Issue 1
31.8.77

DESIGNS DEPARTMENT MANUFACTURING INFORMATION

No.6.307(77)

OS2/47 Fixed Frequency Ringing Oscillator

J.O'Clarey
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Written by: M.T. Ellen

JW

D.D.Man.Inf.No.6.307(77)
Title Sheet

BBC

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OS2/47 Fixed Frequency Ringing Oscillator

1. INTRODUCTION

This oscillator generates a signal suitable for ringing up to three telephone bells simultaneously. It has been designed to replace the OS2/36 in a BMM chassis and it may be used to supply ringing current to UN10/41 voice frequency ringers.

2. SPECIFICATION

Performance Data

Input voltage:	Either 12±0.5 volts d.c. or 13 to 35 volts d.c.
Input current:	200±20mA without load 260±20mA full load.
Output voltage:	120±20 volts peak to peak without load. 50±10 volts peak to peak on full load of 3 telephone bells in parallel.
Output period:	50±4mS.

Technical Data

Chassis:	CH1/65A
Slot positions:	1, 7, 11.
Weight:	0.5kg

Installation Data

Input requirements:	Either 12±0.5 volts PLA17 (+ve) and PLA2 (-ve) or 13 to 35 volts PLA13 (+ve) and PLA2 (-ve) The power supply may be floating or have positive or negative earthed. It should be capable of supplying 300mA.
Earth connections:	PLA1 must be earthed
Output connection:	PLA9 and PLA16

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OS2/47 Fixed Frequency Ringing Oscillator

PRODUCTION TEST SCHEDULE

1. Description

This oscillator generates a signal suitable for ringing up to three telephone bells simultaneouslv. The output is continuous and is suitable for supplying several UN10/41 voice frequency oscillators simultaneously. The unit consists of a transistor multivibrator which drives a power amplifier with a step-up transformer output, therefore the output frequency is not dependant on the load.

2. Information

a) Design Section:	Transmission Section, D.D.
b) Designer:	M.T. Ellen and B.R. Mason
c) Engineer Responsible:	M.T. Ellen
d) Handbook:	Not available 1/8/77.
e) Technical Instruction:	Not available 1/8/77.
f) Other Information:	The basic circuit of this unit is taken from the UN10/33 Telephone Dialling Unit D.D.M.I.No.6.295(77), Handbook No.6.138(76).
g) Pre-production batch:	This P.T.S. has not been tested on a pre-production batch of the OS2/47 but it is based on the P.T.S. for the UN10/33.

3. Manufacturing Performance Specification

a) Input requirements:	None.
b) Output voltage:	120±20 volts peak to peak without load. 50±10 volts peak to peak on full load.
Output period:	50±4mS.
c) Power requirements:	12±0.5 volts or 13 to 35 volts at 200±20mA without load and 260±20mA on full load.
d) Performance:	Rings up to three telephone bells in parallel simultaneously.

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4. Warning

a) Safety: The voltage at the output (SKA) of this unit is greater than 30 volts r.m.s.

b) New Devices: There are no special new devices in this unit.

5. Test Apparatus Required

PSU variable from 0 to 60 volts, current limited to 300mA.

General purpose oscilloscope - Grade II.

Digital voltmeter 0.1% accuracy.

330 ohm MV1A resistor.

Capacitor 5.4µF 100 volt (polyester), comprising 2 x 2.2µF and 1µF in parallel.

6. Inspection Checks

a) Check for overall mechanical defects. In particular check that the heat sinks, transformer and socket SKA have been mounted correctly.

b) The OS2/47 does notcontain any mains wiring but the transformer secondary produces over 30 volts r.m.s. Check the wiring from the transformer secondary to SKA and from the transformer primary to the PCB.

c) Check that the following components are correctly orientated by ensuring that they conform with either the board legend or D 41735 A3:

Capacitors C1 to C7
Resistors R1 to R12
Transformer T1
Diode D1
Transistors TR1 to TR6
Voltage Regulator IC1
Fuse FS1
Link LK1
Plug PLB
Sockets SKA AND SKC.

7. Test Procedure

7.1 To Check Current Consumption

a) Remove LK1 and connect a variable PSU (set to 0 volts and 300mA current limit) to PLA17 (+ve) and PLA1 and 2 (-ve). Gradually increase the voltage to 12 volts while monitoring the current.

b) Check that the current drawn is 200±20mA.

c) If the current is slightly outside the limit (say, within ±50mA) proceed with the following tests and repeat 7.1 at the end of sequence. Otherwise repeat Inspection Checks and test suspected components.

7.2 To Check Operation of Astable Multivibrator

a) With the oscilloscope, observe the signal on the collector of TR3. Repeat with TR4.

b) The signal should be a squarewave with exponential leading edges.

Amplitude: 10±2 volts Pk-Pk.

Period: 50±4mS.

c) If the amplitude of the signal is low check resistors R3, R5, R8 and R10. If the period is incorrect then check R6, R7, C2 and C4.

7.3 To Check Buffer Circuit

a) The astable outputs are buffered by TR1 and TR6. With the oscilloscope observe their outputs at the junction of R1 and R2 and the junction of R11 and R12 respectively.

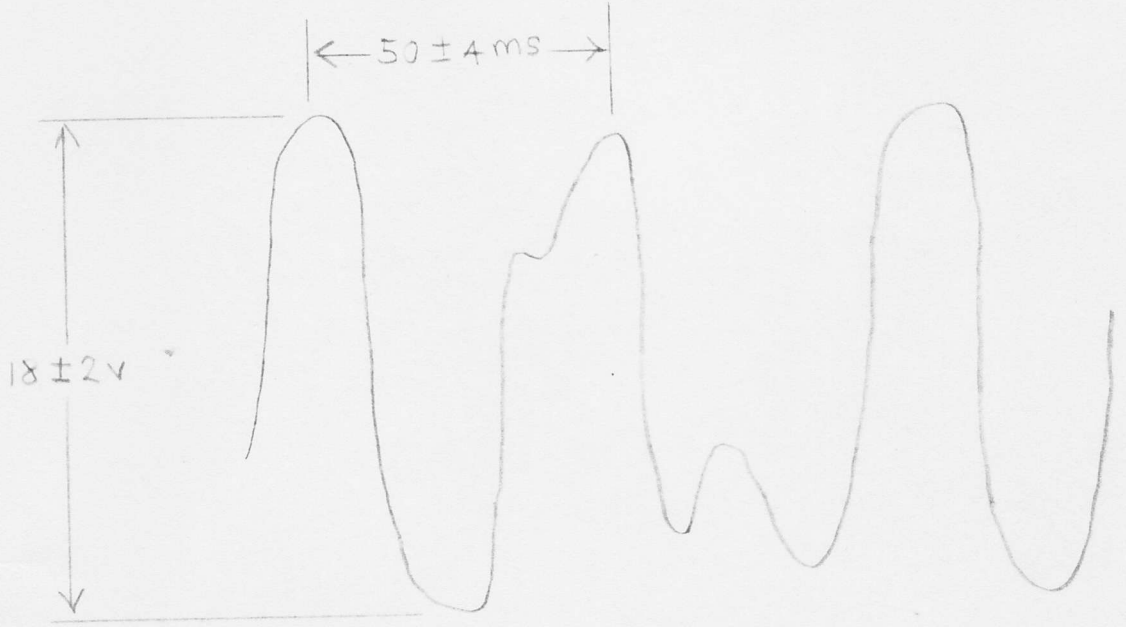
b) The signals should satisfy the same specification as in section 7.3.

c) If they do not, check connections to TR1 and TR6.

7.4 To Check Drive Circuit

a) The output of the oscillator is transformer coupled by T1. Observe the drive signals with the oscilloscope connected to the collector of TR2. Repeat with TR5.

b) The waveforms should be as follows:-



c) If the waveform is incorrect then check the wiring to TR2, TR5 and T1.

7.5 To Check Output Off Load

a) With the oscilloscope observe the signal across SKA.

Beware of the high voltage.

b) Compare the period and shape of this waveform with that illustrated in 7.4.

The amplitude should be approximately 120 volts peak to peak.

c) If the signal is absent or the signal level is low, then check the connections to T1.

7.6 To Check the Output on Load

a) Connect a dummy load (comprising 330 ohm resistor in series with 5.4uF capacitor) across SKA. With the oscilloscope observe the waveform across SKA.

b) The signal should be a distorted sinewave of amplitude greater than 40 volts peak to peak and the current drawn from the PSU should be 260±20mA.

c) If the signal is below 40 volts peak to peak check R4 and R9.

7.7 To Check the Supply Voltage Tolerance

a) Vary the PSU voltage from 11.5 to 12.5 volts.

b) Check that the unit still passes test 7.6.

c) If it does not repeat all the tests with the PSU set to 11.5 or 12.5, as appropriate, in order to isolate the fault.

To Check the Voltage Regulator

a) Leave the dummy load connected (test 7.6), reconnect the PSU to PLA13 (+ve) and PLA1 and 2 (-ve) and fit LK1. Monitor the output on SKA and use a DVM to monitor the voltage between PLA17 and PLA2. Vary the PSU voltage from 13 to 33 volts.

b) Check that the voltage on the DVM remains at 12±0.5 volts and that the output waveform still passes test 7.6.

c) If this test is not passed check IC1, C6 and D1.

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ISS.	CHANGE
1	14/11/44

052/47 (OSCILLATOR, FIXED FREQ, RINGING.)
P/LIST.

ITEM No.	No. OFF	DESCRIPTION	C'C'T REF.	BBC REF. OR DRG. No.
		DRAWING NUMBERS		
		CIRCUIT 041729 A3		
		P/LIST 041730 A4		
		ASSY & WIRING 041731 A2		
		DETAILS 1-5 041732 A2		
		P/BRD WIRING COMP SIDE 041733 A2		
		P/BRD WIRING " 041734 A2		
		P/BRD COMP LOC 041735 A3		
		P/BRD DRILLINGS 041736 A3		
		FURTHER INFORMATION REQ'D FOR MANUFACTURE		
		UNIT ASSY INFORMATION EA 10484		
		P/BRD WIRING " EA 10140		
1	1	CHASSIS CH1165A MODIFIED BY CONTRACTORS AS FOLLOWS :-		
		FRONT PANEL ENGRAVED TO :-		041732 A2. DET 1
		HANDLE MARKING TO :-		041732 A2. DET 4
		CODING PLATE CUT-OUTS TO :-		041732 A2. DET 3
2				
3	1	MOUNTING BLOCK		041732 A2. DET 5
4				
5	1	PRINTED BOARD		041733 A2, 041734 A2 041735 A3, 041736 A3
6	2	TRANSFER, SAFETY PRECAUTION FLASH		EB4486. DET 1
7				
		SCREWS ISO METRIC FOR FIXING ITEMS :-		
8	6	M2.5 x 6 PAN HD ST. ZN. P 5		
9	2	M3 x 6 PAN HD ST ZN. P 137		
10	2	M2.5 x 10 C.S.K. HD ST. ZN. P 144		
11	1	M3 x 10 PAN HD ST. ZN. P 148		
12	2	M2 x 10 PAN HD ST. ZN. P 3		
13				
14				
15				
		SCREWS B.A.		
16	1	8 B.A. x 3/16 C.S.K. HD ST ZN. P 161		
17	1	8 B.A. x 3/16 CH. HD. ST. ZN. P 161		
18				
19				
20				

BBC
DS/PLA4

052/47
OSCILLATOR, FIXED FREQ, RINGING
P/LIST.

DRN.	G.W.W.
TPD.	
CKD.	A.T.E
APPD	

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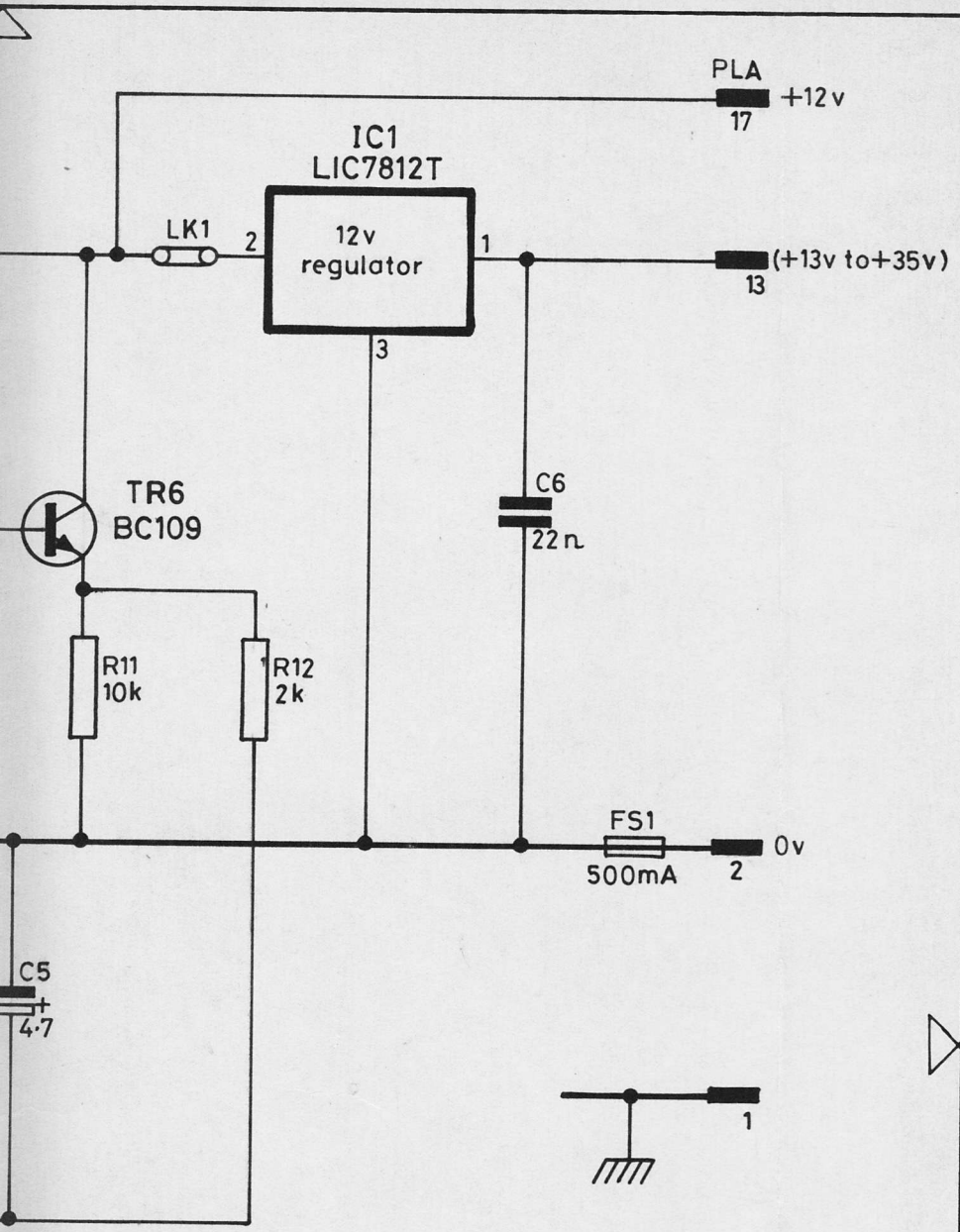
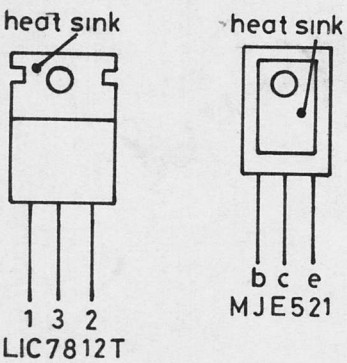


TORS & VOLTAGE REGULATOR TERMINATIONS

ads



PARTS LIST:-D41730 A4

Original Frame Size	BBC
277mm × 400mm	DS/A3

CHANGE	ISS
14/11/44	1

THIRD ANGLE PROJECTION

All dimensions in millimetres unless otherwise stated:

Normal tolerances

no decimal place:–	±1 mm
one decimal place:–	±0.3mm
two decimal places:–	±0.1mm

unless otherwise stated

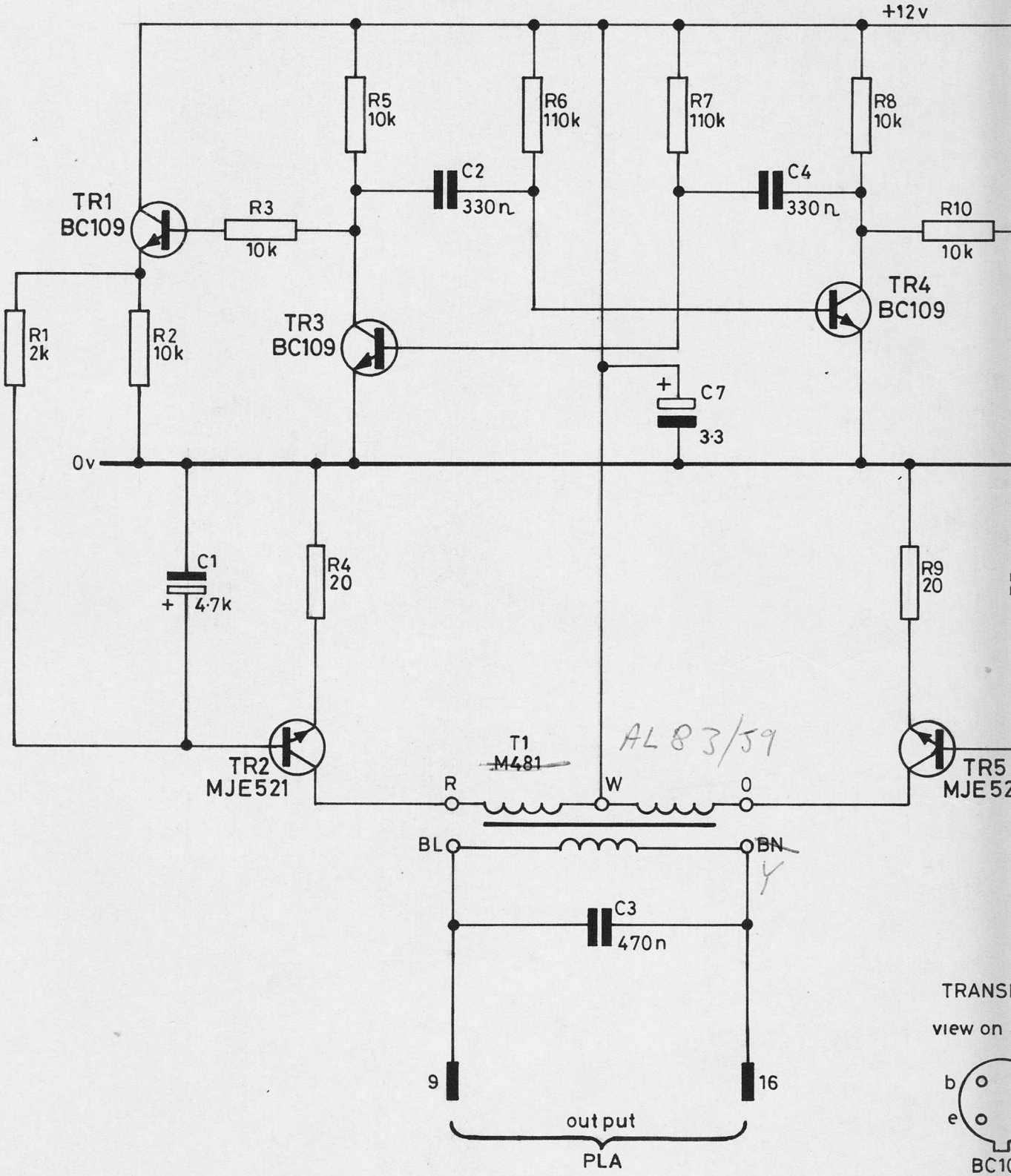
OS2/47 (OSCILLATOR FIXED FREQUENCY RINGING) CIRCUIT

DRN.	TCD.	CKD.	APPD.
G.W.W.	J.C.	M.T.E	

DESIGNS DEPARTMENT

D41729 A3

D41729 A3



SCALE :—