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REVISIONS

APP

APPROVED 3-11-63

K39312

HQ-145-X TEST SPECIFICATIONS

A tag shall be provided and attached to each receiver at the end of the production line prior to any electrical testing. The tag shall have spaces for checking the satisfactory completion of each of the following test steps.

1. Voltage Measurements
2. Resistance Measurements
3. IF, BFO and Slot Filter Alignment
4. RF Alignment
5. Dial Calibration
6. Performance Measurements
7. Air Test.

✓  
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7. Performance Measurements

Meter Reads S9 with 50 mV Volts input  
 AVC rises \_\_\_\_\_ db from 2 to 100,000 u Volts at 4.5 Mc  
 Slot Frequency control nulls at "0"  
 Slot Depth nulls with range of potentiometer  
 Power gain at 4.5 Mcs. 2.0 u Volts input gives  
 1.0 Watt output

SENSITIVITY IS MEASURED AT A SIGNAL PLUS NOISE TO NOISE, POWER RATIO, OF 10 TO 1, (2 to 20 OR 5 to 50 MILLIWATTS, 30% MODULATION.

BAND MC	FREQ MC	AM SENS. uV	CW SENS. uV	IMAGE REJ. RATIO
.54-1.6	.6	.....		
"	1.0	.....		
"	1.5	.....		.....2.41mc
1.6-4.0	1.6	.....		
"	2.8	.....		
"	4.0	.....		.....4.91mc
4-10	4.0	.....		
"	4.5	.....	.....	
"	7.0	.....		
"	10.0	.....		.....10.91mc
10-30	10.0	.....		
	20.0	.....		
	28.0	.....		.....29.97 mc

ALL DIMENSIONS IN INCHES

DO NOT SCALE THIS DRAWING

No. 39312

TOLERANCES  
 FRACTIONS: ±  
 DECIMALS: ±  
 ANGLES: ±  
 UNLESS OTHERWISE SPECIFIED

TITLE: HQ-145-X TEST SPECIFICATION  
 MATERIAL:  
 FINISH:  
 HAMMARLUND  
 NEW YORK

FIRST MADE FOR HQ-145-X  
 DRAWN  
 CHECKED  
 APPROVED

PART NO. ITEM DESCRIPTION MAT. FIN.

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PRODUCTION LIMITS

K39312

DIAL ACCURACY

HQ-145X Main Dial

- Band #1 Maximum Error ± 1/3 Dial Division
- 2 Maximum Error ± 1/2 Dial Division
- 3 Maximum Error ± 1/2 Dial Division
- 4 Maximum Error ± 1/2 Dial Division

Band Spread Dial

- Band #1 Maximum Error ± 2/3 Dial Division
- 2 Maximum Error ± 1 Dial Division
- 3 Maximum Error ± 2/3 Dial Division
- 4 Maximum Error ± 2/3 Dial Division
- 5 Maximum Error ± 2/3 Dial Division

8. AIR TEST

Operational Performance - Check List.

1. Limiter
2. AVC
3. Phones
4. Crystal Filter
5. Crystal Phasing
6. Function Switch
7. Slot frequency
8. Slot depth
9. Telechron Clock with Switch
10. BFO Adjustment
11. Dial Calibration

TYPE TEST

In addition to the performance measurements listed for each production test of each receiver, one receiver taken at random from each successive lot of 25 receivers, shall have the following tests performed and a complete copy of all the performance data shall be forwarded to the Engineering Department in New York.

IF Rejection Ratio at 455 Kcs - 1.9 Mcs (Band 2)  
IF Rejection Ratio at 3035 Kcs - 7.2 Mcs (Band 3)

Frequency Drift at 14 Mcs for a 3 hour run from cold start; data shall indicate the direction and magnitude of the drift in kilocycles.

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**TYPICAL PERFORMANCE MEASUREMENTS FOR  
REFERENCE ONLY**

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Stage Gain Measurements

Input to u Volts for 1 Watt output

2nd IF grid		15K
1st IF grid		600
2nd Mixer grid		150
Jct. "K" Trans -22K (455 Kcs)		860
1st Mixer grid (455 Kcs)		100 (Band 2 - Middle)
" " " (455 Kcs)		120 (Band 1 - Middle)
" " " (3035 Kcs)		100
2nd Mixer grid (3035 Kcs)		310

RF Stage Gain

Freq. Mcs Input for 1 volt RF on Mixer Grid

.6	.36
1.0	.11
1.5	.065
2.0	.0088
2.5	.0113
3.0	.015
4.5	.0109
6.0	.0076
9.5	.0063
11.0	.0250
16.0	.0150
28.0	.0120

Oscillator Voltage (Negative dc Volts)

<u>Band</u>	<u>Osc. Grid Volts</u>	<u>Injection Grid Volts</u>
1	20 - 30	10 - 8.2
2	14 - 23.5	11.5 - 14.5
3	6 - 11.3	4 - 9.2
4	1.2 - 3.5	1.5 - 7.0

BFO Measurements

- 1.88 v dc on Pin 7 6AL5, AVC off
- 3.0 v dc on AVC line AVC on
- 2.1 v RF Across shielded cable
- 2.0 v RF Pin 2 6AL5 to ground

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SPECIFICATIONS FOR HQ-145X

SETTING OF MAIN AND BANDSPREAD DIALS AND CALIBRATION IN HQ-145X RECEIVER

MECHANICAL SETTING OF MAIN DIAL:

BEFORE SECURING MAIN DIAL SET SCREWS, ALIGN THE MAIN DIAL WINDOW SO THAT THE INDICATOR LINE CO-INCIDES WITH THE TWO INDICE LINES AT THE LOW FREQUENCY END OF THE DIAL. WITH THE MAIN CAPACITOR HELD AT FULL MESH, SET THE DIAL SO THAT THE FIGURE 1 OF THE 10 MC LETTERING OF THE TOP DIAL SCALE LINES UP WITH THE INDICATOR AND SECURE THE DIAL SET-SCREWS.

BANDSPREAD DIAL MECHANICAL SETTING:

CHECK THE FULL MESH POSITION OF THE FRONT (OSCILLATOR) SECTION OF THE BANDSPREAD CAPACITOR WITH THE SQUARE END OF A SCALE AND MAINTAINING THIS CONDITION, SECURE THE SET-SCREWS OF THE BANDSPREAD DIAL WITH THE INDICATOR LINES AT THE LEFT END OF THE DIAL ALIGNED WITH THE INDICATOR LINE OF THE WINDOW.

CORRECTION OF MAIN DIAL - IF REQUIRED: (BANDSPREAD DIAL AT 100 ARBITRARY SCALE)

AFTER REGULAR ELECTRICAL ALIGNMENT HAS BEEN COMPLETED, WITH THE DIALS PROPERLY POSITIONED MECHANICALLY AS DESCRIBED ABOVE, CHECK THE MAIN DIAL CALIBRATION USING THE CRYSTAL CALIBRATOR. THE MAIN DIAL SCALES SHOULD BE CORRECT WITHIN ONE HALF DIAL SCALE DIVISION AT EACH FIGURE DESIGNATED INDICE. IF THE DIAL SCALE CALIBRATION ERROR EXCEEDS ONE HALF DIVISION, TUNE IN A 7.0 MC SIGNAL FROM THE CRYSTAL CALIBRATOR ON THE 4 to 10 MC RANGE AND RE-ADJUST THE COIL SLUG OF THE OSCILLATOR FOR THIS BAND TO CORRECT THE DIAL READING AT THIS FREQUENCY. RE-SET THE TRIMMER AT 10 MC AND RE-CHECK UNTIL THESE TWO FREQUENCIES ARE CORRECT ON THE DIAL. THE DIAL SHOULD NOW CHECK WELL WITHIN TOLERANCE AT ALL FREQUENCIES FROM 7.0 TO 10.0 MC. NOW CHECK THE DIAL CALIBRATION FROM 4.0 TO 7.0 MC. IF THIS PORTION OF THE DIAL SCALE IS OFF, CAREFULLY BEND THE SERRATED PLATES OF THE OSCILLATOR CAPACITOR SECTION, STARTING AT 6.0 MC AND WORKING DOWNWARD ON THE SCALE UNTIL THE BAND IS CORRECTED. THE SLUG AND TRIMMER ADJUSTMENTS FOR THE OTHER THREE BANDS WILL HAVE TO BE RE-ADJUSTED AT THE ENDS OF THE RANGES THE SAME AS AT ORIGINAL ALIGNMENT AND THEIR CALIBRATION SHOULD NOW BE WITHIN TOLERANCE.

CORRECTION OF BANDSPREAD CALIBRATION:

AFTER THE MAIN DIAL CALIBRATION HAS BEEN FOUND SATISFACTORY, CHECK THE BANDSPREAD DIAL CALIBRATION. IT SHOULD BE ACCURATE WITHIN ONE QUARTER DIAL DIVISION AT EACH FIGURE DESIGNATED INDICE. IF NOT, PROCEED AS FOLLOWS:

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NEW YORK

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TEST SPECIFICATION

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APPROVED 3-11-43

1ST. CORRECT THE DIAL FOR THE 21.0 TO 21.6 BAND (FOR THESE FIGURES ONLY) BY SLIGHTLY BENDING THE SERRATED PLATES OF THE SMALL FRONT SECTION OF THE BANDSPREAD CAPACITOR. ALWAYS START AT THE HIGH END OF THE BAND AND WORK TOWARD THE LOWER END.

2ND. CHECK THE 28.0 TO 30.0 MC BAND AND ADJUST THE SERRATED PLATES OF THE SMALL FRONT SECTION FOR CORRECTING FROM 28.0 TO 28.5 MC OF THIS BAND ONLY.

3RD. SWITCH TO BAND 5 WITH THE BAND CHANGE SWITCH AND CHECK THE 14.0 TO 14.4 MC BAND. CORRECT THIS BAND BY ADJUSTING THE SERRATED PLATES OF THE LARGE SECTION OF THE OSCILLATOR BANDSPREAD CAPACITOR.

4TH. CHECK THE 3.5 TO 4.0 MC BAND AND CORRECT FROM 3.5 TO 3.7 MC ONLY BY ADJUSTING THE LARGE SECTION OF THE OSCILLATOR BANDSPREAD CAPACITOR.

5TH. CHECK THE CALIBRATION OF THE 7.0 TO 7.3 MC BAND. THERE IS NO ADJUSTMENT FOR THIS BAND, WITHOUT AFFECTING OTHER BANDS.

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