Errata

Title & Document Type: 3702B IF/BB Receiver Operating and Service Manual

Manual Part Number: 03702-95010

Revision Date: November 1971

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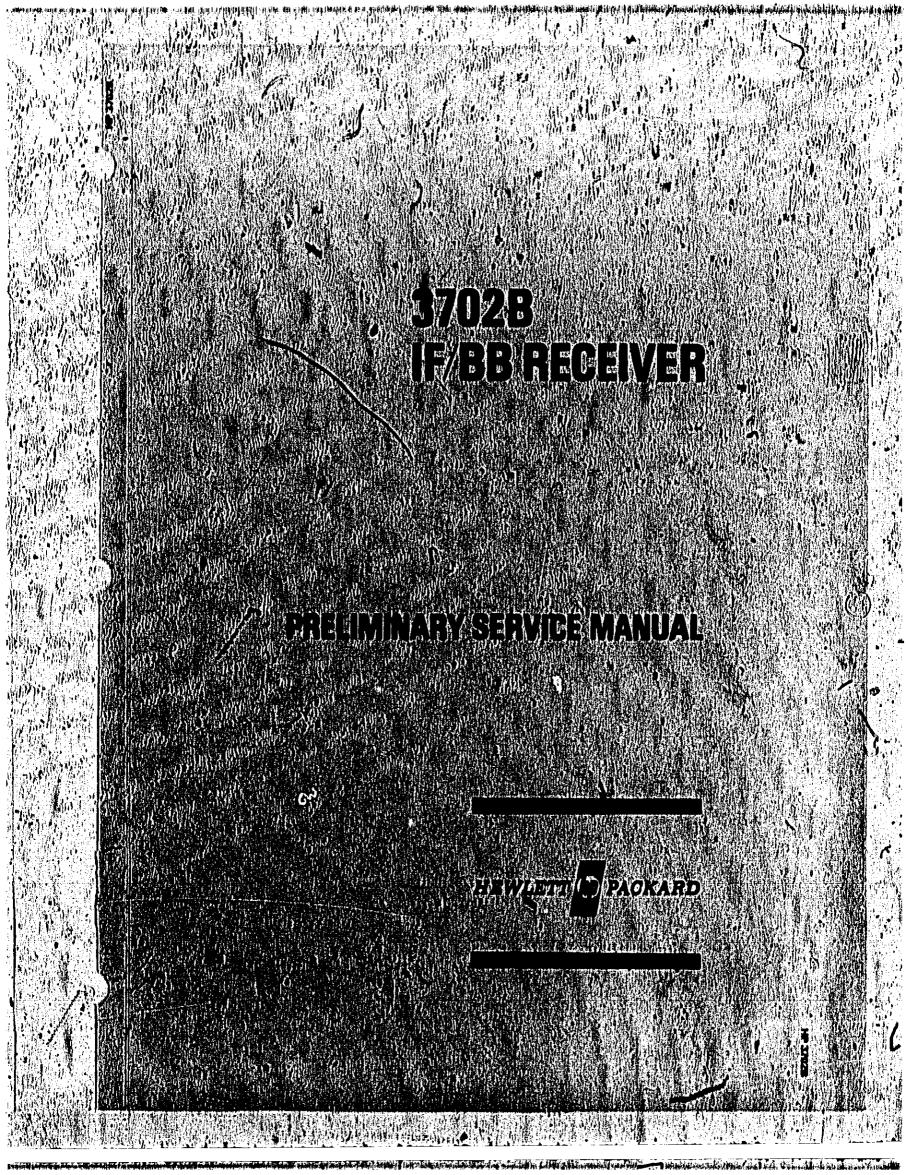
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PRELIMINARY SERVICE MANUAL

MODEL 3702B IF/BB RECEIVER

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FOREWORD

A complete set of manuals for the Microwave Link Analyzer consists of the following:

- System Survice Manual
- Bystem Opelating Instructions
- Service Monual 3719A IF/BB Transmitter
- Service Manual 37,15A BB Transmitter Plug In OR 37,16A BB Transmitter Plug In OR
 - Service Manual 37028 (F/BB Receiver
- Service Manual 37.033 Group Delay Detuctor Rive-In OR-37.05A Different[]], Rhase Detector Plug-In

This preliminary manual contains in alkilowing soutions,

SECTION I' INTRODUCTION

Ganaral introduction and a complete specification.

SECTION'II PERFORMANCE CHECKS

SECTION III CALIBRATION

Not available for preliminary manual.

SECTION IV REPLACEABLE PARTS

Parts are listed in essembly order.

SECTION V SERVICE SHEETS

Ganeral Service Shoets G1 to G5 contain the theory of operation and troubleshooting down to assembly level.

Assembly Service Sheets A1 to A26 (excluding A16 to A19 which are to rassigned), each containing circuit description, component location and grid reference, and an assembly schematic.

TO RECEIVE YOUR FINAL MANUAL WHEN IT IS AVAILABLE, COMPLETE AND RETURN THE PRE ADDRESSED CARD THAT IS TIED TO THE INSTRUMENT.

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BECTION III CALIBRATION

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SECTION IV REPLACEABLE PARTS

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Assembly Service Sheet A10 - External Input Amplifier

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a a man a man a man a man a man a b 78	A10-1 Simplified Block Dingram
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hea	A10-3 Schamatic Diagram - Assembly A10 7.

Assembly Service Sheet A11 -- Marker Comb Generator Paragraph A11-1 CIRCUIT DESCRIPTION " Paga 5-80-11.3 11 - 15: 315: 11 - 50, 3 gilling

Floure A11-1	Simplified Block Diagram	 	ور تارو تاوو .	.: M.		.,, ,, 5 -80
	Component Location and	ni bri print	nalisaa sa ku	. W	4	,, , 6- 81
	Schematic Diagram - Asse					

Assembly Service Sheet A12 - Power Supply Rectifiers Paragraph A12-1 CIRCUIT DESCRIPTION

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A12-1 Simplified Blook Dingram as a market a star in a section of a star in a section of a section A12-2 Component Location and Grid Reference

Assembly Service Sheet A13 - BB Attenuator " A13-1 CIRCUIT DESCRIPTION Parancophy

A13-1 Simplified Block Diagram A13-2 Component Location A13-3 Schematic Diagram – Assembly A13 15-BA Floure 6.66 1. J. B.BB

Assembly Service Sheet A14 + IF Attenuator

A14:1 Simplified Block Diagram A14-2 Component Location A14-3 Schematic Diagram - Assembly A14 Finura

Assembly Service Sheet A15 - BB # Sweep Splitter

Floure.

A18-1 Simplified Block Diagram A18-2: Component Location and Grid Ratarance and the second se

Assembly, Service Sheet A20 - Return Loss Mixer

Paragraph Figura

Assembly Service Sheet A21 - BB Amplifier Paragraph

Floure

Assembly Service Sheet A22 - IF Amplifiar and Detector Paragraph A22-1 CIRCUIT DESCRIPTION Statistics and a statistic statistics. Page 5-00-

A22-1 Simplified Block Diagram A22-2 Component Location and Grid Reference A22-3 Schematic Diagram – Assembly A22 Floore

Mode#3702B

1	Assembly	Service	Shinat A23 -	忭	Mixer and L	local.	Oscillator	

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6	A23-2	Component Location and Grid Reference	; '], :], 15-101 🖹
	A23.3	Schematic Diagram - Assuntity A23	
8 (C. 1997)			

Assembly Service Sheet A24 - IF Discriminator Parayraph A241 CIRCUIT DESCRIPTION ...

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0	Assembly	Service S	heet A25 - CIRCUIT	Sliding/6	HON	n Marko	r Genera	tor				Page 5-108 -
	1 the rate of the second		Sliding Ma				\mathbb{N}					5-103

- Sliding/Spectrum Marker Generator

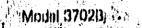
anoprophy JA251 CIRCUIT DESCRIPTION	,, , , , , , , , , , Popu 5 108 -
A28-2 Sliding Markers	yr n o p n b n e n p n n n 5 .100
A26-7' Spoctrum Marker	, , , , , , , , , , , , , , , , , , ,
inura A25-1. Simplified Block Diagram	

A25-2 Component Location and Grid. Reference A25-3 Schematic Diagram + Assembly A25 5-109 5-109 į,

Assembly Service Sheet A26 - Centre Mar Paragraph A26-1 Simplified Block Diag Generato ker

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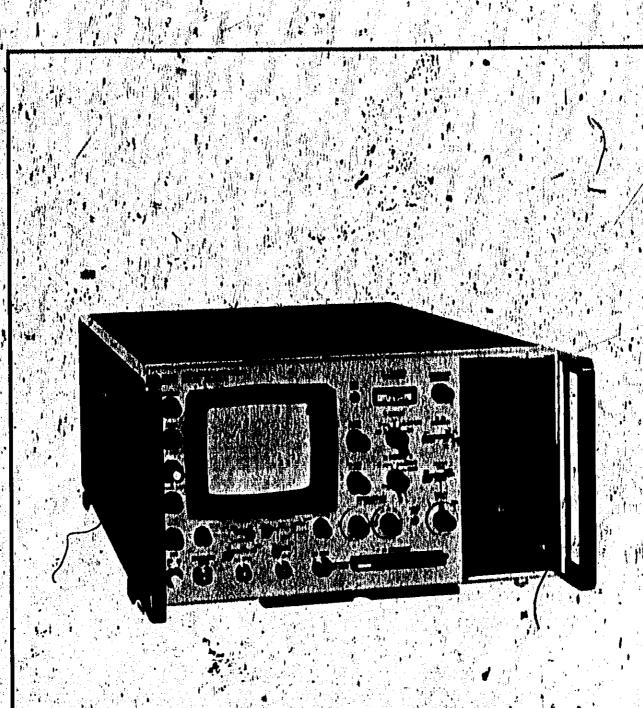


Figure 1-1 3702B IF/BB Receiver

SECTION I SERVICE SHEETS

Bostion

1 GENERAL

1-2 The hp Model C/023 IF/BB Receiver is the receive and display section of the Microwave Link Analyzer. The 3702B accepts BB and swept IF (45 to 95MHz) signals, and processes them to display, egainst a base of frequency, such characterlatics as IF flatness and BB linearity of a Badio Link, A complete system comprises an IF/BB Receiver, with a group delay detector plug in, and a Model 3710A IF/BB Transmitter plug in,

1-3 GROUP DELAY DETECTOR PLUG IN

1.4 The 37030 Group Detay Detector plug-lit, which measures youp detay at BB Arequencies of 03.3, 250 and 500kHz, is compatible with the 3710A or 37/0A BB Transmitters.

1-6 The 8705A Different LePhase Defector plug-in, which measures group delay at BB frequencies of B3,3, 250 and 500kHz and differential phase at BB frequencies of 2,4, 4,43, 5,6 and 8,2MHz, is compatible with the 3716A BB Transmitter.

I-G FEATURES

1-7 The minin features of the 3702B (F/BB Receiver are listed below:

 Dual display, which anables two simultaneous mansuraments to be presented, assists in the optimum adjustment of the test item (or interacting link parameters, b, Automatic Gain Control provides a constant X-axis display independent of Sweep Width changes,

a. AFC LOCK lanp indicates that the internal local oscillator is locked to, and tracking with, the incoming IF signal provided that this signal passes through 70MHz, and is not swept outside the frequency range of 45 to 95MHz.

d. Proquency calibration by sliding and/or combimarkers derived from the swept IF input signal.

(i) The sliding markers consist of one crystal controlled centre fragiency marker at 70MHz, and two pontinuously variable markers, symmetrical about the centre marker, with an offset variable from 0 to 20MHz.

 (ii) A crystal darived marker comb of 2MHz spacing from 48 to 08MHz.
 Wideband, flat response discriminator which enables demodulation up to 5,6MHz.

ر Split-trace emplitude collibration provides maximum sensitivity of 0.01dB/cm for IF inputs, and 0,1%/cm for IBB inputs,

g. High similarity roturn loss channel (0 to -84dBm) measures and displays intern loss from 45 to 05MHz, when used with the Model 15520A Hybrid and a suitable power source such as the 3710A IF/BB Transmitter,

h, SPECTRUM facility, with an accurate 70MHz crystal controlled marker for checking IF 70MHz centre frequency, FM deviation accuracy and movelator sensitivity.

6. Automatic Phase Control compensates for phase differences introduced between the horizontal and vertical axes due to the recovered sweep. Modal:37021

Blave operation permits a remote measurement to be displayed logally; This' Maasuraman gaquhas a Microwava Link Analyzar to be located at both the locat and remote stations as well as an additional return path, which does not invoduce further, distortion, The simple and to and through link measurement requires, that the penerator be remote from the display,

SWIZEP, BOUIRCE switch anables the sweep applied to the SCITT to be selected from the Internal IP, an external sweets spatice, or an external DB with with wither a

positive or negative display. In the EXT mode, the EXT, NPUT permits the use of the Y1 chennel as a do to 50kHz display, with the sweep signal from the 6WBEP BOURCE switch. When a, recovered sweep, signal is used, frequency markers are evaluable. Vertical calibration of this input can be 50mV, or a 10% of input, split wace, m, IF UNCAL temp indicates whether the IF INPUT is within the calibration

limits when measuring parameters derived from the IP signal, such as return loss and BB linearity,

1-8 OPTIONS

All options are listed below and are factory installed. 1.0

OPTION 002 substitutes Blamans typa 2.5mm connectors for the standard BNC front and rear panel connectors,

OPTION 003 substitutes Blambins type 1,0mm connectors for the standard Ð. BNG front and rear panel connectors.

OPTION DO4 Incorporates a 1240 balanced BB Input, and substitutes dommercial equivalent of WECO 47713 connectors for the standard BMC, front-panal connectom only.



Figure 1-2 Instrument Identification

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Table 1-1 / 37020 IF/08 Receiver SPBCIFICATIONS

		YI DISPLAY			Y2 DIBPLAY	
	Bwligh	Motor 4,	Calibration	Bwitch		Colligation
	AND P		lona j	, SPIECTIUM	ing site in the state of the New State of the triplet.	None (
:	1913 •		, 1, 0, 9 or 1,00B , 9 or 10%	DELAY,		0,1, 0,8 or 1,048 1703B of 8706A
•	RET LOBS.	ABT LOBB	lsos l'inturn (Loss '	BLAVE		Audpits remote 3
	EXT*		ttenuator ,' Om∨ or 10% of			display collipration
)put			

Not in BPECTRUM position of Y2 DISPLAY switch.

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24	ng ngangan karapan karita na sala	pergés é se de la serie de		
'	IP INPUT		Markar Combi	2MHz, crystal con-
2	Frequency Renges	70 #20MFIZ		trolled; permits points
	APC Captura Range:	70 ±1,13MHz,"		to be identified to
į	AFC Hold-In Hanges	70 #20MHz (10 to		±200ki1z.
		100Hz awaap)		
	Balaire Divising Datamas			
1	a Input Power Rininge:	+12dBm to -10;	DEMODULATOR	
		22dB IF LEVEL	Prequency Rangel	NOKHE 10 D.OM 44
1		attenuator company	Deviation Range:	6 to BOOkHz rmse
		sales for power levels '	im an constraint a constitues 2	
		proster then - 1008m,	P A A	
	Power			$(1 + N_{1}) = (0, 0, 0)$
~ ,	Measurement Accuracy:	10,06B	BPECTRUM	
	Input Impedance:	376A	Um IF INPUT, AFC Inc	parativa, 👘 👘
	Pidium Losis * 18 files	>30dB (66 to 05MHz)	Contro Proguonay:	70MI1z
F.		>20dB (45 to 05MHz)	Boon Width:	\$0,5 to \$3MHr.
•	Calibration Magnitudes	0.1, 0.3, 1;0dB	Crystal Markor:	70MHz ±5kHz
•		-110N	Nulling Sonsitivity	Quiects ±0,1dB change
	Flatense			in modulation index at
	1. (011)(100)	±0,05dB up to +6dBm;		a Bossal Zhro.
		40. Idll from +B to .	an a	a samani ketiter
4		+10dBm back to back		
7		System check, 40 to 20		کانی کار کار کی ک
		OSMIHZ	RETURN LOBS	
1			NOTE: Roturn Lossma	The trodinous tability of
			IF INPUT to lock AFC,	t 🔨 🕈 a sharan 👘
	FREQUENCY MARKER		Frequency Ranges	70 125MHz
- 1	التقاصين والاستعاد والاستعاد	المعتقب المتعاصية والمتعادية والمتعاد والمستعد المستعد المستعد المستعد المستعد والمستعد والمستعد والمستعد والم		

. 1. ,	Contra Markari 70MHz ± 100kHz,	Flatness	#1dB 70 #25MHz
	crystal controlled.	Input Impedance: 1 2	700
	Siluling Markeist 0 to 20MHz, offact.	(Return Loss) and the	>2000
	Offeet Dial Accuracy: #1MHz,		

1-3

BB INPUT 7512 Fiendency Range:

Input Nangal

Mensurement Accuracy: Input Impedance Return Loss

CALIBRATION

Calibration Magnitulias Accuracy

BORHY to 0.2MHz Sweep.10 to 100Hz BB Power 49 to 10dBm, Sweep Volu nge 600mV 10 10V pkopk, for a 100m, LBmm trace datleption. BB Power 10,00B 750 unbalanced. >20113

1, 3, 10)

BR CHARAOTERISTICS BB INPUT 1240 BALANOED (OPTION 004 ONLY)

Frequency Range:

Input Hallpas

BOKHZ TO D. 2MHz Sweep 10 to 100Hz

BB Power -40 to -10dBm Bwaen Yoltens BOOmV to 10V pk-pk, for a toain stomm trace deflection.

BB Power 10,00B 1240 balanced >20dB

Operates as a con-

10% ±1% relative to

input split mace voltage.

ventional oscillo-

Judini Bacaga

its to bokt iz

12V max

60mV ±6%

0.8mV/cm

10K1

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DISPLAY CHARACTERISTICS

CN Post accelerator, BkV eccelerating potential aluminized P2 phosphor; safety glass facepiale. B x 10 diy parallax free internal graticula.

HORIZONTAL DEFLECTION

BWEEP BOURCE

INTIP

LEXT:

EXT BB +0

EXT 88 -

Recovered from swept 1F INPUT:

From EXT SWEER INPUT. Recovered from BB INPUT If slunal disp

includes sweep, Same as EXT BB + but reversed sweep direction

EXT SWEEP INPUT

Amplitude: · Proglandy Randas Input Impedance:

AGC

-10V pk-pk maximum 10 to 100Hz sinusoldal **ISKO**

Displayed sweep width remains constant to within 5mm for 3 to BOMHz IF Swoop Width and 000mV to tomV to 10V pk pk applied to BB INPUT or EXT SWREP INPUT.

VERTICAL DEFLECTION

Maasulaman1.Accuracy:

Input Innodance:

Return Loss!

Y1 and Y2 controlled by respective DIBPLAY switches (see Display Function table)."

EXT INPUT (Y1)

Function

Progliancy Randal Maximum Input DC Offset Report Calibration:

Input Impedance: Sanaitivity:

Permisse me measurements made by A remote 3702B to be reproduced locally with virtual immunity from the link return path chartes. toristics.

BLAVE OUTPUT

Lovol: 0

Bondwidth Output Impedança:

SO 1 10mV/cm of Y1 or Y2 trade with frequency. markers added. 4Hz to 20kHz (3dB) 2k0

SECTION II PERFORMANCE CHECKS

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Southand

This section is not available for the preliminary manual, but will be included in the final manual.

SECTION III CALIBRATION

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This section is not evaluable for the preliminary manual, but will be included in the final manual,

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Section IN

. He PARE Mandal March 18 (1996)

SECTION IV REPLACEABLE PARTS

INTRODUCTION

This section contains information for ordering replacement parts. Table 4-1 1.2 lists parts in Wighanumerical order of their reference distinutors and gives, the following information for each parts at

Howlets Packard part humbers Ш,

Daschiphion (abbreviations given in list below). b,

D'yplical inamutacium of each part in a 5-digit code (rater to Code List of Manufacturars - Table 4-5).

Manufacturar's part number. d. |

Total quantities of each part used in the instrument (refer to TO column).

43 ORDERING INFORMATION

4-4" To order a replacement part, address the order or enquiry to your local Hewlett-Packard Service Office (see lists at rear of manual for addresses)

4-5 Specify the following information for each part

Model and full serial number of instrument

Hewlett-Packard part number.

Circuit reference designator:

Description, d,

d.

4-6 To order a partract listed in the tables, give a complete description of the part including its function and location in the instrument.

7 REFERENCE DESIGNATORS

С

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£77	. *	ι.	1			Т.,		Ч.	,	i.

= copocitor abolb 🗧 CR:

🖛 lamp . DS

= hiso.

= jack

= relay 🖓

Inductor

🛎 møler

MP = mechanical part

🖹 fransistor :

* rosistor:

- switch'

Intralormári

vacuum!luba · power cable W

XA - PC commotor

* luse holder XF

* CIVEIDE

re packaging material

Model 37028

B DEBORIPTION ADDREVIATIONS

COAX >		
	aonnootor, fariul fixed	
	(permentum henry?) hertz (oyotes/second)	
K 👘	kilo (10 ³) kilohuriz (Kilooyalas/	
LIN	second) • Himers • Hoger Humle	
M `*	· milii (10*) • meda (10*)	

9 COLOUR ABBREVIATIONS

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PC P	# print # plao	êd al) (10 ⁻¹¹	dult 1		
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Table 4=1' Hendecelde Parte

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n. Statistics FAN FURTHERS FAN FURTHERS FAN FURTHERS G1 OFFD-ODYN C. FAN FURTHERS FAN FURTHERS FAN FURTHERS G2 OFFD-ODYN C. FAN FURTHERS FAN FURTHERS FAN FURTHERS G3 OFFD-ODYN FAN FURTHERS FAN FURTHERS FAN FURTHERS G4 OFFD-ODYN FAN FURTHERS FAN FURTHERS FAN FURTHERS G5 OFFD-ODYN FAN FURTHERS FAN FURTHERS FAN FURTHERS G4 OFFD-ODYN FAN FURTHERS FAN FURTHERS FAN FURTHERS G5 OFFD-ODYN FAN FURTHERS FAN FURTHERS FAN FURTHERS G6 OFFD-ODYN FAN FURTHERS FAN FURTHERS FAN FURTHERS G5 OFFD-ODYN FAN FURTHERS FAN FURTHERS FAN FURTHERS G6 OFFD-ODAT FAN FURTHERS FAN FURTHERS FAN FURTHERS G5 OFFD-ODAT FAN FURTHERS FAN FURTHERS FAN FURTHERS G6 OFFD-ODAT FAN				ACCESSINY CHL HILLEND ACCESSINY CHL HICENDO	HINI	
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ALA BIEB-BARB GIEAD DARB <	819	0140-0445 0140-0445 0140-0445 0140-0445 0140-0445		a 1 - February E. Marsha 19 - Anna an anna an Arbara a	TANDA KI Tana Ki Tana Ki Tana Ki Tana Ki	600/16 =107 600/16 =107 600/16 =107 600/16 =107 600/26 =107
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B1 . POWER MUNIT				ITAMP TURNILATON LAMPINULOHN LAMP LAMP ONERY NAMP SHUD, LOV YTHA PROVER NDINLE		

Abbreviations are listed in the introduction to this section

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8 Q -			· ·		_	2.3		 										97 F	21

Ref De	NU POT NO TO	.Decoription	Mir Mir. Part No
	00702-00001 7124=1401	POWER NODULE LAHEL 119-230 V	10001 10007
A1	**************************************	FINE FLOW, ALON, LAT. STRY	
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94	1250-0408 1250-0408 1251-0007/11	GINH GOAR WID NYO DHO TO OHN Ginn Multi Bhd NYO 16-May	EDDLI OH BYBRY DRAW, RA×ARUD+LAN
	04¥0×08¥8	ALY EWANDHOVEN 2H	HUDEL HIDENII-SE-NEE BRANC
	1120-0610 /1	ATH OPIMA OD Moter Bejel Mint Okey,	AUJAL D-INA BOUD
nn -	DB TOP=144 9040=0404 7140=1484	PANEL PRIME LIGHT SHIELD ALAGN	
NPA	offor-out	ALATE TRADEMARK HADNI PANEL ENTRUBION IPPER PRONT PANEL ENTRUBION LOWER	HODOY HODOY
		PRAME ABBY SIDE Side Coven Namile Abby Side Namile Abby Side , Autaines Namole Abby .	
	NOBORNIAN Noporodya	PLATE FINTED AN	2 6000Y 2 84400 14 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
		STAND OFF	
n Pa	ALE-SOLED	STAND OPP PRAME AREY SIDE SIDE COVER	
		ANTAJAHA NAHDLA ANY	(DODY
I NPA		PLATE ALUTED AL Joh Goven Abbeneuv	
	DDTOPPIYE BORDPOTAT	FUDI ABBY	KODDT.
	PDAD+DTAT PDAD-DTAT PDAD-DTAT		ADDDY HODDY HUUDY HIRAC URD
NPA	1440+0000 00707+174	A BIANU IILI PANEL REAN UPPEN ONT COVEN PLATE	House House All All All All All All All All All Al
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Telde 4-1 Nepleceable Parts (continued)

Rof Deal	Part No TC	Description S	Mir	Mir Part No
	1100-0408 1170-0607	CUVAN BOOMPI Plate Abrian	in Podd	9040-9089
MPY	DAYOR=178 Dator=104	PANEL REAR LOWER	E0007 40002	
u , i Li gi e e	03102=148 '0340=0048 0380=0048	A REALDER TAPEED	40007 40007 9044 9044 90449	
NPLO	ONTOP-TRAS	T POWER NORULE SUPPORT	10007 10007 10007	
		CHEN MAIN PRACMET ENTON HACKET POPENTIONETER FAN OUDT	LEDADT HOUNT HOUNT	
	00700×170	A BRACKET BASTING SURPORT CONTRACTOR	EODUT.	
		ARADER ARADINATION ASSAULT)))))))))))))))])))))))))))))))
		L SCAUEN BILLS A STREET	HOODY HOUDY	
		BLUCK GUIVE Dimitikot ont Bracket Bupport (Pratten WRACKET BUPPORT (Pratten	HOADT HODDT HODOT HODOT	
		1	EDDDY HODDY	
		NICCH OUIUU Anachet Stand-Off Coven Ibgavening Input Amplifien		
		TANK SCHERNING, BROSWARD SPLITTER	ADUDY	
npic (CIVER SCREENING COMA GENERATIM Industage Plogram Analaht Supplint Nall Screen		
	ODTOD-DDD	N BAN, SPACIND,	tand.	
		NAN BRADING	10007 40007 40007 40007	
MAJR		SWITCH SUAPPANEL LEFT IN A STAR) HOUDY RODDY	
HP14		AT. STAL BRUEL BRITCH BURPANEL BIGHT		
NPID		NUM BEARANING	FADDT BODDT	
		I LO SCRUMNING CANTING WRACART HIMUR ANDAT Nachet Himur Andat Sca Captive		
	01702-119	SON CAPTIVE	HUDT	
		A PARAN AUSUN	10001 10001 10001 10001	PPUDPAAD
npin	1880-0097 01800-66001	A Y. CAT BHINLD COLUMNACE ALIGN	in the second se	
	SIND-TATAL.	L SCALIGLANN, ABAA	Appor	

oonun

Ref Denig Port No TO	D.C.I.M.	Mir	Mr Part No
00140+01818 58 4 00140+01818 58 4 0440-0114 184*9 155*9 155*	HRADHET PRADUET PRAN STALP CINTACT CHT CUNTACT CHT SCHEH PLATE SCHEN PO SUPPORT HHONT	H0 0 07 F0107 F0107 F0107 F0107 F0107 F0107 F0007 F0007 F0007	
007707-196 0408-0187 220-2187 0408-0187 0408-0188 0408-0188 1 0408-0188 0408-0188	AGREEN PO SUPPORT ABAA" SUIDE PC ADAND-BAN GUIDE PC ADAND-BAN GUIDE PC ADAND-BAN GUIDE PC ADAND-HAN GUIDE PC ADAND-HAN GUIDE PC ADAND-RED GUIDE PC ADAND-RED GUIDE PC ADAND-RED GUIDE PC ADAND-RED	10007 12498 14498 14498 14498	
8485-9354 (490-0138 / A 0401-0138 / A 0401-0138 / A 9405-0138 / A	BUIDE FU BUAND-DAN DUIDE FO ADAND-DAN BUIDE FO ADAND-DAN BUIDE FO ADAND-DAN DUIDE FO ADAND-DAN DUIDE FO ADAND-DAN GUIDE FD ADAND-VEL		
0400+0136 0401-0186 0401-0186 0401-0187 0402-0187 0403-0187	QUIDE PO BOARD-YEL QUIDE PO BOARD-YEL QUIDE PO BOARD-YEL QUIDE PO BOARD-YEL QUIDE PO BOARD-ORY QUIDE PO BOARD-ORY QUIDE PO BOARD-GRM	* 12288 12288 12288 14498	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
01 100-018 100-018 040-018 100-004 1200-0000000000000000000000000000000000	KSTA SI NIM Nimmt ni babb kata Neulatia lata Nimit nu baba kata Nimit nu baba kata Nimulatia kata	DATAR AN Frankler Vitar (* Vitar (*	P014 P114 P117-10-013
00 100-0041 100-0041 100-0042 1400-0042 1400-0042 1400-0048	NIXIMTING BATU XATA INSVLATOR ISTA STALSTA MOUNTING HASH KATA INSULATOR HASH N VAR GOUN DIM TOT L/PM LIM	CAPES IS ANTES P. NO. 1000	555-10-033 8814 133-4
RI (00-0000) (010-000 8040-0410 8000-0410 8000-0410 8000-0410 8000-0410 8000-0410 8000-0410 1400-0008 1400-0008 1	NAOB COVER INSULATING POTENTIONATER NAOB COVER INSULATING POTENTIONATER	NEUS PRAND EUS PRAND FRAND	р с
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Net Deelg	MIT NO TO	Description	Mir	Mic Pait No
AT.	ANDO-0014 9778-1001 8778-1001 8798-0033 9798-0033	HUT JIEN BARNER Anue Anue Var Bok Dim Ion I/PM Hut Hen Ban-Br Knoh		
	100-110; R 010-100; R 100-100; R 100-110; R 100-110; R	A VAR TOK LOB JOK LIN YIDAIN/PUSITION KHOB CONCEN ONTER KHOB CONCEN INTER YI VAR DUK LOB TOK'LIN YROAIN/PUSITION KHOB CONCEN DUTER		
	0370-1414 9100-1439 0540-0043 1490-0043 1490-0043	NNDB GDHCEN IMHER H VAN IN DIM IOU HUT IEH HUT IEH H VAN TSH DIMETEN H VAN TSH DIMETEN H VAN TSH DIMETEN H VAN TSH DIMETEN	60007 60007 60007 60007 60007 80097	
		KHOB DIAL) Rivar Ion. Dim POB IYAM LIN N var ion. Dim POB IYAM LIN N var ion dob Iyam Lin Abyignatism N var iok Dim Iob Pu N fro Itsh Dim Iob Pu N fro Itsh Dim Ib Iyam	K0007 H0007 H0007 H0007 H0007 H0007 H0007 H0007	MPAGY=D;
	101+1348 1, 100-0441, 4 0100-0441, 4 100-0440, 4 100-0440, 1 100-0440, 1 100-040, 1	EM LINR APAT EM LVA EPUT I ANON LEVER EM JADE GREV EN LVA APET I NOR LEVER EM JADE GREV I NOR LEVER EM JADE GREV	NYDDA TANNA LAAVD HORDT LAAVD	03-672HD 184 1970-0929 1970-0929
	A BIOD-0679 BY0-0419 BIOD-0419 BIOD-0419 BIOD-0419 BIOD-0418 BIOD-0418	SW LVA APAT NHOB LAVER SW LAME DAGY SW LVE SPOT SW LVE SPOT SW LVE SPOT SW LVE SPOT SW AVAY PAINT SPAT SW AVAY PAINT SPAT		OBTD-DVA9 UBTO-DVA9
	0370-1107 81781-3181 100-0473 0370-1014	NWOD Blaff Hatendra Siaff Coupler Swathy Coupler Swathy Print Apdt Wood , Print Apdt Ye Display Ye Display	H0007 H0007 H0074 H0074	Data-Inta
50 50 510	BIOD-0480 I 0170-0480 BIOD-0488 BIOD-0484 I 0170-0484	BN LUM AGTUATHD NTAY APAT. YIYE GALIB "Nind" Lavin BN Jada Grby SM Lum Brids Shi Jada Grby BN Lum Byer BN Jade Grby BN Lever BN Jade Grby BANT UPP Marken Diffent	TADDA 14440 14440 14440	0370-0444 0370-0444
	9101-0987 1 9101-0070 9101-0100	SW TOL OPUT EN BLIOR OPDY SW BLIOR OPDY SW PUSINUTTON SPUT	U9393 19721 Kodur Najby	YRD] G=126 1108-1044
	4100-0031 9033-7387 9180-1381		20002	
MIOS MIOD NIOD	BIRD-IBAN BIRD-IBAN BIRD-IBAN BOIAD-IBAN BOIAD-IBAN BOIAD-IBAN BOIAD-IBAN	CATERY COL AC PUN ISTANDARTI ATERY COL AC PUN ISTANDARTI ATERY COL AC PUN IDE CANDONAVIA ATERY COL AC PUN INCANDENAVIA ATERY COL AC PUN INCANDENAVIA CATERY COAN COL NON COMMISSION COL NON COMMISSION COL NON COMMISSION COL NON COMMISSION COL NON COMMISSION COL NON COMMISSION COL NON	ROUDT ROUDT ROUDT ROUDT	为2.清洁的P2.4.8.6.1.6.1.9.9.0.2.9.
NIDE	01708-1343 1880-0610 05701-7887	ANY CAA CHI ARD PUT TP HIM		08 97939 C-119

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	Not Doolg	Part No TO	Description	Mir. Mir Pait No
	WIDD	1110×0911 37	CONN COAN CHE MIC COMMAN ARBY COAN CHE MICH	FUNDA PT-LEV-NNNN
	W DA		COMU COAX GAL ATA COMULX	VADV 61=17A=0000, 100000 100000 1000000
	NION		COMI GUAN CHI, ALO COMIRA Abby Chan Chi Gri Comi Chay Chi, Han Comira	HOUDT
	* W1D6	01707-17844 /** 1 1990-0991	EDAN CHAN CHI ATA BUMILA Adam chan chi ata gunnexa	20001 NI-180-0000 / //////////////////////////////
	WIO		CONH CHAN CHI, MTA DOWNHA Abey Chan Chi Viu Conn Chan Chi Viu	, , , , , , , , , , , , , , , , , , ,
.)). []: []:	wide.		ANNY GUAN GEL, ONY Ednin cuan gel, nta odinien	(000) 51-170- 0000 (6000)
	WIOY XIIP	1700-0-91 0-109-7866 0-109-7866	ANBY COAN GHI, WILL GUNN COAN GUL, NYO, CUMURA ANBY COAN GRI, HANJALX ANBY COAN GRI, HANJALX GUNN CUAN GRI, NYO COMURA	
	NILE I	daton=7890 " 1 .	ASEY COAN GEL MANJONY	ANAVA AJ-JANPUUUU (Adudy Alaina alaina alaina
	W) 19.		AVAN EBAN EBI, MAD GUDUHA Gumu guan ebi, Mad guduha Abay guan ebi, Mad gulu	(1000) (1000) (1000)
	MIPL I	1750/0781 703708-1717	CONH CDAN COL NTO CONINA	****** *******************************
			ANNY CHAR CHI AND/DEU CUMM CHAR CHI HYO COMINES	+0007 • • • • • • • • • • • • • • • • • • •
	NIPA	03708-7819 03708-7843 03708-7843	ABBY COAN CHU AND/DAY	HUDDY HIGHT HUDDY HUDDY
		01708-7886	ABBY EHAR BAL URAZVUL Abby Coan Cal Onnzoan	1888) 1990 - 1997
	N11		ANAY EBAR BHL BAN/ULA Away Ebax BHL MAN/BAYIMA	HBBDT DI-LEA-DUDU
	NINH VIAD NIAT		ABBY, EDAN CHU VAL/HUN	10007
	N 49 N 49		AND EBAT SHI YILANU	
		ORTOR-7034 ORTOR-7036 ORTOR-7046 ORTOR-7046	计局部的第三人称单数形式 化乙基苯基乙基苯基苯基乙基 化乙烯酸化乙烯酸乙烯酸乙烯酸乙烯酸乙烯	
			自我我们们的我们我我们我们我没有我说你们的我们们们我们的我们的。""你们我们们的吗?"	HOUDY HI-IZA-DUOD
	W197 W196		CIWN, GDAN, GAL, MIO/CONHRA (2017)	E0007 NBD07 ND07 ND07 ND07 ND07 ND07 ND07 ND07 N
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Not Dasie Part No. TO	Description	Mir Pait No
N X8 98185-144 1 98185-144 1 98185-144 1	CONVICTORY CHAR CHE HID CONVERT ARRY CHAR CHE CANCELY ARRY CHAR CHE HID CANCELY ARRY CHAR CHE HID CANCELY ARRY CHAR CHE HID CANCELY	
WINT 1 OF OF THE 1	ANDY COAN GIL HLU/YID ANDY COAN GHL HLU/OHY ANDY COAN GHL HUI/OHY ANDY COAN GHL HUI/OHY ANDY COAN GHL HUI/OHY ANDA HANNESS CHI	
	BOCKHY, CHI TUAH Ganla Hannibb (Duah Ruffly Shenah Conn Suah, Chu Ath Lobiex	Y HODOT ARY HODOT HODOT HODOT HODOT HODOT HARY AL-T2H-UUUD
	CIMM CUAX CHL NTO CUMMEA, ABBY CUAX CAL ADD/ADD CUMM CUAX CAL MIC CUMMEA COMM CUAX CAL MIC CUMMEA COMM CUAR CHL MIC CUMMEA ABBY CUAR CHL MIC CUMMEA ABBY CUAR CHL MIC/URH	44794 81=178-0000 44799 81=178-0000 44799 81=178-0000 40007 40007 40007 40007 40007
WV74 (DF07-TAR I BF07-TAR I BF07-BFRI BF07-BFRI NP26 (DF7D2-TAP) 1	GINN COAN CHL MID COMMAN ABAY COAN CHL MID COMMAN GUNN COAN CHL MID COMMAN ABAY COAN CHL MID COMMAN	
ISEB:8881 1470 1581:58158 - 1	- FRAN ERAN FRE ATO EDMINA EDMN MUETE HVB ATO BELAV	YHAY BI-IA-OUDD Yhay BI-IAN-OUDD Yi an Rod-De-Do-Miu Yi an Rod-De-Do-Miu
RAIA 721 2802-1221	CONNAULT BID ATO SEVAY CONNAULT BID ATO SEVAY CANTON CUMULATIO SANTCOMEDIATED AOTION	. 40/07 18807
9828-1846 9220-1849 9228-0328 9228-0328 1	PAD COMBUDATED PADAT PAD COMBUDATED INDULLE CULL BAG POLYTOENE ABBY LOW VOLTAGE POWER SUPPLY	H0007 H0007 H0007 H0007
	PC BD BLANK INTRACION PC BD BHN INTRACION PC BD HAN C FKD IDUF IND-ION INDWVDG- C FKD IDUF IND-ION INDWVDG- C FKD IDIATUF IND-ION ADWVDG-	KODOT 12245 BDAU-BELS BBAU-BELS BBAU BOU EURT SOUDDODM BORNY BOLLURB-UHL
AIGA DIAD-DIA AIGA DIAD-DIA AIGA DIAD-DIA	E FAD, AVATUP SHOPPON PERVEC FAD FUP IN ELVIC FAD FUP IN ELVIC FAD FUP IN BUVIC C FAD STUP IN BUVIC C FAD ATOPP STORED BUDWOUS	ВАЛИЧ ВОЦ КОЛГ КОООДОВИ ЧОСЛУ ВОТАЦАТАТИ ТРОИТ ИВТИТОСТВОО АТАЛ БОТИЧ АВОДАТОВИО АТАЛ БОТИЧ ВОТАТОВИО ВОТОВ ЧОСЛУ ВОТАЦАТОВИИ ЧОСЛУ ВОТАЦАТОВИИ ПОСЛУ ВОТАТОВИИ ПОСЛУ ВОТАТОВИИ ПОСЛУ ВОТАТОВИИ ПОСЛУ ВОТАТОВИИ ПОСЛУ ВОТАТОВИИ ПОСЛУ ВОТОВИИ ПОСЛУ ВОТОВИИ ПОСЛУ ВОТАТОВИИ ПОСЛУ ВОТОВИИ ПОСЛУ ВОТОВИИ ПОСЛУ ВОТОВИИ ПОСЛУ ВОТОВИИ ПОСЛУ ВОТОВИИ ПОСЛИ ВОТОВИИ ПОСЛУ ВОТОВИИ ПОСЛУ ВОТОВИИ ПОСЛИ ВОТОВИИ ПОСЛУ ВОТОВИИ ПОСЛИ ВОТОВИ ПОСЛИ ВОТОВИИ ПОСЛИ ВОТОВИИ ПОСЛИ ВОТОВИИ ПОСЛИ ВОТОВИИ ПОСЛИ ВОТОВИИ ПОСЛИ ВОТОВИИ ПОСЛИ ВОТОВИИ ПОСЛИ ВОТОВИИ ПОСЛИ ВОТОВИ ПОСЛИ ВОТОВИИ ПОСЛИ ВОТОВИИ ПОСЛИ ВОТОВИИ ПОСЛИ ВОТОВИ ПОСЛИ ВОТОВИ ПО ПОСЛИ ВОТОВИ ПО ПОСЛИ ВОТОВИ ПО ПОСЛИ ВОТОВИ ПО ПО ВОТОВИ ПО ПО ПО ПО ВОТОВИ ПО ПО ПО ВОТОВИ ПО ПО ПО ВОТОВИ ПО ПО ВОТОВИ ПО ПО ПО ВОТОВИ ПО ПО ПО ПО ВОТОВИ ПО ПО ПО ВОТОВИ ПО ПО ПО
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able 4-1 Replaceable Parts (continued)

Nol Deelg	Partitie	Chevription	Mit Mr Port No
AICAI AICAA AICAA AICAA AICAA		A ANDRE AND	UATIE 68-11833-480 07410 (11-90-686
	+HA=0077 	1 DID SCA BIS BADA TYPRY BY 2008V 1 DID BADA DO. IV VR. IM DID BADA DO. IV VR. IM DID BADA DO. IV VR. IM	OBHTY OTVIU GU-BBWARA DATIS BE-LIRIB-ATH OTVIO GU BBATA
Alui, Alui, Alui, Alui,	1484-0019 109-001 109-001 149-001 149-001 149-001 149-001 1494-0019	DID SCH I HAA BLAKTPATCH XBTH SA BLAKTPATCH XBTH I HAA BLAKTPATCH XBTH I HAA BLAKTPATCH XBTH	SATAR CARPEDAR-OPPA
AIRE AIRE	1707-0011 1822-8812 8781-8812	INAT DISSIPATOR ABTA ISTA BI AGA DIAL A FAB FLM FOR BIN IN 1/20 A FAB FLM FOR BIN IN 1/20 A FAB FMC#R-000 PWM 1/10/24	VILLAN THAP-DAL-DADA PIETE EPSILES ULEEBE CHAT-D
	8757-5844 0470-0044 8757-5448	RD I A PAD ALIAN DIM LU LANA.	14787 NFTC11-0 1970 AFACT-0 13781 NF4CT-0 13786 NF4CT-0 14787 CF41=0 14787 NF4C
	0797-0037 0498-0037 9787-0439 9100-9638 0498-9188 0797-01880	IS A FAD 2.41 UNA TU IZUM A FAD 444 UNA IN IZUM I CAN TABA UNA IN IZUM I CAN TABA UNA IN IZUM I CAN TABA UNA IZUM I CAN TABA UNA IZUM	TSUAR CHAT-O 19701 MPACI-U 1080. SP-PA-1 19701, MPACI-D 19701, MPACI-D 19704, CRAI-O
Ainia Aini7 Aini7 Aini0 Ainto Ainto	0494-3844 0787-0848 0498-0084 0787-0481 0787-0444 0787-0484	A PAD PLM PALNA DIN IN IAM A PAD IN PA DIM IN IAM A PAD IN PA DIM IN IAM A PAD IN IAM IN IAM A PAD IN IA CHIM IN IAM A PAD ALANY DIM IN IAM	01100 19701 MF7611-0 19701 HF401-0 19701 HF401-0 19701 HF401-0
	0444-3143 A100-8438 0787-0440 0757-0280 0757-0280 0748-0001 0757-0280	A PAD B. BPN DIAN IN LYAN A YAN AN IDN LYAN IN LYAN A PAD P. NA DIAN IN LYAN A PAD IN DIAN IN LYAN A PAD IN DIAN IN LYAN	INTUS MPACINU INTUS MPACINU INTUT ATALI-O INTUT ATALI-O INTUS TOU INTUS TOU INTUS TOU INTUS TOU
	01707-7145 01707-3145 4040-0750 4040-0750	ABBY INTRIZONTAL DEFLUCTION FORD RIAMA ENTRACTURIES AD RED EXTRACTOR FORD RED	
	0140-074 0140-0174 0160-0174	B FAD 5:4 UP IND BUT FRUTIE	inin, bei infernt

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able 4-1 Replaceable Parts (continued

Ref Deele	Part No TO	Depertmen	Mir Port No
ARGU ARGO	0160-0740 D 0160-0649 D	C PAD C. PUP, IN LOUWYDD	ROTOD PHAD, PR.100 ROTOD PHAD, 193100
		G AXO DOPA DU DUWADO G AXO LOPA DU DODWADO G AXO LOPA DU DODWADO G AXO DEDATA DU DOWADO G AXO DEDATA DU DOWADO, G AXO LOPA DU DODWADO,	TATA ADALACLOOJAC
	0140-0137 0150-0141 0160-174 0160-174 0160-0644 0160-0644	C FXD LODUF. JON JANVOD C FAD D. LUF IND-ED JOWVDC C FXD LOVF ION JOWVDC C FXD LOVF ION JOWVDC C FXD LOVF ION JOWVDC	SAPRY SAPRY SCROPIS-CM, SAPRY ISODISAXUOPORA-DVS SAPRY ISODIOPHODORA-DVA
		C FRO BAPP AN DOWVOC C FRO B. APP UN DOWVOC PRO BAPP UN DOWVOC C FRO BAPP UN DOWVOC C FRO BAPP UN DOWVOC	TRANK ALBI-DEB HORAG HORAG HORAG HORAG HORAG HORAG HORAG HORAG HORAG HORAG
		C FXD C.ORUF 100-200 INDWDD C FXD C.ORUF 100-200 IDDWVDC C FXD PAUN IDN ISHVIC C FXD POUDFF 100-200 IDDWVDC C FXD POUPF 100-200 IDDWVDC C FXD POUFF 90 POUFUC	VIAIN IA Sepau Iuodpaenudisea-dvs. VIAIN Aumadraijac VIII A Aumadraijac
	8168-8194 8188-8894	G FAR SOUP IN SUVER	TAPAS BEUDANAADDOAHA-DYS BARAS BARAS BEDDAOANDDOAHA-DYS BARAS BEDDATAKSDIBATA-DYS TAVAR HIJI-ORB
	0140-0140 0140-0040 0140-0187 0140-0187	C PAD LOOUP ADA ROWING	FRAN Solar TA Solar Bolinys-Cmi.
	0140-0174 0140-0174 0140-0174 0140-0174 0140-0174	C PAD 0.470P (AD-200 250006 C PAD 220P 100 10000 C PAD 220P 100 10000 C PAD 2500 400-00 25000 C PAD 3500 100 100 200 C PAD 0.470P +00-200 25000	SAPAY BOLLAYS-CHU BAPAY BOLLAYS-CHU BAPAY BOLLAYS-CHU BAPAY BOLLAYS-CHU BAPAY BOLLAYS-CHU BAPAY BOLLAYS-CHU
	CIRC-DIAL		NARAY ISODDODXODODNA-DYS SARAY ISODISDXVD7DAR-DYS VIAIN TA IROAD SODODD OTNIO CODNAD
ALCAY	1001-0040 1003-3369 1	》••••••••••••••••••••••••••••••••••••	OTVIO COBDAD Indas Kosobo Indas Kosobo Utalo Cobbyna Otvio Cobbyna Otvio Cobbyna Otvio Cobbyna
		VOLTAGE CONTROL MESISION VOLTAGE CONTROL MESISION VOLTAGE CONTROL MESISION VOLTAGE CONTROL MESISION VOLTAGE CONTROL MESISION	
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Table 4=	1 Heplaceel	le Pari	(00) (ntinued)) '
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Ref Deelg	HP Part No	TQ	1 2 2	Description	Mitr	Mir Part No
APHG3 APHGA APHGY	1828=0477 1820=0008 1820=0477	1) 1		AMP		\$H]#73]
Арноо Арнот Арнон Арноч Арноч	1470=0058 1470=0050 1470=0054 1470=0054 1470=0054 1470=07717		"" 10 04 10 09 10 99	ANP ANP AD PHIAD HAND GATE AND	13716 HODDI 13718 07863	6/14/94/2 61/21/4/24 61/21/4/24
APH611	THEO-DOAN		i i 0 0₽			\$1,81,434,
АРОР Ариј Ариј Ариј Ариј			19698. 1819	BI NIN BI NIN I BI NIN I BI NIN I HIT NIGHANNAL	1999 1999 - 1997 - 1997 1999 - 1997 - 1997 1999 - 1997 - 1997 1998 - 1997 - 1997	5%A118A 5%A118A 5%A118A 5%A118A 5%A118A 71101
APOT. APOU APOU APOID APOID	1094=0071 1094=0071 1094=0019 1094=0019 1094=0071	•	NSTR XSTR XSTR	61 ANDA CARACTERISTICS	5 2 01 295 07263 03908	3NA] 184 5HALL84 #H3D40 5KALL84
AP012 AP013 AP014 AP014 AP014	1 ANA=0838 1 ANA=0071 1 ANA=0071 1 ANA=0071 1 ANA=0071 1 ANA=0071			ALL ADNA AN A	01806 01809	5HA11PA 5KA12PA 5HA12PA 5HA12PA 5HA12PA
AFUR T ARUTH APO19 AROAD AROAD	1884-0071 1884-0071 1884-0073 1884-0938 1884-0938 1884-0938		:: 281A- 281A	51 NPN 61 NPN 51 NPN 51 NPN 51 NPN	01899 03500 03500	GRALLPA SHALLPA GRALLPA
APOPT	1884-0071		KBIR	ST NPN - S S S	01790 1	SNALSAN AND A STATE
ARNI APHR ARNI ARNI ARNI ARNI	0757-0449 0757-0415 0757-0415 0757-0463 0757-0465 0757-0470) 	日月月 月 - 2 日月日 月 - 2 日月日 月 - 2 日月日 月 - 2	201 010 18 1764 478 010 18 1764 06118 010 18 3764 1008 010 18 3764 1008 010 18 3764 1008 010 18 3764	14701 • 19701 19703 19703 19701 19701 19701	NFACJ-D NFAC T=D NFAC T=D NFACJ-D NFACJ-D
ABNA APNT APNA APNA APNA ARNIO	0648-0088 0648-0088 0648-0088 0648-0088 0648-0088 0648-2683	2 3 44 	i n kan	P.618 (HH 11 1/AM R.618 (HH 11 1/AM P.618 (HH 11 1/AM R.618 (HH 18 1/AM 1338 (HH 18 1/AM	1970) 1970) 1970)	MP401-0 MP461-0 MP461-0 MP461-0 NP461-0 NP461-0 NP461-0
ARRES	0757-0145 0757-0448 0757-0448 0757-0469 0757-0416 0757-0458		日代年(月)天 100 日代日 日代年(月)	7808 018 38 3748 108 018 38 3748 3808 018 38 3788 5808 018 18 3788 5811 018 18 3788 511 018 18 3788	e i 1970)	NPAC NPACT-0 NPACT-0 NPACT-0 NPACT-0
ARR LD ARR LD ARR 17 ARR 18 ARR 19	0787-0448 0787-0468 0698-3160 0698-3160 0698-3480		, R. P.H. R. Y.H. R. Y.H. R. P.H. R. P.H.	10K DIN 18 1710 100K DIN 18 1780 110K DIN 18 1780 11, 5N DIN 18 1780 14, 78 DIN 18 1780 1488 DIN 18 1780	· · · · · · · · · · · · · · · · · · ·	HF4C HF4CT+0 HF4CT+0 HF4CT+0 NF4CT+0 NF4CT+0
ARNED ARNED ARNED ARNED ARNED ARNED	0757-0470 0757-0467 0757-0467 0590-3480 0757-0440	1 1	A PAD A PAD A PAD	1218 010 18 1704 1388 010 18 1704 1487 010 18 1704 1487 010 18 1704 1487 010 18 1704 150 010 18 1704	19701	нраст-0 мрас Мрас Т-0 мрас Т-0 мрас Т-0

Abbreviations are listed in the introduction to this section

Table 4-1 Replaceable Parts (continued)

	Rof Deelg	HP Part No	τα :	Description	Mfr	Mir Part No
	ARRA ARRA ARRA ARRA ARRA ARRA ARRA	1.0757-0446 0757-0340 0757-0340 0757-0149 0757-0270 0757-0274	- <u>h</u>	PRO LR. (K. 0048) LK L/044 FXD FD OHM JK L/044 FXD FD OHM JK L/044 FXD FD OHM JK L/044 FXD J. FNK DHM JK L/044 JXD L. FJK DHM JK L/044	19701 NFA 19701-NFA 19701 NFA 19701 NFA 75042 GE 19701 NFA	с с1+0 1+0 X
	ARHDI ARHDI ARHDI ARHDI ARHDI ARHDI	0787-0199 0787-0278 0787-0278 0787-0210 0787-0210 0787-0200	동일(14년) - 동일(14년)	PRD R4, 5K, OHN 1K, LYNH PRD X2, 7NK OHN 1K, LYNH PRD R0K OHN 1K, LYNH PRD RK OHN 1K, LYNH PRD 1K, OHN 1K, LYNH PRD 8, 48K, OHN 1K, LYNH	19701 NF4 19701 NF4 19701 NF4 19701 NF4 19701 NF4 19701 NF4)+0 61+0
1	ARN38 ARN37 ARN38 ARN38 ARN38 ARN38 ARN30	0698-0088 200-2516 0787-0468 0787-0468 0787-0468 0787-0488		PRO, R. ALK, DHN LX LZUW WAR LOOK MHA LX LZUW PRD LOOK DHN LX FZUW PRD LOOK DHN LX FZUW PRD DOK DHN LX FZUW PRD 31. IK OHN LX LZUW	1970 NPA 21030 19701 NPA 19701 NPA 19701 NPA 19701 NPA	61+0 · · · · · · · · · · · · · · · · · · ·
 '	AR1143 AR114 AR1143 AR1144 AR1145	0757-0458 0757-0467 0757-0467 0757-0416 0757-0416 0757-0438	18	PAD 63-38 DIN 18 1708 FRD 1218 DIN 18 1709 FRD 5-118 DIN 18 1709 FRD 5-118 DIN 18 1709 FRD 511 DIN 18 1709 FRD 5-118 DIN 18 1709	19701 NF4 19701 NF4 19701 NF4 19701 NF4 19701 NF4 19701 NF4	C1+0 CT+0 CT+0
	- R RAAA ARIAA ARIAA ARIAA ARIAA ARIAA	0757-0442 0757-0729 0757-0442 0757-0442 0757-0416 0757-0442		FRD LOK DHH IN LANG FRD 681 05H IN 1444 FRD 681 05H IN 14 1744 FRD 811 05H IN 18 1784 FRD 811 05H IN 18 1784 FRD 108 05H 18 1784	LUTOL NF4 01295 19701 NF4 19701 NF4 19701 NF4	C
	ARRBI ARRBR ARRBR ARRBR ARRBR ARRBR	*06911-3457 0757-0451 0757-0441 0757-0441 0757-0427 0757-0431	5 19 1 R 14	FXD 3168 0HH 14, 1784, FXD 81.18 0HA 18, 1784, FXD 0.258 0HH 18, 1784, FXD 1.68 0HH 18, 1784, FXD 1.68 0HH 18, 1784, FXD 5.118, 1984 18, 1784,	19701 ,HF4 19701 ,HF4 19701 , HF4 19701 , HF4 19701 , HF4 19701 , HF4	117-0 C1-0 C1-0
	A2857 A2858 A2859 A2860 A2860	0757-0279 0757-0465 0698-3451 0757-0439 0757-0438		FXD 3.16K DHN 1% LYBH FXD 100K DHN 1% LYBH FXD 135K DHN 1% LYBH FXD 135K DHN 1% LYBH FXD 6.01K DHN 1% LYBH FXD 9.11K DHN 1% LYBH	19701 NFA 19701 NFA 19701 NFA 19701 NFA 19701 NFA 19701 NFA	C1-0; C1-0;
	A2R62 A2R63 A2R66 A2R66 A2R66 A2R66	0757-0716 0777-0472 0757-0440 0757-0440 0757-0440	4 1	FRD 162K DIM 18 174W FRD 200K DIM 18 176W FRD 165K DIM 18 176W FRD 165K DIM 18 176W FRD 165K DIM 18 176W FRD 20K DIM 18 176W	01295 19701 MP4 19701 MP4 19701 MP4 19701 MP4 19701 MP4	CT-0 C1-0
	ARRD 7. ARRD 7. ARRD 9 ARR 70 ARR 70 ARR 71	0757-0465 0757-0467 0757-0465 0757-0465 0757-0465		FXD 100K 0HH 12 1/88 FXD 121K 0HH 12 1/88 FXD 1100K 0HH 12 1/88 FXD 100K 0HH 12 1/88 FXD 100K 0HH 12 1/88 FXD 10K 0HH 12 1/88 FXD 10K 0HH 12 1/88	1970] NF4 1970] NF4 1970] NF4 1970] NF4 1970] NF4 1970] NF4	CT-0 CT-0 CT-0
;	N2878 A2878 A2878 A2876 A2876 A2876	0787-0280 2100-2816 0648-0088 0648-3152 0787-0458		FAD 1K' DHN 1X 1/4W VAR 100K DHN 1X 1/2W FKD 2.61K DHN 1X 1/4W FXD 3.40K DHN 1X 1/4W FXD 3.40K DHN 1X 1/4W	75042 CHA ****21030 19701 NFA 19701 NFA 19701 NFA 19701 NFA	C1-0
·	* A2R77 A2R77 A2R79 A2R80 A2R80 A2R81	0757-0464 0698-3449 0698-3158 0757-0443 0757-0472		PX0 90.9% 0HM 1% 1/84 PX0 28.7% 0HM 1% 1/84 PX0 28.7% 0HM 1% 1/88 PX0 28.7% 0HM 1% 1/84 PX0 28.7% 0HM 1% 1/84 PX0 28008 0HM 1%-1/84	01295 1970L HF4 19701 HF4 19701 HF4 19701 HF4 19701 HF4	C1+0
	ARROR:	0757-0444	. 1	אולן אר אות אנגצב מאון	19701 HEA	cr-u

Abbreviations are listed in the Introduction to this section

Section M

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		Table	4-1 Replacesbl	e Parts (continuéd)		
Ref Deel	Part No	TQ	Degori	Hon	Mit	Mfr Pait No
AANHA AANHA ARNHA ARNHA ARNHA	0797-0414 0187-0444 0187-0448 0187-0448 0787-0448		XU 511 0HH 18 1/84 XU 90,96 0HH 18 1/ XU 196 0HH 18 1/84 XU 196 0HH 18 1/94 XU 196 0HH 18 1/94		19701 MP 01290 M 19701 MP 19701 MP	
АКНАТ АКНАВ АКНАВ АКНАВ АКНАВ АКНАВ	0797-0418 0648-3484 0787-0188 0787-0194 0787-0194 0787-0468		XD 8,118 0HH 18 1/ XD 903K 0HH 18 1/0 XD 94.8K 0HH 18 1/ XD 81.9K 0HH 18 1/ XD 81.9K 0HH 18 1/		01495 01495 19705 MP 19701• MP	
AR1198 [AR1193 ARA94 ARA96	- 0757-0448 0757-0468 0757-0468 0757-0468 0757-0840		XD 10K DHN 18 1/04 KD 100K DHN 18 1/0 XD 100K DHN 18 1/0 XD 1K DHN 18 1/0 Y VERTICAL DEFLECT		19701 MP 19701 MP 19701 MP 78042 CU	
	03702-7464 03702-3164 7 4040-0751 4040-0751		BD DLANK RACTOR PC BD DRN RACTOR PC BD DRN RACTOR PC BD DRN		100077 14473 80 14493 80 78136 80	
A3C A3C A3C A3C A3C A3C	0160-2197 0160-2204 0160-2204 0160-20098 0160-0939		ND 1000 BE JODWYDG ND 10000 SE JODWYD ND 10000 SON 20040 ND 43000 SE JODWYD ND 43000 SE JODWYD		72136, 10 562114 15 172136 110	ni beiddjig Ni bridlige Udi tykkirber-dys Ni brasijige Ni brasijige
A3C7 A3C7 A3C7 A3C0 A3C0 A3C0 A3C10	0160-8197 0160-8804 0160-8888 0160-8888 0160-8888 0160-0174		X0 1000 58 3000000 X0 10000 58 300000 X0 150000 58 30000 X0 150000 58 3000 X0 150000 58 3000 X0 0,4700 58 3000		72106 BD 72136 BD 72136 BD 72136 BD 66289 86	NI BF101, J3C NI 9F102, J3C NI 9F102, J3C L1 075-CM NI 9F102, J3C NI 9F100, J3C NI 9F100, J3C
ABCIA ABCIA ABCIA ABCIA ABCIA	0140-2199 0140-3849 0140-3741 0140-3741 0140-3887 0140-3887		XD LOPE SE 700WVD XF LOPE SE 700WVD XD LOPESBUE SE 100W XD COSOLS SE 100W XD COSOLS SE 100 XD COSOLS SE 1000		80795 PM 80795 PM 80795 PM 80795 PM 80795 PM	AU.187100 AO.0651100 AO.0158250 AQ.0338250
A3C17 A3C10 - A3C19 A3CR0 A3CR0 A3CR2	0160-0168 0160-1746 0160-1746 0180-1746 0180-1746 0180-1746		ND D. 10H LDW ROWN ND 16UF LOX 20WVD ND 16UF LOX 20WVD ND 16UF LOX 20WVD ND 16UF LOX 20WVD ND 16UF LOX 20WVD		56289 10 56289 10 56289 10 56289 10	2910492-916 / 041862902002-046 1 001662902002-046 0 001862902002-046 0 001862902002-045
ASCRA ASCRA	0121-0105 0121-0105 1901-0040		/AR 9-3500 /AR 9-3500 / 61		20846 91 12068 50	
A3CA3 A3CA3 A3CA4 A3CA4 A3CA5 A3CA5	1901-0040 1908-3070 1908-3070 1908-3070 1908-3070 1908-3070	010 011 011	D'51/) 3 IKADI 4.22V 58,440 3 IKADI 4.22V 68,400 3 IKADI 4.22V 68,400 3 IKADI 4.22V 68,400		12069 60 07910 CC 07910 CC 07910 CC 07910 CC	20090 20090 20090
ABNCI ABNCR ABNCR	1820-0058 1820-0058 1820-0477		OP ANP OP ANP OP ANP		13715 61 13715 61 01295 51 13715 5	10231 Jan 1
A301 A302 A302 A304 A304	1854-0019 1854-0019 1855-0020 1855-0020 1855-0020		TR BJ NPNG J TR B J NPNG TR FET N-GNANNEL TR BI PHP TR FET N-GNANNEL		13715 S- 21045 PI 07263 21 21845 PI 21845 PI	6514 151 13640 151
AJU A 			TR PET N-CHANNEL			

Abbreviations a this section the introduction to listed in

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ABAY 20010 ABAY 20010 ABAY 20010 ABAY 20010 ABAY 20010 ABAY 20010	Ref Deelg	Pert No Ta	Depription	Mir	Mfr Part No
ABOLT ABOLT <td< td=""><td>A 340 B</td><td>1857-0010 1858-0070 1859-0019</td><td>n () NATA A POTT MACHANNA LATION OF STATES () A STATES</td><td>• (1978) 131177</td><td>1114 84091 41,1097</td></td<>	A 340 B	1857-0010 1858-0070 1859-0019	n () NATA A POTT MACHANNA LATION OF STATES () A STATES	• (1978) 131177	1114 84091 41,1097
Anni Anni Anni Anni Anni Anni Anni Anni	A3012 (12) A3013 A3014	1054+0019 1054+0071 1053+0071	INTERNATIONAL CONTRACTOR CON	111719 111719 111719	5 × 10 10 10 10 10 10 10 10 10 10 10 10 10
ASHO D/SY-DHAR Y/RM Y/RM Y/RM Y/RM ASHO D/SY-DHAR Y/RM Y/RM Y/RM Y/RM ASHI D/SY-DHAR FXD PUDK DUM IX / PUM Y/RM Y/RM ASHI D/SY-DHAR FXD PUDK DUM IX / PUM Y/RM Y/RM ASHI D/SY-DHAR FXD PUDK DUM IX / PUM Y/RM Y/RM ASHI D/SY-DHAR FXD PUDK DUM IX / PUM Y/RM Y/RM ASHI D/SY-DHAR FXD PUDK DUM IX / PUM Y/RM Y/RM ASHI D/SY-DHAR FXD PUDK DUM IX / PUM Y/RM Y/RM ASHI D/SY-DHAR FXD PUDK DUM IX / PUM Y/RM Y/RM ASHI D/SY-DHAR FXD PUDK DUM IX / PUM Y/RM Y/RM ASHI D/SY-DHAR FXD PUDK DUM IX / PUM Y/RM Y/RM ASHI D/SY-DHAR FXD PUDK DUM IX / PUM Y/RM Y/RM ASHI D/SY-DHAR FXD PUDK DUM IX / PUM Y/RM Y/RM ASHI	A 3113 A 3113 A 3113 A 3113 A 3113 A 3114 A 3115 A	0787=0469 0797=0465 0787=0465	* A PRO INDE CON IN IN IN A AND A AN		APAD1=0 APAD1=0 APAD1=0 KBAT=0 KBAT=0
A3101 D767-DANR 4 H PKD FIN D004 IX J404 IV10 H J404 IV10 IV10 H J404 IV10 IV10 H J404 IV10 IV10 H J404 IV10	ABRY	0707-04/2 0707-04/2 0707-0427	THE REAL POINT AND A CARD AND A	1878)	
ASHLO, OTWI-DAAR IF MO FUN DIN IN IN I/ANA IF AND FUN DIN IN I/ANA ASHLO, OTWI-DAAR IF MO FUN DIN IN I/ANA IF AND FUN DIN IN I/ANA ASHLO, OTWI-DAAR IF MO FUN DIN IN I/ANA IF AND FUN DIN IN I/ANA ASHLO, OTWI-DAAR IF MO FUN DIN IN I/ANA IF AND FUN DIN IN I/ANA ASHLO, OTWI-DAAR IF AND FUN DIN IN I/ANA IF AND FUN DIN IN I/ANA ASHLO, OTWI-DAAR IF AND FUN DIN IN I/ANA IF AND FUN DIN IN I/ANA ASHLO, OTWI-DAAR IF AND FUN DIN IN I/ANA IF AND FUN DIN IN I/ANA ASHLO, OTWI-DAAR IF AND FUN DIN IN I/ANA IF AND FUN DIN IN I/ANA ASHLO, OTWI-DAAR IF AND FUN DIN IN I/ANA IF AND FUN DIN IN I/ANA ASHLO, OTWI-DAAR IF AND FUN DIN IN I/ANA IF AND FUN DIN IN I/ANA ASHLO, OTWI-DAAR IF AND FUN DIN IN I/ANA IF AND FUN DIN IN I/ANA ASHLO, OTWI-DAAR IF AND FUN DIN IN I/ANA IF AND FUN DIN IN I/ANA ASHLO, OTWI-DAAR IF AND FUN DIN IN I/ANA IF AND FUN DIN IN I/ANA ASHLO, OTWI-DAAR IF AND FUN DIN IN I/ANA IF AND FUN DIN FUN FUN FUN FUN FUN FUN FUN FUN FUN FU	A3B11 A3B12 A3B12 A3B14	0787-0448 0787-0448 0787-0448 0787-0448	A ALEXANDER DE LE		HIN CALLS AND
A3hR1 () OTBT=0ABT H PHD 15 BK DIM 1 × 1/HW [) PTD HPAD 1 × 1/HW A3hR2 OTBT=0APP H PHD DIM 1 × 1/HW [) PTD HPAD 1 × 1/HW A3hR2 OTBT=0APP H PHD DIM 1 × 1/HW [) PTD HPAD PHD A3hR2 OTBT=0APP H PHD DIM DIM 1 × 1/HW [) PTD HPAD PHD A3hR2 OTBT=0APP H PHD DIM DIM DIM DIM PHD PHD HAR PHD DIM DIM DIM PHD DIM H PHD DIM	AJH10,,, AJH17 AJH10 AJH10 AJH10	0787-0880 0648-3451 0747-0448	A PART AN ADDA AN ANA ANA ANA ANA ANA ANA ANA		4441241 NHAGI241 NHAGI241
A3A26 D767 DAA6 H, PKD 100, DH 100 100 100 100 100 100 100 100 100 10	N3 R1 () N3 R2 N3 R3 N3 R4	0787-0739 0787-0409 0787-0409	A PAD, PK DIM IN JYAH H PAD TOK DIM JN JYAH H PAD TOK DIM JN JYAH		NI 970 ### NI 96 NI 96 ##E
13H21 0787-0619 N FRD 6HL 0701 14701 <th14701< th=""> <th14701< th=""> <th14701< <="" td=""><td>134120 131127 131129 131129</td><td>078700448 07870414 10 0698-3444 8 0787-0446</td><td>TATU ARDO ONA COMPONING AND AND AND AND AND AND AND AND AND AND</td><td> 1910 1910 1910 1910 </td><td>11748141 147481#1 147461#1</td></th14701<></th14701<></th14701<>	134120 131127 131129 131129	078700448 07870414 10 0698-3444 8 0787-0446	TATU ARDO ONA COMPONING AND	 1910 1910 1910 1910 	11748141 147481#1 147461#1
Знай обланация (1) н рид 1.33н онн 18-1744 отрича збат болоп-пона н рид в.38н онн 18 јули (утот рид) (растео збат отбаностан н рид в.68н онн 18 јули отбаностан н рид в.68н онн 98 и звао отбаностан н рид ри онн 98 и звао отбаностан н рид ри онн 18 јули звао отбаностан н рид рици 18 јули звао отбаностан н рид рици 18 јули звао отбаностан н рид ослав онн 18 јули звао отбаностан н рид ослав онн 18 јули	3431)437)433)434	0787-0414 0698-1444 0698-1444 0698-1444 0698-14490	R PAD 681 DDA 38 1700 A PAD 816 DDA 38 1700 A PAD 1708 DDA 38 1700 A PAD 1708 DDA 38 1700 A PAD 28 DDA 18 1700	19701	NFABIND AND AND AND AND AND AND AND AND AND A
aras orbreaday h projoshak ann ar arnh - 19701 miac.	2826 3827, 38211 3839	0698-3104 1 1 6698-0084 0761-0098 0698-8690	(H PAD L. BAN, DIM 18-174M H PAD B. TSN DIM 18 170M H PAD B. ARK DIM 58 170M H PAD B. ARK DIM 58 14	01204 0701 0704 0704 0704 0704	HPAGIND GRON / 2100 32104 HPAGIND
ANA'S DAVID-3380 A FAD RS.TH ADDA IN LYDN DAVID-3RAS A HIND LTAN DDN IN LYDN ANAB DYN-3RAS A HIND LTAN DDN IN LYDN ANAB DYN ANAAU A HAD DON DDN IN LYDN ANAB DYN ANAB A HYD SLIN DDN IN LYDN DYN ANAB HYD LLW	1841 2842 2846 2846	0787-0439 0640-3380 0640-3380 0640-380 0787-0449	H PHD D. HIK DIN IN JUH H PHD B. TH DIN IN JUH H PHD ITAN DIN IN JUH H PHD TAN DIN IN JUH H PHD POK DIN IN JUH	1970) 7 - 1970) 7 - 1970) 1970)	HIAG HIABTAR HIABTAR

Replaceable Parts (continued) Table 4-1

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Abbreviations are lis section lad in the introduction to this

Model #7070

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1.1	Table	1.	i Haniai	akiaa.	Parts	(oonthining)
· · /	1 1 1 1 1 1 1 1		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		L. BILIM 1	[Additionant]

		Table 4=1 Hoplaceable Parts (continu	ed)	an a
Het Desig	Part ND. T	Q / / Description	Mir	Mir Part No
	0898=0084 0787=0474 0787=0474	TAN THE PATEN COMMAN AND AND AND A TANK		
A 1993 A 1994 A	064H=00F3 0757=07H0 0757=055H 069H=5667 0757=0560		4 197	HFA(1220) (FA120) NFA(120) NFA(120) NFA(120) FA(120) FA(120) FA(120)
A3494 A3494 A3404 A3407 A3407 A3407		N HAD LAR ONN IN LAND H HAD LAR ONN IN LAND H HAD LAR ONN IN LAND H HAD LAR ONN IN LAND		HTAUTED UTAUE NFAUE
азнаў Азнаў Азнаў Азвар	0797=0440 0747=0414 0747=0414 0747=0400	N FAD AND IN COMPANY AND A CANADA		
		Abey IF CALTHRATOR PE HD HLANA EXTHACTON TO AD YEL EXTHACTON TO NO YEL		4040+0480 9040+0480
	015010193 01601195 01601195 01601195 019010195 019010195	A HO DAVE AND IN TOTAVIO A HO DAVE AND IN TOTAVIO A HO DAVE AND TOTAVIO	91418 94999 96999 96999 91419 91419	INNERSENSENSE Innertenoinerenye
A40A A407 A407 A404 A4040	0140=1440 0140=0184 0140=0184 0140=0184 0140=0194	R HAD DANK TO THAVE		
AAGI1 AGI1				
ANDIA ANDIA ANDIA	0160+1940 0140+0779 0140+0779	o frid dank tok takydd i	NA PAN Sapan	. 1040330.00032034 1000300.00032074 2013032076
A40A1 A40A1 A40A1 A40A1 A40A1 A40A1	+ +(1 = 0040 + +0 = 0040 + +0 = 0070 + +0 = 145 + +0 = 145 + +0 = = 0064	BIN HALL IN AUDIM AHOMM		
ANGRA ANGRA I,	1407×0084 1407×0084	DAI NACHI 7.5V ADDAN DAI NACHI 7.5V ADDAN DAI NACHI 7.5V ADDAN	0141 1000) CODDATO 1 CODDATO 1 CODDATO
	0190-0801 1000-3500 5080-3500	ALV, NEED	F0001 F0001 F0001	An ann an Anna an Anna Anna Anna Anna An Anna Anna
4401 4407 4407 4407 4405 4405	#54=007 #54=007 #54=007 #54=007 #54=007 #53=003#			SKALIJA
			the set	

Abbreviations are lipited in the introduction to this section

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•	Ref Desig Part No	TO	Description	Mir	Mir Part No
. <u>1</u>					
and the second			ALANA OUM IN IN INA ADAN CHIM IN INA ADAN CHIM IN INA DA CHIM IN INA INA ADAN OUT INA INA ADAN INA INA INA ADAN INA INA INA INA INA INA INA INA INA INA INA		
				19701 //F4G 19701 //F4G 19701 //F4G 19701 //F4G	
	AAMAI OTATEDEND AAMAI OTATEDEND AAMIA AAMIA AAMIA AAMIA AAMIA OTATEDAAT		IN COM IN LAND JOH COM IN LAND AND AN COM IN LAND AND AN COM IN LAND AND AN COM IN LAND AND AN COM IN LAND	79049' CEAT 18181 11-16 18181 11-16	#0]≠0
	A4A1A 44	I A FRO	17.07W-0.0V 14 1/04 47.07 1000 14 1/04 47.04 1000 14 1/04 47.04 5.040 2000 10 10 1/04 10 br>10 1/04 10 10 10 10 10 10 10 10 10 10 10 10 10	INTON MEAG YAUAP CEAS INTON MEAG INTON MEAG INTON MEAG INTON MEAG	
	AAH71 OAYN×00HA AAH71 OAYN×00HA AAH72 300HA AAH73 0177700HA AAH74 300HA AAH75 0177700HA AAH74 300HA AAH75 300HA AAH74 300HA AAH75 300HA		2.194 (/nk 12 1/NM W. (WH 001H 59 1/NM 150 (/NH 14 1/AM AR.9 (101H 14 1/AM AR.9 (101H 14 1/AM	19701 NF46 19042 FEAT 19701 NF46 19701 NF46 21030	
	A4MPA 0787±0419 A4MPA 0787±0419 A4MPA 0751±0419 A4MPA <td< td=""><td></td><td></td><td>14701 NFAG 19701 NFAG 19701 NFAG 19701 NFAG 19701 NFAG</td><td>}π{} }</td></td<>			14701 NFAG 19701 NFAG 19701 NFAG 19701 NFAG 19701 NFAG	} π{} }
	A4ABI 0787-11869 A4ABF 0787-11869		FIDADUN IN IVAN	19701 AP46 19701 AP46 19701 AP46 19701 AP46	×() ≠ () × ()
	A4130 A4137 A4137 A4137 A4137 A4137 A4137 A4137 A4137 A4137 A4147 A417 A41	an a	4,04% (000 12 1/00 14 1/00	1970) MPAC 79047 CEAT 79047 CEAT 79047 CEAT 9701 MEAC 79047 CEAT	A A
	ANNAY OBVIERDAR AGRAF BYTCOAR	A CARLER HE PHD		1970)	

Table 4=1. Replaceable Parts (continued)

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Abbreviations are listed in the introduction to this section Main 31030

episcellie Parts (continued)

		Mir Part No
Ref Deela Peri No. TO Deeerip	and an annual state of the stat	PARTICIPAL PROPERTY PROVIDENT CONTRACTOR
A6HA9 0797=0A47 9994, H FRD LOK (0HH L& L/HH A6HA9 0797=0A47 1994, H FRD LOK (0HH L& L/HH A4HA9 0797=0A40 H FRD LN (0HH L& L/HH	AND A REAL PROPERTY A REAL PROPERTY AND A REAL	
ANNAS OTSTODAAD H FRO TIME UNIT IN ATRA		
	N FR F F F F F F F F F F F F F F F F F F	Phylip #我们的一个问题,我们的一个问题。 And And And And And And And And And And
AAHUA AAHUA	N 1979 - Angel State (1979) - Angel State (1970) - M Angel State (1970) - Angel State (1970)	
AANAA AA		
AAHDY CONBERTAN VIEW H HAD AAAAM UNH IN 1/8 AAHDA AAHDA AAAM UNH IULAAAA		
AANAD OANHEODANYI IYA KAN AYAAR MIIN IA KA Ayaada oo ahaadaa ahaada ah	N 19701 N	1401=0
АЛ НОР АЛ НО АЛ НО А		
AAHAA	N INTEL A	and a state of the second s
AS OFTIEFTITAS ASBY HETEH CONTHING & H	ta a fagi da sua da konov er	
THE ALL PROPERTY AND A DEPOTION OF A DEPOTIO		040+93 4 040+93 4 040+93 4
ASCS CALIFORNIAS CALIF	000VDG Nonvog	
The second	10000000 000000 1000000 10000000 0000000	
ABELT OLAD ALAD C THE D. P.H. POR PUNCH	ODWNEN	SUDADERINANUS DAP
	DUNVOI:	MA .UM UU MA .OM UD
ABAST. OSAGABAANA GAVAD OSSAUD BR JUNIAN ABASS OSAGABANANA GAVAD SOUND BR JUNIAN	Alexandro († 1997) 1997 - Alexandro († 1997) 1997 - Alexandro († 1997)	HAID, 19, 1941 1981 91 91 91 94 94 94 94 94 94 94 94 94 94 94 94 94
ANCHT THOP-BLAP IS TOTO BANK BELLY ME AOD	N	1)35731 1)36731
	10746.4 Hurye.4	http://www.sec.ex.ex.ex.ex.ex.ex.ex.ex.ex.ex.ex.ex.ex.
ANONG TYDE ODED OTO UNING STOLEN	17966 17966	

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Rection IV

		Tabla 4=1 (Replacentile Parts (continued)	
flef Deely	Pert No. TO	Description	Mix	Mir Part No
		IC IN AND AND AND AND AND AND AND AND AND AN	27014	
A 201 A 201A	H44×007 H44×007 H44×007 H44×007 H44×007 H44×007			7201190161 605=3617
A900 A900 A9010 A9011 A9012	1854=0071' 1854=0071' 1854=0071 1854=0096 1853=0096		01299 01299 04713 04713 04713	987,197 98,197 1913900,1 646-3619 1913900,1 545-0617 1913900,1 645-8617
A9013 A9014 A9014 A9014 A9014	1099+0090 1099+0071 1091-0076 1094+0071 1094+0071		04713 01200 04713 01295 01295	SKALIDA AND DE ANALYSIS
A941 A941 A845 A845 A845	A 1893-0036 A 100-2921 VANU-2940 A 100-2822 0767-0430 0767-0442	ABIH NI PHP H VAR, M DIM DON IVAN LIM H PRO H DIM DU IVAN LIM H VAN DIM DU IVAN H VAN DIM DIM DON IVAN H PRD D. LIM DIM IW IVAN H PRD DA DIM IN TAM	7313A V1637 7313H 19701 19701	n#=##### GNH=1/10=3#1=# n#=01=1 HFAUT=0 HFAUT=0 HFAUT=0 HFAUT=0
Abra Abra Abra Ayry Ayry Abrild	0848+3260. 1048-3148 0048-3148 0757-0462 1048-301	R PAD ADAN WITH IN TABE A FND S3.7K PILA IN TABE A FND S3.7K PILA IN TABE A FND S3.7K DILA IN TABE A FND S3.8K DILA IN TABE	1970) 1970) 1970) 1970)	MPACTRO MPACTRO MPACTRO MPACTRO MPACTRO
AGH I I Agh I P Agh I P Agh I Agh I Agh I Agh I G	D/AT-0308 0/57-0740 0/57-0740 0/57-05434 06/8-0087 4' 7100-7633	A, FRO TS (ANN IN IVAN MAD IN (ANN IN IVAN MAD IN (ANN IN IVAN MAD ASHIN DAN IN IVAN A FRO ASA (ANN IN IVAN A VAN IN ION IVAN IN A VAN IN ION IVAN	, 74047 1970) - 1970) - 1970) - 1970)	
A9816 A9817 A9817 A9819 A9819 A9819	0040-3189 0787-0740 0787-0344 0044-3159 0787-040	A FIXO A AAN DIA BA LYAM A FIXO JW DIA IX LYAM A FIXO JW DIA IX LYAM A FIXO JW DIA IX LYAM A FIXO J AAN DIA IX LYAM A FIXO J. AAN DIA IX LYAM A FIXO J. AN DIA IX LYAM	74047 19701 19701 19701	NPAG7+0 6041+0 NPAG7+0 NPAG7+0 NPAG7+0 NPAG7+0
AUNITA Admidd Admidd Admidd Admidd Admidd	0648-8188 0787-0774 0787-0348 0698-3188 0798-3188	A. MND A. GAN TOOM IN 1700 A MND A. GAN TOOM IN 1700 A MND D. TAK DOM IN 1700 A MND TO DOM IN 1700 A MND A. GAN DOM IN 1700 A MND A. GAN DOM IN 1700 A MND 7. SA DOM IN 1700	790A2 19701 19701 19701	i HPAG160. I HPAG160. I HPAG160.
Abhan Abhan Abhan Abhan Abhan Abhan Abhan	0648-8440 0157-0014 0167-0010 0167-0010 0157-0048 0648-0148	A FAD DN DIN IN LUN B FAD D. LAN DIN IN LAN H FRD IN DIN (N. LAN) H FRD IN DIN (N. LAN) H FRD NO, R DIN IN LAN H FRD S. AAN DIN IN LAN	76042 76042 19701	E GIATHO, 4400038147 E GIATHO, 44 E GIATHO, 44 E GIATHO E ARACHO E ARACHO E ARACHO
A\$H31 'A\$H32 A\$H33 A\$H34 - A\$H34	0787-0398 0787-0780 0787-0780 0797-3188 0797-3188 0797-14449	н наки вор ини 18 јуни * н киј вор и кија 18 јуни н киј 18 сија 18 јуни н киј 4, бан ини 18 јуни н киј 4, бан ини 18 јуни н киј 4, бан ини 18 јуни н киј 8, бан ини 18 јуни	150A/ 119701	NUALI-0 CBAI-0 NPACT-0 NPACT-0 NPACI-0 NPACI-0
AUNDA	olur-arny a	and the second	19040	2. GRATHDS

Model 37078

"alpie A=1 : Replaceable Parts (continued)

Ref Deelg	HP Part No	TQ	Description		Mir Part No
A5H37 A5H3H A5H39 A5H40	Pari No 0747=0433 0747=0444 0747=0444 0747=0444		ND 3, 3PA DUN IN IN IAH ND 3, 3PA DUN IN IN IAH ND 3, AK DUN IN IAH ND 3AH DUN IN IAH		AL AL I I I AL AL I I I AL AL I I I
АЦНА] АЦНАД АЦНАД АЦНАД АЦНАД АЦНАД	0694=3199 0698=3190 0797=0397 0797=0397 0797=0479 0797=0477	ing and a second se	KO PATH ONN IN JAHAMA ANA ANA ANA ANA ANA ANA ANA ANA ANA	1970) 1970) 1910) 1910)	M#461=0 Hr66=20 Hr461=20 GHAT=0 Hr461=20
Айнар Айнар Айнар Айнан Айнан Айнай	0797+0974 0797=0974 0797=0900 0797=0997 0797=0997		AD I VAN ONN DA IZAN AD I ZAA DIN IN IZAN AD SHII DIN IN IZAN AD SHII DIN IN IZAN		- MEARTHREE ALL STREET ALE -
A9110) A91107 A91107 A91104 A91104	00098=3490 0757=0448 0698=3154 8100=3981 0757=0481 0757=0481	A P	ND RK OHN IN IAN ND LON DHN IN LAN ND LON DHN IN LAN ND LANK DHN IN LAN ND LAN DHN IN IAN ND LAN DHN IN IAN	- 12231	UHP#1/10=9#1=# NFAC NFAC NFACT=0 AP##29=1 NFACT=0
АРАРО Абар Абар Абар Абар Абар Абар	0797=0448 A100=2882 U797=0407 D598:0058 A100=2874		HD LON DIN IN 1784 An Din Din IN 1784 Joh Din In 1784 An Din Jin IN 1784 An BDD Din IN 1804	19701 73138 19701 19701 19701	MT40 A24227-1 HT401-0
Å986] A986] A986] A986] A9869	0797=0480 0797=0468 0797=0468 0797=0468 0598=5966 0797=0446		ND YED, DIAN IN BYEN ND TOOM OAN IN LYEN ND Abs, Komm in Lyen ND Abs, Komm in Lyen ND Path Dim in Lyen Ad Ibn Dim in Lyen *	19701 19701 19701 01795 19701	
Арнал Авпат Авпат Авпан Авпач Авпач	0797=0394 0797=0394 0797=0394 0797=0394 0797=0200 0694=3449	1 I I I I I I I I I I I I I I I I I I I	ND DESTIMATION DE DE CONTRA PORTE	1970) 1970) 78048	NPAG1>0 NPAG1>0 NPAC CHAT>0 NPAG1+0 NPAG1+0
AUNTI AURTA Ao	0787=0438 0787=0840 03708=7184 03708=2184	R R R	XD BLISH OWN IN FYRM AD IN OWN IN FYRM V RHY DOWNN ROPPLY BD RLANM		NPAD1+13 08A1-0
АЛП] АЛП АЛП АЛПА	0100-0048 0160-0174 0160-0181 \$060-0181 \$060-0403 0160-2084		ND LDOUP PON PONVOC ND 0.4 YOF (ND-PON REWOR ND 4 TOOPE (ND-PON REWOR ND 4 TOOPE (ND-PON ADDONVOC ND 0.6 NUF 10N 30000VDC	UA784 NA784 71940 78480 78480 78430	BUDIOTRATZIAA
албал. Албал Албал	0160-0181 8040-0401 • 0160-0036 8040-0400 0190-0036		ND AYDONH HO-AUN ADDOWNC PONT C ND AYDONH ROW ADDOWNDC PONT C ND AYDONH ROW ADDOWNDC	71940 20400 91414 20400	- REDUCTANTATAA TRUUNAKVATUZUN
АЛСИ АЛСИ АЛСИ!	\$040+0400 0160-2094 1901-0142 1901-0142	\$UP C P A . 010 010	PORT C RD D.DIBDF ION BODDWVDC BI 7800PIV BODA BI 7800PIV BODA	14049	HHB19343H6 8670 3672
ANCHS ANGUN ANLL	1901-0148 1901-0148 9140-0091	610 910		14899 14899 00007	

Table 4-1 Replaceable Parts (continued)	Table	4-1	Replaceable	Parts ((continued)) '
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Hof Danig , F	NP Part No	TQ	Description	Mir	Mir Part No
алнр] Алнрр Алнрр			SCH. 6737X121/H NIT UNEX 6537 HASHEN LOER HEL HO 6 NIT. HEX 6740 VASHEN LOER HEL HM 4	H0 20 73734 H0 20 H0 20 H0 20	
Abn117 Abn119	0340+0903 9990=0045 9990=0045 9990=0045		SGR 0=3789780 14811NAI, LUG BGHEM 2017 11 SPAGEN (1117 61	10007 74463 48007 10007	
Sec. B. S. Same	1854-0077		XTA SI NIN	16790	
	0798=0074 0748=0017 0747=0017 0747=0017 0757=0004 0757=0004		N PAD LUD ATTA ST LAAF P PAD LOV ATTA ST LAAF P PAD A AN ATTA ST LAAF N PAD A AN ATTA ST LAAF N PAD AN ATTA ST LAAF N PAD AN ONN TATA ST N PAD SN ONN DX LAAF		
	0089×1899 0089×1899 0089×1899 0689×1899 0689×1899 0689×1899 0689×1899		H HAND L. HA BAHA BU HA H HAND L. HA DOUL BU H HAND L. HA DOUL BU H HAND L. HA DOUL BU H HAND L. HA DOUN BU H HAND L. HA DOUN BU H HAND DON HAN BU LAM		
AANII AANID	0686=8749 0798=0107 3708=7173		R UND HADN WIN WY LYAN N PHD NTON WIN BY LYAN NYMH	01101 10006 10007	
	3707=7251		ASSY GAL ANTIAN LIDS O PRO DODOPP TPUBNINNI	10007 12482	KP600/363-LOV > .
ATGE	0160×0663 0160×0663 0160×0663		C ANN LUDUPA LANUDINNU Hon Represented	1779HA - HODDY	NR600/363×107
YINPA ATNPA	2940-0001 2420-0002 4190-0011		NUT NAX 374-37 NUT NAX 105-38 WASHRA LOCK INT NU 10	73734 73734 78734 784488	102
ATAL	8300-0746 8708-7808 8708-3808		A VAR ABO DIN POR 177N LEN HET LOSS G Abby Mituan Loss Andligten Po. No. Nlank	7449) 80007 80007	
ATAICA ATAICJ ATAICJ	0190-009) 0100-0199 0100-0199 0190-0199 0190-0199		C HAD O, DAWE CHURLOW JODNVOG G HAD P. RUH PON PUNVHG G HAD P. RUH PON PUNVHG G HAD O. DAUM FRUMJOR JONNVOG G HAD O. DAUM FRUMJOR JONNVOG G HAD R. RUH PON PONVJO		LEODPPENDOPIAR-DYS LEODPENDOPIAR-DYS LEODPENDOPIAR-DYS
ATALCA ATALCT ATALCT	0140-0155 0140-0155 0140-0155 0140-0155		C PHD R.RUF FOR RUNVIC C MAD R.RUF FOR RUNVIC C PHD R.RUF FOR RONVIC C PHD R.RUF RON RONVIC C PHD R.RUF RON RONVIC	60209 90209 • 90209	- TOURPEROUPDAP-DYS TOURPEROUPDAR-DYS
ATALIK	1250-0432 1250-0432	30.	COMM GDAN PC ND NTO CONNEN.	4434)	01=101=0000 191=101=00000
ATALOJ ATALOR ATALOR ATALOR ATALOA ATALOA	1884-0098 1884-0098 1884-0098 1884-0098 1884-0098 1884-0098		XIII A BI NDA NATA IBI NDA KITA BI NDA	0726 0226 0726 0726	////////////////////////////////////
ATAIRL	,0757-0400 		A A BUD NO O DUN SU DZONA A A A A A A A A A A A A A A A A A A	19¥01) NPAGTAU AN

Abbreviations are listed in the introduction to this section.

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rikle 4=1 Peplecekle Perts (ophtinklei)

Ref Deelg	Iment No. TO	Description	Mir Part No
	Pert No Obya=1448 Ofat-Dista Obya=Dista Obya=Dista Obya=3155	A FAIL ASSANCE AND A LIVE AN	19701 AF401=0 19701 AF401=0 19701 AF401=0 19701 AF401=0
A7A]R6 A7A]H7 A7A]H7 A7A]H7 A7A]H7	0448×0088 ;; 9747×0439 0448=3447 ;; 0448×0084 0448×0084;	M. FXD R. 614 (DIM 18 1/4W) H. FXD 258 (DIM 18 1/6W) H. FXD 258 (DIM 18 1/6W) H. FXD 2518K (DIM 18 1/6W)	19701 AF4C1=0 13781 AF281=0 13781 AF281=0 13781 AF281=0
A7A1H11 A7A1H12 A7A1H12 A7A1H13 A7A1H13 A7A1H13 A7A1H13	0694-3145 6747-0574 8757-0574 8757-0397 8648-4057 8648-4057	A PHO 4,644 ODIN IN 1/8W A PHO 1,78K ODIN IN 1/8W A PHO 1,78K ODIN IN 2/8W A PHO 4,78K ODIN IN 2/8W A PHO 46:4 ODIN IN 2/8W A PHO 46:4 ODIN IN 2/8W A PHO 46:4 ODIN IN 2/8W	E9YOI APAGI*D TBOAR CHAT-D 14YOI MIACT-D TBOAR UHAT-D TBOAR CHAT-D 150AR CHAT-D
ATAIHIA ATAIHIT ATAIHIT ATAIHIH A10	0448=4087 0648=4087 0648=4087 0848=4087 08708=7148 08708=7148	R PHD ADIA DIM, IN LYDH R PHD ADIA DIM, IN LYDH R PHD ADIA DIM, IN LYDH R PHD ADIA, DIM, IN LYDH I ADIA' ANTERNAL, INPUT AMPLIFIER PD HD HLANN	TBUAR CRATEO TBUAR CRATEO TBUAR CRATED TBUAR CRATED HODOT
ALDERI -	000-000	B FAD D. ATOP 180 PON BAVVAG DID 61	SARAS BUILDITS-CHL SARAS ISUPRESSUDFOAP-DYS FROAS SOBUBO
	. FRAD-DORA	BURN EDAR FE AD AND EURIA 1 IC UP AMP	SHEEL BIFISIFOODD.
A1001 A1071 A1077 A1077 A1077 A1077	1055-0768 0767-0123 0767-0123 0767-0123 0767-0448	ARTH FUT NECHADINEL A FAD BALAN OLM IN 1/200 A FAD BALAN OLM IN 1/200 A FAD ION OLM IN 1/200 A FAD ION OLM IN 1/200	
ALOND ALOND ALONY ALL	0797-0280 0797-0469 0698-3266 	A BAD BLANK R PAD AGAA DIM IN IVAH R PAD AGAA DIM IN IVAH Abby Namára Cimb Johnston Abby Dada Dim In Ivah Pu BD Blank	• 14703 MP401-0
	UIRI-0044 0140-0148 0140-0148 0140-0440 0140-0148 0140-0148	A C VAN 9-38PF SN BODWVDG FRD IOPF SN BODWVDG FRD IOPF SN BODWVDG FRD APPF SN BODWVDG FRD APPF SN BODWVDG	TRUNB SSN-DIL-VRIG-VAN, '''' TRIDA MUNIDERDIJDC Romas Dar-Mili Polas Dar-Mili Tai Se Romistanojdc Sorny Indoaravubssa-dys
A11CA A11CA A11CA A11CA	0140-0097 0140-0097 0140-0097 1890-0998	C PHD ATUM ION TENVOC E FAB ATUM ION SERVIC CONN CUAN PC NO MTO COMMEN	NARAS INDUSYARADINAD-DYS RATAS INDUSYARADINA-DYS SATAS INDUSYARADINA-DYS SHRAI NI-INI-DODU
A 1 101 A 1 107 A 1 107 A 1 107 A 1 107	1884-0014 1884-0014 1853-0034 1853-0034 1854-0014	NATA BI NPA Asta Bi NPA Asta Bi NPA Asta Bi NPA	IDTIN N-ADIA IDTIN N-ADIA IDTIN N-ADIA IDTIN N-ADIA IDTIN N-ADIA TNUAR-GRA1-D
ALIAL	0797-027A	A PHO SLYNK CAIH IN JANN	

Section IV

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Ret Deel	Peri No TO	Devertption ",	Mir. Mir Part No
		A FAD A AN OTHER IN LYBN A FRE AN COMM IN LYBN A FRE ANT COMM IN LYBN A FRE ANT COMM IN LYBN A FRE ANT COMM IN LYBN	14701 ///AUT=0 14042 CLAT=0 14042 CLAT=0 14701 // 401=0 14042 ULAT=0
ALIAA ALIA7 ALIA7 ALIA9 ALIA10	0797-0448 8494-2448 8494-2448 9494-2448 9494-2448 9494-2448	A FAD LOX DIA IN IVAN A FAD SBY ANA IN VAN A FAD SBY ANA IN VAN A FAD SBY ANA IN VAN	1970) MPAC 1970) MPAC 1970) MPAC 19 1970) MPAC 19 1970) MPAC 19 19 1970) MPAC 19 19 19 19 19 19 19 19 19 19 19 19 19
	0797-0180 9787-0180 0797-0180	A FAD BLOG OMM IN IZAN A FAD SILL DAM IN IZAN	TSUAR GRAI-D ISTOI MEADTOU ISTOI MEADTOU
	0410+0409 1200-0444 00700-7710 03701-7710	ATAL OWANTE PHIN ATAL HULDAN ODREZUNTAL, ABBY POWER SUPPLY HEOTIFIERS	EDDDY AAAAATAA HOODY HOODT HOODT
	VD =0AVA 400 =0A (A 900 =0A (A 900 =0A (A 900 =0A (A 900 =0A (A 900 =0A (A		7 / U47) 3 [MU003 U47] 5 SH HAA=[0 U47] 5 SH HAA=[0 U47] 5 SH HAA=[0 U47] 5 SH HAA=[0 U47] 5 SH HAA=[0
ALROND ALPONT ALPONA ALPONA ALPONA	1401-0416 1901-0416 1901-0416 1901-0416 1901-0416	DID SI ROUPIV BA DID SI ROUPIV BA DID SI ROUPIV BA DID SI ROUPIV BA DID SI ROUPIV BA	UATIN SHIHAA-10 UATIN SHIHAA-10 UATIN SHIHAA-10 UATIN SHIHAA-10 UATIN SHIHAA-10
ALRENI I ALRENI P ALRENI P	140]=0416 1901=0416 1901=0416	DIO VI BOOPIV BA DIO VI BOOPIV BA	04713 \$41846=10 04713 \$41846=10 04713 \$41846=10 04713 \$41846=10
A 1 2 A 1 A 1 2 A 2 A 1 2 A 2 A 1 2 A 2 A 1 2 A 4 A 1 A 4 A 4 A 4 A 4 A 4 A 4 A 4 A 4 A 4	0717-0418 0717-0444 0717-0444 0417-0444 0417-0444 0417-0444 0417-0444 0417-0444	A FRD BLAK DIM AW LYNN A FRD TAK DIM IW LYNN A FRD TAK DIM IW LYNN A FRD TAK DIM IW LYNN A FRD TA DIM YM LYNN A FRD BLAK DIM LW LYNN	VTDI HFACT=D VTDI HFAC VTDI HFAC VTDI HFACT=I VTDI HFACT=I
A1200	, UA98-1470 1 OB708-1147 1 VD60-4406 1	N NHO 100 DIIN BU AN. ARRY AN ALVENDATON HOUBIND ATTAN	10799 BAAN 🗰 1 00007 HODDY
AIDAÍ	01707-7191 01707-1191	ARBY PO BD HB ATTENUATOR PG BD BLANN	HDDDY
	irod-over irod-over	CONN CDAN PG ND MTA CONNER	VARAI BI-101-DUUD VARAI DI-101-DUUD
ALDAIN) ALDAINE	. 3100-0679 03707-309 3100-0476 03708-308	SU ATAY PATHE PEST. NUDPOINT THUS HE ATTENUATOR SU HTAY PATHE PETE NUDPOINT UNITS BE ATTENUATOR	NODPO HOPPO HOUDT
	0440-0114 0440-0100 0440-010 0440-012 0440-012 0440-012	ATTEN FAD DD DE DADA ATTEN FAD DD DE DE DD ATTEN FAD DDB DE DDB	EDDUA DOPADDIA LODUA UDPADDIA EDDUA UDPADDIA LODUA UDPADDIA EDDUA UDPADDIA
ALDALZO	0960+0126	ATTRIC PAD ADD D.RDD	NUQDA UDBADDLO,

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Abbreviations are listed in the introduction to this section

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Table 4=1 Penjapooble Ports (continued

	Pari No TQ 0940-0124 0940-0124 0940-0124 0940-0124 0940-0124 0940-0124 0940-0124 0940-0124	ATTEN FAD TOP 0.200 ATTEN FAD TOP 0.200	Mir Part No HUDOA (ADRAUDET HUDOA (ADRAUDET HUDOA (ADRAUDET HUDOA (ADRAUDET HUDOA (ADRAUDET HUDOA (ADRAUDET HUDOA (ADRAUDET HUDOA (ADRAUDET)
AIA Alanga Alanga		RUTELO ABBY IF ATTENUATOR BOX BOACONTON FACEN CALLYN FACEN CALLYN SCH 2:3683/16 JULYN ALBYN RU SCH 2:3683/16 JULYN ALBYN RU	RODDT RODT RO
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A14A14999	03708-348 03708-7445 03708-348 03708-348 03708-348 1 0360-3760	COMM COAN COL WYO COMMENT ABBY BUAN COL DAWYOLK COMM CODY BUD HYO, ONE 70 CHM COMM ASSY BRESNEEP SPLETTER PC OD BLANN C FAD DERING EN LODWYDG	HODOY HODOY HODOY HODOY HODOY HOTOS PMAC, BBJICO HOTOS PMAC, BBJICO HOTOS HANG, BBJICO

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A1107, (A1908	0140=0174 0140=0174	O FRIMOLATUR LAORAUN PANYID O FRIMOLATUR LAURAU RANYID.	DAPAN UCALATAYONI, ; Dapan Pollatayoni, ; Divin Todayay
ALVERAL	100-1000	NIN BABH, IB:BV BI ABBAN - IND CER APPUN EN	87718 8888738
			化精制度 网络美国建筑和美国美国大学学校 化合同管理 化合同
		ASTA PAT MECHANNEL	
	0197=0998 8197=8978 8197=8978	A COB II CHILIN LYAR.	1970) NFAG 1970) NFAG 1970) NFAG 1970) NFAG 1970 NFAG 1970 NFAG 1=0
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	8181-8185 8181-1118	A ARB TAT BIAN 20 1780. Asby Annuam Loan Minna Ag ad alamn	
	0100-0010 0100-0010 0100-0010 0111-0001		
11867	olio-obio >	E FAB 1888FF INB =188 188BUVDR	
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	81.40-3169 01.40-3169	C MAD ATOPP SU SODWYDD G PAD 14PP BE BODWYDD G AND 14PP BE BODWYDD	12900) 11900) 11900
Albeis Albeis			
AIDCHA		C AND BARLA BUR, ROWVIC.	- PARRY INDREDRODRUAR-DVS RMARY EREC-REED
Alocas Alocas Alocas Alocas	201-0147 101-0147	BIE INT CANALITA	MARD BON-FIED
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Table 4=1 Replaceable Parts (continued)

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	APORD DYB7=0A17 APORT DD98=3168 APORT DD98=3168 APORT DD98=20089	A FAD BOD DIN IN I/HW A FAD COM IN I/HW A FAD COM IN I/HW A FAD COM DIN IN I/HW A FAD TO DIN IN I/HW A FAD TO DIN IN I/HW		NAGT=0 NFAGT=0 NFAGT=0 NFAG NFAG NFAG
	NZORII AZORIZ AZORIZ AZORIZ AZORIZ AZORIZ OF98-DDHA AZORIZ GA98-3199	A PAD 75 DIM 18 JAW '' A PAD JTA DIM 18 JAW H PAD JTA DIM 18 JAW H PAD J JAK DIM 18 JAW A PAD PJUK DIM 18 JAW A PAD A AAK DIM 18 JAW	19701 14701 19701 19701 19701 19701	NHAG NHAGT=11 NHAGT=0 NHAGT=1 NHAGT=1
	AFDA1A; 07N7=0279 APOA1A; 07V7=0397 APOA17; 07V7=0397 APOA14; 0A9N=4037 APOA14; 0A9N=4037 APOA14; 0A9N=4037 APOA14; 0A9N=4037 APOA14; 0A9N=4037	H FND 3.108 DDIN 18 1/84 N DAD 6811 DDIN 18 1/84 N DAD 6811 DDIN 18 1/84 N DAD 6856 DDIN 18 1/84 N FRD 4656 DDIN 18 1/84 N FRD 4656 DDIN 18 1/84 H FRD 4656 DDIN 18 1/84	-)470) 4. 76049 76049 76049 76049 76049	GHA1=0 AFACT>0 [HA1=0 [HA1=0 [HA1=0] [HA1=0]
	APON OANA=4037 APON O3102=736 ARUTA O3102=736 ARUTA O3107=736 APON O3107=736	A 680 A634 0111 14 3744	KODDT HODDT RADOT	
		PC AD BLANK G FAD O, BEIM ADN BUWUU G FAD O, BEIM ADN BUWUU G FAD O, BEIM ADN BUWUU G FAD ISOLA SE SUDWUU G FAD ISOLA SE SUDWUUC G FAD D. ORIM AND PUN INDAVOC		
	APIGA OINDTODYA APIGT OHDOJBB APIGD OIOCOUTA APIGD OICOUTA APIGIO OICOUTA	O PHD SOUP SON ROWUDG G PHD P. RUD PON ROWUDG G PHD P. RUD PON ROWUDG G PHD 0.4 TUR ODD PON REWUND G PHD 0.4 TUR OD PON REWUDG G PHD N. RUP ROW PON VDG	60 204 60 204 60 204 60 204 90 204 90 204	1000700849080084-0784 50082080000088-078 5018076-081 6018076-081 1008268000808-076
	APIGLE 0190>0181 3 APIGLE 0191>0040 3 APIGLE 0191>0040 1 APIGLE 0191>0190 1 APIGLE 0191>0190 1 APIGLE 0191>0193 1 APIGLE 0191>0193 1	C PAD C. HIP SOU-ROR BOWDC C.VAR, U-SADD C.VAR, U-SADD C.PAD C. PROM DON BOWDC C.PAD C. LIP SON BOWDC C.PAD C.LIP SON BOWDC C.PAD C.LIP SON BOWDC	77987 96714 96714	90.910-15-041. 930-(11-1200-941 ()'i 160022444093642-046 900015-041. 19003044403542-046
, , ,	APIGIA DINDAUBTA I APIGIA DINDAUBTA I APIGIA DINDAUBTA I APIGIA DINDAUBTA I APIGIA DINDAUBTA I APIGIA DINDAUBTA I APIGIA	C TED 0.4 THE THO-POR REMAIN C FED R. PUP POR ROMAUL C FED R. PUP ROR ROMAUL C FED R. PUP ROR ROMAUC C FED R. RUP ROR ROMAUC	90214 90214 90214 90214 90214	10004748403548=045 8011075=081 1500225002048=045 1500225002042=045 1500225002042=045 1500225002042=045
	ARIGPI ARIGPR APIGRA APIGRA APIGRA ARIGPA	G FAD 0.470F 480-208 880000 C FAD 2.200 PON RONADE C FAD 2.200 PON RONADE C FAD 2.200 PON RONADE	90789 • • • • • • • • • • • • • • • • • • •	

Ref Deelg	HP Part No	TQ Description	Mir	, Mfr Part No
ARIGRO ARIGRO ARIGRO ARIGRO ARIGRO	0180-0155 0180-0155 0180-0155 0180-0155 0180-0155	C. FRID R. RUF RON ROWVDC C. FRID R. RUF RON ROWVDC	86284 56289	1 200252200202020020020020 1 200252200202002002002 1 2002522002002002002002002002002002002002
ARIGHI ARIGHR ARIGHR ARIGHI ARIGH	1901-0047 1901-0047 1901-0047 1901-0047 1901-0047 1901-0047	5 010 \$1 010 \$1 010 \$1 010 \$1 010 \$1 010 \$1 010 \$1	28100 28100 28100	D3730 D3730 D3730 D3730 D3730 D3730
APIGNA AFIGNY ARIGND ARIGNY ARIGNIG	1901-0047 1902-3139 1902-3088 1902-3088 1902-3088 1902-3193	010 61 1 010 BKDN 8.289 58 400HH 010 BKDN 4.649 58 400HH 010 BKDN 4.649 58 400HH 010 BKDN 4.649 58 400HH 010 BKDN 13.39 58 400HH	07910 07910 07910	1) 37 38 CU 30682 CU 30610 CU 30610 CU 30610 CU 30742
ARIJIT	1880-0438 1880-0438	CONN COAR PC ND NTG CONNEX		81-181-0000
ARILI ARILA ARILA	9100+166R 03708-741 9140-0137	IND PRO BROWN BR IND VAR IND FYD IAH BR	BOOD7	2800-24 1837-28
AP101 AR107 AR103 AR103 AR104 AR105	1054-0092 1054-0092 1054-0092 1054-0092 1054-0092	• XSTR SI NPN XSTR SI NPN XSTR SI NPN XSTR SI NPN XSTR SI NPN XSTR SF NPN	(* 07263 07263 07263	5-6816 2N3563 / 2N3563 / 2N3563 - 2N3563 - 2N3563 -
AZIDA 42107.0 42100.0 42100.0 42100.0 421010.0	1854-0072 1854-0072 1854-0071 1854-0071 1854-0071 1853-0034	KETR EL-NPN XETR EL NPN XETR EL NPN XETR EL NPN XETR EL NPN XETR EL PNP	07263 D1295 D1295 01295	2N3602 2N3603 6KA1124 6KA1124 5N3147
ARIOIL ARIAI ARIAI ARIAI ARIAI ARIAI	1884-0082 0787-0381 0498-3439 0467-0381 0467-0381 0767-0398 0767-0279	XSTR 51 NPN A FXD 15 OHN 18 1/8W R FXD 170 OHN 18 1/8W R FXD 15 OHN 18 1/8W R FXD 75 OHN 18 1/8W R FXD 75 OHN 18 1/8W	19701 19701 19701 19701	51 1087 NHACT-0 NAC CRAT-0
AR186 AR187 AR187 AR187 AR180 AR180 AR180	0757-0394 0757-0394 0757-0200 0757-0274 0757-0274	R FRD 51.1 OHM 18'1/AW R, FRD 51.1 DHM 18'1/AW R FRD 5.02K DHM 18'1/AW R FRD 5.02K DHM 18'1/AW R FRD 1.21K DHM 18'1/AW R FRD 5.16K DHM 18'1/AW	19701 19701 19701	NFACT-U NFACT-Q1 NFAC NFACT-O CEAT-O
NEIRII AINIE GEIRIE AZIRIA VEIRIE	0757-0279, 0757-0407 0757-0407 0698-0004 0698-3154.	R FRD 3.166 OHN 18 170M R FRD 200 DHN 18 170M R FRD 200 DHN 18 170M R FRD 2.16K DHY 18 170M R FRD 2.16K DHY 18 170M R FRD 4.22K DHY 18 170M	19701 ,19701 ,19701	CEAT-0 NF4C NF4C NF4CT-0 NF4CT-0 NF4CT-0
APIR16 APIR16 APIR10 APIR10 APIR10 APIR10 APIR10	D698-3155 0757-0278 0757-0200 0698-3444 0757-0290	R FRD 4,64K DIN 18 1/84 R FRD 1,78K DIN 18 1/84 R FRD 1K DIN 18 1/84 R FRD 1K DIN 18 1/84 R FRD 516 DIN 18 1/84 R FRD 516 DIN 18 1/84	75042 75042 19701	,HFACT-0 CEAT-0 CEAT-0 HF4CT-0 CEA
AZ]AZ1 ANTAZZL 4 AZIAZ3 4 AZIAZ4 AZIAZ5	0757-0274 0757-0279 0757-0280 0757-0280 0757-027 0757-0280	B FRO 1.21K OHN 18 1/89 B FRO 3.16K OHN 18 1/89 B FRO 1K OHN 18 1/89 P FRO 1.3K OHN 18 1/89 B FRO 1.3K OHN 18 1/89 B FRO 1.8 OHN 18 1/89	75042 75042 19701	HFACT-U- CEAT-0 HFACT-0 CEAT-0 CEAT-0

Abbreviations are listed in the introduction to this section

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Replaceable Parts (continued) Table

Ref Deelg	Pert No	TO	Description	Mf	Mir Part No
AR 1886 AR 1887 AR 1887 AR 1886 AR 1887 AR 1877 AR 1977 AR 19777 AR 19777 AR 19777 AR 19777 AR 197777 AR 19777777777777777777777777777777777777	0787-0419 0787-0198 0787-0198 0787-0199 0787-0199 0698-0088 1		ABI ODIN IN IARM ALOOK DINN IN IARM SIOK DINN IN IARM RISK ODIN IN IARM AGA DINN IN IARM	1970) 76048 19701	NPAGI=0 NPAGI=0 NPAGI=0 NPAGI=0 NPAGI=0
ARIADA ARIADA ARIADA ARIADA ARIADA ARIADA	D757-0738 0757-0738 044-3-45 0757-0879 0757-0879	K R KU R PXD I R PXD	909 000 14 1/40 4 909 000 14 1/40 940 000 14 1/40 940 000 14 1/80 9.168 000 14 1/80 168 000 18 1/60	19701 19701 74088 19701	MIBRG1+0 NISACT-0 NIACT-0 Chat-0 NIACT-0 NIACT-0
ARINJA APINJY APINJY ARINAU ARINAU	0757-0788 *0498-3445 0498-3459 0757-0788 0757-0780 0757-0418	, R PND S B PND B PND	619 OBM 18 1/40 247 DBM 18 1/80 178. DBM 18 1/80 0197 DBM 18 1/80 36 DBM 18 1/80 619 DBM 18 1/80 619 DBM 18 1/80	19701 19701 19701 78048	NFBRGI=U NFACT=D NFBRGI=U GUAT=D NFACT=D
AR 1848 AR 1844 AR 1844 AR 1848 AR 1848	0448-3188 0448-4037 0448-4037 0448-4037	A PAD	40.4 UNA 18 1/00 40.4 UNA 18 1/00 40.4 UNA 18 1/00 40.4 UNA 18 1/00 40.4 UNA 18 1/00	1470) 78042 78042 78042	HIACT-0 GRAT-0 GRAT-0 GRAT-0 GRAT-0
ARIAAN ARIAAN ARIAAN ARIAN ARIAN	0444-4037 0644-4037 0444-4037 0444-4037 0444-3155 03702-7212	A PHO A PHO A PHO A PHO A PHO	46.4 1014 18 1/80 46.4 1014 18 1/80 46.4 1014 18 1/80 45.4 1014 18 1/80 45.648 1014 18 1/80 16 ANPLSP104 6 OBTECTOR	76042 76042 ,19701 E0007	CHAT=0 GRAT=0 GRAT=0 NFACT=0 NFACT=0
APRCI APPCR APPCR APPCR	03702-3212 0160-0093 0160-0662 0150-0050 0150-0155	AC FND C FND C FND C FND C FND	ALANK, F U.OLUF +80-LOW LOOMVDG BLPF BW BOWVIC LOOOPF +80 -20% LOODWVDG 2.200 F 400 -20% LOODWVDG 2.200 F 400 -20% LOODWVDG 3.200 LOW LOWVDG	- HUDUT 71418 - RUA46 91418 56284	
ABYCS ABYCS ABBCT ABBCT ABBCT ABBCT ABBCT	0100-0155 0140-0155 0140-0562 0150-0050 0150-0050 0150-0050	C FAD C RAD C FAD	R. RUF RON ROWVIC BINN BE SOWVIC LODDIFF HO - RON LODOWVIC LODOIN HO - RON LODOWVIC LODOFA HO - RON LODOWVIC	BARBY	LBODZEDKOUZUAE-DVS DEB-#131
	0150-0050 0180-0155 0150-0050 0150-0050 0160-0155	C PAD C PAD C RAD C RAD	LODOPF +AD - 208 LOODWVDC 8.20F 208 20WVDC LODOPF +BO - 208 LOODWVDC +4 LOOOPF +BO - 208 LOODWVDC +4 2.209 208 20WVDC - 3	y 91410 91410 96209	LBODERBHOUZUAR-DYB
ARACIA ARRCIN ARRCIN ARRCIN ARRCIN ARRCIN ARRCIN	0150-0050 0150-0050 0150-0059 0150-0059 0150-0050 0150-0050	C PAD C PAD C PAD C PAD	LODDYF +RO, -ROK LODDWYDC LODDYF +RO -ROK LODDWYDC R.RUF ROK ROWYDC LODDYF -RO -ROK LODDWYDC LODDYF -RO -ROK LODDWYDC LODDYF -RO -ROWYDC	91410 91410 86289 91414 91414 91414	LOUZEBNURZAR DVS
ARRECEL ARRECER ARRECES ARRECES ARRECES	0150-0050 0150-0050 0150-0050 0150-0050 0150-0050	- C FAD C FAD C FAD C FAD	1000PF 400 -20% L00DWVDC 1000PF 400 -20% L00DWVDC 1000PF 400 -20% L00DWVDC 1000PF 400 -20% L00DWVDC 0.01UF 480-10% 100WVDC	91418 91418 91418 91418 91418	
ABBCRY ABBCRN ABBCRN ABBCBY	0127-0602 0160-0643 0140-0155	C VAR	1.4-9PF .BONVDC,	E0002	HD9-05002 4131-025 1500285x0020AR-DY5

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Hof Deelg	Pert No	TO Decomplinity	Mir Part No
ARXBOD	0180-0144	o exp system box bomade.	APARA LAUDAPAKODADAP=DVA,
APROSI	0140=0155	a red a gift And Polyders	POTAV I SUDIARKOPOAR=DVS
APPON	,010-0199; 0100-0199;	8 FXD FINE YOL FORVOR	AAAAY ISUNAAAAAYS
APPONI	1401-0347	A 16 HOT DANNINA	PRAND PRERENDED
APPEND	1901-0010 1901-0447	KIN MAY DANNIER	
I SANRUNA (EXPlan 1972 - La Villey (Explanation)	1407=0075	DIO WERN INV KUNIN	OTVID CITIBTON
	140×0435	CONTROL CHART MO. AD ATO COMMENTS A CONTROL OF CONTROL	
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	03701=776 9140×0144		A A A A A A A A A A A A A A A A A A A
E ARRIGER STOL	03100=0144 (77000 1078-36 X10000
网络机动 非常可能分子	03701y730	化自己可见了中心 机装置器 化合同管管 法非法法法 经过程的 计分词数数 计推翻	HOUDE
AFEDI	1884+0071+ 1884+0071+	自己是非常的问题,我们也能能能够有了,只是有中国多了。""你们	01790 SKALL24
ARRUD	1844×0389		
AVADA	1401-0808	A A A A A A A A A A A A A A A A A A A	SULARY BANKARDERA
	1004-0239;; 1209-0008-1	XETH BE NPN URAT OF SETPATAR AFTR	ALITZAA JALYADDERH
ARRUN		NEAL DUSINGATOR ASTR.	
ANAGT	1805-0838+ 1805-0008	- 2019년 - Maria 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997	
ARRUN	100420042	IBAT DI STRAADR NOTH .	UTANA ANIMADANAN, Utana animada
APPH1 APPHP	OAVA=ODAA	A HND PLICH OWN IN LYNN	TYTOL HEADT=D
APRN3 (C. C.	0787=0448 0787=0448	A IN IN AN A SALE SALE SALES	AN TOTAL AND A SECOND AND A SECOND
ARTHE	0757=0469	A FAD INDA DINA IN IZANA A FAD INDA DINA IN IZANA	INTEL HEADTED
	-0747=))279	H. PHD J. LOK DHIN 14 178W	THOAR THAT FOR
APPNA	D757-D774 DAVA-3444	A PAD ALAY DUT IN LAW	, ACT BOAD, GRATHORN, C. C. B. C. C. C. S.
ARAHLO	0648=3444 0747=0284	A PAD BIA DIA IN IVAN	A COMPANY AND A CO
APPRIL	0787-0464*	TH PHD THEN ONN IN LAR	414701 HPACT+0
ARRIE	0787=0469	A PAD LOOK DAN IN LYDN A PAD LON DAN IN LYDN A PAD LON DAN IN LYDN	NINTRE APAD
APPRIA W	0787-0448 0787-0348	H FAIL TO MH IN LYNN F	ALATOL MPAL
AZRALA	0767-0280	H PHIL IN DUA IN AND A SALE	YADAA CHATAU 19701 H M ANTAU
ARRALT	07#7#04#4 0698#2430	A FAD LLA DIN TA LAN	19701 HEAD1=0'
ARXAL4 ARRARD	0698-3444 6787-0419	A FAD ANY MIN IN 1700	NYOI NYAGTAO
ARRARI	0698-3445 ·	N PRIJ DIA DIM IN TANK N PRIJ DIA DIM IN TANK	A TATOL ADAGTADE A SALAS
ARRARA	0767×0402;	ALAND LLO DIN IR LOW	2 1970 HEADTHO THE STATE STATE
ARTREP	0448-3441	A 2 II KAO ALL ONN IN LOON	1970L NEADIND
Steme S	0698-3138	B TRANSPORT ROL DINN IN AVAIL	1970) NPAGARO

Table 4+1 Replaceable Parts (continued

Abbreviations are listed in the introduction to this section

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			Mir Mir Pari No
Ref Davig	NIND TO	Pescipion,	
ABERT	797=0400 640=0048 640=0040 640=0040 640=0000		
	787=(1284 648=3236 648=3236 757=(116 757=(116 16		
			1400 NI 401=0 1404 P (FAT=0 CYOI N 401=0 1404 P (FAT=0 1404 P (FAT=0) 14120 1412
	YAT=0140 AVA=1430 AVA=1430 T4T=0140 T4T=0140 AVA=1430		ATTOL HAAPLE ATTOL HAAPLE ATTOL HAAPLE ATTOL HAAPLE
		A AND PAL ONI IN LAM, A ANALI A ANALI	
PIRE 2	101=7154	ALIAR MAR IN MINEH & LODAL DEGILLATOR	eungtverti
		C PO AD ALANK P O FRO I DOPP AN BUDAVOS FRO I DOPP ANO BUDAVOS FRO I DOPP AN BUDAVOS FR	
A760 A790 A790 A790 4790 4790)100=0000 1100=0000 1100=0000 1100=0000 1100=0000	D PAD TODOPT AND FYDE TODOWNDA 6 PAD TODOPT AND FYDE TODOWNDA 0 PAD TODOPT AND FYDE TODOWNDA 0 PAD TODOPT AND FYDE TODOWNDA 0 PAD TODOPT AND FYDE TODOWNDA	ANALA SOLARANDOROAR-OVS
	DI 60-2260 DI 60-2260 DI 0-0020 DI 00-0020 DI 60-2200 DI 60-2200	G FRU ADER DE BOUNVOU G FRU ADER DE BOUNVOU G FRU TODOPE AND ADAT LODONVOU G FRU TODOPE AND ADAT LODONVOU G FRU TODOPE AND ADD BOUNVOU	
APICIA APICIA AFREIO	0190-0090 0190-0090 0190-0090 0190-0090	C HAD TOPP IN DOUVDON C HAD DOORPH IND -PON DOOUNDO C HAD DOUPPH IND -PON DOOUNDO C HAD DOUPPH IND -PON DODUNOC C HAD DODUPH IND -PON DODUNOC C HAD DODUPH IND -PON DODUNOC	
APSCA APSCA	D190>0090 D190>0090 D190>0093 D190>0093 D190>0093 D190>0093 D190>0093 D190>0093	C HAD ANDER IN TOOMADD C HAD APPA PA DOUADD C HAD OFOUND THOMADD C HAD OFOUND THOMADD	9)ALN BAPRY IDUNIUDUAPAP-DYS 9)BA ADAIDATBUJIC IAAN ADAIDATBUJIC
ARBORN, SA APRIL	6160-8807 6160-0184	C FAD ANPP SE DOUNYOG C FAD PROPP SE DOUNYOG	, 77136 AUH201470356 Laops Anni 19773330

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fief Deelg	Pari No	ta d	Description	MI	Mfr Part No 🕫
					Anny beyend an Isbupper nusualauxy
APD5 01 APD5 01 APD5 01 APD5 01 APD5 01 APD5 01	HIHO=0149 HIHO=0149 OIA0=0469 OIA0=0469 OIA0=0469		C FRI R. SUIL POR ZOÄVIO C FRI R. SUIL POR ZOLVIO C FRI R. SUIL POR ZOLVIO	2. 管理有利用的	
A#BCBA	0140=0147		G' NKO LHOPP, SH BOOWVOO	14136	AULALIA A
			HIVER SAN AND TRY BARRIER RATEILED WAS	1000 1000 1000 1000 1000 1000 1000 100	191192/19912 191192/19912
- Altona Aftony	1901=0845 1901=0845		DIO SI SCHOTTAY HANATHA HATUNED DUAD DIO SI SCHOTTAY HANATHA HATUNED DUAD'	n in hand	
			LONN GDAN PG HD ATG COMMEX CONN GDAN PG HD ATG COMMEX	90291 90291 90291 90291	
APJJA APJJA APJJA	1890-0938 09702=778 7140-0144		CONNI CDAN PC AD MTO CONNER IND YAN ALTUN 101	44400 40001 44400	10 6 1-101-0100
	9100-1441 03702-7944 03702-7944				
AP916 AV917 AP91,0 AP91,0	01707=7101 01707=7100 01707=7144 9100=2349		THO VAR THO VAR HID VAR HID VAR HID VAR HID VAR	60007 60007 60007 17509	Dufandarjik
ADDACL	+ 1400-0477 1804-0019		IC UP AVP	11799 11799 11799 11799	5/11/2 31
	1464-0019 1464-0019 1464-0019 1464-0019			19710 19710	6#6814 6#6810 5=6810
APBUA AKANT	1894-0048 1894-0098		NETN BI NUM	01409	RNADA
APDRI APDRP APDRD ARDRD ARDRD ARDRD	0797=0448 0797=0446 0797=0446 0698=4477 0698=4477 0797=0434		A FRO SER OHN EN LYNN A FROMSEK OHN EN LYNN A FRO GOUN OHN EN LYNN A FRO GOUN OHN EN LYNN A FRO GOUN OHN EN LYNN	1970) 1970) 1970] (1970] (1970] (1970]	НРАБ ННАБ Станца и станция и с
АВЭН6 АВЭН7 АВЭН4 АВЭН4 АВЭН4 АВЭН10	2100-2891 0698-3182 0787-0448 0787-0487 0787-0487		R. VAN REKSONS LUE 1780 A PRO 3.ABK DIN IN 1780 A PRO 3.ABK DIN IN 1780 A PRO 108 DIN IN 1780 A PRO 108 DIN IN 1787 R PRO 108 DIN IN 1847 R		HPAGT#D
429411 914944	R100+1738			-1, 19701	62-209-1 HP4C1-0 HP4C1-0

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Abbreviations are listed in the introduction ťö Beetin IV

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Replaceable Parts (continued)

Ref Deely Par	P TQ	- Description	Mir	Mir Part No
APARIA .UNY	R THE STATE	NAD 604 000 18 1700 FRD 1138K,000 18 1700	YUUU	AFADI.»D GRAT.»D
APANIA" 075 AP3617 075 AP3617 075 AP3614 075	17#10403 17#0403 17#0400 17=0401 17=0401 17=0401 14#3439 13		75(14) 1770) 1970) 1970)	NBAG1=1) GHA1=0 NAG1=1) (H5G1=1) H5G1=1) H5G1=1)
АРЭНРР АРЭНРР АРЭНРР АРЭНРР АРЭНРР АРЭНРР ПТ	1 a () 4 () 4 5 7 × (0) 4 6 7 × (0) 4 7 × (0)	FRD FRD <th>19701 75047 75047</th> <th>лплы Анастэн) Анастэн) Статэн Статэн Анастэн</th>	19701 75047 75047	лплы Анастэн) Анастэн) Статэн Статэн Анастэн
Арэнрү Арэнри Арэнри Арэнри Арэнри Арэнри Арэнри	97:0340 91:0340 91:0714 91:0714 91:0714	IND ORYL DUNK IV 170M FAID IO DUNK IV 170M FAID FAIT DUNK IV 170M FAID FAIT DUNK IV 170M FAID ISD DUNK IV 170M FAID ISD DUNK IV 170M	74047 19701 78047 79047	
AV3437 AV3A37 AV3A34 AV3434 AV3434 AV3439	N - 744 1 - 1446 4 - 1446 4 - 1446	PAD 210 ONN IX 1700 VAR 25K ONN IV 1720 PAD 19K DIM IN 1720 PAD 19K DIM IN 1700 PAD 316 ONN IX 1700 PAD 316 ONN IX 1700	91030 19701 19701 19098	62-31]-1 MAG(1-1) MAG(1-1) USAT-0 UHA1-0
аранат Аранан Аранан Аранан Аранан Аранан От	6120397 87206012 98720601 98720601 98720601 98720601 98720601 98720601 98720 97720 97720 97720 97720 97720 97720 97720 97720 97720 97720 97720 97720 97720 97720 97720 97700000000	PAD DISA (004 IN IADA PAD ADSI (004 IN IADA PAD 100 DUA IN IADA PAD AGA (064 IN IADA PAD AGA (064 IN IADA PAD ISA (064 IN IADA	1970) 1470) 15042 1970)	
Арэнар Арэнаа Арэнса Арэнса Арэнса Арэнса Арэнса Арэнса	97-0140 97-0410 97-0419 00-1980 1	PRO 01.000 0000 10 1200 PRO 11.000 000 10 1200 PRO 10.0000 10 1200 PRO 010 1000 10 1200 VAN 10.000 100 1200 0.000 01.00 000 00 0.000 01.00 000	76048 78048 1970] 81030	GIA1=0 GIA1=0 MPAG1=0 AR=20A=1 AR=20A=1
АНЭНАТ АЛЭНАН АЛЭНАН АЛЭНАЦ АЛЭНИЦ ОЛ	#/#=3430 67=1094 67=0874 67=0874 98=344	AD FIN OWN IN 170M	19701 19701 19701 76048	HPACT=0 HPACT=0 CTAT=0 HPACT=0 HPACT=0
AP314 AP314 AP314 AP314 AP314 Q21	10-7024 10-7024 10-7029 10-7029	MAIL PAN FAR FAR FAR FAR FAR FAR FAR FAR FAR FAR	HOUDT EODDT EODDT EODDT EODDT HOUDT	
APACI 01 APACE 01 APACE 01 APACE 01 APACE 01	90-0090 10-0188 00-0188 00-2149 00-2149 00-2149 00-2149		91418 56289 91418 91418 91418 91418	Hohireyjjar 19 19 19 19 19 19 19 19 19 19 19 19 19
AZACH 01 AZAC9 01 AZAC10 01 (AZAC10 01 (AZAC11 01	60-0737 60-0667 60-0156 60-0156	ind d'unit de rounde ind ander de societ ind ander de societ ind societ ex rounde ind societ ex rounde partager an societ partager an societ	78982 `86289	нинтыгчагуд 1920 жучя-ить асилстанияс
	IND-RIAB	, UNUTADDODIE AND-VOR TOUNADD END PODDIE AND-VOR TOUNADD	91411 91411	

Section IV

Ref Deely	Pert No. T	Q Descrip	ntion and the Mfr	Mir Part No.
АРАСІВ - Арабія Арабія Арабія	0190×0093 0140×0199 0140×0199	G. FND 0,010 140-101 I FND 2-200 POLYDE G AND 2-200 POLYDE	1000VDB 91410 8 90704	LODPPEKDDRUAP-DV5
АРАДІН АЛАЦІЧ АЛАЦІЧ АЛАЦІЦ АЛАЦІЦ АЛАЦІЦ АЛАЦІЦ АЛАЦІЯ	0140×0145, 0140×0145, 0140×0145, 0140×0243, 0140×0243, 0140×0243, 0150×0043,	6 (PRO R. DUP FOR POHYDE C (PRO R. DUP FOR POHYDE C (PRO R. DUP FOR POHYDE C (PRO 6800 SW (POHYDE) C (PRO 6800 SW (POHYDE) C (PRO 0.0300 (POHYDE)	6 100NVD6 100NVD6 100NVD6 91414 91414	I BODZABKODZUAZ=DYB
ARAGRA ARAGRA ARAGRA ARAGRA ARAGRA	0140×0199 '0140×8840 0140×8844 0140×8149 0140×8149 0140×8149	G PAD P. PUP FOR BORVIO G PAD 4300 BY SUDAVDO G PAD 4300 BY SUDAVDO G PAD 7, SPP DO FOR POP BO G PAD R. PUP FOR POP BOADD	ONADE L'UNE CONTRACTORIS CONTRACTORIS CONTRACTORIS CONTRACTORIS CONTRACTORIS CONTRACTORIS CONTRACTORIS CONTRACTORIS C L'UNE CONTRACTORIS CONTRACTORIS CONTRACTORIS CONTRACTORIS CONTRACTORIS CONTRACTORIS CONTRACTORIS CONTRACTORIS CO	1 BODRA BNDORDA 4-DYB HOHL BUA BDJ 10 9 D1 - NHD-7 - 9HH 1 BDDRA BNDDRDA R-DYB 1 BDDRA BNDDRDA R-DYB 1 BDDRA BNDDRDA R-DYB
ARAGRH ARAGRY ARAGRY ARAGR ARAGR	0190>0093 0140=7190 0590=0171 0140=0174 0140=0174	G FXO 0.4100 +80-108 1 G FXO 0.4000 +80 -108 1 G FXD 0.400 +80 -800 -80 G FXD 0.4700 -808 -808 G FXD 0.4700 -808 -808 G FXD 0.4700 -80 -808	ONANA ARMANYA ARMANYA	
ARAC33 ARAC34 ARAC34 ARAC39 ARAC39 ARAC30 ARAC30 ARAC37	0100-7714 0140-0700 0140-0700 0140-0300 0140-0300 0140-0300 0140-0140	G PRO 6600P SY ADDIVID C PRO 3000P OR 3000000 C PRO 0.00700 JON 300 C PRO 5.600 0.8500 SU G PRO 8.000P 300 RUMA	C	номі чила і цэс Комі визчі цэс Зоі +000-сонні-вача Ічаривача-и і б
ARAGON NACOV Aragao Aragao Aragai Aragai	0160-0300 (0160-2251) 0160-0159 0160-0699 0160-0699 0100-0159	C FRO D. OD TUP LON 300 C FRO D. APP D. 2007 C FRO 33000 JON 2004 C FRO 3000 D. 30000 C FRO 8. APP 200 2000 C FRO 8. APP 200 2000	ONADC ADC ADC ADD ADD ADD ADD ADD ADD ADD	101-000-0000-8696 1920132092-016
ARAGAB ARACAA ARACAB ARACAB ARACAB	0100-0155 0100-0155 0100-0155 0100-0155 0100-2150	C PHD R.RUP ROW ROWAD C PHD R.RUP FOR ROWAD C PHD R.RUP FOR ROWAD C PHD R.RUP FOR ROWAD C PHD R.RUP SN. ROUMAG	G G G G G G G G G G G G G G G G G G G	
APACRI ARACAR ABACAR ABACAR ARACAR ARACAR ARACAR	1401-0039 1401-0347 1902-0041 1408-3036 1408-3036	E DIO PIN IMMZZIGHZ DIO HDT CARRIER I DIO BRDN BADIV BU AQDI I DIO BRDN IAIVY BU AQDI I DIO HDT CARRIER DIO HDT CARRIER	NU NU NU NU NU NU NU NU NU NU NU NU NU N	5008-0300 CO36028 5008-0350
ARACHT Araji Arajr Arajr Arajz	1901-0347 ,1250-0932 1250-0932 1250-0932	DIO HOT CANGEN CONN COAN PC ND HTG GI CONN COAN PC ND HTG GI CONN COAN PC ND HTG GI	ONNEX ONNEX ONNEX VH291	51-151-0000 51-151-0000 51-151-0000
AP4L1 AR4L8 AR4L8 AR4L3 AR4L5	03702-7186 03702-7186 03702-7185 03702-7185 03702-7185 03702-7185	I IND VAR I IND VAR I IND VAR I IND VAR I IND VAR I IND VAR		
AZANGI Azamer Azamer Azamer Azamea Azamea	L020-0477 L020-0148 L020-0477 L020-0477 L020-0477	LC OP ANP LC OP ANP C OP ANP LC UP ANP LC UP ANP LC OP ANP	01295 04713 01295 01295 01295 01295	6N19231 .
ARADI ARADR ARADR	1854-0071 1854-0014 1854-0019	XSTH BI NPN KSTH BI NPN XSTR BI NPN	13715	5KA] 12A 5-6516 5-6516

Abbreviations are listed in the introduction to this section

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Nef Deelg	Pert No	TO	Description	Mfr	Mfr Part No
ATAD	1997 in Anna - Anna Anna		\$1 NPN	13715 \$	
ARAQA	1899×0090 1894×0098	REPART AND A STA		04713 5	1, 1607
АРАОЛ Арацу Арацу Арацу	1894-0019 1894-0019 1893-0034			19719'N 19719 5 19719 5	i×6016 set set in statistic
ARAQUI	1003-0034	ABTH		DAYIŞ N	
APAUIB APAUIB ARAUIB ARAUIA	066#0039 065#0034 065#0034 01064=0039	100 - 100		19719 6 04713 6 19719 6	
AR4010	1094+0014 1094-0014	XATIL	i CI NDN - Article Control (Control Control Contro Control Control Con	19719 B 19719 B	
AP481	0767-0401	a a ph	0'100 DIN 14 1709	19701 H	PADAD
ARANA	0798+3430 0797=0401 0767=0880	二十二日 化化物	D XIVO DHA IN IN IVANA D DO DHA IN IVAANA D DO DHA IN IVAANA D N DAA	SA 19701 N - 19701 N - 19701 N	PACT=D
ARANU	, 0707-0401		D. DO. DIN 18 178N STATES AND	19701 N	MADI-0
ARANA ARANY ARANY	0690=0084 0757=0401 0757=0401	\$P\$	D A. DAN DIN IN IVAN D LOD DIN IN IVAN D SANK DIN IN IVAN	(* 1970) N (* 1970) N (* 1970) N	FAGTED SET
AZARU AZARIO	0648-0088 0787-0487		B H:BEK DIM IN I/AM I.BK. DIM IN I/AM	10461 A 19701 (N	PAGY=O S (States) (States) (States)
ARARIL	0757-0203 0757-0442	小方河市 非例	D' AK DHH TH TANK D' TOK DHH TK TANK	19701 N	
A24113 A24114 A74415	0787-0458 0698-3136 0787-0449		D BLAK OHN IN DANK D 17.08 IN 1400 D 806 OHN IN 1704	1970) A 1970) A 1970) A	NACIPO STREET, S
ARABID	UPAN-DOHK		D 404 DHN 14 1/84	19701 H	PAGE-0, 22
AZAR17 AZAR18 AZAR19	, 0757-0458; 069873138; ,0698-3136;	I I I I I I I I I I	D B1.1K OHM 14 1/1M D R61 OHM 14 1/1M D 17.HK 18 1/1M	19701 H 19701 H ,19701 H	HACT-0 HALT-0
ARANRO	0757-0280	法法法的利用	D 18 DHN 18 1700 D 1.168 DHN 18 1700	YBOAR CI YBOAR CI	RAT+D
AROHRR ARAHRZ	0757-0416	land Theat of R (PA)	D B11 DHN 1K L/AW states a second state D 3.10K DH11k 1/AW states a second states	75042 G	PAGT-D RAT-D
A24824 A24825	0757-0401 0698-3351	R PRI	0. 100 DIM 14 1700 D. R. N7X DIM 14 1700	19701 H 19701 H	PAGT-U
AR41126 A241327	0757-0280 0757-0283	B. PXI	D IK DHN IN IZNN	75042 CI 10001 19701 NI	
A24R30 A24R31 A24R31	0757-0439 0757-0200 0757-0200	E BAR BAI	D 6. MIK DIM JR 1/BH D 8. 63K DIM JR 1/HK D 562, DHM JR 1/24	19701 N 19701 N	
AR4833 A24834	0757-0200	, R FXI	D BLARK DHA IN JANA	19701 HI 76047 CI	BATHD
A24835 A24836	0690-3430 0698-3155	n sa sa ka ka ka ka Marata ka ka ka ka	D 2165 DHM 1% 1/04 D 4.64K DHM 1% 1/04	19701 - N 19701 - N	PACTAD BALL AND
AZARDY	0787-0419 2100-2061		D AUL DIM LK L/OM B 200 DIM LOK L/20	81030 19701 AI	
A24839 , A24840	0767-0418	haa sita n phi	D 619 CIAN 1W 178W D IN CIAN 1W 178W D BALLOUN 1W 178W	78042 CI	RACT-D.
A24R41 A24R42	0698-3446	1	D 241 DIM 18 1/44	- 19701 HI	PACT-O
+ AZ4R43 A24R44 A24R45	2100-1788 0757-0427 0757-0427	REPAR	A BOD DHM IOK I/2N LINA D 1.6N DHM IX 1/8N D 1.6N DHM IX 1/8N D 1.6N DHM IX 1/8N	21030,68 Lv701 Mi L9701 Mi	K-KUD-1 FACT-U
		N , N N			

Table 4-1 Replaceable Parts (continued)

Section IV

	Р., с. Т. I.	Table	4-1 Ropinponisin Parta (cont	inu ed)	
Ref Desig	Part No	TO	Description	Mir.	Mir Part No
АЈАВАВ Ајанат	0797=0398 0797=0398		10 76 (1111 3 K 1781) 10 76 (1111 3 K 1781)	19701 / 19701 /	
аранан Аранау	0757×0477	1111日1日1日 111日前日 11日日日 11日日日	D 109 MM 18 JAH	19701	HABTAD HABTAD
- ADAHOD 7 ADAHOD	- 0767×0419 > 0767×0790 - 0767×0790	二十二十二十十月 日月	1) 661 0100 11 1709 1) 6, 910 0100 11 1709 1) 6, 910 0100 11 1709	Se i 1970 î h	
алания Арапия	2100-1700	S S S S A N V	H BOD HIM THE LARN LINE	A 08018	P=205=1
Аланда. Аранду Аранду	0797×0414; 0767×0366 0757×0401	11111年1月1日 1111日日 - 111日 1111日日 - 111日		1970) 70080 70080 70080	HAR THU STATES
ABANY7 APANND	0797=0416` 0698=0084		(), 911, 6104, 13, 1704, 3704, 371, 371, 371, 371, 371, 371, 371, 371	1970151	(FAG1=0
Аланич Аланоо	0/148>0084 0797=0788 0797=0780	- 一川 橋	ID DK IDIN DW DZAN D DK IDIN DW DZAN	190AR (IPNGT#DELSE RAT#DELSE RAT#DELSE
АЛАНА) Аланал	0797=0400		B 15 BIN 17 1/80 D 61.98 DIN 34.1/84	• 10 • • • • • • • • • • • • • • • • • •	
Аданој Аданој Аданој	0757=0486	a da	ID) TOOR (INNE DE DYNNES) (ABARANA) ID, Thank Brinne De Dynnes) (Abarana)	THUAR OF	HA THD. HAGTHD
Azakad	0787-0240 0787-0217	は、作用	D K DIN DR ZAN	79048 C	
АРАНАН Аранач Аранто	0797+0460 0797+0460	出口 的复数	D R.108 (D(H))18 1700 D 61.998 (D(H) 18 1700 D 7808 (D(H) 18 1709	1970) A 1970) A 1970) A	
ARARTI ARARTR	0787-0484 0787-0401	一 完成 打印	D 6198 DIN LE 1780 D 109 DIN LE 1780	91637	PAG1=0
ARANY3 ARANY3	0797-01138	:治疗 打印的	D ROT DON TH TANK	19701 B 19701 B	HAG1+0
ARANTO	01702-7168		D ATTO IDIN TR 1210 NANKRII OLINHAATRA	, 14töl k ndody	HACT HO
ARSCL	0150-0050		0 1000PT +H0 -ROB LOODWOG	10007 100000000	
ANDES	0160-0186		D R. RUP ZOR REMADO DI LODUPH (+40 - PON LUQUAVDE DI LODUPH (+40 - RUN LUQUAVDE		SUDERSNUDADAR-DY6
ARDEA Ardea	0160+0666		D-ALBPE BR JONADE	PONAD U	· · · · · · · · · · · · · · · · · · ·
ARUCA ARUCT ARUCI	0150-0629		D 6.4PF 5% 304406 D 1000/F (400 + 20% 10004406 D 10PF 5% 304406	41414 20040 1	111-025
ARBEY ARBEJO	0150=0050- 0150=0050-		D'1000PF++H0R0K 1000WVDC	12.10 - 91410 1.10 - 91410 1.10 - 91410	
ARDGII	0150-0050	6 JU	o 1000pm +ho =ros 1000wydd -		01=1)#11=7+0 #4 01=1)#10=7+0 #4
A25013 A25014 A25016	0160-8856 0160-0686 0160-0174	1 2 2 6 19	р-7. врр. 0. дврр. воончос 0. вкрр. 9ж. вончос 0. 0. 4 тир. 400-дож. квичос		III-ORB GIIN76-CNL
ARUCIO ARUCIO	0)10-0155		D R. MIR 208 20000C	, • 66269.5	80022880020A2-076 C11076-CND
ARBCIN ARBCAY ARBCRO	0180-0155 0180-0841 0180-0884	C B)	D 2. AUP ZON ZOHVOC D RRIF BN DONVOC D SKIF BN JOHVOC	ROHAN, U	8002288002082-075 25-8111 31-025
ARBERE	0160-0640.	6 (1)	O LIPPE BY ADAVIDE	20HAD U	20-0111
ARUCZZ	0160-2261		D TALL DX RODAADC		01-000-0000-1907 01-000-0000-1907

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Table	4 6 1	I. KA	ביירי ויין		7888		100 - 0	•
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Ref Deelg	Part Ala T	Description	Mfr	Mir Part No
АРКОРА Аркора Аркора		C PAD A. PUP PON PONYDA	96809 96809	a di da na di sa si
AP4026. AP4027 AP4027	0140=0199 0180=0199 0180=0199	g pair provide for ponyde. 8. fair 1: Bur for Ponyde.	96209 96209 96209	
ANDERL	0100=0199 010#=0601 1001=0547	G VILT VAN DID UDY GARAIRH	2000 2000 2000	0107-0601 6080-6090
АРВСНЯ, АРВСНЯ, Арвсня, Арвсня,	901=0347 1401=0347	DIO HID- CANNYIN DIO HID- CANNYIN DIO HIDT CANNYIN	20480	9007-9390 9007-0390 9007-0390
APUCHO	11903-0947 1409-0947 1901-0947	DID ANT GARATIA DID ANT GARATAA DID ANT GARATAA DID ANT GARATAA DID ANT GARATAA	20400 20400 20400	C BONDADO CONTRACTOR CONTRACTOR
APBCHIO APBCHIO	1901-0347 1901-0347	DID, THE BARDIAN DID NOT GAADIAN	PHAND	800%-8380 900%-8380
ABBENIS	" [V0]=0147 90]=0347	BID HIDE CARALITE	рилии Вилии	
APUJI APUJI APUJI APUJI APUJI	1890-0938 . 1890-0938 : 1890-0938 : 1890-0938	GONN GUAN PC ND MIO CONNERT GONN GUAN PC ND NIO CONNERT GONN GUAN PC UD NIO CONNER GONN GUAN PC UD NIO CONNER GONN GUAN PS ND NIO CONNER	90291 90291 90291 90291	
A#\$,} A#\$,} A#\$,# A#\$,\$ A#\$,\$	03708-7898 9140-0144 03701-786 03701-786 03701-781 03701-786	I IND YAB A. TUN JON ND YAB ND YAB ND YAB	,80001 ,80001 ,80001 ,80001	
A291.6 A291.7 A291.4 A291.4 A291.9 A291.10	V140-0199) V140-018V V100-8488 V100-8488 V100-8488	A IND FAD D. AYUN RON HID PAD D. AYUN RON DID PAD D. AYUN RON NIC PAD D. PAUN SN NIC PAD D. BAUN SN NIC PAD D. BAUN SN NIC PAD D. BAUN SN NIC PAD D. BAUN SN NIC PAD D. ABUN SN N	7808/ 82141 82141 82141 82141	14703 14703 4418-RJ 448-RJ 448-JJ 448-RJ 448-RJ
APPLIL	03707-738	IND VAR	180001 180001	
A2803 A2802 A2803 A2804 A2804	1054-0323 1054-0219 1154-0092 1554-0092 1554-0092	ASTR SI NPA ASTR SI NPA ASTR SI NPA ASTR SI NPA ASTR SI NPA ASTR SI NPA ASTR SI NPA	0726	a knaphateri se steri e steri
ARBON Arbuy	1884-0098 1884-00198	NETH BI NPN NETH BI NPN	1371	8 A11968 8 5-6816
A & B (L) A & B & F, R A & B & F, R & F, R A & B & F, R & F,	0767-0430 0787-0407 0648-8490 0648-8490 0648-8490 0648-3493	AL MAD B. FIN KOHM IN IN I/AW R PAD-ROD DHA IN I/AW N PRO RA OHM IN I/AW N PRO RA OHM IN I/AW N PRO RA OHM IN I/AW N PRO R. NAK DHM IN I/AW	31970 9163 9163	NPACT-0 NPAC 7 CN/42/10-321-2 7 CN/41/10-321-2 1 NPACT-0 1 NPACT-0
A2510 A2510 A2510 A2510 A2510 A2511	0698-3443 0698-0084 0757-0401 0698-3447 0757-0398	N PRO RHT DHN IN LYNM N PRO RHT DHN IN LYNM H PRD IDD DHN IN LYNM R PRD ARR DHN IN LYNM H PRD ARR DHN IN LYNM H PRD 75 DHN IN LYNM	21970 1970 1970	I МРАСТ-U I МЛАСТ-О I МРАСТ-О I МРАСТ-О I МРАСТ-О I МРАС
AZBRLL AZBRLL AZBRLZ AZBRLZ AZBRLA	Q098-3431 0757-0401 05987-0401 05987-3431 0598-3431 0598-3435	A H PRO REF OHN IN LANA R PHD 100 OHN IN LANA R PHD 200 OHN IN LANA R PHD 200 OHN IN LANA R PHD 20 A DHN IN LANA R PHD 30 A DHN IN LANA	i i cooo	I NPACI-D

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Table 4-1 Replaceable Parts (continued)

Ref Deelg	Part No	TQ	Desorption	Mir 1,	MIC PARL NO
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Model 37078

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Table 4-3 Replaceable Parts OPTION 003

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Table 4-4 Replaceable Parts OPTION 004

Abbreviations are listed in the introduction to this section

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Table 4-14 Repieceable Parts OPTION 004 (CONTINUED)

Modal 3702B

Table 4-5 Code List of Manufacturers

The following onde numbers are from the Pederal Supply Code for Manufacturers Cetaloging Handbooks 114-1 (Name to Code) and 114-2 (Code to Name), Alphabetics) codes have been arbitrarily apagned to suppliers not appearing in the 114 handbooks?

Code No Menufacturer Dollas Cole ENGINEERING CO, INC.

DI121-ALLEN DRADLEY CO. 01205-TEXAS INSTRUMENTS INC. D2050 AMPHENOL CORP. 02735-11,0,A, SEMICONDUCTOR DIV. 03800-GENERAL BLECK CONP. 03977-THANBITHON BLECK CONP. 04713-MOTOROLA BENLOON, INC. 07263 FAINCHILD C M. LCORP. 07344 BIRCHER CO. ING. 07623-ECK AND KREBS INC 07010 CONTINENTIAL DEVICE CORP. 00353-C & K COMPONENTS INC. 12005-TRANSITRON ELEC, CORP. 12505-ARCO PLASTICS CO. 12607-CLAROSTAT MFG, CO, INC 13716 FAIRCHILD C & I CORP. 14000 SEMTECH CORP. 14403 HEWLETT-PACKAND CO. 10200 LORNING GLASS WORKS 17856-SILICONIX INC, 10701-ELECTRA MFG, CO. 20846-ERIE MFG, CO, 21030 BECKMAN INSTR. INC. 21845 SOLITION DEVICES INC. 22070 G.M, NAMEPLATEINO. 22753 U.I.D. ELECTRONICS CORP. 23036-PAMOTOR INC. 24355 ANALOG DEVICES 28106-BYLVANIA ELEG, PROD. INC. 20480 HEWLETT-PACKARD CO. 28489-TEXBERRY CONTAINER CO. 56137-SPAULDING FIBRE CD. INC. 66289-SPRAGUE ELECTRIC CO, 60741-TRIPLETT ELECT, INSTR. CO. 70674-ADC PRODUCTS INC. 71400-BUSSMAN MFG, DIV, OF McGRAW-EDISON CO.

71436-CHICAGO CONDENSER CORP. 71690-CENTRALAB'DIV. OF GLOBE 71786-CINCH MFG. CO. 72136-ELECTRO MOTIVE MFG. CO. 72825-EBY HUGH H INC.

Addres CITY OF INDUSTINY CALIF MILLWAUKEE WIB; DALLAS TEXAS BHOADVIEWILL Bomerville N.J. SYRACUSE N.Y. WAKEFIELD MASS, PHOENIX ARIZ. MILWAUKEE WID, MTN, VIEW GALIF, ROCHESTER N.Y. LONG ISLAND N.Y. AWTHORNE CALIF. NEWTON MASS BOSTON MASS, MORRIBTOWN N.J. DOVEN'N.H. SAN RAFAEL CALIF. NEWBURY PARK CALIF. LOVELAND COLO RALEIGH N.C. SUNNYVALE CALIF. INDEPENDENCE KANS. MILWAUKEE WIS. TORONTO ONTARIO **RIVIERA BEACH FLA.** SEATTLE WASH. HOLLYWOOD FLA. BAN FRANSISCO GALIF, NORWOOD MASS. **BURLINGTON IOWA** PALO ALTO CALIF. HOUSTON TEXAS TONAWANDA N.Y. BLUFFTON OHIO. MINNEAPPOLIS YST, LOUIS MO,

> CHICAGO ILL. MILWAUKEE WIS, CHICAGO'ILL, WILLIMANTIC CONN, PHILADELPHIA PA,

Mapulanturar Dude No 72982 BRIE 4ECH, PRODUCTS INC. (EN)# PA FULLERTON CALIF, 73138-BECKMAN INSTRUMENTS INC. 73734-FEDERAL BOREW PRODUCTS INC. CHICAGO ILL. PHILADELPHIA PA. 76042-1,R,C, DIV, OF TRW INC, 75916-LITTLEFUSE INC. PLAINES ILL 70530-GINCH - MONADOCK DIV. OF CITY OF INDUSTRY CHYSTAL LAKE ILL. 76854-OAK MFG, CO, HANNIBUNG PA. 77764-REBISTANCE PRODUCTS CO. 78189-ILLINOIS TOOL WORKS INC. **HLGINILI** 70727-CONTINENTAL-WIRT ELECTRONICS CORP. PHILA; DELPHIA PA NEW HOCHEL'I'E N'A' 70983 ZIERICK MFG, CORP. 80120-SCHNITZER ALLOY PRODS. CO. ELIZABETH N.J. BO294-BOURNS INC, **RIVERSIDE CALIF** BO785-INTERNATIONAL TELEPHONE NEW YORK N.Y. A TELEGRAPH CORP. 82142 JEFFERS ELECTRONICS DIV. DU BOIS PA. OF SPEER CARBON CO CHICAGO ILL. B2389-SWITCHCRAFT INC. OGALLALA NEBR 84411-TRW CAPACITOR DIV. B7034-MARCO-OAK INDUSTRIES A DIV OF OAK ELECTRO/NETICS CORP. ANAHEIM CALIF. BAN FRANCISCO CALIF. 91200-CONNOR SPRING MFG. CHICAGO ILL. 91418 RADIO MATERIALS CO. COLUMBUS NEBR. 91637-DALE ELECTRONICS INC. MAMARONECK NY. 98291-SEALECTRO CORP. 99800 DELEVAN ELECTRONICS CORP. EAST AURORA NY. BEDFORD BEDS E0001-TEXAS INSTRUMENTS LTD. LONDON W.C.1 E0002-MULLARD LTD

LONDON W.C.T E0004-ELECTRONIC PROD LTD CO-DURHAM, E0006 ELECTROBIL LTD, SOUTH QUEENSFERR E0007 HEWLETT PACKARD LTD. WEST LOTHIAN PAIGNTON E0000-STANDARD TELEPHONES & CABLES LTO DEVON E0011-GREENPAR ENGINEERING LTD HARLOW ESSEX BEDLINGTO E0012 WELWYN ELECTRIC E0017-W.E.L. COMPONENTS LTD READING BERM EAST GRINSTEAD SUSSE E0021-HELLERMAN DEUTCH WURTTEMBURG, W. GER. E0022 HP GMBH E0024-ERIE ELECTRONICS LTD GT, YARMOUTH NORFOLK, TITCHFIELD HAMPS. E0026-PLESSEY LTD

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3702B IF/BB RECEIVER

PRELIMINARY SERVICE MANUAL

320CE 4



HP 37025

CERTIFICATION

LETT (h) PACKARD

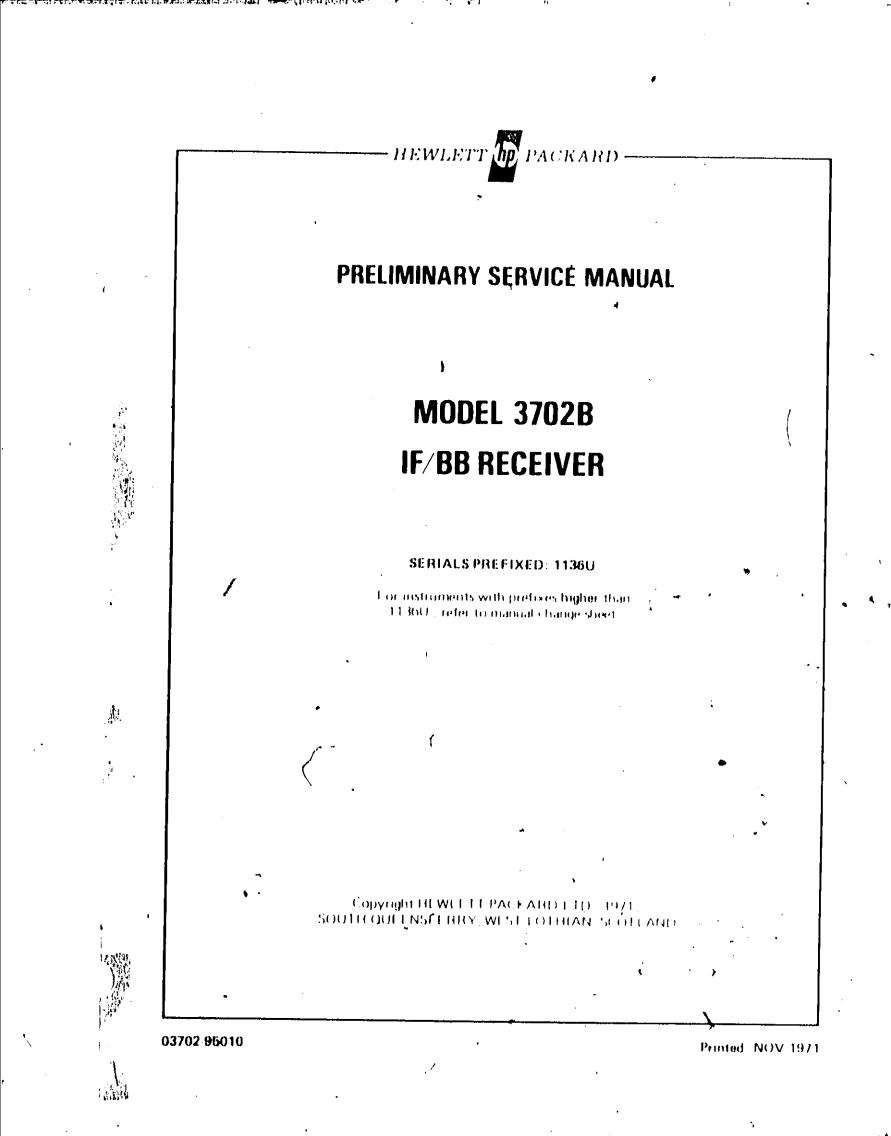
The Hewlett-Packard Company certifies that this instrument was thoroughly tested and inspected and found to meet its published specifications when it was shipped from the factory. The Hewlett-Packard Company further certifies that its calibration measurements are traceable to the U.S. National Bureau of Standards to the extent allowed by the Bureau's calibration facility.

WARRANTY AND ASSISTANCE

All Hewlett-Packard products are warranted against defects in materials and workmanship. This warranty applies for one year from the date of delivery, or, in the case of certain major components listed in the operating manual, for the specified period. We will repair or replace products which prove to be defective during the warranty period provided they are returned to Hewlett-Packard. No other warranty is expressed or implied. We are not light for consequential damages.

Service contracts or customer assistance agreements are available for Hewlett-Packard products that require maintenance and repair on-site.

For any dissistance, contact your nearest Hewlett-Packard Sales and Service Office Addresses are provided at the back of this manual



SECTION V SERVICE SHEETS

5-1 INTRODUCTION

5-2. This section includes the following:

a. General Service Sheets G1 to G5 which contain the theory of operation as well as procedures for troubleshooting the 37028 down to assembly levely. Routing the service sheets is indicated by the general service sheet, number followed by the appropriate assembly number and pin of connector number.

b. Assembly Service Sheets A1 to A26 (excluding A16 to A19 which are not assigned) contain circuit descriptions, component locations together with a grid veterence and an assembly schematic.

Routing between service sheets is indicated by the assembly number indicated by the appropriate pin or connector number.

5-3 Where 'select on test' components are used, they are indicated on the schematics by an asterisk (*) and only the average value shown. If a 'select on test' component is replaced, then the appropriate adjustment procedure should be performed.

54 For the complete reference designation of a component within an assembly, add the assembly number as a prefix to the component reference.

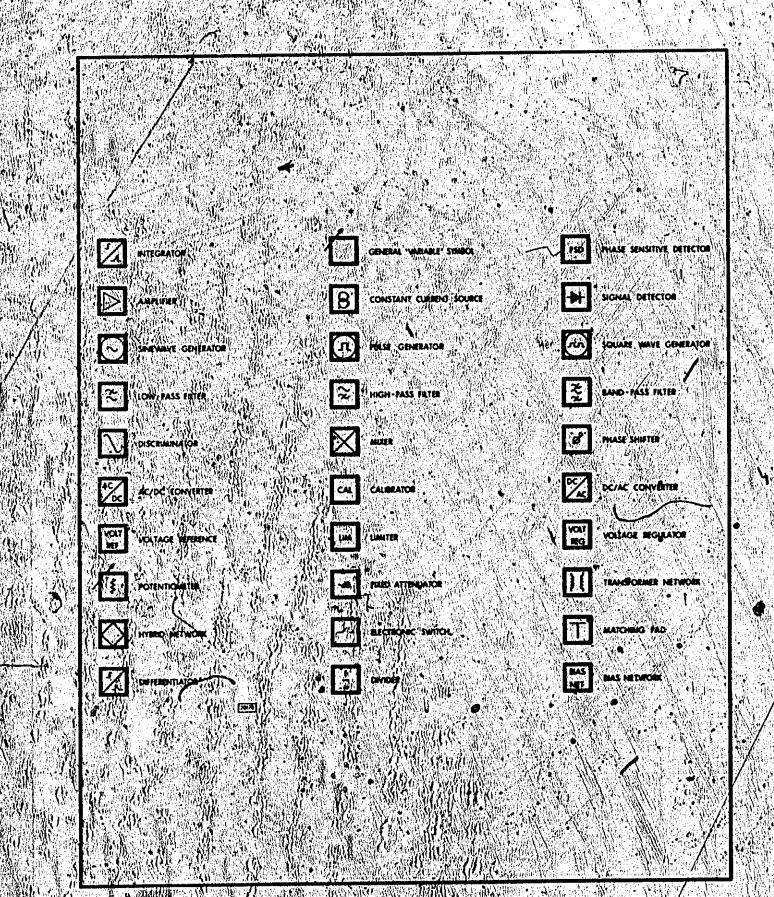
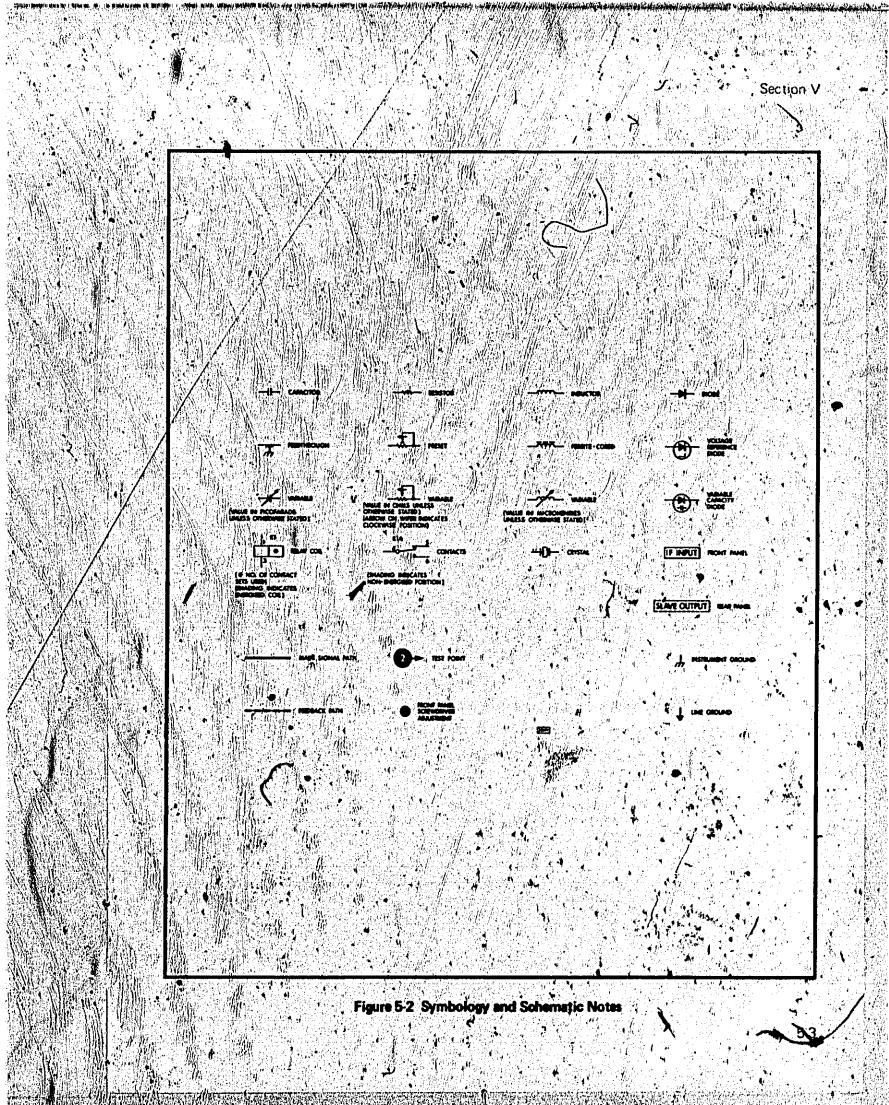


Figure 5-1 Symbology and Schematic Notes



Model 3702B

GENERAL SERVICE SHEET G1

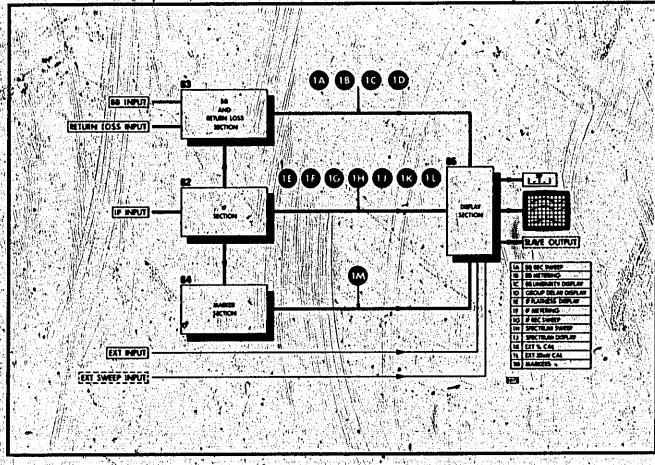


Figure G1-1 Simplified Block Diagram

G1-1 MODE OF OPERATION

G1-2 The 3702B IF/BB Receiver is the hp MLA receive and display unit, containing FM detection and measurement circuits. The outputs from the detection and measurement circuits are internally routed to the inbuilt CRT display. Metering of the IF and BB inputs allows absolute level measurement to be made and also indicates when the input signal to the IF detector or BB amplifier has been adjusted to the correct operating level. Two interacting parameters such as IF amplitude response and group delay can be simultaneously displayed on the CRT thus facilitating the optimum adjustment of the test item.

G1-3 Two types of frequency marker are available on the horizontal deflection, i.e., a 2MHz marker comb over the range 45 to 95MHz and a pair of sliding markets which are continuously variable from 0 to 26MHz about a crystal derived 70MHz marker.

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G1-4 The Y1/Y2 CALIBRATION switch provides a calibrated 'split' trace CRT, display. The vertical distance between the 'split' traces can be adjusted by the Y1 and Y2 GAIN controls and is equivalent to the calibration step selected. The calibration signal can be selected in steps of 0.1, 0.9 and 1.0dB for IF measurements and in steps of 1.3 and 10% for BB linearity measurements. Group delay and differential phase calibration steps are provided in a similar manner by the plug in 1 The EXT INPUT is used as an external Y-axis input. Calibration of this input can be 50mV, or a 10% of input, split trace.

G1-5 The sweep signal for the horizontal deflection circuits is selected by the SWEEP SOURCE switch. The sweep signal may be demodulated from the IF INPUT, applied to the EXT SWEEP INPUT on the rear panel or internally separated from a composite BB + Sweep signal applied to the BB INPUT. This ability to internally recover the sweep signal permits the IF/BB Receiver to operate remote from the 371DA IF/BBTransmitter.

G1-6 TROUBLESHOOTING

G1-7 General

G1-8 Troubleshooting procedure should always begin with reference to the SYSTEM SERVICE MANUAL. The SYSTEM SERVICE MANUAL indicates the conditions under which signals are present.

G1-9; A malfunction within the 3792B IF/BB Receiver will be located to the 3702B from the SYSTEM SERVICE MANUAL, which will also reference the GENERAL SERVICE SHEET and, where possible, the test point. From the Simplified Block Diagram, test point information and location within the GENERAL SERVICE SHEET; the malfunction will then be isolated to the appropriate ASSEMBLY SERVICE SHEET, which should then be consulted.

G1-10 The simplified block diagram, Figure G1-1, indicates the principal trouble shooting test points and divides the instrument into four main blocks:

IF Section.

2

BB Section (including return loss).

Marker Section.

Display Section...

G1-11 The Y1 DISPLAY and Y2 DISPLAY switches control the operation and interfacing of these sections.

5-6

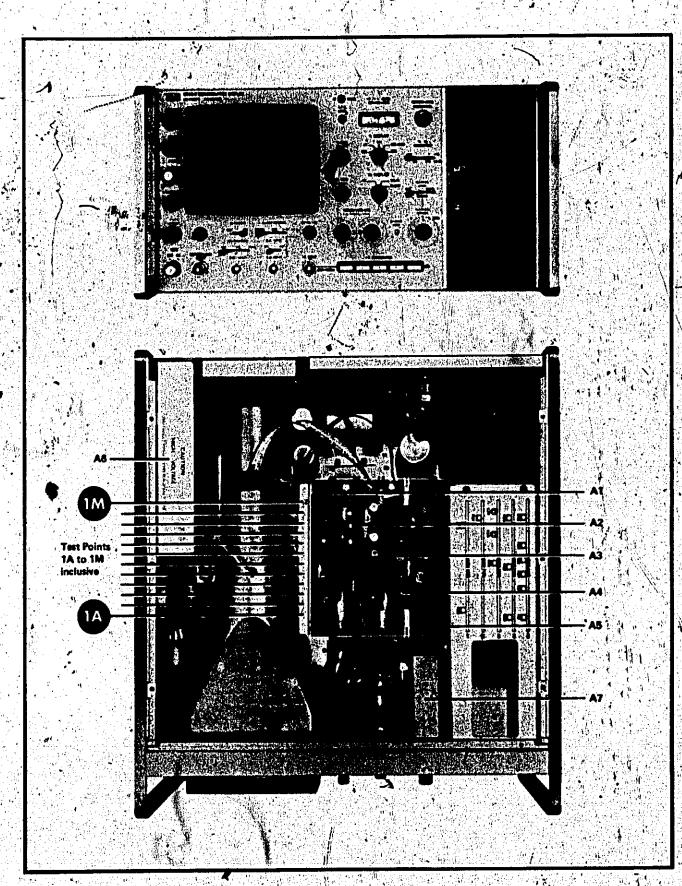
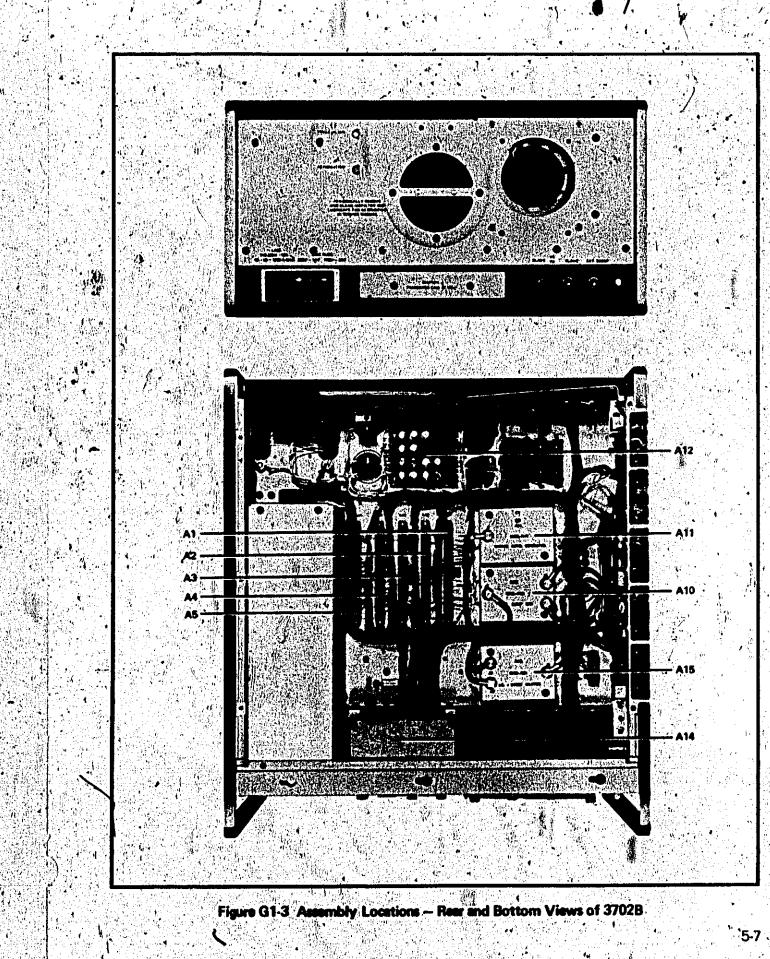
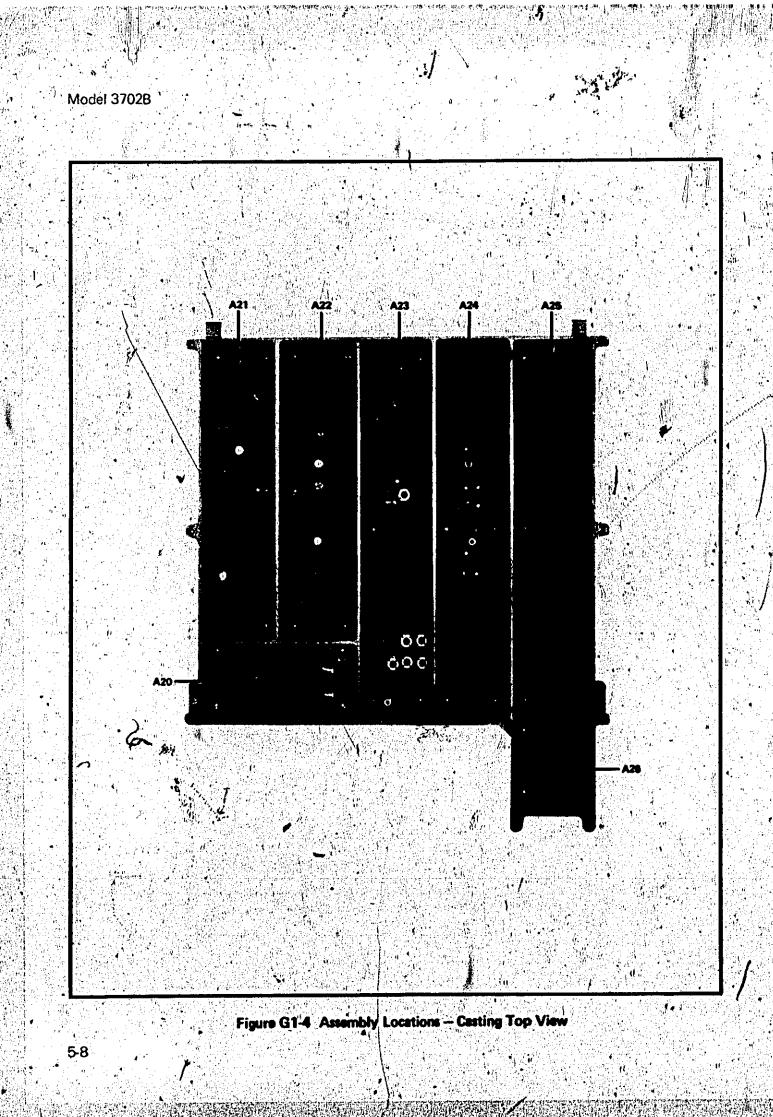
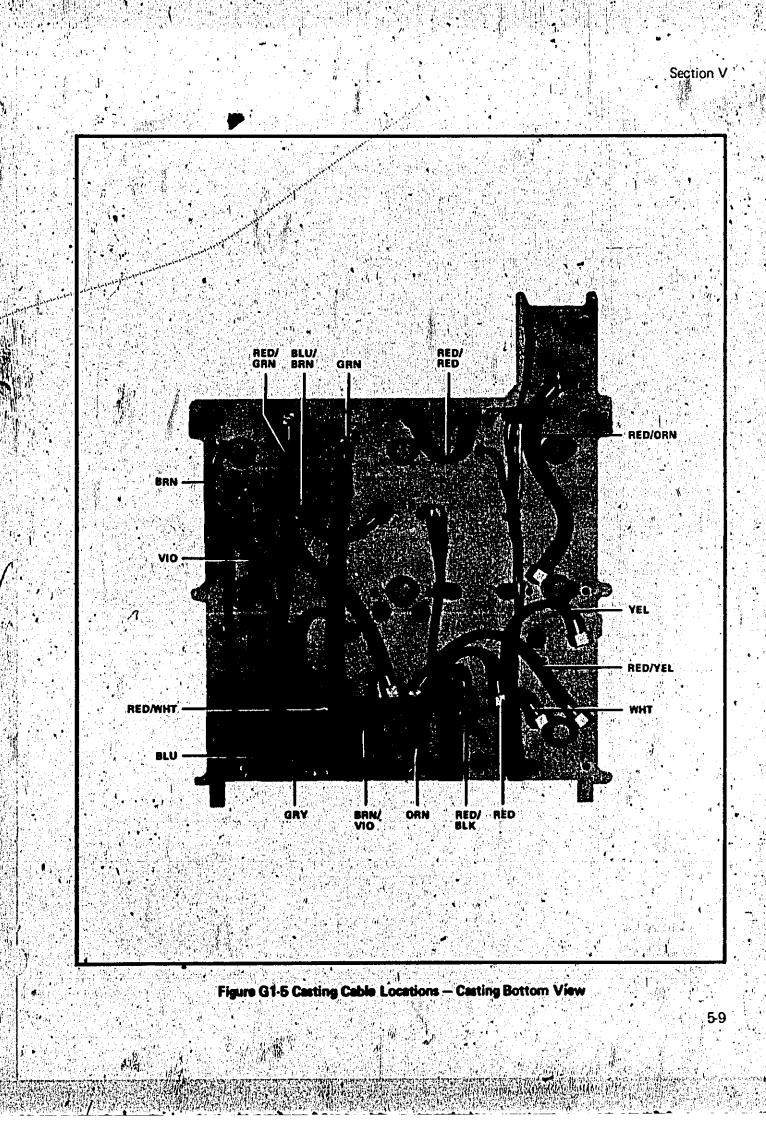


Figure G1-2 Assembly Locations - Front and Top Views of 37028

Section V



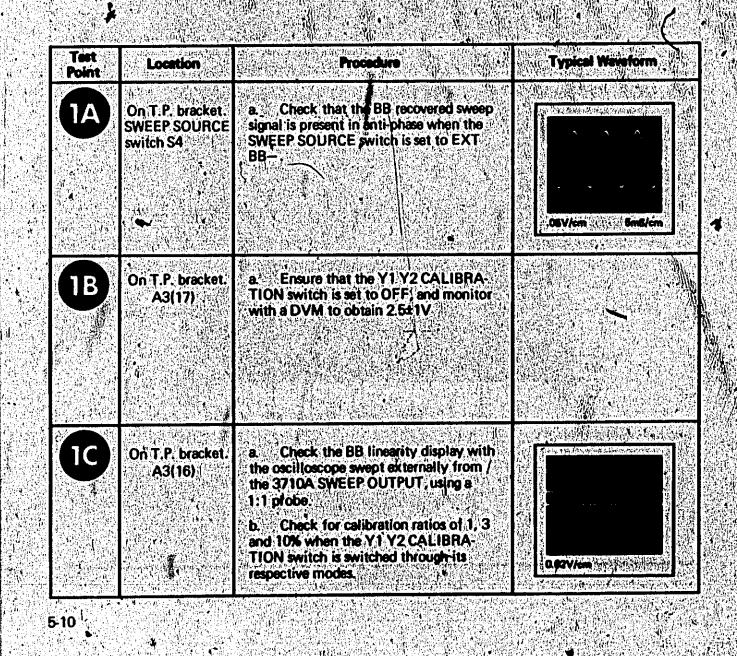




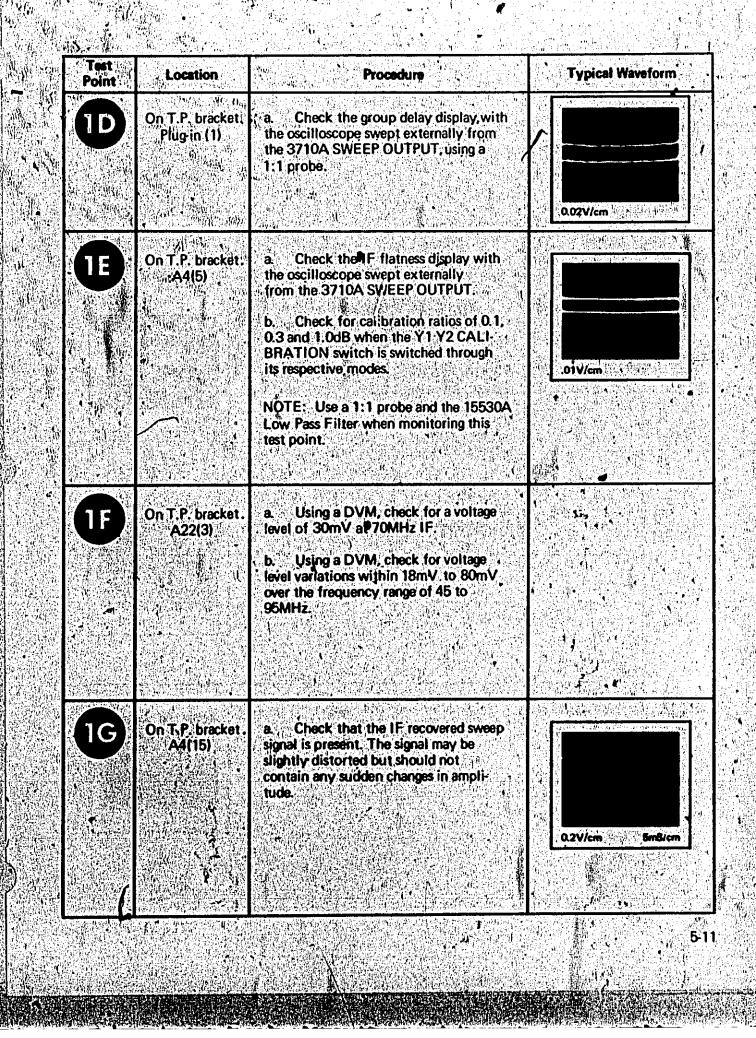
G1-12 Test Point Troubleshooting Procedure

G1-13 General Test Points, as shown on the simplified block diagram Figure G1-1 and listed in the accompanying table are given below. The test points are shown together with typical waveforms as displayed on a T80A Oscilloscope using a 10:1 probe, unless otherwise stated.

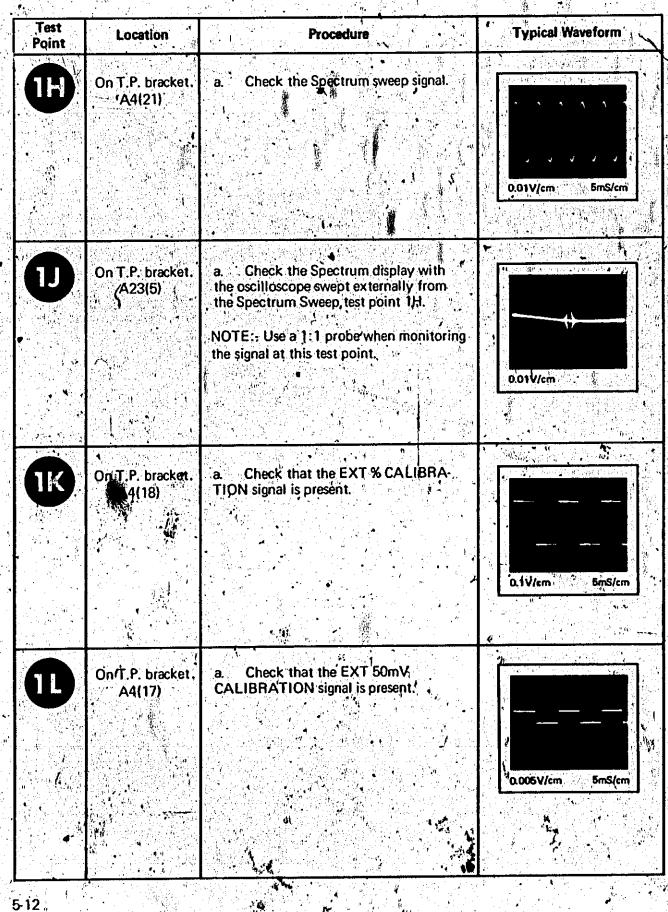
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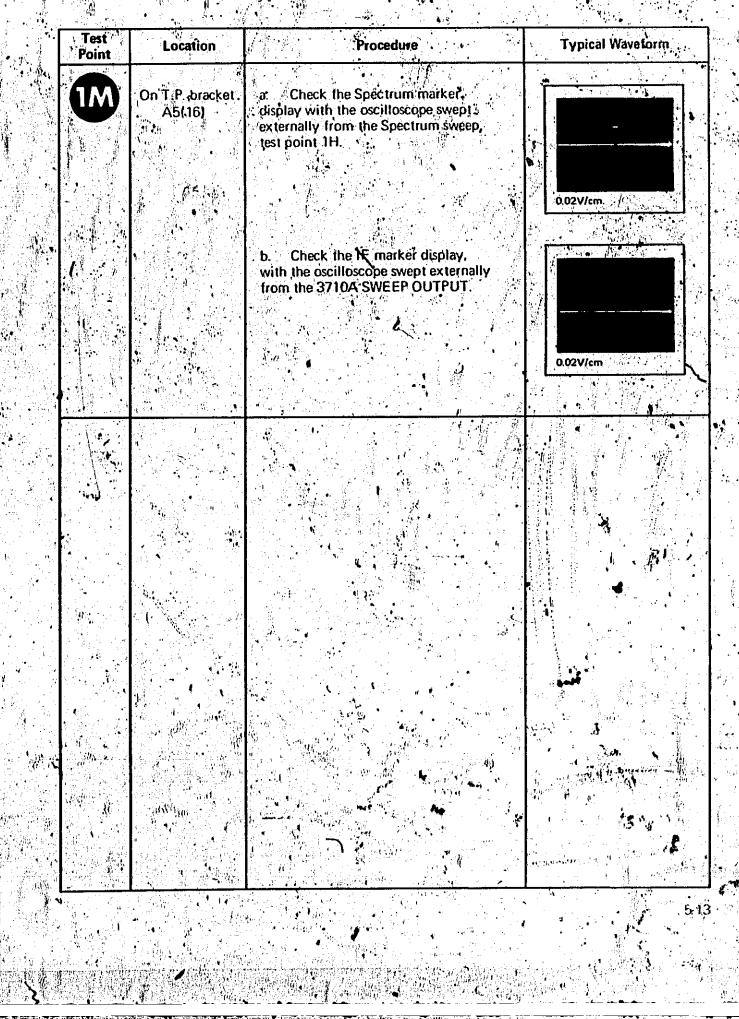


Section V



Model 3702B





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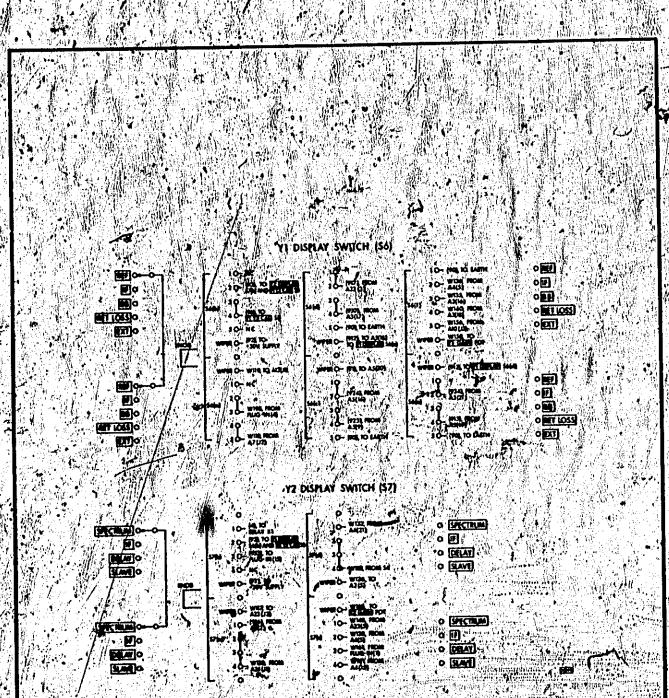


Figure G1-6-Y1 and Y2 DISPLAY Switches

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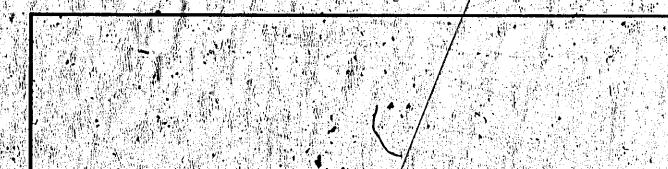
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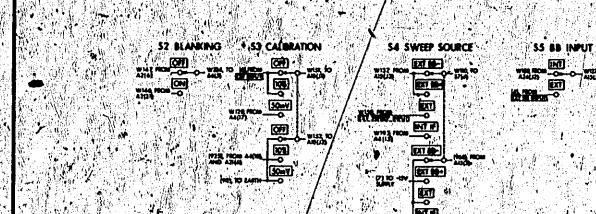
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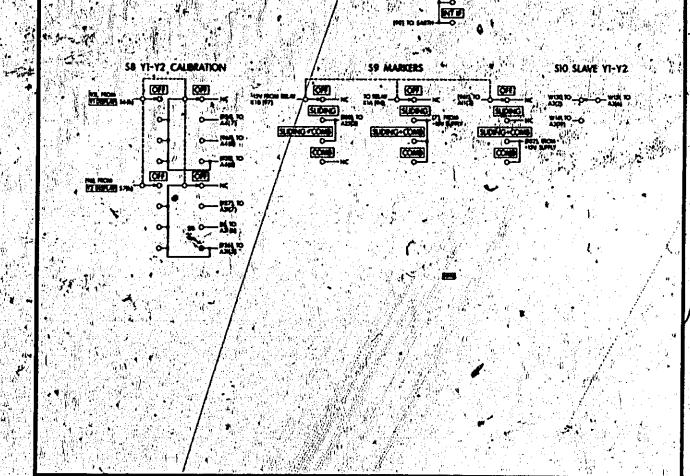


Figure G1-7 Remaining Switches

GENERAL SERVICE SHEET G2-IF SECTION

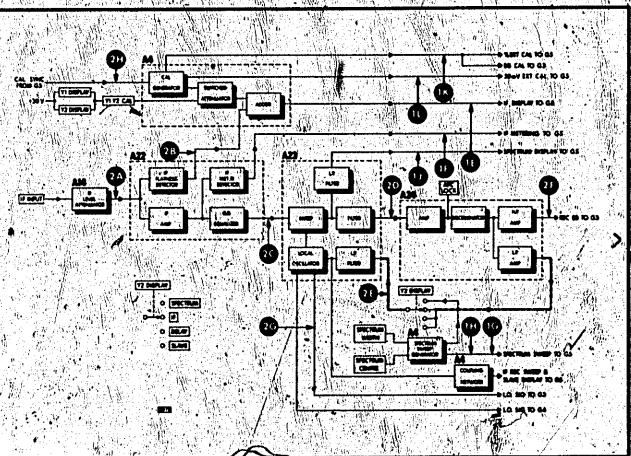


Figure G2-1 Simplified Block Diagram/

G2-1 MODE OF OPERATION

G2-2 General

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- G2-3 The functions of the IF SECTION are listed below:
 - to recover the BB signal from the IF input signal
- b. / to recover the sweep signal from the IF input signalr/
 - to provide the IF flatness display signal
 - to provide the IF metering signals
 - to provide the spectrum display signal and spectrum sweep.
 - to provide the calibration signal.

G2-4. The swept IF signal applied to the IF INPUT is adjusted, by the IF Attenuator/A14, to a level of -10dBm indicated by a zero meter reading for application to the IF Amplifier and Delector A22. The signal from the detector provides the IF flatness display and is supplied to the DISPLAY SECTION 65 with a calibration signal available from the IF Calibrator A4. The output from the IF amplifier is simultaneously applied to the IF meter detector and the group delay equalizer. The meter detector supplies a dc signal, corresponding to the IF level, to the meter on G5. The group delay equalizer is preset to compensate for group delay introduced in the IF amplifier and supplies one input to the mixer on A23. The other input to the mixer is obtained from the local oscillator. The local oscillator is maintained at a frequency 17.4MHz above the IF INPUT frequency by the action of the AFC loop, except in the SPECTRUM mode of the Y2 DISPLAY switch. The 17.4MHz output from the mixer has the same BB frequency modulation characteristics as the IF INPUT, and is bandpass filtered before application to the Demodulator A24. In A24, the mixer output is amplified and applied to the discriminator, which recovers the BB and sweep signals. These signals are simultaneously applied to the BB SECTION G3. The tow-pass filter allows only the sweep information to be applied to the local oscillator and to the SWEEP SOURCE switch on G5.

Section \

G2-5 AFC Loop

G2-6 The purpose of the AFC loop is to enable the local oscillator to track with the IF INPUT frequency and so maintain the discriminator input at a constant frequency of 17.4MHz. By this action, the discriminator is always operating over the central and most linear portion of its characteristic, irrespective of the incoming frequency.

G2-7 The operation of the AFC loop is such that the discriminator will give an output voltage which is proportional to the input frequency and is preset such that a zero output coltage is achieved for an input frequency of 17.4MHz. The voltage controlled local oscillator is controlled by the output from the discriminator and is preset to give an output of 87.4MHz for a zero output from the discriminator.

G2-8 - Consider a fixed 70MHz signal applied to the IF INPUT, the local oscillator will be at 87.4MHz, resulting in a mixer output of 17.4MHz. The mixer output is applied to the discriminator via a bandpass filter which rejects the other mixing products. The discriminator output is preset to give a zero output voltage at 17.4MHz and therefore the local oscillator frequency will remain unchanged. If the frequency applied to the IF INPUT changes to 71MHz, the mixer output will change, before loop action, to 16.4MHz to produce a change in the discriminator output voltage. The resultant change in discriminator output voltage causes the local oscillator frequency of 17.4MHz.

G2-9 Spectrum,

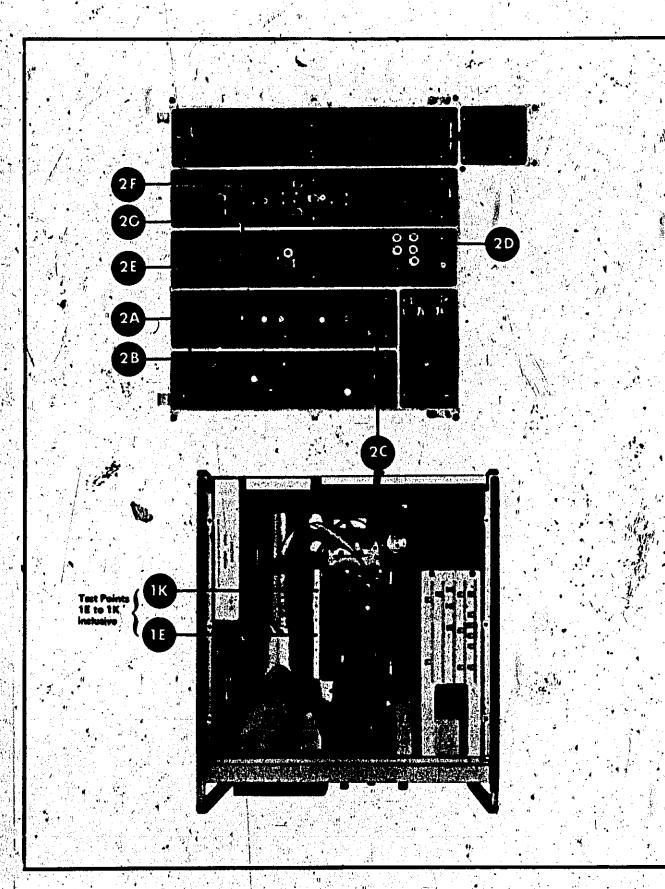
G2-10 When the Y2 DISPLAY switch is in the SPECTRUM mode, the AFC loop is opened, and A24 effectively becomes inoperative. The Spectrum Sweep Generator A4 now produces the control for the local oscillator and provides the sweep signal to the DISPLAY SECTION G5. The SPECTRUM WIDTH control adjusts the amplitude of the sinewave applied to the local oscillator and the dc level of the signal is controlled, by the SPECTRUM CENTRE control. The SPECTRUM CENTRE control is adjusted such that the local oscillator is swept symmetrically about 70MHz. The local oscillator output to the mixer is swept about 70MHz by an amount determined by the setting of the SPECTRUM WIDTH control.

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G2-11 Consider a fixed 70MHz signal applied to the IF INPUT. The mixer output will become a zero beat as the local oscillator frequency sweeps through 70MHz. The mixer output is applied to a low-pass filter which rejects all the mixer products except the low frequency around the zero beat. The output from the low-pass filter is applied to the DISPLAY SECTION G5 to provide the 'birdie chirp' for the SPECTRUM display.

G2-12 Calibration Generator

G2-13 The calibration generator is essentially a bistable multivibrator which is triggered at the sweep frequency by pulses from the DISPLAY SECTION G5, to provide a square wave output at half the sweep frequency. One output from the calibration generator is applied to the BB SECTION G3 and the DISPLAY SECTION G5, to provide the BB calibration and the EXT INPUT calibration. The source output is supplied to the adder, via the switched attenuator, where it is superimposed on the output from the IF flatness detector on A22 to provide the split-trace IF calibration display. The Y1 Y2 CALIBRATION switch enables a split-trace of 0.1, 0.3 and 1.0dB to be selected by controlling the switched attenuator.



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Figure G2-2 Test Point Locations - Casting Top View and Top View of 3702B

Model 3702B

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G2-14 TROUBLESHOOTING

1.

2.

G2-15 The typical outputs given in the troubleshooting table are obtained from the 3702B with the system controls set as indicated below, except where otherwise stated. When the controls are altered for a specific test, the controls should then be reset as indicated below on completion of that test.

Set the 3710A controls as below:

C	WEEP					ry He	OFF		ying ying Sang Sang Dagi Sang
		WIDT	H				50M	Hz	
1 N L		TION	- 1. Min 1. A 3.		140		. 200k	Hz	
		QUEN					. 70M	Hz 🐴	
1	F VEF	NIER		•• ;••	13 •••		. ,0 .	J	
1	F ATT	ENU	TOR		,		/ inser	1 10dB	
1	FAL	HNUP	NUR			 · · · · ·	/ mser		¥.

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Set the 3715A/3716A controls as below:

Set the 3702B controls as below:

BB INPUT

SWEEP SOURCE

1 DÌS				
	1 1 1 I		14 C	•
2 DIS	1 I I I	(4) (4)	- 121 - C	+
F ATT	FNU	AIU	к	•

.. IF .. IF .. insert 10dB .. INT.

IE

OFF

	•		
Test Point	Location	Procedure	Typical Waveform
2 A	A22(J2)	a. Disconnect the RED/WHT coded cable from A22J2.	
		b: Connect the 432A Power Meter, via the 75/50Ω matching pad, to the RED/ WHT coded cable.	
		c. Measure the power Vevel.d. Check the attenuator steps.	
		The attenuator steps should be accurate to within 0.2dB. Reconnect the RED/WHT cable to A22J2.	
2 B	A4(4)	a. DC level with variations.	

Section V

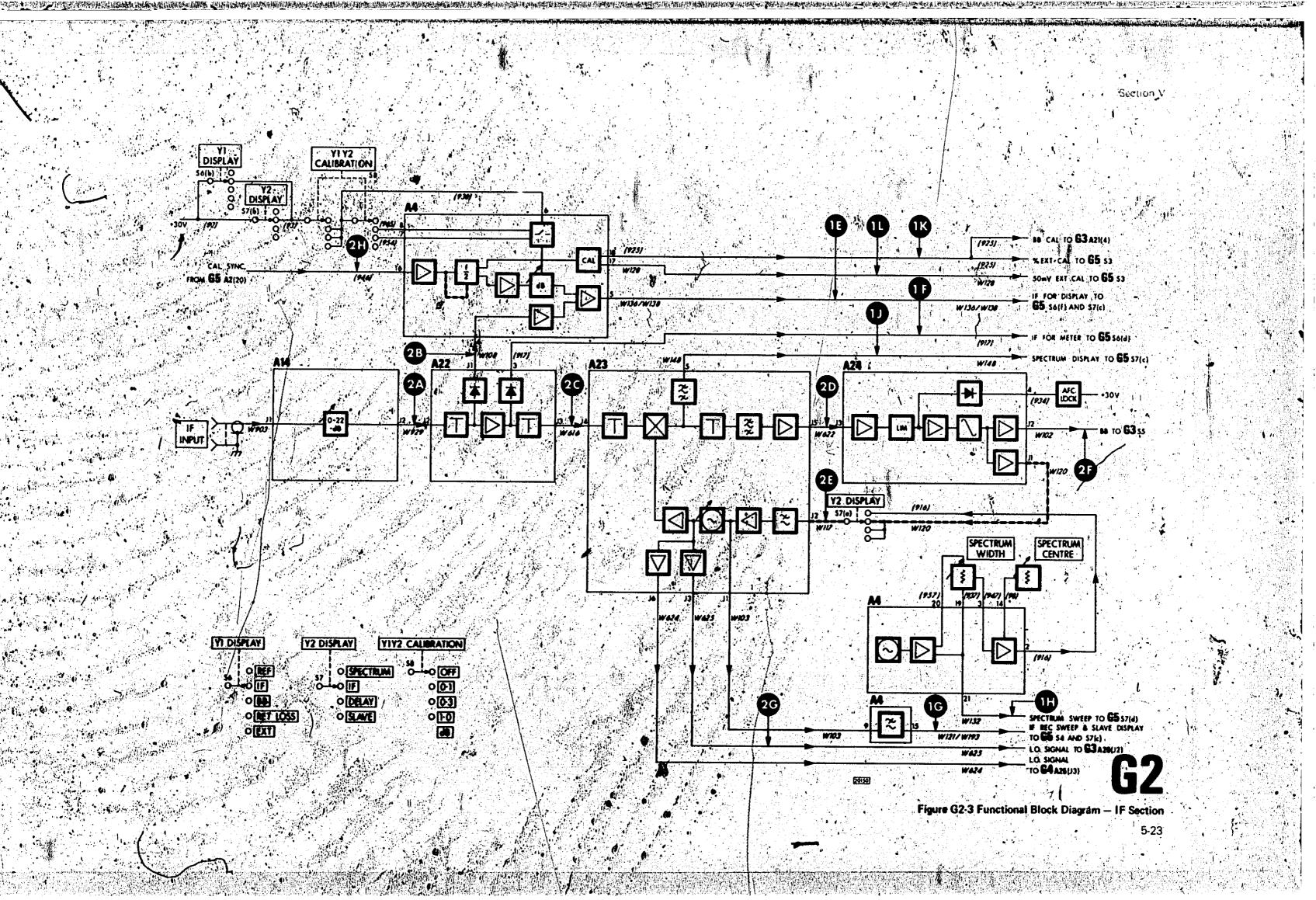
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Test Point	Location	- Procedure	Typical Waveform
20	A22J3	a. Disconnect the BRN/BLU coded cable from A2203.	
		b. Connect the 411A RF Millivoltmeter, via the 75/50Ω matching pad and a 15539A cable, to A22J3.	
		c. Measure the voltage level.	
		d. Measure the voltage output varia- tion as the 3710A IF FREQUENCY control is varied over the range 45 to 95MHz. The voltage output variation should be less than 0.02V. Reconnect the BRN/BLU cable to A22J3.	
20	A23J5	a. Check that the signal output level is approximately 0.4V pk-pk.	
		b. Monitor the frequency with the 5245L Electronic Counter.	NAMANANAN MARAANA Ny finina maraana
		c. Check the variations in signal level are not greater than 0.05V as the 3710A IF FREQUENCY control is varied from 45 to 95MHz.	0.01V/cm 0.1µS/cm
29	A23J2	a. To measure the IF recovered sweep, set the 3710A SWEEP control to INT. The signal may be slightly distorted but should not contain any sudden changes in amplitude.	
		b. To measure the Spectrum sweep, set the Y2 DISPLAY switch to SPEC- TRUM.	0.2V/cm 5mS/cm
		c. Check that the amplitude variation is 1.8V as the SPECTRUM WIDTH control is varied from fully anticlock- wise to fully clockwise.	
		d. Check that the dc level variation is 2.5V as the SPECTRUM CENTRE control is varied from fully anticlock- wise to fully clockwise.	0.05V/cm
	ate	THOC LU BULLY GOULK WISE	

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Model 3702B ,

Test 4 Point	Location	Procedure	Typical Waveform
2F	A24J2	a. Set the 3715A/3716A BB FRE- QUENCY control to 83.3kHz.	
		b. Check that the recovered BB signal has an amplitude of 0.3V	
		c. Check that the recovered BB ampli- tude is 0.3V for all BB FREQUENCY control settings up to 5.6MHz.	0.006V/cm 1µS/cm
		d. Check that the variation in ampli- tude is not greater than 0.05 V as the 3710A IF FREQUENCY control is varied from 45 to 95MHz.	
in Balanda (Halanda) in set			
2G	* A23J3	a. Disconnect the RED/GRN coded cable from A2313.	
		L Connect the 411A RF Milli voltmeter, via the 75/50Ω matching pad to A23/3.	
		c, Check that the voltage level does not drop below 0.34V as the 3710A IF FREQUENCY control is varied from 4 45 to 95MHz,	
		d. Disconfect the 3710A IF OUTPUT from the 3702B JF. INPUT.	
		e. Connect the 3710A AUX OUTPUT to the 3702B JF INPUT, and set the 3710A AUX OUTPUT to 70MHz XTAL.	
		1. Check that the frequency at A23J3 is 87.4MHz ±0.1MHz using the 5245L Electronic Counter. Reconnect the RSD/GRN cable to A23J3.	



Model 3702B

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GENERAL SERVICE SHEET G3-BB SECTION

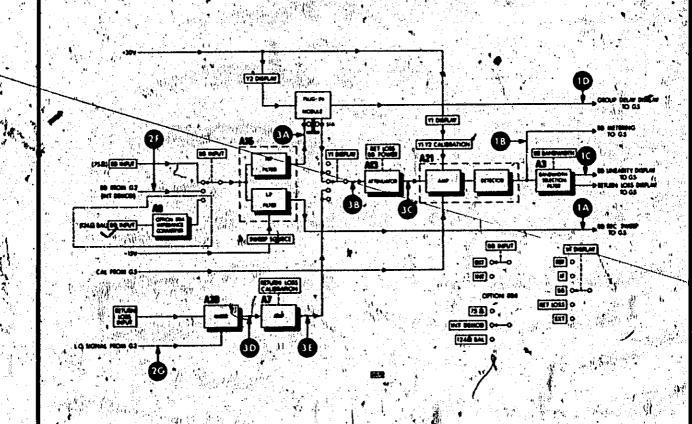


Figure G3-1 Simplified Block Diagram

MODE OF OPERATION G3-1

G3-2 General

G3-3

Functionally, this Service Sheet consists of two sections: The BB section, the input of which can be from an external source or the a recovered BB from the IF SECTION G2. The BB section measures the power and examines the signal for variations in amplitude, and phase (when a 3703B or 3705A Plug in is fitted), with the IF INPUT frequency, and converts the variations into a suitable form for application to the DISPLAY SECTION G5; ie, BB linearity (amplitude variations) and group delay (phase variations). If the external BB contains sweep information, the two signals are separated and the sweep is applied to the SWEEP SOURCE switch on G5.,

The return loss section enables the power of the RETURN LOSS INPUT to b. be measured and examined for variations against frequency. The variations obtained are converted into a suitable form for application to the DISPLAY SECTION G5

G3-4 Baseband

The BB INPUT switch selects the source of the BB signal, and applies the G3-5 signal to A11, which uses high pass and low pass filters to separate the BB from the sweep (if present). The sweep signal is then applied to the DISPLAX SECTION G5. The BB signat is applied to the BB Attenuator A13 via either the oush-button switch S14 (when the Plug in is removed) or a low-pass filter in the Plug in A portion of the BB signal is examined in the Plug in for phase variations, and the resultant group delay or differential phase is applied to the DISPLAY SECTION G5. Detailed information on the operation of the Plugin is contained in the relevant service manual. The BB Attenuator A13 is adjusted to give the correct signal input level to the BB Amplifier and Detector A21. The correct input level is indicated by a zero reading on the meter. The setting of the BB POWER attenuator will then give a direct reading in -dBm of the BB INPUT power. The Y1 Y2 CALIBRATION switch enables the calibration signal from the IF SECTION G2 to switch the gain of the amplifier, at half the sweep rate, to provide the calibration of 1, 3 or 10%. The BB signal is detected, and the output is simultaneously applied to the DISPLAY SECTION G5 to provide the meter signal; and to a low pass filter on A3. The BANDWIDTH switch, controls the low-pass filter on A3 by limiting the bandwidth of the BB linearity display to 1 or 5kHz. The BANDWIDTH switch is located on the Plug in and when no Plug-in is fitted, the bandwidth is set to 1kHz.

G3-6 Option 004

G3-7 Option 004 provides an additional BB INPUT, at a balanced impedance of 124 Ω . The Impedance Converter A8 separates the BB signal from the sweep signal and converts each to 75 Ω impedance. The BB signal is applied to the three position BB INPUT switch and the sweep signal is applied to the DISPLAY SECTION G5.

G3-8 Return Loss

G3.9 In the Return Loss mode, the AFC loop in the IF SECTION G2 must be operated with a replica of the IF Return Loss Input signal. The 3710A UNCAL IF OUTPUT is normally connected to the 3702B IF INPUT to operate the AFC loop, and the 3710A IF OUTPUT is connected to the 3702B RETURN LOSS INPUT via the *hp* 15520A Hybrid of a long cable, to enable the return loss measurements to be made.

G3-10 The RETURN LOSS INPUT supplies one input of the return loss mixer, the other input being supplied by the output from the local oscillator on the IF SECTION G2. Due to the action of the AFC loop, the local oscillator signal will track the return loss input signal with a frequency difference of 17.4MHz. The output from the Return Loss Mixer A20 will therefore be a 17.4MHz signal with the same amplitude variations as at the RETURN LOSS INPUT. The mixer output is applied to the Return loss Amplifier A7, the gain of which can be adjusted by the RETURN LOSS CALIBRATION control. The output from the amplifier is then applied, via the Y1 DISPLAY switch, to the BB POWER/RETURN LOSS Attenuator A13

G3-11 The RETURN LOSS CALIBRATION control/enables the attenuator A13 to be calibrated in the following manner

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G3-12 A known return loss power is measured and the attenuator A13 is set to this known value. The RETURN LOSS GALIBRATION control is idjusted to set the input to amplifier A21 at the correct power level; which is indicated by a zero meter reading. The CRT position controls are adjusted to set the return loss display to a reference position. The unknown return loss to be measured is substituted for the known value and attenuator A13 is adjusted to bring the display trace back to the reference position. The attenuator setting is a direct reading of the Return Loss Power. The action of the circuits following the attenuator A13 is the same a when the BB is applied.

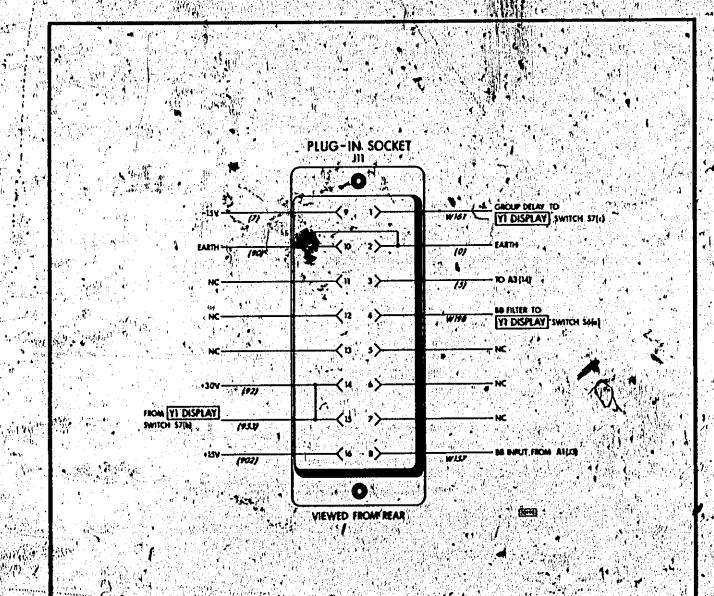
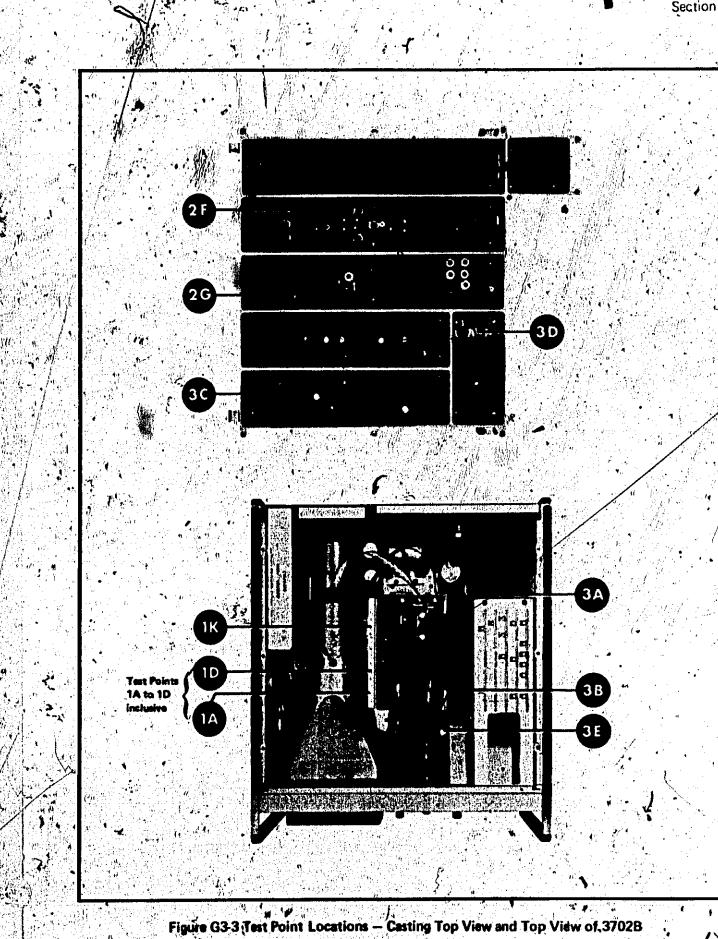


Figure G3-2 Plug in Socket



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Section V

5.

Model 3702B /

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G3-13 /TROUBLESHOQTING

G3-14 The typical outputs obtained for test points A, B and G in the troubleshooting table are derived from the 3702B when the system is adjusted as in Test Set Up 1.

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G3/15 The typical outputs obtained for test points D and E in the moubleshooting table are derived from the 3702B when the system is adjusted as indeest Set Up 2.

TEST SET UP 1 Set the 3710A controls as below: OFF Set the 3715A/3716A controls as below: BB FREQUENCY 83.3kHz -10dBm BB POWER /.... **BB + SWEEP VERNIER** CAL

Set the 3702B controls as below: .-BB INPUT EXT BB / Y1 DISPLAY

Set the 3705A controls as below: BB FREQUENCY

Connect the 3715A/3716A BB + SWEEP OUTPUT to the 3702B BB INPUT.

TEST SET UP 2

Set the 3710A controls as below: SWEEP AUX OUTPUT IF ATTENUATOR

insert/40dB

Set the 3715A/3716A controls as below: BB FREQUENCY

Set the 3702B controls as below:

Y1 DISPLAY Y2 DISPLAY IF ATTENUATOR SWEEP SOURCE

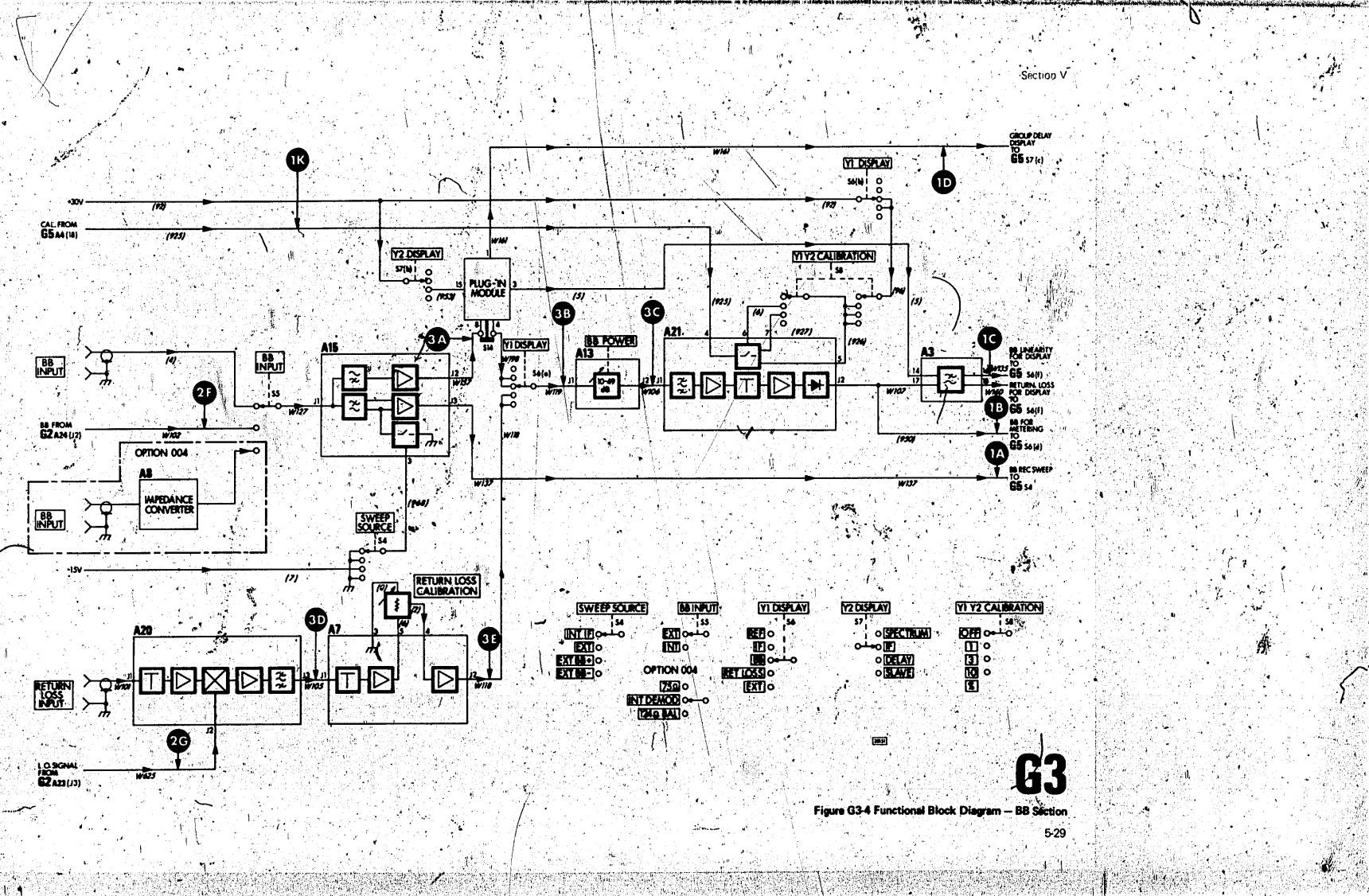
RETLOSS . . .

/ YOFF

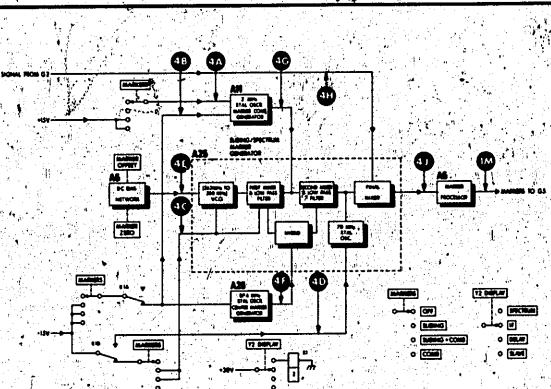
nsert 2dB

Connect the 3710A IF OUTPUT to the 3702B RET LOSS INPUT. Connect the 3710A AUX OUTPUT to the 3702B IF INPUT, and check that the AFC LOCK lamp is alight.

Test Point	Location	Procedure	Typical Waveform
	Plug-in (8)	a. Check that the signal level is 0.2V pk-pk for all 3715A/3716A.BB FRE- QUENCY control settings.	.005V/cm (5µS /cm
3B	Y1 DISPLAY S6(A)	a. Check that the signal level is 0.2V pk-pk for all 3715A/3716A BB FRE- QUENCY control settings. NOTE: If the 3702B is fitted with a 3705A plug-in, the 3705A BB FRE- QUENCY control setting must be the same as the 3715A/3716A.	.005V/cm 5µS/cm
30	A2TJ1	a. Use a 1:1 probe to check that the BB signal level remains constant ±5mV- as the 3702B and 3715A/3716A BB POWER attenuators are simultaneously adjusted to the same setting.	0.005V/cm 10µS/cm
30	A20J3	 a. Disconnect the GRN coded cable grom A20J3, and connect the 180A via the 15539A Test Cable to A20J3. b. Check that the variations in signal amplitude are not greater than 0.01V over the range 45 to 95MHz. Reconnect the GRN cable to A20J3. 	
3	A7J2	 a. Disconnect the BRN/GRY coded cable from A7J2, and connect the 180A via the 15539A. Test Cable to A7J2. b. Check that the variation in signal amplitude is 2V over the full range of the RETURN LOSS CALIBRATION control. Reconnect the BRN/GRY cable to A7J2. 	



Model 3702B



GENERAL SERVICE SHEET G4 - MARKER SECTION

Figure G4-1 Simplified Block Diagram

G4-1 MODE OF OPERATION

G4-2 General

1.

2.

G4-3 The function of the MARKER SECTION is to generate and process the follow-

IF frequency markers which can be either a fixed crystal controlled 70MHz centre-marker with sympletrical sliding markers, a 2MHz crystal controlled marker comb — or a combination of both. A 70MHz crystal controlled spectrum marker.

G4-4 The MARKERS switch, by connecting the ±15V lines to various oscillators, determines which markers are generated, except when the Y2 DISPLAY switch is set to SPECTRUM. Table G4-1 indicates which oscillators are operative for the various modes of the MARKERS switch.

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1	able	G4-	18	witching	of Mark	er	Oscillators
					,		

Y2 DISPLAY Switch	- - 1 -1-1	F. DELAY	OR SLAVE	9	SPECTRUM
MARKERS Switch	OFF	SLIDING	SLIDING + COMB	СОМВ	Any mode
Oscillator A11, 2MHz Xtal	No	/ No	Yes	Yes	No
A25, VCO A26, 87,4MHz Xtal A25, 70MHz Xtal	No No No	Yes Yes	Yes Yes No	No Yes No	No No Yes

G4-5 Centre and Sliding Markers

G4-6 The dc Bias Network on A5 supplies the dc voltage to control the frequency of the Voltage Controlled Oscillator (VCO) on A25. The MARKER OFFSET control (calibrated from 0 to 26MHz) can be adjusted to set the frequency of the VCO within the range 262,2MHz to 288,2MHz. Zero on the MARKER OFFSET control corresponds to a VCO frequency of 262.2MHz and 26 to 288,2MHz. The zero end of the MARKER OFFSET can be calibrated by the MARKER ZERO control.

G4-7 The first mixer on the A25 has two inputs, one from the VCO and the other via the hybrid from the 87:4MHz crystal oscillator on A26. The mixer product derived from the VCO output and the third harmonic of the 87.4MHz oscillator is selected via a low-pass filter to give a mixer output in the range 0 to 26MHz depending on the setting of the MARKER OFFSET control.

G4-8 Consider any setting of the MARKER OFFSET control, say 10MHz. One input to the second mixer will then be 10MHz while the other input will be 87.4MHz from A26 via the hybrid. The mixer products thus formed, 87.4 + 10MHz and 87.4 - 10MHz, are selected by filtering and together with some 87.4MHz signal leaked across the second mixer from one input to the third mixer. Thus one input to the third mixer consists of three frequencies, 77.4MHz, 87.4MHz and 97.4MHz. The other mixer input from the Local Oscillator is held 17.4MHz. above the frequency of the IF, input by the action of the AFC loop. As the local oscillator sweeps through 77.4MHz, 87.4MHz and 97.4MHz the final mixer output will become a zero beat. The zero beats will correspond to an IF input frequency of 60MHz, 70MHz and 80MHz. The zero beats are processed in A5 into a suitable form to provide the marker display. Model,37028

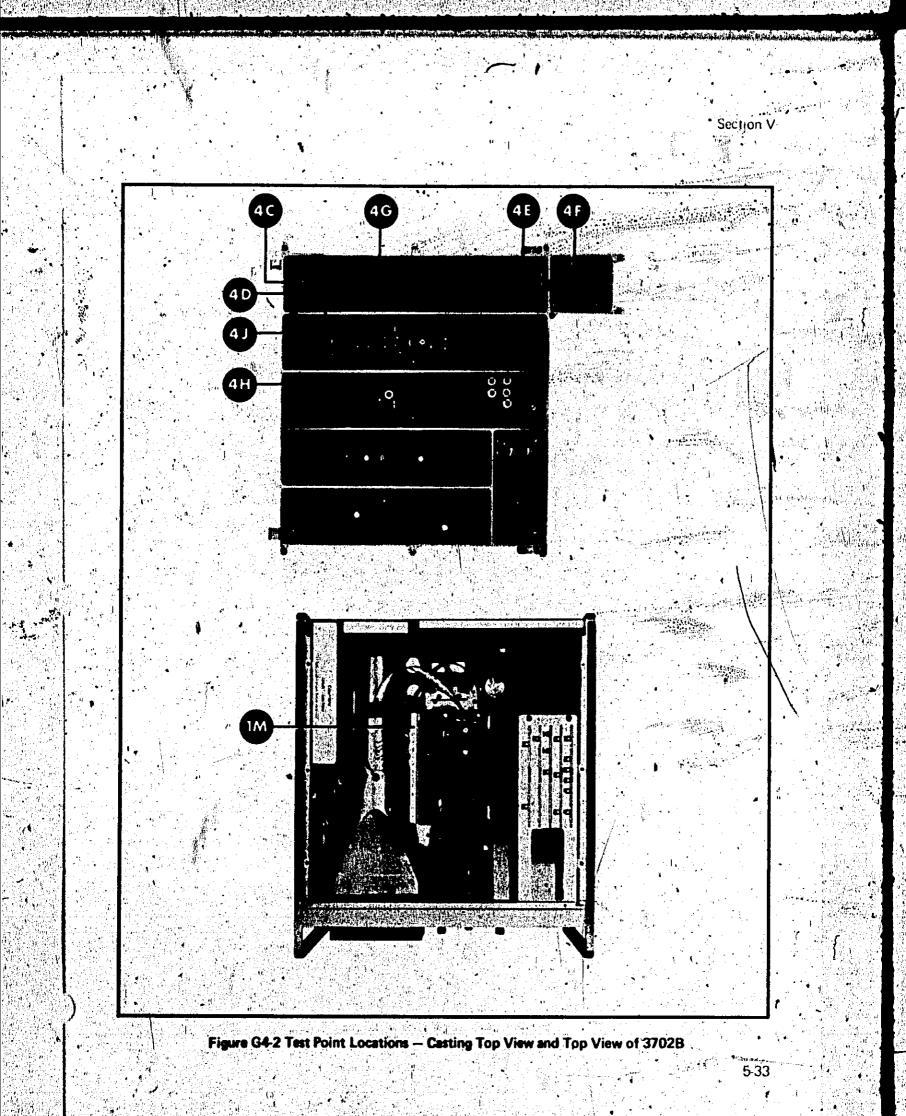
G4-9 Comb Markers

G4-10 With the marker comb switched on, the 2MHz Crystal Oscillator A11 provides a further input to the second mixer. The 87.4MHz combines with the 2MHz signal and its harmonics to produce a final mixer output of zero beats of 2MHz intervals.

G4-11 Spectrum Marker

G4-12 In SPECTRUM mode the AFC loop is inoperative and the local oscillator frequency is swept by the spectrum sweep around 70MHz. To produce the spectrum marker the second input to the final mixer is provided by the 70MHz' crystal oscillator. A zero beat will now be produced when the local oscillator frequency sweeps through 70MHz:

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G4-13 TROUBLESHOOTING

G4-14 The markers required for display are selected by the MARKERS switch. The MARKERS switch and the Y2 DISPLAY switch govern which circuits will operate by controlling application of the power supply lines.

G4-15 Check the switching operation as indicated below.

	Monitor f	. Location	Voltage	MARKERS Setting	Y2 DISPLAY Setting
	44	A11(2)	+15V	COMB, SLIDING + COMB	₹ ĂIĨ
	4B	A11(1)	15V	All except OFF	All except
1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	4C	A25(2)	-15∨	COMB, SLIDING + COMB	All except SPECTRUM
	4D	A25(3)	-15V	All	SPECTRUM

G4-16 To troubleshoot the IF markers, the system controls must be set as follows:

Set the 3710A controls as below:

SWEEP	INT [
SWEEP WIDTH	50MHz
IF FREQUENCY	70MHz
IF ATTENUATOR	insert 10dB

Set the 3702B controls as below:

2

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Y1 DISPLAY	ANY position
Y2 DISPLAY	 IF
IF ATTENUATOR	 insert 10dB
MARKERS	 as indicated

Connect the 3710A IF OUTPUT to the 37028 IF INPUT, and ensure that the AFC LOCK lamp is alight.

G4-17 To troubleshoot the Spectrum marker, check that the Y2 DISPLAY switch is set to SPECTRUM before monitoring test points H and J.

	1		
Test Point	Location	Procedure	Typical Waveform
	A25(5)	This signal only contributes to the sliding markers operation: a. Check that the dc level is continu- ously variable from approximately3.6V to -4.6V by operation of the MARKER OFFSET control. b. Check, when the MARKER OFF- SET control is set to 0, that the MARK- ER ZERO control varies the dc level by 2V.	
4	Â26(J1)	a Set the MARKERS switch to any position except OFF.	
		b. Disconnect the RED/ORN cable for A26J1.	
		c. Connect the 411A RF Millivoltmeter A26J1 via the 75/50Ω matching pad and measure the voltage output for all positions of the MARKERS switch except OFF	c. 1V ±0.2V
		d. Disconnect the 411A RF Milli- voltmeter and connect the 5245L Elec - tronic Counter to A26J1, and measure the frequency output for all positions of the	
		MARKERS switch except OFF. Reconnect the RED/ORN cable to A26J1.	
40	A25(J1)	a Set the MARKERS switch to COMB and perform the following checks, then set the MARKERS switch to SLIDING + COMB and repeat the checks.	
		b. Check A11J1 for 2MHz spikes of amplitude 0.45V pk-pk. c. Measure the frequency at A11J1 using the 5245L Electronic Counter.	0. 1V/cm _'Q.\$µS/cm
			<u></u> 5.35

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Model 3702B

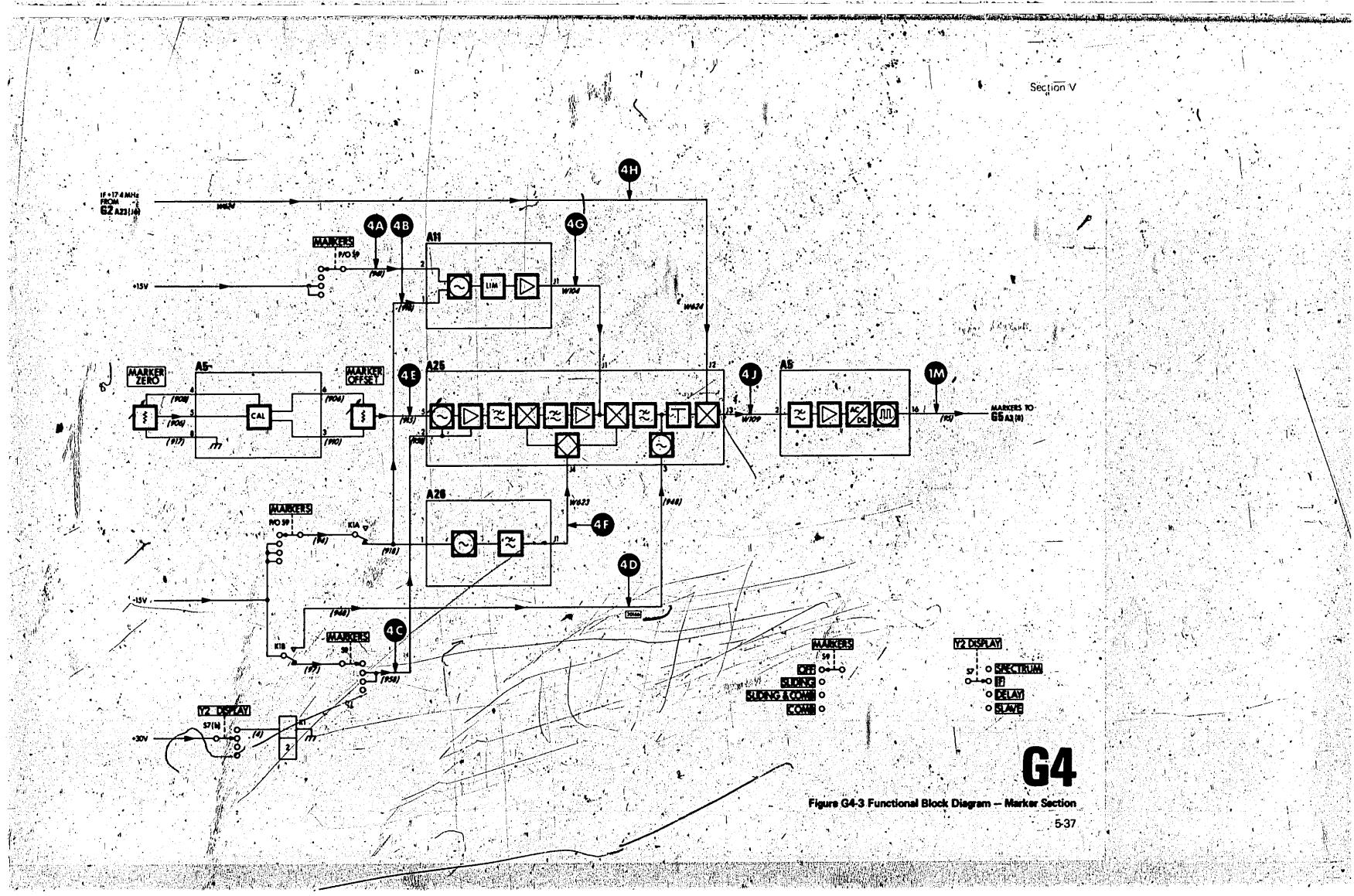
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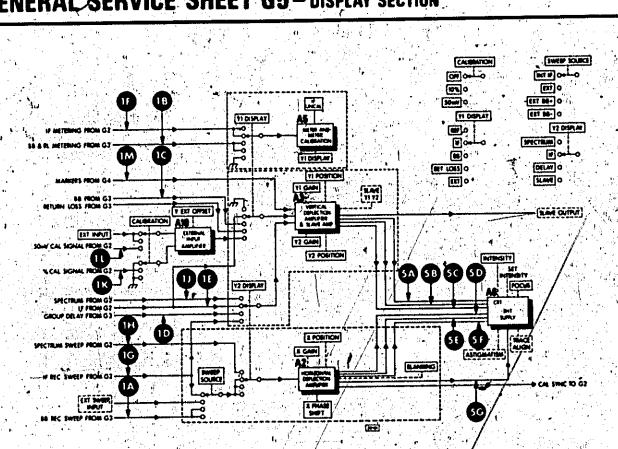
Test Point	Location	Procedure	Typical Waveform	
		Part I		
4H)	- A23J6	a. Set the YI DISPLAY switch to SPECTRUM.		
		b. Disconnets the RED/YEL coded cable from A2306.	an bini ya sa	
		c. Connect the Spectrum Analyzer to A2316.		
		d. Check that the output is a swept frequency, the centre of which can be		
		set to 70MHz using the SPECTRUNI CENTRE control.		
		e. Check that the sweep width can be adjusted from \$1MHz to \$6MHz using		
		the SPECTRUM WIDTH control, f. Disconnect the Spectrum Analyzer		
		and connect the 411A RF Millivoltmeter to A2316 via the 75/50Ω matching page.	· · · · · · · · · · · · · · · · · · ·	
		g Check that the voltage output is		
		Reconnect the RED/YEL cable to A2316.		
		Part I		
	S.,	a. Set the Y2 DISPLAY switch to	≤ 1	
		b. Disconnect the RED/YEL coded cable from A23J6.		
		 c. Connect the 411A RF Millipoltmeter to A2316, via the 75/50Ω matching 		
		pad.		
		OFF, and vary the 3710A SWEEP switch to OFF, and vary the 3710A IF FRE- QUENCY from 48 to 95MHz. The voltage		
		level should not drop below 0.34V.	N * 17 -	
		for the 3702B IF INPUT.		
		.f. Set the 3710A AUX OUTPUT to		
		g Using the 5245L Electronic Counter, check that the frequency at A23J6 is		
		87:4 ±0.1MHz. Reconnect the RED/YEL cable to A23J6.		

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Test Point	Location	Procedure	Typical Waveform	
4 J	A25J3	Part 1. a. Set the Y2 DISPLAY to SPEC- TRUM.		
	• •	b. Disconnect the WHT coded cable from A25J3.	- Alt	
		c. Connect the 180A Oscilloscope to A25J3, via the 15530A Low-Pass Filter, with the oscilloscope being externally swept from the Spectrum sweep, test point 1H. Reconnect the WHT cable to A25J3	0.01V/cm	
		Part It		
		 a. Set the Y2 DISPLAY switch to any position except SPECTRUM. b. Disconnect We WHT coded cable from A25J3. 	- if - The file	
		to A25J3, via the 180A Oscilloscope to A25J3, via the 15530A Low-Pass Filter, with the oscilloscope being externally swept from the 3710A SWEEP OUTPUT. Reconnect the WHT cable to A25J3.	Q.1V/cm . 1mS/cm	
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GENERAL SERVICE SHEET G5 - DISPLAY SECTION

Figure G5-1 Simplified Block Disgram

G5-1 MODE OF OPERATION

G5-2 General

G5-3 The display section provides the CRT and meter displays of all the measurement functions.

G5-4 The display section is similar to a conventional oscilloscope operated in the chop mode to give simultaneous displays of Y1 and Y2, and has all the usual oscilloscope controls.

G5-5 All inputs to the deflection amplifiers are routed via the Y1 and Y2 DIS-PLAY switches except the markers which are connected directly to the Y1 amplifier to enable markers to be available for all measurements.

. d. ...

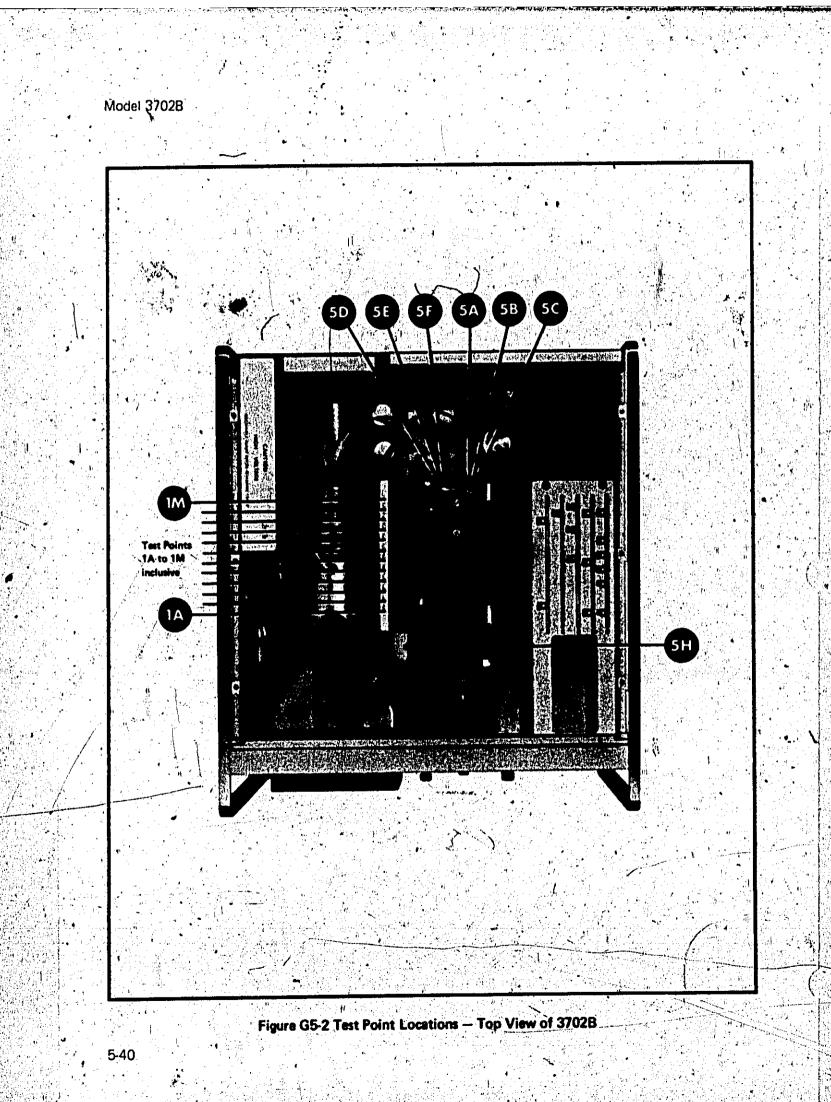
G5-6 The meter function is controlled by the Y1 DISPLAY switch with A5 providing the meter calibration circuits.

G5-7 The input to the Y1 amplifier which is dc coupled is selected by the Y1 DISPLAY switch to be either earth (Ref), the BB Linearity or Return Loss signal from G3, the IF Flatness signal from G2, or an external signal from the EXT INPUT. Any signal applied to the EXT INPUT is amplified by the External Input Amplifier A10 before being applied to the Y1 DISPLAY switch. The dc level of the external input signal can be adjusted by the Y EXT OFFSET control. Also a CALIBRATION switch enables the gain of the amplifier to be switched by 10% to provide a 10% split trace calibration of the input signal, or a 50mV signal may be substituted for the external input.

G5-8, The input to the Y2 amplifier is selected by the Y2 DISPLAY switch and can be either the Spectrum of IF Flatness signal from G2 or the Group Delay signal from G3. In slave operation the slave information is recovered in the AFC loop and fed to the Y2 DISPLAY switch via the IF recovered sweep path.

G5-9 The SLAVE OUTPUT from A3 is replica of either the Y1, or Y2 display with markers added, selected by the SLAVE Y1 and Y2 switch. The sweep signal is applied to the Horizontal Deflection Amplifier A2 via the Y2 DISPLAY switch and the SWEEP SOURCE switch. In all Y2 DISPLAY switch positions except SPECTRUM, the SWEEP SOURCE switch selects whether the signal is IF recovered sweep from G2; BB recovered sweep from G3; or from an external source via the EXT SWEEP INPUT. In SPECTRUM operation the spectrum sweep from G2 is applied directly to the Y2 DISPLAY switch. The Bias Network A4 ensures that the coupling capacitor on A23 cannot be wrongly polarised.

G5-10 The X-PHASE SHIFT control on A2 is adjusted to compensate for any phase shift between the sweep signal and the Y1 information. A portion of the sweep signal is phase shifted 90° and squared to provide the blanking pulse to suppress the return path of the CRT trace and also provide the calibration sync signal. The BLANKING switch allows the blanking to be switched OFF.



G5-11 TROUBLESHOOTING

G5-12 A fault will be located to this General Service Sheet when the signals at General Service Sheet G1 are correct but the meter of CRT display is faulty.

G5-13 For a meter fault refer directly to A5 Assembly Service Sheet. For all other faults attempt a back-to-back IF Flatness check as follows and check monitor points in troubleshooting table in order to isolate the fault to a particular Service Sheet.

Set 3710A controls as below:

SWEEP WIDTH	50MHz
SWEEP	INT
F FREQUENCY	70MHz
FATTENUATOR	10dB

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Set 3702B controls as below: 2.:

			· · · · · · · · · · · · · · · · · · ·	
YI DISPLAY		** ** ** **	IF	
Y2 DISPLAY		, (, , , , , , , , , , , , , , , , , ,	IF	있는 것이 있는 것이다. 같은 것이 같은 것이 같이 있는 것이 있는 것이 없다. 것이 있는 것이 있는 것이 있는
Y1 GAIN		estere per del 14. Notes del 14.	ant	iclockwise
Y1 POSITION				
Y2 GAIŃ			かいぶん かいがく あい	iclockwise
Y2 POSITION		100 (100 (100 (100 (100 (100 (100 (100		ckwise
Y1/Y2 CALIBRAT				F
MARKERS				
MARKER OFFSET				VHz
SWEEP SOURCE	Per collection de la co	•••••••••••••		
EXT INPUT CALIB			OF	
IF ATTENUATOR		** ** ** **		1 R State and T

Connect the 3710A IF OUTPUT to the 3702B IF INEUT.

Test Location	Procedure	Typical Waveform
50 A3 pin (1)	Trigger Oscilloscope externally from the 3710A SWEEP OUTPUT. a. Monitor the dc level using 180A Oscilloscope and check for a dual trace. Check the variation in dc level of each trace as the Y1 and Y2 POSITION con- trols are varied over their full range. Gheck that each POSITION control only adjusts one trace. (The Procedure is continued on the following page).	0.5V/cm 5mS/cm

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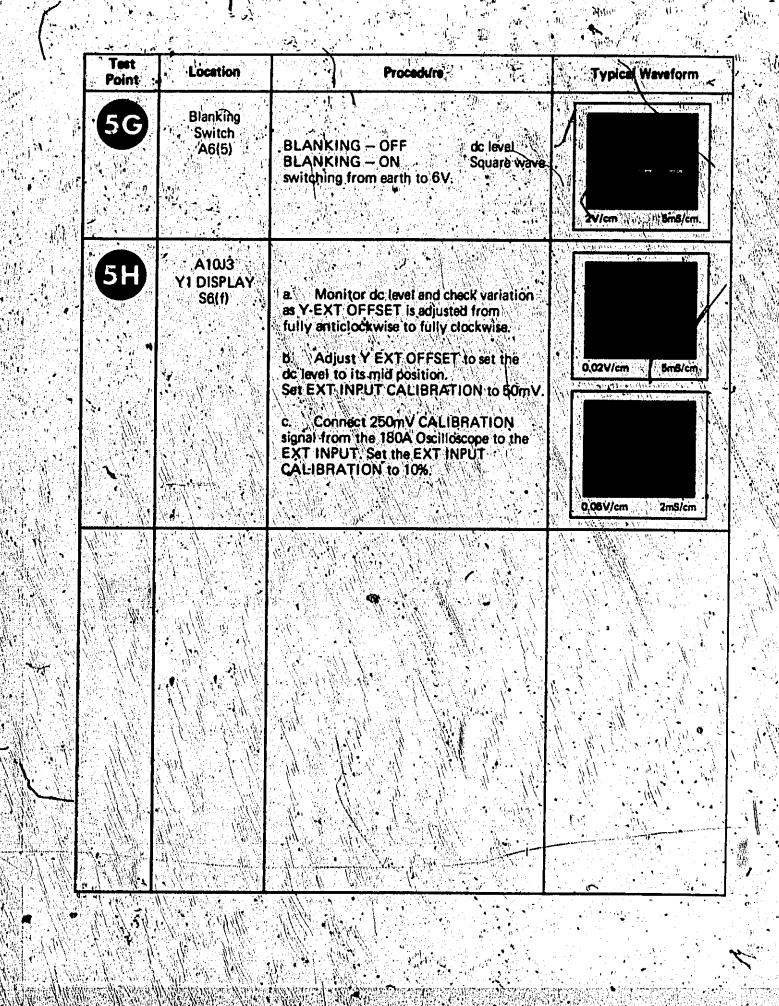
Section V

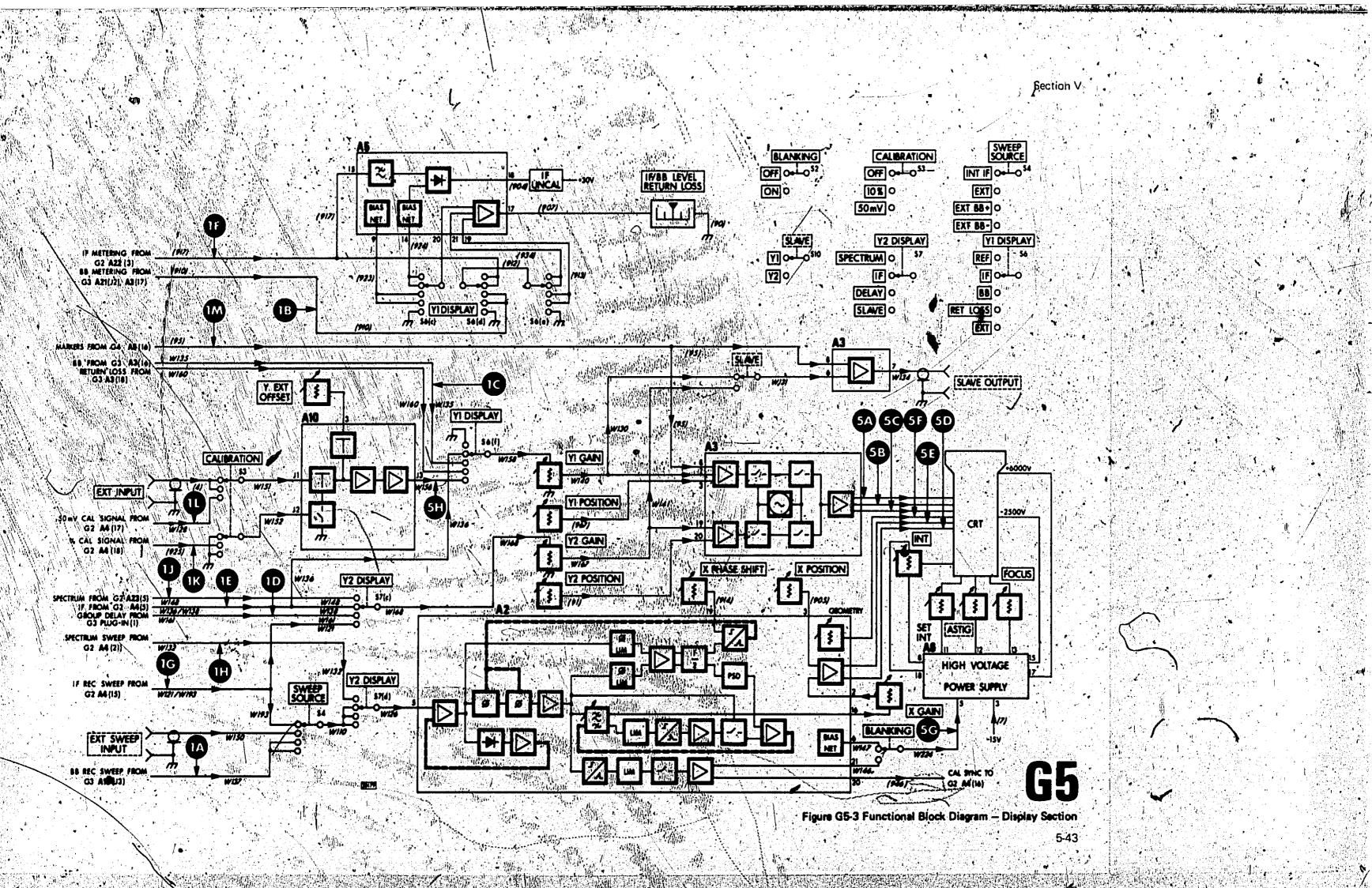
Model 3702B

Test Point	Location	Procedure	Typical Waveform
54	A3 pin (1)	Adjust the Y1 and Y2 POSITION controls to set the dc level to its mid position. b. Set the Y1 Y2 CALIBRATION control to 0.1dB and the Y1 GAIN control fully clockwise. c. Set the Y1 GAIN anti-clockwise and the Y2 GAIN fully clockwise.	0.5V/cm SmS/cm
5B	A3 pin (2)	As for A, but in anti-phase.	i an
50	A3 piń (3)	dc level	
5	A2 pin (2)	Trigger the Oscilloscope externally from the 3710A SWEEP OUTPUT. a. Set the SWEEP SOURCE switch to EXT and monitor dc level variation of 8V as the X-POSITION is varied over its full range. Adjust the X-position control to set the dc level to its mid position. b. Reset the SWEEP SOURCE switch to IF REC and adjust X-GAIN control for a sinewave just out of limiting. c. Turn X-GAIN fully anticlockwise and check for a signal amplitude reduction of .30V. d. Turn the X-PHASE SHIFT from fully anticlockwise to fully clockwise and check the phase shift is 180°. c. Vary the 3710A SWEEP WIDTH control over the range 50 to 3MHz and check signal amplitude remains con- stant. f. Set the 3710A SWEEP to LINE and 18Hz and check that the phase of the signal does not vary by more than 90%.	ZV/cm Sm/cm
(5E)	A2 pin (3)	As for D and check signal is in anti- phase to the signal at D.	
SF	A2 pin (1)	dc level	

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Model 3702B

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ASSEMBLY SERVICE SHEET A1 - LOW VOLTAGE POWER SUPPLY

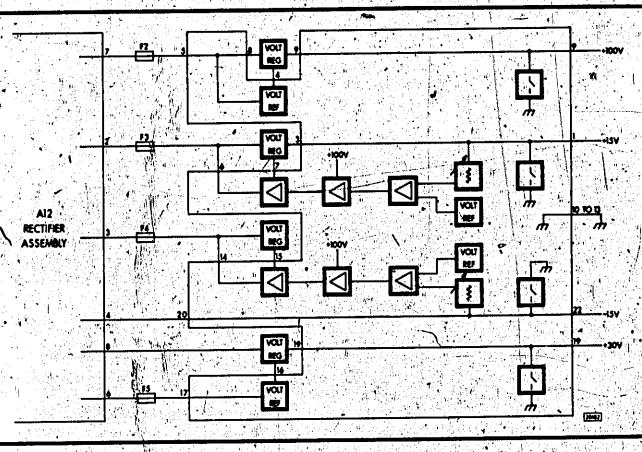


Figure A1-1 Simplified Block Diagram

A1-1 CIRCUIT DESCRIPTION

A1-2 There are four regulated voltage supply rails generated on this assembly, - the +100V, the +30V, the +15V and the -15V rails.

A1-3 +100V Supply

A1-4 A reference voltage is applied to the base of Q1 from breakdown diode A1CR1. The +100V supply is thus regulated by Q1 sensing voltage changes between its base and emitter and adjusting the current available from half-wave rectifier A12CR1. The +100V supply is used to bias the Set Intensity potentiometer R14, and the $\pm 15V$ supplies.

AT-5 +30V Supply

A1-6 A reference voltage is applied to the base of Q4 from breakdown diode A1CR10. The +30V supply is thus regulated by Q4 sensing voltage changes between its base and emitter and adjusting the current available from full-wave bridge rectifiers A12CR10 to CR13

A1-7 +15V Supply

A1-8 Transistor A1Q3 is a differential amplifier which provides thermal stability and amplification for error signals. The input at A1Q3A base is referenced by A1CR4, the other input to A1Q3B base monitors the +15V dc output rail. Any difference in input levels generates an error signal at A1Q3A collector which is applied to control transistor A1Q2. This signal, through driver transistor A1Q1, controls the series regulator and hence the +15V dc output rail. Adjustment of the +15V dc output rail is controlled by R13. Note that the circuit operation is dependent upon the +100V supply.

A1-9 -15V Supply

A1-10 Transistor A1Q6 is a differential amplifier which provides thermal stability, and amplification for error signals. The input at A1Q6A base is referenced by A1CR7, the other input to A1Q6B base monitors the -15V dc output rail. Any difference in input levels generates an error signal at A1Q6B collector which is applied to control transistor A1Q5. This signal, through driver transistor A1Q4, controls the series regulator and hence the -15V dc output rail. Adjustment of the -15V dc output rail is controlled by R23. Note that the circuit operation is dependent upon the +100V supply.

A1-11 Overload Protection

A1-12 Thyristors A1CR3, 6, 9 and 12 and breakdown diodes A1CR2, 5, 8 and 11 provide overvoltage protection on all supply lines. If the voltage of any supply exceeds that of the breakdown diode in its protection circuit, the breakdown diode will conduct turning the thyristor on, which will in turn short circuit the supply and blow the line fuse.

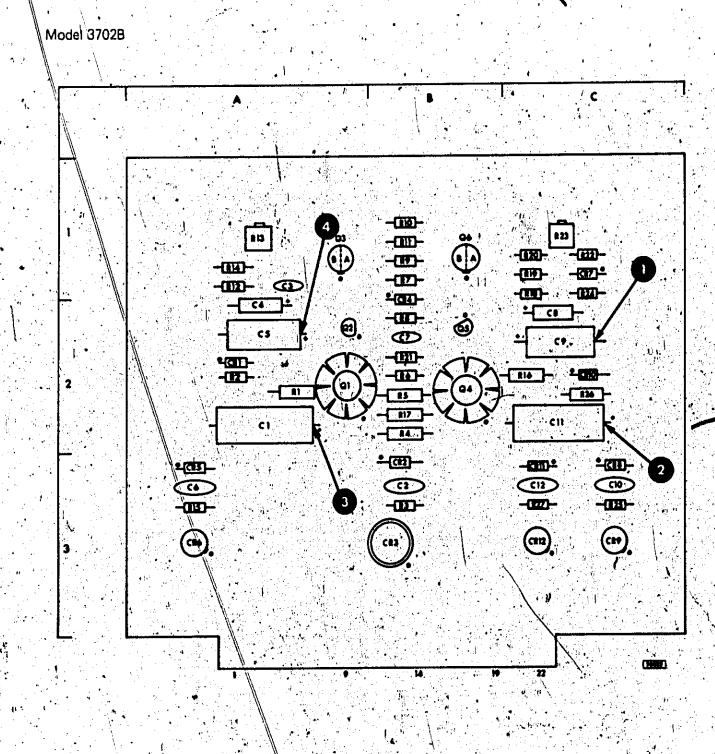
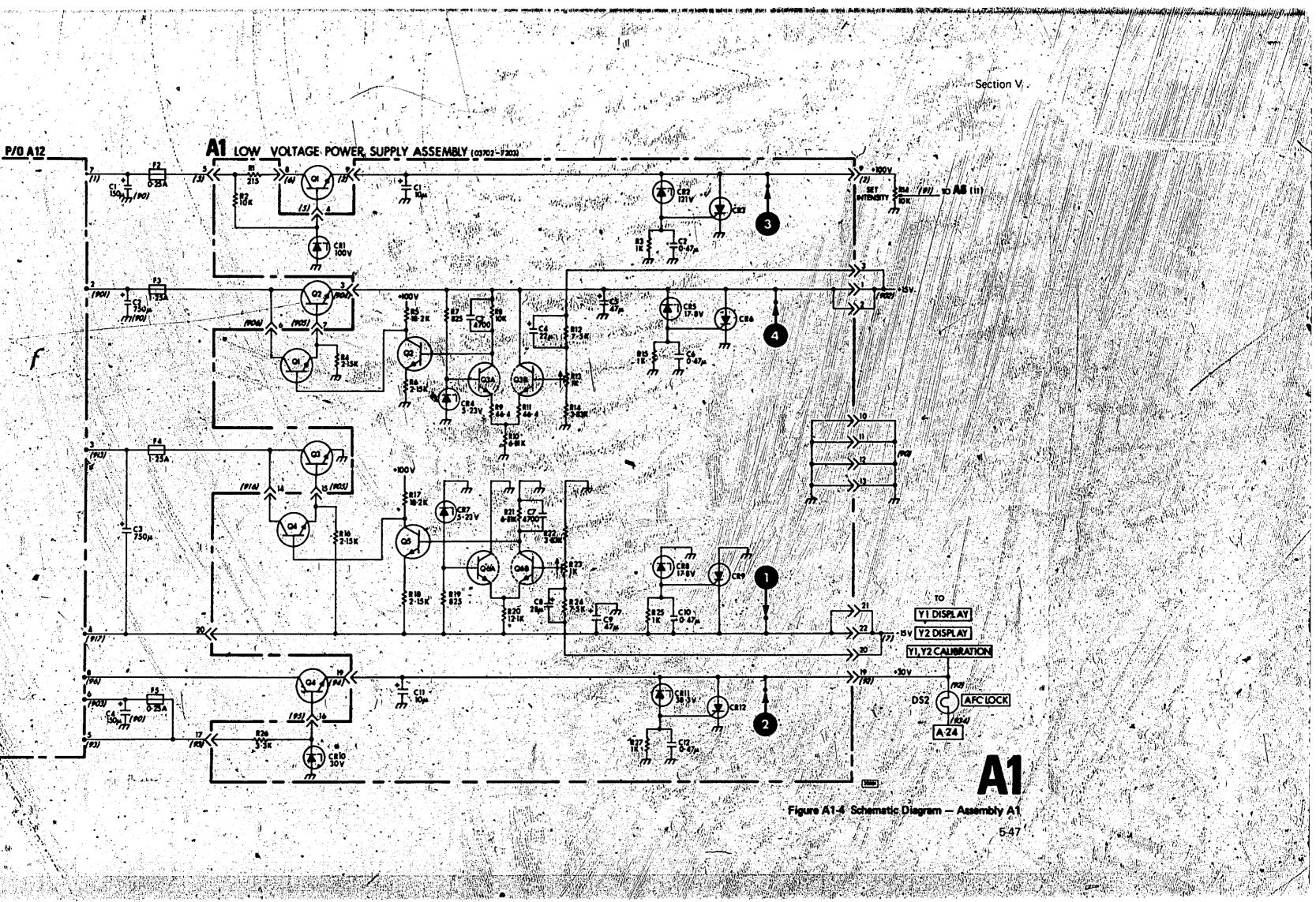
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Figure A1-2 Component Location

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	<u> </u>	•	
	С	02	A-2
	REF GRID	03	A-1
	DESIG	04	B-2
	C1 A-2	Q5 .	B-2
	C2 B-3	Q6	B-1
•	C3 A-1	R	
Å.	C4 A-2	REF	GRID
	C5 A-2	DESIG	LOC
•	C6 · A·3 C7 B-2	· 是我想到了我的问题。	1.11
	C8 C-2	R1 R2	A-2 A-2
•	C9 C·2	R2 R3•	B-3
	C10 C-3	R4	/8-2
i Ant	C11 C-2	R5	B-2
	C12 C-3	R6	B-2
	CR	R7	B-1
	The second second second	R8	B-2
	REF GRID DESIG LOC	R9	B-1
	전 관련을 가슴을 감각할 것이다.	R10	B-2 B-1 B-1 B-1
39 20	CR1 A-2	R11	B-1
	CR2 B-3	R12	A-1 A-1
	CR3 B-3 CR4 B-2	R13 R14	A-1 .A-1
3 a 1	CR5 A-3	R15	A-3
545 80	CR6 A-3	R16	C-2
	CR7 C-1	-R17	B-2
	CR8 C-3	R18	C-1
	CR9 C-3	R19	C-1
	CR10 C-2	R20	Ç-1
	GR11 C-3	R21	B •2
	CR12 C-3	R22	C-1
ř	0	R23	C-1 C-1
	DEF	R24	C-1 C-3
	REF GRID DESIG LOC	R25 R26	C-3 C-2
		R27	C-2
	Q1 A-2		0.0
1.0	69 - 366 S. 69 - 57 - 56		5 2 5

Figure A1-3 Grid Reference



ASSEMBLY SERVICE SHEET A2 -HORIZONTAL DEFLECTION

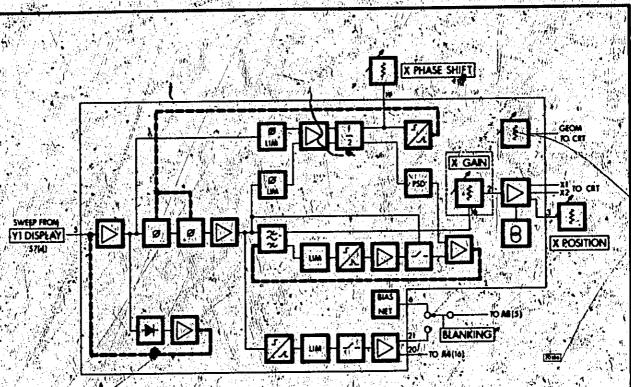


Figure A2-1 Simplified Block Diagram

A2-1 CIRCUIT DESCRIPTION

A2-2 This assembly applies a constant amplitude sinewave, in phase with the Yaxis amplitude variations, to the horizontal deflection plates X1 and X2.

- A2-3 "The complete circuit can be broken down into four main blocks: 1. Automatic Gain Control — which provides a constant X-axis display, independent of Sweep Width changes:
 - Automatic Phase Control compensates for any phase differences introduced between the horizontal and vertical axes due to the recovered sweep, Tracking Filter – narrow bandpass filter with a centre frequency that can be varied to coincide with the sweep frequency. Thus only the sweep frequency (is passed while the harmonic content is rejected. Blanking Circuit – supplies blanking pulses to the CRT via the High Voltage Assembly A6

2-4 Automatic Gain Control

A2-5 Initially the gain of amplifier MC1 is determined by the resistance of R2, E1 and R75. Consider an increase in signal amplitude at the input. This causes an increase in the output from MC1 resulting in an increase in the output from peak detector CR3, R79 and C28 which when amplified and inverted by the error amplifie MC10 will reduce the current through and hence the brightness of lamp DS1. A reduction of the brightness of DS1 will increase the resistance of E1 reducing the amplifier gain and restoring the output from MC1 to the original level. و و المان ، ا

Section V

A2-6 Automatic Phase Control

A2-7 Initially the sweep signal at the input to MC3 will have an arbitrary phase shift introduced by phase shifters \$1 and \$2, depending upon the position of the X PHASE SHIFT control R4. With the BLANKING switch set to OFF any phase shift between the vertical information (Y) and the horizontal sweep (X) will result in a separation of the markers on the forward and flyback traces. The X PHASE SHIFT, control R4 is adjusted to bring the markers together, ie, in phase. The control circuit will now function in the following manner to keep the correct phase relationship between horizontal and vertical axes.

A2-8th The input and output from the phase shifters are applied to two very high gain limiting amplifiers MC6 and MC7. The output from the amplifiers saturate to either +12V or -12V when the input sinewave passes through zero, ie, the output will be +12V when the sinewave is decreasing through zero, and -12V when the sinewave is increasing through zero. (See Figure A2-2 Timing Waveforms).

A2-9 Suppose now there is a change in the phase of the incoming sweep signal $(60^{\circ}$ shown in Figure A2-2), then the output square wave from MC6 will either lead or lag the output from MC7. The outputs from MC6 and MC7 are applied via pulse amplifiers Q14 and Q13 to the R-S flip-flop MC8, which triggers on the positive going edges giving a pulsed output with a mark to space ratio proportional to the phase shift in the input signal. The flip-flop output is integrated by error integrator MC9 giving a dc voltage propertional to the input phase change. This will result in an increase or decrease in correct through famps DS2 and DS3, thereby changing the resistance of E2 and E3 giving a dc voltage propertional to phase.

A2-10 MC2 acts as a unity gain buffer to prevent other circuits from loading phase shifter ϕ 2, when E3 has a high resistance.

A2-11 Tracking Filter

A2-12 The sweep signal from the phase control loop is passed through active bandpass filter MC3 to improve its harmonic content. However, since the sweep frequency can be anywhere in the range 10 to 100Hz, and the bandwidth of the filter is 6Hz, the centre frequency of the filter must be controllable or the sweep frequency may be outside the filter bandwidth. The filter also introduces a 180° phase shift at its centre frequency but at other frequencies varies as shown in Figure A2-3.

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A2-13 To control the centre frequency of the filter, the filter output is applied to limiting amplifier MC4, producing a square wave as described under the Automatic Phase Control section. The square wave is applied to pulse amplifier Q5 via described under the Automatic Phase Control section. The square wave is applied to pulse amplifier Q5 via described under the Automatic Phase Control section. The square wave is applied to pulse amplifier Q5 via described under the Automatic described under the Automatic phase Control section. The square wave is applied to pulse amplifier Q5 via described under the square wave is applied to pulse amplifier Q5 via described under the square wave is applied to pulse amplifier Q5 via and R to but will be turned off by the negative pulses from the differentiator. The resulting pulses on Q5 collector will turn the N channel FET sampler Q6 on, sampling the input at MC3 via C12 and charging the store capacitor C13, which is buffered to the input of error amplifier MC5 by QTT rensistor Q8 compensates for variations in Q7 due to temperature.

A2-14 Any change in the input sweep frequency will produce a change in charge on C13, producing an error voltage which when amplified by MC5 will change the cutrent through DS4. This alters the value of control resistor E4 shifting the filter centre frequency to coincide with the input frequency.

A2-15 To speed up the loop response of the tracking filter, transistors 021-22 and integrated circuit MC12 detect instantaneous changes of phase in the R-S flip-flop ME8 inferring a frequency change and shifts MC5 of put to the value required by the new frequency.

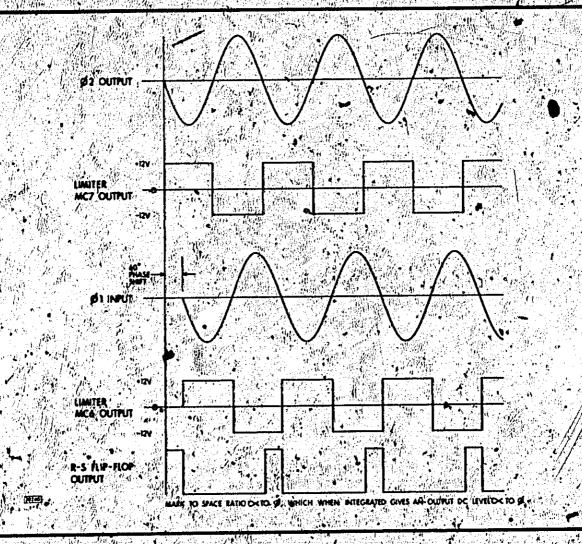
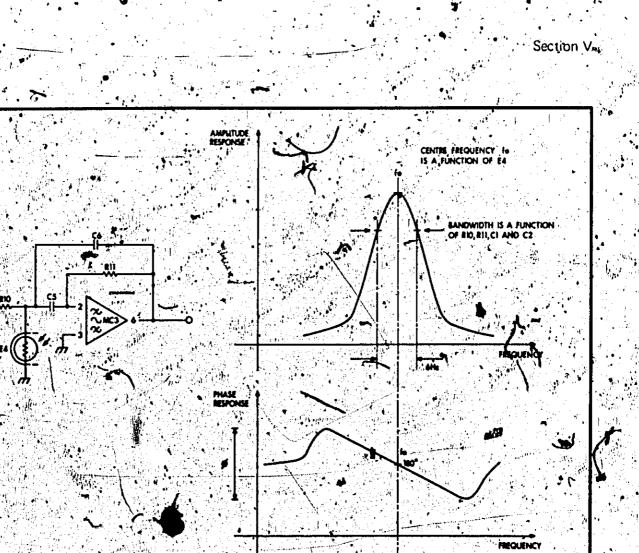


Figure A2-2 Timing Waveforms



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Figure A2-3 Active Filter

A2-16 Output Stage

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A2-17 The output from the active filter MC3 is applied via the X GAIN control R3 to differential amplifier Q10 to Q12, giving a differential output on Q10 and Q12 collectors, which is applied to the X deflection plates. The X POSITION control R7 varies the dc bias on the base of Q12, Q11 is a constant current generator supplying bias current to Q10 and Q12.

A2-18 Blanking Circuit

A2-19 The sweep output from MC2 is phase shifted 90° by the blank integrator Q18, and applied to the limiting amplifier MC11. Thus Q19 is alternatively switched on and off producing a 60V pk-pk blanking pulse to the intensity control grid via emission follower Q20.

A2-20 Screen geometry is adjusted by bias resistor R37.

A2-21 Bias network R73 keeps the CRT intensity constant when changing the BLANKING switch from ON to OFF.

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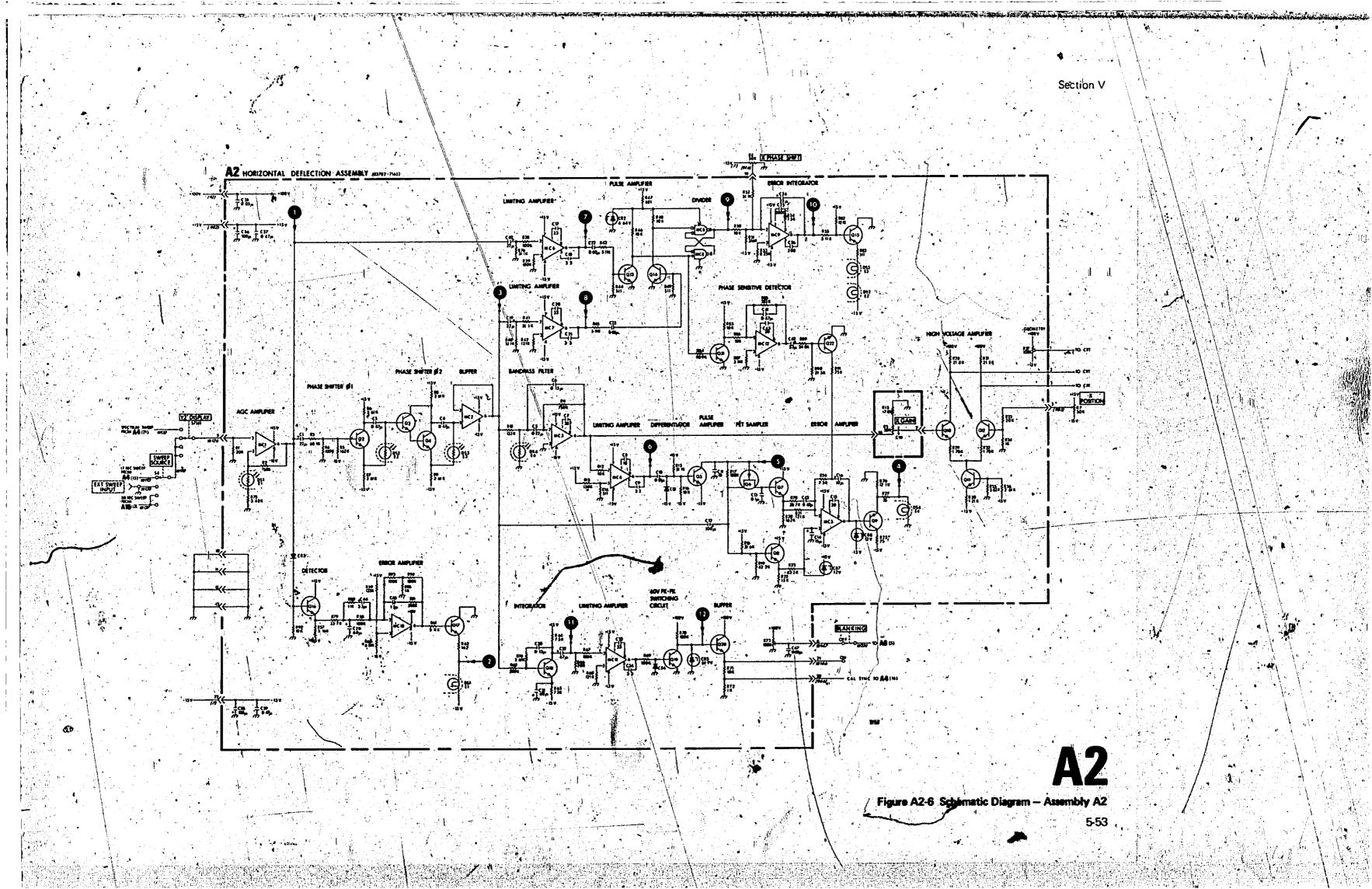
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A2-4 Component Location

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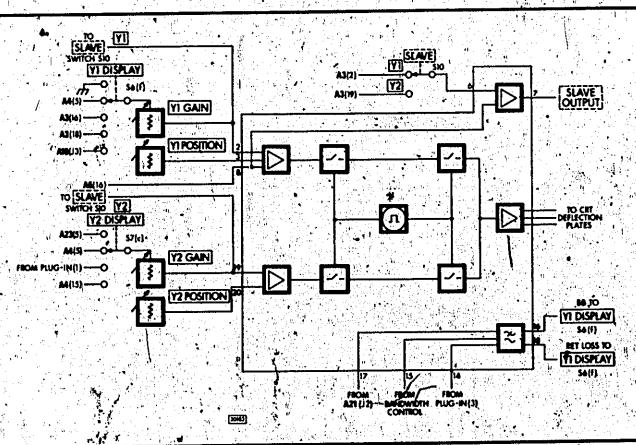
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С		C41"	C-1	C)	*R14.	" D-3	R57>	B 4
REF	GRID	C42	D-1	REF	GRID	R15	E-3	R58	A-4
DESIG	LOC	C43	•E-1	DESIG	1	R16	E-3	R59	A 3
		C44	A-3		LOC	R17	D-2	R60	A-4
Ci	B-5	C45	C-1	02	B-5	R18	D-1	R61	Å-3
C3	C-5	C46	B-4	03	C-5	R19	D-2	R62	B-3
Ċ4	C-5	CF	2	Q4	C 5	R20.	E-2	R63	D-4
C5	D-3.	· · · · ·		Q5	D-2	R21	E-1	R64	E-4
· C6	E 3	REF	GRID	Ω6 · ·	D-2	R22 ·	E-1	R65	E-4
C7	E-4.	DESIG	LOC	07	D-1	R23	.Ę-1	R66"	D-4
C8	D-3	CR1	E-3	08 <	D-1	R24	D-1	R67	D-4
C9	_E-3	CR2	A-1	09	C-3	R25	Ç-2-	R68	D-5
C10	E-2	CR3 4	.A-5	- Q10	A-1	R26	C-3	R69	E-4
C11	D-2	CR4	E-5	Q11	A-1	R27.	C-3	R70	D-5
C12	C-2	CR5	E-5	012	A-1	R28	"A-1	R71	D-5
C13	E 2	CR7	D-1	Q13	A-2	R29	A-1	R72	D-5
C14	D-1	CR8	C-2	_014	A•2	R30	B-2	R73	, В-1
, C15	E-1 '	foorgite geologi G	an h a dha an a	`Q15	C-3	R31	B-1	R74	E-4
C16	.C-2	E.		Q16	A-4	R32	A-1	R75	·A5
C17	A-2	DEE	GRID	Q17	'A-3	R33	B-4	R76	A-2
C18	B-2	REF DESIG	LOC	Q18	D-4	R34	C-1 *	R78	E-1
C19	B-4			Q19	D-5	R35	A-1	R79	A-4
C20	A-3	E1	- B-4	Q20	D-5	R36	A-1	R80	A-4
C21	8-3	E2	C-4	Q21	C-1	R37	B-1	R81	A-4
′C22	B-3	E3	C-4	Q22	C 1	R38	A-3	R82	C-3
C23	• B-3	E4	C-4	Ŗ)	R39 '	* B-3	R83	.C-3
C24	C-1	MC		,	1	R40	8-4	R84	B-1
C25	B-2		Area	REF	GRID	R41	B-4	R85	B-1
C26	B-2	REF	GRID	DESIG	LOC	R42	B-4	R86	C-1
C28	A-3	DESIG	LOC	R1	B-5	R43	B-2	R87	C 1
C30	E-4	мсі	A-5	B2 3	B-5	R44	A-2	R88	C-1
C31	D-4	MC2	C-5	R3	B-5 B-5	R45	B-3	R89	D 1
C32	D-4	MC3	D-3	R4	B-5	R46	- A-2	R90	E-1
C33	D-4	1000		R5 -	C-5	R47	A-2		D-1
C34	E-4	MU4	D-3	R6	B-5	R48	+ A-2	R91	A-5
C35	B-5	MC5	D-1		B-5	R49	B-2	R92 R93	A-3 A-4
C36	A-5	MC6	'A-3	R8		R50	B-1		
Ç37	A-5	MC7	B-3	R9	C-5	R51	B-1	R94	· A4
C38	E-5	MC8	8-1 - P 2	R10	D5	R52	B-2	· R95	A-4
C39	E-5	MC9	B-3		E-4	R53	B-3	•	-
C40	A 3	MC10	A-4	R11-		R54	B-2	٩	
	л. У	MC11	D-4	R12	⁵ D-3	R55	• C 3	•	a
				R13	D-3			· ·	(:

Figure A2-5 Grid Reference



Model 3702B

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ASSEMBLY SERVICE SHEET A3-VERTICAL DEFLECTION



A3-1 CIRCUIT DESCRIPTION

A3-2 The two signals to be displayed are applied via the Y1 DISPLAY and Y2 DISPLAY switches and the Y1 GAIN and Y2 GAIN controls to the input amplifiers in assembly A3. The outputs from the amplifiers are applied to series and shunt switches which are controlled by an astable multivibrator. The 'chopped' signals are applied to a high voltage amplifier which supplies the signals to the vertical deflection plates on the CRT.

A3-3 Y1 Deflection

A3-4 The signal for application to the Y1 trace is obtained from the Y1 DISPLAY switch S6(F). A portion of the amplitude of the input signal, determined by the position of the Y1 GAIN control, is simultaneously applied to the Y1 amplifier on assembly A3, and the SLAVE Y1 Y2 switch. The Y1 amplifier, MC1 and Q1, is a low voltage amplifier in which Q1 provides a low output impedance over the amplifier frequency range. The gain of the Y1 amplifier is determined by resistors R1 and R5 to R7. The markers from assembly A5(16) are also applied to the Y1, amplifier. The Y1 POSITION control varies the dc reference to the Y1 amplifier:

A36 Y2 Deflection

A3-6 The signal for application to the Y2 trace is obtained from the Y2 DISPLAY switch S7(C). A portion of the amplitude of the input signal, determined by the position of the Y2 GAIN control, is simultaneously applied to the Y2 amplifier on assembly A3, and the SLAVE Y1 Y2 switch. The Y2 amplifier MC2 and Q2 is a low voltage amplifier in which Q2 provides a low output impedance over the amplifier frequency range. The gain of the Y2 amplifier is determined by resistors R14, R16, and R18 to R20. The Y2 POSITION control varies the dc reference to the Y2 amplifier.

A3-7 Trace Chopping

A3-8 Since the CRT is only a single beam type, it is necessary to rapidly sample the Y1 and Y2 traces in order to display them simultaneously.

A3.9 When Q4 is off, Q7 is on. The collector voltage of Q7 will change from -15V to almost 0V allowing maximum current flow in Q6 and Q8. Therefore, the Y1 signal is grounded through Q6 while the Y2 signal is applied to the output, high voltage amplifier Q9 to Q12. With Q4 off, the collector of Q4 is at a potential of -15V and no current flows in transistors Q3 and Q5. Therefore Q3 is closed and Q5 opens. Similarly when Q7 turns off and Q4 turns on, maximum current flows in Q3 and Q5. The Y2 signal is grounded by the action of Q5 but the Y1 signal is allowed to pass to the output high voltage amplifier. Zener diodes CR3 to CR6 limit the amplitude of the chopped waveform to ±4.9V.

A3-10 The chopped signal containing the Y1 and Y2 information is applied to the differential high voltage amplifier Q9 to Q12. The collectors of Q10 and Q11 drive the CRT vertical deflection plates at the correct operating voltage, with Y1 and Y2 information, giving an effective double beam display. The amplifier balance is adjusted by R63, ie, zero volts between Q10 and Q11 collectors, with no input. Capacitors C23 and C24 adjust both sides of the amplifier for the best pulse response.

A3-11 Slave Output

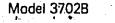
A3-12 The Y1 and Y2 signals on R8A and R9A wipers are also applied via the SLAVE Y1 Y2 switch S10 to the slave amplifier MC3, where it is combined with the markers from A5(16). The output from the slave amplifier is routed directly to the back panel SLAVE OUTPUT connector.

A3-13 BB Post Detector Filter

A3-14 The detected BB signal from A21(J2) is applied to the filter via pin 17. The BB signal is then filtered by either a 1kHz or 5kHz low-pass filter depending upon the position of either the bandwidth control on the Receiver Plug-in or the switch in the plug-in housing.

A3-15 When the bandwidth control is in the 1kHz position, +30V is applied to the Junction of R47 and R64 turning Q13 hard on, grounding one end of C14. Components Q14, R50, 51 and C13, 14 then form a 1kHz Sallen and Key active filter which will limit the frequency of the detected BB to 1kHz. In the two 5kHz positions of the bandwidth switch, the Junction of R47 and R64 is grounded, turning Q13 off, and effectively open providing C14. The input for the detected BB will then be as shown in Figure A3-2.

5 55 G



5-56

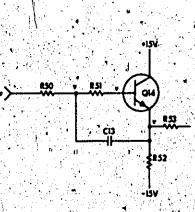


Figure A3-2 BB Post Detector Filter

(1924)

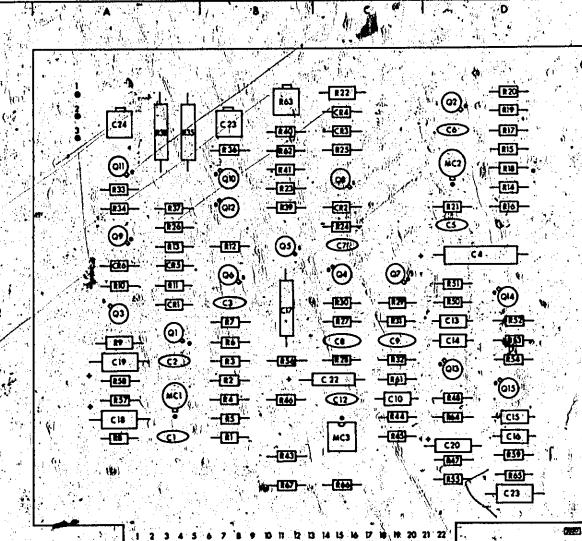
A3-16 If we assume that the input impedance is high, then there will be no current drawn through R50 and R51, thus giving no voltage drop. The input voltage will then appear at Q14 emitter at the same amplitude. Thus C13 has virtually no effect on the input signal. The 1kHz filter no longer exists and the detected BB signal is then applied to another Sallen and Key filter Q15, R53, R54 and C15, 16 which has a cut-off frequency of 5kHz.

4 $\boldsymbol{\boldsymbol{\theta}}^{[j]}$

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2

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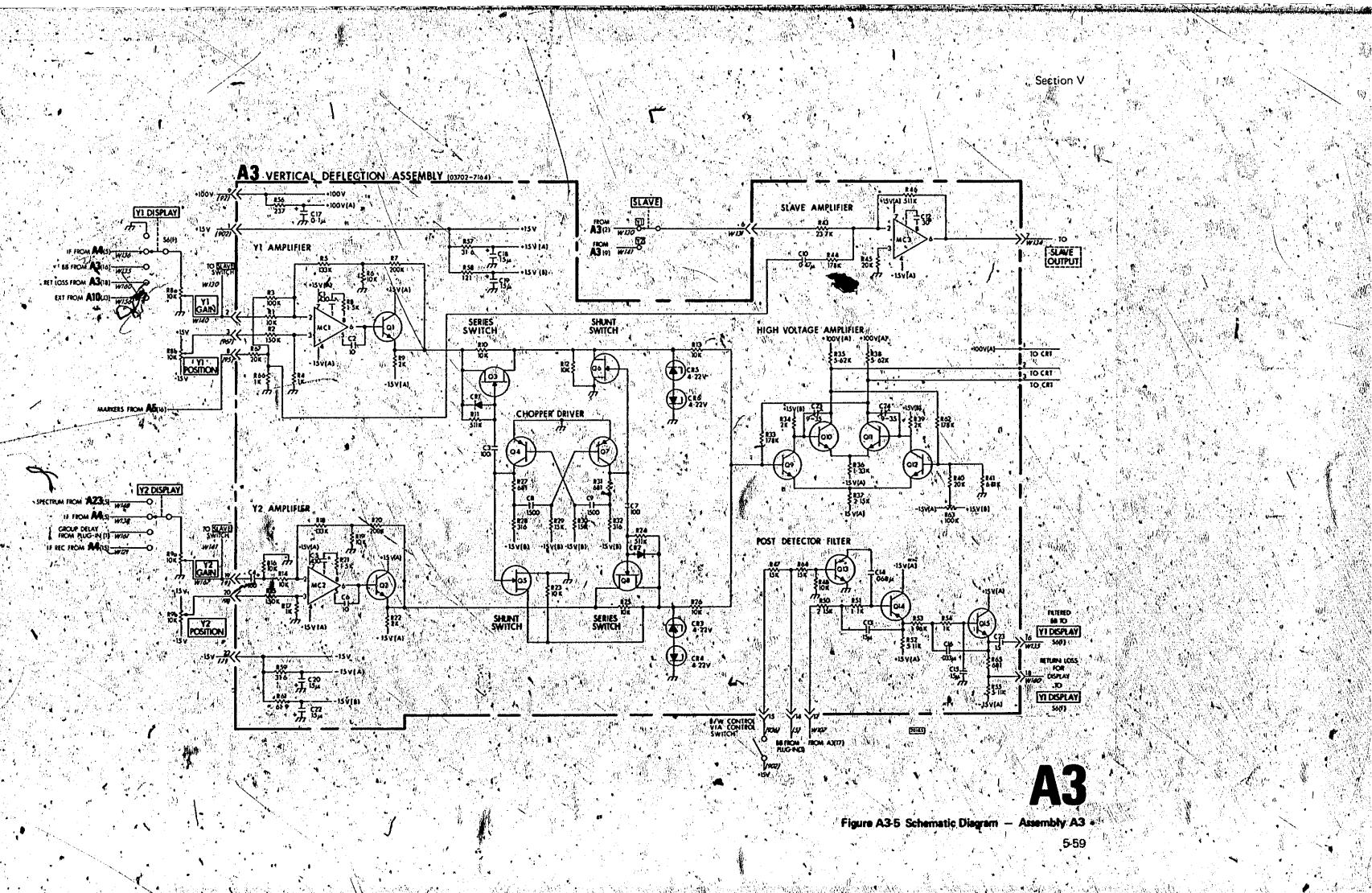
14 15 16 V 10 10 20 21 22 1 2 В

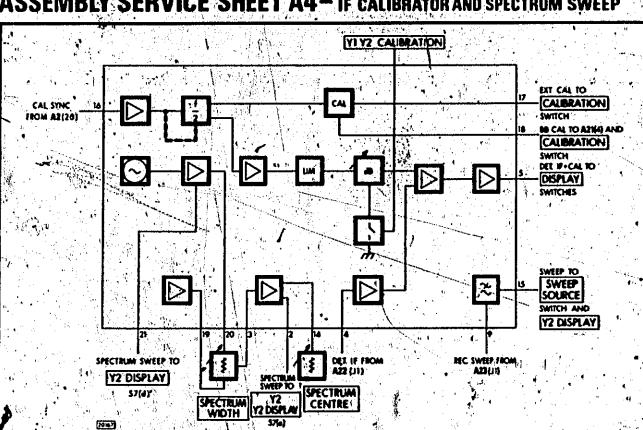
Figure A3-3 Component Location

C J REF GRID BESIG REF GRID LOC R22 R23 B-1 R23 C1 A-3 O1 A-2 R2 B25 C-1 R24 C-1 C-1 C-2 C2 A-2 C2 O2 D-1 R25 R26 A-1 R27 C-2 C-2 C4 D-2 C5 O-1 D-1 O5 B-2 R29 R29 C-2 C-2 C5 D-1 O-1 O6 B-2 R30 R30 C-2 R31 C-2 C-2 C6 D-1 O-1 O6 B-2 R30 R30 C-2 R31 C-2 C-2 C9 C-2 O9 A-1 R33 A-1 R33 A-1 R33 A-1 R33 C10 C-3 O10 B-1 R34 R41 A-1 R35 A-1 R36 C10 C-3 O11 A-1 R35 R37 A-1 R36 B-1 R44 A-1 R36 C14 D-2 O13 D3 R37 A-1 R41 B-1 R44 B-1 R41 C17 B-2 R2 C-3 R44 B-3 R40 B-1 R41 B-1 R44 C-3 R44 C-3 R44 <th>) 1 년</th> <th></th> <th></th> <th>· ····</th> <th></th> <th></th> <th>$\mathcal{F}_{i} = \mathcal{F}_{ij}^{i} + \mathcal{F}_{ij}^{i}$</th>) 1 년			· ····			$\mathcal{F}_{i} = \mathcal{F}_{ij}^{i} + \mathcal{F}_{ij}^{i}$
REF GRID REF GRID R23 B-1 DESIG LOC DESIG LOC R24 C-1 C1 A.3 O1 A.2 R25 C-1 C2 A.2 O2 D1 R26 A-1 C3 B.21 O3 A.2 R27 C-2 C4 D-2 O4 C-2 R28 C-2 C5 D-1 O5 B-2 R29 C-2 C6 D-1 O6 B-2 R30 C-2 C6 D-1 O6 B-2 R30 C-2 C6 D-1 O6 B-2 R30 C-2 C7 C-2 O7 C-2 R31 C-2 C8 C-2 O8 C-1 R33 A-1 C10 C3 O10 B-1 R34 A-1 C10 C3 O11 D-1 R35 A-1 C11	((2		2	822	C 1
DESIG LOC DESIG LOC R24 C-1 C1 A.3 01 A.2 B25 C-1 C2 A.2 02 D-1 B26 A-1 C3 B-21 03 A.2 R27 G-2 C4 D-2 04 C-2 R28 C-2 C5 D-1 05 B-2 R30 C-2 C6 D-1 06 B-2 R30 C-2 C6 D-1 06 B-2 R30 C-2 C9 C-2 07 C-2 R31 C-2 C9 C-2 09 A-1 R33 A-1 C10 C-3 O10 B-1 R34 A-1 C10 C-3 O11 A-1 R35 A-1 C13 D-2 O12 B-1 R36 ⁴ B-1 C14 D-2 O13 D3 R37 A-1 C16<		REF "	GRID	REF	GRID		
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C4 D-2 Q4 C-2 R28 C-2 C5 D-1 Q5 B2 R29 C-2 C6 D-1 Q6 B-2 R30 C-2 C7 C-2 Q7 C-2 R31 C-2 C9 C-2 Q9 A-1 R33 A-1 C10 C-3 Q10 B-1 R34 A-1 C12 C-3 Q11 A-1 R35 A-1 C13 D-2 Q12 B-1 R364 B-1 C14 D-2 Q13 D-3 R37 A-1 C15 D-3 Q14 D-2 R38 A-1 C16 D-3 Q15 D-3 R39 B-1 C17 B-2 REF GRID R44 C-3 C18 A-3 REF GRID R44 B-3 C20 D-3 B51 D2 R45 C-3 C23 B-1 R1 'B-3 R46 B-3 C24 A-1				1.			
C6 D-1 Q6 B-2 R30 C-2 C7 C-2 Q7 C-2 R31 C-2 C8 C-2 Q8 C-1 R32 C-2 C9 C-2 Q9 A-1 R33 A-1 C10 C-3 Q10 B-1 R34 A-1 C12 C-3 Q11 A-1 R35 A-1 C13 D-2 Q12 B-1 R36 ⁴ B-1 C14 D-2 Q13 D-3 R37 A-1 C15 D-3 Q14 D-2 R38 A-1 C16 D-3 Q15 D-3 R39 B-1 C17 B-2 REF GRID R40 B-1 C18 A-3 REF GRID R43 B-3 C20 D-3 DESIG LOC R44 C-3 C22 C-3 R1 B-3 R46 B-3 C24 A-1 R2 B-3 R47 D-3 G23 B-1<	-	C4					
C7 C-2 Q7 C-2 R31 C-2 C8 C-2 Q8 C-1 R32 C-2 C9 C-2 Q9 A-1 R33 A-1 C10 C-3 Q10 B-1 R34 A-1 C12 C-3 Q11 A-1 R35 A-1 C13 D-2 Q12 B-1 R364 B-1 C14 D-2 Q13 D-3 R37 A-1 C15 D-3 Q14 D-2 R38 A-1 C16 D-3 Q15 D-3 R40 B-1 C16 D-3 Q15 D-3 R40 B-1 C18 A-3 REF' GRID R43 B-3 C19 A-2 REF' GRID R44 C-3 C22 C-3 R1 B-3 R46 B-3 C23 B-1 R2 R45 C-3 C24 A-1 R3 B-2 R48 D-3 R5 B-3 R51 <th>. н</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>	. н						
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C9 C-2 Q9 A-1 R33 AJ C10 C-3 Q10 B-1 R34 A-1 C12 C-3 Q11 A-1 R35 A-1 C13 D-2 Q12 B-1 R36-4 B-1 C14 D-2 Q13 D-3 R37 A-1 C15 D-3 Q14 D-2 R38 A-1 C16 D-3 Q15 D-3 R39 B-1 C16 D-3 Q15 D-3 R39 B-1 C17 B-2 REF GRID R43 B-3 C20 D-3 DESIG LÓC R44 C-3 C22 C-3 R1 B-3 R45 C-3 C24 A-1 R2 B-3 R47 D-3 C24 A-1 R2 B-3 R51 D-2 R5 B-3 R51 D-2 R5 B-3 R51 D-2 CR1 A-2 R6 B-2 R53 D-2 D-2 </th <th>1</th> <th></th> <th>•</th> <th></th> <th></th> <th></th> <th></th>	1		•				
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C14 D-2 Q13 D-3 R37 A-1 C15 D-3 Q14 D-2 R38 A-1 C16 D-3 Q15 D-3 R39 B-1 C17 B-2 R40 B-1 C18 A-3 R R40 B-1 C19 A-2 REF' GRID R43 B-3 C20 D-3 C22 C-3 R1 'B'3 R46' B-3 C22 C-3 R-1 'B'3 R46' B-3 R45' C-3 C23 B-1 C R45' C-3 R45' C-3 R1 'B'3 R46' B-3 R50 D-2 R4 B-3 R50 D-2 R5' B-3 R51 D-2 REF GRID R6 B-2 R52' D-2 R7 B-2 R5 D-3 CR1 A-2 C R6 B-2 R55' D-3 CR2 C-1 R1 A-2 R55' D-3							
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C16 D-3 Q15 D-3 R39 B-1 C17 B-2 R R40 B-1 C18 A-3 R R41 B-1 C19 A-2 REF' GRID R43 B-3 C20 D-3 DESIG LOC R444 C-3 C22 C-3 R1 B-3 R46' B-3 C23 B-1 R2 B-3' R47 D-3 C24 A-1 R3 B-2 R48 D-3 R4 B-3 R50 D-2 R5 B-3 R51 D-2 REF GRID R6 B-2 R52 D-2 DESIG LOC R7 B-2 R53 D-2 CR1 A-2 R9 A-2 R55 D-3 CR2 C-1 R11 A-2 R56 B-2 CR3 C-1 R11 A-2 R56 B-2 CR4 C-1 R12 B-2 R58 A-3 CR5			· · · · · · · · · · · · · · · · · · ·	• • •	· · · · · · · · · · · · · · · · · · ·		
C17 B-2 R40 B-1 C18 A-3 REF GRID R41 B-1 C19 A-2 REF GRID R43 B-3 C20 D-3 DESIG LOC R444 C-3 C22 C-3 R1 B-3 R44 C-3 C23 B-1 R2 B-3 R47 D-3 C24 A-1 R3 B-2 R48 D-3 R45 C.3 R47 D-3 R46 B-3 C24 A-1 R3 B-2 R48 D-3 R5 B-3 R51 D-2 R5 R5 D-3 REF GRID R6 B-2 R52 D-2 R2 R5 B-3 R51 D-2 REF GRID R6 B-2 R52 D-2 R44 B-3 R54 D-2 R53 D-2 R1 A-2 R5 B-3 R54 D-2 CR1 A-2 R9 A-2		C16	the state of the s	115 - 7		R39	B-1
C19 A-2 REF ⁺ GRID R43 B-3 C20 D-3 DESIG LÓC R444 C-3 C22 C-3 R1 B-3 R46 B-3 C23 B-1 R2 B-3 R46 B-3 C24 A-1 R3 B-2 R48 D-3 R4 B-3 R50 D-2 R4 B-3 R50 D-2 R5 B-3 R51 D-2 R5 B-3 R51 D-2 R5 B-3 R51 D-2 R5 B-3 R51 D-2 R6 B-2 R52 D-2 R5 B-3 R51 D-2 R6 B-2 R53 D-2 R6 B-2 R53 D-2 R6 B-2 R53 D-2 R6 B-2 R53 D-2 CR1 A-2 R9 A-2 B55 D-3 CR2 C-1 R11 A-2 R56	1				$1_{i_1, i_2} \in 1_{i_1, i_2}$		1.12
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C23 B-1 R1 B-3 R46 B-3 C24 (A-1) R3 B-2 R48 D.3 R3 B-2 R48 D.3 R4 B-3 R50 D-2 R4 B-3 R50 D-2 R4 B-3 R50 D-2 R4 B-3 R50 D-2 R5 B-3 R51 D.2 REF GRID R6 B-2 R52 D-2 DESIG LOC R7 B-2 R53 D-2 CR1 A-2 R9 A-2 B55 D3 CR2 C-1 R11 A-2 R56 B-2 CR3 C-1 R11 A-2 R56 B-2 CR4 C-1 R11 A-2 R57 A-3 CR5 A-2 R13 A-2 R59 D-3 CR6 A-2 R14 D-1 R61 C-3 CR5 A-2 R14 D-1 R62 B-1	*	11 M 11		REF	GRID		
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Figure A3-4 Grid Reference

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ASSEMBLY SERVICE SHEET A4 - IF CALIBRATOR AND SPECTRUM SWEEP

Figure A4-1 Simplified Block Diagram

CIRCUIT DESCRIPTION

IF Calibrator A4-2

CAL SYNC pulses at the sweep frequency, from A2(20) are applied to A4-3 the bistable Q2-3 via emitter-follower Q1, producing a 4V pk-pk square wave at half of the sweep frequency on O2 and O3 collectors.

A4-4 The square wave on O2 collector is applied to emitter-follower O4 and amplifier Q5, which form the calibrator circuit, producing calibration signals for EXT and BB displays.

A4-5. The square wave on O3 collector is applied via emitter-follower Q6 and relay contact K1A to limiting amplifier Q7 and Q8. The output from Q8 collector is applied to buffer Q9 and can be varied by potentiometer R25 which sets the calibration of the split trace display when using the Y1 Y2 CALIBRATION switch. From 09 emitter the signal is applied to switched attenuator R30 to R33 which is operated by relays K2 and 3, to give 0,1, 0.3 and 1dB calibration according to the setting of the Y1, Y2 CALIBRATION switch S8.

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A4-6 The detected IF from A22(J1) is added via emitter follower Q14 to the calibration signal in the differential amplifier Q11 and Q12. The resulting calibrated, detected IF signal is then buffered by Q13 and applied to the A3 Vertical Amplifier via the Y1 DISPLAY and Y2 DISPLAY, switches S6 and S7.

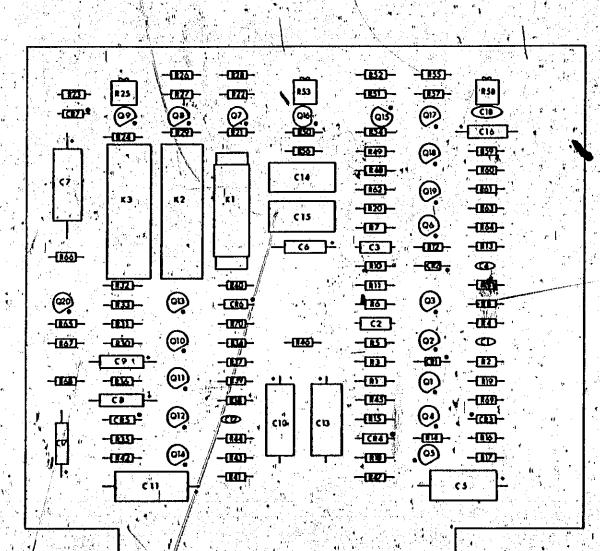
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A4-7 Spectrum Sweep

A4-8 Spectrum Sweep Oscillator, Q15 and Q16 generates a 100Hz signal which is applied via the variable driver Q17 to Q19 to the spectrum sweep output (21) and the SPECTRUM WIDTH control R3. Transistors Q18 and Q19 are identically biased so that both emitters are at the same dc potential, allowing the amplitude of the 100Hz signal into emitter follower Q20 to be varied by the SPECTRUM WIDTH control R3 without varying the dc level. The SPECTRUM CENTRE control R6 varies the dc offset on the 100Hz signal from Q20 emitter, and the resulting signal (dc + sweep) is used to control the A23 Local Oscillator frequency in the SPEC-TRUM mode. Model 3702B

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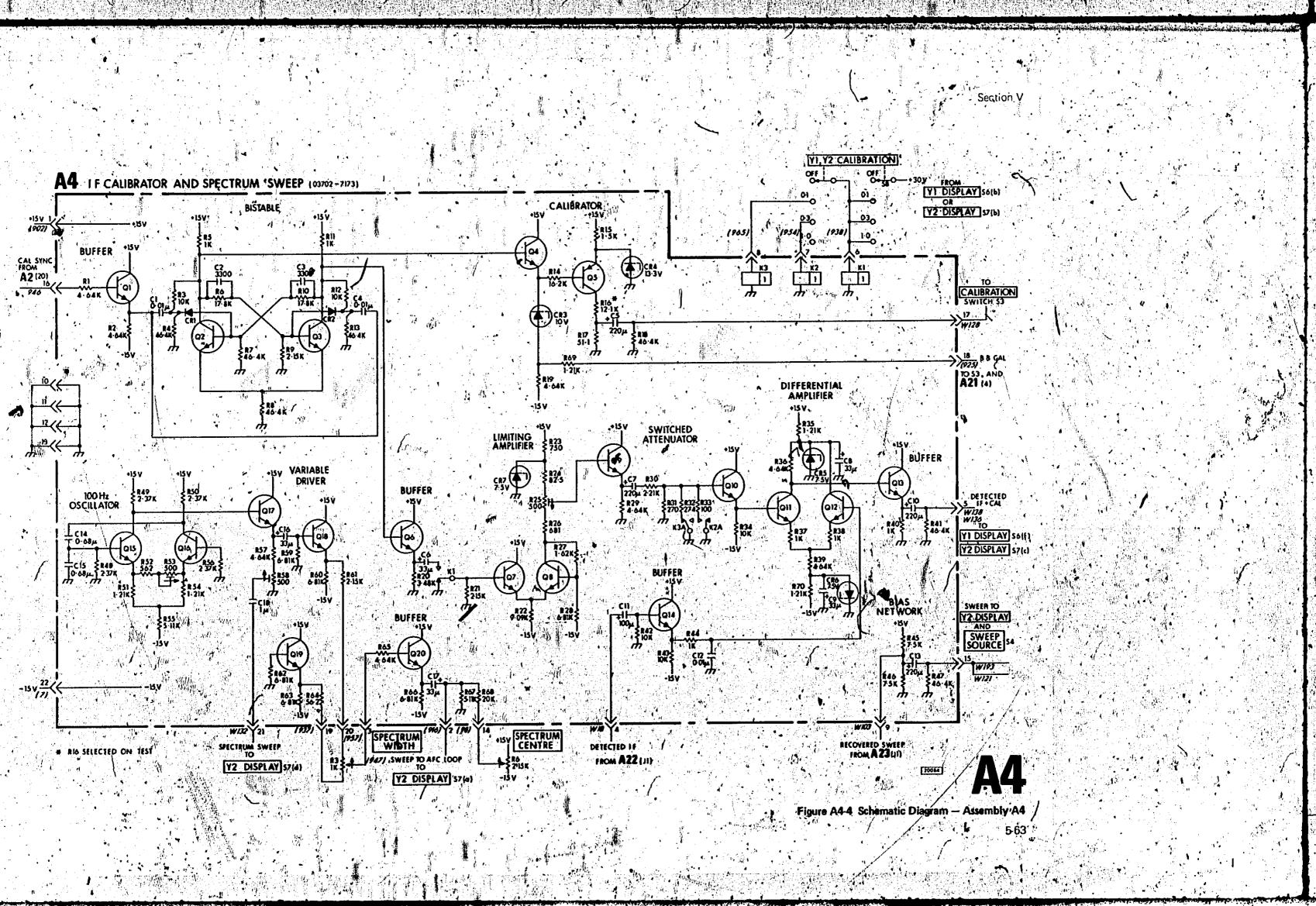
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Figure A4-2 Component Location

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C12 B-4 Q5 D-4 R18 C/4 R53 C-1 C13 C-4 Q6 D-2 R19 D-4 R54 C.1 C14 C-2 Q7 B-1 R20 C-2 R55 D-1 C15 C-2 Q8 B-1 R21 B-1 R56 C-2 C16 D-1 Q9 A-1 R22 B-1 R57 D-1 C17 A-4 Q10 B-3 R23 A-1 R58 D-1 C17 A-4 Q10 B-3 R23 A-1 R58 D-1 C17 A-4 Q10 B-3 R23 A-1 R59 D-2 Q12 B-4 R24 A*1 R59 D-2 Q12 B-4 R25 A-1 R60 D-2 Q13 B-3 R26 B-1 R61 D-2 Q15 C-1 R28 B-1 R63 D-2 CR1 D-3 Q16 C-1 R29 B-1 R64 D-2 Q17 <th></th> <th></th> <th></th> <th></th> <th>R16</th> <th>_)∴D-4/</th> <th>R51</th> <th>C-1</th> <th></th>					R16	_)∴D-4/	R51	C-1	
C13 C-4 O6 D-2 R19 D-4 R54 C.1 C14 C-2 Q7 B-1 R20 C-2 R55 D-1 C15 C-2 Q8 B-1 R21 B-1 R56 C-2 C16 D-1 O9 A-1 R22 B-1 R57 D-1 C17 A-4 O10 B-3 R23 A-1 R58 D-1 C17 A-4 O10 B-3 R23 A-1 R58 D-1 C17 A-4 O10 B-3 R23 A-1 R58 D-1 C18 D-1 O11 B-4 R24 A*1 R59 D-2 O12 B-4 R25 A-1 R60 D-2 O13 B-3 R26 B-1 R61 D-2 O14 B-4 R27 B-1 R62 C-2 O15 C-1 R28 B-1 R64 D-2 CR1 D-3 O16 C-1 R29 B-1 R64 </th <th></th> <th></th> <th></th> <th></th> <th>R17</th> <th></th> <th>R52 💈</th> <th>C-1</th> <th></th>					R17		R52 💈	C-1	
C14 C-2 Q7 B-1 R20 C-2 R55 D-1 C15 C-2 Q8 B-1 R21 B-1 R56 C-2 C16 D-1 Q9 A-1 R22 B-1 R57 D-1 C17 A-4 Q10 B-3 R23 A-1 R58 D-1 C17 A-4 Q10 B-3 R23 A-1 R59 D-2 C18 D-1 Q11 B-4 R24 A+1 R59 D-2 C18 D-1 Q12 B-4 R25 A-1 R60 D-2 Q13 B-3 R26 B-1 R61 D-2 Q13 B-3 R26 B-1 R61 D-2 Q14 B-4 R27 B-1 R62 C-2 Q15 C-1 R28 B-1 R63 D-2 CR1 D-3 Q16 C-1 R29 B-1 R64 D-2 CR2 D-2 Q17 D-1 R30 A-3 R65<					R18	C/4			
C15 C-2 Q8 B-1 R21 B-1 R56 C-2 C16 D-1 Q9 A-1 R22 B-1 R57 D-1 C17 A-4 Q10 B-3 R23 A-1 R58 D-1 C18 D-1 Q11 B-4 R24 A+1 R59 D-2 CR Q12 B-4 R25 A-1 R60 D-2 Q13 B-3 R26 B-1 R61 D-2 Q13 B-3 R26 B-1 R61 D-2 Q14 B-4 R27 B-1 R62 C-2 Q14 B-4 R27 B-1 R62 C-2 Q15 C-1 R28 B-1 R64 D-2 Q16 C-1 R29 B-1 R64 D-2 Q17 D-1 R30 A-3 R65 A-3 CR4 C-4 Q19 D-2 R32 A-3 R66 A-2 Q16 B-3 R33 A-3 R66<			<i>e</i> .	2 I I I I I I I I I I I I I I I I I I I	R19			. C-1	
C16 D-1 O9 A-1 R22 B-1 R57 D-1 C17 A-4 O10 B-3 R23 A-1 R58 D-1 C18 D-1 O11 B-4 R24 A+1 R59 D-2 CR O12 B-4 R25 A-1 R60 D-2 O13 B-3 R26 B-1 R61 D-2 O13 B-3 R26 B-1 R61 D-2 O13 B-3 R26 B-1 R61 D-2 O14 B-4 R27 B-1 R62 C-2 O15 C-1 R28 B-1 R63 D-2 CR1 D-3 O16 C-1 R29 B-1 R64 D-2 CR2 D-2 O17 D-1 R30 A-3 R65 A-3 CR3 D-4 O18 D-2 R31 A-3 R66 A-2 CR4 C-4 O19 D-2 R33 A-3 R68 A-4 CR5					R20	/C-2	R55	· D-1	
C17 A-4 O10 B-3 R23 A-1 R58 D-1 C18 D-1 O11 B-4 R24 A+1 R59 D-2 CR O12 B-4 R25 A-1 R60 D-2 BEF GRID O14 B-4 R27 B-1 R61 D-2 O15 C-1 R28 B-1 R61 D-2 CR1 D-3 O16 C-1 R29 B-1 R63 D-2 CR1 D-3 O16 C-1 R29 B-1 R64 D-2 CR2 D-2 O17 D-1 R30 A-3 R65 A-3 CR3 D-4 O18 D-2 R31 A-3 R66 A-2 CR4 C-4 O19 D-2 R32 A-3 R67 A-3 CR5/ A-4 C-4 R09 D-4 R33 A-3 R68 A-4 CR6 B-3 R R R34 B-3 R69 D-4 CR7<					R21	∫ B-1 ∖	R56	C-2	ľ
C18 D-1 O11 B-4 R24 A*1 R59 D-2 CR O12 B-4 R25 A-1 R60 D-2 BEF GRID O13 B-3 R26 B-1 R61 D-2 O14 B-4 R27 B-1 R62 C-2 O15 C-1 R28 B-1 R63 D-2 CR1 D-3 O16 C-1 R29 B-1 R64 D-2 CR2 D-2 O16 C-1 R29 B-1 R64 D-2 CR3 D-4 O18 D-2 R31 A-3 R66 A-2 CR4 C-4 O19 D-2 R32 A-3 R66 A-2 CR5/ A-4 O20 A'3 R33 A-3 R66 A-2 CR5/ A-4 C-4 D19 D-2 R32 A-3 R67 A-3 CR6 B-3 R R34 B-3 R69 D-4 CR7 A-1 R R </th <th></th> <th></th> <th></th> <th>(1) 1. (1) 1. (2) 1.</th> <th>R22</th> <th></th> <th>R57</th> <th>D-1</th> <th></th>				(1) 1. (1) 1. (2) 1.	R22		R57	D-1	
C R Q12 B-4 R25 A-1 R60 D-2 BEF GRID Q13 B-3 R26 B-1 R61 D-2 DESIG LOC Q15 C-1 R28 B-1 R63 D-2 CR1 D-3 Q16 C-1 R29 B-1 R64 D-2 CR2 D-2 Q17 D-1 R30 A-3 R65 A-3 CR3 D-4 Q19 D-2 R31 A-3 R66 A-2 Q19 D-2 R32 A-3 R67 A:3 Q20 A'3 R33 A-3 R68 A-4 CR6 B-3 R R44 B-3 R69 D-4 R70 B-3 R35 A-4 R70 B-3 R1 C-4 R37 B-3 R37 B-3		A				∖` ∖,A-1	R58	D-1	
BEF GRID 013 B-3 R26 B-1 R61 D-2 DESIG LOC 014 B-4 R27 B-1 R62 C-2 CR1 D-3 O16 C-1 R29 B-1 R64 D-2 CR2 D-2 O17 D-1 R30 A-3 R65 A-3 CR3 D-4 O18 D-2 R31 A-3 R66 A-2 CR4 C-4 O19 D-2 R31 A-3 R66 A-2 CR5/ A-4 O20 A43 R33 A-3 R68 A-4 CR6 B-3 R R44 B-3 R69 D-4 CR6 B-3 R R34 B-3 R69 D-4 CR7 A-1 REF GRID R35 A-4 R70 B-3 R1 C-4 R37 B-3 R37 B-3 R	,C18	ויט			R24	A+1	R59	D-2	
BEF GRID Q14 B-4 R27 B-1 R62 C-2 DESIG LOC Q15 C-1 R28 B-1 R63 D-2 CR1 D-3 Q16 C-1 R29 B-1 R63 D-2 CR2 D-2 Q17 D-1 R30 A-3 R65 A-3 CR3 D-4 Q18 D-2 R31 A-3 R66 A-2 CR4 C-4 Q19 D-2 R32 A-3 R66 A-2 CR5/ A-4 Q20 A'3 R33 A-3 R68 A-4 CR6 B-3 R R R34 B-3 R69 D-4 CR7 A-1 REF GRID R35 A-4 R'70 B-3 R1 C-4 R37 B-3 R'70 B-3 R'70 B-3	CF	3			R25	A-1	R60	D-2	1
DESIG LOC O14 D-4 R27 B-1 R62 C-2 CR1 D-3 O16 C-1 R28 B-1 R63 D-2 CR1 D-3 O16 C-1 R29 B-1 R64 D-2 CR2 D-2 O17 D-1 R30 A-3 R65 A-3 CR3 D-4 O18 D-2 R31 A-3 R66 A-2 CR4 C-4 O19 D-2 R32 A-3 R67 A-3 CR5/ A-4 O20 A'3 R33 A-3 R68 A-4 CR6 B-3 R R R34 B-3 R69 D-4 CR7 A-1 REF GRID R35 A-4 R70 B-3 R26 LOC R37 B-3 R37 B-3 R R	RFF	GRID			R26	B-1	R61	D-2	,
CR1 D-3 O16 C-1 R28 B-1 R63 D-2 CR2 D ₄ 2 O17 D-1 R29 B-1 R64 D-2 CR3 D-4 O18 D-2 R31 A-3 R66 A-2 CR4 C-4 O19 D-2 R32 A-3 R67 A-3 CR5/ A-4 O20 A'3 R33 A-3 R68 A-4 CR6 B-3 R R R34 B-3 R69 D-4 CR7 A-1 REF GRID R35 A-4 R'70 B-3 R1 C-4 R37 B-3 R R R R R					R27	/B-1	R62	C-2	
CR2 D ₄ 2 O17 D-1 R30 A-3 R65 A-3 CR3 D-4 O18 D-2 R31 A-3 R66 A-2 CR4 C-4 O19 D-2 R32 A-3 R67 A-3 CR5/ A-4 O20 A'3 R33 A-3 R68 A-4 CR6 B-3 R R R34 B-3 R69 D-4 CR7 A-1 REF GRID R35 A-4 R70 B-3 R1 C-4 R37 B-3 I I I I		🐒 a 🕹 🕹 a L			R28	/ B-1	R63	D-2	Ι,
CR3 D-4 Q18 D-2 R31 A-3 R66 A-2 CR4 C-4 Q19 D-2 R32 A-3 R67 A-3 CR5/ A-4 Q20 A'3 R33 A-3 R68 A-4 CR6 B-3 R R R R34 B-3 R69 D-4 CR7 A-1 R R R1 CC4 R35 A-4 R70 B-3 R1 CC4 R37 B-3 R37 B-3 R37 B-3		2			R29	B-1	R64	D-2	
CR4 C-4 O19 D-2 R32 A-3 R67 A-3 CR5/ A-4 O20 A'3 R33 A-3 R68 A-4 CR6 B-3 R R R44 B-3 R69 D-4 CR7 A-1 R R R1 CC4 R35 A-4 R70 B-3 R1 C-4 R37 B-3 R37 B-3 R R R					R30	'A-3	R65	'A-3	Ì
CR5/ A-4 O20 A'3 R33 A-3 R68 A-4 CR6 B-3 R R34 B-3 R69 D-4 CR7 A-1 REF GRID R35 A-4 R70 B-3 CR7 A-1 REF GRID R35 A-4 R70 B-3 R1 C-4 C-4 R37 B-3 C-4 C-4 C-4	• · · · · · · · · · · · · · · · · · · ·				R31	'A-3	R66	A-2	ł
CR6 B-3 R R34 B-3 R69 D-4 CR7 A-1 REF GRID R35 A-4 R70 B-3 DESIG LOC R36 A-4 R R 1 R1 C-4 C-4 R R 1 1					R32	A-3	R67	A'3	
CR6 B-3 R R34 B-3 R69 D-4 CR7 A-1 REF GRID R35 A-4 R70 B-3 DESIG LOC R36 A-4 R70 B-3 R1 C-4 R37 B-3 I I			, Q20	A'3	and the second	1. A	R68	A-4,	Ĺ
CR7 A-1 REF GRID R35 A-4 R70 B-3 DESIG LOC R36 A-4 -1 R1 C-4 R37 B-3			R				R69 1	D-4 ·	
DESIG LOC R36 A-4 1 R1 C-4 R37 B-3	CR7	A•1 '	BFF	GRÍN		A-4	R70 (- B-3	
R1 C-4 R37 B-3				and the second sec	1 1 1 1 1 N	A-4	1		k
			and the state			B-3			Ľ.
a Astronomical (1997), and D3 and Carl					4 g 🛔	e e s band	- 1		
	1		H2 (D-3			×,		ľ

Figure A4-3 Grid Reference



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Model 3702B

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ASSEMBLY SERVICE SHEET A5 - METER CONTROL AND MARKER PROCESSOR

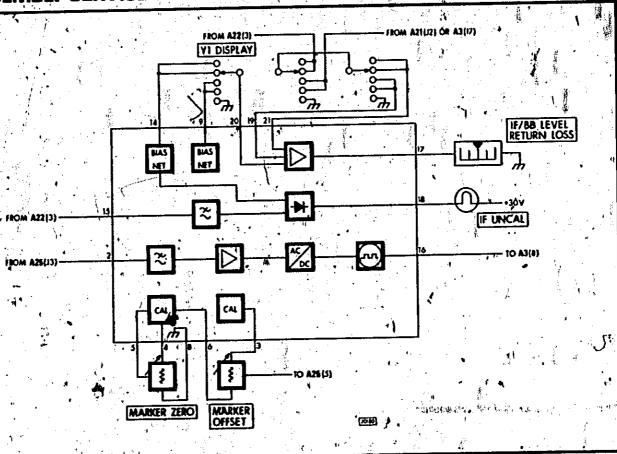


Figure A5-1 Simplified Block Diagram

A5-1 CIRCUIT DESCRIPTION

A5-2 Meter Control

A5-3 The meter amplifier MC1 compares the IF or BB input voltage level at one input, with the reference level determined by R57 or R60 on the other input. The time constant of the circuit, determined by R6 and C2, slows down the action of the meter and cancels any modulation which might cause meter jitter.

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A5-4 The detected IF output from A22(3) is applied to low pass lifter MC3, which is a three pole active filter Any 3dB ripple on the IF signal is removed by this filter, and the output is supplied to the IF level detector.

A5-5 The IF level detector MC2 compares the level of the IF signal from the low-pass filter with the reference level determined by R57. If both the inputs are equal, there will be no output from MC2, therefore Q1 will remain off and the IF UNCAL lamp will remain extinguished. If the output level of the low-pass filter varies by greater than 2 1dB from the reference level, then MC2 will cause Q1 to conduct and the IF UNCAL lamp will light.

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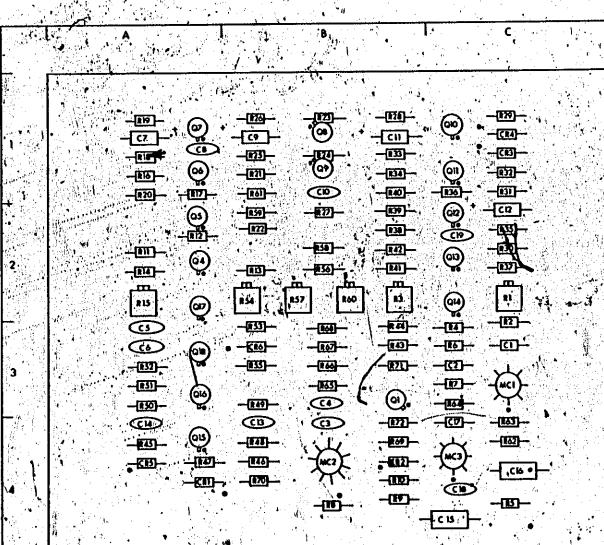
AB-6 Marker Processor

A5-7 Markers from the Marker Generator A25 are applied to amplified 4-5 which a has a low pass section to eliminate frequencies above 15kHz. Amplifier Q6 to Q9 amplifies the markers by 52dB.

A5-8 Amplifier Q10 and Q11 inverts the positive zero beats and applies them to full wave rectifier CR3 and CR4 which provides negative markers to switch Schmitt trigger Q12 and Q13. The markers are then applied to the Vertical Deflection Assembly A3 via emitter follower Q14.

A5-9 Amplifier Q15 to Q18 forms a stable constant ourrent source holding the voltage across R10 and R11 constant to provide stable reference voltages for marker calibration.

A5-10 The voltage from the wiper of R11 is applied to the voltage controlled oscillator on the Silding Marker Generator Assembly A25. This varies the frequency of the oscillator thereby varying the sliding markers from 0 to 26MHz.



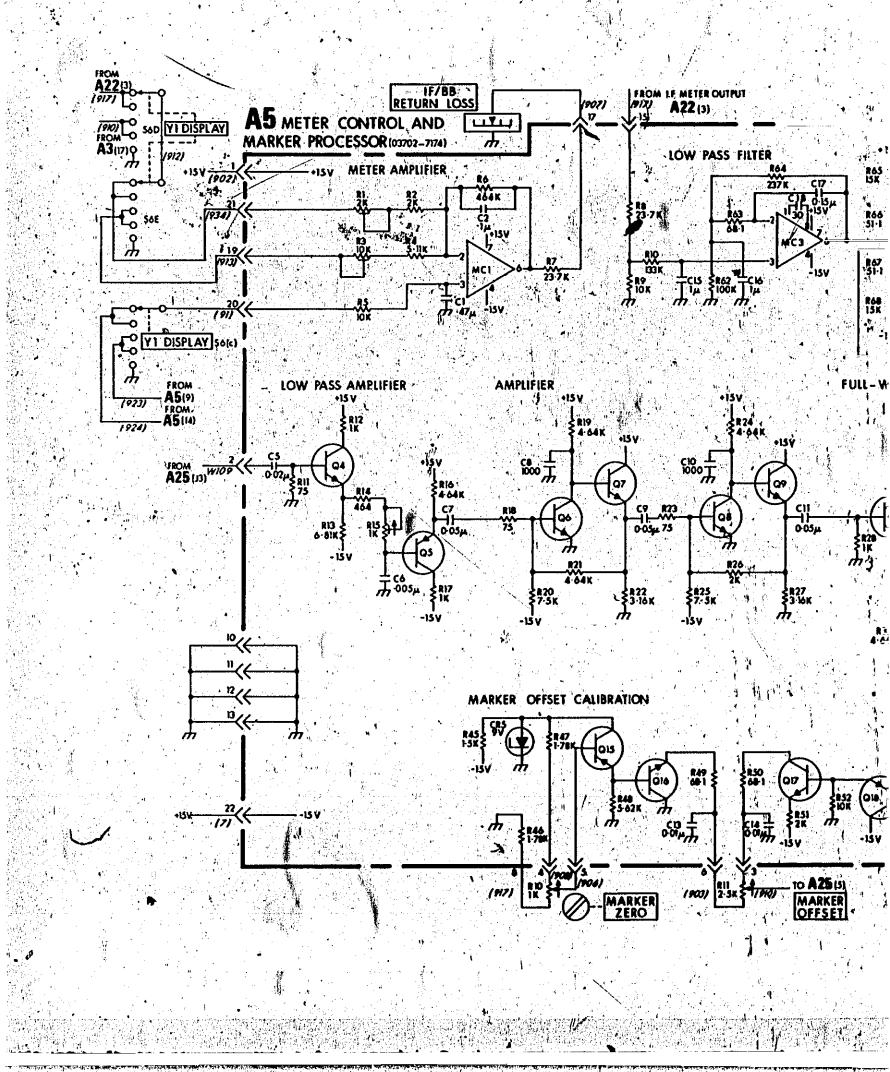
2 3 4 4 6 7 8 9 10 11 12 10 14 15 16 17 18 19 20 21 22

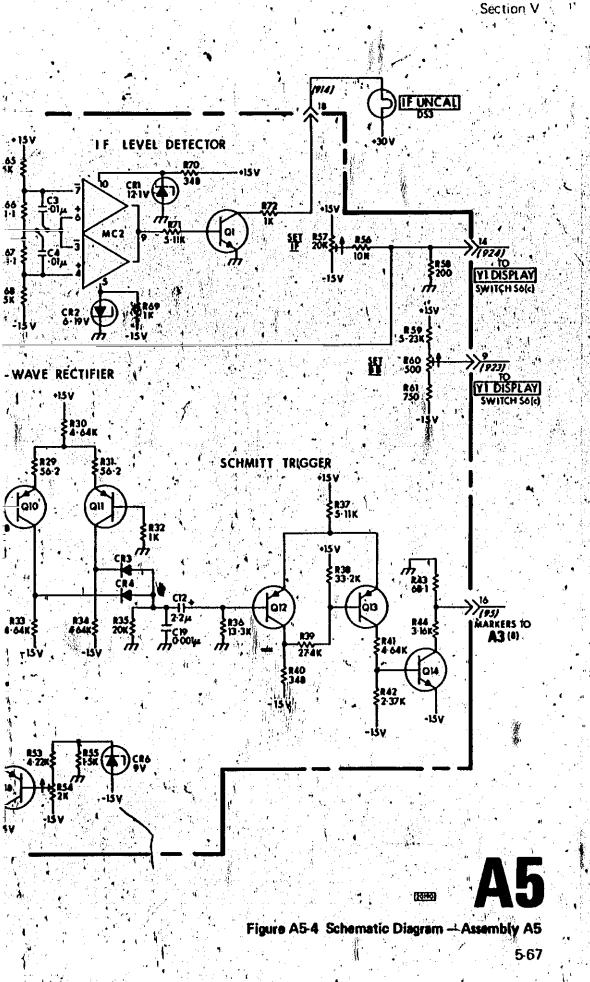
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Figure A5-2 Component Location

,		an a			•	X 2.
	С		Q5	A-2	R27	B 2
	REĘ	GRID	Q6	A-1	R28	B-1
с. 1	DESIG	LOC	·07 ;	A-1	R29	C-1
			08	B-1	R30	. C-2
3 3 -	_C1	C-3	09	B-1	R31	, C-1
•	02	, C-3	Q10	C-1 #	.R32	C-1
	C3	B-4	011	C-1	R33	B-1
	C4	B-3	Q12	C-2	, R34	B-1
l.	, C5	A-3	013	C-2	R35+	C-2
	C6	A-3	Q14	C-2	R36	C-1
45	C7	A-1	015	: A-4	R37	• C-2
1	C8 C9	A11 B-1	Q16	A-3	R38	B-2
	CIÓ	B-1	Q17*	A-2	R39	" B-2
	C10	B-1	, Q18	A-3	R40	B-1;
	C12	C-2		3 (A 1), 1	R 41	·B-2
	C12	B-4.1	R		R42	, B -2
	C14	A-4	REF	GRID	'R43	B-3
	C15	C-4	DESIG	LOC	R44	_ B-3
.સ	C16	Č4	$\mathcal{L}_{1,1} = \{1,\dots,n\} \in \{1,\dots,n\}$	1.11.11.11	R45	A-4
	C17	C-4	R1	C-2	• R46 / 4	B-4
	C18	Č-4	R2	C-3	R47 *	A-4
	_C19	C-2	R3	· B-2	R48	B-4
1			R4	C-3	R49	B-3
		K	°R5	C-4	R60 '	A-3
	RÈE	GRID	R6	C-3	R51	A-3
5.00	DESIG	LOC	. B7	C-3	R52	A-3
1	CR1	A-4	R8 /	B-4/	R53	8.3
	CR2	B-4	R9	B-4 B-4	R54 R55	8-2 B-3
	CR3	C-1	R10	A-2	R56	B-2
4.	CR4	¹ C-1 ¹	811 R12	A-2	·857	B-2 B-2
	CR5	A-4 ·	R13	B-2	R58	B-2
	CR6	B-3		A-2	R59	B-2
	海峡 化制定器	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	R14#.	A-2	R60	B-2
<u></u>	M	C	R 16	A 1	R61	B-1
	REF	GRID	R17	A-1	R62	C-4
	DESIG	LOC	R18	A 1	R63	C-4
•	MC1	C-3	R19	A-1	R64	`C -3
Сти С	MC2 -	• B-4	*R20	A-1	R65	B-3
	MC3	C-4	R21	B-1	R66	B-3
	с. Г)	R22	B-2	R67	'B-3
			R23	8-1	R68	B-3
100	REF	GRID		B-1	R69	B-4
۲	DESIG	LOC		B 1	R70	B-4
	• 01		R26	B-1-	R71	• B-3
	Q 4	A-2.			R72	B-4
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Figure A5-3 Grid Reference

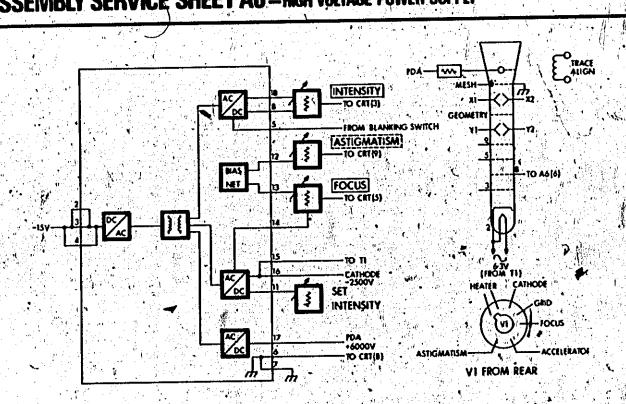




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ASSEMBLY SERVICE SHEET A6 -- HIGH VOLTAGE POWER SUPPLY

Figure A6-1 Simplified Block Diagram

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A6-1 CIRCUIT DESCRIPTION

A6-2 Transistors Q1, 2 and transformer T1 operate as a push-pull converter changing the low voltage 15V dc supply to a high voltage ac supply. The transformer T1 is driven into saturation alternatively by Q1 and Q2, producing a 13kHz, 30V pk-pk square wave on T1 primary to be transformed to about 6000V pk-pk by the action of T1.

A6-3 Half wave rectifier CR1 provides -2650V dc which is applied to the CRT grid via the INTENSITY control R1. This control sets the grid cathode potential and hence beam current. Providing the BLANKING switch S2 is in the ON position; a blanking signal from A2(21) is applied via A6(5) driving the grid beyond cutoff and reducing the beam current to zero.

A6-4 Half wave rectifier CR2 provides -2500V dc for the CRT cathode. Potential divider chain R6 to R9 and R11 provides control voltages for ASTIGMATISM control R13 and FOCUS control R2.

A6-5 The voltage doubler CR3, CR4, C5, C7 and R12 provides a post deflection acceleration (PDA) voltage of +6kV for the CRT.

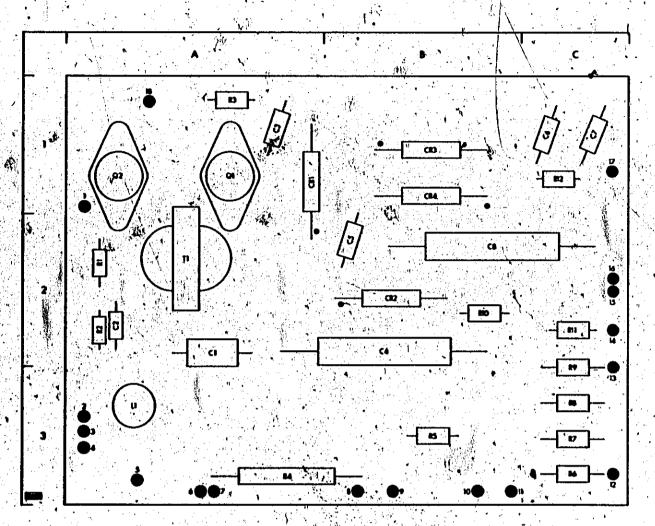
A6-6 Fine adjustment of the cathode supply is made by Set Intensity control R14.

A6-7 Trace alignment is achieved by the TRACE ALIGN control R12 varying the potential across L1 between +15V and +15V.

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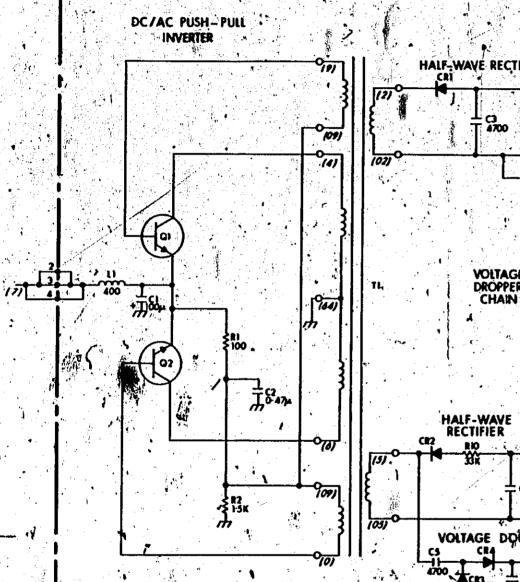
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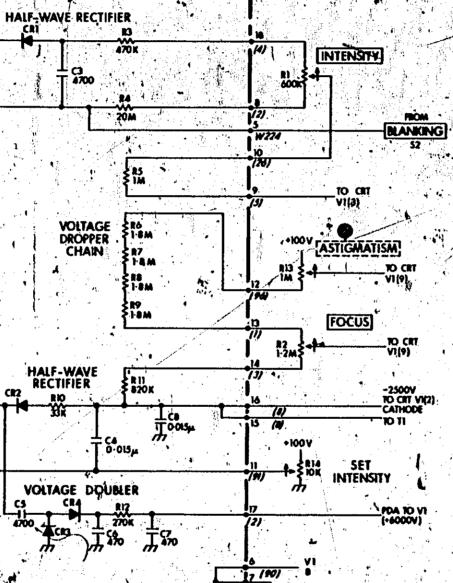
С		CR2 B-2	R	
REF DESIG	GRID LOC	CR3 B-1 .CR4 B-1	REF DESIG	GRID LOC
C1 2	A-2	en e	-R1	• `∆ -2
C2	A ₇ 2		R2	A-2
C3	A-1	REF GRID	R3 🔬	A-1
C4	B-2	DESIG LOC	R4	: A'3
C5	. B-2	L1 A-3	R5	B-3
C6	• C-1	LI AS	, R6	C-3
C7	C-1	0	R7	C-3
C8	B-2	an an an an an an an Arran	- R 8	C-3
CF	₹	REF GRID	·R9	C-3
REF	GRID	DESIG LOC	R10	B-2
DESIG	LOC	Q1 A-1	B11	C-2
CR1	A-1	02 Å 1	R12	C-1

Figure A6-2 Component Location and Grid Reference

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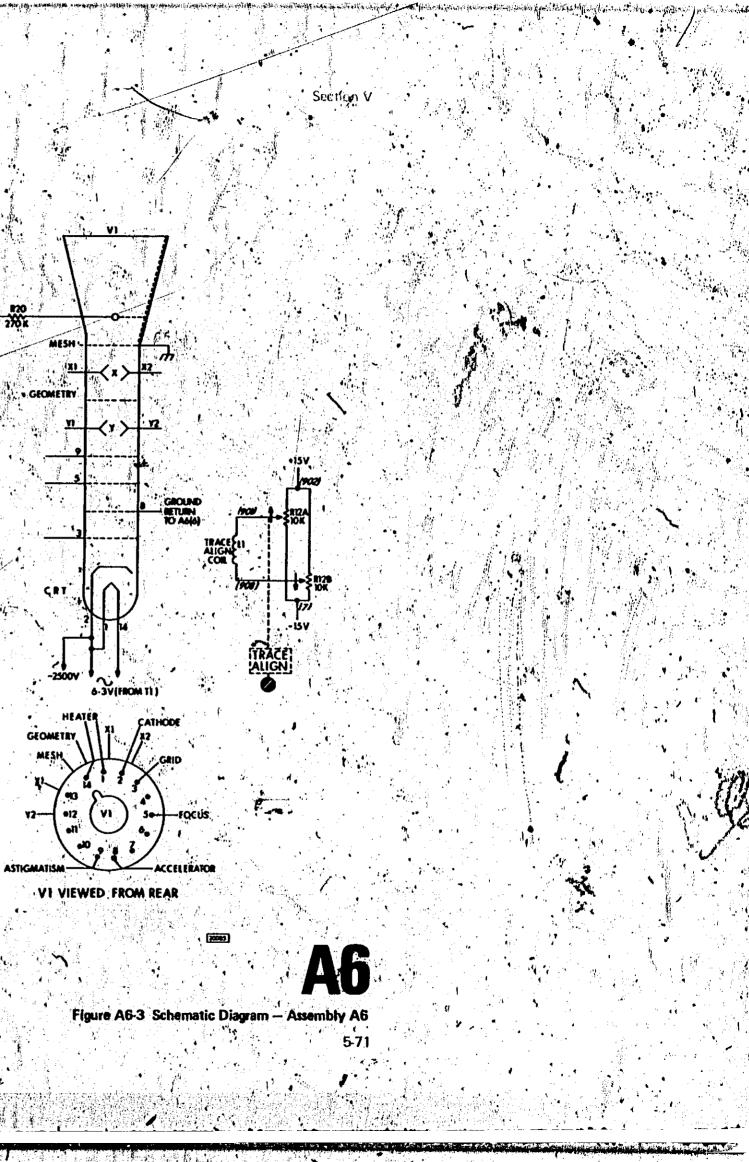
AG HIGH VOLTAGE POWER SUPPLY ASSEMBLY (03702-7154)



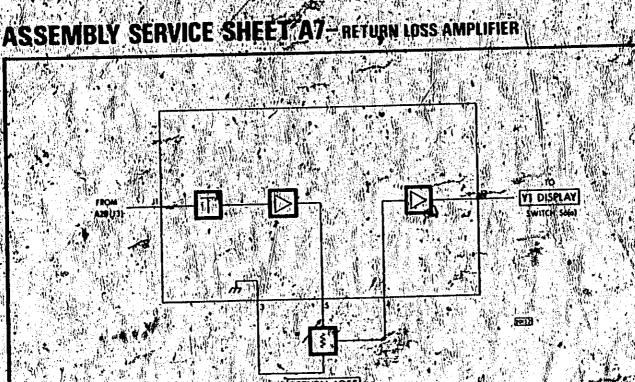


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PDA



Modeli37028



RETURN LOSS

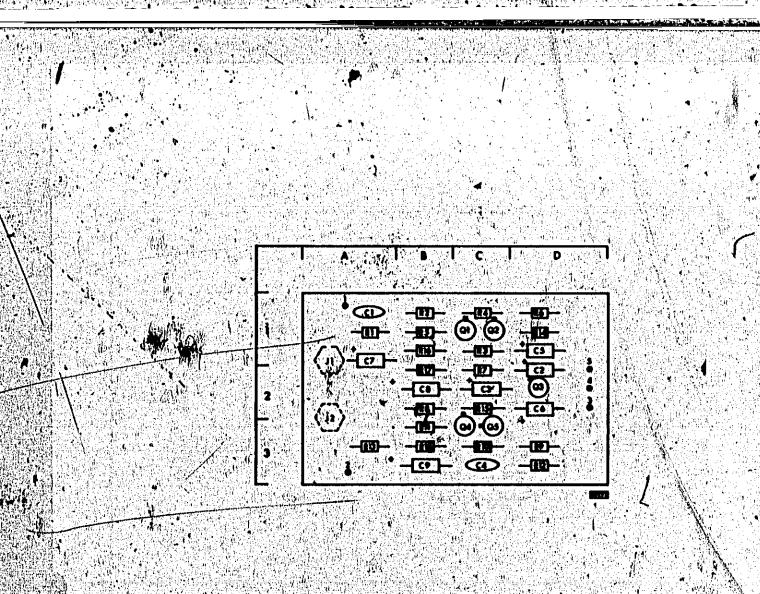
Figure A7-1 Simplified Block Diagram;

A7-1 CINCUIT DESCRIPTION

A7-2 The output from Return Loss Mixer A20 is applied to input J1. A matching pad formed by C1 and B1 provides a good return loss at input J1.

A7-3 The gain of the amplifier Q1 to Q5 can be varied by R1, the BETURN LOSS CALIBRATION control, to zero the RETURN LOSS meter M1. The output from the amplifier is applied via Y1 DISPLAY switch S6 to the BB/RETURN LOSS. Attenuator A13,

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	С	R
Υ,	REF GRID	REF GRID
i i	DESIG LOC C1 A-1	DE8IG, LOC R1 A-1
	C2 C D-2	R2
	C3 C-2 C4 C-3	R3
Į,	C5 D-1	R5 B-1
	C6 D-2 C7 A-1	R6 D-1 R7 C-2
	C8 B-2	R8 B-2
	C9	R9 D-3 R10 C-3
	REF	A11 B3
	REF GRID	R12 D-3 R134 A-3
	01 C-1.	R14 D-1
	02 C-1 03 D-2	R15 C-2 R16 B-1
	Q4 C-3	R17 B-2
	05 C-3	R18 / B-3

Figure A7-2 Component Location and Grid Reference

A8.5 Resistors R1 to R6 also combine with resistors R7 to R9, R15 and High Pass Filter, C1 to C4 and L1; to provide a 124 Ω balanced impedance match to the high frequency BB signals. The action of the high pass filter allows only the BB signal to be amplified by Differential Amplifier Q1 and Q3. The single ended fourput on the collector of Q1 is applied to the base of Q4 which presents a 75 Ω unbalanced output impedance via J3 to the BB + Sweep Splitter Assembly A15 Section V

5-75

A8-6 Transistor Q2 acts as a constant current generator for biasing Q1 and Q3. Capacitors C6 and C7 are adjusted for a flat frequency response over the BB range.

A8-7 The output from the BB INPUT SWITCH A9 is applied to A15 the BB + Sweep Splitter Assembly.

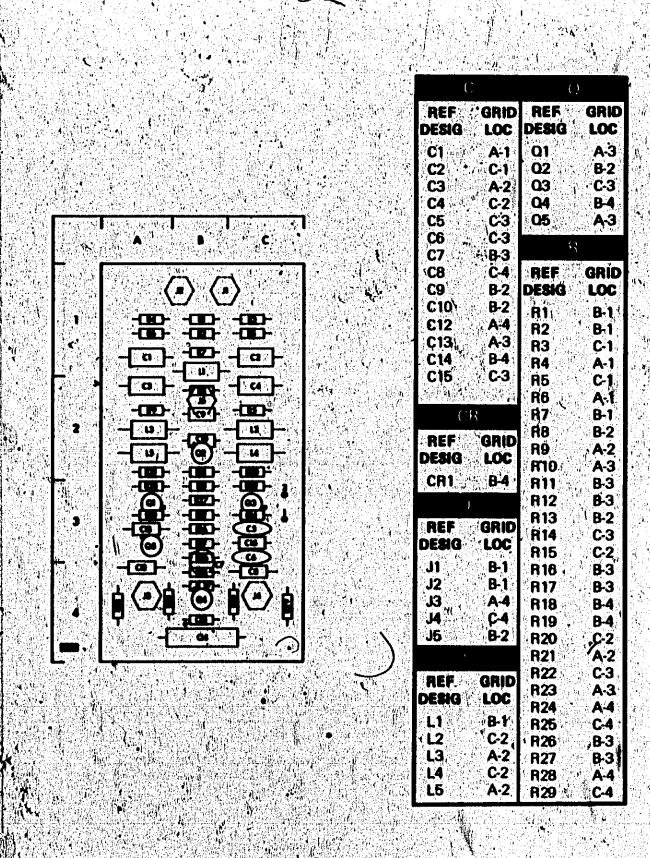
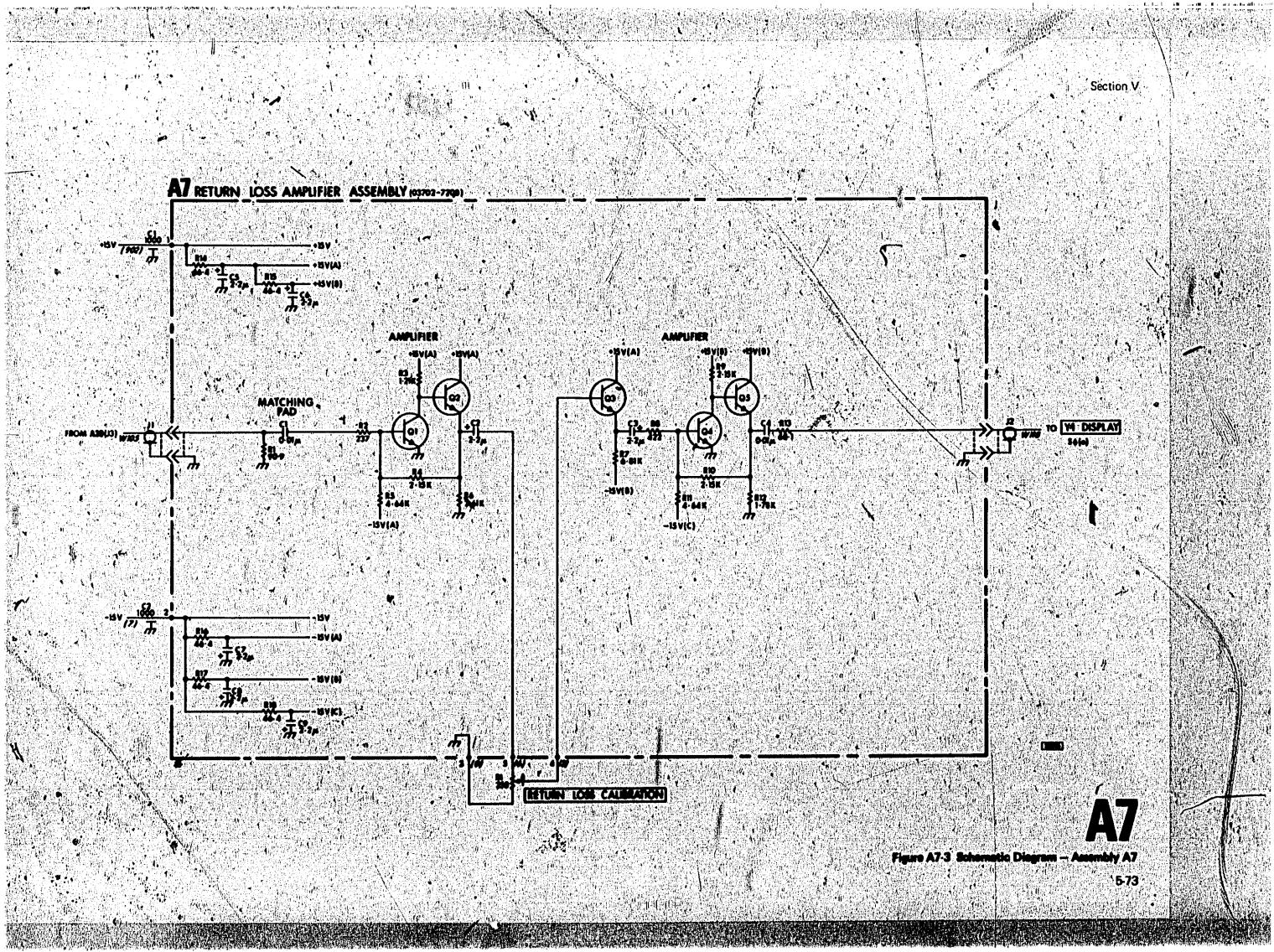
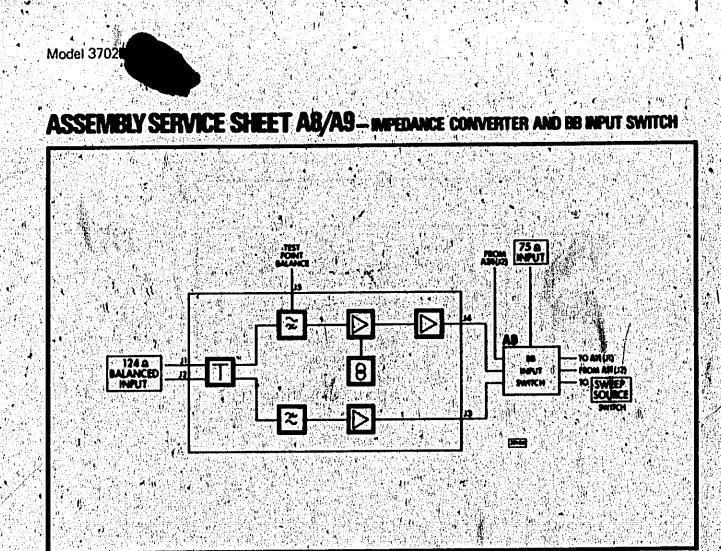


Figure A8/A9-2 Component Location and Grid Reference

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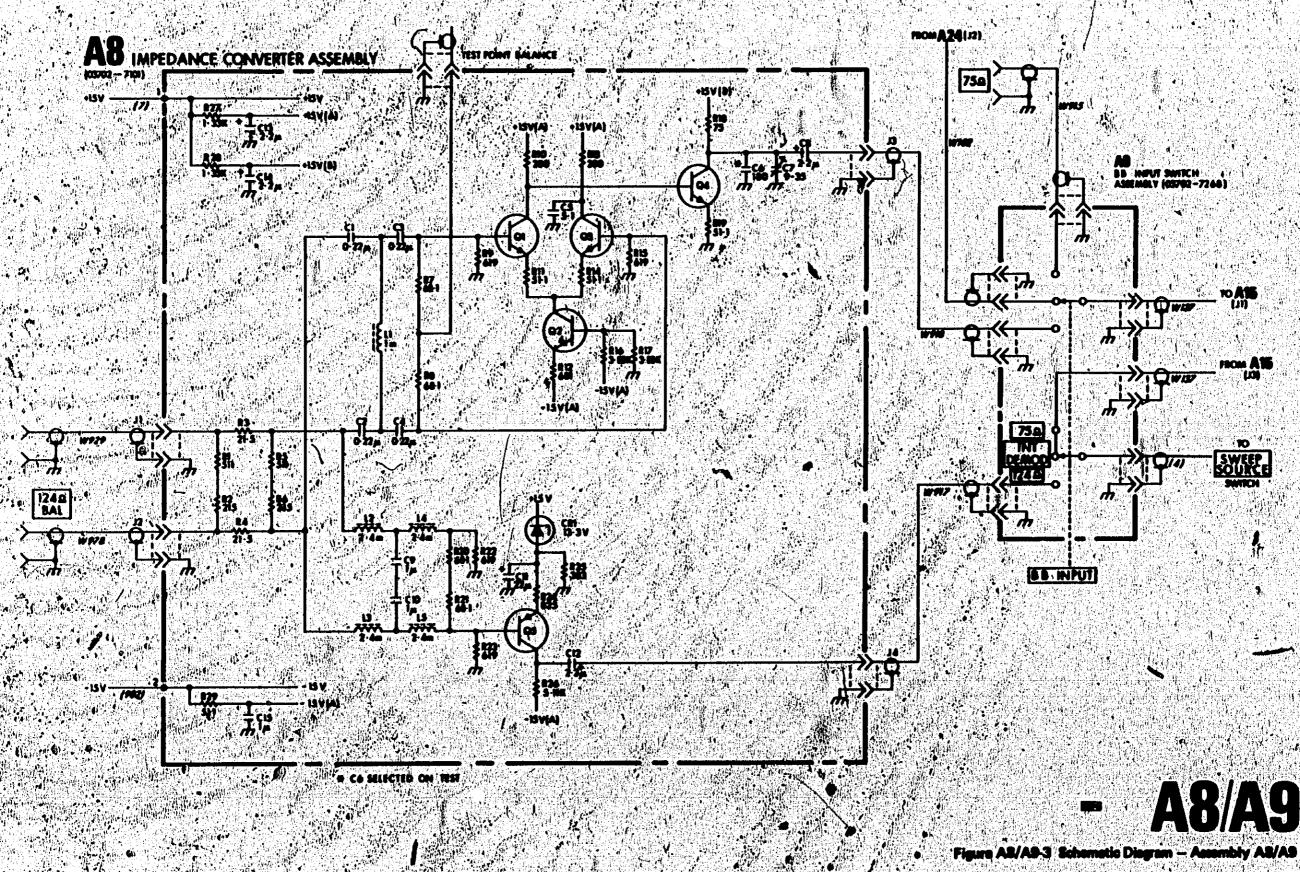
Figure A8/A9-1 Simplified Block Diagram

AS-1 CIRCUIT DESCRIPTION

A8-2 The A8 and A9 assemblies combine to form OPTION 004, which impedance matches the 124 Ω balanced input at A8U1 and A8U2 and converts the impedance to an unbalanced 75 Ω .

A8-3 The input signal at ABJ1 and ABJ2 can be either Baseband or Baseband + Sweep:

A8-4. Resistors R1 to R6 combined with resistors R20 to R23 and Low Pass Filter 44 C9, C10 and L2 to L5 provide an impedance match to the low frequency sweep signals. The action of the low pass filter allows only the sweep signal to appear at the base of Q5 providing a recovered sweep signal is applied via J3 to the BB INPUT SWITCH Assembly A9.



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Model 3702B

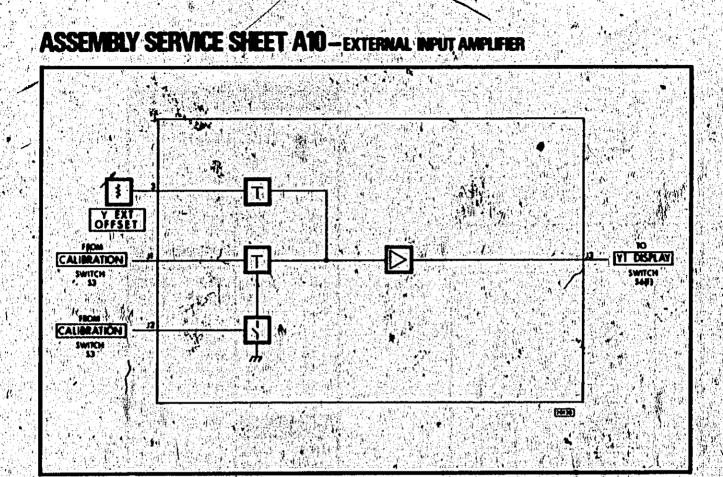


Figure A10-1 Simplified Block Diagram

A10-1 CIRCUIT DESCRIPTION

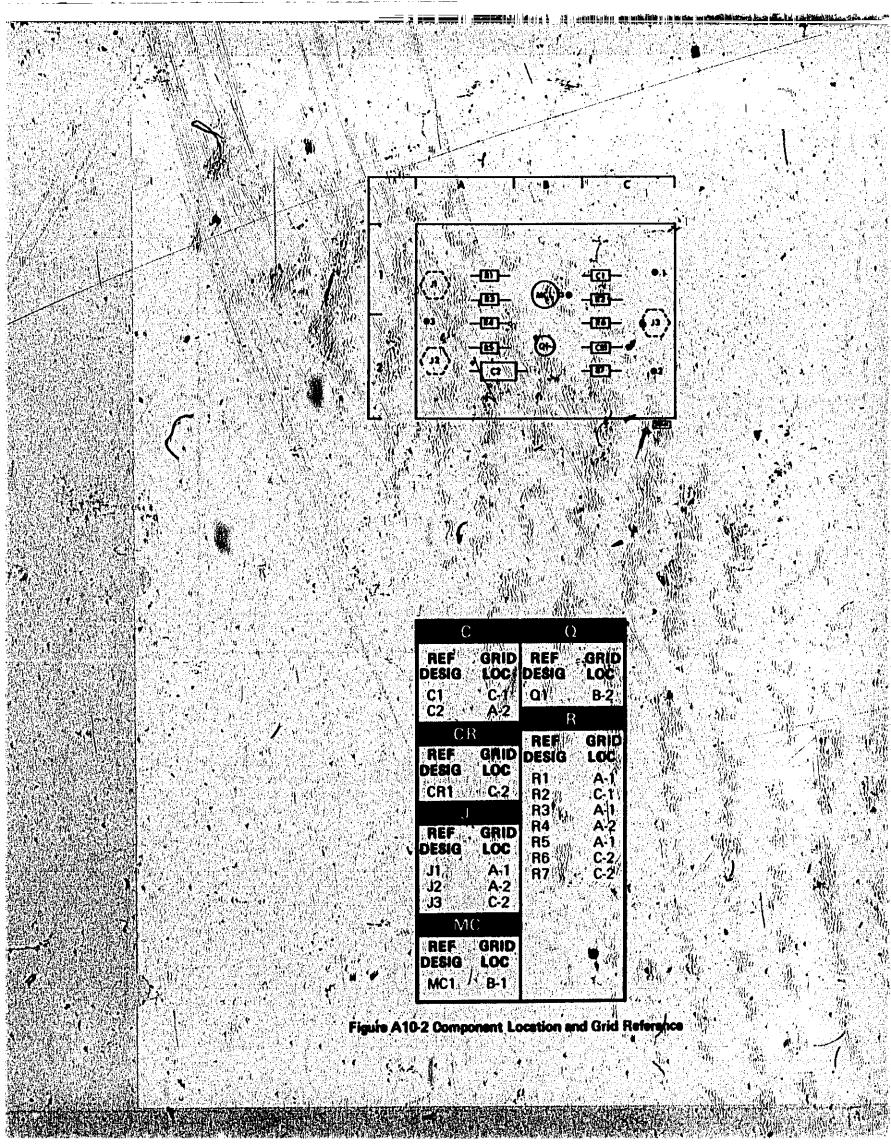
A10-2 Calibration is achieved by applying a switching waveform from the IF Calibrator A4 via J2 to diode CR1 which clamps the voltage to the correct level in order to switch Q1. This varies the characteristic of the T-pad by switching the amplitude of the input signal by 10%.

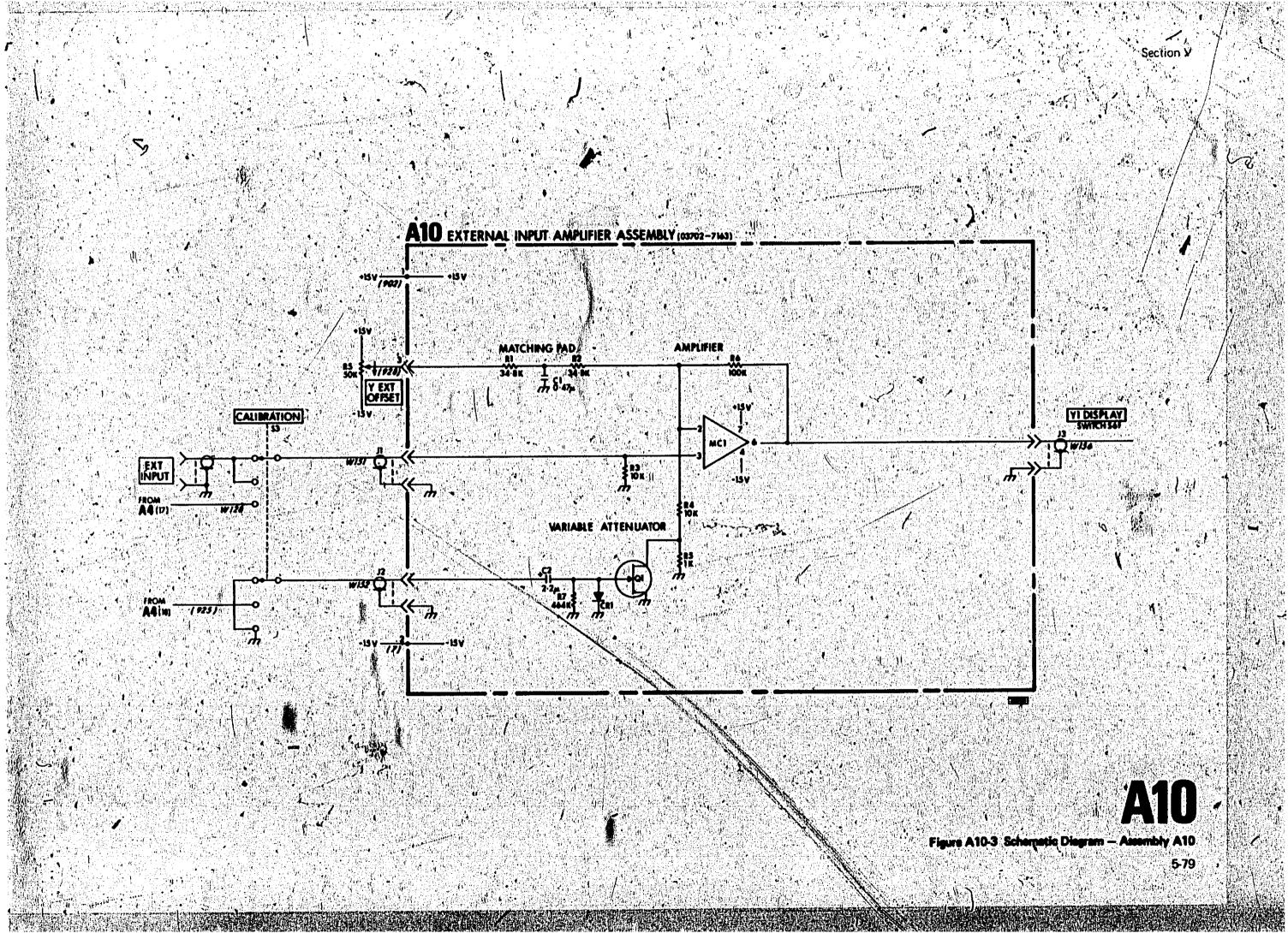
A10-3 The EXT INPUT signal is applied via J1 to a T-pad H3 to R5 which provides an input impedance of 10kD

A104 Amplifier MC1 amplifies the signal by a factor of 10 and the output is applied to J3. The output from J3 is applied to the Vertical Deflection Assembly A3 via the Y1 DISPLAY switch.

A10.5 The Y EXT OFFSET control is used to balance the Vertical Deflection A3 when large dc input signals are applied. Filter C1, R1 and R2 removes line noise.

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Model 3702B

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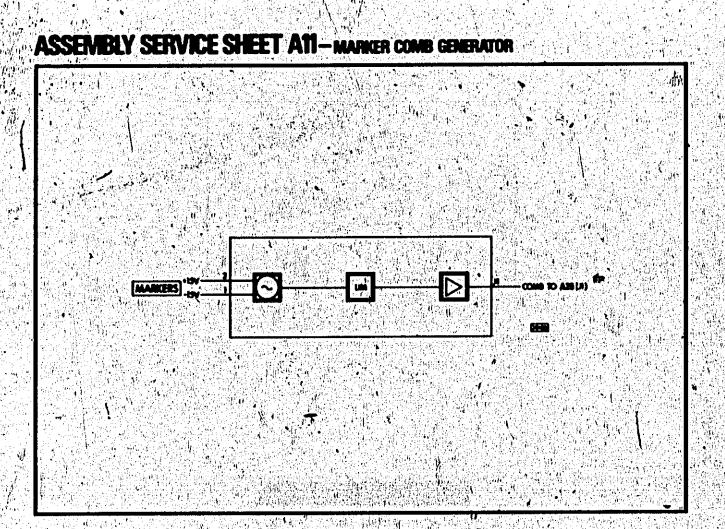


Figure A11-1 Simplified Block Diagram

A11-1 CIRCUIT DESCRIPTION

A11-2 The marker comb is generated by the 2MHz crystal oscillator Q1 and Q2. The sinewaye on the collector of Q2 is himited by Q3 to produce a 2MHz square wave, which when differentiated by C3 and R8, forms positive pulses. The pulses are then amplified and inverted by Q4 and applied via J1 to the Sliding/Spectrum: Marker Generator assembly A25.

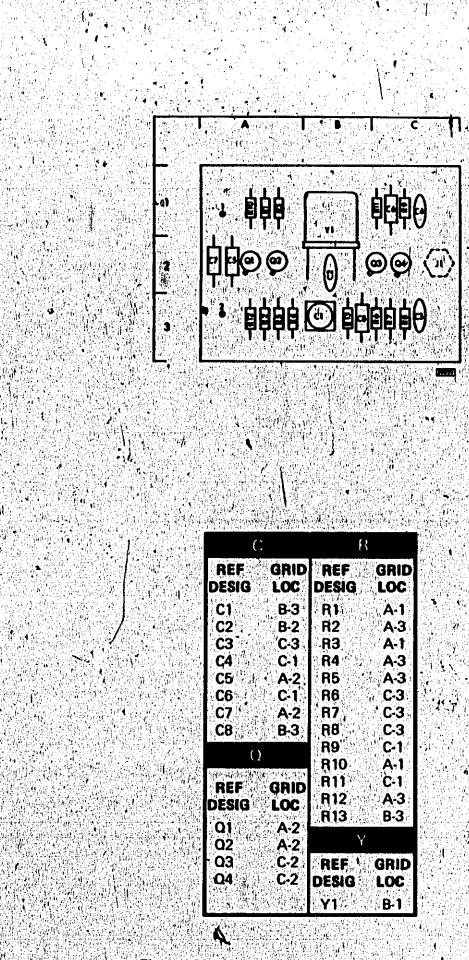
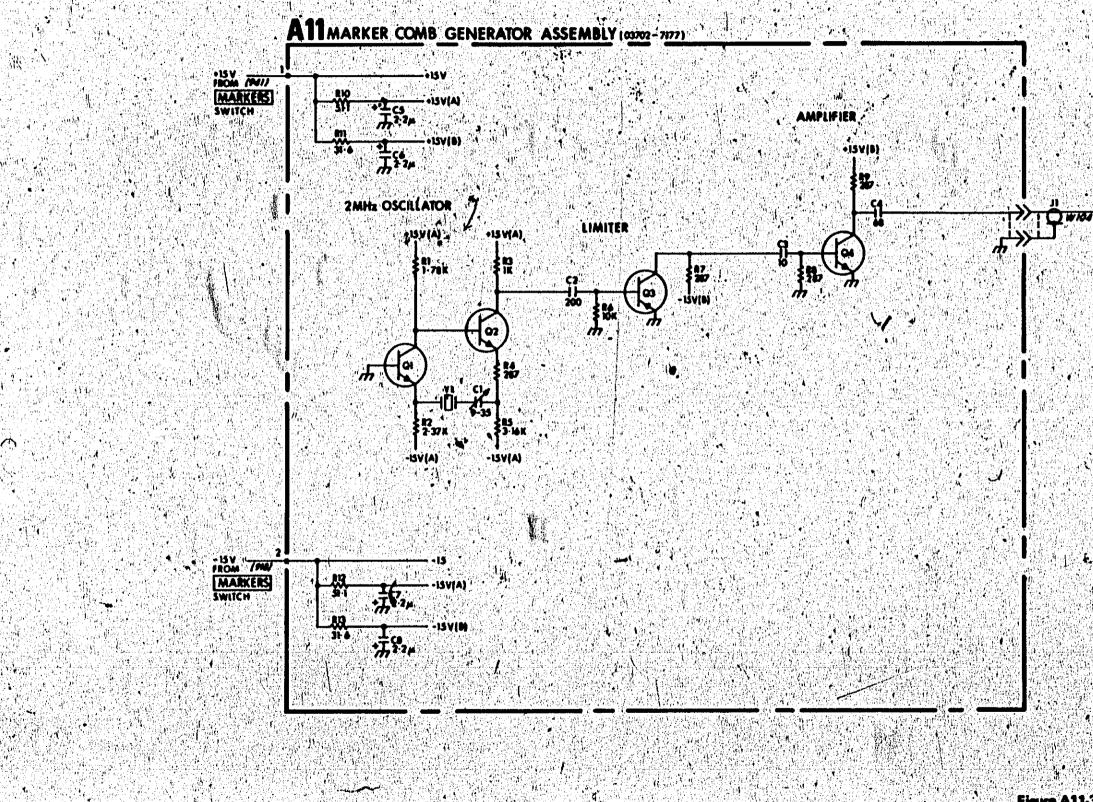
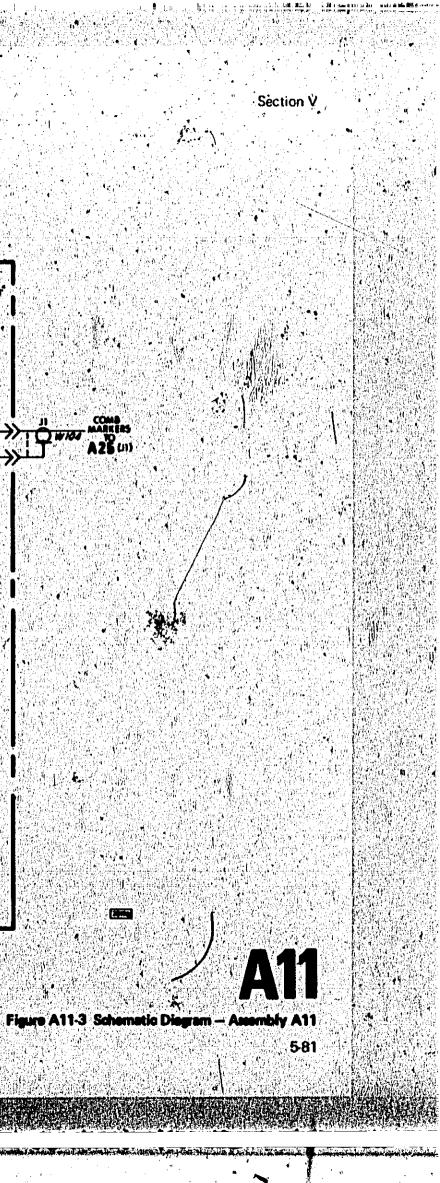


Figure A11-2 Component Location and Grid Reference





Model 3702B

ASSEMBLY SERVICE SHEET A12 - POWER SUPPLY RECTIFIERS

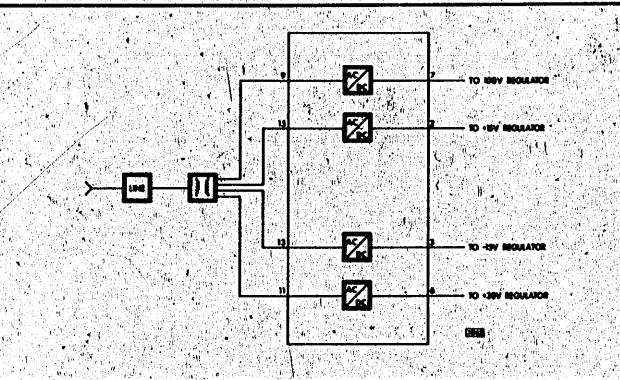


Figure A12-1 Simplified Block Diagram

A12-1 CIRCUIT DESCRIPTION

A12-2 The LINE voltage via Line Module E1 is reduced and isolated by transformer T1 to provide the rectifiers with the required voltages. The transformer primary windings are connected in a series parallel configuration to enable Line voltages of 115V or 230V to be used according to the setting of the selection switch in E1. The Line fuse should be a 2A slow-blow when using 115V Line and A slow-blow when using 230V Line.

A12-3 Half-wave rectifier CR1 provides 154V dc to drive the +100V regulator Q1.

A12-4 Bridge rectifier CR2 to CR5 provides 27V dc to drive the +15V regulator Q2.

A12-5 Bridge rectifier CR6 to CR9 provides 27V dc to drive the +15V regulator Q3.

A12-6 Bridge rectifier CR10 to CR13 provides 72V/dc to drive the +30V regulator Q4, for which R6 is the collector load.

A12-7 The 6.3V winding supplies the CRT heater which is also connected to the CRT cathode at a dc level of -2500V.

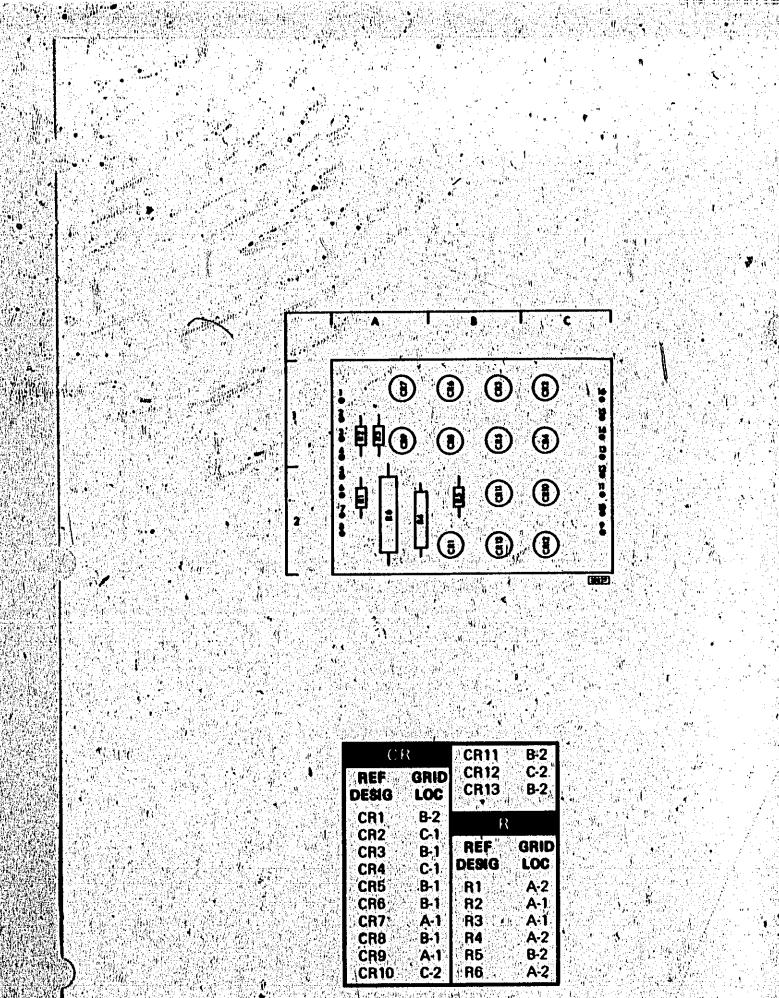
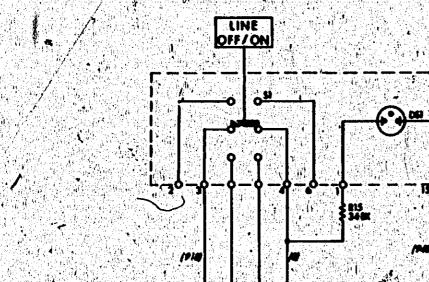
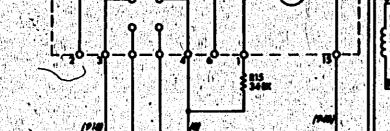


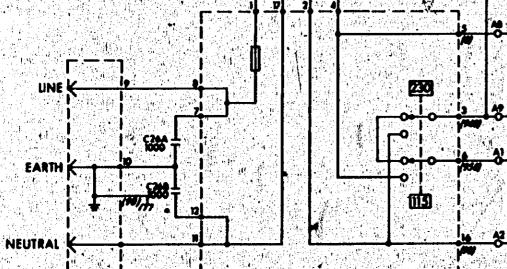
Figure A12-2 Component Location and Grid Reference



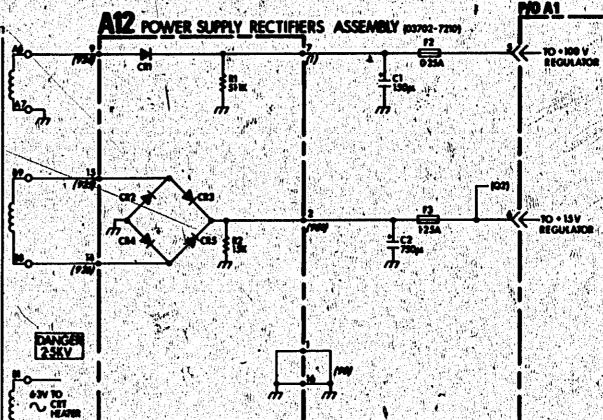












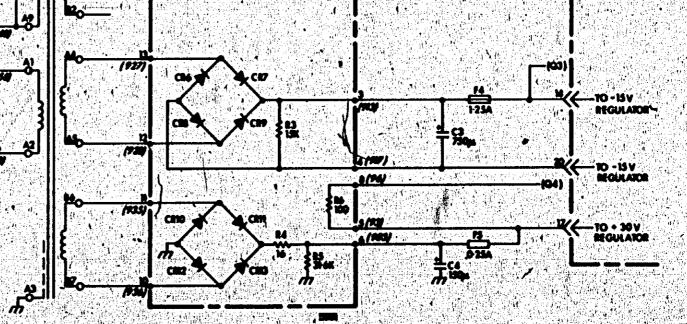
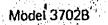


Figure A12-3 Schemetic Diegram y A12

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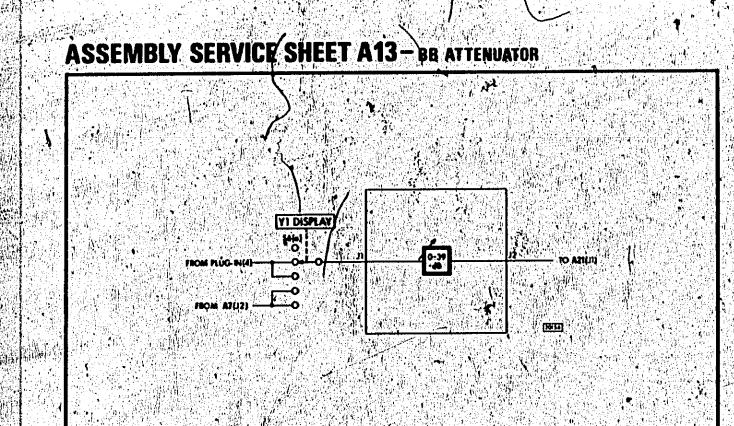
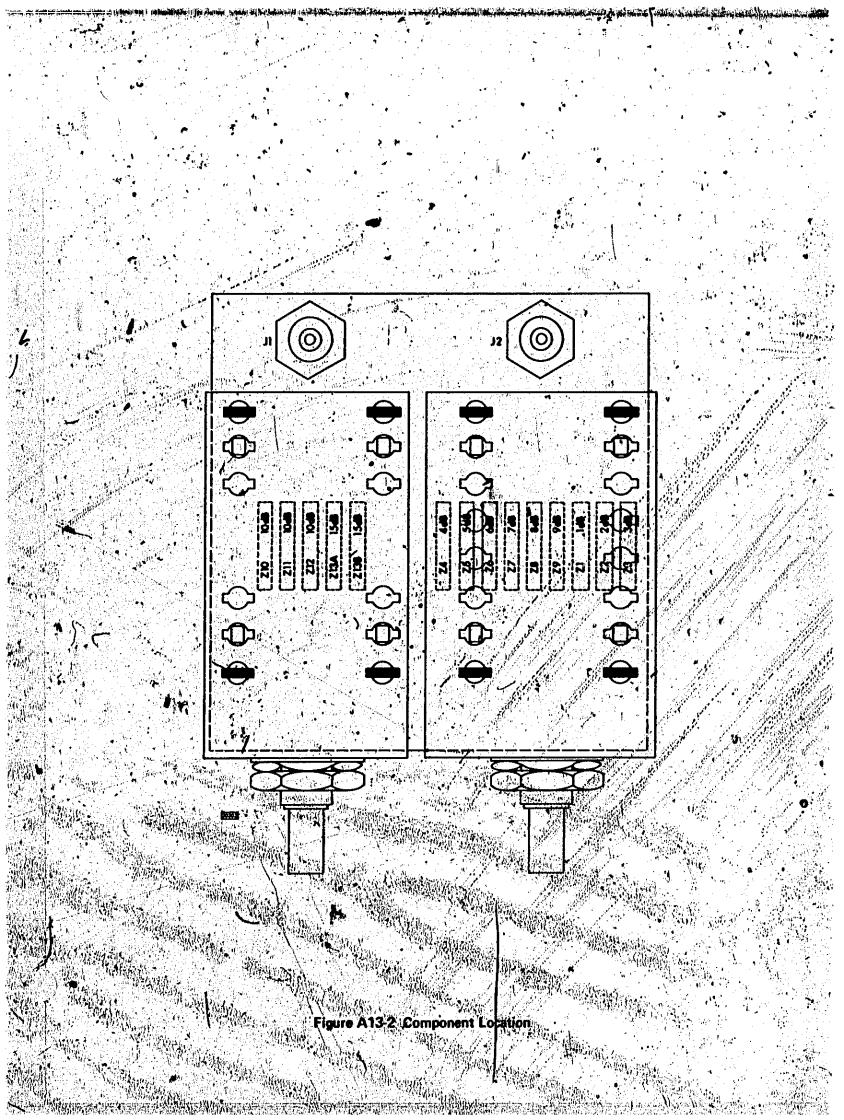


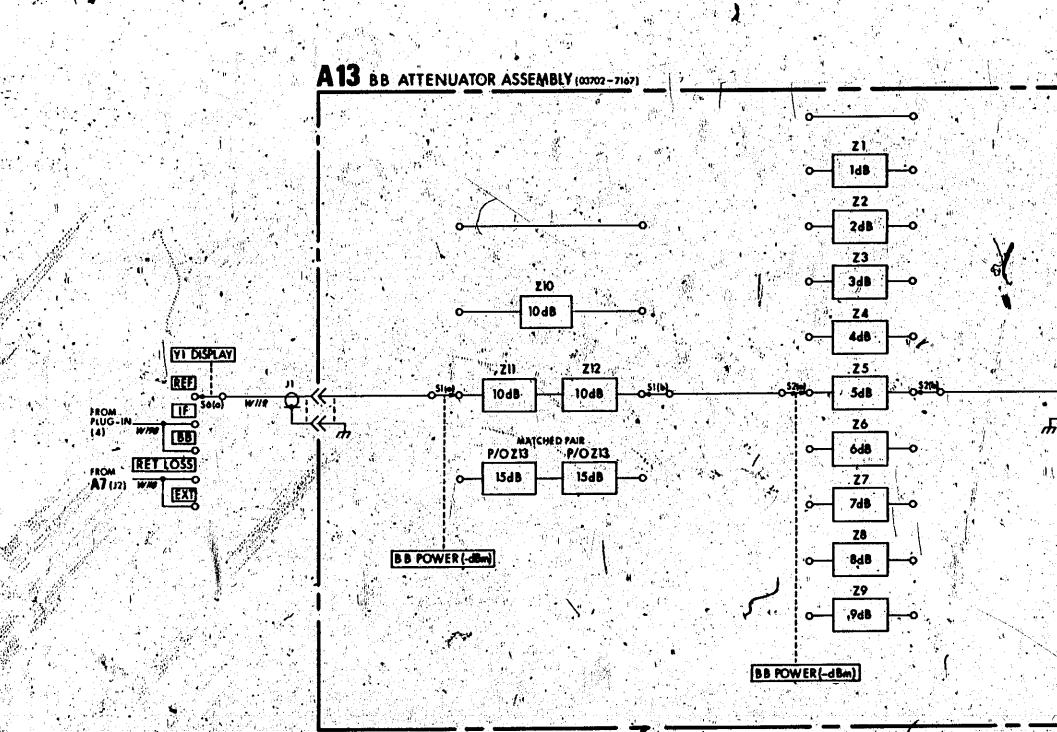
Figure A12-1/Simplified Block Disgram

A13-1 CIRCUIT DESCRIPTION

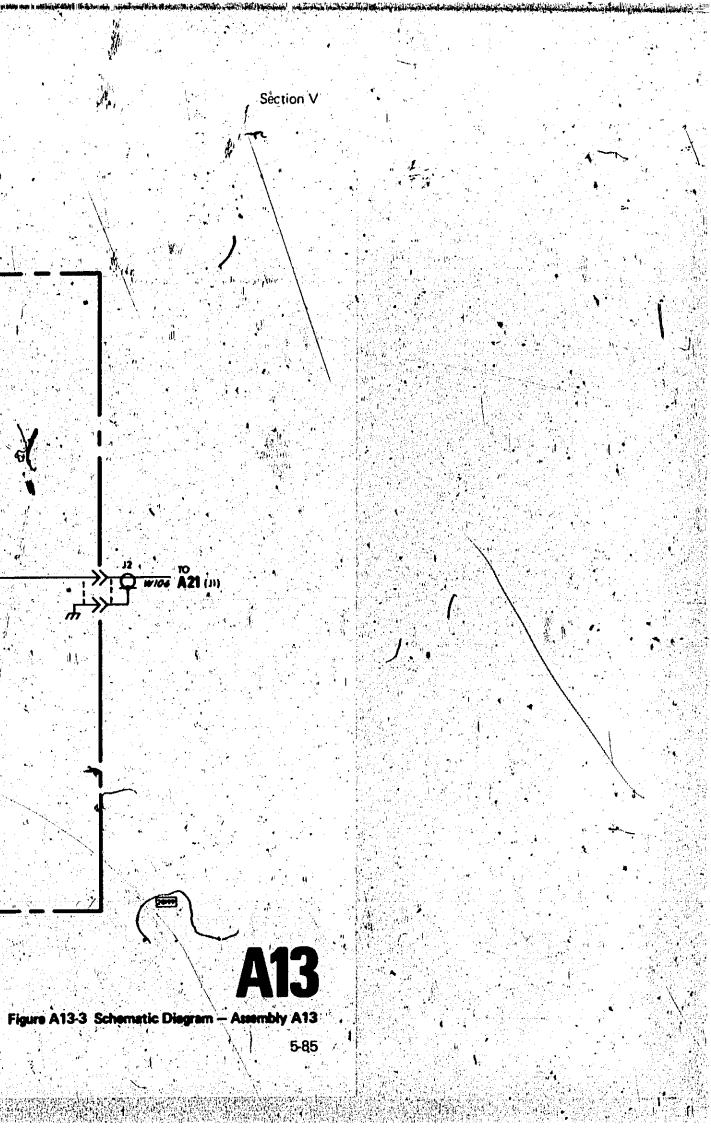
A13-2. The BB attenuator provides 39dB of attenuation, in 1dB steps and is calibrated from -10 to -49dB to maintain the input level to the BB Amplifier A21 of -49dBm.

A133 For BB power measurements the attenuator reads in dBm and for Return Loss measurements in dB.

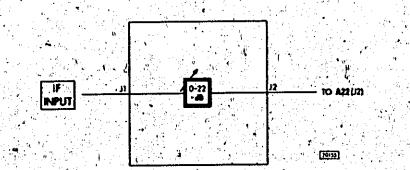




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ASSEMBLY SERVICE SHEET A14 - IF ATTENUATOR



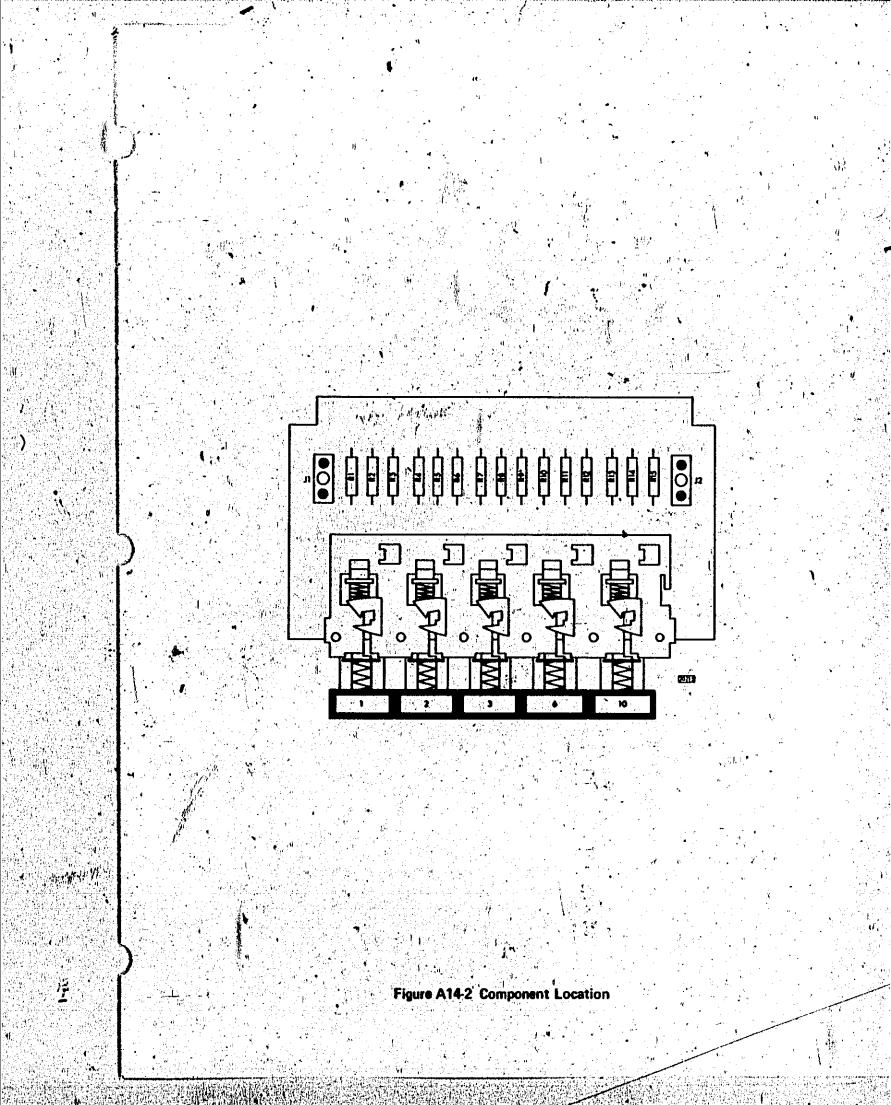
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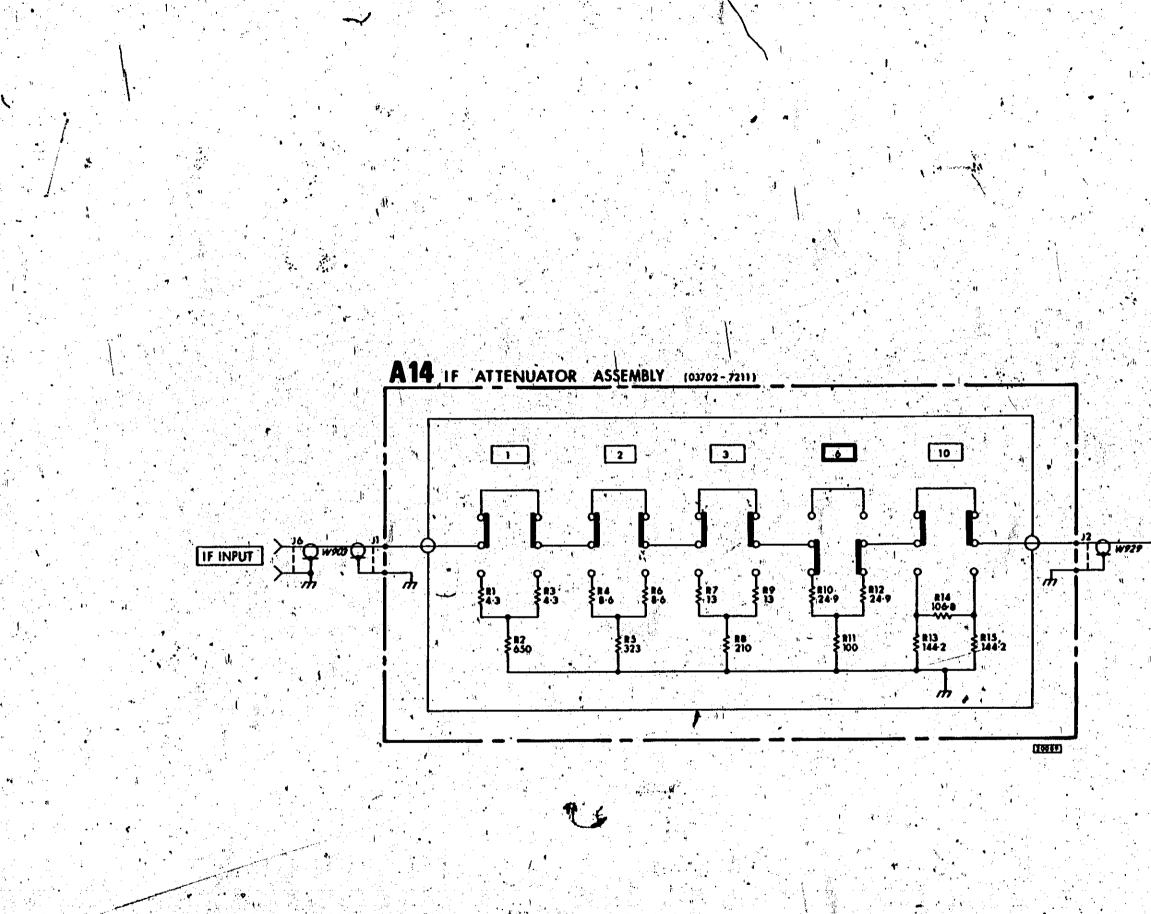
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Figure A14-1 Simplified Block Diagram

A141 CIRCUIT DESCRIPTION

A14-2 This five section attenuator adjustable in 1dB steps from 0 to 22dB, allows IF signals in the range 10 to +12dBm to be applied to the IF INPUT connector 36. Output to IF Amplifier and Detector assembly A22 is adjusted to -10dBm.

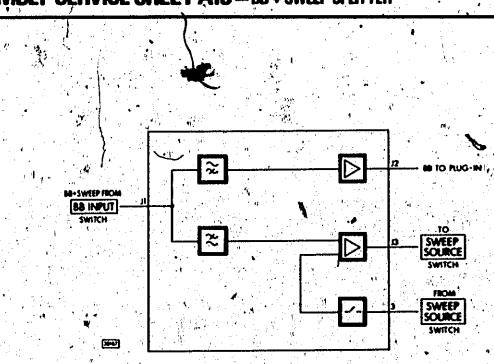




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ASSEMBLY SERVICE SHEET A15 - BB + SWEEP SPLITTER

Figure A15-1 Simplified Block Disgram

A15-1 CIRCUIT DESCRIPTION

A15-2 The BB + Sweep Splitter consists of a BB amplifier and a sweep amplifier/ phase inverter. The BB + Sweep signal (INT or EXT) is applied to J1 via the BB INPUT switch S5. High-pass filter C1, C2 and L1 removes the sweep and the remaining BB is then amplified by Q1 and applied to the plug-in unit via J2. Lowpass filter L2, L3 and C5 removes the BB and the remaining sweep signal is then amplified by Q2 and Q3 and applied to the Y2 DISPLAY switch S7 via J3.

A15-3 When the SWEEP SOURCE switch S4 is in the EXT BB + position, -15V is applied to Q4 gate turning it, hard on and grounding Q3 base. Q3 is then effectively in a common base configuration, and the sweep signal at J3 is in phase with the signal at Q2 base. When S4 is in the EXT BB - position, Q4 gate is grounded turning it off. Transistors Q2 and Q3 then function as a normal differential amplifier with 180° shift through Q3.

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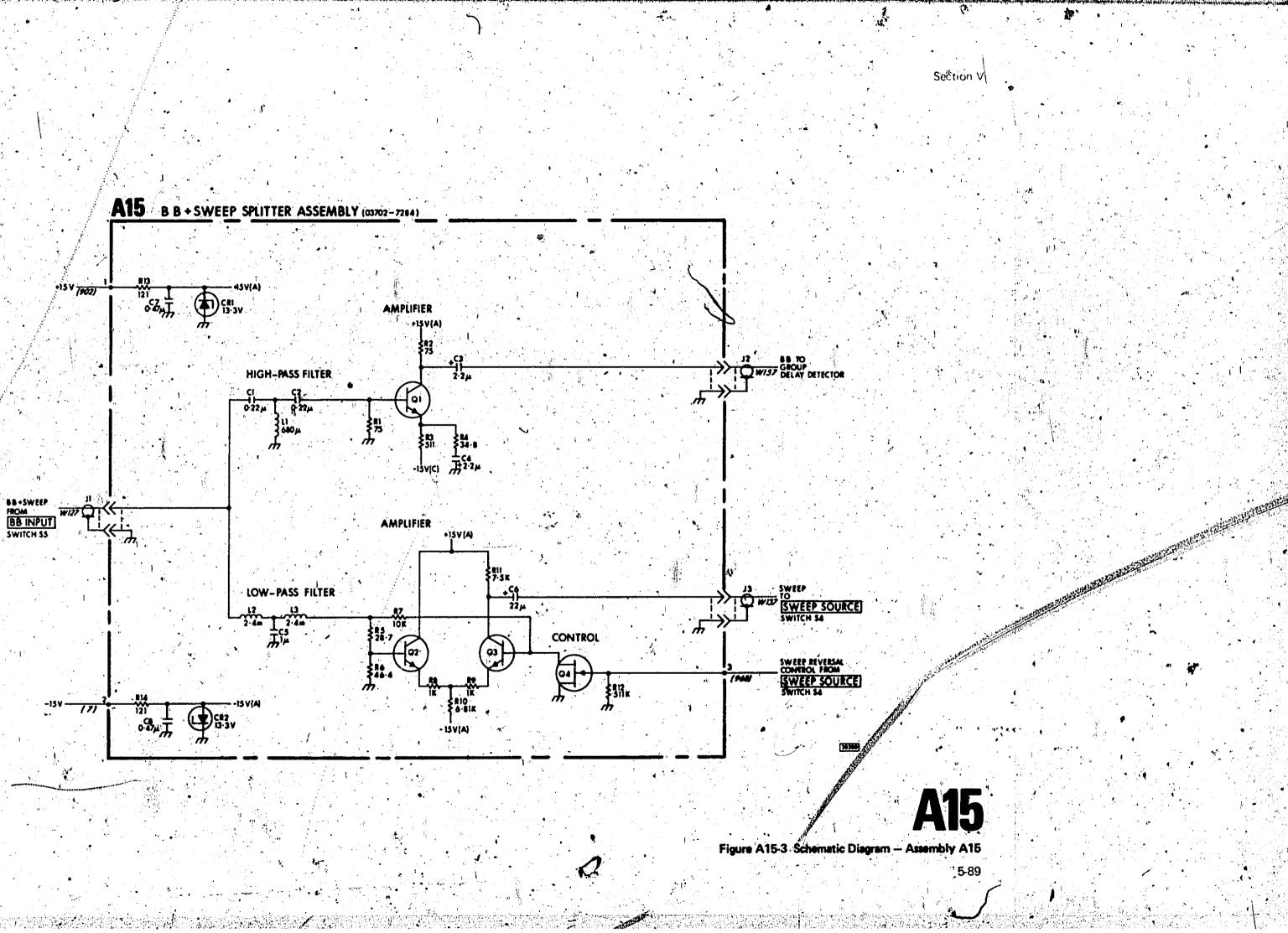
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C1 A-3	01	A 2
C2 A-3	Q2	A-2
C3 B-1	03	B 2
C4 B-3	Q4	B-2
C5 A-1	R	
C6 · B·1	REF	GRID
C7 A-1	DESIG	LOC
C8 2A-3	A 11	
CR	R1	B-3
REF	R2	A 1
DESIG LOC	R3	B-3
	R4	B 3
CR1 A-2	R5	B-2
CR2 A-2	R6	B-1
Ĺ	R7 .	B-2
	R8	B-3
REF GRID	R9 .	B-2
DESIG LOC	R10	B-3
L1 A-3	R11	B-1
L2 A-1	R12	B-1
L3 A-1	R13	• A 1
	R14	A 3

Figure A15-2 Component Location and Grid Reference



ASSEMBLY SERVICE SHEET A 20 - RETURN LOSS MIXER

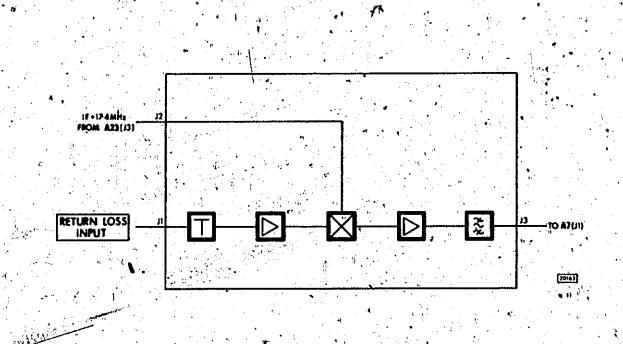


Figure A20-1 Simplified Block Diagram

A20-1 CIRCUIT DESCRIPTION

A20-2 The 8dB Matching Pad R1 to R3 ensures a good match at the RETURN LOSS INPUT. Amplifier Q1 and Q2 raises the input'signal to a level sufficient to drive the return loss mixer. Variable capacitor C3 is adjusted to provide a flat response over 50MHz.

A20-3 Mixer T1, T2 and CR1 to CR4 mixes the IF return loss signal with the IF +17.4MHz signal from J2. The lower sideband signal of 17.4MHz is amplified by Q3 and Q4 and applied to the parrowband filter, C6 to C12 and L1 to L3, to remove unwanted mixing products. The filter has a bandwidth of 1MHz and is 3dB down at 16.9MHz and 17.9MHz.

A20-4 The output from the filter is applied to the Return Loss Amplifier assembly A7 via J3.

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		REF GRID	REF GRID	
		C1	Q1 B-2	
		C2 A-3 C3 B-3	O2 B-2 O3 B-4	
		C4 C-3 C5 B-4 C6 A-4	Q4 ∖ B-4 R	
		C7 A-5	REF GRID DESIG LOC	
		C8 B-5 C9 ¹ B-5 C10 B-5	, R1	
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		013 C·2 C14 C-4	R5 -1 A-2 R6 B-2	
		C15 A-2 C16 A)4	R7 · A-2 R8 · C-1	
		CR	R9 C-2 R10 A-3 R11 C-3	
)), B 4 9	REF GRID DESIG LOC	R11 C-3 R12 B-4	
		CR1 B-3 CR2 B-3	R13 B-4 R14 B-4.	
		CR3 · B-3 CR4 · B-3	R15 A-4. R16 C-4	
			R17	
s •	10 @ 0 h	REF GRID DESIG LOC	R20 A-1	
		J2 A-4	∖ R20 A-1 R21 A-4	
		• J3 , B-5	REF GRID DESIG LOC	
		REF GRID	T1 A-3	
		L1 A-5	т 2 С-3.	
		L2 B-5 L3 C-5		

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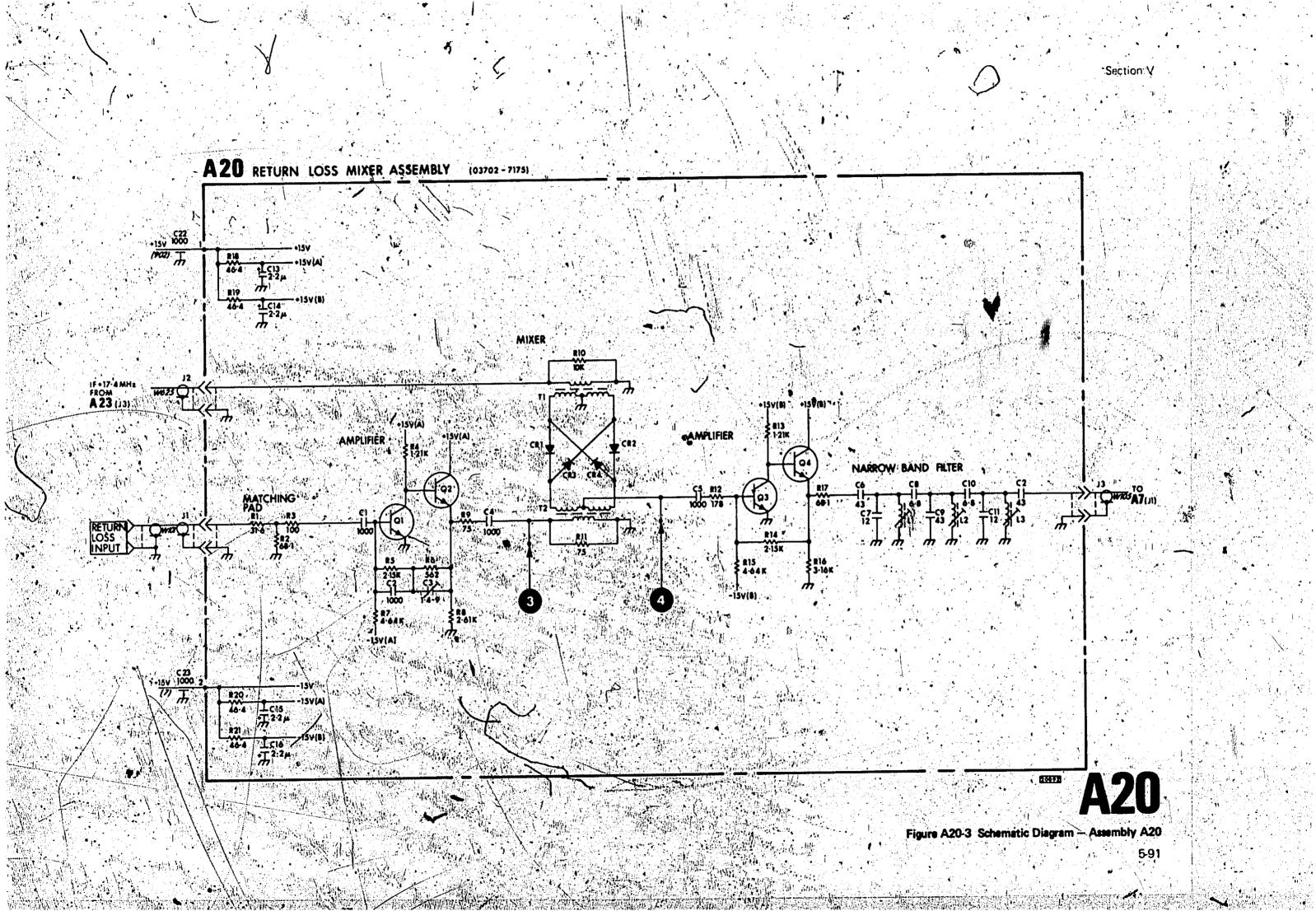
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Figure A20-2 Component Location and Grid Reference

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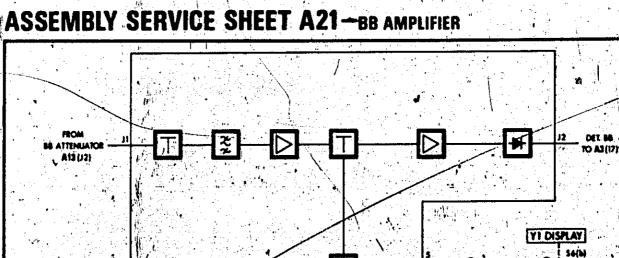
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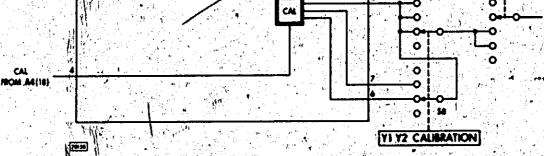
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Model 3702B ·

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A21-1 CIRCUIT DESCRIPTION

A21-2 The BB signal at J1 from the BB attenuator A13, is applied to the base of Q1 via a 2dB matching pad, R1 to R3, and a bandpass filter. The filter consists of a high and lowpass section in series; the high pass section, C1, C2 and L1, has a lower cutoff frequency of 10kHz; while the low pass section, C3, C4 and L2 is adjustable to give a lower cut-off frequency, 1dB down, at 15MHz.

A21-3 The BB signal is amplified by approximately 60 times, by Q1 to Q3 before being chopped by the calibration signal from the switching network. Y1 Y2 CALIBRATION switch S8 selects an incremental change in attenuation proportional to 1, 3 and 10% of the BB signal during the presence of a calibration pulse at Q11 base. This is achieved by diodes CR1 to CR6 by passing resistors R33, R34, R35, R37 and R38; which constitutes part of the shunt element of T-attenuator R2, R13, R29 and R30. Diode switches CR1 to CR6 are controlled by zener diodes CR7 to CR9, which are activated by the Y1 Y2 CALIBRATION switch.

Section V

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A21-4 The chopped BB signal is then applied to amplifier Q4 to Q7. Capacitor C12 is adjusted to provide a flat response up to approximately 12MHz.

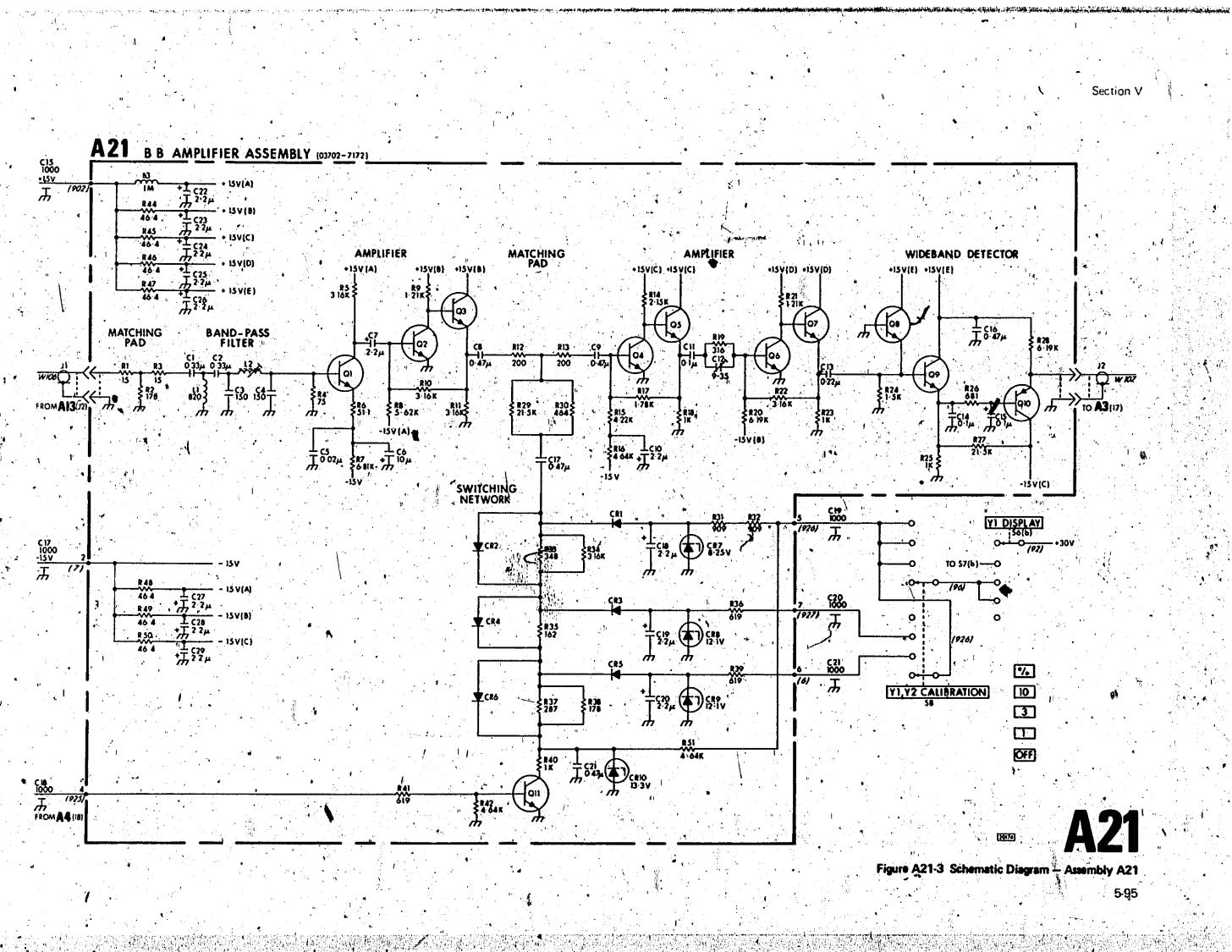
A21-5 The signal from amplifier Q4 to Q7 is detected by wideband detector Q8 to Q10, producing an output at T2 proportional to the amplitude of the BB signal at Q9 base. Transistor Q8 clamps the negative half cycles to approximately 0.6V, while Q10 is an emitter follower which drives the meter amplifier on A5, and also the post detector filter on A3.

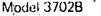
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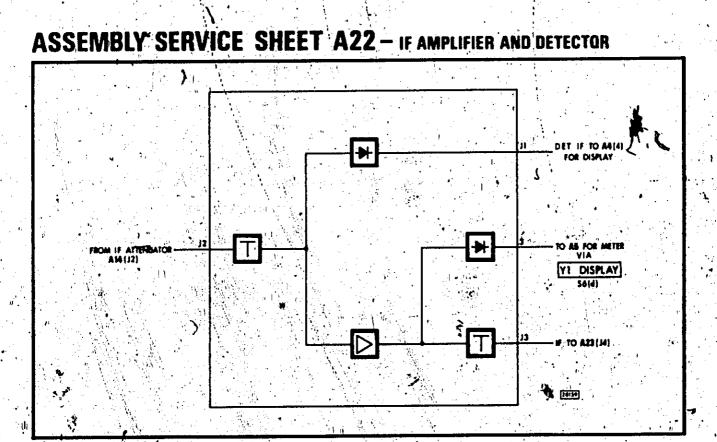
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			C3 C4	A-1	L		821	B-4
			C5	B-2	REF	GRID	R22	B-4
			C6	A-2	DESIG	LOC	R23	C-4.
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			C8	C-2	L2	C-1	R25	B-4
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			C10	A-4			R27	A-4
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			C14	C-4	Q1	B-1	R31	B-3
		114 4 4	C15	A-4	02	B-2	R32	B-8
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			. C18	A 2	Q5	в-3,	R35	°C-3
			C19	A-3	Q6	B-4	R36	B-3
			C20	A 3	07	B 4	R'37	C-3,
		V.	C2.1	B-3	08	1 B-4	·R38	C-3
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			C25	C 4	R		R42	C-2
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			C29	A-4	°R1	B-1	R47	C-4
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Figure A21-2 Component Location and Grid Reference









A22-1 CIRCUIT DESCRIPTION

A22-5 Resistors R39 to R41 form an 8dB Matching Pad, matching Q7 output to the group delay equalizer C27, R28 and L4, L5 which provides an overall flat group delay characteristic. The output from the group delay equalizer at a level of approximately +3dBm is applied to the IF Mixer and Local Oscillator assembly A23.

A22-3 Grounded base stages, Q3 to Q7 form a flat response wideband, IF amplifier covering the range 45 to 95MHz. The overall gain of Q3 to Q7 is 21dB giving a +11dBm signal at the input of detector Q8. Detector Q8 gives a voltage proportional to the IF level which, with 10dBm at J2, will give a centre scale reading on the IF LEVEL meter in REF and IF positions of the Y1 DISPLAY switch.

A22-4 The balanced detector CR1, CR2 and Q1, Q2 is biased to detect the IF signal and gives an output proportional to the pk-pk IF input which can then be displayed on either Y1 or Y2 trace.

A22-5 Resistors R39 to R41 form an 8dB Matching Pad, matching Q7 output to the group delay equaliser C27, R28 and L4, L5 which provides an overall flat group, delay characteristic. The output from the group delay equaliser at a level of approximately +3dBm is applied to the IF Mixer and Local Oscillator assembly A23.

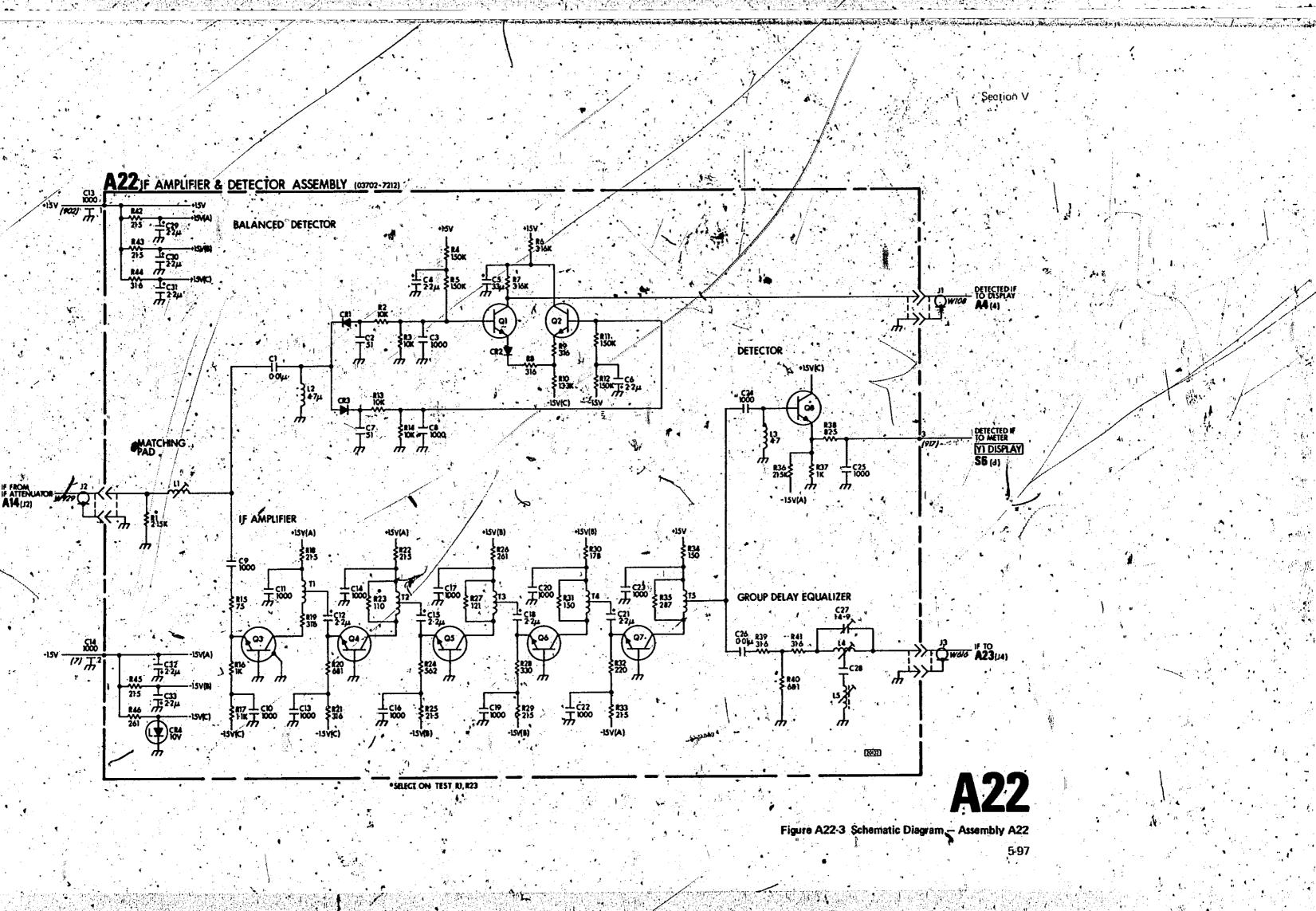
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		C2	C 2	J2 B 2	R17	A 2
		C3	C-1	J3 A-6	R18	B-3
	1	C4	Č I		R19	B-3
	Υ	C5	C-1	L	R20	A 3
		°C6	A-1	REF GRID	R21	A-2
		C7	A-2	DESIG LOC	R22) C-3
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	1	C9	C 2	L1 C-2	.R24	A-3
		C10	· A·2	L2	R25	A4
		C11	B.3	L3 C-0	R26	C-4
	a a stra	C12	A-3	L5 A5	R27	B-4
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		"Ĉ18	B-4	Q2 B-1	R33	A-4
-[174] [143]		C19	A-4	Q3 B-2	R34	C-5
	•	. C20	C-4	Q4 B-3	R35	C-5
-[127]-		C21	B-5	Q5 B-3	R36	B-6
		C22	A-5	Q6 B-4	R37	- <mark>В</mark> б
[*] - <u>RES</u> - • • (13) - <u>(28)</u> +		°C23 →	C-5	Q7 B-5	R38	B:6
		C24	C-6	Q8 B-6	R39	B-6 B-6
		C25	B 6		R40	во 85
- 8 28 8 30 -		C26	C-6	R	R41 R42	C:3
		C27	A-6	REF GRID	R42	C-3
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		C29	C-2	B1 C-2	845	A 4
		C30	• C-4	R2 C-2	R45	A 2
		Č31	C-6			<u> </u>
		C32	A-4	R3 C-1		
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(13) a - 114-	-	CR2	8-1 	R10 A-2	T3	B-4 C-4
		CR3	. B-2	R11 A-1	T4 T5	
.	•	CR4	A-2	:R12 A-1	C T	C:5
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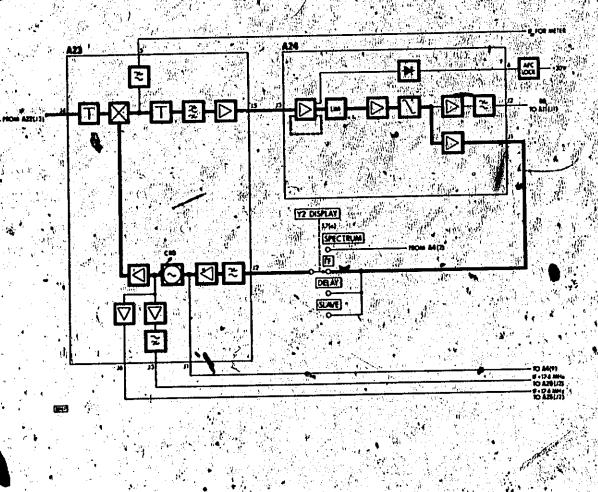
Figure A22-2 Component Location and Grid Reference

rinner miteret

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A23-1 Simplified Block:Diagram

A23-1 CIRCUIT DESCRIPTION

5-98

A23-2 The primary function of this assembly is to mix the IF signal from the IF Amplifier A22 with an internally generated frequency from the local oscillator, to produce a 17.4MHz signal for the IF Discriminator A24.

A23-3 IF Mixer

A23-4. The main IF signal, from IF Amplifier A22, is appled to the mixer T1, to T4 and CR4 to CR7 via matching bad R24 to R26, where it is mixed with the local oscillator output (IF + 17.4MHz) to produce the 17.4MHz signal for the IF discriminator A24 in IF, DELAY and SLAVE positions of the Y2 DISPLAY switch. An 8dB matching bad R35 to R37 matches the mixer output to bandpass filter C23 to C27 and L4 to L8 which selects the 17.4MHz lower sideband. Transistors O6 and Q7 amplify the TV 4MHz signal to provide a 5V place output which is adjusted by R46. Section

5.99

A235 Local Oscillator

A23-6. Voltage controlled/Oscillator Q1 produces a local oscillator signal between 62.4 and 112.4MHz depending upon the bias voltage on varactor drode-CR3. The bias on CR3 is adjusted in the range -2 to -5V by A24R23 while Li runes the frequency of the oscillator to 87.4MHz in the all positions of the Y2 DISPLAY switch S7/except SPECTRUM. The AFC signal from S7 controls the blas on CR3 and hence the local oscillator frequency. The AFC signal is applied from U2 via a band-stop filter, which rejects any BB signal present on the AFC signal, and amplifier MC1, which has a low pass characteristic. The local oscillator signal is then fed to the mixer via buffer emplifier Q4 and Q5 which prevents spuricus signals from the mixer appearing on the other local oscillator outputs.

A23-7: In addition, the local oscilutor signal is applied to:

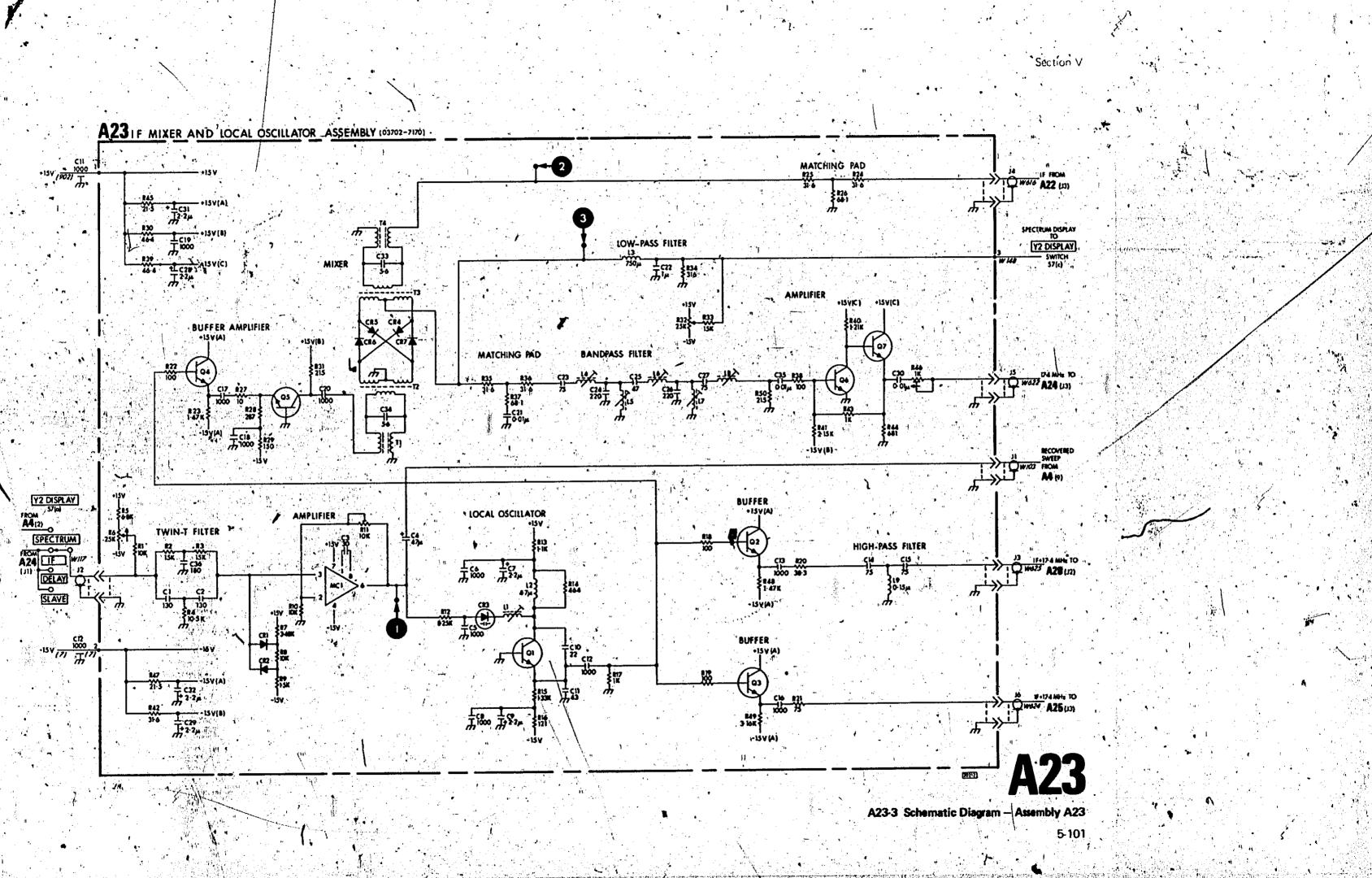
a. Buffer amplifier 02 - which provides a local oscillator output to the Return Loss Mixer via assembly A20 high pass filter C14 to C15 and L9 which prevents the lower sideband mixing product from the A20 from affecting local oscillator outputs.

Buffer amplifier 03 – which provides a local oscillator output to Sliding/ Spectrum Marker Generator A25

A23-8 In the SPECTRUM position of the Y2 DISPLAY switch the local oscillator will be swept approximately ±3MHz about 70MHz. This swept signal is applied to a mixer on the Stiding Spectrum Marker Generator assembly A26 via 16 where it is mixed with the 70MHz from the crystal decillator, producing a zero beat marker at 70MHz for display on the Y1 trace. The signal is also applied to mixer T1 to T4 and CR4 to CR7 where it is mixed with the incoming IF at 14, again producing a zero beat marker when the local oscillator frequency is the same as the IF trequency This marker, is smoothed by filter L3 and C22 and displayed on the Y2 trace for comparison with the Y1 trace.

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C27 A-5 REF GRID R39 C-6 C28 C-6 C29 A-6 DESIG LOC R40 B-6 C30 B-6 C1 B-3 R41 A-6 C31 B-2 O2 B-2 R43 B-6 C32 A-2 O3 C-2 R43 B-6 C33 B-4 O4 C-4 R45 B-2 C33 B-4 O4 C-4 R45 B-2 C33 B-4 O4 C-4 R45 B-2 C34 B-4 O5 A-4 R45 B-2 C36 B-1 O7 B-6 R47 A-2 R48 A-3 R46 B-6 R47 A-2 R48 A-3 R49 C-2 R48 A-3 R49 C-2 R1 A-1 R48 A-3 R49 C-2 R4 B-4 B-6 R47 A-2 R48 C-2 R1 C-1 R2 B-1			Y .		C24	C-5	MC1	_ C-2	R36	່ C-5 _:
C27 A-5 REF GRID R39 C-6 C28 C-6 C29 A-6 DESIG LOC R40 B-6 C30 B-6 C1 B-3 R41 A-6 C31 B-2 O2 B-2 R43 B-6 C32 A-2 O3 C-2 R43 B-6 C33 B-4 O4 C-4 R45 B-2 C33 B-4 O4 C-4 R45 B-2 C33 B-4 O4 C-4 R45 B-2 C34 B-4 O5 A-4 R45 B-2 C36 B-1 O7 B-6 R47 A-2 R48 A-3 R46 B-6 R47 A-2 R48 A-3 R49 C-2 R48 A-3 R49 C-2 R1 A-1 R48 A-3 R49 C-2 R4 B-4 B-6 R47 A-2 R48 C-2 R1 C-1 R2 B-1	N. F				C25 -	- B-D			' R37 '	B-5∳
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(*) (C20	0.0 A.6	DESIG	LÕC	R 40	B·6
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(*) (C31	B.2	02	[°] B ⁵ 2	r R42	A-6
(*) (Ţ				C32	A.2	03	C-2	H43	8.0
(*) (رو				C33	B-4	Q4`	C-4		• 10.0
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CR3 B3 R4 CR3 B3 R4 CR4 B4 CR5 B4 CR5 B4 CR5 B4 CR5 B4 CR6 B4 CR6 B4 CR7 B4 CR7 B4 CR1 T1 B4 CR5 B-1 T2 B4 CR5 CR1 T3 B4 CR5 CR1 T4 B4			9 Y	· .	CB2	C.1			REF ^S	GRID
CR6 B-4 R5 B-1 T2 B-4 CR5 B-4 R6 B-1 T2 B-4 CR6 B-4 R7 C-1 T3 B-4 CR7 B-4 R8 C-1 T4 B-4					CB3			Δ.1	DESIG	LOC
- [39]- - [39]- - [30]- CR5 4 B.4 R6 B-1 12 B.4 - [30]- - [30]- - [30]- CR6 B-4 R7. C-1 T3 B-4 - [30]- <th></th> <th></th> <th></th> <th>n di san ang san sa</th> <th>CR4</th> <th></th> <th></th> <th>B.1</th> <th>T1</th> <th></th>				n di san ang san sa	CR4			B.1	T1	
CR6 B-4 R71 C-1 T3 B-4 CR7 B-4 R8 C-1 T4 B-4										
CR7 B-4 RB C-1 14 B-4		• 🚳 .	r v ⊶itte ••••	•						B-4
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A23-2 Component Location and Grid Reference



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ASSEMBLY SERVICE SHEET A24 - IF DISCRIMINATOR

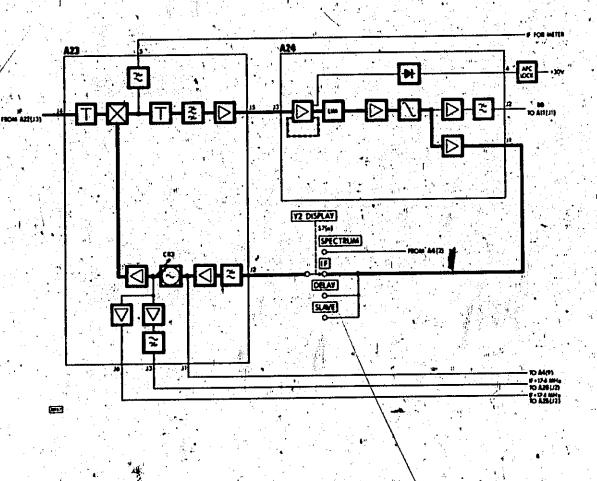


Figure A24-1 Simplified Block Diagram

A24'1 CIRCUIT DESCRIPTION

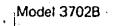
A24-2 The IF discriminator recovers the BB + Sweep signal which has been modulated onto the original IF signal. The input signal at J3 is applied to an AGC amplifier Q2 and Q3, with feedback loop MC1 and Q1, which has a gain of 4QdB at 70Hz. The PIN diode attenuator CR1 is controlled by Q1. The PIN diode attenuator ensures that the input level, and hence the output level of amplifier Q2, Q3 remains constant, at 1.2V pk-pk. If the output level from the amplifier varies, it is detected by CR2 which varies the dc level to MC1 which in turn controls Q1 and hence CR1. The AGC amplifier also suppresses AM contained on the input signal. The output from MC1 also supplies the detector Q6 and Q7.

A2A-3. The detector Q6 and Q7 is used to drive the AFC LOCK lamp. If there is no IF signal applied to detector CR5, then transistor Q6 will be held on resulting in Q7 being held off and the AFC LOCK lamp extinguished. When the applied IF signal from Q5 emitter, at a level of 1.5V pk-pk, is applied to CR5; it is sufficient to drive Q6 off and turn Q7 on which lights the AFC LOCK lamp.

A24-4 The 17.4MHz signal is then applied to limiter MC2 which consists of MECL gates to ensure that the AM is almost completely suppressed. The signal from the limiter MC2 is amplified by Q4, Q5 to a level of 1.5V, pk-pk and applied to a tuned amplifier.

A24-5 Harmonics of the 17,4MHz signal generated in the limiting process are reduced by tuned amplifier Q8, Q9, L1 and C21, which is balanced by variable resistor R38. To improve the modulator linearity, the tuned circuit is tuned to 15.3MHz and not to 17.4MHz. The output from the tuned amplifier, which also constitutes part of the triple tuned discriminator, is applied to the remainder of the discriminator. The two other tuned amplifiers Q10, C24 and L2 and Q11 C25 and L3 are tuned to 9.5MHz and 25MHz respectively. Each amplifier has the same gain at 17,4MHz. The outputs from the tuned amplifiers are detected by CR6 and CR7, passed through emitter followers Q12 and Q13, and summed at R53. Variable resistor R53 sets the demodulator output to 0V, when there is no 17.4MHz IF applied to the circuit. Variable resistor R43 adjusts the voltage level at R53 wiper to 0V when a 17.4MHz IF signal is applied to J3.

A24-6 The demodulated IF signal is applied through emitter follower Q14 to the series feedback amplifier Q15 and Q16 which drives the low-pass filter, L4, L5 and C32 to C34. The low-pass filter removes any remaining high frequency signal before the BB output from J2 is applied to the BB INPUT switch. In addition, the recovered BB + Sweep signal is applied to amplifier MC3 to MC5 which has 90dB of gain. This amplifier sets up the AFC control to ensure that the bias voltage on the varactor A23CR3 is at the correct level, such that an IF frequency of 70MHz will be equivalent to a local oscillator frequency of 87.4MHz.



5-104

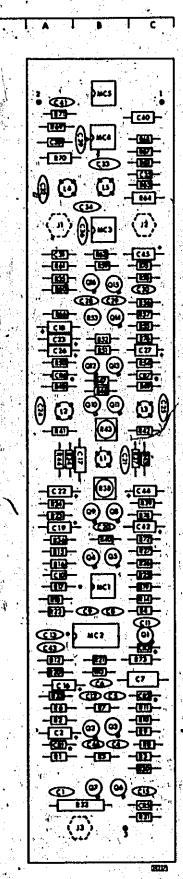
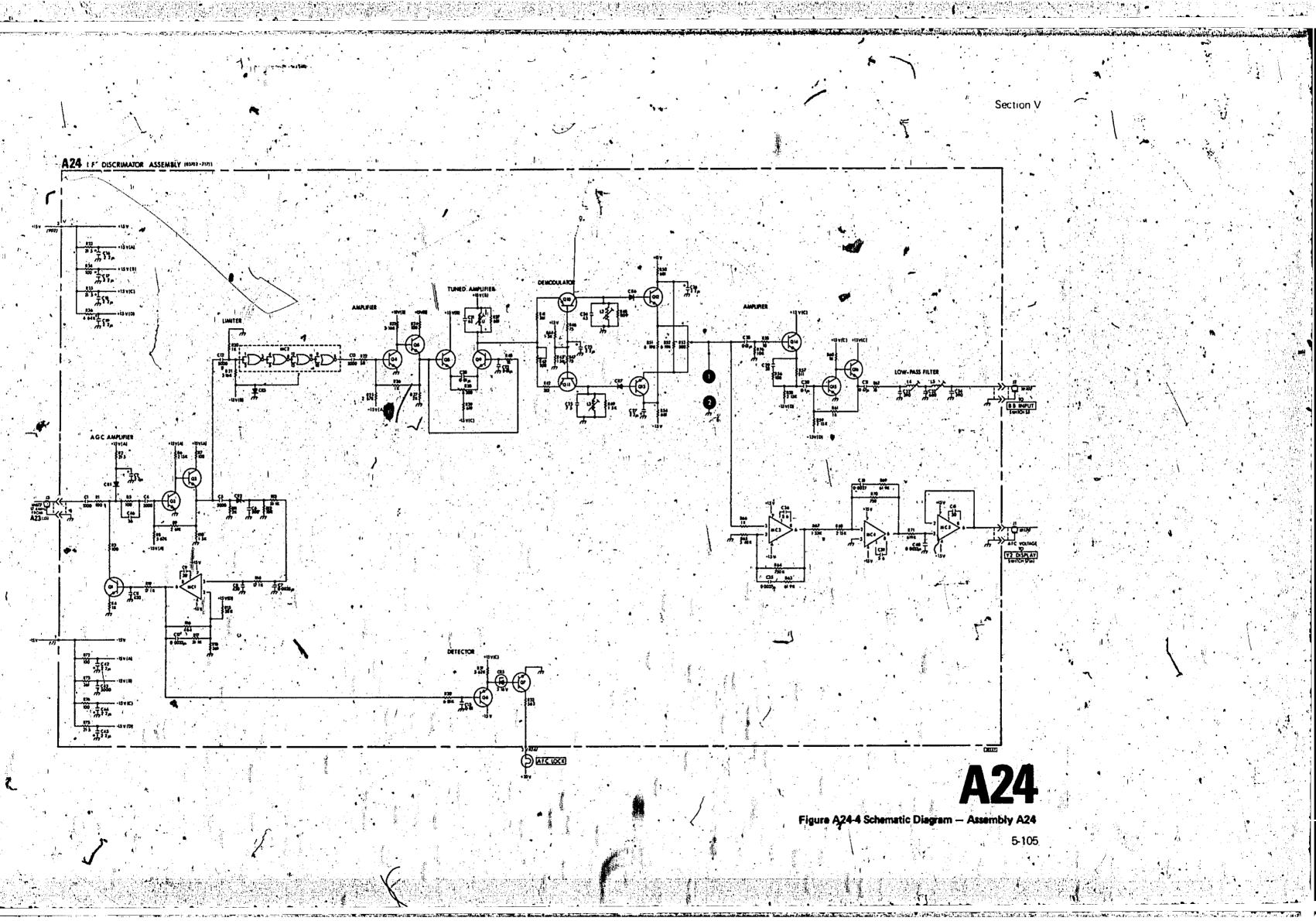


Figure A24-2 Component Location

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C		C	R	Q6	B-6		
				07	• B-6	R33	" A-5
REF	GRID		GRID	08	B-4	R34	A-3
DESIG	LOC	DESIG	LOC	Q9	B-4	R35	A-2
/C1 1	Å∙6	CR1	A-6	010 ⁻¹	B-3	R36 1	A-4
C2	A-6	CR2	C-5	011	B-3	R37	C-3
C4	B-6 -		C 5	012 -	B-3	R38	B-4
C5 `	B-5	CR5	C-6	013	B-3	R39	C-4
C 6	B-5	·CR6	A-3	Q14	, B-2	R40	B-4
°C7	C-5	CR7	C-3	Q15	B-2	-R41	A-3
C8	B-5			°Q16	B•2 B•2	R43	C-3
C9	B-5	J			D*2	R43	B-3
C10	A-4	REF	GRID		R	R44	A-3
C11	C-5	DESIG	LOC			R45	C 3.
C12	B-5			REF	GRID	R46	B-3
C13	A-5	J1	A-2	DESIG	LOC	R47	B-3
C15	C-6 '	J2	C•2	- R1	A-6	R48	A 34
C16	A-5	સ	A-6	R2	À-6	R49	C-3
C18	A-3			R3	C-6	R50	A-3 C-3 A-3
C10	A-4			,R4	°.C•5	R51	B2
C19	B-4	REF	GRID	R5_	B-6	R52	B-2 B-2
		DESIG	LOC	R6	A-5	853	B 2
C21	B-3	LI	B 3	R7	B-5	R54	C 3
C22	A-4	L2	A-3	R8	C-6	R55	C-2
C23	·A-2	L3	C-3	R9	C-6	R56	Č-2
C24	A-3	L4	A 1	R10	C 6	R57	C 2 ;
C25	C-3	L5	R-1	R11	C-5	R58	C-2 ¹
C26	A-2			R12	A-5	R59	B-2
C27	C-2	M	С	R13	B 5	B60	A-2
C28	B-2	DEE	CDID	R14	`Ç-4	100 061	
C29	B-2	REF.	GRID			R61	A-2
C30	C-2	DESIG	LOC	R15	A-4	R62	B·2
C31	A-2	MC1	B-4	R16	A-4	R63	C-1
C32	A-1	MC2	B-5	R17	-A-4	R64	C-1
C33	B-1	MC3	B-2	R18	A-4	R65	C-1
C34	B-1	MC4	B-1 ⊳	R19	C-4	_R66	'A-2
C35	C-1	MC5	B'1	R20	'A-5	R67	C-1
C36	B-2	and the second second	4	R21	B-5	R68	C-1
C38	A-1	Q	2	R22	A-5	R69	A-1
C39	B-1	REF	GRID	R23	A-4	R70	A-1
C40	C-1	DESIG		R24	· A-4	R71	, A-1
C41	A-1		LOC	R25	C-4 ⊨	R72	C 4
C42	C-4	Q1	C-5	R26	C-4	.R73	C-5
C43	. A-5	Q2	B-6	R27	· C-4	R74"	C-4
C44	C-4	Q3	B 6	R30	- C-6	R75	C 2
C45	C-2	Q4 🥒	B-4	R31	C-6	R76	C-2
C46	B-6	Q5	B-4	R32	A-6		
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Figure A24-3 Grid Reference



Model 3702B

ASSEMBLY SERVICE SHEET A25 - SLIDING/SPECTRUM MARKER GENERATOR

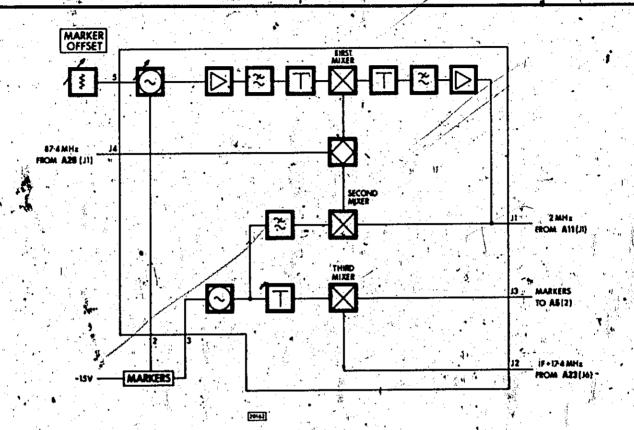


Figure A25-1 Simplified Block Diagram

A25-1 CIRCUIT DESCRIPTION

A25-2 Sliding Markers

A25.2 Voltage controlled oscillator Q1 generates a signal in the 262 to 281MHz range dependent upon the bias voltage applied from the MARKER OFFSET control to the varacter CR1. Variable inductor L1 is tuned to allow the oscillator frequency to vary from 262 to 287MHz when the MARKER OFFSET control is, tuned over its range. Transistor Q2 forms a wideband amplifier which applies the oscillator signal through a low-pass filter and a matching pad to the first mixer. The low-pass filter and matching products affecting the oscillator.

A25.4 Wideband amplifier Q2, with a flat gain versus frequency response, amplifies. the signal from Q1 which is then applied to a low-pass filter L3 to L5 and C12, C13 and a matching pad R11 to R13 to prevent higher order mixing products affecting the oscillator. Centre marker generator A26 provides an 87.4MHz signal via J4 to the hybrid which divides the signal equally between the first and second mixers, at the same time preventing mixing products from one mixer affecting the other. The first mixer T1, T2 and CR2 to CR31mixes the third harmonic of the 87.4MHz with the output from the voltage controlled oscillator to provide an output from which 0 – 25MHz is filtered by low-pass filter L6, L7 and C14. Amplifier Q3-6, which has a gain of 43dB, amplifies the signal which is then applied to the second mixer along with 2MHz spikes from the Comb Marker Generator A26 via J1.

Section.

A25.5 The second mixer T4, T5 and CR6 to CR9 mixes the 87.4MHz from the centre marker generator with the 0 - 25MHz from the first mixer to produce an output of 87.4MHz with two sidebands of 0 - 25MHz, spaced equally. Low pass filter L8 to L10, C22 and C23 passes these frequencies to the third mixer via the matching pad R38 to R40 but rejects higher order mixing products.

A25-6 The third mixer T6, T7 and CR10 to CR13 mixes the A23 local oscillator frequency via J2 with the output from the second mixer to produce zero beat markers which are applied to the Marker Processor A5 via J3.

A25-7 Spectrum Marker

A25-8 Relay K1 is controlled by the Y2 DISPLAY switch and S9(A) when in the SPECTRUM mode, removes through the MARKERS switch and contact K1A the -15V rail to assemblies A11 and A26, while K1B disables the MARKERS switch S9(B) and energizes the -15V (D) rail. In the SPECTRUM mode therefore, only the 70MHz oscillator 07 is energized and the third mixed produces one marker centred on 70MHz.

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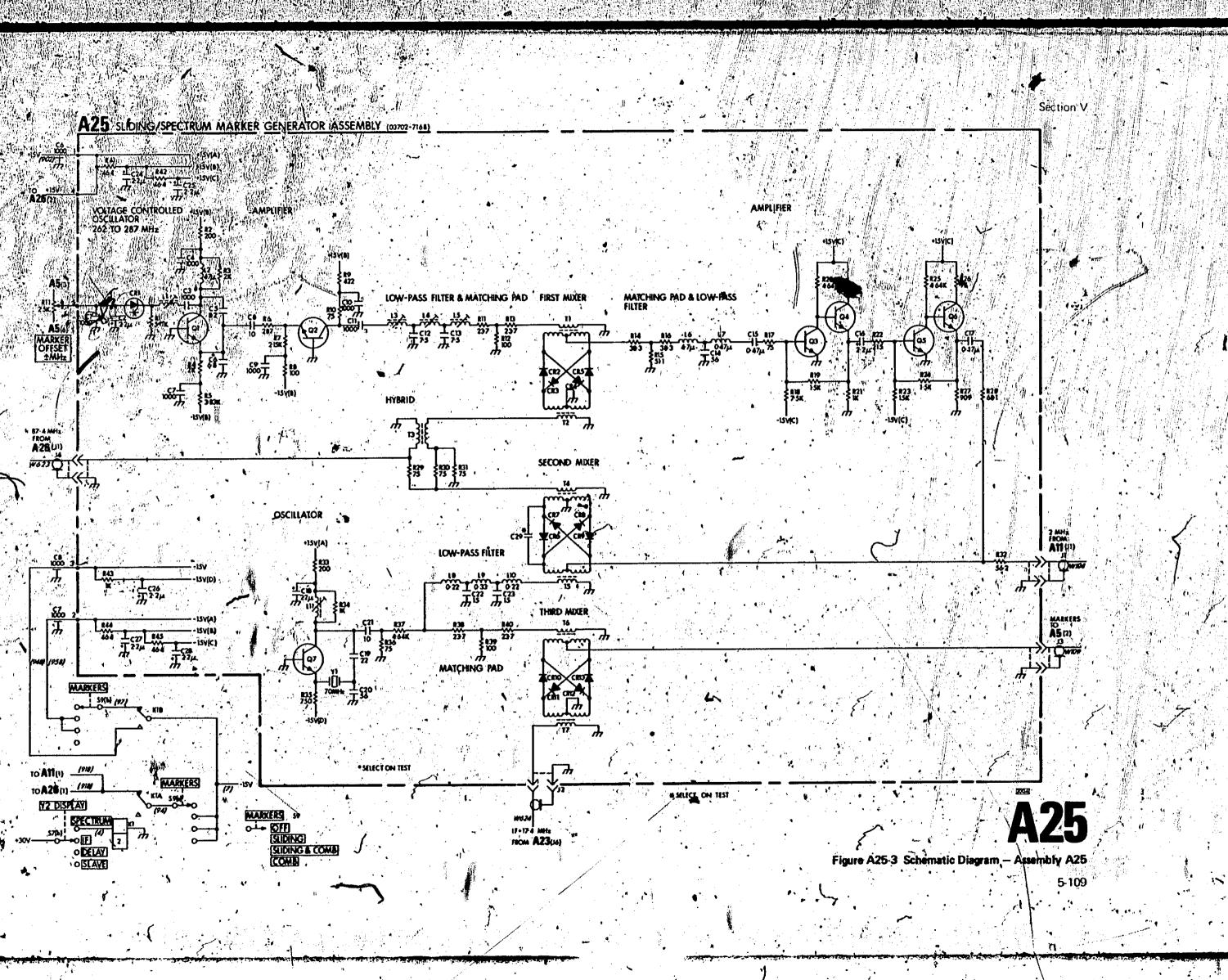
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	ି ଭି ନ୍ନ	ആ	-[23]-		C3-	B-4		A-3	·RV	C 3
		00	- <u>EU</u> -:		C4	A-4	J4	<u></u> A-3_1	· R 18	C2
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	(B)		é in XXI	, 1 N I	G6 -	B-4	المتعادية المستحد الم	GRID	R20	B-2
1.46			<u>```</u>	1.18	C7	C-4	REF			
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144 174				a Million and Anna Anna Anna Anna Anna Anna Anna	.C9 · **	C-3	L1 (B-4	822	. <mark>B-2</mark>
- 41 ²³ ♣* 124 :	··-[14]-	-00-	@		C10	A-4	112	A-4	R23	C-2
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	- 				,C12	A-3		· B-3	R25	* A·2
-	-[20]-			C age - 6		B-3	L4	корология КС-3	R26	'A 2
34. L	• (14		(B).	A	C13		· L5 // · ·		*R27	B-2
i ille	U.	- ()		one of the s	C14	B-3	ʻL6	@ .3 [.]	R28	B-2
朝		-000-	7-m		"C15"	°C•3	¦∕L7⊙	° C-3	R29	A-3
	and the second	·	(n);]		·C16	B-2	L8	A-1	R30	B-3
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	· -[20]-	$\Theta \odot$	-007		C18	A-1	L10	.∵C-1 C ¹ 1	*R31	A.3.
	-1126	-[117]-	9		C19	B.J.	L11 🖔	A-1	R32	B-2
•.			-[3]-		Ç20	B-1 •			R33	A 1
		-000-	[\$18]		C21	B-1	Q		R34 . R35	A-1
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	Ęнў		<u>ه</u>		C24	A-4	01 -	B-4	R38	A 1
		-UU-	4121		C25	•A-2	02 /	B'4	R39	A-1
Σ.		-199-			C26	C-1	03 04	₹ [™] Β-3	R40	A-1
\$ 		-000-	- 100- 1		C27	; C -4	Q4	B-3 -	R41	A-4
3.	•(")	-03-	- [14]- (-C28	C-2	- 05	• B-2		
		-00-	5		CR		. 06	8-2	R42	A-Z
	••(12 -)		(n) =•			GRID	Q7	8-2 B-1	R#3	A-2 Ç-1 C-4
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		Ğ.	GD .		CR5	0.0	R3^()	⁷ A,4	ТЗ .	A-3
	-020-	<u> </u>	-@] •		CR6 🖌	B-2	R4	.C-4		
					CR7	B-2	R5	°C-4	T3	A-3 A-2
4	() () () () () () () () () ()				CR8	B 2	R6	C-4		A-Z
		1			CR9	- B-2 B-1 -	87	C-4	T5	C-2
		() ()	Ē		CR10	B 1 *	-R8		. 16 ∙	A-1
	· · ·	- <u>CO</u> 1*		1	CR11 (B-1	1 no*	C-4.	17:20	C-1
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]: !	2.	.		CR13	B] -	R10	B-4,		
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Figure A25-2 Component Location and Grid Reference

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Model 3702B

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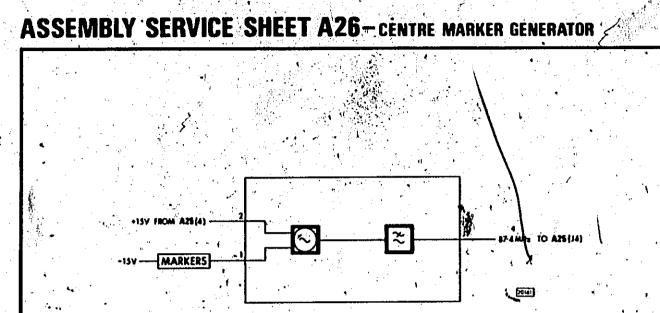


Figure A26-1 Simplified Block Diagram

A26-1 CIRCUIT DESCRIPTION

A26-2 The crystal oscillator Q1 generates 87.4MHz to provide a centre marker in all modes other than SPECTRUM, and to drive the first and second mixers on the Sliding/Spectrum Marker Generator A25. Inductor L1 adjusts the oscillator output to approximately 1.1V pk-pk.

A26-3 Low pass filter L2 to L4 and, C7 and C8 removes unwanted harmonics to prevent spurious mixing products in the mixers.

A26.4 In SPECTRUM mode the oscillator is disabled and a single marker is produced by the 70MHz crystal oscillator on the Sliding/Spectrum Marker Generator A25.

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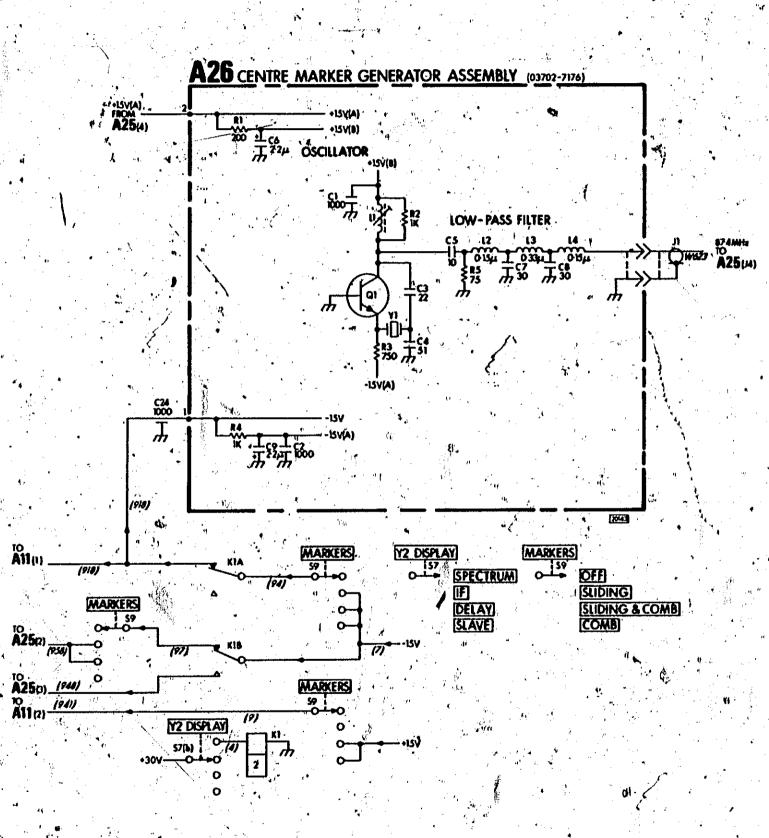
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C REF GRID	L3 L4	A-2 B-2	
DESIG LOC	R		1
C1 C-2 C2 A-1	REF DESIG	GRID LOC	
C3 B-1 C4 C-1	R1 R2	C-2	
C5 B-2 C6 C-2	R3 R4	.C-2 A-1 A-2	
C7 A-2 C8 B-2	R5	B-2	
C9 A-1	Y		
L REF, GRID	REF DESIG	GRID LOC	
DESIG LOC	Y1 . J1	^{ст} В-1 В-2	
L1 C-1 L2 A-2	•	.∦ B-1	F

Figure A26-2 Component Location and Grid Reference

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CATHODE-RAY TUBE WARRANTY

The cathode ray tube (CRT) supplied in your Hewlett-Packard Instrument and replacement CRT's purchased from hp are warranted by the Hewlett-Packard Company against electrical failure for a period of one year from the date of sale. Broken tubes and tubes with phosphor or mesh burns are not included under this warranty. If the CRT is broken when received, a claim should be made with the responsible carrier.

Your nearest Hewlett Packard Sales/Service Office (listed at rear of instrument manual) maintains a stock of replacement tubes and will assist in processing the warranty claim.

We would like to evaluate every defective CRT. This engineering evaluation helps us to provide a better product for you. Please fill out the CRT Failure Report on the reverse side of this sheet and return it with the defective CRT to:

Hewiett-Packard Limited, South Queensferry, West Lothian, Scotland.

Attention:- CRT QA

To avoid damage to the tube while in shipment, please follow the shipping instructions below; warranty credit is not allowed on broken tubes.

SHIPPING INSTRUCTIONS

It is preferable that the defective CRT be returned in the replacement CRT carton. If the carton or packaging material is not available, pack the CRT according to the instructions below:

- 1. Carefully wrep the tube in Kinch thick cotton batting of other soft padding material
- 2. Wrap the above in heavy kraft paper.
- 3. Pack wrapped tube in a rigid container which is at least 4 inches larger than the tube in each dimension.
- 4. Surround the tube with at least 4 inches of packed excelsion or similar shock absorbing material; be sure the packing is tight all around the tube.

CRT Department/

Thank you, 🥠



CATHODE-RAY TUBE FAILURE REPORT

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HP MANUAL CHANGES

Make all corrections in your interval eccording to errets. Check the following table for your instrument serial prefix and make indicated changes in the manual:

3702B MANUAL TITLE: MANUAL PRINTED: November, 1971 MANUAL PART NO: 03702-95010 CHANGE DATE: 5th August, 1974

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SERIAL PREFIX	MAKE CHANGE	SERIAL PREFIX	AAKE CHANGE	SERIAL PREFIX	MAKE CHANGE
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•	Manual	Changes	4	΄ ι ·	Mode1	: 3702B	n ye ev Alan ye eve	Pag	je 1Å	
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ERRATA	
Page 4-3	Table 4-1 Add:7124-2339 1 LABEL (to Accessory Kit material list).
Page 4-4	Table 4-1, Page 5-47, Figure A1-4, Page 5-83, Figure A12-3 Change: F3 2110-0094 FUSE 1.25A to F3 2110-0043 FUSE 1.5A
•	* FA 2110-0094 FUSE 1.25A to FA 2110-0043 FUSE 1.5A
	KI 0490-0893 RLY CHANGEOVER 2P to K1 0490-1061 RLY CHANGEOVER 3P
	Delete: L1 5060-0408 COIL TRACE ALION Change: Part No of MP4 03702-350 STRIP VACING SIDEFRAME to 03702-364
•	Delete: NP7 1490-0030 STAND TILT
Page 4-5	Table 4-1
Ŭ	Delete: MPIO 03702-10013 BRACKET STAND OFF
	Change: Part No Of MP 15 03702-346 BOX SCREENING to 03702-365
Page 4-6	
,	Delete: MP16 00180-01218 BRACKET (2 BFF) Change Part No of R1 5040-0418 COVER INSULATING POTENTIONETER to 5040-0421
• ,	Delete: 5040-0418 R2 COVER INSULATING POTENTIONETER
Page 4-7	Table 4-1
	Change: Part No of R6 0370-1005 KNOB SPECTRUM CENTRE-to 0370-2191
•	Part No of R14 2100-0156 R; VAR 10K OHM to 2100-3193
	Table 4-1, Page 5-53, Figure A2-6 Change: R15 0698-3136 R: FXD 17.8K OHM to R15 0757-0123 R: FXD 34.8K OHM
.•	Table 4-1
	Add: W4 03702-7304 1 ASSY TROUBLESHOOTING HARNESS
· · · ·	O3702-366 1 CAPTIVE SPACER 03702-10026 1 ASSY.TERMINAL BRACKET
(
rage-4-9	Table 4-1 Add: W170 03702-7305 1 ASSY COAK CBL VIO/BLK
1	Change: Part No of W925 03702-769 ASSY COAX CAL RED/GRN 03702-7306

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Manual Changes

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ASSEMBLY A1

Page 4-10 Table 4-1, Page 5-47, Figure A1-4

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Change: "AIRI 0698-0088 R: FXD 215 OHM 17 W to AIRI 0698-3401 R: FXD 215 OHM 17 W Delete: AICI2 0160-0174 C FXD 0.47UF 107 25WVDC A1CI1 1902-3311 DIO BKDN 38.3V A1CR12 1884-0073 DIO SCR.

A1R27 0757-0280 R FKD 1K OHM 17 W

ASSEMBLY A2

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rage 4-10 Table 4	-1, Page 5-53, Figure A2-6
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	A2E4 RESISTOR
Delete:	A2R27 0757-0398 R: FXD 75 OHH
Change:	A2R30.0757-0274 R FXD 1.21K OHM to A2R30 0757-0280 R FXD 1K OHM 17 W
	A2R34 0757-0280 R: PXD 1K OHM to A2R34 0757-0438 R: PXD 5.11K OHM 12 W
	A2R65 0757-0440 R: FXD 7.5K OHM to A2R65 0757-0430 R: FXD 5.11K OHM 12 W
	A2R82 0757-0444 R; FXD 12.1K OHM to A2R82 0698-3455 R: FXD 261K OHM
	A2R83 0757-0416 R: FXD 511 OHM to A2R83 0698-3132 R: FXD 261 OHM
	A2R66 0757-0449 R: PXD 20K OHM to A2R66 0757-0442 R: FXD 10K OHM 17 W
是一些"是是的"。他们是	A2R67 0757-0465 PL PVD LOOP OTHER ADDITION OF ALL AND TOK OHM 17 W
Add:	A2R67 0757-0465 R: FXD 100K OHN to A2R67 0757-0442 R: FXD 10K OHM 17 1W
Change:	A2R96 0698-3455 R. FXD 261K OHM 12 W between Q3 base and Q2 emitter
	Position of R82 from Q15 base to between Q4 emitter and MC2 pin 3
Deleter	A2R60 0757-0439 R: FXD 6.81K OHM to A2R60 0757-0200 R FXD 5.62K OHM 17 W
	A2R68 0757-0467 R YXD 121K OHM 12 W
Cliange:	A2R74 0698-0085 R FXD 2.61K OHM 17 W
	A2R89 0757-0123 R FXD 34.8K OHM to A2R89 0757-0440 R FXD 7.5K OHH 1% W
Add	200444240472/2V47224 2X4022120X3UHM3CO/A2R9D3075740173 72 FYD 37 87 000 17 Lu
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	440340180-0100000 FAD 600F 107 6 NVDC to A2C31 0180-1960 C PVD 13000 1 50000
	A2C42 0180-0229 C FID 22UF 15WVDC to A2C42 0180-1940 C FRD 33UF 15WVDC
SEMELY A3	
	L. Page 5-59 Figure A3-5
Addie	Cable Assembly 03702-750
Delete:	
Change:	A3C4 0180-0098 C: 1770 1000F 207 20WVDC
	A3C8 0160-2222 C: FID 1500PF to A3C8 0160-2221 C: FXD 1300PF 5% 300WVDC
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Change:	1222-2022-2022-2022-2022-2022-2022-2022
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	A3CR5 1902-3070 DIO BRDN 4.22V to A3CR5 1902-3048 DIO BRDN 3.48V
计复数分离子 网络小麦瓜 法财政 化分子子原料	

AJUR6 1902-3070 DIO BKDN 4 22V to AJCR6 1902-3048 DIO BKDN 3.48V

A3Q4 1853-0015 XSTR SI NPN to A3Q4 1853-0036 XSTR SI NPN A2Q7 1853-0015 XSTR SI NPN to A3Q7 1853-0036 XSTR SI NPN

A3014 1854-0015 XSTR SI NPN to A3014 1853-0036 XSTR SI NPN

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anual Changes	Model 3702B
SSEMBLY A3 (cont'	
Change:	A3R4 0757-0280 R: FXD 1K OHM to A3R4 0698-3132 R: FXD 2.61 OHM 17 4
-	A3R17 0757-0280 R: FXD 1K OHM to A3R17 0698-3132 R: FXD 2.61 OHM 17 30
	A3R47 0757-0446 R: FXD 15K OHM to A3R47 0757-0465 R: FXD 100K OHM
	A3R64 0757-0446 R: FXD 15K OHM to A3R64 0757-0465 R: FXD 100K OHM
•	A3C1 0160-0939 C FXD 430PF to A3C1 0410-0210 C FXD 270PF
	A305 0160-0939 C FXD 430PF to A3C1 0410-0210 C FXD 270PF
Add:	A3C26 0180-0195 C FXD 0.33UF 10% 35WVDC
SSEMBLY A	
	1, Page 5-63, Figure A4-4
Change:	
	A4C4 0150-0093 C: FXD 0.01UF to A4C4 0160-2146 C: FXD 0.02UF
N	A4C14 0160-3367 C: FXD 0.68UF to A4C14 0160-0627 C: FXD LUF
	A4C15 0160-3367 C: FXD 0.68UF to A4C15 0160-0627 C; FXD 1UF
	A4R8 0698-3162 R: FXD 46.4K OHM to A4R8 0698-0084 R: FXD 2.15K CHM
, 1	A4R9 0698-0084 R; FXD 2.15K OHM to A4R9/0698-3162 R; FXD 46.4K OHM
Delete:	
Change:	A4R61 0698- R: FID 2.15K OHM CO A4R61 0757-0422 R; FID 909 OHM
•	A4R64 0757-0395 R: FXD 56.2 OHM to A4R64 0757-0316 R: FXD 42/2 OHM
	A4R67 0757-0438 R: FXD 5.11K OHM to A4R67 0698-0085 R: FXD 2.61K OHM
SSEMBLY A5	
	1, Page 5-67, Pigure A5-4
Change:	이 것 같은 것 같은 것 같은 것 같은 것 같은 것 같은 것은 것 같은 것 같 ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ?
	A5C9 0150-0096 C: FXD 0.05UF to A5C9 0160-2672 C: FXD 0.047UF 5% 80NVDC
	A5C11 0150-0096 C: FXD 0,05UF to A5C11 0160-2672 C: FXD 0,047 UF 5% 80WV
Delete:	A5C12 0180-0155 C: FXD 2.2UF 207 20WVDC
Change; `	A5C19 0150-0050 C: FXD 1000PF to A5C19 0160-2145 C: FXD 0.005UF
-	A5MC1 1820-0217 IC OF AMP to A5MC1 1820-0203 IC OP AMP
•	A5R1 2100-2521 R: VAR 2R OHH to A5R1 2100-2522 R: VAR 10K OHH
	A5R2 0698-5490 R: FXD 2K OHM to A5R2 0757-0438 R: FXD 5.11K OHM
• •	A5R4 0757-0438 R: FXD 5.11K OHM to A5R4 0757-0280 R: FXD 1K OHM
	A5R11 0757-0398 R; FXD 75 OHM to A5R11 0757-0420 R; FXD 750 OHM
· · · · ·	A5R18 0757-0398 R: FXD 75 OHM to A5R18 0757-0420 R: FXD 750 OHM
Delete:	A5R36 0757-0289 13.3K OHM 17 W
Change:	A5R38 0757-0457 R: FXD 33.2K OHM to A5R38 0757-0469 R: FXD 150K OHM
Ň	A5R39 0757-0452 R: FXD 27.4K OHM to A5R39 0757-0123 R: FXD 34.8K OHM
s 🕐 👘 💡	A5R41 0698-3155 R: FXD 4.64K OHM to A5R41 0757-0416 R: FXD 511 OHM
•	A5R53 0698-3154 R: FXD 4.22K OHM to A5R53 0698-0084 R: FXD 2.15K OHM
Change:	A5R63 68.k OHM to 68.1K OHM
Add: 👘	A5R73 0698-3155 R: FXD 4:64K OHM 1% W in place of A5C12
• •	Alter: A5R61 should go to NOT to -15V

A6C4 0160-2054 C: FXD 0.015UF to A6C4 0160-3907 C: FXD 0.02UF A6C8 0160-2054 C: FXD 0.015UF to A6C8 0160-3907 C: FXD 0.02UF Change: Change the positions of C4 and C8 as shown on page 7, Figure 1

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Hodel 3702B

Page 4

ASSEMBLY A10 Page 4-22 Tabl

	D-/9, Figure ALO-3		· · · · · · · · · · · · · · · · · · ·
hanga: AlOR4 O	0757-0442 R: FXD 10K 0	HM to A10R4 0757-0447 R:	FXD 16.2K OHM
Alors O	0757-0280 R: FXD 1K 0	HH to ALORS 0698-3152 R:	PYD 9 697 OD4
A107 0	1609-3360 B. PWD 4649		FAD 0.40K UNH
1111 N 18 1 N 19 1 19 1 19 1 19 1 19 1 1	1030-3200 A: PAU 404K	OHM to A10R7 0757-0465 R	: FXD TOOK OHM 17. W
A1001 0)160-0174 C: FXD 0.47U	F 25V to A10C1 0160-0128	C: FXD 2.2UF 25V
Atori 0)757-0123 R: FXD 34.8K	OHM to ALOR1 0757-0283	R. FXD 2K OUM 17 ky
Alor2 O	1757-0123 R. PTD 34 8P	OWN to ALOP2 0757 0461	
		VILL LO RIVKZ U/J/-0401	KI FAD 08.1K UHM 1% WW
'Alor2 o	1757-0123 R: FID 34.8K	OHM to Alor2 0757-0461	R: FXD 68.1K OHM 17 w

ASSEMBLY ALL

Fage 4-22 Table 4-1, Page 5-81, Figure All-3

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ASSEMBLY A12

Page / 5-83 Figure A12-3

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Change: The following transformer designations from:

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ASSEMBLY A13

Page 4-23 Table

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7, Figure 2

ASSEMBLY A15

Page 2-24 Table 4-1, Page 5-89, Figure Al5-3

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Change	A15C3 0180-0097 CT FXD 47UF to A15C3 0180-0155 C: FXD 2.2UF
	A15C4 0180-0097 C: FXD 47UF to A15C4 0180-0155 C: FXD 2.2UF
	A15C9 0180-0155 C: PKD 2.20F (between +15V(A) and GRD)
	(Detween +15V(A) and (RD)
1997 (A. 1997)	A15010 0180-0155 C: FXD 2.2UF (Between -15V(A) and GRD)
a Delete	AI 5CR1 1902-3193 DIO BKDN 13:3V
R. M. S.	A15CR2 1902-3193 DIO BKDN 13.3V
Change	A1512 9100-1662 IND PED 2,4MH to A1412 03716-70042 IND FXE 2MH
Delete	A1513-9100-1662 IND PXD 2.4MH
	A15R5 0698-2322 R: FXD 28 7 OHM to A15R5 0698-3429 R:FXD 19.6 OHM 17 W
	A15R6 0698-4037 R: FXD 46.4 OHM to A15R6 0698-3432 R: FXD 26.1 OHM 17 W
	AT 509 0757 0900 B 000 TY 000 14 000 000 3452 K: FAD 20.1 UHM 14 8W
	A15R8 0757-0280 R: FXD 1K OHM to A15R8 0757-0274 R: FXD 1.21K OHM 1% W
	A15R9 0757-0280 R: FXD 1K OHM to A15R9 0757-0274 R: FXD 1.21K OHM 17 W

Manual C	hanges	Model 3702B	Page 5	
ASSEMBLY	A21 -			
		1, Page 5-95, Figure A21-3		end Massachter
	Change	A21C9 0160-0174 C: FXD 0.47UF to A21C9 0150-0096 C: FXD 0.	OSUF	
		A21C13 0180-1735 C: FXD 0.22UF to A21C13 0150-0096 C: FXD	0,05UF	
	•	A21C14 0150-0121 C: FXD 0, 1UF to A21C14 0150-0093 C: FXD C		
	,	A21C15 0180-1743 C: FXD 0, 1UF to A21C15 0150-0093 C: FXD C	,01UF	
		A21C17 0160-0174 C: TXD 0.470F to A21C17 0150-0096 C: FXD		
		A21C21 0160-0174 C: FXD 0.47UF to A21C21 0150-0096 C: FXD	0.0507	
	Add:	A21C30 0160-3136 C; FXD 3.3FF between Q4 base and Q5 emitt A21CR8 1902-3082 DIO BKDN 4,64V to A21CR8 1902-3182 DIO BB		
	Change:	A21CR9 1902-3082 DIO BKDN 4,64V to A21CR9 1902-3182 DIO B		
		A21R17 0757-0278 R: FXD 1.78K OHM to A21R17 0698-0084 R: 1		
	•	A21841 0757-0418 R: FXD 619 OHM to A21841 0698-5490 R: FXL		
		A2101 0170-0071 C: FXD 0.33UF 20% 50WVDC to A2101 0160-373		307
			5% SON	VDC
••	, i	ALC2 0170-0071 CI FXD 0.33UF 20% 50WVDC to A21C1 0160-373	15 C: 7XD 0.3	SUP AND SUP
	•			
		A21C14 0150-0093 C: FXD 0.01UF to A21C14 0180-1735 C: FXD	0.2207	
ASSEMBLY				
Page 4-2		L, Page 5-97, Vigure A22-3		
t	Change:	A22R18 0698-3430 R: VXD 21.5 OHM to A22R18 0757-0418 R: VX		
4		A22R38 0757-0399 R: WXD 82.5 OHM to A22R38 0757-0282 R: WX		
		A22C5 0180-0229 C: FXD 33UF 10V to A22C5 0180-1940 C: FXD		
	•	A22CR4 1902-0025 DIO BKDN 10Y to A22CR4 1902-1264 DIO BKDN A22R34 0758-0715 R: FXD 150 OHM 1% W to A22R34 0757-0801		n an
ASSEMBLY				
Page 4-30	O TADIE 4-1	, Page 5-101, Figure A23-3		
	Change:	A23C14 0160-2202 C: TXD 25PT to A23C14 0160-2264 C: TXD 20 A23C15 0160-2202 C: TXD 75PT 57 300WVDC		
		A23C22 0180-0291 C: FXD 1UE to A23C22 0160-0627 C: FXD 1UF	107 1000000	
		A23C37 0160-0174 C1 700 0.47UF		
		A2315 03702-7300 IND VAR to A2315 03702-7311 IND VAR	Start and the proof of	
		A23L7 03702-7300 IND VAR to A23L7 03702-7311 IND VAR		
·		A23L9 9100-2249 IND FXD 0.15UF to A23L9 9100-2247 IND FXD	0.1UH	
	Add:	A23L10 9100-2247 IND FXD 0,10H		
	Change:	A23Q6 1854-0092 XSTR SI NPN to A23Q6 1854-0071 XSTR SI NPN		
	Add:	A23Q7 1854-0092 XSTR SI NPN to A23Q7 1854-0071 XSTR SI NPN A23Q8 1854-0071 XSTR SI NPN	来的考虑你是	
	and the second sec	A23C41 0160-0665 C; FXD 5.6FF 57 30WVDC		
	Change:	A23CR1 1901-0347 DIO 81 to A23CR1 1901-0518 DIO 81		
***	-	A23CR2 1901-0347 DIO SI to A23CR2 1901-0518 DIO 81		
		A23R7 0698-3152 R: VXD 3.48K OHM to A23R7 0757-0739 R: VXD		
		A23R8 0757-0442 R: FXD 10K OHM to A23R8 0757-0449 R: FXD 2	OK OHM	
	Add:	Q8 and C37 as bown on page 7, Figure 3		
•	•			en av er stadske De stadste stadste
	14 A		1997 N. 1997 N. 1998	
			学科主要法常职制	
		Change A23R9 0757-0427 R: FXD 1,5K OHM to A23R9 2100-2497	R: VAR 2K OHD	107 - 11
	Add:	A23R51 0757-0401 R: FXD 100 0HM 1C W		和消化
	Delete:	A23C38 0150-0050 C: FXD 1000PF 480 -20% A23R34 0698-3444 R: FXD 316 OHM 17 W		
	Add:	A23C40 0160-0174 C: FXD 047UF (between junction of R33 and	C22 and DTL	設設的
		A23C39 0160-2264 C: FXD 20PF		
		A23L11 9100-2247 IND FXD 0.1UH		
		A23L12 9100-2247 IND FXD 0.1UH		A Star
				CT Sail

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Manual Changes

Model 3702B

Assembly A23 (Cont'd) Change: A23Q1 1854-0019 XSTR SI NPN to A23Q1 1854-0427 XSTR SI NPN A23R12 0757-0441 R: FXD 8.25K 0HM to A23R12 0757-0280 R FXD 1K 0HM 1% W A23C5 0150-0050 C: FXD 1000FF to A23C5 0160-2218 C: FXD 1000FF 5% 300WVDC

ASSEMBLY A24

Page 4-	32 .Table 4-	L, Page 5-105, Figure A24-4
	Change:	A24C15 0150-0093 C: FXD 0.01UF to A24C15 0160-0174 C: FXD 0.47UF
		A24C24 0160-2200 C: FXD 43PR to A24C24 0160-2150 C: FXD 33PF
		A24C43 0180-0155 Ct FXD 2.2UF to A24C43 0160-2145 Ct FXD 5000FF
	Delete:	A24C46 0160-0660 C: FXD 36PF 57 30WVDC
	Add:	A24C48 0160-3138 C: FXD 18PF 57 30WVDC
an a		A24CRA 1901-0040 DIO 81
	Change:	에서 이번 것이 가지 않는 것이 있었다. 이번 것에서 이번 것이 있는 것이 없는 것이 없다. 것이 있는 것이 있는 것이 없는 것 같은 것이 없는 것이 없
	Add:	A24CR8 1902-3203 DIO BKDN 14.7V 5% 400mW
	Change:	A24R8 0757-0200 R: FXD 5,62K OHM to A24R8 0698-0085 R: FXD 2.61K OHM 17 W
		A24R9 0698-0085 R: FXD 2.61K OHN to A24R9 0757-0317 R: FXD 1.33K OHM 17 W
		A24R16 0698-0082 R: FXD 464 OHM to A24R16 0698-3260 R: FXD 464K OHM 17 W
的目的意思。		A24R32 0698-5615 R; FXD 562 OHM to A24R32 0757-0159 R; FXD 1K OHM
	は、語る、書語の語言で	A24R33 0757-0200 R1 FXD 5, 62K OHM to A24@33 0698-3430 R; FXD 21.5 OHM
1.67		A24R2 0757-0280 R: FKD 1K OHM to A24R34 0757-0401 R: FKD 100 OHM 1% W
	使用和人们的人	A24R61 0757-0280 R; FXD 1K OHM to A24R61 0757-0421 R; FXD 825 OHM
	Add:	A24R76 0698-3160 R: FXD'31.6K OHN 17 W
re state of a set of A set of a set		A24R77 0698-3136 R: WD 17.8K OHN 17 W
	Change:	A2484 0757-0280 R: FXD 1K OHM to A2484 0757-0317 1.33K OHM 17 W
	这个专家的问题。	

Detector circultry as shown on page 8, Figure 4.

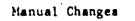
Change: A24R15 0757-0449 R: FXD 20K OHM to A24R15 0757-0123 R: FXD 34.8K OHM 17 W A24R18 0698-3132 R: FXD 261 OHM to A24R18 0757-0417 R: FXD 562 OHM 17 W A24R55 0757-0346 R: FXD 10 OHM to A24R55 0757-0401 R: FXD 100 OHM 17 W A24R66 0757-0280 R: FXD 1K OHM to A24R66 0757-0447 R: FXD 16.2K OHM 17 W A24R66 0757-0317 R: FXD 1 33K OHM to A24R66 0757-0447 R: FXD 3.16K OHM 17 W A24R68 0698-0084 R: FXD 1.33K OHM to A24R68 0757-0438 R: FXD 3.16K OHM 17 W A24R68 0698-0084 R: FXD 2.15K OHM to A24R68 0757-0438 R: FXD 5.11K OHM 17 W A24R68 0698-0084 R: FXD 2.15K OHM to A24R68 0757-0438 R: FXD 5.11K OHM 17 W A24R68 0698-0084 R: FXD 2.15K OHM to A24R68 0757-0438 R: FXD 5.11K OHM 17 W A24R68 0698-0084 R: FXD 2.15K OHM to A24R68 0757-0438 R: FXD 5.11K OHM 17 W A24R68 0698-0084 R: FXD 2.15K OHM to A24R68 0757-0438 R: FXD 5.11K OHM 17 W A24R68 0698-0084 R: FXD 2.15K OHM to A24R68 0757-0438 R: FXD 5.11K OHM 17 W A24R68 0698-0084 R: FXD 2.15K OHM to A24R68 0757-0438 R: FXD 5.11K OHM 17 W A24R68 0698-0084 R: FXD 2.15K OHM to A24R68 0757-0438 R: FXD 5.11K OHM 17 W A24R68 0698-0084 R: FXD 2.15K OHM to A24R68 0757-0438 R: FXD 5.11K OHM 17 W

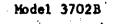
ASSEMBLY A25 Page 4-35 Tal

5 Table 4-1	L, Page 5-109, Figure A25-3	
Add: Add:	A25C29 0150-0050 C: FXD 1000PF	600WVDC
Chance	A25L1 03702-7298 IND VAR to A2	111 03769-326 NID VAD
Service Barrier	a de la companya de s	ML OJIOZ-IZO INO VAK
· · · · · · · · · · · · · · · · · · ·	Position of C29 from second min	ter to (between, J3) and deck.

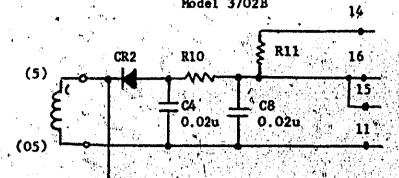
ASSEMBLY A26

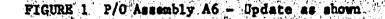
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\mathbf{P}	art	4-37:	Table	4-1	226 5-11	1. Figure A26-3	
. (S.)	5. C	6. 13. 35.	Coange		1013 0757	-0420 R: FXD 750 OHM to A26R3 0757-0731 R: FXD 825 OHM 17 W	
1 12 1	ाल्य						
1.1.1	: • · ·	1. S. S. S. S.	(1, 2, 2)	ala da 🕰	(OKA (U/)/	-0280 R: FXD 1K OHM to A26R4 0757-0407 R: FXD 200 OHM	
S	A 4 4 16	18 N S	1	18 St. 31.	1000 0000	-0428 XTAL 87.4HH	
۳Þ.	-	A X1	T-11-	<i>К. Е.</i> т	ANT COC	Figure 3-2, Page 5-29, Figure G3-4, Page 5-89, Figure A15-3	
1 👘	-8 <u>-</u>			1977 H & A. 4	EXECT-TO	WEAR STERE STAR STAR STAR STAR STAR STAR STAR STAR	
			Chanos	ំ ំ ហៅ	57 02702	-7249 ASSY COAX CEL GRN/VIO to W169 03702-7303 ASSY COAX CBL BLU/WHT	• .
		101 er	C 19 30 A	े हिंद	om A1512	to Plug-in (8) for OPTION 004 ONLY	
5 C			1.144				
		· · · ·	Add: 🔅		29 03702	-7302 ASSY COAX CBL RED/WHT for OPTION 004 ONLY	
· · ·	1.1						
1.1		• ,		a series de la compañía de		- 网络海洋海道加州东北部城市 化动物器 医口口 有品质等的 人名	











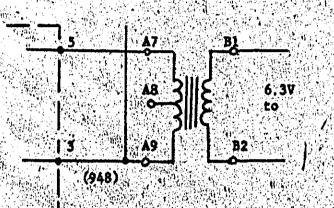


FIGURE +2 P/O Assembly A12 Update as shown

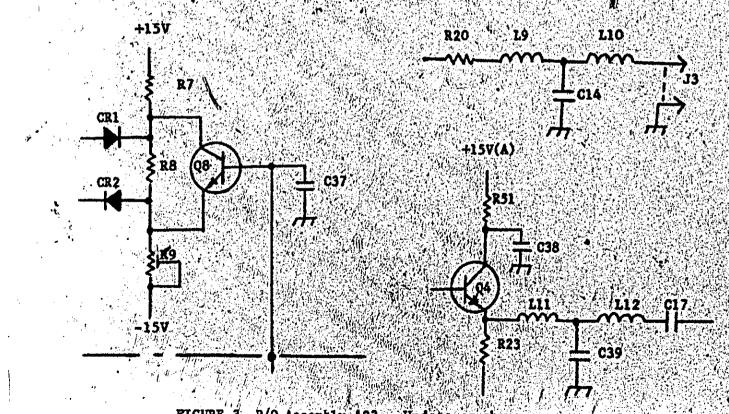


FIGURE 3 P/O Assembly A23 - Upda shown

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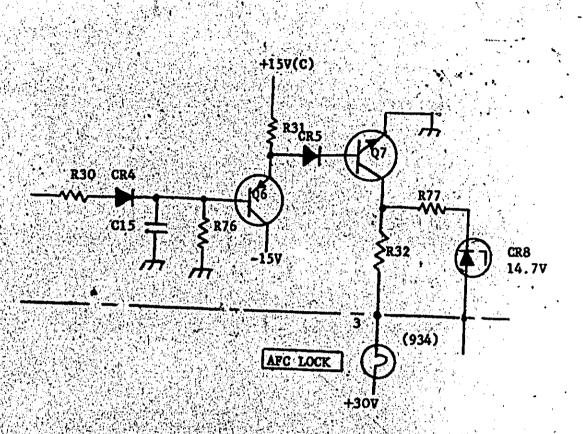


FIGURE 4 - P/O Assembly A24 - Update as shown

Manual (hanges	<i>}.,</i>	Mael 37828	Page 9
Page 4-1	•			
	Add:	A2MC12 IC OF	Amp	
Page 4-1		· · · · · · · · · · · · · · · · · · ·		
۱.	Change;	A2C3, 4, to' PE	IN 0160-3910 C: FXD 0.1uF 57 300	
Page 4-1	.1 .			
	Change:	A2C40 to Par	Part No 0180-1940 C: FXD Elec t No 0180-0106 C: FXD Elec 60ul t No 1902-3203 Diode Zener 14.	6VDCW
Page 4-1	•	40090 to Dee		
	Change:		t No 0757-0488 Ri FXD 909K ohm Part No' 0698-3449 R: FXD 28,7K	
			Part No 0757-0280 R: FXD 1K ohs	
	•	A2R38,76 to	Part No 0757-0442 R: FXD 10K of	17. W
-		A2R52 to Par	t No 0757-0460 R: FXD 61.9K ofth	117. 新生產(19.11)。主要主要
Page 4-1				
	Delete:	A2R88		
+	Change:		t No 0698-3152 R; FXD 3.48K ohn t No 0757-0280 R: FXD 1K ohn 17	
*			t No 0757-0488 R: FXD 909K ohm	
<u> </u>	A2-4,Á2-5, Delete:	이번 가슴 옷 같이 가지 않는 것이 있는 것이 같이 했다.	ace with wire link	
CHANGE 1	· · ·			
Table 4-1 Delete:	R15			
	A23R11			
Change:		0160-3138 C:.		
A -			FXD 7.5K OHM 17 W	
Figure A2		2100-2030 K;	VAR 20K OHH 10% W	
		11 with wire 1	iok.	
Figure A2	4-4			
Change:	C39 to 15			
	R65 to 7.	SK OHM K OHM Variable		
	AU7 LO 20	N VILL VALIAULE	CELECC	
CHANGE 2 Table 4-2	• •			
Change:		0757-0465 R:	FXD 100K OHM 3	
		2100-3218		
CHANGE 3	Pere 4-2	0, Teble 4-1		
Change:		0160-0907, C:FX	D 0.01uF	
'Add:		0-3958 C:TXD 0		
· •	-	, Figure A6-3		
	Make chan	ges as below		
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ŧ	y 2.4	CRI	0 19-14 C9	
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R5

3)RT

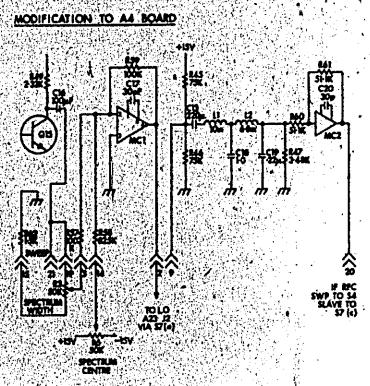
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PIN 9 PIN 5

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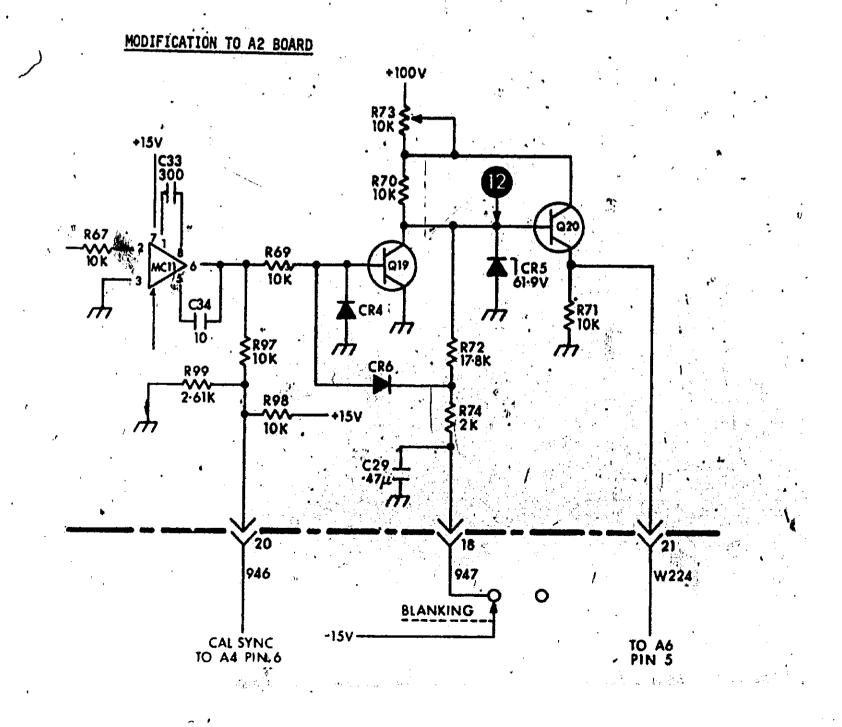
Manual Changes

Change 3	(cont'd)
	Page 4-15, Table 4-1
Change:	A2R46 to 0698-3457 R:FXD 316K
	Page 5-59, Figure A3-5
Change:	R46 to 316K
ار العواد المحقوق عوم المراجع المراجع المرور المعاد المحقوق المحقوق المحقوق	Page 4-26, Table 4-1
Change:	A21C25 to Part No 0150-0121 C:FXD 0.1uF
	Page 5-95 Figure A21-3
Change:	C25 to 0.1
	Page 4-14, 17, 18, Table 4-1
Change:	A4CR3 to Part No 1902-1264
	A4CR4 to Part No 1902-0626
	A4CR5, 6, 7 to Part No 1902-1263
	A4C16 to C:ELEC Part No 0180-0098 100uP
	A4C17 to Part No. 0160-2199 C:FXD 30pF
sing of the second s Second second	A4R45,46 to Part No 0757-0462 R;FXD 75K
	A4R47 to 0698-3152 R:FXD 3.48K
	A4R57,59 to Part No 0757-0465 R:FED 100K
	A4R58 to Part No 0757-0487 R:FXD 825K
	A4R60 61 to 0757-0658 R:FXD 51 1K
	A4R62 to Part No 0757-0427 R:FKD 1.5K
Delete:	A4R63, 64, 65, 66, 67, 68
· · · · · · · · · · · · · · · · · · ·	A4Q17,18,19,20
Add:	A4C18 Part No 0160-0127 C: FXD 1uF
	A4CI9 Part No 0160-3740 C:FXD 0.22uF
	A4C20 Part No 0160-2199 C:FXD 30pF
1. 网络普鲁尔	A4L1 Part No 9140-0131 I:FXD 10mH
	A4L2 Part No 9100-1637 I; FXD 6.8mH
	A4MC1, 2 Part No 1820-0477 LINEAR IC
	Page 5-63, Figure 44-4
	Hodify as follows



Page 4+6, Table 4-1 Change: R3 to Part No 2100-3298 R:VAR 50K LIN - 50K LIN CHANGE 4

	Table 4-1	, î	• •	Ń
Change	: A25L1 to part no	03701-731 In	d Var	•
	A25C5,6 to part i	no 0150-0091	C. Exd 1:5nE +*	25nF SOOVDWC
Delete	; NYDRIQ TO DART NO	0 15537A Hvhr	id a nort RNC	
Change	: A2 to part no 03	702-7321 Assy	Horiz Deflecti	ົາຄ.
	ALKOY, /U TO part	no 0757-0442	R. Fxd 10k 1%	1/84
	A2R/2 to part no	0698-3136 R	Fxd 17.8K Ohm	1 1/RN
-	A2R/3 to part no	2100-2522 R.	Var 10k Ohm 109	2 1W
Delete :	A2C47 to part no	0150-0096 C.	Ext 0.050E 100	
Add :	A2R/4 to part no	0698-5490 R.	Fxd 2K Ohm 1% 1	ANN +
	A2R99 to part no	0698-0085 R.	Fxd 2.61K 0hm 1	X 1/8W
	A2C29 to part no	0160-0174 C.	Exd 0.47uf -204	SOX 25WVDC
	A2R97,98 to part	no/0757-0442	R. Fxd 10K Ohm	1% 1/8W
		L 3		···· · · · · · · · · · · · · · · · · ·



-	Manual	·Changes		Model :	3702B	• . • •	•	Page	.12
	•				·· ·		۷.	-	
• . ,	CHANGE		Table 4-4				\sim ,	•	
•	· .	Add 1	A23 part no (3702-70002	IF Mixer	and Local Os	cillator	۸	
			(in place of Table 4-1	03/02-/1/0	9				
1 ×.		Ćhange		ó part no	1902-3066	Di Bkdn & O2	7 52	•	
• • •		Add :	CR1 part no 1	.901-0040 D	i Si 📩	•	•	۰.	
•		Change	• • •	t no 0698-	0082 R. Fx	d 464 Ohm 1%	1/8W	1	
	- ''	Chence	A6Q1,2 to par						
	.	Change	: A3Q3/8 to part A4R16 to part	no 0757-0	0081 XBET 989 p p-4	12 3K (Channe)	1/00		۰ ۰
		•	A4R15 to part	no 0698-3	444 R. Frad	316 Ohm 17	1/8W		
	•		A4R17 to part	no 0757-0	394 R Fxd	51.1 Ohm 17	1/8W	۰,	
۹.	CUANOR	۰.		•	•		. <u>.</u>	A .	
κ.	CHANGE	, ppv	Table 4-1 A27 part no	03702-7000	16 12120 0.4.		1.	,	
			C30 part no	0170-2019		nulus Oscilla JuF 200V 5%	tor ,		
		•	•	0180-0089		10uF 150V			
	· •	N _1	-	2.0	•	. `			
		Delete	: A6C9 part no A6C2 part no			1uF 250V 107			
			NOCZ PERC NO	0100-0174	U. FXC .	47uP -20+807	25¥		
• •		∆dd :	A6C11 part no	0160-0907	C. Fxd	01uF 5KV	•		
				t i	· · ·				
	•	<u>S.M.L.</u>	for 03702-70004	-	* u			•	
		A27C1,2	C. Fxd 0.22uF	57 100V	0160-3740	• •			
		A27C3	C. Fxd 0.068uF	5% 100V .	0160-3741)	•.
	1.4	A27C4	C. Fxd 0.1uF 5	160V	0160-3910	1			
		A27CR1,2	dio Si Xstr. Si PNP		1901-0050				
			R. Fxd 1K 17 1/	- 'RU	1853-0036 0757-0280				
	•		R. Fxd 10K 17 1		0757-0442				
•		A27R5	R. Fxd 100 Ohm	17 1/8W	0757-0401				
		1	P.C. Board Blar	ik se se s	03702-300	04			
	•		 ↓ ↓ 	·	••••••				
	•	CIRCUIT	DIAGRAM FOR 0370	2-70004	i.	4			
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	Manual	Changes	" Model 3702B	Page 13
	1	."		
	CHANCE		Table 4-1	
)		Change	: A5R46 to part no 0757-0278 R. Fxd 1.78K Ohm 17 1/8W	
		b b A	: A25030. part no 0160-0662 C. Fxd 51pF 5% 30V	
	•	Change	Fit C10 Across R22 : A5R14 to part po 0757-0280 R. Fxd 1K 0hm 1% 1/8W	
	· X			r, t
	ÇHANGE	8	Table 4-1	
		Change .	: A5R66/67 to part no 0698-3434 R. Fxd 34:8 0hm 1% 1/8W	
	• •	Change	: A4C14/15 to part no 0160-0627 C. Fxd 1.0uF 10%	
	•	Change	A22R46 to part, no 0698-3441 R. Fxd 215 0hm 1% 1/8W A22C20 to part no 0150-0093 C. Fxd 014F 100VWDC	
	•			
			Table 4-4	
		Change	A8R19 to part no 0698-4382 R. Fxd 53.2 0hm 1% 1/8W	
	•		Table 4-1	
		Delete	A4R62 part no 0757-0427 R. Fxd 1.5K 0hm 14W 1%	
		Add	R21 part no 0757-0427 R Fxd 1.5K 0hm 1% 1/8W	
		$\sim 10^{-10}$	(R21 filled between XA3 pin 2) and pin 13)	8 B. 1 A
		OL all and	(R3 wire routed to XA3 pin 21)	
	⁷ 1,	Change	: A2R70 to part no 0757-0839 R. Fxd 10K 0hm 1% 1/2W	
	CHANGE	9 '	Table 4-4	
			: A8C1/2/3/4 to part no.0160-3740 C. Fxd 0.22µF.	
			Ref. Change 6	
		Change	A27CR1/2 to part no 1901-0025 D1 S1	
	CHANGE	10	Table 4-1	
	-1-		A6C10 part no 0160-3958 C., Fxd'0.1uF 250V	
•			(fitted between pin 5 and ground)	7
		Change	A6 to part no 03702-70006 Assy High Voltage Power Supp	ly in the second
•		ruevde 🖗	"under Bl" to part no 03710-10050 Fan Filter Assy.	
	CHANGE		Reference Change, 5 on Change Sheet (03702-70002)	
•	· . •	Change :	A23L3, 10 part no. 03702-7328 Coll RF	ી કુટ્ટી અને આવ્યું છે. તે મુખ્ય છે. આ ગામ છે
•	<i>,</i> *		A23L4,5,6, to part no 03702-7329 Coil RF	
		X.	A23L8 to part no 03702-7338 Coll RF	
	· A	•	A23L9 to part no 03702-7331 Coll Rf A23520,24 to part no 0160-2211 C. Fxd 510pF 5%	
			A23C21,22,23 to part no 0160-2206 C Fid 160pF 51	
			A23C21,22,23 to part no 0760-2206 C_Fxd 160pF 5% . A23C27,28 to part no 0160-2204 C. Fxd 100pf 5%	n o ann an Seanna an Seanna Seann an Seanna an Seanna a n Seanna Seanna an Seanna an Seanna
		•	- FF 13 part no U3/U2-19U to part no U3/U2-10046 Ltd Scre	ening Casting
	• ,	•	A24 to part no 03702-70003 Assy Disoriminator	
	•			Wern werd Street at

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Manual Changes

Add

CHANGE 12

Mode 1 : 3702B

A4 part	no 03702-70001 IF	Calibrator Assembly
	03702-30001	PC Board
A4 C1 A4 C2 A4 C3 A4 C3 A4 C4 A4 C5 A4 C5	0160 -0127	C FXD 1uF
A4 62	0160 +0127 0180 -0098	C FXD 1uF C FXD 100uF
A4 C4	0160 -2199	C 5XD 30pF
A4 C5 A4 C6	0180 -0159 0160 -0127	C FXD 220uF C FXD 1uF
A4 C7	0160 - 3740	C FXD 0.22UF
A4 C8	0160 -2199	C FXD 30pF
A4 C10	0160 -3740 0160 -2199 0180 -0155 0160 -2199	C FXD 2.2uF
253 P F M S D I I P P	0160 - 3958 10 - 0159	C FXD Q TUF
A4 CT3	0160 -3958	C FXD 220uF C FXD 0.1uF
A4 C14	0160 -3958 0180 -0155 0180 -1746	C FXD 0.1uF C FXD 2.2uF
2. 107 (10.10)	VIOU (= 1/4D - 1/20)	C FXD 150F C FXD 150F
A4 C17	0180 -0155	C FXD 2.2uF
A4 CR1	1902 -0025 1901 -0025 1902	DIO BKON TOV
A4 CR3	1902 +3094	DIU 5110 Store 5.11v
A4 CR4	1902 43172	D10' BKDN, 11v
A4 L1	9140 -013T	IND FXD 10mH
A4 L2	9100, -1673	IND FXD 6.8mH
A4 MC1	1820 -0477	I.C. LM 901
A4 MC2	1820 -0477	I.C. « LM , 301
a A4 ML4 a	1820 -0054 (1820 -0304)	1.C. SN7400 1.C. SN7472
A4 MC5	1820 -0477	I.C. LM 301
A4 MPT	4040 -0752	Extractor yellow
A4 P2	4040 -0752	Extractor yellow
A4 Q1	1854 -0071	XSTR ST NPN 2N3391
A4 02 A4 03	1854 -0071 1854 -0071	* XSTR S1 NPN 2N3391
A4 Q4	1854 -0071	XSTR SJ NPN 2N3391 XSTR ST NPN 2N3391
A4 Q5	1854 -0071	XSTR S1 NPN 2N3391
- 14 . Q6	1854 -0071	XSTR ST NPN 2N3391
A4 R1 A4 R2	0698 -3150	R FXD 2.37K OHM
A4 R3	0698 -3150 7 · 0757 -0417	R FXD 2,37K OHM R FXD 562 OHM
A4 R4 A4 R5	0757 -0274	R FXD 1.21K OHM
A4 R6	0698 -3150 0698 -3150	R FXD 2.37K OHM
A4 R7	0757 -0274	R FXD 1.21K OHM
A4 R8 A4 R9	0698 -3151 0757 +0465	R FXD 2.87K OHM R FXD 100 K OHM

Table 4-1

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) 	(ar di Natio	•			
	ې ۲۹ م د ۲۹ م	ند (ب الرقام				
FXD	61	9K (0K (OHM	grade Nationals		
FXD	75)HM			

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: A4 R12	0757 -0452	R FXD 75K	NUM COMPANY
A4. RT3			
A4 R14	0/07 0402	R FXD 75K	
	0698 - 3152	R FXD 3.48K	UNIFS的行动的
A4 R15	10/5/7-0458	R FXD 51.1K R FXD 51.1K	DHM and the second
A4 R16	10757 +0458	R FXD 51.1K	OHM
A4/R17	0757 -0288	N R FXD 9.09K	DHM ALC: MALE
25. A4' R18 🛞 🦿	UCYO MD4YU	396.K学自关13。 新潮波范之长	OHM
A4 R19	0698 -3155	R FXD 4.64K	
A4 R20	0698 -3155 0757 -0280	R FXD	
A4 R21	0698 - 3443	R FXD 287	
A4 R22	0608 -5400	D EVN 2V	
A4 R23	0030 -0430	R FXD 2K	
A DZANA	0070 0004	R FXD 2.15K	和時間是以此。主
A4 R24	/ CC10- OKON/	R FXD 4.64K	HM 2
A4 R25	2100 -2044	R VAR 500K)HM (A Grades
A4 R26	0757 -0438	R FXD 5.11K)HM (All All All All All All All All All Al
A4 R27	0757 -0458	· R FXD 51.1K	14月6日,夏二月日
A4 R28	0757 -0424	R FXD 1.1K ()HM The APP The s
A4 R29	N 0759 +0420	R FXD 2750 (2)	HM OMENE VOC
A4 R30	0698 -3156	R FXD 14.7K)HM SESSION (See
A4 R3T	0757 -0469	R FXD 150)HM & CARAGE
A4 R32	0757 -0420	R FYD 750	HM
A4 R33	0757 -0469 0757 -0420 0757 -0278	P FYN 1 78K	HM 1% 1/8w
A4 R34	0698 - 3443	R FXD 287	
A4 R35	10757-0420 R.	Ful 7500 14 1	
A4 R36	0600 -2156		
AA DOT	0767 0460	R FXD /14.7K	
A4 R37	A CADY TO CONTRACT	R FXD 150	4. 称为东京的论
A4 R38	U/D/ 004U3	R-FXD 100 0	
A4 R39	0698 -4307		
A4 R40	0757-0398	R FXD 75. C	用。這個新聞中華
A4 R41	0698 +3155	R FXD 4.64K0	
A4 R42			とりし さくぶく ちくね こうしい
A4 R43	0757 -0180	R FXD 31.6 0	
A4 R44	0698 +3402	R FXD 316 0	HM系流的短点
A4 R45	0757 -0401	R FXD 100 0	的基本是行为
A4 R46	0757 -0180	R FXD(31.6 0	
A4 R47	0757 -0460	R FXD 61.9K0	可能经常的
A4 853	12100 -2574	R VAR 500 0	
的复数多数学习的影响	把人们在50%。而15%。		化的复数形式

0757 -0484 0757 -0465

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CHANGE 13

Table 4-1

Changer	El to part no 37 connector mains socket 4
Delete :	voltage 5060-9410 MP9 Panel rear lower 03702-172
	MP8 Panel rear upper 03702-174
Add	MP8 Panel rear 03702-10040-
	Table 4-2
Change :	MP9 to part no /03702-10042
Change :	Table 4-3 MP9 to part no 03702-10043
	Alor7 to part no 0757-0449 R.Exd. 20Ko

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Manua] Chan	iges	Model 3702B	Page	16
CHANGE 14		Table 4-1		*
	Delete :	A1 C2 part no 0160-0174 C Fxd 0.47uf		
		Al R3 part no 0757-0280 R Fxd lkohm 12 1/8	ntingi Norjetia,	
		A1 CR2 part no 1902-0664 Di Si Bkdn 12v	internationale State de la composition Notationale	
		A1 CR3 part no 1884-0012 D1 Sch.		
	Change	A2R72 to part no 0698-3161 R.Fxd. 38.3Kn 1	6 3W	
		A24R49 to part no 0757-0338 R.Fxd 1Ko 1% 1 A4R37 to part no 0757-0461 R.Fxd 68.1Kn 1%	10	
		A4R47 to part no 0757-0199 R.Fxd. 21.5Kg 1	(3พ.	
CHANGE 15		Table 4-1		· •
	Change :	A4R40 to, part no 0757-0398 R.Fxd 750 1% IN	•(•
	ne station in the second s Second second br>Second second	A2R73 to part no 2100-2489 R.Var 5Ko 102 0.	5W	
CHANGE 16		Table 4-1	•	
	Change :		ł₩	
		A4R32 to part no 0698-3446 R.Fxd 3830 1% 14 A4R33 to part no 0757-0430 R.Fxd 2.21K0 1%	i. IN	a.
	Add	Table 4-4		· •
	Aud	A8C16 C.Fxd 75pF 5% part no 0160-3143	, t	
CHANGE 17		Table 4.1	•	
	Change	A2R47 R.Fxd 6810 to R.Fxd 3320 1% 0.5W part	no e	757-0809
		A10 R5 R.Fxd. 8.48K to R.Fxd 2.67K 1% Part No). 069) 8-3492 [,]
CHANGE 18		Table 4-1	•	
	Change :	A24R8 R.Fxd 6190 17 0.125W to R.Fxd 6190 19 0757-0158	4 0.5k	Part No

	Å23	03702-70002	IF	MIXER	AND	LOCAL	OSCILLATOR
	<u>743</u>		15	птуру			USUILLAIUR
A23R1	•	0757-0442,	•	R	FXD F	LM LOK	17 W
A23R2		0757-0446	1 1			LM 15K	
A23R3	• .	0757-0446	. .			LH 15K	
A23R4		0698-4477					ik 17 w
A23R5		0757-0439					K 17 W
A23R6		2100-2591	•				107 JW
A23R7		0757-0739				L'I 2K 1	
A23R8	, · · ·	0757-0449				LH 20K	
A23R9 A23R10		2100-2497				ER 2K 1	
A23R11	•	0757 0280				LM 10K LM 1K 1	
A23R12	י- ר ר	0698-6250				LM 2.5K	
A23R13	×	07.37-0442				LM IOK	
A23R14	e	0757-0419					OHM 17 W
A23R15 /		0698-4579	. (OHM 17 W
A23817	•	0757-0401					OHM 17 W
A23R17		0757-0398			· · · · · · · · · · · · · · · · · · ·	• • • • • • • • • • • • • • • • • • •	EM . 17 W
A23R18		0698-3430	e dig Y. Star				OHM 17 W
A23R19	.•	0698-3444					OHM 17 W
A23R20	-	0757-0401					OHM 17 W
A23R21		0757-0398					HM 17 W
A23R22	• • 2	0698-3430					OHM 17 W
A23R23		0698-3444					OHH 17 49
A23R24 .	· •	0757-0401					OHM 17 W
A23R25		0698-3204	1999 - 1999 -				OHM 17 W
A23R26	•	0698-7660	- E				OHM 17 W
A23R28		0698-3430 0757-0403	· .				OHM 17 5W
A23R29		0757-0346					OHM 17. W HM 17. W
A23R30	1	0698-4037	1999 - 1999 1999 - 1999				OHM 17 W
A23R31		0757-0346	• .				EM 17 W
A23R32		0698-3446					OHM 1% W
A23R33		0757-0180					OHM 17 W
A23R34	•	0757-0180	ैंट				OHM 17 W
A23R35		0757-0397	ંગ્યુ				OHM 17 W
A23R36 (~		0757-0180					OHM 17 W
A23R37		0757-0397					'OHM 17 W
A23R38		0757-0180					OHM 17 W
A23R39	· · · ·	0757-0398	State 1				EM 17 W
A23R40	in the	0757-0427				M 1.5K	
.A23R41 A23R42		2100-1984	Salari S				0HM 107 4W
A23R42		0757-0346 0757-0279					EM 17 W
A23R44		0757-0401					к 17/ ум они 17 ум
A23R45		0757-0427	19 %		PYD PI	M 1.5K	
A23R46		0698-0084					C 17 W
A23R47		0757-0280				M 1K 1	
A28R48		0757-0346					IM 17 W
A23R49		0757-0398-					IM 17 5W
Å 23R50		0698-3430	•				OHM 17 W
A23R51		0698-3430					OHM 17. W
A23R52		0698-3430		R	FXD FI	M 21.5	OHM 17. W
							2 - 1 - 1 - 1

فتنت فيشوا أتركونها وبتوهد واله

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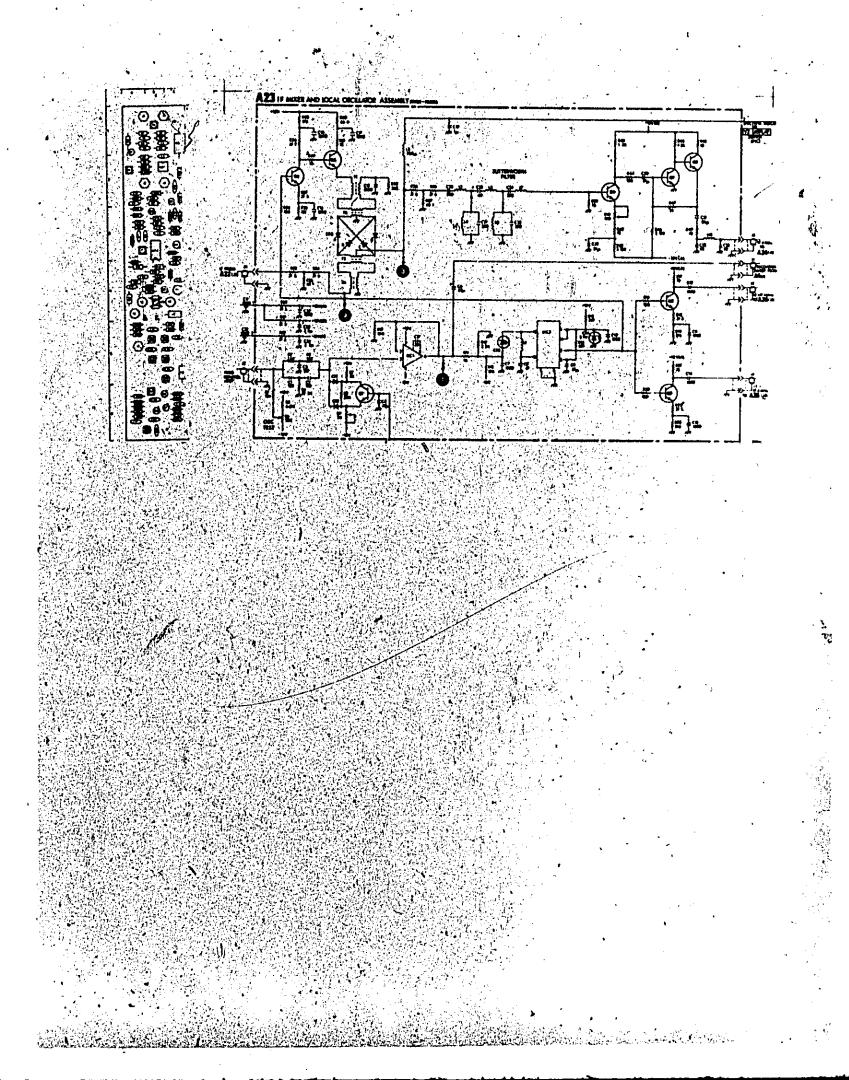
	A23 03702-70002 IF	MIXER AND LOCAL OSCILLATOR
A23C1	0140-0195	C FXD MICA 130 PF 5% 300VDC
A23C2	0140-0195	C FXD MICA 130 PF 5% 300VDC
A23C3	0140-0197	C FXD MICA 180 PF 57 SOOVDC
A23C4	0160-0174	C FXD CER .47 UF 25VDCW
A23C5	0160-2199	C FID MICA 30 PF 300VDCW
A2306	0180-0097	C FXD TA 47 UF 35VDCW
A23C7 A23C8	0150-0050	C FRD CER 1000 PF 1KVDCW
A23C9	0150-0093 0150-0093	C FXD CER 101 UF 100VDCW C FXD CER 101 JF 100VDCW
A23C10	0150-0050	C FXD CER 1000 PR 1KVDCW
A23C11	0150-0050	C FXD CER 1000 PF. 1KVDCW
A23C12	0150-0050	C. FXD CER 1000 PF 1KVDCW
A23C13	0150-0050	C FXD CER 1000 PF 1KVDCW
A23C14	0150-0050	C FED CER 1000 PF 1KVDCW
A23C15 A23C16	0150-0050	C FXD, CER 1000 PF 1KVDCW
A23C17	0150-0050	C FXD CER 1000 PF 1KVDCW C FXD CER 1000 PF 1KVDCW
A23C18	0150-0050	C FXD CER 1000 PF 1KVDCW
A23C19	0160-0627	C FXD POLY CARB 1 UF
A23C20	0160-0134	C FXD HICA 220 PF 300VDCW
A23C21	0140-0198	C FXD MICA 200 PF 300VDCW
A23C22	0140-0192	C FXD MICA 68 PF 300VDCW
A23C23	0140-0198	C FXD HICA 200 PF 300VDCW
A23C24 A23C29	0160-0134 0150-0093	C FXD MICA 220 PF 300VDCW
A23C30	0150-0093	C FXD CBR .01 UF 100VDCK
A23C31	AT 20 000	C FXD CER .01 UF 100VDCW C FXD CER .01 UF 100VDCW
A23C32	0140-0193	C FXD CER 82 PF 30VDCW
A23C33	0140-0193	C FXD CER 82 PF 30VDCW
A23C34	0150-0050	C FXD CER 1000 PF 1KVDCW
7 A23C35	0180-0155	C FXD DTA 2.2 UP 20VDCW
A23C36	0180-0155	C FXD, DTA 2.2 UF 20VDCW
A23CR1 A23CR2	1901-0518 1901-0518	DIO HOT CARRIER
A23CR3	0122-0602	⁴ DIO HOT CARRIER CVVAR
A23CR4	1902-0041	DIO BKDOWN 5.11V
A23CR5	1901-0545	QUAD SIL HOT CARR
A23L1	03702-739	COIL RF
A23L2	9140-0144	COIL MLD CHOKE 4.7 UH 107
A23L3 A23L4	03702-7182	COIL: RF
A23L5	03702-7300	COIL RF COIL RF
A23L6	-03702-7300	COIL RF
A23L7	03702-7182	COIL RP
A23L8	03702-7182	COIL RP
A23JI	1250-0932	CONN RF 75 OHMS
A23J2 (1250-0932	CONN RF 75 OHMS
A23J3	1250-0932	CONN RF 75 OHMS
A23J4 A23J5	1250-0932 1250-0932 (CONNERF 75 OHMS
A23J6	1250-0932	CONN RF 75 OHMS CONN RF 75 OHMS

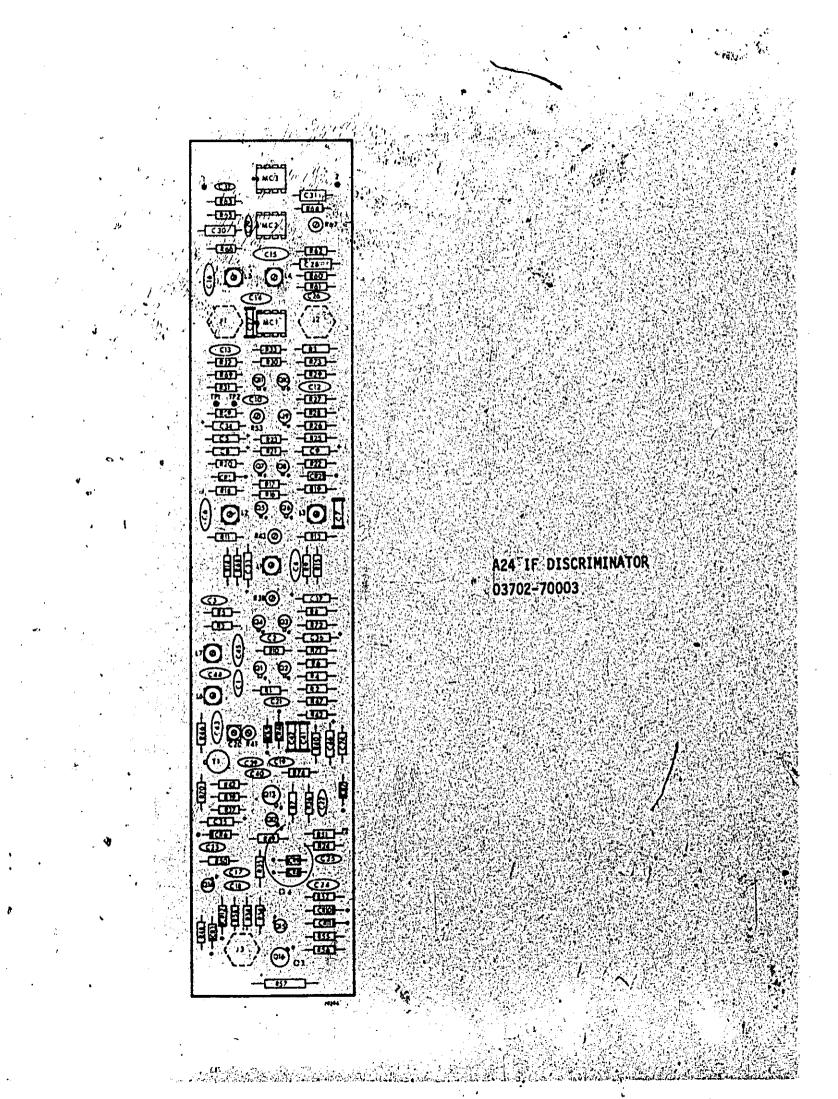
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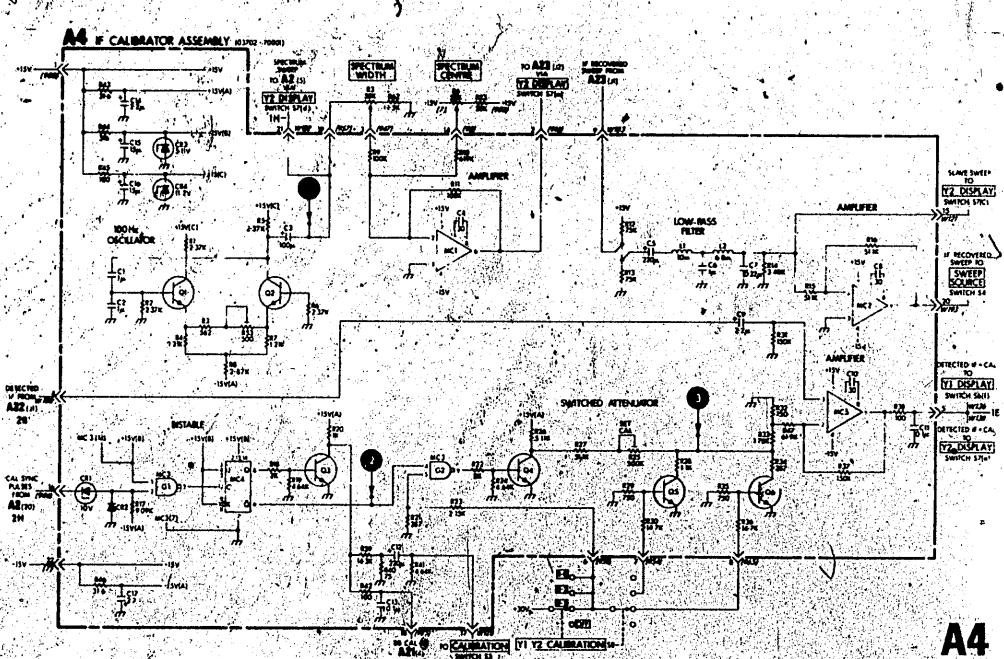
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•	A23 03702-70002	IF MIXER AND LOCAL OSCILLATOR
A23Q1	1854-0071	XSTR NPN SI
A23Q2	1854-0073	XSTR NPN SI
A2 3Q3	1854-0073	XSTR NPN SI
A23Q4	1854-0233	XSTR NPN SI
A23Q5	1854-0233	XSTR NPN SI
A23Q6	1854-0073	XSTR NPN SI
A23Q7	1854-0073	XSTR NPN SI
A2 3Q8	1854-0073	XSTR NPN SI
A23MC1	1820-0477	OP AND
A2 3MC2		MOTOROLA MC 1648
A23T1	03710-70023	
A23T2	03710-70024	
A23T3	03710-70024	
A23T4 ,	03710-70023	
		· 1997年,王治帝王帝,王帝帝,王帝帝帝,王帝帝,王帝帝,王帝帝,王帝帝帝帝,王帝帝帝帝,王帝帝帝帝,王帝帝帝,王帝帝帝,王帝帝帝,王帝帝,王帝帝,王帝帝,王

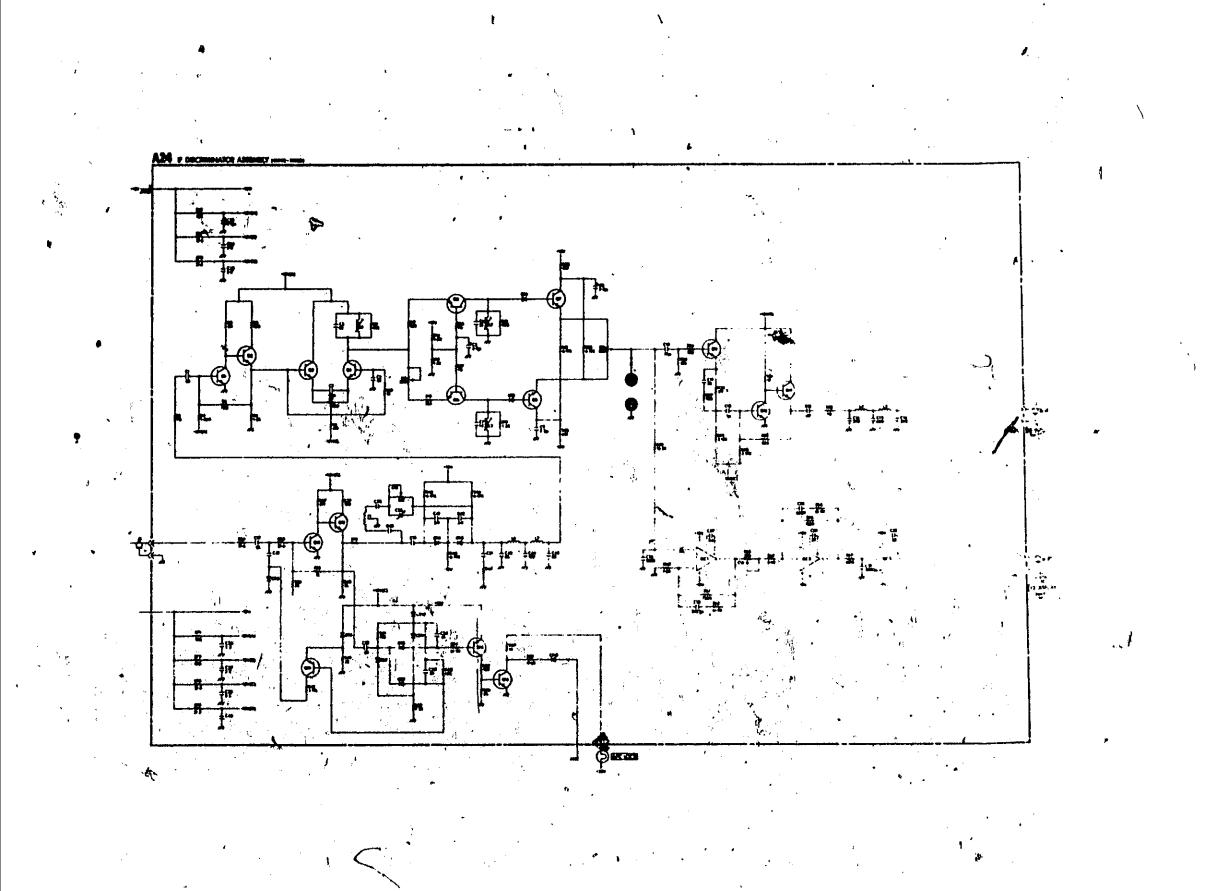


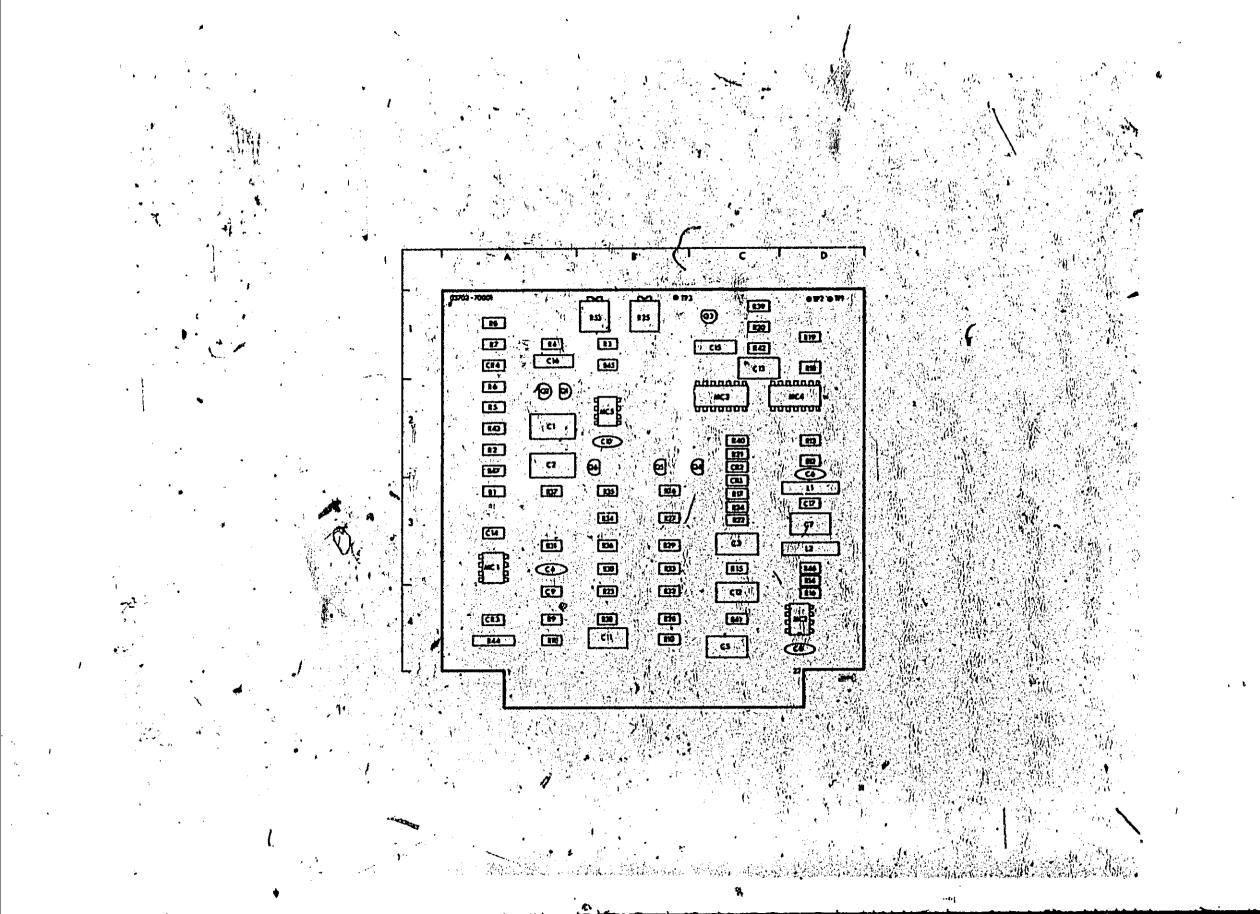




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Supercedes : None

HP MODEL 3702B IF/BB RECEIVER Serial Nos below 1136U00124

REMOVAL OF CROSSTALK BETWEEN Y1 AND Y2 TRACES

Trouble may be experienced with crosstalk between the Y1 and Y2 displays when either is positioned well off the screen.

> To eliminate the problem replace the following parts : A3Q3 with Hp Part' No 1855-0081 A3Q8 with Hp Part No 1855-0081 A3CR3 with Hp Part No 1902-3066 A3CR4 with Hp Part No 1902-3066 A3CR5 with Hp Part No 1902-3066 A3CR6 with Hp Part No 1902-3066

/ Update your Service Manual to indicate this change.

KHcD/mm/W.A

1/73 - 14



Europe 7 rue du Bois-du Lan, 1217 Meyrin 2, Switzerland: Cable: "HEWPACKSA" Tel. (022): 41-54-00 United States: 333 Logue Avenue, Mountain View, California 94040. Tel. (415): 968-9200

3702B-2 PRODUCTION 1 MEMO ٢ hp Service Facilities To: From: hp Limited, South Queensferry Subject: hp 3702B IF/BB Receiver UNDERRATED CAPACITOR IN A2 ASSEMBLY A2C12 Serial No:s below 1317U-00381 except 1251U-00373 1251U-00378 1251U-00379 On the above serial numbers A2C12 is underrated and should be replaced with 100µF 20V, hp Part Number 0180-0098. This change should be implemented whenever instruments become available. Update the service manual parts list to show this change. 7/73-14 KMcD/WA HEWLETT hp PACKARD

3702B-3

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	SERVIC/E	ΝΟΤ
·	Supercedes . Norse)	
	Supercedes : None `	, <i>,</i>
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	,	· ·
HP MODEL 3702B IF/BB RECE	1	1
	SIVER	
All Serial Nos	<i>*</i>	
	·	
PREFERED REPLACEMENT FOR A4, C	IR3, CR4, CR5, CR6, CR7.	
, .		
In Order to eliginate percebbe set		
In Order to eliminate possible nois prefered replacements for the following di		
· · · · · · · · · · · · · · · · · · ·	odes are :-	
A4CR3 HP Part No 1902-1264		ı
A4CR4 HP Part No 1902-0626		
A4CR5 HP Part No 1902-1263	/	
A4CR6 HP Part No 1902-1263	1	
A4CR7 HP Fart No 1902-1263		
Indate your Constant Manual as also	, , , , , , , , , , , , , , , , , , ,	
Update your Service Manual to show (chis change.	
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1 ×		
CMcD/mm	1/73	- 14
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·	HEWLETT hp F	

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Europe 7 rue du Bois-du-Lan, 1217 Meyrin 2, Switzerland Cable "HEWPACKSA" Tel. (022): 41:54:00 United States: 33 Logue Avenue, Mountain View, California 94040 Tel. (415): 968:9200

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Supercedes : None

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Quantity

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HP MODEL 3702B IF/BB RECEIVER

Serial Nos below 1242000251

IMPROVEMENT IN MARKER DISPLAY

The following modification improves the performance of the marker generator and allows A5R15 to be adjusted to provide narrower markers.

To implement this modification the following parts are required :

Description

<u>Hp Part No</u> 0122-0601 4

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0150-0091 0160-0644 0160-0662 0698-3441 0757-0280 03701-731 9170-0817 0360-0124

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Voltage Variable Capacitor Capacitor 1.5pF Capacitor 100pF Capacitor 51pF Resistor 215 Ohm Resistor 1K Inductor Variable Ferrite bead Pins

Instruments above serial number 12050-00211 are already partially modified on A25.



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MODIFICATION PROCEDURE

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1. Remove instrument top and bottom covera 2. Replace ASR14 with 1K hp Part No 0757-0280 3. Remove A25 P.C. board from casting 4. Remove and discard A25 Cl, C5, C6, L1, R22, CR1 5. Fit and solder pins to P.C. Board as indicated in Fig.1. Modify P.C. Board track as indicated in Fig.2. 6. 7. Replace A25 Cl, C5, C6, L1, R22, CR1, and fit new parts A25 R46 and C30 as follows : R22 215 Ohm HP Part no 0698-3441 C30 51pF HP Part no 0160-0662 C30 is connected in parallel with R22 with both parts aoldered to the pins fitted in (5). Fit a ferrite bead to each leg of C30. See Fig.1. CR1 HP Part no 0122-0601 Cl 100pF HP Part no 0160-0644 R46 1K HP Part no 0757-0280 The anode end of CR1 and one leg of C1 is soldered to pins fitted in (5). R46 is soldered to pins. See Fig.1. C5 1.5pF HP Part no 0150-0091 C6 1.5pF HP Part no 0150-0091 L1 HP Part no 03701-731 (Ensure correct location) 8. Replace A25 board in casting. 1 **CALIBRATION** 1. Set the 3710A controls : Sweep Width 50 MHz **f** | Sweep Int I.F. Frequency 70 MHz I.F. Attenuator 10dB Line ON Set the 3716A/3715A controls :

OFF

B.B. Frequency

Set ... / Cont ...

3702B-4

j.

Calibration

1. (Cont)

Set the 3702B controls :

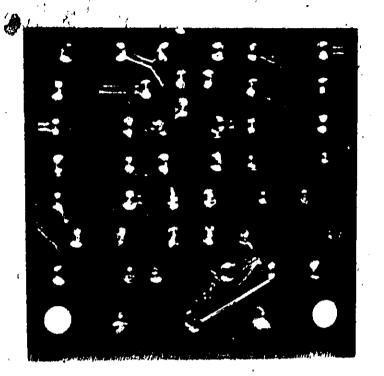
Yl Display	REF
Y2 Display	I.F.
Yl Gain	Counter Clockwise
Y2 Gain	Counter Clockwise
Yl Position	Mid-travel
Y2 Position	Mid-travel
Markers	Sliding
Marker Offset	10
Sweep Source	Int I.F.
Line	ON Tr

3 -

- 2. Connect the 3710A I.F. OUTPUT to the 3702B I.F. INPUT and adjust the 3702B IF ATTENUATOR for an on scale meter reading.
- 3. Set the BLANKING to OFF and adjust the X-PHASE SHIFT to superimpose the markers on the forward and return traces. It is possible rist only the centre marker will be displayed at this stage. Set the BLANKING to ON.
- 4. Set the MARKER OFFSET to 0 and adjust A25 L1 to superimpose al three markers in the centre. Use the MARKER ZERO as a fine control and adjust it so that the sliding markers move from the centre before the MARKER OFFSET control reaches 0.5 MHs.
- 5. Set the MARKERS switch to SLIDING & COMB and set the MARKER OFFSET to 20.
- Using the 2 MHz marker comb as standard adjust A5 R54 to superimpose the sliding markers on the 20 MHz comb marker.
- 7. Recheck marker sero as in (4) and reset MARKER ZERO if necessary and repeat (6)
- 8. ... Cont / ...

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- 8. Check the calibration of the MARKER OFFSET control against the 2 MHz comb markers for an accuracy of ±0.5 MHz up to 20 MHz and ±0.75 MHz 20 to 25 MHz. If necessary adjust A25 L1 slightly, reset MARKER ZERO and repeat 5 through 8 as necessary.
- Set the MARKERS switch to comb and adjust A5 R15 for the narrowest markers consistent with a solid marker display over the whole sweep and check for solid marker display with the MARKERS switch in COMB + SLIDING and SLIDING Readjust A5 R15 if necessary.
- 10. Update Service Manual to show this change.



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FIGURE 2.

- 1. Remove track from p.c. board at points A.
- 2. Fit wire link at point B.

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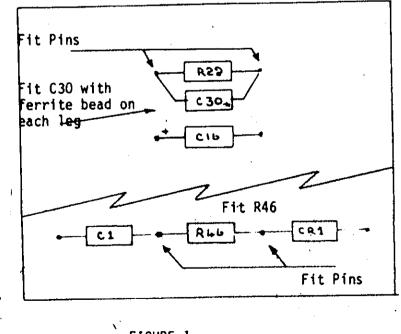


FIGURE 1.

Supercedes : None

HP MODEL 3702B I.F./BB RECEIVER

ALL SERIAL NOS

PREFERRED REPLACEMENT FOR A2C35

. In the event of a replacement being required for A2C35, replace with HP Part No 0150-0052.

This capacitor has a higher voltage rating allowing a greater margin of safety.

Update your service manual to show this change.

KH/mm/WO

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2/73 - 14

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37028-6

SERVICE NOTE

Supercedes : None

HP MODEL 3702B I.F./BB RECEIVER

All Serial Nos.

PREFERRED REPLACEMENT FOR R11

In the event of field replacement of R11 the MARKER OFFSET control, replace with HP Part No 2100-3347.

A new part number has been set up to distinguish between high and low torque potentiometers.

Update your Service Manual to show this change.

، KM/mm

2/73 - 14



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S	E	R	V	I	С	Ε	N	0	Τ	Ε
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Supercedes : None

HP MODEL 3702B I.F./BB RECEIVER

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All Serial Nos.

PREFERRED REPLACEMENT FOR I.F. ATTENUATOR

In the event of field replacement of the I.F. ATTENUATOR replace with : 3702B 0P 002 - 03702-7314 3702B 0P 003 - 03702-7317 3702B 0P 003 - 03702-7318 3702B 0P 004 - 03702-7319

In order to extend the I.F. INPUT range the attenuator steps have been changed to 1,2,4,8,16.

Update your service manual to show this change.

KM/mm

2/73 - 14



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Supercedes : None

HP MODEL 3702B 1.F./BB RECEIVER

| All Serial Nos.

PREFERRED REPLACEMENT OF A6 Q1 AND A6 Q2

In the event of field replacement of A6 Q1 or A6 Q2 replace with 1854-0590.

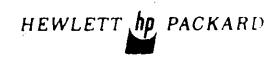
Difficulty has been experienced due to transistor parameter variation with manufacturer and the use of 1854-0590 eliminates the problem.

Update your Service Manual to show this change.

KM/mm

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2/73 - 14



Europe: 7 rue du Bois du Lan 1217 Meyrin 2 Switzerland: Cable: HEWPACKSA: Fei: 0.11.3.1.54.30 United States: 3.53 Logue Avenue: Mountain View California 94040; Fei: (415): (683) 100

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Supercedes .: None

HP MODEL 3702B IF/BB RECEIVER Serial Nos below 1136000124

REMOVAL OF CROSSTALK BETWEEN YI AND Y2 TRACES

* Trouble may be experienced with crosstalk between the Y1 and T2 displays when either is positioned well off the screen.

> To eliminate the problem replace the following parts : A3Q3 with Hp Part No 1855-0081 A3Q8 with Hp Part No 1855-0061 A3CR3 with Hp Part No 1902-3066 A3CR4 with Hp Part No 1902-3066 A3CR5 with Hp Part No 1902-3066 A3CR5 with Hp Part No 1902-3066

Update your Service Manual to indicate this change

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1/73 - 14

HEWLETT hp PACKARD

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3702B-2

PRODUCTION MEMO

To: hp Service Facilities 🧤

From: hp Limited, South Queensferry

Subject: hp 3702B IF/BB Receiver

UNDERRATED CAPACITOR IN A2 ASSEMBLY A2C12 Serial No:s below 1317U-00381 except 1251U-00373 1251U-00378 1251U-00379

On the above serial numbers A2C12 is underrated and should be replaced with 100μ F 20V, hp Part Number 0180-0098.

This change should be implemented whenever instruments become available.

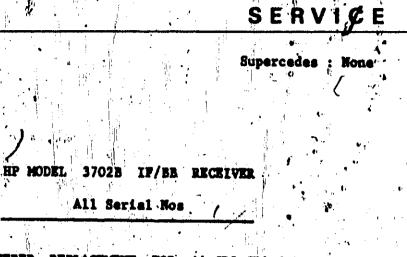
Update the service manual parts list to show this change.

ЌМcD/WA

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PREFERED REPLACEMENT FOR A4, CR3, CR4, CR5, CR6, CR7.

In Order to eliminate possible noise problems the prefered replacements for the following diodes are :-

1	4	a	3 1	HP ND	Par(i No	190 190	2-1	264	
1	7	CR	7. in 5	HP.	Pari	. No	190	2-U 2-1	263	
ļ	- 19 - 19		5	HP	Part	; Xo	190	2 - 1 .	263	ł
							190			ч 1

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Update your Service Manual to show this change.

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NOTE

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HEWLETT (hp) PACKARD

Supercedes : None

HP MODEL 3702B IF/BB RECEIVER Seriel Nos below 1242000251-

INPROVEMENT SIN MARKER DISPLAY

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The following modification improves the performance of the marker generator and allows ASR15 to be adjusted to provide narrower markers.

To implement this modification the following parts are required :

BEPPertiNoss bussietts Al IS Description and ISS and the Quantity Voltage Variable Capacitor 0122-0601 F100 - Capacitors 1. 5pF 0150-0091 0160-0644 Capacitor 100pF Capacitor 51pF 0160-0662 50-1 1 De 0698-3441 Margaret 181-SQResistor 215 Obs Resistor IK 0757-0280 03701-731 Inductor Variable 9170-0817 Ferrite bead 0360-0124 Pins

Instruments above serial number 12050-00211 are already partially modified on A25.

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医霍弗里氏试验 法资本

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MODIFICATION PROCEDURE

_		
1.	Remove instrument top and bottom covers	
2.	Replace A5R14 with 1K hp Part No 0757-0280	
3.	Remove A25 P.C. board from casting	,
4.	Remove and discard A25 C1, C5, C6, L1, R22, CR1	
5.	Fit and solder pins to P.C. Board as indicated in Fig.1.	
6.	Modify P.C. Board track as indicated in Fig.2.	
7.	Replace A25 C1, C5, C6, L1, R22, CR1, and fit new parts	
	A25 R46 and C30 as follows :	
	R22 215 Ohm HP Part no 0698-3441	
	C30 51pF , HP Part no 0160-0662	
• ·	C30 is connected in parallel with R22 with both parts	
	soldered to the pins fitted in (5). Fit a ferrite bead to	
	<pre># yet # 11 is strike met all get is to say that is the say is the set is the set of the set is /pre>	
	CR1 HP Part no 0122-0601	
	The rates Classes 100pF and HP Part no 0160-0644 the rest for a fill	
•	R46 1K HP Part no 0757-0280	
	The snode end of CR1 and one leg of C1 is soldered to pins fitted	
×	in (5). R46 is soldered to pins. See Fig.1.	
;	<pre>c c c c c c c c c c c c c c c c c c c</pre>	•
	C6 1.5pF HP Part no 0150-0091	
	L1 sut HP / Part no 303701-731 (Ensure correct location))
8.	Replace A25 board in casting.	•
	and the second	
CALI	BRATION	

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Set the 3710A scontrols as: CLARGERED and Darks and the set The TANKS 1114

Sweep Width 50 MHz Sweep Int . 70 MHz I.F. Frequency I.F. Attenuator 10dB Line ON 行法的财产科

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Set the 3716A/3715A controls :

٠. B.B. Frequency

Set ... / Cont ...

3702B-4

3702B-4

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5.

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7.

(Cont)	
Set the 3702B controls	• • • • • • • • • • • • • • • • • • •
Y1 Display	REF
Y2 Display	I.F.
Yl Gain	Counter Clockwise
Y2 Gain	Counter Clockwise
Y1 Position	Mid-travel
Y2 Position	Mid-travel
Markers	Sliding
Marker Offset	10 40 40 40
'Sweep Source '	Int I.F. /
Line	ON C

Connect the 3710A I.F. OUTPUT to the 3702B I.F. INPUT and adjust the 3702B IF ATTENUATOR for an on scale meter reading.

Set the BLANKING to OFF and adjust the X-PHASE SHIFT to superimpose the markers on the forward and return traces. It is possible that only the centre marker will be displayed at this stage. Set the BLANKING to ON:

Set the MARKER OFFSET to 0 and adjust A25-L1 to superimpose .all three markers in the centre. Use the MARKER ZERO as a fine control and adjust it so that the sliding markers move from the centre . before the MARKER OFFSET control reaches 0.5 MHs.

Set the MARKERS switch to SLIDING & COMB and set the MARKER OFFSET to 20.

Using the 2 HHz marker comb as standard adjust A5 R54 to superimpose the sliding markers on the 20. Mis comb marker.

Recheck marker sero as in (4) and reset MARKER ZERO if nece and repeat (6)

... Cont / ... 8.

Check the calibration of the MARKER OFFSET control against the 2 MHz comb markers for an accuracy of ± 0.5 MHz up to 20 MHz and ± 0.75 MHz 20 to 25 MHz. It necessary adjust A25 L1 slightly, reset MARKER ZERO and repeat 5 through 8 as necessary.

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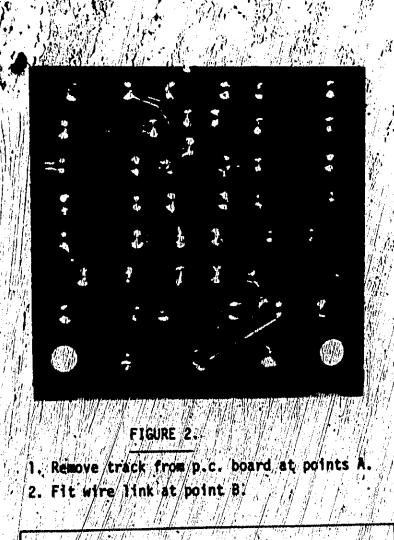
Set the MARKERS switch to comb and adjust AB R15 for the marrowest markers consistent with a solid marker display over the whole sweep and check for solid marker display with the MARKERS switch in COMB + SLIDING and SLIDING . Readjust A5 R15 if necessary.

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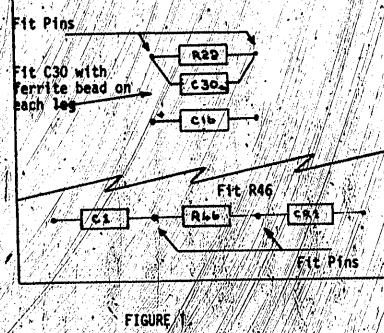
10. Update Service Manual to show this change.

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HEWLETT . hp PACKARD

Supercedes : None

HP MODEL 3702B I.F./BB RECEIVER

ALL SERIAL NOS

PREFERRED REPLACEMENT FOR A2C35

In the event of a replacement being required for A2C35, replace with HP Part No 0150-0052.

This capacitor has a higher voltage rating allowing greater margin of safety.

Update your service manual to show this change.

KM/mm/WO

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3702B-6

SERVICE NOTE

Supercedes : None

HP MODEL 3702B I.F./BB RECEIVER

All Serial Nos.

PREFERRED REPLACEMENT FOR R11

In the event of field replacement of R11 the MARKER OFFSET control, replace with HP Part No 2100-3347.

A new part number has been set up to distinguish between high and low torque potentiometers.

Update your Service Manual to show this change.

2/73 - 14

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#3702B-7

SERVICE NOTE

Supercedes : None

HP MODEL 3702B I.F./BB RECEIVER

All Serial Nos.

PREFERRED REPLACEMENT FOR I.F. ATTENUATOR

In the event of field replacement of the I.F. ATTENUATOR replace with : 3702B 03702-7314

37028 OP 002 - 03702-7317. 37028 OP 003 - 03702-7318 37028 OP 004 - 03702-7319

In order to extend the I.F. INPUT range the attenuator steps have been changed to 1,2,4,8,16.

Update your service manual to show this change.

KH/m



2/73

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Supercedes : None

HP MODEL 3702B I.F./BB RECEIVER

All Serial Nos.

PREFERRED REPLACEMENT OF A6 Q1 AND A6 Q2

In the event of field replacement of A6 Q1 or A6 Q2 replace with 1854-0590.

Difficulty has been experienced due to transistor parameter variation with manufacturer and the use of 1854-0590 eliminates the problem.

Update your Service Manual to show this change.

KM/m

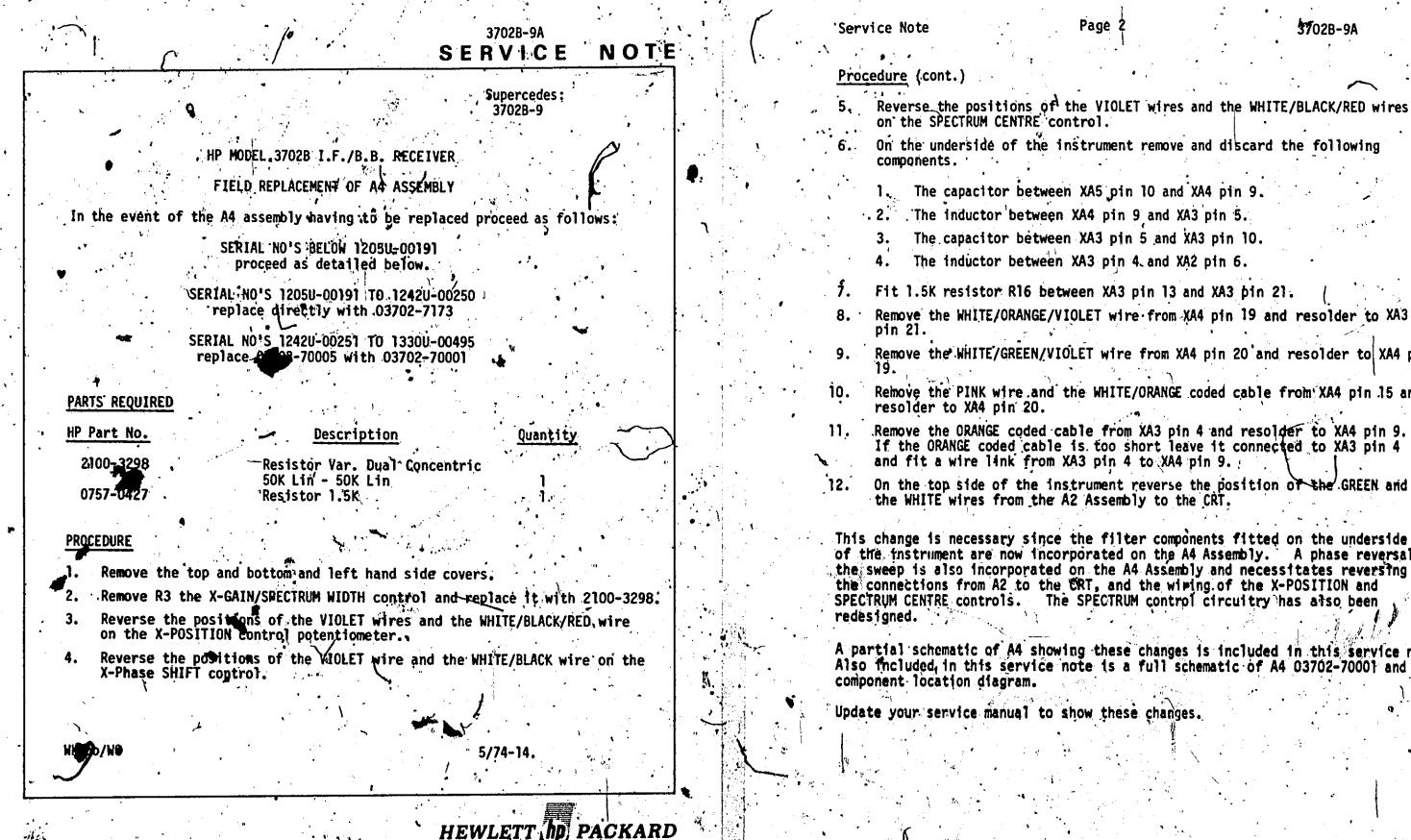
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2/73 - 14



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Page 2

3702B-9A

Reverse the positions of the VIOLET wires and the WHITE/BLACK/RED wires

On the underside of the instrument remove and discard the following

The capacitor between XA5 pin 10 and XA4 pin 9. . The inductor between XA4 pin 9 and XA3 pin 5.

The capacitor between XA3 pin 5 and XA3 pin 10.

The inductor between XA3 pin 4 and XA2 pin 6.

Fit 1.5K resistor R16 between XA3 pin 13 and XA3 pin 21: Remove the WHITE/ORANGE/VIOLET wire from XA4 pin 19 and resolder to XA3 Remove the WHITE/GREEN/VIOLET wire from XA4 pin 20 and resolder to XA4 pin

Remove the PINK wire and the WHITE/ORANGE coded cable from XA4 pin 15 and

Remove the ORANGE coded cable from XA3 pin 4 and resolder to XA4 pin 9. If the ORANGE coded cable is too short leave it connected to XA3 pin 4 and fit a wire link from XA3 pin 4 to XA4 pin 9.

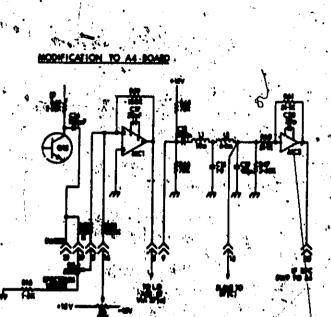
This change is necessary since the filter components fitted on the underside of the instrument are now incorporated on the A4 Assembly. A phase reversal of the sweep is also incorporated on the A4 Assembly and necessitates reversing " p the connections from A2 to the CRT, and the wiging of the X-POSITION and SPECTRUM CENTRE controls. The SPECTRUM control circuitry has also been

A partial schematic of A4 showing these changes is included in this service note. Also fincluded in this service note is a full schematic of A4 03702-70001 and a





3702B-9

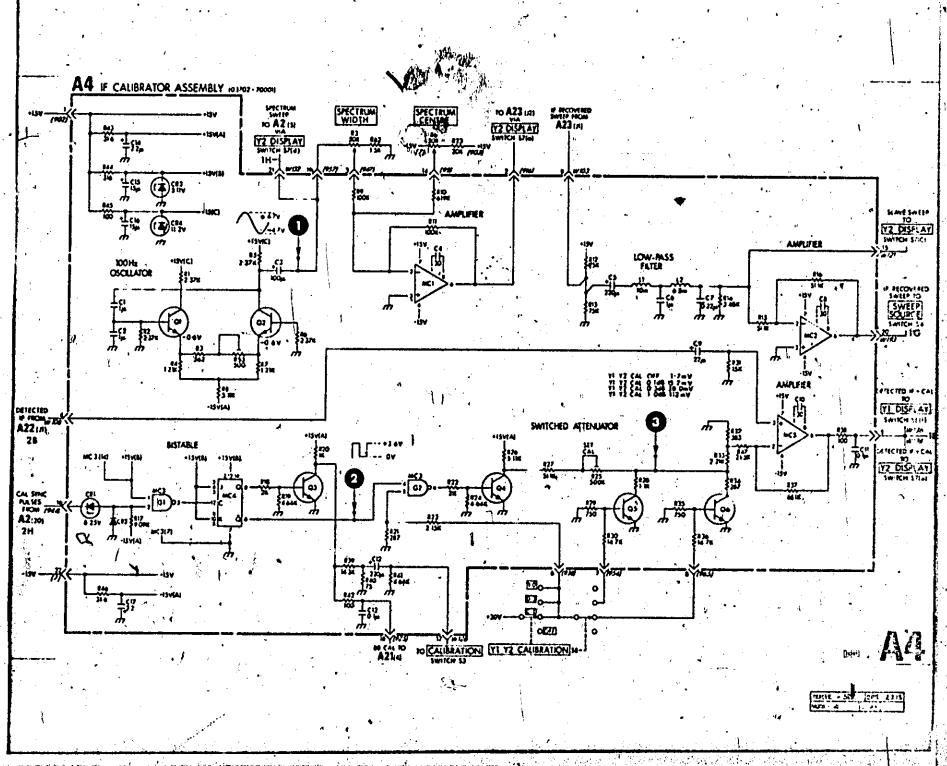


Ą C D . 172 711 © 03702-70001 ς. R53 ୭ -031----{170-- [1]?]---00---[142]--+ [10 C13 ممممممم aaaaaaa 6 •) MC3 อออออ์อออ MC4 0000000 173 **C** R25 -[110]---[11]-C1 -03---<u>@</u>____ C2 · -- (22)--<<u>C</u>ð 6 -[[]]-6 U -(1917)---00---@28)---(323)--000-+ ଔ -@22)---0127)-C7' *-<u>[[]</u>--(833)--(833)--(833)---[83]]---020-Ċ3 · L2 Sanci B -[223]--000-<u>–(10)</u>– --<u>[1]</u>---<u>[1]</u>--77 - (1))-C12 C9 -(27)-AKCZ -[110]---<u>(m)</u>--070--[20]-R44 -**D**-C11 Cş

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37028-10

SERVICE NOTE

Supercedes : None

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HP MODEL 37028 I.F./BB RECEIVER

Serial Nos below 12060-00191 FIELD REPLACEMENT OF A2 ASSEMBLY 03702-7165

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the start of a

In the event of field replacement of the A2 Assembly the position of the GREEN and WHITE wires of the flying leads from the board to the CRT must be reversed.

This is necessary to maintain correct display, See Service Note 3702B-9

KH/mm

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Supercedes : None

HÞ	MODEL	3702B	I.F./88	RECEIVER

Serial Nos below 12050-00191

REDUCTION OF X-POSITION OFFSET WHEN CHANGING X-GAIN

The amount of X-position offset when adjusting the X-GAIM control can be reduced by adding R17 10% HP Part Number 0757-0442.

RIT is fitted between XA2 Din 2 and XA2 Din 10. Update your Service Manual to show this change.

KN/m

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· 3702B-12

SERVICE NOTE

Supercedes : None

HP	MODEL	3702B	I.I./BB	RECEIVER
	- * ·			
a**	Seria	í Nos	: <u>1205U-</u>	00239
	1		1205U-	00240
			12050-	00248
	, t	ر در بر ک	12450-	00256
	1.1		12450-	00258
• •		· · · ·	12450-	00260
			12450-	00252

12450-00263 and above

FIELD REPLACEMENT, OF A6 ASSEMBLY.

In the event of field replacement of A6 the EHT Assembly, replace with hp Part No 03702-70006.

03702-70006 incorporates modifications to the original assembly which are required on instruments which have been fitted with A27.

KMcD/mm -

3-73/14



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19-19-20

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PART NUMBERS FOR 03702-70006

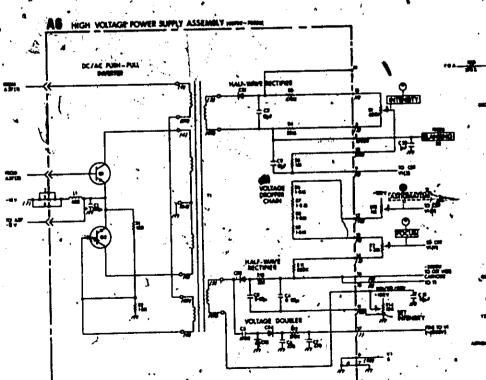
<u>REF)</u>	STOCK NUMBER	DESCRIPTION
C1	0180-0098	C. Fxd 100uF
C2	0160-0174	C. Fxd 0.47uF
C3	0160-0907	C. Fxd .01uF
C3	5040-0401	Support
C4	0160-3907	C. Fxd 0.02uE
C5	0160-0151	C. Fxd 4700PF
Ç5 5	5040-0401	Support
C6	0150-0036	C. Fxd 470P
C6	5040-0400	Support
C7	0150-0036	C. Fxd 470P
C7	.5040-0400	Support
C8	0160-3907	C. Fxd 0.02u
C9	0160-3958	C. Fxd .1Uf
C11	0160-0907	C. Fxd .01uF
CRT	1901-0142	Diode Si
CR2	1901-0142	Diode St
CR3	1901-0142	Diode St
CR4	1901-0142	Diode Si
LI	9140-0051	Ind. Fxd 400uH
MP1	2360-0015	SCW 6-32 x 1
HP2	2420-0003	Nut 6-32
MP3	2190-0018	Lkws No.6
MP4	2260-0001	Nut 🦄
MP5	2190-0003	Lknsp
NP6	2390-0007	Scw 6-32 x 5/16
HP7	0362-0042	Lug
0	185440590	Xstr Si NPN
Q2	1854-0590	"Xstr Si NPN
R1	0758-0024	R. Fxd 100 Ohm
R2	0758-0017	R. Fxd 1.5K
45 R3	0757-0374	R. Fxd 475K
R4	0836-0006	R. Fxd 20M
R5	0757-0059	R. Fxd 1M
R6	0698-1855	R. Fxd 1.8M
Cont /	• • •	

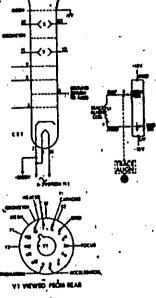
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ì	REF	STOCK NUMBER	* 4	DESCRIPTION	
	•		*	• • •	
•	R7	0698-1855		R. Fxd 1.8M	
. <i>1</i> °	R8*	0698-1855		R ^{.W} Fxd 1.8M	
-	R9	0698-1855	·	R.'Fxd 1.8M	
	R10	0758-0049		R. Fxd 53K	•
	R11	0686-8245		R. Fxd 820K	
	R12 ·	0758-0102		R. Fxd 270K	
	TI	03702-7121	•	Transformer	
		03702-3154	} ■	P. C. Board Blank	•
	* , *				

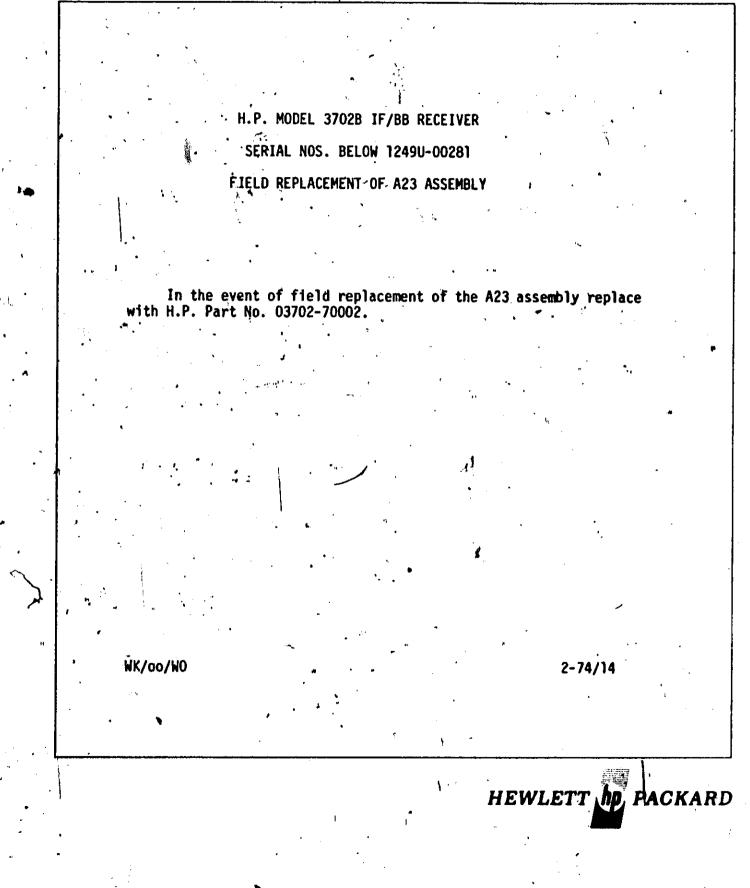
Cont



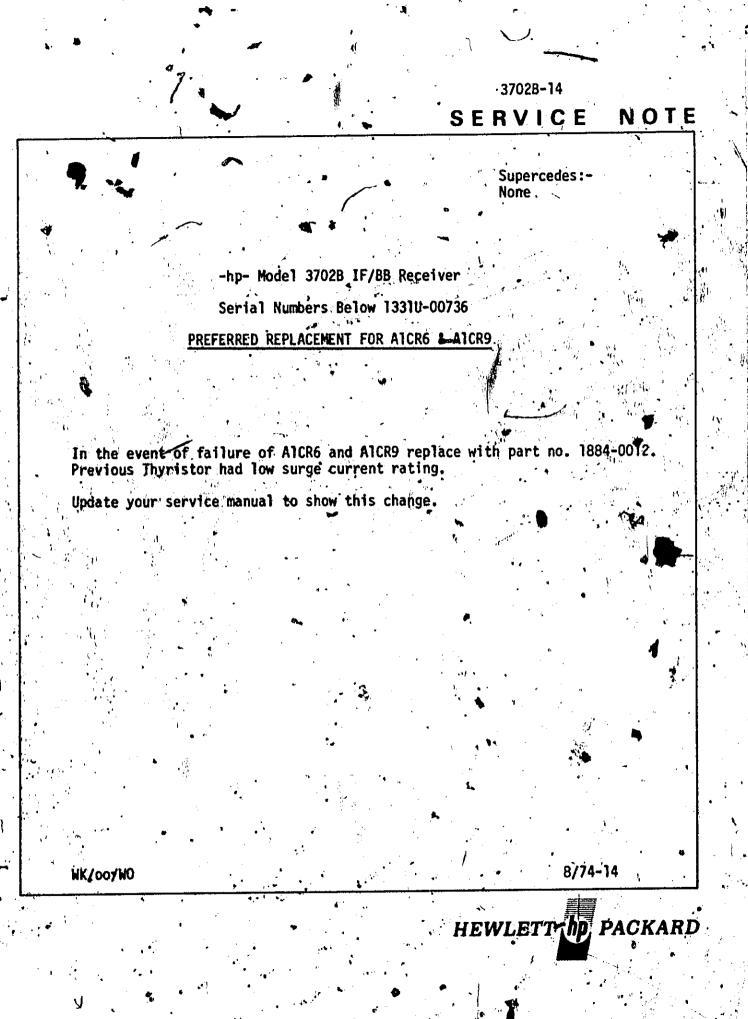


A6





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Supercedes: None

-hp- Model 3702B IF/BB RECEIVER Serial Numbers Below 1331U-00896 FIELD REPLACEMENT OF R6 SPECTRUM CENTRE POTENTIOMETER OR R7 X POSITION POTENTIOMETER

In the event of a replacement being required for R6 or R7 parts number 2100-2635 replace with the following:- R VAR 50K0 20% part number 2100-3189; NUT part number 2950-0072 Quantity 1; PLAIN WASHER 3050-0014 Quantity-1 and WASHER LOCK part number 2190-0084 Quantity 2.

This provides bett alignment of knobs on potentiometers. Update your service manual to show this change.

WK/00/74

8/74-14

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