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REJECTOR UNITS, B47 AND B48

TECHNICAL HANDBOOK - FIELD AND BASE REPAIRS

GENERAL INSTRUCTIONS

Introduction

1. This regulation describes the testing of the rejector units, and the dismantling of the equipments where necessary for fault-finding or replacement of components. The units are sealed and should not be opened unless drying and seal-testing facilities are available.

Test requirements

2. Table 1 lists the test equipment required to carry out repair and tests on the units.

Table 1 - Test equipment

Preferred Instrument	Part No	Suitable alternative	Part No
Multimeter, set, Avo, type 9SX equipment	Z4/6625-99-949-1999	Multimeter, Avo, model 8S panclimatic equipment	Z4/6625-99-943-1524
Signal generator No 18, Mk 1, CT402, equipment	Z4/ZD 004302		
Wattmeter, absorption, h.f., No 2, CT211 equipment	Z4/ZD 00747	Wattmeter, absorption, CT419 equipment	Z4/6625-99-943-5568
Transmitter-Receiver, radio, C42 No 1	Z1/5820-99-943-9362	Transmitter-Receiver, radio, C42 No 2	Z1/5820-99-949-2153
or			
Transmitter-Receiver, radio, C45 No 1	Z1/5820-99-943-9363	Transmitter-Receiver, radio, C45 No 2	Z1/5820-99-949-5476
Transmitter-Receiver, radio, B47	Z1/5820-99-911-0848	Frequency source 38-56 Mc/s 1/2W into 70Ω impedance	
or			
Transmitter-Receiver, radio, B48	Z1/5820-99-949-0460	Frequency source 26-38 Mc/s 1/2W into 70Ω impedance	

Table 1 - (Cont)

Preferred Instrument	Part No	Suitable alternative	Part No
Leak locator (CT509)	W3/6625-99-200-2271		
Tuner r.f. antenna No 6	Z1/5820-99-949-0858		
or			
Tuner r.f. antenna No 9	Z1/5820-99-900-9976		
Power supply rectifier type, Westinghouse (12/24V)	Z4/6130-99-911-0563	Power supply rectifier type, Salford (12/24V)	Z4/6130-99-911-0564
Resistor, fixed, film, (carbon) 18Ω ±5% 1W	Z/5905-99-021-5034	Resistor, fixed, film, (carbon) 18Ω ±5% 1W	Z/5905-99-012-1778
Connector coaxial No 94 3 ft (2.off)	Z4/ZD 00378	(may be supplied with equipment)	

INSTRUCTIONS FOR DRYING AND SEALING

3. The units should be opened and repaired in the driest possible conditions.
4. On receipt for repair, a unit should be pressurized to 5 lb/sq. in., using the leak locator, and immersed in water. This will check the presence of any leaking seals, gaskets, etc, or pin holes in the castings. As the leak specification for the unit is 10 c.c./hr, this inspection should be carried out thoroughly with the unit immersed for at least five minutes. The addition of a small quantity of wetting agent (eg Teepol) to the water is recommended.
5. Ensure that the equipment is thoroughly dry before carrying out repairs and tests.
6. After completion of repairs and tests the equipment must be dried for at least 10 minutes, with warm dry air at 140-160°F from the Oven, drying tels (Tels M601 gives details).
7. Smear the gasket with silicone grease (H1/6850-99-942-3548) and reseal the unit, fitting one anti-tamper cap on the bottom right-hand securing screw. Fit a new desiccator.
8. Connect the unit to the leak locator using the seal testing hole at the rear of the unit. Pressurize the unit to 5 lb/sq. in. above atmospheric pressure using dry air from the Oven, drying, tels (Tels M601). The time constant for the pressure to fall to 37% of its original value is 75 hours.
9. Finally fit the seal plug and check the operation of the unit.

DISMANTLING AND RE-ASSEMBLY

10. Before dismantling it is advisable to check the sealing of the unit (See par 4).

Component board

11. To gain access to some components on the component board it is advisable to remove the screening cans of L1 and L4, situated directly in front of the board. The screening cans are each secured by two screws situated on top of each can. Remove the screws and lift the screening cans from the unit. Care should be taken not to damage L1 and L4 when testing and replacing components.

Variable capacitors

12. To remove variable capacitor C1 or C4, proceed as follows:-

- (a) Label and unsolder the co-axial cables from the two Burndept type sockets.
- (b) Remove L4 screening can as described in para 11.
- (c) Remove the two nuts to release the component board from the meter.
- (d) Remove the four No 2 BA cheese-head screws securing the main sub-chassis to the four main supporting pillars.
- (e) Release the flexible coupling connected to C1 shaft.
- (f) Carefully lift the main sub-chassis and component board from the unit. C1 can now be easily removed.
- (g) To release C4 it is first necessary to remove the reduction gear assembly. To do this remove the three screws securing the assembly to the plastic panel and remove the taper pin securing the plastic collar to the capacitor spindle.
- (h) On re-assembling the gear mechanism ensure that the springs in the anti-backlash gear wheels are suitably compressed.
- (j) When replacing capacitors C1 and C4 ensure that they are at their maximum values when the UNWANTED TUNE FOR MINIMUM control is turned fully anti-clockwise, and the WANTED TUNE FOR MAXIMUM control is turned fully clockwise.

Level meter

13. (a) Remove screening cans L1 and L4 as directed in para 11.
- (b) Remove the two nuts to release the component board from the meter.
  - (c) Remove the hexagon-headed nuts and screws supporting the meter bracket.
  - (d) Remove the meter and its supporting bracket clear of the unit.

ELECTRICAL PERFORMANCE TESTS

Rejection test

14. (a) Connect the terminating unit to the signal generator and link the 52Ω output via an 18Ω resistor to the input of either C42 receiver (for Rejector unit, B47) or the C45 receiver (for Rejector unit, B48).

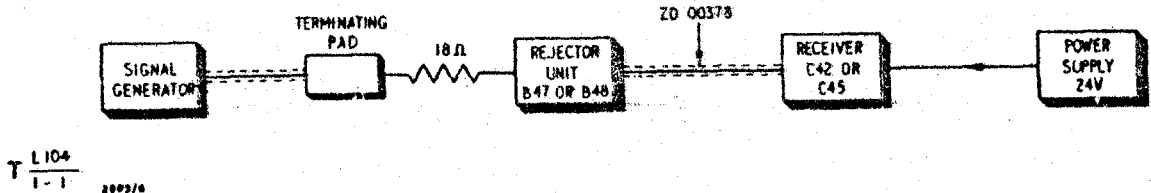


Fig 1 - Rejection test

- (b) Set the signal generator to give 1μV output at the first of the unwanted test frequencies detailed in the appropriate table (Table 2 or 3).
- (c) Connect the multimeter to measure the limiter grid current in the receiver. Tune the receiver for maximum reading and note this reading.
- (d) Insert the rejector unit between the signal generator and the receiver input (Fig 1).
- (e) Tune the rejector unit for maximum rejection (minimum reading on the multimeter) using the UNWANTED TUNE FOR MINIMUM control.
- (f) Adjust the signal generator and tune the receiver to the corresponding wanted test frequency shown in the table. Tune the WANTED TUNE FOR MAXIMUM control for maximum reading on the multimeter.
- (g) Re-adjust the signal generator and tune the receiver to the unwanted test frequency and repeat (e).
- (h) Progressively increase the output of the signal generator with this tuning until the receiver limiter grid current is the same as that noted in (c).
- (j) The increase required is the rejection figure and should be not less than 30dB.
- (k) Repeat the above tests (c) to (j) for all test frequencies shown in the appropriate table.

Frequency Mc/s	
Unwanted	Wanted
36	38
36	56
54	56
58	56
60	38

Table 2 - Test frequencies, B47

Frequency Mc/s	
UNWANTED	WANTED
24	26
36	38
23	38
26	28
38	36

Table 3 - frequencies, B48

Insertion loss

15. (a) Connect the appropriate transmitter (C42 with the B47 or C45 with the B48) via the 18Ω resistor to the wattmeter on its 52Ω 1W range (Ensure that the leads to the resistor are kept as short as possible).
- (b) Set the transmitter to LOW power and tune it to the first wanted frequency shown in Table 2 or 3 as applicable.
- (c) Note the reading indicated on the wattmeter.
- (d) Now insert the rejector unit between the transmitter and wattmeter as shown in Fig 2, and tune the WANTED TUNE FOR MAXIMUM control for maximum reading of the level meter.

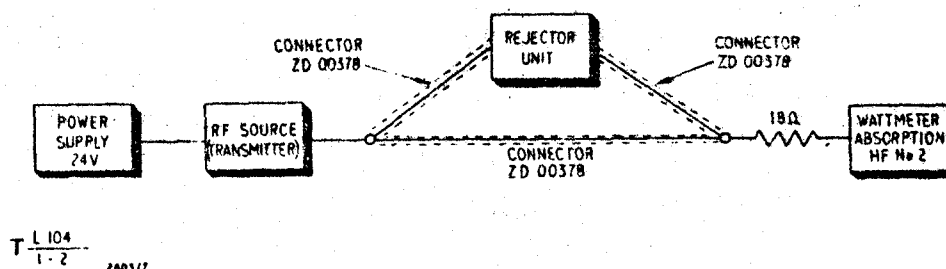


Fig 2 - Insertion loss test

- (e) Adjust the transmitter to the corresponding unwanted test frequency and tune the UNWANTED TUNE FOR MINIMUM control for minimum reading of the level meter.
- (f) Re-adjust the transmitter to the wanted test frequency and tune the WANTED TUNE FOR MAXIMUM control for maximum level meter reading. Note the wattmeter reading.

- (g) Check that the difference in output watts between (c) and (f) is not greater than 4dB.
- (h) Repeat (c) to (g) for all the test frequencies shown in Table 2 or 3.

Level meter.

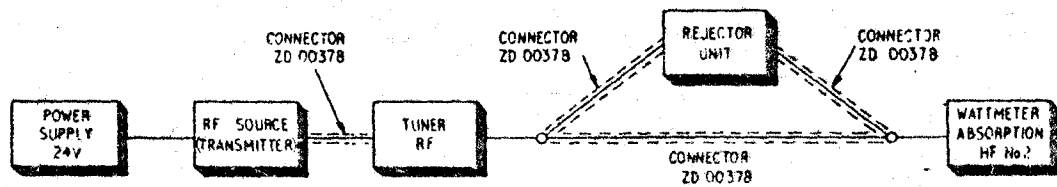
16. The set-up required for the following test differs as shown in Table 4 according to which rejector unit is under test.

Rejector unit	R.F. source		Tuner r.f.	Test frequencies
	Protection test	Sensitivity test		
B47	C42	B47	No 6	38, 47, 56 Mc/s
B48	C45	B48	No 9	26, 32, 38 Mc/s

Table 4 - Level meter test

Meter protection test

- 17. (a) Connect the appropriate transmitter (C42 or C45) and Tuner r.f. antenna, to the wattmeter on its 70Ω 25W range.
- (b) Set the transmitter, on HIGH power, and adjust it to a test frequency (Table 4)
- (c) Adjust the r.f. tuner until the wattmeter indicates 3W.



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Fig 3 - Level meter test

- (d) Insert the rejector unit between the r.f. tuner and the wattmeter as shown in Fig 3.

- (e) Tune both the UNWANTED TUNE FOR MINIMUM and the WANTED TUNE FOR MAXIMUM controls for maximum reading on the level meter.
- (f) Check that the level meter does not read more than full scale deflection.
- (g) Repeat (b) to (f) for all test frequencies shown in Table 4.

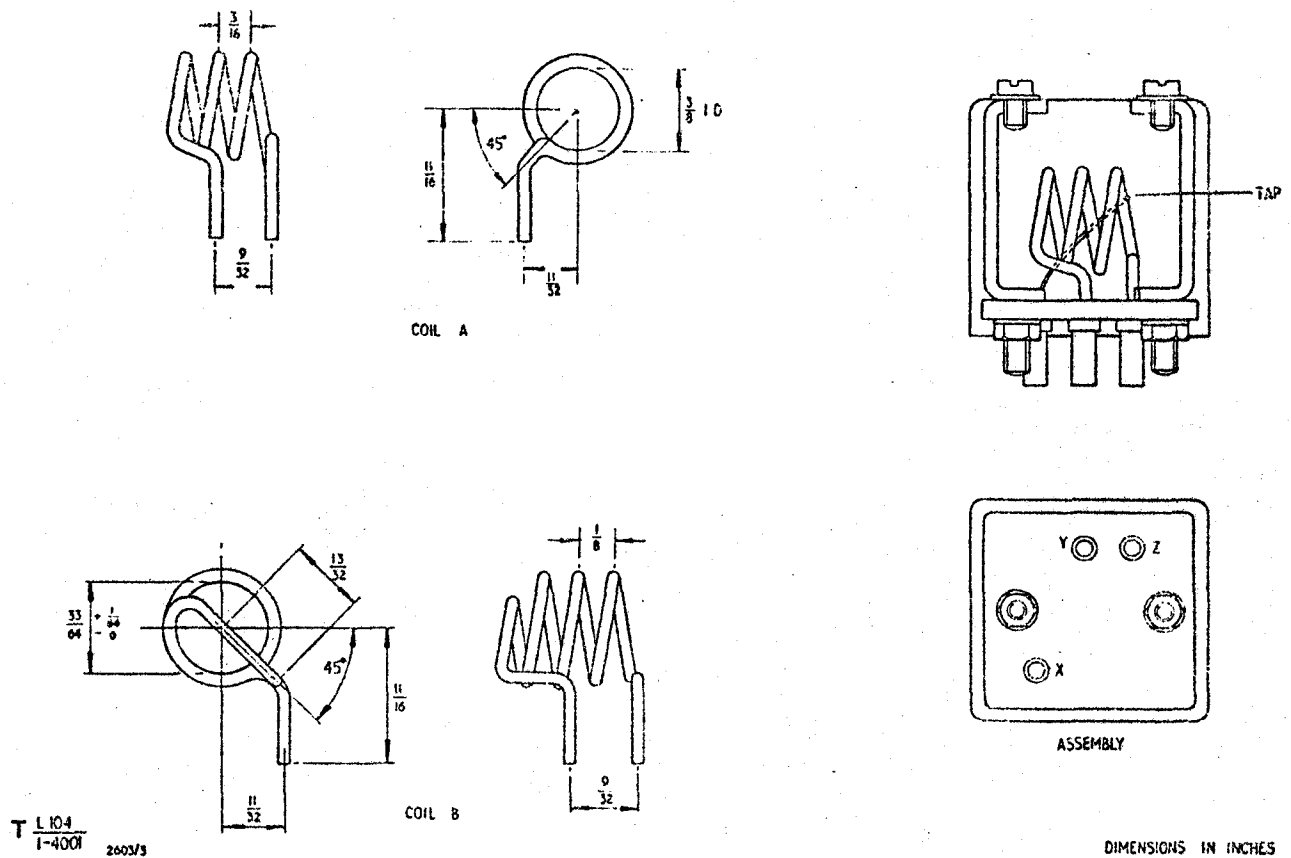
Meter sensitivity test

18. (a) Connect the appropriate transmitter (B47 or B48) via the 18Ω resistor to the wattmeter on its 52Ω 1W range.
- (b) Set the transmitter to a test frequency (Table 4), and adjust its power supply (Power supply set, rectifier type) to give a reading of 0.37W on the wattmeter.
- (c) Switch off the transmitter power supply and insert the rejector unit between the transmitter and the wattmeter as shown in Fig 2.
- (d) Switch on the transmitter power supply and tune the UNWANTED TUNE FOR MINIMUM and the WANTED TUNE FOR MAXIMUM controls for maximum reading on the level meter.
- (e) Check that the level meter does not read less than 1/5 full scale deflection.
- (f) Repeat (b) to (e) for all test frequencies shown in Table 4.

Note: The next page is Page 1001





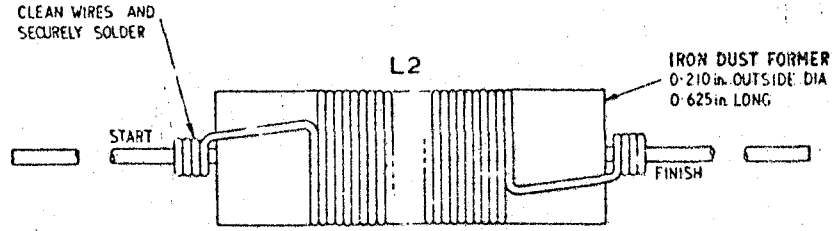


DIMENSIONS IN INCHES

Fig 4001 - L1 and L4 winding detail

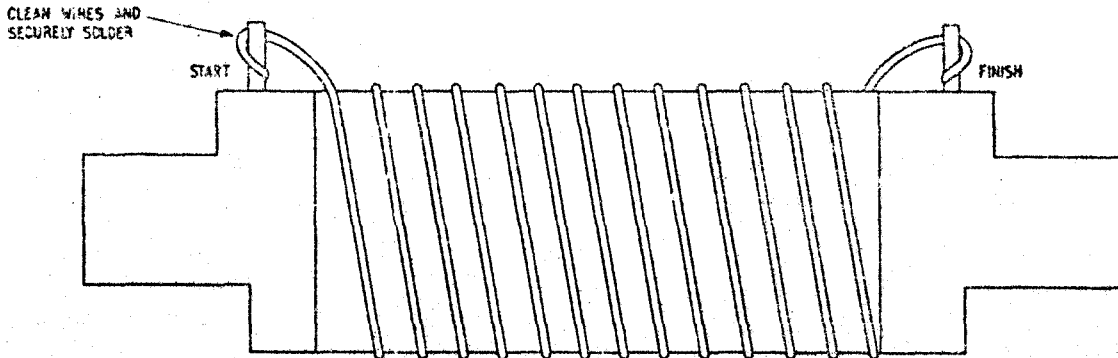
	COIL A	COIL B	Type of Wire
Used on	Rejector unit B47	Rejector unit B48	)16 s.w.g. cu wire )silver plated to )D.T.D. 919 18 s.w.g. cu wire silver plated to D.T.D. 919
No of turns	3	3.1/2	
Pitch	3/16	1/8	
Tapping to X	1/2 turn from Z	1.1/8 turns from Z	
Test frequency	47Mc/s	32Mc/s	
Resonates with	133±5pF	160±pF	
Minimum Q	150	160	
Loaded coil resonates within	2-6pF of previous value	3-7pF of previous value	With 70Ω ±5% N.I. resistor across X and Y
Loaded Q	6 ±0.5	6.5 ±0.5	

Table 4001 - L1 and L4, winding and test data



<p>T L104 I-4002 260376</p>	<p><b>ELECTRICAL DATA</b> INDUCTANCE <math>10\mu H \pm 10\%</math> SELF RESONANT FREQUENCY NOT LESS THAN 35 Mc/s</p>	<p><b>WINDING DATA</b> 28 TURNS CLOSE WOUND AND CENTRALLY DISPOSED OF 33 SWG (0.010) ECC</p>	<p><b>TEST DATA</b> TEST FREQUENCY 5 Mc/s RESONATES WITH <math>100p \pm 5p</math> Q = <math>90 \pm 10</math></p>
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Fig 4002 - L2 winding detail



<p><b>FORMER</b> P.T.F.E. <math>\frac{1}{16}</math> O.D. x <math>1\frac{1}{2}</math> LENGTH OVERALL, THREADED 11 TPI FOR 1 inch</p>	<p><b>WINDING DATA</b> 11 TURNS CENTRALLY DISPOSED, 18 SWG TINNED COPPER WIRE.</p>	<p><b>TEST DATA</b> TEST FREQUENCY 42 Mc/s RESONATES WITH <math>18p \pm 1p</math> MINIMUM Q220</p>
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Fig 4003 - L3 winding detail

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