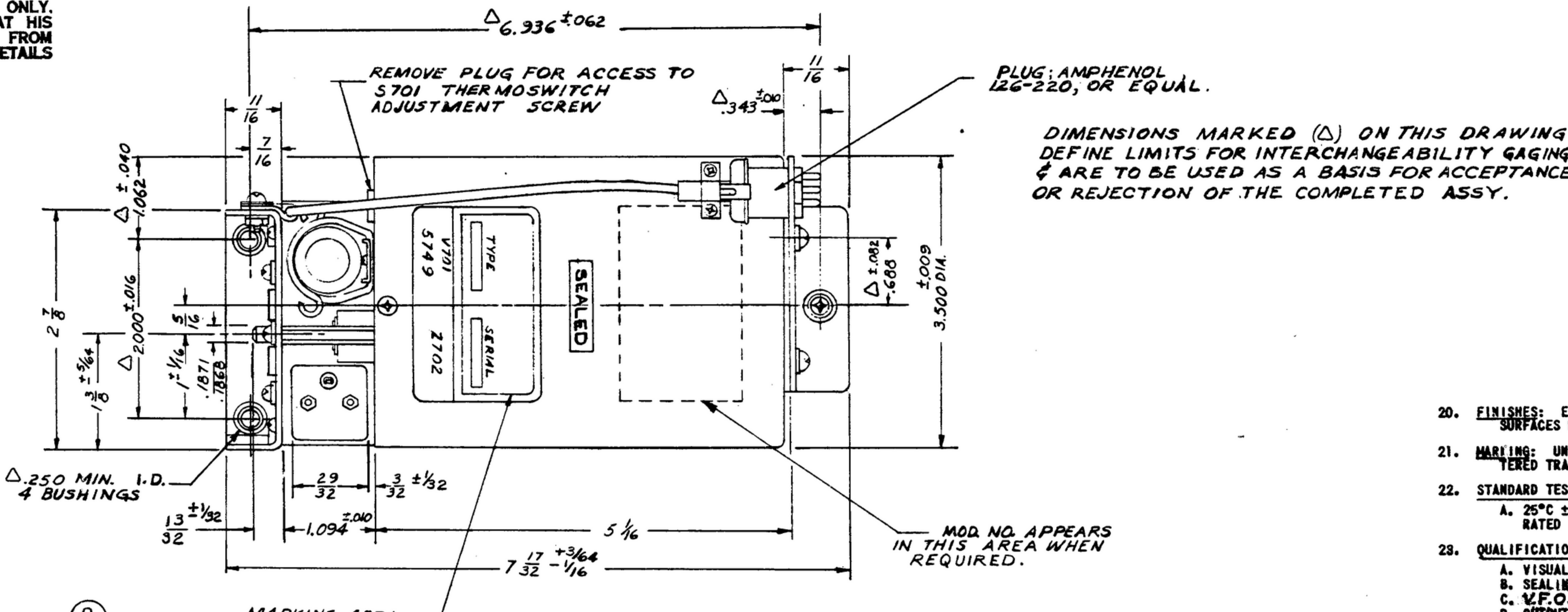
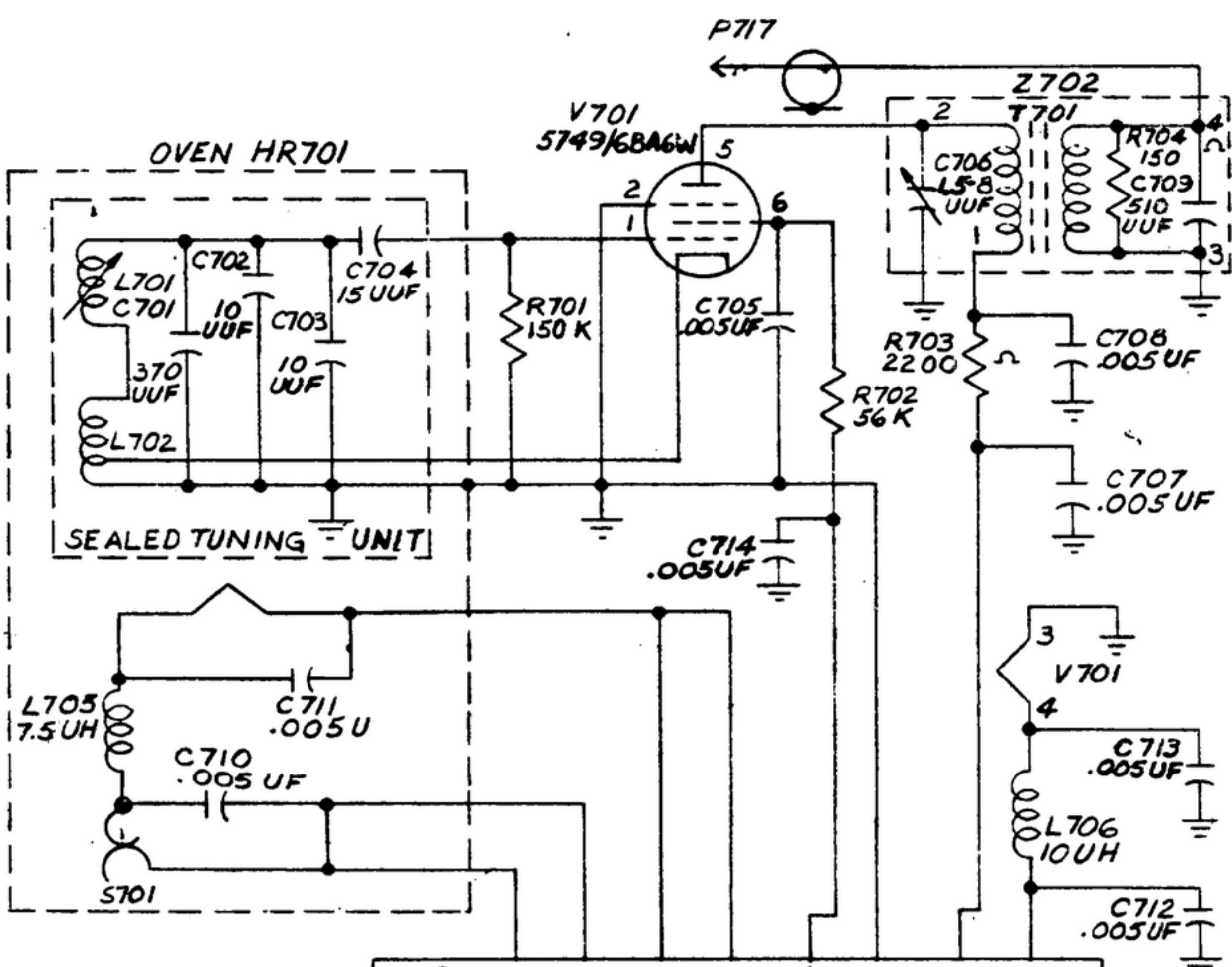


NOTE: THESE DIMENSIONS ARE APPROXIMATE. SPECIFICALLY, ON OTHER DATA FOR ANY PARTS OTHER THAN THOSE LISTED IN THIS DRAWING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER IDENTIFICATION OF THE PARTS AND THE PROPER IDENTIFICATION OF THE PARTS AND THE PROPER IDENTIFICATION OF THE PARTS.

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NOTE: \*FOR INFORMATION ONLY. CONTRACTOR MAY AT HIS OPTION DEVIATE FROM THESE PROCESS DETAILS

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A <sub>3</sub>	(1) TRIMMER PLUG MOVED TO CLEAR POSITION (2) CABLE LENGTH WAS 12 INCHES (3) NOTE 26 ADDED.	15 FEB 1963	B.E.A. EDB R.E.A.
B <sub>1</sub>	(1) MS24233-2 WAS SM-B-114043	24 MAR 1963	21 FEB 1963 R.E.A. P.M.C.



POWER PLUG INFORMATION		
PIH	WIRE COLOR	FUNCTION
A	WHT-RED	B + 100 V PLATE
B	WHT-BRN-RED	150 V REG. SCREEN
D & E	BROWN	25.5 V OVEN
F	WHITE	OSC. GROUND
N	WHT-BLK	6.3 V HEATER
J & K	WHITE	OVEN GROUND

3/64 RADIAL CLEARANCE IN FRONT BRACKET MOUNTING HOLES AVAILABLE FOR ALIGNMENT OF OSCILLATOR IN PARENT EQUIPMENT.

A<sub>3</sub> NOTES:

- PART MAY BE TYPE 70H-12 (#522 0298 004) AS SUPPLIED BY COLLINS RADIO CO., CEDAR RAPIDS, IOWA OR EQUAL, PROVIDING IT MEETS THE FOLLOWING REQUIREMENTS AND DIMENSIONS SHOWN.
- TYPE AND FUNCTION OF EQUIPMENT: THE UNIT IS A PERMEABILITY-TUNED, VARIABLE FREQUENCY OSCILLATOR THAT IS SEALED TO ATMOSPHERIC CHANGES. IT IS MECHANICALLY AND ELECTRICALLY STABLE AND HAS A THERMOSTATICALLY CONTROLLED OVEN ATTACHED. IT ALSO FEATURES A BANDPASS OUTPUT FILTER PROVIDING A SOURCE OF LOW IMPEDANCE. THE OUTPUT IMPEDANCE OF THE FILTER WILL VARY FROM 100 TO 145 OHMS OVER THE TUNING RANGE 2.455 TO 3.455 MC. A TYPE 5749/68A8M MINIATURE TUBE IS USED.
- FREQUENCY RANGE: 2.455 TO 3.455 MC PER SECOND.  
TUNING: THE TUNING RATE IS 100 KC PER TURN OF THE TUNING SHAFT FOR TEN TURNS. THE OSCILLATOR FREQUENCY INCREASES WITH COUNTERCLOCKWISE ROTATION OF THE TUNING SHAFT WHEN VIEWED FROM TUNING SHAFT.
- MECHANICAL OVERTRAVEL: MECHANICAL OVERTRAVEL BEYOND END FREQUENCIES IS 1-1/2 TURNS MINIMUM EACH END. CAUTION: DO NOT EXCEED THESE LIMITS OR SERIOUS DAMAGE MAY BE DONE TO INTERIOR OSCILLATOR MECHANISM.
- OUTPUT VOLTAGE: WHEN PROPERLY ENERGIZED, IT PROVIDES AN OUTPUT VOLTAGE ACROSS A 1000 OHM LOAD OF 1.70 TO 2.5 VOLTS, WHEN MEASURED WITH A HEWLETT-PACKARD 410A VACUUM TUBE VOLTMETER, AS SUPPLIED BY HEWLETT-PACKARD, PALO ALTO, CALIFORNIA OR EQUAL.

- OVEN: A THERMOSTATICALLY CONTROLLED OVEN IS ADJUSTED TO +75°C ± 1/2°C TO HOLD TEMPERATURE OF THE OSCILLATOR CONSTANT OVER THE OPERATING TEMPERATURE RANGE.
- TUBE RETAINER CLIP: A SPECIAL SPRING AND RETAINER ASSEMBLY PROVIDE VIBRATION DAMPING TO THE VACUUM TUBE.
- QUALIFICATION AND PERFORMANCE REQUIREMENTS:  
9. AMBIENT TEMPERATURE RANGE: 0° TO +90°C. (MAY BE OPERATED TO -40°C IF PROVISIONS ARE MADE TO LIMIT AIR MOVEMENT OVER THE OSCILLATOR.)  
10. AMBIENT HUMIDITY RANGE: 0 TO 95% RELATIVE.  
11. ALTITUDE: NO EFFECT  
12. SHOCK: 10 G'S MOUNTED. A SHOCK APPLIED DIRECTLY ON THE TUNING SHAFT WILL AFFECT THE FREQUENCY STABILITY.  
13. VIBRATION: AVERAGE FREQUENCY DEVIATION FROM CENTER FREQUENCY WHEN VIBRATED AT 10 G'S AT 60 CPS AS MOUNTED, WILL BE 100 CYCLES OR LESS. PERMANENT SHIFT NOT TO EXCEED 50 CPS.
- CALIBRATION: THE OSCILLATOR FREQUENCY VARIES LINEARLY WITH LEADSHAFT ROTATION OVER THE FREQUENCY RANGE, AND WITH THE ENDPOINT SET TO ZERO, ERROR WILL NOT BE IN ERROR BY MORE THAN 750 CYCLES WHEN MEASURED FROM THE MOST POSITIVE TO THE MOST NEGATIVE DEVIATION FROM LINEARITY. IN ADDITION, THE FREQUENCY ERROR IS NOT IN EXCESS OF 250 CPS WHEN CHECKED TO ADJACENT 25 KC POINTS WITHIN THE LINEAR TUNING RANGE.

NOTE 19.C.

BEFORE START OF TEST THE V.F.O. SHALL BE OPERATED WITH OVENS OFF FOR AT LEAST TWO HOURS AND UNTIL DRIFT IS LESS THAN 40 CPS PER HOUR. THE AMBIENT TEMPERATURES SURROUNDING THE RECEIVER SHALL BE APPROXIMATELY 20°C. (THE V.F.O. COMPARTMENT TEMPERATURE WILL BE APPROXIMATELY 35°C). THE OVENS SWITCH SHALL THEN BE TURNED ON AND THE 20 HOUR TEST SHALL START AT THIS TIME. DURING THE 20 HOUR STABILITY TEST, FREQUENCY CHANGE FROM THE POINT JUST BEFORE THE OVENS ARE TURNED ON TO 1-1/2 HOURS LATER, SHALL BE WITHIN -300 TO +800 CPS. FREQUENCY CHANGE FROM THE 1-1/2 HOUR POINT TO THE END OF THE 20 HOUR PERIOD SHALL NOT EXCEED A TOTAL OF 300 CPS.

- ENDPOINT SPREAD: WHEN TUNED FROM THE LOW FREQUENCY ENDPOINT (2.455 MC) TO THE OPPOSITE EXTREME (3.455 MC) THE DEVIATION FROM 3.455 MC WILL BE NO MORE THAN +1500 CPS AND NO MORE THAN -200 CPS. LONG STORAGE OR OPERATION MAY REQUIRE TRIMMER ADJUSTMENT.
- FREQUENCY TEMPERATURE CHARACTERISTICS: THE FREQUENCY CHANGE, DUE TO A TEMPERATURE CHANGE FROM 0°C TO +75°C WITH OVEN OPERATING, IS NOT GREATER THAN ±150 CPS. WHEN OPERATED FROM 0°C TO -40°C IN STILL AIR, THE FREQUENCY WILL NOT DEVIATE IN EXCESS OF ±150 CPS. OPERATION TO +90°C WILL PRODUCE LARGER FREQUENCY SHIFTS.
- FREQUENCY-VOLTAGE CHARACTERISTICS: THE FREQUENCY DOES NOT CHANGE BY MORE THAN 75 CYCLES WHEN THE B<sub>+</sub> VOLTAGES ARE VARIED FROM -10% TO +10% NOMINAL VOLTAGE, OR WHEN THE FILAMENT VOLTAGE IS VARIED FROM -10% TO +10% NOMINAL.
- FREQUENCY-OVEN CYCLING CHARACTERISTICS: FREQUENCY CHANGE WITH OVEN CYCLING DOES NOT EXCEED 30 CYCLES TOTAL.
- A. FREQUENCY-TIME CHARACTERISTICS: THE FREQUENCY DOES NOT CHANGE BY MORE THAN 10 CYCLES PER DAY WHEN MEASURED OVER A PERIOD OF AT LEAST 10 DAYS STARTING 5 DAYS AFTER TEMPERATURE HAS STABILIZED.  
B. FREQUENCY-RAPID VARIATIONS: SUDDEN FREQUENCY CHANGES IN EXCESS OF 10 CYCLES PER SEC/SEC SHALL NOT EXCEED 25 CPS. NO MORE THAN THREE SUCH CHANGES (10-25 CPS) SHALL OCCUR DURING A 20 HOUR TEST PERIOD.

- FINISHES: EXPOSED ALUMINUM SURFACES E513 PER SPEC. MIL-F-14072. EXPOSED BRASS SURFACES M220 PER SPEC. MIL-F-14072. STAINLESS STEEL E300 PER SPEC. MIL-F-14072.
- MARKING: UNIT SHALL BE MARKED WHERE INDICATED THE PRIME MANUFACTURER'S NAME, REGISTERED TRADEMARK OR CODE SYMBOL, TOGETHER WITH HIS PART NUMBER OR OTHER DESIGNATION.
- STANDARD TEST CONDITIONS:  
A. 25°C ± 3°C AMBIENT 50% RELATIVE HUMIDITY AND NORMAL ATMOSPHERIC PRESSURE WITH RATED INPUT PER TABLE 1.
- QUALIFICATION TESTS: 5 SAMPLES REQ'D.  
A. VISUAL AND MECHANICAL INSPECTION AND MECHANICAL GAUGE INSPECTION.  
B. SEALING: AT 15 POUNDS DRY NITROGEN.  
C. OVEN TEMPERATURE ADJUSTMENT.  
D. OUTPUT TRANSFORMERS: (T701) PEAKING  
E. R.F. OUTPUT VOLTAGE:  
F. ERRATIC OPERATION: ANY RAPID AND RANDOM FREQUENCY VARIATION NOT DUE DIRECTLY TO VIBRATION, VOLTAGE OR TEMPERATURE CHANGES.  
G. VIBRATION: AVERAGE FREQUENCY MODULATION & PERMANENT FREQUENCY SHIFT.  
H. TEMPERATURE COMPENSATION: AT 3 MC., 2.455 MC AND 3.455 MC.  
I. FREQUENCY TEMPERATURE CHARACTERISTIC:  
J. FREQUENCY VOLTAGE CHARACTERISTIC:  
K. FREQUENCY OVEN CYCLING  
L. CALIBRATION  
M. END POINT SPREAD  
N. MECHANICAL OVERTRAVEL  
O. TEST GROUP I  
TESTS SAMPLES  
23A TO 23P 1, 2, AND 3  
R. TEST GROUP II  
TESTS SAMPLES  
4 & 5  
INSTALL THE 2 SAMPLES IN RADIO RECEIVERS R990A AND SUBJECT RECEIVER TO ALL PRODUCTION AND TYPE TESTS. THE V.F.O. SHALL NOT BE CAUSE FOR THE FAILURE OF THE RECEIVER TO MEET ANY OF ITS REQUIREMENTS. RECEIVER TESTING AMONG OTHERS WILL INCLUDE THE FOLLOWING:  
ALTITUDE HUMIDITY & FINISHES REVIEW  
V.F.O. AGING FREQUENCY - TIME CHARACTERISTICS
- ACCEPTANCE TESTS: THE PRIME MANUFACTURER SHALL PERFORM THE FOLLOWING ACCEPTANCE TESTS AT STANDARD TEST CONDITIONS ON 100% OF UNITS, UNLESS SPECIFIED OTHERWISE. A COPY OF THE TEST DATA SHEET SHALL BE SUPPLIED WITH EACH UNIT. A CONTROL NUMBER SHALL BE ASSIGNED AND STAMPED ON EACH UNIT AND CORRESPONDING DATA SHEET.  
A. VISUAL, MECHANICAL, GAGING INSPECTION.  
B. SEALING AT 15 POUNDS DRY NITROGEN.  
C. OVEN TEMPERATURE ADJUSTMENT.  
D. OUTPUT TRANSFORMER (T701) PEAKING  
E. R.F. OUTPUT VOLTAGE.  
F. ERRATIC OPERATION: ANY RAPID AND RANDOM FREQUENCY VARIATION, NOT DUE TO DIRECTION VIBRATION, VOLTAGE OR TEMPERATURE CHANGES.  
G. VIBRATION: AVERAGE FREQUENCY MODULATION AND PERMANENT FREQUENCY SHIFT.  
H. TEMPERATURE COMPENSATION: 100% OF UNITS AT 3 MC. 1% OF UNITS AT 2.455 MC AND 3.455 MC.  
I. FREQUENCY TEMPERATURE CHARACTERISTIC  
J. FREQUENCY VOLTAGE CHARACTERISTIC  
K. FREQUENCY OVEN CYCLING  
L. CALIBRATION  
M. END POINT SPREAD  
N. MECHANICAL OVERTRAVEL  
O. TEST GROUP I  
P. MECHANICAL OVERTRAVEL
- INCOMING INSPECTION TESTS: (S.W.E.)  
A. VISUAL AND MECHANICAL  
B. GAGING  
C. CALIBRATION  
D. END POINT SPREAD  
E. MECHANICAL OVERTRAVEL  
F. INSPECTION LEVEL AS DETERMINED BY S.W.E., QUALITY CONTROL DEPARTMENT.
- THE END-POINT ADJUST SCREW SHALL BE SO POSITIONED THAT ADJUSTMENT CAN BE READILY MADE WITHOUT REMOVING ANY COMPONENTS EXCEPT THE PLUG THAT COVERS THE END POINT ADJUST HOLE.

REQD	PART NO.	DESCRIPTION	QTY	QTY. SPEC	NOTES
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LIST OF MATERIAL	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES ± 1/64 ± .005 ± —	STEWART-WARNER- ELECTRONICS 42428-PC-59-A1- 51 SIGNAL CORPS DRAWN BY G. G. HODGSON CHECKED BY J. J. HODGSON NEXT ASSY USED ON APPLICATION ENG APPROVAL
REVIEWED P.M.E. APPROVED P.M.E. DATE 7 OCT 59	SCALE 1/1
OSCILLATOR, VARIABLE FREQUENCY 2.455 MC TO 3.455 MC	
DEPARTMENT OF THE ARMY SIGNAL CORPS ENGINEERING LABORATORIES FORT MONMOUTH NEW JERSEY SN-D-343626	