

TRANSMITTER/RECEIVER OPERATION OF
COBRA 146GTL, PRESIDENT AR144, SEARS 663.38100050
REALISTIC TRC451, TYPE CHASSIS

Reference: Block Diagram, Volume 12 page 11

AM OPERATION, TX:

An AF signal from the MIC is fed to TR26 through TR27. This signal is amplified by TR26 and TR25, Mic Amp, and is fed to TR42 and TR43. The signal amplified by TR44 is applied to TR39 and TR38 for modulation. For the RF portion, two signals are mixed by IC5, mixer, with a 27MHz signal being produced. (One of these signals is 10.7 MHz generated by TR23 and the other signal is the VCO output approximately 16 MHz.) The 27MHz signal is amplified by TR41 and TR40. The signal is amplified and modulated by TR39 and TR38 and then delivered to the antenna. D52 and D53 make up the RF Power Meter detector.

AMC:

TR29 is a detector for AMC and the input attenuator consists of R157 and TR27. In an overmodulated condition, TR29 turns on and the detected current flows into R153. This current drives TR 28 and TR27. As the collector-emitter impedance of TR27 lowers, the input signal is lowered.

SSB:

The audio signal from the MIC is amplified by TR26 and TR25. It is then applied to the Balanced Modulator, IC3. The carrier signal (10.6925 USB; 10.6975 LSB) is applied to the other input of IC3. IC3 produces a carrier-suppressed double sideband signal. The DSB signal is converted into SSB by the filter FL1. In the USB Mode, carrier plus audio signal is produced; in the LSB Mode, carrier minus audio signal results.

TRANSMITTER/RECEIVER OPERATION cont'd.

EXAMPLES: USB Mode:

Using a 1KC tone, two signals are produced:

$$(USB) \quad 10.6925\text{MHz} + 1\text{KHz} = 10.6935\text{MHz}$$

$$(LSB) \quad 10.6925\text{MHz} - 1\text{KHz} = 10.6915\text{MHz}$$

LSB Mode:

$$(USB) \quad 10.6975\text{MHz} - 1\text{KHz} = 10.6965\text{MHz}$$

$$(LSB) \quad 10.6975\text{MHz} + 1\text{KHz} = 10.6985\text{MHz}$$

The center frequency of the crystal lattice filter is 10.6950 and will pass $\pm 2.5\text{KC}$ or 10.6925 - 10.6975. So, on USB, the 10.6935 signal is passed but the 10.6915 signal is attenuated. In LSB the 10.6965 signal is passed and the 10.6985 signal is attenuated.

The SSB signal is then mixed with the VCO frequency by IC5 and the resulting 27MHz is amplified by TR41, TR40, TR39, TR38 and fed to the antenna.

ALC:

TR37 is the ALC detector. If the power level exceeds a level set by VR6, TR28 drives TR27 to decrease the audio input to IC3, thereby lowering SSB Power.

UNLOCK DETECTOR:

TR33 shuts off the transmit output if the PLL is unlocked by turning off TR32. Pin 15 of IC2 goes low in an unlocked condition.

RECEIVER:

A signal from the antenna is fed to RF Amp TR12. It is then mixed with the VCO frequency at TR13 which produces the IF frequency of 10.7MHz. This 10.7MHz signal is amplified by TR14, TR15, TR16, and TR17. In the AM Mode, the signal is detected by D22 and D23 and sent to TR10, the AF amp.

TRANSMITTER/RECEIVER OPERATION cont'd.

In SSB Mode, the signal is fed to TR10 which operates as a demodulator. A signal from the carrier oscillator is necessary for this; the clarifier must be "user adjusted" for best audio intelligibility. The signal is then routed to the AF Power Amp, IC4 via TR11 (Squelch Switch) and TR36 (AF Driver). It is then sent to the speaker.

AGC:

IC1 is the AGC amp. The processed signal is switched by TR8 and TR9 and fed to TR14 and D13/D14 which adjusts the IF and RF gain respectively. Part of the signal from IC1 also goes to the squelch control circuit (TR11).

TRC 448 VSB-1 HOOK-UP

COMPRESSOR:

1. Remove C95.
2. Solder Black wire to + side of hole.
3. Solder White wire to other hole.
4. Remove AMC control Q14.

(C95 is a 1 ufd. close to Q15.)

EXPANDOR:

1. Remove C274 (.022).
2. Solder Black wire towards collector of Q210.
3. Solder White wire towards R253.

No Pre-Amp needed.