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896

SERVICE BULLETIN AMATEUR RADIO

SUBJECT	DATE
TS-940S LCD CLOCK DISPLAY ERRATIC OPERATION	9-14-85

We have received a few reports concerning erratic operation of the LCD clock display when the Main Dial is rotated, or the VBT or SLOPE TUNE controls are operated. This appears as if you had pressed the SET, SCROLL, OR GRAPH switches.

This erratic operation may be caused by improper timing of the input pulses applied to the auxiliary display microprocessor, IC 1.

1. This symptom is easily corrected by replacing IC 2 MBM2764-30T1 with MBM2764-30T2, on Digital Unit A (X54-1830-00). Early models of the improved IC will carry the old nomenclature but will be distinguished by a white dot on the top of the chip.

2. After the IC has been changed reset the main microprocessor by pressing and holding the [A=B] key, and then turning the power switch OFF and then back ON. Then release the [A=B] key.

3. After this change is made the subdisplay will not immediately track the main display. A slight delay has been introduced in the new IC to prevent any timing errors. It may take approximately 0.5 seconds for the LCD to track the main display.

4. Please return the old IC 2 to the Service Department along with the the WSR for credit.

Perform this procedure only if the symptom occurs, as a repair. This change is not required otherwise.

Time required for this modification is 1 hour or less. ©TKC985CLM

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900

SERVICE BULLETIN AMATEUR RADIO

SUBJECT	DATE
TS-940S PLL UNLOCK	10-18-85

Some users of the TS-940S have reported a blanking of the display accompanied by a loss of transmit and receive. Readjustment of the PLL unit will correct this tendency.

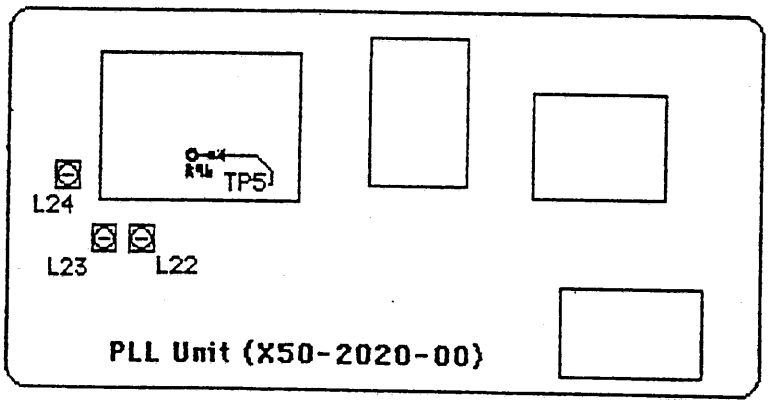
Procedure:

On the PLL Unit (X50-2020-00)

1. Set the Dial frequency for approximately 1.8 Mhz (inside the band).

2. Using an RF probe at TP #5 adjust L22, L23 and L24 for a maximum reading on the meter. You should see approximately 250 mV.

3. Adjustment of L24 will produce the greatest change, which may be up to a 90° adjustment from its present position.



Time required for this procedure is .5 hour or less. ©TKC101785
CLM

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SERVICE BULLETIN AMATEUR RADIO

SUBJECT	DATE
TS-940S ANTENNA TUNER RELAYS	4-4-86

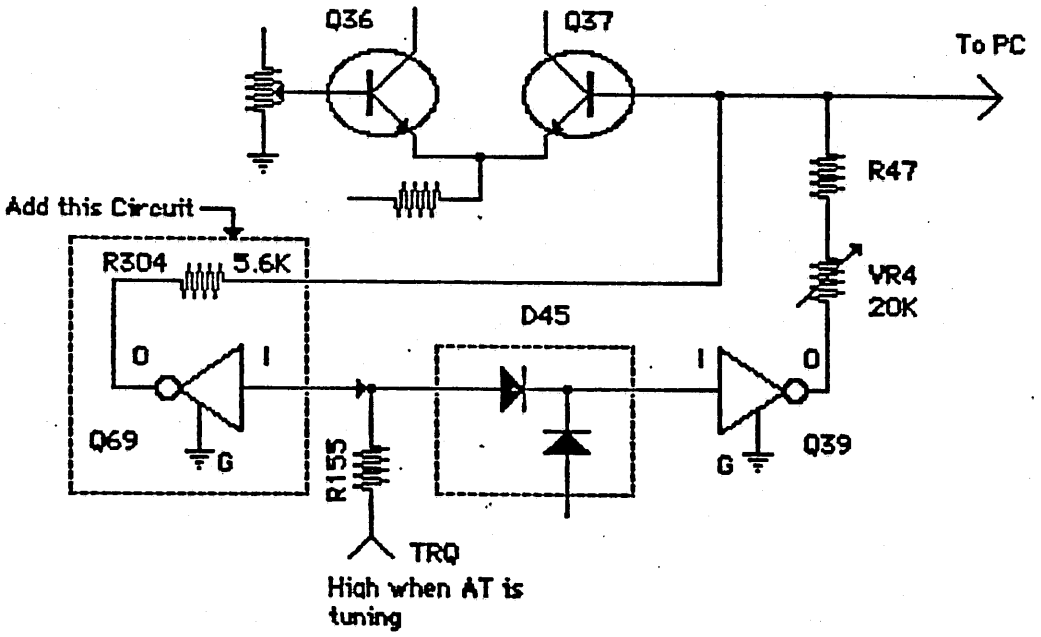
Occasionally during operation of the AT-940 a VSWR of greater than 1.5 to 1 might cause overloading of the relay contacts in the antenna tuner. This may be especially noticeable when switching BANDS, or if TUNING is performed too frequently. The following procedure should reduce or eliminate this tendency.

Parts Required

Q69: Digital Transistor DTC124ES
R304: 5.6K ohm 1/6 W Resistor.....RD14BB2C562J

Procedure:

1. Add the circuit as shown below.
2. After the circuit has been installed adjust VR4 for a 10-15 watt output when the antenna tuner operates.



Time Required for this modification is 1 hour or less. ©TKC32186CLM

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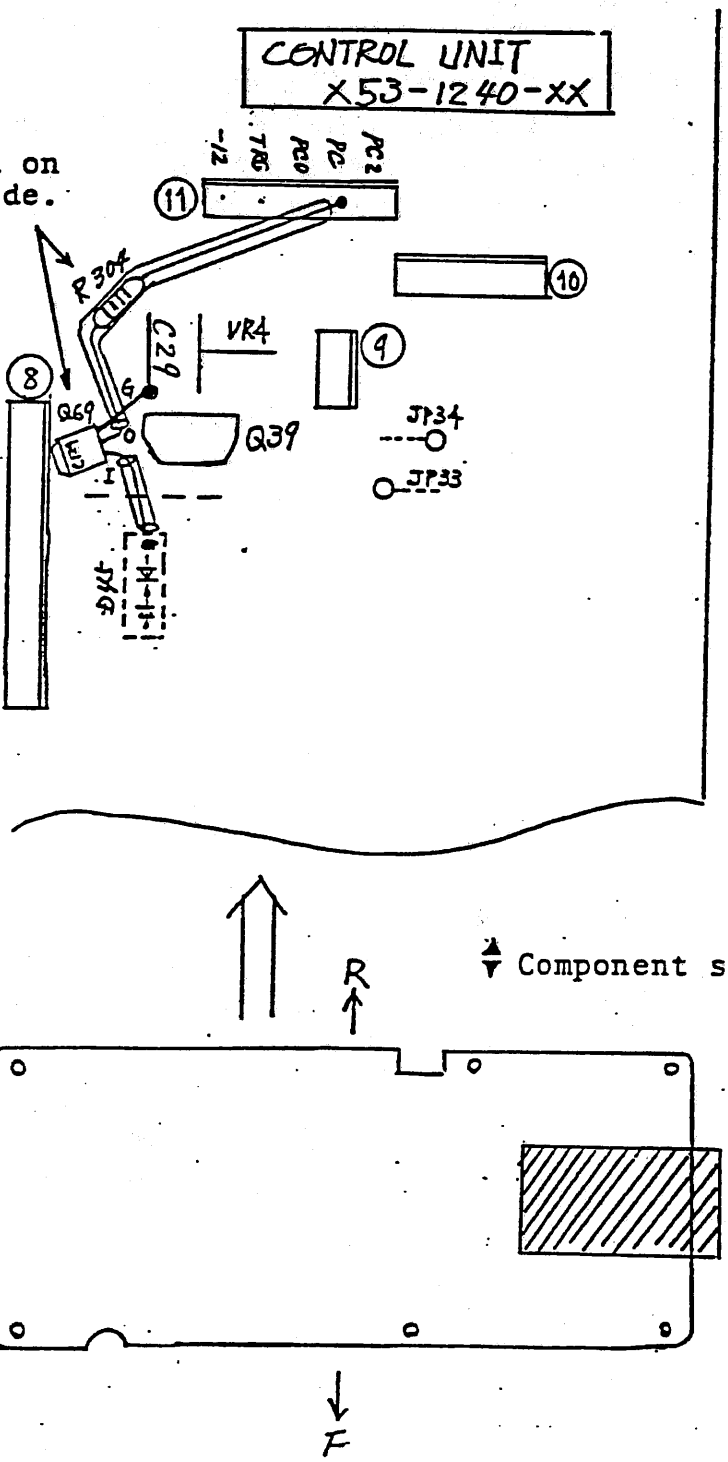
ADD

* Mounted on foil side.



Component side view.

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SERVICE BULLETIN

AMATEUR RADIO

SUBJECT	DATE
TS-940S PLL UNLOCK	4-8-86

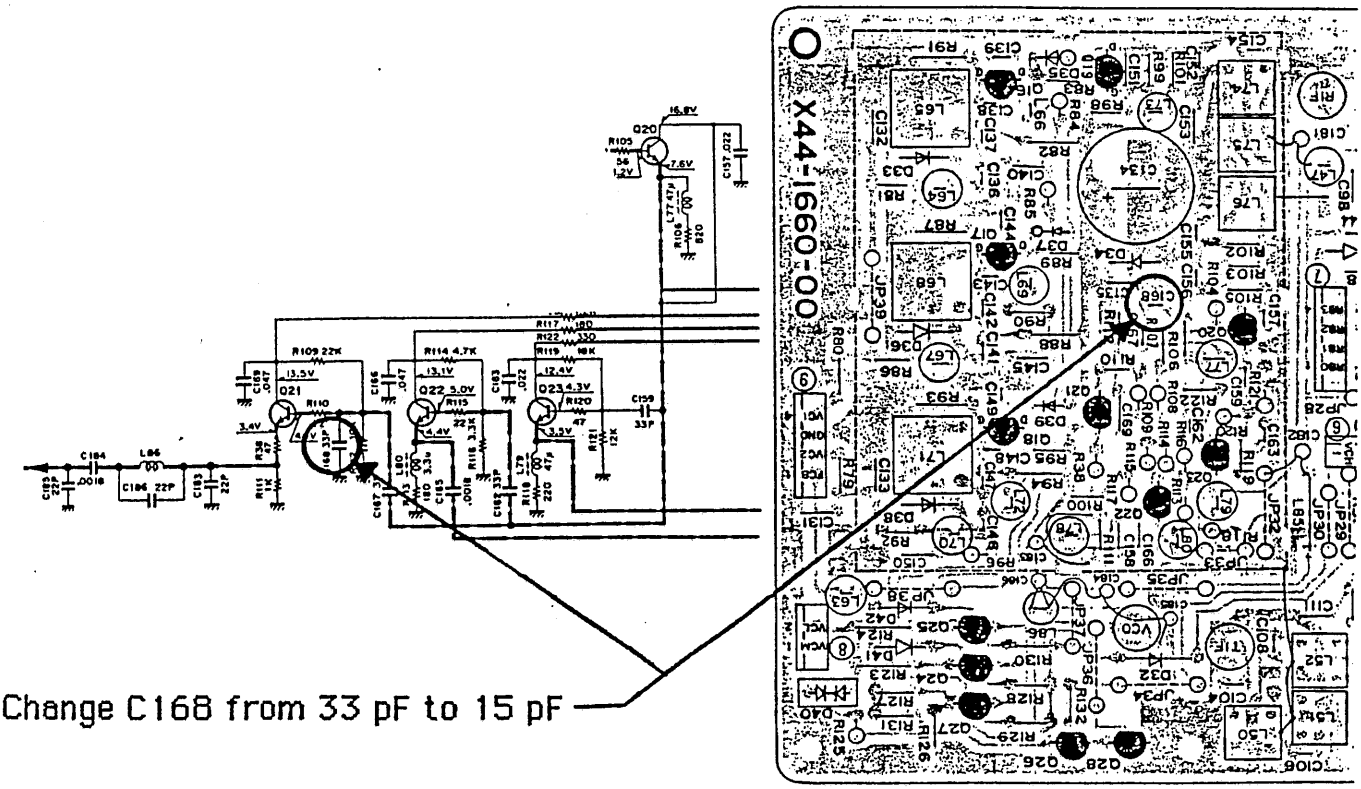
Reports of a PLL Unlock on the lower frequencies may be due to low VCO levels. The following change will increase the VCO level and should prevent reoccurance of this symptom.

Part Required

C168.....change to 15 pF 50 v (CC45SL1H150J)

Procedure:

1. On the RF Unit (X44-1660-00) change C168 from a 33 pF capacitor to a 15 pF 50 v capacitor.
2. Readjust the VCO BPF (RF unit L74-76) according to the instructions contained in the TS-940Sservice manual.



This change is applicable to units prior to serial number 606XXXX.

Time Required for this modification is 1 hour or less. ©TKC40886CLM

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909

SERVICE BULLETIN

AMATEUR RADIO

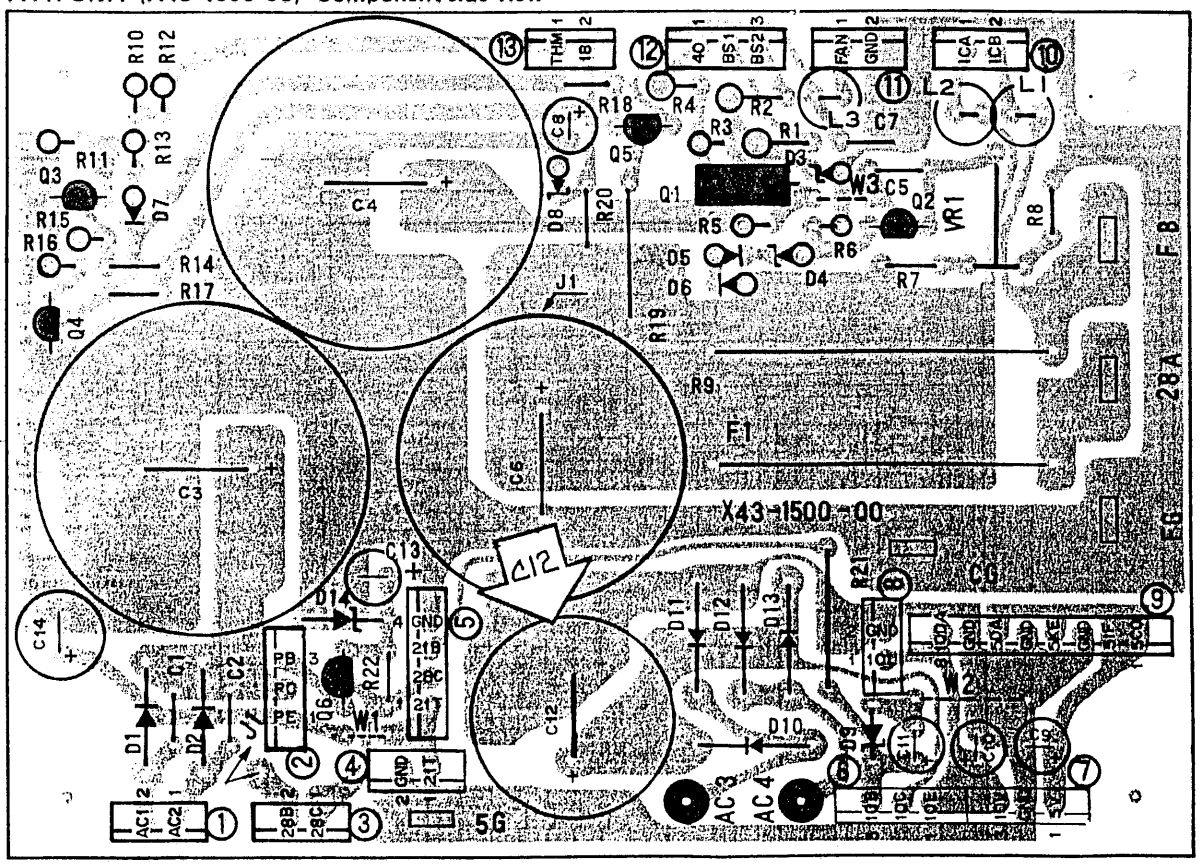
SUBJECT	DATE
TS-940S AVR UNIT CAPACITOR CHANGE	4-8-86

In those areas of the country that are subject to large power line voltage fluctuations, excessive voltage may be applied to capacitor C12 on the AVR Unit (X43-1500-00). These voltage fluctuations might exceed the capacitor breakdown voltage. Replacing capacitor C12 with a capacitor having a higher breakdown voltage will help prevent this potential problem.

Procedure:

On the AVR Unit (X43-1500-00) change C12 from a 6800 µF capacitor to a 5600 µF 25 v capacitor (C90-2037-05).

AVR UNIT (X43-1500-00) Component side view



This change is applicable to serial numbers prior to 701XXXX.

Time Required for this modification is 1 hour or less. ©TKC41086CLM

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SERVICE BULLETIN AMATEUR RADIO

SUBJECT	DATE
TS-940S AGC CIRCUIT IMPROVEMENTS	6-03-86

The following changes will improve the adjacent channel rejection of the TS-940S when a relatively strong nearby signal is present (S-4 or above).

The AGC switch should remain in the SLOW position for all but high speed data communications. Most CW operations will also benefit from operation in the SLOW position.

Parts Required:

15 K ohm 1/4 watt resistor.....RD14CB2E153J
1 uF 16v Electrolytic.....CE04BW1E010M
1S1555 diode.....V1S1555
.047 uF capacitor.....C91-0119-05

Procedure:

RF UNIT

1. Remove jumper wire JP7 and replace it with the parallel combination of the 15 k ohm resistor and the 1S1555 diode. Pay close attention to polarity.

2. Add the 1 uF capacitor as shown in the diagram.

IF UNIT

Change capacitor C75 from a 1 uF 50 v capacitor to a .047 uF 50v capacitor.

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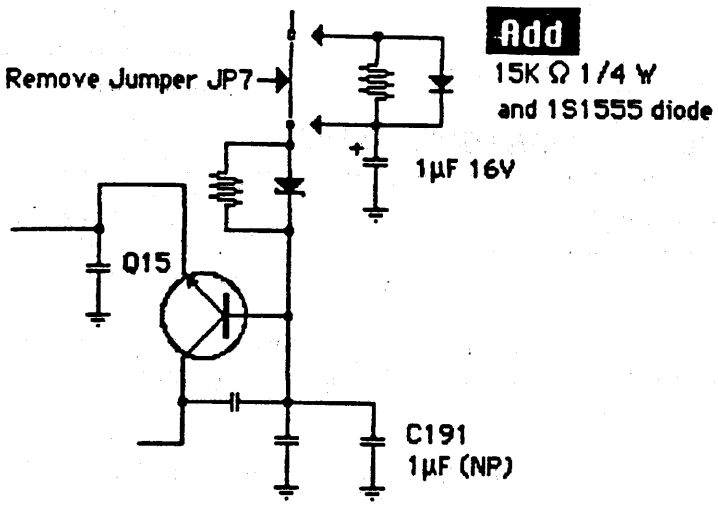
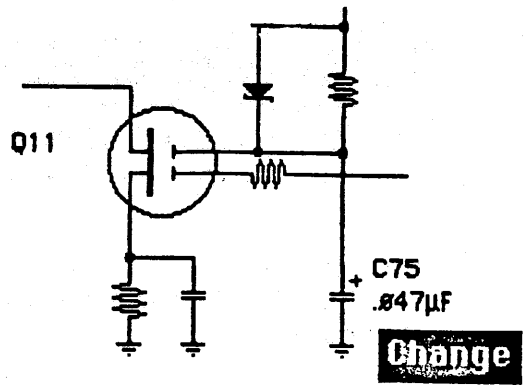
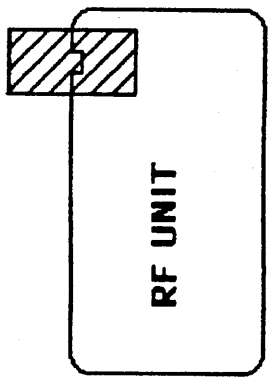
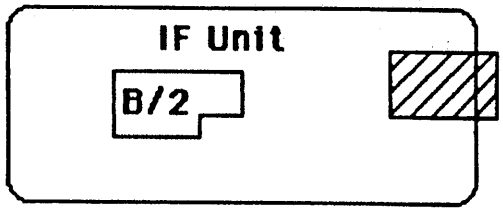


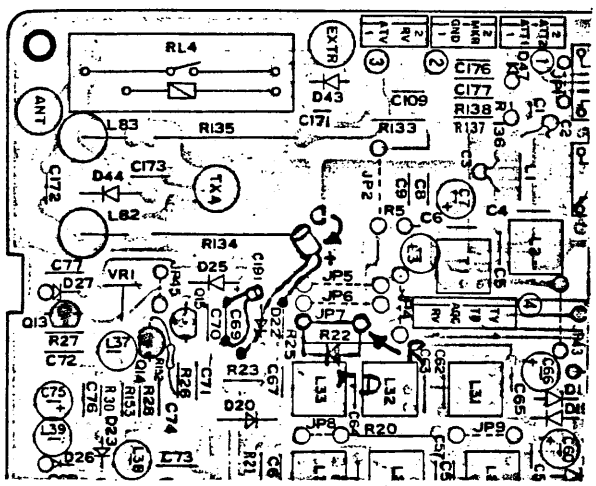
RF Unit

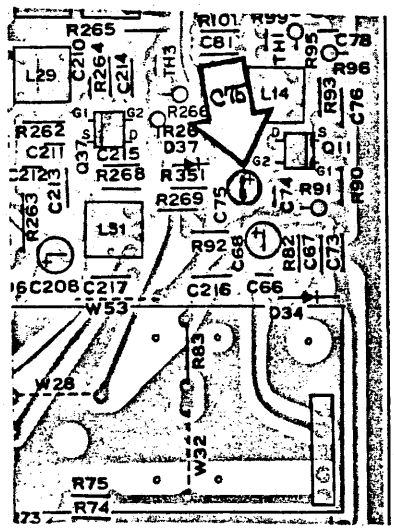


IF Unit









Time required for this modification is 1 hour or less.

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912

SERVICE BULLETIN AMATEUR RADIO

SUBJECT	DATE
TS-940S TRANSMITTER HUM IN SSB	9-15-86

For reports of a low level audio hum superimposed on the normal transmitted audio, especially when the Speech Processor is used perform the following modification.

Parts required

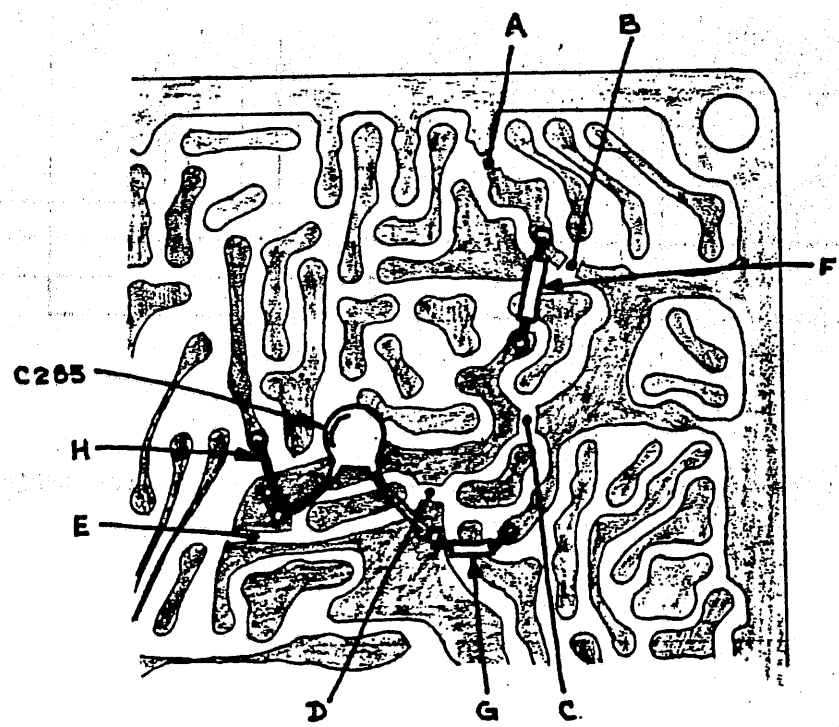
C285 .01 uF 50 v Disc Ceramic capacitor CK45F1H103Z

Procedure:

On the IF UNIT (X48-1430-00) make the following changes:

a. Cut the foil patterns labeled A-E in figure 1.
b. Add the jumpers wires labeled F-H in figure 1.
c. Add capacitor C285 .01 uF 50 v as shown.

This change will be included on all units shipped after 9-15-86.



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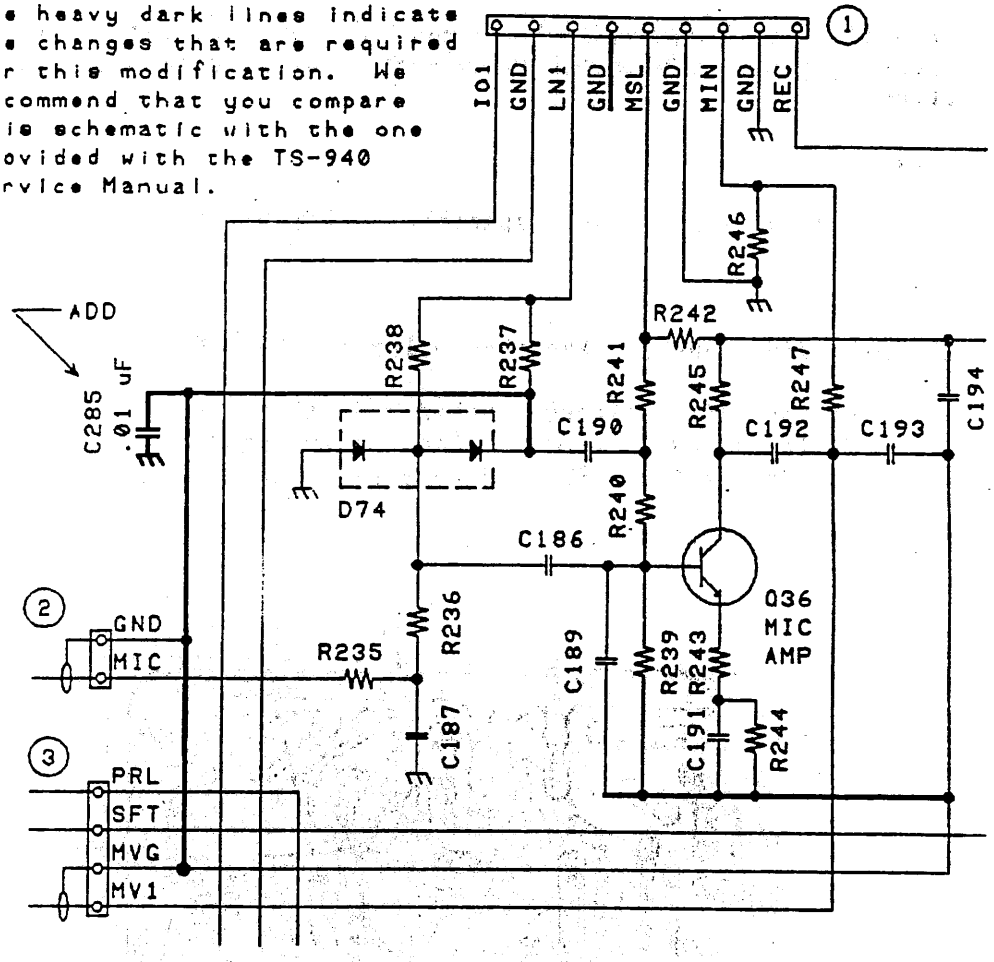
IF UNIT (X48-1430-00)

The heavy dark lines indicate the changes that are required for this modification. We recommend that you compare this schematic with the one provided with the TS-940 Service Manual.



Time required for this modification is 1 hour or less.

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SERVICE BULLETIN AMATEUR RADIO

SUBJECT	DATE
TS-940S SIGNAL TO NOISE RATIO IMPROVEMENT	8-28-86

The following change will reduce the tendency of the Zener Diode in the Noise Blanker circuit to cause an increase in the ambient noise level. This change ensures that no current flows thru this diode in the normal receive position.

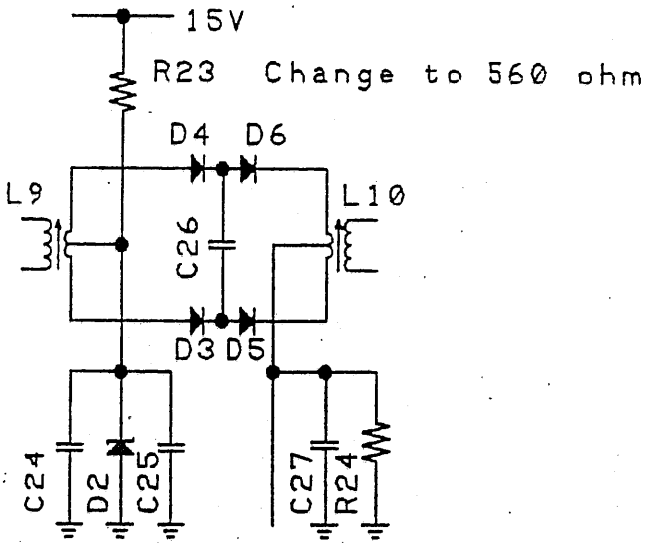
Parts required

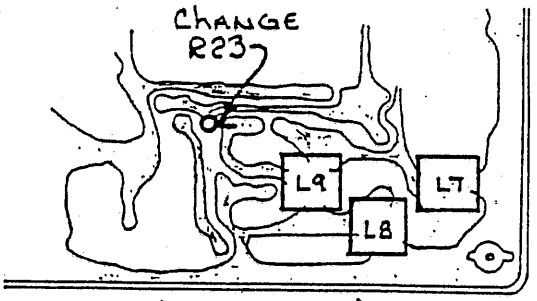
560 ohm 1/4 watt resistor RD14CB2E561J

Procedure:

On the IF UNIT (X48-1430-00) change R23 from 330 ohms to 560 ohms.

This change will be incorporated in all models beginning with serial number 603XXXX.





IF Unit (X48-1430-00)
foil Side

IF UNIT (X48-1430-00)

Time required for this modification is 1 hour or less. (C)82086TKCCLM

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917

SERVICE·BULLETIN AMATEUR RADIO

SUBJECT	DATE
TS-940S VCO CARRIER TO NOISE RATIO IMPROVEMENT	3-2-87

The Carrier to Noise ratio of the TS-940S may be improved by the following changes. This bulletin supersedes bulletin number 911 dated September 15, 1986.

Parts required:

PLL UNIT (X50-2020-00)

R120,129	3.3K ohm 1/6 watt carbon resistor	RD14CB2C332J
R121,124	680 ohm 1/6 watt carbon resistor	RD14CB2C681J
C180,181	.01 uF disc ceramic capacitor	C91-0117-05
C184,185	.33 uF 35v Tantalum capacitor	CS15E1VR33M

RF UNIT (X44-1660-00)

R154,155	3.9K ohm 1/6 watt carbon resistor	RD14BB2C392J
C193,194	1 uF 25v Tantalum capacitor	CS15E1E010M

Procedure:

On the PLL UNIT (X50-2020-00) remove capacitors C176, C180, and C181. Change resistors R120 and R129 from 470 ohms to 3.3 K ohms. Change resistors R121 and R124 from 1 K ohm to 680 ohms. Change capacitors C184 and C185 from .22 uF to .33 uF 35V tantalum capacitors. Install C180 and C181 in the positions shown in the accompanying diagrams. The use of new capacitors is recommended to improve reliability, don't try to reuse the old capacitors! Capacitors C181 and C180 should be attached to the foil side of the PLL unit.

On the RF Unit (X44-1660-00) install the series RC circuits composed of R154 and C193, and R155 and C194, as shown in the accompanying diagrams. As the diagrams illustrate it is easiest to move C132 and C133 to the foil side of the board and install the series RC circuits on the component side.

This is an optional change and may not be performed under warranty. Time required for this modification is 1.5 hour or less. (C)21887TKCCLM

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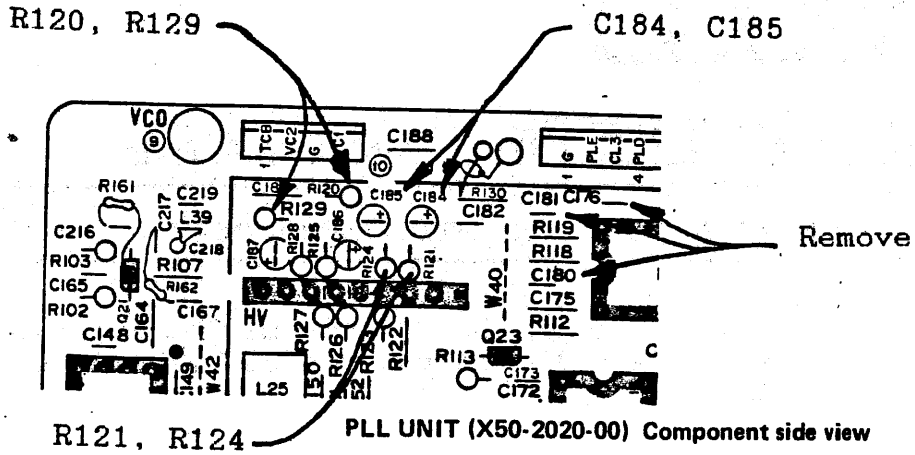
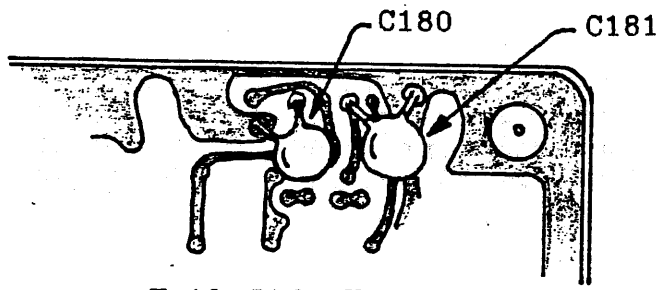
PLL UNIT

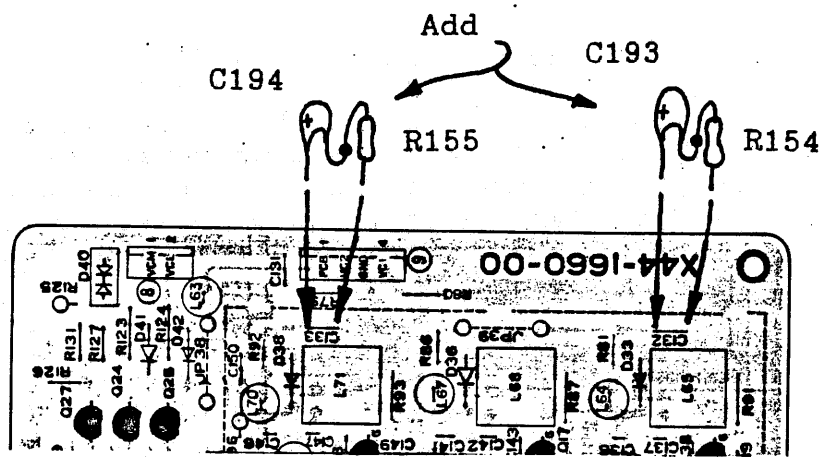


PLL UNIT (X50-2020-00) Component side view

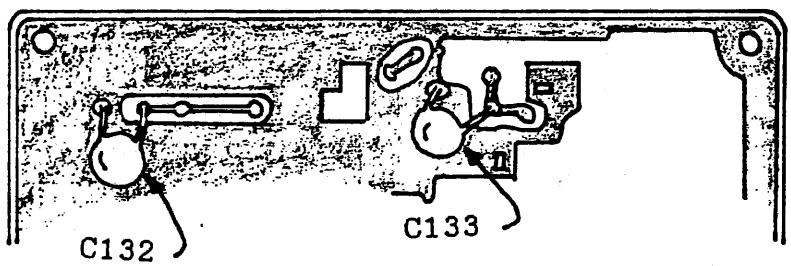


Foil Side View

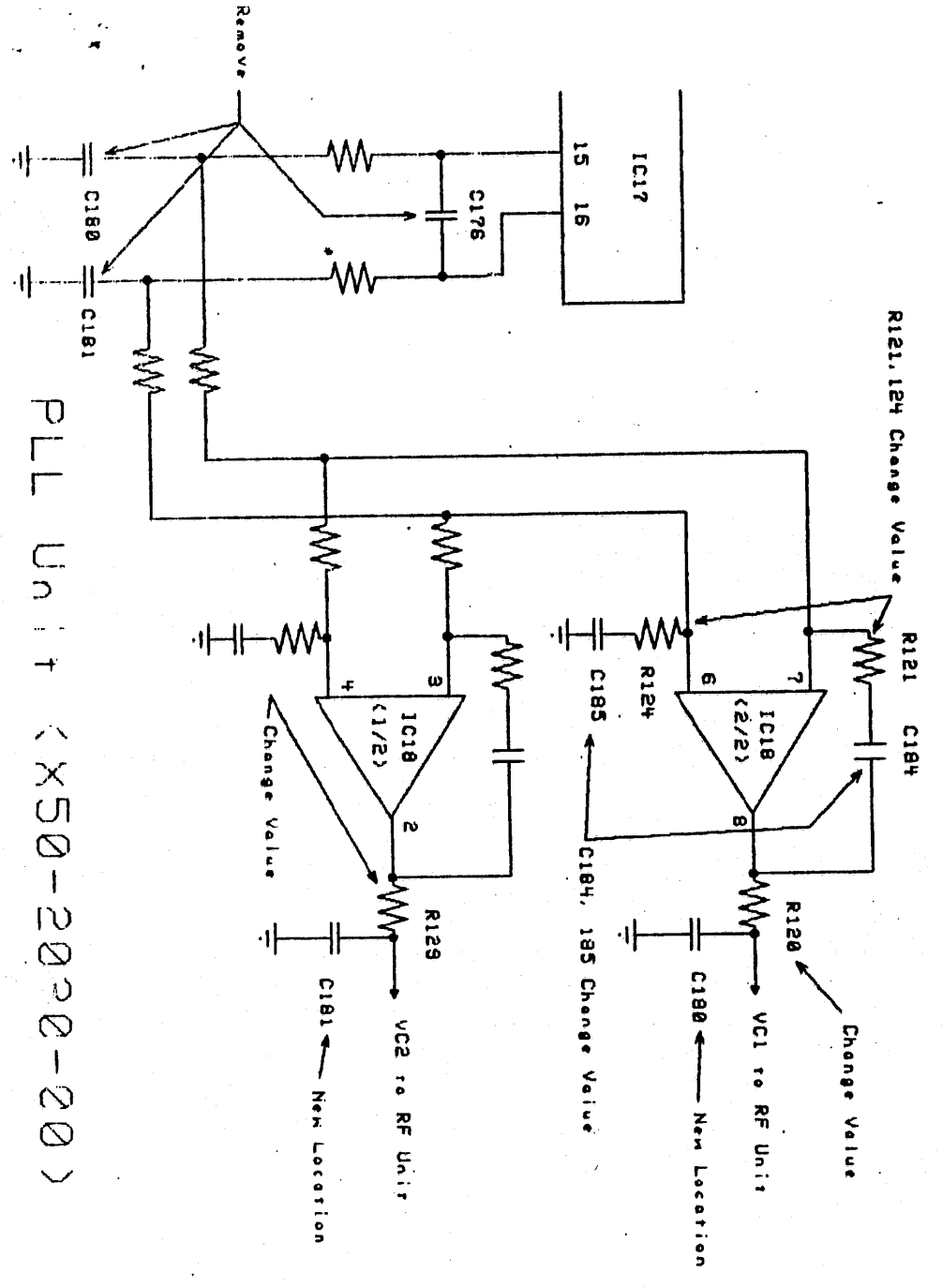
RF UNIT



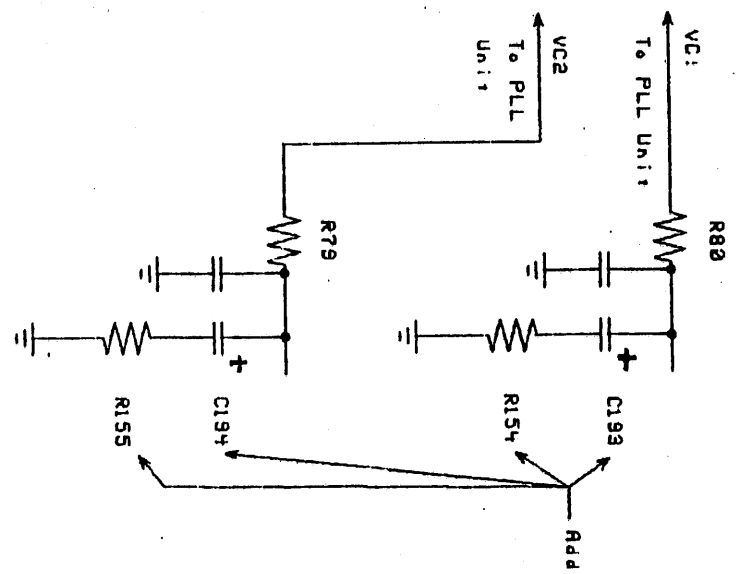
RF UNIT (X44-1660-00) Component side view



Foil Side View



PLL Unit (X50-2020-20)



RF Unit (X44-1550-00)

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SERVICE BULLETIN AMATEUR RADIO

SUBJECT	DATE
TS-940S SQUELCH SWITCHING NOISE	7-21-87

In some TS-940S below S/N 711xxxx, a "popping" or "clicking" noise may be heard when the squelch circuit is opened or closed. This may be more noticeable when an optional CW filter is installed. The following procedure will minimize the noise.

Parts required

R194	560K ohms 1/6W	RD14CB2C564J
R197	220 ohms 1/6W	RD14BB2C221J
R355,356	220K ohms 1/6W	RD14BB2C224J
C284	0.47 uF, 50V electrolytic	C90-0484-05

Procedure:

1. Disconnect the power cord and antenna from the transceiver.
2. Remove the top and bottom covers (16 screws).
3. Locate the I.F. board on the bottom of the transceiver.
4. Remove the 7 screws from the I.F. board.
5. Carefully unplug connector # 17 (right side of optional CW filter) by prying up on the plug. Do not pull on the wires.
6. Move the 4 wires (yel, org, brn, red) that run across the far side of the I.F. unit out of the way so the board may be removed.
7. Carefully lift and rotate the board toward the left side of the transceiver to expose the foil side of the board.
8. Using a small craft knife, cut the foil at the 3 points shown in figure 1 (top right corner of the board).
9. Unsolder and discard resistors R194 and R197. They are mounted on the component side of the board and soldered on the foil side.
10. Install a 560K ohm resistor on the component side of the board as shown in figure 2. This resistor is now designated as R194.

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11. On the foil side of the board, add the 3 resistors (R197, 355, 356) as shown in figure 3.

12. Add a small jumper wire as shown in figure 3.

13. Add capacitor C282 as shown in figure 3. Observe polarity and insulate the positive (+) lead with shrink tubing.

14. Carefully place the board in its original position (do not pinch wires) and secure it with the 7 screws.

15. Plug in connector # 17. Move the 4 wires on the far side of the board back to their original position.

16. Put the covers back on the TS-940S and secure them with the 16 case screws.

17. Connect the antenna and power cord then test the transceiver for normal operation.

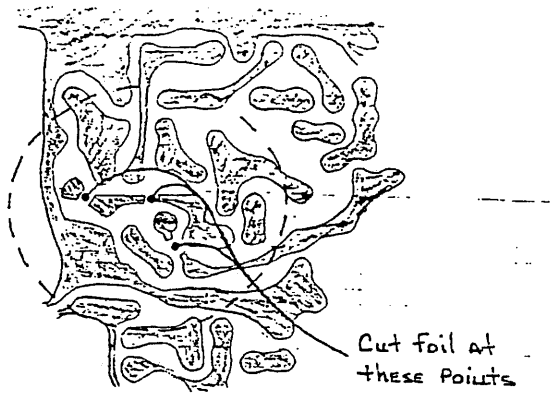

FIGURE 1

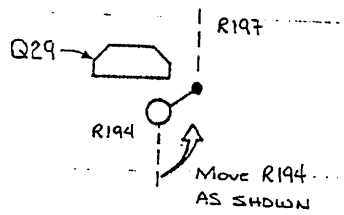

FIGURE 2

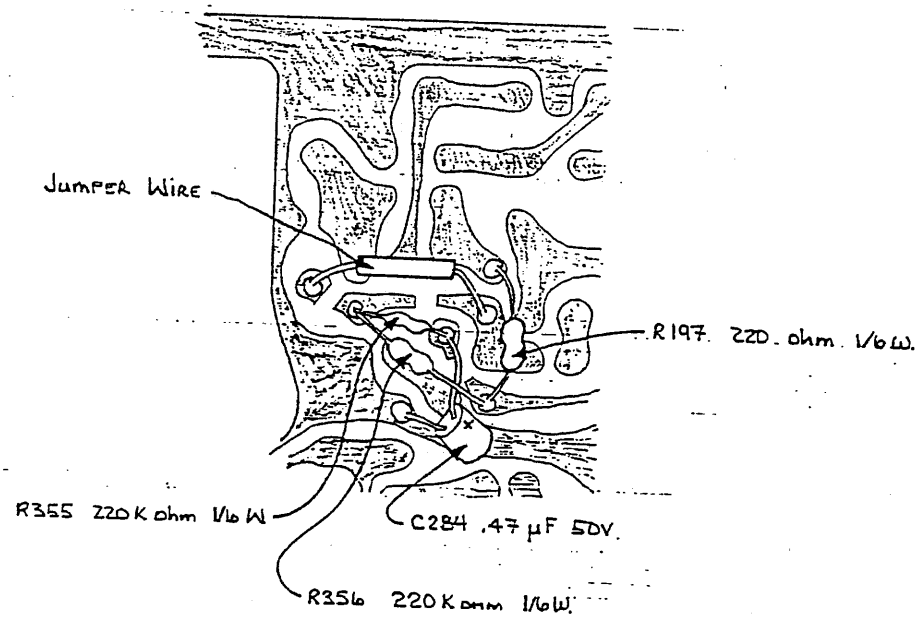

FIGURE 3

This is an optional change that may not be performed under warranty. Time required for this modification is 1.0 hrs or less. (C)072287TKC

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921

SERVICE BULLETIN AMATEUR RADIO

SUBJECT	DATE
TS-940S SSB TALK POWER IMPROVEMENT	7/22/87

TS-940S in the serial number range of 601xxxx through 708xxxx may be limited in SSB peak power as compared to full CW output. The level may be increased by changing the value of capacitors C182 and C183 in the ALC circuit on the Control board. The recommended replacement value for each capacitor is 0.0022 uF, 50V (PART # CK45B1H222K).

Procedure:

1. Disconnect the power cord and antenna from the transceiver.
2. Remove the top and bottom covers (16 screws).
3. Locate the Control board on the bottom of the transceiver.
4. Locate transistor Q37 on the board (toward the back right hand side). The two capacitors are mounted on the foil side of the board underneath Q37.
5. To access the bottom of the board remove the 8 screws that mount the board and heat sink to the chassis (See figure 1).
6. Carefully lift the board/heat sink from the right hand side and pivot it toward the front of the transceiver.
7. Replace C182 and C183 with 0.0022 uF, 50V capacitors (see figure 2 for PC board view).
8. Lower the board/heat sink back into its original position (do not pinch any wires) and re-install the 8 mounting screws.
9. Put the covers back on the TS-940S and secure them with the 16 case screws.
10. Connect the antenna and power cord then test the transceiver for normal operation.

This is an optional change that may not be performed under warranty. Time required for this modification is 1.0 hrs or less. (C)072287TKC

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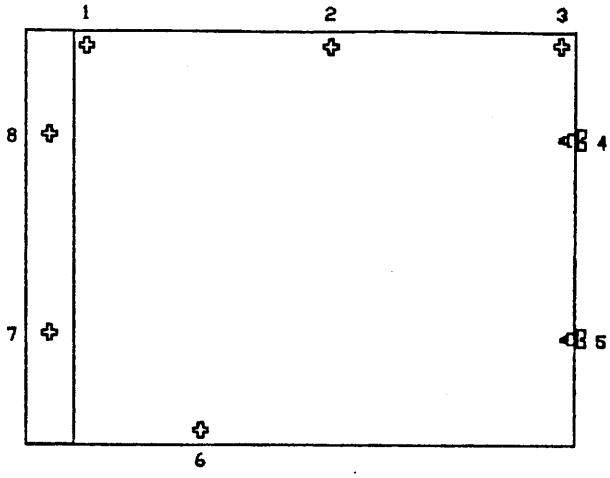


FIGURE 1

C182,183 ---------

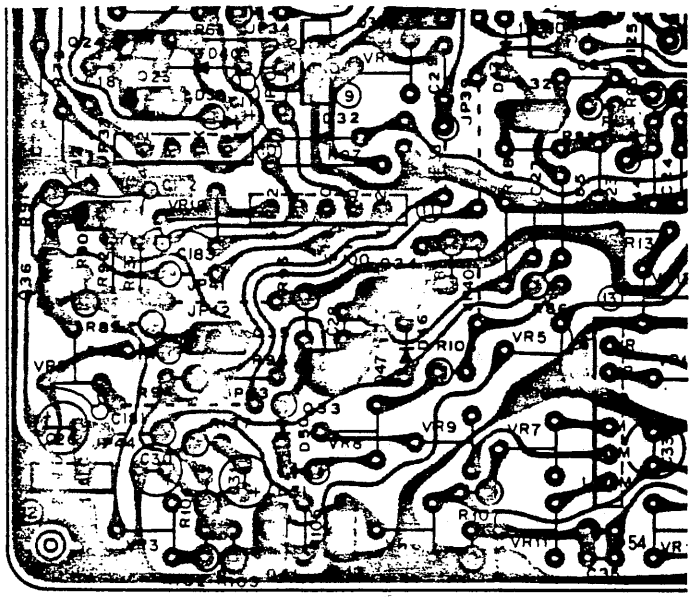
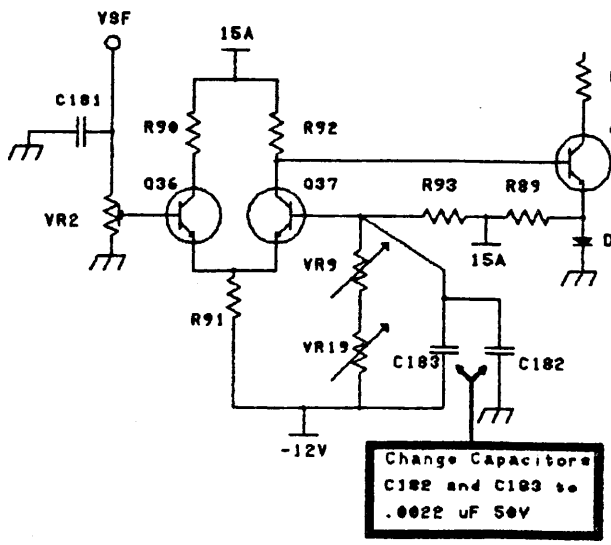


FIGURE 2



X53-1420-00
Control Unit

KENWOOD

SB-951

SERVICE BULLETIN AMATEUR RADIO

SUBJECT	DATE
TS-940S ERRATIC DISPLAY	01/20/89

Intermittent control or display problems that are difficult to correct with the reset procedure may be caused by a faulty ROM socket. The socket should be checked to insure that it makes good electrical contact with each pin of the ROM. If it is found to be intermittent, remove the socket and solder the ROM directly to the board. It should be noted that units between serial numbers 701XXXX to 811XXXX and from 903XXXX to 909XXXX are not likely to have this failure. In addition, units with a serial number of 909XXXX and above do not incorporate a socket.

CAUTION

Removing the socket requires good soldering skills. The ROM is mounted on the Digital A unit and is designated as IC2. The board, being double sided, has solder connections on both component and foil sides. When the socket is removed, it is very important to insure that each pin is completely solder free. Having to pry up on the socket means that it is not completely desoldered and will cause the circuit foils to tear.

When performing any work on the Digital A board, CMOS handling techniques must be observed. Such techniques include using a grounded or isolated soldering tip, avoid touching the pins of IC chips with your fingers, and ground yourself with a wrist ground strap.

To remove the socket:

1. Disconnect the power cord and antenna coax.
2. Remove the top and bottom covers from the transceiver.
3. Remove the 2 flat head screws from each side of the front panel chassis.
4. Loosen the round head screw on each side of the front panel chassis.
5. Carefully rotate the front panel forward. It will be necessary to unplug the VS-1 cable from the transceiver.
6. Remove the 4 screws from the speaker mount.

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7. Carefully pull up on the mount and rotate it toward the front panel. Swing the mount toward the right side of the transceiver and allow it to rest on the Digital B unit shield.

8. Remove the 8 screws from the Digital A unit shield plate.

9. Lift the plate and rotate it to the left side of the transceiver.

10. While avoiding contact with the pins, remove the ROM (IC2) and set it aside on anti-static foam.

11. Remove the 6 screws that mount the Digital A board. Rotate the board toward the front panel to expose the bottom side of the board.

12. Carefully desolder the socket and remove it from the board. Do not pry up on the socket. If it does not easily pull off the board, the top foils are still soldered to the socket.

13. Install the ROM in the board and solder it in place.

14. Assemble the transceiver by reversing steps 1 - 11. Do not pinch the power switch cables between the front panel and the body of the transceiver.

This modification may be covered under warranty during the warranty period.
Time required for this modification is 1.5 hrs or less. (C) 011189TKC

KENWOOD

SB-988

SERVICE BULLETIN Amateur Radio Division

SUBJECT TS-940S MRF-485 Driver Transistor Notes	DATE Janurary 16, 1992

Some MRF-485 transistors are being supplied by Motorola with a Green or Blue color ranking. If these transistors are installed without modifiying the driver bias circuit there is a very strong possiblity that they will fail within a very short time frame.

These high gain transistors cause the circuit to become unstable which can cause the circuit to break into self oscillation, and therefore self-destruct.

Recommendations:

Use of Red, Orange, or Yellow hfe color rankings is recommend. These lower gain transistors work just fine and do not suffer from the circuit instability problem. If you are only able to obtain the higer gain transistors you will need to modify the varistor/temperature compensation circuit on the final unit (X45-1400-00) by changing R16 from 1.2K to 2.2K ohms.

During its production the TS-940S used two different varistor values. The original part was an STV3H (O). It was changed in mid-production to an SV-03YS. R15 was changed from an 820 ohm resistor to a 1K ohm resistor at the same time. Therefore the countermeasure differs depending upon the serial number of the radio.

Serial number lot	Varistor D2	R15	R16	MRF485 Green or higher rank
106XXXX or earlier	STV3H(O)	820	1.2K	See "Caution below"
107XXXX or later	SV-03YS	1K	2.2K	Change R16 from 1.2K to 2.2 K

Caution: If using a Green or higher hfe rank one of the above countermeasures must be taken depending upon the serial number of the set. After replacing the drivers check the bias current. We recommend transmitting for 1 hour in the SSB mode with no modulation into a dummy load. After this time frame check the bias current. It must not exceed 300 mA on the original radio. If the current changes you must change R16 from 1.2K to 2.2K.

Communications & Test Equipment Group

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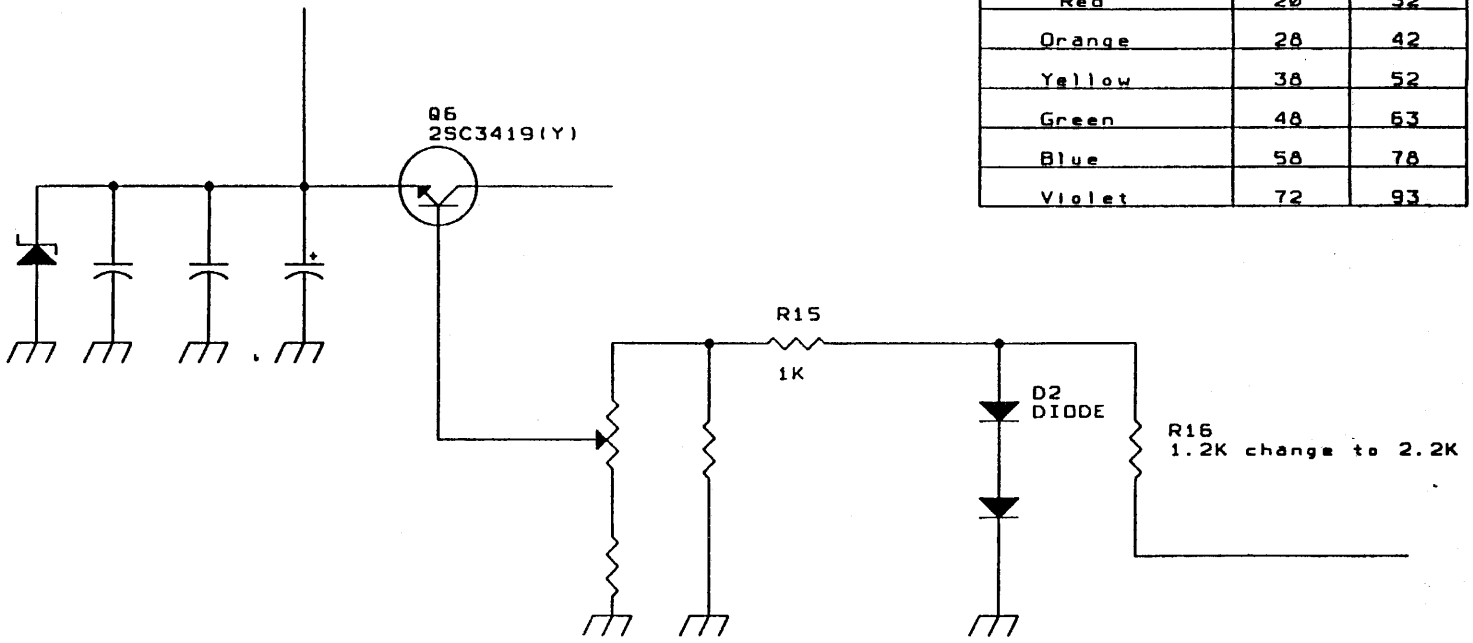
MRF485 hfe Color Codes

Color range	Limits MIN	MAX
Red	20	32
Orange	28	42
Yellow	38	52
Green	48	63
Blue	58	78
Violet	72	93



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Title
TS-940S MRF-485 Driver Transistor

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