

SERVICE
550- AND 551-TYPE
1A2 KEY TELEPHONE SYSTEM
KEY SERVICE UNITS

1. GENERAL

1.01 This section provides identification, installation, connection, and maintenance information for the 550- and 551-type key service units (KSUs). The information pertaining to the 550A, 551A, 550B, and 551B KSUs was formerly contained in Sections 518-255-101 and 518-255-401. These units have been rated manufacture discontinued (MD) and replaced by the 550C and 551C KSUs. Information required for maintenance of existing installations of the MD-rated KSUs has been retained in this section.

1.02 This section is reissued to:

- Add information on the 415B key telephone unit (KTU)
- Change power supply to 28D2
- Provide information on new KS-22453 power cord tag
- Change information on grounding requirements.

1.03 This issue of the section is based on the following drawings:

SD-69477-01, Issue 8A

CD-69477-01, Issue 4B

If this section is to be used with equipment or apparatus reflecting later issues of the drawings, reference should be made to the SD and the CD to determine the extent of the changes and the manner in which the section may be affected.

1.04 Incoming central office (CO) lines to be installed in compliance with the Federal Com-

munications Commission (FCC) Registration Program must be routed through a standard network interface. Information on approved interfaces is contained in Section 461-604-105, entitled Connecting Blocks, 66M3-50R—Identification, Installation, and Maintenance.

1.05 ♦After January 1, 1980, a 415B KTU must be used when furnishing the automatic, dc signaling, private line feature in these units.♦

2. IDENTIFICATION

2.01 Purpose: A 550- or 551-type KSU provides a factory-wired 1A2 key telephone system (KTS) package arranged to mount four of the following KTUs:

400-type (CO or PBX Line Circuit)

Note: The 400H KTU is AT&TCo Standard; the 400G, 400D, and earlier KTUs are rated MD.

401-type (Manual Intercom Line Circuit)

415-type (Automatic, DC Signaling, Private Line Circuit)

467A (Low-Voltage Monitor Circuit).

2.02 Application

- 1A2 KTS installations.

2.03 Ordering Guide

(a) **Basic Units (Fig. 1):**

- Unit, Service, Key—550C (for installations where suitable external source of required talk and signal voltages is available)

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SECTION 518-215-407

- Unit, Service, Key—551C (built-in power unit).

(b) *Replaceable Components:*

- Interrupter, KS-19175, List 1—furnished with 550- and 551-type KSU (requires 10-volt ac motor supply)
- Unit, Power, J86738A, List 1 (MD)—furnished with 551A KSU (MD)
- Unit, Power, 28A1—furnished with 551B KSU (MD)
- Unit, Power, 28D2—furnished with 551C KSU
- Lamp, 51A
- Fuses, Bussman, MDL-1 (1 ampere, one per power unit)
- Fuses, 24E (1/2 ampere, three per power unit)
- Fuses, 24B (3 ampere, one per power unit)
- ♦Tag, Cord, Power—KS-22453.♦

(c) *Replaceable (Optional) Components:*

- Interrupter, KS-19385, List 1 (MD) (requires 24-volt dc motor supply)
- Interrupter, KS-19385, List 2 (requires 24-volt dc motor supply)
- Generator, Frequency 118A—for use with 550B, 550C, 551B, and 551C KSUs; 105-volt ac ringing supply (supplied with three mounting screws)
- Bracket, Mounting, 841720857—for mounting 118A frequency generator on 550/551C KSU
- Kit of Parts, D-180699—for mounting 118A frequency generator on 550/551B KSU.

(d) *Associated Apparatus (order separately):*

- Cord, Power, 834167652, 1-1/2 feet*
- Cord, Power, 824013262, 1-1/2 feet†

- Cord, Power, 834167660, 2 feet*
- Cord, Power, 824013270, 2 feet†
- Cord, Power, 834167678, 4 feet*
- Cord, Power, 824013288, 4 feet†
- Cord, Power, 834167686, 6 feet*
- Cord, Power, 824013296, 6 feet†
- Cord, Power, 824010995, 12 feet†
- Plate, Adapter, 814862611‡

*For 551A KSU (MD).

†For 551B KSU (MD) or 551C.

‡For mounting two single width or one double width 1A KTS angle bracket-type KTUs in 550-type KSU.

Order required combination of up to four of the following KTUs, subject to specified limitations:

- Unit, Telephone, Key, 400H (maximum of four)
- Unit, Telephone, Key, 401-Type (maximum of four)
- Unit, Telephone, Key, 415-Type (maximum of three)
- Unit, Telephone, Key, 467A (maximum of one)

2.04 *Design Features*

- 550-type KSUs do not have internal power units, while 551 types are factory-equipped with plug-in power units:

551C—28D1 (MD) or 28D2 Power Unit

551B (MD)—28A1 Power Unit

551A (MD)—J86738A, List 1 Power Unit (MD).

- The basic KSU assembly contains four jacks for 400-series KTUs, two separate jacks for a

plug-in KS interrupter and a plug-in power unit, and a factory-wired connecting block with "quick-clip" terminals.

- All external connections are made on front of connecting block.
- The 10-volt ac operated KS-19175, List 1 interrupter furnished with each KSU provides lamp flash, wink, and audible signal feature interruptions. It is a plug-in unit locked into place by a captive screw.
- A 24-volt dc operated KS-19385, List 1 (MD) or List 2 interrupter can be substituted for the one furnished with the KSU at locations where only 24-volt dc power is available.
- Intended for vertical mounting on a wall or other suitable surface.
- Protective front and back covers provided.
- 550C and 551C have line status lamps which display the same signals as the line lamps at associated stations.
- 550C and 551C are 17.18 inches high, 9.7 inches wide, and 7.12 inches deep.
- 550B/551B (MD) and 550C/551C can be equipped with a 118A frequency generator which provides power for operating ringers at associated stations. Earlier type KSUs must be connected to an external ringing supply.
- Common audible signaling can be provided by appropriate strapping on the connecting block.

3. INSTALLATION AND CONNECTIONS

3.01 The information in paragraphs 3.02 through 3.17 applies specifically to the 550C and 551C KSUs, and also to the 550A, 551A, 550B, and 551B KSUs (all MD), unless otherwise noted. Most new installations will involve the "C" KSUs, but the MD units will be encountered in existing installations. For methods of strapping and terminating wire and cable, refer to Section 461-604-100. Cables and wire must be brought into the 550C and 551C KSUs from the bottom. Clamps are provided for retaining the

power, line, and station cables. Dress wires along the sides of the connecting block. In the "A" and "B" KSUs, cable and wire may enter from top or bottom.

A. Installation

3.02 Mounting: Mount the KSU on a clean, firm, dry, vertical surface where it is easily accessible for service (mounting hardware to be obtained locally depending on mounting surface). If the KSU has a built-in power unit or if it is to be equipped with a 118A frequency generator, it must be located within cord length of a grounded 117-volt 60-Hz power outlet provided by the customer (see *Ordering Guide* for cord lengths). The outlet should be separately fused and not under the control of a switch. A KSU without built-in power unit should be mounted as close as possible to the separate telephone company power source.

Warning: *Do not connect the KSU to external power until all other wiring is complete and all KTUs are installed.*

3.03 External AC Power Cord: An external ac power cord is required with all 551-type KSUs and with any KSU equipped with a frequency generator.

Note: ♦A KS-22453 power cord tag should be snapped on the ac power cord at the ac receptacle.♦

(a) **550/551C KSUs:** Open the cable clamp in the lower left corner of the KSU and insert the receptacle end of the external power cord into the trough; secure the cord with the clamp.

(b) **551B KSU (MD) Only:** The 551B KSU is shipped with its power unit cord carried through an insulating grommet in the bottom of the KSU case. To install an external power cord:

- (1) Compress the grommet to release it from the case.
- (2) Remove the grommet from the internal power cord.
- (3) Insert the receptacle end of the external power cord through the cutout in the housing where the grommet was removed.
- (4) Place the grommet around the external power cord.

- (5) Seat the grommet in the cutout, again from inside the case.
- (6) Connect the external power cord to the power unit cord.



Inspect existing installations of 551B KSUs for improper installation of grommets and power cords (ie, grommet around power unit cord). Correct where necessary.

- (c) **551A KSU (MD):** Connect the external power cord to the power unit cord through the cutout in the bottom of the KSU case.

3.04 Frequency Generator: Install the 118A frequency generator on the 550/551C KSU as described in (a) or on the 550/551B as described in (b). Connect as described in paragraph 3.07.

- (a) Attach the generator to the mounting bracket (841720857) with the three screws supplied (Fig. 1). Snap the pins of the bracket arms into the holes in the backboard flanges of the KSU. Let the generator rest against the front of the interrupter with its power cord to the left. Connect the feed-through type plug to the external ac power cord and, if the KSU is a 551C, to the power unit cord.

- (b) To mount a 118A frequency generator on a 550/551B KSU, first install D-180699 Kit of Parts. Remove the cable clamp provided with the KSU and replace it with the one in the kit. Mount the bracket on the door of the KSU as shown in Fig. 2. Attach the frequency generator to the bracket with the three screws supplied with the generator. Connect the feed-through type plug to the external ac power cord and, if the KSU is a 551B, to the power unit cord [see paragraph 3.03(b) for instructions on positioning the grommet].

B. Connections

3.05 Table A provides a key to the connection diagrams in this section for the various models of the 550/551 KSUs.

3.06 Internal Power: The 551-type KSUs have built-in, factory-wired power units, and normally require no internal power wiring by the installer unless 105-volt ac ringing voltage is required (see paragraph 3.07 for details). The KSUs of the

NOTE:
550C KEY SERVICE UNIT IS SAME AS 551C EXCEPT IT DOES NOT HAVE POWER UNIT.

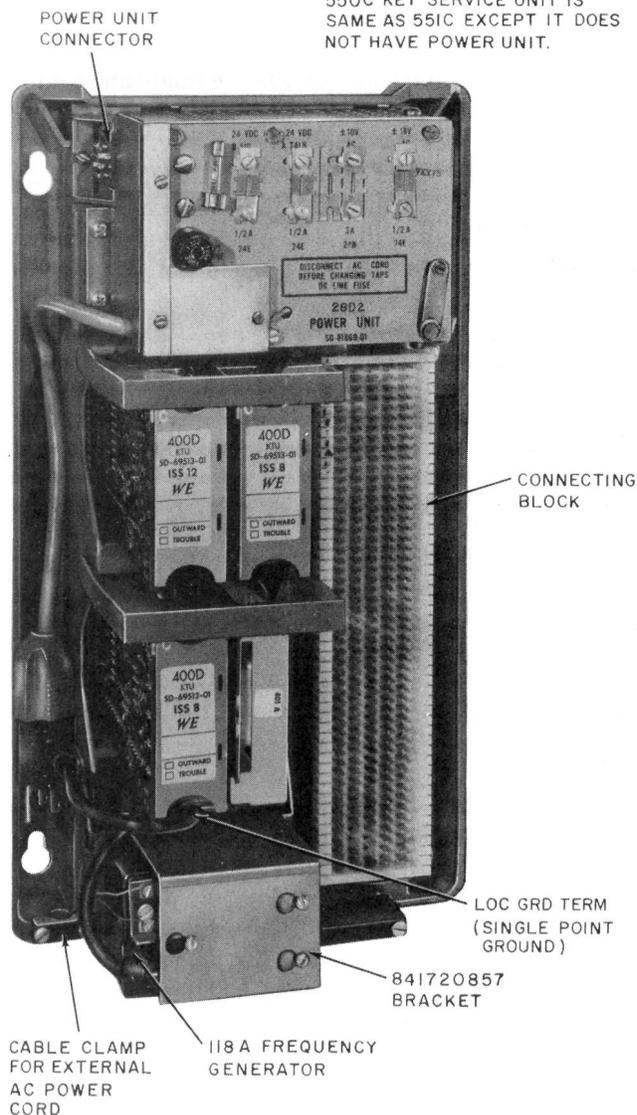


Fig. 1 — 551C KSU With Frequency Generator

550-type must be wired to a suitable external power supply for all operating voltages. Make all external power lead connections to the terminals in the D or E columns on the front of the connecting block.



If an external power source is to be used, be sure that it can supply the minimum 20-volts dc signal battery required by 400-series KTUs. If it cannot, convert the KSU to a

TABLE A
CONNECTION DIAGRAM INDEX

	550/551C	550/551B(MD)	550/551A(MD)
Terminal Layout with Station and Line Connections	Fig. 3	Fig. 4	Fig. 4
Power Connections	Fig. 5	Fig. 6	Fig. 7
Common Audible Connections	Fig. 8	Fig. 10	Fig. 10
Common Audible Auxiliary Control Connections	Fig. 9	Fig. 11	Fig. 11
Manual Intercom Connections	See 3.11	See 3.13	See 3.13
Lead Designations	Fig. 12	Fig. 12	Fig. 12

551-type by installing an appropriate power unit (see Ordering Guide).

3.07 Audible Signaling Voltage: Audible signaling can be provided at the stations associated with the KSU on either the ringer or the buzzer at each telephone set. Ringer voltage must be supplied from a separate 105-volt ac source, such as the 118A frequency generator, connected to the RG and RB terminals on the front of the connecting block. Buzzer voltage can be derived from the 18-volt ac audible signal supply available at the internal or external power unit. Connect buzzer voltage by installing straps from terminals G \pm and S \pm to RG and RB, respectively.

Warning: Do not use the 18-volt ac supply to operate KS-20419, L1 buzzer supplied in key telephone sets. Doing so will result in damage to the buzzer. If KS-20419, L1 buzzers are to be used, strap the RG and RB terminals to the LG and LB terminals, respectively (10-volt ac lamp power supply).

3.08 Common Audible: This feature allows multiple stations to receive incoming call signals from the same line and a single station to receive sig-

naling from several lines. Common audible signaling is provided by strapping together the appropriate R1 leads at the connecting block and wiring signaling voltage to the RG and RB terminals. Auxiliary control of common audible signaling is possible through the use of a separately mounted 227-type or 421A KTU wired to the connecting block.

3.09 Line Connections: Connect the incoming CO/PBX lines to the T-R terminals (43 to 50) in the A column of the connecting block. The KSU can accommodate a maximum of four lines.

3.10 Station Connections: Terminate the station cables on the connecting block, the first cable on column A, the second on column B, etc. A maximum of five stations can be wired directly to the KSU. If more stations are required, use loop-through terminations or provide distribution facilities. Connect the ringer or buzzer leads of the station cables to the B1-R1 terminals.

C. Manual Intercom

3.11 This feature is provided by installing a 401-type KTU in the KSU. In early production models of the 550/551C KSUs, only jack J4 was factory-wired with the talk (A) battery and ground re-

quired for operation of the 401-type. Later models (indicated by an asterisk [*] stamped after the code on the KSU) are wired to accept a 401-type KTU in any of the four jacks.

3.12 The early models can be modified to accept a 401-type in another jack by disconnecting the green wires from terminals 3 (A GRD) and 18 (A BAT) of J4 on the back of the KSU, and transferring them to the same terminals of the desired jack.

3.13 On the 550/551A and B KSUs (MD), the talk battery terminals are factory-wired at each KTU jack, but only the BR-W/W-BR pair on J4 is wired back to the talk battery terminals on the connecting block. The pairs from the other jacks are dead dressed. To use a jack other than J4 for the manual intercom KTU, disconnect the BR-W/W-BR pair from the back of the connecting block, and connect the pair from the other jack as shown in Table B. Insulate and store the disconnected pair.

D. Grounding

3.14 Any installation of the 550/551-type KSU should be grounded and protected in accordance with the requirements in Section 518-010-105. The frame of the KSU power unit is grounded through the third, or "green," wire of its power cord. The local or circuit ground of the power unit, which is the positive side of the dc output, should be connected to the same ground as the system protector. **Do not connect circuit ground and frame ground together.**

3.15 The 550/551C KSU has an external grounding terminal, labeled LOC GRD, on the front of

the backboard above the interrupter. It is wired internally to the power unit ground circuit at the G± terminal of the connecting block. Connect this terminal to the single-point ground and the coupled bonding conductor to the protector ground. This must be a 12-gauge wire brought through one of the cable clamps below the connecting block. On 550/551A and B KSUs (MD), a multiple-post grounding terminal is located on the top of the connecting block. On 550-type KSUs, with external power supply, the LOC GRD must be connected to an approved ground through the single-point ground and the coupled bonding conductor.

3.16 Connecting of KTUs: Insert each KTU into its receptacle with a gentle, vertical rocking motion until it is firmly seated. Then lower the locking bar to hold the KTU in place.



Do not drive more than 20 line lamps from one 400-type KTU or more than 50 lamps from one interrupter contact.

3.17 External Power Connections: After all internal connections have been made, the KSU properly grounded, and the KTUs installed, connect the KSU to the required external power source.

4. MAINTENANCE

4.01 Maintenance activity on the 550/551-type KSUs should be limited to the following:

- Clearing wiring troubles
- Fuse replacement

TABLE B

MANUAL INTERCOM WIRING
550/551A AND B (MD) KSUs

CONNECT TALK BATTERY PAIR TO CONN BLOCK	TALK BATTERY PAIR			
	J1	J2	J3	J4*
550/551B { GA (F43) BA (F44)	W-BL BL-W	W-O O-W	W-G G-W	W-BR BR-W
550/551A { GA (F45) BA (F46)	W-BL BL-W	W-O O-W	W-G G-W	W-BR BR-W

* Factory-wired.

- Lamp replacement
- Replacement of defective KTUs, power units, interrupters, and frequency generators.

Note: Be careful when inserting or removing plug-in type KTUs to avoid damage to the printed wiring and other circuit components. Blister packs should be used when returning KTUs.

4.02 Interrupter Replacement: When replacing the KS-19175 10-volt interrupter with a KS-19385 24-volt type, either at initial installation or as a repair procedure, it is necessary to change the

connecting block wiring (see Fig. 5, 6, and 7). Remove the strap which supplies 10-volt ac to the motor lead (Fig. 5), and connect whatever wiring is required to supply 24-volt dc from internal or external supplies. The interrupter is removed by loosening the captive screw in the right center of the unit, and pulling it out of the plug.

4.03 Wire-Wrap Connections: The KS-16492, List 2 unwrapping tool should be used when removing solderless wrapped connections on line jack contacts, if required, for circuit testing. The 635B tool may be used to reterminate a wire on a wrapping terminal, but wires must be soldered when reconnected to ensure circuit reliability.

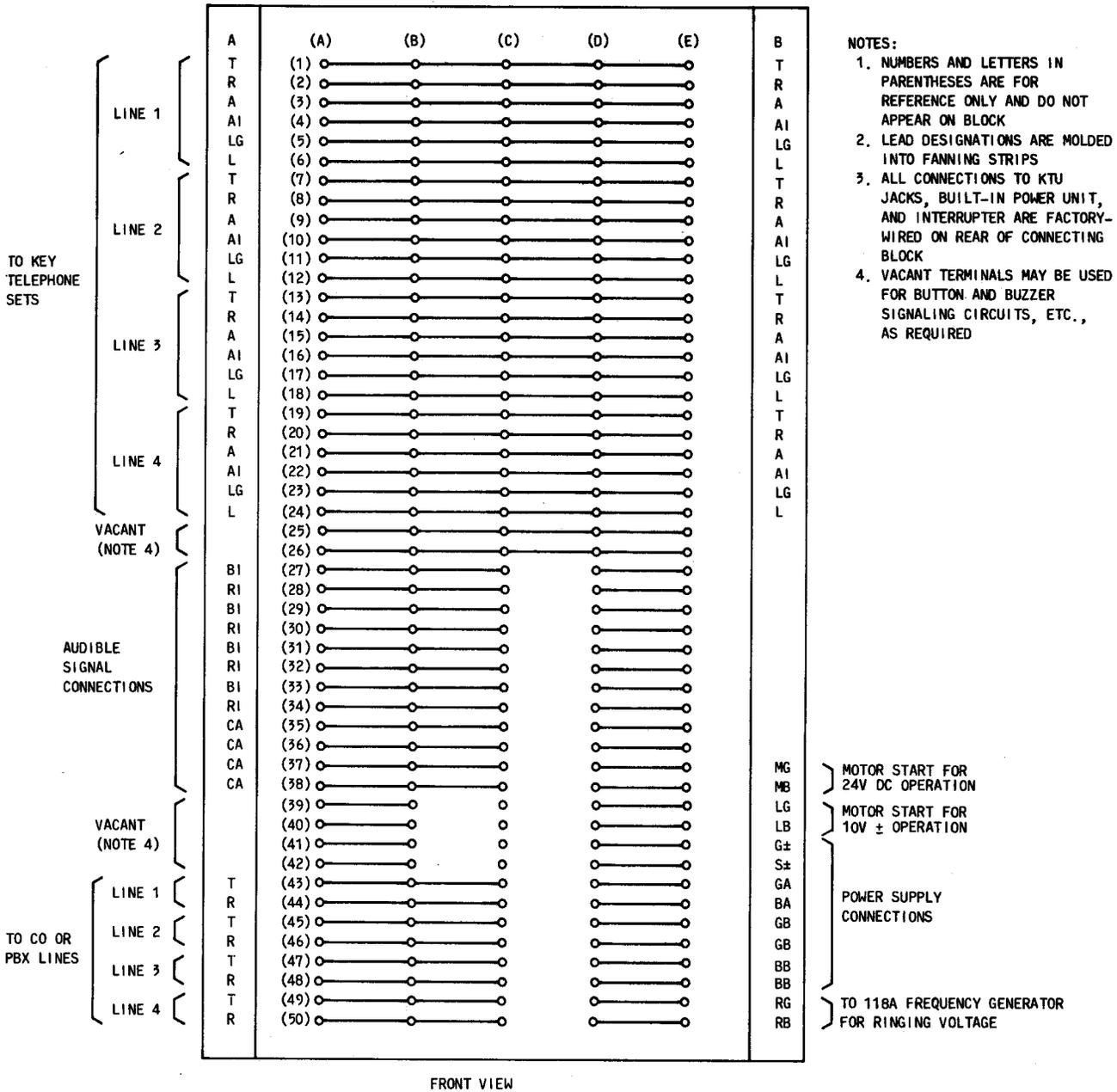


Fig. 3—Terminal Layout of Connecting Block on 550/551C KSUs Showing Installer Connections for Incoming Lines and Stations

SECTION 518-215-407

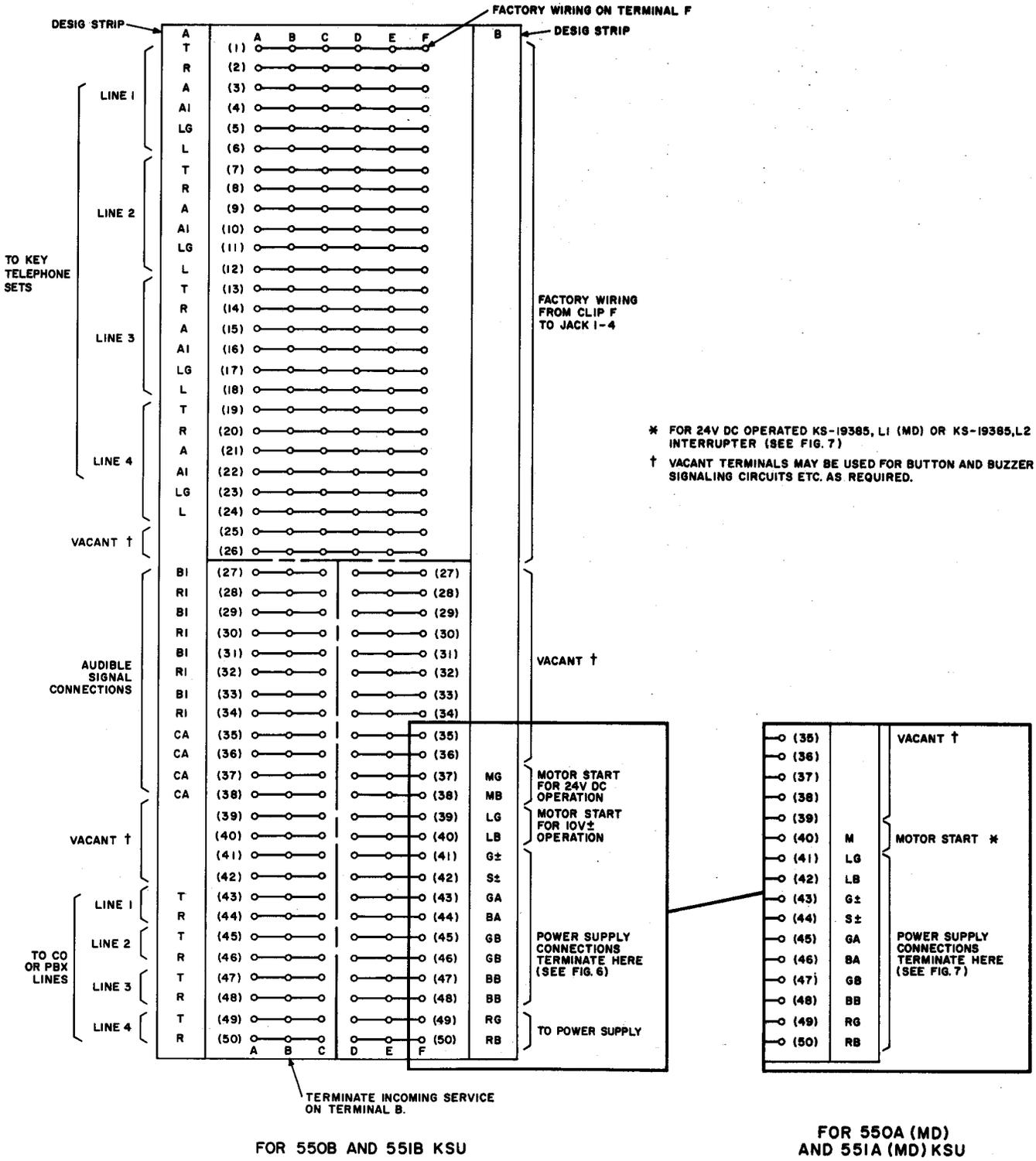
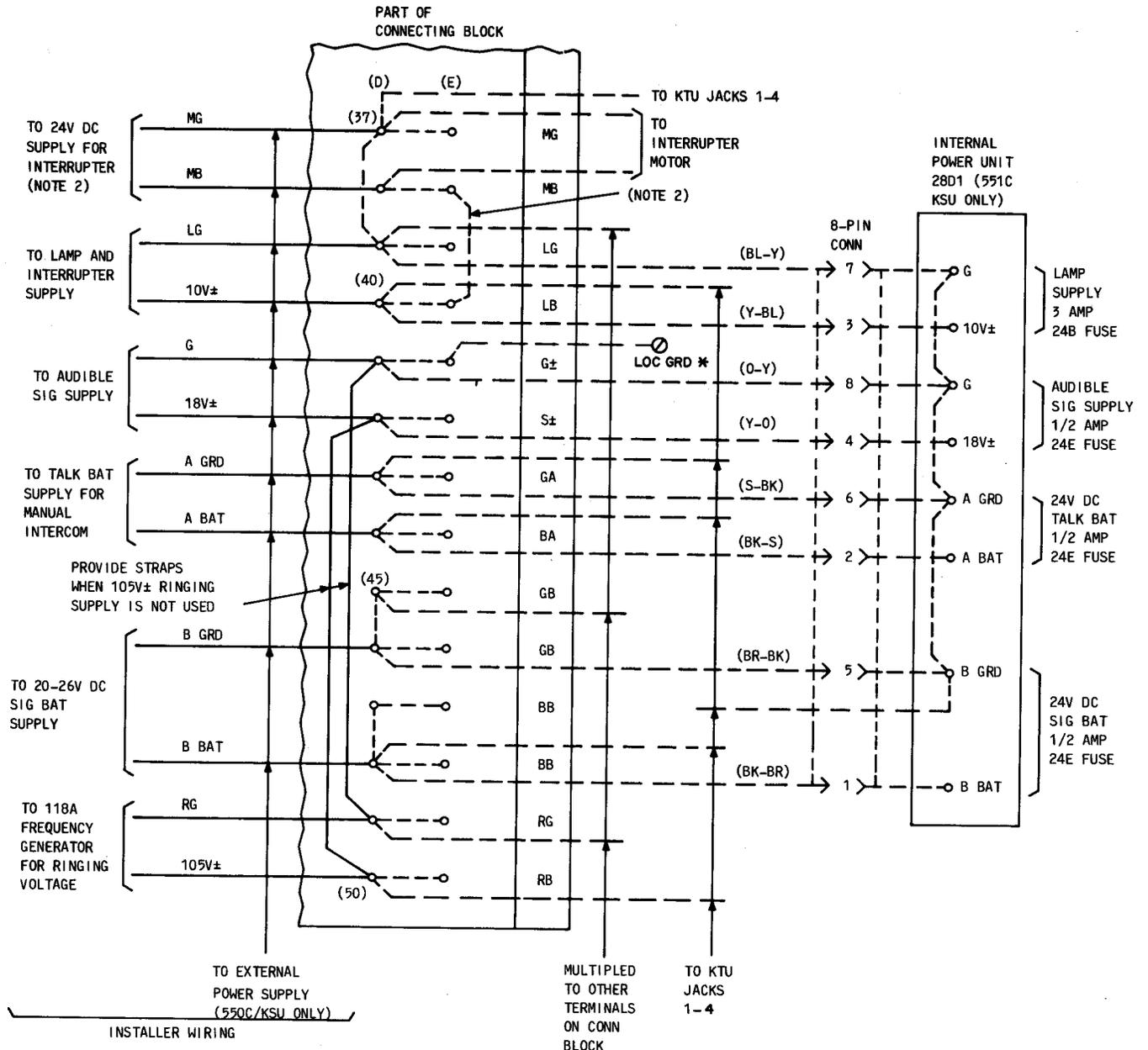


Fig. 4— Terminal Layout of Connecting Block on 550/551A and B KSUs (MD) Showing Installer Connections for Incoming Lines and Stations



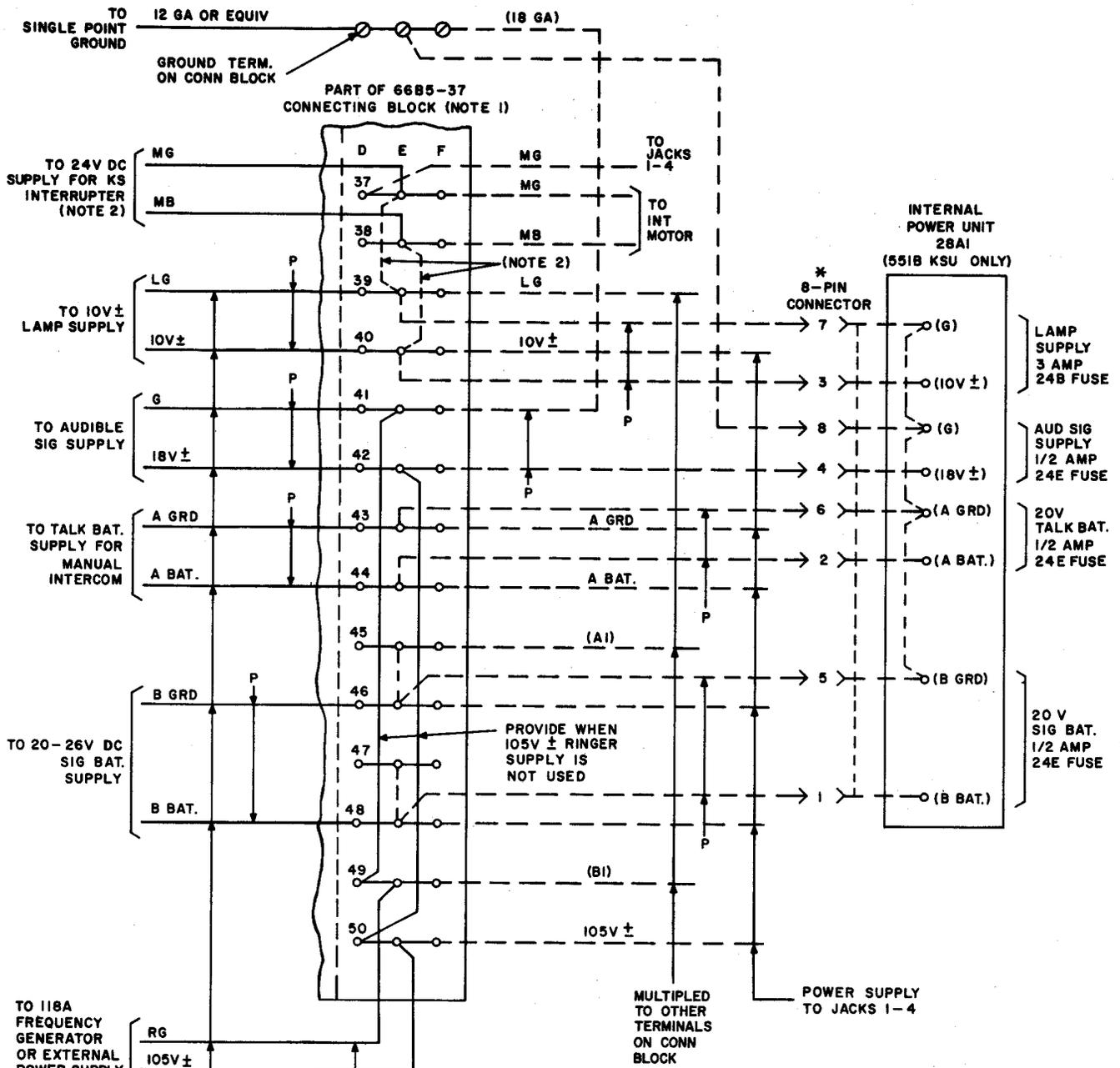
NOTES:

1. DASHED LINES REPRESENT FACTORY WIRING. SOLID LINES REPRESENT WIRES TO BE RUN BY INSTALLER AS REQUIRED
2. WHEN KS-19385 L2 24V DC INTERRUPTER IS USED, REMOVE FACTORY STRAP BETWEEN 38E AND 40E ON FRONT OF BLOCK: IF KSU IS 551C, PUT STRAP BETWEEN 38E AND 47E. IF KSU IS 550C, CONNECT EXTERNAL SUPPLY TO 37D AND 38D AS SHOWN ABOVE.
3. NUMBERS AND LETTERS IN PARENTHESES ARE FOR REFERENCE ONLY AND DO NOT APPEAR ON BLOCK.

* LOCATED ON FRONT PANEL ABOVE INTERRUPTER.

Fig. 5—Power Supply Connections for 550/551C KSUs

SECTION 518-215-407

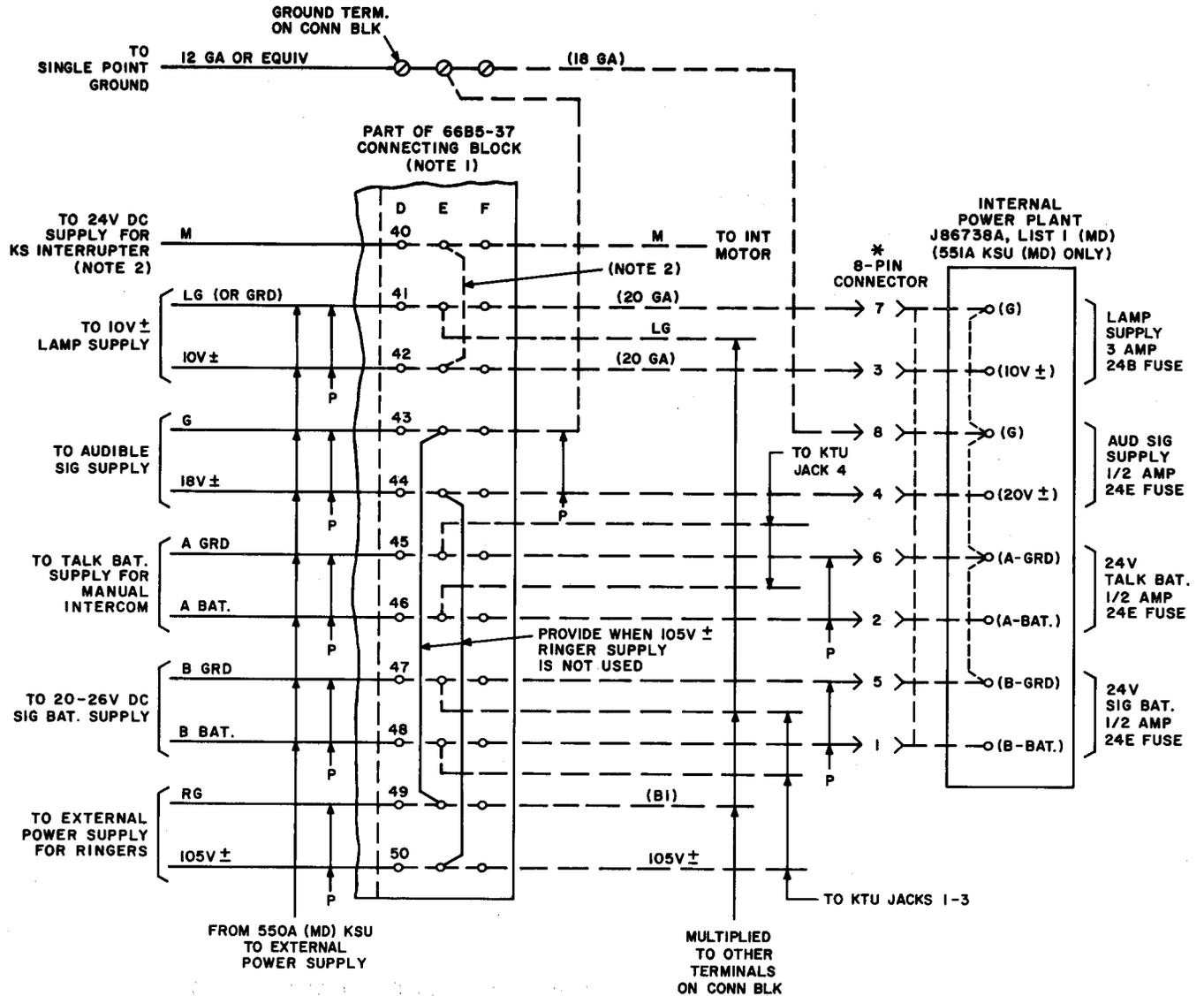


- NOTES:
1. DASHED LINES REPRESENT FACTORY WIRING. SOLID LINES REPRESENT WIRES TO BE RUN AS REQUIRED.
 2. REMOVE FACTORY STRAPS BETWEEN 37E AND 39E AND 38E AND 40E FOR 24V DC KS INTERRUPTER OPERATION. THE POWER SUPPLY CONNECTIONS FOR EITHER INTERRUPTER MOTOR ARE SHOWN AT LEFT.

* 8-PIN CONNECTOR AND WIRING TO CONNECTING BLOCK FURNISHED IN BOTH 550B AND 551B KSU.

MOTOR SUPPLY	KS-19175, L1	KS-19385, L1 (MD)	KS-19385, L2
10V±	38E (STRAPPED TO 40E)	---	---
GRD	37E (STRAPPED TO 39E)	---	---
24V DC	---	38E (STRAPPED TO 47D)	38E (STRAPPED TO 47F)
GRD	---	37E (STRAPPED TO 45D)	37E (STRAPPED TO 39E)

Fig. 6—Power Supply Connections for 550/551B KSUs (MD)



NOTES:

1. DASHED LINES REPRESENT FACTORY WIRING. SOLID LINES REPRESENT WIRES TO BE RUN AS REQUIRED.
2. REMOVE FACTORY STRAP BETWEEN 40E AND 42E FOR 24V DC KS INTERRUPTER OPERATION. THE POWER SUPPLY CONNECTIONS FOR EITHER INTERRUPTER MOTOR ARE SHOWN AT RIGHT.

* 8-PIN CONNECTOR AND WIRING TO CONNECTING BLOCK FURNISHED IN BOTH 550A (MD) AND 551A (MD) KSU.

MOTOR SUPPLY	KS-19175, L1	KS-19385, L1(MD)	KS-19385, L2
10V±	42E (STRAPPED TO 40E)	—	—
GRD	41E	—	—
24V DC	—	48D	48F (STRAPPED TO 40F)
GRD	—	47F (STRAPPED TO 40F)	47D

Fig. 7—Power Supply Connections for 550/551A KSUs (MD)

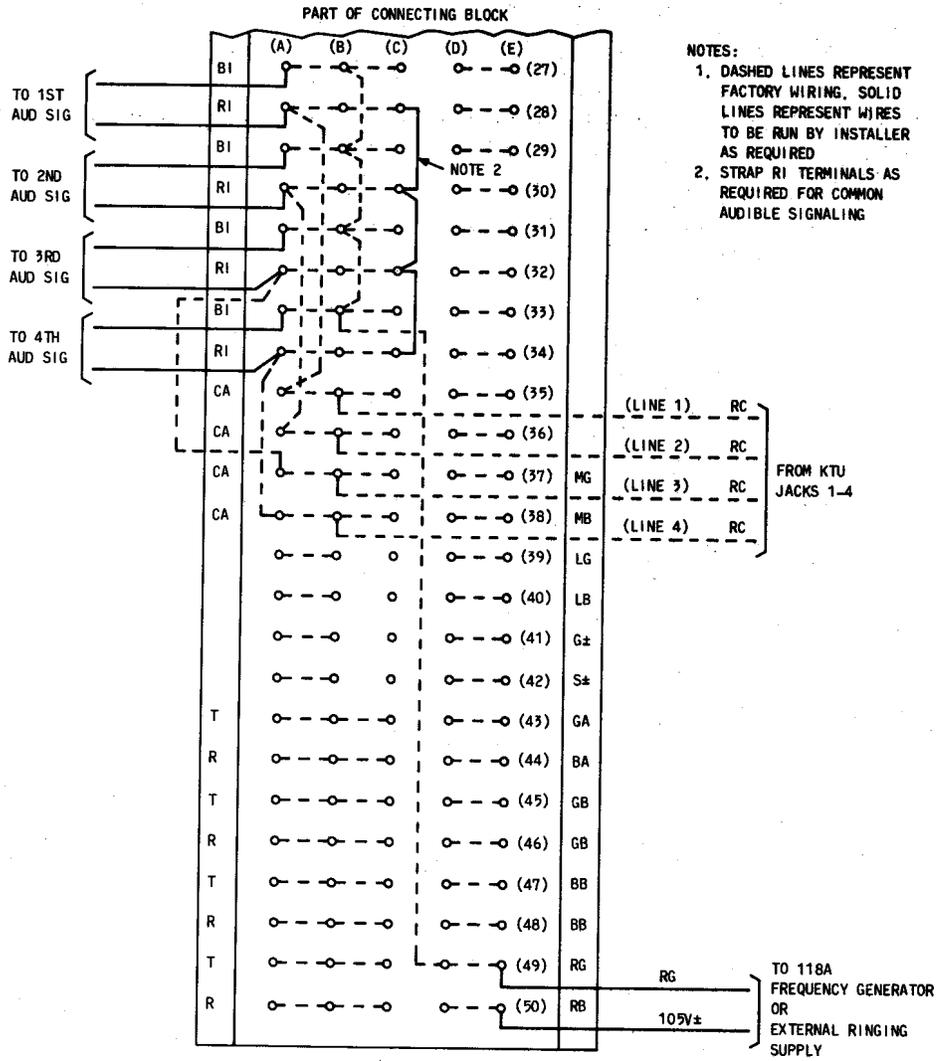


Fig. 8—Connections for Individual or Common Audible Signaling on 550/551C KSUs

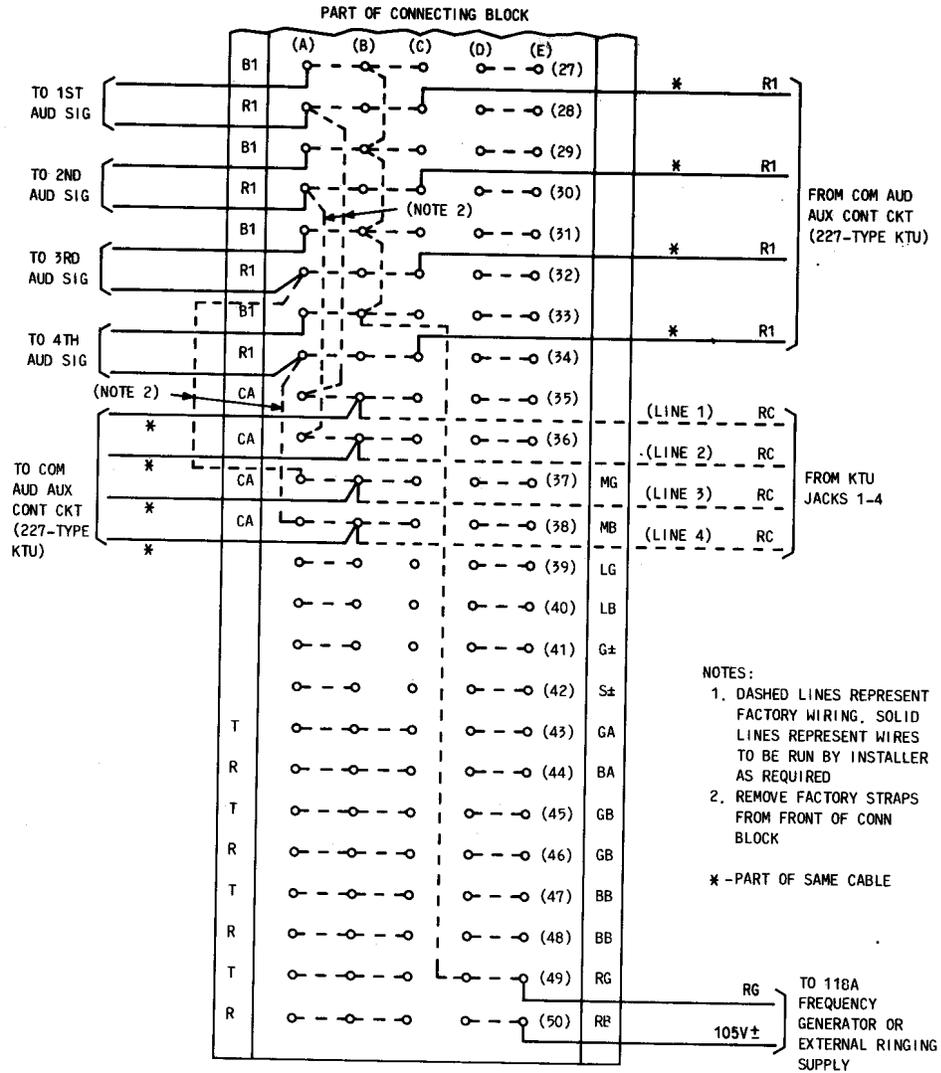


Fig. 9—Connections for Common Audible Auxiliary Control on 550/551C KSUs

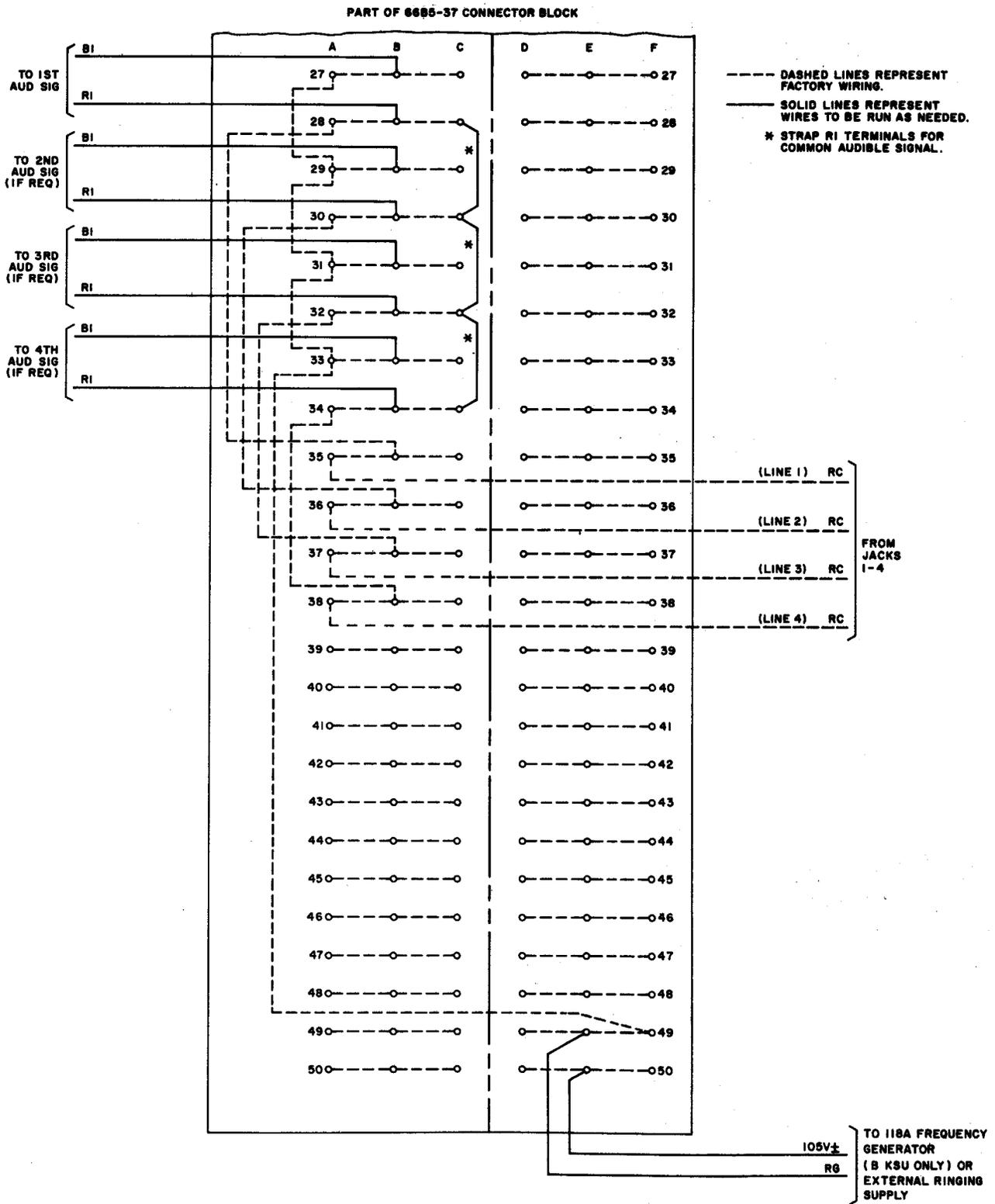


Fig. 10—Connections for Individual or Common Audible Signaling on 550/551A and B KSUs (MD)

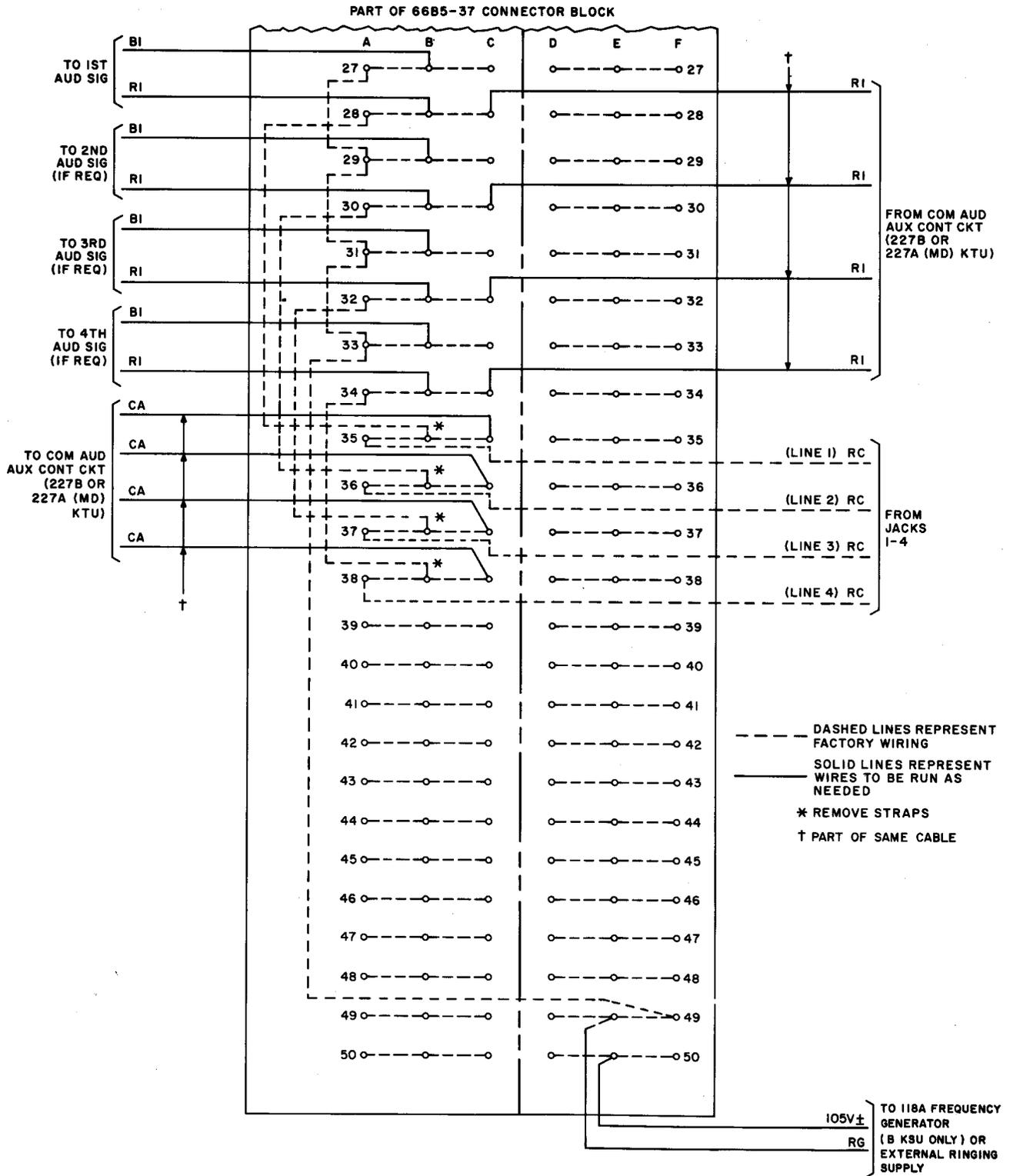


Fig. 11—Connections for Common Audible Auxiliary Control on 550/551A and B KSUs (MD)

