

DESIGNS DEPARTMENT SPECIFICATION

No. 5.225(72)

OS3/505 Oscillator, Offset Generator


.....
(G. G. JOHNSTONE)
for Head of Designs Department

Written by: M.T. Ellen

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D.D. Spec. No. 5.225(72)
Title Sheet

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BBC

DS/SPA4

DESIGNS DEPARTMENT SPECIFICATION NO. 5.225(72)

OS3/505 Oscillator, Offset Generator

This unit consists of three crystal oscillator circuits which resonate at 24MHz, 32MHz and 40MHz respectively. Only one circuit may be used at a time, and the required circuit may be selected by plugging in the appropriate crystal.

The unit, which is housed in a CH1/12A, has a metal cover which must be removed in order to change a crystal.

The offset Generator forms part of a UHF Translator type EP7/513 and it is powered by the Translator power supplies.

Power supplies	+6V 50mA -6V 50mA
Output power	+7dBm \pm 2dB into 50 ohms
Output socket	TNC
Output frequencies	selected by crystal
Circuit 1	24MHz 24MHz \pm 26KHz 24MHz \pm 52KHz
Circuit 2	32MHz 32MHz \pm 26KHz 32MHz \pm 52KHz
Circuit 3	40MHz 40MHz \pm 26KHz 40MHz \pm 52KHz
Crystal type	BBC/ITT Specification C.3212
Frequency Stability	
long term	\pm 150Hz for a temperature range of -10°C to + 40°C and a supply voltage variation of \pm 5%.
short term	Frequency deviation better than -60dB relative to 50KHz deviation, with 50uS pre-emphasis.
Spurious outputs (Not harmonically related)	Better than -70dB relative to centre frequency.
Harmonic outputs	Better than 20dB relative to centre frequency

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OS3/505 Oscillator, Offset Generator

Equipment required:-

Power supplies to supply +6V 50mA and -6V 50mA
Power meter (Hewlett-Packard type 432A or equivalent with
thermistor mount type 478A)
Frequency counter (Hewlett-Packard No. 5245L or equivalent).
10dB pad.
Spectrum Analyser (Hewlett-Packard No. 8554L and 8552B)

Remove the cover around the CH1/12A chassis and check that the unit has been manufactured in accordance with the appropriate drawings.

Connect the power supplies as follows: earth (0V) pin 9, +6V pin 10, -6V pin 13, and connect the power meter via the 10dB pad to the output socket. Plug a 24MHz crystal into the socket marked 24MHz and adjust the core of L6 so that it is mid way between the two positions at which oscillation ceases. The power meter will indicate when the circuit is oscillating but the output level may not be +7dBm. Remove the 24MHz crystal and repeat the above procedure with 32MHz and 40MHz crystals in the other circuits.

With the 40MHz crystal in circuit adjust the position of the secondary of L2 so that an output power of +7dBm is produced. Remove the 40MHz crystal and repeat the above procedure with the 32MHz and 24MHz crystals in the other circuits.

The adjustment of the cores and the secondary windings of L2, L4 and L6 are interdependant, therefore all the above adjustments should now be repeated.

Connect the frequency counter to the output and check that each crystal can be pulled to its nominal frequency by adjusting C4, C10 or C16.

Plug the following crystals into the appropriate sockets and check that the output power is +7dBm \pm 2dB in each case:-

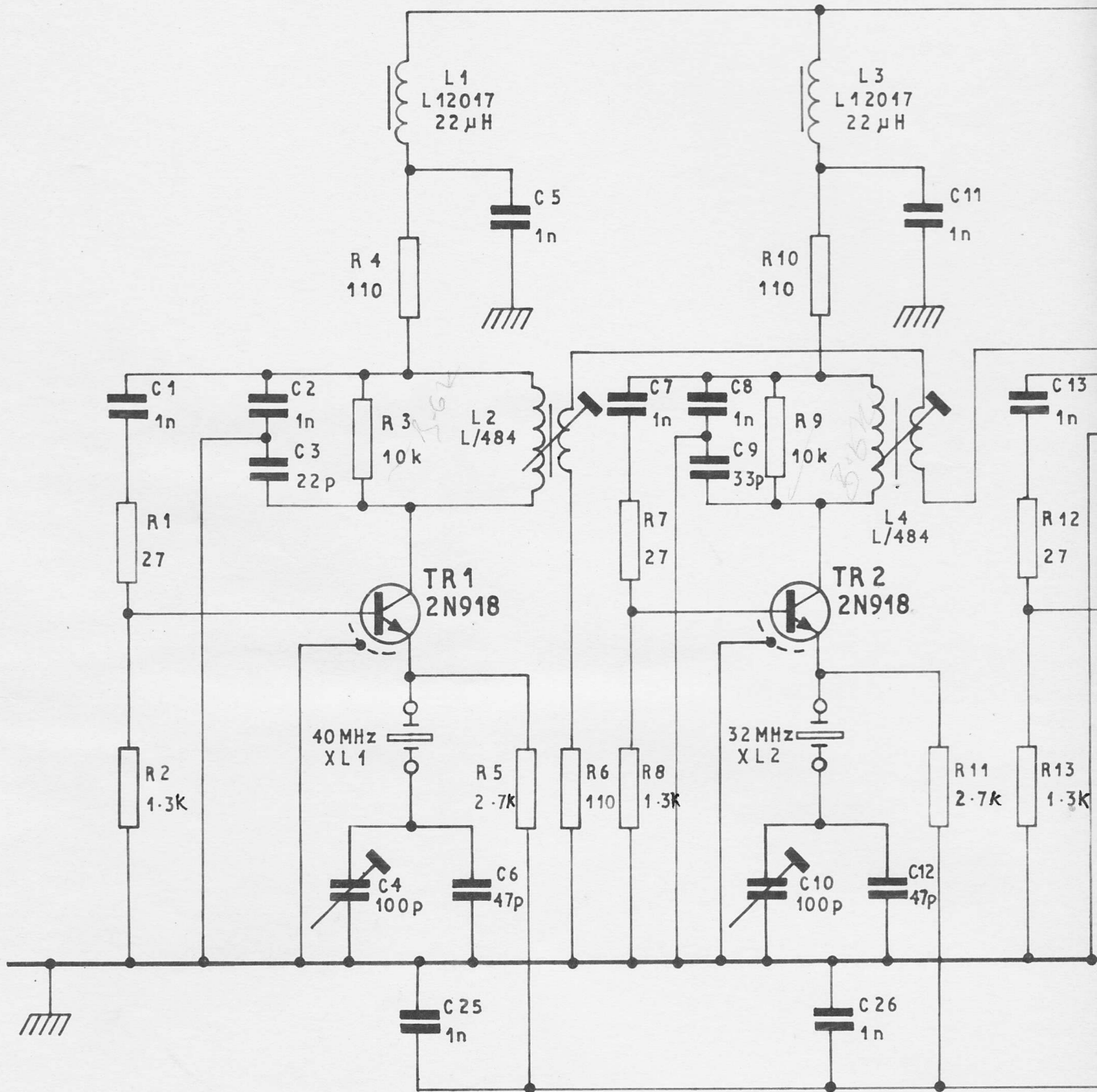
23948KHz
24052KHz
31948KHz
32052KHz
39948KHz
40052KHz

Seal the windings of L2, L4 and L6 in position with Denfix.

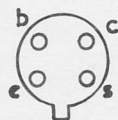
Fit the crystal specified in the requisition and adjust the oscillator to its nominal frequency with C4, C10 or C16.

Connect a spectrum analyser to the output of the oscillator and check that the spurious outputs conform with the specification. Check that the output disappears when the crystal is removed. Replace the metal cover and fix a label showing the output frequency to the back of the unit.

O53/505 (OSCILLATOR OFFSET GENERATOR) CIRCUIT



transistor terminations
view on lead

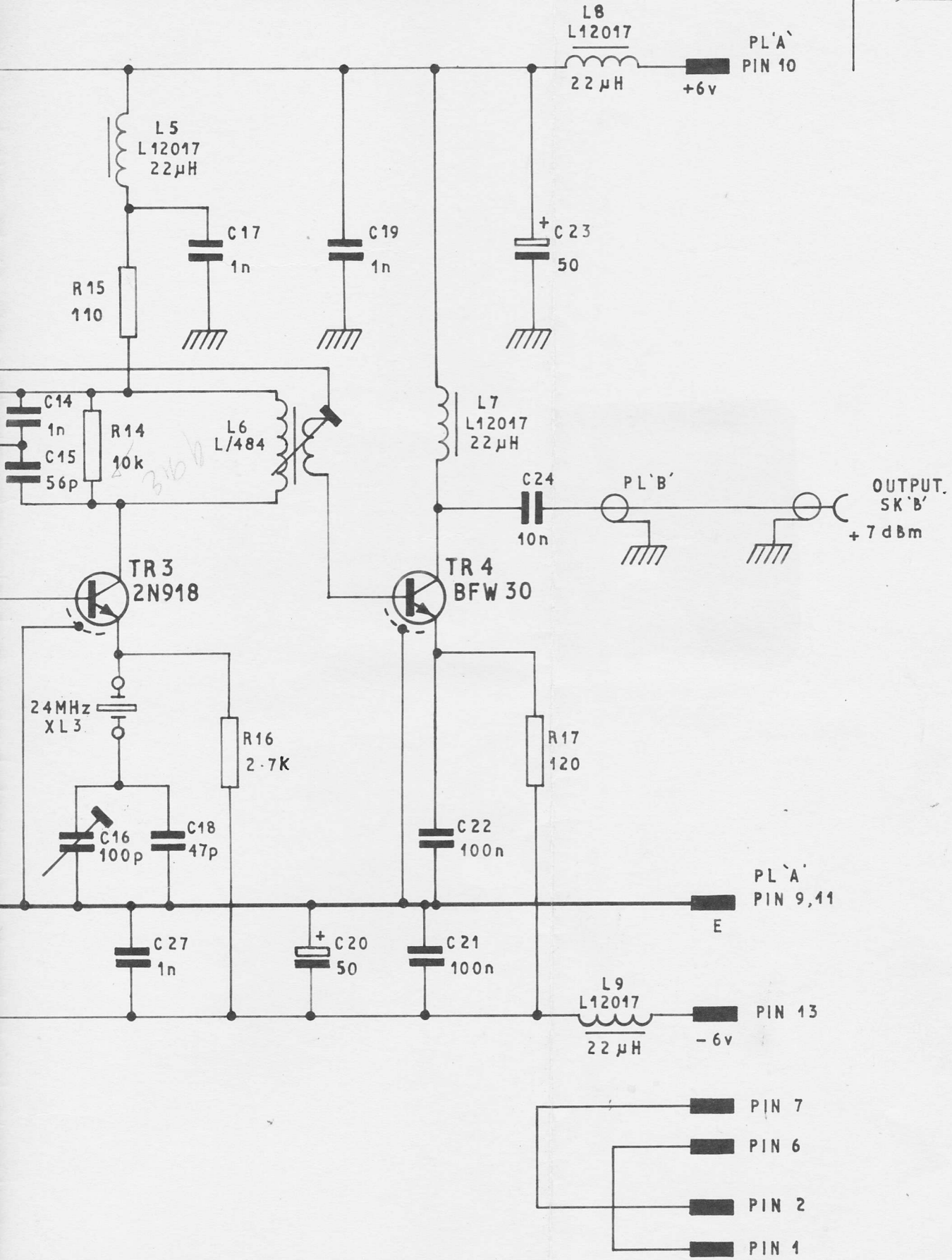


2N918
BFW 30

NOTE:-

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CHANGE	ISS
21 / 4 / 42	1



crystals XL1-XL3 (3 positions provided)
 but only one used per unit (see spec)

parts list D 32217 A4

ATOR) CIRCUIT

DRN.	G.W.W.	DESIGNS DEPARTMENT
TCD.	P.J	D32216 A3
CKD.		
APPD	R.B.P.P.	

D32217A4.

sheet 1 of 3 sheets.

CHANGE 31 / 7 / 42 ISS. 1

OS3/505 OSCILLATOR, OFFSET GENERATOR PARTS LIST

ITEM No.	No. OFF	DESCRIPTION.	CCT REF.	BBC REF. OR DRG. No.
<u>DRAWING NUMBERS.</u>				
		Circuit		D32216A3
		Parts List		D32217A4
		Assembly & Wiring		D32218A2
		Details 1-3		D32219A2
		P.B. Wiring		D32221A2
		P.B. Wiring (Comp.Side)		D32222A2
		P.B. Comp.Loc.		D32223A4
		P.B. Drillings		D32224A4
<u>FURTHER INFORMATION REQUIRED FOR MANUFACTURE.</u>				
		Unit Assy. Information		E410484
		Unit Wiring Information		E410139
		Printed Board Wiring Information		E410140
		Inductor Information		E13127A4
		L/12017, L/484		
		D32106A4, D26951A4		
1	1	Chassis CH1/12A Modified by Contractors as follows:p		
		Escutcheon drilled and engraved to:-		D32219A2, Det.1
		Front Bracket drilled to:-		D32219A2, Det.2
		Rear Bracket Drilled to:-		D32219A2, Det.3
2	1	CH1A/16, Chassis R.F. Screen		
3	1	Printed Board		D32221A2, D32222A2 D32223A4, D32224A4
4	1	Bulhead, Jack GE35830C22 T.N.C. 'Greenpar'	SK'B'	
5	1	Cable Receptacle right angle	PL'B'	
		55-021-0000 Sealectro 'Conhex'		
6	6	Jack Printed Circuit 'Cambion' 450-3388-1-03		
7	2	Spacer, Insulating Ceramic		1-58261-030
8	1	Plug, 15 Pole, P.C. Brd.	PL'A'	1-25086-315
9	5	Tag No.A0013620 'Sealectro'		
10				
<u>TRANSISTORS.</u>				
12	1	2N918 Mullard	TR1	
13	1	2N918 "	TR2	
14	1	2N918 "	TR3	
15	1	BFW30 "	TR4	
16				
17	1	Quartz Crystal C3157 B.B.C./I.T.T.	XL	(For Freq. See Spec)

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BBC DS/PLA4	OS3/505	DRN. <i>C.W.W</i>	DESIGNS DEPARTMENT
	OSCILLATOR, OFFSET GENERATOR	TPD.	D32217A4.
	PARTS LIST	CKD.	
		APPD. <i>R.P. P.C.</i>	
			sheet 1 of 3 sheets.

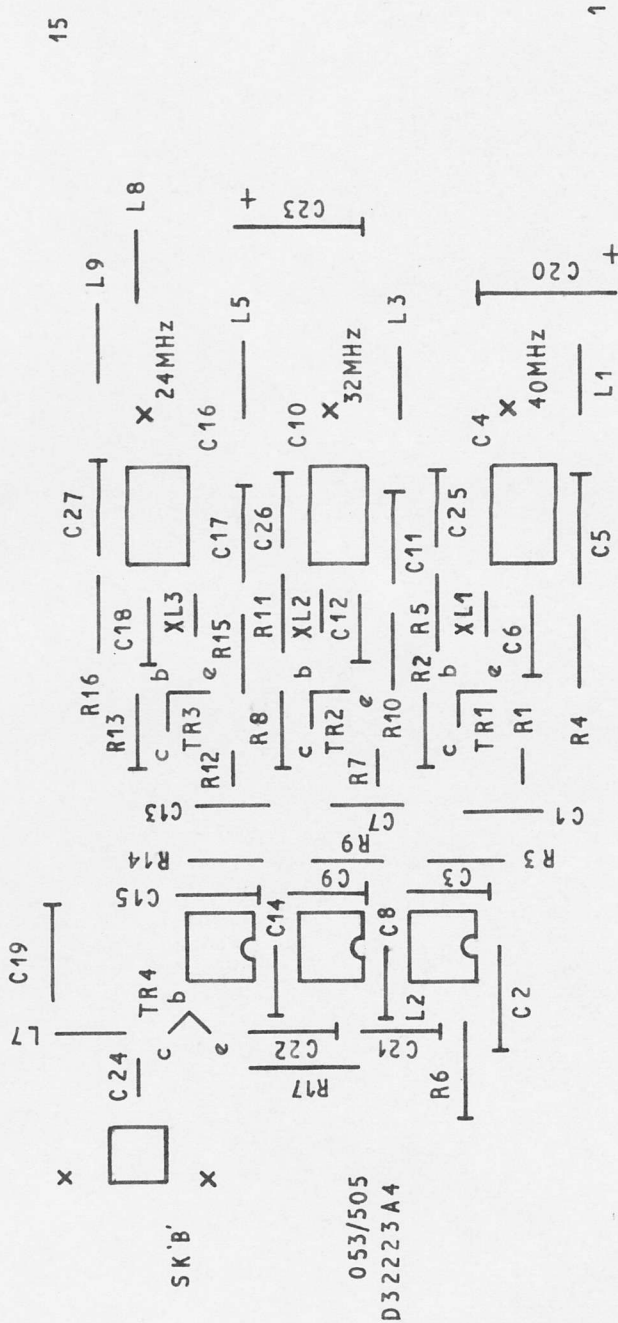
CHANGE

31 7 72

ISS

MINIMUM SIZE TO CUT NEGATIVE

TOP



053/505
D32223A4

CHARACTERS AND LINES TO BE PRINTED IN WHITE
PRINTED WIRING ON REVERSE SIDE OF BOARD IS D 32221A2
PRINTED WIRING ON COMP SIDE IS D 32222 A2

SCALE

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DRN	
TCD	
CKD	
APPD	RSS 14P

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BBC

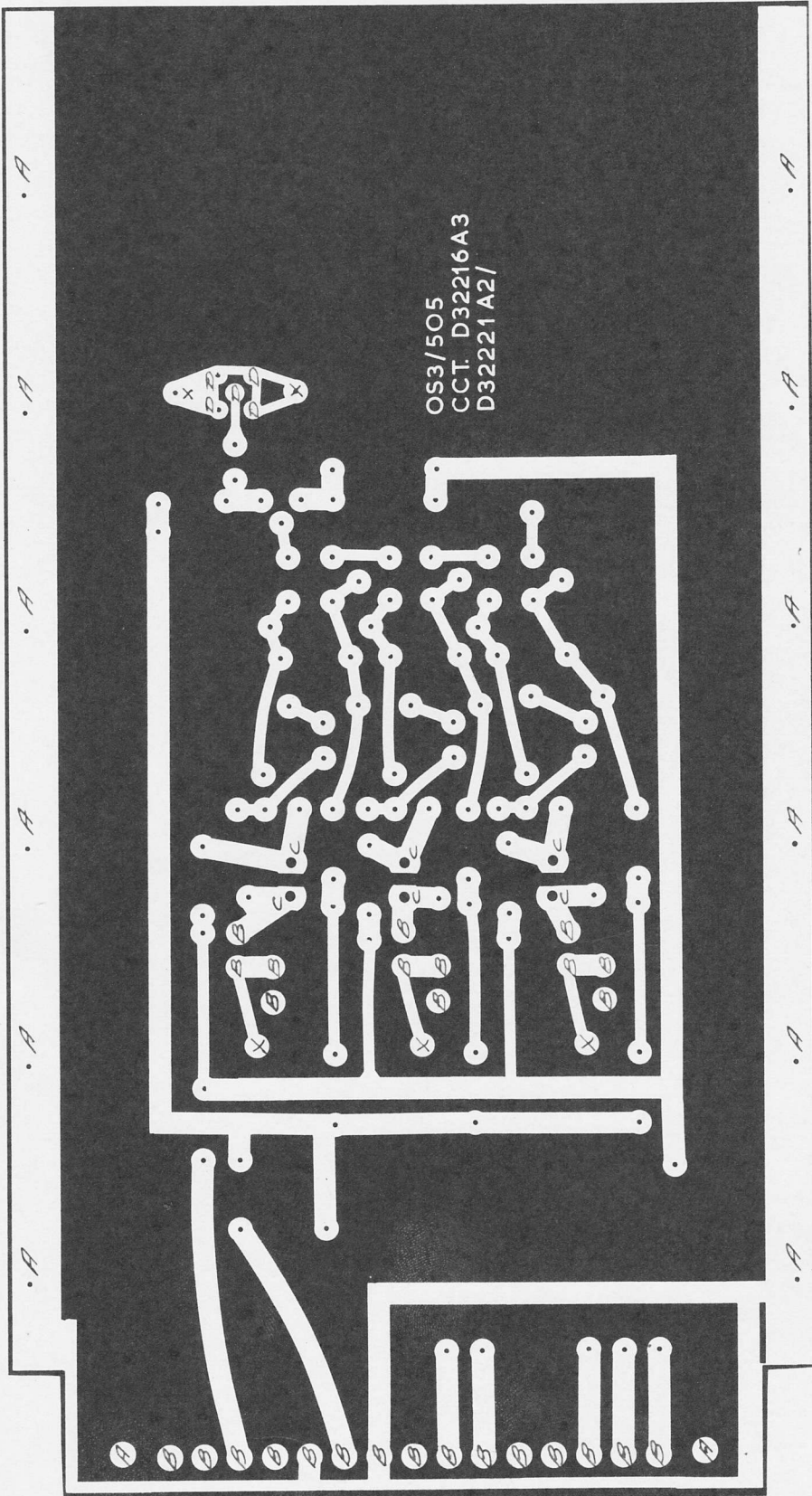
VM246A4

PRINTED BOARD DRILLING

OS3/505.

D 32224A4

CHANGE
21/4/72



HOLE REF	DRILL NO OR SIZE	DIAMETER	
		DEC	MM
A	27	.144"	3.70
B	55	.052"	1.3
C	41	.096"	2.44
D	52	.063	1.60
X	-	-	0.85
UN-LETTERED	60	.040"	1.0

CUT BOARD TO OUTER EDGE OF COPPER. SCALE 1:1

MATERIAL: 1.5MM THICK BAKELITE XYLONITE LTD.
SHEET TYPE HT6FR/11 CLAD ON ONE/BOTH SIDES WITH COPPER 35 MICRONS THICK.
FINISH: TINNED.
MANUFACTURED TO D 32221A2, D 32222A2, D 32223A4.

OS3/505.
PRINTED BOARD DRILLING


ORN G.W.W.
TCD
CKD
APPD R.S. P.P.

DESIGNS DEPARTMENT
D32224A4.

L1484

ISS
CHANGE
FIRST USED ON
053/505
26-6-72

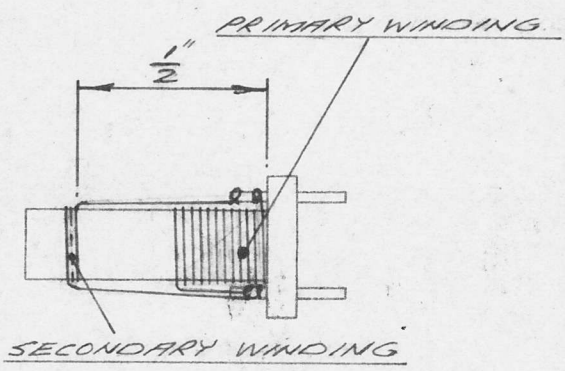
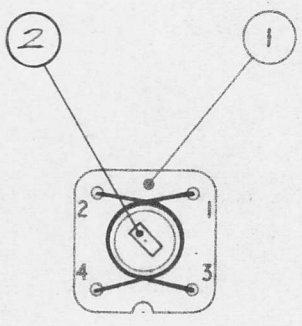
ROTATION



Y Z

THIRD ANGLE PROJECTION

SCALE 2:1



IMPORTANT - THESE WINDINGS TO BE FINALLY SEALED ONLY AFTER UNIT HAS BEEN A.O.T.

INDUCTOR TO BE MANUFACTURED IN ACCORDANCE WITH DRG. E13127A4 NOTES 1, 7, 8, 9

ITEM No.	No. OFF	SEE NOTE	DESCRIPTION	BBC. REF OR DRG. No.
1	1		Coil former Neosid type 790/2 4-pin	
2	1		CORE NEOSID GRADE 900/SL PURPLE (2X0.5X10)	
3	A/R		Wire 28 S.W.G. self-fluxing to BS 3188 'F'	

* DENOTES ITEMS SUPPLIED ON EMBODIMENT LOAN TO THE CONTRACTOR BY THE B.B.C. FREE OF CHARGE

WINDING DETAILS

WDG	WIRE	TURNS	START	FINISH	TAP	ROTATION	SPECIAL REQUIREMENTS
A	ITEM 3	10 1/2	1	3		Z	CLOSEWOUND
B	ITEM 3	1 1/2	2	4		Y	CLOSEWOUND. DIM 1/2" WILL BE A.O.T.

TEST INFORMATION

WDG	INDUCTANCE 'L'		R _e MIN L	SPECIAL TEST REQUIREMENTS
	MIN	MAX WITH CORE		
A	0.52 μH	1.15 μH		
B	0.02 μH	0.04 μH		

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BBC
VM244A4

DATA SHEET

DRN G.W.W. DESIGNS DEPARTMENT
TCD
CKD
APPD R.B.P.P.
L/484.