

Production Test  
Overall HX-500 Test

Equipment Required:

1. M. C. Jones Model 263.3 Micromatch R. F. Power and VSWR meter and coupler unit.
2. M. C. Jones Model 636N 50 ohm load resistor.
3. Connecting cables for Power Meter and Load.
4. HQ-170 or HQ-180 receiver or equivalent.
5. Microphone
6. Key (Bug)
7. Oscilloscope and capacity divider probe.
8. Two tone audio generator. Approximately 400 and 1000 cycles.
9. 0 - 300 Milliampere meter

GENERAL INSTRUCTIONS:

Assemble a pretested "Exciter" and "VFO" chassis pair to a pretested "Main" chassis. Connect receiver to HX-500 as in a regular amateur station. Use diagrams in instruction book. Connect M. C. Jones Power and VSWR meter and Load Resistor to J10. Connect 0 - 300 mil. meter to terminals 13 (ground) and 14 (Plus).

TEST PROCEDURE:

1. Rotate "Operations" switch to Stby, "Function" switch to DSB, "Band Selector" to 80M, "AIC adj." maximum CW. Allow about 30 minutes warmup time. Note: Warmup may be done previous to final test by allowing assembled units to heat up prior to testing. Do not turn HX-500 off for more than a few minutes while connections are made for final test if it is necessary to do so for any reason. Rotate "Operations" switch to CAL. Tune HX-500 and receiver to exactly 4.0Mcs. Using the receiver 100 Kcs calibrator and making sure that both the HX-500 scale pointer and "Frequency Kcs" dial is on exactly 4.0 Mcs and 0

respectively, adjust L17 for zero beat with the 100 Kcs calibrator. Advance HX-500 "Calibrate Level" control as required to obtain a strong beat note in the receiver. Tune HX-500 and receiver to exactly 3.5 Mcs again making sure the HX-500 Pointer and "Frequency Kcs" is on 3.5 Mcs and 0 respectively. Adjust C92 for zero beat with the 100 Kcs calibrator. Retune HX-500 and receiver to exactly 4 Mcs. Readjust L17 to zero beat. Retune HX-500 and receiver to exactly 3.5 Mcs. Adjust C92 for zero beat. Repeat above until a beat note less than 100 cycles is heard when tuned to either 4 Mcs or 3.5 Mcs. Tune HX-500 and receiver simultaneously to 3.6, 3.7, 3.8 and 3.9 Mcs resting the "Frequency Kcs" dial on 0 as the pointer rests on or near the frequency marking. Listen at each frequency beating with the 100 Kcs calibrator. If a beat note can be heard that is lower than 5 Kcs the VFO and calibration is acceptable.

2. Observe 0 - 30 0 milliammeter and note the reading. Adjust R136 (Bias Adj.) unit meter reads 60 milliamperes.

3. Rotate "Operations" switch to MOX. Tune up transmitter first at 3.5 Mcs then at 4 Mcs. At each frequency rotate "RF Level" control CW until the power meter reads 100 watts or over. Observe milliammeter and note that reading does not exceed 260 milliamperes. Reduce output power to 25 watts. VSWR as read on the power meter should be less than 1 watt.

Rotate "Band Selector" to 40M. Record power output, current, and VSWR as above at 7 and 7.5 Mcs.

Rotate "Band Selector" to 20M, 15M and the four 10M bands each time checking for power, current and VSWR at the scale extremes as above.

4. Tune up HX-500 to 3.75 Mcs as per instruction book. Feed the two tone audio generator (400 and 1000 cycles) into the patch input. Connect oscilloscope to J10 by means of capacity divider probe connected directly to the deflection plates of the oscilloscope. Rotate "Function" switch to LSB. Advance the "Audio Level" control CW and note the current reading on the 300 millimeter at the point where the two tone signal as observed on the oscilloscope starts to flat top. Current reading should be 150 - 160 mils. Advance "Audio Level" control further until two tone signal shows a definite flat topping. Rotate R124 ("ALC Adj.") CCW and note that the flat topping disappears. Recheck two tone signal on oscilloscope with "Function" switch on USB. Rotate "Audio Level" control CCW. Observe "Level Indicator" MI. Reading in either USB or LSB position of the "Function" switch should be less than -50 db with the "Operations" switch on MOX.

5. Connect key (Bug) to "Key" jack on front panel. Rotate "Function" switch to CW. Operate key and note that power output with key down is over 100 watts. Send a series of dots and note the rise and decay time of the RF power on the oscilloscope. This should be similar to that observed on a tested and approved HX-500.

6. Connect a microphone to "Mike". Rotate "Function" switch to LSB. Advance "Audio Level" control to about 5 and talk into microphone. Observe RF signal on oscilloscope.

7. Rotate "Function" switch to FSK. Rotate "Operations" switch to CAL. Tune receiver to 3.75 MCS and set receiver BFO to zero beat with 3.75 MCS signal from HX-500. Connect Key (Bug) to 11 and 12 of J11. While sending a series of dots rotate "FSK

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"Deviation" (R140) until a low beat note is heard in the receiver each time the key makes contact. This sets the "FSK Deviation" control (R140) for close to zero deviation. Send a series of dots and rotate the "FSK Deviation" control (R140) first CW and then CCW from the point of almost zero beat. As the "FSK Deviation" control is advanced in either direction, a series of dots sent with the key should increase in audio pitch to at least 1500 cycles.