SERVICE BULLETIN

from: TRIO–KENWOOD COMMUNICATIONS, INC. 26

SUBJECT: SERVICE NOTE ON DG-1 DATE 10-25-77

It is our experience here in the Compton service facility that the vast majority of DG-1 problems are not component failure, but cold solder connections on the digital P.C.B. (X54-1160-00).

The second most frequent problem is dirty Molex connectors between the 2 P.C.B.'s in the DG-1.

Recommended service procedure: Remove both boards. Using a fine point, low wattage iron (less than 45W), and a good quality, low flux content solder, carefully resolder all component side connections plus the print throughs containing no components. (There are 18 of these points - only one is not top accessible, but is located under IC 11 and can be resoldered from the bottom). Resolder the Molex connectors. There are 9 print-thru's where solder may not have flowed thru to the component side.

Using a good quality tuner cleaner with solicone lubricant, spray both boards' Molex connectors and work the pins in 3 or 4 times to insure good contact. Reassemble and final check.

Total time on the bench: 20 minutes. We will allow up to 1 hour only warranty labor time.

JEB:adr

TRIO-KENWOOD COMMUNICATIONS, INC.
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MAILING: P.O. BOX 7065 - COMPTON, CALIFORNIA 90224

SERVICE BULLETIN

from: TRIO-KENWOOD COMMUNICATIONS, INC.

53

SUBJECT: DG-1 STANDARD SERVICE PROCEDURE	DATE 8/10/79

INTRODUCTION

A majority of DG-1 failures are caused by either dirty connectors, or cold soldered connector pins between the top and bottom foil paths of the double printed boards.

Before any component level service is attempted, it is advisable to eliminate the possibility of an intermittent connection causing or complicating Counter failure.

1. PHYSICALLY DISCONNECT THE MAIN POWER CORD!
2. Remove cabinet covers; top with speaker lead, and bottom.
3. Unplug the top and bottom connectors from the DG-1 unit.
4. Remove the Digital Unit assembly by removing 4 screws from the chassis underside.
5. Disassemble the Digital Unit; remove 8 screw and slide off the cover.
6. Remove both PC Boards, 4 screws each.
7. For those connector pins joining top and bottom foil paths; reheat pin, flow .031" diameter solder from the top to insure the solder joint through the PC Board.
8. Wash the board to board Molex connectors with FRESH trichlorethelyne. Heat dry and inspect for flux residue. If necessary, reclean. Also, remove the pin connectors from the DG-1 chassis, (note they insert from the Digital PC board side) and clean in FRESH trichlor. Heat dry and spray with silicone lubricant. Spray into the board mounted connectors with silicone.
9. Reassemble by reversing steps 8,6, and 5.
10. Reinstall by reversing steps 4,3, and 2.

HOW TO SOLDER ON THE DG-1 PC BOARDS

1. Use a LOW POWER PENCIL, 35W or LESS!
2. Use rosin core solder, small diameter.
3. DO NOT create solder bridges or splotches.
4. DO NOT overheat or otherwise lift the foil from the board.
5. Wash excess flux away with FRESH trichloretheylyne and a small flux brush. Neatness counts - it's YOUR radio.

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SERVICE BULLETIN

from: TRIO–KENWOOD COMMUNICATIONS, INC. 25

SUBJECT: REPAIRING DG-5 DATE 12-20-77

THE MOST COMMON PROBLEM WE HAVE FOUND WITH THE DG-5 TO DATE HAS BEEN ASSOCIATED WITH THE RCA TYPE JACKS. THE MAJORITY OF THE DG-5'S WE HAVE RECEIVED HERE FOR REPAIR HAVE HAD DIRTY CENTER PINS ON THE JACKS. THE CAUSE APPEARS TO BE EXCESSIVE ROSIN FROM SOLDERING RUNNING INTO THE CENTER PIN. THE STANDARD REPAIR HAS BEEN TO CLEAN THE CENTER PIN WITH SOLVENT. ANOTHER POSSIBLE PROBLEM IS A COLD SOLDER CONNECTION AT THE RCA JACK. YOU SHOULD ALSO CHECK THE INTERCONNECTING CABLES FOR CONTINUITY. THIS SHOULD TAKE CARE OF ABOUT 90% OF THE DG-5 REPAIRS YOU WILL SEE.

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SERVICE BULLETIN

from: TRIO-KENWOOD COMMUNICATIONS, INC. 28

SUBJECT: REPAIRING DG-5 **DATE** 2-3-78

1. SYMPTOMS: TWO DOTS ON L.E.D. DISPLAY
   CHECK: HET INPUT AND VFO INPUT CONNECTIONS (DIRTY, INTERMITTANT, MISSING).

2. DISPLAY READING WRONG FREQUENCY
   CHECK: IF DISPLAY FREQUENCY IS READING OFF BY 2MHZ AND LAST FOUR DIGITS ON DISPLAY READING (894.9) CHECK CARRIER INPUT WIRE (DIRTY, INTERMITTANT, MISSING).

3. NO DISPLAY OR DIM DISPLAY, DIGITS MISSING
   CHECK: 5V REG (IC POWER) NOT WORKING OR PLATED THRU HOLES NOT PLATED THRU.

ABOVE ARE COMMON MECHANICAL FAILURES THAT OCCUR WITH DG-5. WE SUGGEST THE FOLLOWING TROUBLESHOOTING PROCEDURE:

CHECK:

A. POWER ALL POWER SUPPLY LEVELS.
B. REFERENCE OSCILLATOR (Q21) AND DIVIDER CHAIN IC5~IC11 (RF, WAVEFORMS, D.C.).
C. CARRIER, VFO AND HET, ALSO COUNTER (WHEN APPLICABLE) FOR RF, WAVEFORMS AND D.C. LEVELS; SEE SERVICE MANUAL FOR PROPER LEVELS.

NOTE: OPERATION OF THE CIRCUITS ARE ESSENTIAL BEFORE PROCEEDING.

IT'S BEEN KENWOOD'S EXPERIENCE THAT WHEN PROBLEMS DO OCCUR WITH THE DG-5 THAT APPROXIMATELY 90% OF THE PROBLEM WILL BE CAUSED BY INSUFFICIENT SOLDER CONNECTIONS AND NOT THE ACTUAL COMPONENTS THEMSELVES.

NOTE: WE SUGGEST THE FOLLOWING PROCEDURE IF BUFFERS, MIXERS AND OSCILLATORS ARE WORKING PROPERLY: SEE SERVICE MANUAL FOR PROPER LEVELS.

CHECK:

A. ALL SOLDER CONNECTIONS (LOOSE OR COLD).
B. SOLDER ALL PLATED THRU HOLES; 32 GAUGE WIRE INSERTED IN PLATE HOLES TAKES APPROXIMATELY 30 MINUTES TO DO AND IS VERY, VERY, EFFECTIVE.

PLEASE TURN TO NEXT PAGE

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SERVICE BULLETIN

from: TRIO–KENWOOD COMMUNICATIONS, INC. 29

SUBJECT: Theory of Operation - DG-5 **DATE** 2-8-78

The DG-5 is a dynamic display type frequency counter. All this means is that fewer wires and decode drivers are needed for frequency displaying.

We shall start the explanation of the DG-5 with the reference osc. (Q21). This circuit provides the timing pulses, calibration and scanning pulses for operation of the DG-5. The ten MHz ref. osc. is divided 1/10 by IC5 to provide calibrated one MHz output. It is then further divided by IC6 and IC7 1/100. The divided signal is then passed thru IC8 which consists of two sections, a 1/5 and 1/2 divider. The divide by 1/5 section now gives a resultant 2KHz signal on its output. This is the scanning pulse. IC40 receives the scanning pulse which gives an output in a modified B.C.D. code. Then IC41 which is a decode driver (Neg. Logic Type) is used to switch Q25~Q30 via terminals T_1~T_6 to put a plus voltage on display D_1~D_3 (L.E.D. Type).

At the same time, outputs T_1~T_6 of IC41 are inverted by IC42 positive logic and the B.C.D. information is presented to IC32~IC37 the and-or-invert gates which provide the conditional inputs for the multiplexer or distributor. IC38 provides Neg. Logic inversion for IC39, the decode driver.

The multiplexer information starts with the heterodyne of three components, ref. osc., carrier and VFO input signals.

IC26~IC31 are the multiplexer inputs. These are latches which store B.C.D. information until they are told to release their output by IC3 the strobe or latch signal.

I will mention now, that if the HET or VFO input signal are absent, that the blanking circuits will take effect. At this time the HET input is amplified and is wave-shaped by the Schmidt Trigger IC1 and IC1B. The carrier output is then mixed with the balance mixer Q16 and Q17, its output is then mixed again with VFO and its output appears on Q18 drain. Its buffered by Q19 and waved-shaped by IC2B. This output is placed on timing window IC2C. Two signals are presented to the timing window; 1) signal to be measured, 2) gating signal .1 sec. in length (IC11 pin 8).

The DG-5 contains two window circuits IC2C and IC1C. IC1C forms the HET counter window circuit and IC2C forms the preset counter circuit.

With a gate signal the HET counter begins to count the pulses which pass thru the gate, and so does the preset counter circuit. The outputs of the timing windows are a ratio of signal input divided by gate pulse. Example, with a .1 sec. gating pulse the display would be updated once every .2 sec. period. If a 1.2MHz input was measured, the display would read "1200" in KHz. The gated output information of IC1C is then distributed on the HET counters IC12~IC18. At this time it should be realized that IC41 the decode driver is

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SERVICE BULLETIN

from: TRIO-KENWOOD COMMUNICATIONS, INC.

54

SUBJECT: DG-5 STANDARD SERVICE PROCEDURE	DATE 8/10/79

(SUPPLEMENT TO THE DG-5 SERVICE MANUAL)

INTRODUCTION

A majority of DG-5 failures are caused by nothing more than an intermittent opening of a plated-through hole connecting top and bottom foil paths of the PC Board.

Before any component level service is attempted, it is advisable to eliminate the possibility of an intermittent connection causing or complicating Counter failure.

PROCEDURE:

1. Disconnect all cables.
2. Remove cabinet; 2 screws at the rear, 2 screws with star washers on the bottom.
3. Disassemble display from chassis; 4 countersunk screws on the side rails.
4. The display unit has 2 through holes without leads, and the Counter main Board has 82 through holes without leads passing through them. Ideal service would be to first remove all solder from these holes using devices as a Pace Sodr-X Tractor, EREM Soldovac, or WIK-IT braid. Then, pass a length of #24 tinned bare wire into each clean through hole, solder, and clip flush. For the 10 holes listed under IC's solder sparingly so as not to create a solder bridge under the component. For the remaining 72 holes, inspect each "pinned" connection from both sides to insure (1) no bridges and (2) a good solder joint.
5. Wash the Display to Counter Board PC Board connectors (male and female) with FRESH trichlorethelyne. Heat dry and inspect for flux residue. Spray the connectors with silicone.
6. Similarly, clean and coat the rear panel RCA jacks as in step 5.
7. Reassemble, reversing steps 3,2,1.

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SERVICE BULLETIN

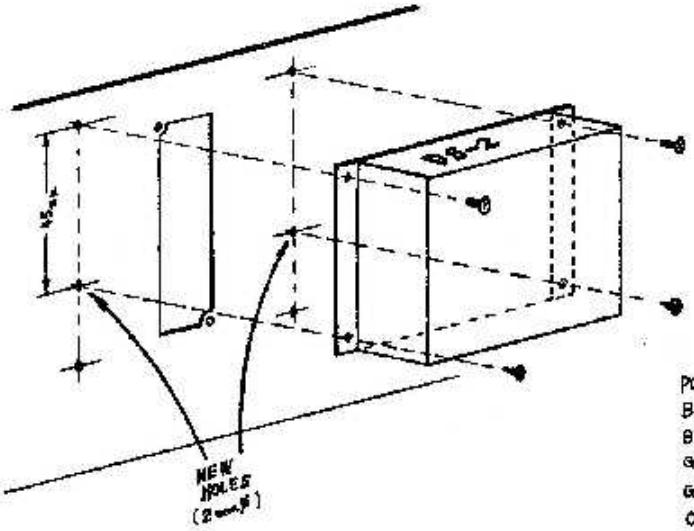
from: TRIO-KENWOOD COMMUNICATIONS, INC.

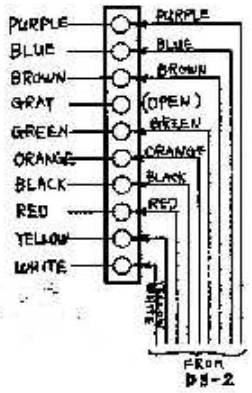
TS-520/S, TS-820/S #842

SUBJECT: DS-2 Replaces DS-1A DC-DC Converter

DATE 01/26/81

The DS-1A DC-DC converter for the TS-820 series and TS-520/S has been replaced by a new model, the DS-2. Wiring color code is the same. Physical size is smaller. Two additional mounting holes must be drilled in the transceiver rear panel.





JEB/jeb

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SERVICE BULLETIN

from: TRIO-KENWOOD COMMUNICATIONS, INC.

SUBJECT:

DATE Oct. 6, 1977

DG-5, DK-520 ADDENDUM FOR USE WITH SERIES TS-511, TS-900, AND T/R-599.

The DG-5, DK-520 package was primarily designed for the TS-520 transceiver. Their use with other Kenwood products requires certain alterations to the installation procedure included with the DK-520 kit. General power supply, and specific wiring considerations will be detailed.

POWER SUPPLY (All models)

A. DC Supply; a source of 13.8V, @1.5A min, may be directly connected to the DG-5. An AC Xfrmr, 12-16V, @ 1.5A may be wired to the DK-520. Direct wiring to Kenwood power supplies (PS-3, PS-5, and PS-6 for example) is also possible.

B. Power supply ripple must not exceed 4V P-P under load.

TOOLS REQUIRED (Additional to those listed for the DK-520 installation:

1. Electric drill and bits.
2. Hi-Z RF VTVM capable of measuring .1V to 5V.

MOUNTING, TS-511

DK-520 will be mounted between the screen switch and RF and bias pots on the rear panel, over the ground screw terminal, which will be used for support.

A. Remove DK-520 cover (3 screws). Mark and drill 4mm hole in rear cover to mate with TS-511 ground terminal screw. Mount cover using ground screw, and install DK-520 in place.

B. Mount supplied Buffer unit (X44-1210-00) between stand up filter caps C2, C3 (1000uF x2), and Driver PCB (X47-0005-01), using existing screw nearest "R1", and "V1", buffer foil towards filters.

1. Remove JJY & NOR leads from buffer.
2. Connect GND Black lead to driver GND near "R1".
3. Connect 14V Red lead to "C3", passing lead through existing hole between RIT & RF gain controls.
4. Connect the JJY terminal to the "CP" terminal through three (3) series wired 1pf caps, 50wv each. DO NOT WIRE DIRECT!!!

C. Coaxial cables must first be trimmed. DON'T LOSE THEIR

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SERVICE BULLETIN

from: TRIO-KENWOOD COMMUNICATIONS, INC.

52

SUBJECT: TS-520/520S: BS-5 SWEEP INTERFERENCE	DATE 8/10/79

BS-5 users may report ignition-like interference on 80 &40M from their SM-220 with BS-5. Noise will be heard between 3850-3870 Khz, and 7245- 7260Khz any time the scope is on.

The sweep signal mixes with the IF (carrier) frequency. This derived signal, or its second harmonic will usually be less than an S1 signal, unless the coax ground to the scope is opened, in which case S9 may be indicated.

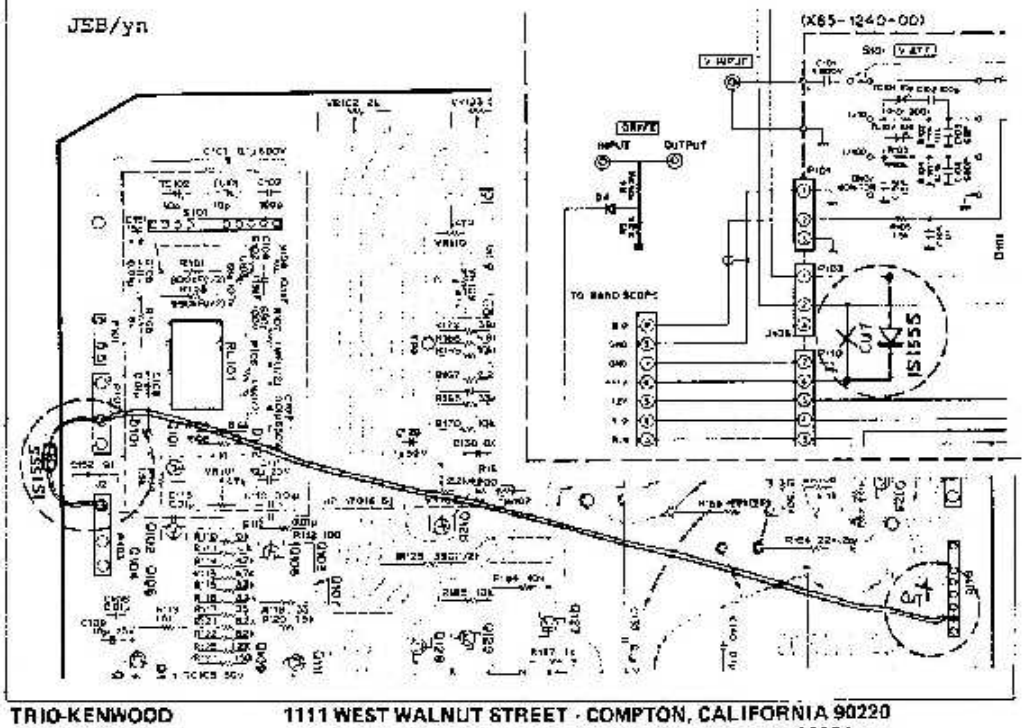
On the SM-220 PCB X65-1240-00, change the BS-5 +11V DC supply point:

1. Cut the foil path between connector P110 pin 6 & Connector P103 pin 2.
2. Install a 1S1555 diode between Connector P110 pin 6 and Connector P103 pin 1.

New Part: 1S1555 V11-0076-05

Please notate your Service Manuals: SM220, TS-520 & TS-520S

JSB/yn



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SERVICE BULLETIN

from: TRIO–KENWOOD COMMUNICATIONS, INC.

41

SUBJECT: BS-8 ALIGNMENT WITH THE TS-180S TRANSCEIVER. ADDENDUM TO THE SM-220 OPERATING MANUAL

DATE 9/4/79

The SM-220/BS-8 scope combination are fully compatible with the TS-180S transceiver. However, as the TS-180S does not have a 25Khz calibrator, BS-8 alignment will not be in accordance with the SM-220 Operating Manual.

Procedure:

Install the BS-8 in accordance with the SM-220 Manual, however, leave the scope covers off until step 1 is completed (IF input alignment). See note 1,2.

Perform steps 8.4.1, 8.4.2. steps 8.4.3, 8.4.4 do not apply to the TS-180S. After step 8.4.2, continue:

1. With the Marker ON, turn the transceiver On, and in the USB mode, any band, you should hear the scope Marker directly injected into the IF. Peak T201, the BS-8 input IF transformer, for maximum signal into the TS-180S. This transformer is not shown in Fig 8-2, but is the only other adjustment on the BS-8, and is located below the three identified access openings. If you cannot hear the Scope Marker in the TS-180S, turn the marker OFF and tune a local station on the 1.5MHz band. Peak the drive control, and then peak T1 in the BS-8 for maximum amplitude at scope center and equal roll-off at the display edges. See note 1 Page 2

2. Turn on TS-180S, 1.5 MHz band, and tune to the local AM Broadcast station nearest 1.6MHz.

3. Enter this frequency in the M1 Memory. Depress the DSP/Diff pushbuttom for a differential display.

4. Tune up and down approximately 100KHz, observing the scope display. Note the verticle displacement of the original frequency to the left and right. If equal, or linear displacement is observed, stop.

5. If the display does not shift equally when tuned up or down frequency, adjust VR202 for linearity of scan width. Then reset to the center frequency (by the scope Marker or retuning the transceiver). Reset TC201 if necessary. Repeat two or three times for correct scope center frequency, and linear display.

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SERVICE BULLETIN

from: TRIO-KENWOOD COMMUNICATIONS, INC. 8

SUBJECT: SERVICE NOTES ON R-599A/D DATE 11-2-77

1. VFO drift: Bad Q1 3SK22(Y) (40-0016-18). Also change R1-270K to 1 meg Q1 bias.

2. Low sensitivity: Check Q1 3SK22(GR) (X44-0020-00).

3. No tranceive operation: Check for dirty contact of transceive switch or broken wires at switch.

4. Receiver sensitivity: Q4 2SC733(Y) on IF unit (X48-0011-00).

5. No receive with tranceive switch in the Tx or reverse: Check for cut coax at VFO terminal of IF unit (X48-0011-00).

6. No VFO receiver: Check L3 at Q1 in VFO (X40-0016-00).

7. Receiver 10 to 20 dB down: Check protection diodes D1, D2 IN60 at (X44-0020-00).

8. FM doesn't work: Check T-8 discriminator transformer on (X48-0011-00).

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SERVICE BULLETIN

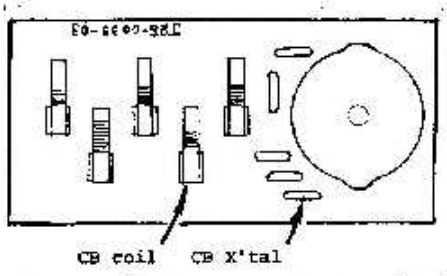
from: TRIO–KENWOOD COMMUNICATIONS, INC. 31

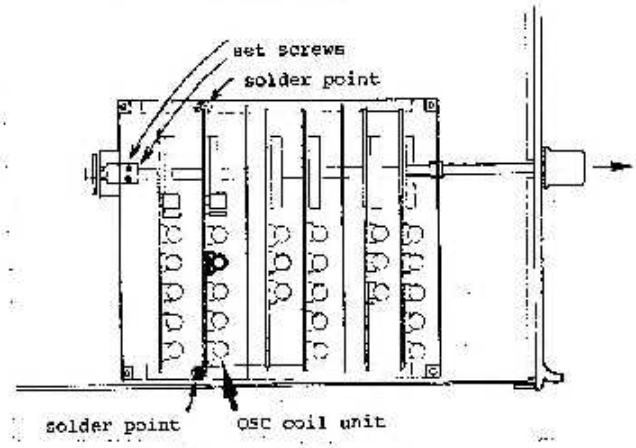
SUBJECT: Removing CB Band From R-599A/D DATE 3-15-78

One of the items in the FCC's expansion of the CB band to 40 channels was to require all receivers that have a specific CB or 11 meter band be type accepted. The R-599A and R-599D receivers have not been type accepted and we do not plan to have this done as they are designed for the ham bands. We have therefore removed the CB position from the current production of R-599D receivers and this band position is now labeled AUX.

This ruling also applies to any used R-599A or R-599D receiver you may have in stock. The following instructions are for removing the CB band. This will satisfy the FCC and make the receiver saleable.

1. Remove top cover.
2. Remove bottom cover.
3. Remove shield plate from coil pack.
4. Set band switch to 14MHz.
5. Remove the black wire from the OSC Coil Unit. (This wire is on the top side.)
6. Loosen screws on shaft coupling and slide shaft out about 2 inches.
7. Unsolder the OSC Coil Unit from the mounting bracket and remove it from the coil pack.
8. Unsolder and remove the CB coil and crystal.
9. Replace the OSC Coil Unit and solder it in.
10. Slide the band switch shaft in place, making sure that each wafer is properly indexed.
11. Resolder the black wire to the OSC Coil Unit.
12. Replace all covers.
13. Check for proper operation.





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SERVICE BULLETIN

from: TRIO–KENWOOD COMMUNICATIONS, INC.

41

SUBJECT: BS-8 ALIGNMENT WITH THE TS-180S TRANSCEIVER. ADDENDUM TO THE SM-220 OPERATING MANUAL

DATE 9/4/79

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SERVICE BULLETIN

from: TRIO-KENWOOD COMMUNICATIONS, INC.

52

SUBJECT: TS-520/520S: BS-5 SWEEP INTERFERENCE	DATE 8/10/79

BS-5 users may report ignition-like interference on 80 &40M from their SM-220 with BS-5. Noise will be heard between 3850-3870 Khz, and 7245- 7260Khz any time the scope is on.

The sweep signal mixes with the IF (carrier) frequency. This derived signal, or its second harmonic will usually be less than an S1 signal, unless the coax ground to the scope is opened, in which case S9 may be indicated.

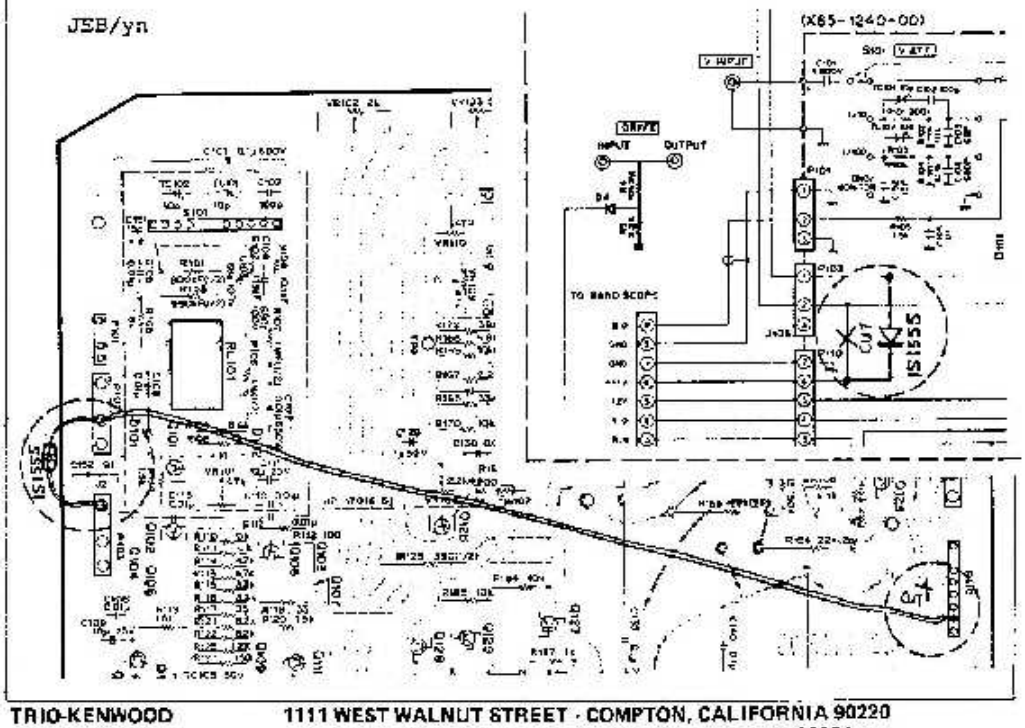
On the SM-220 PCB X65-1240-00, change the BS-5 +11V DC supply point:

1. Cut the foil path between connector P110 pin 6 & Connector P103 pin 2.
2. Install a 1S1555 diode between Connector P110 pin 6 and Connector P103 pin 1.

New Part: 1S1555 V11-0076-05

Please notate your Service Manuals: SM220, TS-520 & TS-520S

JSB/yn



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SERVICE BULLETIN

from: TRIO-KENWOOD COMMUNICATIONS, INC.

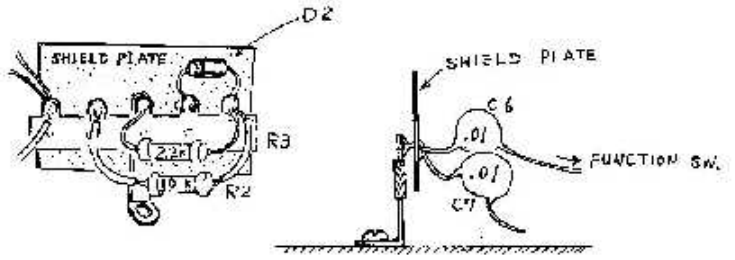
57

SUBJECT: SM-220 Shield Installation

DATE 11/30/79

For Sweep interference from the SM-220 back into either a TS-520, or TS-180S, install an additional shield in the RF compartment in the SM-220.

1. Disconnect the power cord from the back of the scope.
2. Remove the scope top cover.
3. Loosen the Function and RF ATT shaft couplers using a 1.5mm allen key. Withdraw the shafts away from the RF compartment.
4. Remove RF compartment screws from the rear panel.
5. Remove 4 screws to open the RF comp.
6. Remove one screw to remove internal shield.
7. C6, a .01uF, runs from the Function Switch to a ground point under the RF ATT switch. Cut the ground lead and shorten so the cap is grounded to the ground point under the function switch.
8. R2, a 10k ohm, is attached to the terminal strip directly under the function switch. Reposition this resistor from the top of the terminal strip to the bottom of the strip.
9. Install the additional shield to the ground point under the function switch.
10. Reverse disassembly procedure to reassemble.



JEB/yn

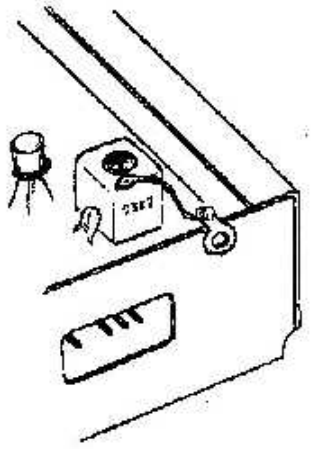
TRIO-KENWOOD COMMUNICATIONS, INC.
1111 WEST WALNUT STREET - COMPTON, CALIFORNIA 90220
MAILING: P.O. BOX 7065 - COMPTON, CALIFORNIA 90224

SERVICE BULLETIN

from: TRIO-KENWOOD COMMUNICATIONS, INC.

SUBJECT: Feedback Between Pan Display and IF Out DATE: 7/25/78

We have found a few cases of feedback when the pan display option was installed in the SM-220 Station Monitor. This is due to the isolated ground of the BS-5 or BS-8 pan display option. It may be remedied by grounding the case of the input transformer in the BS-5 or BS-8 to the case. (See drawing below.) This change will be incorporated in all future deliveries of the BS-5 and BS-8.



TRIO-KENWOOD COMMUNICATIONS, INC.
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MAILING: P.O. BOX 7055 - COMPTON, CALIFORNIA 90224

KENWOOD

SB-970

SERVICE BULLETIN AMATEUR RADIO

SUBJECT	DATE
SM-230 BANDSCOPE ATTENUATION	05/29/90

When the SM-230 is used as a bandscope, the attenuator circuit is bypassed. Sometimes it is necessary to use the attenuator during strong signal reception or high noise conditions. The following modification will allow the attenuator circuit to function in the bandscope mode.

REQUIRED PARTS:

W05-0309-00 ATT SUB-UNIT

1. Disconnect the power cord and patch cords.
2. Remove the top cover (6 screws).
3. Remove the Horizontal unit's mounting screw and secure the ATT sub-unit with the supplied 2.6mm screw and washer.
4. Remove connector P12 from the Horizontal unit and insert it into jack P1 on the ATT sub-unit.
5. Insert connector JA from the ATT sub-unit into jack P12 on the Horizontal unit.
6. Insert the two wire plug, supplied in the kit, into jack P2 on the ATT sub-unit.
7. Solder the exposed ends of the red and the brown wires to the Panel unit as shown in figure 2.
8. Solder the two jumper wires (they look like resistors) as shown in figure 2.

This modification may be covered under warranty.
Time required to perform the modification is 0.5 hrs. or less.

KENWOOD U.S.A. CORPORATION
2201 EAST DOMINGUEZ STREET - LONG BEACH, CALIFORNIA 90810
MAILING: P.O. BOX 22745 - LONG BEACH, CALIFORNIA 90801-5745
TELEPHONE: (213) 639-9000

KENWOOD

SB-975

SERVICE BULLETIN AMATEUR RADIO

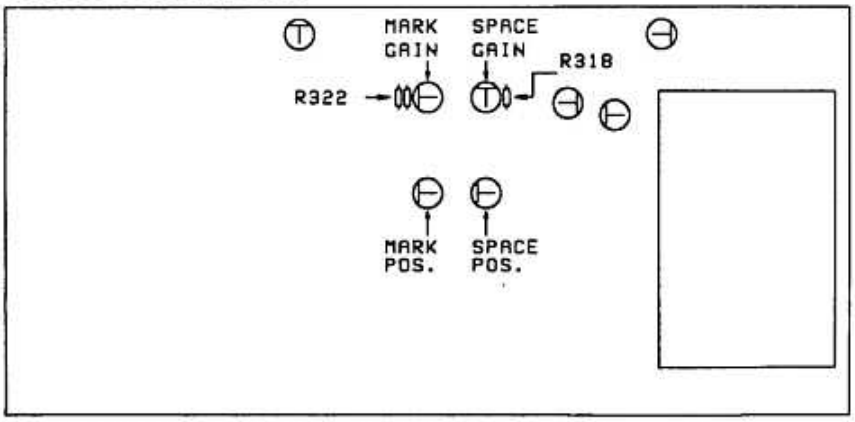
SUBJECT	DATE
SM-230 RTTY CROSS PATTERN ATTENUATION	08/08/90

Some users of the SM-230 have reported that the MARK and SPACE gain adjustments do not sufficiently reduce the signals to display them on the CRT. The following modification will correct this condition.

REQUIRED PARTS:

680 OHM 1/8W RESISTOR RD14CB2B681J QTY. 2

1. Disconnect the power cord and control cables.
2. Remove the top cover (6 screws).
3. Locate the Horizontal unit. This board is vertically mounted on the right side of the SM-230.
4. Locate resistors R318 and R322 on the Horizontal unit.
5. Replace R318 and R322 with 680 ohm resistors.
6. Assemble the SM-230.
7. Adjust the MARK and SPACE gain adjustments as necessary to obtain the correct cross pattern.



Time required to perform this modification is 1 hr. or less.

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MAILING: P.O. BOX 22745 - LONG BEACH, CALIFORNIA 90801-5745
TELEPHONE: (213) 639-9000

SERVICE BULLETIN

from: TRIO-KENWOOD COMMUNICATIONS, INC. 7

SUBJECT: SERVICE NOTES ON T-599A/D DATE 11-2-77

1. No ALC - Drive 10 meters: Check for loose contact at oscillator wafer on coil pack.

2. No Tx any band: Check the T-1 on generator board (X52-0009-00).

3. No Tx: Bad driver FET Q1 3SK22(GR) on (X47-0004-00).

4. No relay action when Tx: Bad Q8 2SA562(Y). When replacing Q8 change resistor R16 to 4.7 ohm.

5. Rubber belt slipping on drive and load: TKC has Chain Modification Kit.

6. No drive when shock: Check for loose output terminal at carrier unit (X50-0002-00).

7. Low Power 75 meters: Check for shorting terminals at final rotary switch (S10-1002-05).

8. No output on any band: Check T-2 on GEN unit (X42-0009-00).

9. No Tx: Check final relay for burned contacts. (S51-4017-15).

10. Bias current too high and blows fuse: Check for bad S-7001A and shorted cathode resistors 10 ohm.

11. Cannot neutralize: Make sure shield is properly installed on driver 12BY7.

12. No output from generator unit (X52-0009-00): Bad Q4 TA7045.

13. No 9 volt out at AVR (X43-0010-00): Check Q1 2SA606(L).

14. Low output power: If American 12BY7 is used in driver circuit, this can cause parasitic oscillation. Please use standard Kenwood replacement tubes.

15. Blows fuse: Check for shorted electrlytics at power supply (X43-0011-00).

16. AC hum on SSB transmission: Send for TKC bulletin.

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SERVICE BULLETIN

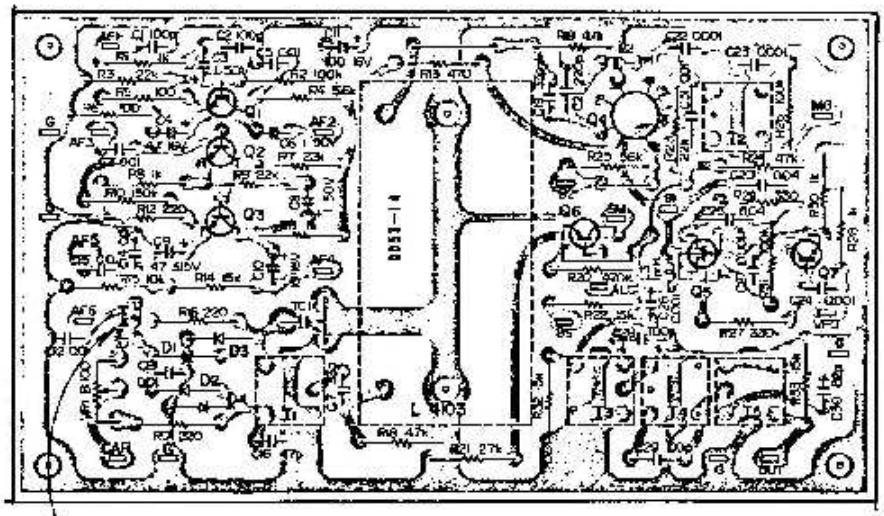
from: TRIO–KENWOOD COMMUNICATIONS, INC.

17

SUBJECT: Reducing 120Hz hum in T-599D

DATE 9/6/77

There have been some cases of 120Hz hum in the T-599D. This may be reduced by removing L-1 (1mH) on the generator unit (X52-0009-00) and replacing it with a 47 ohm resistor. Shown below is the generator unit board with this change.



FOIL SIDE OF BOARD

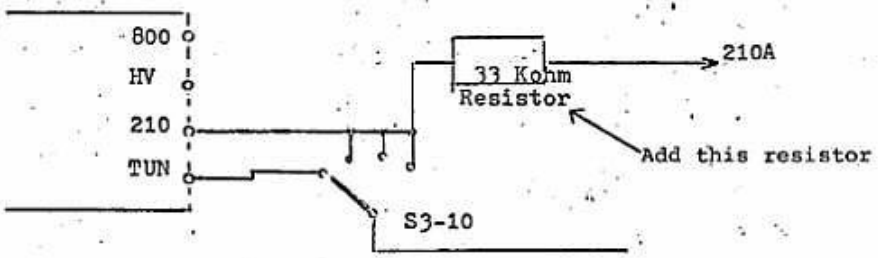
L-1

SERVICE BULLETIN

from: TRIO–KENWOOD COMMUNICATIONS, INC. No. 2

SUBJECT: TS-520 Novice Operation (75 watts) DATE 10-01-75

HV UNIT (X43-1110-00)



1. Cut wire (see figure 1) .... red color.
2. Insert 33Kohm resistor in series between red wire and pin 210.
3. Readjust bias current to 60ma.

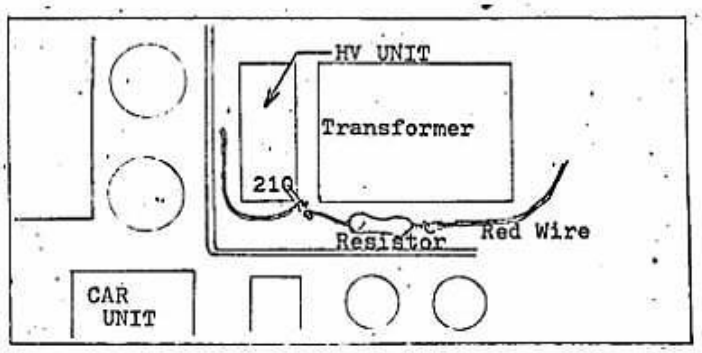
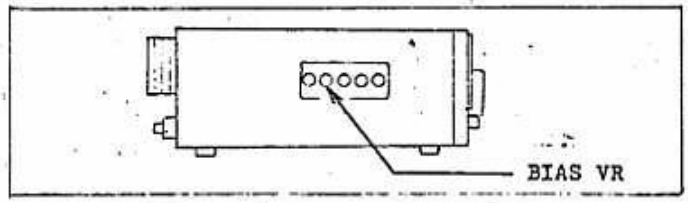


Figure 1 (Bottom side)

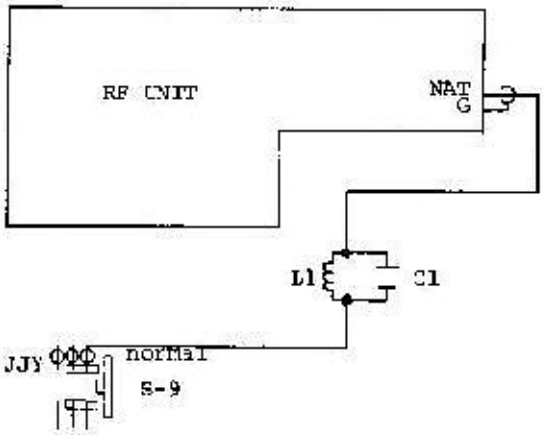


SERVICE BULLETIN

from: TRIO-KENWOOD COMMUNICATIONS, INC. 4

SUBJECT: AM BROADCAST INTERFERENCE IN TS-520 DATE June 3, 197

We have found a few instances of customers who live near an AM broadcast station hearing that station on the 3.5MHz band of their TS-520. Shown below is a filter that may be installed if this occurs.



FREQ.	L1	C1
1300KHz	22uh	680pf
1000KHz	100uh	220pf
700KHz	100uh	470pf

A suggested location for the filter is on a small terminal strip that is then mounted on a mounting screw of the RF unit. This screw is located at the front corner next to the VFO. The cable between S-9 (WWV switch) and terminal NAT of the RF unit is removed from terminal NAT and connected to one side of the filter. A short piece of RG-174/U is then connected from the other side of the filter to the terminal NAT. This should prevent the AM broadcast interference.

SERVICE BULLETIN

from: TRIO-KENWOOD COMMUNICATIONS, INC.

52

SUBJECT: TS-520/520S: BS-5 SWEEP INTERFERENCE	DATE 8/10/79

BS-5 users may report ignition-like interference on 80 &40M from their SM-220 with BS-5. Noise will be heard between 3850-3870 Khz, and 7245- 7260Khz any time the scope is on.

The sweep signal mixes with the IF (carrier) frequency. This derived signal, or its second harmonic will usually be less than an S1 signal, unless the coax ground to the scope is opened, in which case S9 may be indicated.

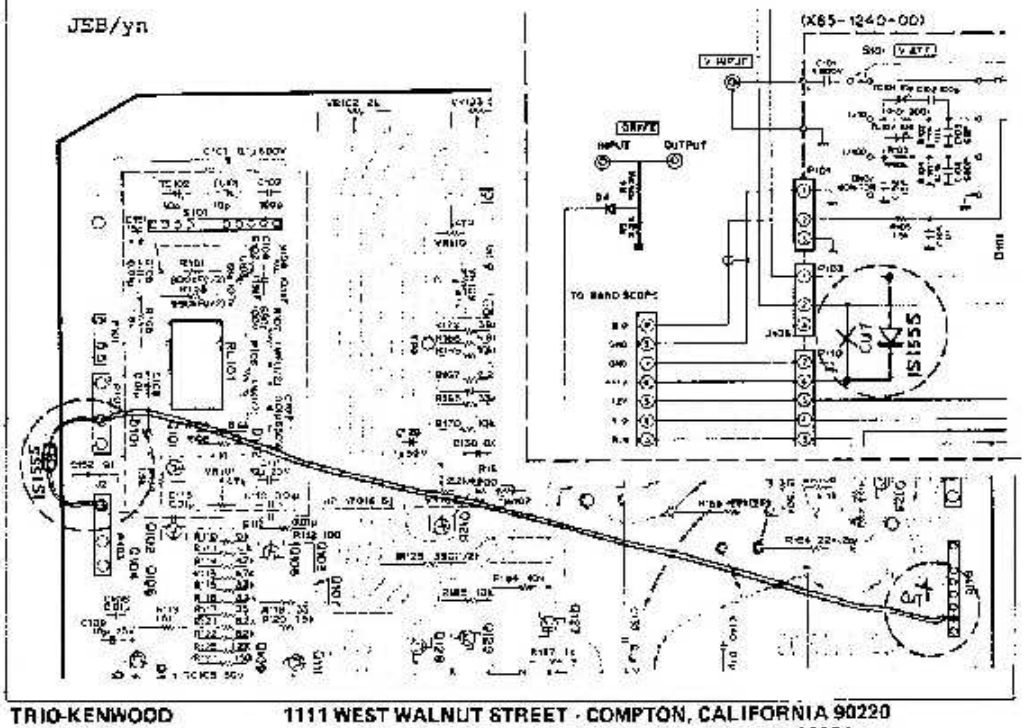
On the SM-220 PCB X65-1240-00, change the BS-5 +11V DC supply point:

1. Cut the foil path between connector P110 pin 6 & Connector P103 pin 2.
2. Install a 1S1555 diode between Connector P110 pin 6 and Connector P103 pin 1.

New Part: 1S1555 V11-0076-05

Please notate your Service Manuals: SM220, TS-520 & TS-520S

JSB/yn



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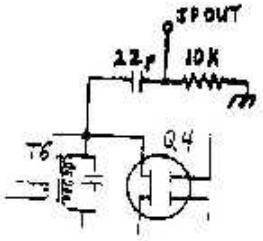
SERVICE BULLETIN

from: TRIO-KENWOOD COMMUNICATIONS, INC.

SUBJECT: Adding IF output to the TS-520 and TS-520S transceivers for use with the SM-220

DATE 8/16/78

The TS-520 and TS-520S transceivers do not provide an IF output signal. It is necessary to have this if you want to look at a specific received signal on the SM-220 station monitor. The best place to pick up this signal is at the tuned output of Q4 on the IF unit (X48-1060-00). A 22 pf capacitor should be used for coupling and a 10 Kohm resistor for impedance matching. This is shown in the schematic below. The center conductor of a 36 cm (14") length of 50 ohm (RG-174/U or similar) cable is connected to the pick-up at one end and to pin 7 of the REMOTE socket on the other end. The shield is connected to pin 1 of the REMOTE socket and the ground path of the IF Unit. A 76 cm (30") 50 ohm cable should be made up with one end connected to pins 7 and 1 of the 8 pin plug supplied with the transceiver and BNC connector on the other end. The BNC connector will be plugged into the vertical input jack on the front of the SM-220.



JRJ:ar

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SERVICE BULLETIN

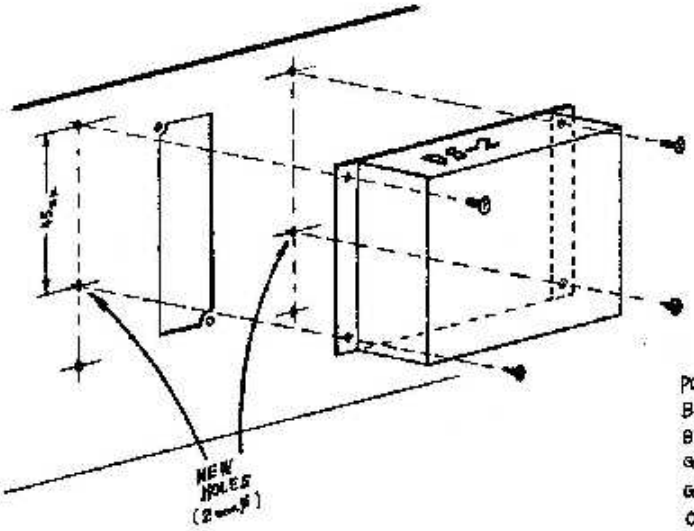
from: TRIO-KENWOOD COMMUNICATIONS, INC.

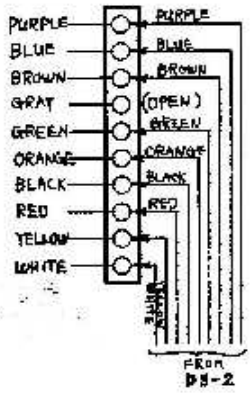
TS-520/S, TS-820/S #842

SUBJECT: DS-2 Replaces DS-1A DC-DC Converter

DATE 01/26/81

The DS-1A DC-DC converter for the TS-820 series and TS-520/S has been replaced by a new model, the DS-2. Wiring color code is the same. Physical size is smaller. Two additional mounting holes must be drilled in the transceiver rear panel.





JEB/jeb

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SERVICE BULLETIN

from: TRIO-KENWOOD COMMUNICATIONS, INC.

43

SUBJECT: TS-520S -6V DC SUPPLY FAILURE	DATE 8/9/79

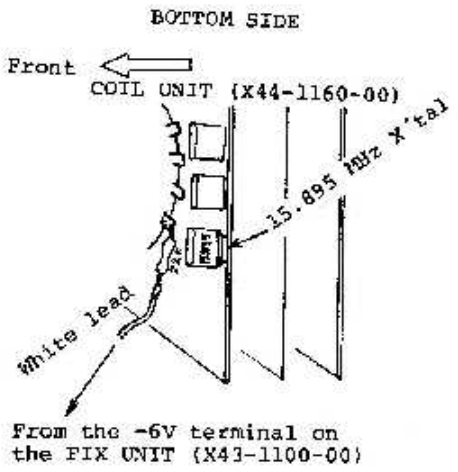
When troubleshooting a TS-520s, check all power supply voltages, including the -6V DC supply. Symptoms such as dead, blown 2A DC fuse and now dead, low RX, no TX, or similar may occur after switching between 80 & 40M.

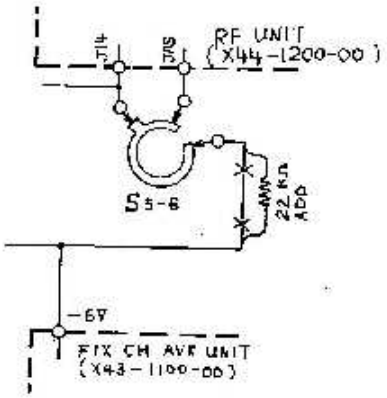
Cause of failure may be traced to an intermittent shorting between the 14V DC & -6 DC supplies as the Band Switch is rotated between 40 & 80 M. This will weaken or destroy D8,6V Zener on the FIX CH AVR unit. To prevent repeat failure, break the WHITE lead & install a 22K ohm ½W resistor at the Bandswitch S5-6, between the -6V supply line and switch terminal. And of course replace D8 on the FIX CH AVR unit, X43-1100-00.

New Part 22k ohm ½W

Please notate your Service Manual.

JEB/yn





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SERVICE BULLETIN

from: TRIO-KENWOOD COMMUNICATIONS, INC.

46

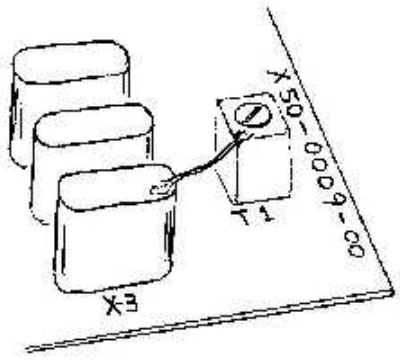
SUBJECT: TS-520/520S CW FREQUENCY SHIFT	DATE 8/6/79

Reports of intermittent frequency shift during CW operation, on the order of a few hundred cycles, may be traced directly to the Carrier unit.

On the Carrier unit X50-0009-01, install a ground lead of #18 tinned wire or similar, between the cases of T1 transformer and X3, the LSB XTAL. Recheck frequencies after installing this ground lead.

Please notate your Service Manuals.

JEB/yn



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SERVICE BULLETIN

from: TRIO—KENWOOD COMMUNICATIONS, INC.

TS-520/S, TS-820/S #812

SUBJECT: TS-520/S, TS-820/S CW FILTER SELECT CONTROL

DATE 2/14/80

In the TS-520SE, the Heater Switch has been replaced with a CW WIDE/ NARROW select switch. For those operators who desire this type feature for their transceiver, the following information may be considered as a guideline

TS-520S Series Transceivers

1. A minature SPDT switch may be installed at the operators preference, on the rear side, or bottom panel. Use this to switch the CW or SSB filters by wiring the BROWN lead, which normally is transferred to the CW terminal on the IF unit, between the SSB filter, for WIDE, and CW filter for NARROW.
2. A "Traditional" solution has been to use the FIX CH switch, position 3 and 4 for filter switching. This may be done by completely rewiring the switch, or by leaving the switch wiring and the filter wiring as for normal operation, and bridging the following terminals:

A. FIX CH "C" terminal to IF "SSB" terminal.
B. FIX CH "4" terminal to IF "CW" terminal.
Placing the FIX CH switch to 4 will operate the SSB filter in CW Mode.

TS-820/S Series Transceivers:

1. Similar to the TS-520 series, a miniature SPDT toggle switch may be installed at the operators preference at the rear or on the bottom cover.
2. The FIX CH switch, or Digital Hold switch may be rewired to control the CW WIDE/NARROW function.

On the MODE switch, S6-1, the SSB filter control is GREEN, and the CW filter control line is GREY. Break the GREY line and connect from the MODE switch to the SPDT common terminal. Connect the GREY line to the IF unit to one terminal, and bridge the GREEN SSB line to the other Switch terminal.

JEB/yn

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SERVICE BULLETIN

from: TRIO-KENWOOD COMMUNICATIONS, INC.

TS-530S #848

SUBJECT: TS-530S Low Voltage Supply Optional Improvements

DATE 7/30/81

Power supply drift may be improved by these optional component changes.

On the AF AVR unit X49-1150-00 (Vicinity of Q19, Q20) change:

R68 from 1kΩ to 1.5kΩ (RD14CB2E152J)
R72 from 470Ω to 390Ω (RD14CB2E391J)
R14 from WZ-061 to XZ-053 (V11-4101-60)

This will improve temperature drift from a maximum of about 100mV to a maximum of 10mV, and may be applied to any unit before serial # 201xxxx.

NOTE: These changes are at the owners option and may not be performed in-warranty.

JEB/sh

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KENWOOD

#878

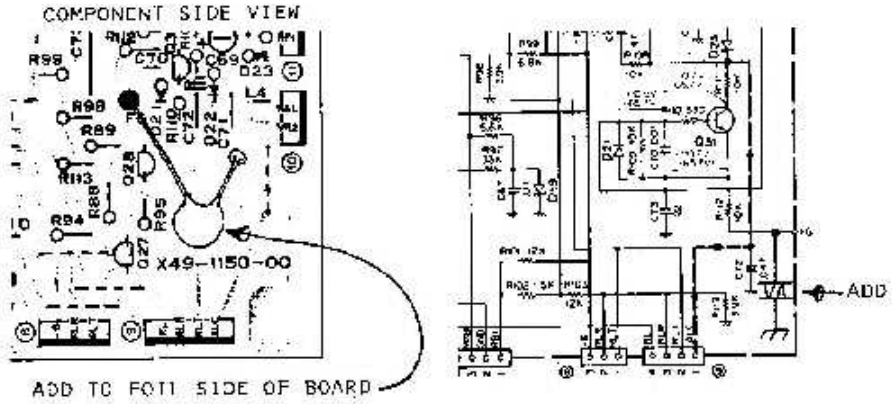
SERVICE BULLETIN AMATEUR RADIO

SUBJECT	DATE
TS-530S IF UNIT Q2,Q7 PROTECTION	8-25-83

High voltage transients at the receiver antenna can be felt in the ALC circuitry and cause a failure of IF Unit transistors Q2 and Q7. Symptoms encountered may be a loss of RX sensitivity, and or loss of S-Meter deflection.

Add the surge suppressor, as shown in the figures below, to the AF Unit (X49-1150-XX) to prevent a reoccurance of this symptom.

Parts Required: Surge Suppressor #ERZD03DK331



Time required for this modification is 1/2 hour or less.

CLM/cm

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TELEPHONE: (213) 639-9000 SERVICE TELEPHONE: (213) 639-7140

SERVICE BULLETIN

from: TRIO-KENWOOD COMMUNICATIONS, INC.

SUBJECT: SERVICE NOTES ON TS-820 DATE 10-25-77

TRANSMITTER

1. Mushy audio on transmit: Mic. amps. Q20 and Q21 on IF (X48-1150-00) are bad.

2. No 14V supply: Bad bridge diodes D8 - D10 on (X43-1090-02).

3. Intermittant operation of any one band: Check for loosely soldered Xtals in PD unit (X50-1340-00).

4. Mic. gain down: Cold solder joint at SSB xtal filter IF unit (X48-1150-00).

5. Self oscillation when Tx: Bad final tubes S2001-X2. Burned cathode resistors 10 ohms R2 R3 at final unit (X56-1200-00).

6. No VOX operation. No sidetone: Burned resistor R12 220 ohms at key socket.

7. No USB or LSB: Check CAR-1 X1 - X2 crystal cold soldered CAR-1 on (X50-1310-00).

8. No Tx: Check for shorted Q-1 and Q-8 balanced mixer on RF unit (X44-1150-00).

9. No ALC meter movement: Readjustment of meter amp VR-1, VR-2 on IF unit (X48-1150-00).

10. Intermittant ALC action after peaking drive: One final tube S2001-A is bad.

11. Fix lite on when in VFO position: Wire shorted terminals of function switch.

12. No loading of Tx: Cold solder joint at relay socket RL-1 antenna relay.

13. Using Sure 444 speech processor is distorted: See TKC bulletin regarding 16dB pad for mic. input.

14. No relay closure on Tx: Q9 on fix VOX (X50-1350-00) is bad.

15. Very low RF output only when using RF speech processor: Bad Q30 2SC733(y) on IF (X48-1150-00).

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SERVICE BULLETIN

from: TRIO-KENWOOD COMMUNICATIONS, INC.

SUBJECT: SERVICE NOTES ON TS-820 DATE 10-25-77

TRANSMITTER (Cont'd.)

16. Low RF output on SSB without RF speech processor: Bad Q20 2SC733(y) on (X48-1150-00).

17. Large audio difference between USB and LSB: realign carrier unit per TKC specifications.

18. No loading on 40 meters: Foil path is open on RF coil pack.

19. No Tx when using send switch: Bad R-28 1K and Q-9 2SA562(y) on fix VOX (X50-1350-00).

20. Blows fuse: Check for shorted C-21, C-22 100uf 500V.

21. No drive, no Tx or bias: Open screen resistor R-6 470 ohms at reflector unit (X43-1090-02).

22. VFO intermittant: Check for cold solder at VFO power plug.

23. Audio distortion on Tx with processor: C96 may be loose on IF board (X48-1150-00)

24. Faulty LED indications: Check for loose ground screws on LED board (X54-1180-00).

25. Low output on CW: R-14 470 ohms touch to filter case on IF unit (X48-1150-00).

26. VOX operation is intermittant: Solder touch VS terminal and 14V at (50-1350-00).

27. Intermittant Tx: Make sure ground strap for 12BY7 shield is under shield.

28. Insuffient power out to drive linear amp: An increase of 5-7 watts can be obtained by paralleling R-6 on receiver unit (X43-1090-02).with 47 ohm 2 watt.

29. VFO output level is down: Q2 2SK19(y) inside VFO is bad.

30. No Tx or Rx on any band. No VCO output: Q14 2SC741 on (X50-1330-00) is bad.

31. No Tx or Rx: Loose contact VFO output terminal on fix VOX (X50-1350-00).

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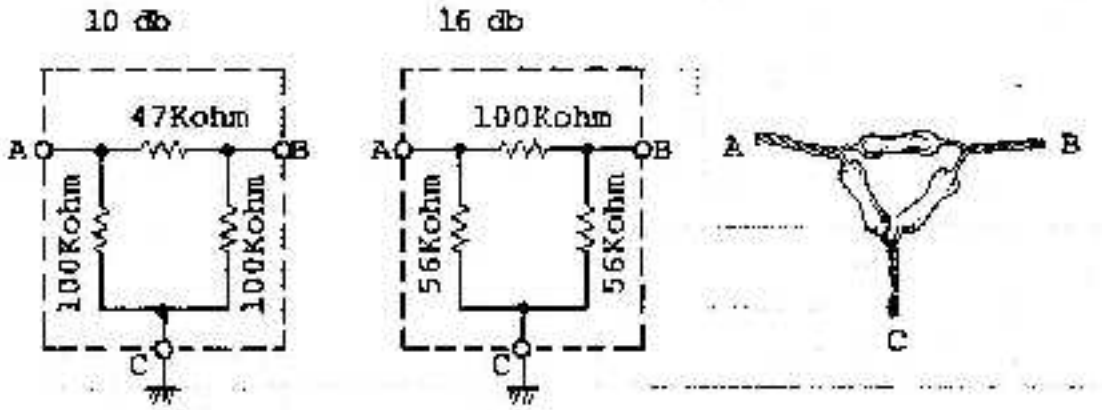
SERVICE BULLETIN

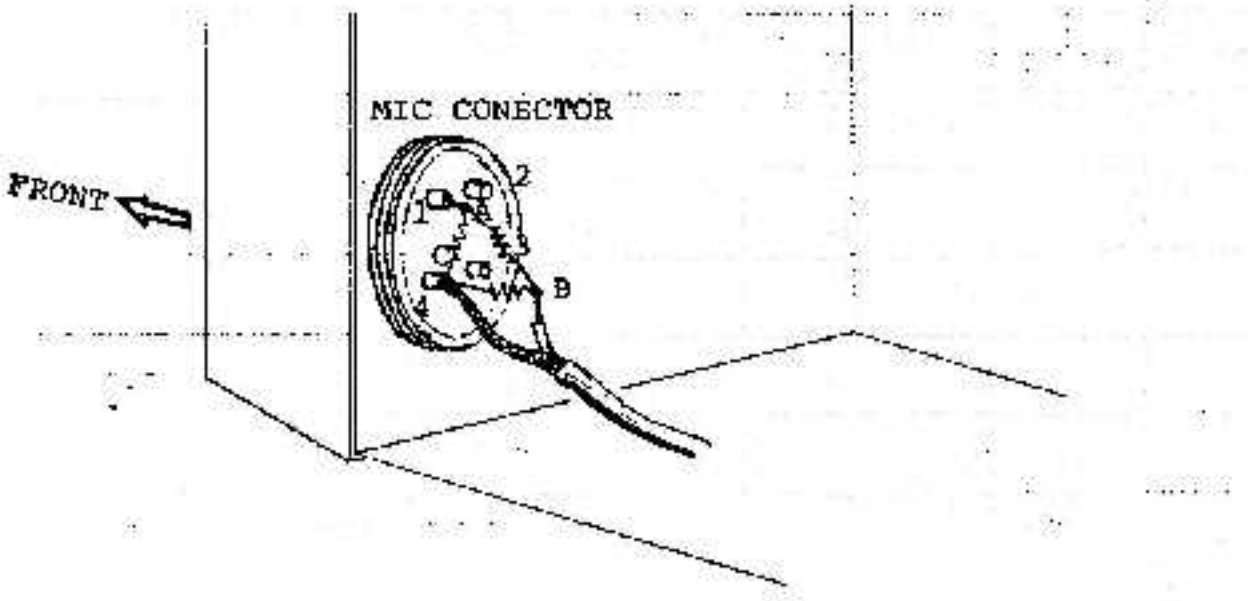
from: TRIO–KENWOOD COMMUNICATIONS, INC.

No. 14a

SUBJECT: Microphone input attenuator for TS-820 **DATE** 2/16/77

When using a high output microphone (i.e. Shure 444), it is very likely that there will be distortion of the transmitted audio if the processor is used. The reason the distortion occurs is because the processor is between the first microphone amplifier and the microphone gain control. The installation of one of the attenuators shown below will reduce the microphone input to a level that will not cause RF speech processor distortion. The attenuator figures are approximate.





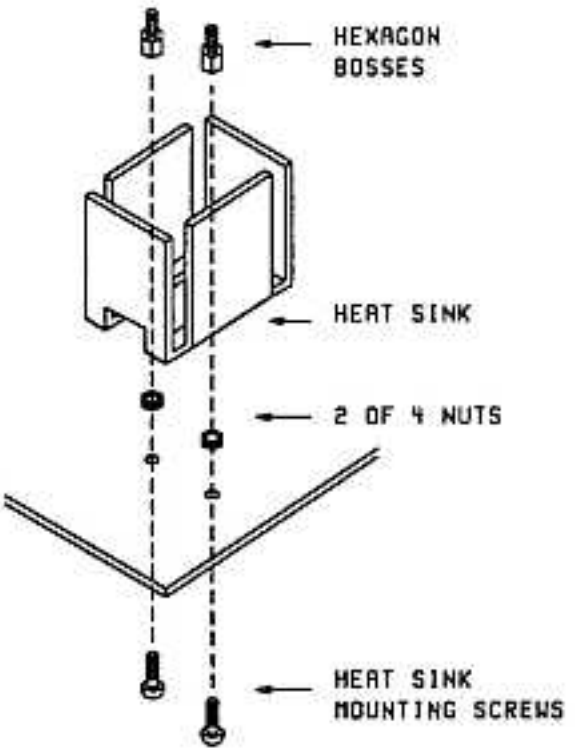


FIGURE 3

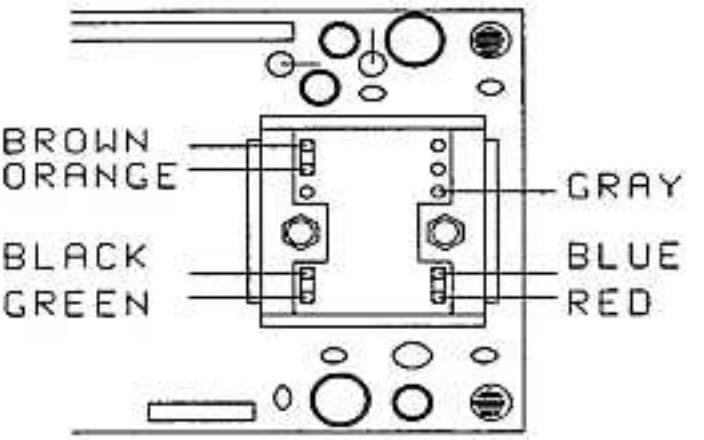


FIGURE 4

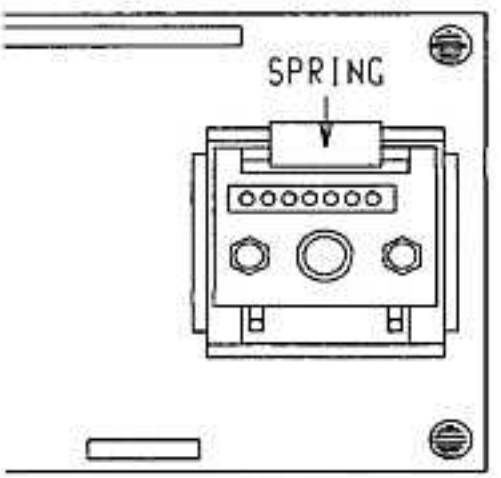


FIGURE 5

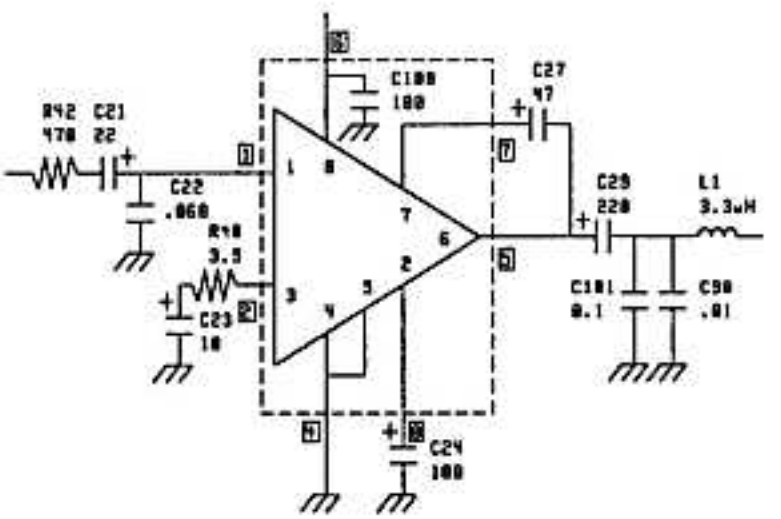


FIGURE 6

SERVICE BULLETIN

from: TRIO-KENWOOD COMMUNICATIONS, INC. 24

SUBJECT: GENERAL NOTES ON TS-820 DATE 10-25-77

1. No output Tx: SG switch is "off".

2. No Tx, Rx, or VFO: There is not a 9P plug installed.

3. Low Rx sensitivity, no Tx: The transverter switch is "on".

4. S meter full deflection when first turned on: Make sure RF gain is not fully CCW.

5. If digital display does not count: Make sure DH is not "on".

6. If there is no DG display: Make sure you are not in remote VFO with no remote VFO.

7. When intermittant in any circuit:

   a. Check for loose black jumper from point to point on circuit board.

   b. Check for broken foil path.

   c. Check for component that has been pulled out or loosely soldered.

   d. Check for solder spash across foil path.

   e. Check for loose pins.

   f. Check for component leads touching to metal IF cans.

   g. Check for wire not soldered at function switch or at any switch or control.

   h. When checking FET, check for excessive voltage at can top usually source, or same G-1, G-2 voltage.

   i. Check for loose Molex mini connector or any foreign substance on pins.

8. Complaint of frequency shift when Tx - CW: This is normal. 800 Hz.

9. Not proper PLL action: Make sure PLL slide switch is in NOR not TUNE.

10. Receiver audio self oscillation at high level: Make sure audio board mounting screws are tight.

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SERVICE BULLETIN

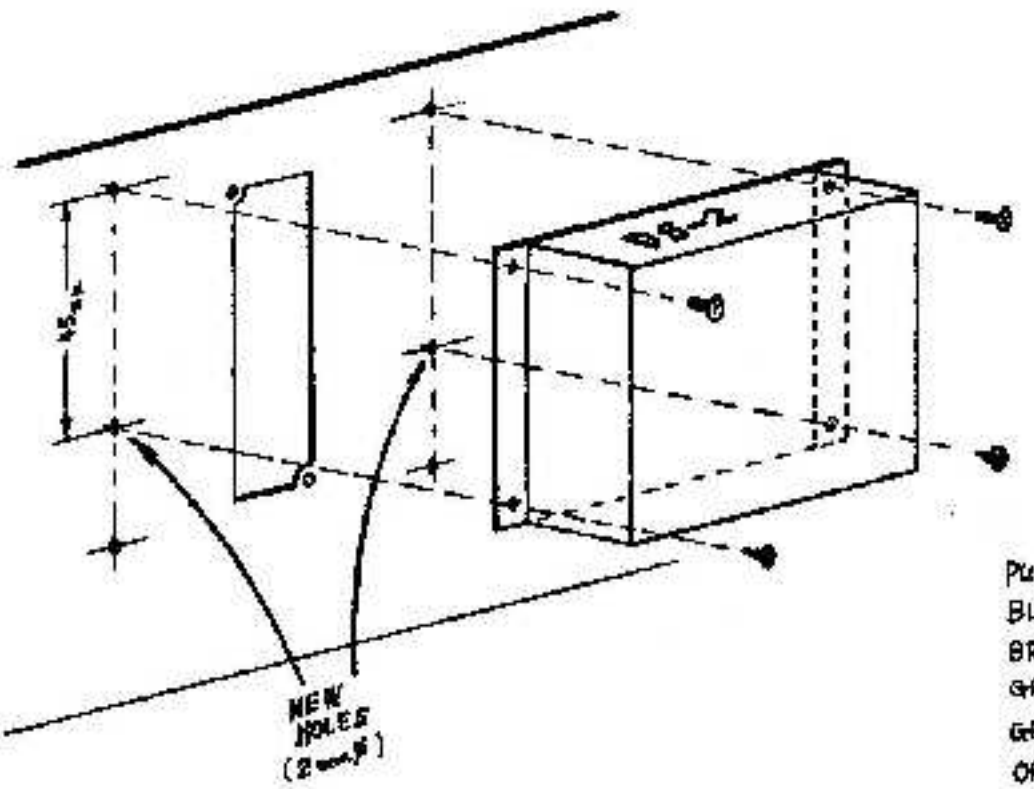
from: TRIO-KENWOOD COMMUNICATIONS, INC.

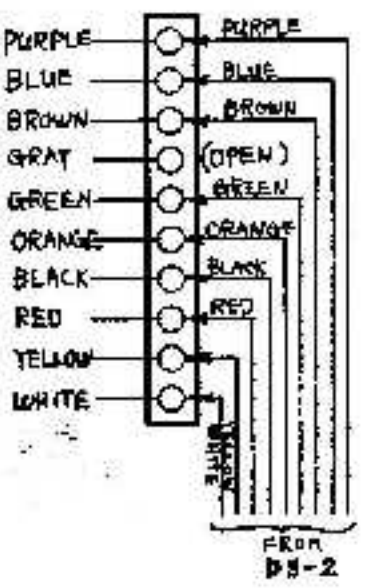
TS-520/S, TS-820/S #842

SUBJECT: DS-2 Replaces DS-1A DC-DC Converter

DATE 01/26/81

The DS-1A DC-DC converter for the TS-820 series and TS-520/S has been replaced by a new model, the DS-2. Wiring color code is the same. Physical size is smaller. Two additional mounting holes must be drilled in the transceiver rear panel.





JEB/jeb

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SERVICE BULLETIN

from: TRIO–KENWOOD COMMUNICATIONS, INC.

NO- 9

SUBJECT: TS-820 Speech Processor Alignment DATE 11/17/76

The following alignment procedure may be used in lieu of the one in the Service Manual.

Test equipment required:
Audio signal generator
Audio VTVM
Oscilloscope or RF VTVM

1. Preliminary control settings:
   Screen grid switch off
   Mode switch to USB
   Comp level to Max (CW)
   Processor sw to Pull "on"
   Meter switch to "Comp"

   Send/Rec switch to "Send" as required when making adjustments.

2. Apply 1500Hz audio signal to the mic jack at 10 mv level.
   Connect RF VTVM or scope to TP-2.
   Adjust T-11, 12, 13, for maximum level on the S-meter.
   Adjust T-14 for maximum level on scope or VTVM at TP-2.

3. Turn compression level to min, (CCW)
   Reduce audio sig at mic jack to 0.3 mv
   Adjust TC-4 (freq response for speech processor) so that level at TP-2 is not changed when changing audio gen from 400Hz to 2000Hz.

4. Turn compression level to max, (CW)
   Set audio gen to 1500Hz at 0.3 mv.
   Adjust TC-3 and VR-6 (carrier bal for speech proc) for maximum level at TP-2.

5. Set audio gen to 10 mv 1500Hz
   Send/Rec switch to send
   Adjust VR-7 (comp level for speech processor) so that the level at TP-2 is not changed when turning the processor on and off. VR-7 should be adjusted for the particular microphone the customer will be using with his TS-820.

6. Finally check for non distortion of signal, and that comp level of 20 to db can be obtained at full comp on.

SERVICE BULLETIN

from: TRIO-KENWOOD COMMUNICATIONS, INC.

No. 12
DATE 1/13/77

SUBJECT: Installing AUX band in TS-820
(receive only)

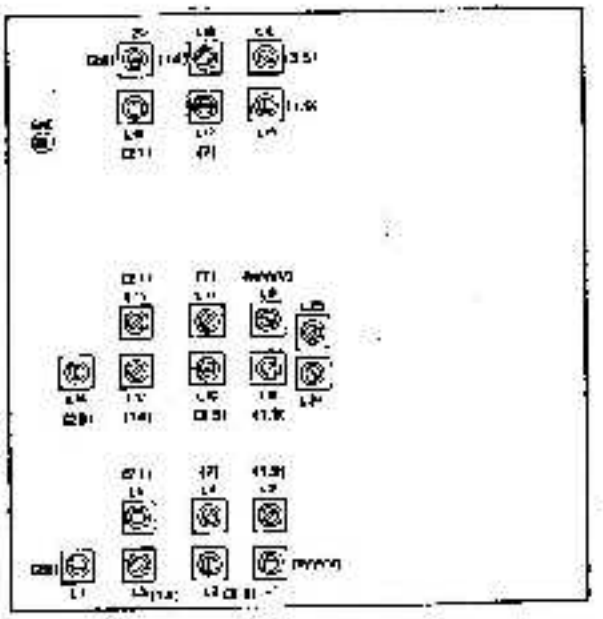
The following information is for the installation and alignment of the AUX band in the TS-820. This extra band will be for receive only. Reference will be made to schematics and board layouts as shown in the Service Manual.

INSTALLATION

1. Remove top and bottom covers.
2. Remove the connectors from the PLL Assembly X60-1010-00.
3. Remove the PLL Assembly X60-1000-00 and set it aside.
4. Use the board layout of the Coil Pack X44-1140-00 to locate the positions for the ANT and MIX coils on the Coil Pack X44-1140-00.
5. Install the ANT and MIX coils on the Coil Pack X44-1140-00.
6. Remove both covers from the PLL Assembly X60-1010-00.
7. Remove the 5 phillips screws holding the PD Unit X50-1340-00 in the PLL Assembly X60-1010-00 and carefully remove the PD Unit.
8. Use the board layout of the PD Unit X50-1340-00 to locate Q11.
9. Install R01, R02, C01, C02, and X01 as needed for the band desired.
10. Locate terminals AUX, B1, B2, B3, and B4 on the PD Unit X50-1340-00.
11. Install a jumper from the AUX terminal to the B terminal for the band desired. B1 is for 1.8MHz to 9MHz, B2 is for 10MHz to 18MHz, B3 is for 19MHz to 24MHz and B4 is for 25MHz to 30MHz.
12. Replace the PD Unit X50-1340-00 in the PLL Assembly X60-1010-00.
13. Use a 3mm nutdriver to remove the 4 hex nuts mounting the VCO Unit X50-1330-00 in the PLL Assembly X60-1010-00, then remove the two phillips screws.
14. Carefully remove the VCO Unit X50-1330-00 from the PLL Assembly X60-1010-00.
15. Use the board layout of the VCO Unit X50-1330-00 to locate Q11.
16. Install C01, C02, C03, C04, C05, and T11 as needed for the band desired. (Install T11 last)
17. Replace the VCo Unit C50-1330-00 in the PLL Assembly X60-1010-00.
18. Install the connectors on the PLL Assembly X60-1010-00.

ALIGNMENT

1. Turn on TS-820
2. Tune VFO to 250.
3. Set band switch to AUX.
4. Set the TUN/NOR switch on the VCO Unit X50-1330-00 to TUN.
5. Connect a frequency counter to terminals TP5 and TP6 on the VCO Unit X50-1330-00. (TP6 is ground.)



4. CARRIER POINT (X50-1310-00)

A) Peak TX power in CW mode. Then switch to LSB and modulate with Audio Gen. (A.G.) @ 5mv 1500Hz while reducing mic. gain to 50 watts output.
B) In the CW mode connect a frequency counter to TP5 on the IF Unit (X48-1150-00) and adjust TC1 on the CAR-2 Unit (X50-1320-00) for 8.830.7MHz.
C) Adjust VR1 on the CAR-1 Unit (X50-1310-00) for equal output freq. on USB and LSB.
D) In LSB mode, check the RX and TX frequency at TP-5 on the IF Unit. It should not change.
E) With mode switch in LSB position Audio Gen. input @ 5mv, vary input frequency from 400Hz to 2600Hz and check for BALANCED output while monitoring on scope LSB to USB and vice versa.

5. SPEECH PROCESSOR (X48-1150-00)

A) Tune TX for maximum output power at 14.175MHz.
B) Set mic. gain in center and S.G. off, comp. meter on.
C) Place scope on TP2 and counter on TP3
D) Set A.G. for 10mv @ 1500Hz and modulate unit.
E) Turn processor max. "on" position, and adjust TC4 to 451.9 ± 200Hz. Adjust T11, T12, T13 for peak indication on COMP. meter.
F) Peak T14 by scope on TP2.
G) Turn processor full C.C.W. and reduce A.G. gain to 1mv @ 400Hz.
H) Adjust TC4 for max. level on scope but <u>at proper</u> frequency. (451.9 ± 200Hz) (May adjust slightly off frequency if higher peak can be obtained.)
I) Sweep A.G. frequency from 400Hz to 2000Hz and check for balanced output on LSB and USB.
J) COMP. full clockwise and @ 1500Hz adjust TC3 and VR6 for min. reading on COMP. meter.
K) At 1500Hz @ 10mv adjust VR7 to balance processor in "on" and "off" positions (same level).

6. BALANCE MOD. ADJUSTMENT (X48-1150-00)

A) In CW position adjust Tx for max. output. Key unit with mode switch in SSB position (no Mod.).
B) Adjust VR5 and TC2 for min. output level on scope.
C) Check BALANCED output LSB and USB.

SERVICE BULLETIN

from: TRIO–KENWOOD COMMUNICATIONS, INC.

No. 13

SUBJECT: TS-820 RIT Modification

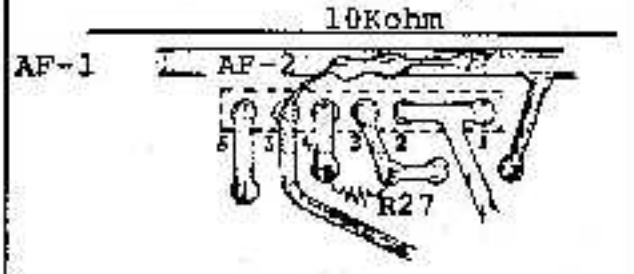
DATE 1/27/77

We have had a few reports of the TS-820 RIT tuning being "rubbery". The following information will solve this.

HOW TO MODIFY

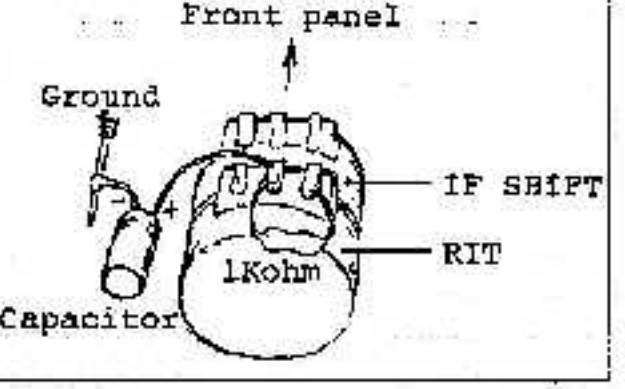
1. Remove resistor R27 (1Kohm) on AF-AVR UNIT (X49-1080-00).
2. Install a 10Kohm resistor on foil side of AF-AVR UNIT --- see Figure 1.
3. Install a 1Kohm resistor on RIT control --- see Figure 2.
4. Install a capacitor (3.3μF~10μF) between RIT control and ground --- see Figure 2.
5. Adjust VR-2 on AF-AVR UNIT (X49-1080-00) for the same frequency as the center position of the RIT control.

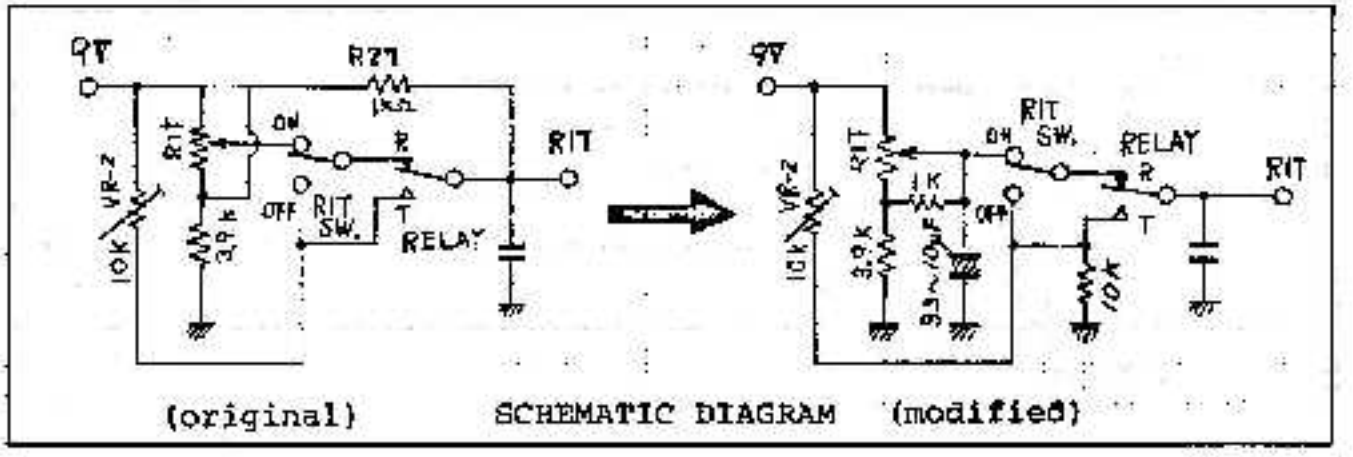
Fig. 1



Foil side of AF-AVR UNIT

Fig. 2





(original) SCHEMATIC DIAGRAM (modified)

SERVICE BULLETIN

from: TRIO-KENWOOD COMMUNICATIONS, INC.

SUBJECT: SERVICE NOTES ON TS-820 DATE 10-25-77

RECEIVER

1. Low audio output receiver sensitivity and no transmit: -6V supply is bad. Q13 on fix VOX (X50-1350-00).

2. 25KHz callibrator will not zero: ADD 3pf in parallel with TC-1 at (X52-0005-01) marker unit.

3. Receiver sensitivity down: Q2 3SK35(GR) on RF unit (X44-1150-00). +9V on PD unit is shorted. L-6 shorted to ground.

4. Intermittant receive when moving set. (Shock): Check for touching terminals at final relay socket.

5. No receiver or digital: 14V wire pinched between DG-1 chassis and ground.

6. Receiver sensitivity 40dB down: Check for shorted L-8 1.9 antenna coil on coil pack (X44-1140-00).

7. Adjacent signal interferance: See TKC bulletin.

8. No receive audio: Check for shorted TA 7201-P IC module at (X49-1080-00).

9. Poor receive audio: The 100V AC 120 volt taps were mis-wired.

10. Receiver doesn't work 20-40: Check for wafer touch to ground on band switch.

11. No DG-1, no Rx, no Tx, no VCO: Bad D-1 5 volt Zener on Relayunit (X43-1190-00).

12. RIT action seems warbly: See TKC bulletin.

13. Receiver has bad static and is noisey: Bad C14, C15 tantalum on PD unit (X50-1340-00).

14. VFO frequency shift: Check for loose tension of VFO tension spring.

15. USB - LSB will not work: Check for loose connection at C-18 CAR-1 on (X50-1310-00).

16. Intermittant audio: Check for Loose mounting screws on audio board (X49-1080-00).

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6. Adjust T11 for a frequency of 9.08MHz plus the lower limit of the band desired.
7. Connect a frequency counter to TP4 and ground on the PD Unit X50-1340-00 and verify the frequency of the reference oscillator. It may vary ±500KHz.
8. Return the TUN/NOR switch on the VCO Unit X50-1330-00 to the NOR position.
9. Turn off the TS-820.
10. Replace the covers on the PLL Assembly and reinstall it in the TS-820.
11. Replace the top and bottom covers on the TS-820.

CAUTION

Do not use magnetized tools when working on the PLL Assembly X60-1010-00. Beryllium tools would be better than ferrous ones. If the PLL Assembly X60-1010-00 should become magnetized, use a bulk tape eraser on open core AC transformer to demagnetize it.

SERVICE BULLETIN

from: TRIO–KENWOOD COMMUNICATIONS, INC.

TS-520/S, TS-820/S 8812

SUBJECT: TS-520/S, TS-820/S CW FILTER SELECT CONTROL

DATE 2/14/80

In the TS-520SE, the Heater Switch has been replaced with a CW WIDE/ NARROW select switch. For those operators who desire this type feature for their transceiver, the following information may be considered as a guideline

TS-520S Series Transceivers

1. A minature SPDT switch may be installed at the operators preference, on the rear side, or bottom panel. Use this to switch the CW or SSB filters by wiring the BROWN lead, which normally is transferred to the CW terminal on the IF unit, between the SSB filter, for WIDE, and CW filter for NARROW.
2. A "Traditional" solution has been to use the FIX CH switch, position 3 and 4 for filter switching. This may be done by completely rewiring the switch, or by leaving the switch wiring and the filter wiring as for normal operation, and bridging the following terminals:

A. FIX CH "C" terminal to IF "SSB" terminal.
B. FIX CH "4" terminal to IF "CW" terminal.
Placing the FIX CH switch to 4 will operate the SSB filter in CW Mode.

TS-820/S Series Transceivers:

1. Similar to the TS-52D series, a ministure SPDT toggle switch may be installed at the operators preference at the rear or on the bottom cover.
2. The FIX CH switch, or Digital Hold switch may be rewired to control the CW WIDE/NARROW function.

On the MODE switch, S6-1, the SSB filter control is GREEN, and the CW filter control line is GREY. Break the GREY line and connect from the MODE switch to the SPDT common terminal. Connect the GREY line to the IF unit to one terminal, and bridge the GREEN SSB line to the other Switch terminal.

JEB/yn

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SB-954

SERVICE BULLETIN AMATEUR RADIO

SUBJECT	DATE
TA7201P SUBSTITUTION PARTS KIT	07/20/89

The Toshiba TA7201P audio amplifier (Q3) used in the TS-820(S) and R-820 is no longer available. The part has been replaced with a kit (PART # W05-0257-00). This service bulletin will provide the correct installation procedures for replacing a defective TA7201P with the new kit.

1. Disconnect the power cord and antenna from the transceiver.

2. Remove the covers from the transceiver and disconnect the speaker wire.

3. Remove the AF AVR board from the bottom of the transceiver (4 screws and 3 connectors).

4. Remove the two nuts that secure the heat sink to the audio amplifier (Q3) and then remove the heat sink. FIGURE 1

5. Desolder and remove Q3, C21, C22, C26, C33, R40, R42, and R47 from the AF AVR board. C33 and R47 are mounted on the foil side of the board, but may not be installed on some models. FIGURE 1 & 2

6. Using the parts from the kit, install a 22uF capacitor in the C21 position, a 0.068uF capacitor (labeled 683K) in the C22 position, a 3.9 ohm resistor in the R40 position, and a 470 ohm resistor in the R42 position. FIGURE 1

7. Solder a 0.1uF capacitor (labeled 104K) in parallel with C30. Mount the part on the foil side of the AF AVR board. FIGURE 1

8. Remove the two nuts from the heat sink mounting screws. FIGURE 3

9. Replace the mounting screws with the ones in the kit. If the original screws have been soldered to the board, remove the excess solder and while the screws are still hot, turn the board upside down to allow the screws to fall onto the working surface. FIGURE 3

10. Secure the new mounting screws with the two nuts that were removed in step 8. FIGURE 3

11. Install the heat sink and secure it with the two hexagon bosses from the kit. FIGURE 3

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TELEPHONE: (213) 639-9000

SERVICE BULLETIN

from: TRIO–KENWOOD COMMUNICATIONS, INC. 30

SUBJECT: General Alignment Procedure for the TS-820(S) DATE 3-14-78

The purpose of this bulletin is to give a simplified alignment procedure for the TS-820 and TS-820S transceivers. We have tried to combine some of the steps and rearranged the sequence of steps so the alignment may be done quicker. This may be used in lieu of the alignment procedure in the Service Manual.

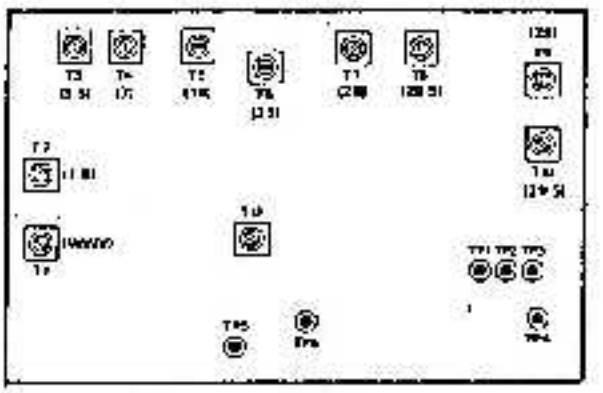
1. ADJUSTMENT, A.V.R. UNIT (X49-1080-00)

   A) Adjust VR1 for 3.3V
   B) Adjust VR4 for 9V.

2. ADJUSTMENT, V.C.O. UNIT (X50-1330-00)

   A) Place S1 to TUNE and connect a frequency counter to TP5.
   B) Adjust T1~T11 for proper frequency. (See table)

Band	Coil	Set frequency
WWV	T 1	24.08 MHz
1.8	T 2	10.88 MHz
3.5	T 3	12.58 MHz
7	T 4	16.08 MHz
14	T 5	23.08 MHz
21	T 6	30.08 MHz
28	T 7	37.08 MHz
28.5	T 8	37.58 MHz
29	T 9	38.08 MHz
29.5	T10	38.58 MHz
AUX	T11	Received signal +8.83 MHz



3. ADJUSTMENT OF COIL PACK (X44-1140-00)

   A) Turn screen grid (S.G.) switch (rear panel) off, heater switch ON.
   B) Center DRIVE control.
   C) Peak coil pack all bands for max. reading on panel meter in TX and RX (except WWV in TX).

Adjusting sequence	BAND	VFO scale
1	1.8	100
2	3.5	250
3	7	150
4	14	175
5	WWV	0 (15.0MHz)
6	21	225
7	28.5	500

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7. NEUTRALIZATION

A) S.G. switch turned off after Tx has been tuned in CW mode at 21.3MHz.
B) Adjust neutralization cap in final cage for min. output as seen on scope.

SB:ar

SERVICE BULLETIN

from: TRIO-KENWOOD COMMUNICATIONS, INC.

TS-830S #837

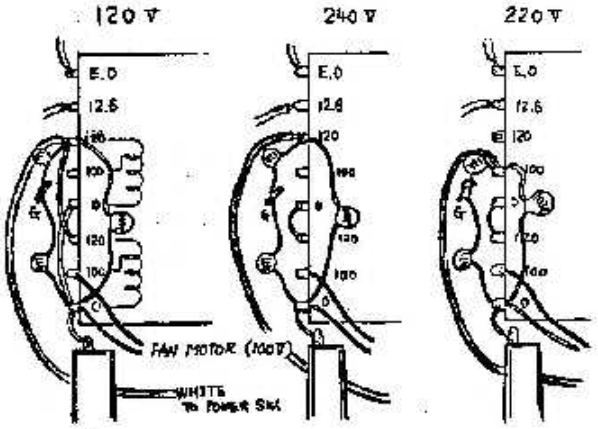
SUBJECT: TS-830S OPERATION ON 240V AC

DATE 12/15/80

To operate the TS-830S on 240V AC, the power transformer split primaries must be rewired from parallel to series connection.

1. Unplug the AC power cable.
2. Remove the bottom cover.
3. Remove the jumper wires between the two Ø terminals and two 120 terminals on the bottom of the power transformer.
4. Connect the adjacent 120 and Ø terminals at the middle of the transformer. This will provide 240V AC operation.

   For 220V A.. operation, connect the adjacent 100 to Ø winding.
5. Change the AC fuse from 6A to 4A. Tag the power cord at the back of the radio to indicate that the transformer is strapped for 240V AC, and the power fuse should be 4A, and not 6A.
6. Replace the bottom cover and reconnect power to verify your work.



JEB/yn

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SERVICE BULLETIN

from: TRIO–KENWOOD COMMUNICATIONS, INC.

TS-830S #840R

SUBJECT: TS-830S Frequency Shift

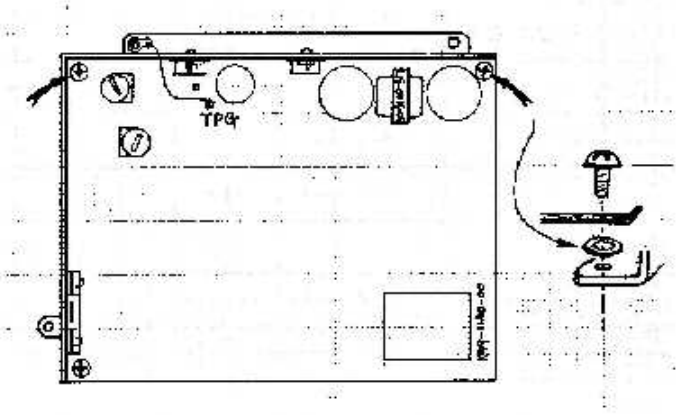
DATE 04/14/82

Some users may report an intermittent shift in display and operating frequency. This may typically be a 1 to 4 KHz random shift. Cause will be a loose grounding screw on the AF-AVR unit heat sink.

On the AF-AVR unit X49-1140-00, there are three self-tapping screws holding the aluminum heat sink to the PCB. These also supply the ground connection to that section of the board. Between the heat sink and PCB foil, add a tooth-lock washer N17-1030-41 at the two self-tapping screws shown. (The remaining screw already has a tooth-lock washer.) When replacing the board to the chassis, add a solder lug E23-0420-05 to the heat sink mounting screw as shown, and tighten all screws for this board. Solder an insulated lead between the TPG (Test Point Ground) wrap post adjacent to C81, and the added solder lug.

Procedure:

1. Remove the top cover (8 screws) and unplug the speaker.
2. Remove the bottom cover (8 screws).
3. Remove 5 screws holding the AF-AVR unit and swing the board over. Leads do not have to be unplugged.
4. Add two tooth-lock washers as shown.
5. Replace the circuit board and heat sink to the chassis, adding the solder lug as shown.
6. Solder a jumper between the TPG wrap post and the added solder lug.
7. Replace the top and bottom covers.



Installation time for this procedure is ½ hour or less.

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TRIO-KENWOOD COMMUNICATIONS, INC.
1111 WEST WALNUT STREET - COMPTON, CALIFORNIA 90220
MAILING: P.O. BOX 7066 - COMPTON, CALIFORNIA 90224

SERVICE BULLETIN

from: TRIO–KENWOOD COMMUNICATIONS, INC.

TS-830S #847R

SUBJECT: TS-830S low voltage Supply Optional Improvements | DATE 04/14/82

Power supply drift and stability may be improved by these optional component changes and additions.

On the AF AVR unit X49-1140-00 (Vicinity of Q27-Q30) change:

R124 from 1kΩ to 1.5kΩ (RD14CB2E152J) *
R127 from 470Ω to 390Ω (RD14CB2E391J) *
R130 from 47kΩ to 33kΩ (RD14CB2E333J) *
D25 from WZ-061 to XZ-053 (V1I-4101-60)*

*This will improve temperature drift from a maximum of about 100mV to a maximum of 10mV, and may be applied to any unit before serial # 201xxxx.

Add two 22kΩ ½W resistors (RD14CB2E223J), one each across Q30 & Q34, collector to emitter. *

*This will improve overall stability and may be applied to any unit before serial #105xxxx.

NOTE: These changes are at the owners option and may not be performed in-warranty.

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SERVICE BULLETIN

from: TRIO–KENWOOD COMMUNICATIONS, INC.

#851R

SUBJECT: TS-830S Noise Blanker Optional Improvements | **DATE** 7/26/82

Receiver Cross-modulation while using the noise blanker may be improved by these optional component changes and additions. Realignment is not required.

At the Noise Blanker level control VR8, change R19 from 22Ω to 15Ω (RD14BB2E150J)*

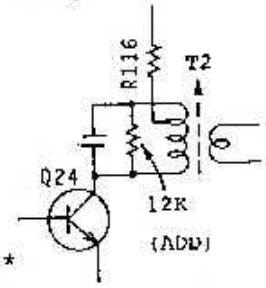
On the AF AVR unit X49-1140-00 (vicinity of Q20) change:
D22 from an MV-13 to an MV-203 (V11-3379-16)*
R96 from 2.2kΩ to 820Ω (RD14CB2E821J)*

(vicinity of Q24)

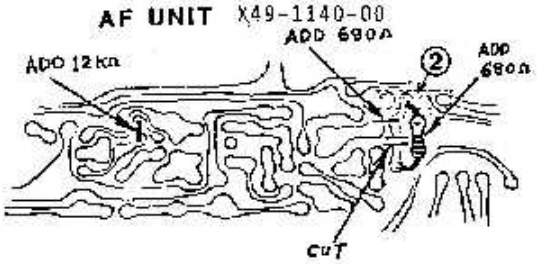
R112 from 47KΩ to 56KΩ (RD14CB2E563J)*

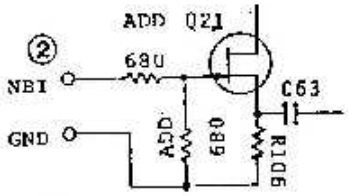
Across T2, (Fig. 1) add a 12KΩ (RD14CB2E123J)*

At Q21 (Fig. 2,3) add 2 pcs. 680Ω (RD14CB2E681J)*



AF UNIT X49-1140-00





NOTE: 1. Applies to any unit before serial: 2010000*, 1120950*, 1112058*.
2. These changes may be performed at the owners option and may not be performed in-warranty.

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SERVICE BULLETIN

from: TRIO–KENWOOD COMMUNICATIONS, INC.

TS-830S #857

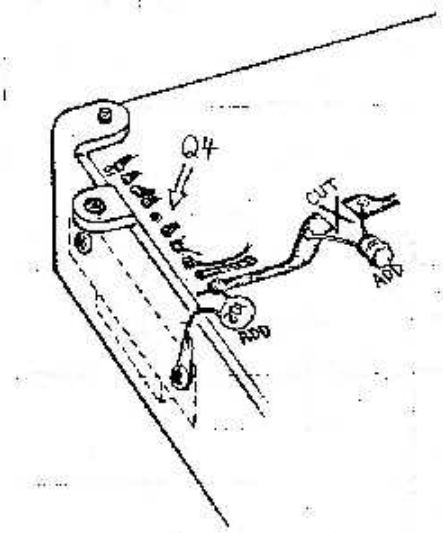
SUBJECT: TS-830S Transmitter "Talkback"

DATE 2/11/82

Transmitter "talkback", either with or without a linear amplifier, may be eliminated by adding a filter at the receiver audio power amplifier.

On the AF unit X49-1140-00 at Q4, cut the 12V DC B+ line between R47 and C28, and add a 1μh choke (L40-1092-02) in-line. Add a .01μF cap (C52-1710-36) from the IC pin 1 to ground, as shown using a 3mm lug (E23-0015-04) under the IC mounting screw on the Heat Sink.

Note: Installation time for this procedure is 1/2 hour or less.



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