INSTRUCTIONS FOR INSTALLING THE 199446 MODIFICATION KIT TO PROVIDE SIGNAL REGENERATION ON MODEL 35 8A1 SETS

1. GENERAL (See Section 4 for the Theory of Operation)

1.01 The 199446 modification kit may be installed on the following sets to provide signal regeneration.

(a) 35BC and 35BP (friction feed) and 35BF and 35BR (sprocket feed) Automatic Send-Receive Sets.

(b) 35BD (friction feed) and 35BG (sprocket feed) Keyboard Send-Receive Sets with or without the 305464 modification kit to connect a tape reader.

(c) 35BE (friction feed) and 35BH (sprocket feed) Receive-Only Sets with the 305464 modification kit to connect a tape reader.

1.02 The 199446 modification kit consists of the following major components:

(a) Signal regenerator assembly.

(b) Parts to provide improved timing contacts on transmitters and keyboards.

(c) The wires and cable clamps to make changes in the mode switch and the electrical service unit wiring required for operation of the sets with the signal regenerator.

Note: The 199446 modification kit may be used on the sets as wired from the factory for half-duplex operation, or as wired with the 198495 set of parts for full duplex operation.

1.03 The 199446 modification kit consists of the following parts.

1	2669	Lockwasher	2	179800	Toggles
0.25ft	39603RM	Wire	1	182520	Rectifier (or diode)
1	41382	Spring			
1	90391	Felt washer	4	195241	Screws with contact
1	121247	Clamp			
1	121249	Clamp	1	198236	Cam follower stop
1	125015	Flat washer	1	198259	Wire assembly
1	177894	Nut	1	198831	Wire assembly

1	199443	Cable assembly	1	324010	Contact assembly
1	199444	Cable assembly	1	324011	Cam follower
1	199449	Switch section with straps	1	324012	Stud
			1	324013	Spring post
1	305446	Signal Regenerator	1	326635	Spark suppression network
1	321915	Eccentric			
1	321916	Contact assembly			

1.04 The 199446 modification kit is compatible with the following modification kits:

(a) 308412 modification kit to make an 8A1 Receive-Only Station Set operable from a Private Line Automatic Send-Receive Set. This kit may be used on the 35BE or 35BH RO Sets along with the 305464 modification kit.

(b) 312390 modification kit to detect EOT at a reader in Station Sets 35BC, 35BE, 35BF, 35BH, 35BP, and 35BR.

2. INSTALLATION

Note 1: The following equipment is needed in making the modification:

Long nose pliers
Wire cutter
Soldering iron and solder
Tweezers
1/4 inch socket or end wrench (both may be used)
Screwdriver
Electrical tape

Note 2: All direction (front, rear, left, right) are given with reference to the set as viewed by a person typing or reading the page printer copy.

2.01 Installation in 35BD (Friction Feed) and 35BG (Sprocket Feed) Keyboard Send-Receive Sets: These sets consist of a VCL324 and typing unit. They have an LESU314 electrical service unit and LK804/ATL keyboard.

(a) Isolate the set from all power sources.

(b) Open the upper cover, push the lower cover latch, and raise the lower cover in accordance with standard procedure.

Note: It is not necessary to remove the bezel. For better access to the electrical service unit, it may be found desirable to remove the cover in accordance with standard procedure.

(c) Replace the 192485 or 319946 timing contact assembly in the LAK806 Keyboard with the 324010 timing contact assembly. If the signal generator contacts have been used in a circuit with a power level greater than 40 v dc at 20 ma, they should be replaced. The procedures are given in Specification 50479S. Disconnect arc suppressor in signal generator as shown in Figure 11.

(d) Remove the cover above the C wiring field and make the following wiring changes in the LESU314 electrical service unit. Refer to 6936WD Actual Wiring Diagram and Figure 6. The schematic wiring is shown in Figures 2 and 3, and 6471WD-B7.

Remove the strap between C-2B and C-3B.

Note: This strap is present only if 305464 modification kit is not used.

Move brown wire (F-1-BR) from C-5C to C-6B.
Move blue-slate wire (J-39-BL-S) from C-5C to C-6B.
Move white-black-red wire (J-43-W-BK-R) from C-2B to C-3B.

(e) Install the 305446 signal regenerator assembly in the LESU314 electrical service unit as follows:

(1) Loosen two screws which mount the selector magnet driver (SMD) assembly to the electrical service unit frame, and loosen the four posts which fasten the C wiring field to the electrical service unit frame. Lift the wiring field and SMD and route the cable of the 305446 assembly under the SMD and through the opening at the rear of the C wiring field. Mount the 305446 signal regenerator assembly in the electrical service unit with the circuit card on the right, adjacent to the left edge of the SMD. Fasten the 305446 and SMD assemblies and C wiring field.

(2) Connect the wires of the 305446 signal regenerator assembly to the C wiring field as follows:

White-black to C-5A
White-purple to C-2B
White-green to C-3B
White-orange to C-5B
White-blue to C-6B
Brown-yellow and white-yellow to C-5C
White-slate to C-1G
White-red to C-4G

Tape the end of the red-green wire.

(f) The following parts are required for an ASR Set only and are not used on the KSR or RO Set with or without the 305464 modification kit.

39603RM	Bare wire
121247	Cable clamp
121249	Cable clamp
182520	Rectifier (or diode)
198259	Electrical wire assembly (strap)
199443	Cable assembly
199444	Cable assembly
199449	Switch section with strap

(g) If the KSR Set is not equipped with a 305464 modification kit to connect a tape reader to the set, the following parts are not used:

2669	Lockwasher
177894	Nut
321915	Eccentric
321916	Contact assembly
326635	Spark suppression network

If the KSR is equipped with a 305464 modification kit to connect a tape reader to the set, proceed with the following additional changes.

(1) Replace the 192605 contact assembly in the LXD transmitter distributor with the 321916 contact assembly and install the 321915 eccentric, 2669 lockwasher, and 177894 nut. The procedure is given in Specification 50479S. Disconnect arc suppressor in signal generator as shown in Figure 11. If the signal generator contacts have been used in a circuit with a power level greater than 40 v dc at 20 ma, they should be replaced. The procedure is given in Specification 50479S.

(2) Refer to Figure 7 and to Figure 3 of Specification 50362S and 6936WD, and change the wiring in the electrical service unit as follows:

Move white-black-red wire (J-43-W-BK-R) from C-3B to C-6G
Move black wire (F-2-BK) from C-3B to C-6G
Move white-red wire of 305464 Mod Kit from C-6B to C-5A
Move black wire of 305464 Mod Kit from C-6B to C-3B
Move yellow wire of 305464 Mod Kit from C-2B to C-3B
Move green wire of 305464 Mod Kit from C-3B to C-6G

(3) Connect the 326635 spark suppression network between terminal C-1E and C-6F.

2.02 Installation in 35BE (friction feed) and 35BH (sprocket feed) Receive-Only Sets which have the 305464 modification kit to connect a tape reader to the set. These sets consist of a VCL325 and typing unit. They have an LESU314 electrical service unit and LB802 base. The installtion procedure is the same as for the KSR Set with the 305464 modification kit except for the following:

(a) The 324010 keyboard timing contact assembly is not used.

(b) The strap from C-3B to C-5C must be removed.

(c) Add the 198831 strap between terminals C-6B and C-6G.

(d) Connect the 326635 spark suppression network between terminals C-1E and C-6F.

2.03 Installation in 35BC and 35BP (friction feed) and 35BF and 35BR (sprocket feed) Automatic Send-Receive Sets. The 35BC and 35BF sets consist of a VCL323 and typing unit. The 35BR and BP sets consist of a VCL375 and typing unit. The VCL323 has an LPR805/DRC typing reperforator. The VCL375 has an LRPE803 nontyping reperforator. These sets all have an LXD804 tape reader, LAK806/ATL keyboard, and LESU315 electrical service unit.

(a) Isolate the set from all power sources.

(b) Open the upper cover, push the lower cover latch, and raise the lower cover in accordance with standard procedure.

Note: It is not necessary to remove the bezel. For better access to the electrical service unit, remove the cover. Follow standard procedure.

(c) Replace the 192485 or 319946 timing contact assembly in the LAK806 keyboard with the 324010 timing contact assembly, and replace the 192605 timing contact assembly in the LXD804 transmitter distributor with the 321916 timing contact assembly. If the signal generator contacts have been used in a circuit with a power level greater than 40 v dc at 20 ma, they should be replaced. The procedures are given in Specification 50479S. Disconnect arc suppressor in signal generator as shown in Figure 11.

(d) Remove the mode switch panel by removing the two screws in front which mount it. Make the following changes in the wiring of the mode switch assembly. Refer to 6903WD and Figure 7. The schematic wiring is shown in Figures 4 and 5.

(e) Remove the two nuts and two lockwashers which hold the rotary switch assembly together. Lift off switch sections 5, 4, and 3 and remove the brown-blue, red, blue, and red-green wires. Remove the end of the strap which has its other end fastened to terminal 7 of section 2. Reassemble the switch using the 199449 switch section for section 3 and solder the previously removed four wires and strap to this

section as shown in Figure 8. Make sure that all sections are oriented as shown, and that the key slots in the rotating portion in the center of the sections are lined up on the same flat surface on the side of the switch shaft.

(f) Connect the 199443 cable and strap terminals on the mode switch as follows:

White-orange wire to terminal 8, section 3, and add strap between terminals 7 and 8, section 3, using a piece of the 39603RM bare wire furnished.

White-brown wire to terminal 8, section 5, and add strap between terminals 7 and 8, section 5, using a piece of the 39603RM bare wire furnished.

White-black wire to terminal 6, section 5.

(g) Remove the cable clamp and clamp the new cable with the old cable using the 121247 (7/16 inch) cable clamp provided.

(h) Push the terminals into the V connector as follows:

White-brown to V-10
White-orange to V-11
White-black to V-12

(i) Remove the strap between terminal 9 of section 1 and terminal 7 of section 2 and replace it with the 182520 rectifier (or diode). Install the banded end of the diode toward terminal 7 of section 2. Refer to Figure 8.

(j) Remount the mode switch panel.

(k) Make the following changes in the LESU315 electrical service unit. Refer to 6935WD and Figures 9 and 10. Schematic wiring is shown in Figures 4 and 5.

(l) Push the terminals on the wires of the 199444 cable into the V mode switch connector of the LESU315 as follows:

White-orange-purple to V-10
White-red-brown to V-11
White-black to V-12

(m) Remove the cable clamp and clamp the new cable with the old cable using the 121249 (5/8 inch) cable clamp provided. Mount with the cable below the clamp mounting screw so the cable runs close to the bottom of the electrical service unit.

(n) Remove the cover above the C wiring field. Move wires on the C wiring field of the electrical service unit as follows:

Remove strap between C-2D and C-2E
Move orange-brown wire (S-1-0-BR) from C-4A to C-5E
Move blue-slate wire (S-5-BL-S) from C-5C to C-2D
Move blue-green wire (F-35-BL-G) from C-3E to C-4E
Move black-brown wire (U-4-BK-BR) from C-2E to C-2D
Move red-yellow wire (S-7-R-Y) from C-2D to C-2E
Move white-black-red wire (J-43-W-BK-R) from C-2D to C-2E
Move blue-green wire (U-1-BL-G) from C-3E to C-4L

Note: There are two blue-green wires on C-3E. The U-1-BL-G wire to be moved can be seen to go into the cable to the transmitter distributor by loosening its four mounting posts and raising the C wiring field, or the wires may be checked for continuity.

Move green-slate wire (U-2-G-S) from C-4E to C-3E
Move red-blue wire (F-3-R-BL) from C-6E to C-5L

For full duplex operation see Note on Figure 10.

Remove the two 197054 straps connecting C-4M, C-5M, and C-4N, and reconnect these terminals using the 198259 strap.

(o) Loosen the screws which mount the two selector magnet driver assemblies and the assembly with the 198248 card to the electrical service unit frame. Loosen the four posts which mount the C wiring field to the electrical service unit frame.

(p) Lift the assemblies and wiring field, and route the mode switch cable under the assemblies and through the opening at the rear of the C wiring field. Connect the wires as follows:

White-orange-purple wire (V-10-W-O-P) to C-6E
White-red-brown wire (V-11-W-R-BR) to C-5F
White-black wire (V-12-W-BK) to C-5L

(q) Lift the assemblies and route the cable of the 305446 assembly under the assemblies and through the opening at the rear of the C wiring field. Mount the 305446 signal regenerator assembly in the electrical service unit with the circuit card on the right, adjacent to the left edge of the SMD. Connect the wires to the C wiring field as follows:

White-yellow and brown-yellow to C-5C
White-green to C-2D
White-purple to C-4E
White-orange to C-6E

White-black to C-5F
White-blue to C-4L
White-red to C-4M
White-slate to C-2N

Tape the end of the red-green wire. Also connect the 326635 spark suppression network between terminals C-4D and C-5J.

(r) Tighten the screws which mount the two SMD assemblies, the assembly with the 198248 card, and the signal regenerator assembly. Tighten the posts which mount the wiring field, and replace the cover on the wiring field.

(s) Replace the set cover.

3. SERVICE

3.01 No special tools or periodic maintenance is required. For troubleshooting, an oscilloscope is necessary.

3.02 The voltage levels at various numbered test points are indicated on Figure 1. The physical locations of the test points are shown on Figure 12. The ground lead of the oscilloscope should be connected to test point no. 9. All voltages given are with reference to the common return to the signal regenerator power supply (test point no. 9) as 0.

CAUTION 1: THE SET SHOULD BE REMOVED FROM ALL POWER SOURCES WHEN ATTACHING OR REMOVING PROBE OR GROUND LEADS, OR WHEN INSERTING OR REMOVING CIRCUIT CARDS. PROBE OR GROUND LEADS SHOULD BE SECURELY FASTENED IN SUCH A MANNER THAT NO SHORT CIRCUIT CAN OCCUR.

CAUTION 2: THE GROUNDING ARRANGEMENTS OF THE OSCILLOSCOPE AND THE CABINET AND CIRCUITS OF THE TELETYPEWRITER SET SHOULD BE CHECKED BEFORE ATTACHING THE OSCILLOSCOPE PROBE OR GROUND LEAD TO THE SET IN ORDER TO AVOID SHOCK HAZARDS AND SHORT CIRCUITS.

3.03 If the set is equipped with a mode switch (or other switching device), be sure it is operating so that the signal generator contacts are connected to the signal regenerator (for example, in K or KT mode).

3.04 The steps below may be followed for a complete check of the signal regenerator circuit card.

	STEP	NORMAL INDICATION	ABNORMAL INDICATION	POSSIBLE CAUSES
1.	Connect the oscilloscope probe to test point no. 10 (oscilloscope ground lead is connected to test point no. 9).	Without the set idling, the output of the signal regenerator (at test point no. 10) should be a steady 0 voltage indicating a steady marking condition. With the signal generator operating, the voltage level should rise to the voltage of the positive side of the signal line (or local power supply) on spacing pulses. When transmitting a "U" character (1, 3, 5, 7 marking and 2, 4, 6, 8 spacing with even parity), the stop pulse should be approximately 18 milliseconds long (2 cm in length) and individual marking and spacing pulses 9 milliseconds long (1 cm in length) when the time/div is set at 10 ms/cm.	Output always mark (steady 0 voltage).	Transistor Q6 may be shorted. Proceed to Step 2 to check for other possible causes.
			Output always space (steady + signal line voltage).	Transistor Q6 may be open. Proceed to Step 2 to check for other possible causes.
2.	Place the oscilloscope probe on test point no. 1.	The voltage level is +10 on mark and 0 on space.	Steady 0 voltage.	Transistor Q3 may be shorted. Diode CR8 may be shorted. Proceed to Step 3 to check for other possible causes.

	STEP	NORMAL INDICATION	ABNORMAL INDICATION	POSSIBLE CAUSES
2.	(Continued)		Steady +10 voltage.	Transistor Q3 may be open. Diode CR8 may be open. Proceed to Step 3 to check for other possible causes.
3.	Place the oscilloscope probe on test point no. 2	The voltage level is 0 on mark and +2 on space.	Steady 0 voltage.	Transistor Q2 may be shorted. Diode CR5 may be open. Proceed to Step 4 to check for other possible causes.
			Steady +2 voltage.	Transistor Q2 open. Proceed to Step 4 to check for other possible causes. Note: If diode CR5 is shorted, signal will be 0 to +1.
4.	Place the oscilloscope probe on test point no. 7.	With the unit idling, the voltage level should be at +12. The timing contact is open when the unit is idling. It closes when signal generation begins	No 6 volt positive or negative going spikes but voltage is +12 on marking and 0 on spacing pulses. Proceed to Step 5 for possible causes.	

	STEP	NORMAL INDICATION	ABNORMAL INDICATION	POSSIBLE CAUSES
4.	(Continued)	and opens and re-closes in the middle of each pulse. Opening of the timing contact should cause a negative going spike of 6 volts. Closing of the timing contact should cause a positive going spike of 6 volts. On marking pulses, the spikes will be from +12 volts to +6 volts, and from +12 volts to +18 volts. On spacing pulses the spikes will be from 0 to -6 volts and 0 to +6 volts.	Spikes present, but voltage level remains at +12 during spacing pulses. Spikes present, but voltage level remains at 0 during spacing and marking pulses.	Transistor Q5 shorted. Transistor Q4 open. Signal generator spacing contact not closing. Transistor Q4 shorted. Transistor Q5 open. Signal generator marking contact not closing
5.	Place the oscilloscope probe on test point no. 3.	The voltage level is 0 when the unit is idling (the timing contact is open). With the timing contact operating, the voltage level should be at +6 volts when the timing contact is closed and 0 volts when it is open.	Steady 0 voltage.	Transistor Q1 shorted. Proceed to Step 6 for other possible causes.
6.	Place the oscilloscope probe on test point no. 6.	With the unit idling, the voltage level should be at approximately 0 (timing contact open). When transmitting from the signal generator contacts, the voltage level goes to -8	Steady -8 voltage. Steady 0 voltage.	Timing contact fails to open. Timing contact fails to close. Diode CR1 open.

STEP	NORMAL INDICATION	ABNORMAL INDICATION	POSSIBLE CAUSES
6. (Continued)	while the contacts are closed.	-20 v on closing of the timing contact and 0 volts on the opening of the timing contact.	Diode CR1 shorted.

4. THEORY OF OPERATION (Figure 1)

4.01 The dc coupled flip-flop is set by the signal generator contacts as follows:

(a) When the M (marking) signal generator contact is closed, current flows from ground thru CR6, R14, and the M contact to -20 v. Because of the voltage drop across CR6, the base-emitter junction of Q4 is reverse biased and Q4 does not conduct. This causes the base-emitter junction of Q5 to be forward biased. Q5 conducts, and its collector will then be close to ground potential. The collector of Q4 will be at +12 volts because of the voltage divider formed by R10 and R12.

(b) When the S (spacing) signal generator contact is closed, current flows from ground through CR7, R15, and the S contact to -20 v. Because of the voltage drop across CR7, the base-emitter junction of Q5 is reverse biased and Q5 does not conduct. This causes the base-emitter junction of Q4 to be forward biased. Q4 conducts, and its collector will then be close to ground potential. The collector of Q5 will be at +12 volts because of the voltage divider formed by R11 and R13.

(c) The ac coupled flip-flop is then set by the opening of the timing contact as follows:

(1) With the timing contact closed, the anode of CR1 is at -20 volts. Since the drop across CR1 is 12 volts, the base of Q1 is at -8 volts, and the base-emitter junction of Q1 is reverse biased. The collector of Q1 is at +6 volts because of the voltage divider formed by R3 and R4.

(2) After the dc coupled flip-flop has been set by the signal generator contacts as described above, the timing contact opens, removing the short around R2 to -20 v. The base of Q1 goes positive until the base-emitter junction of Q1 is forward biased. Q1 conducts and the collector goes from +6 to ground. This transition appears as a negative going spike of 6 volts at the cathodes of CR3 and CR4. On marking pulses, the dc coupled flip-flop is set with the cathode of CR4 near ground so that the -6 volt negative going spike causes it to go to a negative potential, reverse biasing the base-emitter junction of Q3, turning Q3 off and Q2 on. With Q3 off, the collector of Q3 is at about +10 volts. CR8 breaks down and Q6 is turned on.

(3) On spacing pulses, the dc coupled flip-flop is set with the cathode of CR3 near ground, so that the -6 volt negative going spike causes it to go to a negative potential, reverse biasing the base-emitter junction of Q2, turning Q2 off and Q3 on. With Q3 conducting, the collector of Q3 will be near ground potential and the voltage across CR8 will be less than 9.1 volts, which is not enough to break it down. Q6 does not conduct.

4.02 Mode Switching Circuit on ASR Set (Figures 4 and 5)

(a) In the keyboard mode, the K contacts are closed and the KT and T contacts are open.

(b) The keyboard and transmitter distributor signal generator and timing contacts are connected to the signal regenerator card. However, the transmitter distributor is inoperable. The keyboard is therefore "on line" or in local.

(c) The reperforator is disabled by connecting its selector magnet driver to the auxiliary local power supply through S-11, the K mode switch contact, and S-3.

(d) The page printer SMD is in the line (or local) circuit in series with the signal regenerator transistor switch Q6 through S-4, the K mode switch contact and S-2.

4.03 In the keyboard-tape mode, the KT contacts are closed, and the K and T contacts are open.

(a) The keyboard and transmitter distributor signal generator and timing contacts are connected to the signal regenerator card. The transmitter distributor is operable. Therefore, both keyboard and transmitter distributor are "on line" or in local.

(b) The reperforator and page printer selector magnet drivers are connected in series in the signal line (or local) circuit through S-4, the KT mode switch contact, and S-11.

4.04 In the tape mode the T contacts are closed and the K and KT contacts are open.

(a) The keyboard signal generator and timing contacts are disconnected from the signal regenerator card and connected in series with the reperforator selector magnet driver in the auxiliary local power supply circuit. The circuit is from + auxiliary local power supply through R2, S-3, the T mode switch contact, S-6, the keyboard signal generator marking contact, S-7, the T mode switch contact, S-11, and the reperforator SMD to - auxiliary local power supply.

(b) The transmitter distributor is operable and its signal generator and timing contacts remain connected to the signal regenerator circuit card, so that the transmitter distributor is "on line" or in local.

(c) The page printer is in the line (or local) circuit through the T contact and S-4.

4.05 Signal Line and Local Circuit (Figures 2, 3, 4, & 5)

(a) Switching between the signal line and local circuits is accomplished by the line-local relay in the same manner as before the signal regenerator was installed. The main difference is that the signal regenerator switching transistor (Q6) has replaced the signal generator contacts in the line-local circuit, and the signal generator contacts are used to provide the input to the signal regenerator. The rectifier (or diode) at terminal 9 on circuit B of section 1 prevents a short circuit to -20 volts on the signal regenerator while the mode switch is between the KT and T positions. Circuit A of section 3 has early make late-break contacts to "blind" the reperforator during switching in order to prevent the reperforator from punching spurious characters while the mode switch is between the KT and T positions.

(b) The 6.2 volt zenner diode CR10 is strapped out as shown by connecting the leads from A to H and when transistor Q6 is used for switching signal line current. When Q6 is to be used to provide an EIA output at its collector instead of for switching signal line current, CR10 is placed in the circuit by disconnecting the lead from H. The collector of Q6 will be at -6.2 volts on a marking pulse and +20 volts on a spacing pulse.

(c) Refer to EIA Standard RS-232-A for the definition of an EIA interface.

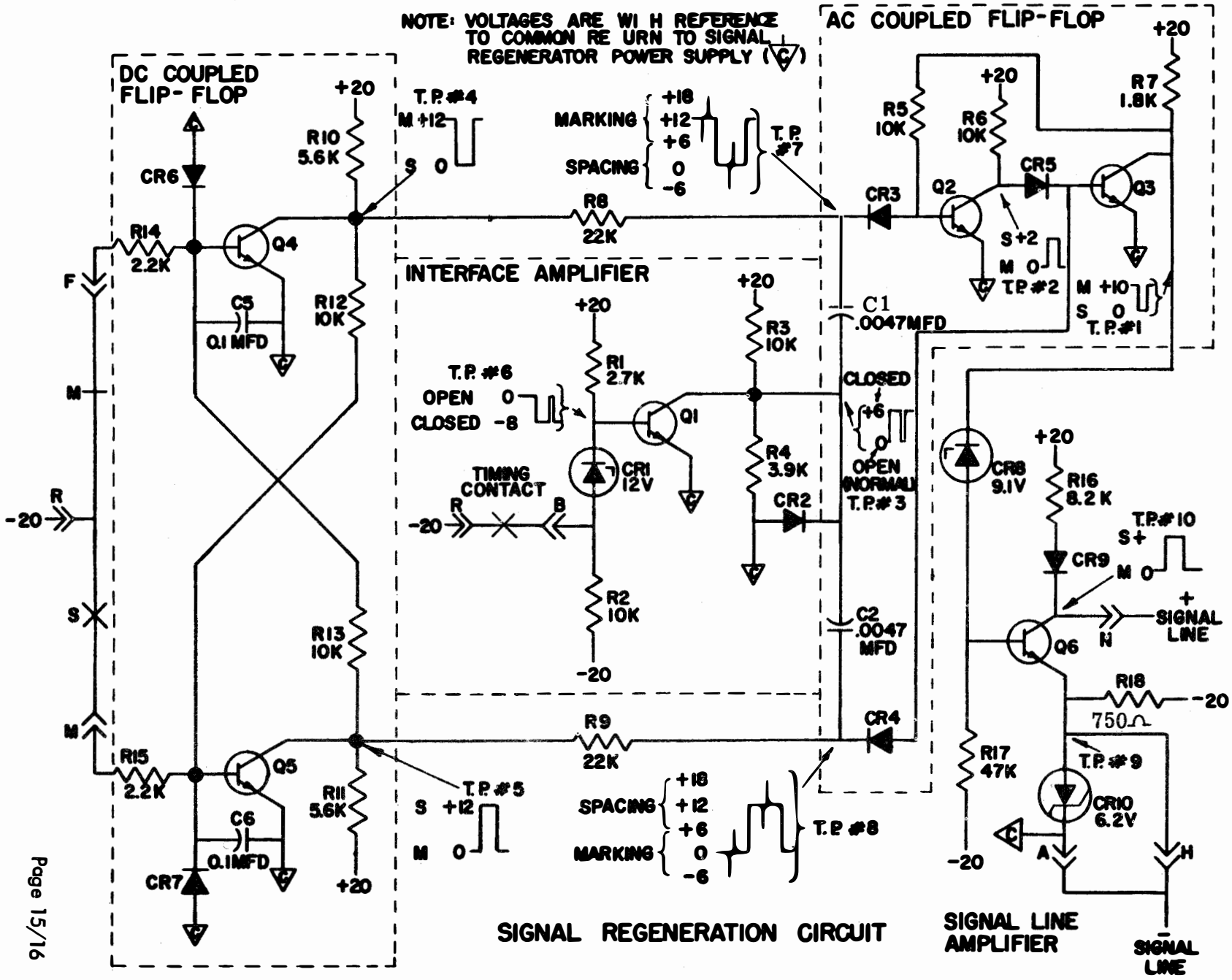
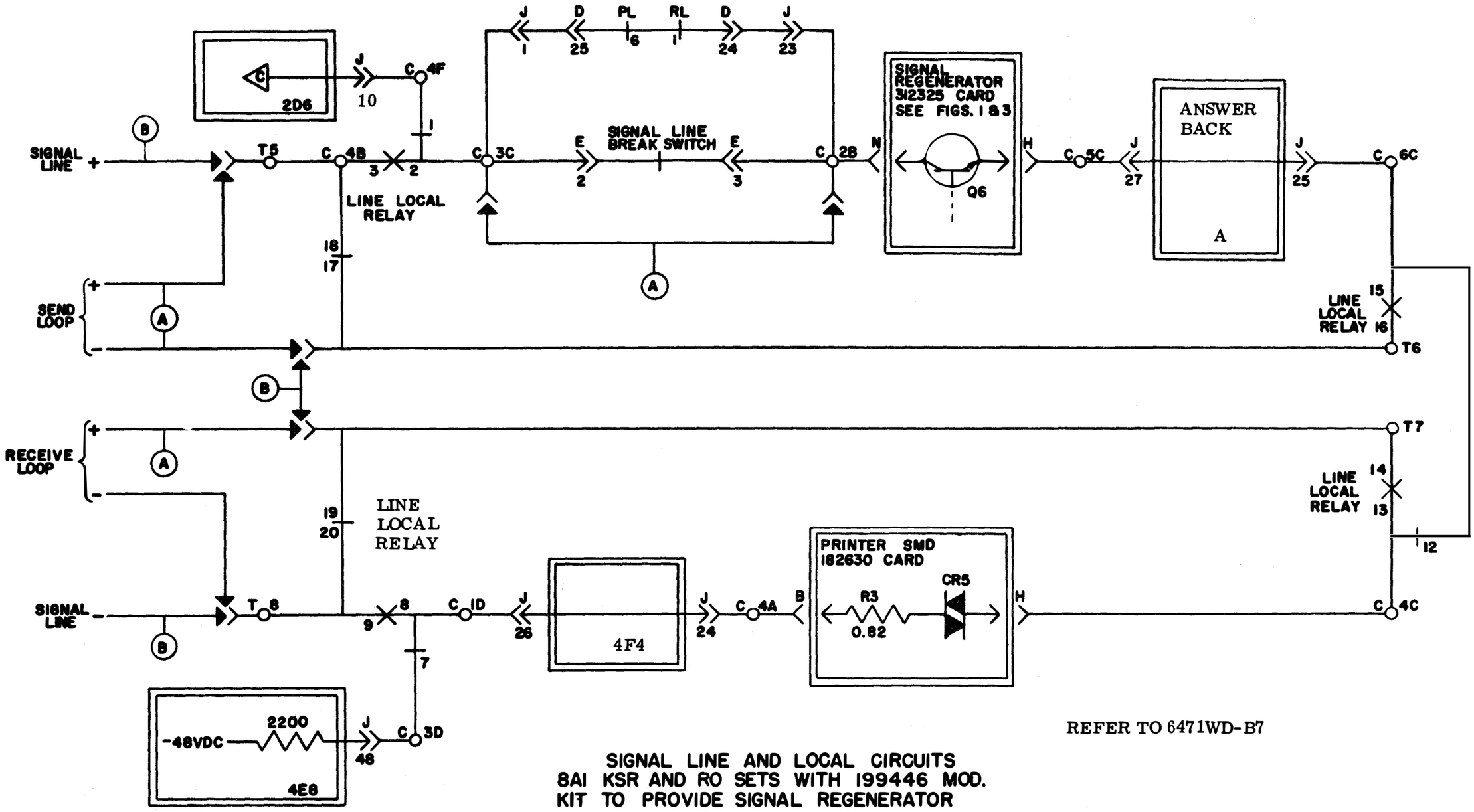

NOTE: VOLTAGES ARE WI H REFERENCE TO COMMON RE URN TO SIGNAL REGENERATOR POWER SUPPLY (C)
DC COUPLED FLIP-FLOP
AC COUPLED FLIP-FLOP
INTERFACE AMPLIFIER
+20
R10 5.6K
R14 2.2K
R12 10K
R13 10K
R15 2.2K
R11 5.6K
R8 22K
R9 22K
R5 10K
R6 10K
R7 1.8K
R3 10K
R1 2.7K
R4 3.9K
R2 10K
C1 .0047MFD
C2 .0047 MFD
C3 0.1 MFD
C6 0.1MFD
CR6
CR7
CR1 12V
CR2
CR3
CR4
CR5
Q1
Q2
Q3
Q4
Q5
Q6
T.P.#4
T.P.#5
T.P.#6
T.P.#7
T.P.#8
T.P.#1
T.P.#2
T.P.#3
MARKING +18 +12 +6
SPACING 0 -6
S +12
M 0
S +2
M +10
OPEN 0
CLOSED -8
CLOSED +6
OPEN NORMAL
TIMING CONTACT
R
B
F
M
S
-20
CR8 9.1V
R16 8.2 K
CR9
T.P.#10
S+
M 0
+ SIGNAL LINE
N
R18
750Ω
R17 47K
CR10 6.2V
T.P.#9
A
C
H
SIGNAL REGENERATION CIRCUIT
SIGNAL LINE AMPLIFIER
SIGNAL LINE

FIGURE 1



REFER TO 6471WD-B7

SIGNAL LINE AND LOCAL CIRCUITS
8AI KSR AND RO SETS WITH 199446 MOD.
KIT TO PROVIDE SIGNAL REGENERATOR

FIGURE 2

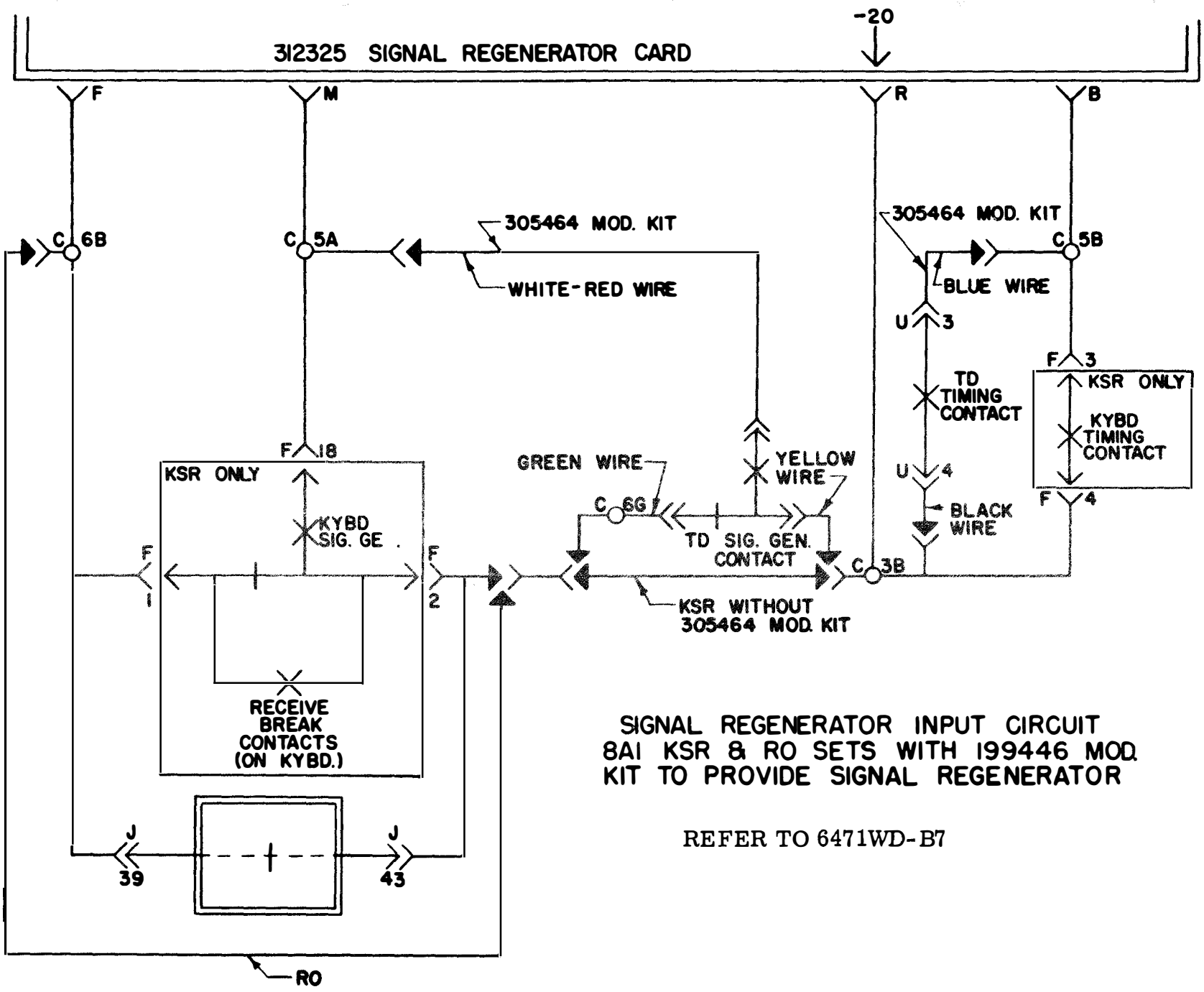
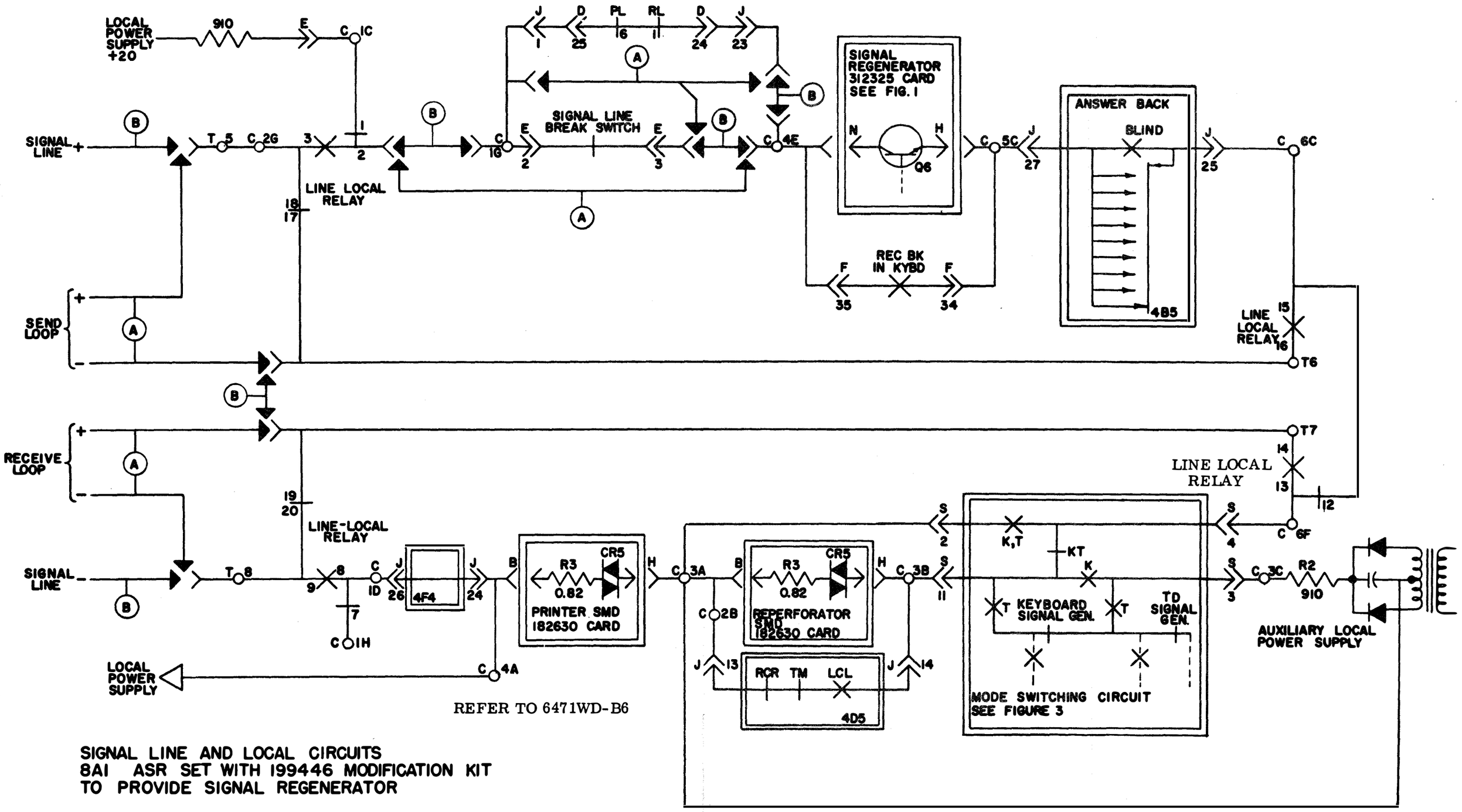


FIGURE 3

SIGNAL REGENERATOR INPUT CIRCUIT
8A1 KSR & RO SETS WITH 199446 MOD.
KIT TO PROVIDE SIGNAL REGENERATOR

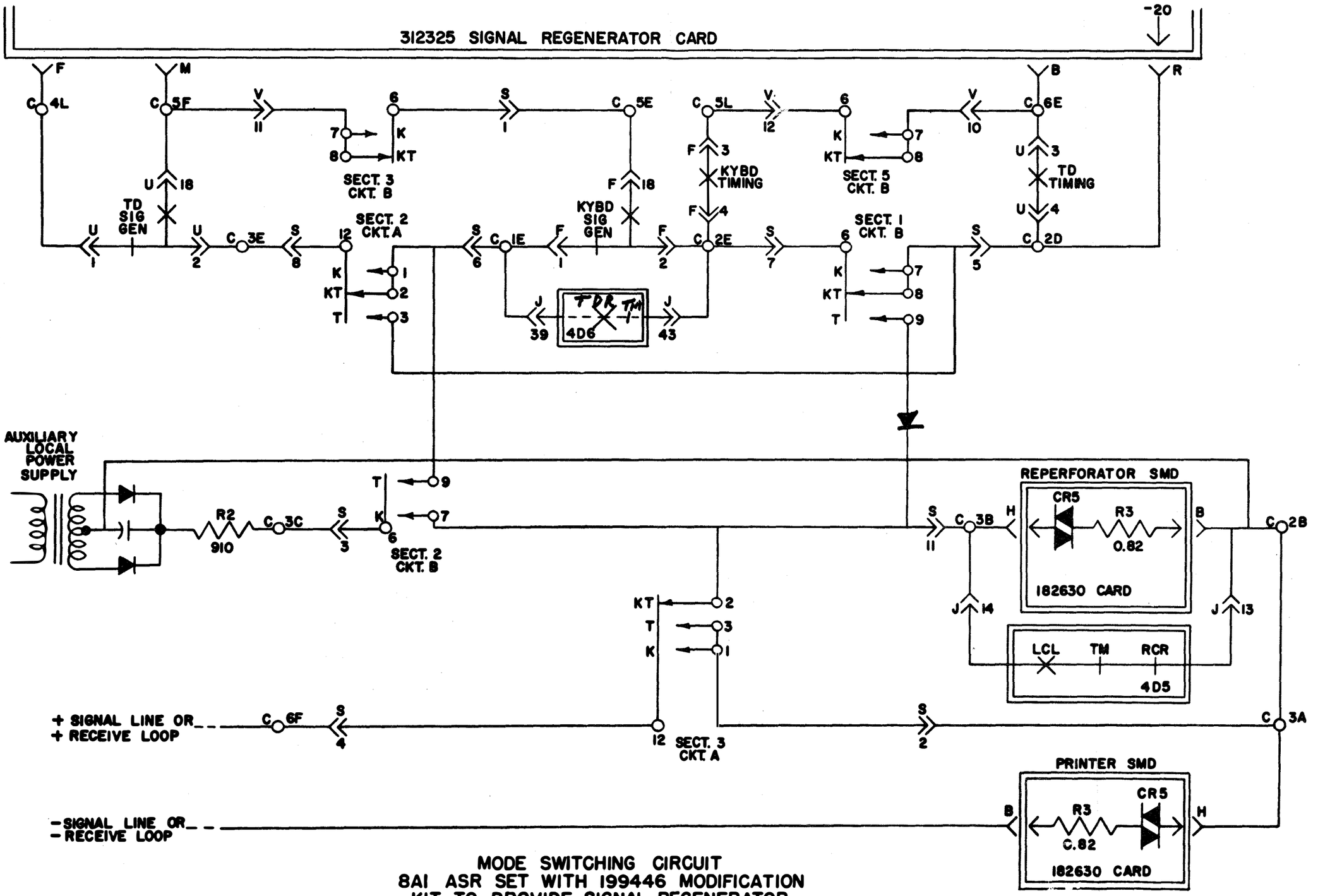
REFER TO 6471WD-B7



REFER TO 6471WD-B6

SIGNAL LINE AND LOCAL CIRCUITS
8AI ASR SET WITH 199446 MODIFICATION KIT
TO PROVIDE SIGNAL REGENERATOR

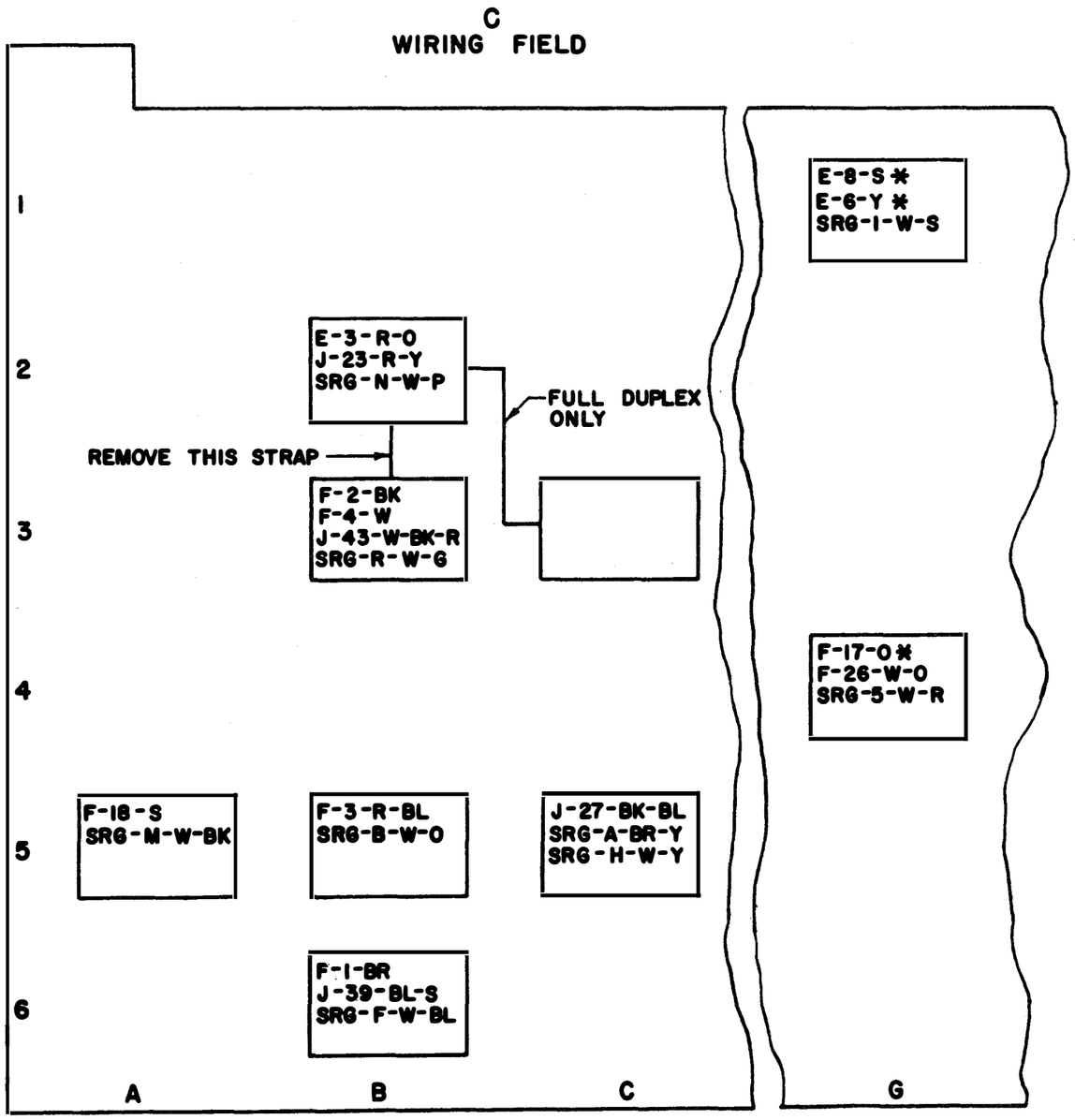
FIGURE 4

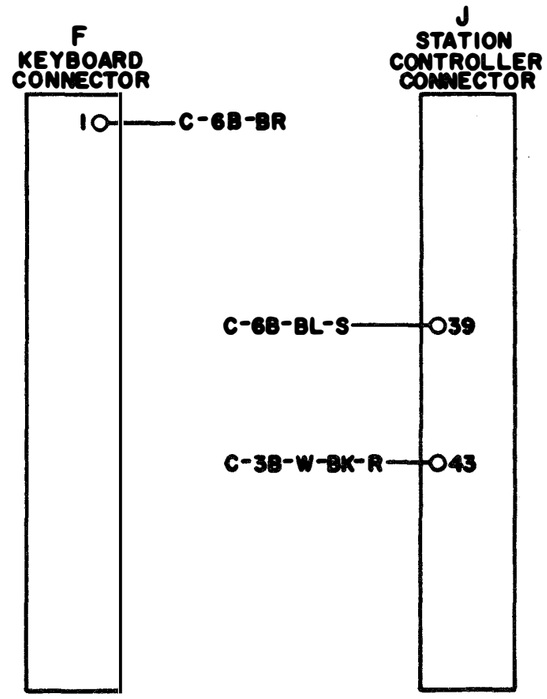


MODE SWITCHING CIRCUIT
8AI ASR SET WITH 199446 MODIFICATION
KIT TO PROVIDE SIGNAL REGENERATOR

REFER TO 6471WD-B6

FIGURE 5

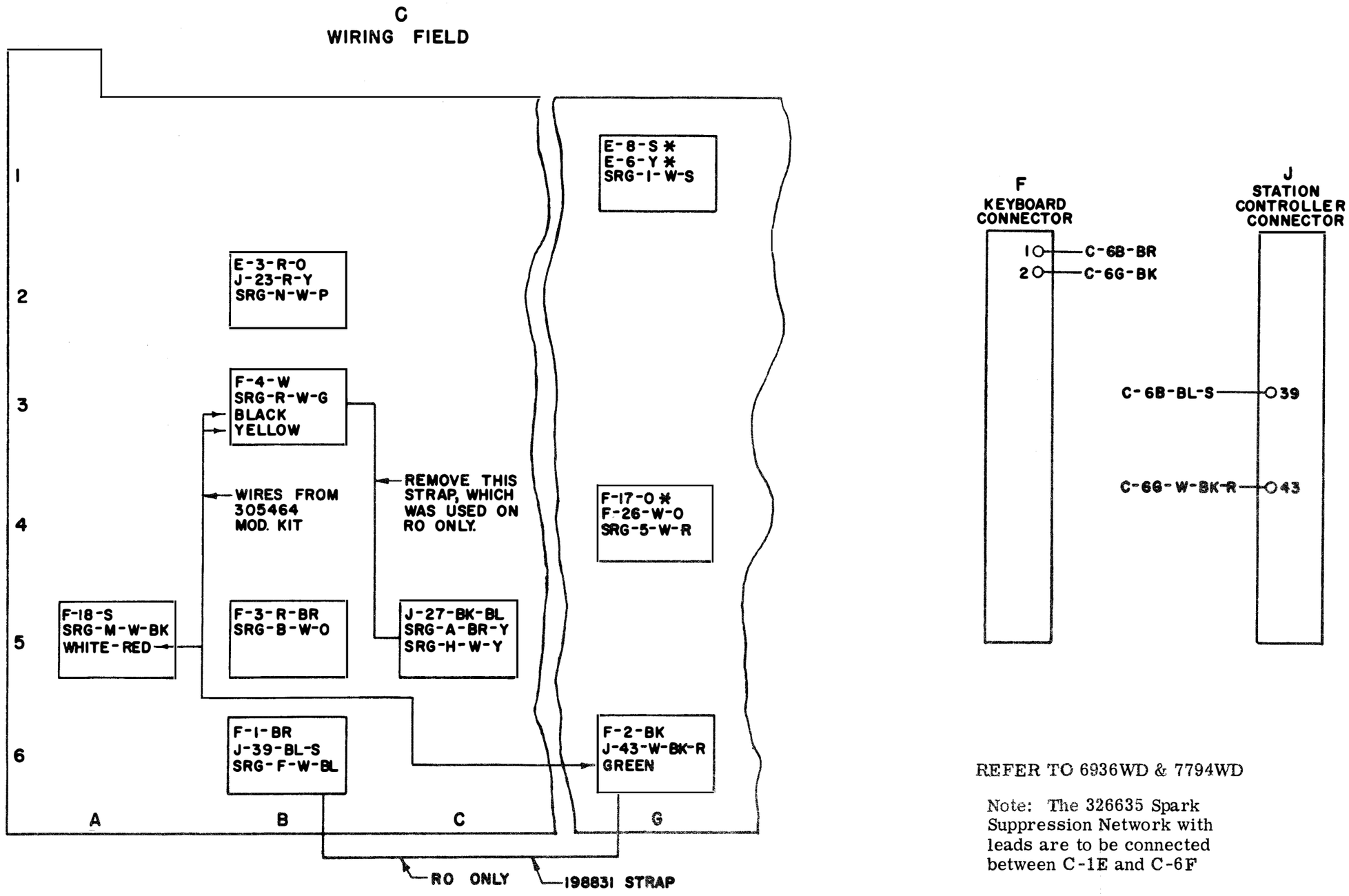




REFER TO 6936WD & 7794WD

WIRING OF LESU314 WITH 199446 MOD. KIT IN 8AI KSR SET WITHOUT 305464 MOD. KIT

FIGURE 6

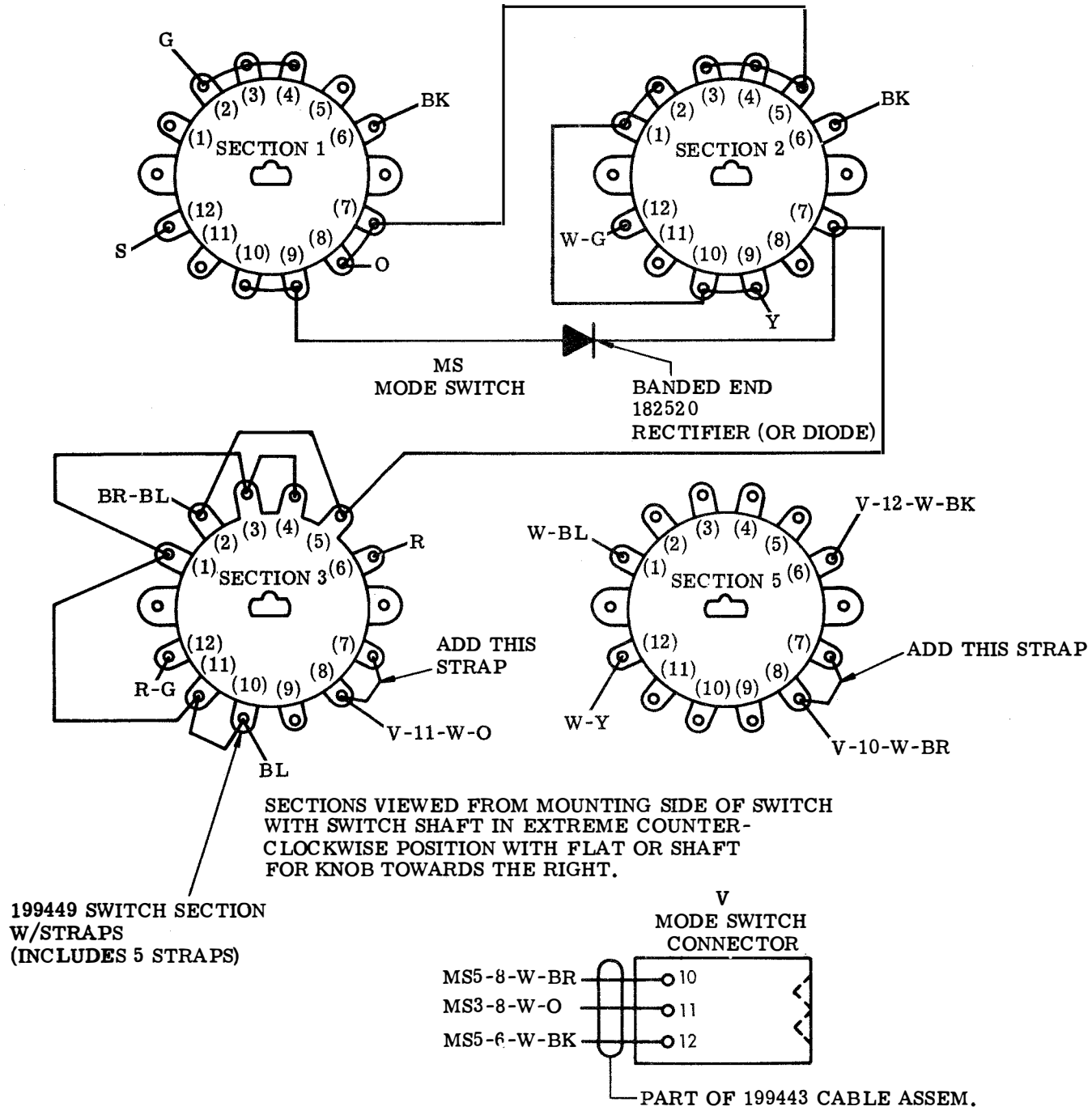


WIRING OF LESU314 WITH 199446 MOD. KIT IN 8AI KSR OR RO SET WITH 305464 MOD. KIT

REFER TO 6936WD & 7794WD

Note: The 326635 Spark Suppression Network with leads are to be connected between C-1E and C-6F

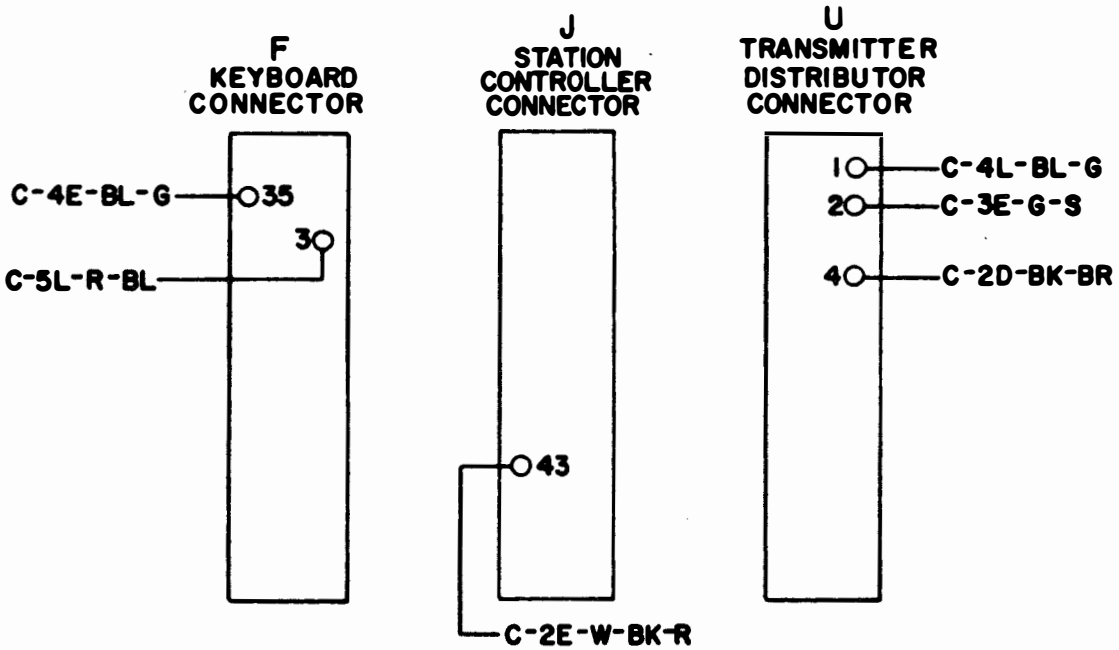
FIGURE 7



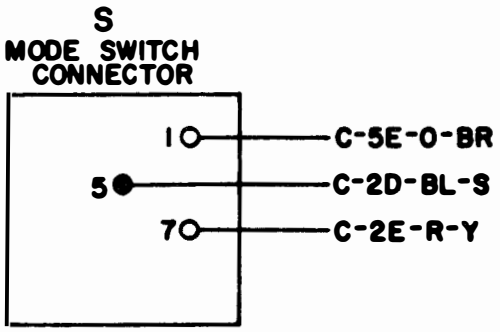
8A1 ASR MODE SWITCH WIRING
WITH 199446 MOD. KIT

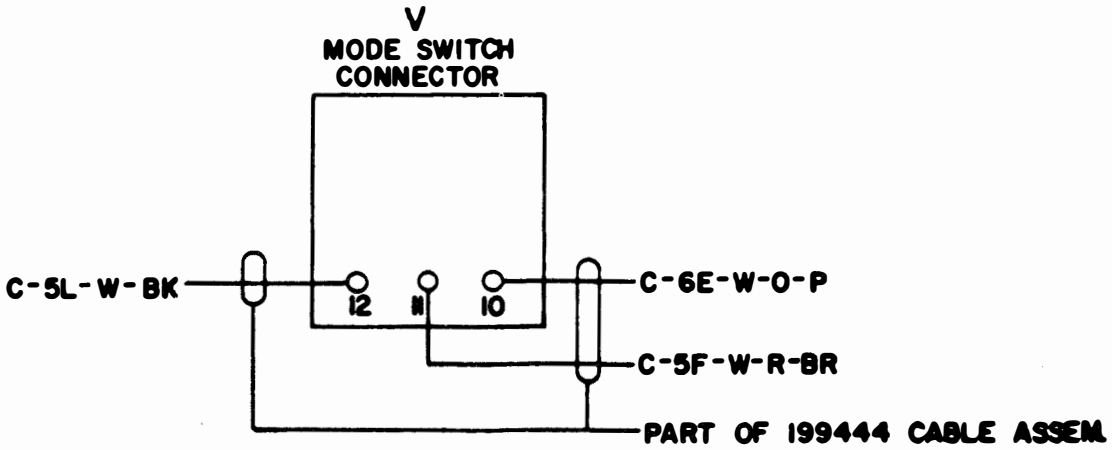
REFER TO 6903WD

FIGURE 8



REFER TO 6935WD

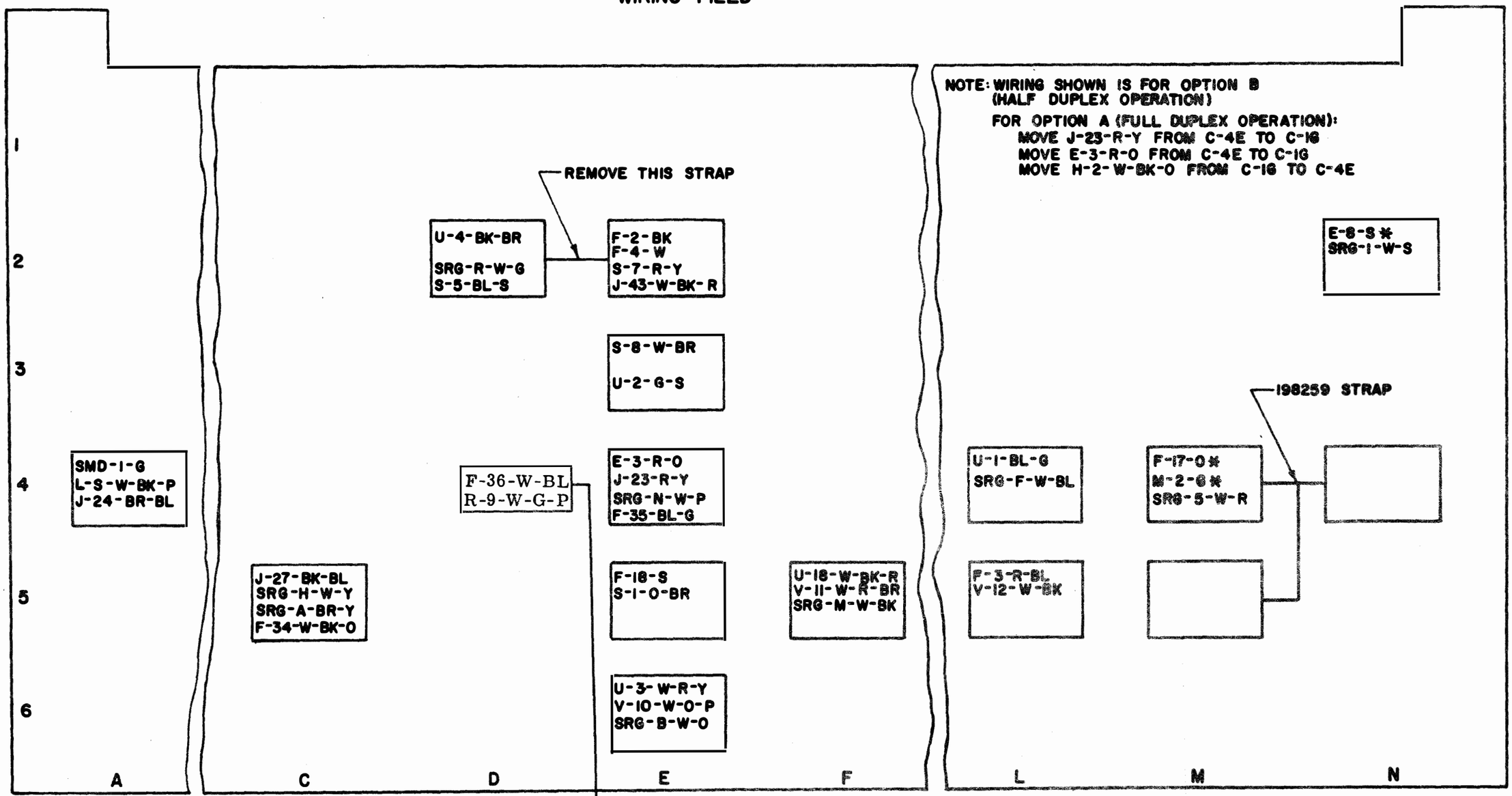




8AI LESU 315 WIRING WITH 199446 MOD. KIT

FIGURE 9

C
WIRING FIELD



8AI ASR ELECTRICAL SERVICE UNIT (LESU315)
WIRING WITH 199446 MOD. KIT

FIGURE 10

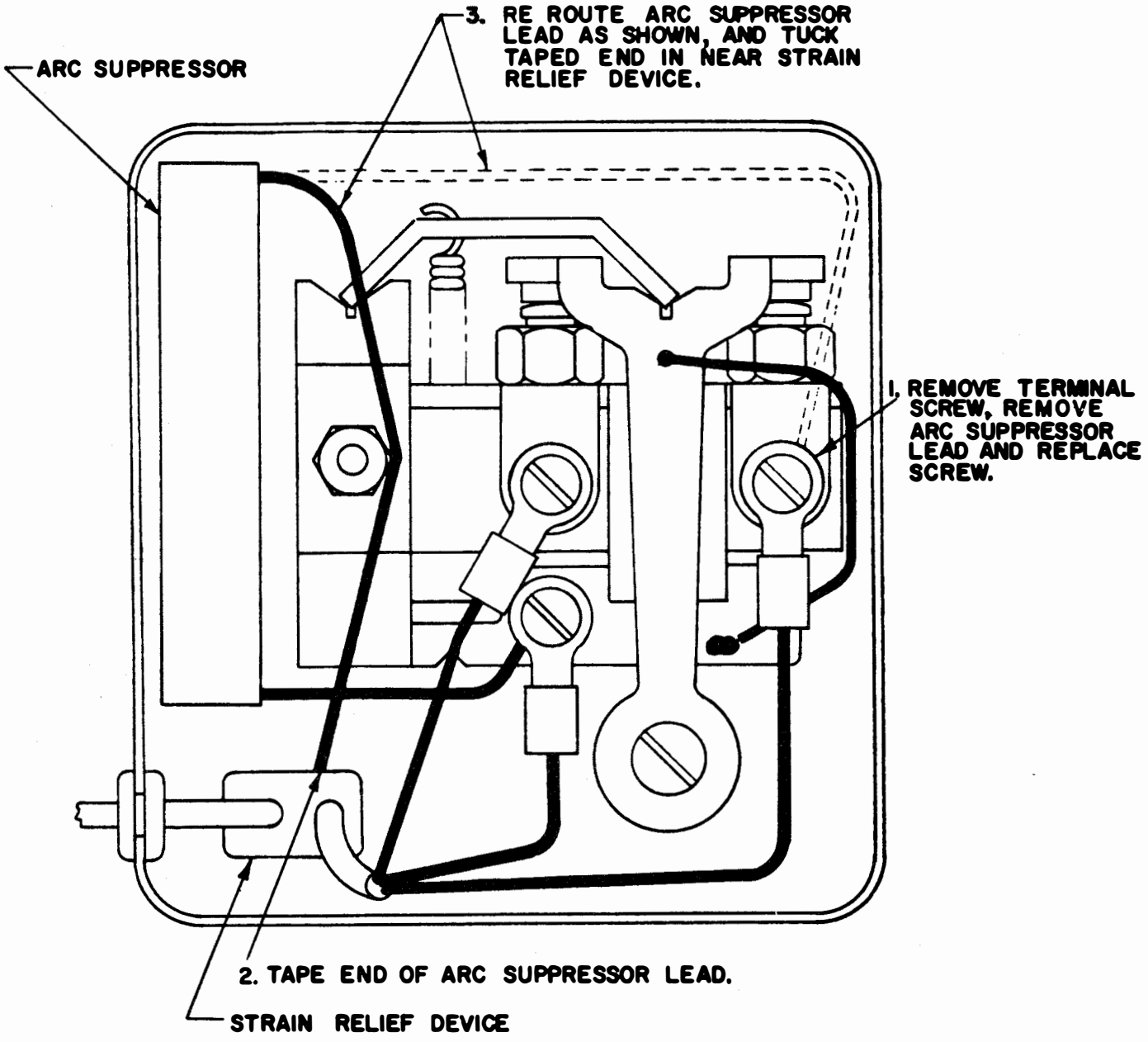

3. RE ROUTE ARC SUPPRESSOR LEAD AS SHOWN, AND TUCK TAPED END IN NEAR STRAIN RELIEF DEVICE.
ARC SUPPRESSOR
1. REMOVE TERMINAL SCREW, REMOVE ARC SUPPRESSOR LEAD AND REPLACE SCREW.
2. TAPE END OF ARC SUPPRESSOR LEAD.
STRAIN RELIEF DEVICE

FIGURE 11

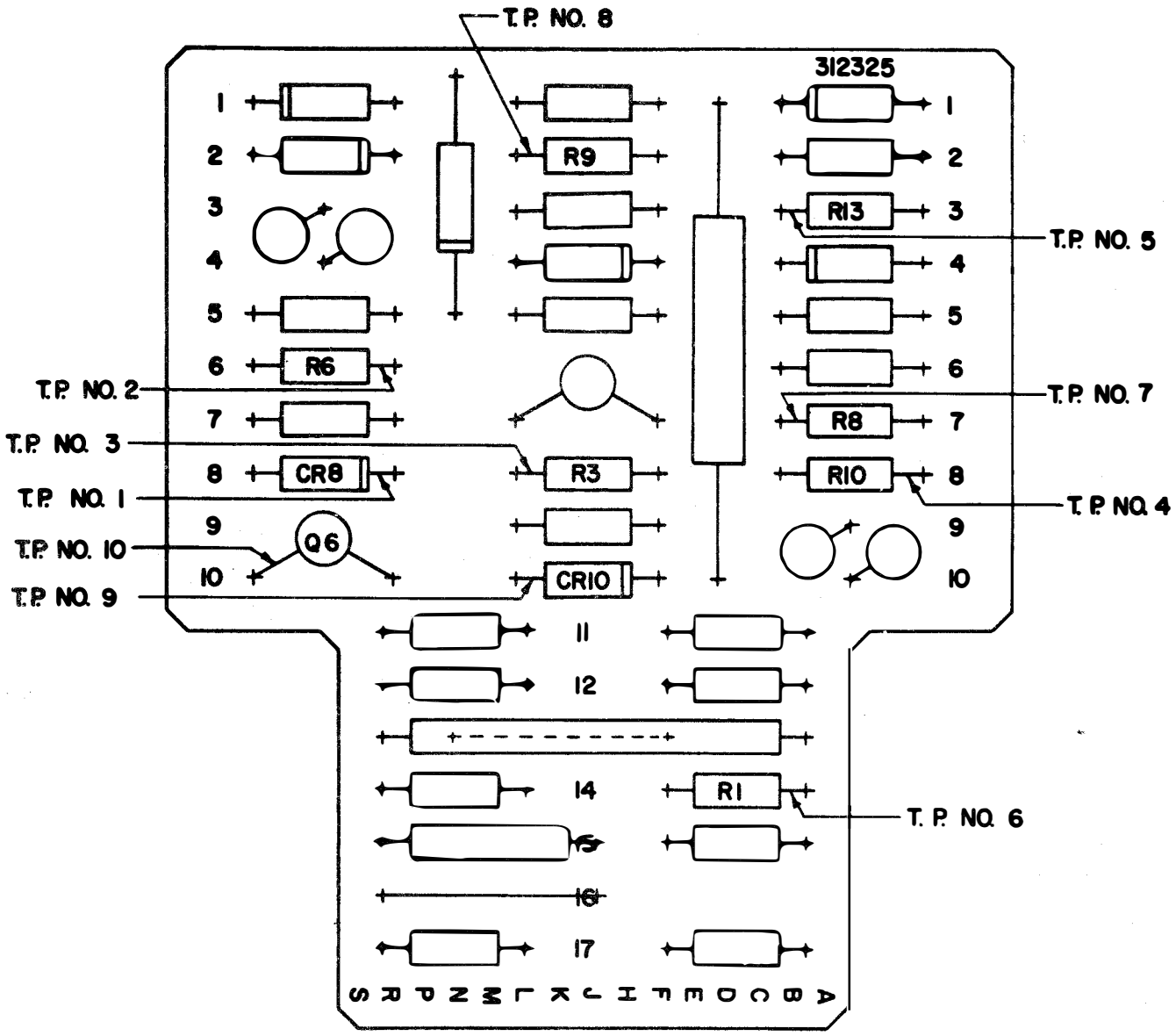

T.P. NO. 8
312325
R9
R13
T.P. NO. 5
T.P. NO. 2
R6
T.P. NO. 7
T.P. NO. 3
R8
R3
T.P. NO. 1
CR8
R10
T.P. NO. 4
T.P. NO. 10
Q6
T.P. NO. 9
CR10
R1
T.P. NO. 6

FIGURE 12