

651S-1
GENERAL PURPOSE HF RECEIVER

PUB NO.	NOTE	DATE	SUBJECT
IB 1-72 ✓		03/01/72	Subassembly Interchangeability
SB 1		10/01/72	Reduction of 450-kHz Leakage From Synthesizer Reference Board All
SB 2		06/06/73	Reduction of Noise Level
SB 3		07/15/73	Add Keep-Alive Frequency Memory Function
SB 4		07/15/73	Extend Comma and Decimal Lamp Life in Frequency Display
SB A ✓		11/01/73	Change DCFE Filter Switching Diode
SB 5	1	12/15/74	Minimize TCU Circuit Card Response to Data Link Noise and Failure
SB 6	2	03/01/75	Reduce Intermodulation Level
SB 7		02/07/75	Reduce Internal Spurious Signals
SB 8		12/27/74	Allow Remote Control Operation With RS-232C Serial Control Interface Card A9
SB 9 ✓		02/15/75	Increase Life of Display Tubes
SB 10 ✓	2	12/31/75 Revised 08/02/76, 04/01/77	Replacing Display Tubes With LED Plug-in Assemblies
SB 11		Not issued	
SB B ✓		11/15/74	KAV
SB C ✓		01/15/78	Supply KAV Power to DCFE
SB 12 ✓		05/01/78 Revised 07/01/78	Replacing Nonprocurable Integrated Circuits
SB 13 ✓		10/01/80	Replace Nonprocurable Parts
SB 14 ✓		11/01/80	Reduce 100-kHz Sidebands
SB 15 ✓		05/01/81	Prevent Invalid Monitor Responses from the HF Receiver

NOTE:

1. Also applicable to 651S-1A.
2. Also applicable to 651S-1A and 651S-1B.



INFORMATION BULLETIN

COLLINS RADIO COMPANY

SUBJECT 651S-1 GENERAL PURPOSE HF RECEIVER, CPN 522-4836-002 THRU -015, AND -019, SUBASSY INTERCHANGEABILITY

DATE Mar 1/72

FROM LIGHTWEIGHT HF COMMUNICATIONS PRODUCT LINE

INFORMATION BULLETIN 1-72

The purpose of this information bulletin is to disseminate information on interchangeability of subassemblies used in subject radio. The attached table lists all subassemblies, Collins part number, and interchangeability.

When an order is received for a subassembly no longer in production, Collins will automatically substitute the latest subassembly that is interchangeable with the old one.

Subassembly Interchangeability

SUBASSEMBLY	COLLINS PART NO	REMARKS
Power supply Regulator card A1	778-2949-001	Only production part number (the last three digits of part no indicate the status of equipment/subassembly)
Audio card A2	778-2948-002, -003	Not interchangeable, production part number -002 includes squelch, -003 no squelch
ISB card A3	778-2952-001	Only production part number
If amplifier card A4	778-2951-001, -003	Not interchangeable, production part number -001 is standard, -003 allows fast reaction to AGC
Filter card A5A1	797-3571-001, -002, -003, -004	Not interchangeable, different bandwidth and/or frequency requirements
Filter card A5A2	797-3585-002, -003, -004, -005, -006, -007, -008, -009	Not interchangeable, different bandwidth and/or frequency requirements
Rf module A6	790-1048-003, -008, -009, -010	Production part numbers -003 and -008 are interchangeable with each other; -009 and -010 are not interchangeable
Decoder/driver card A7	778-2928-002, -003	Interchangeable

Subassembly Interchangeability (Cont)

SUBASSEMBLY	COLLINS PART NO	REMARKS
Interconnect card A8	778-2924-002, -003, -004, -005, -006	Not interchangeable
DCFE card A8	793-9402-001, -002	Not interchangeable
DCFE card A8	624-5744-001	Only production part number, not interchangeable with 793-9402-001, -002
DCU card A9	793-9414-001	Only production part number
TCU card A9	783-9480-001	Only production part number
SCAN card A9	783-9368-00	Only production part number
Synthesizer divider card A10	793-9334-001, -002, -006	Production part numbers -001 and -002 are interchangeable with each other; -006 is not interchangeable
Synthesizer reference card A11	793-9333-001, -002	Interchangeable
Synthesizer mixer card A12	793-9332-001, -002	Interchangeable
Synthesizer vco card A13	793-9331-002, -003	Interchangeable
Frequency control card A14	783-9283-001	Only production part number



SERVICE BULLETIN

1 November 1973

FROM: Telecommunications Group

651S-1 GENERAL PURPOSE HF RECEIVER (522-4836-004)
651S-1A GENERAL PURPOSE HF RECEIVER (622-1062-001)
DCFE CARD A8 (624-5744-001)

SERVICE BULLETIN A

SUBJECT: Change DCFE Filter Switching Diode

This modification is applicable to all DCFE cards supplied to the US Coast Guard under contract DOT-CG-23014A.

The purpose of this modification is to change the DCFE switching to allow proper operation of the receiver in the narrow shift radioteletypewriter (NSRT) bandwidth. The 10.35 MHz filters must be bypassed when the offset NSRT filter is used.

Future DCFE cards incorporating this change will be manufactured under Collins part number 624-5744-002.

Parts may be ordered at no charge from Collins Radio Company, Service Parts Department Cedar Rapids, Iowa 52406. The order should include the part number of the item and reference 651S-1 service bulletin A.

No special tools or equipment are required. Estimated time to perform this modification is 0.2 man-hour.

MODIFICATION PROCEDURE

- a. Remove the DCFE card from the receiver.
- b. Locate, note position of anode, unsolder and remove diode CR26. Discard old diode, as its leads are too short for new mounting. Refer to figure 2.
- c. Install and solder the anode end of the new diode in the same position as the anode of the original diode. Refer to figure 1.
- d. Slide sleeving on the cathode lead of the new diode. Wrap the lead on the cathode lead of diode CR34 and solder.
- e. Mark circuit card "RWK-002" to indicate that it is electrically the same as the new part number 624-5744-002.



SERVICE BULLETIN

SERVICE BULLETIN A

MATERIAL INFORMATION

The following parts are required to perform this modification.

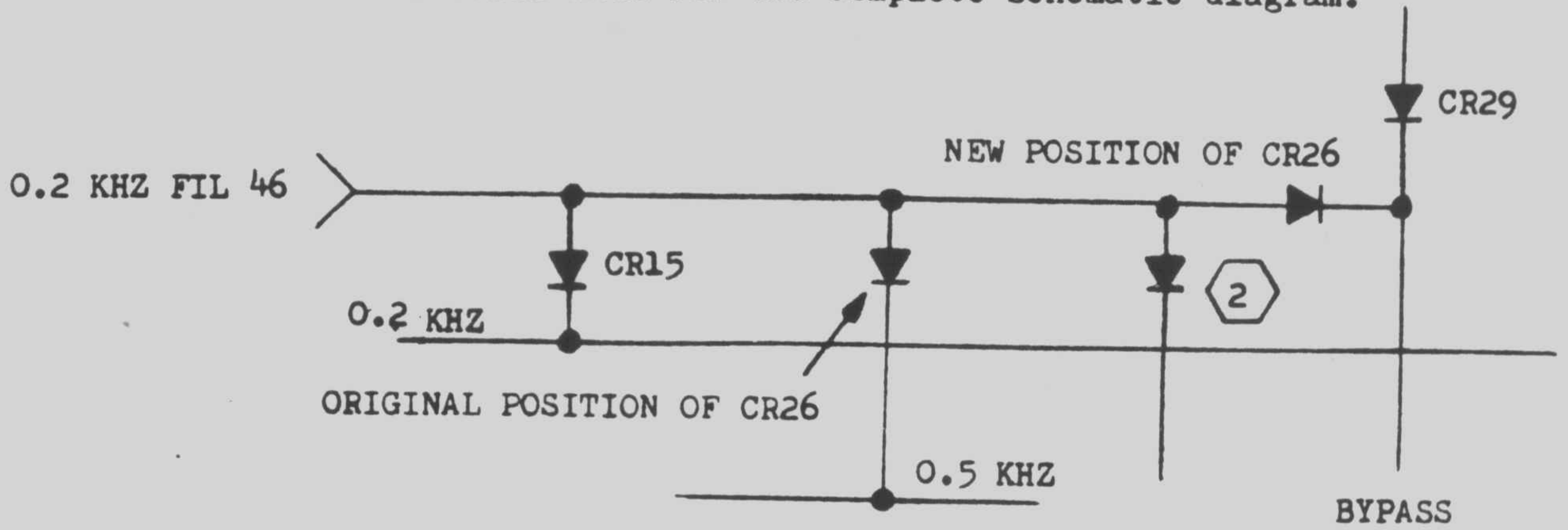
<u>NEW COLLINS PART NUMBER</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>DESCRIPTION</u>	<u>REPLACED COLLINS PART NUMBER</u>	<u>INSTRUCTIONS DISPOSITION</u>
353-0206-000	1		Diode 1N459	353-0206-000	discard
152-2483-000	0.1 ft		Sleeving	-	-



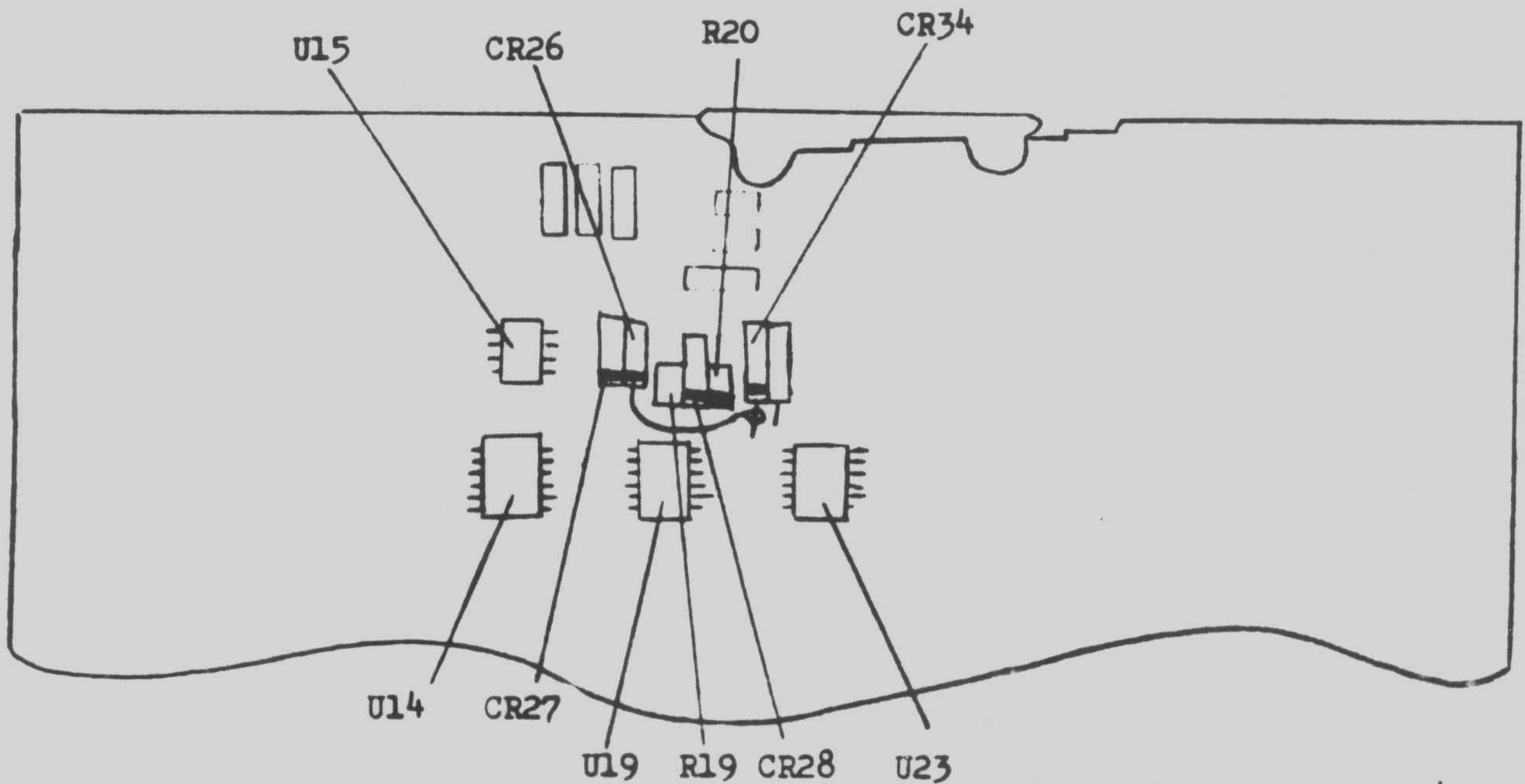
SERVICE BULLETIN

SERVICE BULLETIN A

NOTE: Refer to figure 20 of the diagrams section in the 651S-1/1A instruction book for the complete schematic diagram.



Partial Schematic Diagram of the DCFE Card
Figure 1



Location of CR26
Figure 2

NOTE: Refer to figure 14 of the parts list section of the 651S-1/1A instruction book for complete parts location.



SERVICE BULLETIN

K. L. Roland

137-138

15 November 1974

FROM: Telecommunications Equipment Group Product Management

651S-1 GENERAL PURPOSE HF RECEIVER (522-4836-199)
TELETYPEWRITER CONVERTER UNIT (TCU)
CIRCUIT CARD A9 (783-9480-001, -002)

SERVICE BULLETIN B

SUBJECT: Frequency keep-alive operation with TCU

This modification is applicable to 651S-1 receivers (522-4836-199) containing both the frequency keep-alive and TCU remote control options. This bulletin will not be incorporated into production units.

The purpose of this modification is to permit operation of the TCU logic from the 5-Vdc keep-alive supply.

The keep-alive option does not normally work when the TCU is used because the TCU logic gives false frequency change pulses when it loses power in local operation mode. This change prevents such pulses. The problem does not exist when the remote control is in operation because the receiver frequency may be retransmitted immediately by the 514S-1 control.

Interchangeability is affected as follows. A modified TCU will not operate in an unmodified receiver chassis. A DCU remote control card A9 (793-9414-001) will be damaged if plugged into a modified receiver. After modification, the current drain from the external keep-alive battery will increase from 0.8 to 1.4 amperes.

Estimated time to perform this modification is 2 man-hours.

The modification parts (as listed in the material information paragraph) are available for shipment within 30 days after receipt of order at a price of \$2.53 (price is subject to change without notice; minimum order price is \$25.00). Parts may be ordered from Collins Radio Group, Service Parts Department, Cedar Rapids, Iowa 52406. All orders should specify part numbers and reference 651S-1 service bulletin B.

No special tools or equipment are required.

Refer to parts list section of the 651S-1/1A General Purpose HF Receiver Instruction Book for assistance in locating parts.

This modification will not be incorporated into the 651S-1/1A instruction book.



SERVICE BULLETIN

SERVICE BULLETIN B

MODIFICATION PROCEDURE

- a. Remove the dust cover by removing two retaining screws at the rear and sliding the cover from the unit.
- b. Remove the screws and the cover from the top left module compartment.
- c. Remove TCU card A9 from the receiver.
- d. Remove connector sockets 35 and 36 from connector shell and card as follows: (figure 1):
 1. On the back of the card, suck the solder from the holes occupied by sockets 35 and 36.
 2. Using a scribe, or a similar tool, carefully remove the contacts from the holes and slide the contacts out of the blue-line connector.
- e. On the back of the card, solder one end of a jumper (428-4821-000) in the hole where socket 35 was located.
- f. Wrap and solder the other end of the jumper around the contact lead of socket 22.
- g. Mark "SB B" on the TCU card near the part number.
- h. On the bottom of the 651S-1 chassis sideboard, connect a jumper (428-4821-000) from J1-17 (mates with A14 connector) to J30-22 (mates with A9 connector). Refer to figure 2.
- i. On keep-alive voltage regulator circuit assembly TB501, remove diodes CR501 and CR502. Refer to the 651S-1/1A instruction book (part 2) parts list, figure 27, for parts location.
- j. Install new diodes CR501 and CR502 (353-3718-040) in the spaces where the old diodes were located and with the same orientation as the old diodes.
- k. Mark information chart (280-3778-010) with "SB B" and apply to chassis near name-plate.
- l. Reassemble receiver in the reverse of steps a, b, and c check for proper operation.

MATERIAL INFORMATION

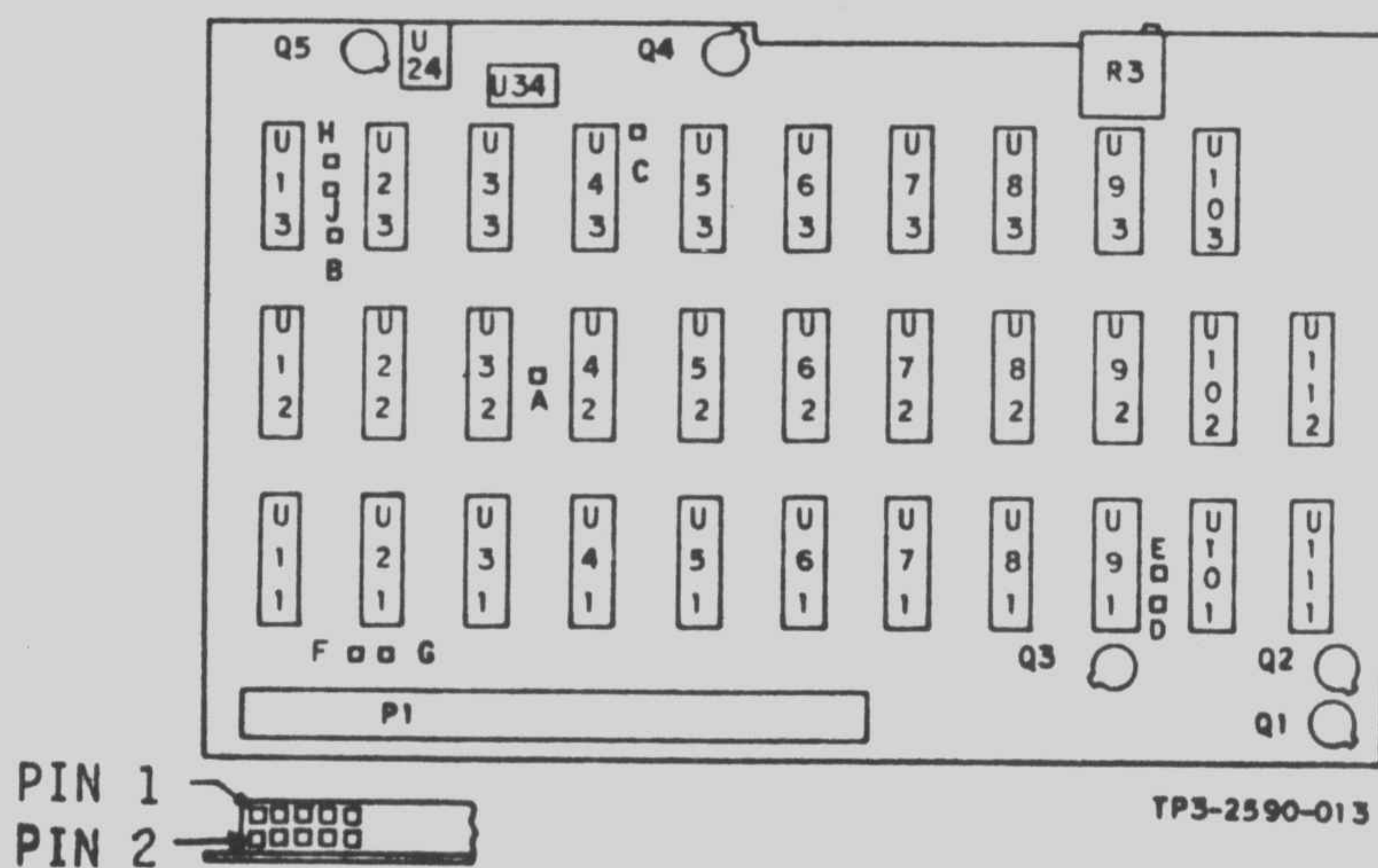
The following parts are required to modify one 651S-1.

<u>COLLINS PART NUMBER</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>DESCRIPTION</u>
280-3778-010	1	\$0.30	Chart, information
353-3718-040	2	1.11	Diode, 1N5550
428-4821-000	0.5 ft	0.01	Wire, bus, #28



SERVICE BULLETIN

SERVICE BULLETIN B

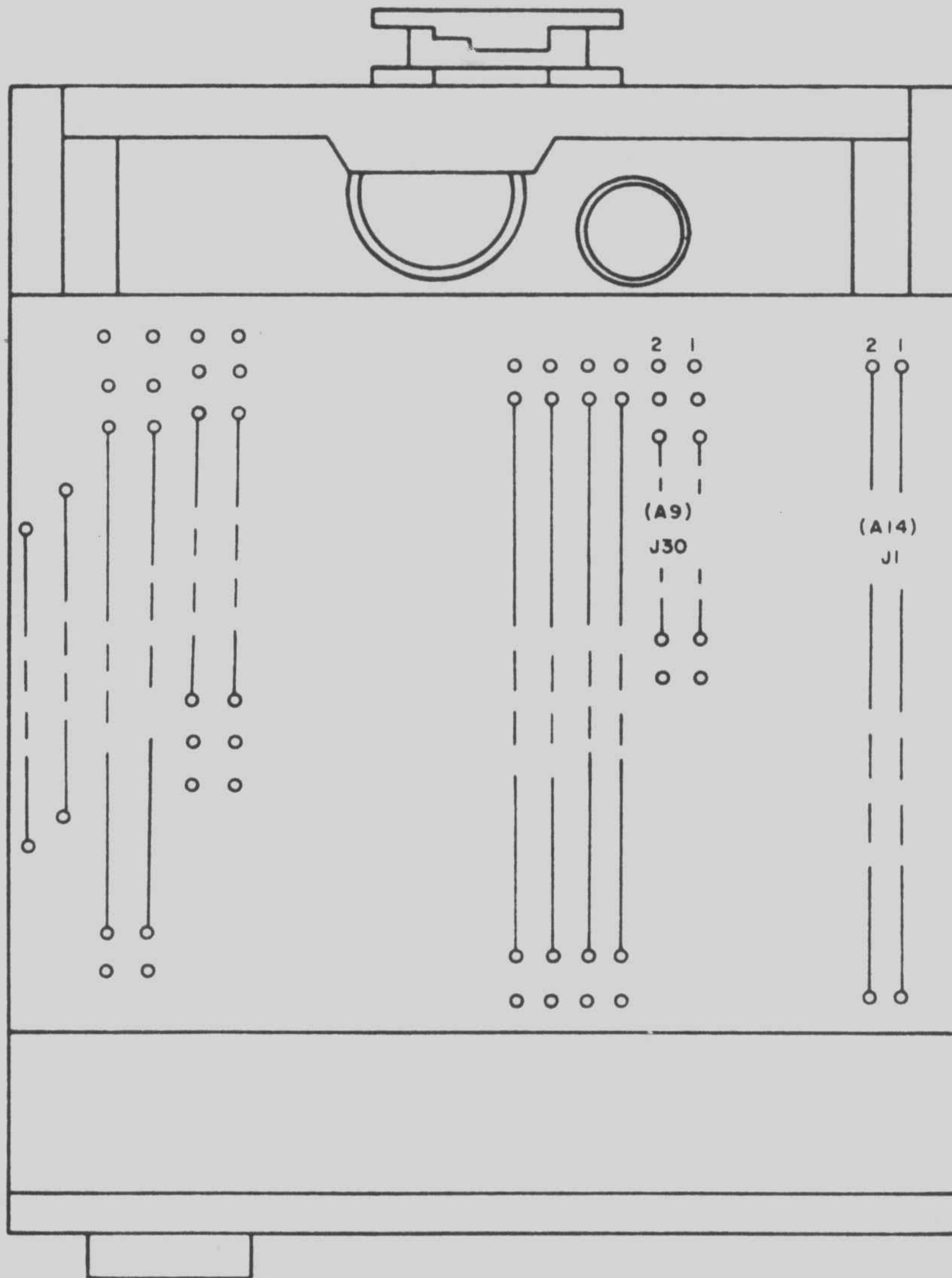


TCU Circuit Card A9
Figure 1.



SERVICE BULLETIN

SERVICE BULLETIN B



651S-1 Sideboard, Bottom View, Connector Locations
Figure 2

COLLINS

Collins Government Telecommunications Group/Rockwell International

651S-1 GENERAL PURPOSE HF RECEIVER (522-4836-XXX)

DEVICE CONTROL FUNCTIONAL ELEMENT (DCFE)

CIRCUIT CARD A8 (624-5744-001)

SERVICE BULLETIN C

SUPPLY KAV POWER TO DCFE

This service bulletin is applicable to 651S-1 units in certain installations that require keep-alive power for the DCFE card. 651S-1 Service Bulletin B must be installed prior to installing this bulletin. Interchangeability is affected as follows: A modified DCFE card will not operate in an unmodified chassis. A modified chassis will accept either modified or unmodified DCFE cards. A DCU card must not be used in a modified chassis as noted in 651S-1 Service Bulletin B.

This service bulletin will not be incorporated into production units.

The purpose of this modification is to allow the DCFE card to operate on 5-volt power from the keep-alive power bus in the receiver. This permits retention of mode information during power interruptions.

This modification consists of inspecting and possibly replacing one resistor and rerouting 5-volt power to the DCFE circuit card.

The modification parts are itemized in the material information paragraph. Contact Collins Groups/Rockwell International, Service Parts Department, Cedar Rapids, Iowa 52406, for price and availability of parts.

Estimated time required is 1 man-hour.

No special tools or equipment are required.

This service bulletin references the 651S-1 General Purpose HF Receiver Instruction Book, Collins part number (CPN) 523-0764052.

This bulletin will not be incorporated into the instruction book.

MODIFICATION PROCEDURE

NOTE: Refer to the 651S-1 instruction book maintenance section, CPN 523-0764056, for disassembly/assembly procedures.

A. Remove all power to the receiver.

COLLINS SERVICE BULLETIN

Collins Government Telecommunications Group/Rockwell International

- B. Remove the DC FE circuit card A8, CPN 624-5744-001, from the receiver.
- C. Disconnect +5-volt power by removing contact P1-27 from the blue line connector on the card. Refer to figure 1.
- D. On the back of the card, connect a #26 insulated bus wire (422-4008-000) from the vacated hole at P1-27 to spare contact P1-48.
- E. Mark "KAV OPERATION" near the part number on the card.
- F. On the receiver sideboard, connect a #26 insulated bus wire (422-4008-000) from XA8-48 to XA9-22 to provide keep-alive power to A8. Refer to figure 2.
- G. Reinstall DC FE card in receiver.

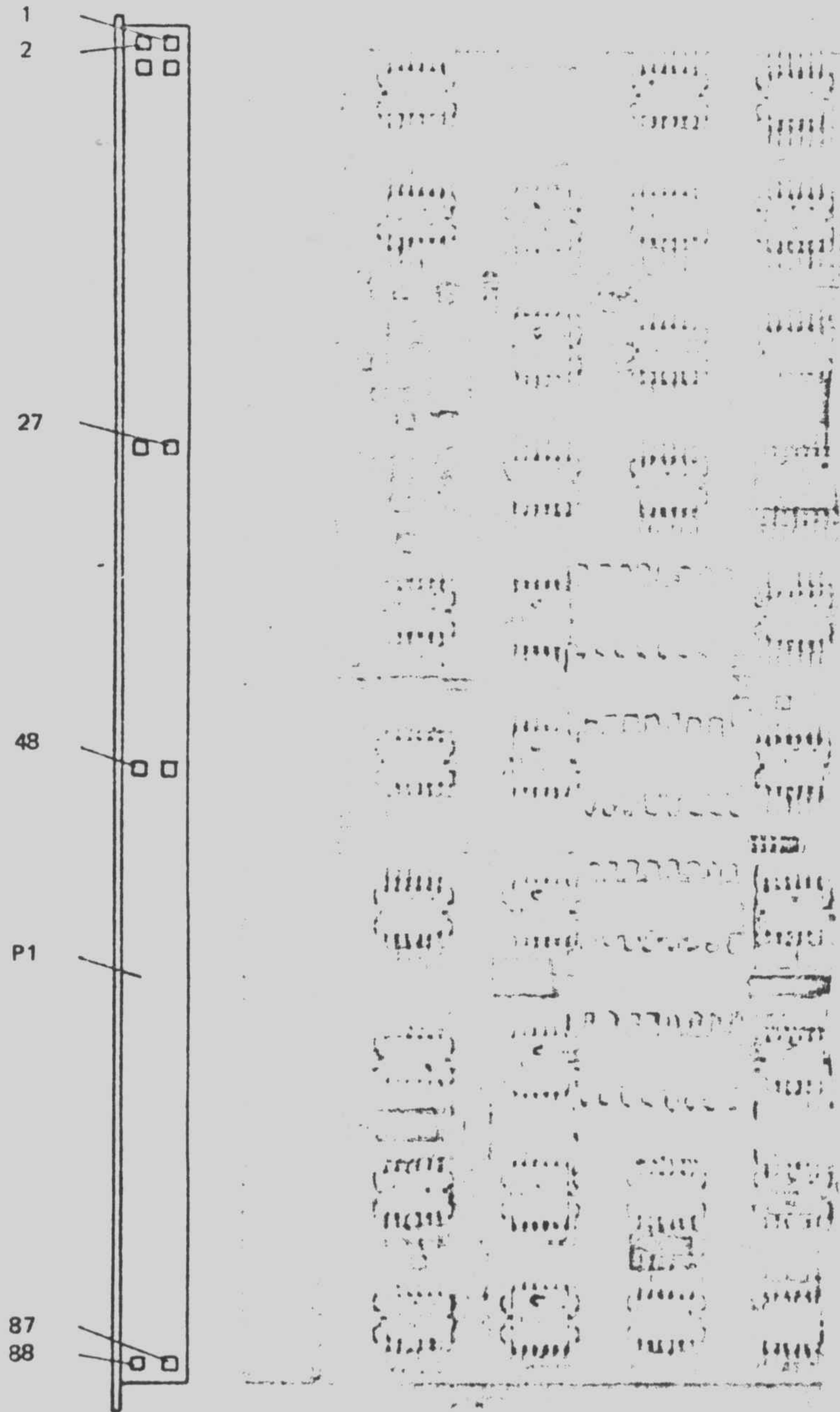
NOTE: Refer to 651S-1 instruction book parts list section, CPN 523-0764057, for parts location in steps H and I. Figure and item numbers are in parentheses.

- H. Inspect the wire from TB106-1 (40-64) to power switch S104 (39-30). If the wire is #26 copperweld, replace it with #22 red stranded (439-4032-000).
- I. Inspect resistor R506 (27-1) on the keep-alive regulator assembly. If it is not 1800 ohms, replace it with an 1800 ohm resistor (745-0758-000).
- J. Reassemble the receiver.
- K. Mark SB C on the information chart.
- L. Perform the simple test in the front of the 651S-1 instruction book maintenance section to ensure that the receiver is operating satisfactorily.

MATERIAL INFORMATION

The parts listed below are required to modify one 651S-1.

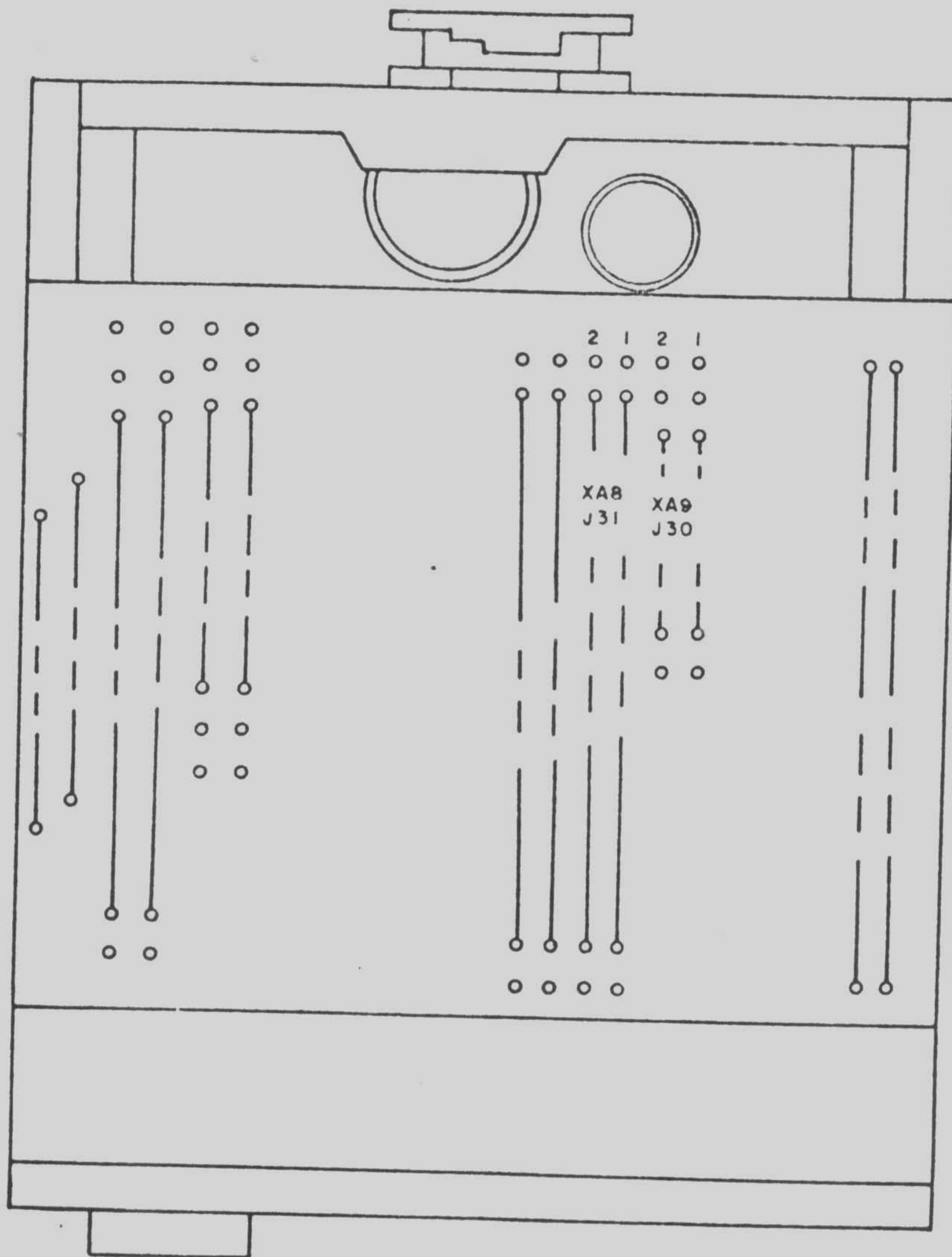
<u>COLLINS PART NUMBER</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>DESCRIPTION</u>
422-4008-000	305 mm (1 ft)		Wire, bus, insulated, #26 AWG
439-4032-000	1830 mm (6 ft)		Wire, stranded, red, #22 AWG
745-0758-000	1		Resistor, 1800 ohms, R506



P/O DC FE Circuit Card A8, Connector Pin Locations
Figure 1

COLLINS SERVICE BULLETIN

Collins Government Telecommunications Group/Rockwell International



651S-1 Sideboard, Bottom View, Connector Locations
Figure 2

651S-1 GENERAL PURPOSE HF RECEIVER (522-4836-XXX)
 651S-1A GENERAL PURPOSE HF RECEIVER (622-1062-001)
 651S-1B GENERAL PURPOSE HF RECEIVER (622-1165-XXX)
 INDICATOR HOUSING ASSEMBLY (606-9707-002)

SERVICE BULLETIN NO 10

REPLACING DISPLAY TUBES WITH LED PLUG-IN ASSEMBLIES

This modification is applicable to all 651S-1/1 () General Purpose HF Receivers with serial number 5000 and below.

Production cut-in: None. A single display board will replace the individual display tubes in production units serial number 5000 and above.

The purpose of this modification is to replace the display tubes in the 651S-1 with plug-in LED assemblies.

This modification consists of replacing the six display tubes with plug-in LED assemblies, replacing six current limiting resistors with jumper wires, removing the comma and decimal point assemblies, and moving the location for a meter mounting screw.

INTERCHANGEABILITY INFORMATION

A brief description of display configurations for the 651S-1/1A is as follows:

651S-1/1() SERIAL NUMBER	DISPLAY	FREQUENCY CONTROL CARD A14
5000 and below	Tube	783-9283-001 or 601-3363-001
5000 and below SB No 10 installed	LED Plug-In Assembly	783-9283-001 or 601-3363-001
5001 and above	LED Board	601-3363-002

CAUTION: A DISPLAY TUBE WILL BE RUINED IF IT IS INSERTED IN A 651S-1/1() MODIFIED BY SB NO 10.

An LED plug-in assembly will not operate in a 651S-1/1() with serial number 5000 and above or one that isn't modified by SB No 10. An incorrect Frequency Control Card A14 will cause the frequency display to operate incorrectly.

Frequency Control Cards A14, 601-3363-001 and 601-3363-002 use the same printed circuit board. Both cards provide the "keep alive" function. One card status may be converted to the other card status by changing the display driver components (integrated circuits), handle, and card markings as follows:

COMPONENT	601-3363-001	601-3363-002
U26, U28, U30, U32, U34, U36, U38	Use SN 7406 (351-7632-010)	Use SN 7407 (351-7633-010)
Handle	CPN 601-3538-001	CPN 635-0703-001

Estimated time to perform this modification is 1 man-hour.

Modification kit, Collins part number 635-4887-001 (as itemized in the material information paragraph), is required to perform the subject modification. Contact Collins Radio Group/Rockwell International, Finished Goods Department, Cedar Rapids, Iowa 52406 for price and availability. All requests should specify the kit part number and reference 651S-1 Service Bulletin No 10.

No special tools or equipment required.

The next revision to the diagrams section (523-0764058) and the parts list section (523-0764057) of the 651S-1/1(1A) General Purpose HF Receiver Instruction Book (523-0764052) will cover the changes included in this bulletin.

MODIFICATION PROCEDURE

- A. Disconnect all external cables and wiring. Remove two screws from rear of unit and slide cover from the unit.

CAUTION: SUPPORT CENTER OF THE CHASSIS AND FRONT PANEL WHILE REMOVING SCREWS IN STEP B.

NOTE: Refer to figures in the parts list section (523-0764057) of the 651S-1/1() Instruction Book (523-0764052, Part 2) for the location of components in the following procedures.

- B. Remove four screws on each of the two tie (side) plates (39, PL figure 1) that hold the front panel assembly to the main chassis. Carefully swing the front panel from the main chassis and lay the unit on its left side.
- C. Remove the six display tubes (25, 26, 27, 28, 29, 30, PL figure 1).
- D. Remove all knobs from the front panel.
- E. Remove marking plate (38, PL figure 1) by removing the three nuts at rear of front panel assembly.
- F. Release tuning switch S109 (17, PL figure 39) by removing four screws from the face of the front panel and carefully position to the side.

- G. Drill a new 0.125-inch hole 0.25 inch to the right of the original screw on the bracket (3, PL figure 39) through the bracket and indicator housing (73, PL figure 39). Remove the screw and pressed-in nut from the bracket.
- H. Remove the upper screw and loosen the lower screw from the nut strip (136, PL figure 39). Swing the nut strip away from the meter assembly.
- I. From the face of the front panel, remove the six mounting screws from the indicator housing (73, PL figure 39) and the two screws from the meter bracket (13, PL figure 39). Carefully pull the indicator housing and meter assembly away from the front panel.
- J. Unsolder and remove the six resistors R172, R164, R156, R148, R140, and R132 (108, 112, 116, 120, 124, 127, PL figure 39).
- K. Install a bus wire (428-4824-000) in the locations where the six resistors were removed (pin 6 of the tube sockets).
- L. Unsolder the wires connected to lamp blocks DS104 and DS105 (76 and 78, PL figure 39) and remove the lamp blocks. Wires removed from the same terminal must remain connected to each other. Tape the ends of the wires.
- M. Insert the LED plug-in, with decimal point (635-4586-001), in the fourth tube socket from the right (V104) as viewed from the front.
- N. Insert the five LED plug-ins (635-4586-002) in the remaining tube sockets.
- O. Replace the indicator housing (73, PL figure 39) in the front panel assembly and secure with the six mounting screws. Apply caution label (637-1743-001) to indicator housing.
- P. Mount bracket assembly (3, PL figure 39) with the meter in place, and attach to the indicator housing, using new hole with screw (343-0133-000), lockwasher (310-0279-000), and nut (313-0132-000). Secure the nut strip (136, PL figure 39) to the front panel assembly with the two screws removed in step H.
- Q. Mount tuning switch S109 (17, PL figure 39) on chassis and secure with four screws.
- R. Place marking plate (38, PL figure 1) in front panel assembly and secure with the three nuts.
- S. Replace all knobs on the front panel.
- T. Perform the following procedures if the unit is modified by 651S-1/1A Service Bulletin No 9.
 - (1) Refer to figure 1. Unsolder blue wire connected on one standoff terminal on TB103 and connect and solder to J56-4.
 - (2) Unsolder and discard the 3.3-ohm resistor.
- U. Mount the front panel assembly to the main chassis and secure with four screws on each of the two tie (side) plates (39, PL figure 1).
- V. Mark information chart with SB 10.

W. Slide cover back on unit and replace two screws on rear of unit.

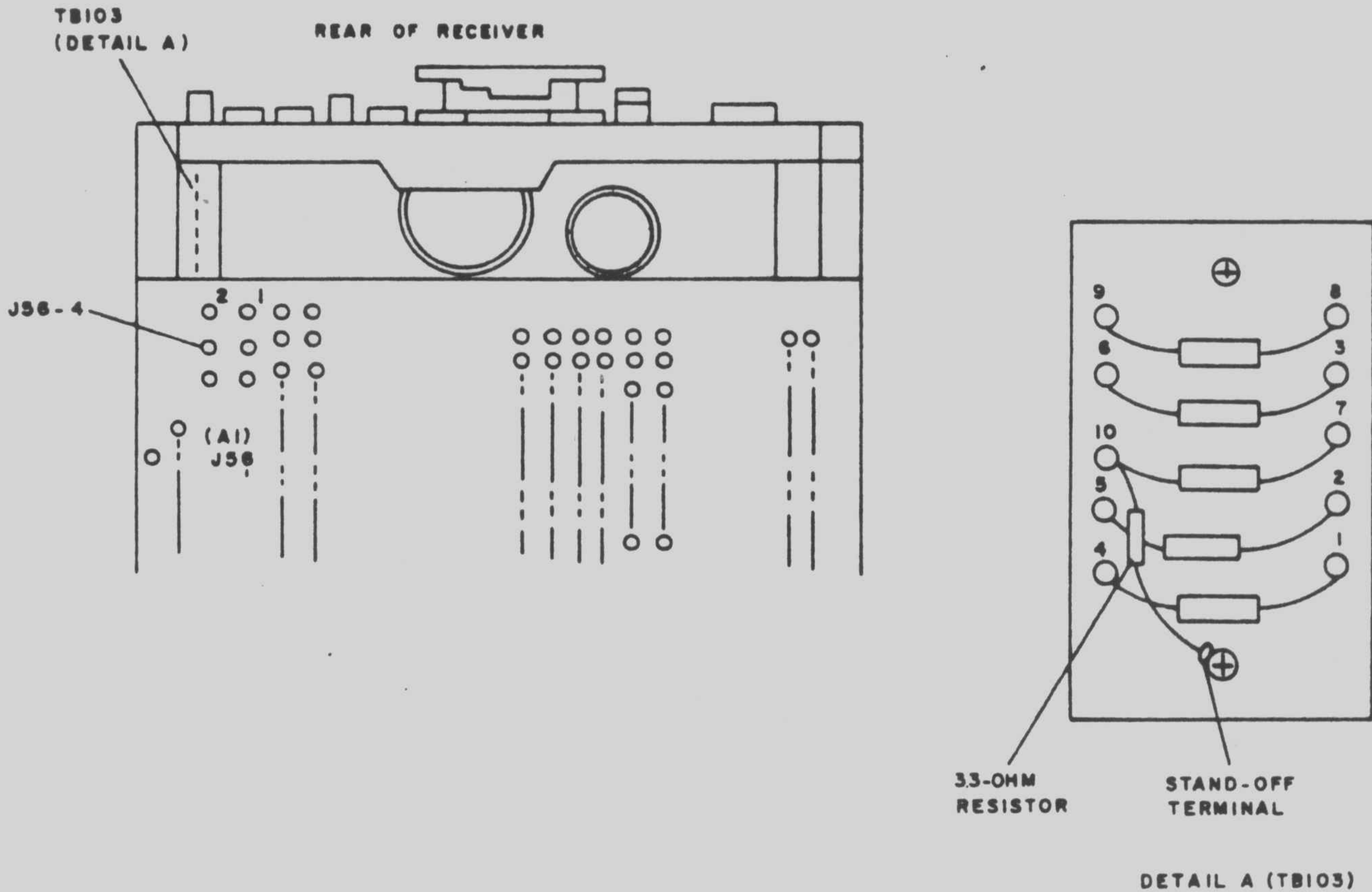
X. Reconnect external cables and wires and check that display lights properly.

NOTE: Schematic modifications are shown in figure 2. Figure 3 is the schematic for the LED plug-in assembly.

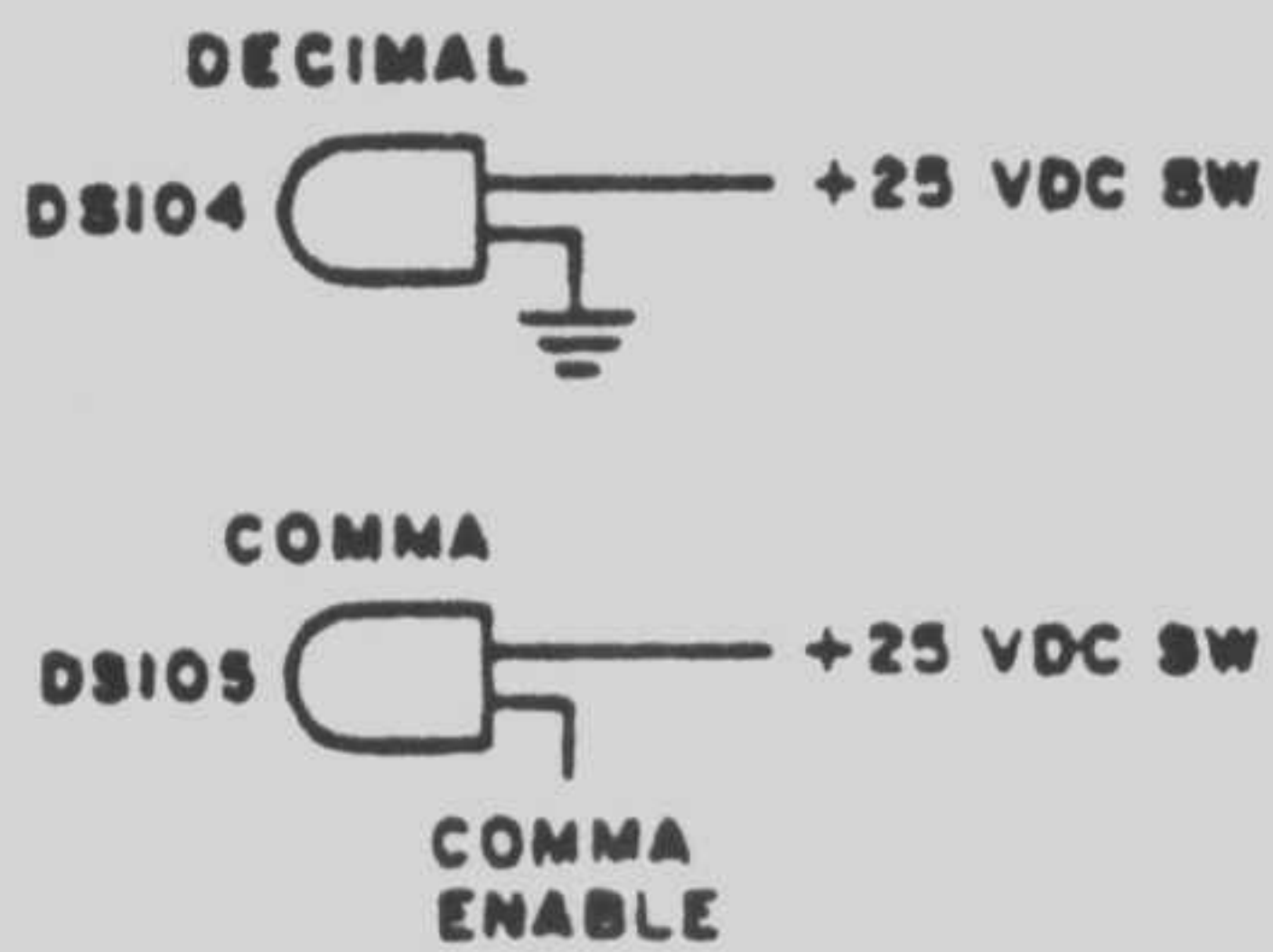
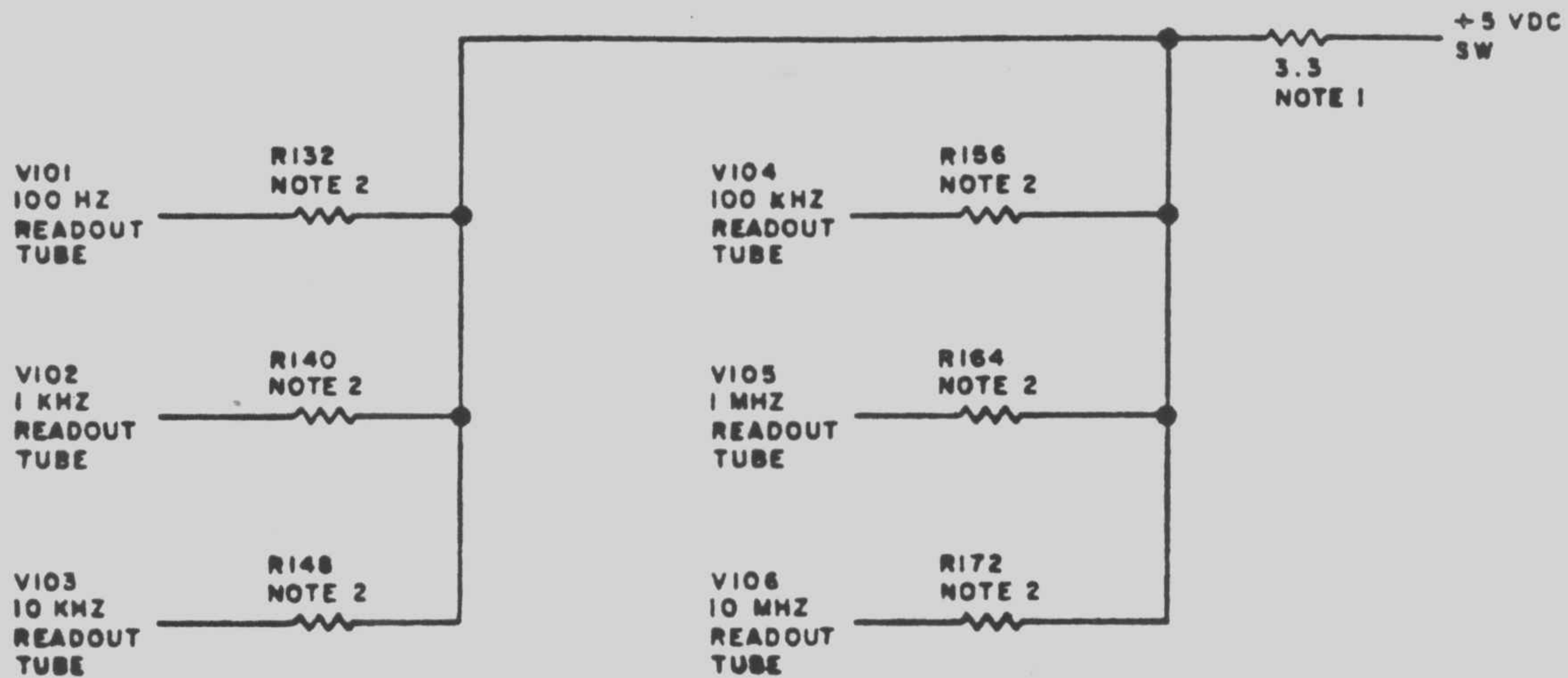
MATERIAL INFORMATION

Modification kit 635-4887-001 is required to modify one 651S-1/1() and is itemized below.

<u>COLLINS PART NUMBER</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>DESCRIPTION</u>
310-0279-000	1		Washer, split lock
313-0132-000	1		Nut, 4-40 hex
343-0133-000	1		Screw, 4-40 x 0.25
428-4824-000	305 mm (1 ft.)		Wire, AWG #22
635-4856-001	1		LED plug-in assembly (with decimal point) DS104
635-4856-002	5		LED plug-in assembly (without decimal point) DS101, DS102, DS103, DS105, DS106.
637-1743-001	1		Label, caution
280-3778-010	1		Chart, information



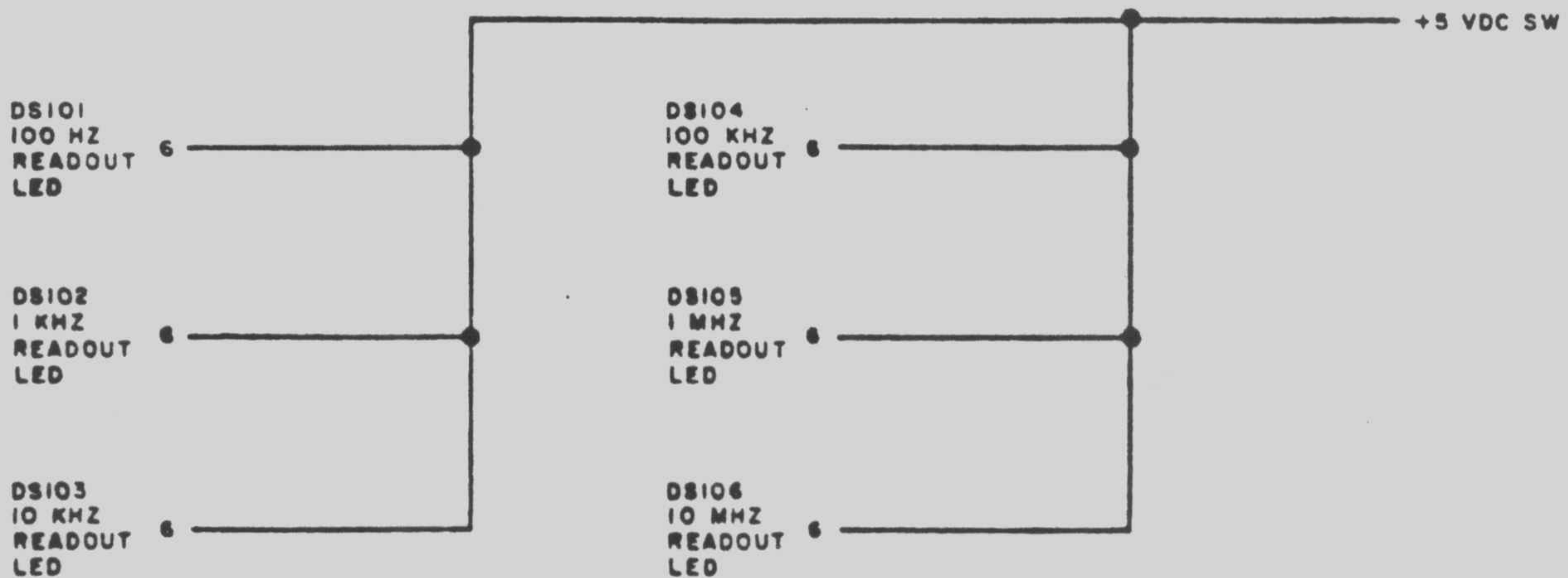
651S-1/1 () Chassis, Partial Bottom View
Figure 1



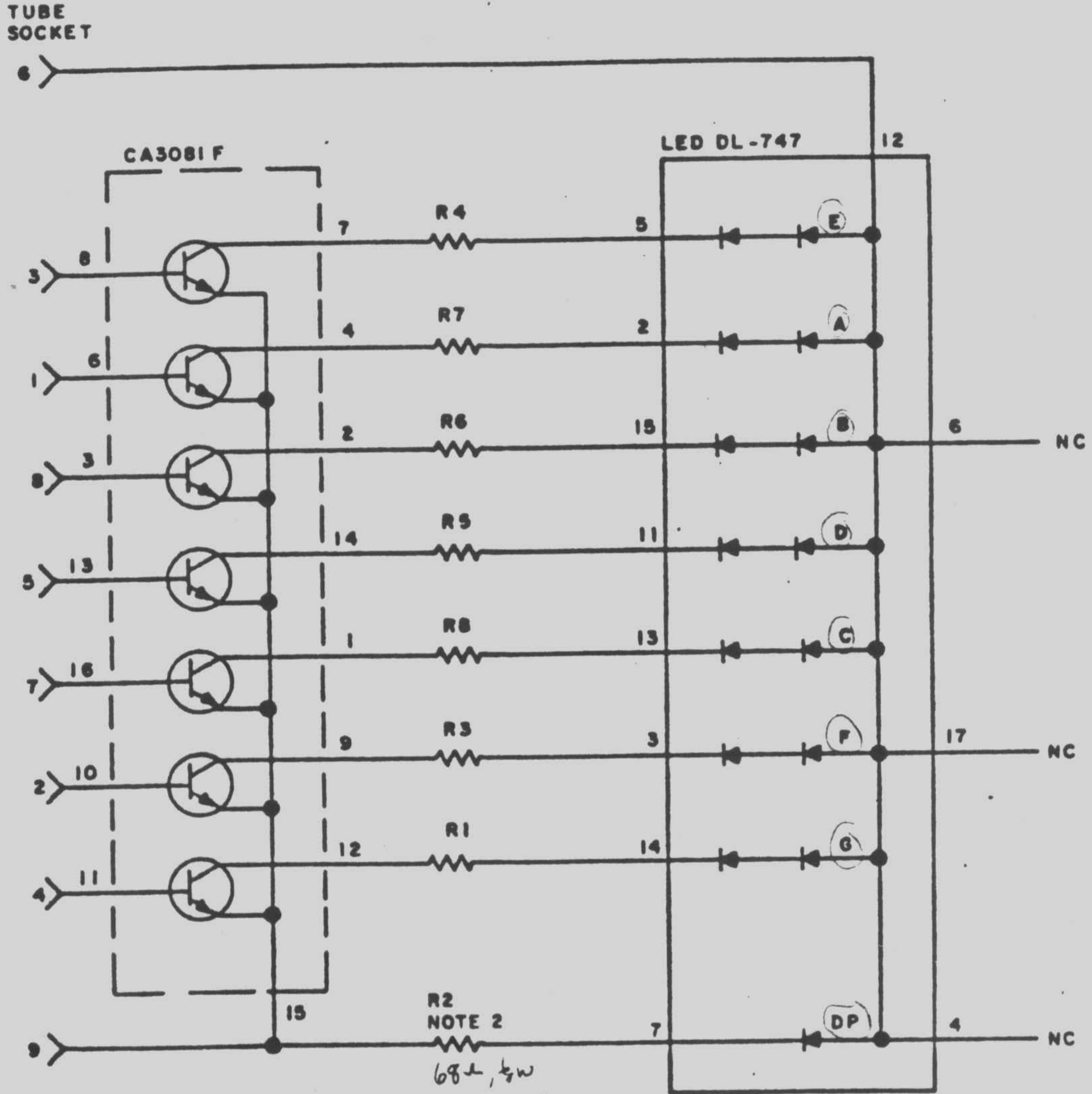
NOTES:

1. THE 3.3-OHMS RESISTOR IS ONLY ON UNITS WITH SB 9
2. R132, R140, R148, R156, R164 AND R172 ON INDICATOR HOUSING ASSEMBLY ARE:
82 OHMS BEFORE REV G;
100 OHMS REV G AND ABOVE.

BEFORE

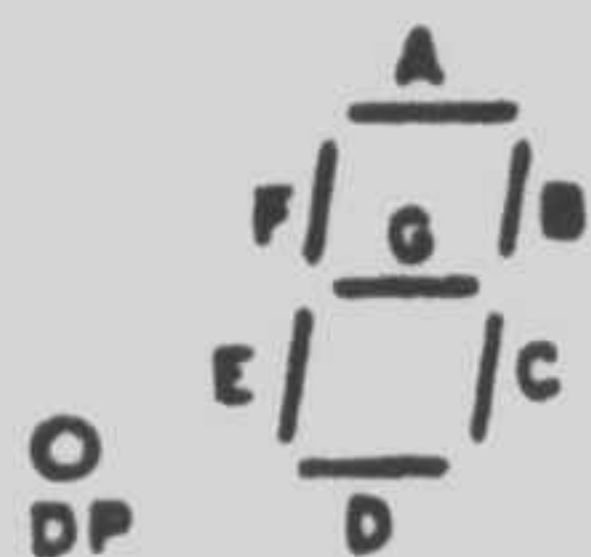


AFTER



NOTES:

1. ALL RESISTORS ARE 68 OHM, 1/8 WATT
2. RESISTOR R2 IS NOT PART OF THE 655-4856-002 LED PLUG-IN ASSEMBLY
3. SEGMENT DESIGNATIONS ARE:



April 1, 1977

REVISION 2
TO
651S-1/1A/1B SERVICE BULLETIN NO 10

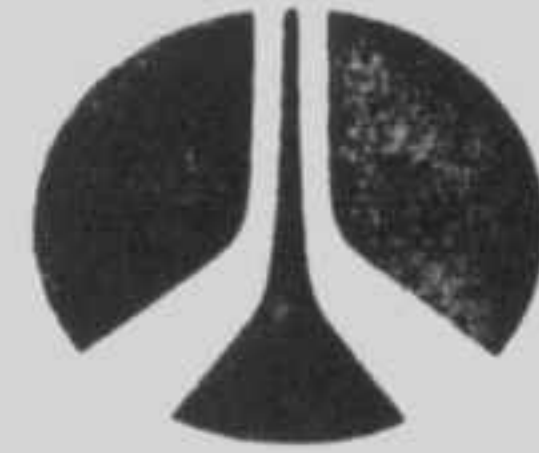
Attached is a revised issue of 651S-1/1A/1B Service Bulletin No 10 titled, "Replacing Display Tubes with LFD Plug-in Assemblies." dated 31 December 1975 and revised 2 August 1976.

This revision consists of the following changes:

1. Page 1: last paragraph was expanded for clarification.
2. Page 2, paragraph F; added "from the face of the front panel."
3. Page 3; paragraphs II and I were rewritten for clarification.
4. Page 3, paragraph K; corrected part number 439-4000-000 to 428-4824-000.
5. Page 3; paragraph P was expanded for clarification.
6. Page 4, parts list; corrected part number 439-4000-000 to 428-4824-000.
7. Page 4, parts list; added 280-3778-010, quantity 1, information chart.
8. Page 5; figure 1 revised for clarification.

Black bars in the margin indicate where changes were made. This revised issue replaces the entire original publication.

Collins Divisions
Cedar Rapids, Iowa 52406
(319) 395-1000
Cable COLINRAD Cedar Rapids



Rockwell
International

Z. F. 1978
~~REVISION 1~~

July 1, 1978

REVISION 1
TO
651S-1/1A/1B SERVICE BULLETIN NO 12

Attached is a revised issue of 651S-1/1A/1B Service Bulletin No 12 titled, "Replacing Nonprocurable Integrated Circuits," dated 1 May 1978.

The changes are as follows:

1. Page 1, third paragraph, first sentence; change 351-7569-202 to 351-7569-020.
2. Page 1, third paragraph, third sentence rewritten for clarification.
3. Page 1, table, MODIFICATIONS REQUIRED column; change "No modification required by conversion" to "No modification required but conversion".

Black bars in the margin indicate where changes were made. This revised issue replaces the original publication.

651S-1 GENERAL PURPOSE HF RECEIVER (522-4836-XXX)
 651S-1A GENERAL PURPOSE HF RECEIVER (622-1062-001)
 651S-1B GENERAL PURPOSE HF RECEIVER (622-1165-001)
 FREQUENCY CONTROL CARD A14 (783-9283-001)

SERVICE BULLETIN NO 12

REPLACING NONPROCURABLE INTEGRATED CIRCUITS

This service bulletin is applicable to 651S-1/1A/1B receivers equipped with Frequency Control Card A14 (783-9283-001).

When this modification is incorporated, the part number of Frequency Control Card A14 changes from 783-9283-001 to 783-9283-002. Therefore, production cut-in is 651S-1/1A/1B units that contain A14 cards with Collins part number 783-9283-002.

The component manufacturer has discontinued production of integrated circuits F9327B, Collins part number 351-7569-020. However, it will not be necessary to install this bulletin unless a failure of integrated circuits U1, U2, U3, U4, U5, or U6 (CPN 351-7569-020) on A14 card occurs. If any of these components are replaced, it is recommended that they all be replaced although it is not necessary. Receivers that still use the gas discharge type display must have service bulletin No 10 installed prior to installation of this bulletin.

A brief description of display configurations and modifications required for the 651S-1/1 () follows:

DISPLAY TYPE	A14 CPN	MODIFICATIONS REQUIRED
Tube	783-9283-001	(1) Rework A14 to 783-9283-002 (2) Convert to plug-in LED display by installing Service Bulletin No 10
Tube	601-3363-001	No modification required but conversion to plug-in LED display per Service Bulletin No 10 is recommended.
Plug-in LED	783-9283-001	Rework A14 to CPN 783-9283-002
Plug-in LED	601-3363-001	No modification required.
LED board	601-3363-002	No modification required.

CAUTION: MODIFICATION OF FREQUENCY CONTROL CARD A14, CPN 783-9283-001, MAKES IT IMPOSSIBLE TO USE GAS DISCHARGE DISPLAY TUBES.

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This modification consists of replacing six integrated circuits and the A14 circuit card handle.

Estimated time required is 1 man-hour.

The modification parts are itemized in the material information paragraph. Contact Collins Telecommunications Products Division/Rockwell International, Service Parts Department, Cedar Rapids, Iowa 52406, for price and availability of parts. All correspondence should reference 651S-1/1A/1B Service Bulletin No 12.

No special tools or equipment are required.

This service bulletin references the 651S-1/1A General Purpose HF Receiver Instruction Book maintenance section, Collins part number (CPN) 523-0764056, and parts list, CPN 523-0764057.

The next change to the 651S-1/1A instruction book maintenance section and parts list will include the change covered in this bulletin.

MODIFICATION PROCEDURE

A. Remove all power from the receiver.

NOTE: Refer to 651S-1/1A instruction book parts list section while performing this modification. Figure and item numbers are in parentheses.

B. Remove dust cover from 651S-1/1A/1B by removing two screws at rear of unit and sliding unit out of dust cover.

C. Remove card cage cover (1-8).

D. Remove Frequency Control Card A14 (1-10), CPN 783-9283-001, from the receiver.

E. Locate and note orientation (pin 1) of integrated circuits U1 (2-1), U2 (2-46), U3 (2-44), U4 (2-41), U5 (2-38), and U6 (2-33).

F. Remove U1 through U6 and replace them with new integrated circuits (351-1898-010).

G. Remove handle (2-134) and replace it with new handle (638-6356-001).

H. Reinstall A14 card into receiver.

I. Reinstall card cage cover. Be sure the magnetic shield is over the synthesizer cards, A10-A13.

J. Slide unit into dust cover and secure with two screws at rear of unit.

K. Mark SB 12 on information chart.

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L. Refer to instruction book maintenance section, paragraph 4, and perform a simple test to ensure that the frequency display is working properly.

MATERIAL INFORMATION

The parts listed below are required to modify one 651S-1, 651S-1A, or 651S-1B.

<u>COLLINS PART NUMBER</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>DESCRIPTION</u>
351-1898-010	6		Integrated circuit, 5448,
638-6356-001	1		U1, U2, U3, U4, U5, and U6 Handle

651S-1 GENERAL PURPOSE HF RECEIVER (522-4836-XXX)
 651S-1A GENERAL PURPOSE HF RECEIVER (622-1062-001)
 651S-1B GENERAL PURPOSE HF RECEIVER (622-1165-001)
 RF MODULE A6 (790-1048-XXX)
 RF MIXER (618-3258-001)
 RF MIXER (606-9877-002)

SERVICE BULLETIN NO 13

REPLACE NONPROCURABLE PARTS

This service bulletin applies to 651S-1/1A/1B receivers equipped with the following rf mixer assemblies.

COLLINS PART NUMBER	APPLIES TO	PRODUCTION CUT-IN
606-9877-002	REV P and below	REV R
618-3258-001 (Q1, Q2, Q3 change)	REV S and below	REV T
618-3258-001 (A6A1U1 change)	REV T and below	REV U

The component manufacturers have discontinued production of integrated circuit U1 (350-3080-020) and transistors Q1, Q2, and Q3 (352-0756-070) in the rf mixer assemblies. This service bulletin provides a procedure for replacing these components with suitable substitutes. This modification should not be made unless the original components fail and no original spare parts are available.

Rf mixer assembly 618-3258-001 must be modified to 618-3258-002 when the original A6A1U1 (350-3080-020) is replaced by a substitute part.

Estimated time required is 2 man-hours.

The modification parts are itemized in the material information paragraph. For parts information, contact Collins Telecommunications Products Division/Rockwell International, Service Parts Department, Cedar Rapids, Iowa 52406. Reference 651S-1/1A/1B Service Bulletin No 13 in all correspondence.

No special tools or equipment are required.

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This service bulletin references the 651S-1/1A General Purpose HF Receiver Instruction Book, Collins part number 523-0764052.

MODIFICATION PROCEDURE

- A. Turn off all power to the receiver.

NOTE: For location of subassemblies and components, refer to the 651S-1/1A instruction book, part 2, parts list section, CPN 523-0764057. Figure and item numbers are in parentheses.

- B. Remove the 651S-1 dust cover (1-1) by removing two screws on the rear of the unit. Slide the unit out of the dust cover.

- C. Remove rf module assembly A6 (1-18).

NOTE: Steps D through G apply to rf modules with rf mixer assembly, CPN 606-9877-002, only.

- D. Remove chassis cover (16-79).

- E. Remove transistors Q1 (16-99), Q2 (16-98), and Q3 (16-108).

- F. Install new transistors (352-0756-150) as follows:

NOTE: Refer to figure 1 of this bulletin while performing steps F.(1) through (5).

- (1) Clip the case leads of the new transistors to a maximum length of 1.58 mm (1/16 in).
- (2) Install the transistors upside down on the chassis using adhesive (005-1688-001). Q1 and Q2 must have the same vendor symbol for testing qualifications. Use insulation sleeving (152-2473-000) on all leads that cross over the transistor body.
- (3) Connect Q1 source to terminal 21, drain to terminal 18, and gate to terminal 19.
- (4) Connect Q2 source to terminal 21, drain to terminal 23, and gate to terminal 22.
- (5) Connect Q3 source to terminal 8, drain to terminal 9, and gate to terminal 11.

- G. Locate rf mixer assembly part number 606-9877-002 and mark RWK REV R near the part number.

NOTE: Steps H through Q apply to rf modules with rf mixer assembly, CPN 618-3258-001, only.

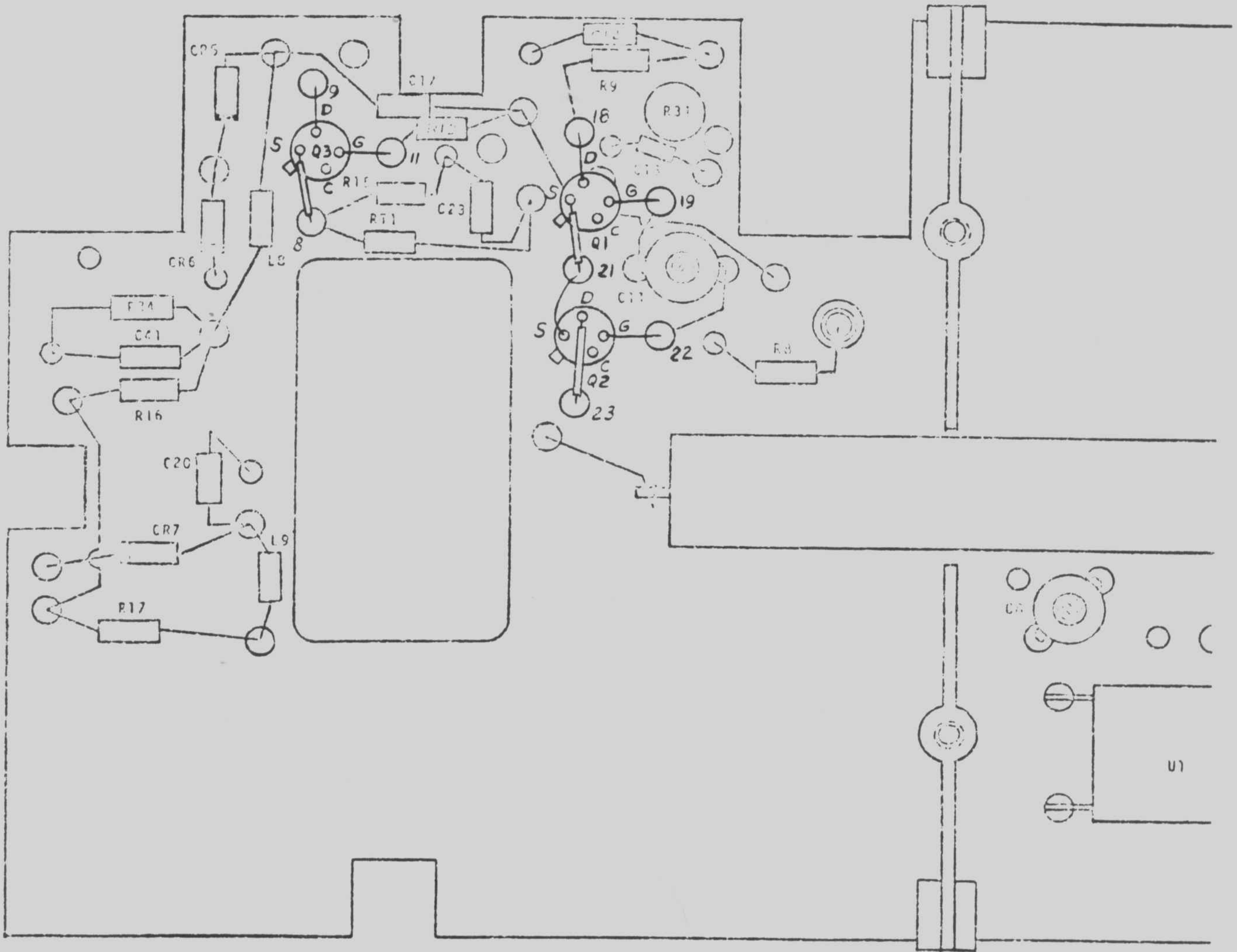
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- H. Remove rf mixer cover (36-1).
- I. Remove transistors Q1 (37-17), Q2 (37-48), and Q3 (37-117).
- NOTE: Refer to figure 2 of this bulletin while performing steps J through L.
- J. Clip the case leads of the new transistors (352-0756-150) to a maximum length of 1.58 mm (1/16 in).
- K. Install the transistors upside down on the chassis using adhesive (005-1688-001). Q1 and Q2 must have the same vendor symbol for testing qualifications. Use insulation sleeving (152-2473-000) on the drain leads of Q1 and Q3.
- L. Connect the new transistors as shown in figure 2.
- NOTE: Refer to figure 3 of this bulletin and the 651S-1/1A instruction book parts list while performing steps M through P. Refer to figure 4 for a schematic diagram which includes these changes.
- M. Remove mixer U1 (350-3080-020).
- N. Install new mixer U1 (351-0208-010) and connect as shown in figure 3.
- O. Remove capacitors C49 (37-6) and C50 (37-5).
- P. Remove capacitors C44 (37-141) and C46 (37-148) and replace them with 0.01 μ F capacitors (913-4240-100).
- Q. Locate rf mixer assembly part number 618-3258-001 and change it to 618-3258-002. Mark RWK REV T and RWK REV U near the part number.
- R. Reassemble the receiver in the reverse order of disassembly.
- S. Mark SB 13 on the service bulletin information chart. If the receiver does not have an information chart, install a chart (280-3778-010) near the nameplate.

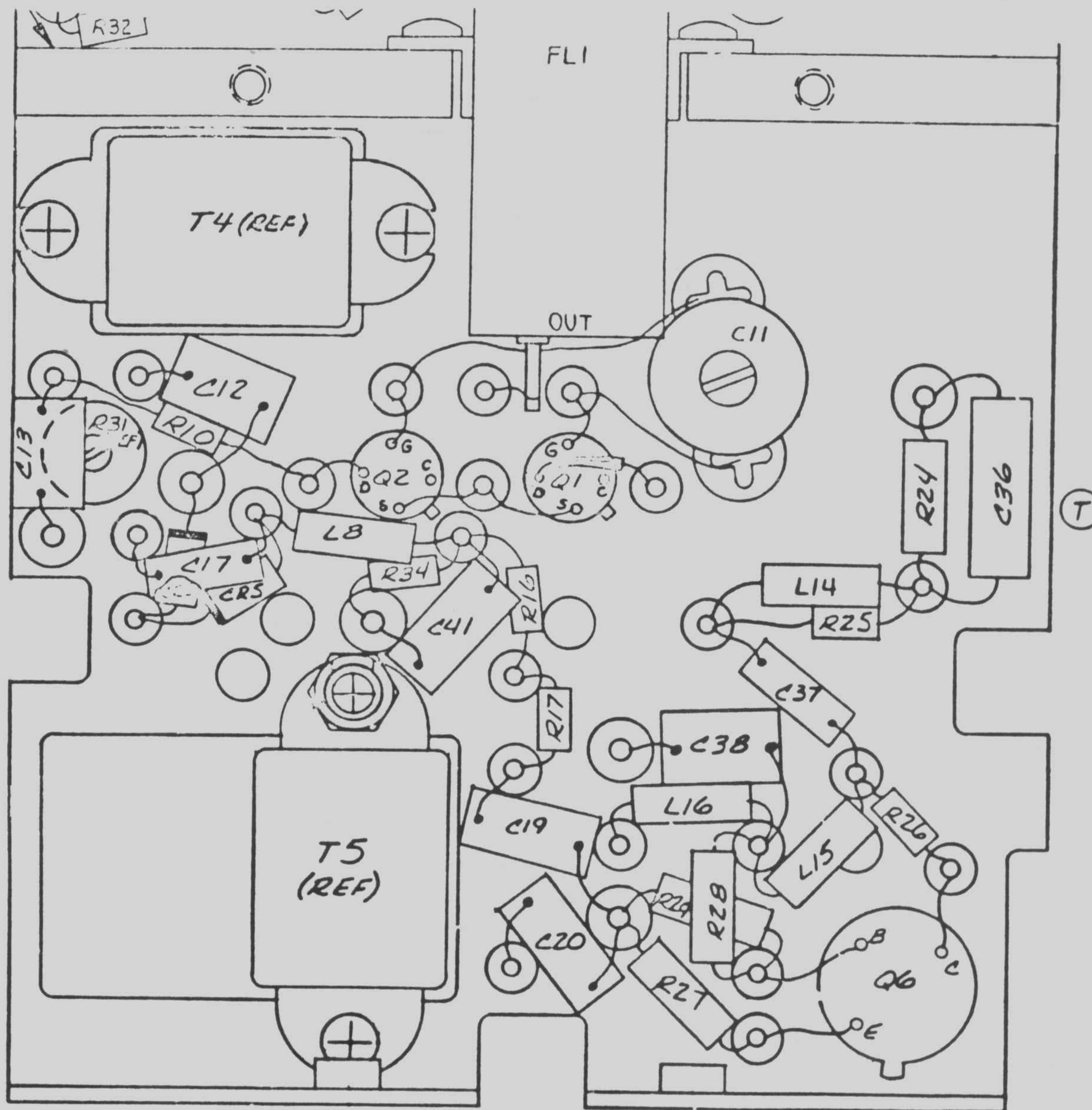
MATERIAL INFORMATION

<u>COLLINS PART NUMBER</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>DESCRIPTION</u>
352-0756-150	3		Transistors, Q1, Q2, Q3
005-1688-001	AR		Adhesive
152-2473-000	50 mm (2 in)		Sleeving, insulation
351-0208-010	1		Integrated circuit, U1
913-4240-100	2		Capacitor, 0.01 μ F, C44, C46
*280-3778-010	1		Chart, information

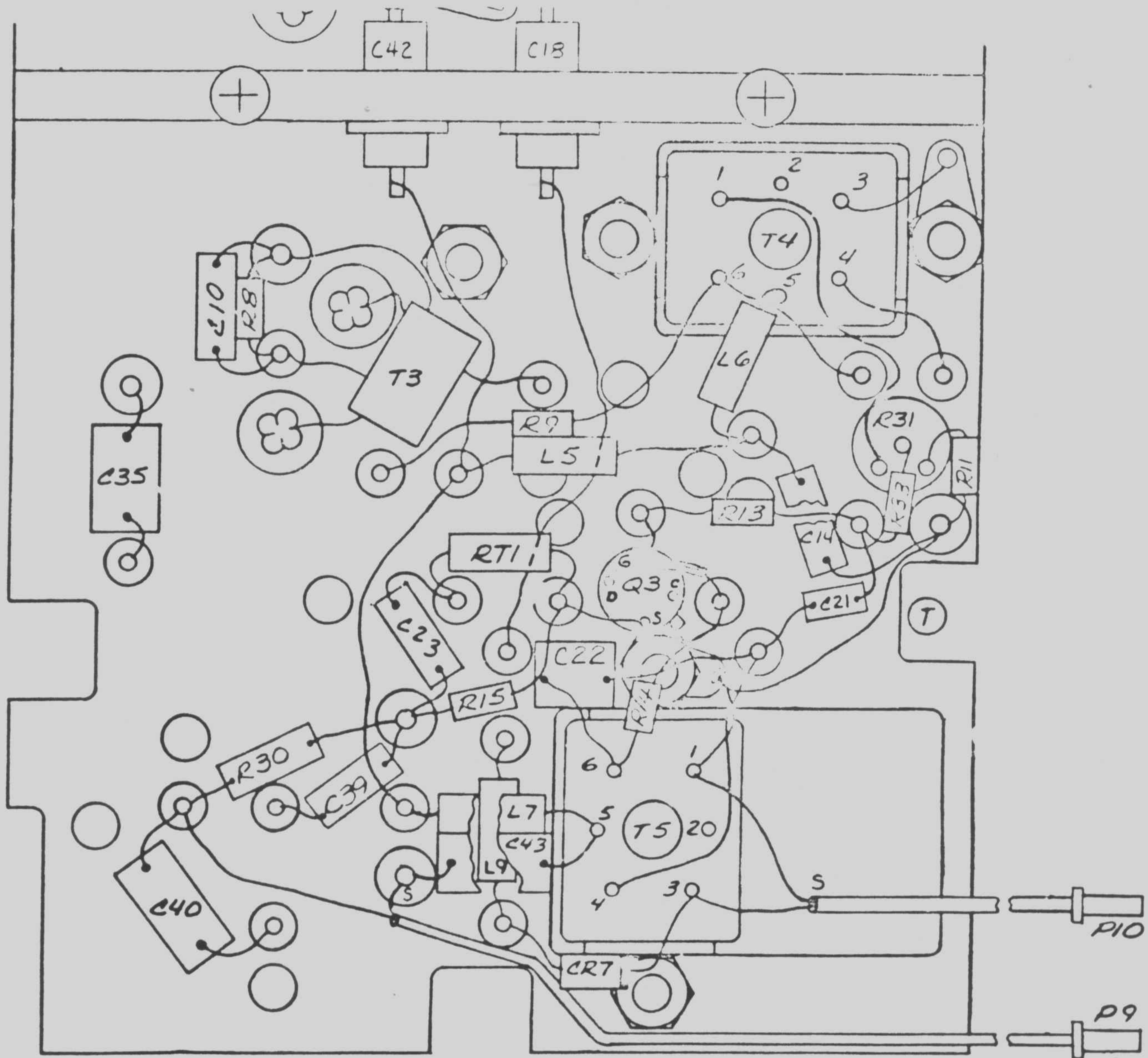
*Order if needed.



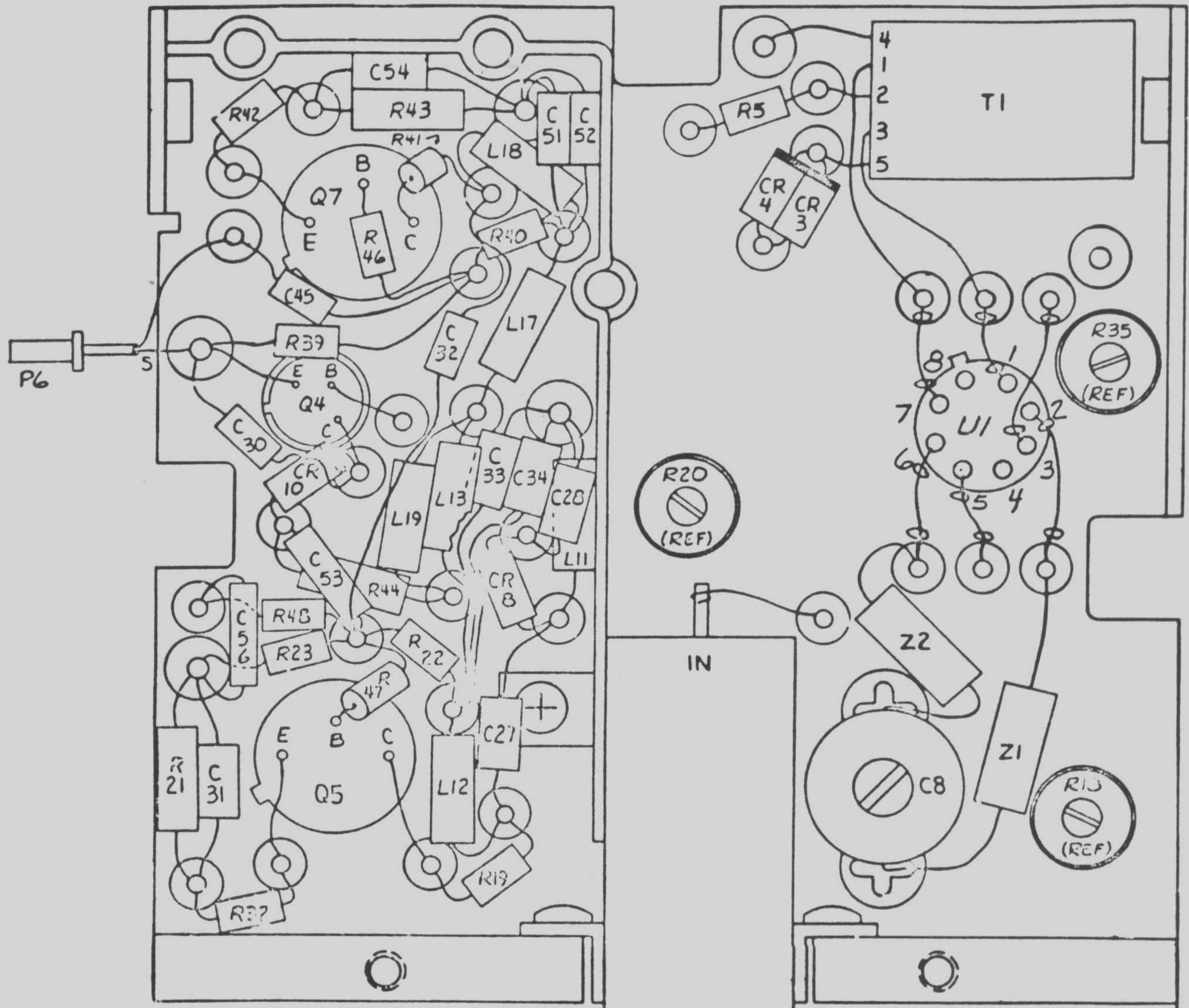
P/O RF Mixer (606-9877-002)
Figure 1



P/O RF Mixer (618-3258-002)
Figure 2 (Sheet 1 of 2)



P/O RF Mixer (618-3258-002)
Figure 2 (Sheet 2)



P/O RF Mixer (618-3258-002)

Figure 3

651S-1 GENERAL PURPOSE HF RECEIVER (522-4836-XXX)
651S-1A GENERAL PURPOSE HF RECEIVER (622-1062-001)
651S-1B GENERAL PURPOSE HF RECEIVER (622-1165-001)
SYNTHESIZER REFERENCE CARD A11 (608-9442-001)

SERVICE BULLETIN NO 14

REDUCE 100 kHz SIDEBANDS

This service bulletin applies to 651S-1 (522-4836-XXX), 651S-1A (622-1062-001), and 651S-1B (622-1165-001) units that contain synthesizer reference card A11 (608-9442-001) with REV H and below.

Production cut-in for reference card A11 is REV J.

This modification reduces the external standard sidebands on the phase-locked 9.9-MHz injection and is needed when operating the 651S-1 with a 100-kHz external standard and using the vlf up-converter for vlf reception. It prevents 100-kHz "birdies" from interfering with reception when the vlf converter is enabled.

This modification consists of removing three capacitors, replacing one coil, and adding one crystal and one jumper wire.

Estimated time required is 1.5 man-hour.

The modification parts are itemized in the material information paragraph. For parts information, contact Collins Telecommunications Products Division/Rockwell International, Service Parts Department, Cedar Rapids, Iowa 52406. Reference 651S-1/1A/1B Service Bulletin No 14 in all correspondence.

No special tools or equipment are required.

This service bulletin references the 651S-1/1A instruction book, part 2, Collins part number 523-0764052.

MODIFICATION PROCEDURE

- A. Turn off all power to the receiver.

NOTE: Refer to the 651S-1/1A instruction book, part 2, parts list, CPN 523-0764057, for location of subassemblies and components. Figure and item numbers are in parentheses.

- B. Remove the dust cover (1-1) by removing two screws on the rear of the unit. Slide the unit out of the dust cover.

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- C. Remove card cage cover (1-8) by removing the screws that secure it to the card cage.
- D. Remove synthesizer reference card A11 (1-13) from the card cage.
- E. Remove and discard coil L5 (6-31), and capacitors C17 (6-32), C18 (6-33), and C19 (6-30).

NOTE: Refer to figure 1 of this bulletin while performing steps F through I. Refer to figure 2 for before and after modification schematic diagrams.

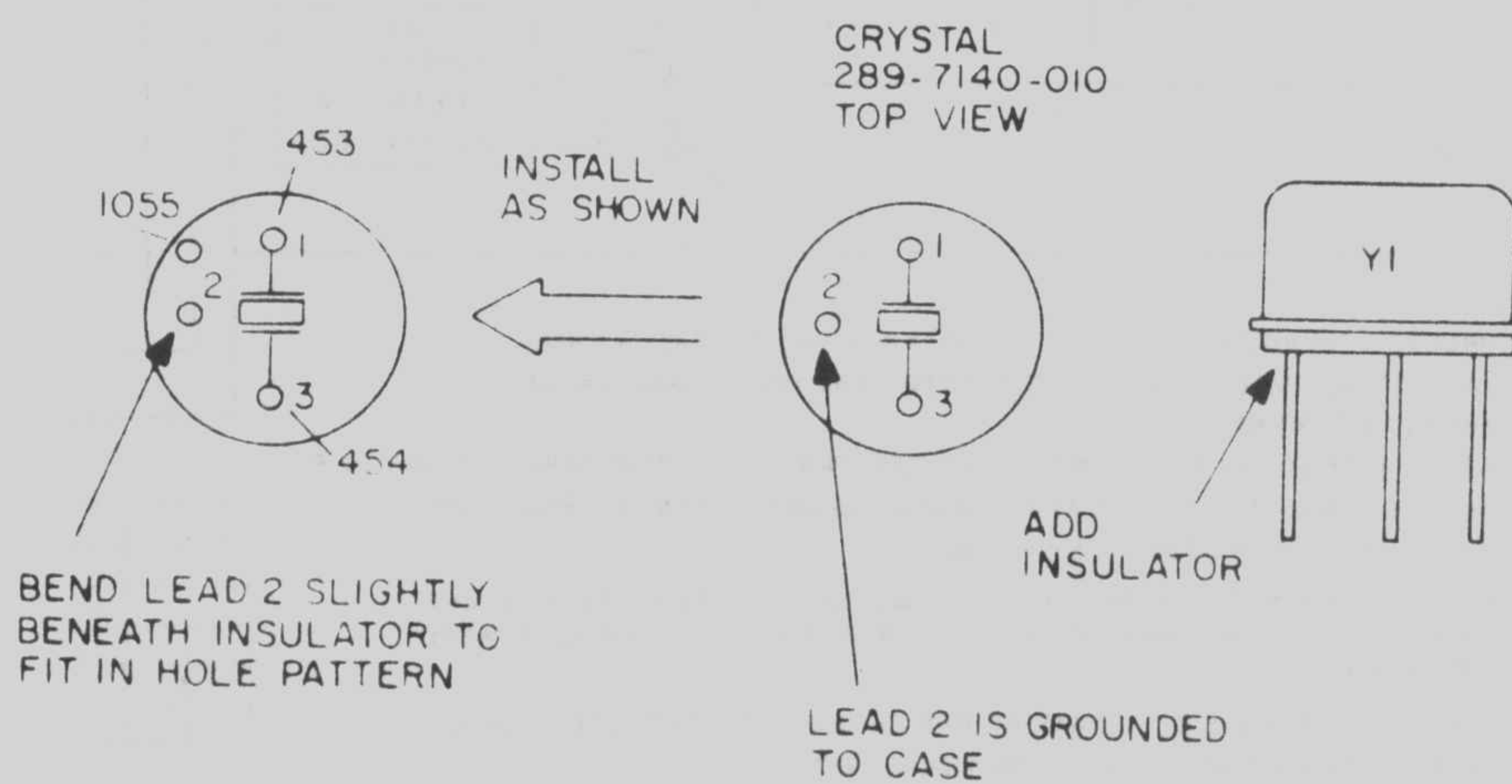
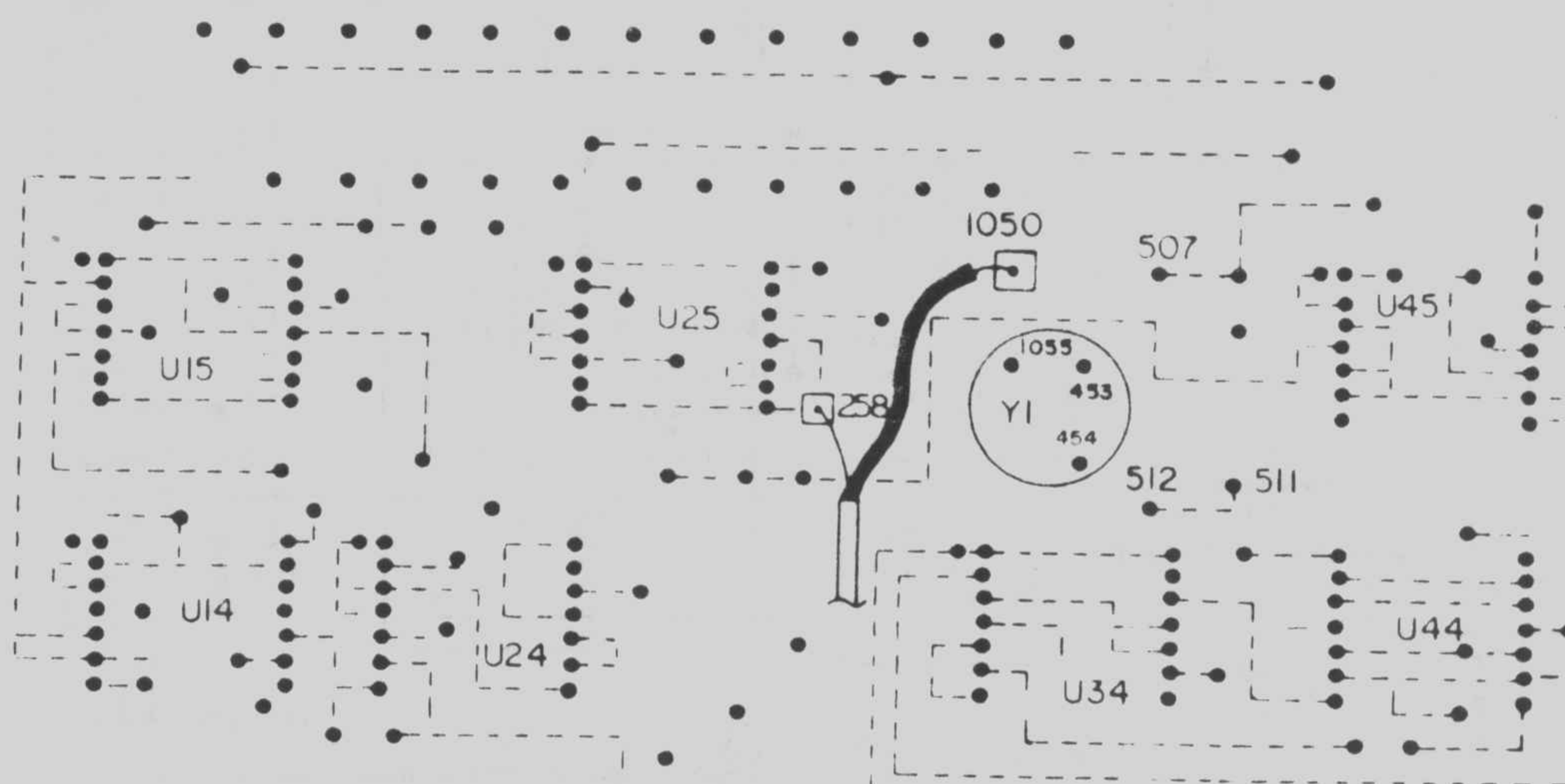
- F. Unsolder and move the square pin and coax cable shield from hole 1055 to hole 258. Solder the pin in hole 258.
- G. Install 9.9-MHz crystal Y1 (289-7140-010) with insulator (352-9552-550) into holes 453, 454, and 1055 on top of board as shown in figure 1.
- H. Install new 82 μ H coil L5 (240-2715-360) flat onto top of card with leads connected to hole 511 and the square pin in hole 1050. Use insulation sleeving (152-2493-000) on the L5 lead to hole 1050. The coax cable center conductor should remain on the square pin in hole 1050.
- I. Install and solder a #26 AWG bus wire from hole 512 to hole 507 on top of board.
- J. Stamp RWK REV J near the existing REV letter.
- K. Reassemble the receiver in the reverse order of disassembly.
- L. Mark SB 14 on the service bulletin information chart. If the receiver does not have an information chart, install a chart (280-3778-010) near the nameplate.

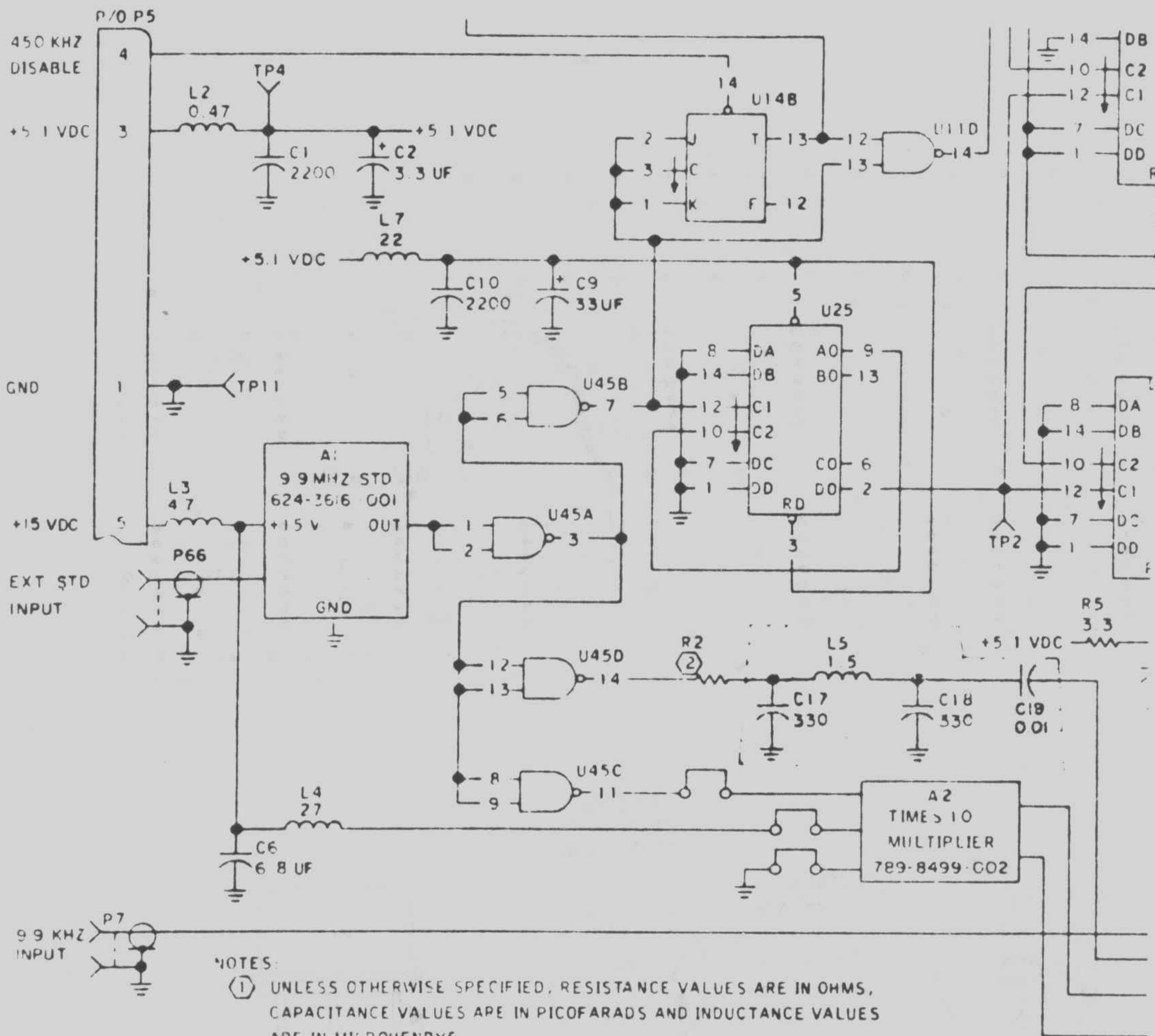
MATERIAL INFORMATION

The parts listed below are required to modify one 651S-1, 651S-1A, or 651S-1B.

<u>COLLINS PART NUMBER</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>DESCRIPTION</u>
289-7140-010	1		Crystal, 9.9 MHz, Y1
352-9552-550	1		Insulator
240-2715-360	1		Choke, 82 μ H, L5
428-0282-030	25 mm (1 in)		Wire, #26 AWG
152-2493-000	25 mm (1 in)		Sleeving, insulation
*280-3778-010	1		Chart, information

*Order if needed.

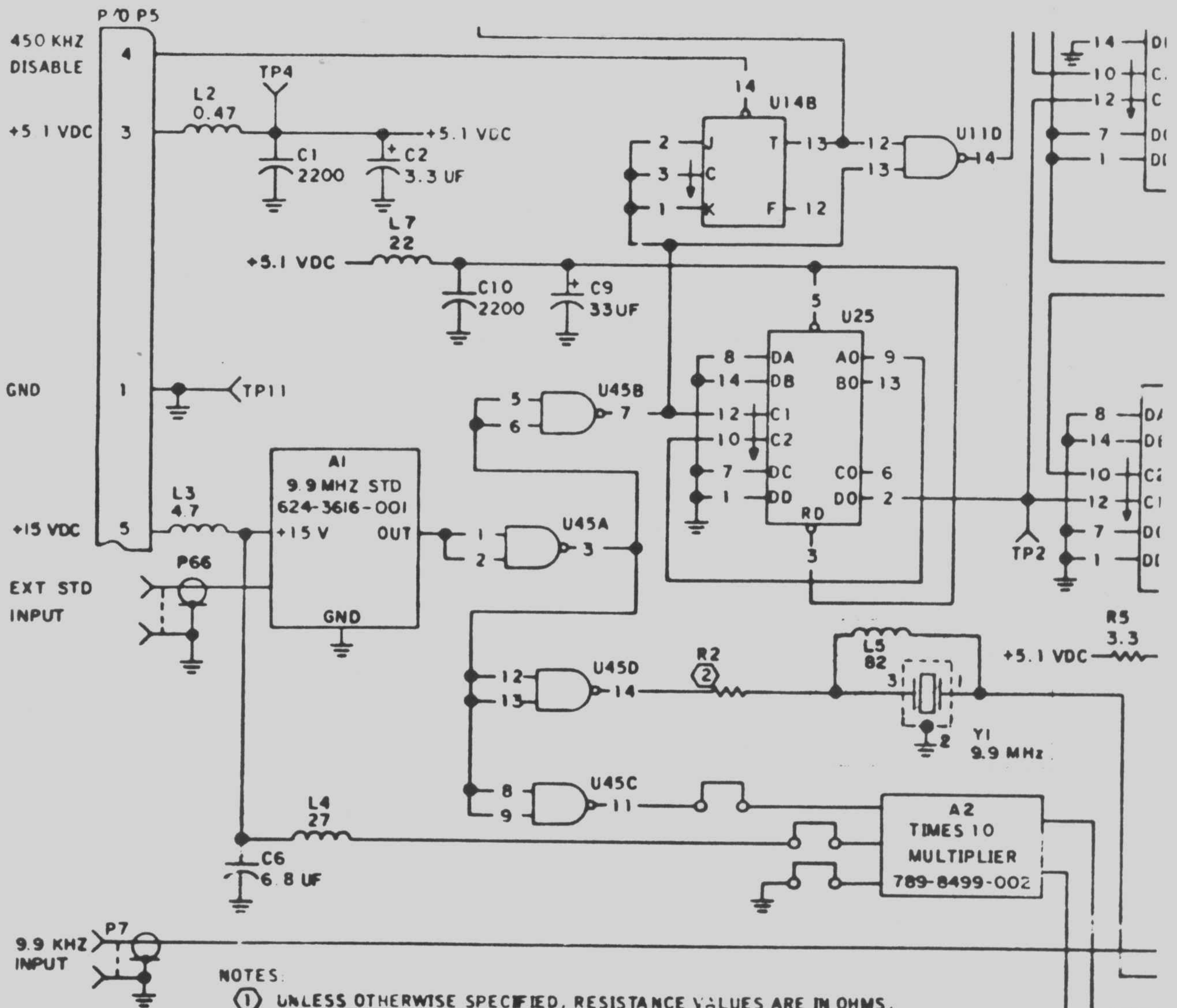




NOTES:

- ① UNLESS OTHERWISE SPECIFIED, RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN PICOFARADS AND INDUCTANCE VALUES ARE IN MICROHENRYS.
- ② R2 IS A TEST SELECT COMPONENT, SEE PARTS LIST FOR TABLE OF VALUES
- ③ UNLESS CONNECTIONS TO POWER AND GROUND ARE SHOWN, MICROCIRCUIT PIN 4 IS +5 VDC AND PIN 11 IS GROUND.
- ④ ALL TEST POINTS ARE P/O TEST CONNECTOR P/O TEST POINTS ARE IDENTIFIED, WITH CARD INSTALLED, FROM FRONT OF RADIO TOWARD THE REAR.
- ⑤ PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATION, PREFIX WITH UNIT AND/OR ASSEMBLY DESIGNATION.

TENS	
1	50
2	50
3	50
4	50



NOTES:

- ① UNLESS OTHERWISE SPECIFIED, RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN PICOFARADS AND INDUCTANCE VALUES ARE IN MICROHENRYS
- ② R2 IS A TEST SELECT COMPONENT, SEE PARTS LIST FOR TABLE OF VALUES.
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- ④ ALL TEST POINTS ARE P/O TEST CONNECTOR P/O TEST POINTS ARE IDENTIFIED, WITH CARD INSTALLED, FROM FRONT OF RADIO TOWARD THE REAR.
- ⑤ PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATION, PREFIX WITH UNIT AND/OR ASSEMBLY DESIGNATION.

TENS	
1	S
2	S
3	S
4	S

651S-1 GENERAL PURPOSE HF RECEIVER (522-4836-XXX)
 651S-1B GENERAL PURPOSE HF RECEIVER (622-1165-XXX)
 DCFE CIRCUIT CARD ASSEMBLY A8 (624-5744-XXX)
 DCFE CIRCUIT CARD ASSEMBLY A8 (608-9322-001)

SERVICE BULLETIN NO 15

PREVENT INVALID MONITOR RESPONSES FROM THE HF RECEIVER

This service bulletin applies as follows:

EQUIPMENT	APPLIES TO SERIAL NUMBERS	PRODUCTION CUT-IN SERIAL NUMBER
651S-1 522-4836-XXX	6266 and below	6267
651S-1B 622-1165-XXX	134 and below	135
Production cut-in for circuit card A8 (624-5744-XXX) is REV Y, and circuit card A8 (608-9322-001) is REV G.		

When using the DCFE card with the RS-232 control option, DCFE shift register strobe logic level transitions may be coincident with the shift register mode control line transitions. Coincidence of these signals may cause logic upset in some integrated circuits (SC5047F or RL301J), resulting in an invalid monitor response from the receiver.

In the 651S-1, if integrated circuits U9, U17, U21, U25, U29, U33, or U37 on A8 (624-5744-XXX) are replaced or if symptoms described above appear, this service bulletin should be implemented.

In the 651S-1B, if integrated circuits U7, U14, U21, U25, U30, U35, or U40 on A8 (608-9322-001) are replaced or if the symptoms described above appear, this service bulletin should be implemented.

This modification consists of adding a capacitor on the DCFE circuit card to delay the parallel input strobe to the DCFE shift registers.

Estimated time required is 1.0 man-hour.

The modification parts are listed in the material information paragraph. For additional information concerning parts, contact Collins Telecommunications Products Division/

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Rockwell International, Service Parts Department, Cedar Rapids, Iowa, 52406. Reference 651S-1/1B Service Bulletin No 15 in all correspondence.

No special tools or equipment are required.

This service bulletin references the 651S-1/1A General Purpose HF Receiver Instruction Book, CPN 523-0764052, and the 651S-1B General Purpose HF Receiver Instruction Book, CPN 523-0765619.

MODIFICATION PROCEDURE

- A. Disconnect the receiver from the power source.

NOTE: Refer to the 651S-1/1A instruction book, part 2, parts list section, CPN 523-0764057, and to the 651S-1B instruction book parts list section, CPN 523-0765625, for location of subassemblies and components. Figure and item numbers are in parentheses.

- B. Remove dust cover (1-1, 651S-1 or 1-2, 651S-1B) by removing two screws on the rear of the unit. Slide the unit out of the dust cover.

- C. Remove left hand card cage cover (1-8) by removing the screws that secure the cover to the card cage.

- D. Remove DCFE circuit card A8 (1-16, 651S-1 or 1-32, 651S-1B) from the card cage.

NOTE: Refer to the parts list section, figure 14 (651S-1) or figure 16 (651S-1B) for orientation while installing the new capacitors. Steps E and F apply to circuit card A8, CPN 624-5744-XXX.

- E. Install a 1500-pF capacitor C20 (913-3279-040) between U29-3 and C4 bottom lead as shown in figure 1. Use sleeving (152-2463-000) on the capacitor leads.

- F. Stamp RWK REV Y near the existing REV letter.

NOTE: Steps G, H and I apply to circuit card A8, CPN 608-9322-001.

- G. Install a post (372-2601-010) at U14-3 on the top of the circuit card as shown in figure 2.

- H. Install a 1500-pF capacitor C12 (913-3279-040) between the new post and the ground lead of C9 as shown in figure 2. Use sleeving (152-2463-000) on the capacitor leads.

- I. Stamp RWK REV G near the existing REV letter.

- J. Reassemble the receiver in the reverse order of disassembly.

- K. Mark SB 15 on the service bulletin information chart. If the radio does not have an information chart, order a chart (280-3778-010) and attach it near the nameplate.

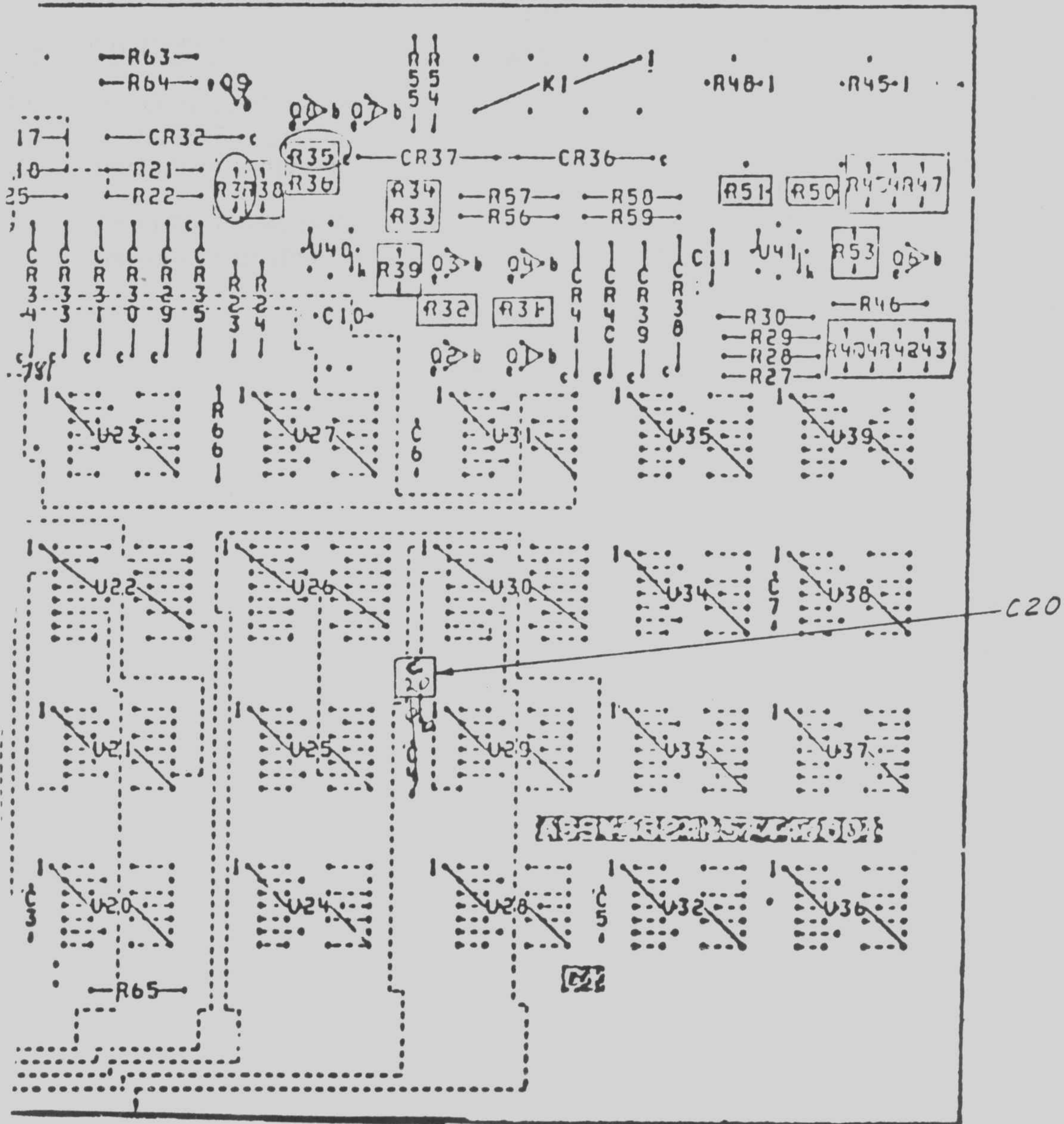
Collins Telecommunications Products Division/Rockwell International

MATERIAL INFORMATION

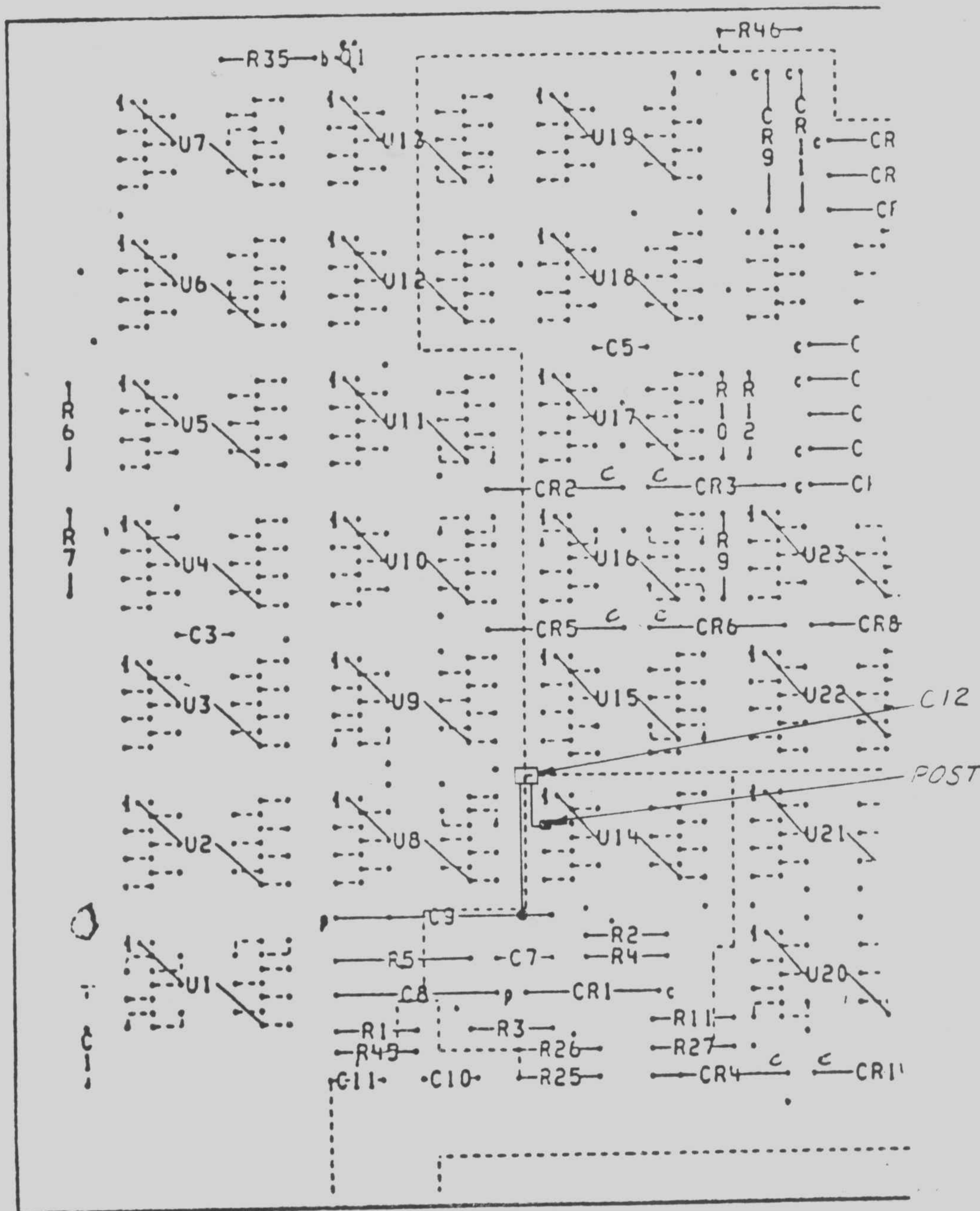
The parts listed below are required to modify one 651S-1 or one 651S-1B.

<u>COLLINS PART NUMBER</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>DESCRIPTION</u>
913-3279-040	1		Capacitor, 1500 pF, C20 (651S-1) or C12 (651S-1B)
152-2463-000	50 mm (2 in)		Sleeving, insulation
372-2601-010	1		Post (651S-1B only)
*280-3778-010	1		Chart, information

*Order if needed.



P/O DCFE Circuit Card Assembly A8 (624-5744-001)
Figure 1



P/O DCFE Circuit Card Assembly A8 (608-9322-001)
Figure 2

651S-1 GENERAL PURPOSE HF RECEIVER (522-4836-XXX)
651S-1A GENERAL PURPOSE HF RECEIVER (622-1062-001)
INDICATOR HOUSING ASSEMBLY (606-9707-002)

SERVICE BULLETIN NO 9

INCREASE LIFE OF DISPLAY TUBES

This modification is applicable to all 651S-1/1A receivers containing indicator housing assembly (606-9707-002) that is marked with Rev F and below.

Production cut-in for the indicator housing assembly: Rev G and above.

The purpose of this modification is to increase the life of display tubes by decreasing the filament voltage. This condition has little effect on the initial brightness of the display tubes.

The modification consists of moving a wire and installing a resistor. This accomplishes the same result as the production revision, which changes the values of R132, R140, R148, R156, R164, and R172 from 82 to 100 ohms.

Estimated time to perform this modification is 1 man-hour.

The modification parts (as listed in the material information paragraph) are available for shipment within 30 days after receipt of order at a price of \$0.55 (price is subject to change without notice; minimum order price is \$25.00). Parts may be ordered from Collins Radio Group/Rockwell International, Service Parts Department, Cedar Rapids, Iowa 52406. All orders should specify part numbers and reference 651S-1/1A Service Bulletin No 9.

No special tools or equipment required.

Revision 1 of the 4th edition of the diagrams section (523-0764058) of the 651S-1/1A General Purpose HF Receiver Instruction Book, Part 1 (523-0764052), and revision 2 of the 4th edition of the parts list section (523-0764057) of the 651S-1/1A General Purpose HF Receiver Instruction Book, Part 2, will cover the changes included in this bulletin.

MODIFICATION PROCEDURE

- A. Disconnect all external cables and wiring. Remove two screws from rear of unit and slide dust cover from the unit.
- B. Mount standoff terminal (306-1018-000) on TB103 (refer to figure 1).
- C. Mount 3.3-ohm resistor between the standoff terminal and TB103-10 and solder.

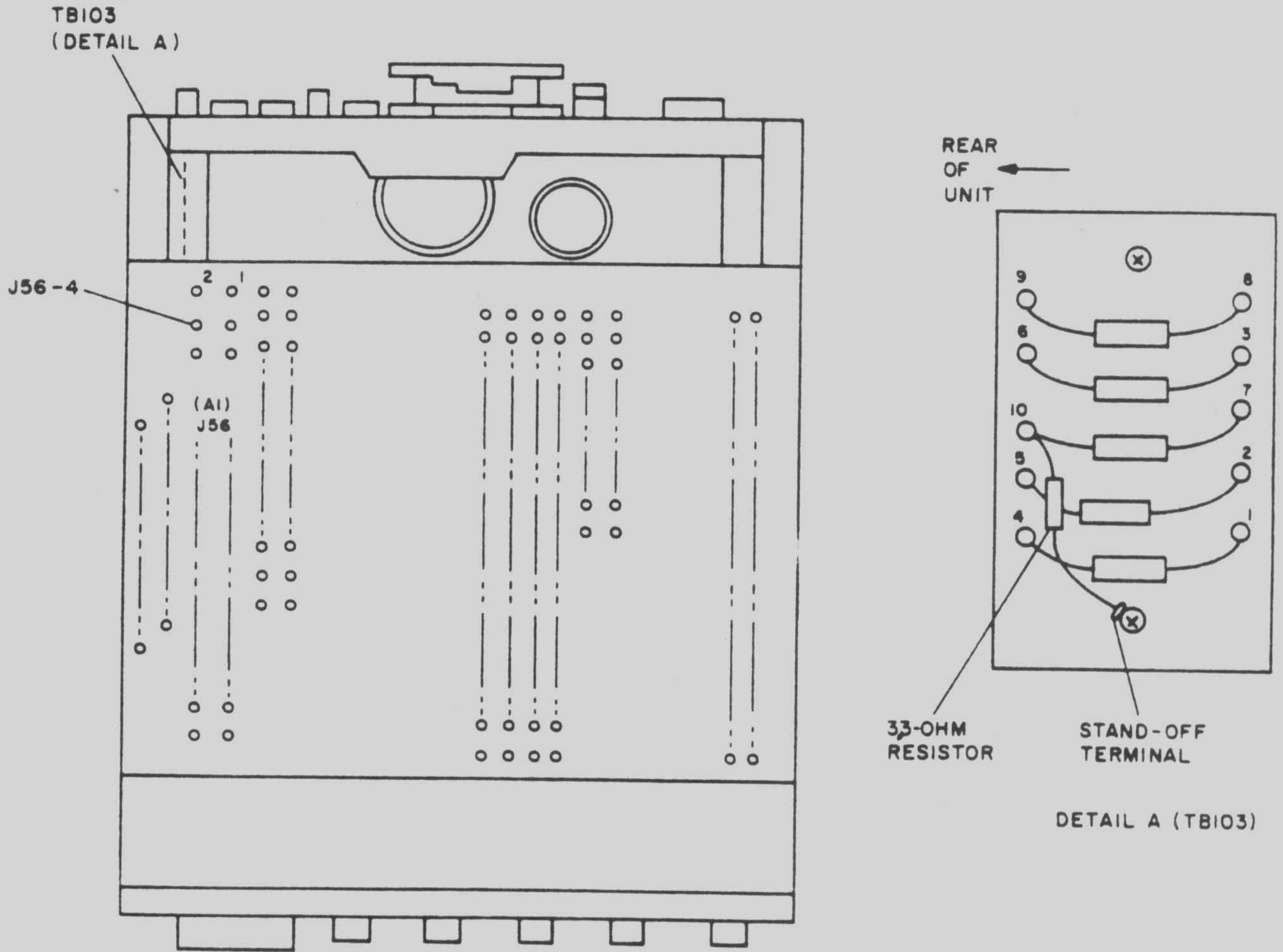
- D. Unsolder blue wire from J56-4. See figure 1. Pull this wire through the cable ties and connect and solder to the standoff terminal mounted in step B.
- E. Mark information chart (280-3778-010) with SB 9 and apply to chassis near nameplate.
- F. Slide cover back on unit and replace two screws on rear of unit.
- G. Reconnect external cables and wires and check that the display tubes light properly.

NOTE: Refer to figure 2 for the schematic modifications.

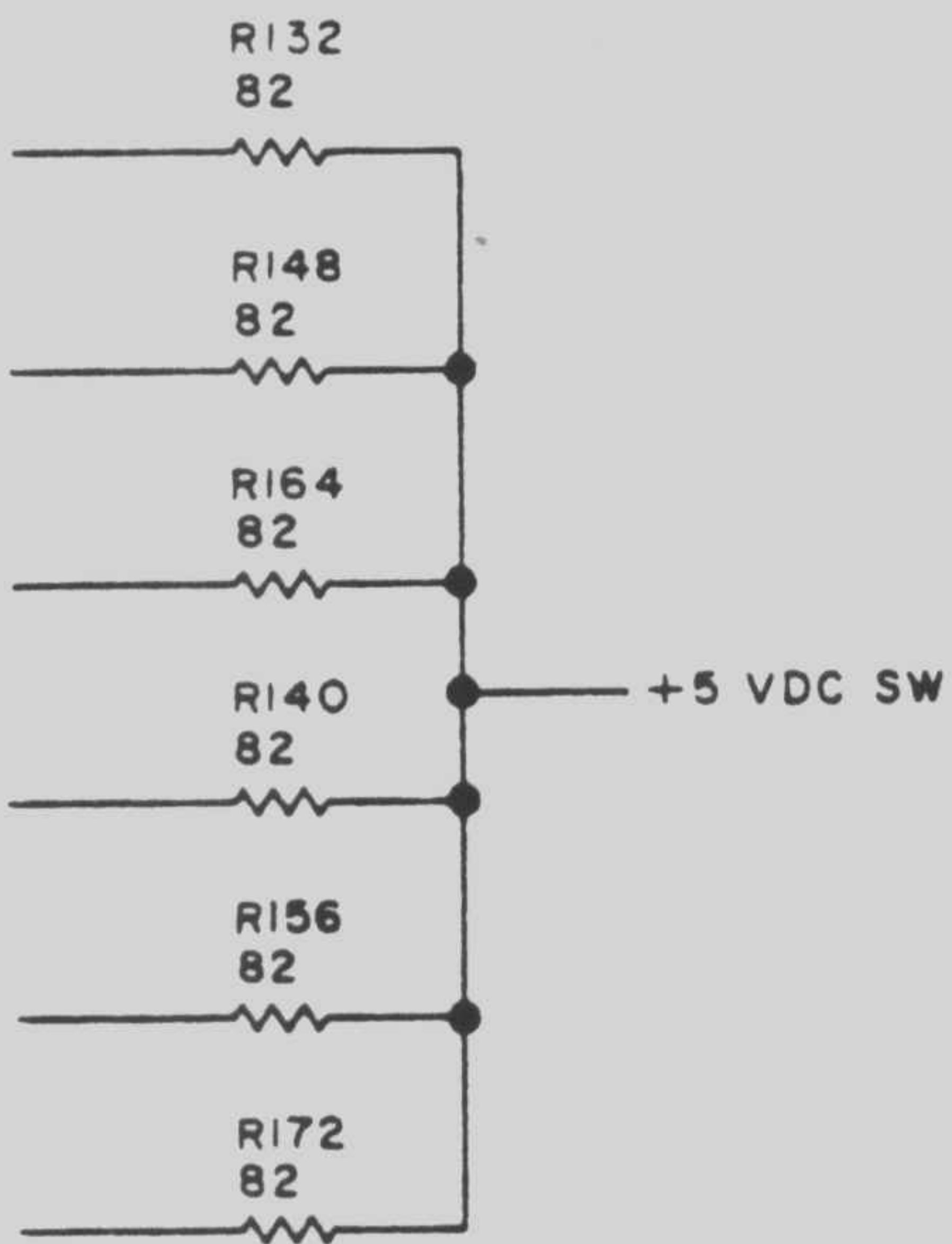
MATERIAL INFORMATION

The following parts are required to modify one 651S-1/1A.

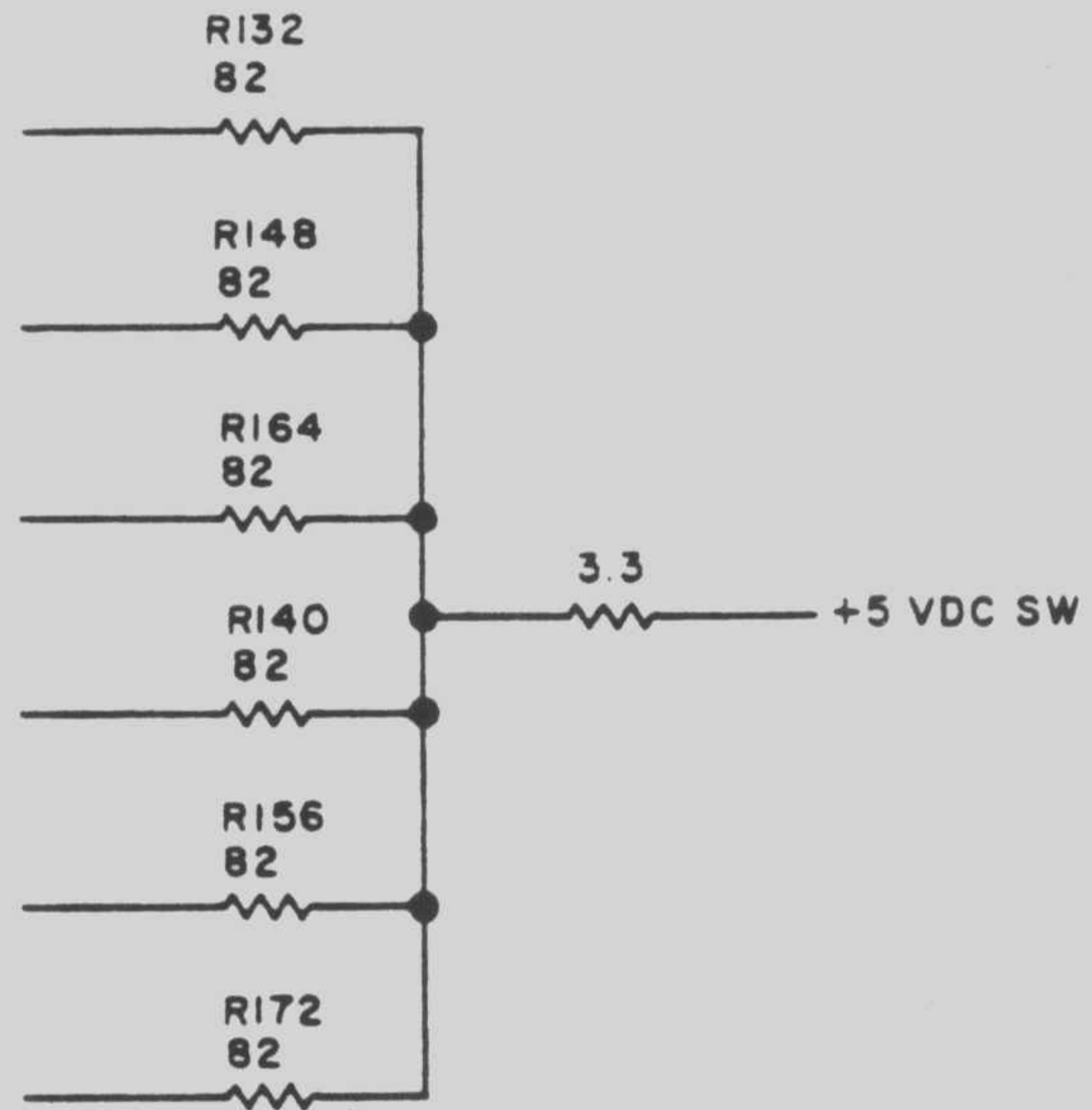
<u>COLLINS PART NUMBER</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>DESCRIPTION</u>
280-3778-010	1	\$0.30	Chart, information
306-1018-000	1	0.09	Terminal, standoff
745-4376-000	1	0.16	Resistor, 3.3-ohm, 1/4-watt, RCR07G3R3JS



651S-1/1A Chassis, Bottom View
Figure 1



BEFORE



AFTER

NOTE:

INSTEAD OF ADDING 3.3 OHM RESISTOR ON PRODUCTION UNITS WITH REVISION G, THE SIX RESISTORS ARE CHANGED FROM 82 TO 100 OHMS.

651S-1/1A Chassis, Partial Schematic Diagram
Figure 2