

TRANSMITTER-RECEIVER, RADIO, C42

TECHNICAL HANDBOOK - INSPECTION STANDARDS

Errata

Note: This Page 0 will be filed immediately in front of Page 1, Issue 1, dated 2 Jun 60. The title has been amended.

1. The following amendments will be made to the regulation.
2. Page 1, title
Delete: 'WIRELESS SET C42'
Insert: 'TRANSMITTER-RECEIVER, RADIO, C42'
3. Page 3, para 10(a), line 8
Delete: '6dB'
Insert: '2dB'
4. Page 4, Table 5, column 8, line 2
Delete: 'Not less than +6dB'
Insert: '-6.5dB or more'
5. Page 9, item 4, column 4, lines 2 and 3
Delete: '6'
Insert: '2'
6. Page 11, item 21, column 3, line 7
Delete '+6'
Insert: '-6.5'

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WIRELESS SET C42

TECHNICAL HANDBOOK - INSPECTION STANDARDS

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INTRODUCTION

1. This regulation details the inspection standards to be observed when this equipment is being overhauled in REME workshops. It also contains condemnation limits for field inspection.
2. Departure from these standards will not be permitted unless authorized by War Office or DEME of the overseas theatre concerned.
3. This regulation is divided into the following:-
 - (a) **Inspection schedule.** This details the standards to be observed when the equipment undergoes overhaul and the limits and tolerances quoted will be a guide to REME workshops personnel engaged in the repair of the equipment in the field.

(b) **Inspection in the field.** This section is for the use of examiners engaged in the inspection of equipment in the hands of the troops. The field inspection record lists the standards appropriate to a minimum number of tests considered necessary to ensure that the equipment still meets its overall field requirements.

(c) **Inspection after overhaul.** This section is for the use of examiners engaged in the inspection of equipment after overhaul and includes the Base inspection record.

4. For more detailed information regarding the purpose and use of this regulation reference should be made to Tels A 619.

INSPECTION SCHEDULE

Test equipment

5. Figures quoted in this schedule are based on measurements made using the following test equipment:-

Table 1 - Test equipment

<i>Item</i>	<i>Part No</i>	<i>Designation</i>
1	Z4/ZD 03985	Kits, testing, vehicle and manpack wireless stations
2	Local manufacture	Test harness (Tels H 444 Fig 4033 refers)
3	Z4/ZD 02674	Signal generator No 12
4	Z4/ZD 00391	Signal generator No 1, Mk 3
5	Z4/WD 3941	Signal generator No 13
6	Z4/ZD 04302	Signal generator No 18
7	Z4/105/831	Oscilloscope, type 13A
8	Z4/ZD 00657	Voltmeter, valve, No 3
9	Z4/ZD 00198	Oscillator, b.f., No 8, equipment
10	Z4/ZD 00661	Wattmeter, absorption, a.f., No 1

Table 1 - (cont)

Item	Part No	Designation
11	Z4/ZD 00747	Wattmeter, absorption, h.f., No 2
12	W3/WC 53340	Apparatus, seal testing
13	Z4/ZC 1411	Frequency meter SCR 211
14	Z4/ZD 00252	Instrument, testing, Avometer, Model 8S, 28 range
15	NIV	Calibrator, crystal, precision or
16	Z4/WY 0241	Wavemeter, standard, No 2
17	Z4/ZD 01833	Test set, deviation, f.m., No 2
18	Z4/ZD 00389	Wavemeter No 4, Mk 3

General

6. (a) The condition, generally, will be in accordance with Tels A 779 where applicable.
- (b) The set case rubber seal and all controls passing through the front panel will be lightly smeared with Grease, silicone, high pressure, Cat No HI 6850-99-942-3548.
- (c) Capacitors which are mounted vertically on the a.f. and a.m.c. sub-chassis will be firmly soldered in position with an additional strap placed across the top.
- (d) The workmanship and finish will conform to sample pilot model produced by the workshop to the satisfaction of REME Technical Services.
- (h) The standard modulation will be 300c/s at a deviation of 5kc/s, except where otherwise stated.
- (j) Limiter grid current will be measured by connecting the Avometer (switched to the 50 μ A d.c. range) between pin SK2H and earth.
- (k) The a.f. output will be measured on Wattmeter, absorption, a.f., No 1 with the input impedance set to 50 Ω except where stated otherwise.
- (l) The receiver internal preset gain control will be set so that an input signal of 4 μ V at 46Mc/s, modulated at 1600c/s with 15kc/s deviation, applied to the aerial input will produce an a.f. output of 150 \pm 25mV.

Conditions of test

7. (a) The set and test equipment will be connected to a test harness.
- (i) Z4/ZD 03985 Kits, testing, vehicle and manpack wireless stations, or
- (ii) Locally manufactured item (Tels H 444 Fig 4033 refers).
- (b) Supply unit, vibratory, No 12, 24V, (or 12V) used to supply power to the set, will conform to specifications. The voltage measured at the input plug of the p.s.u. will be 23V (or 11V in the case of the 12V unit) with the set in the operational condition and the VCR switch closed (ie low voltage condition).
- (c) The set will be tuned in the normal operational manner using the set tune meter and the internal crystals (but see sub-para 22 (a)).
- (d) The frequency of the 100kc/s crystal oscillator will be checked with a Calibrator, crystal, precision or Wavemeter, standard, No 2 to within 2c/s of the nominal frequency at 20 $^{\circ}$ C.
- (e) Signal generator No 13 or 18 will be connected to the set aerial plug as follows:-
- (i) Signal generator No 13 via 7.5 Ω termination and Connector, coaxial, SD/B 177908, 7 in. (ZD 03999).
- (ii) Signal generator No 18, via Adaptors, terminating, r.f. (ZD 03916) and Connector, coaxial, No 136, 6 in. (ZD 03919).
- (f) The Signal generator No 12 or No 1, Mk 3 will be used to provide i.f. signals (a series resistance will be necessary to bring the source impedance to 75 Ω).
- (g) The signal generator will be tuned to the set by tuning for minimum noise on the output meter (signal generator at C.W.).
- (m) With the set tuned to 46Mc/s and SQUELCH control set at two-thirds of its clockwise travel, the internal preset squelch control will be adjusted until the SIGNAL lamp LP2 just lights.
- (n) The transmitter output power will be measured on Wattmeter, absorption, h.f., No 2, switched to the 70 Ω 25W load position. When measuring LOW power the valve voltmeter will be connected across the wattmeter.
- (o) For transmitter deviation measurements, Test set, deviation, No 2 will be connected across the 52 Ω 1W plug of Wattmeter, absorption, h.f., No 2.
- (p) The a.m.c. preset control will be set, with the sender tuned to 46Mc/s, to produce a deviation of 4.5 \pm 0.5kc/s with the input to the microphone terminals from a 300 Ω source adjusted to 1kc/s at 10mV.
- (q) Input to the intercomm amplifier will be obtained from a 300 Ω source. Output from the intercomm amplifier will be fed into a 30 Ω impedance. (See Tels H 444 para 68).

RECEIVER**Quieting**

8. Tune the set to 38Mc/s, connect the signal generator to the aerial plug and tune the signal generator to the set.
- (a) With the carrier off, note the reading of the output meter (Call this reading A).
- (b) Inject a 1.25 μ V signal into the set. The output will decrease from reading A by more than 10dB.
- (c) Repeat at 46Mc/s and 58Mc/s.

Bandwidth and symmetry

9. (a) Tune the set and signal generator to 46Mc/s and inject an unmodulated signal of 1 μ V into the aerial plug. Note the value of the limiter grid current (reading B).

- (b) Connect the frequency meter to the negative lead of the Avometer. Note the second intermediate frequency, nominally 2.4Mc/s.
- (c) Increase the input to 1.4 μ V and detune signal generator either side of resonance until reading B is again obtained. Note the extreme frequencies f1 and f2. The difference between the two frequencies will be between 58 and 72kc/s, and the mean will be within 2kc/s of 2.4Mc/s.
- (d) Repeat the above with input of 1mV, again noting the extreme frequencies. The difference between the two frequencies will not exceed 250kc/s and the mean will be within 10kc/s of 2.4Mc/s.

Second local oscillator harmonics

10. (a) Tune the set and signal generator in turn to 42.1 and 41.9Mc/s and note the modulated input signal which produces a 10dB signal/noise ratio. With the set and signal generator tuned to 42Mc/s (5th harmonic) adjust the input to give a 10dB signal/noise ratio. The input level will not increase by more than 6dB.
- (b) Repeat sub-para (a) above at 50.4 and 58.8Mc/s (6th and 7th harmonics respectively) and at ± 100 kc/s from these nominal frequencies, for the same result as at 42Mc/s.

Second channel rejection

11. (a) Tune the set and signal generator to 58Mc/s. Inject a 1 μ V unmodulated signal into the aerial plug and note the limiter grid current (reading C).
- (b) With the set controls unaltered, adjust the signal generator to 70Mc/s. Increase the input level to obtain the same limiter grid current as reading C. The input level will not be less than 3.16mV.
- I.F. rejection**
12. (a) With conditions and test procedure as in para 11, obtain reading C.
- (b) The signal input level at 6Mc/s to produce the same limiter grid current as reading C will not be less than 10mV.
- (c) Repeat para 12(b) at 2.4Mc/s.

Limiting

13. Tune the set and signal generator to 46Mc/s. With a modulated signal as detailed in sub-para 7(h), vary the input level from 2 μ V to 100mV. The audio output power will not vary more than ± 1 dB.

A.F. response

14. With conditions and test procedure as in para 13, adjust input level to 4 μ V. The audio output power will be within 2dB of the figures quoted in Table 2 relative to that obtained at 300c/s.

Table 2 - Receiver a.f. response

Modulating frequency	100c/s	300c/s	600c/s	1kc/s	2kc/s	4kc/s
Output relative to that at 300c/s	-2dB	0dB	-2dB	-5dB	-10dB	-15dB

A.F. output and distortion

15. With a signal applied to the aerial plug as detailed in para 7(1), the audio output will be 150 ± 25 mW. There will be no apparent distortion of the waveform observed on a c.r.o.

A.F. linearity

16. Tune the set and signal generator to 46Mc/s. Inject a modulated signal of 1600c/s and vary the deviation. The a.f. output, relative to that obtained with 8kc/s deviation, will be within the limits given in Table 3.

Table 3 - Receiver a.f. linearity

Deviation	4kc/s	8kc/s	16kc/s
A.F. output relative to 8kc/s	-6 ± 2 dB	0dB	+6 ± 2 dB

A.F. output regulation

17. (a) With conditions and test procedure detailed in para 15, obtain an audio output of 150 ± 25 mW.
- (b) Change output meter impedance to 150 Ω . The a.f. output will not exceed 60% of that obtained in sub-para (a) above.

Hum and microphony

18. Tune the set to 46Mc/s, switch to CHANNEL ADJ (ie 100kc/s crystal in circuit) and tune for maximum quieting.

- (a) With the output meter set to 150 Ω impedance, the output will not be more than 20 μ W.

- (b) After the set has received a sharp blow with the hand, the meter reading will quickly return the 20 μ W or less.

Squelch

19. Tune the set and signal generator to 46Mc/s.

- (a) Switch off the signal generator carrier, and turn the NOISE switch to ON. Adjust the SQUELCH control until the SIGNAL lamp is just extinguished. Note the reading on the output meter (reading D).

- (b) Switch on the signal generator carrier and increase the signal input level until the SIGNAL lamp lights. The output meter reading will not be reduced by more than 5dB with respect to reading D.
- (c) Repeat with the SQUELCH control fully anti-clockwise. The output meter reading will now be reduced by more than 10dB with respect to reading D.

for which a 1Mc/s crystal should be substituted for the purpose of testing. Note the self-generated second i.f. at pin SK2H as f1.

- (b) Tune the set to 1Mc/s above the selected frequency by means of the film scale only and note the i.f. as f2. The difference between f1 and f2 will not exceed 30kc/s.
- (c) Repeat the procedure of sub-para (b) above at 1Mc/s below the selected frequency.

Muting

- 20. (a) With the SQUELCH control fully anti-clockwise, inject a 46Mc/s signal modulated at 300c/s with 5kc/s deviation, and adjust the input level until the SIGNAL lamp is extinguished.
- (b) With the NOISE switch at OFF, the a.f. output will be 40dB less than with the NOISE switch at ON.

SENDER

High power

23. Connect the Wattmeter, absorption, h.f., No 2. set to 70Ω 25W range, to the aerial plug of set, with the Avometer (1A d.c. range) connected in series with the 350V h.t. +ve line. The maximum values of r.f. power output with the corresponding values of p.a. current will conform to the values given in Table 4 with the set tuned to 38Mc/s, 46Mc/s and 58Mc/s in turn. The r.f. power delivered will not be less than 15W at any frequency. (For values of r.f. power other than those quoted the current in the h.t. +ve line will be proportional).

Stability of first local oscillator

21. Variation of the input voltage to the p.s.u. by ±10% of the nominal 23V or 11V will not vary the first l.o. frequency by more than 7kc/s.

Film scale calibration

- 22. (a) Tune the set to any harmonic of the internal 1Mc/s crystal and adjust the cursor. Note that some older sets have a 2Mc/s crystal,

Table 4 - P.A. current for certain values of r.f. power

R.F. power in watts	Maximum 350V h.t. +ve line current in mA
15.0	130
18.5	140
22.0	150
25.5	160

Low power

24. With conditions and test procedure as in para 23 switch to LOW POWER and connect the valve voltmeter across the wattmeter plug. The valve voltmeter will indicate between 4 and 7.2V with the set tuned to 38Mc/s, 46Mc/s and 58Mc/s in turn.

Deviation variation with carrier frequency change

- 23. (a) With the sender tuned to 58Mc/s adjust the input to the set from the b.f.o. to 10mV at 2kc/s and note the deviation produced.
- (b) Change the sender frequency to 38Mc/s. The deviation produced will not be reduced by more than 1kc/s below the value obtained in sub-para (a) above.

Deviation and a.m.c.

- 25. (a) With conditions as detailed in para 7 (o) and (p) the deviation produced will be 4.5 ±0.5kc/s at 46Mc/s.
- (b) Increase input level to 200mV. The deviation will not increase by more than 50% of the reading obtained in sub-para (a) above.
- (c) Tune the sender to 58Mc/s. With a signal input of 200mV at 4kc/s to the microphone terminals, the deviation will not exceed 18kc/s.

A.F. response

- 27. (a) Tune the set to 46Mc/s, with the a.m.c. inoperative (ie V28 removed) and the deviation meter connected across the 52Ω 1W plug of the wattmeter. Adjust the b.f.o. output at 1kc/s to give a deviation of 15kc/s. Note the b.f.o. output voltage.
- (b) At other frequencies the b.f.o. output voltage required to produce 15kc/s deviation relative to that needed at 1kc/s will be within the limits shown in Table 5.

Table 5 - Sender a.f. response

B.F.O. frequency	100c/s	300c/s	600c/s	1kc/s	2kc/s	4kc/s	10kc/s
Output relative to that at 1kc/s	Not less than +28dB	+12 to +18dB	+4 to +10dB	0dB	-6 to -12dB	-10 to -18dB	Not less than +6dB ref level at 4kc/s

Hum and microphony

28. With sender switched to high power and tuned to 46Mc/s and the output meter set to 150Ω impedance, the a.f. output will be less than 70μW.

Stability of master oscillator

29. Switch on the sender and set the system switch to TUNE R.F. With the input voltage to the p.s.u. varied by ±10%, the output frequency measured with a wavemeter will not vary by more than 150kc/s.

A.F.C.

- 30. (a) Tune the sender to 58Mc/s and lock the RF TUNE dial. Couple the frequency meter to the 2nd i.f. stages (see para 9(b)) and note this frequency.
- (b) Tune the CHANNEL dial first to 58.4Mc/s then to 57.6Mc/s; switch to receive then back to send and note each change in the 2nd intermediate frequency.
- (c) Repeat at 38Mc/s, retuning to 38.25Mc/s and 37.75Mc/s respectively. In each case the 2nd i.f. will not vary by more than the values shown in Table 6.

Table 6 - Variation of 2nd i.f. with a.f.c. operation

Sender frequency	Channel frequency	Maximum 2nd i.f. change
58Mc/s	58.4Mc/s	-10kc/s
58Mc/s	57.6Mc/s	+10kc/s
38Mc/s	38.25Mc/s	-7kc/s
38Mc/s	37.75Mc/s	+7kc/s

Calibration of r.f. scale

31. Set the system switch to TUNE RF and measure the r.f. output frequency with a wavemeter. The calibration error at any point within the tuning range will not exceed 1Mc/s.

INTERCOMM AMPLIFIER

Gain and distortion

32. Switch on the intercomm amplifier. See para 7 (g). The open-circuit input level to the amplifier at 1kc/s from the b.f.o., needed to produce an audio output of 250mW will be between 40 and 100mV. There will be no apparent harmonic distortion observed by means of a c.r.o. connected across the wattmeter terminals.

Output regulation

33. Adjust the input at 1kc/s to produce 250mW output. With the output meter switched to 150Ω impedance the a.f. output will be less than 90mW.

Frequency response

- 34. (a) Adjust the output from the b.f.o. at 1kc/s to produce an audio output of 100mW. Note the b.f.o. output voltage.
- (b) At other frequencies the b.f.o. output voltage required to produce 100mW output relative to that needed at 1kc/s will be within the limits shown in Table 7.

Table 7 - Intercomm amplifier a.f. response

B.F.O. frequency	100c/s	300c/s	600c/s	1kc/s	2kc/s	4kc/s	10kc/s	20kc/s
Output relative to that at 1kc/s	Greater than 0dB	-2 to 0dB	-2 to 0dB	0dB	+2 to +4dB	+6 to +8dB	Greater than +15dB	Greater than +25dB

Intercomm CALL facility

35. Connect the equipment headset, in parallel with the output meter set to 30Ω impedance, to the amplifier output. Couple the input and output circuits (pins C and J of SK2) of the amplifier together via a 0.5μF capacitor and pins B and G of SK2 to earth. The a.f. output will not be less than 200mW. The frequency, checked aurally, will be between 500 and 2000c/s.

- (d) Re-adjust SQUELCH control to illuminate HOMING HT lamp. Set the NOISE switch to ON, the HOMING HT lamp will extinguish.
- (e) Reset NOISE switch to OFF to illuminate HOMING HT lamp. Switch the test harness from receive to send. The HOMING HT and REBRO lamps will extinguish.

FUNCTIONAL CHECK

- 36. (a) The BATTERY light on the Kits, testing will be on all the time the set is switched on.
- (b) Tune the set to 46Mc/s and adjust the SQUELCH control until the SIGNAL lamp lights; switch the NOISE switch to OFF. HOMING HT and REBRO lamps will light, on Kits, testing.
- (c) Adjust SQUELCH control anti-clockwise until SIGNAL lamp is extinguished. The HOMING HT lamp will extinguish.

SEAL TEST

37. With an initial pressure of 5 lb/sq.in. the time constant of the set will be 150 hours. (Tels M 631 refers).

NOTE FOR EXAMINERS

38. The tuning cores on the i.f. transformers are held in position by an internal rubber ring and therefore will not require sealing after alignment.

INSPECTION IN THE FIELD

Introduction

39. (a) This part of the regulation is to be used when inspecting equipment in the hands of the troops. The field inspection record lists condemnation limits beyond which the equipment cannot be expected to carry out its task efficiently.
- (b) Using these condemnation limits as the standard, examiners should classify the equipment in accordance with the latest ACI. When the equipment is serviceable, but barely satisfies the minimum standard in the field inspection record, the symbol O must be used to indicate that the equipment should be kept under observation with the facilities available to the unit concerned. If facilities are not available to the unit the equipment may have to be downgraded. In borderline cases, and particularly where quantitative measurements are not given, the final assessment must be based on the examiner's experience and judgement using this standard as a guide.
- (c) Endeavour has been made in the field inspection record to include, without further amplification, all necessary information in order to test the electrical performance.

General

40. The condition, generally, will be such that:-

- (a) Cases and panels are undamaged, but dents may be allowed provided they do not affect the entry of the set into its case, or the weather-proofing.
- (b) Plugs, sockets and connectors are in a satisfactory condition with rubber parts neither perished nor cracked, pins and socket connections straight, clean and firm

and with plugs making a good fit in their respective sockets.

- (c) Meter dial is clean and legible.
- (d) Film scales are legible throughout the whole of the tuning range.
- (e) Control knobs are secure on their shafts and, where spring-loaded handles are provided, these are serviceable. The dial lock functions correctly.
- (f) Carrying handle is adjusted correctly.
- (g) All securing screws are available to secure the set in its case.
- (h) Quick-lime desiccators are replaced when the set has been unsealed. Unsealing, however, for the purpose of inspection, should be avoided.
- (j) Rubber gasket sealing set case, and rubber seals on all controls passing through the front panel are in good condition and lightly smeared with Grease, silicone.
- (k) Paintwork is intact apart from minor scratches.
- (l) Modification and miscellaneous instructions have been carried out where applicable.

Test equipment

41. Figures quoted in this schedule are based on measurements made using the test equipment listed in Table 1 except for items 7, 12, 15, 16 and 18.

Field inspection record

42. In the following particulars paragraph numbers refer to the Inspection Schedule and other preceding text.

Item	Test	Specification limits			Result
		Min	Max	Unit	
I General (para 40)					
(a)	Cases will be undamaged, and free from distortion	-	-	-	
(b)	Sockets will be clean and pins straight and firm	-	-	-	
(c)	Meter dial will be clean and legible	-	-	-	
(d)	Film scales will be legible throughout whole range	-	-	-	
(e)	Knobs will be secure, and correctly aligned to reference marks. Dial locks will function correctly	-	-	-	
(f)	Carrying handle will be adjusted correctly	-	-	-	
(g)	All securing screws will be available to secure set in case	-	-	-	
(h)	Quick-lime desiccators are replaced when set has been unsealed	-	-	-	
(j)	Rubber gasket sealing set case, and rubber seals on control through front panel will be in good condition and lightly smeared with Grease, silicone	-	-	-	
(k)	Paintwork will be intact apart from minor scratches	-	-	-	
(l)	Mod and Misc Instr will have been carried out where applicable	-	-	-	

Item	Test	Specification limits			Result
		Min	Max	Unit	
RECEIVER					
2	Quieting (para 8) At 38, 46, 58Mc/s Input 1.25 μ V (c.w.) will give quieting of	10	-	dB	
3	Bandwidth and symmetry (para 9) At 46Mc/s, input 1 μ V (c.w.) note limiter grid current Bandwidth at 3dB (input 1.4 μ V) will be Asymmetry at 3dB (input 1.4 μ V) will be Bandwidth at 60dB (input 1mV) will be Asymmetry at 60dB (input 1mV) will be	58	72	kc/s	
		-	± 2	kc/s	
		-	250	kc/s	
		-	± 10	kc/s	
4	A.F. output (para 15) Set and signal generator tuned to 46Mc/s Input 4 μ V modulated 1600c/s with 15kc/s deviation The audio output will be	100	200	mW	
5	Hum and microphony (para 17) Tune set to 46Mc/s, switch to CHANNEL ADJ Output meter to 150 Ω . Audio output will be After sharp blow with the hand, output reading will quickly return to	-	30	μ W	
		-	30	μ W	
6	Squelch (para 19) At 46Mc/s with SQUELCH control set at two-thirds of its clockwise travel, the SIGNAL lamp will light	-	-	-	
7	Muting (para 20) Connect headphones and check that switching to 'NOISE OFF' will decrease the output	-	-	-	
8	Film scale calibration (para 22) Tune set to any harmonic of the internal crystal and check that the cursor will adjust correctly	-	-	-	
SENDER					
9	Sender high power output (para 23) Connect Wattmeter, h.f., to set aerial plug, and Avometer (1A range) in the 350V h.t. line At 38Mc/s power output will be At 46Mc/s power output will be At 58Mc/s power output will be The maximum value of 350V h.t. current will correspond with values shown in Table 4	12	-	W	
		12	-	W	
		12	-	W	
10	Sender low power output (para 24) Switch to LOW power, connect Wattmeter, h.f. to aerial plug, and connect valve voltmeter across wattmeter terminals At 38Mc/s valve voltmeter reading will be At 46Mc/s valve voltmeter reading will be At 58Mc/s valve voltmeter reading will be	3	8	V	
		3	8	V	
		3	8	V	
11	Deviation and a.m.c. (para 25) (a) Couple deviation meter across 53 Ω 1W terminals of wattmeter. Input to microphone terminals of 1kc/s at 10mV At 46Mc/s the output deviation will be	3.5	5.5	kc/s	

Item	Test	Specification limits			Result
		Min	Max	Unit	
(b)	Increase input to 200mV. The deviation will not increase by more than	-	50	%	
(c)	At 58Mc/s, with input 4kc/s at 200mV the deviation will be	-	15	kc/s	
12	Hum and microphony (para 28)				
	At 46Mc/s with sender to HIGH power, the wattmeter set to 150Ω will read	-	80	μW	
13	A.F.C. (para 30)				
	Couple frequency meter to 2nd i.f. stages. Tune the channel dial to the following frequencies, switching to receive then back to send each time:-				
	At 58Mc/s with CHANNEL at 58.4Mc/s the i.f. change will be	-	-10	kc/s	
	At 58Mc/s with CHANNEL at 57.8Mc/s the i.f. change will be	-	+10	kc/s	
	At 38Mc/s with CHANNEL at 38.25Mc/s the i.f. change will be	-	-7	kc/s	
	At 38Mc/s with CHANNEL at 37.75Mc/s the i.f. change will be	-	+7	kc/s	
	INTERCOMM AMPLIFIER				
14	Amplifier gain (para 32)				
	Connect b.f.o. with an output of 1kc/s to produce 250mW output from the amplifier				
	Input will be	40	120	mV	
15	Intercomm CALL facility (para 35)				
	Couple input and output via 0.5μF capacitor				
	The frequency, checked aurally, will be	500	2000	c/s	
16	FUNCTIONAL CHECK (para 36)				
(a)	Switch set on, BATTERY lamp will light	-	-	-	
(b)	Adjust SQUELCH control until SIGNAL lamp lights, set NOISE switch to OFF. HOMING HT and REBRO lamps will light	-	-	-	
(c)	Adjust SQUELCH control until SIGNAL lamp is extinguished. HOMING HT lamp will extinguish	-	-	-	
(d)	Set the NOISE switch to ON and HOMING HT lamp will extinguish	-	-	-	
(e)	Switch the test harness from receive to send and the REBRO and HOMING HT lamps will extinguish	-	-	-	

INSPECTION AFTER OVERHAUL

Base inspection record

43. In the following particulars paragraph numbers refer to the Inspection Schedule.

Item	Test	Specification limits			Result
		Min	Max	Unit	
1	General (para 6)				
(a)	Condition will be in accordance with Tels A 779	-	-	-	
(b)	Seals on front panel will be lightly smeared with Grease, silicone	-	-	-	
(c)	Capacitors mounted vertically on a.f. and a.m.c. chassis will be firmly soldered into position and strapped	-	-	-	
(d)	Workmanship will conform to the pilot model	-	-	-	
	RECEIVER				
2	Quieting (para 8)				
	At frequencies of 38, 46 and 58Mc/s Input 1.25 μ V (c.w.) will produce quieting of	10	-	dB	
3	Bandwidth and symmetry (para 9)				
	At 46Mc/s with input 1 μ V (c.w.) note limiter grid current (reading B)				
	Bandwidth at 3dB (1.4 μ V input) will be	58	72	kc/s	
	Asymmetry at 3dB (1.4 μ V input) will be	-	± 2	kc/s	
	Bandwidth at 60dB (1mV input) will be	-	250	kc/s	
	Asymmetry at 60dB (1mV input) will be	-	± 10	kc/s	
4	Second local oscillator harmonics (para 10)				
	At 42.1 and 41.9Mc/s note signal generator input to give 10dB signal/noise ratio	10	-	dB	
	At 42Mc/s, again note signal generator input to give 10dB signal/noise ratio. The input level will increase by	-	6	dB	
	Repeat at 50.4Mc/s and 58.8Mc/s, as for test at 42Mc/s	-	6	dB	
5	Second channel rejection (para 11)				
	Set and signal generator tuned to 58Mc/s. Inject a c.w. signal of 1 μ V. Note limiter grid current (reading C)				
	Retune signal generator to 70Mc/s and obtain the same limiter grid current. The signal generator output will be	3.16	-	mV	
6	I.F. rejection (para 12)				
	Set and signal generator tuned to 58Mc/s Inject a c.w. signal of 1 μ V. Note limiter grid current (reading C)				
	Retune signal generator to 6Mc/s and adjust output to obtain same limiter grid current; the output will be	10	-	mV	
	Retune signal generator to 2.4Mc/s and adjust output to obtain same limiter grid current; the output will be	10	-	mV	
7	Limiting (para 13)				
	Set and signal generator tuned to 46Mc/s Input varied from 2 μ V to 100mV modulated at 300c/s with 5kc/s deviation. The audio output will vary by	0	± 1	dB	
8	A.F. response (para 14)				
	Input level 4 μ V. Note the audio output at 300c/s	0	0	dB	
	At 100c/s the audio output will be	-4	0	dB	
	At 600c/s the audio output will be	-4	0	dB	

Item	Test	Specification limits			Result
		Min	Max	Unit	
	At 1kc/s the audio output will be	-7	-3	dB	
	At 2kc/s the audio output will be	-12	-8	dB	
	At 4kc/s the audio output will be	-17	-13	dB	
9	A.F. output and distortion (para 15)				
	Set and signal generator tuned to 46Mc/s.				
	Inject 4 μ V signal modulated at 1600c/s with 15kc/s deviation				
	The audio output will be	125	175	mW	
	Note distortion observed on a c.r.o.				
10	A.F. linearity (para 16)				
	Set and signal generator tuned to 46Mc/s				
	Inject a signal modulated at 1600c/s				
	At a deviation of 8kc/s the audio output will be	0	0	dB	
	At a deviation of 4kc/s the audio output will be	-8	-4	dB	
	At a deviation of 16kc/s the audio output will be	+4	+8	dB	
11	A.F. output regulation (para 17)				
	Conditions as in item 9. Note the a.f. output				
	Output meter to 150 Ω , the audio output, compared with the noted above, will be	-	60	%	
12	Hum and microphony (para 18)				
	Tune set to 46Mc/s, switch to CHANNEL ADJ				
	Output meter to 150 Ω , the output will be	-	20	μ W	
	After a sharp blow with the hand, output will quickly return to	-	20	μ W	
13	Squelch (para 19)				
	Set and signal generator tuned to 46Mc/s				
	With signal generator carrier off, set NOISE switch to ON, and adjust SQUELCH control to extinguish SIGNAL lamp. Note output meter reading (reading D)	-	-	-	
	With carrier on and input signal adjusted until SIGNAL lamp lights, the output will be reduced by	-	5	dB	
	Repeat with SQUELCH control fully anti-clockwise				
	Output meter reading will be reduced by	10	-	dB	
14	Muting (para 20)				
	SQUELCH control fully anti-clockwise				
	Input 46Mc/s modulated at 300c/s with 5kc/s deviation				
	Adjust input until SIGNAL lamp is extinguished. Note the a.f. output with NOISE switch at ON. With the NOISE switch at OFF, the output will decrease by	40	-	dB	
15	Stability of first local oscillator (para 21)				
	Vary input voltage to the p.s.u. by $\pm 10\%$ of nominal value				
	The first l.o. frequency will vary by	-	± 7	Kc/s	
16	Film scale calibration (para 22)				
	Tune set to any harmonic of internal 1Mc/s crystal (after changing a 2Mc/s crystal if necessary) and adjust cursor. The calibration error within 1Mc/s of this frequency will be	-	30	Kc/s	

Item	Test	Specification limits			Result
		Min	Max	Unit	
SENDER					
17	High power output (para 23) Connect Wattmeter, h.f., to set aerial plug, and the Avometer (1A d.c. range) in 350V h.t. line At 38Mc/s power output will be At 46Mc/s power output will be At 58Mc/s power output will be The maximum value of 350V h.t. current will correspond with values shown in Table 4	15 15 15	- - -	W W W	
18	Low power output (para 24) Switch to LOW power, connect Wattmeter, h.f., to set aerial plug, and connect valve voltmeter across wattmeter terminals At 38Mc/s valve voltmeter reading will be At 46Mc/s valve voltmeter reading will be At 58Mc/s valve voltmeter reading will be	4 4 4	7.2 7.2 7.2	V V V	
19	Deviation and a.m.c. (para 25)				
(a)	Connect deviation meter across 52Ω 1W terminals of wattmeter. Input to microphone terminals of 1kc/s at 10mV At 46Mc/s the output deviation will be	4	5	kc/s	
(b)	Input to microphone terminals of 1kc/s at 200mV. The deviation will increase by	-	50	%	
(c)	At 58Mc/s with input of 200mV at 4kc/s the deviation will be	-	15	kc/s	
20	Deviation variation with carrier frequency change (para 26) At 58Mc/s, with input from b.f.o. of 2kc/s at 10mV, note the deviation At 38Mc/s, with the same input, the deviation will be reduced by	-	1	kc/s	
21	A.F. response (para 27) Tune set to 46Mc/s, remove V28 Adjust 1kc/s output from the b.f.o. to give a deviation of 15kc/s and note the b.f.o. output The relative b.f.o. output to produce 15kc/s deviation at 100c/s will be at 300c/s will be at 600c/s will be at 2kc/s will be at 4kc/s will be at 10kc/s, reference level at 4kc/s will be	0 +28 +12 +4 -6 -10 +6	0 - +18 +10 -12 -18 -	dB dB dB dB dB dB dB	
22	Hum and microphony (para 28) At 46Mc/s with sender to HIGH power, Wattmeter, a.f., set to 150Ω will read	-	70	μW	
23	Stability of master oscillator (para 29) Switch to TUNE R.F. and switch on the sender Vary input to the p.s.u. by ±10%. The output frequency will vary by	-	150	kc/s	
24	A.F.C. (para 30) Couple frequency meter to the 2nd i.f. stages. Retune the channel dial to the following frequencies, switching to receive then back to send each time:- At 58Mc/s with CHANNEL at 58.4Mc/s the i.f. change will be At 58Mc/s with CHANNEL at 57.6Mc/s the i.f. change will be	- -	-10 +10	kc/s kc/s	

Item	Test	Specification limits			Result
		Min	Max	Unit	
	At 38Mc/s with CHANNEL at 38.25Mc/s the i.f. change will be	-	-7	kc/s	
	At 38Mc/s with CHANNEL at 37.75Mc/s the i.f. change will be	-	+7	kc/s	
25	Calibration of r.f. scale (para 31)				
	The calibration error at any point in the tuning range will be	-	1	Mc/s	
	INTERCOMM AMPLIFIER				
26	Gain and distortion (para 32)				
	Connect b.f.o. at 1kc/s to produce 250mW amplifier output. Input will be	40	100	mV	
	No apparent harmonic distortion observed on c.r.o.				
27	Output regulation (para 33)				
	Conditions as in item 26 to give 250mW output				
	Switch output meter to 150Ω and the audio output will decrease to	-	90	mW	
28	Frequency response (para 34)				
	Adjust the 1kc/s input to give 100mW output and note input level	0	0	dB	
	The input relative to that at 1kc/s				
	at 100c/s will be	0	-	dB	
	at 300c/s will be	-2	0	dB	
	at 600c/s will be	-2	0	dB	
	at 2kc/s will be	+2	+4	dB	
	at 4kc/s will be	+6	+8	dB	
	at 10kc/s will be	+15	-	dB	
	at 20kc/s will be	+25	-	dB	
29	Intercomm CALL facility (para 35)				
	Couple input and output via 0.5μF capacitor				
	The output meter reading will be	200	-	mW	
	The frequency, checked aurally, will be	500	2000	c/s	
30	FUNCTIONAL CHECK (para 36)				
(a)	Switch on the set, BATTERY ON lamp will light	-	-	-	
(b)	Adjust SQUELCH control until SIGNAL lamp lights. Set NOISE switch to OFF. HOMING HT and REBRO lamps will light	-	-	-	
(c)	Adjust SQUELCH control until SIGNAL lamp is extinguished. HOMING HT will extinguish	-	-	-	
(d)	Set NOISE switch to ON. HOMING HT will extinguish	-	-	-	
(e)	Switch the test harness from receive to send and the REBRO and HOMING HT lamps will extinguish	-	-	-	
31	SEAL TEST (para 37)				
	Initial pressure of 5lb/sq.in.; the time constant will be	150	-	hr	

EME8c/1046
57/m/7323

END