

JOHNNY'S COPY

KD5EXR & W5BOB 6 Meter Receiving Converter

Refer to 6 meter receiving converter schematic diagram.

All resistors 1/4 watt except 330 ohm resistors are 1/2 watt.  
All capacitors are microfarads (uf) except where indicated.

L1 : 0.6 uh coil. 7 turns No. 20 solid buss or enamel wire, 5/8 inch diameter, 1/2 inch long. Tapped at 1.9 turns and 3.1 turns from ground end.

L2 : 0.35 uh coil. 6 turns No. 20 solid buss or enamel wire, 5/8 inch diameter, 1/2 inch long.

L3 : 2.7 uh coil. 17 turns No. 24 enamel wire close wrapped for 1/2 inch on 3/8 inch slug tuned form. Tunes 14 Mhz with 47 pf.

L4 : 2 turns No. 22 insulated wire close wrapped over cold end of L3.

L0 : 1.3 uh coil. 11.8 turns No. 20 solid buss or enamel wire, 5/8 inch diameter, 3/4 inch long, tapped at ~~2.8~~ turns from cold end. <sub>3.8</sub>

C1, C2, C0, : Trimmer capacitor, 5-30 pf, Mouser PN 24AA023, \$1.05 each.

1 5 pf capacitor: Radio Shack PN 272-120, \$.49.

1 12 pf capacitor:

1 47 pf capacitor: Radio Shack PN 272-121 \$.49.

4 .001 uf capacitors: Radio Shack PN 272-126, pkg of 2, \$.59.

1 .047 uf capacitor: Radio Shack PN 272-134, pkg of 2, \$.49.

1 100 uf capacitor, 50 volt: Radio Shack PN 272-1044, \$1.19.

3 330 ohm, 1/2 watt resistors: Radio Shack PN 271-1113, pkg of 5, \$.49.

1 270 ohm, 1/4 watt resistor: Radio Shack PN 271-1314, pkg of 5, \$.49

2 100 k ohm, 1/4 watt resistor: Radio Shack PN 271-1347, pkg of 5, \$.49

1 3.3 k ohm, 1/4 watt resistor: Radio Shack PN 271-1328, pkg of 5, \$.49

1 Diode: Radio Shack PN 276-1102, \$.59

3 MPF102 FET transistors: Radio Shack PN 276-2062, \$.99 each.

1 Y1 : 36.00 Mhz crystal, HC18/U, for receiving converter, Tolerance 50 ppm, 32 pf load capacitance, \$11.00:  
Jan Crystals: 1-800-526-9825

NOTE: The below item is not included in receiving converter:

- 1 36.00 Mhz crystal, HC6/U, for transmitting converter, Tolerance 50 ppm, 32 pf load capacitance, \$11.00: Jan Crystals: 1-800-526-9825

Aluminum enclosure : 5-1/4 x 3 x 2-1/8 inch, Radio Shack PN 270-238 \$2.79

Panel mount DC connector for 12 volt adapter, Radio Shack PN 274-1582 \$1.99

SO-239 connectors: 2, Radio Shack PN 278-201 \$1.99 each.

Standoffs: Radio Shack PN 276-1381, \$2.19.

Switch: SPST, Radio Shack 275-634, \$2.79

AC Power Adapter: 12 volt, Radio Shack 273-1652, \$12.99

PC board: One side, etched as shown.

#### Aluminum Box Preparation:

1. Before mounting any components on the PC board, lay the board on top of the aluminum box, foil side up. Center the board and, using a pencil, mark the 4 1/8 inch mounting holes and the 1/4 inch coil mounting hole.
2. Drill out the 4 mounting holes with a 1/8 inch bit. Drill the coil mounting hole with a 1/4 inch bit.
3. Mark the centers for the SO-239 connectors as shown on each end of the box as shown and drill out to 5/8 inch. A chassis punch is best to make these holes. Next, insert the SO-239 connectors into the cut-out and mark and drill the screw holes with a 1/8 inch bit.
4. Mark the centers of the DC connector and the switch and drill these out using a 3/8 inch bit for the DC connector and a 3/16 inch bit for the switch.

#### PC Board Preparation:

1. Drill all component mounting holes in PC board using a #57 bit (.043 inch).

#### Coil Preparation:

1. Wind coils L1, L2, and L0 on a 5/8 inch form. Keep the windings adjacent to each other. When the proper number of turns have been completed the coil can be evenly 'stretched' to the proper length. Allow an extra inch at each end of the coil for insertion into the PC board.
2. Do not solder any taps to the coil at this time.

Assembly Instructions:

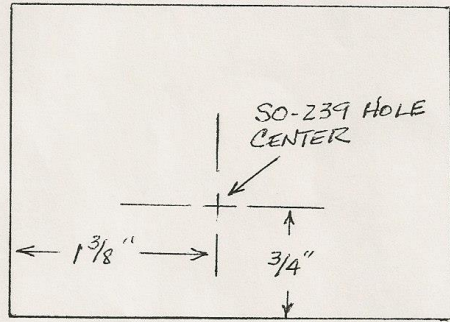
1. Mount all resistors, capacitors, and the diode on the component side of the PC board and solder all of these components to the foil side. Observe polarity and use a heat sink when soldering the diode. Also, observe the positioning of the trimmer capacitors. The leg of the rounded end should go to the ground connection of the foil.
2. Mount and solder the 3 FET's, taking care to place the flat side of each transistor in the proper direction. Use a heat sink on the transistor legs when soldering.
3. Mount and solder the crystal into place. Use a heat sink when soldering.
4. Mount each coil into its proper position on the board and slightly adjust the ends if necessary so that the coil sits squarely on the board. Once the coil is in the proper position then solder each end. Adjust the windings slightly if necessary so that they are evenly spaced.
5. To solder taps on the coils, run a short piece of #20 buss wire through the proper PC board tap mounting hole and position so that one end is near the proper tap on the coil. Now solder the buss wire to the PC board. Then position the free end of the buss wire on the coil where it is to be tapped and solder in place. Take care not to 'bridge' the solder between adjacent coil windings.
6. The mixer output coil is mounted in the 1/4 inch hole on the component side of the board with the slug adjustment on the foil side. Wire the drain of the mixer to the end of the coil nearest the board. Wrap 2 turns of hook-up wire around the upper end of the coil and twist the 2 ends together for about 2 inches to enable it to be connected to the SO-239 output connector. Solder a 47 pf capacitor across the coil terminals.
7. Connect about 3 inches of insulated hook-up wire to the RF input of the PC board and twist together. These will be connected to the input SO-239 connector.
8. Connect a short piece of hook-up wire to the DC input foil on the board. This should be long enough to reach the switch when the board is mounted in the box.
9. Mount the insulated stand-offs to the PC board. Now mount the board in the box.
10. Solder the input and output twisted pairs to the SO-239 connectors, removing any excessive wire lengths. Also connect the DC power connector through the switch to the board.

### Testing and Alignment

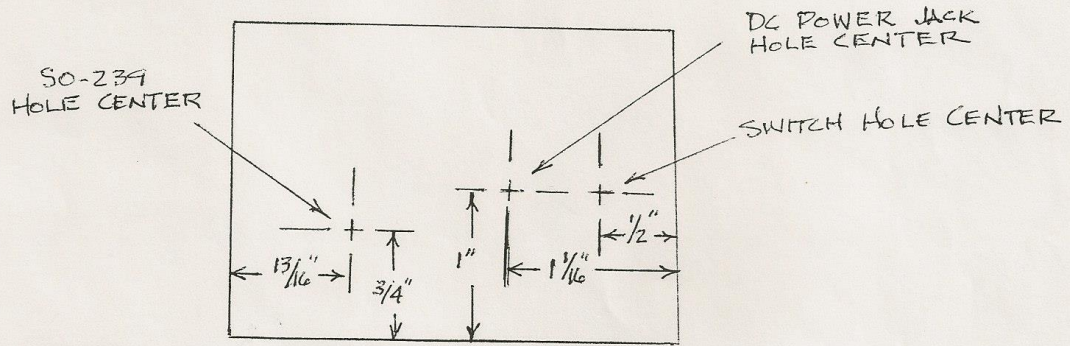
1. Use an ohm meter to verify that no DC points read directly to ground (common) points on the PC board.
2. Once satisfied that no direct shorts are present, attach a volt meter between the cathode side of the diode and ground. Briefly apply power (Positive 11 to 15 volts DC) to the circuit and verify that the correct voltage is present. The voltage measured on each end of the 330 ohm resistors should be within 1.5 volts of each other. Once this has been verified the circuit can be powered continuously.
3. Tune a receiver to 36.0 Mhz and adjust C0 until the oscillator is heard and is running at 36.0 Mhz.
4. Connect a receiver tuned to 14.20 Mhz to the output of the converter. Connect a signal generator tuned to 50.20 Mhz to the input of the converter.
5. Adjust C1, C2, and L3 for maximum signal strength into the receiver while gradually decreasing the 50.20 Mhz signal level.

### Specifications:

Frequency input: 50.0 - 50.5 Mhz  
Frequency output: 14.0 - 14.5 Mhz  
Bandpass +/- 1 db: 0.6 Mhz.  
Voltage Required: + 11 to + 15 volts DC  
Current Required: 8.4 milliamps at 15 volts  
Oscillator: 3.3 ma.  
RF Amp: 4.4 ma.  
Mixer: 0.7 ma  
Sensitivity with FT-767 (FM mode):  
20 db quieting: .15 microvolt  
40 db quieting: 1.3 microvolt  
S Meter, S7+: 5.0 microvolt

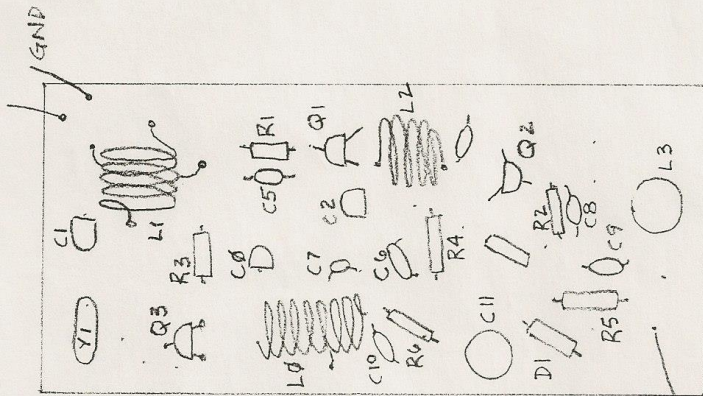


SIGNAL INPUT END

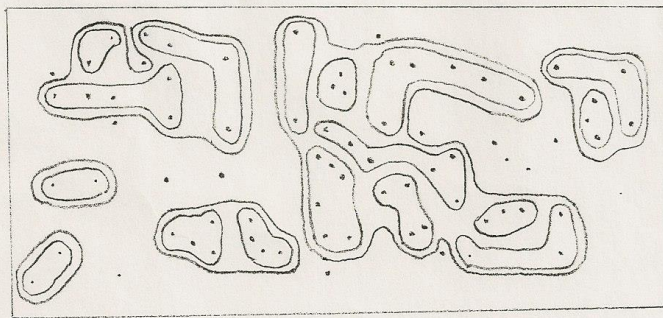


SIGNAL OUTPUT END

TO 50MHZ INPUT  
SO-Z39



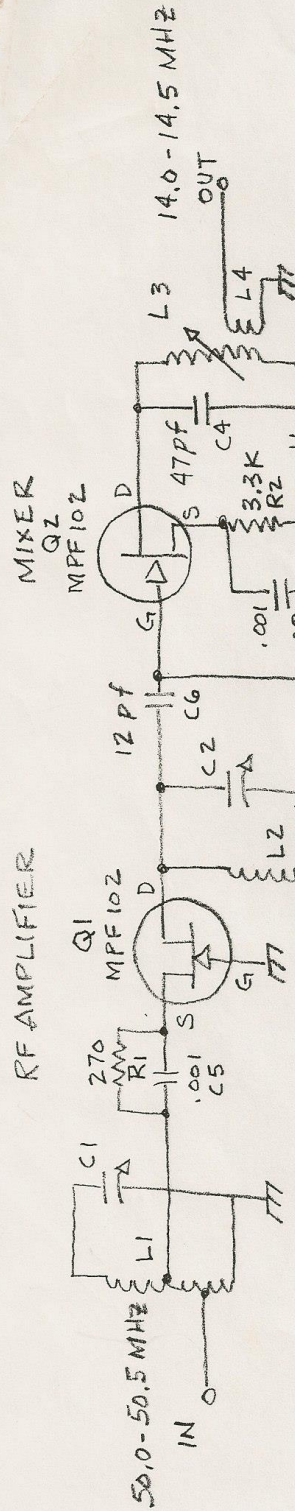
COMPONENT SIDE  
COMPONENT LOCATION



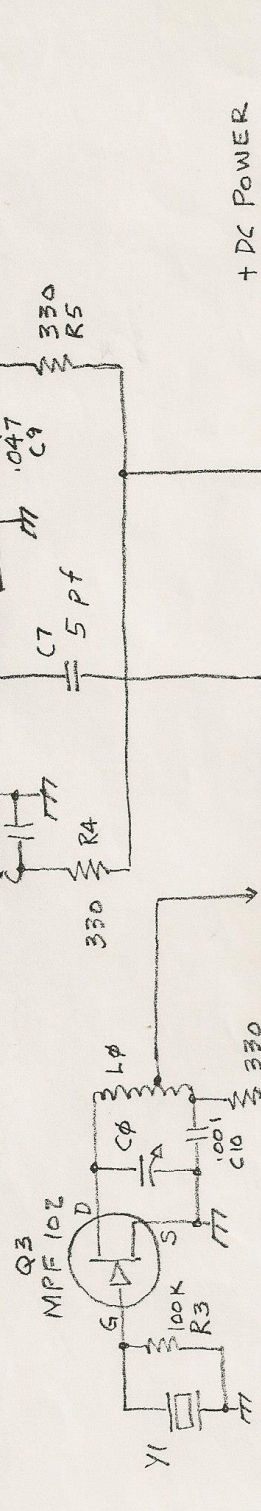
ETCH PATTERN  
FOIL SIDE

# WSBOB 6 METER RECEIVING CONVERTER

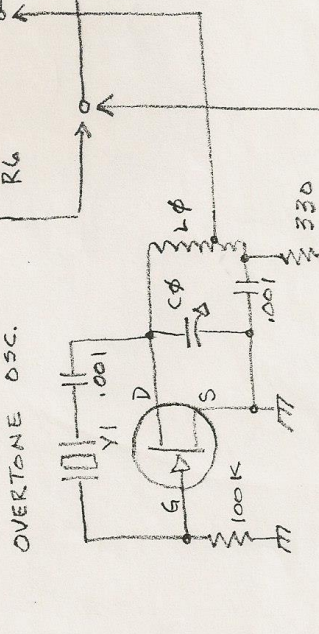
## RF AMPLIFIER



## MIXER



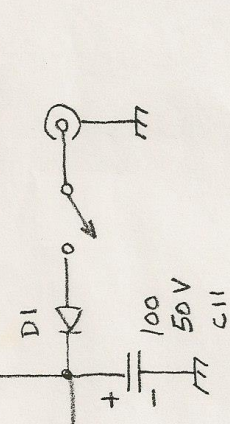
## OVERTONE OSC.



## PIERCE OSC. (OPTIONAL)



+ DC POWER



14.0 - 14.5 MHz

OUT

50.0 - 50.5 MHz

IN