ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS
(By Command of the Defence Council)

TELECOMMUNICATIONS
L 102

REJECTOR UNITS, B47 AND B48

TECHNICAL HANDBOOK - TECHNICAL DESCRIPTION

INTRODUCTION

Role and purpose

1. These rejector units are used in vehicle installations to limit interference in the B47 receiver from the C42 transmitter, or in the B48 receiver from the C45 transmitter. The interference is caused by the local transmitter, which induces an unwanted signal into the local receiver antenna, thus limiting the number of usable channels or the facilities offered.

Performance

2. Provided the frequency separation between the wanted and unwanted signals is not less than 2Mc/s, then each unit when correctly tuned attenuates the unwanted signal by 30dB or more, but passes the wanted signal with minimum loss (not greater than 4dB).

Brief description

3. Both units contain fixed and variable reactances, forming two tuned circuits which select and reject the wanted and unwanted frequencies respectively. A level meter is utilized as a tuning indicator for both tuned circuits. The two rejector units are identical in appearance and differ internally only in respect of the values of their input and output inductors. These govern the frequency coverage of 36-60Mc/s for the B47 and 23-38Mc/s for the B48.

Construction

4. Each unit is housed in a sealed die-cast metal box 7.1/8 in. wide, 5 in. high, 6 in. deep. A desiccator is fitted in the rear of the case while tuning controls and the level indicator are mounted in the front panel, together with an earth terminal and the Burndept type coaxial input and output plugs. A friction lock secures the tuning controls once they have been correctly set.

DETAILED TECHNICAL DESCRIPTION

Fig 2001

Overall principle

5. Basically the unit consists of two tuned circuits, a series and a parallel circuit. The series circuit L3 and C4, is tuned to the unwanted frequency and provides a low impedance path to earth. At the wanted frequency this series circuit will appear inductive or capacative. The parallel circuit consists of C1, L1 and L4 plus the reactance of the series circuit, and is tuned to the wanted frequency. The complete unit is thus a shunt across the receiver input which presents a high impedance to the wanted signal and a very low impedance to the unwanted signal. Coils L1 and L4 are tapped in order to obtain the necessary impedance matching.

Operation

6. Initially C1 is tuned approximately to the frequency of the wanted signal. C4 is then tuned for maximum rejection of the unwanted signal, indicated by minimum reading on the level meter. C1 is now accurately tuned to obtain a maximum meter reading at the wanted frequency. Adjustment of C4 is little affected by the rest of the circuit whereas the adjustment of C1 depends considerably on the setting of C4. The frequency separation between wanted and unwanted signals is normally not less than 2Mc/s otherwise the series circuit will attenuate the wanted signal excessively.

Level meter

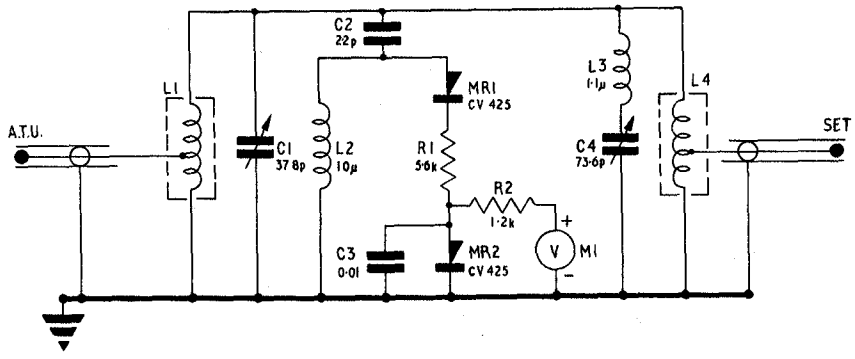
7. The level meter provides means for tuning the resonant circuits by measuring the voltage developed across them. The signal is rectified by MR1 and fed to the moving coil meter via R1 and R2. C3 is an r.f. by-pass across the meter, while L2 provides a d.c. return path. The rectifier MR2 is a non-linear shunt whose impedance decreases as the applied voltage increases. It thus increases the useful range of the meter and protects it against overloads whilst retaining the high sensitivity to low level signals.

Note: The next page is Page 1001

Cct ref	Description	Value	Tol ±%	Rating	Part No
		RESISTORS AND CAPACITORS			
R1	fixed, comp	5.6k	5	0.25W	Z/5905-99-021-5331
R2	fixed, film	1.2k	5	0.25W	Z/5905-99-021-5251
C1	variable, air dielectric	378p max			Z1/ZA 55148
C2	fixed, ceramic dielectric	2.2p	±.5p	750V d.c.	Z/5910-99-011-8337
C3	fixed, paper dielectric	0.01µ	20	250V d.c.	Z/5910-99-012-0113
C4	variable, air dielectric	73.6p max			Z1/ZA 55147

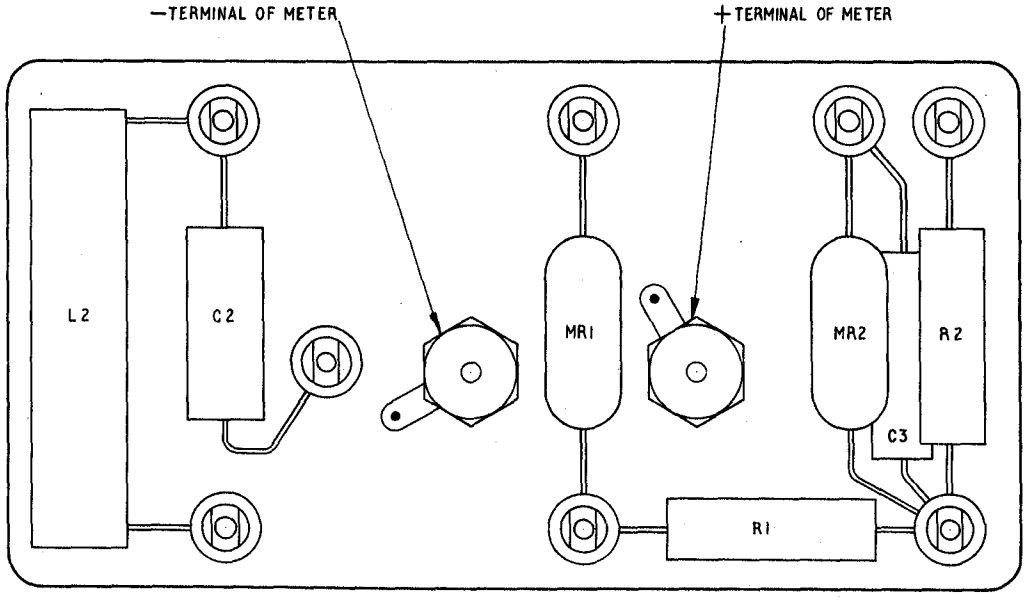
Cct ref	Description	Details	Part No
		INDUCTORS	
L1 (B47)	R.F., fixed screened	3 turns	Z1/ZA 55193
L1 (B48)	R.F., fixed screened	3.1/2 turns	Z1/ZA 56226
L2 (B47 & B48)	R.F., unscreened	10µH	Z1/ZA 55180
L3 (B47 & B48)	R.F. fixed unscreened	11 turns	Z1/ZA 55190
L4 (B47)	R.F., fixed screened	3 turns	Z1/ZA 55193
L4 (B48)	R.F., fixed screened	3.1/2 turns	Z1/ZA 56226
		MISCELLANEOUS	
MR1	Semi-conductor device, diode	CV425	Z/5960-99-000-0425
MR2	Semi-conductor device, diode	CV425	Z/5960-99-000-0425
PL1	Plug, electrical, R.F., fixed, female shell		Z/5935-99-011-9484
PL2	Plug, electrical, R.F., fixed, female shell		
M1	Meter, non-sealed	0.5mA f.s.d.	Z1/6625-99-949-092

Table 2001 - Components list



T L102 / 1-2001 2603/1

Fig 2001 - Circuit diagram



T L102 / 1-2002 2603/2

Fig 2002 - Component board

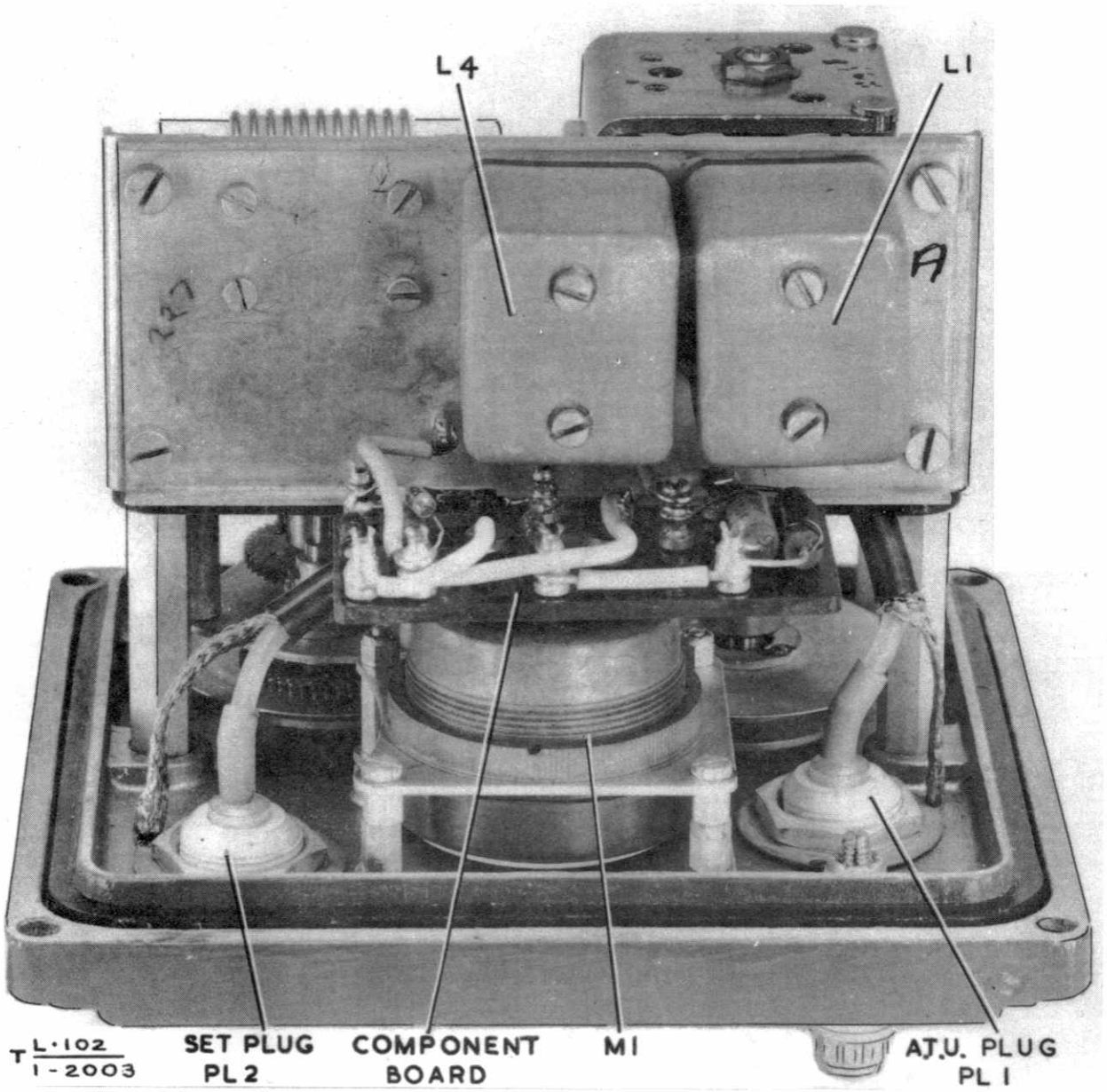


Fig 2003 - Overall view top

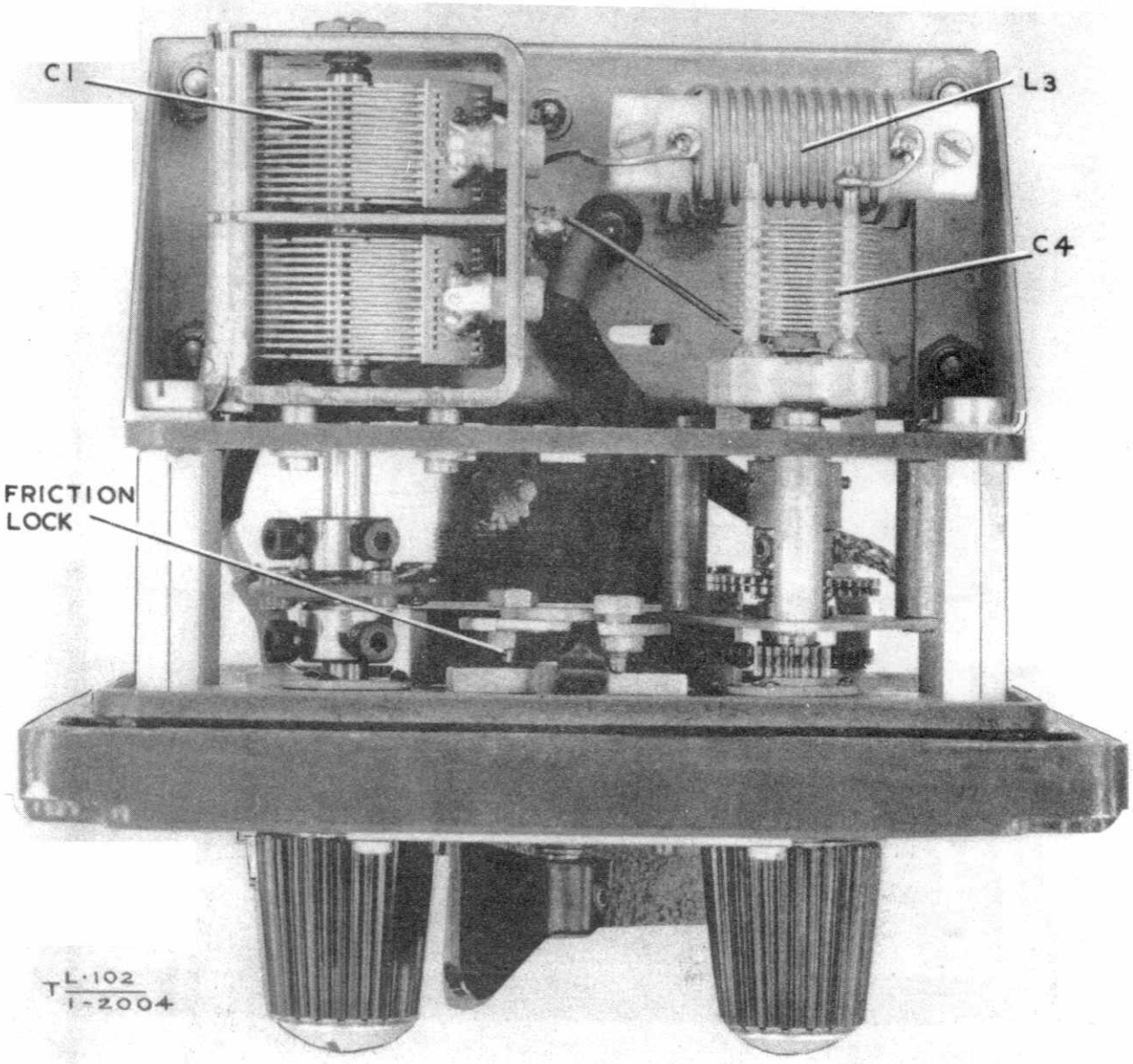


Fig 2004 - Overall view underside

EME/8c/(A)2603

END

REJECTOR UNITS, B47 AND B48

FORWARD CODING

Note: The following list of Assembly Codes must be used in conjunction with EMER Mgmt J 021 Part 4

Assembly code	Designation
0001	Rejector unit, B47
0002	Rejector unit, B48

END