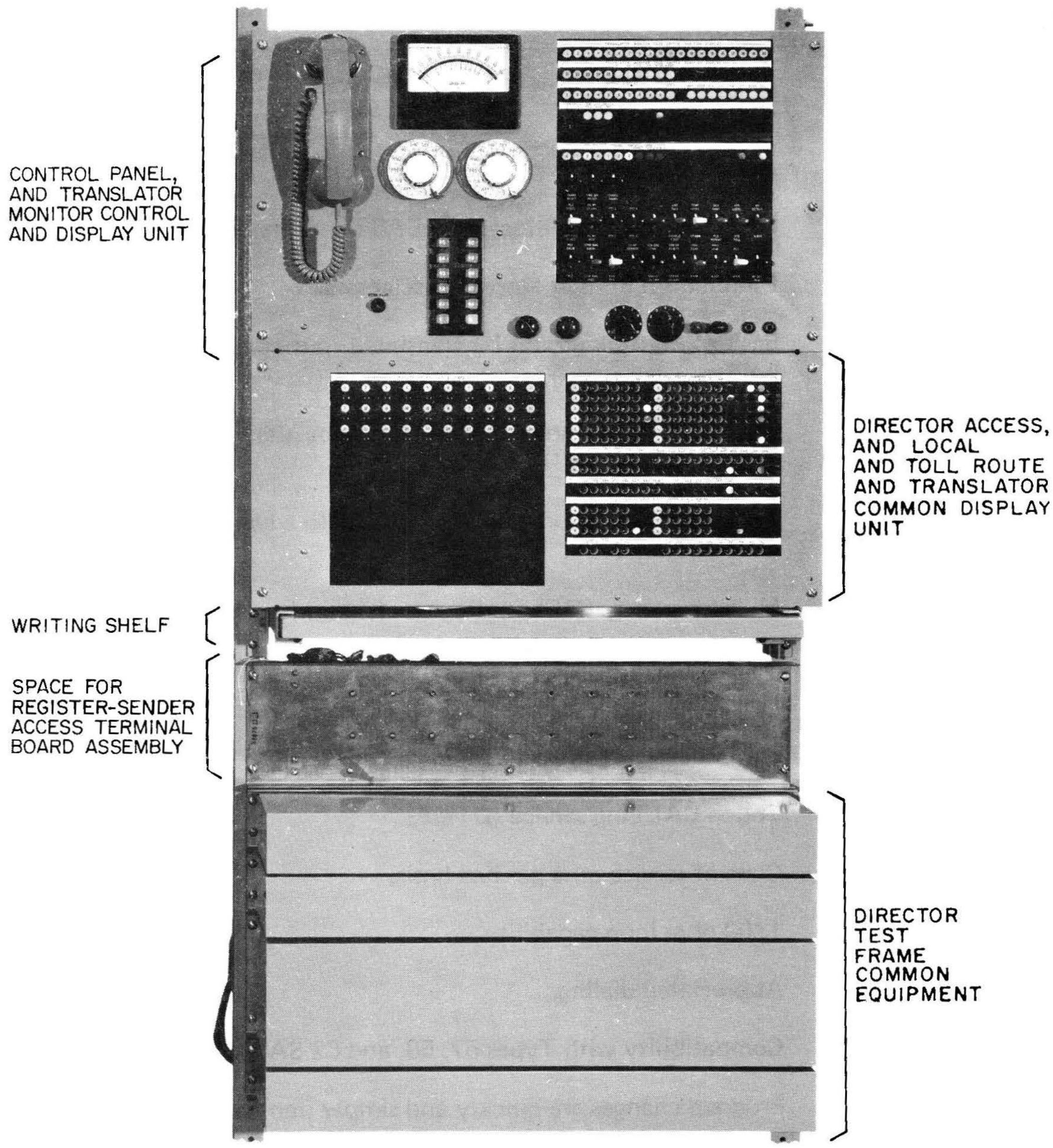

Figure 20. Typical Test Frame Used With Series 100 Director Systems.

Table 1. Basic Office Features of the 101 Director System.

FEATURE	DESCRIPTION
1.	Expansion of an Extended Area Service (EAS) network to include additional offices.
2.	Extended Area Service of a per-line basis.
3.	Universal seven digit local and EAS directory number dialing.
4.	Elimination of digit absorbing selectors.
5.	Savings in trunk groups by translated routing through tandem points.
6.	Savings in the number of trunks by using alternate routing to carry overflow traffic.
7.	Sending of a full complement of digits to a connecting office when required.
8.	Multifrequency (MF) sending to offices when needed.
9.	Flexibility to introduce single-digit SATT access codes (1+DDD and 0+EDDD).
10.	Standardization of special service codes.
11.	Touch CALLing service (DTMF).
12.	Class of service on a per-line basis.
13.	1700 ohm loop capability.
14.	Abbreviated dialing.
15.	Compatibility with Types 57, 59, and 62 SATT systems.
16.	Program changes are quickly and simply implemented.
17.	Second dial tone available for use with PABX's.
18.	Compatible with large or small offices.

Table 2. Additional (METRO) Features.

FEATURE	DESCRIPTION
1.	Optional EAS capability with uniform "1".
2.	Increased MF routing capability.
3.	Provides up to a maximum of three alternate routes.
4.	Interfacing with TSPS (Traffic Service Position System).
5.	Emergency calling (911).
6.	Capability of working in extremely large EAS networks.
7.	Future provision for international calling (01 prefix).

Table 3. A Translator Fuses.

Fuse	Value	Negative battery supplied to
1	1 AMP	Lamp FA
2	1 AMP	Primary time division power supply
3	1 AMP	Standby time division power supply
4	1-1/3 AMP	Alarm lamp panel
5	3 AMP	Alternate route relays
6	3 AMP	Transfer relays
7	3 AMP	Primary translator power supply
8	3 AMP	Standby translator power supply
9	3 AMP	Register alarm panel
10	5 AMP	Time division power supply

Table 4. Primary Translator Fuses.

Fuse	Value	Negative battery supplied to
1	5 AMP	Time division filter circuit (odd)
2	5 AMP	Time division filter circuit (even)
3	3 AMP	Primary time division power supply
4	3 AMP	Standby time division power supply
5	3 AMP	Primary translator power supply
6	3 AMP	Primary alternate route relays
7	3 AMP	Time division transfer relays
8		
9	Spares	
10		

Table 5. Standby Translator Fuses.

Fuse	Value	Negative battery supplied to
1	3 AMP	Standby translator power supply
2	3 AMP	Standby alternate route relays

Table 6. Type A Translator Monitor Controls and Lamps.

Component	Function
0,1,2,4,7 Lamps	Two- or three-out-five code-checking lamps light to provide a visual display of the returned translated code.
ALM Lamp	The ALM alarm lamp lights to indicate nonstandard translator operation has been detected.
TD TR Lamp	The TD TR lamp lights in the event that a time division failure (or permanent condition) has occurred; the lamp is extinguished when transfer to duplicate time division generator equipment has taken place.
T DIV 2 Lamp	The Time Division 2 lamp lights when a time division generator failure (or permanent) has occurred, resulting in transfer to duplicate standby time division generator 2.
TBP, TGP Lamps	The TBP and TGP lamps monitor timed battery and timed ground, respectively, from the translator primary time division generator.
TBS, TGS Lamps	The TBS and TGS lamps monitor timed battery and timed ground, respectively, from the translator standby time division generator.
TRANSL 2 Lamp	The Translator 2 lamp lights if a transfer to the duplicate translator (2) takes place.
SCAN SPEED Switch (Toggle)	Controls rate of RS scan.
SLOW	Normal scan speed for continuous 24-hour operation.
FAST	Accelerated scan speed for testing.
T DIV RST	The Time Division Reset key is a non-locking push key used to manually transfer to either standby or primary time division generator, as required.
TRANSL RST	The Translator Reset key is a non-locking push key used to manually transfer from the duplicate standby translator to the primary translator.
TRANSL TRANS	The Translator Transfer key is a locking turn key used to manually transfer to either standby or primary translator.

Table 7. Type B Translator Monitor Controls and Lamps.

CONTROL	FUNCTION
Scan Speed (Toggle Switch)	Controls scan speed of rotary switch RS.
SLOW FAST	Normal scan speed Accelerated scan speed for testing.
TIME DIV RST	Manual transfer from standby time division generator to primary time division generator.
TRANSL RST	Manual transfer from standby translator to primary translator.
TRANSL TRANS	Manual transfer to either standby or primary translator.
Transfer Test Control	The transfer test control is a locking lever key used to check the off-line translator.
DEL	Translator monitor will DELay the start of off-line translator testing until the on-line translator test cycle in progress is completed.
NOR	Translator monitor is in NORmal mode and will transfer test cycle from on-line translator to off-line translator after a predetermined number of tests.
IMD	Translator monitor will IMmeDiately start testing the off-line translator, regardless of what the on-line testing status is.
CODE RECHECK	When operated will prevent rotary switch RS1 from stepping off the bank contacts corresponding to the code being checked.
LAMPS	**FUNCTION**
0,1,2,4,7	Provides a visual display of the translated code returned by the translator.
MTT Mode	Lights to indicate that key TRANSL TRANS is operated.
TIME DIV	Lights to indicate a transfer to the standby time division generator.
TD TRANS	Lights to indicate that a time division failure has occurred, and that transfer to the standby time division generator has not occurred.
ALM	Lights to indicate that non-standard translator operation has been detected.
TGP, TBP	Lights to indicate that timed ground and timed battery, respectively, is being received from the primary time division generator.
TGS, TBS	Lights to indicate that timed ground and timed battery, respectively, is being received from the standby time division generator.

Table 7. Type B Translator Monitor Controls and Lamps (Continued).

LAMPS	FUNCTION
TRANSL ON LINE PRI	Lights to indicate that the primary translator is in service.
STBY	Lights to indicate that the standby translator is in service.
TRANSL ON TEST PRI	Lights to indicate that the primary translator is in the test mode.
STBY	Lights to indicate that the standby translator is in the test mode.
AR	Lights to indicate that the code being received from the translator is an alternate route.
ITB FAULT	Lights to indicate foreign potentials on the route commons.
ATT MODE	Lights to indicate that a fault has been detected in the primary translator, and the standby translator has automatically been put into service.
1-25	Lights to indicate the code switch (SB) position in a group of 25 codes.
X1-X4	Lights to indicate which group of 25 codes, within a particular hundreds group, the code switch is on.
+100	Lights to indicate that the code switch position is in the second group of 100 codes (101-200).
+200	Lights to indicate that the code switch position is in the third group of 100 codes (201-300).
A-M	Lights to indicate which route commons leads have been accessed.
1FAL 1-4	Lights to indicate which primary translator rack has an open fuse for the translator power supply.
2FAL 1-4	Lights to indicate which standby translator rack has an open fuse for the translator power supply.
FA	Lights to indicate an open fuse in the translator equipment.

Table 8. Comparison of Director Systems Features.

FEATURE	DIRECTOR SYSTEM 101-A	101-B	101-C
REGISTER-SENDER			
Routing capability	11 spaces available for digits and commands.	Same as Type A	With prefix digit card, 4 routes may be programmed and 2 attemped per call. Maximum of 3 routing digits per route if MF sending is used.
CLR (0-) calls	Timed period in R/S, No translation available on basis of line class.	Timed period in R/S, Translation is available on line class basis.	Same as Type B, plus capable of going to TSPS via MF.
International dialing	No provision	No provision	Provisions arranged for.
2/6 MF sending	Yes-includes capability of MF routing digits.	Same as Type A	(Non-Metro) Same as Type A (Metro) No MF routing digits.
Translator			
Route control marks	6 per translator rack	10 per translator rack	30 per translator rack.
Alternate route relays	Maximum of 12 per translator rack	Maximum of 40 per translator rack	Maximum of 60 per translator rack.
C lead subscriber class-of-service	15 classes	40 classes	80 classes