KENWOOD

SB-959

SERVICE BULLETIN AMATEUR RADIO

SUBJECT	DATE
TS-950SD SPEECH PROCESSOR NOISE	01/12/90

When the Processor-In control is set to some level below 10dB of compression, a crackling noise can be induced on the transmit signal. The following modification will reduce the noise. After the modification has been performed, the noise can only be heard when the Processor-In control is set too low to be functional.

NOTE: This modification has already been performed on models starting with serial number 0120441.

REQUIRED PARTS:

TRANSISTOR (PNP)	PART # 2SC2458Y
4.7 OHM, 1/4W RESISTOR	PART # RD14CB2E4R7J → smaller 1/6W RD14CB2C4R7J
10 OHM CHIP RESISTOR	PART # RK73FB2A100J
39 OHM CHIP RESISTOR	PART # RK73FB2A390J
10K OHM CHIP RESISTOR	PART # RK73FB2A103J

1. Disconnect the power cord and antenna.
2. Remove the top and bottom covers (18 screws).
3. Locate the Signal board on the bottom of the transceiver. This is the front right board of the 4 boards on the bottom of the transceiver.
4. Disconnect the 3 flex cables and remove the 6 mounting screws from the Signal board.
5. Carefully lift the board and rotate it towards the AF unit (front left board) to expose the foil side of the Signal board. Loosen the wire harness as necessary to rotate the board.

THE FOLLOWING WILL BE PERFORMED ON THE FOIL SIDE OF THE SIGNAL BOARD.

1. Cut the foil between pin 3 of CN18 and chip resistor R229.
2. Desolder and remove R229.
3. Solder a 10 ohm chip resistor across the cut foil.
4. Solder a 39 ohm chip resistor in place of R229 (it will be slightly offset due to the installation of the 10 ohm resistor).

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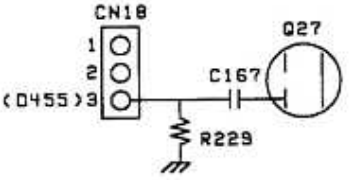
5. Solder a 4.7 ohm resistor to the collector of a 2SC2458(Y) transistor. Shorten the lead length to accommodate the following installation and insulate the leads with shrink tubing.

6. Solder the exposed end of the 4.7 ohm resistor to chip capacitor C167.

7. Solder the base and emitter leads as shown in the accompanying diagram.

8. Solder a 10K ohm resistor to the circuit as shown.

This modification is covered under the 1 year warranty.
Time required to perform the modification is 1 hr or less. (C)010390EWP



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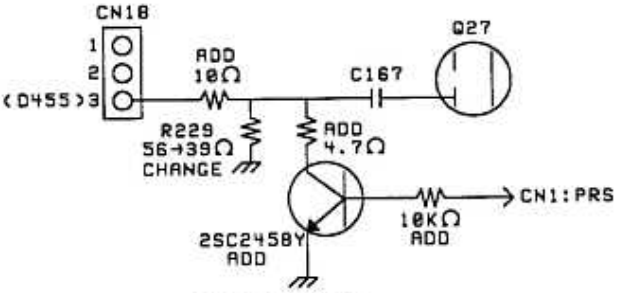

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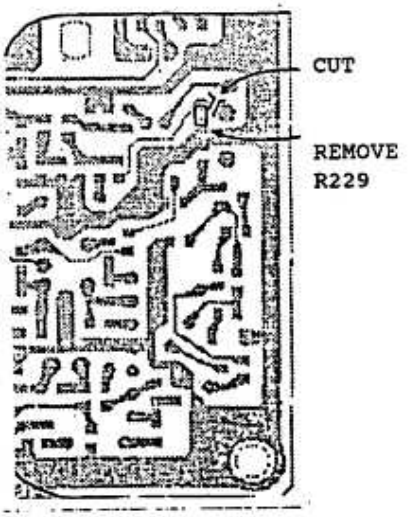

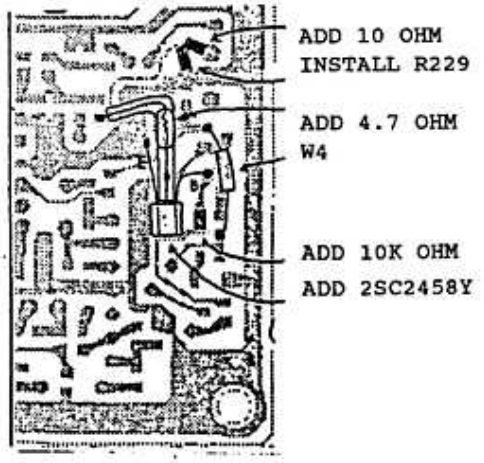

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SB-960

SERVICE BULLETIN AMATEUR RADIO

SUBJECT	DATE
TS-950SD LOW VS-2 AUDIO	01/12/90

Early TS-950S Digital transceivers will not produce sufficient audio from the optional VS-2 voice synthesizer. The following modification will correct this condition.

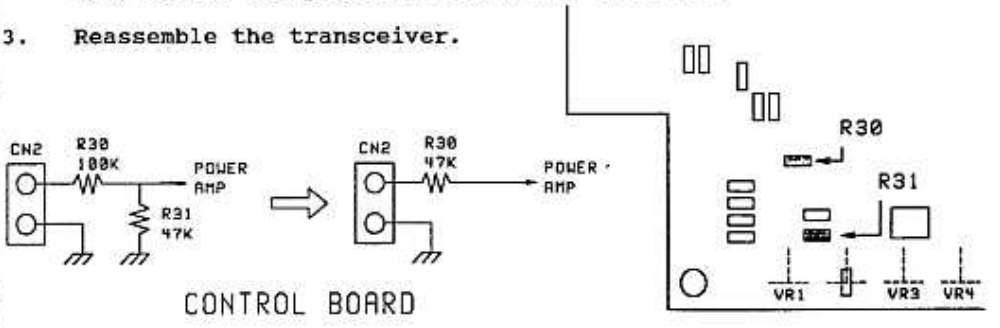
NOTE: This modification has already been performed on models starting with serial number 103XXXX.

REQUIRED PART: 47K OHM CHIP RESISTOR PART # RK73FB2A473J

1. Disconnect the power cord and antenna.
2. Remove the top and bottom covers (18 screws).
3. Remove the top screw from each side of the front panel assembly.
4. Loosen the bottom screw on each side of the front panel assembly.
5. Pull the front panel assembly forward to expose the Digital and Control boards.
6. Remove the two screws that secure Control board B/3 to the top of the chassis and swing the board out of the way.
7. Remove the 4 screws from Control board A/3 and rotate the board down.

THIS WORK WILL BE DONE ON THE FOIL SIDE OF CONTROL BOARD A/3.

1. Desolder and discard chip resistors R30 and R31.
2. Install a 47K ohm chip resistor in place of R30. Do not use R31 (47K ohm) in the R30 position. Use a new resistor.
3. Reassemble the transceiver.



CONTROL BOARD

This modification is covered under the 1 year warranty.
Time required to perform the modification is 1 hr or less. (C)010390EWP

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SB-961

SERVICE BULLETIN AMATEUR RADIO

SUBJECT	DATE
TS-950SD N.B. GATE SWITCHING NOISE	01/11/90

Switching noise from the main band noise blanker circuit may be induced on the 15V line and pass through the AF amplifier to the speaker. The following modification will correct this condition.

NOTE: This modification has already been performed on models starting with serial number 104XXXX.

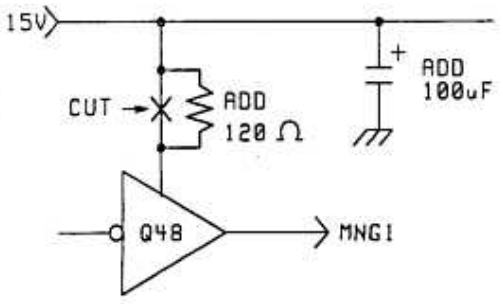
REQUIRED PARTS:

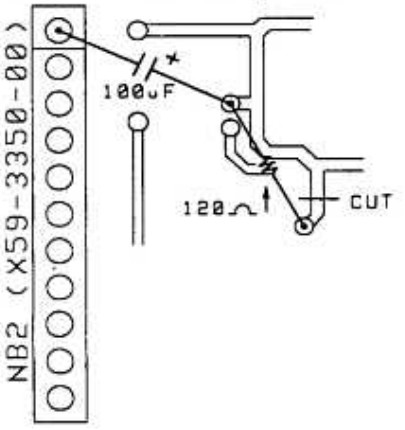
120 OHM, 1/8 WATT RESISTOR	PART # RD14BB2B121J
100uF, 16V ELECTROLYTIC CAPACITOR	PART # ~~CE04EW1C101~~M

1. Disconnect the power cord and antenna.
2. Remove the top and bottom covers (18 screws).
3. Locate the AF board. This is the front left board of the 4 boards on the bottom of the transceiver.

THIS WORK WILL BE DONE ON THE COMPONENT SIDE OF THE AF BOARD.

1. Cut the foil as shown in the acompanying diagram.
2. Add a 120 ohm resistor between the emitter of Q48 and the 15V line.
3. Add a 100uF, 16V capacitor between the 15V line and ground.
4. Reassemble the transceiver.





This modification is covered under the 1 year warranty.
Time required to perform the modification is 0.5 hrs. (C)011190EWP

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SB-962

SERVICE BULLETIN AMATEUR RADIO

SUBJECT	DATE
TS-950SD EARLY PROTECTION WITH TL-922A	01/17/90

The TS-950SD RX to TX switching time in semi break-in is approximately 10mS. At key down, the transceiver momentarily sees an open circuit because the linear's keying relay has not engaged. As a result, the transceiver's protection circuit turns on, causing the output power to be reduced. The following modification will make the RX to TX switching time, in semi-break-in, approximately 30mS. This modification does not affect full break-in switching. Increasing the switching time to 30mS may restrict certain long distance high speed communications.

REQUIRED PARTS:

DIGITAL TRANSISTOR (QTY 2)	PART # DTC124ES
100K OHM, 1/4W RESISTOR	PART # RD14BB2E104J
2.2uF, 50V ELECTROLYTIC CAPACITOR	PART # CE04EW1H2R2M

1. Disconnect the power cord and antenna.
2. Remove the top and bottom covers (18 screws).
3. Remove the top screw from each side of the front panel assembly.
4. Loosen the bottom screw on each side of the front panel assembly.
5. Pull the front panel assembly forward to expose the Digital and Control boards.
6. Remove the two screws that secure Control board B/3 to the top of the chassis and swing the board out of the way.
7. Remove the 4 screws from Control board A/3 and rotate the board down. Disconnect the right hand plugs as necessary to expose the foil side of the Control board.
8. Install the circuit shown in figure 1 on the foil side of Control Board A/3.
9. Assemble the transceiver by reversing steps 1 - 7.

This modification is covered under the 1 year warranty.
Time required to perform this modification is 1hr. or less. (C)12990EWP

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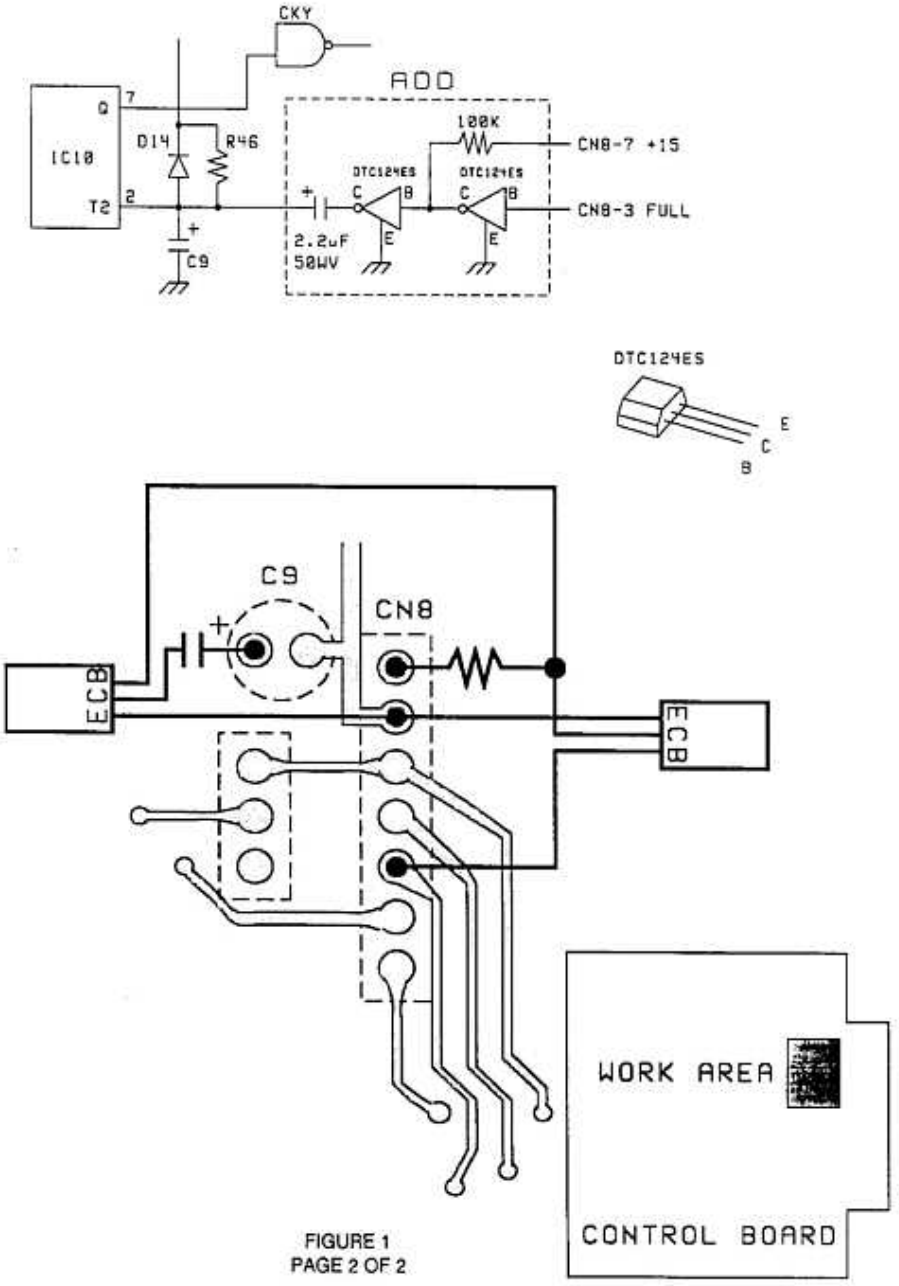

FIGURE 1
PAGE 2 OF 2

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SB-963

SERVICE BULLETIN AMATEUR RADIO

SUBJECT	DATE
TS-950SD RX DIGITAL NOISE	01/17/90

Some early TS-950SD transceivers may exhibit a low Signal to Noise ratio on ten and fifteen meters. In addition, rotating the encoder may allow the user to hear a crackling noise in his headphones. The following modification will correct this condition.

NOTE: This modification has already been performed on models from serial number 101XXXX

1. Disconnect the power cord and antenna.
2. Remove the top and bottom covers (18 screws).
3. Open the subchassis as shown in figure 1 (remove 4 top screws, remove 3 back panel screws, unplug the RX ANT OUT and DRIVE IN connectors).
4. Remove the cover from the subchassis (12 screws). FIGURE 1.
5. Remove the 9 screws from the Filter board.
6. Desolder the antenna connector wires at the antenna connector. Do not damage the surge absorber.
7. Rotate the Filter unit to expose the foil side of the board. Disconnect coax cables as necessary to rotate the board and remove the mesh plate as the board is rotated.
8. Cut the two ground foils as shown in figure 2.
9. Assemble the transceiver by reversing steps 1 - 7. Remember to install the mesh plate, resolder the antenna connector, and plug in the two connectors on the back panel.

This modification is covered under the 1 year warranty.
Time required to perform the modification is 1 hr. or less. (C)12690EWP

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SB-964

SERVICE BULLETIN AMATEUR RADIO

SUBJECT	DATE
TS-950SD TWO SECOND TX POWER DELAY WITH MONI ON	01/22/90

When the MONI switch is turned on, transmit power may not develop for two seconds after key down. During this time, the ALC meter will pin and the SWR meter will read high. This will more likely develop on 18MHz and 21MHz bands. The following modification will correct this condition.

NOTE: This modification has already been performed on models from serial number 0120441.

REQUIRED PART:

2.2K OHM CHIP RESISTOR KENWOOD PART # RK73FB2A222J

1. Disconnect the power cord and antenna.
2. Remove the top and bottom covers (18 screws).
3. Locate the RF unit on the bottom of the transceiver. This is the back left board of the four boards on the bottom of the transceiver.
4. Remove the RF board shield plate (4 screws).
5. Remove the 3 remaining screws from the RF board.
6. Remove the black screw that secures the DRIVE OUT/RX ANT IN jack to the back panel.
7. Disconnect the right hand coax cables from the RF board and unplug connector #2.
8. Slide the RF board forward and then rotate it towards the front of the transceiver to expose the foil side of the board.
9. Locate chip resistor R135 as shown in figure 1.
10. Replace R135 with a 2.2K ohm chip resistor.
11. Assemble the transceiver by reversing steps 1 - 8.

This modification is covered under the 1 year warranty.
Time required to perform the modification is 1 hr. or less. (C)12590EWP

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RF BOARD
FOIL SIDE VIEW

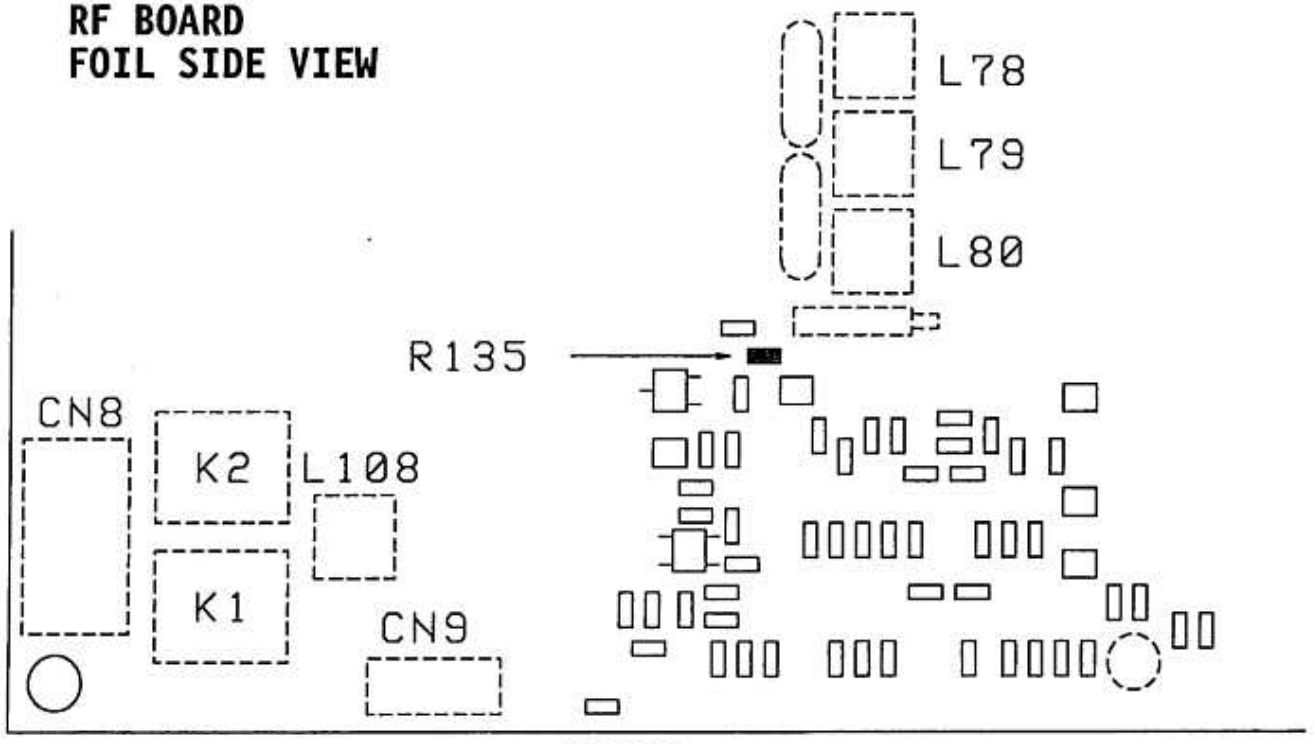

FIGURE 1

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SB-971

SERVICE BULLETIN AMATEUR RADIO

SUBJECT	DATE
TS-950S/SD RECEIVER NOISE	05/29/90

About 1mV of noise is present at the speaker or headphone jack in the receive mode with the AF GAIN control set to minimum. If the transceiver is in the CW mode, a faint tone might also be heard through the headphones (sidetone leakage). The following modification will reduce the level of the noise and the tone.

REQUIRED PARTS:

2SD1757K(S)

1. Disconnect the power cord and antenna.
2. Remove the top and bottom covers (18 screws).
3. Locate the AF unit on the bottom of the transceiver. This is the front left board of the four boards on the bottom of the transceiver.
4. Remove the screws from the AF unit and disconnect the plugs as necessary to turn the board over to expose the foil side of the board.
5. Replace Q6 with a 2SD1757K(S).
6. Solder a 22 AWG jumper wire as shown in figure 1.

This modification may be covered under warranty.
Time required to perform this modification is 1 hr. or less.

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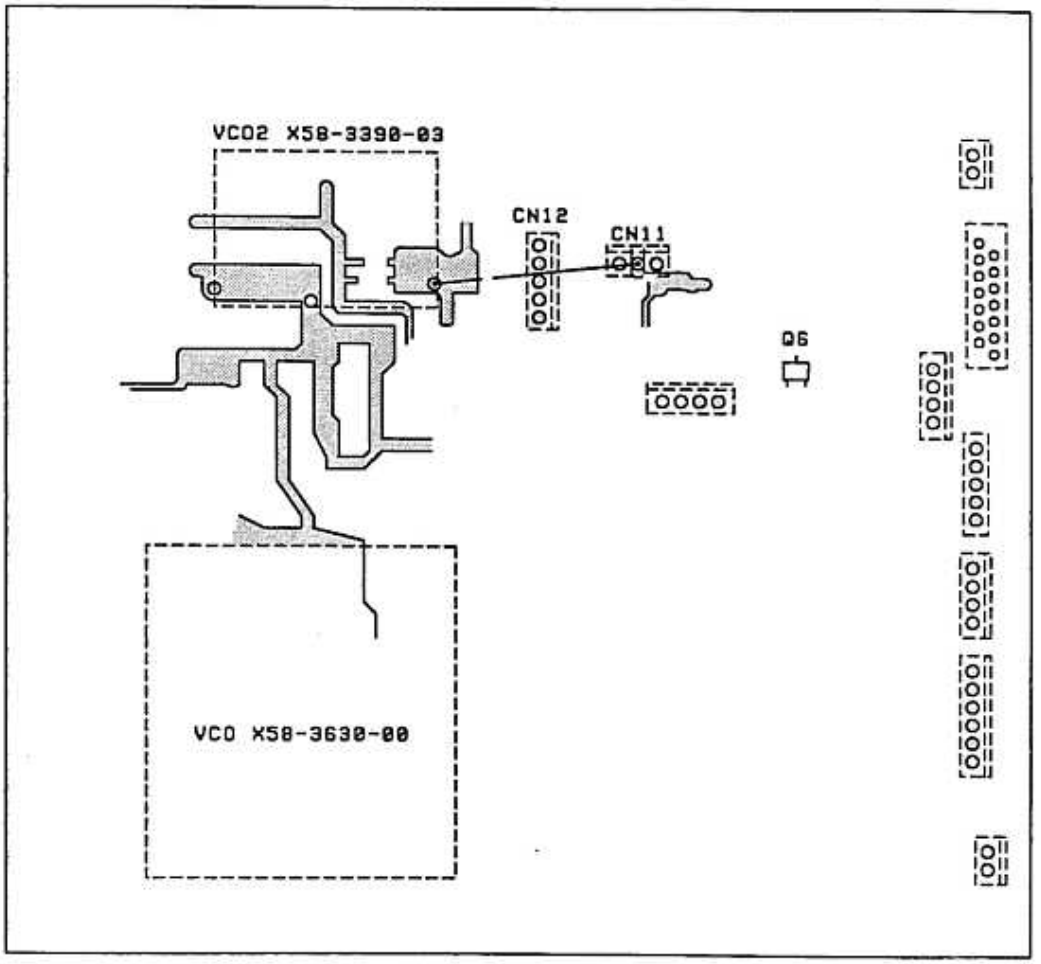
AF UNIT X49-3020-00



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SB-982

SERVICE BULLETIN AMATEUR RADIO

SUBJECT	DATE
TS-950S/SD TX IMAGE ON 18.115MHZ	02/06/91

Some TS-950SD owners have reported a transmit image at 18.115MHz that causes the receiving station to hear distortion on the carrier. If the operating frequency is shifted 3KHz above or below 18.115MHz, the image disappears. This modification will lower the image level from -30dB (worse case) to better than -40dB by installing a trap on the 455KHz I.F.

REQUIRED PARTS:

4pF TRIMMER CAPACITOR	C05-0308-05
40pF TRIMMER CAPACITOR	C05-0309-05
2.2uH COIL	L40-2292-14

MODIFICATION:

1. Disconnect the power cord and antenna.
2. Remove the top and bottom covers (18 screws).
3. Locate the I.F. board on the bottom of the transceiver. This is the back right board of the 4 boards on the bottom of the transceiver. Figure 1
4. Locate L36 by connector CN17 on the I.F. board. Figure 2
5. Install and solder into place a 4pF trimmer capacitor across L36. Figure 3
6. Install a 2.2uH coil and 40pF trimmer capacitor in series from the output of L36 to ground. The can of L31 can be used for ground. Figure 3

ALIGNMENT:

1. Connect the TS-950S/SD to a power meter and 50 ohm load.
2. If you are working on the TS-950S Digital, connect the DSP cables on the bottom cover to the back panel.

This modification is covered under the 1 year warranty.
Time required for this modification is 1 hr. or less. (C) 020691EWP

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3. In the CW mode, adjust the front panel power control for 150W while the ALC level is just at the starting point on the meter. This will create the highest image level condition.

4. Using a monitor receiver with narrow filters installed and AGC set to off, tune the receiver to the image frequency.

5. Alternately adjust the two trimmer capacitors until the image cannot be heard. This procedure may need to be repeated several times.

6. Push the wire harness around the I.F. board toward the chassis of the transceiver.

7. Assemble the transceiver.

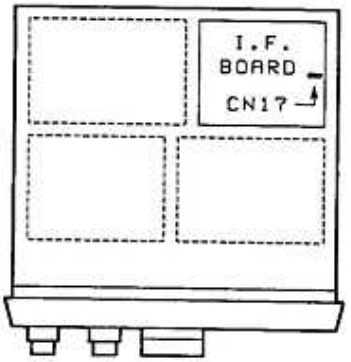


FIGURE 1

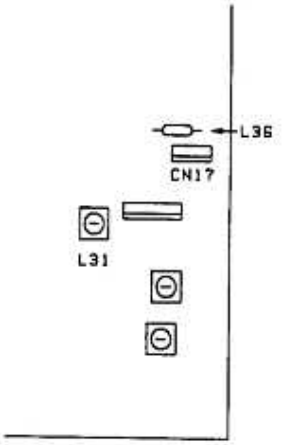


FIGURE 2

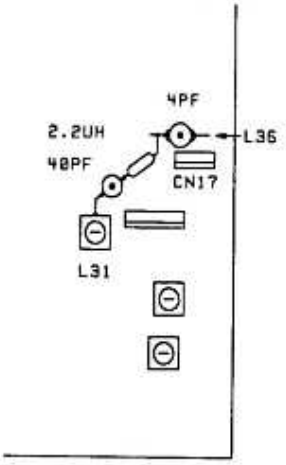
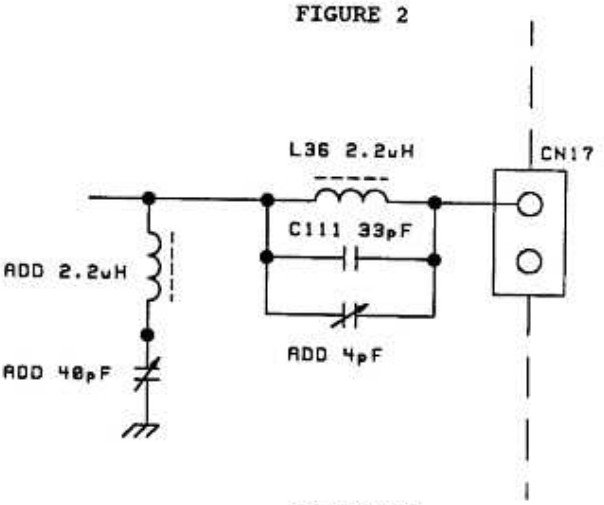


FIGURE 3



SCHEMATIC

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SB-984

SERVICE BULLETIN AMATEUR RADIO

SUBJECT	DATE
TS-950S/SD 80 METER SPURIOUS EMISSION	02/06/91

Some TS-950SD owners have reported a transmit spurious emission between 3.500MHz and 3.520MHz. This modification will reduce the spurious emission to -65dB.

REQUIRED PARTS:

10pF CAPACITOR	CC73FCH1H100J	QTY. 1
16pF CAPACITOR	CC73FCH1H160J	QTY. 1
12uH COIL	L40-1201-17	QTY. 1
2.6X4MM SCREWS	N09-0650-05	QTY. 4

1. Disconnect the power cord and antenna.
2. Remove the top and bottom covers (18 screws).
3. Open the subchassis to expose the PLL board (Figures 1-3). To open the subchassis remove 4 top screws, remove 3 back panel screws, and unplug the RX ANT OUT and DRIVE IN connectors.
4. Replace the four VCO shield plate screws with the type listed above. Figure 3
5. Close the subchassis and secure it with the screws removed in step 3.
6. Locate the A.F. board on the bottom of the transceiver. Figure 4
7. Remove the board's mounting screws and disconnect the necessary connectors to expose the bottom of the board.
8. Locate the foil pattern area shown in Figure 5. This area is below IC11.
9. Cut the foil pattern and add the components shown in Figure 6.
10. Assemble the transceiver. Remember to plug in the two connectors on the back panel.

This modification is covered under the 1 year warranty.
Time required to perform the modification is 1 hr or less. (C) 020691EWP

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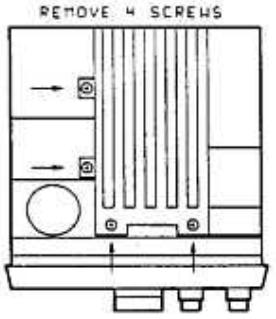

FIGURE 1

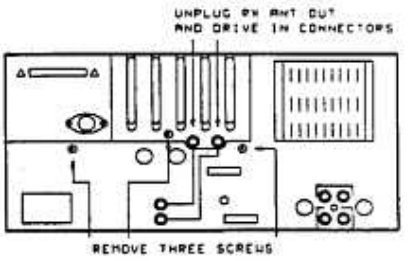

FIGURE 2

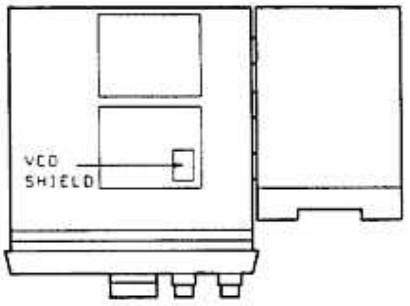

FIGURE 3

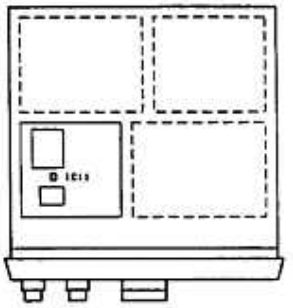

FIGURE 4

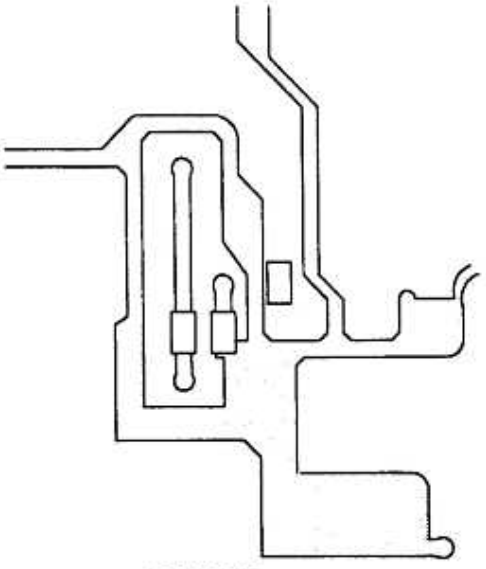

FIGURE 5

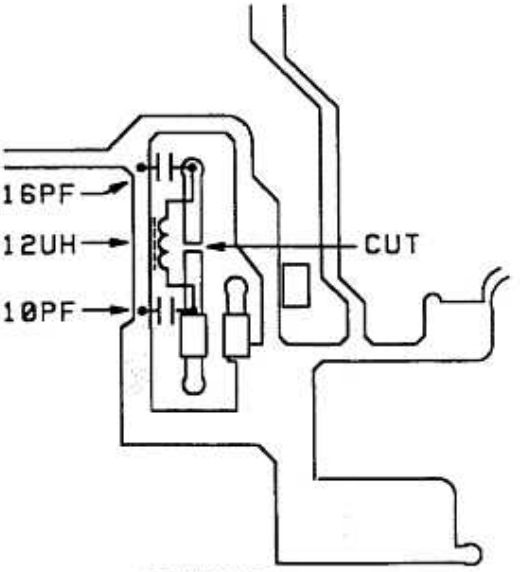

FIGURE 6

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ASB-1024

Service Bulletin

Amateur Radio Division

Subject: TS-950S/SD Transmit Spur **Date:** May 27, 1993

Symptom:

A transmitter spur might be present at a dial frequency of X X. X X 1 MHz. This spur (f_0 +/- 1 kHz) is quite small (-55dB relative to f_0) but might become noticeable when the transceiver is used with a linear amplifier.

Cause:

The transmitted signal enters pin 5 of IC11 which is in the last PLL loop in the AF unit due to RF feedback. This pin is the input for the 10 MHz Ref Osc signal from the CAR unit. IC11 is the source of the spurious signal since both the band and 10 MHz frequencies are divided by the 500 kHz comparison frequency supplied by IC11.

Corrective Action:

To reduce this RF feedback increase the Ref Osc level from .2V to .7V rms by adding the accompanying circuit to the input of IC11.

Parts Required:

Qty	Description	Kenwood Part No.	Circuit Description
1	12 uH Ferri-inductor	L40-1201-17	NA
1	10 pF Chip Cap	CC73FCH1H100J	NA
1	16 pF Chip Cap	CC73FCH1H160J	NA

Caution: *This modification requires soldering equipment rated for CMOS type circuits. It also requires familiarity with surface mount soldering techniques. If you do not have the proper equipment or knowledge do not attempt this modification yourself. Seek qualified assistance.*

Time required for this modification is 30 minutes or less. Service code A:56 B:X49-3020 C:ADDC D:91

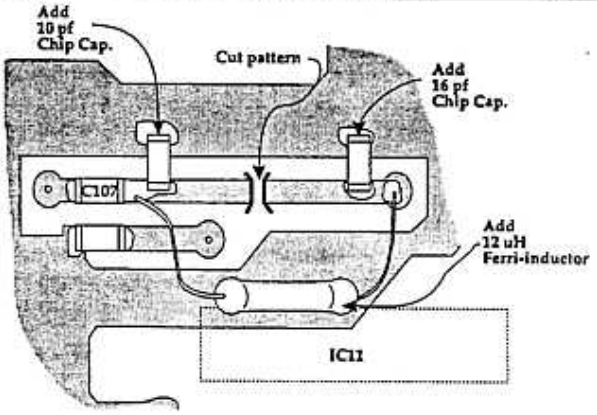
KENWOOD

ASB-1024

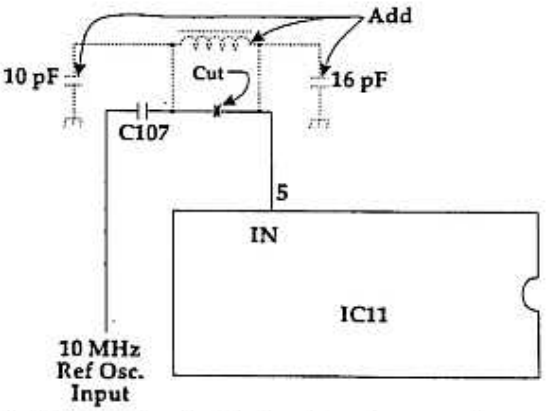
Service Bulletin

Amateur Radio Division

Subject: TS-950S/SD Transmit Spur **Date:** May 27, 1993



AF Unit (X49-3020-00)
Foil Side View



Caution: *This modification requires soldering equipment rated for CMOS type circuits. It also requires familiarity with surface mount soldering techniques. If you do not have the proper equipment or knowledge do not attempt this modification yourself. Seek qualified assistance.*

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