

U. S. MARINE CORPS TECHNICAL MANUAL

**TELETYPEWRITER SETS
AN/TGC-14 (V) AND AN/TGC-14A (V)**

OPERATION AND MAINTENANCE



SECTION I

GENERAL INFORMATION

1-1. SCOPE.

This Technical Manual contains installation, operation, and maintenance instructions for Teletypewriter Set AN/TGC-14(V) and Teletypewriter Set AN/TGC-14A(V). The teletypewriter sets (figure 1-1) are manufactured by Mite Corporation, New Haven, Connecticut. This Technical Manual is in effect upon receipt and supersedes MARCORPS TM-03315-15, 14 September 1964. Extracts from this publication may be made to facilitate the preparation of other Department of Defense publications.

1-2. GENERAL DESCRIPTION.

a. PURPOSE OF EQUIPMENT. - Teletypewriter Sets AN/TGC-14(V) and AN/TGC-14A(V) are ruggedized, light-weight, miniature, alphanumeric-printing telegraph equipments for general service use under a wide range of operating conditions. The teletypewriter sets are fully compatible with other commercial and military teletypewriter equipments employing the standard Baudot code and can be integrated into existing land-line and radio-link communications systems. By appropriate signal patching, the equipment can be operated in either half-duplex (simplex) or full-duplex on-line and off-line circuits. Patching facilities are also provided to allow off-line local operation as an electric typewriter or for local testing. As figure 1-1 illustrates, the teletypewriter sets are furnished in either of two cases; the tactical case for use in field and mobile installations, or the non-tactical case for use in fixed-station and aircraft installations.

b. OPERATING OPTIONS. - Teletypewriter Sets AN/TGC-14(V) and AN/TGC-14A(V) consist of a basic group of components supplemented by other components which are selected to fit the requirements of a given installation. Hence the designations Teletypewriter Sets AN/TGC-14(V) and AN/TGC-14A(V) effectively cover not one but rather a series of teletypewriter sets. The basic teletypewriter set consists of a keyboard, a printer, and an electrical chassis. To this is added a power supply kit which contains a signal line power supply, line sensor, service cable, heating element, and fuses. The motor must be selected separately. An hysteresis-synchronous alternating-current motor is available for 115-volt, 60-cycles per second operation, and an additional 115-volt motor is available for 400-cycles per second, single-phase operation. For housing these components, either a tactical or a non-tactical case is selected. Optional shock mounts, available for either case, are used for installation sites in which the equipment will be subjected to severe shock or vibration. The versatility of the teletypewriter sets is further extended by the patching options which allow half-duplex (simplex), full-duplex, or off-line local operation. In addition, by proper patching, the tele-

typewriter sets will supply signal line current up to 100 milliamperes at 28 volts direct current. Operational speed can be varied; speed-change gears for 60, 75, and 100 words per minute are supplied with the AN/TGC-14(V); the AN/TGC-14A(V) is supplied with speed change gears for 45.45, 50, and 75 baud. Baud rate of 45.45 is compatible with 60 words per minute; baud rate of 50 is compatible with 66 words per minute; baud rate of 75 is compatible with 100 words per minute.

c. PRINCIPLES OF OPERATION. - Essentially, the teletypewriter sets provide the means of transmitting and receiving printed intelligence comprising the 26 letters of the alphabet, the digits 0 through 9, and a basic group of punctuation signs and other symbols. In addition to the printing of these characters, certain necessary mechanical operations are provided; spacing between words, letters-figures shifting, line feed, and carriage return. Other operating features include a bell function for signaling the remote station; provisions for stopping and starting the motors of both the local and remote machines; and a repeat key, which when depressed causes the last transmitted character to be continuously repeated until the key is released.

To effect the transmission of a character or mechanical operation, the operator depresses the applicable key on the keyboard. This action causes a coded series of pulses to be generated and transmitted over the line. (Signal line current can be supplied either externally or by the internal signal line power supply.) At the other end of the line, the train of pulses is received and decoded by the line sensor in the remote teletypewriter set and translated into the required mechanical action by the printer, resulting in either the printing of a character or the performance of a mechanical operation. For reception, the roles of the local and remote teletypewriter set are simply reversed. For off-line local operation, the keyboard, signal line power supply, line sensor, and printer of a single teletypewriter set are connected in a closed loop.

The signal code developed by the keyboard when a key is depressed is the standard five-level (7.42-unit for AN/TGC-14(V); 7.0-unit for AN/TGC-14A(V)) Baudot serial teletypewriter code. In this code, each keyboard function is represented by a discrete combination of mark pulses (current) and space pulses (no-current). Each pulse group contains five of these intelligence pulses; the letter J, for example, is represented by mark-mark-space-mark-space. In addition to the five intelligence pulses, each pulse group begins with a start pulse (spacing) and ends with a stop pulse (marking). The stop pulse is 1.42 (AN/TGC-14(V)) or 1.0 (AN/TGC-14A(V)) times as long as any of the other six pulses, each of which may be considered as one time-unit long. The entire pulse

group consisting of a start pulse, five intelligence pulses, and stop pulse is therefore 7.42 (AN/TGC-14(V)) or 7.0 (AN/TGC-14A(V)) units in length. The actual time duration of a pulse group is dependent upon operational speed. At 60 words per minute, each unit is 22 milliseconds in length and each pulse group is 163 milliseconds in length (7.42 times 22 milliseconds). At 45.45 baud, the length of 22 milliseconds for each unit may be calculated by dividing 1000 milliseconds by the baud rate of 45.45. The length of each pulse group is 22 times 7.0 or 154 milliseconds. The difference in length of pulse group (163 milliseconds for 7.42 unit code and 154 milliseconds for 7.0-unit code) is due to the different length of the stop pulses. The complete Baudot code is illustrated in figure 1-2.

Although the keyboard operates on a 7.42-unit or 7.0-unit basis, the receiving printer operates on a 6.7-unit basis. This feature increases both the reliability and the versatility of the teletypewriter set, allowing it to correct for slight speed differences between machines as well as to operate on any code between 7 and 8 units.

d. OPERATING FEATURES. - The teletypewriter sets employ a standard teletypewriter keyboard which, when the set is in the transport condition, may be stowed in a recess in the electrical chassis beneath the printer. Figure 1-3 shows the equipment with the keyboard extended and locked in the operating position. The 32 keys are arranged in three rows which are banked for operator comfort. Each of the keys on the keyboard (except FIGS, LTRS, LINE FEED, CAR RET, and blank keys and the space bar which normally do not cause printing) serves a dual purpose. When the teletypewriter set is in the figures condition, the symbol shown on the upper portion of the depressed key will be printed. When the teletypewriter set is in the letters condition, the letter shown on the lower portion of the depressed key will be printed. The blank key at the lower right is one of the 32 available characters, but normally does not cause printing to take place. The group of four buttons below the copy window control mechanically operated local off-line functions of line feed, figure shift, letters shift, and carriage return. These functions are purely local and have no effect on the signal line. The operating controls are grouped at the lower left side of the keyboard. Behind the LIFT panel are the PAPER pressure release lever and the LINE FEED shift arm. The AN/TGC-14(V) is equipped with a figure H motor stop feature which when actuated shuts off power to the motors of all teletypewriter sets in the circuit but maintains their heaters, line sensors, and signal line power supplies in a standby condition. The motor is reactivated upon receipt of the first start pulse or a break in the signal line. The AN/TGC-14A(V) is equipped with a time delay motor stop which turns off the motor and places the heater, line sensor, and signal line power supply in a standby condition when no mark-to-space transition is received for 90 seconds (45.45 baud) or 60 seconds (75 baud). Receipt of the first mark-to-space transition automatically restarts the motor. Transmitting figures H from an AN/TGC-14A(V) to another AN/TGC-14A(V) on the signal line will not stop either of the teletypewriters; however, any AN/TGC-14(V) on the same signal line will be stopped.

CHARACTERS		* 7.42 UNITS						
		7.0 UNITS						
		CODE SIGNALS					UNIT	UNIT
LET.	FIG.	START	1	2	3	4	5	STOP
A	-							
B	?							
C	:							
D	\$							
E	3							
F	!							
G	a							
H	# ③							
I	8							
J	'							
K	(
L)							
M	.							
N	,							
O	9							
P	ø							
Q	i							
R	4							
S	⓪ ①							
T	5							
U	7							
V	:							
W	2							
X	/							
Y	6							
Z	"							
BLANK	①							
SPACE	②							
CAR.RET	①							
LINE FEED	①							
FIGURES	①							
LETTERS	①							

① NON-PRINTING; NON-ADVANCING
② NON-PRINTING; ADVANCING
③ PRINTING; ADVANCING (MOTOR STOP)
* STOP PULSE IS 1.42 UNITS LONG FOR 7.42 UNIT CODE.

Figure 1-2. Five-Level Baudot Code

The AN/TGC-14(V) uses standard single or multiply rolls of copy paper 8-1/2 inches wide and of any diameter up to 5 inches, with a 1-inch hollow core. The paper supply roll is stored in the electrical chassis (figure 1-4). The AN/TGC-14A(V) uses either the same copy paper stored in the electrical chassis or fan-fold, sprocket-feed, multi-ply copy paper stored externally and fed into a slot in the rear of Non-Tactical Case CY-2977A/UG. Tactical Case CY-2976A/PG does not have this provision.

The electrical chassis (figure 1-5) accommodates the printer and the copy paper. The printer prints six lines to the inch when set for single line feed and three lines to the inch when set for double line feed. Automatic carriage return and line feed occur when either 72 or 76 characters (depending on the adjustment of the carriage return mechanism) have been printed on a line and a carriage return signal has not been received.

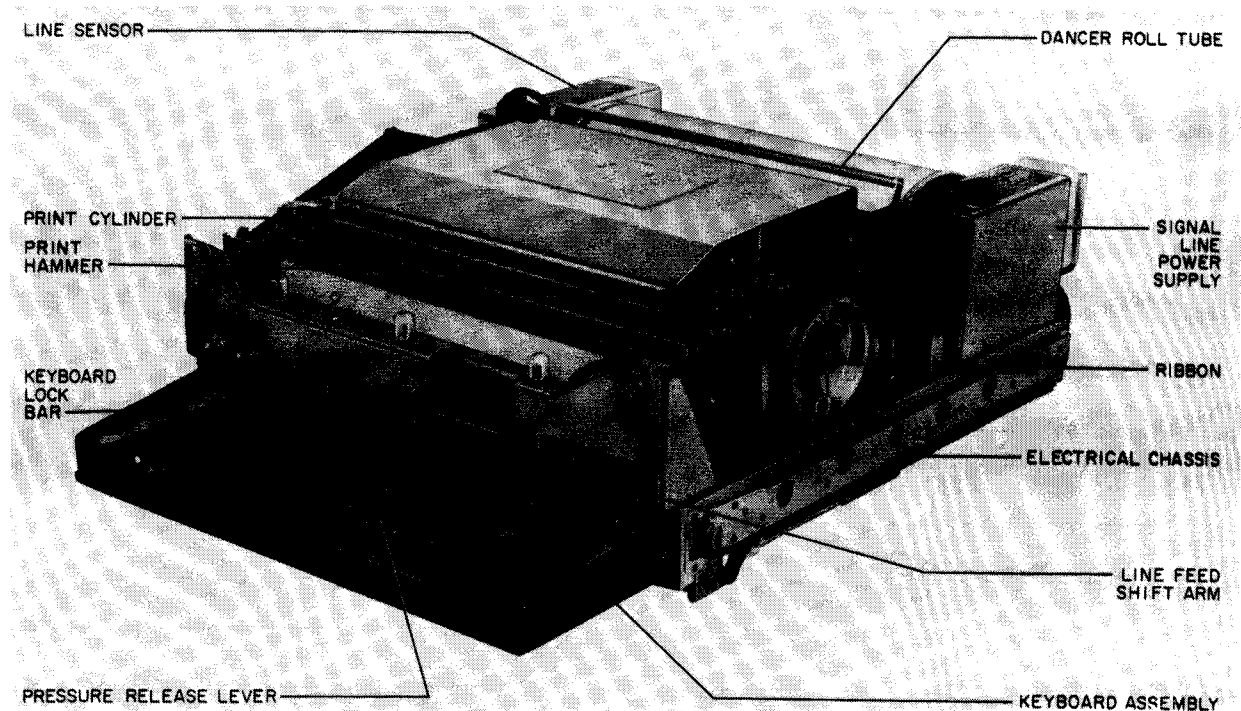


Figure 1-5. Teletypewriter Set, Case and Cover Removed

During operation of the printer, the copy paper feeds in front of an eight-sided print cylinder which contains 64 characters. This print cylinder is positioned so that the selected character is correctly located behind the paper; the print hammer then strikes the paper through a standard 1/2-inch Underwood-type inked ribbon, causing the character to be printed. Since the print cylinder never touches the ribbon, little cleaning of the print cylinder is required. Ribbon reversal is automatic.

The signal line power supply and line sensor are box-like plug-in assemblies mounted at the rear corners of the electrical chassis. The rear panel of the electrical chassis (figure 1-4) houses five fuse holders and seven option patching jacks. Figure 1-4 also shows the location of the service cable receptacle through which all power, signal line, and ground connections are made. The service cable and junction box are shown in figure 1-6.

The tactical case (figure 1-7) is of resin-reinforced glass fiber and, when closed, is air-tight and immersion-proof. A vacuum relief valve is provided to relieve excessive pressure within the case caused by changes in altitude or temperature. The ventilation ports at the sides of the case and the service cable access port at the rear are fitted with screw-type covers. The inlet ventilation port is also equipped with an air filter, which can be removed easily for cleaning. A compartment in the case cover (figure 1-8) provides stowage space for the service cable, spare ribbon, spare fuses and spare lamps. A thermostatically controlled heating element (figure 1-9) is

situated on the underside of the electrical chassis. The heating element is used when operating in an ambient temperature below 0° centigrade (32° fahrenheit).

The metal non-tactical case, shown in figures 1-1 and 1-4, may be opened from the top for replacement of paper and fuses without removing the printer from the case. The spare parts box is attached to the rear of the signal line power supply. Inlet and exhaust ventilation ports, an air filter, and a heating element are provided. A slot at the rear of the case is used for admitting the externally stored fan-fold, sprocket-feed copy paper.

1-3. REFERENCE DATA.

a. NOMENCLATURE. - Teletypewriter Set AN/TGC-14(V); Teletypewriter Set AN/TGC-14A(V).

b. SPECIAL FEATURES.

- (1) Internal signal line potentiometer.
- (2) Self-contained signal line power supply.
- (3) Automatic carriage return and line feed.
- (4) Input not polarity sensitive.
- (5) Provision for dual current range operation.
- (6) May be installed into signal line of 20 to 80 milliamperes without any internal adjustments.
- (7) Offers a resistive load to signal line.
- (8) Capable of either printing or not printing and spacing or not spacing on all functions.
- (9) External signal and test connections made to universal binding posts on service cable junction box without necessity of stripping field wire.
- (10) Integral copy holder.

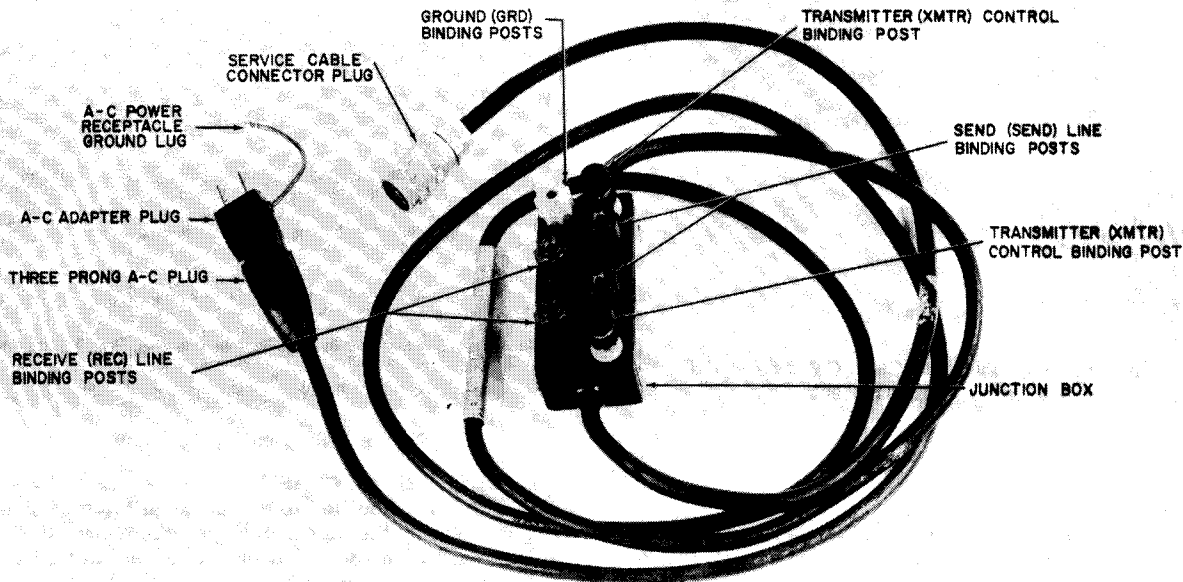


Figure 1-6. Service Cable Assembly

c. POWER REQUIREMENTS.

(1) 115 volts alternating current, 60 cycles per second, single-phase, 70 watts (additional 200 watts required for heating element when operating).

(2) 115 volts alternating current, 400 cycles per second, single-phase, 70 watts (additional 200 watts required for heating element when operating).

d. TYPE OF INSTALLATION.

(1) Tactical. - Mobile and field station.

(2) Non-Tactical. - Airborne and fixed station.

e. AMBIENT TEMPERATURE LIMITS. - Minus 55° Centigrade (-67° Fahrenheit) to plus 55° Centigrade (+131° Fahrenheit).

f. OPERATING SPEED. - Gears for 60, 75, or 100 words per minute are supplied with the AN/TGC-14(V). Gears for 45.45, 50, and 75 baud are supplied with the AN/TGC-14A(V). (Intermediate speed gears are obtainable.)

g. SIGNAL CODE TYPE. - Direct-current pulse, five-level, 7.42-unit (AN/TGC-14(V)) or 7.0-unit (AN/TGC-14A(V), Baudot serial, neutral line.

h. KEYBOARD. - Standard communications.

i. TYPE OF CHARACTERS. - English.

j. TYPE FACE. - Gothic, 12-point.

k. PRINTER LINE SPACING.

(1) Single Line Feed. - Six lines per inch.

(2) Double Line Feed. - Three lines per inch.

l. CHARACTERS PER LINE. - Adjustable for either 72 or 76.

m. INPUT IMPEDANCE.

(1) High Current Range (20 to 80 milliamperes). - 115 ohms, resistive, at 60 milliamperes.

(2) Low Current Range (1 to 5 milliamperes). - 2200 ohms, resistive, at 5 milliamperes.

n. ALARM DEVICES.

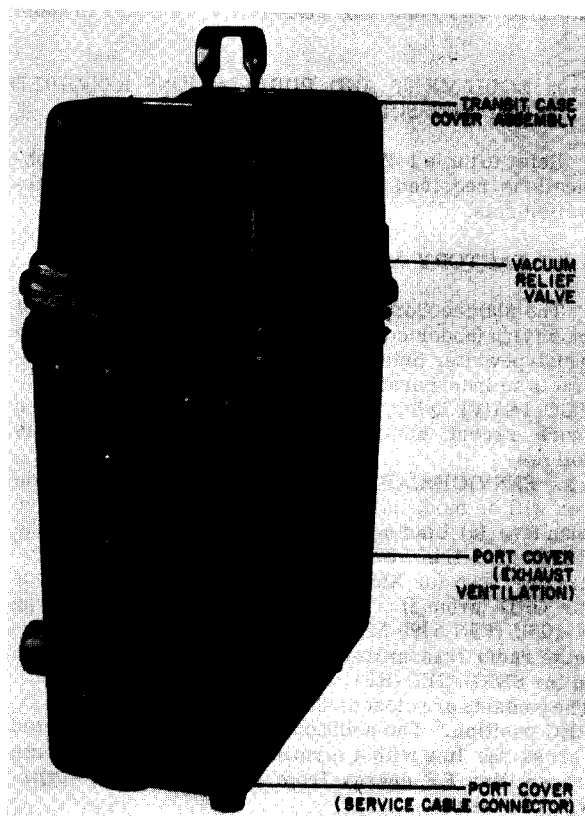


Figure 1-7. Tactical Case CY-2976A/PG

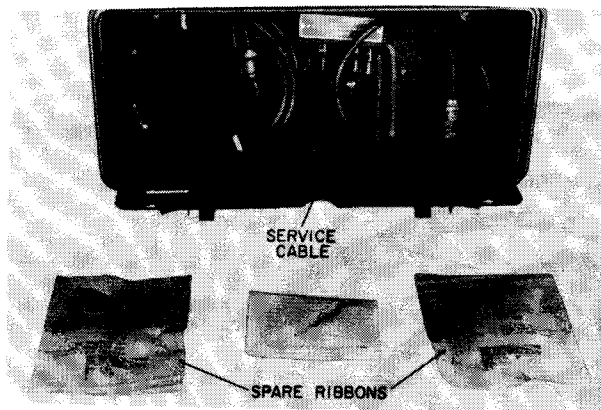


Figure 1-8. Tactical Case CY-2976A/PG
Cover Compartment

- (1) End of line bell.
- (2) Signal-activated bell.

o. **COPY PAPER.** - The AN/TGC-14(V) uses maximum 5-inch diameter (multi-ply or single) roll, 8-1/2-inch wide, with 1-inch hollow core. The AN/TGC-14A(V) uses either the same copy paper or fan-fold, sprocket-feed, multi-ply paper.

1-4. EQUIPMENT SUPPLIED.

The equipment supplied as Teletypewriter Sets AN/TGC-14(V) and AN/TGC-14A(V) is listed in table 1-1.

1-5. EQUIPMENT AND PUBLICATIONS REQUIRED BUT NOT SUPPLIED.

Refer to table 1-2 for the list of equipment and publications required but not supplied with the teletypewriter sets.

1-6. FACTORY AND FIELD CHANGES.

The Marine Corps is currently in the process of modifying (under contract NOM 73359) AN/TGC-14(V) Teletypewriter Sets manufactured under earlier contracts to incorporate changes already included in AN/TGC-14A(V) Teletypewriter Sets manufactured under more recent contracts. The modification areas follows:

a. **SERVICE CABLE.** The service cable junction box will be modified to incorporate seven (7) rather than five (5) binding posts. Two for terminating the REC signal line, two for terminating the SEND signal line, two for XMTR (transmitter) control and one for GRD (ground). The XMTR posts are push type U-106U (FSN 5490 557 1486) to permit keying of a remote radio transmitter through a set of dry contacts in the SEND.REC-REC switch (refer to figure 5-107). The contacts are closed when the switch is in the SEND . REC position. The addition of an RF filter connected across the line with a terminus to ground, prevents transmitter RF energy from reaching the teletypewriter chassis.

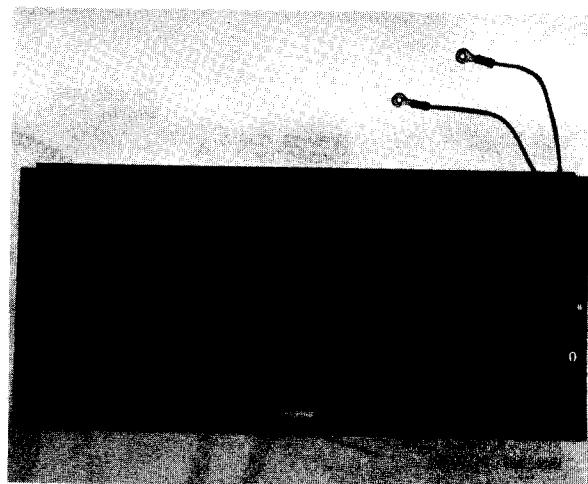


Figure 1-9. Heating Element

b. **ELECTRICAL CHASSIS.** The electrical chassis wiring will be modified to enable regulation of signal line current by the signal line potentiometer (R2) in all half-duplex modes, battery supplied internally or externally. In full-duplex modes, internal regulation is possible only on the REC line, requiring external regulation of the SEND line.

NOTE

The equipments modified for the Marine Corps have fuse F-5 in series with signal line power supply (1A4). This feature prevents damage to the signal line power supply if more than one equipment in a series loop is supplying signal line current. Fuse F-4, a 2.5 amp. fuse, is connected in the A. C. heater circuit.

1-7. EQUIPMENT SIMILARITIES.

Refer to table 1-4 for a comparison between Teletypewriter Sets AN/TGC-14(V) and AN/TGC-14A(V).

1-8. PREPARATION FOR RESHIPMENT.

The teletypewriter sets require no special preparation for reshipment. The equipment may be shipped to another operating site or depot by repacking the complete teletypewriter set in the original shipping container in accordance with packing specification MIL-P-17555E. A teletypewriter set may also be shipped partially disassembled. Refer to table 1-5 for the sizes and weights of the shipping containers. Advise the packing and packaging facility as to the type of equipment and whether preparation shall be for domestic shipment-immediate use; domestic shipment and storage; or for overseas shipment. If the technical manual is to be included, advise the facility to mark the shipping container, TECHNICAL MANUAL INSIDE.

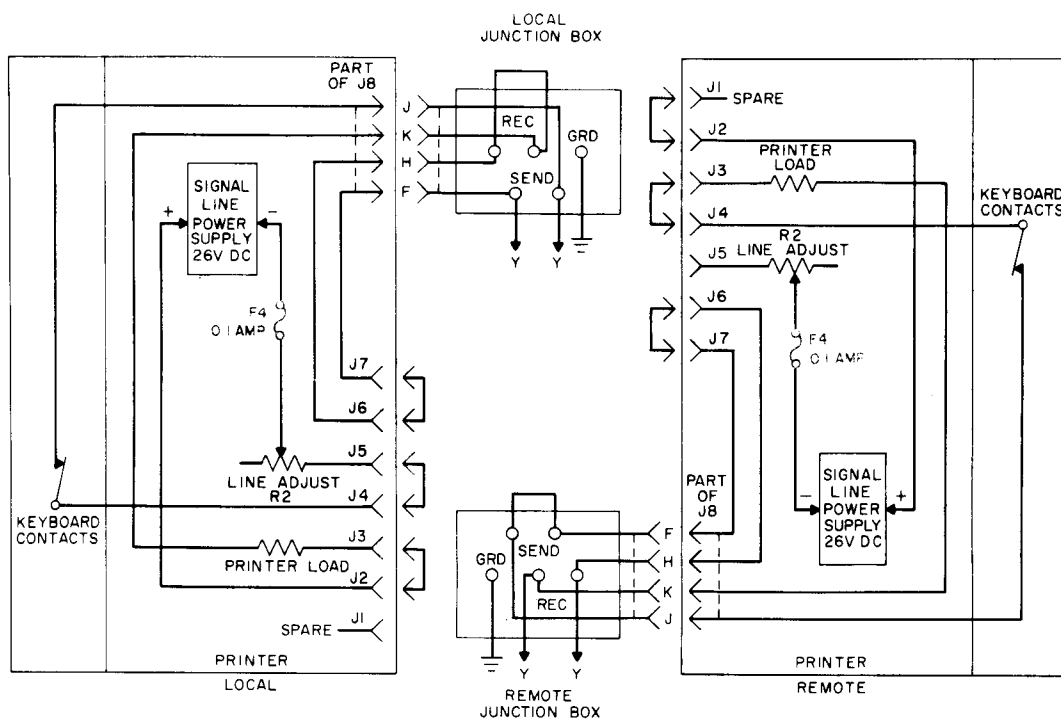


Figure 2-10. Patching Mode 1, (Internal Line Battery)
AN/TGC-14(V)

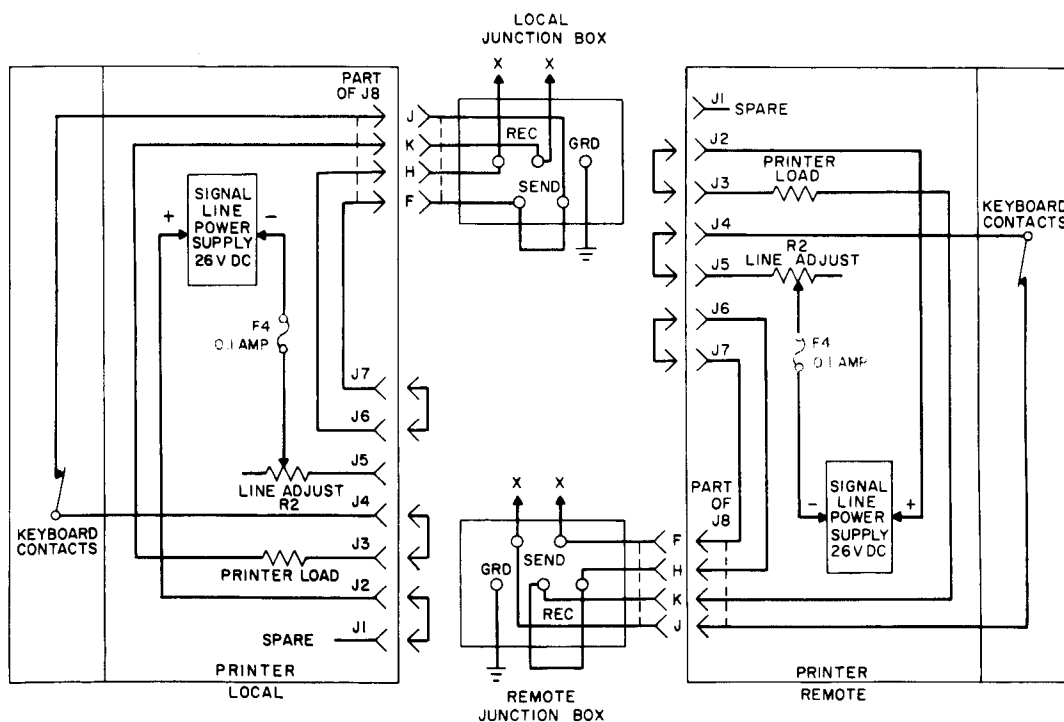


Figure 2-11. Patching Mode 2, (External Line Battery)
AN/TGC-14(V)

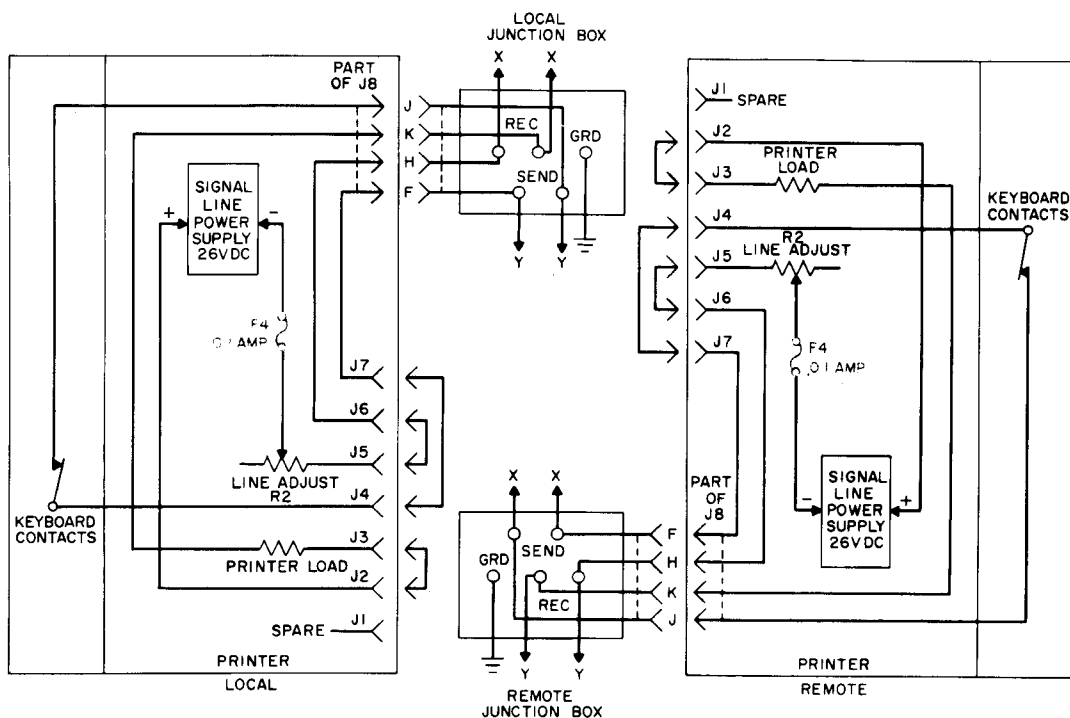


Figure 2-12. Patching Mode 3, (External Battery in Send Line;
Internal Battery in Receive Line) AN/TGC-14(V)

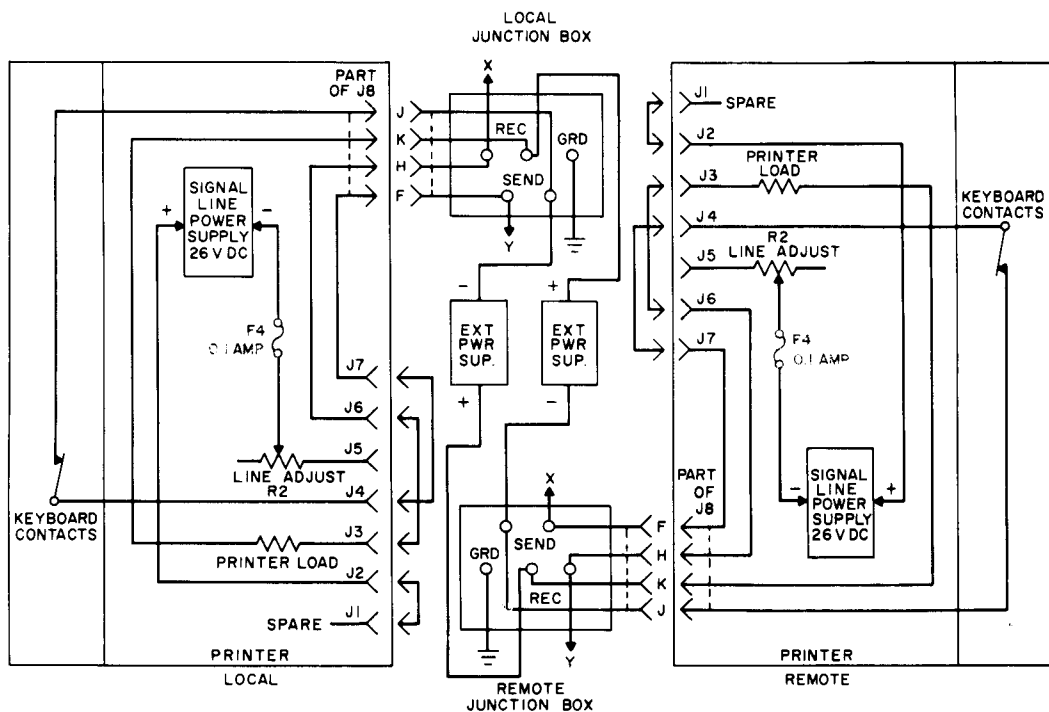


Figure 2-13. Patching Mode 4, (External Battery in Both Send and Receive Lines)
AN/TGC-14(V)

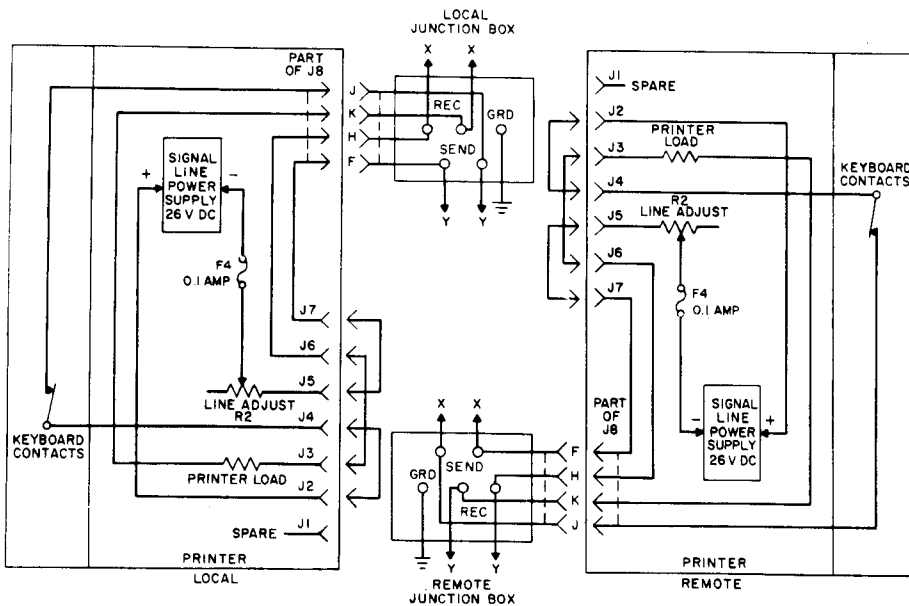


Figure 2-14. Patching Mode 5, Simplified Wiring Diagram
AN/TGC-14(V)

(2) RECEIVE LINE BATTERY SUPPLIED EXTERNALLY, SEND LINE BATTERY SUPPLIED EXTERNALLY (MODE 4). - Operation in Mode 4 (see figures 2-13 and 2-18) means that all signal line power is supplied by an external power supply or by a remote teletypewriter set. Patch jacks J1 to J2, J3 to J6, and J4 to J7 to obtain Mode 4 operation.

(3) SEND LINE BATTERY SUPPLIED INTERNALLY, RECEIVE LINE BATTERY SUPPLIED EX-

TERNALLY (MODE 5). - Operation in Mode 5 means that the local teletypewriter set is supplying power to the local keyboard and the remote printer, and that the remote teletypewriter set is supplying power to the remote keyboard and the local printer. (See figures 2-14 and 2-19.) Patch jacks J3 to J6, J2 to J4, and J5 to J7 to obtain Mode 5 operation.

1. AN/TGC-14A(V) Chassis
 - a. Patch 2 to 3, 4 to 5 and 6 to 7 (Patching jacks on rear of chassis)
2. Service Cable Connections:
 - a. Patch receive (red) posts.
 - b. Connect external line to the send (black) posts.
 - c. For local operation jump the send (black) posts, as shown by the dotted lines.
3. Line sensor load is either the R1(100 ohm) for 20-80 ma operation, or R2 (5.6k) for 5-10 ma operation, located in line sensor.
4. Check line current and adjust R2 (line current adj) for proper line current value.

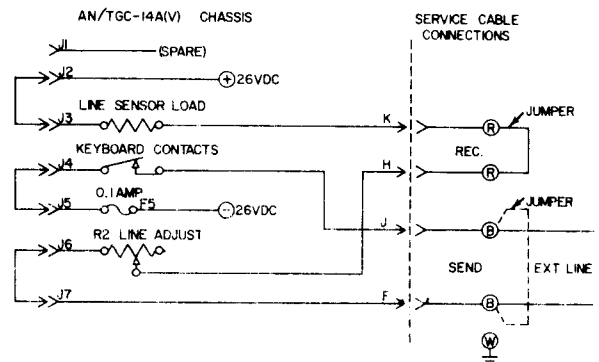


Figure 2-15. Patching Mode 1, Half Duplex (Internal Line Battery)
AN/TGC-14A(V)

1. AN/TGC-14A(V) Chassis:
 - a. Patch 1 to 2, 3 to 4 and 6 to 7 (Patching jacks on rear of chassis).
2. Service Cable Connections:
 - a. Patch send (black) posts.
 - b. Connect external line to the receive (red) posts.
3. Line sensor load is either the R1 (100 ohm) for 20-80 ma operation, or R2 (5.6k) for 5-10 ma operation, located in the line sensor.
4. Check line current and adjust R2 (line adjust pot) for proper line current value.

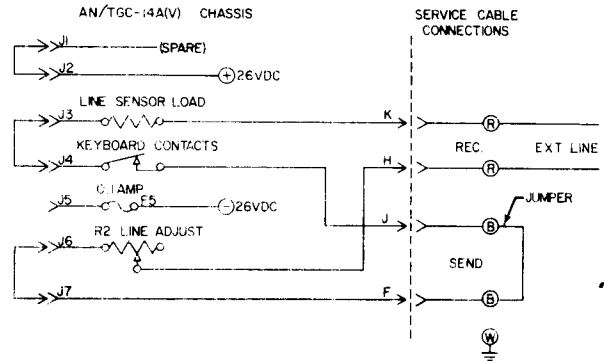


Figure 2-16. Patching Mode 2, Half Duplex (External Line Battery)
AN/TGC-14A(V)

1. AN/TGC-14A(V) Chassis:
 - a. Patch 2 to 3, 4 to 7, and 5 to 6 (patching jacks on rear of chassis)
2. Service Cable Connections:
 - a. Connect remote stations send line to receive (red) posts.
 - b. Connect remote stations receive line to send (black) posts.
3. Line sensor load is either the R1 (100 ohm) for 20-80 ma operation, or R2 (5.6k) for 5-10 ma operation, located in the line sensor.
4. Check the line current in the receive line and adjust R2, line adjust pot, for proper line current value. Send line current is controlled externally.

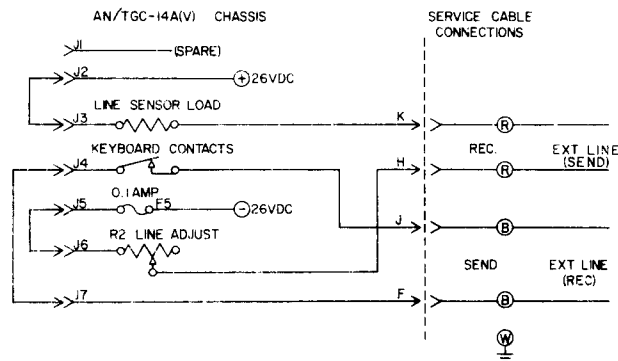


Figure 2-17. Patching Mode 3, Full Duplex (External Battery in Send Line)
(Internal Battery in Receive Line) AN/TGC-14A(V)

1. AN/TGC-14A(V) Chassis:
 - a. Patch 1 to 2, 3 to 6 and 4 to 7 (Patching jacks on rear of chassis)
2. Service Cable Connections:
 - a. Connect remote stations send line to receive (red) posts.
 - b. Connect remote stations receive line to send (black) posts.
3. Line sensor load is resistor R1 (100 ohm) for 20-80 ma operation, or R2 (5.6k) for 5-10 ma operation, located in the line sensor.
4. Check line current in the receive line and adjust R2, (line current adjust pot) for proper line current value. The send line current is controlled externally.
5. This mode will always be used with converter TH-5 and similar converters supplying line current.

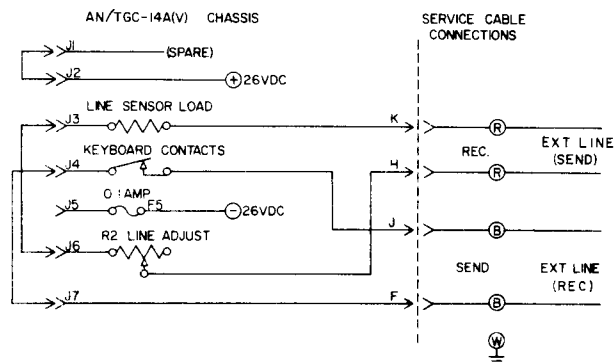


Figure 2-18. Patching Mode 4, Full Duplex (External Battery
in Both Send and Receive Lines) AN/TGC 14A(V)

1. AN/TGC-14A(V) Chassis:
 - a. Patch 2 to 4, 3 to 6 and 5 to 7 (Patching jacks on rear of chassis).
2. Service Cable Connector:
 - a. Connect remote stations send line to receive (red) posts.
 - b. Connect remote stations receive line to send (black) post.
3. Line sensor load is resistor R1 (100 ohm) for ma operation, or R2 (5.6k) for 5-10 ma operation, located in the line sensor.
4. Check line current in the receive line and adjust R2 (line current adjust pot) for proper line current value. The send line current is controlled externally.

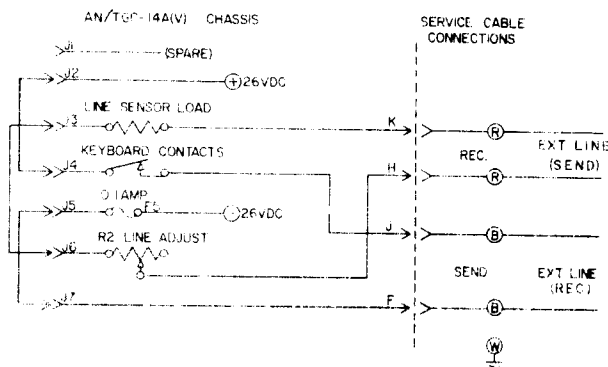


Figure 2-19. Patching Mode 5, Full Duplex (External Battery in the Receive Line) (Internal Battery in the Send Line) AN/TGC-14A(V)

c. **EXTERNAL LINE PATCHING OF CONVERTERS.**
- The AN/TGC-14(V) and AN/TGC-14A(V) equipments may be patched to converters using either two or four wire simplex or duplex connections. Determine the circuitry of the converters before making any connections. Figure 2-20 shows the connections to a typical converter circuit using Converter TH-5/TG, which supplies the line current, connected for full-duplex operation (Mode 4).

d. **PATCHING TELETYPEWRITER SET WITH REMOTE RADIO TRANSMITTER.** When the teletypewriter set is to be used in conjunction with a remote radio transmitter, connect the transmitter keying relay leads to the XMTR posts on the service cable junction box.

NOTE

It is important that all of the components for any communications link have common ground. This is especially important in aircraft installations.

2-10. SPEED CHANGE GEAR REPLACEMENT.

The teletypewriter sets are supplied with a choice of three speed change gears. Establish the operating speed and install the correct color-coded gear. For the AN/TGC-14(V), the 60 words per minute gear is

coded blue, the 75 words per minute gear is coded green, and the 100 words per minute gear is coded white.

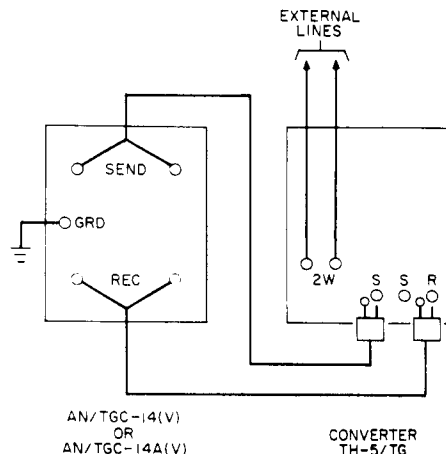


Figure 2-20. External Line Patching, Typical Connection Circuit

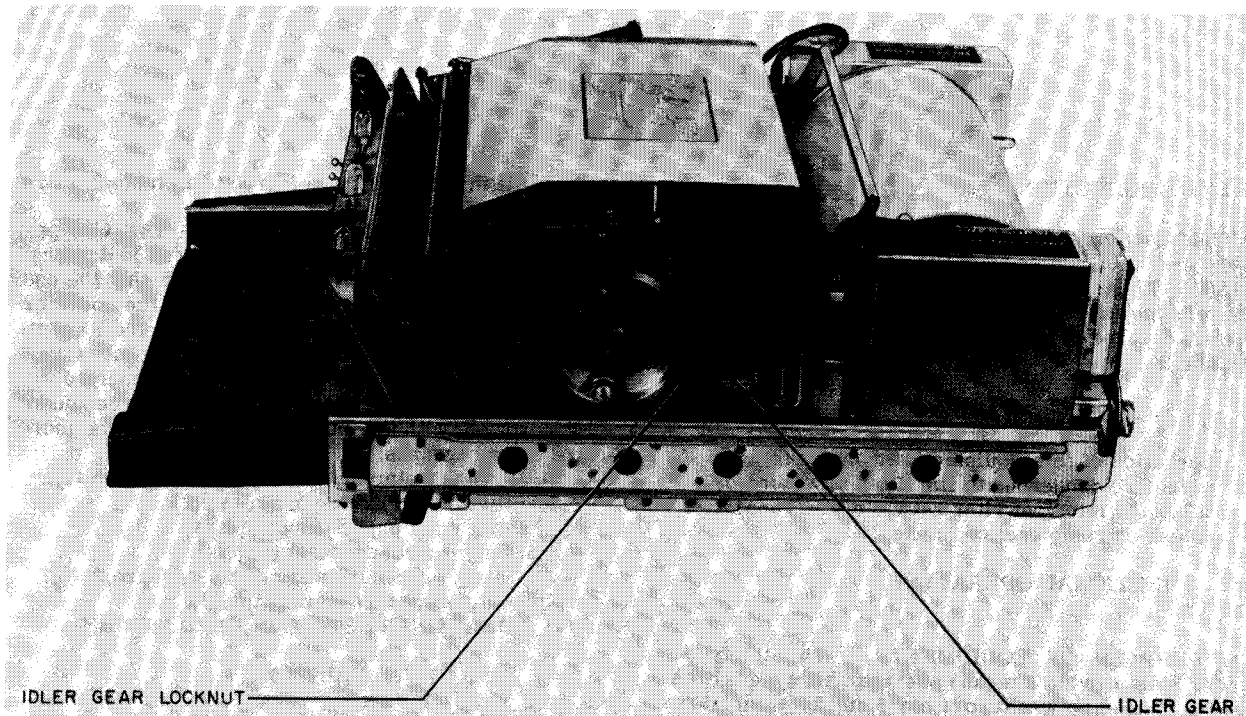


Figure 2-21. Printer and Electrical Chassis, Right-Side View

For the AN/TGC-14A(V), the 45.45 baud gear is coded orange, the 50 baud gear is coded brown, and the 75 baud gear is coded black. Refer to figure 2-8 for the location of the optional speed change gears. To replace a speed change gear, turn off the equipment and proceed as follows:

Step 1. Loosen the idler gear locknut (figure 2-21) and allow the idler gear and locknut to swing away from the speed change gear.

Step 2. Loosen and remove the speed change gear lock knob.

Step 3. Remove the speed change gear.

Step 4. Select the desired replacement speed change gear and install it so that its slot engages the pin on the post.

Step 5. Insure that the speed change gear is properly seated and install the speed change gear lock knob on the shaft.

Step 6. Swing the idler gear upwards against the speed change gear and mesh the two gears, taking care not to exert excessive pressure. Allow minimum backlash (distance between the gears).

Step 7. Tighten the idler gear locknut while holding the speed change gear and idler gear in mesh with the other hand. Adjust the backlash to approximately 0.002 inches.

Step 8. Run the motor; if excessive gear noise indicates too much or too little backlash, stop the motor and readjust the backlash. Repeat this procedure for minimum gear noise.

2-11. FINAL PREPARATION FOR USE.

Upon completion of the adjustments and tests necessary to ascertain that the teletypewriter set is functioning properly, re-install it into the case as follows:

Step 1. Set all switches to the OFF position.

Step 2. Disconnect the service cable from the primary power source; then remove the connector-plug from the electrical chassis by carefully turning the connector-plug a quarter turn counterclockwise and pulling the connector-plug out.

Step 3. Align the electrical chassis groove with the slides in the case and insert the assembly into the case.

NOTE

The half-circle locks on each side of the electrical chassis have now come in contact with the half-circle locks in the case. These matching half circles are locked together by the fork located in the front cover.

Step 4. Secure the electrical chassis in the case by engaging the locking fork in the front cover. Press the bottom of the front cover down and then push the top in toward the case.

Step 5. Secure the front cover by engaging the two quick-disconnect fastener studs with a quarter turn clockwise.

Step 6. Connect the service cable as instructed in paragraph 2-8b.

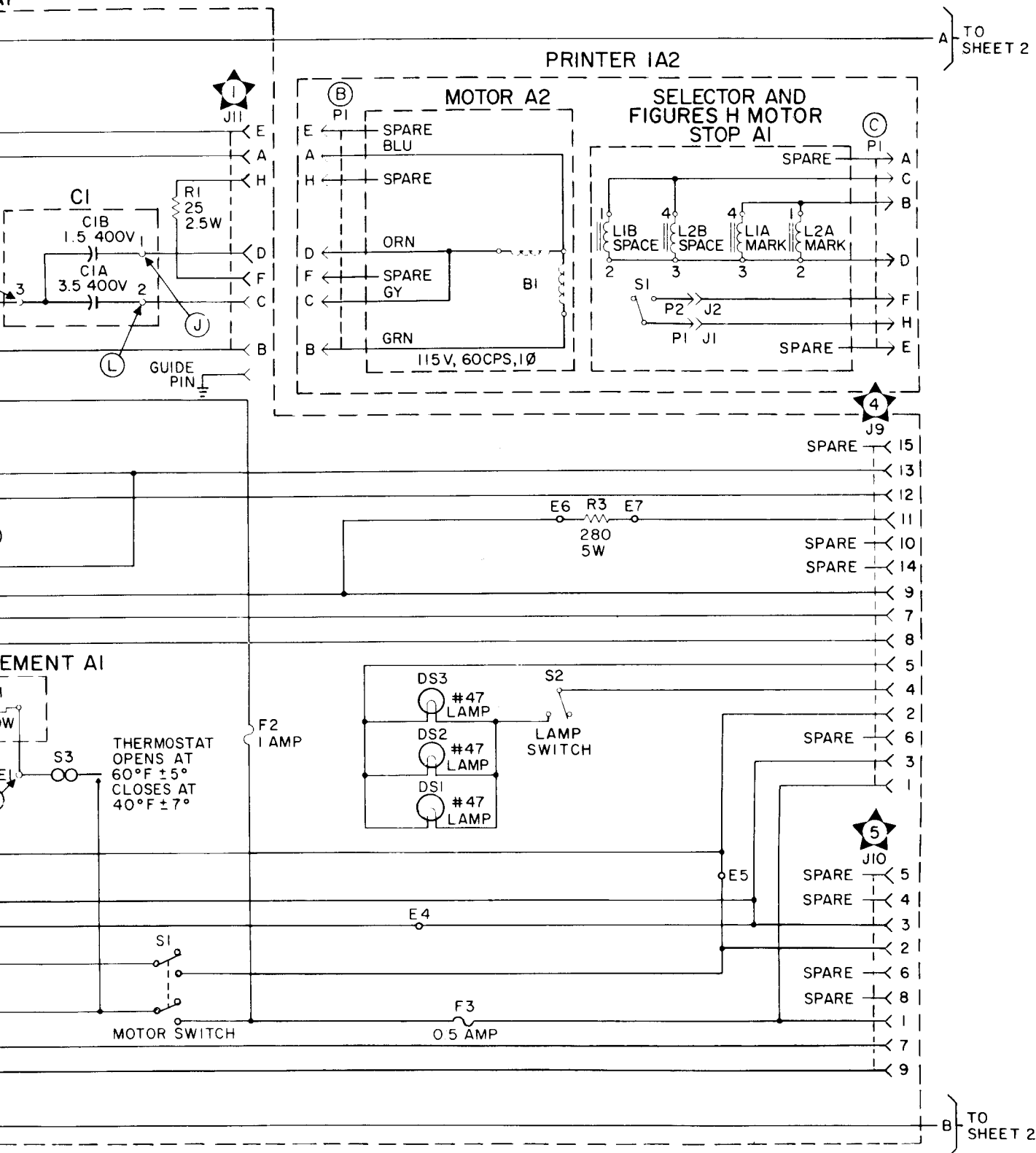


Figure 5-106. Teletypewriter Set AN/TGC-14(V), Schematic Diagram (Sheet 1 of 2)

TELETYPEWRITER SET AN/TGC-14(V)
AND AN/TGC-14A(V) - APPENDIX

ELECTRICAL CHASSIS 1A1

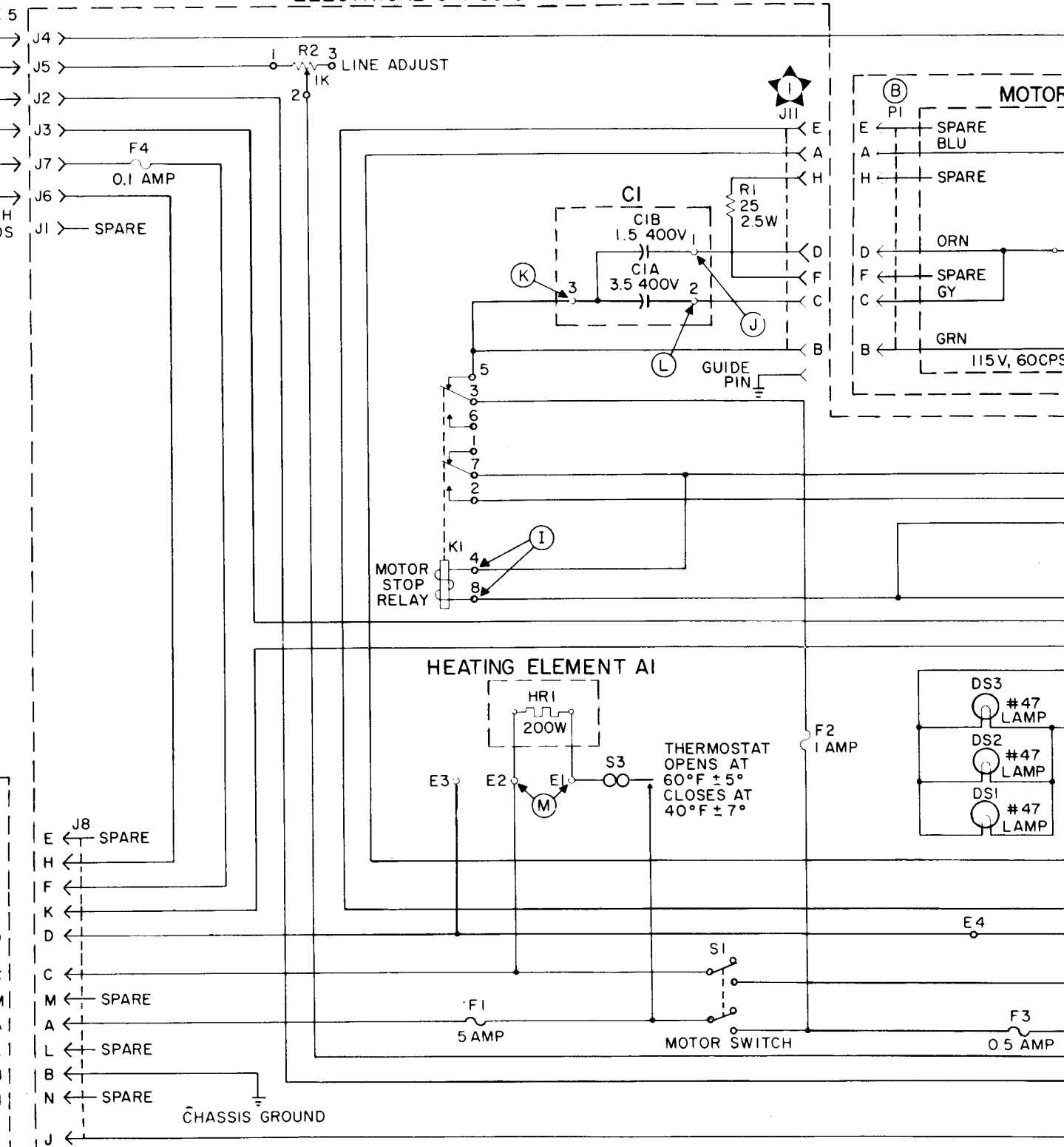



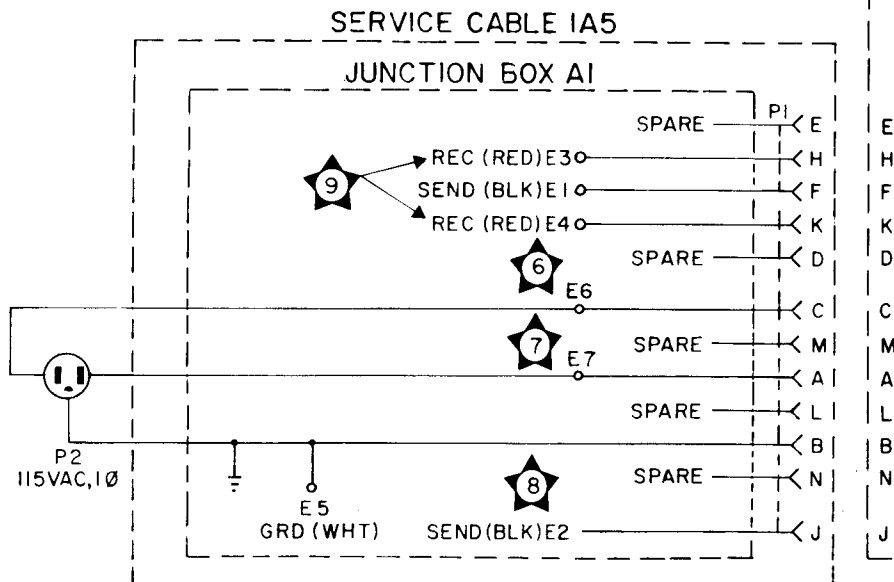
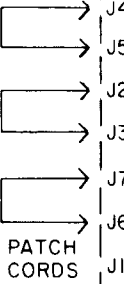
Figure 5-106. Teletypewriter S

ORIGINAL

NOTES

1. REFERENCE DESIGNATIONS ARE ABBREVIATED. PREFIX THE DESIGNATION WITH THE UNIT NUMBER, OR ASSEMBLY DESIGNATION, OR BOTH.
2. ALL RESISTORS ARE 1/2 WATT $\pm 5\%$ AND VALUES ARE IN OHMS UNLESS OTHERWISE INDICATED.
3. ALL CAPACITORS ARE $\pm 10\%$ AND VALUES ARE IN MICROFARADS (UF) UNLESS OTHERWISE INDICATED.
4. ALL MEASUREMENTS OBTAINED WITH 20,000-OHMS-PER-VOLT METER. UNLESS OTHERWISE INDICATED, VALUES AT SIGNIFICANT TEST POINTS ARE TO COMMON GROUND, WITH ALL UNITS INTERCONNECTED, BUT WITH THE EQUIPMENT DEENERGIZED. SEE SECTION 4 FOR COMPLETE VOLTAGE READINGS.
5. PATCHED FOR SIMPLEX INTERNAL BATTERY OPERATION. FOR PATCHING OPTIONS SEE PARAGRAPH 2-9.
6. ALL DIODES ARE TYPE AFIN645 UNLESS OTHERWISE INDICATED.
7. THE SYMBOL  DENOTES A ZENER DIODE.

SEE NOTE 5



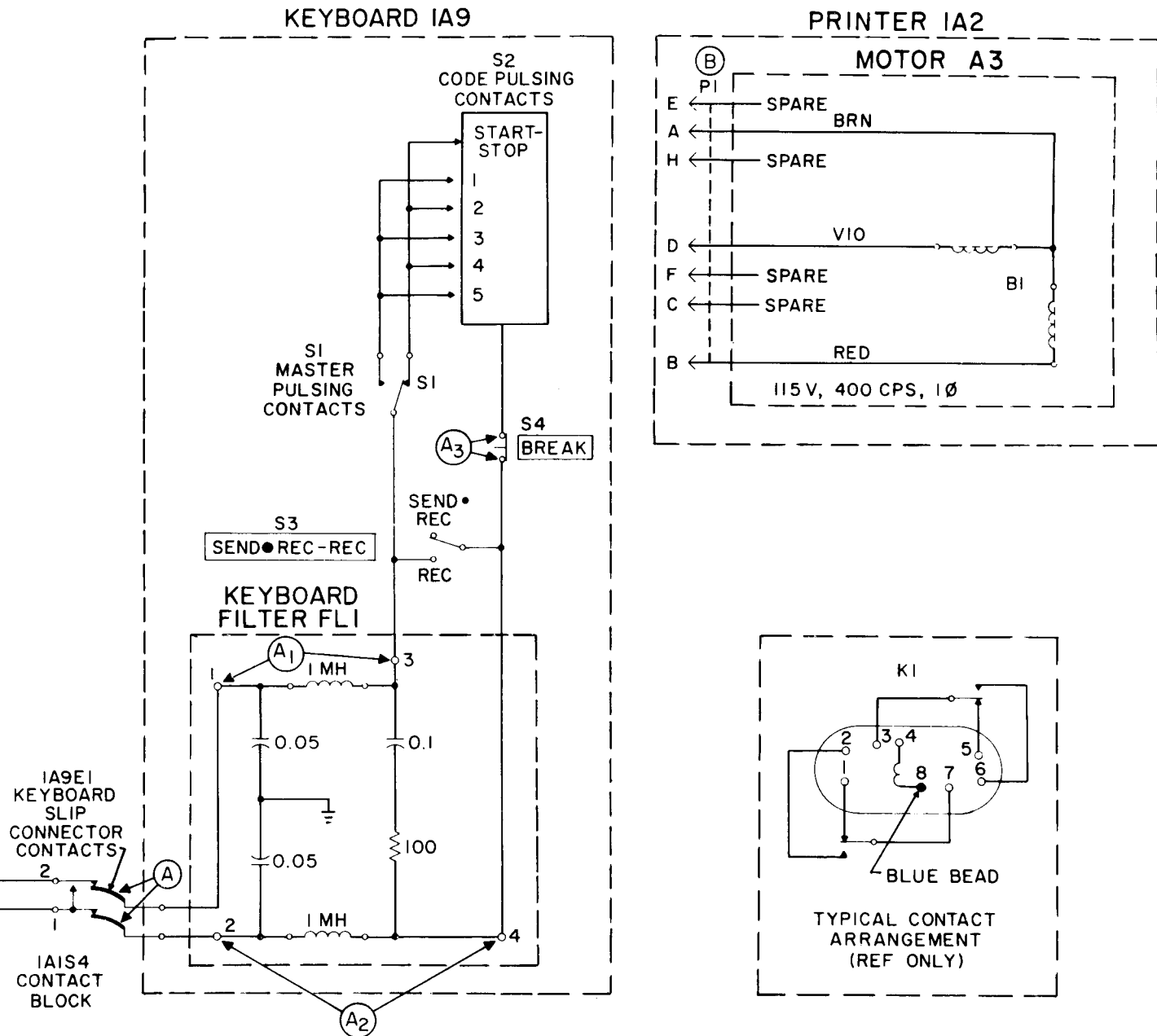
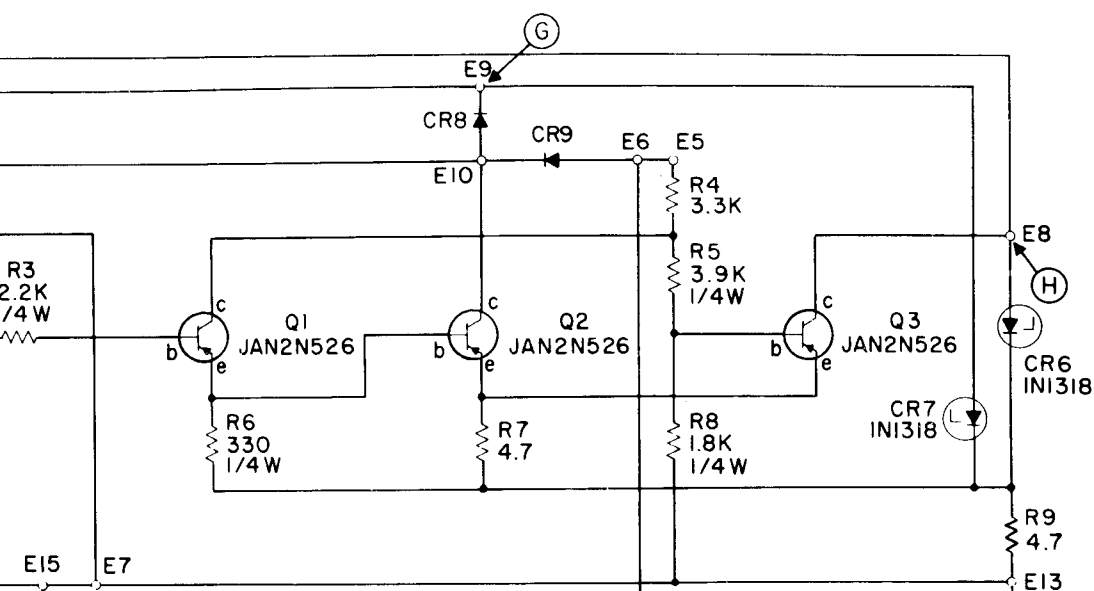


Figure 5-106. Teletypewriter Set AN/TGC-14 (V), Schematic Diagram (Sheet 2 of 2)

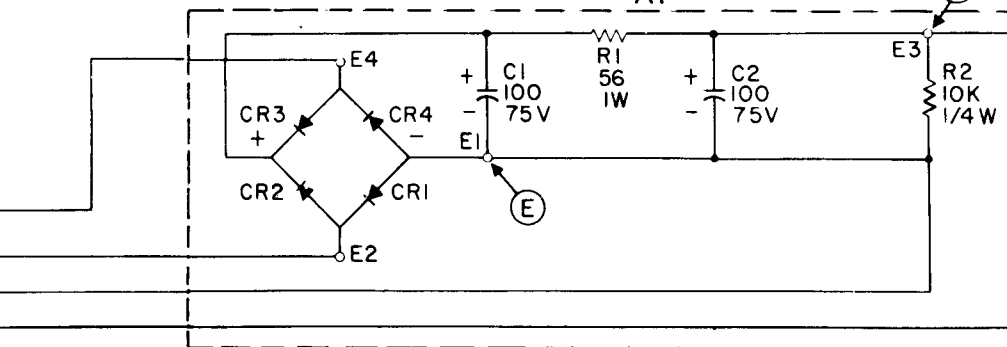
LINE SENSOR IA3

A2



AL LINE POWER SUPPLY IA4

A1



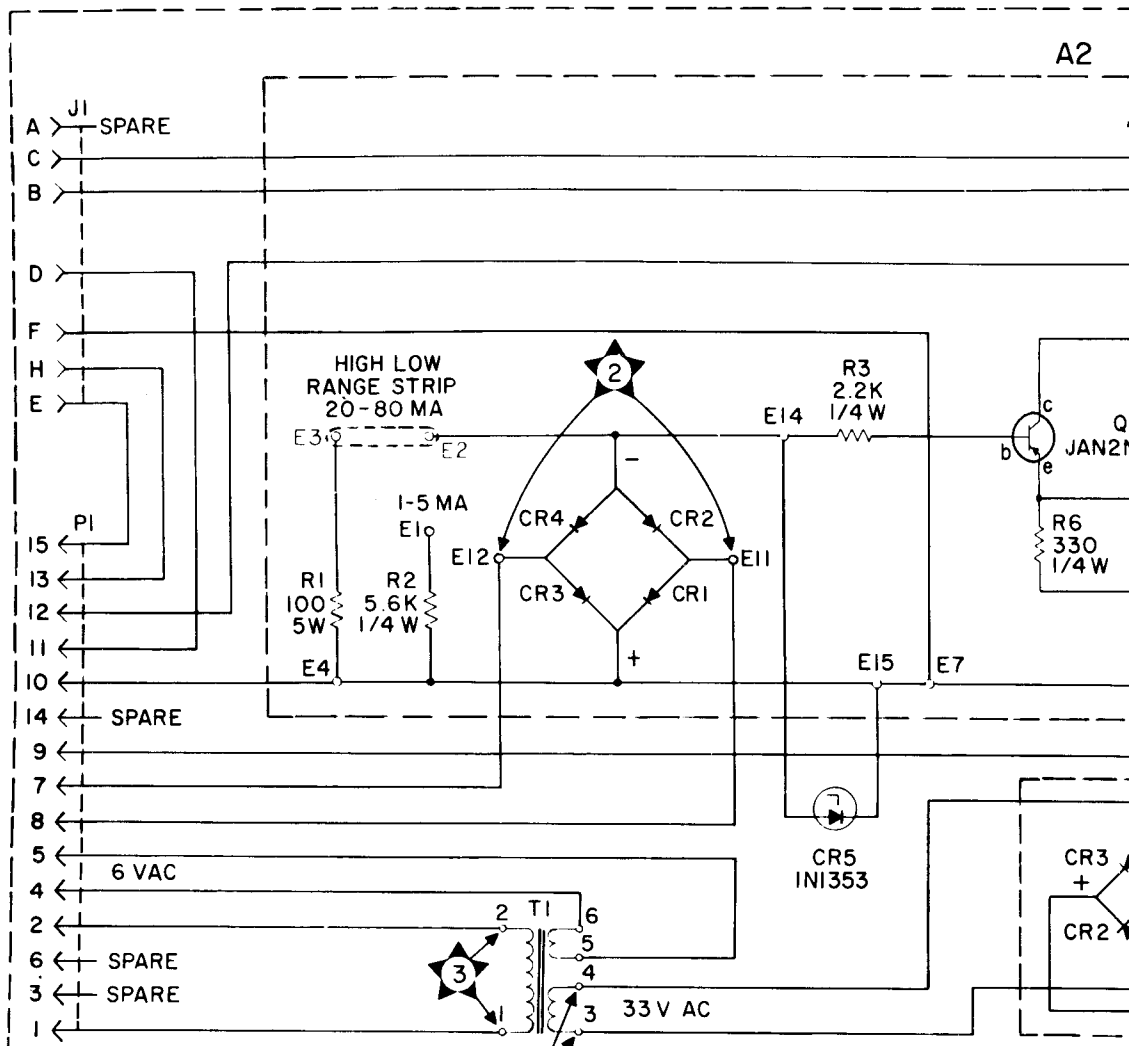
IA9E1
KEYBOARD
SLIP
CONNECTOR
CONTACTS

IAIS4
CONTACT
BLOCK

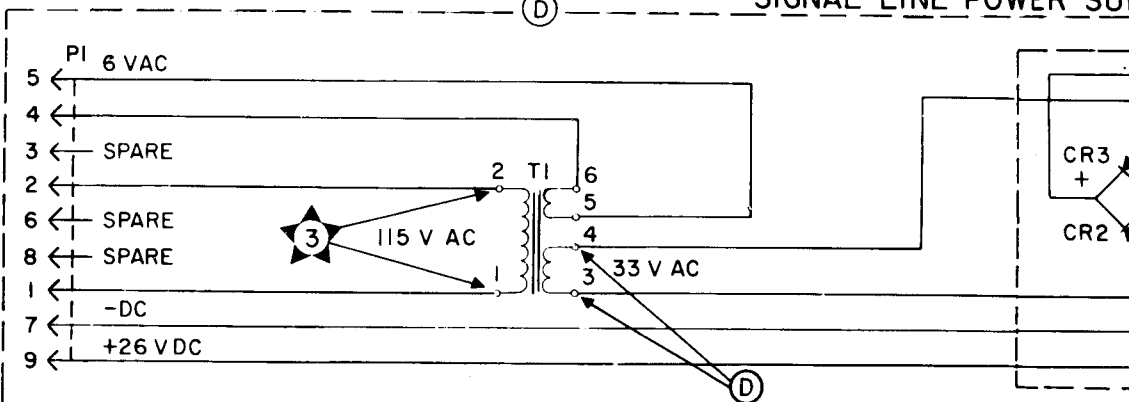
FROM
SHEET 1 { A

LINE SENSOR 1A

A2



SIGNAL LINE POWER SUPPLY



FROM
SHEET 1 { B

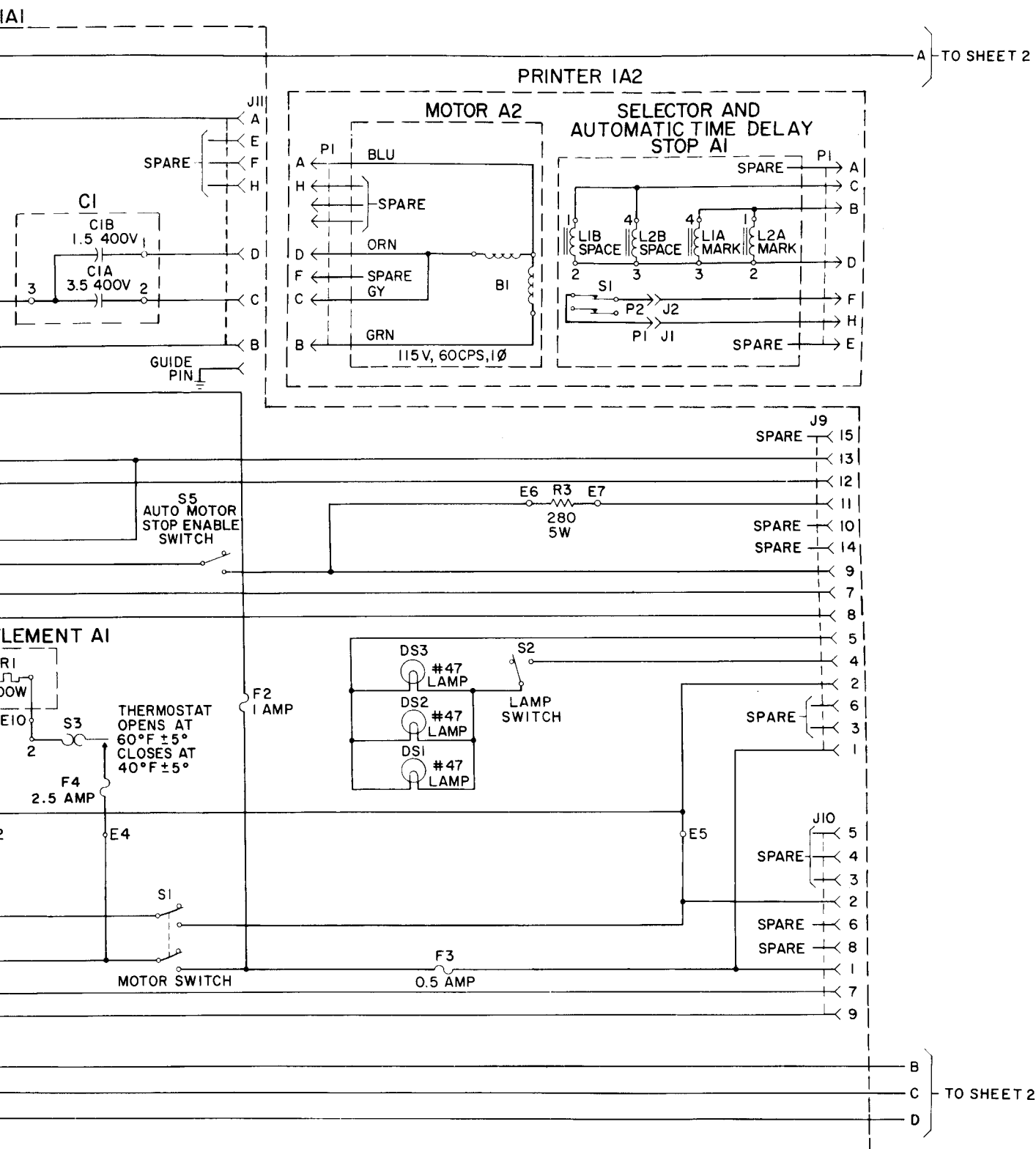


Figure 5-107. Teletypewriter Set AN/TGC-14A(V), Schematic Diagram (Sheet 1 of 2)

ELECTRICAL CHASSIS 1A1

SEE NOTE 5

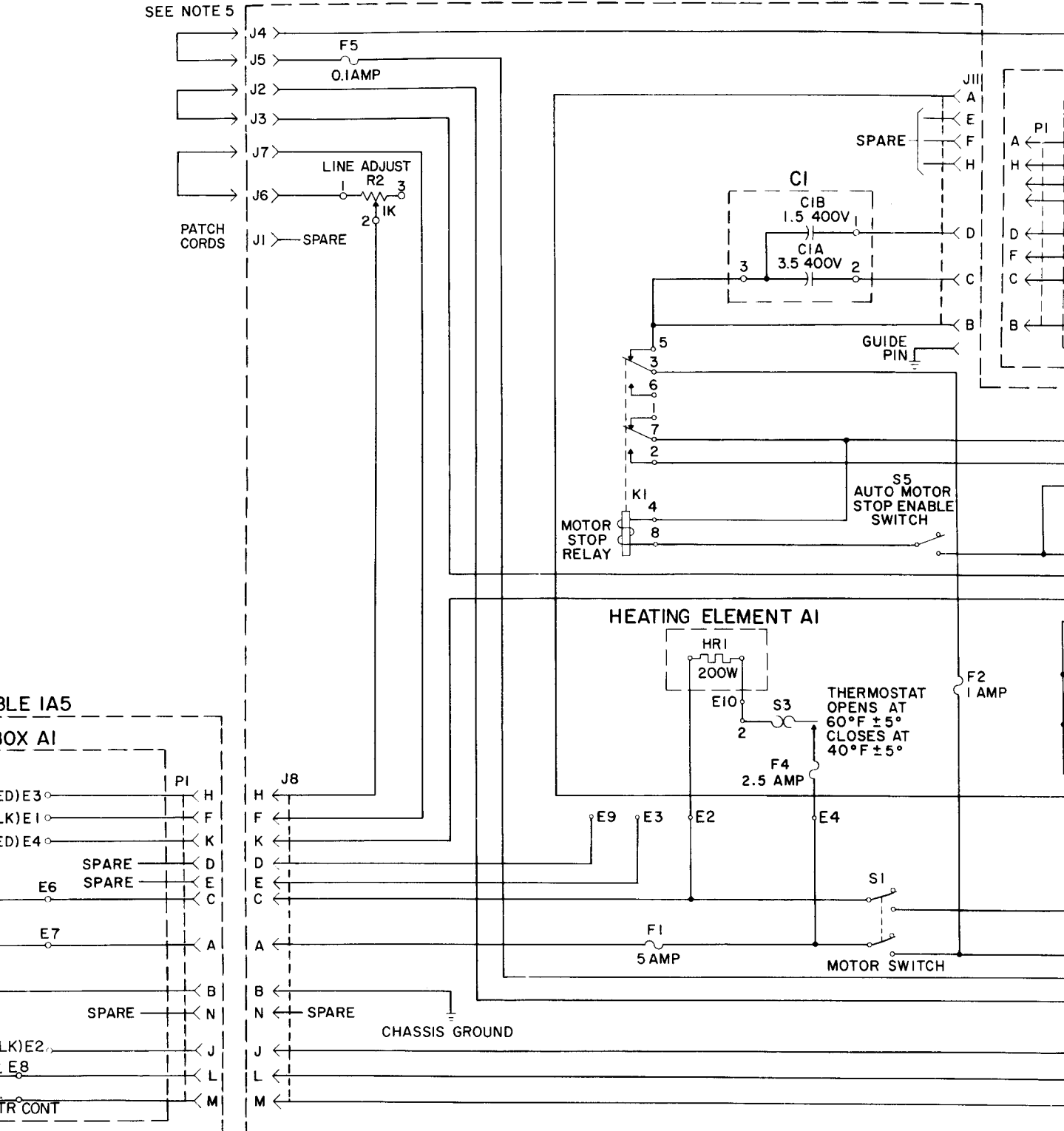



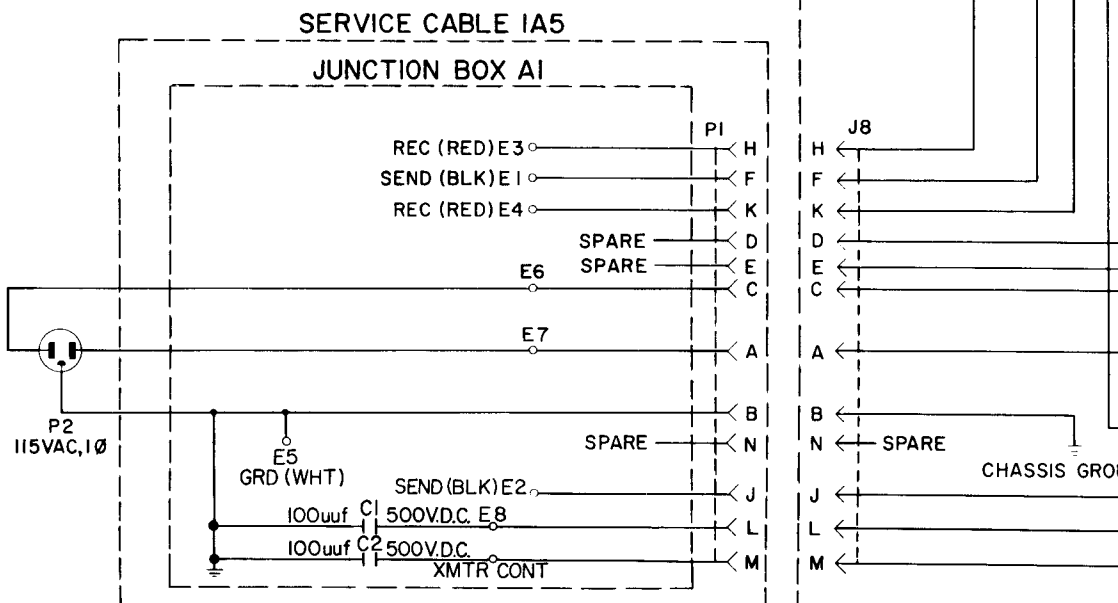
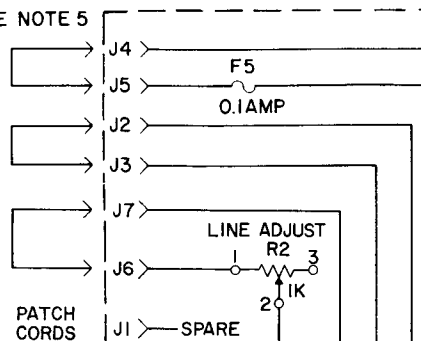
Figure 5-107.

ORIGINAL

NOTES

1. REFERENCE DESIGNATIONS ARE ABBREVIATED. PREFIX THE DESIGNATION WITH THE UNIT NUMBER, OR ASSEMBLY DESIGNATION, OR BOTH.
2. ALL RESISTORS ARE 1/2 WATT $\pm 5\%$ AND VALUES ARE IN OHMS UNLESS OTHERWISE INDICATED.
3. ALL CAPACITORS ARE $\pm 10\%$ AND VALUES ARE IN MICROFARADS (UF) UNLESS OTHERWISE INDICATED.
4. ALL MEASUREMENTS OBTAINED WITH 20,000-OHMS-PER-VOLT METER. UNLESS OTHERWISE INDICATED, VALUES AT SIGNIFICANT TEST POINTS ARE TO COMMON GROUND, WITH ALL UNITS INTERCONNECTED, BUT WITH THE EQUIPMENT DEENERGIZED. SEE SECTION 4 FOR COMPLETE VOLTAGE READINGS.
5. PATCHED FOR SIMPLEX INTERNAL BATTERY OPERATION. FOR PATCHING OPTIONS SEE PARAGRAPH 2-9.
6. ALL DIODES ARE TYPE AFIN645 UNLESS OTHERWISE INDICATED.
7. THE SYMBOL  DENOTES A ZENER DIODE.

SEE NOTE 5



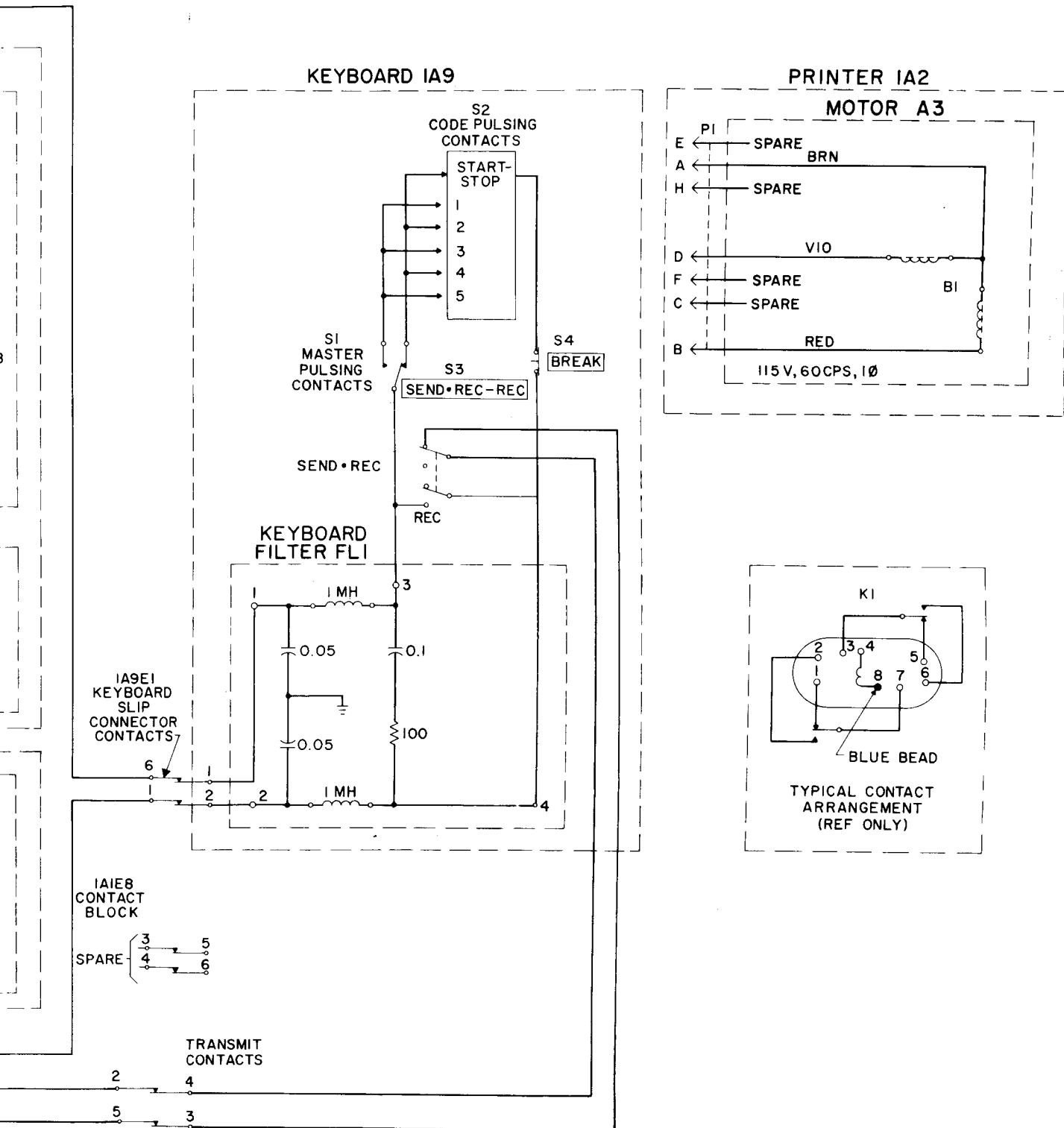
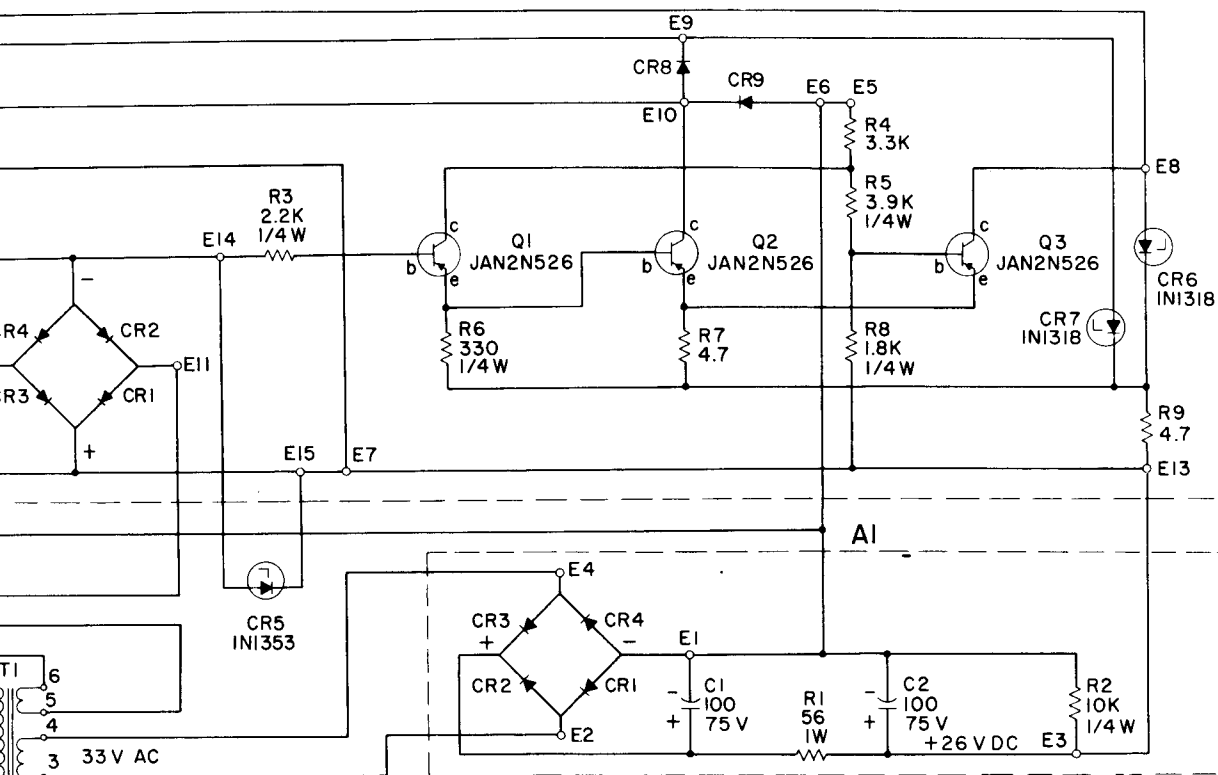


Figure 5-107. Teletypewriter Set AN/TGC-14A(V), Schematic Diagram (Sheet 2 of 2)

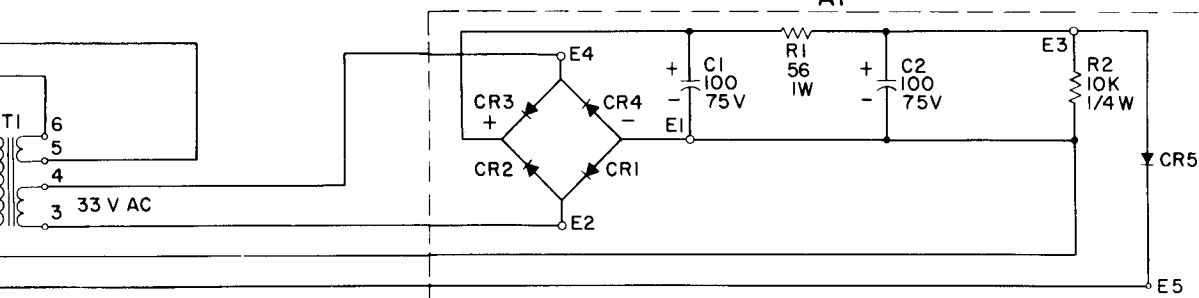
LINE SENSOR IA3

A2



SIGNAL LINE POWER SUPPLY IA4

A1

IA9E1
KEYBOARD
SLIP
CONNECTOR
CONTACTSIAIE8
CONTACT
BLOCK

SPARE { 3, 4 }

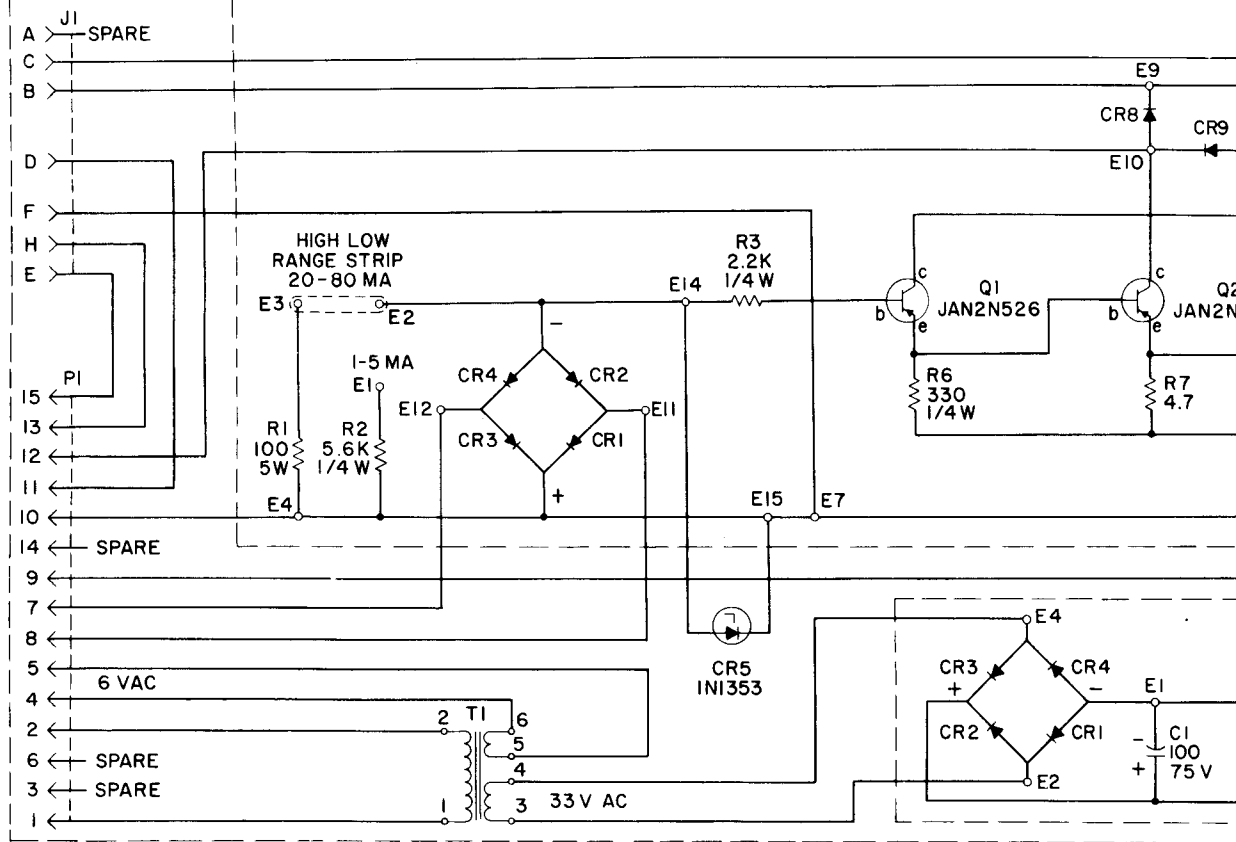
2

5

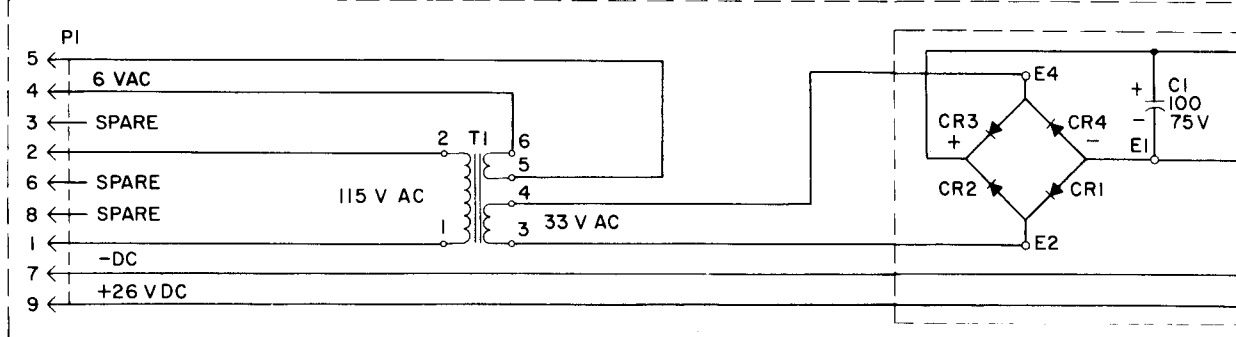
FROM
SHEET 1

LINE SENSOR 1A3

A2



SIGNAL LINE POWER SUPPLY 1A4



FROM
SHEET 1

B
C
D