Issue 1
24.1.73

DESIGNS DEPARTMENT

MANUFACTURING INFORMATION NO. 5.227(72)

UHF Level Control Unit UN3/547

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

Written by: M.T. Ellen

BBC

DS/SPA4

SC

D.D.M.I. No. 5.227(72)
Title Sheet

Issue 1
24.1.73

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UHF Level Control Unit UN3/547

C O N T E N T S

D R A W I N G S

AGC Unit UN3/547

Circuit	DSK 14316 A4
Parts List	DSK 14315 A4
Assembly and Wiring	DSK 14318 A3
Order of Assembly	ESK 2679 A4
Details 1 and 2	DSK 14319 A3
Detail 3	DSK 14317 A4
Printed Board Wiring Side	D 29843 A2
Printed Board Comp. Side	D 29844 A2
Printed Board Comp. Loc.	D 29845 A4
Printed Board drilling	D 29846 A4

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UHF Level Control Unit UN3/547

Introduction

The UN3/547 is a slave gain control unit for use in UHF translators and active deflectors type EP7/513 and EP7/514 respectively.

The unit has an input and output impedance of 50 ohms and an attenuation which is variable between 2dB and 20dB. Its attenuation is controlled by a potential from 0 to +6V applied to a pin to top of the box. The minimum attenuation of the unit can be adjusted by a potentiometer, this is used to set the threshold level at which the applied potential begins to take effect.

The unit is housed in a CH1/57B and does not include power supplies.

General Specification

Supply voltages	-6V 3.5mA +6V 3.5mA to 23mA
Minimum insertion loss	< 2dB from 470-860MHz
Maximum insertion loss	> 20dB from 470-860MHz
Return loss	
Minimum attenuation	> 12dB
Maximum attenuation	> 20dB

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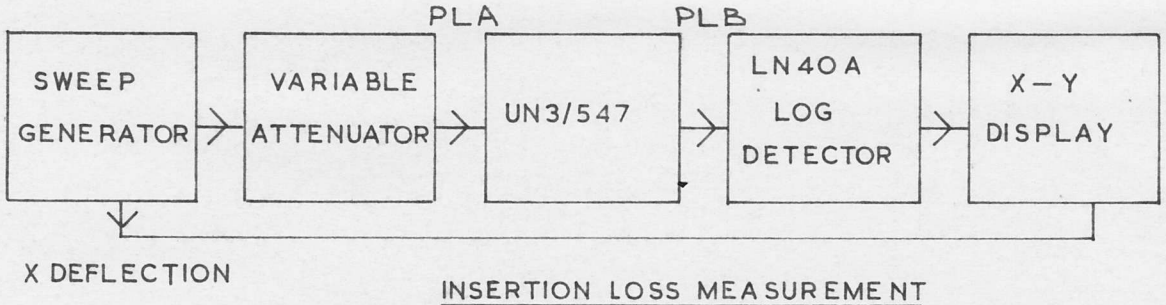
UHF Level Control Unit UN3/547

PRODUCTION TEST SCHEDULE

Equipment Required

Sweep generator 0dBm out, 400-900MHz	(Texcan VS80 or equivalent)
Switched attenuators 1dB steps and 10dB steps	
Coupler, 20dB	(Narda Microline or equivalent)
Detector and display of good sensivity	(Texcan LN40A + 2 x AM14/540)
Termination, 50 ohms return loss >30dB	

1. Connect the correct voltage supplies and provide an earth to the earth tag on the box. . Switch on and ensure that the correct current is being drawn. For average current levels see the specification. This test should be done before the SMB connectors are fitted.
2. Set up the test equipment as shown in the following block diagram so that the insertion loss of the unit may be measured.

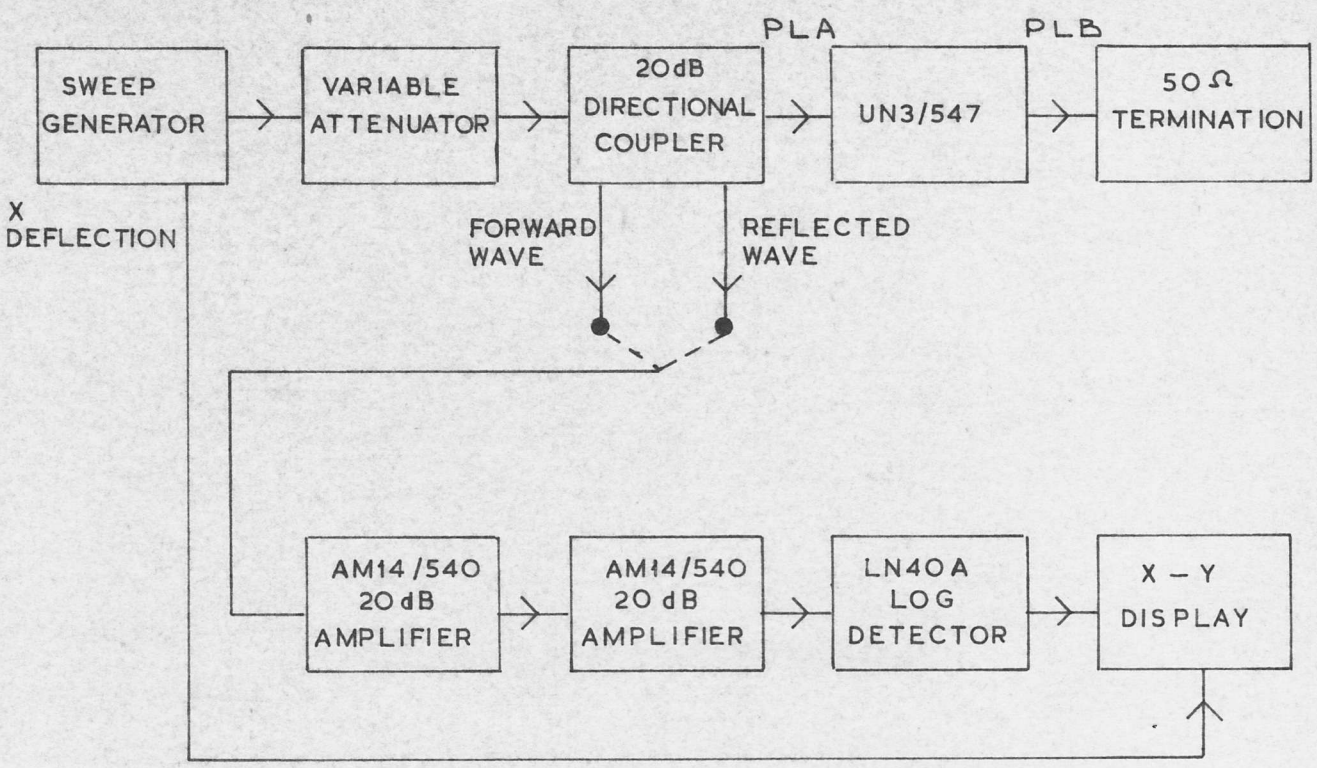


INSERTION LOSS MEASUREMENT

3. Feed a swept UHF signal in the range 470-860MHz at a level of approximately 0dBm into PL'A'.

   Adjust the potentiometer accessible through the hole in the frame labelled 'adjust' from one end of its range to the other and check that the insertion loss of the unit swings from its maximum to minimum, or vice versa, as specified for this unit.

   Set the potentiometer to give minimum insertion loss. Feed a d.c. voltage variable from 0 to +6V into the unit via the pin labelled 'AGC CTRL' and check that the insertion loss of the unit swings from its maximum to minimum, or vice versa, as in the specification. Reduce the voltage to zero.
4. Set the potentiometer to give the unit about 10dB insertion loss, and check that by altering the d.c. potential at the 'AGC CTRL' pin the insertion loss will only increase from this value to the maximum.
5. Set up the test equipment as shown in the following block diagram so that the return loss of the unit may be measured.



RETURN LOSS MEASUREMENT

6. The lead from the coupler to PL'A' must be less than three inches long. With approximately -40dBm from the generator, connect the detector amplifiers' input to the forward wave port on the input coupler, and set up a convenient trace on the X-Y display. Increase the generator output by 12dB and transfer the detector amplifiers input to the reflected wave port. This should be below the forward wave trace over the range 470-860MHz for all attenuation settings. Adjust the attenuator to measure the return loss to the nearest dB.

DSK14815 A4

UN3/547 UNIT CONTROL UHF LEVEL. PARTS LIST. Sheet 1 of 4 Sheets

ISS.	CHANGE
2	REVISED & REDRAWN. EJA 22/11/72

ITEM No.	No. OFF	SEE NOTES	DESCRIPTION	C'C'T REF.	BBC REF. OR DRG. No.
			Drawing Numbers		
			Circuit DSK.14816 A4		
			Parts List DSK.14815 A4		
			Assembly & WIRING DSK14818 A2		
			Order of Assembly ESK2679 A4		
			Details 1 & 2 DSK.14819 A3		
			Details 3 DSK.14817 A4		
			P.B. Wiring Side D.29843 A2		
			P.B. Comp. Side D.29844 A2		
			P.B. Comp. Loc. D.29845 A4		
			P.B. Drilling D.29846 A4		
			Further Information Required for Manufacture		
			UNIT WIRING INFORMATION P.BOARD EA10140		
			Unit Assembly Information EA.10484		
			Spec. ED/UN3/547.		
1	1	*	Chassis CH1/57B modified by Contractor AS FOLLOWS:- Frame DRILLED TO:-		SPEC. ED/CH1/57 DSK14819 A3, Det.1
2					
3					
4	1	*	Bulk Head Receptacle Sealectro Type 51-045-000	PL.A	
5	1	*	" " " "	PL.B	
~~6~~	~~1~~	~~*~~	~~" " " "~~	~~PL.C~~	
~~7~~	~~1~~	~~*~~	~~Switch S.P.C.O. Wayeom Type MST 105D~~	~~S1~~	
8	1	*	Unit Label		DSK14817 A4, Det.3 & ESK2571 A3.
10	1		6BA Solder Tag D/E		
11	2		6BA " " S/E		
12	1	*	PRINTED BOARD ASSEMBLY COMPRISING ALL ITEMS MARKED THUS +		SPEC. ED/D0/6
13	7	+	Vero Half Pin TP 11034		
14	1	+	Printed Board		D.29843 A2 D.29844 A2 D.29845 A4 D.29846 A4
15	1	+	Tag, Lead Through		1-28652-002
16	1	+	TRANSISTOR MOUNTING PAD		1-59193-018
17	A/R		Copper for Strip, 0.001" thick x $\frac{3}{8}$" wide		
18	A/R		" " " " " x 1/16" wide		

BBC

DS/PLA4

UN3/547
UNIT CONTROL UHF LEVEL.
PARTS LIST

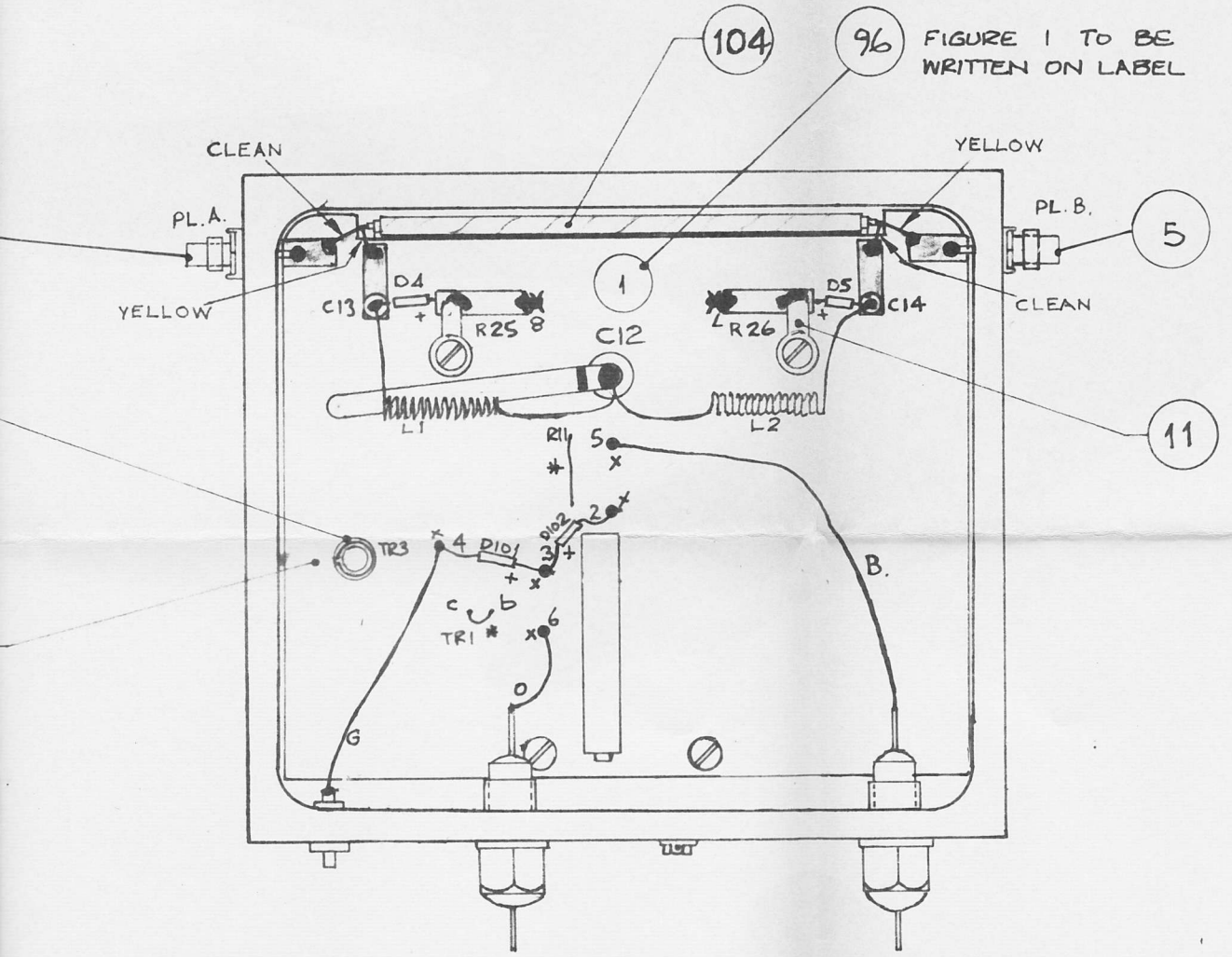
DRN.	
TPD.	
CKD	D.D.
APPD	D.D

DESIGNS DEPARTMENT

DSK14815 A4.

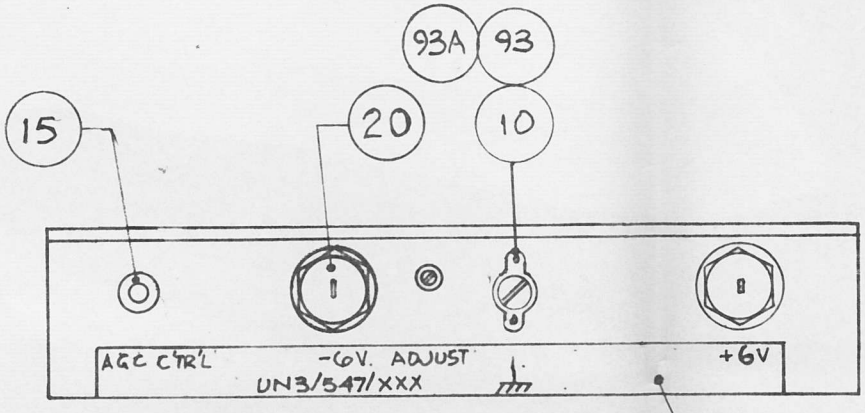
Sheet 1 of 4 SHEETS

N.B. 2 INNER CONDUCTORS OF SAGE WIRELINE ARE CLEAN & YELLOW WRAPPED, ENSURE CONNECTIONS ARE AS SHOWN



* 22 SWG BTC LINKS

VIEW WITH LID REMOVED FOR CLARITY



SERIAL Nº TO BE STAMPED IN 3/32" HIGH CHARACTERS IN SPACE PROVIDED. LABEL TO BE STUCK IN ALIGNMENT WITH COMPONENTS USING ARALDITE ADHESIVE.

8

3/8" SQ. x .001" THICK COPPER FOIL SOFT SOLDERED, AS SHOWN, TO COPPER CLAD OF PRINTED BOARD.

CHANGE	ISS
21/11/72	1

UN3/547- ORDER OF ASSEMBLY

ORDER OF ASSEMBLY

PART I

IMPORTANT Solder used for assembling capacitors on board must be multicore LMP colour code red/blue or equivalent, used with a 500°F soldering iron.

1) Take printed board, ready drilled and soft solder square of copper foil, in position shown on D29839A2, to underside.

2) Fit C12 (220pF) to printed board by tinning one side of the capacitor and dropping it into the hole in the board, on top of the foil. Applying the soldering iron to the pad on the underside of the board is easier and less likely to crack the capacitor. The soldering iron must be applied to these disc capacitors for the absolute minimum time possible, and in any case, less than five seconds.

3) Solder C13 and C14 in position on top of board taking equal care.

4) Tin upper surfaces of C12 C13 and C14

5) Solder short strip of 1/16" Wide x .001 Thick copper foil to copper line and C12, on top of board, to connect the two electrically.

6) SOLDER SAGE WIRELINE COUPLER earthing foil to underside of printed board with couplers in positions shown; then connect to topside of the board in positions shown, taking care to connect 'clean' and yellow wrapped wires as shown. Inner conductors must be kept as short as is possible.

7) Fix SEVEN termination pins to board in positions shown and solder to underside.

8) Fit and solder all components, with the exception of D4, D5, R25 and R26, to board,
N.B C1-C9, C15, C16, D1, D2, TR1, TR2 IC1 R1-R11 R14-R22 R28 & R29 ALTHOUGH SHOWN ON THE COMPONENT LOCACTION ARE NOT REQUIRED TO BE FITTED.

.../...

ISS	CHANGE
1	21/11/72

9) **Return the unit** to the test laboratory for inspection and D.C. tests according to the test production schedule.

PART II

10) **Fit the board to the frame and screw down with 6B.A. solder tags under the two rear screws as shown.**

11) Solder completely wrapped ends of resistors R25 and R26 to termination pins as shown and then solder copper wrap at other ends to solder tags.

12) Solder D4 and D5 to leads of resistors R25 and R26 and to topsides of C13 and C14 respectively, keeping the diode and resistor lead lengths to the dimensions shown on the assembly drawing D29839 A2.

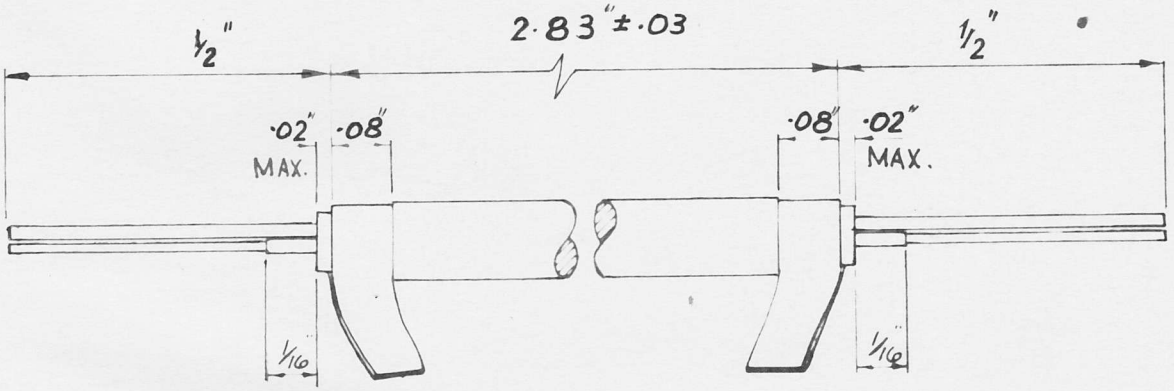
13) Fit PL.A, and PL.B to frame as shown, **using s/proof washers but discard nut.** Solder inner to copper area on corner of printed board.

14) Fit C10, C11, lead through tag and earth tag to frame and solder blue, orange, green, wires in positions shown.

15) Screw on lid.

UN3/547 - ORDER OF ASSEMBLY

ISS	CHANGE	
1	21/11/79	



SCALE 4 1

STRIPPING OF WIRELINE HYBRIDS

STEP 1. USING THERMAL STRIPPER REMOVE OUTER COVER FOR ·5 ± ·020 AT EACH END, DOUBLE WRAP FOIL WILL BE EXPOSED.

STEP 2. UNWIND BOTH FOIL WRAPS TO OUTER JACKET, SO THAT TOTAL FOIL LENGTH IS 2·83" ± ·03", TIN THE INSIDE OF BOTH STRIPS & SOLDER TOGETHER KEEPING THEM AS TIGHT AND AS SQUARE AS POSSIBLE AGAINST THE SHOULDER OF THE OUTER JACKET. CUT TO APPROX ¼" LONG.

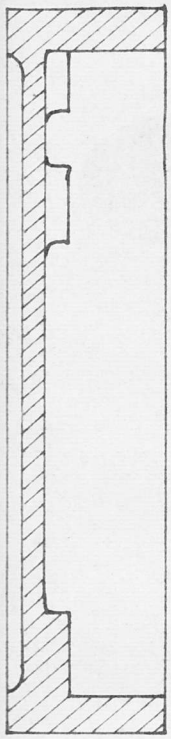
STEP 3. HEAT STRIP AND THEN TRIM THE TEFLON JACKET (THE LAYER UNDER THE FOIL) FROM THE TWO CONDUCTORS SO THAT NO MORE THAN ·02" IS VISIBLE PAST THE FOIL WRAP. TAKE CARE WHILST TRIMMING NOT TO DAMAGE THE YELLOW FILM ON ONE CONDUCTOR WITHIN 1/16" OF THE TEFLON COATING.

STEP 4. STRIP THE YELLOW H-FILM BACK, TO WITHIN 1/16" OF THE TEFLON COATING.

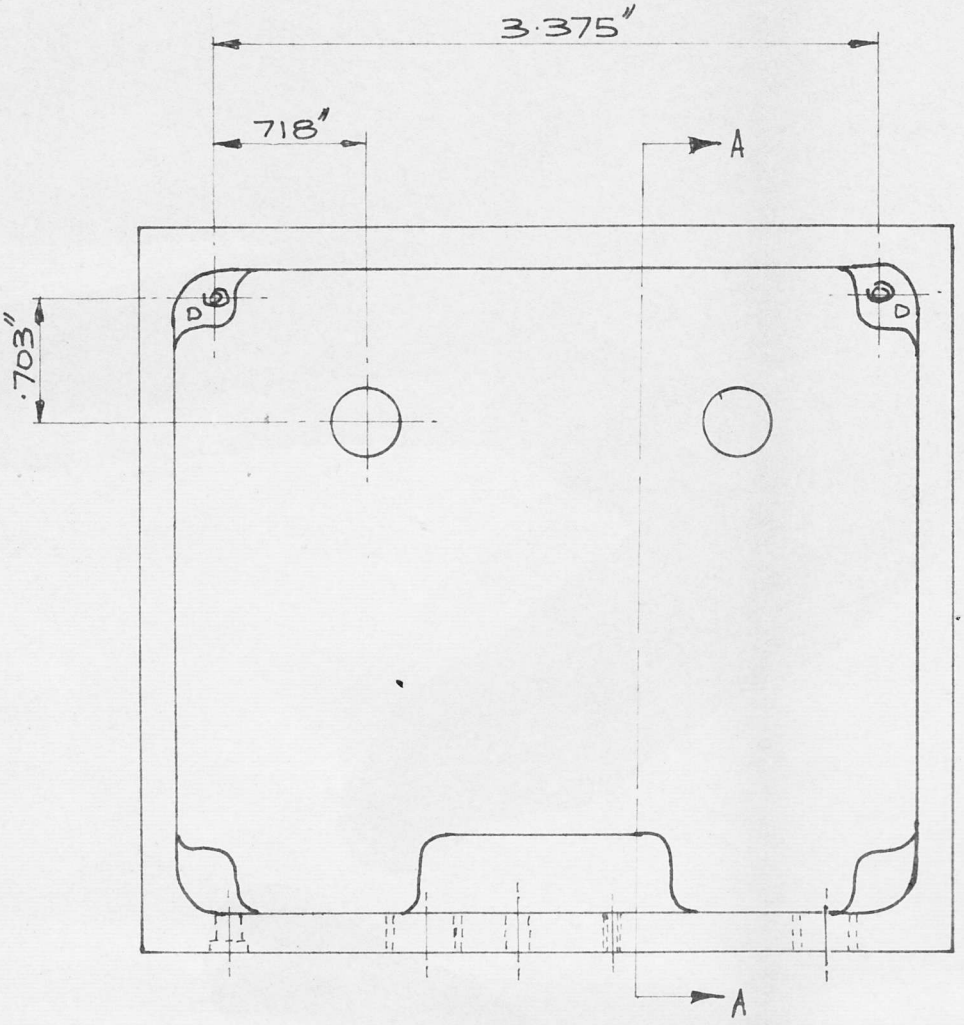
SPEC. ED/UN3/547.

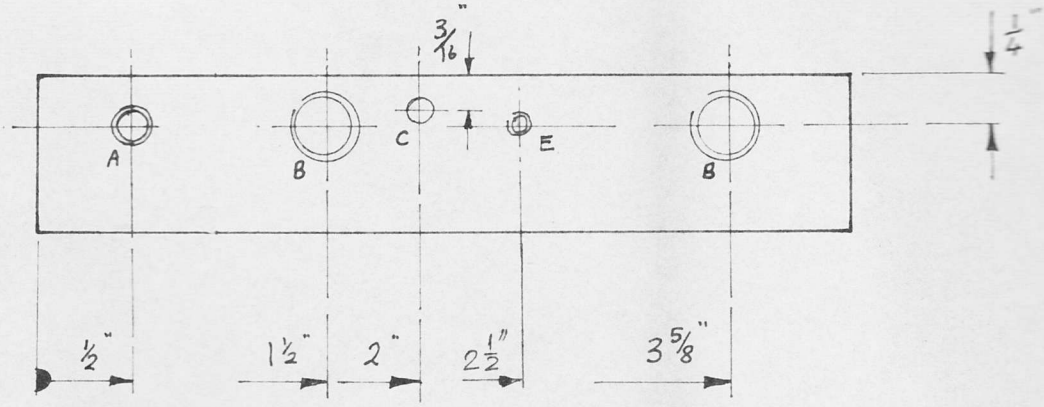
BBC	UN3/547 ORDER OF ASSEMBLY	DRN
DS A4		TCD
		CKD
		APPD

DESIGNS DEPARTMENT
ESK2679 A4
SHEET 3 OF 3 SHEETS



SECTION A-A





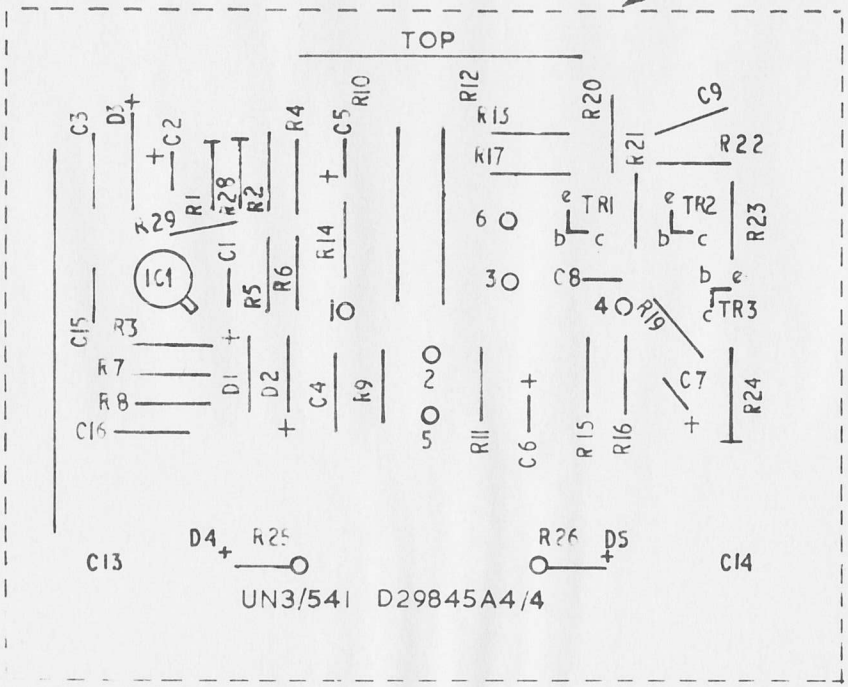
UN 3/547 DETAILS 1&2

UN3/541 PRINTED BOARD COMPONENT LOCATION

D29845 A4

CHANGE	ISS
17. 11. 71.	1
R1 'T' ADDED. UNIT CODE & DRG. No. ADDED. RBA 11-1-72.	2
REDRAWN. J.H. R.B.A. 6-3-72.	3
R28 & R29 ADDED. R18 DELETED. CJA CF11142, CF11173(3) 21/11/72	4

MINIMUM SIZE TO CUT NEGATIVE



UN3/541 D29845A4/4

CHARACTERS AND LINES TO BE PRINTED IN WHITE

PRINTED WIRING ON REVERSE SIDE OF BOARD IS D29843A2.

SCALE 1:1

UN3/541 PRINTED BOARD COMPONENT LOCATION

DRN	T.C.H.	DESIGNS DEPT
TCD		
CKD		
APPD		

D29845 A4

VM246 A4

BBC

UN3/541 PRINTED BOARD DRILLING

D 29846 A4

CHANGE	ISS
17. 11. 71.	1
'A' HOLE WAS .2126" DIA. 'B' HOLES WERE 1/8" DIA. ALL REFS. TO 'C' & 'D' HOLES DELETED. 'ALL OTHER' HOLES WERE DR. No. 66. MAT'L TYPE WAS MG 53 & Cu WAS 35 MICRONS THICK. R.B.A. 11-1-72.	2
COPPER & HOLE REF'S. REVISED J.H. R.B.A. 7-3-72.	3
C-HOLES ADDED. COPPER REVISED. CF7811, CF11142 CF11173(3) CJA 21/11/72	4

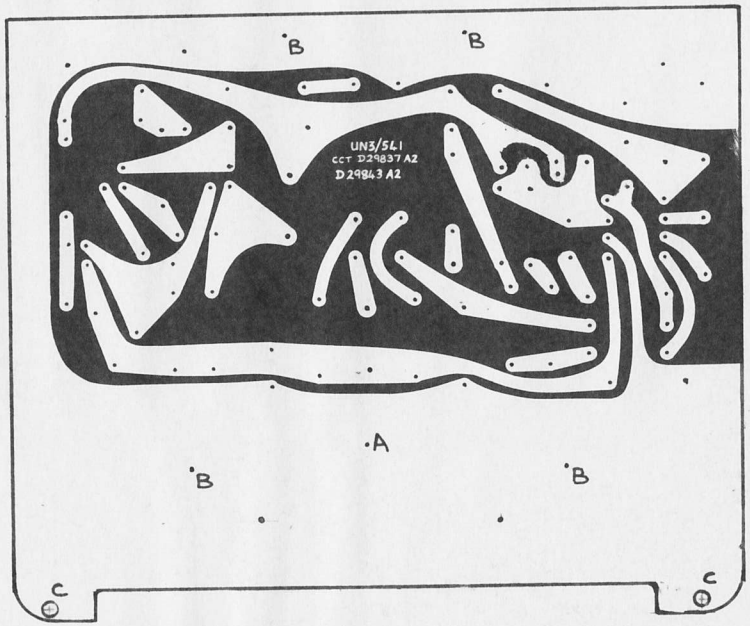
PRINTED BOARD DRILLING

UN3/541

DRN	T.C.H.	
TCD		
CKD		
APPD		

D29846 A4

DESIGNS DEPARTMENT



HOLE REF.	DRILL NO. OR SIZE	DIAMETER DEC.	DIAMETER MM
A	3	.213"	5.40
B	27	.144"	3.70
C	37	.104"	2.65
ALL OTHER	60	.040"	1.00

CUT BOARD TO OUTER EDGE OF COPPER

MATERIAL:
1.5 THICK SILICON GLASS LAMINATE MICA & MICANITE TYPE MG5/2/2 CLAD ON BOTH SIDES WITH COPPER 70 MICRONS THICK

MANUFACTURED TO:
D 29843 A2 D 29844 A2 D 29845 A4

FINISH:
ROLLER TINNED

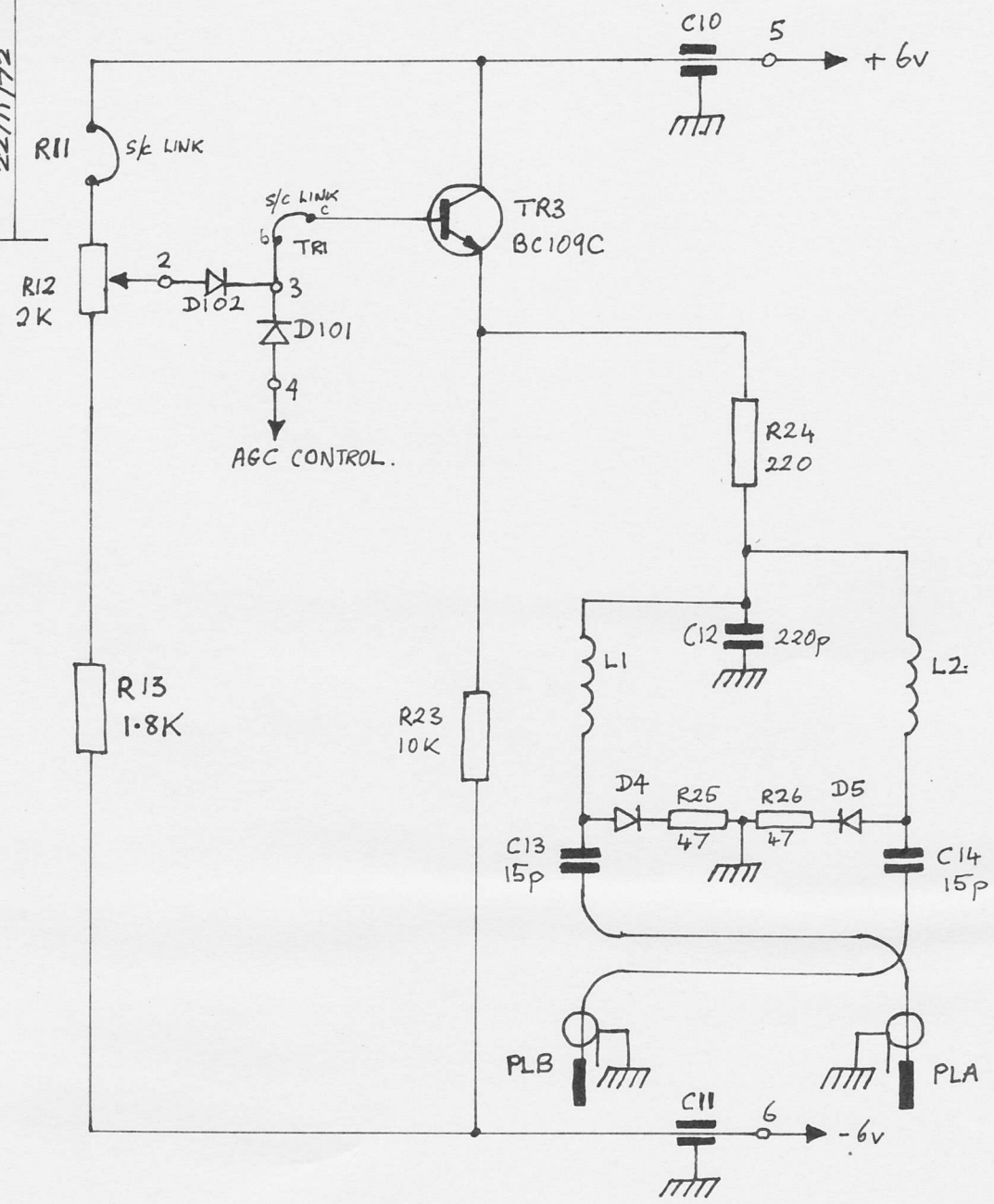
APPROX. Nº OF HOLES – 110.

SCALE

DSK 14816 A4

UN3/547 (UNIT, CONTROL, LEVEL, UHF) CIRCUIT.

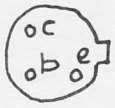
ISS	CHANGE
1	9 August 1972
2	TRANSISTOR TERM' ADDED. CJA 22/11/72



NOTE

1. THE COMPONENT NUMBERS APPLY TO THE COMPONENT LOCATION ON THE UN3/541 AGC UNIT, PRINTED CIRCUIT BOARD D29843 A2, D29844 A2, AND COMPONENT LOCATION D29845 A4.

TRANSISTOR TERMINATIONS
VIEW ON BASE



BC109C

BBC

DS/A4.

UN3/547 (UNIT, CONTROL, LEVEL, UHF) CIRCUIT.

DRN.	fbf
TCD.	
CKD.	fbf
APPD	fbf

DSK 14816 A4