

May 23, 1974

SB-100  
SSB Transceiver

Bulletin No:  
SB-100-1

### **Diode Leakage In The SB-100, SB-101, HW-100**

The silicon diodes used in the SB100 & SB101 are standard power diodes rated at 500PIV & 750MA. For each condition described, the diodes should be replaced with an equal value to maintain proper operation.

1. Diodes D902 & D903, when leaky, will have an effect on ALC indication. The ALC indication will be normal for the first half hour to an hour. Then the meter indication will start dropping off until there is very little indication.
2. D101, when leaky or defective, will cause slow or no receiver recovery after transmitting for any period of time.
3. D905, under leaky conditions, will cause very slow or no receiver recovery and false meter indications. The meter will kick up scale & slowly drift down to zero.
4. D201 will result in a decrease in VOX sensitivity to the point where the VOX circuit will not be activated. It can also result in increasing VOX delay, causing the relay to stay in the transmit condition.

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May 23, 1974

SB-100  
SSB Transceiver

Bulletin No:  
SB-100-2

### **Alternate Method of Neutralizing the Final Amplifiers**

**NOTE:** Be sure unit is off and power supply high voltage capacitors are discharged.

1. Disconnect final plates & screen grid.\*\*\*
2. Turn unit on.
3. Rotate the BAND switch to 28.5.
4. Place the VTVM RF probe in the ANTENNA connector.\*\*
5. Set the FUNCTION switch to TUNE.
6. Rotate the LEVEL control fully clockwise.
7. Adjust the PRESELECTOR control for a maximum reading on the VTVM.
8. Adjust the FINAL control for a maximum indication on the VTVM, with the LOAD control set at the 50 ohm position.
9. Using an insulated screwdriver, adjust neutralizing capacitor for a MINIMUM indication on the VTVM.
10. Readjust the neutralizing capacitor for a minimum indication on the VTVM.
11. Turn the FUNCTION switch to the off position.

12. Discharge high voltage power supply capacitors.

13. Reconnect final plates & screen grid.

\*\*VTVM & RF probe will be needed.

\*\*\*To remove screen voltage in SB-100, SB-101, HW-100 & HW-101 disconnect R920 (100 ohm resistor) from buss wire between pins of V8 & V9. In the SB-102 removal of accessory plug is all that's required. To remove high voltage in SB-100, SB-101 & SB-102 disconnect red wire at lug 4 (in Sb-100 lug 3) of terminal strip BK that goes to grommet BL. In HW100 & HW101 disconnect red wire going to lug 1 of RF choke in final cage.

**NOTE:** Take adequate steps to eliminate any possible contact with B+ or B+ shorts to chassis after disconnecting wire & resistor.

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May 23, 1974

SB-100  
SSB Transceiver

Bulletin No:  
SB-100-3

### **SB & HW Series Audio Preamplifier & VOX Circuit Trouble Shooting Guide**

It is assumed that the basic steps such as making DC voltage measurement, checking tubes & reviewing the soldering have been completed.

The following information was compiled from the above transceivers in the **80M LSB** position. The mike level control was at the 9:00 o'clock position.

AC signal voltages are listed below. These voltages were measured from the microphone connector through the VOX circuit. All measurements were made with a VTVM. A microphone or audio generator for .1V @ 1KHZ can be used as the signal source.

Mike Connector Lug 1	.1VAC
Pin 2 of V1	.02VAC
Pin 6 of V1	10-15VAC
Pin 6 Level Control	10-15VAC
Pin 5 Level Control	.5VAC
Pin 9 of V1	.2VAC
Pin 8 of V1	.1 - .3VAC
Center Arm of VOX Sensitivity Control	5-15VAC
Pin 7 of V17	5-10VAC
Pin 6 of V17	40-50VAC
Junction of C211-D201	40-50VAC
Pin 9 of V12	9-15VAC

By tracing the AC signal from stage to stage the point of trouble can be isolated & steps taken to correct it.

#### **POSSIBLE TROUBLE AREAS**

- Check each of the shielded cables for a possible open or poorly grounded shield.
- Check for continuity through each of the shielded cables.
- Check for a proper ground at the mike control level.
- If the frequency response of the audio stage is not within specifications check the values & installation of C1, C2, C3 & C9.
- A change in VOX delay after operating for a period of time can be caused by leakage in diode D201.

The other possibility is a change in value of capacitor C213. Either component could experience a change in operation characteristics due to heat.

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May 23, 1974

SB-100  
SSB Transceiver

Bulletin No:  
SB-100-4

### **SB & HW Series Instability and Corrective Information**

We suggest you check for each of the following possible causes:

1. Intermittent, rosin or cold solder joints.
2. Loose hardware at the tube sockets, terminal strips, circuit boards, shields and rear panel sockets.
3. Poor lead dress at tube sockets V8 & V9. The component leads must be short as possible.
4. Check C925 (Final tune capacitor) to be sure it is isolated from the tuning shaft. This is to prevent RF from traveling on the shaft to the front panel.
5. Check all edges of the final enclosures for proper grounding to the main chassis.
6. Check the hardware for the side rails to be sure a good ground is being provided.
7. Be sure that all the ground clips on the coil cover are making good contact with the switch shields.
8. Check the soldering of the switch shields to the center pins of tube sockets V6, V7, V10 & V11.
9. Check the ground leads from the switch board & shields, to be sure they are going to ground foil & not to the preselector capacitor foil pods on the RF driver board.
10. Check for broken or shorted pigtailed on each of the shielded cables in the unit.
11. Check RFC801 & L901 for any signs of deterioration or physical damage, (burn spots). If apparent replace the part.
12. Improper adjustment of the Het. Osc. coils could cause improper mixing action, resulting in the final operating at a different frequency appearing as instability.
13. Change driver & final tubes then reneutralize per manual instructions.
14. Check driver tube shield to be sure that it has a good ground contact with the socket spring clip.
15. Check for a good ground between the front panel & chassis.
16. Check the SWR of the antenna system at the frequency of operation. Should be below 2:1.
17. Check the antenna coax for leakage, poor connectors & broken shield connections.
18. Is the transmitter properly grounded?
19. Be sure all shields & tube shields are installed.
20. Realign using a properly terminated 50 ohm non-reactive dummy load. **NOTE: This does not include a light bulb.**
21. Check for normal Het. Osc. test-point voltage.
22. Check for proper LMO injection voltage 1.0-1.5 VRF.
23. Check for a high AC ripple content in the LV-B+, HV-B+ and bias voltages from the power supply.
24. Check to be sure that the shafts do not touch each other in the insulated coupling, and that the set screws do not touch the PA shield.
25. Check to be sure that the PA tune shaft turns the variable capacitor & is not slipping in the insulated coupling.

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December 18, 1974

SB-100  
SSB Transceiver

Bulletin No:  
SB-100-5

### **Oscillations or Low Drive**

Loose boards cause sporadic self oscillations & unstable RF conditions, particularly at the high [15 & 10 meter] bands. The comb brackets which have been used are aluminum & could not be soldered. Steel brackets are now available [PN 204-2096] & should be used whenever encountered in the field. Both the switch shields & the driver boards should be soldered to these brackets.

This change helps to increase grid drive as well as increase stability.

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May 2, 1975

SB-100  
SSB Transceiver

Bulletin No:  
SB-100-6

**Self Oscillations Occurring After Installation  
of Steel Comb Brackets.**

It has been found that in a number of units, self oscillations are still occurring after installation of both steel comb brackets [Part No: 204-2096]. To correct the condition, the screws around the RF driver board must be tightened securely. Also, the lockwashers between the circuit board & chassis must be installed, otherwise a good ground is not assured. Retightening screws which are already snug will also cause these oscillations to disappear in units where it is a problem.

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March 26, 1976

SB-100  
SSB Transceiver

Bulletin No:  
SB-100-7

**S-Meter Drift**

To bring the meter drift to an acceptable level, install the following:

**CHANGE:** R107 from 100K Ohm 1/2 Watt to 100K 1 Watt  
[PN 1-28-1]

This makes the voltage divider string more stable with temperature changes caused by internal heating.

This change will be made in future production runs.

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September 27, 1977

SB-100  
SSB Transceiver

Bulletin No:  
SB-100-8

**Transmitter Oscillates in Transmit with the Mic Keyed**

+ + + + *Information not yet available* + + + +

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February 22, 1978

SB-100  
SSB Transceiver

Bulletin No:  
SB-100-09

**Tuning Erratic**

Some of the earlier LMOS can be opened up for service, such as cleaning the wiper contacts on the tuning cap when tuning becomes erratic. Some of these units have fiber washers between the frame of the tuning capacitor and the worm gear assembly. Intermittant contact between the teeth of the gears can change the ground path for the tuning cap and also cause erratic tuning. Simply replacing a fiber washer with a metal washer will give good connection between the tuning cap frame and the worm gear assembly to eliminate this problem.

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June 5, 1978

SB-100  
SSB Transceiver

Bulletin No:  
SB-100-10

### **Relays Remain Energized After Transmit Condition**

After keying the transceiver with PTT for thirty to forty seconds, a positive voltage in excess of 10 volts appears at the control grid, pin 9 of V12, thus keeping the relays energized.

To correct the problem, replace V12 [PN 411-124]. IEC brand tubes have been found defective in several cases, but other brands may also cause this problem.

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June 5, 1978

SB-100  
SSB Transceiver

Bulletin No:  
SB-100-11

### **Poor AGC Action**

Leakage in the 6HS6 [PN 411-247] at V10 and/or V11 has been found to cause:

- Poor AGC action
- Fast S-Meter decay,
- Poor sensitivity when RF gain control is fully clockwise.

This usually occurs after warmup of at least an hour. A positive voltage, usually over 1 volt, will appear at the grid, pin 1 of either one or both tubes.

Replacement of the tube with the positive voltage corrects the problem.

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June 5, 1978

SB-100  
SSB Transceiver

Bulletin No:  
SB-100-12

### **100KHZ Calibrator Spurs**

Strong signals may occur at other than 100 KHZ points.

Look at the calibrator output [ahead of output diode] with an oscilloscope. Use high input gain and a slow sweep speed. If the upper portion of the sine-wave signal appears choppy or uneven, the Y201 crystal may be at fault.

After installation of a new crystal [PN 404-43], recheck with an oscilloscope.

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July 24, 1978

SB-100  
SSB Transceiver

Bulletin No:  
SB-100-13

### **LMO Drift; Intermittent Frequency Shift**

Check for a dirty or corroded phono connector on the rear of the LMO. Clean if necessary.

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July 24, 1978

SB-100  
SSB Transceiver

Bulletin No:  
SB-100-14

### **Poor Preselector Tracking**

This problem is more noticeable on the 10-meter band. It may be caused by the drive belt slipping or by one of the variable capacitors not turning due to excessive friction in its bearings.

Check the belt for being loose or worn and replace as needed. Lubricate the bearing of the variable capacitors.

If lubricating the capacitor bearings does not allow the rotor to turn freely, replace the capacitor [PN 26-122].

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July 24, 1978

SB-100  
SSB Transceiver

Bulletin No:  
SB-100-15

#### **Carrier Nulls With IC14 Trimmer Plates Completely Meshed**

If C14 nulls the carrier with its plates fully meshed toward V2 [to the right], relocate C18, 12pf capacitor, to the other section of the null trimmer [C14].

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August 7, 1978

SB-100  
SSB Transceiver

Bulletin No:  
SB-100-16

#### **Relays Chatter In VOX Mode**

This may occur when the VOX gain is in the near-full CW position with the MIC level advanced past the 12 o'clock position. Also, the unit will not return to receive when the operator stops talking.

Check the tube at V1. A "GE" tube will tend to oscillate, thus causing the above problem. Other 6EA8 tube brands should operate properly at V1.

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August 7, 1978

SB-100  
SSB Transceiver

Bulletin No:  
SB-100-17

#### **Loading Capacitor Turns As Plate Capacitor Is Rotated**

This problem can be caused by:

- Insufficient friction in the loading capacitor or;
- Excessive friction between the plate and load tuning shafts.

If the problem persists after freeing and lubricating the shafts, install a rubber grommet [PN 73-3] on the loading capacitor shaft between the pulley and the RF cage. Apply slight pressure to the grommet as the pulley set-screw is tightened. This will add enough friction to keep the loading capacitor still while tuning the plate control. Use only as needed.

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August 7, 1978

SB-100  
SSB Transceiver

Bulletin No:  
SB-100-18

#### **"Chirping" and Slow Receiver Recovery**

If "chirping" of the audio in the receive mode and slow recovery of the receiver after long periods of transmitting are encountered, remove the cover of RL2 and check for carbon buildup at the base, just below the contact. Clean dirt or carbon tracks, or replace if necessary.

A dirt or carbon buildup will cause the +300 volts to be applied to adjacent contacts such as the bias or AGC lines, adversely affecting receiver cutoff by upsetting the operation of 1) V12, receiver mixer; 2) V10, RF amplifier; and 3) V11, first receiver mixer.

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August 22, 1978

SB-100  
SSB Transceiver

Bulletin No:  
SB-100-19

### **S-Meter Drift**

If the S meter drops below zero and pins after 1/2 hour of operation, there may be leakage in one or more of the following tubes: V3, V4, V10 or V11. New RCA tubes may exhibit the same problem. The following procedure will aid in finding the leaky tube:

1. Disconnect R415 to isolate V3 and V4 from the AGC line. Monitor the control grid at P1 of V3 for several minutes. If the voltage drifts in the positive [+] direction, V3 or V4 is leaky. Proceed to step 2. If the voltage remains stable, go to step 5.

2. Remove the white/blue wire from pin 2 of T102 and repeat the test. This will isolate V4 from V3. If the voltage still drifts, V3 is at fault.

3. To verify, reconnect the white/blue wire and then disconnect R101. Monitor the voltage at pin 1 of V4. The voltage should remain stable.

4. Reconnect R415 and R101.

5. Disconnect R408 and check the voltage at pin 1 of V10. If voltage drifts, replace V10. If the voltage is stable, replace V11.

6. Reconnect R415 and R408.

Straight substitution with new tubes may not work if more than one tube is causing the problem, since even a small leakage can cause the drift. When you replace a tube, check for stable voltage at its control grid. Replace with the tube which gives most stable voltage.

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September 26, 1978

SB-100  
SSB Transceiver

Bulletin No:  
SB-100-20

### **Poor IF Sensitivity**

Check C101. It may have inadvertently been wired to point 2. It should be wired to point 15. It is an "easy-to-overlook" wiring error that would cause the transceiver to have low if sensitivity which would result in poor receiver sensitivity and low power output.

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April 25, 1979

SB-100  
SSB Transceiver

Bulletin No:  
SB-100-21

### **Low Power Output; Poor VOX Sensitivity**

It has been determined that Sylvania, RCA and Westinghouse brand tubes do not function properly at locations V3 and V4.

The brands found to work at these locations are: El-Menco, IEC, General Electric and Realistic.

Westinghouse tubes at other locations throughout the unit may cause low power output and VOX problems. It is suggested not to use Westinghouse tubes at all.

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January 21, 1980

SB-100  
SSB Transceiver

Bulletin No:  
SB-100-22

**Low Grid Drive on Certain Portions of One or More Bands**

+++ *Information not yet available* +++

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April 10, 1980

SB-100  
SSB Transceiver

Bulletin No:  
SB-100-23

**Germanium Diode Change**

+++ *Information not yet available* +++

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December 17, 1980

SB-100  
SSB Transceiver

Bulletin No:  
SB-100-24

**VOX Oscillation**

+++ *Information not yet available* +++

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That's all that is listed for the SB-100 up to 1989. Enjoy!