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B.R.1565 ADDM.

**ADDENDUM N° 1 TO
B.R.1565 HANDBOOK FOR TYPE 618
AND RECEIVER OUTFIT CAS**

**PROCEDURES AND TEST RIGS FOR
FAULT FINDING USING C.N.R.T.E. ON
RECEIVER OUTFIT CAS**

ANY SUGGESTIONS FOR AMENDMENTS OR ADDITIONS TO THIS BOOK
SHOULD BE SUBMITTED TO THE CAPTAIN SUPERINTENDENT, A.S.R.E.,
THROUGH THE USUAL CHANNELS



**RADIO EQUIPMENT DEPARTMENT, ADMIRALTY
JUNE. 1958 (R.E.1058/56)**

★ AMENDMENTS ★

When an amendment to this handbook is promulgated the brief details required below are to be filled in.

AMENDMENT Nº	AUTHORITY (A.F.O. Nº ETC.)	DATE OF INSERTION	INITIALS

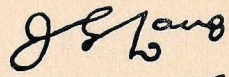
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June 1958.

R.E. 1058/56

B.R. 1565 Addm. "Addendum No. 1 to Handbook for Type 618 and Receiver Outfit CAS" having been approved by My Lords Commissioners of the Admiralty, is hereby promulgated.

By Command of Their Lordships



To:-

Flag Officers and
Commanding Officers
of H.M. Ships and
Vessels concerned.

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R E C E I V E R O U T F I T C A S

Procedures and Test Rigs for Fault Finding using

C.N.R.T.E. in Receiver Outfit CAS

Para.

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FIGURES

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PROCEDURES AND TEST RIGS FOR
FAULT FINDING USING C.N.R.T.E. ON RECEIVER OUTFIT CAS

General

1. Detailed tests will normally be required when the Noise Generator Tests described in Chapter 5 indicate that either a fault has developed or the receiver has deteriorated beyond its reject level of performance.

In either case access to the receiver circuits will be required and in the following paragraphs details of the procedure and test figures to be expected when using C.N.R.T.E. are given.

The receiver has been considered in three separate sections:-

- (i) Audio frequency section.
- (ii) Intermediate frequency section.
- (iii) Radio frequency section.

When a receiver is being checked stage by stage it is normal practice to work from the audio frequency section back to the r.f. stages.

2. Generally the trend of the results of previous routine Noise Generator Tests will give a clue to the location of the fault, e.g. see fault finding Table 4, Chapter 5.
3. In the following paragraphs, detailed test rigs are included for r.f. Sensitivity and Signal-to-Noise Ratio, i.f. bandwidth and centre frequency, a.f. sensitivity and frequency response. The type of test instrument used will depend upon the part of the circuit under test. Sufficient information is included for all relevant C.N.R.T.E. instruments.

The test rigs given should be closely followed, particularly when r.f. and i.f. measurements are being made. Variation of layout can alter the results obtained.

4. The tests are given in the following order:-
 - (i) Audio Amplifier Gain Measurement.
 - (ii) Audio Amplifier Frequency Response.
 - (iii) I.F. Amp. Sensitivity and Stage Gain.
 - (iv) Measurement of Overall Sensitivity of i.f. amplifier, with Bandwidth set at 8 kc/s.
 - (v) I.F. Amplifier Frequency Response.
 - (vi) R.F. Amplifier Signal-to-Noise Ratio.
 - (vii) R.F. Sensitivity and Stage Gain.

- (viii) List of C.N.R.T.E. Instruments which can be used in place of those shown in the Test rigs, showing also the normal control positions.
- (ix) List of leads and adaptors required.

A.F. GAIN MEASUREMENT (large and small ships)

5. The object of this test is to determine whether the overall gain of the Audio Amplifier and also the stage gain is correct.
6. Connect Test Equipment as shown in Figures 1 or 2 as appropriate. Connect output of a.f. attenuator (or resistance pad) to grid of V301 and connect the screened outer of this cable to earth.

Set CAS receiver controls as follows:-

(a) CAS Controls

- (1) Set wave change switch to the 60 - 180 kc/s position.
- (2) Set bandwidth switch (SW201) to 3 kc/s position.
- (3) Set AGC switch (SW202) to OFF.
- (4) Set BFO switch (SW203) to OFF.
- (5) Set crystal switch to OUT (i.e. in the fully counter-clockwise position).
- (6) Set r.f. gain control fully counter-clockwise.
- (7) Set a.f. gain control fully clockwise.
- (8) Set "phone volume" fully clockwise.
- (9) Connect a 0.01 μ F capacitor between the grid of V203 (Pin 1) and earth.

(b) Method of Test (Cruisers and above only)

- (1) Set test equipment controls as detailed in test rig Fig. 1 or Fig. 2 as appropriate.
- (2) Set the frequency of the Test Oscillator to 1000 cycles.
- (3) Adjust the output control of the Test Oscillator until the avometer indicates 10V a.c.
- (4) Set the coarse attenuator switch of the A.P.100321 to 20 dB and the fine attenuator control to 18 dB.
- (5) Adjust the fine attenuator control until the CT44 indicates 33 dBm (2W).
- (6) The attenuator fine control reading should indicate in the region of 10 dB, for a typical receiver. If the a.f. gain is correct, proceed to the test of a.f. frequency response (Para. 10). If the a.f. gain is unsatisfactory the individual a.f. stages should be tested as described in sub-paras. (7) to (14).

- (7) Re-set the fine attenuator to 20 dB. Then proceed as follows to determine the stage gain.
- (8) Set the controls of the CT44 output wattmeter to +25 dBm 600 mW range and 600 ohm impedance.
- (9) Check that the avometer indicates 10V a.c. at a 1000 cycles.
- (10) Adjust the a.f. fine attenuator slowly in a counter-clockwise direction until the output meter indicates 24.8 dBm (300 mW) and note reading of the fine and coarse attenuator and insert total attenuation in table 1 column 2 line 2.
- (11) Disconnect clip lead from grid of V301 and connect it to the grid of V302 (pin 1) leaving the 0.01 μ F capacitor connected as before.
- (12) Adjust the a.f. fine attenuator until the output meter indicates again 24.8 dBm (300 mW). Note the fine attenuator reading. Insert the total attenuation in column 2 of table 1 line 3. The fine attenuator should never be set on the red part of its scale if it can be avoided.
- (13) Remove the clip lead from the grid of V302 and transfer it to the grid of valve V303 (Pins 1 and 2).
- (14) Adjust the attenuator fine control in a counter-clockwise direction until the output meter indicates 24.8 dBm (300 mW) and again note the reading of the fine and coarse attenuators and insert the total reading in column 2 of table 1 line 4.

TABLE 1

	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5
Line No.	Valve No. & pin No.	Attenuator Reading total (i.e. coarse and fine) [†]	Stage Gain dB	Standard Output Level	Frequency of Test Oscillator
1	V301 (Grid Pin 1)	30 dB	-	33 dBm 2W	1000 cycles
2	V301 (Grid Pin 1)	38.0 dB	Stage Gain of V301 25 dB	24.8 (300 mW)	1000 cycles
3	V302 (Grid Pin 1)	13.0 dB	Stage Gain of V302 10.0 dB	24.8 (300 mW)	1000 cycles
4	V303 (Grid Pin 1 and 2)	3 dB	-	24.8 (300 mW)	1000 cycles

Note throughout the test the Avometer reading should be set to 10V a.c.

[†] The figures in Column 2 lines 1, 2, & 3 above must be within +3 dB of the indicated figure.

7. This completes the measurements necessary to determine stage gain of the audio sections. The stage gain can be found as follows:-

Example

To find gain from grid of V301 to the grid of V302 (i.e. the stage gain of V301).

Subtract the dB reading in table 1 column 2 line 3 from the dB in Column 2 line 2 of table 1.

i.e. $38 - 13 \text{ dB} = 25 \text{ dB}$.

Thus stage gain is 25 dB - insert this in Column 3 line 2 of table 1.

NOTE: The readings given in the table are typical but it is possible for the stage gain to vary widely and variations of 6 dB are acceptable.

8. Having completed these tests the equipment should be disconnected, unless the frequency response is required. In this case reference to paragraph 2 should be made.

To Check a.f. Gains in Small Ships

9. To check a.f. gain in destroyers, frigates and below, the test rig shown in Fig. 2 should be used. Before proceeding with test below, check value of 600 ohms terminating resistance and values of resistors in the 20 dB attenuator pad A Fig. 2. Repeat directions as laid down in paras. 5-6(a), 6(b) (1) and (2). Increase the a.f. oscillator output from zero until the CT54 indicates 33 dB above 1 mW = 2W, i.e. the reading on the CT54 voltmeter will be 34.6V.

Note the reading indicated on the avometer.

The voltage applied to the grid of V301 will be 20 dB down on the voltage indicated, i.e. AVO reading
10

A typical voltage at the grid of V301 would be 0.3V, i.e. the avometer should read 3.0V. A tolerance $\pm 1V$ is permissible. It is not convenient to perform stage gain tests when the a.f. attenuator A.P.100321 is not available.

AUDIO AMPLIFIER FREQUENCY RESPONSE: (Cruisers and above)

10. (1) Repeat operations detailed in Paras. 5, 6(a), 6(b), (1) to (6).
(2) When the test oscillator is set at 1000 cycles and the output meter indicates 33 dBm (2W) the attenuator reading corresponds to the 0 dB point i.e. the reference level to which it is intended to work (see table 2).
(3) Adjust the frequency of test oscillator to 300 cycles.
(4) Check that the avometer still indicates 10V.

- (5) Adjust the attenuator fine control until the output meter again indicates 33 dBm (2W). A typical receiver should give a result of the order of 32 dB (see table 2).
- (6) Retune the Test Oscillator to 2500 cycles and adjust the fine attenuator for the standard output of 33 dBm (2W).

The attenuator should then indicate approximately 29.3 dB for a typical receiver.

It is emphasised that figures quoted above are figures obtained from a typical receiver, variations from the figure are possible however.

Table 2 below details the limits between which the attenuator readings should be. Care should be taken during these tests to ensure that the voltage output of the test oscillator is maintained at 10V as indicated by the AVO throughout tests.

TABLE 2

A.F. Test Oscillator Frequency in cycles per second	Attenuator settings dB	Output meter level	Response levels
1000	30	33 dBm 2W	0 dB
300	31 - 22 Limits	" " "	+1 dB -8 dB
2500	32 - 26 Limits	" " "	+2 dB to -4 dB

Frequency response on Small Ships

11. It is not recommended that the frequency response of the a.f. amplifier be checked on destroyers frigates and smaller ships.

I.F. SENSITIVITY AND STAGE GAIN

12. The object of this test is to determine the overall i.f. sensitivity and stage gain of the i.f. amplifier when the bandwidth is set to the 3 kc/s and 8 kc/s positions.

Procedure

13. Connect test equipment as shown in the test rig Fig. 3. Connect the test oscillator output to the grid of V103 in the first instance.
 - (a) Set the receiver controls as follows:-
 - (1) Set the Waveband switch to 60-180 kc/s range.
 - (2) Set Bandwidth switch to the 3 kc/s position.
 - (3) Set a.f. volume control fully clockwise.

- (4) Set the crystal switch to OUT.
- (5) Set the BFO switch to OFF.
- (6) Set the AGC switch to OFF.
- (7) Set the r.f. gain control fully clockwise.
- (8) Set phone volume to maximum.

Switch on receiver and allow receiver to warm up for at least fifteen minutes.

(b) Set Test Oscillator Controls of the CT212 as follows:-

- (1) Set function switch to C.W.
- (2) Set frequency range switch to range 3.
- (3) Set tuning control to 800 kc/s.
- (4) Set meter switch to CAR.
- (5) Adjust the set carrier control until the meter indicates CAL.
- (6) Set attenuator coarse control to 40 dB (100).
- (7) Set attenuator fine control to +6 dB (2 μ V).

Detailed Test Procedure

14. Before proceeding with the actual test it is necessary to set the test oscillator to 800 kc/s using the internal 800 kc/s crystal fitted in the CAS receiver.

This is accomplished as follows:-

- (1) Continuing from 13(a) and 13(b) above.
- (2) Reset BFO switch to "CAL" (on CAS receiver).
- (3) Tune the test oscillator tuning control slowly through the 800 kc/s calibration point indicated on the dial of CT212.
- (4) Adjust the test oscillator tuning control for zero beat. This will be indicated by a dip in the CT44 output meter. (A pair of 600 ohm headphones will greatly facilitate the locating of the zero beat.)

When the test oscillator is tuned through the i.f., the output power meter reading or the note in the headphones will first rise, then fall to zero, then rise again. The position of the power fall to a minimum is the correct tuning position for the test oscillator.

- (5) Set the receiver "BFO" switch to "OFF".

To measure i.f. Sensitivity

15. (1) Set CT44 Controls for 600 ohm and for the +30 dB range.
- (2) Set Test Oscillator Function Switch to A.M. Modulation.
- (3) Adjust set mod. controls until the meter pointer is on the CAL. mark. Check that the "set carrier" control is correctly adjusted.
- (4) Set fine attenuator control to 6 dB ($2 \mu V$) and the coarse attenuator control to +40 dB (x 100).
- (5) The output meter CT44 should now indicate 33 dBm (2W). If this output level is not obtainable with the input of 46 dB adjust the CT212 attenuator fine control until it is obtained (see Note 3) and record the figures in Col. 2 of Table 3 below. If the attenuator reading is less than 52 dB the i.f. sensitivity is satisfactory so proceed to Para. 16 or 17. If the attenuator reading is greater than 52 dB the i.f. sensitivity is unsatisfactory. The defective stage is found by proceeding with sub-paras. (6) to (8).
- (6) Disconnect the test oscillator lead from grid of V103 and connect it to the grid of V201, (see Note 2) and adjust the test oscillator attenuators to obtain the standard output level of 33 dBm (2W) (see Note 3). Record the attenuator readings in column 2 of Table 3.
- (7) The test oscillator lead should now be disconnected from the grid of V201 and connected to grid of V202 and the test oscillator output adjusted for the standard output of +33 dBm (see Note 3). Record readings in column 2 of Table 3.
- (8) Repeat with signal injected at grid of V203. (See Note 4.)

TABLE 3

Line No.	Col. 1	Col. 2	Col. 3	Col. 4
	Injection Point For Signal	Attenuator Readings	Stage Gain	CT44 Output Level
1	Injector Grid of V103 (Marked L.O. Volts)	50 dB	12	2W or 33 dBm
2	V201 Grid Pin 1	62 dB	19	2W or 33 dBm
3	V202 Grid Pin 1	81 dB	25	2W or 33 dBm
4	V203 Grid Pin 1	*106 dB	-	*2W or 33 dBm

The stage gains can be found as indicated in Table 3.

* See NOTE 4.

Example

To obtain the stage gain from the grid of V103 to the grid of V201 (i.e. the stage gain of V103) subtract the dB shown in Column 2 line 1 from those shown in column 2 line 2.

$$\text{i.e. } 58 \text{ dB} - 46 \text{ dB} = 12 \text{ dB}$$

Thus stage gain of V103 is 12 dB

NOTE 1 The results in the table are those for a typical receiver. Quite wide variations are possible in individual stage gains and in overall gain, but the figures obtained should give a clear picture of the i.f. sensitivity. A tolerance of ± 6 dB is possible on the figures given in Column 2.

NOTE 2 To get access to grids of V201 and V202 and V203, it is necessary to release the small back chassis containing V301, V302, V303 etc.

NOTE 3 In some instances when measuring sensitivity and stage gain, it will be found difficult to set the fine attenuator to a figure for attenuation closer than 1 dB, when trying to obtain the standard output of 33 dBm on the output meter.

The following method should be used to estimate the input.

Example

When making a measurement at the injector grid of V103 the following figures were obtained:-

The CT212 coarse attenuator 40 dB.

The CT212 fine attenuator when set to 6 dB, the output meter was indicating an output greater than 33 dBm. Consequently, the fine attenuator was set to 4 dB. The output level then fell below the 33 dB level by -1 dB (i.e. fell to 32 dB). Therefore, the true attenuator reading = (40 dB + 4 dB) + (33 dB - output meter reading dB).

$$= 45 \text{ dB}$$

If this method is used the true attenuator reading can be measured to the required accuracy.

NOTE 4 The level of 106 dB cannot be attained on the signal generator attenuators but by taking into consideration the output level on the a.f. wattmeter one can obtain a figure to determine stage gain.

Method The signal generator is adjusted as for the previous tests. The attenuator level is set to 100 dB. The a.f. output level is then measured on the a.f. wattmeter relative to 33 dBm (2W). Let us take for example the a.f. wattmeter indicates a level of 27 dB. Now the true level that the signal generator would indicate if there were no limits on the attenuators would be $100 \text{ dB} + (33 \text{ dB} - 27 \text{ dB}) = 106 \text{ dB}$.

Measurement of Overall Sensitivity of i.f. Amplifier with 8 kc/s Bandwidth

16. In general the 3 kc/s sensitivity is sufficient. However if it is desired to measure the bandwidth in the 8 kc/s position, the same procedure is adopted as that when measuring 3 kc/s sensitivity except that the bandwidth of the receiver is set to 8 kc/s and the overall gain is normally slightly lower (approximately 4 dB).

I.F. AMPLIFIER FREQUENCY RESPONSE

17. The object of this test is to determine the overall bandwidth of the i.f. amplifier when the receiver bandwidth is set to 3 kc/s and 8 kc/s. The 3 kc/s bandwidth should be not less than ± 1.5 kc/s at the -6 dB level and not more than ± 6 kc/s at -30 dB level at the i.f. centre frequency of 800 kc/s. The 8 kc/s bandwidth should be not less than ± 4 kc/s at the -6 dB level and not greater than 12 kc/s at -30 dB level.

Procedure for measuring i.f. Response

18. (If the overall i.f. sensitivity has just been performed the instruments should be already correctly connected.)

If not connect test equipment as shown in Fig. 3 (test oscillator output connected to the grid of V103).

- (1) Set receiver controls as detailed in Para. 13(a).
- (2) Set test oscillator controls as detailed in Para. 13(b).
- (3) Check that the CT212 test oscillator is set at the i.f. centre frequency as detailed in Para. 14.
- (4) Finally, set controls as detailed in Para. 15(1) - (5). The a.f. gain control may be adjusted slightly if necessary to set to the 33 dB level.

Method of Test

19.
 - (1) The output meter indication of 33 dBm corresponds to 0 dB on the response curve. Therefore, note reading of the attenuator and the reading indicated on the CT212 tuning control logging scale.
 - (2) Increase the test oscillator output by +6 dB, turn the tuning control in a clockwise direction until the output meter again indicates 33 dBm. Note the reading on the logging scale of the test oscillator.
 - (3) Turn the tuning control in a counter-clockwise direction until the output meter again indicates 33 dBm. Note reading on the logging scale of the test oscillator.
 - (4) The difference of the two readings obtained will give an indication of the bandwidth.

(Ten divisions on the logging scale correspond to 1 kc/s.)

- (5) When measuring the bandwidth in the 3 kc/s position the difference in the logging scale readings must not be less than thirty divisions at the -6 dB points and not greater than 120 divisions at the -30 dB points.
- (6) To obtain the 30 dB points on the response curve, repeat (1) to (5) above but increasing the test oscillator attenuator reading to +30 dB above the 0 dB reference level instead of 6 dB as in (2) above. The test oscillator should be well detuned from the i.f. centre frequency to avoid over-loading the output meter, when increasing the test oscillator output.

To measure the bandwidth in the 8 kc/s position

20. (1) Repeat Para. 19 (1) to (6) except with the receiver bandwidth switch set to 8 kc/s.

Table 4 gives the appropriate limits for the different tests.

TABLE 4

CT212 Attenuator Reading Approx. for normal receiver	3 kc/s Bandwidth		8 kc/s Bandwidth		CT44 Output Meter Level
	Response level	Bandwidth Relative to i.f. centre frequency 800 kc/s	Response level	Bandwidth Relative to i.f. centre frequency 800 kc/s	
50 dB	0 dB	i.f. centre frequency	0 dB	i.f. centre frequency	33 dBm (2W)
56 dB	-6 dB	-1.5 kc/s } Not	-6 dB	-4 kc/s } Not	
56 dB	"	+1.5 kc/s } less	"	+4 kc/s } less	
80 dB	-30 dB	-6 kc/s } than	-30 dB	-12 kc/s } than	
80 dB	"	+6 kc/s } greater	"	+12 kc/s } greater	

R.F. AMPLIFIER TEST: (1st rate frigates and above)

Signal to noise ratio and noise factor

21. The CT82 noise generator is usually preferred for the measurement of noise factor instead of using a signal generator and measuring S/N. Detailed test procedure is included using a test oscillator as the situation may arise where a CT82 is not readily available. It is also convenient to use the same test rig and connections for overall sensitivity measurements. Provided the standard output of 33 dBm can be obtained in the S/N test, then the overall sensitivity of the receiver is satisfactory.

To measure Signal to Noise Ratio and Sensitivity

22. (a) Set CAS receiver controls as follows:-

- (1) Crystal control to the out position (fully counter-clockwise).

- (2) Set r.f. gain-control fully clockwise (maximum).
 - (3) Set waveband switch 60-180 kc/s.
 - (4) Set bandwidth switch to 3 kc/s.
 - (5) Set the BFO switch to OFF.
 - (6) Set the AGC switch to OFF.
 - (7) Set a.f. gain control fully clockwise (maximum).
 - (8) Set Phone Volume fully clockwise (maximum).
- (b) Setting of Test Oscillator CT212 controls
- (1) "Frequency Range" to 1.
 - (2) "Tuning" to 118 kc/s.
 - (3) Deviation to 30.
 - (4) Fine attenuator 0 dB.
 - (5) Coarse attenuator 40 dB.
 - (6) Selector Switch to a.m.
 - (7) Carrier function switch to "CAR" and adjust "Set CAR" control till meter reads "CAL".
 - (8) Carrier function switch to "MOD" and adjust "Set MOD" control till meter reads "CAL".
 - (9) Recheck (7) and (8).
 - (10) Connect the output of the test oscillator (lead No. 1) to the aerial input socket of the receiver.

Procedure for S/N Measurement (see also Fig. 4)

- 23.
- (1) Tune receiver to 118 kc/s, and tune for maximum output into the CT44.
 - (2) Check that the test oscillator level is correct and the output is 40 dB (100 μ V). (The modulation is automatically set in the CT212 at 1000 c/s 30%, when the "set MOD" and "set CAR" controls are correctly set.)
 - (3) Adjust a.f. gain control until the output meter reads the standard output of 33 dBm.
 - (4) Set CT212 to C.W. and note the fall in output power as indicated on the CT44. Insert the drop in output in column 2 of Table 5 below.

- (5) Repeat (1) to (4) above for the other frequencies shown and hence complete the table.

The minimum drop for a receiver just up to its specification is given in column 3.

TABLE 5

Col. 1	Col. 2	Col. 3
Frequency	Actual Fall in Audio Output level In typical receivers dB	Specification Minimum Fall dB
118 kc/s	30 - 35	30
344 kc/s	30 - 35	30
2.91 Mc/s	30 - 34	30
8.8 Mc/s	26 - 35	26
21.0 Mc/s	24 - 33	24

NOTE: Figs. in Column 2 are from a typical receiver.

LIST OF C.N.R.T.E. INSTRUMENTS WHICH CAN BE USED IN
PLACE OF THOSE SHOWN IN THE TEST RIGS

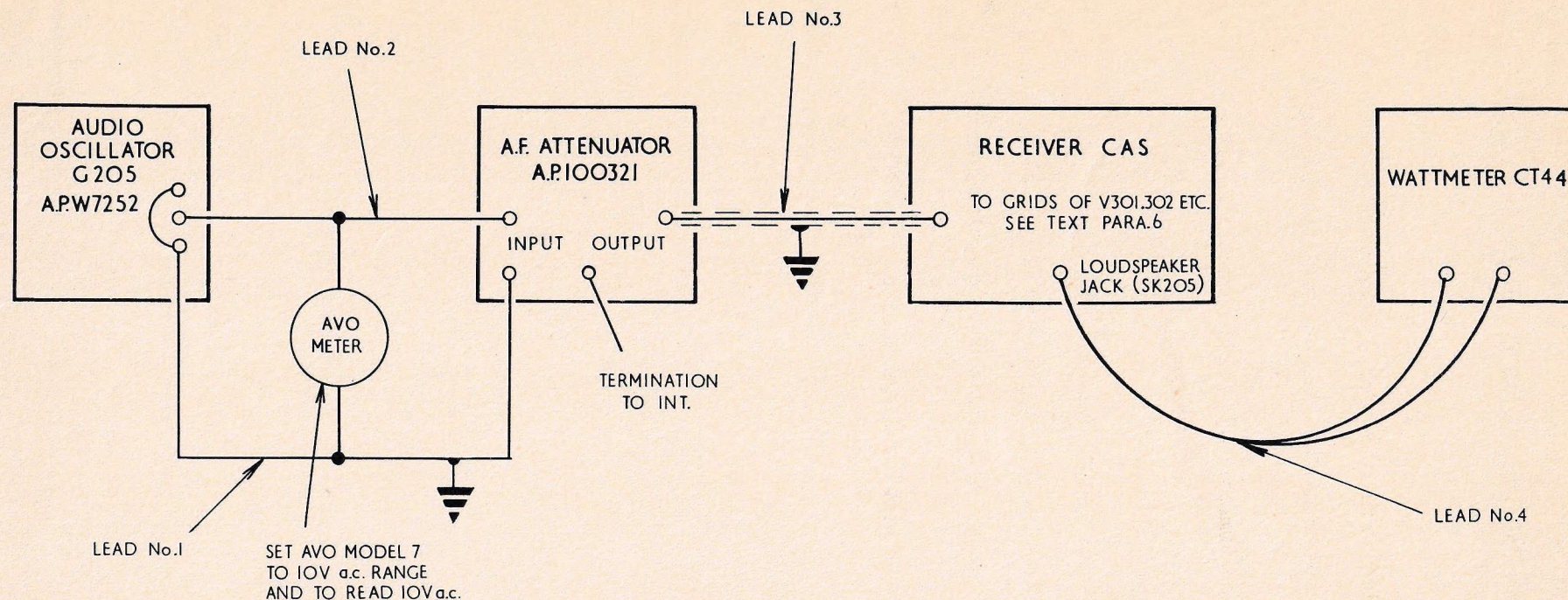
24. The type of instrument used will depend upon the test outfit supplied to the particular ship. In addition to those used in the preceding tests the following C.N.R.T.E. may be used as substitutes. The normal position of the controls are also given.

A. F. POWER METERS

CT54, A.P. 67921, Valve Voltmeter and 600 ohm Load

- (Set function switch to a.c.
- (Set range switch to 48 volts.
- (Connect 600 ohm resistor between the terminal marked low and A.C. high terminal.
- (Adjust set zero control.

WATTMETERS { A.P. 54708, Output Power Meter T.F. 340
 (Set ohms switch to 60
 (Set impedance multiplier to 10
 (Set meter multiplier to 100.



CONTROL POSITIONS FOR G205 (IF NOT AVAILABLE USE ADVANCE J1)

SET MAIN SWITCH TO ON
SET L F SCALE TO 0
SET H F SCALE TO 1000 c/s
SET METER SWITCH TO a.c. VOLTS
SET OUTPUT CONTROL TO POSITION 5
AND THEN ADJUST TO GIVE 10V
ON AVOMETER

CONTROL POSITIONS FOR ADVANCE J1

SET MAINS SWITCH TO ON
SET OUTPUT CONTROL TO GIVE
10V ON AVO
SET RANGE SWITCH TO B
SET FREQUENCY CONTROL TO 1000 c/s
SET 600Ω ATTENUATOR TO 0dB.
CONNECT LEADS TO 600Ω OUTPUT
WHEN ALL CONNECTIONS AND OTHER
TEST INSTRUMENTS ARE CORRECTLY SET

CONTROL POSITIONS FOR FOR A.F. ATTENUATOR A.P.100321

SET COARSE ATTENUATION TO 20 dB
SET FINE CONTROL TO 18 dB
SET ATTENUATOR TERMINATION SWITCH
TO INTERNAL (INT)
ADJUST CONTROLS AS IN TEXT
PARAS. 6A AND 6B.

CONTROL POSITIONS OF CT44 ZD00661 WATTMETER ABS

SET POWER RANGE SWITCH TO
2 WATT + 30 dB
SET IMPEDANCE SWITCH TO 600Ω
ADJUST RANGES AS DETAILED IN
TEXT PARAS. 6A AND 6B.

SEE PARA.25 FOR DETAILS OF LEADS

FIG.1 TEST RIG FOR A.F. GAIN AND FREQUENCY RESPONSE MEASUREMENT
(FOR CRUISERS AND ABOVE)

CT218 Signal Generator Control Positions for i.f. Sensitivity

Test

- SIGNAL GENERATOR
- (Set signal generator mains switch to ON.
 - (Set frequency range switch to range C.
 - (Set frequency tuning control to 800 kc/s.
 - (Set crystal cal. to OFF.
 - (Set carrier switch to ON.
 - (Adjust set carrier level control until meter indicates X1.
 - (Set modulation selector to a.m.
 - (Set modulation frequency to 1000 c/s.
 - (Adjust set modulation control until meter indicates 30% Mod. depth.
 - (Set output voltage selector to 6 dB.
 - (Set coarse attenuator to 40 dB.

LIST OF LEADS AND ADAPTORS REQUIRED

Figure 1

25. (i) Leads No. 1, 2 These should be short, insulated, "hook-up" type of wire.
- (ii) Lead No. 3 This lead should be a short screened type of lead, with crocodile clips at one end.
- (iii) Lead No. 4 Depends upon wattmeter used. One end should be fitted with a jack plug.
- (iv) 0.01 μ F capacitor Pattern Z115625 and clips.

Figure 2

26. (i) Lead No. 1 and Lead No. 2, both should be as short as possible and of insulated "hook-up" type wire.
- (ii) The pad A, should be made up and the value of the resistors checked. The whole unit should be mounted as close to the Audio oscillator terminals as possible.
- (iii) Lead No. 3, short screened lead, with crocodile clips at one end.
- (iv) Lead No. 4, depends upon wattmeter used. One end should be fitted with a jack plug.

Figure 3

27. (i) Lead No. 1 Coaxial lead 75 ohm A.P.61670 (5-ft long supplied with CT378) or Coaxial lead 75 ohm ZD.00378 (3-ft long supplied with CT218).
- (ii) Lead No. 2 Short adaptor lead fitted with crocodile clips A.P.60866 (supplied with CT82).

- (iii) Lead No. 3 Depends upon wattmeter used. One end should be fitted with a jack plug.
- (iv) Adaptor No. 1 Terminating Pad 75 ohm A.P.71232 (supplied with CT378).

Figure 4

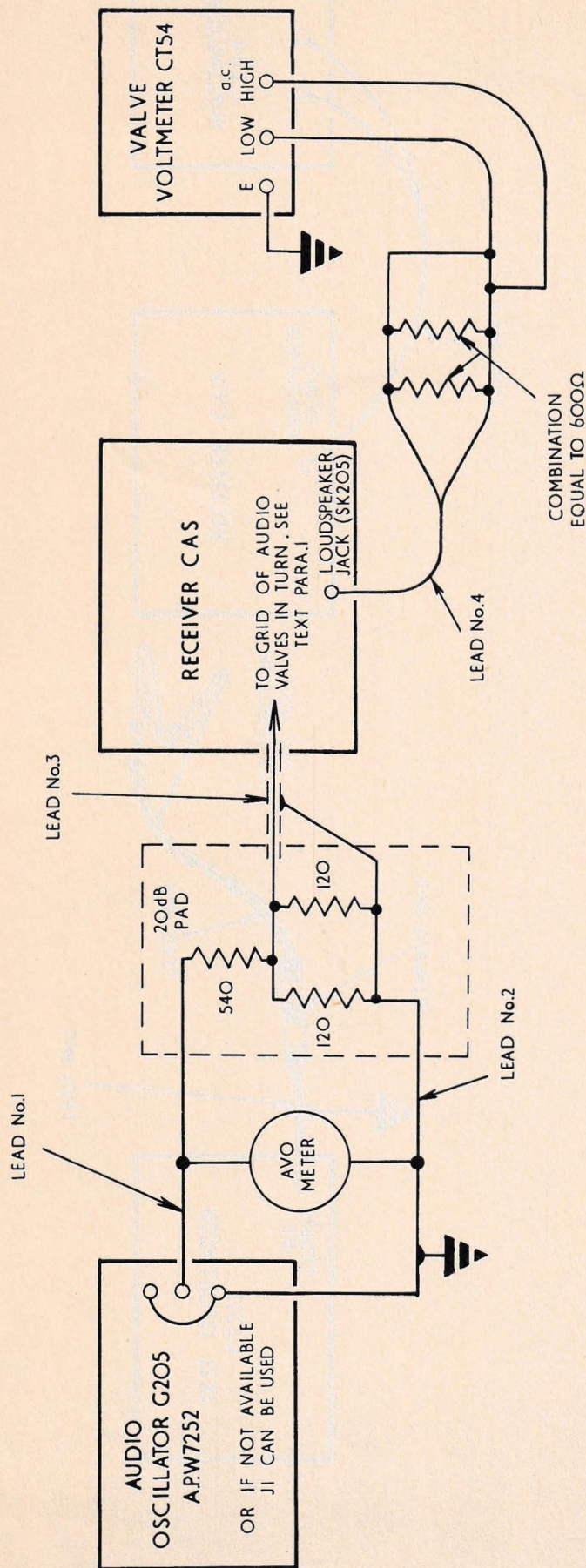
- 28. (i) Lead No. 1 A.P.64960 (supplied with CT82 for use on B40).
- (ii) Lead No. 2 Depends upon wattmeter used. One end should be fitted with a jack plug.
- (iii) Adaptor No. 1 20 dB 75 ohm attenuator A.P.71231 (supplied with CT378).

Test Oscillator Leads

- 29. (i) 75 ohm terminating pad, A.P.71232 (supplied with CT378).
- (ii) 75 ohm 20 dB attenuator A.P.71231 or 3 (supplied with CT378).
- (iii) R.F. Cable A.P.64960 (4 Pin Plessey and Burndept) (supplied with CT82).
- (iv) R.F. Cable A.P.60861 and adaptor A.P.60865 (supplied with CT82).

A.F. Output Meter Leads

- 30. (i) A.P.5438 Jack plug and cable.



CONTROL POSITIONS FOR G205(W7252)
(IF NOT AVAILABLE USE ADVANCE J1)

SET MAIN SWITCH TO ON
SET IF SCALE TO 0
SET HF SCALE TO 1000 c/s
SET METER SWITCH TO a.c. VOLTS
SET OUTPUT CONTROL TO POSITION 5
AND THEN ADJUST TO GIVE 3V
ON AVOMETER

CONTROL POSITIONS (A.P.104290)
FOR ADVANCE J1

SET OUTPUT TO GIVE 3 VOLTS ON AVO
SET RANGE SWITCH TO B
SET FREQUENCY CONTROL TO 1000 c/s
SET 600Ω ATTENUATOR TO 0dB
CONNECT LEADS TO 600Ω OUTPUT
MAINS SWITCH ON WHEN ALL CONNECTIONS
AND OTHER TEST INSTRUMENTS ARE
CORRECTLY SET

AVOMETER READING
TO BE NOTED

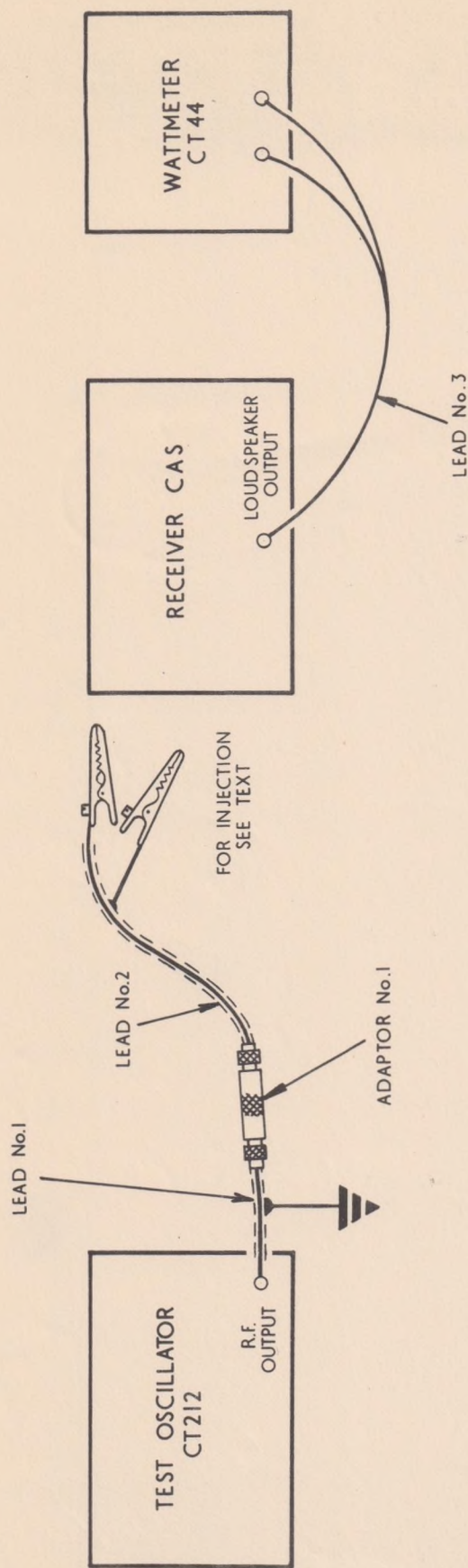
SEE TEXT FOR DETAILS

CT54 VALVE VOLTMETER (A.P.67921)
USED AS A WATTMETER

SEE TEXT FOR DETAILS

SEE PARA.25 FOR DETAILS OF LEADS

FIG.2 TEST RIG FOR A.F. GAIN AND FREQUENCY RESPONSE MEASUREMENT
(FOR FIRST RATE FRIGATES AND BELOW)



CT212 TEST OSCILLATOR CONTROLS ZDOO784

(FOR NORMAL TEST CONDITIONS)

SET FREQUENCY RANGE SWITCH TO POSITION 3

SET COARSE ATTENUATOR TO 40 dB (x100)

SET FINE ATTENUATOR TO 6 dB (2)

SET TUNING CONTROL TO 800 Kc/s

SET FUNCTION SWITCH TO CW.

SET CARRIER LEVEL TO CAL MARK

CONTROL POSITIONS FOR CT218 SIGNAL GENERATOR ARE DETAILED IN PARA. 24

CT44 OUTPUT METER ZDOO661

SET POWER RANGE SWITCH TO 2 WATT + 30 dB

SET IMPEDANCE SWITCH TO 600 Ω

SEE TEXT FOR OTHER RANGES

FIG.3 TEST RIG FOR I.F. SENSITIVITY AND STAGE GAIN TEST

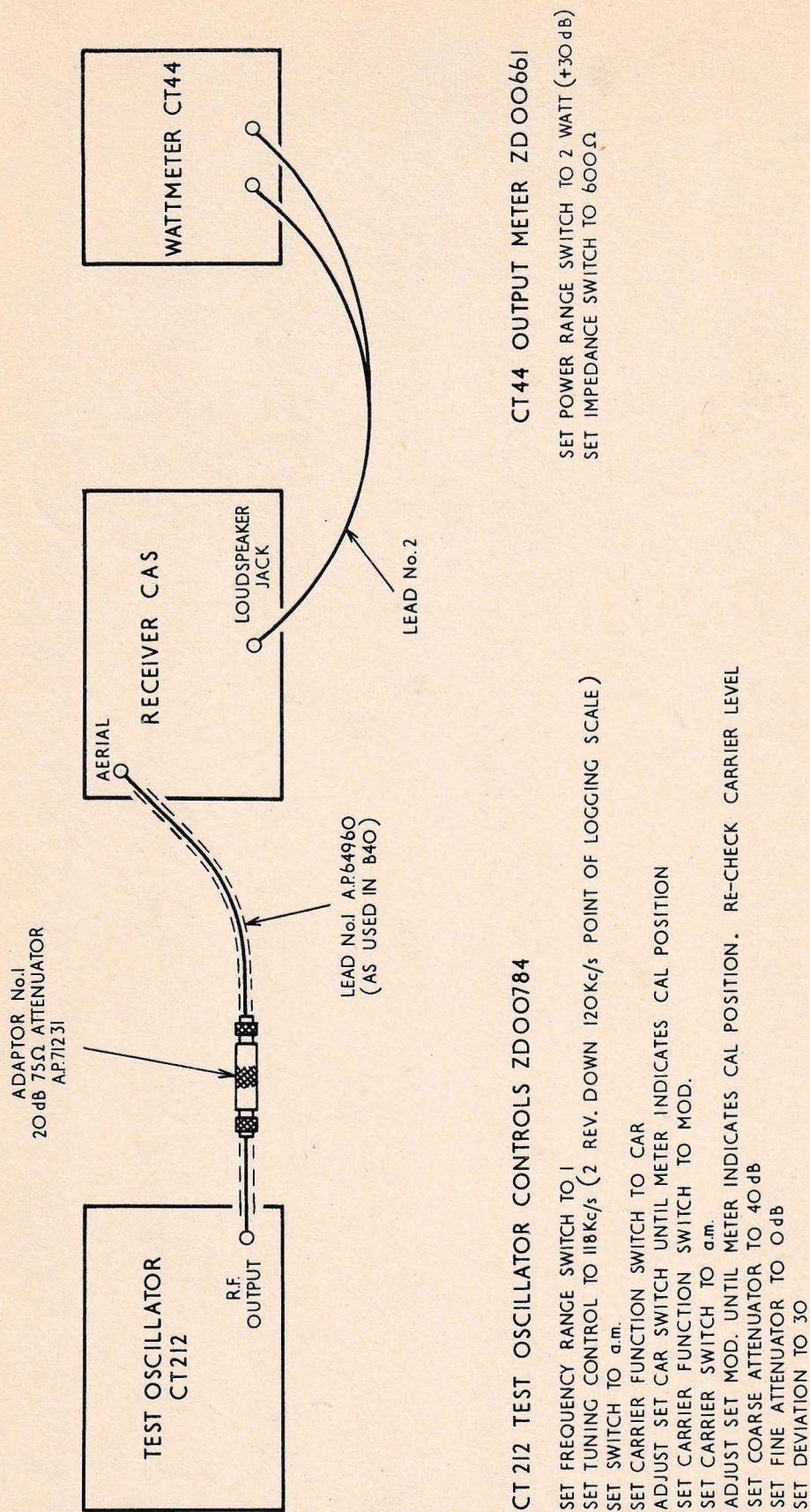


FIG.4 TEST RIG FOR OVERALL R.F. SENSITIVITY