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TMC   SPECIFICATION NO. S-561

REV

TITLE: TEST & ALIGNMENT PROCEDURE FOR GPR-90 RXD

JOB

A

1. Check B⁺ line for shorts to ground. (both +250 v and +150 lines)

2. Turn set on and measure B⁺ (should be +250 v.d.c. and +150 v.d.c.)

3. Connect a 600 ohms resistor across the 600 ohms winding of the output transformer. Measure the hum level across this resistor with a high impedance A.C.V.T.V.M. for the following conditions: (Hum should measure under 0.03 v.r.m.s. across 600 ohms) SSB Switch on OFF position. AUDIO GAIN control -full on.

RADIO-PHONO SWITCH in RADIO		PHONO
AUDIO SEL. SW. IN	NORMAL	NORMAL
AUDIO SEL. SW. IN	LO-PASS	LO-PASS
AUDIO SEL. SW. IN	1200cps (NAR.)	1200 cps

4. Audio Amplifier Gain Measurements: Feed a 1000 cps signal from an audio (HP200C) oscillator into the PHONO input jack (RADIO-PHONO SWITCH in PHONO position) AUDIO GAIN control should be completely clockwise. Measure the input voltage which will produce an output voltage of 34.6 v.rms. on an A.C. VTVM across the 600 ohms load resistance in normal position.

AUDIO SEL. SW. IN NORMAL	0.3 v. rms	----	34.6 volts
AUDIO SEL. SW. IN LO-PASS	0.3 v. rms	----	31.0 volts
AUDIO SEL. SW. IN 1200cps (NAR.)	0.3 v. rms	----	28-50 volts

5. I.F. Alignment (455 kc. I.F. with BAND SWITCH in Band 540 kc-1.4 mc.).

   A. Adjust R106 for 1.8 Volts on Pin #2 of v6

SWITCHES
AVC-OFF
N.L.-OFF
S.R.-REC.
BFO-OFF
SSB-OFF
RAD/PH-RAD.

   B. Feed the 455 kc. output of the Harvey Radio Labs Model 46 sweep generator into the signal grid of V3 (pin 1). CRYSTAL SEL. SW. should be in the 2kc position. Observe output waveform at the detector load (terminal strip junction R 58 and R 60). For maximum output as observed on the scope, peak T 8,7,6, L20, & T5,4. Repeat in this order as many times as is necessary for optimum response. CRYSTAL PHASING CONTROL must be at zero for this alignment. Check relation of this control with condenser setting. With control on zero, condenser should be half open.

   C. When the above alignment has been completed vary the CRYSTAL PHASING CONTROL clockwise and counterclockwise about the zero position and observe waveform on the scpe. The rejection notch should move above and below the frequency of the series resonance peak. Compare with response curves.

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D.   Put CRYSTAL PHASING CONTROL in the zero position and observe the wave-
forms for all positions of the CRYSTAL SELECTIVITY SWITCH. Compare
with response curves.

E.   Disconnect scope and connect VTVM in its place. (VTVM remains c nnected
throughout test of the receiver.

F.   Feed a Measurements 65-B or 82 signal generator into pin 1 of V3 and
measure the 6 db. bandwidths of all positions of the CRYSTAL SEL. SW.
The following results should be obtained: ('CRYSTAL PHASING control
at zero) (All frequency readings ±10%.)

Non- Crystal	7000 CPS
2 KC.	2000 CPS
1.5 KC.	1500 CPS
1 KC.	1000 CPS
.5 KC.	500 CPS
.25 KC.	250 CPS

G.   With signal generator modulated 1000cps at 30% mod.,
measure the 455kc output in the NON CRYSTAL position to produce .35 v.
rms across the detector load (input signal between 80-100 uv).
2 kc position 160-200 uv.   .5 kc position 50-70 uv.

6.   Check the BANDSPREAD dial calibration in several places throughout each band.

B.F.O. Operation

a.   Check B.F.O. Switch action. Switch ON-V 13 plate voltage is on. Switch
OFF V 13 plate voltage is off.

b.   Set B.F.O. PITCH CONTROL on zero (condenser should be half open).

c.   Feed an R.F. Signal Generator set at 455 KC. into pin 1, V3. +

d.   With B.F.O. SWITCH ON, adjust the B.F.O. tuning slug L22 so that the
BFO zero beats with the incoming 455 KC. signal. The zero beating may
be ascertained by means of earphones or a speaker.
Connect Audio Frequency Meter across 600 ohms load and observe 3 KC
swing each side of "0" setting of BFO Pitch Control.

7.   3.955 I.F. Alignment (Bandswitch in Band 4).

Feed 3.955 KC from signal generator to pin #1 of V3 (adjust output from
signal generator accordingly).

a.   Align L19 for peak on VTVM.

b.   Align T2 top and b ttom slugs.

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c. Align T3 bottom slug.

d. Sensitivity: For 20 uv into Pin # of V3 at 3.955 KC should produce approximately .35 V at the detector load.

8. R.F. Alignment

(Bandspread and Antenna Tuning Capacity at minimum capacity and osc. trims. 1/2 open)

a. . Set the MAIN TUNING condenser and dial at the top end of the band. See alignment chart below.

b.. Feed into the ANTENNA terminals (75 ohms), through an appropriate matching network from a Measurements 82 or 65 -B signal generator a frequency corresponding to the high end of band alignment frequency. Tune oscillator slug for maximum audio output. Adjust the corresponding R.F. trimmer for maximum audio output.

c. Set the MAIN TUNING condenser and dial at the low end of band calibrating frequency. Feed in an R.F. signal corresponding to this. Adjust oscillator, R.F. and Antenna tuning slugs for maximum output.

d. Repeat (b) and (c) as many times as necessary for optimum output. In repeating (b) adjust the oscillator trimmer instead of the tuning slug. i.e. adjust trimmers at high end of band and slugs at low end of band.

* e. Measure the R.F. input at several points in the band for .35 v. rms across the det. load.

* f. Check the dial calibration at several points in the band.

* g. Check the 10 db noise figure at several points in the band.

* h. Check the image rejection at several points in the band, must be no-less then 60 db.

i. Repeat (a) - (h) for all bands.

ALIGNMENT CHART

Band	High End	Low End	Min. Sens.
1	1450 kc.	540 kc.	2.5 uv
2	3.3 mc.	1.43 mc.	1.0 uv
3	5.6 mc.	3.2 mc.	2.5 uv
4	9.0 mc.	5.8 mc.	1.0 uv
5	17.0 mc.	10.0 mc.	1.0 uv
6	31.0 mc.	18.0 mc.	1.0 uv

CRYSTAL SEL. - NON CXTL

* Peak ANTENNA TUNE capacity before each measurement.
  Compare results with standard charts.