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June 16, 1992

J.H. Hugo, ZS1JH
P.O. Box 12
Paarl 7622
South Africa

Dear OM:

The number you gave for the SSB GENERATOR board is the number for the blank board (no parts installed). The finished board number is 80131.

We have included instructions and schematics for both versions of the SSB Generator board in the Triton II.

If you need further assistance, please don't hesitate to contact us.

Sincerely,

A handwritten signature in cursive script that reads 'Rick'.

Rick Long, KE5XY
Customer Service

80131 SSB GENERATOR *NEW STYLE*

Transistor Q1 operates as a crystal controlled carrier generator. Capacitors C1, C2 and C3 set the crystal to the proper frequency for USB, LSB and CW. Capacitor C1 sets the crystal to the high frequency side of the filter passband. A positive 8 to 12 V at terminals "LSB" and "CW" will cause transistor switches Q2 and Q3 to place capacitors C2 and C3 in the circuit. These capacitors will set the crystal to the low frequency side of the filter passband. Both the upper and lower frequency carriers are positioned approximately 15 dB down on the filter skirts. For CW operation, the "CW" pin is brought to ground with a suitable switch. This removes capacitor C3 and places the generator in the filter passband. Frequency change is approximately 750 Hz. The total output of the oscillator is brought out to a terminal pin for use as a BFO. A portion of this output is fed to the balanced modulator, CA3053. The balanced modulator is an integrated circuit differential amplifier. Using an integrated circuit insures good balance under varying voltages and temperatures. The balanced modulator output passes through a four crystal filter terminated in 470 ohms. Transistors Q4 and Q5 are used as a microphone amplifier. When terminal CWU is grounded (CW and LOCK modes), the modulator is purposely unbalanced to allow the CW carrier to pass through.

Alignment - Proper alignment of the SSB generator requires the use of a frequency counter and either an rf VTVM or oscilloscope with a response extending to 9 MHz. T1 is first peaked in the center of the passband of the crystal filter and then C1, C2 and C3 are adjusted to set the carrier oscillator frequencies to the upper and lower skirts for SSB operation and 750 Hz up from the lower skirt for CW transmitting. Frequency adjustments should be kept within ± 20 Hz.

- 1.) Connect the frequency counter to the junction of R6 and R7. R7 is the 150 ohm resistor in the oscillator emitter lead. If there is no dc blocking capacitor in the input of the counter, connect the input through a .01 uF capacitor.
- 2.) Jumper the CWU terminal pin on the SSB assembly to chassis ground.
- 3.) Connect either the VTVM or oscilloscope to the OUTPUT pin terminal on the assembly.
- 4.) Set MODE switch to SB-R position and apply power.
- 5.) Adjust capacitor C1 for a frequency reading of 9,001,500 Hz. This adjustment is a temporary one to place the oscillator in the center of the passband.
- 6.) Peak T1 for maximum reading on the VTVM or 'scope. Reading should be approximately 0.5 to 1 volt, rms.
- 7.) VTVM or 'scope may now be disconnected. Remove CWU jumper.
- 8.) Readjust C1 now for 9,003,500 Hz.
- 9.) Set MODE switch to LOCK position, DRIVE control fully CCW. Adjust C2 for 9,000,600 Hz.
- 10.) Set MODE switch to SB-N position, DRIVE fully CCW. Adjust C3 for 8,999,850 Hz.
- 11.) Repeat steps 8, 9 and 10 in sequence until no further adjustments are necessary. C2 and C3 both determine the 9,999,850 Hz frequency and both affect the C1 setting slightly, so readjustment of all three usually is necessary after any one is changed.
- 12.) Reconnect the VTVM and null the carrier in SB-N position with the CARRIER BALANCE trimpot, R10.

Pin Voltage Readings - (SB-N mode, no signal.)

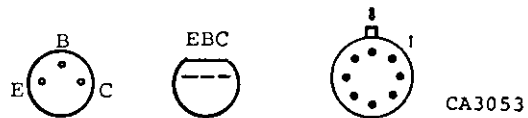
Pin	Receive		Pin	Receive	
	Transmit	Receive		Transmit	Receive
GND	0	0	OUTPUT	0	0
LBS	7	7	MIC VOL	0	0
CW	13	13	MIC VOL	0	0
+8.5	8	8	GND	0	0
T	9*	0	MIC	0	0
+8.5	8	8	RX I.F.	0	0
BFO	5.5	5.5	CWU	5.5	5.5

*In LOCK mode, variable between 1 and 9 V, depending on position of DRIVE control.

Transistor Voltage Readings

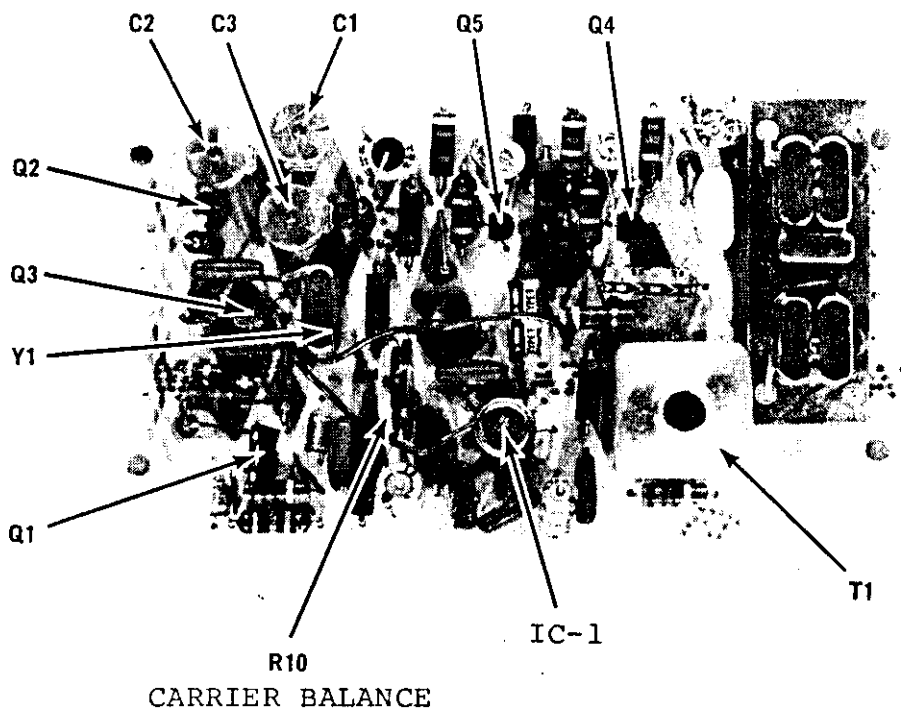
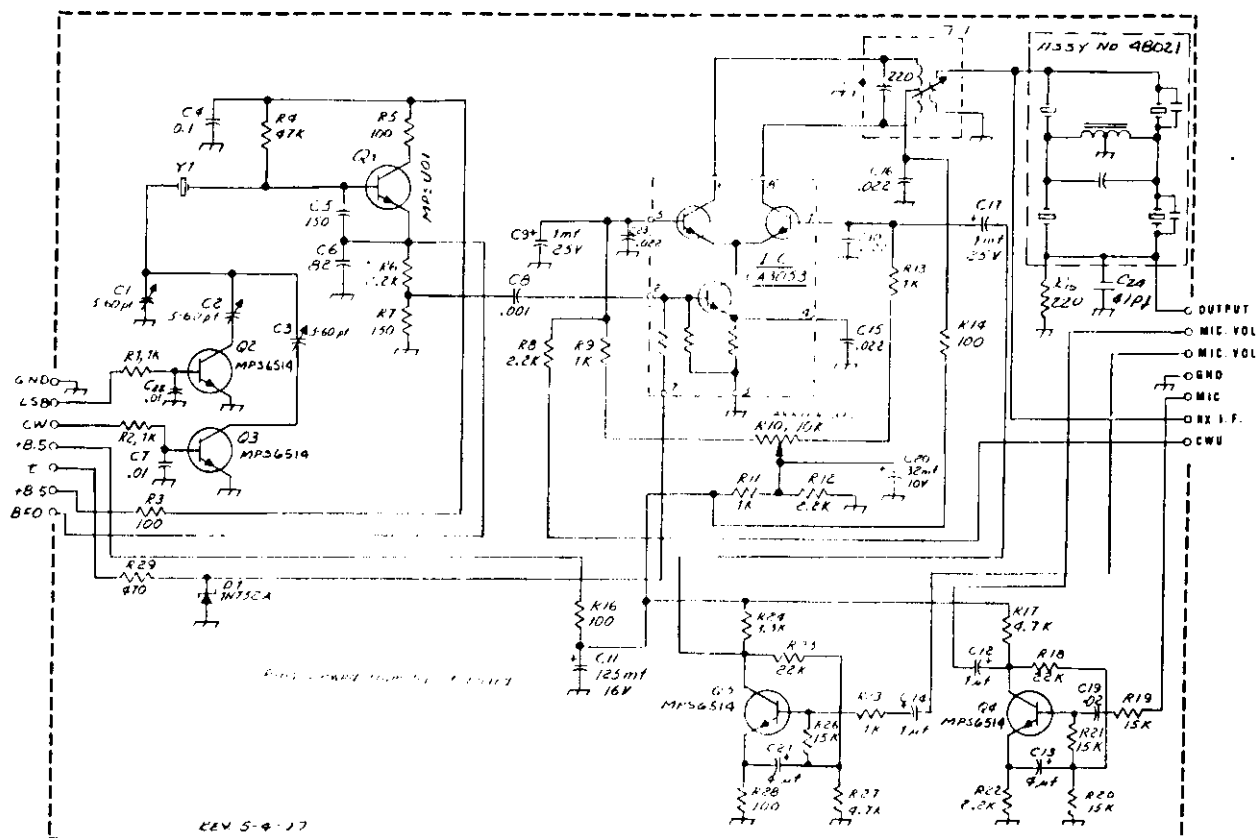
Transistor	Collector		Base		Emitter	
	Transmit	Receive	Transmit	Receive	Transmit	Receive
Q1	7.5	7.5	5.5	5.5	5.5	5.5
Q2	0	0	0.8	0.8	0	0
Q3	0	0	0.8	0.8	0	0
Q4	4.5	4.5	1.8	1.8	1.2	1.2
Q5	4.3	4.3	0.7	0.7	0.1	0.1

IC-1	Transmit	Receive
Pin 1	5	5
Pin 2	1.9	0
Pin 3	0	0
Pin 4	1.2	0
Pin 5	5	5
Pin 6	8	8
Pin 7	5.6*	0
Pin 8	8	8



Pins viewed from bottom of circuit board.

*In LOCK position voltage between 0.5 and 5.6 volts, depending on position of DRIVE control.



80131 SSB GENERATOR

80131 SSB GENERATOR *OLD STYLE*

Transistor Q1 operates as a crystal controlled carrier generator. Capacitors C1, C2 and C3 set the crystal to the proper frequency for USB, LSB and CW. Capacitor C1 sets the crystal to the high frequency side of the filter passband. A positive 8 to 12 V at terminals "LSB" and "CW" will cause transistor switches Q2 and Q3 to place capacitors C2 and C3 in the circuit. These capacitors will set the crystal to the low frequency side of the filter passband. Both the upper and lower frequency carriers are positioned approximately 15 dB down on the filter skirts. For CW operation, the "CW" pin is brought to ground with a suitable switch. This removes capacitor C3 and places the generator in the filter passband. Frequency change is approximately 750 Hz. The total output of the oscillator is brought out to a terminal pin for use as a BFO. A portion of this output is fed to the balanced modulator, CA3053. The balanced modulator is an integrated circuit differential amplifier. Using an integrated circuit insures good balance under varying voltages and temperatures. The balanced modulator output passes through a four crystal filter terminated in 470 ohms. Transistors Q4 and Q5 are used as a microphone amplifier.

Alignment - Proper alignment of the SSB generator requires the use of a frequency counter and either an rf VTVM or oscilloscope with a response extending to 9 MHz. T1 is first peaked in the center of the pass band of the crystal filter and then C1, C2 and C3 are adjusted to set the carrier oscillator frequencies to the upper and lower skirts for SSB operation and 750 Hz up from the lower skirt for CW transmitting. Frequency adjustments should be kept within ± 20 Hz.

- 1.) Connect the frequency counter to the junction of R6 and R7. R7 is the 150 ohm resistor in the oscillator emitter lead. If there is no dc blocking capacitor in the input of the counter, connect the input through a .01 uF capacitor.
- 2.) Jumper the CWU terminal pin on the SSB assembly to chassis ground.
- 3.) Connect either the VTVM or oscilloscope to the OUTPUT pin terminal on the assembly.
- 4.) Set MODE switch to SB-R position and power the TRITON.
- 5.) Adjust capacitor C1 for a frequency reading of 9,001,500 Hz. This adjustment is a temporary one to place the oscillator in the center of the pass band.
- 6.) Peak T1 for maximum reading on the VTVM or 'scope. Reading should be approximately 0.5 to 1 volt, rms.
- 7.) VTVM or 'scope may now be disconnected. Remove CWU jumper.
- 8.) Readjust C1 now for 9,003,500 Hz.
- 9.) Set MODE switch to LOCK position, DRIVE control fully CCW. Adjust C2 for 9,000,600 Hz.
- 10.) Set MODE switch to SB-N position, DRIVE fully CCW. Adjust C3 for 8,999,850 Hz.
- 11.) Repeat steps 8, 9 and 10 in sequence until no further adjustments are necessary. C2 and C3 both determine the 9,999,850 Hz frequency and both affect the C1 setting slightly, so re-adjustment of all three usually is necessary after any one is changed.
- 12.) Reconnect the VTVM and null the carrier in SB-N position with the CARRIER BALANCE trimpot, R10.

Pin Voltage Readings - (SB-N mode, no signal.)

Pin	Transmit	Receive	Pin	Transmit	Receive
GND	0	0	OUTPUT	0	0
LBS	7.0	7.0	MIC VOL	0	0
CW	13	13	MIC VOL	0	0
+10 V	10	10	GND	0	0
t	0*	0	MIC	0	0
+10 V	10	10	RX I.F.	0	0
BFO	6.0	6.0	CWU	6.6	6.6

*In LOCK mode, variable between 1.0 and 12 V, depending on position of DRIVE control.

Transistor Voltage Readings

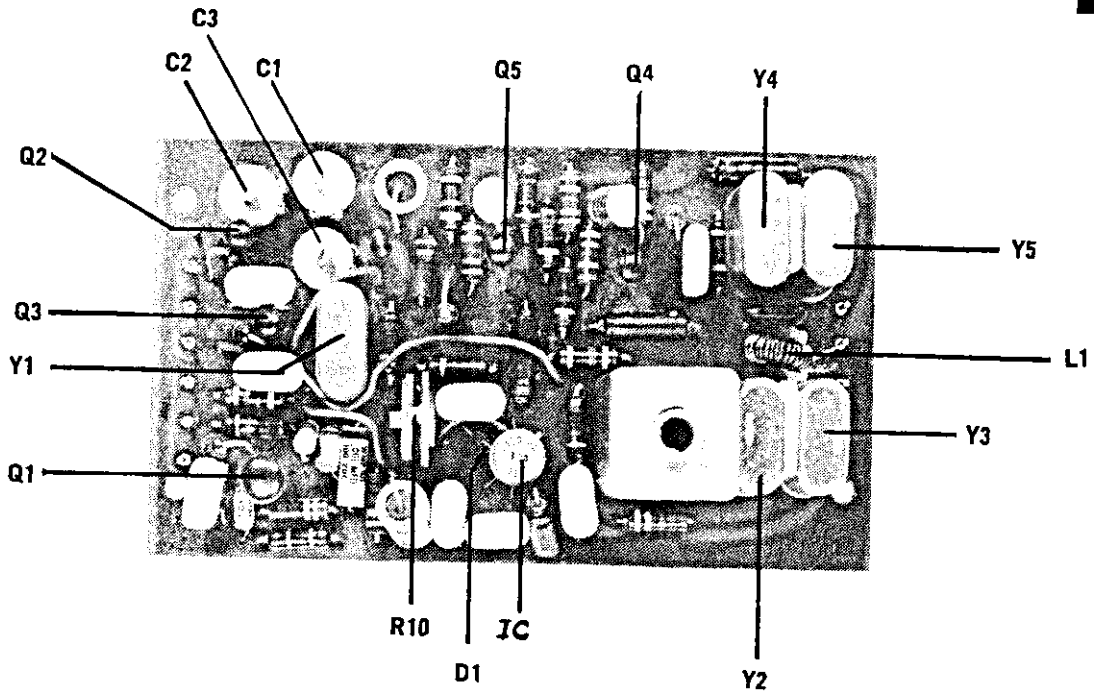
Transistor	Collector		Base		Emitter	
	Transmit	Receive	Transmit	Receive	Transmit	Receive
Q1	9.5	9.5	5.5	5.5	6.2	6.2
Q2	0	0	0.8	0.8	0	0
Q3	0	0	0.8	0.8	0	0
Q4	5.7	5.7	2.2	2.2	1.6	1.6
Q5	5.0	5.0	0.8	0.8	0.1	0.1

IC-1	Transmit	Receive
Pin 1	6.5	6.5
Pin 2	1.9	0
Pin 3	0	0
Pin 4	1.2	0
Pin 5	6.5	6.5
Pin 6	10	10
Pin 7	0*	0
Pin 8	10	10

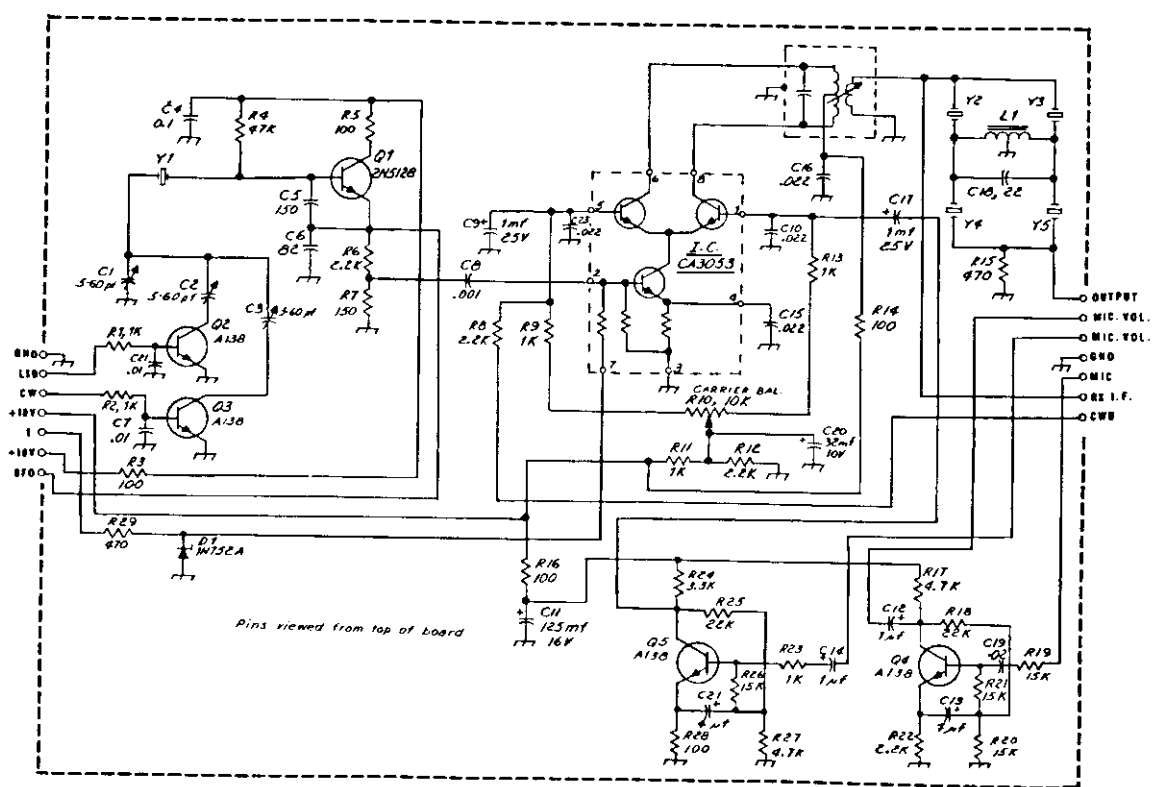
* In LOCK position voltage between zero and 5.6 volts, depending on position of DRIVE control.



Pins viewed from bottom of PC board.



SSB GEN 80131



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