

DATE <u>17/1/61</u>	TMC SPECIFICATION NO. S - 10052 - A	
SH. <u>1</u> OF <u>5</u>		
COMPILED BY CLB/hh	TITLE: TEST SPECIFICATION FOR BAA-1	JOB
APPROVED <i>W.A.G.</i>	<i>He</i>	

T E S T S P E C I F I C A T I O N

FOR

BROADBAND AMPLIFIER

MODEL BAA-1

T.M.C. (CANADA) LIMITED
OTTAWA ONTARIO

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1. CROSS-MODULATION TEST

Equipment to be set up in accordance with Figure 2 attached. The Signal Generator levels to be calibrated by measurement with a Hewlett Packard Model 410B Voltmeter at the input terminal of the BAA-1. Signal Generator No. 1 being calibrated with the attenuator of Signal Generator No. 2 at minimum. Reference with attenuator set for 300,000 microvolts. The outer ring of the attenuator to be adjusted to obtain 300,000 microvolts at the BAA-1 input terminal. Procedure repeated with Signal Generator No. 1 at minimum and Signal Generator No. 2 calibrated in a similar manner.

NOTE:

Care must be taken not to disturb the calibration setting of the outer attenuator ring after this calibration.

The output levels of both Signal Generators to be adjusted to read 7,500 microvolts. The receiver attached to the output of the BAA-1 in accordance with Figure 2 is tuned to the desired cross modulated product and calibrated to arbitrary reference.

Signal Generator No. 2 attenuator to be set to minimum. Signal Generator No. 1 frequency adjusted to the frequency chosen and to which the receiver is tuned. Calibration of the Signal Generator on this new frequency to be carried out as previously detailed, and the attenuator adjusted to re-gain the previously determined output level.

CROSS MODULATION IS EQUAL TO $20 \text{ LOG}_{10} \frac{V_1}{V_2}$.

WHERE V_1 IS THE REFERENCE LEVEL OF 7500 MICROVOLTS AND V_2 IS THE EQUIVALENT ANTENNA VOLTAGE OF THE CROSS MODULATION COMPONENT. At least 55 db down
i. e. $V_2 \leq 13.5 \text{ uv.}$

Signal Generator No. 1 should always be modulated 30% at one thousand cycles.

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2. GAIN - DURING THIS TEST

The equipment to be set up in accordance with Figure 1. The receiver to be connected to point 1 indicated. Signal Generator output level set to 100 microvolts modulated 30% at 1,000 c/s. Receiver tuned and output level adjusted to an arbitrary reference. Receiver connection transferred to point 2. Signal Generator attenuator re-set to re-gain the output level as before.

$$\text{GAIN} = 20 \times \text{Log}_{10} \frac{V_1}{V_2} = 14 \pm 2 \text{ db.}$$

WHERE V_1 IS THE 100 MICROVOLT LEVEL

AND V_2 IS THE INDICATED SIGNAL GENERATOR OUTPUT NECESSARY TO RESTORE RECEIVER OUTPUT POWER INDICATION. i. e. $15.8 \text{ uv.} > V_2 > 25 \text{ uv.}$

3. NOISE FIGURE

Using temperature saturated Diode Noise Generator. Receiver connected to top of BAA-1. Output calibrated with Diode Noise Generator switch-off.

STEP 2:

Diode Noise Generator power turned on, diode current adjusted to obtain $\sqrt{2}$ times original output voltage indication from receiver. $\sqrt{2} \approx 1.4$

NOTE:

The increase of output voltage by $\sqrt{2}$ effectively doubles receiver output power.

NOISE FIGURE EQUALS INDICATED DIODE CURRENT TIMES $\frac{70}{50}$ MINUS CORRECTION FACTOR FOR RECEIVER NOISE. N. F. ≤ 4.5

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NOTE:

To calculate correction for receiver noise figure, the following formula should be used:

$$NF(\text{comb}) = N1 + \frac{N2-1}{G1}$$

Where N1 = BAA-1 NF

$$NF = I \text{ milliamps} \times \frac{70}{50}$$

N2 = RX NF

G1 = (V gain)² of BAA-1.

IMPEDANCE:

$\frac{N2-1}{G1}$ = Correction Factor

Input and output impedance bridged using 916-A or 1606-A General Radio Impedance Bridge. VSWR to be less than 2.5/1.

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GAIN INPUT LEVEL 100 μ v MOD. 1000 cps. 30%

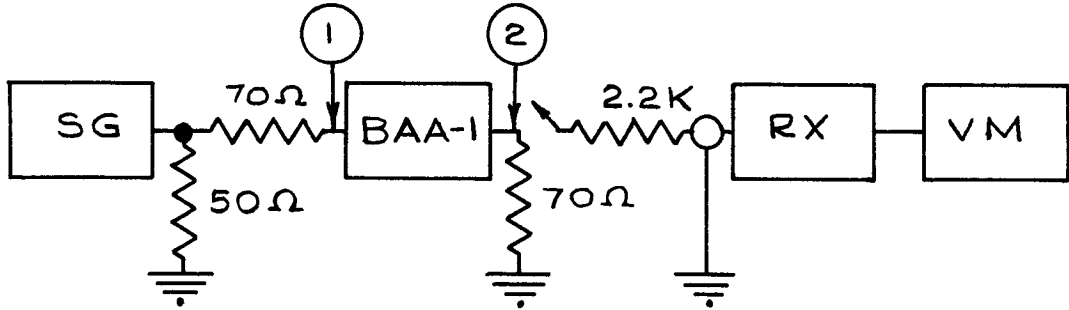


FIG. 1

XMOD. LEVEL 7500 μ v.

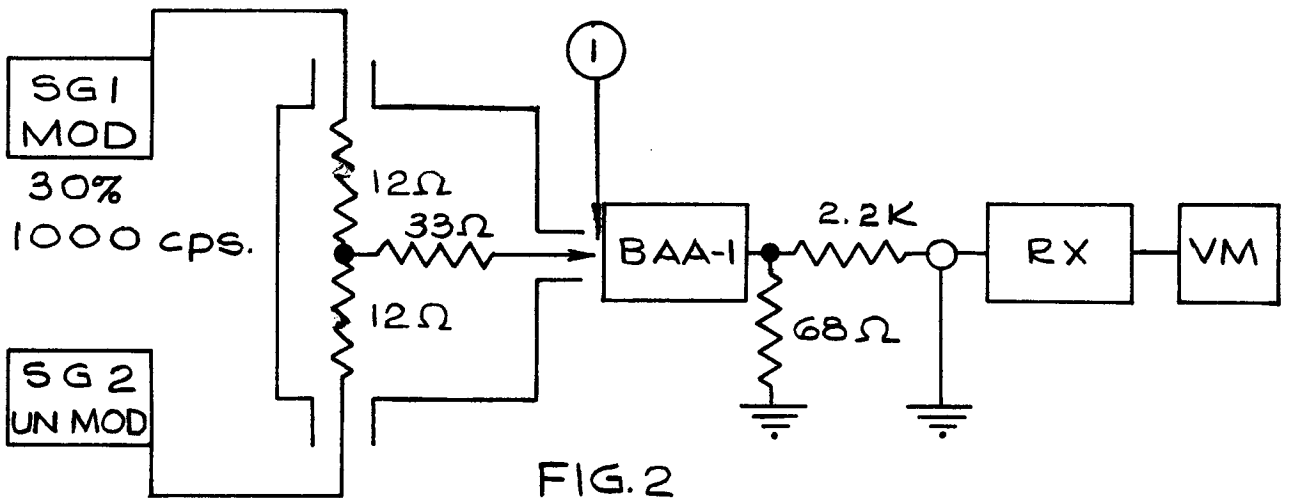


FIG. 2

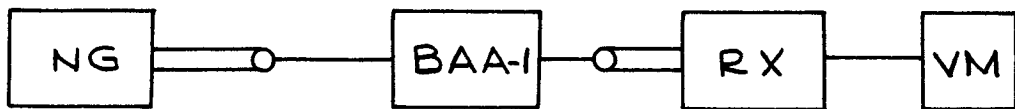


FIG. 3

