

INTRODUCTION

WRL sincerely believes you will be very satisfied with your Duo-Bander 84 transceiver. It represents a significant achievement in the art, enabling us to provide you with a high performance transceiver covering the 75 and 40 meter SSB phone bands at unusually low cost.

THEORY OF OPERATION

TRANSMITTING: The microphone voice signal, from the microphone input jack, is amplified in the first 2N2926 amplifier stage and coupled to another 2N2926 operating as a phase inverter. This delivers a balanced signal to the bases of the two 2N2926's which are the balanced modulators. Also being fed into the balanced modulator is a signal at 5.55 mc. from the crystal oscillator, which is a multi-function 6GX6 tube. The balanced modulator combines the two signals, audio and RF, the product of which will be a double side-band, suppressed carrier signal at 5.55 mc.

The double-sideband suppressed carrier signal is then passed through the special crystal lattice filter. The frequency passband of this filter is such that it will allow the lower sideband signal to pass, but effectively rejects the upper-sideband component that was also present at the input. This then passes the lower sideband component to the 12BA6 IF amplifier tube where it is amplified and passed on to the 6EJ7 transmitting mixer tube. At this tube another signal from the VFO is also injected, which will be in the range of 1.75 to 1.55 mc. The output of this tube has tuned circuits which will effectively reject all but the desired sum or difference between the input signals. The sum is used for 40 meters, the difference for 75 meters. Additional bandpass circuits follow and couple the signal to the 12BY7 driver tube. This tube drives the final amplifier, which is a pair of 6HF5s.

The plates of the final amplifier tubes are connected in parallel and, through DC isolation blocking capacitors, through the Pi-network which matches the plate impedance of the final tubes to a fixed impedance of 50 Ohms. A diode detector is attached to this circuit to sample RF output voltage and thereby provide a means to tune the amplifier stage for maximum power output to the antenna system.

RECEIVING: The incoming signal from the antenna is coupled to the 12BY7 tube through the antenna relay. This was used as a driver when transmitting, but also serves as a receiving RF amplifier stage during reception. The output of this amplifier is connected to the 6HG8 receiving mixer tube. A signal from the VFO is also injected into the 6HG8 in the range of 1.55 to 1.75 mc. The product of these signals that equals 5.55 mc. will be selected by the crystal filter and further amplified by the 12BA6 IF amplifier. A second 12BA6 IF amplifier is then used.