



**service
information**

Commodore Computer

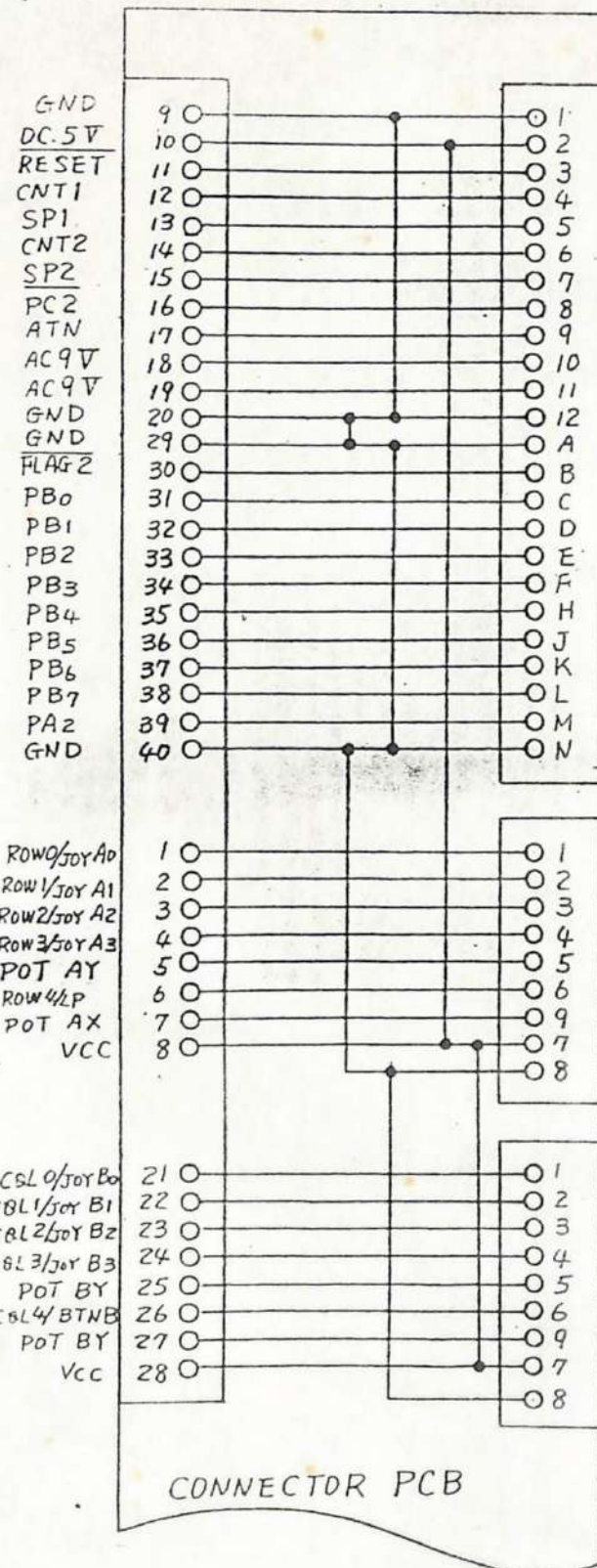
Technical Manual

Model SX-64

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 **commodore**
COMPUTER

P7



P6 USERS PORT

(COMPONENT SIDE)
1 2 3 4 5 6 7 8 9 10 11 12
A B C D E F G H J K L M N
(SOLDER SIDE)
24P Edge Connector

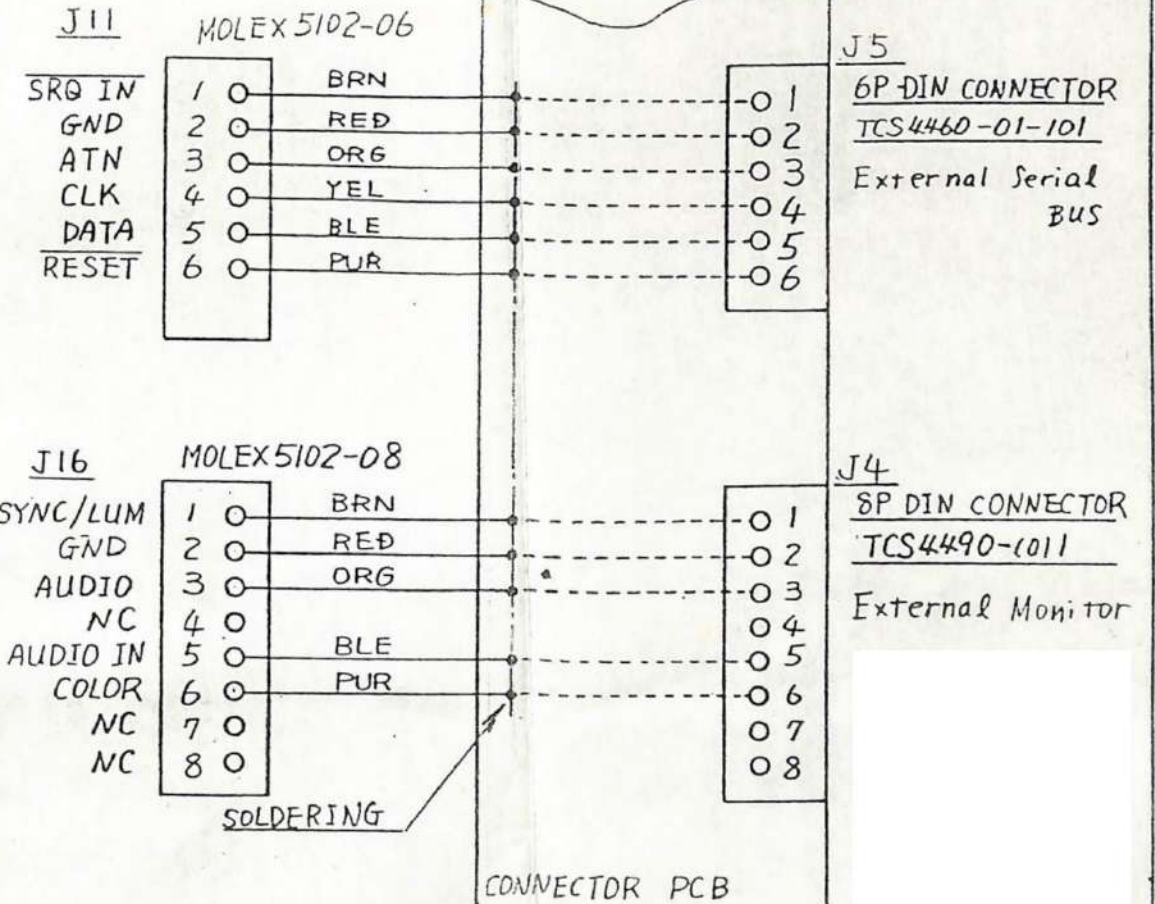
P3 CONTROL PORT 1
9P D-SUB Connector

P2 CONTROL PORT 2
9P D-SUB Connector

CONNECTOR PCB

REVISIONS

LTR	ZONE	DESCRIPTION	DATE	APPROVED
A		PRODUCTION RELEASE	10-27-83	J. Migo



Wier Material
AWG26
AWM1007 VW-1

UNLESS OTHERWISE SPECIFIED TOLERANCES ON DECIMALS		DRAWN BY: J. Migo		DATE: 7.13.83		commodore SCHEMATIC, CONNECTOR, PCB ASSY	
X XX XXX 4'S		CHKD: CHAQUISAKA		8/16/83			
		ENGR: J. Migo		8-16-83			
		APPR: J. Migo		10-27-83			
MATERIAL		USED ON		NEXT ASSY		SIZE	
FINISH		SX-64		250674		B 250421	
						REV A	
						SCALE NONE SHEET 1 OF 1	

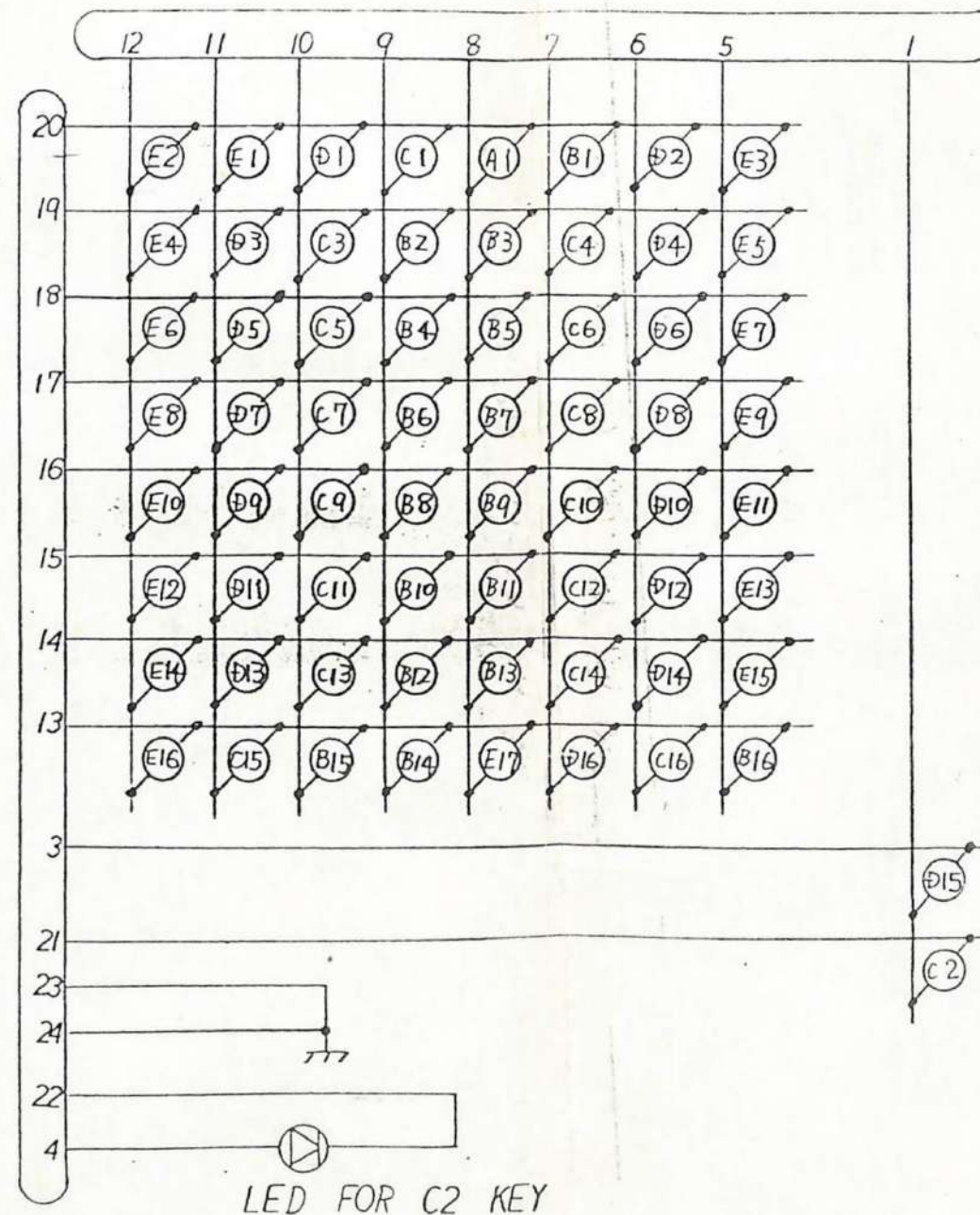
LTR ZONE

REVISIONS

DESCRIPTION

DATE APPROVED

SEE SHEET



SCHEMATIC

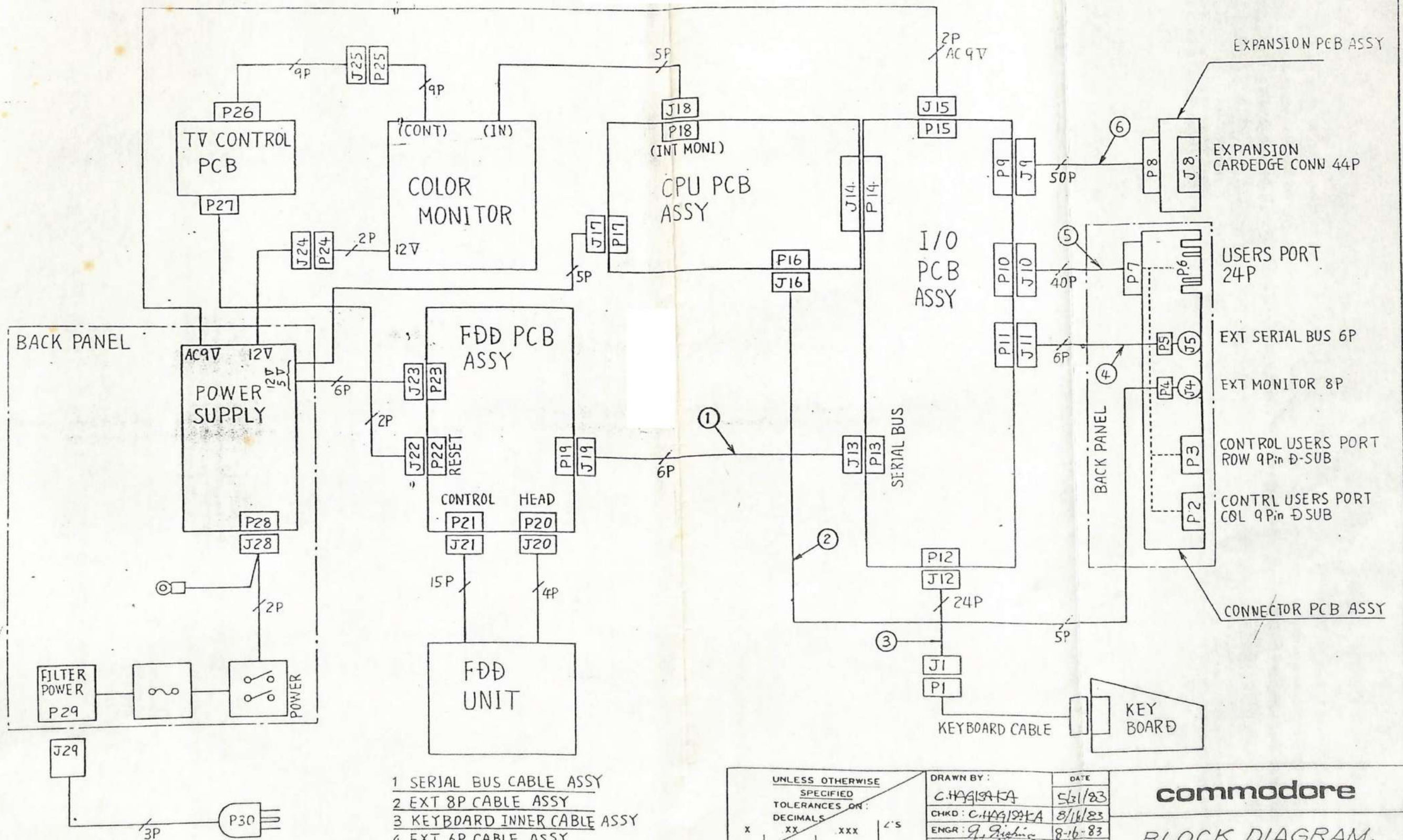
UNLESS OTHERWISE SPECIFIED TOLERANCES ON DECIMALS		DRAWN BY: <i>M. Khano</i>		DATE: <i>7/30/83</i>	
X XX XXX L'S		CHKD: <i>C. HARRIS</i>		DATE: <i>8/16/83</i>	
		ENGR: <i>R. R. R.</i>		DATE: <i>8-16-83</i>	
		APPR: <i>J. H. L.</i>		DATE: <i>10-27-81</i>	
MATERIAL		USED ON		NEXT ASSY	
FINISH					
SIZE <i>B</i>				REV <i>A</i>	
251555					

commodore

KEYBOARD

REVISIONS

LTR	ZONE	DESCRIPTION	DATE	APPROVED
A		PRODUCTION RELEASE	10-19-83	<i>[Signature]</i>



- SERIAL BUS CABLE ASSY
- EXT 8P CABLE ASSY
- KEYBOARD INNER CABLE ASSY
- EXT 6P CABLE ASSY
- USERS 40P CABLE ASSY
- EXPANSION 50P CABLE ASSY

UNLESS OTHERWISE SPECIFIED TOLERANCES ON: DECIMALS		DRAWN BY: C. HAGATA		DATE: 5/31/83		
X XX XXX L'S		CHKD: C. HAGATA		8/16/83		
		ENGR: G. Richter		8-16-83		
		APPR: J. P. L.		10-19-83		
MATERIAL:		USED ON: SX-64		NEXT ASSY: 250618		
FINISH:						
commodore				BLOCK DIAGRAM, SX-64		
				SIZE B	251425	REV A
				SCALE NONE SHEET 1 OF 1		

QUANTITY BILLED PER PART / DASH NO.				PART NUMBER		DESCRIPTION		REF DES		BEND		NOTES	
QTY	UNIT	QTY	UNIT	QTY	UNIT	QTY	UNIT	QTY	UNIT	QTY	UNIT	QTY	UNIT
1	1	1	1	251070-16	B	CAPACITOR CERAMIC DISC 330PF/50V	C51					RADIAL	
2	1	2	1	-24	B	150PF/50V	C38, 110						
1	1	1	1	-27	B	270PF/50V	C34						
2	1	2	1	251070-30	B	470PF/50V	C24, 50						
1	1	1	1	251074-01	B	1000PF/50V	C49						
2	1	2	1	251069-12	B	2200PF/50V	C31, 32						
15	1	15	1	251075-06	B	0.1uF/25V	C12, 14, 15	20	27, 40, 46, 55, 24, 40				
10	1	10	1	251075-07	B	0.22uF/25V	C1, 2, 4, 7, 9	10	27, 33				
2	1	2	1	251069-11	B	2200PF/102V/50V	C53, 54						
1	1	1	1	251075-04	B	CERAMIC DISC 0.047uF/25V	C52						
5	1	5	1	900464-31	B	CERAMIC 0.47uF/120V/50V, C8, 11	25	28, 35					
11	1	11	1	900100-01	B	ELECTROLYTIC 10uF/25V	C3, 15, 17	21	23, 26, 30, 36, 39, 47				
1	1	1	1	251072-21	B	CAPACITOR CERAMIC DISK 820PF/5V, C101						SUITABLE FOR ITEM 21	
25	1	25	1	251068-41	B	RESISTOR 82Ω 1/4W 15% CARBON R1						RADIAL	
5	1	5	1	-76	B	1kΩ	R8, 9, 13, 22, 35						
2	1	2	1	-51	B	100Ω	R3, 15						
1	1	1	1	-107	B	18kΩ	R6						
3	1	3	1	-101	B	10kΩ	R10, 11, 12						
1	1	1	1	-98	B	8.2kΩ	R7						
1	1	1	1	-151	B	1MΩ	R23						
2	1	2	1	-61	B	270Ω	R14, 21						
1	1	1	1	-111	B	27kΩ	R16						
1	1	1	1	-108	B	20kΩ	R17						
1	1	1	1	-117	B	47kΩ	R24						
1	1	1	1	-68	B	510Ω	R20						
1	1	1	1	-80	B	1.5kΩ	R4						
1	1	1	1	-88	B	3.3kΩ	R5, 31, 32, 33						
1	1	1	1	-73	B	820Ω	R18						
1	1	1	1	251068-83	B	2kΩ 1/4W 15% CARBON R19						RADIAL	
2	1	2	1	902423-03	B	PACK 33Ω 4COMP. 8PIN R21, 2							
1	1	1	1	902410-09	B	15kΩ 9COMP, 10PIN R23							
1	1	1	1	902442-29	B	PACK 23kΩ 7COMP, 8PIN R24							
2	1	2	1	251068-55	B	150Ω 1/4W 15% CARBON R2, 34							
1	1	1	1	-53	B	120Ω	R36						
1	1	1	1	-58	B	200Ω	R37						
1	1	1	1	251068-63	B	RESISTOR 330Ω 1/4W 15% CARBON R25							

commodore

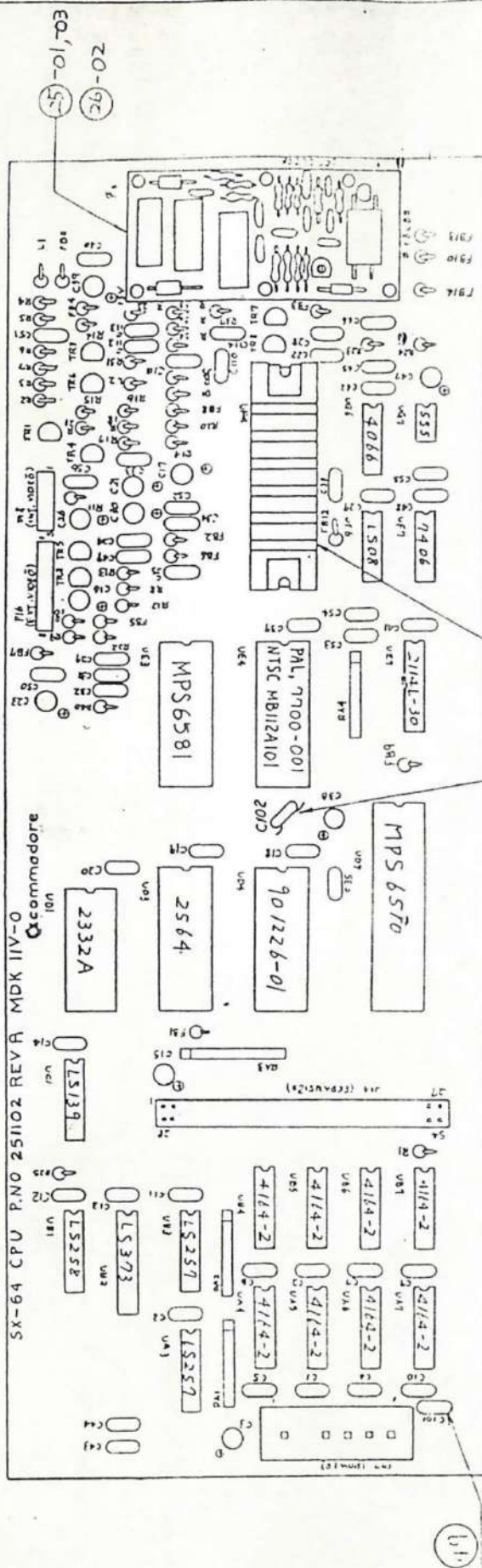
PCB ASSY, SX-64 CPU

DATE: 11-27-73
 SIZE: B
 250408
 REV: B
 SH: 5

ACTIVITY REPORT FOR PART/DESCRIPTION

ITEM			QTY	SO	PART NUMBER	DESCRIPTION	REF DES	QTY REQ	NOTES
1	2	3							
1	1	1	1	13	P	250642-27	HEADER ASSY 54 PIN	J14	JAB PS-54SD-B4TS1-1
1	1	1	1	14	B	250669-08	8 PIN	P16	MOLEX 5045-08A
1	1	1	1	15	B	250669-05	5 PIN	P18	MOLEX 5045-05A
1	1	1	1	16	B	250643-06	HEADER ASSY 6 PIN	P17	MOLEX 5285-06A
1	1	1	1	17					
1	1	1	1	18					
1	1	1	1	19					
1	1	1	1	80	C	251429-01	HEAT SINK		
2	2	2	1	81	C	251341-01	LEAF SPRING		
1	1	1	1	82					
1	1	1	1	83					
1	1	1	1	84	B	251102-01	PCB FABRICATION, SX-64 CPU		NEKO FOR UL,BSI, VDE
1	1	1	1	85	B	251102-02	PCB FABRICATION, SX-64 CPU		FOR CSA
1	1	1	1	86	B	251430-01	PCB ARTWORK, SX-64 CPU		
1	1	1	1	87	B	251431-01	PCB SILKSCREEN, SX-64 CPU		
1	1	1	1	88	B	251432-01	PCB SOLDER MASK, SX-64 CPU		
1	1	1	1	89					
1	1	1	1	90					
1	1	1	1	91					
2	2	2	1	92	B	251069-03	CAPACITOR CERAMIC DISK 330PF	C111, C112	
1	1	1	1	93	B	251070-22	100PF	C113	
2	2	2	1	94	B	251070-20	CAPACITOR CERAMIC DISK 68PF	C102, C114	
1	1	1	1	95					
1	1	1	1	96					
1	1	1	1	97					
1	1	1	1	98					
1	1	1	1	99					
1	1	1	1	100	B	900850-05	DIODE SIGNAL WG 713C	D1	
1	1	1	1	101					
1	1	1	1	102					
1	1	1	1	103					
1	1	1	1	104					
1	1	1	1	105					
1	1	1	1	106					
1	1	1	1	107					
1	1	1	1	108					

commodore	TITLE: PCB ASSY, SX-64 CPU	DRWN BY: J. M. Zohata	DATE: 7/30/83	ENGR: J. M. Zohata	DATE: 8/16/83	SIZE: B	REV: B	SMT: 4/5
		CHKD: CHANGHATA	DATE: 8/15/83	APPR: J. M. Zohata	DATE: 8/27/83			

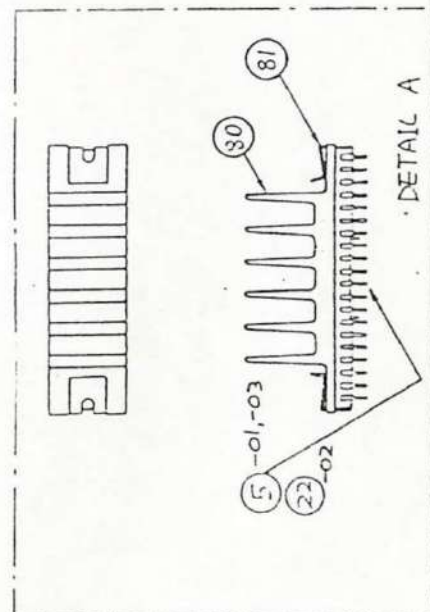


DETAIL/



SEE DETAIL A

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE DECIMALS		DATE		commodore	
X XX XXX		7.25.83		PCB ASSY.	
MATERIAL:		CHKD: CHY/DA KA 21.15.83		SX-64 CPU	
FINISH		ENGR: B. Roberts 8-16-83		REV B	
		APPR: B. Roberts 8-22-83		SCALE NONE SHEET 3 OF 5	
		USED ON		SIZE B	
		NEXT ASSY			
		SX-64		250408	



PART NO.	DESCRIPTION
50410-01	PCB ASSY, SX-64 FDD CONTROL
250410-02	PCB ASSY, SX-64 FDD CONTROL FOR CSA

REVISIONS		CAT.	REV.
LTR	ZONE	DESCRIPTION	
A		PRODUCTION RELEASE	
B		REVISED PER ECO 230529	

1. SHEET 6 OF 6 SIZE B

ASSY DWG

NOTES-UNLESS OTHERWISE SPECIFIED:

commodore	TITLE PCB ASSY, SX-64 FDD CONTROL
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DRAWN BY: I. MIZOHATA	DATE 7/30/83	FIGURE 9	DATE 9/26/83	SIZE B	DRAWING NUMBER 250410
CHKD C. HIGASHI	7/31/83	APPR J. K. L.	C. J. L.	SHEET 1	OF 6

ACTIVITY RECORD PAGE
PART / DASH NO.

QTY	QTY	PART NUMBER	DESCRIPTION	REF DES	REV	NOTES
37	B	900850-05	DIODE SIGNAL WQ712C	91-6-DR-010		
38	B	900850-01	SIGNAL IN4148			SUBSTITUTE FOR ITEM 37
39	B	325505-01	REVER HZ3C-2	D9		RADIAL
40	B	325506-01	REVER HZ5C-2	D7		RADIAL
41	B					
42	B	325566-01	CRYSTAL MODU 16MHZ ±50PPM			
43	B	325566-02	CRYSTAL MODU 16MHZ ±100PPM			SUBSTITUTE ITEM 42
44	B	325513-01	COIL INDUCTOR 22uH	L6		RADIAL
45	B		COIL INDUCTOR 22uH	L4.5		
46	B	325513-02	COIL INDUCTOR 100uH	L1-3		
47	B					
48	B	325563-01	FERRITE BEAD	FB1-10		RADIAL
49	B					
50	B	900100-01	CAP ELECTROLYTIC 10uF/25V	C18, 32, 33		
51	B		CAP ELECTROLYTIC 33uF/50V	C3		
52	B	900100-40	ELECTROLYTIC 1uF/25V	C31		
53	B	900402-17	TANTALUM 0.47uF/50V	C6, 7		
54	B	251072-24	CERAMIC DISC 47PF, 50V	C17		
55	B		330PF, 50V	C15, 12		
56	B	251072-32	280PF, 50V	C14, 16, 5		
57	B	251074-01	1000PF, 25V	C9, C50		
58	B	251074-09	0.022uF, 25V	C10, 11		
59	B	251075-06	CERAMIC DISC 0.1uF, 25V	C1, 2, 4, 8		
60	B			C35, 36, 37, 38		
61	B	904150-06	JC SOCKET 42PIN	UFC4, UDC5		
62	B	904153-03	24PIN	UA4, UA1		
63	B	904153-04	30PIN	UA3		
64	B	250644-06	HEADER ASSY AP, L-ANGLE	P19		
65	B	250644-02	PP	P22		
66	B	250648-01	SP	P20		
67	B	250644-15	ISP, L-ANGLE	P21		
68	B	250643-06	HEADER ASSY AP, STRAIGHT	P23		
69	B					
70	B					
71	B					
72	B					

commodore

PCB ASSY, SX-64 FDD CONTROL

TITLE

DESIGNED BY
T. HAZELTON

DATE
8/15/83

ENGR
J. G. GIBSON

DATE
8-15-83

SIZE
B

REV
B

SHEET
3

[illegible]

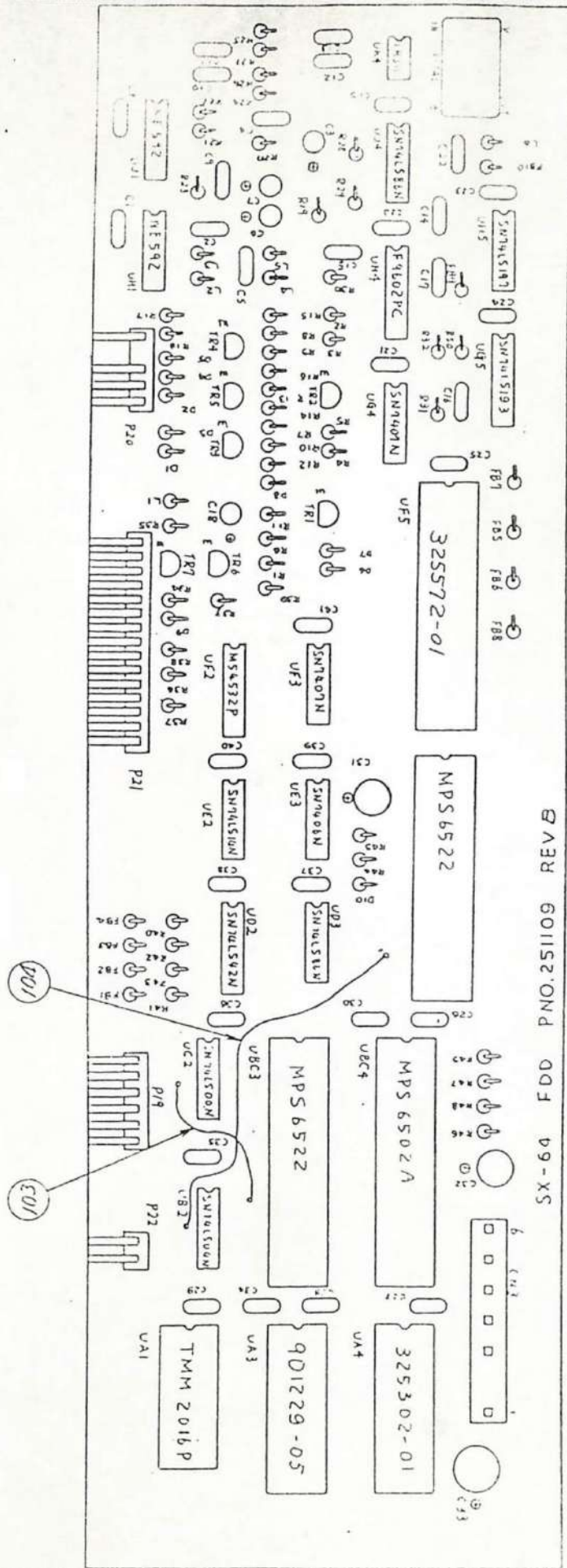
QUANTITY REQUIRED PER PART DASH NO.		QTY	SO	PART NUMBER	DESCRIPTION	REF DES	BEND	REVISION
0201								
		S 109	B	901521-04	IC 74LS04 HEX INVERTER	UF3		SUBSTITUTE FOR ITEM 35.
		S 110	B	901522-19	IC 7414 HEX SCH INVERTER	UF3		SUBSTITUTE FOR ITEM 35
		S 111	B	901521-30	IC 74LS14 HEX SCH INVERTER	UF3		SUBSTITUTE FOR ITEM 35
		112						
		S 113	B	901522-05	IC 7404 HEX INVERTER	UB2		SUBSTITUTE FOR ITEM 13
		S 114	B	901522-19	IC 7414 HEX SCH INVERTER	UB2		SUBSTITUTE FOR ITEM 13
		S 115	B	901521-30	IC 74LS14 HEX SCH INVERTER	UB2		SUBSTITUTE FOR ITEM 13
		116						
		117						
		S 118	B	900850-02	DIODE SIGNAL 1S2473	DI-6, 8, 10		SUBSTITUTE FOR ITEM 37
		S 119	B	-07	1S 953 (3)			
		S 120	B	-08	1S 953 (7)			
		S 121	B	900850-14	DIODE SIGNAL 1S1588	DI-6, 8, 10		SUBSTITUTE FOR ITEM 37
		122						
		123						
		124						
		125						
		126						
		127						
		128						
		129						
		130						
		131						
		132						
		133						
		134						
		135						
		136						
		137						
		138						
		139						
		140						
		141						
		142						
		143						
		144						
		145						
		146						
commodore					PCB ASSY, SX-64 FDD CONTROL			
TITLE		PCB ASSY, SX-64 FDD CONTROL			DRAWN BY R. J. J. J.		DATE 12-20-83	ENGR
					CHECKED			APPR
							SIZE B	REV B
							SHEET 250410	

REVISIONS

DESCRIPTION

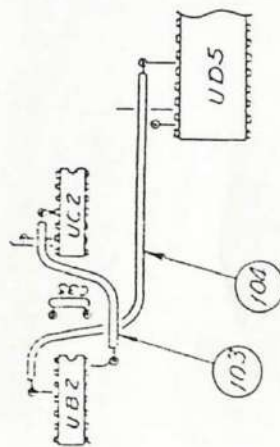
LTR ZONE

SEE SHEET



SX-64 FDD PNO.251109 REV B

DETAIL OF ITEM 103 & 104 SOLDERING



UNLESS OTHERWISE SPECIFIED TOLERANCES ON DECIMALS		DATE	7/12/83
DRAWN BY: T. M. R. J. N.		CHKD: C. M. H. J. N.	8/15/83
ENGR: J. R. J. N.		APPR: J. R. J. N.	8-16-83
MATERIAL:		USED ON	SX-64 250410
FINISH:		NEXT ASSY	
commodore		PCB ASSY,	
SX-64 FDD CONTROL		SIZE	B
		REV	B
		SCALE	NONE
		SHEET	6 OF 6

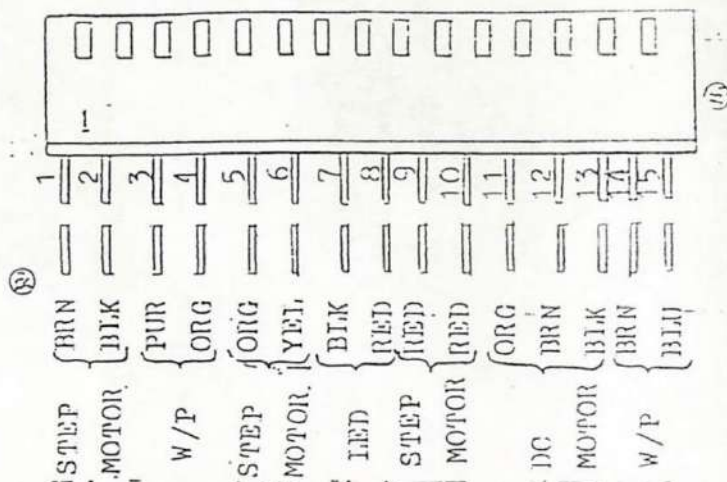
CLASS. NO.

TITLE

Control Line

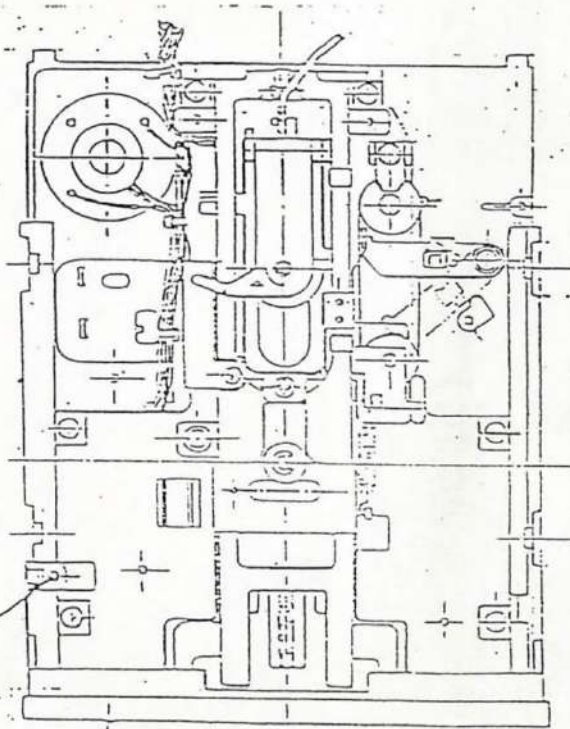
FUNCTION

Nail to lock



DC MOTOR {
 BLK RETURN
 BRN +12V
 ORG MOTOR ON

STEP MOTOR {
 RED +12V
 RED +12V
 YEL C
 ORG A
 BLK B
 BRN D



W/P
 TRANSISTOR
 ORG(+)
 PUR(-)
 DIODE
 BRN(+)
 BLU(-)

LED
 RED(+)
 BLK(-)

※ Recommended connector
 Molex ~~5045NA~~ 5046NA
 5045NA

FACE	SYMB.	DATE	APPO.	CHKD.	DSGD.	TITLE	OR
					Jul. 22, 81		
					U. H. H.	DOCUMENT NO.	(/)

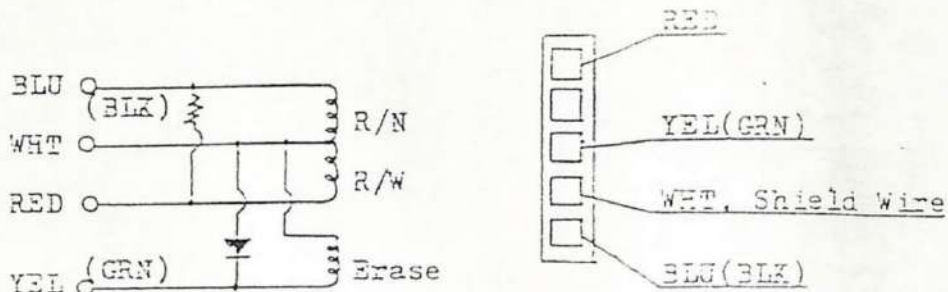


ALPS ELECTRIC CO., LTD.

(東京・大阪・名古屋・福岡)

1981.7.22

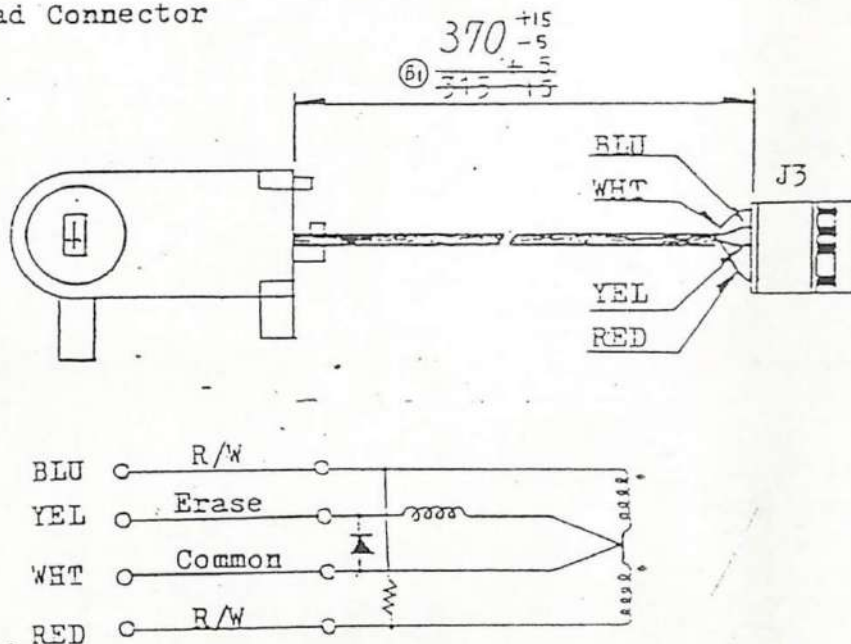
Connector Pin



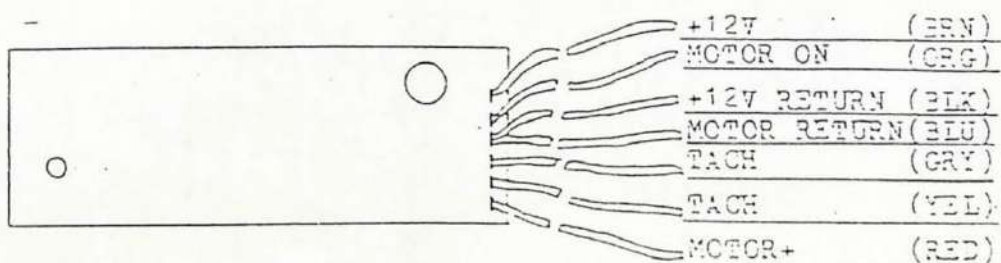
Housing
Hirose HIF3G-5S-254C

Terminal
Hirose HIF3-2428SCFA

Head Connector



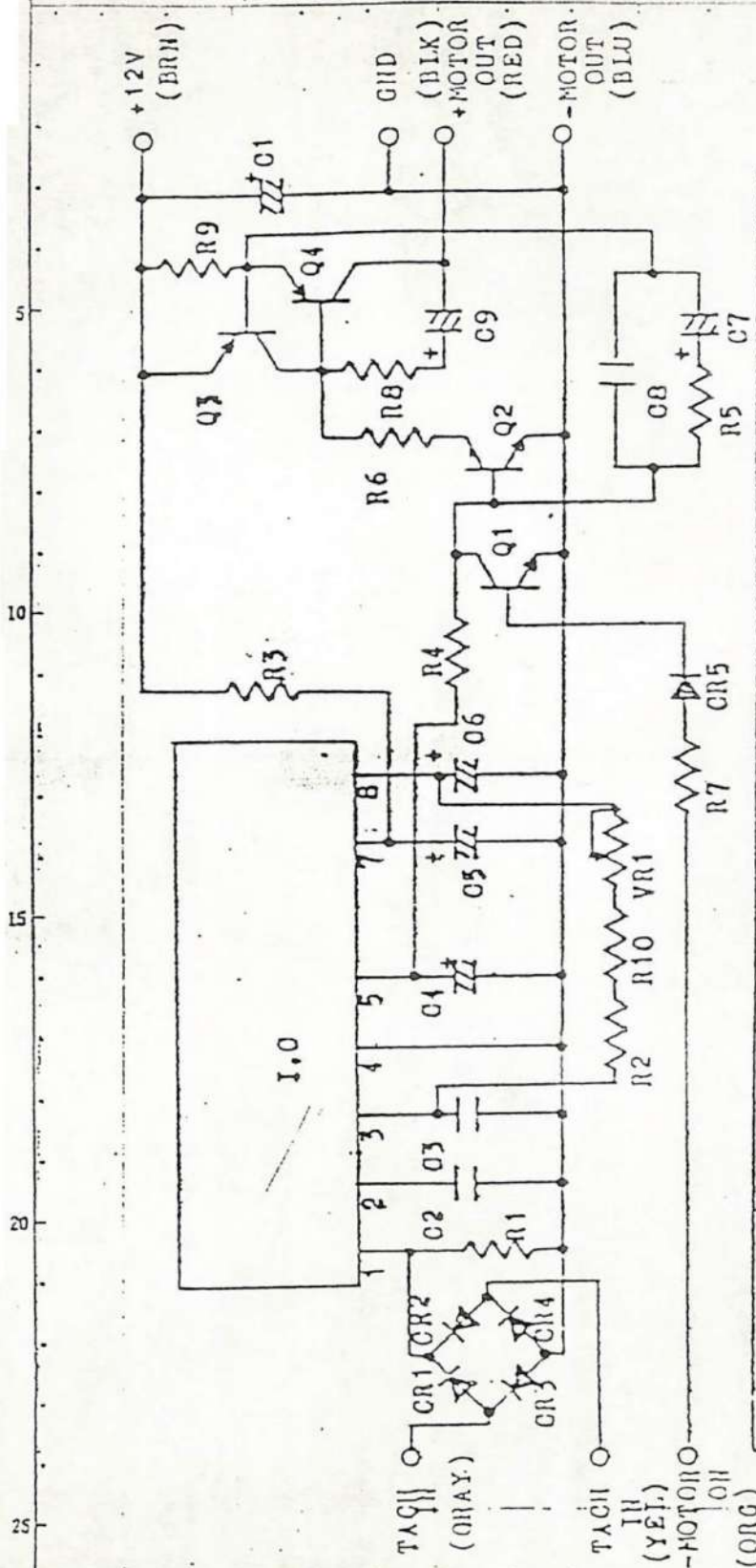
DC Motor Control P.C.B



CLASS. NO.

TITLE

Motor control assembly

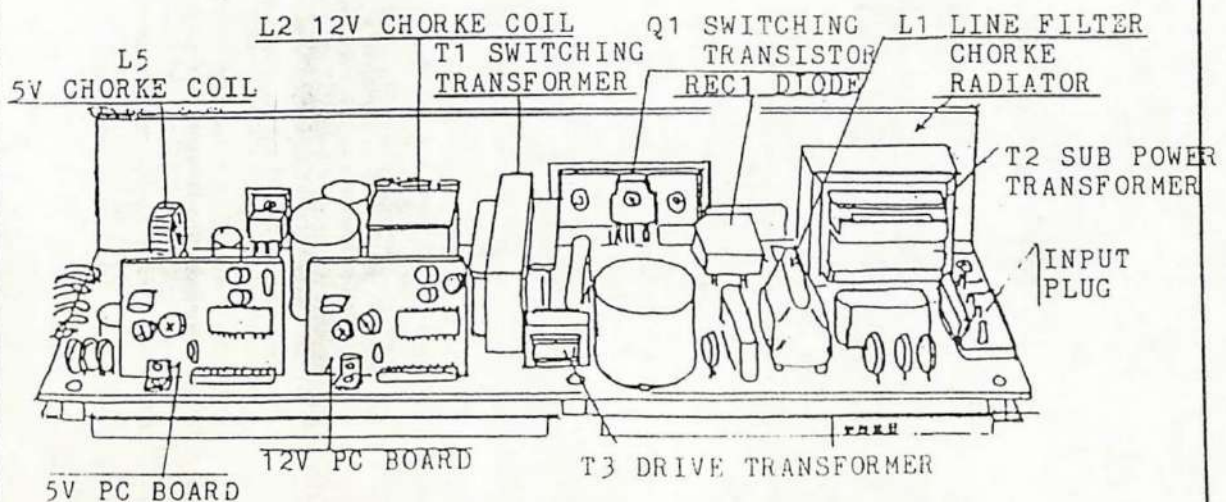
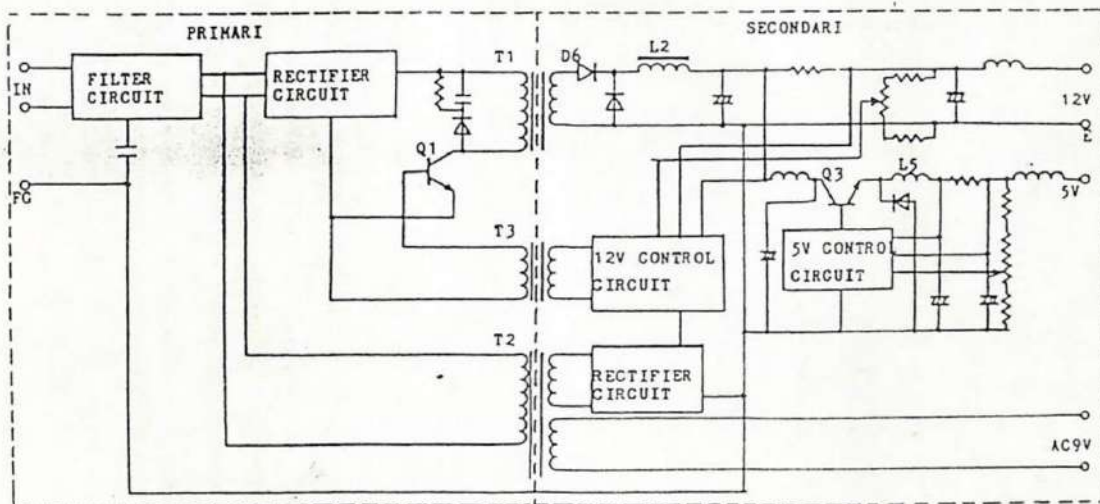


Symbol	Description	Symbol	Description
I.O.	CX-065B	R8	Resistor, 150 Ω /4W
Q1	Transistor	R9	Resistor, 0.68 Ω 2W
Q2	Transistor	R10	Resistor, 5.1K Ω /8W
Q3	Transistor	VR1	Variable Resistor, 20K Ω
Q4	Transistor	C1, 5, 6	Capacitor, 10 μ F35V
CR1, 2, 3, 4, 5	Diode	C2	Capacitor, 0.0047 μ F50V
R1	Resistor, 1K Ω /4W	C3	Capacitor, 0.033 μ F50V
R2	Resistor, 68K Ω /4W	C4, 9	Capacitor, 0.47 μ F35V
R3	Resistor, 220 Ω /4W	C7	Capacitor, 2.2 μ F16V
R4	Resistor, 3.3K Ω /4W	C8	Capacitor, 0.068 μ F50V
R5	Resistor, 2.7K Ω /4W		
R6	Resistor, 820 Ω /4W		

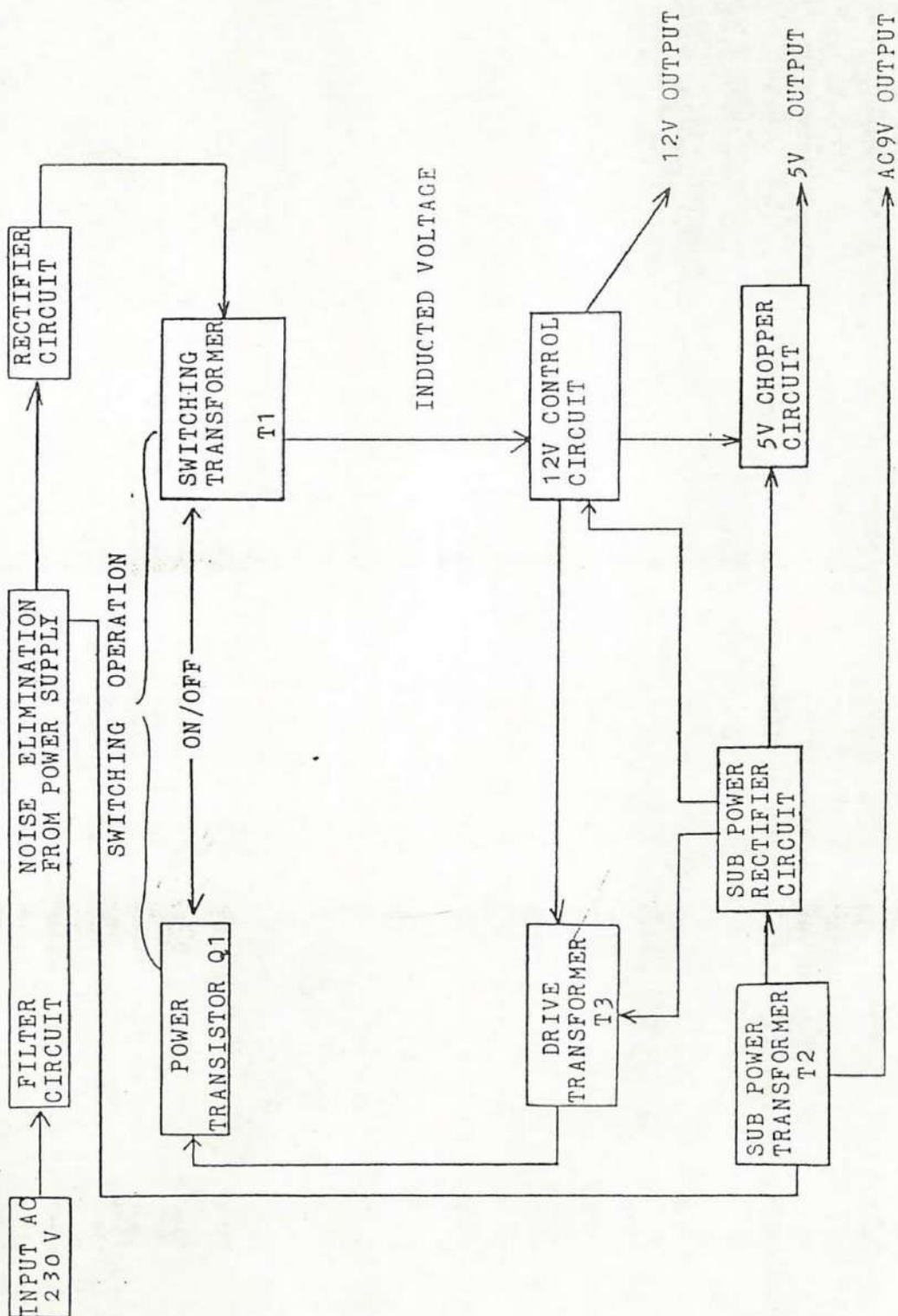
1, specifications

1-1	INPUT		
1-1-1	VOLTAGE	AC 230V 10%	50.60Hz
1-1-2	POWER	75W typ	
1-1-3	SURGE CURRENT	25A max	
1-2	OUTPUT		
1-2-1	VOLTAGE	5V 2% , 12V 2% , AC9V 3%	
1-2-2	CURRENT	5V; 3.15A , 12V; 2.76A , AC9V; 200mA	
1-2-3	VARIATION	5V 3% , 12V 5% , AC9V 15%	
1-2-4	RIPPLE	5V; 150mV(p-p) , 12V; 290mV(p-p)	
1-2-5	OVER CURRENT	5V ; 3.6~4A	
	PROTECTION	12V ; 3.6~4A	

2, CIRCUIT



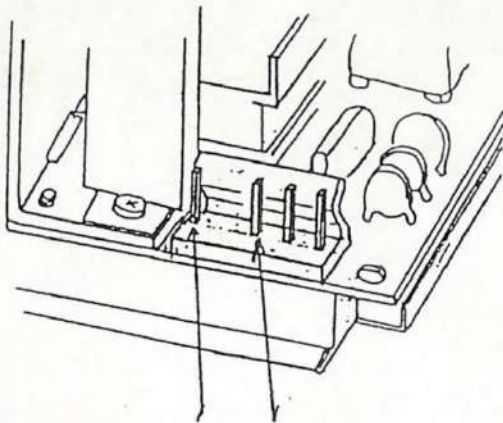
BLOCK DIAGRAM



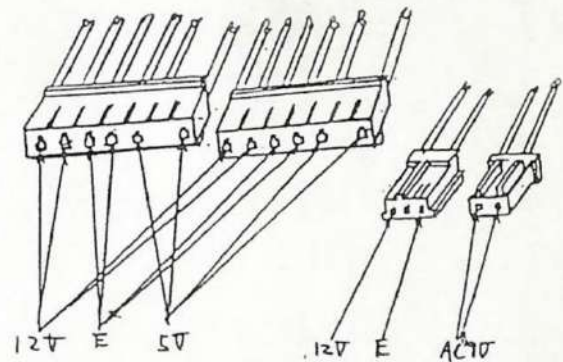
3. ALIGNMENT INSTRUCTION

1. INPUT OUTPUT CONNECTION

INPUT

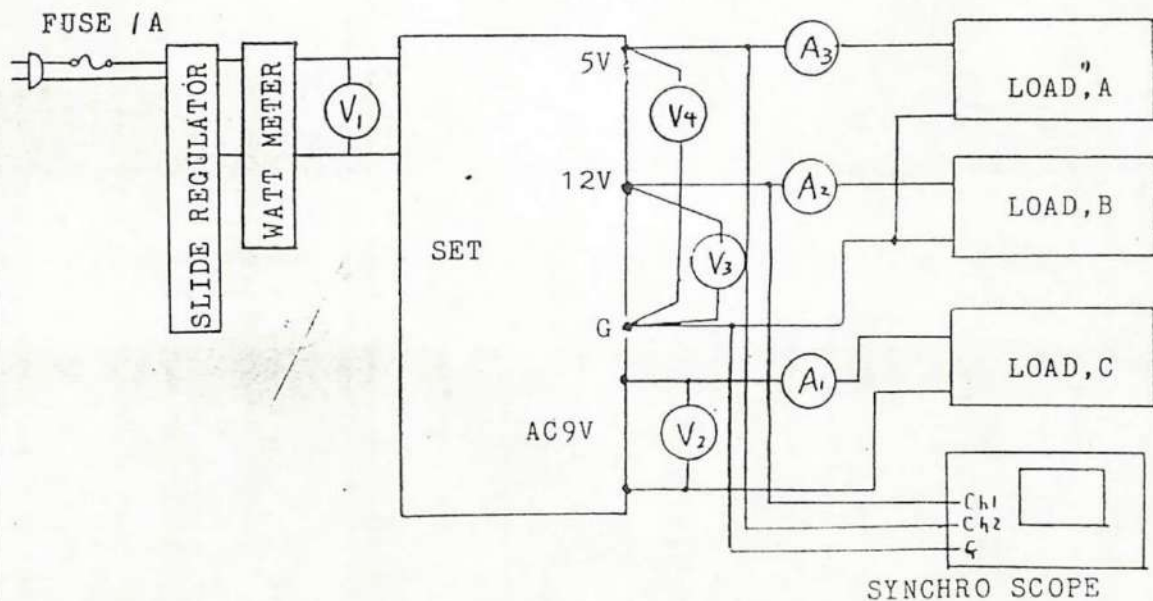


OUT PUT



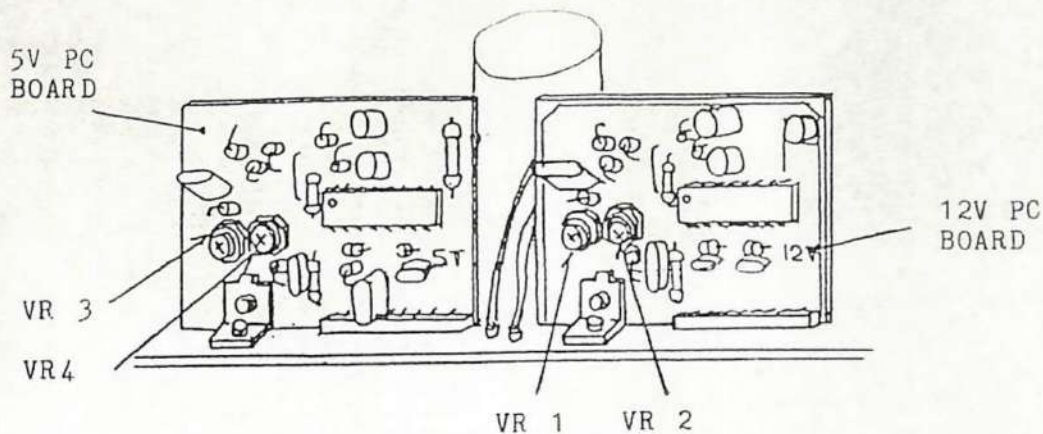
IN PUT 230V 50/60Hz

CONNECT :ON

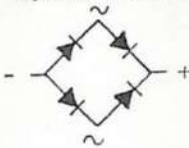
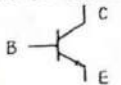
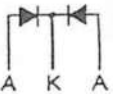
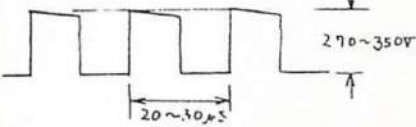
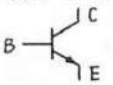
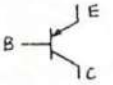
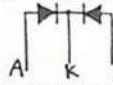
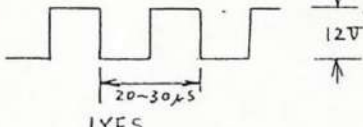


- 1) SLIDE REGULATOR
- 2) WATT METER
- 3) LOAD A, B
- 4) V₁
- 5) V₂
- 6) V₃
- 7) V₄
- 8) A₁
- 9) A_{2,3}
- 10) LOAD C

AC 220~240V
 AC WATT METER TYP 75W
 ELECTRONIC LOAD TYP 12V , 5A
 AC VOLTAGE METER TYP 120V 240V
 AC VOLTAGE METER TYP 9V
 DC VOLTAGE METER TYP 12V
 DC VOLTAGE METER TYP 5V
 AC CURRENT METER TYP 200mA
 DC CURRENT METER TYP 3A
 SLIDE RESISTOR TYP 45Ω

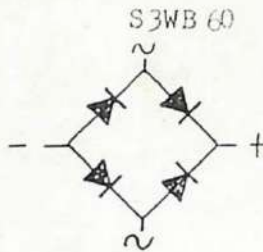


Step	Item	Remarks For Adjustment
1	Connection	Connect the SET as Per SKETCH 6
2	Volume (VR)	Turn VR1, VR2, VR3, VR4 on PC Board for 5V, 12V Till the End in Clockwise Rotation
3	AC Power ON	Set Slide Reguleter at 230V and AC Power ON
4	Rated Current Setting	Set Circuit Loaded as Belows 1) Load A DC 5V 3.15A 2) Load B DC 12V 2.76A 3) Load C AC 9V 200mA
5	Output Voltage Adjustment	Adjust VR2 and VR4 then Set in the Range of the Following Voltage 1) DC 5V (VR4) 4.970~5.030V 2) DC 12V (VR2) 11.950~12.050V
6	Operation of Over-Current Protection and Adjustment of the Point	Adjust and Set VR1, VR3 to Operate Over-Current Protection at the Following Values 1) DC 5V (VR3) 3.6~4A 2) DC 12V (VR1) 3.6~4A

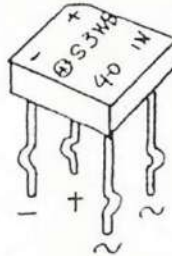
PROBLEMS	CHECK POINT	CAUSES AND TEST	SOLUTION
NO OUTPUT	SOME SCRAP INSIDE OK	SHORT CIRCUIT BY SCRAP YES	REPAIR
NO AC 9V OUTPUT	SUPPLEMENTARY CIRCUIT OK	T2 TRANSFORMER SHORT OR OPEN YES T2 PRIMARY LEAD WHITE TO WHITE 160~200Ω SECONDARY LEAD RED TO RED 9~12Ω SECONDARY LEAD BLUE TO BLUE 3.2~3.4Ω OK	CHANGE T2
IN CASE OF REC1 SHORT FUSE IS CUT	CHECK BRIDGE DIODE OK	REC2 S1V5-10 DIODE RECTIFIED VOLTAGE DC 12~15V REC1 S3WB40 SHORT OR OPEN YES	CHANGE REC1
			
IN CASE OF Q1 SHORT FUSE IS CUT	CHECK SWITCHING TRANSISTOR OK	Q1 2SC2792 SHORT OR OPEN YES	CHANGE Q1
			
	CHECK HIGH-SPEED RECTIFY DIODE OK	D6 ESAC85-009 SHORT OR OPEN YES	CHANGE D6
			
12V CONTROL CIRCUIT		CHECK BETWEEN COLLECTOR AND EMITTER OF 2SC2792 IN Q1 BY SYNCHRO-SCOPE NO	CHANGE A BOARD OF 12V CONTROL
			
		YES 12V OUTPUT ADJUSTMENT SHIFT YES	RE-ALIGNMENT
5V output ONLY NO OUTPUT	CHECK SWITCHING TRANSISTOR OK	Q3 2SC2334 SHORT OR OPEN YES	CHANGE Q3
			
	CHECK DRIVE TRANSISTOR OK	Q4 2SA1020-007Y SHORT OR OPEN YES	CHANGE Q4
			
	CHECK HIGH-SPEED RECTIFY DIODE OK	D7 ESAC82-004 SHORT OR OPEN YES	CHANGE D7
			
5V CONTROL CIRCUIT		CHECK BETWEEN EMITTER OF 2SC2334 AND GROUND IN Q4 BY SYNCHRO-SCOPE NO	CHANGE A BOARD OF 5V CONTROL
			
		YES 5V OUTPUT ADJUSTMENT SHIFT YES	RE-ALIGNMENT

5. SEMICONDUCTOR OUTSIDE APPEARANCE

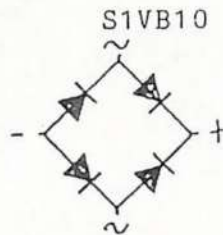
1, REC1



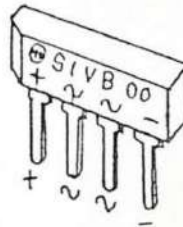
RECTIFIER STACKS DIODES



2, REC2



RECTIFIER STACKS DIODES



3, D1

ERB28-08

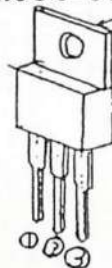
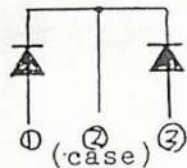


FAST RECOVERY DIODES



4, D6,7

ESAC85-009 , ESAC82-004 SCHOTTKY BARRIER DIODES

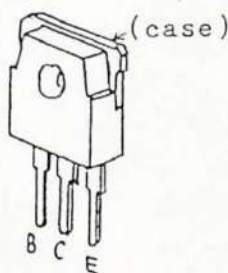
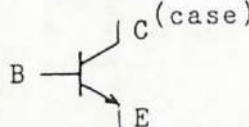


JEDEC:TO-220AB

5, Q1

2SC2C2792or3351

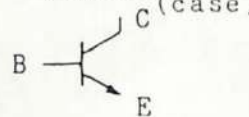
POWER TRANSISTOR



6, Q3

2SC2334 (case)

POWER TRANSISTOR



JEDEC:TO-220AB

7, Q4

2SA1012

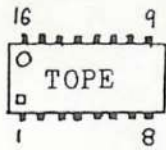
TRANSISTOR



8, IC1,2

MB3759

INTEGRATED CIRCUITS



7. Q4

2SA1012

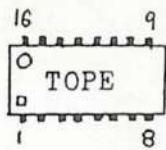
TRANSISTOR



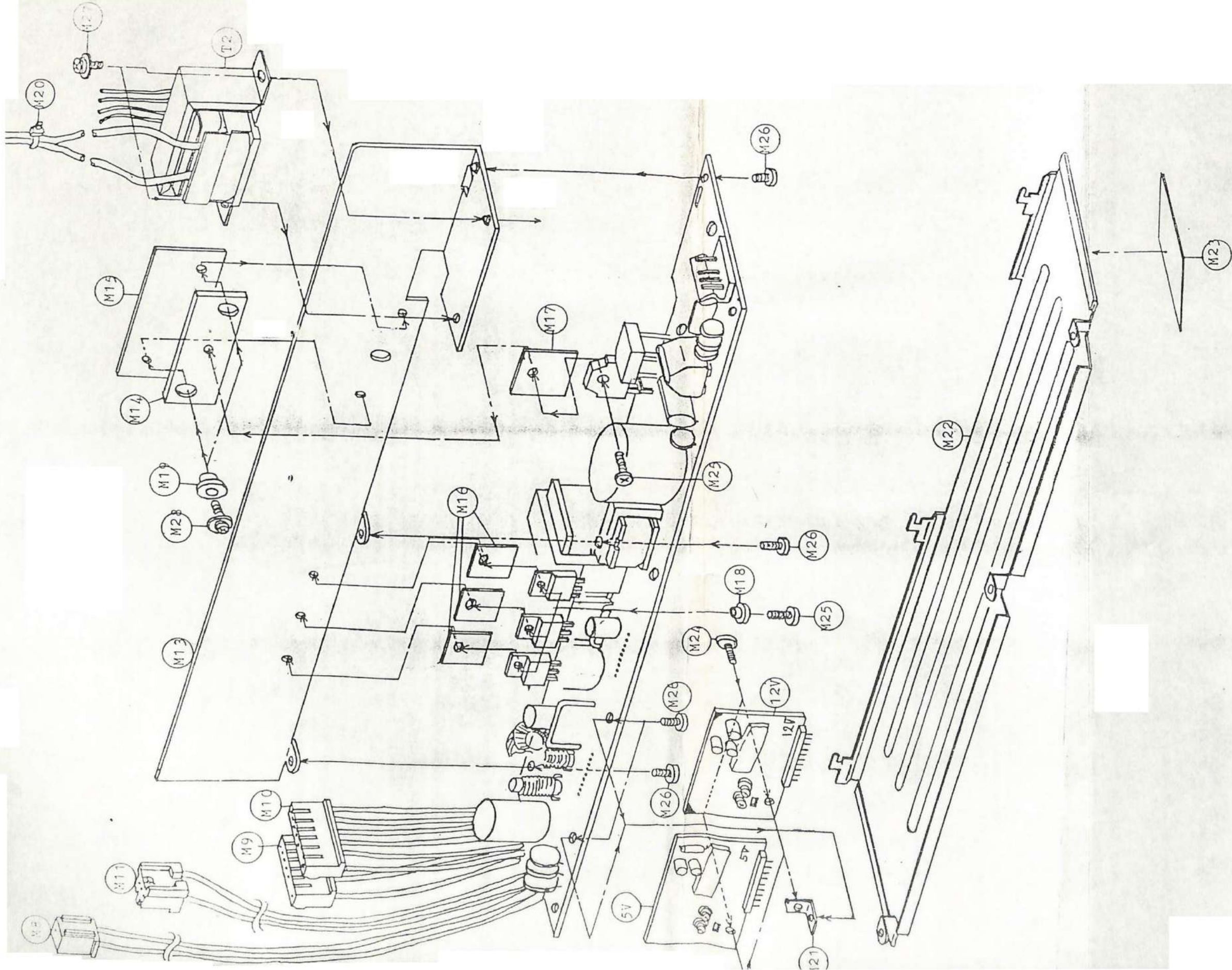
8. IC1,2

MB3759

INTEGRATED CIRCUITS



EXPLODED VIEW AND PARTS LISTS
EXPLODED VIEW



Symbol	Part, No	Part Name	Description	Safety Part	Service Part
C21	68-0343F	CEE102A10V	CEE CAPACITOR		
C22	68-2701K	CMP224A63K-N	CMP CAPACITOR		
C23	68-27080	CPS104A50K-N	CPS CAPACITOR		
C24	68-0343F	CEE102A10V	CEE CAPACITOR		
C25	68-27080	CPS104A50K-N	CPS CAPACITOR		
C27	68-0341E	CEE479A50V	CEE CAPACITOR		
C28	68-2708I	CPS103A50K-N	CPS CAPACITOR		
C29	68-0341F	CEE100A50V	CEE CAPACITOR		
C30	68-2708F	CPS332A50K-N	CPS CAPACITOR		
C31	68-0341E	CEE479A50V	CEE CAPACITOR		
C32	68-2708I	CPS103A50K-N	CPS CAPACITOR		
C33	68-27080	CPS104A50K-N	CPS CAPACITOR		
C34	68-0341E	CEE479A50V	CEE CAPACITOR		
C36	68-2811G	CC472A2500Z	CC CAPACITOR		
C37	68-2811G	CC472A2500Z	CC CAPACITOR		
C40	68-0341F	CEE100A50V	CEE CAPACITOR		
C41	68-27080	CPS104A50K-N	CPS CAPACITOR		
RESISTORS					
Part Name.with RD:Carbon Resistor					
Part Name.with SRM:Metal Oxide Film Resistor					
R1	68-2503K	8D-13	POWER SHERMISTOR	!	0.5%
R2	68-4951Y	SRM15K-J3A	SRM RESISTOR	!	
R3	68-4943Y	SRM100-J2A	SRM RESISTOR	!	
R4	68-0332Y	RD22-J1/2A	RD RESISTOR	!	
R5	68-4937A	SRM10-J1A	SRM RESISTOR	!	
R9	68-4937A	SRM10-J1A	SRM RESISTOR	!	
R10	68-4937A	SRM10-J1A	SRM RESISTOR	!	
R11	68-0353A	MANGANEN WIRE			
R12	68-0299V	RD30K-J1/4D	RD RESISTOR		
R13	68-0298M	RD1K-J1/4D	RD RESISTOR		
R14	68-0299C	RD4.7K-J1/4D	RD RESISTOR	!	
R15	68-0298R	RD1.6K-J1/4D	RD RESISTOR	!	
R16	68-0297S	RD150-J1/4D	RD RESISTOR		
R17	68-0280S	RD820-J1/4B	RD RESISTOR		
R18	68-4937A	SRM10-J1A	SRM RESISTOR		
R19	68-0299V	RD30K-J1/4D	RD RESISTOR		
R20	68-0353A	MANGANEN WIRE			
R21	68-0298M	RD1K-J1/4D	RD RESISTOR		
R22	68-0298Y	RD3.3K-J1/4D	RD RESISTOR		
R24	68-0298V	RD2.4K-J1/4D	RD RESISTOR		
R25	68-0281K	RD4.7K-J1/4B	RD RESISTOR	!	
R26	68-0281S	RD10K-J1/4B	RD RESISTOR	!	
R27	68-0300Y	RD470K-J1/4D	RD RESISTOR	!	
R30	68-0299Q	RD18K-J1/4D	RD RESISTOR		
R31	68-0299G	RD6.8K-J1/4D	RD RESISTOR		
R32	68-0300I	RD100K-J1/4D	RD RESISTOR		
R33	68-4937A	SRM10-J1A	SRM RESISTOR		
R34	68-0298S	RD1.8K-J1/4D	RD RESISTOR		
R35	68-0281M	RD5.6K-J1/4B	RD RESISTOR		
R36	68-0281M	RD5.6K-J1/4B	RD RESISTOR		
R37	68-0300I	RD100K-J1/4D	RD RESISTOR		
R38	68-0299V	RD30K-J1/4D	RD RESISTOR		
R40	68-0299M	RD12K-J1/4D	RD RESISTOR		
R41	68-0298A	RD330-J1/4D	RD RESISTOR		

10. PARTS LIST

Symbol	Part, No	Parts Name	Description	Safety Parts	Service Parts
TRANSFORMERS & COILS					
T1	68-4090A	SWITCHING TRANSFORMER		!	0.5%
T2	68-1110A	SUB POWER TRANSFORMER		!	
T3	68-0854A	DRIVE TRANSFORMER		!	
L1	68-1606D	UF2327F	LINE FILTER CHORKE		
L2	68-1366D	SKU-33-B8	CHORKE COIL		
L3	68-0306A	5μH	CHORKE COIL		
L4	68-0013B	FN-R8S	CHORKE COIL		
L5	68-1351A	SK11-2-100	CHORKE COIL		
L6	68-0306A	5μH	CHORKE COIL		
TRANSISTORS & DIODES					
Symbol No.with Q:Transistor		Symbol No.with REC:Diode			
Symbol No.with D:Diode					
Q1	68-2056F	2SC2792or3551	SWITCHING TRANSISTOR	!	0.5%
Q3	68-0040C	2SC2334-K	SWITCHING TRANSISTOR		0.2%
Q4	68-2001A	2SA1020-0,Y	TRANSISTOR		0.1%
REC1	68-0345F	S3WB-60	DIODE	!	0.1%
REC2	68-2254A	S1VB-10	DIODE		0.1%
D1	68-2034C	ERB28-08	DIODE		0.1%
D6	68-0035D	ESAC-85-009	DIODE		0.1%
D7	68-0035B	ESAC-82-004	DIODE		0.1%
ICs					
IC1	68-1912A	MB3759	IC	!	0.1%
IC2	68-1912A	MB3759	IC	!	0.1%
CAPACITORS					
Part Name.with CC:Ceramic Capacitor					
Part Name.with CMP:Metallized Polyester Film Capacitor					
Part Name.with CPS:Polyester Film Capacitor					
Part Name.with CEE:Aluminum Electolytic Capacitor					
C1	68-2712I	CMP224A250K-N	CMP CAPACITOR	!	
C2	68-2811D	CC102A2500K	CC CAPACITOR	!	
C3	68-2811D	CC102A2500K	CC CAPACITOR	!	
C4	68-2811E	CC222A2500M	CC CAPACITOR	!	
C5	68-2811E	CC222A2500M	CC CAPACITOR	!	
C6	68-2712G	CMP104A250M	CMP CAPACITOR	!	
C7	68-2610D	CEE221D400R	CEE CAPACITOR	!	
C8	68-2709S	CMP104A630K-N	CMP CAPACITOR	!	
C9	68-2812A	CC221A1000K	CC CAPACITOR	!	
C11	68-0341R	CEE101A35V	CEE CAPACITOR		
C12	68-2814D	CC222A2000K	CC CAPACITOR		
C13	68-2814D	CC222A2000K	CC CAPACITOR		
C14	68-2610B	CEE472D25Q	CEE CAPACITOR		
C15	68-2701K	CMP224A63K-N	CMP CAPACITOR		
C16	68-2708D	CPS104A50K-N	CPS CAPACITOR		
C17	68-0342R	CEE222A16V	CEE CAPACITOR		
C18	68-2708D	CPS104A50K-N	CPS CAPACITOR		
C19	68-0342S	CEE332A16V	CEE CAPACITOR		

Symbol	Part, No	Part Name	Description	Safety Part	Service Part
R42	68-0300I	RD100K-J1/4D	RD RESISTOR		
R45	68-0299A	RD3.9K-J1/4D	RD RESISTOR		
R50	68-0336U	RD330K-J1/2A	RD RESISTOR	!	
SEMI FIXED RESISTOR					
VR1	68-0119B	RGS6-FAN500		!	0.2%
VR2	68-0119F	RGS6-FAN1K			0.2%
VR3	68-0119B	RGS6-FAN500			0.2%
VR4	68-0119F	RGS6-FAN1K			0.2%
MISCELLANEOUS					
M1	68-4114A	PC BOARD (A)		!	
M2	68-4115A	PC BOARD (B) 1/2		!	
M3	68-4505A	JOINT P=7.5mm			
M4	68-4505B	JOINT P=10mm			
M5	68-4505C	JOINT P=12.5mm			
M6	68-4505D	JOINT P=15mm			
M6	68-3521F	ANGLE PLUG, M34-09-30-134P		!	
M7	68-3514C	PLUG, 5285-04A			
M8	68-3516A	CONNECTOR 2P ASS			0.2%
M9	68-3519A	CONNECTOR 6P ASS			0.2%
M10	68-3519A	CONNECTOR 6P ASS			0.2%
M11	68-3517A	CONNECTOR 3P ASS			0.2%
M12	68-4003L	TUBING (UL)		!	0.5%
MECHANICAL PART					
M13	68-5086A	RADIATOR (A)			
M14	68-5087A	RADIATOR (B)			
M15	68-5082A	RADIATION SEAT (SARCON 45F)		!	
M16	68-0026B	RADIATION SEAT TO-220 (SARCON 45F)		!	0.2%
M17	68-0352A	RADIATION SEAT TO-3P (SARCON 45F)		!	0.5%
M18	68-0076A	BUSHING		!	
M19	68-0025A	BUSHING (C)		!	
M20	68-5078A	BAND (KM-85)			
M21	68-0061A	L ANGLE			
M22	68-5083A	SIIRUDO PLATE			
M23	68-5088A	LABEL			
SCREWS					
M24	68-5800C	BIND HEAD 3.0×6mm			
M25	68-5800D	BIND HEAD 3.0×8mm			
M26	68-0015E	BIND HEAD 3.0×6mm (SUS)			
M27	68-5802B	W-SEMS 3.0×6mm			
M28	68-5802D	W-SEMS 3.0×10mm			
M29	68-5089A	NYLON RIVET			
PCB ASS					
12V	68-5100	12V PC BOARD ASS		!	0.2
5V	68-5099	5V PC BOARD ASS			0.2

900504

HOW TO REMOVE FOR SERVICE

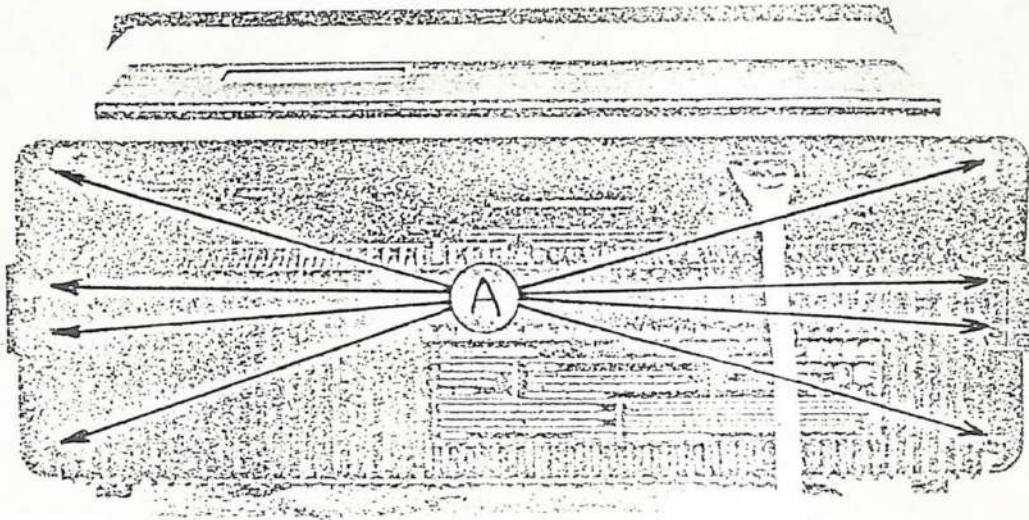


Fig. 1

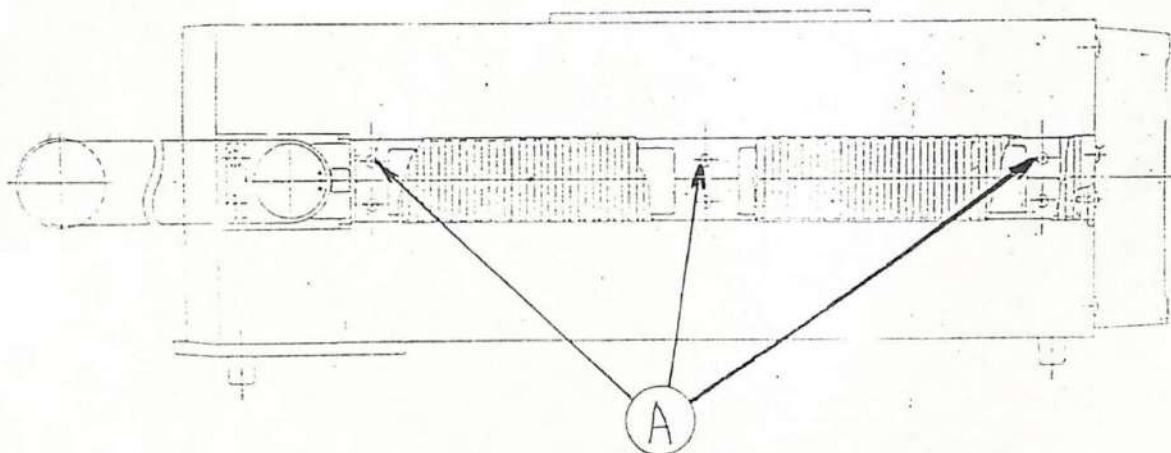
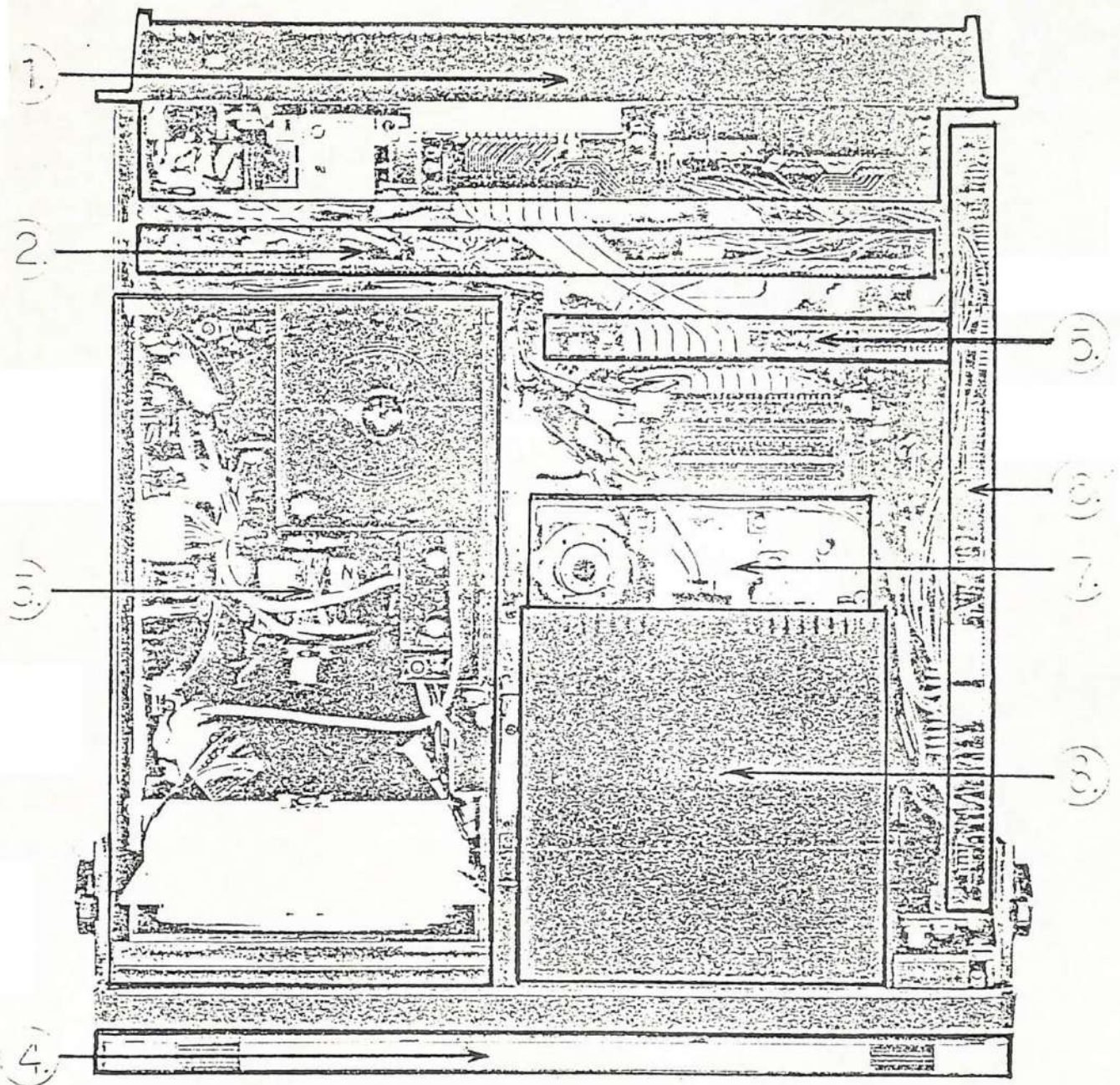


Fig. 2

How to remove the top cover assy

1. Remove six screws marked A in Fig. 1.
2. Remove two side ventilators B.
3. The top cover will come apart by removing six screws marked A (on both sides) in Fig. 2.

DETAILS OF INSIDE



1. BACK PANNEL
ASSY

2. PCB ASSY SX-64
FDD CONTROL

3. MONITOR, SX-64

4. KEY BOARD ASSY

5. PCB ASSY SX-64
I/O

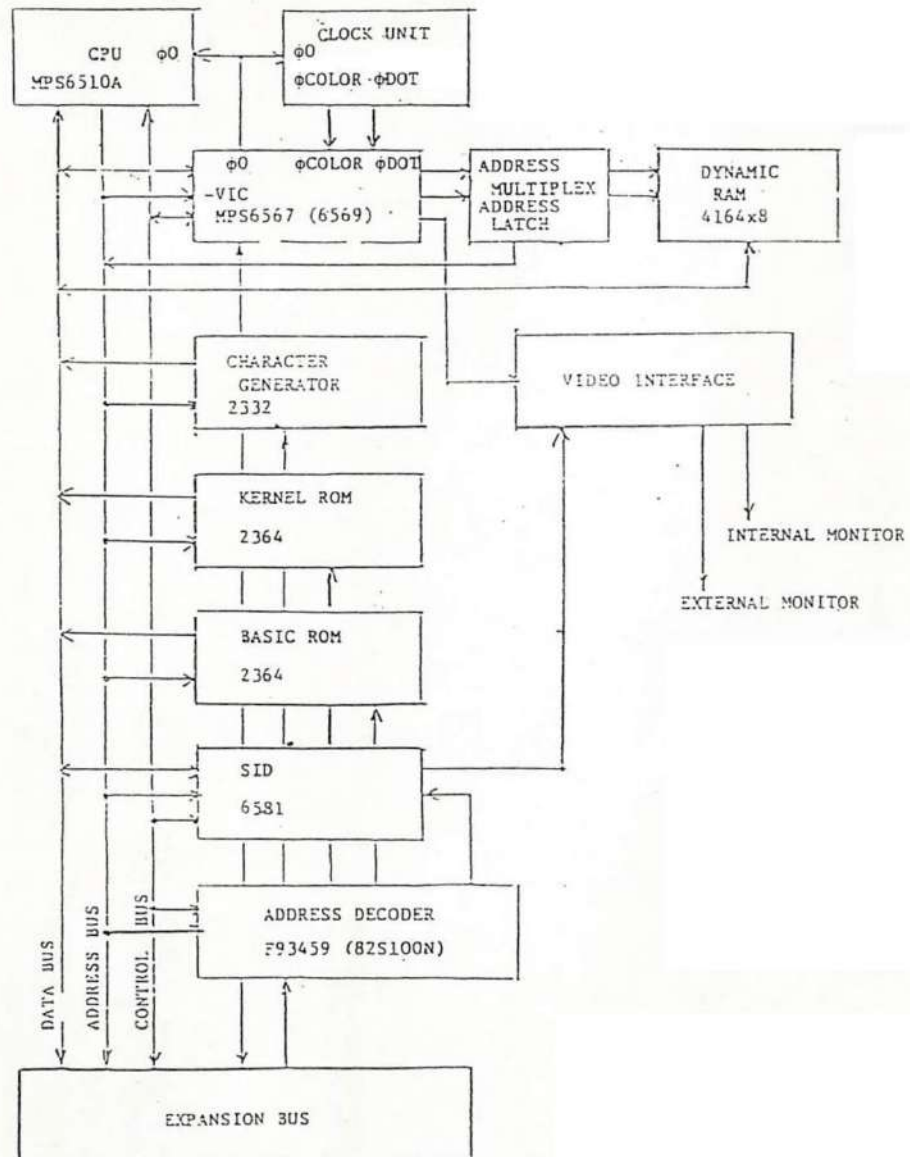
6. PCB ASSY SX-64
CPU

7. FLOPPY DISK
DRIVE

8. DISK POCKET

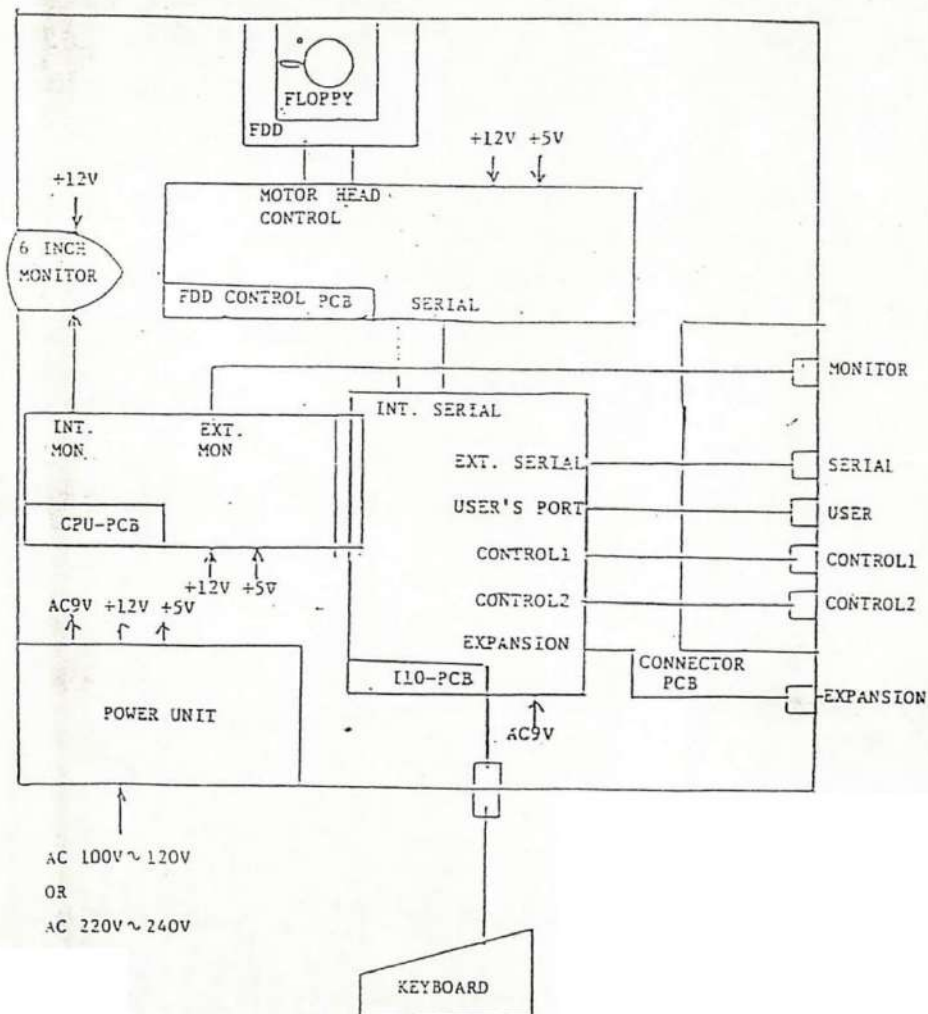
B. Operation of Each Block

B1. Internal block diagram of CPU-PCB



1. SX-64 OPERATION MANUAL

A. Block Diagram



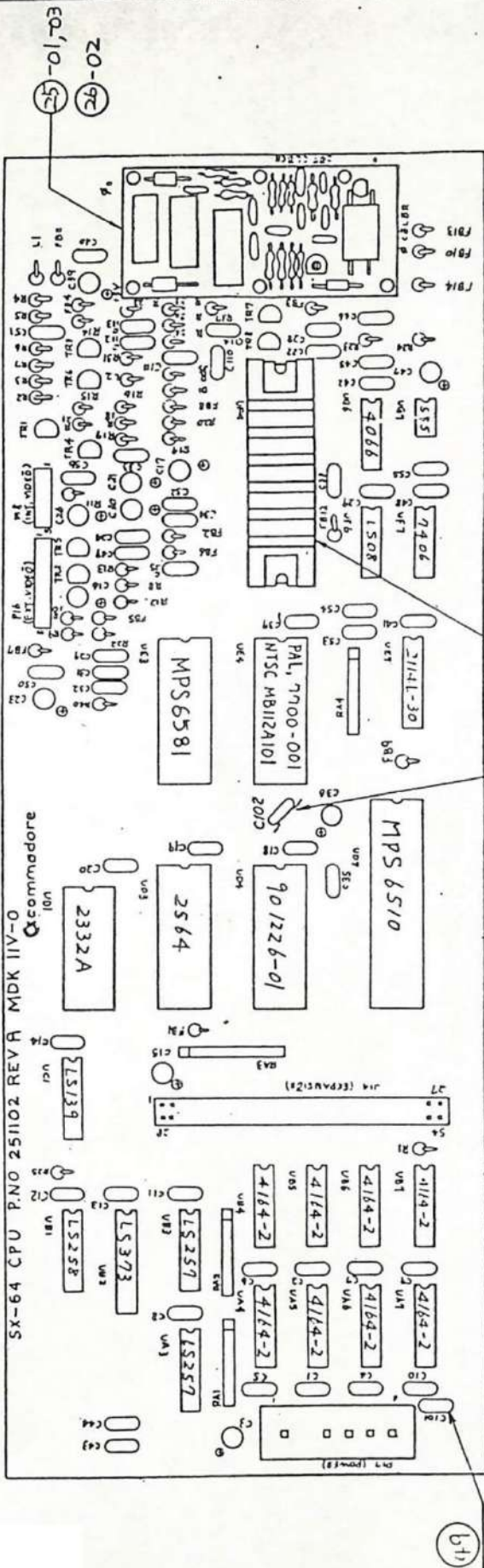
REVISIONS

DATE APPROVED

DESCRIPTION

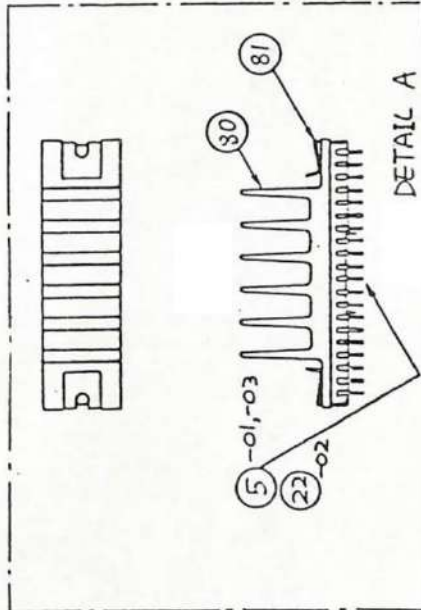
SEE SHEET

LTR ZONE



SEE DETAIL A

DETAIL



commodore

PCB ASSY,
SX-64 CPU

UNLESS OTHERWISE SPECIFIED	DRAWN BY	DATE
TOLERANCES ON DECIMALS	T. H. Schuler	7.25.83
XX XXX	CHKD: CHAS. A. B. 8/15/83	
	ENGR: J. G. 8-16-83	
	APPR: J. G. 8-27-83	
MATERIAL:	USED ON	NEXT ASSY
	SX-64	Z50619
FINISH:		

SIZE	REV
B	B
250408	
SCALE NONE	SHEET 5 OF 5

THIRD ANGLE SYSTEM DIMENSIONING

PART	DESCRIPTION
250409-01	PCB ASSY, SX-64 I/O
250409-02	PCB ASSY, SX-64 I/O FOR CSA

REVISIONS			
LTR	ZONE	DESCRIPTION	DATE APPROVED
A		PRODUCTION RELEASE	10-17-83 YGL
B		REVISED PER ECO 830484	11-22-83 YGL

1. SHEET 4 OF 4 SIZE B
 ASSY DWG
 NOTES-UNLESS OTHERWISE SPECIFIED

commodore	TITLE: PCB ASSY, SX-64 I/O	DRAWN BY: T. MIZOHATA	DATE 7/30/83	ENGR: R. G. GIBSON	DATE 7/26/83	SIZE B	DRAWING NUMBER 250409
		CHKD: C. MAGUISTA	7/15/83	APP: Y. G. L.	7/27/83		SHEET 1 OF 4

QUANTITY REQD PER PART / DASH NO.				ITEM	DS	PART NUMBER	DESCRIPTION	REF DES	BEND	NOTES
				1						
				2						
				3	C	251107-01	SCHEMATIC DIAGRAM, SX-64 I/O			
				4						
				5	B	901522-06	IC 7406 HXE INVERTER BUFFER	UD2		
				6	B	901521-06	74LS74A DUAL D-FLIP-FLOP	UE2		
				7	B	901523-03	NE5556 DUAL TIMER	UE3		
				8	B	901502-01	4066 QUAD ANALOG SW	UC1		
				9	B	906108-01	IC MPS6526 CIA	UB2, UB3		
				10						
				11	B	251108-01	CRYSTAL MODULE 60KHZ	UA1	KYDSERA	
				12						
				13	B	902671-01	TRANSISTOR 2SC945	TRI		
				14						
				15						
				16						
				17	B	251071-28	CAPACITOR CERAMIC DISK 330PF/25V IND. C7			
				18	B	251075-06	0.1μF/25V 20V C1~5, 8, 9, 10, 11			
				19	B	900100-01	ELECTROLYTIC 10μF/20V C12, C13			
				20	B	900464-36	CAPACITOR CERAMIC 0.47μF/25V C6			RADIAL
				21	B	251068-88	RESISTOR 3.3KΩ 1/4W ±5% R10, R3			
				22	B	251068-59	RESISTOR 220Ω 1/4W ±5% CARBON R1			RADIAL
				23	B	-76	1KΩ R5, R6, R7			
				24	B	-117	47KΩ R4, R11			
				25	B	251068-126	RESISTOR 100KΩ 1/4W ±5% CARBON R8			RADIAL
				26						
				27						
				28	B	902442-22	RESISTOR PARK 1KΩ 7-comp 8PIN RA1			
				29						
				30	B	325513-01	COIL INDUCTOR 2.2μH L1			RADIAL
				31						
				32	B	325563-01	FERRITE BEAD FB1~6			RADIAL
				33						
				34	B	904150-06	IC SOCKET 40PIN UB2, UB3			
				35						
				36						
				37						

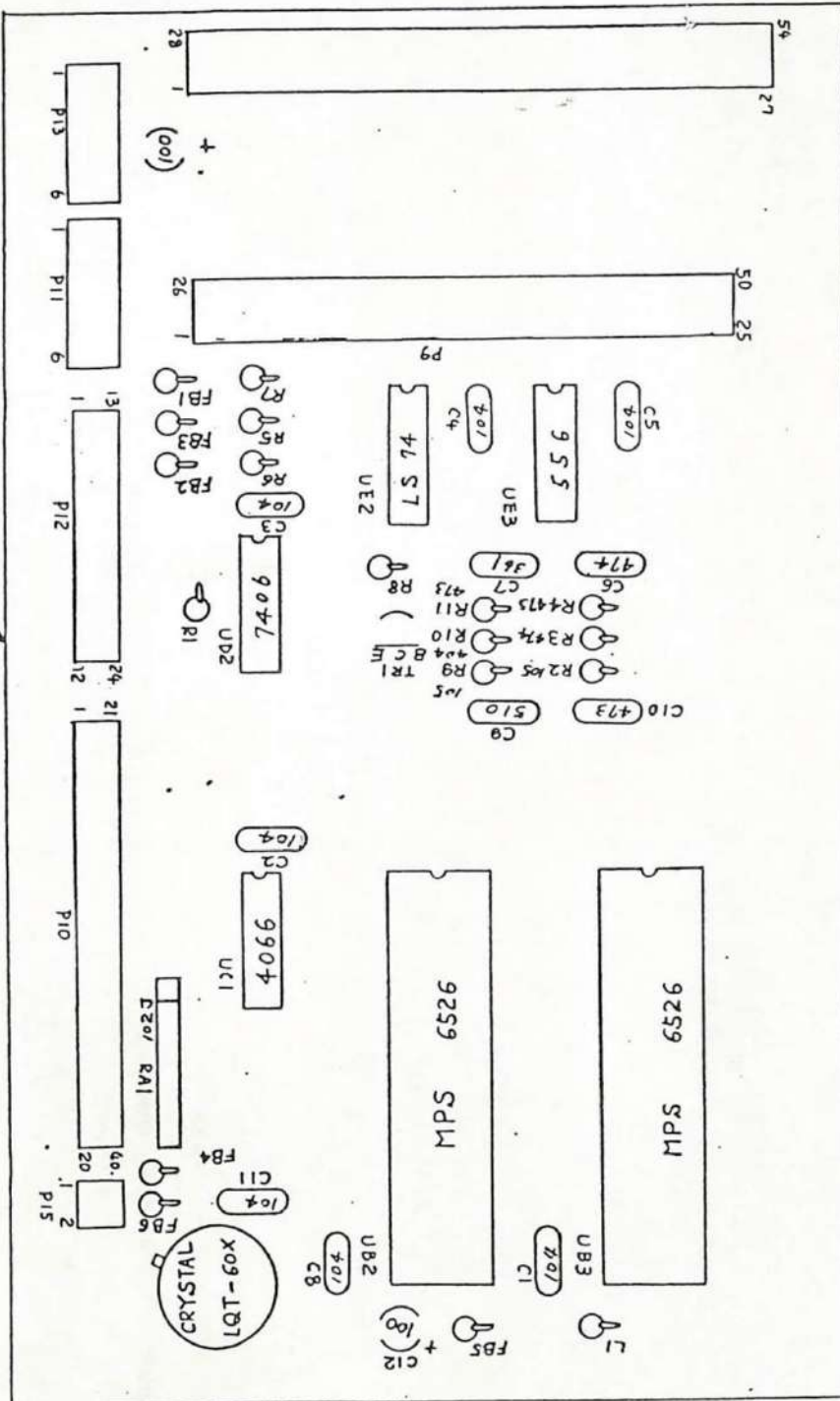
commodore	TITLE: PCB ASSY, SX-64 I/O	DRWN BY: T. M. 20	DATE: 7/30/83	ENGRI: S. J. G. 8/1/83	DATE: 8-15-83	SIZE: B	REV: B	SHT: 2/4
		CHKD: C. H. 8/1/83	APPR: 8/27/83					

QUANTITY REQD PER PART / DASH NO.			ITEM	Q	PART NUMBER	DESCRIPTION	REF DES	BEND	NOTES
			22	B	250644-06	HEADER ASSY 6P, L-ANGLE	P11, P13		MOLEX 5046-06A
			39						
			11	B	250644-02	HEADER ASSY 2P, L-ANGLE	P15		MOLEX 5046-06A
			41						
			11	B	250645-01	HEADER ASSY 24P, STRAIGHT	P12		MITSUMI
			43						
			44						
			45						
			11	B	250646-27	HEADER ASSY 54P, L-ANGLE	P14		FUJITSU FCN-725P054-AU/L
			47						
			48						
			49						
			11	B	250695-20	HEADER ASSY 40P, STRAIGHT	P10		FUJITSU FCN-724P040-AU/L
			51						
			52						
			53						
			11	B	250647-01	HEADER ASSY 50P, STRAIGHT	P9		FUJITSU FCN-724P050-AU/L
			55						
			56						
			57						
			58						
			11	B	251106-01	PCB FABRICATION, SX-64 I/D			MEIKO
			1	B	251106-02	FABRICATION, SX-64 I/D			MEIKO FOR CSA
			61	B	251436-01	ARTWORK, SX-64 I/D			
			62	B	251437-01	SILKSCREEN, SX-64 I/D			
			63	B	251438-01	PCB SOLDER MASK, SX-64 I/D			
			64						
			65						
			66						
			67						
			68						
			69						
			70						
			71						
			72						
			73						
			74						

commodore	TITLE	PCB ASSY, SX-64 I/D	DATE	ENG	DATE	SIZE	REV	SHT
			7/30/83	J. Williams	7-15-83	B	250409	B

REVISIONS		
LTR	ZONE	DESCRIPTION
		SEE SHEET 1
		DATE
		APPROVED

58-01
59-02



UNLESS OTHERWISE SPECIFIED TOLERANCES ON:		DRAWN BY: T.M. ASHATA		DATE: 7.12.83	
DECIMALS		CHKD: CHAS/KA		DATE: 8.11.83	
XXX		ENGR: R. G. H. /		DATE: 8.15.83	
X		APPR: C. J. H. /		DATE: 10.22.83	
MATERIAL:		USED ON: SX-64 250619		NEXT ASSY:	
FINISH:		SIZE: B		REV: B	
		SCALE: NONE		SHEET: 4 OF 4	

commodore

PCB ASSY, SX-64. I/O

SIZE: B
REV: B
SCALE: NONE
SHEET: 4 OF 4

PART NO.	DESCRIPTION
250410-01	PCB ASSY, SX-64 FDD CONTROL
250410-02	PCB ASSY, SX-64 FDD CONTROL FOR CSA

REVISIONS			
LTR	ZONE	DESCRIPTION	DATE
A		PRODUCTION RELEASE	10-17-83
B		REVISED PER ECO 830529	12-21-83

1. SHEET 6 OF 6 SIZE B
 ASSY DWG
 NOTES-UNLESS OTHERWISE SPECIFIED:

commodore	TITLE: PCB ASSY, SX-64 FDD CONTROL	DRAWN BY: T. MIZO HATA	DATE: 7/31/83	ENGR: R. GIERING	DATE: 8/15/83	SIZE: B	DRAWING NUMBER: 250410
		CIND: C. H. GIERING	DATE: 8/15/83	APPR: J. H. L.	DATE: 8/15/83	SHEET: 1 OF 6	

QUANTITY REQD. PER
PART / DASH NO.

ITEM	QTY	PART NUMBER	DESCRIPTION	REF DES	BEND	NOTES
37	B	900850-05	DIODE SIGNAL WQ713C	D1~1, D8, D10		
38	B	900850-01	SIGNAL IN4148			SUBSTITUTE FOR ITEM 27 RADIAL
39	B	325505-01	TRIMER HZ3C-2	D9		RADIAL
40	B	325506-01	TRIMER HZ5C-2	D7		RADIAL
41						
42	B	325566-01	CRYSTAL MODU 16MHZ ±50PPM			
43	B	325566-02	CRYSTAL MODU 16MHZ ±100PPM			SUBSTITUTE ITEM 42
44	B	325513-01	COIL INDUCTOR 22μH	L6		RADIAL
45	B	325513-02	COIL INDUCTOR 22μH	L4, 5		
46	B	325513-03	COIL INDUCTOR 100μH	L1~3		
47						
48	B	325563-01	FERRITE BEAD	FBI~10		RADIAL
49						
50	B	900100-01	CAP ELECTROLYTIC 10μF/35V	C18, 33, 33		RADIAL
51	B	900100-02	CAP ELECTROLYTIC 33μF/50V	C3		
52	B	900100-03	TANTALUM 0.47μF/25V	C31		
53	B	900403-17	CERAMIC DISC 47PF 50V	C6, 7		
54	B	251072-24	CERAMIC DISC 330PF 50V	C17		
55	B	251072-28	CERAMIC DISC 680PF 50V	C15, 12		
56	B	251072-32	CERAMIC DISC 1000PF 25V	C14, 16, 5		
57	B	251074-01	CERAMIC DISC 1000PF 25V	C9, C50		
58	B	251074-09	CERAMIC DISC 0.022μF/25V	C10, 11		
59	B	251075-06	CAP CERAMIC DISC 0.1μF 25V	C1, 2, 4, 8		13 22, 23, 24, 25, 26, 27, 28 29, 30
60						38 39, 40 41, 34, 19, 20, 21
61	B	904150-06	IC SOCKET 40PIN	C35, 36, 37		6502-1, 6502-2, PLA-1 (WFS, UBC3)
62	B	904153-03	IC SOCKET 24PIN	U8C4, U8C5		2364-1, 2016-1
63	B	904153-04	IC SOCKET 28PIN	UA4, UA1		2364-1
64	B	250644-06	HEADER ASSY 4P, L-ANGLE	UA3		MULEX 5046-06A
65	B	250644-02	HEADER ASSY 2P, L-ANGLE	P19		MULEX 5046-02A
66	B	250644-01	HEADER ASSY 5P, L-ANGLE	P22		MURSE HIF3G-SP-2.54DS
67	B	250644-15	HEADER ASSY 15P, L-ANGLE	P20		MULEX 5046-15A
68	B	250643-06	HEADER ASSY 4P, STRAIGHT	P21		MULEX 5046-06A
69				P23		
70						
71						
72						

commodore

PCB ASSY, SX-64 FDD CONTROL

DRAWN BY:
T. HAZAROTA

CHKD: CHAWATATA

ENGR: J. GIBBING

DATE: 8-16-83

SIZE: B

REV: B

SHT: 3

250410

QUANTITY REQD PER PART / DASH NO.				ITEM	Q	PART NUMBER	DESCRIPTION	REF DES	BEND	NOTES
				1	73	B	251068-42	RESISTOR 47Ω 1/4W ±5% CARBON R50		RADIAL
				4	74	↑	-55	R21.22.37.38		
				3	75		-59	R19.20.33		
				3	76		-63	R23.24.36		
				2	77		-64	R28.31		
				6	78		-67	R5.7.8.13.	26	27
				1	79		-68	R29		
				2	80		-71	R1.6		
				9	81		-76	R35.40.41	42	43
				1	82		-80	R4		46. 47. 48. 49
				1	83		-101	R44		
				6	84		-84	R9.12.14.24	25	
				4	85		-109	R2.15.16.30		
				1	86	↓	-126	R39		
				1	87		251068-51	100Ω 1/4W ±5% CARBON R45		
				1	88		251265-49	91Ω 1/4W ±1% METALOXIDE R3		
				1	89		-51	R11		
				1	90		-55	R10		
				2	91	↓	-99	RESISTOR 91kΩ 1/4W ±1% METALOXIDE R7.18		RADIAL
				1	92	B	251265-98	8.2kΩ 1/4W ±5% CARBON R32		
				93						
				94						
				1	95	B	251109-01	PCB FABRICATION, SX-64 FDD		FOR CSA
				1	96	↑	251109-02	PCB FABRICATION, SX-64 FDD		
				1	97		251433-01	PCB ARTWORK, SX-64 FDD		
				1	98	↓	251434-01	PCB SILK SCREEN, SX-64 FDD		
				1	99	B	251435-01	PCB SOLDER MASK, SX-64 FDD		
				100						
				101						
				102						
				1	103	B	251584-08	WRAPPING WIRE AWG28 L=45MM		
				1	104	B	251584-09	WRAPPING WIRE AWG28 L=95MM		
				105						
				106						
				107						
				108						

commodore

PCB ASSY. SX-64 FDD CONTROL

TITLE

DATE

DATE

DATE

SIZE

250410

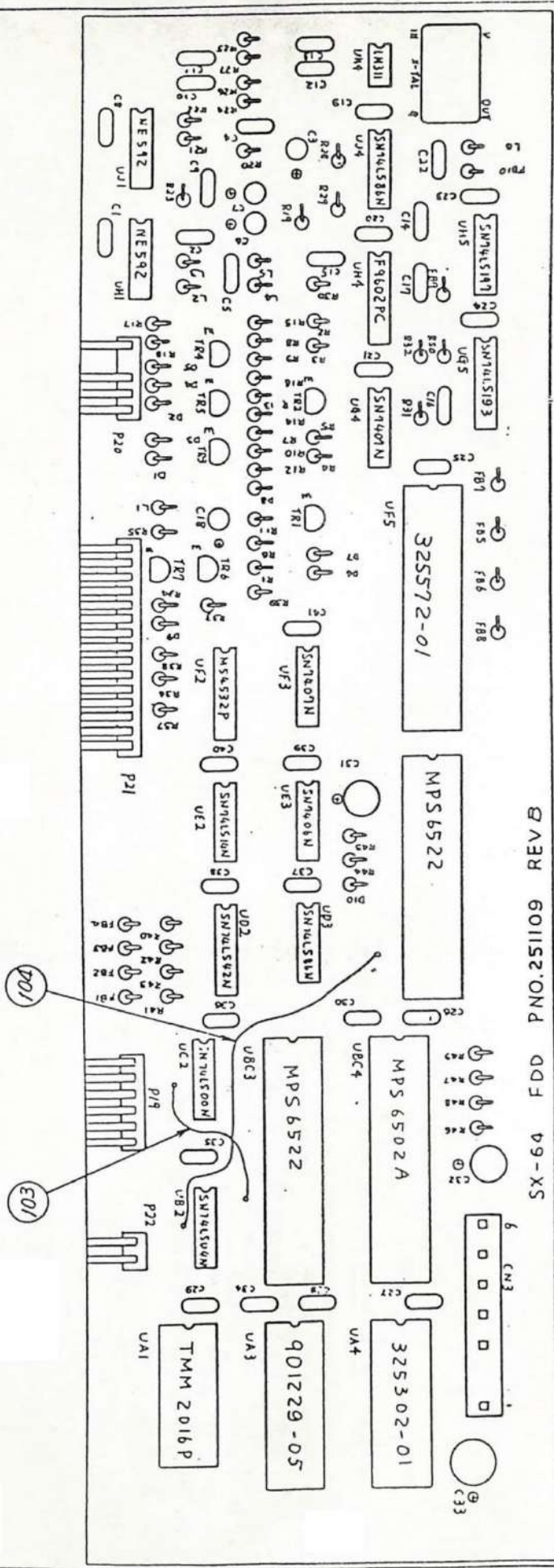
REV

SHEET

B 4 6

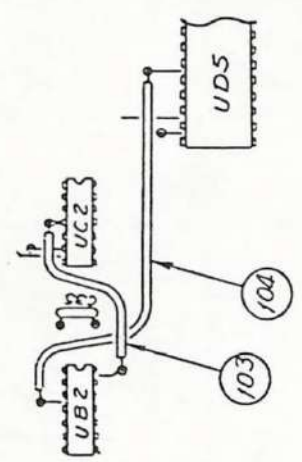
QUANTITY REQUIRED PER PART/DASH NO.			ITEM	OS	PART NUMBER	DESCRIPTION	REF DES	BEND	NOTES
		0201							
			109	B	901521-04	IC 74LS04 HEX INVERTER	UF3		SUBSTITUTE FOR ITEM 35
			110	B	901522-19	IC 7414 HEX SCH INVERTER	UF3		SUBSTITUTE FOR ITEM 35
			111	B	901521-30	IC 74LS14 HEX SCH INVERTER	UF3		SUBSTITUTE FOR ITEM 35
			112						
			113	B	901522-05	IC 7404 HEX INVERTER	UB2		SUBSTITUTE FOR ITEM 13
			114	B	901522-19	IC 7414 HEX SCH INVERTER	UB2		SUBSTITUTE FOR ITEM 13
			115	B	901521-30	IC 74LS14 HEX SCH INVERTER	UB2		SUBSTITUTE FOR ITEM 13
			116						
			117						
			118	B	900850-02	DIODE SIGNAL 1S2473	DI-6,8,10		SUBSTITUTE FOR ITEM 37
			119	B	-07	1S 953 (3)			
			120	B	-08	1S 953 (7)			
			121	B	900850-14	DIODE SIGNAL 1S1588	DI-6,8,10		SUBSTITUTE FOR ITEM 37
			122						
			123						
			124						
			125						
			126						
			127						
			128						
			129						
			130						
			131						
			132						
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			142						
			143						
			144						
			145						
			146						
commodore			TITLE: PCB ASSY, SX-64 FDD CONTROL				DRAWN BY: R. Jida		
							DATE: 12-20-83		
							ENGR: APPR:		
							SIZE: B		
							DRAWING NUMBER: 250410		
							SHEET: 3 OF 3		
							REV: B		

REVISIONS			DATE		APPROVED	
LTR	ZONE	DESCRIPTION	SEE SHEET			



SX-64 FDD PNO.251109 REV.B

DETAIL OF ITEM 103 & 104 SOLDERING



UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: DIMENSIONS IN INCHES DECIMALS .XXX FRACTIONS XX/100		DRAWN BY: T. H. B. J. H.		DATE: 7/12/83
CHECKED: G. J. H. J. H.		ENGR: G. J. H. J. H.		8/15/83
APPROVED: J. H. J. H.		DATE: 8-15-83		4-27-83
USED ON: SX-64		NEXT ASSY: 250410		REV: B
MATERIAL:		FINISH:		SCALE: NONE
				SHEET 6 OF 6

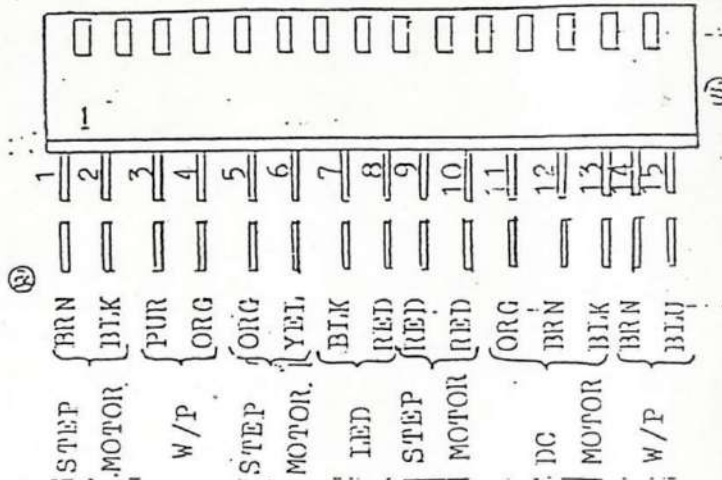
commodore
PCB ASSY,
SX-64 FDD CONTROL

SCALE NONE SHEET 6 OF 6

Control Line

FUNCTION

Nail to lock

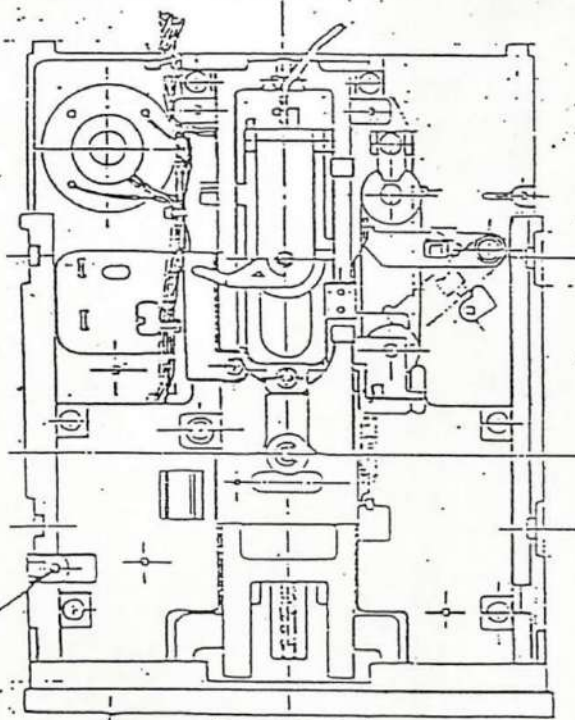


DC MOTOR

BLK RETURN
BRN +12V
ORG MOTOR ON

STEP MOTOR

RED +12V
RED +12V
YEL C
ORG A
BLK B
BRN D



W/P

TRANSISTOR

ORG(+)
PUR(-)

DIODE

BRN(+)
BLU(-)

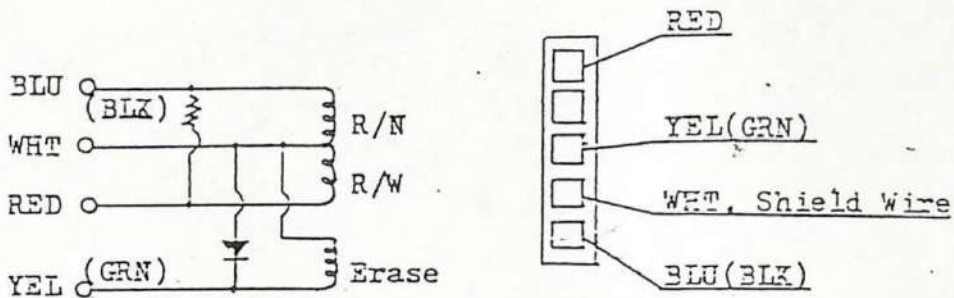
LED

RED(+)
BLK(-)

※ Recommended connector
Molex 5045NA 5046NA
5045NA

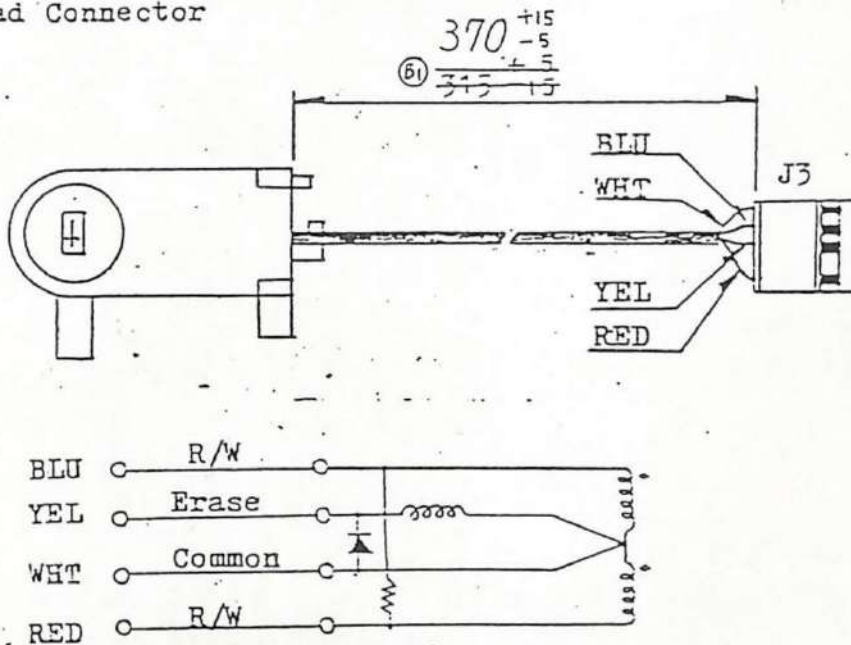
APPO.	CHKD.	DSCD.	TITLE
		Jul 22 '81	
		Y. H. H.	
DOC. NO.			
PAGE	SYMB.	DATE	APPO. CHKD. DSCD.

Connector Pin

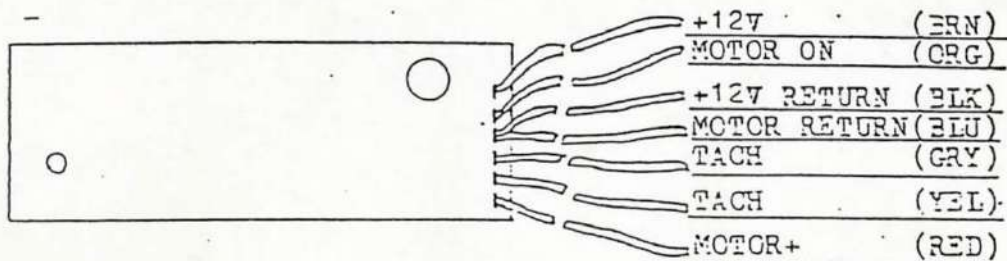


Housing
Hirose HIF3G-5S-254C
Terminal
Hirose HIF3-242ESCF

Head Connector



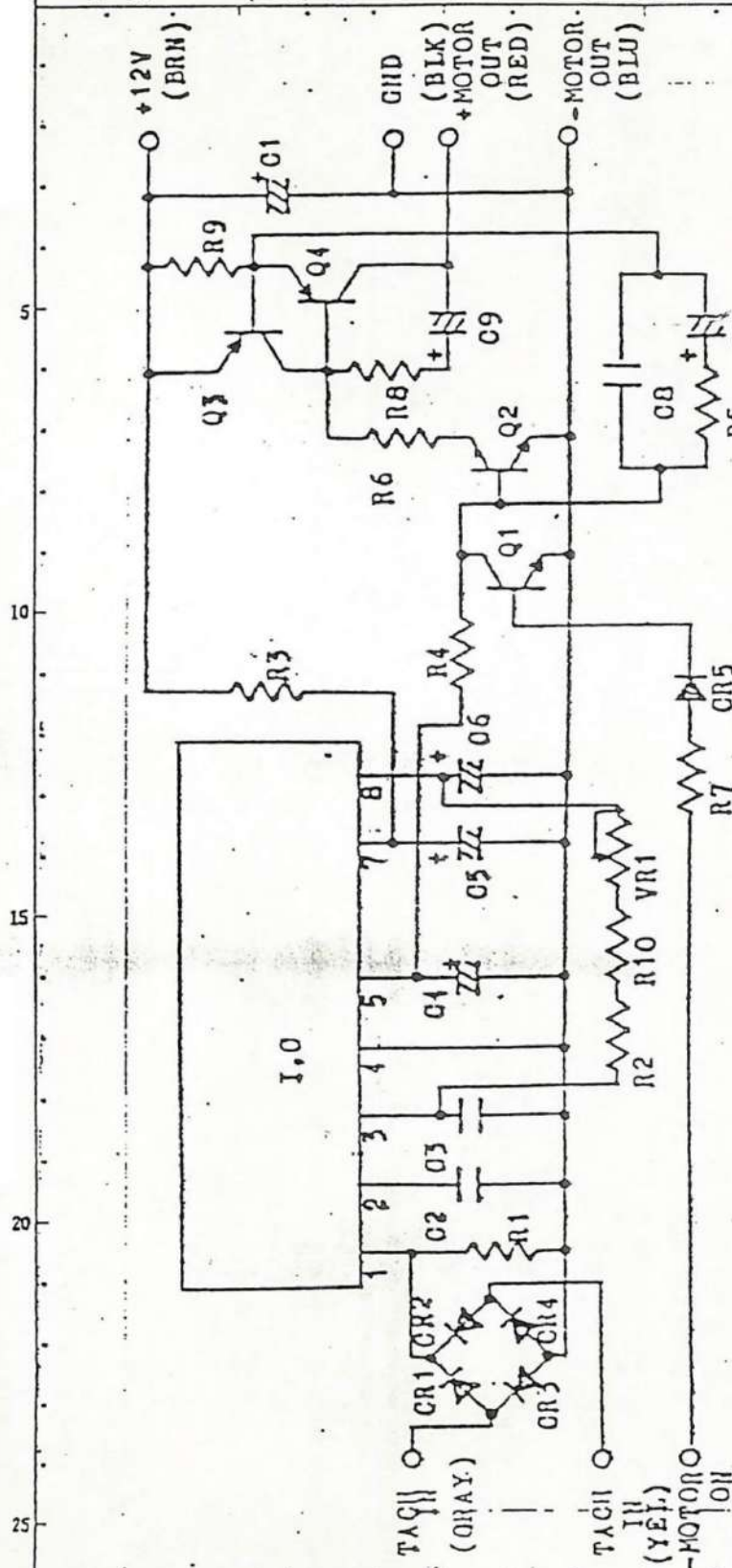
DC Motor Control P.C.B



CLASS. NO.

TITLE

Motor control assembly



Symbol	Description	Symbol	Description
I,0	CX-065B	R8	Resistor, 150 Ω /4W
Q1	Transistor	R9	Resistor, 0.68 Ω 2W
Q2	Transistor	R10	Resistor, 5.1K Ω /5W
Q3	Transistor	VR1	Variable Resistor, 20K Ω
Q4	Transistor	C1,5,6	Capacitor, 10 μ F35V
CR1,2,3,4,5	Diode	C2	Capacitor, 0.0047 μ F50V
R1,7	Resistor, 1K Ω /4W	C3	Capacitor, 0.033 μ F50V
R2	Resistor, 68K Ω /4W	C4,9	Capacitor, 0.47 μ F35V
R3	Resistor, 220 Ω /4W	C7	Capacitor, 2.2 μ F16V
R4	Resistor, 3.3K Ω /4W	C8	Capacitor, 0.068 μ F50V
R5	Resistor, 2.7K Ω /4W		
R6	Resistor, 820 Ω /4W		

PAGE SYMB. DATE APPD. CHKD. DSGD.

APPD.

CHKD.

DSGD.

TITLE

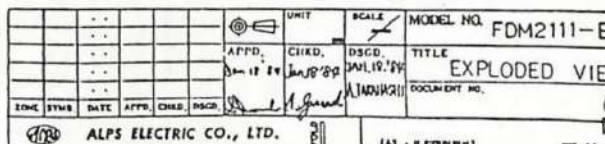
DOCUMENT NO.



ALPS ELECTRIC CO., LTD.

(株)アルプス電気

2089 A 4 32 4 300 3



NO.	PART NO.	NAME	NO.	PART NO.	NAME	NO.	PART NO.	NAME
1	BH212-A	Door Assy.	25	HY616	Guide Shaft Keeper	49	GR123	Band
2	HY623	Collar	26	EY142	Guide Shaft	50	QY153-A	Stepper Assy.
3	WS114	Clamp Spring	27	HY712	Hinge Spring	51		
4	GW115	Wave Washer	28	BG111	LED Holder	52		
5	GW114	Thrust Washer	29	BH131	Front Panel	53		
6	BJ122-A	Collet Assy.	30	2A121064	Screw	54		
7	WS142	Hub Spring	31	DE111-AG	LED Assy.	55		
8	BJ112	Hub	32	BG211	LED Holder Ring	56		
9	EY114	Hub Shaft	33	VY119	Housing	57		
10	WS171	Door Spring	34	GR134	Steel Belt	58		
11	2LO03001	E-Washer	35	GW118	Washer	59		
12	GR111	Drive Belt	36	QY124-D	Head Assy.	60	2A271030	Screw
13	HY581	Hub Support	37	2A331050	Screw	61	2LFD0011	Washer
14	FY117	Hub Frame	38	WS157	Eject Spring	62		
15	2A151040	Screw	39	HY532-A	Eject Assy.	63		
16	2G102602	Washer	40	GW123	Poly Slider	64		
17	HY582-A	Arm Support Assy.	41	2A341060	Screw	65		
18	2A132040	Screw	42	HY551	Carriage Stopper	66	2M313001	C-Washer
19	HY625	Collar	43	BG262-A	Disk Guide-R Assy.	67	GP114	Eject Pin
20	2A131050	Screw	44	PY133AA	Motor Control P.C.B	68		
21	BG261-AL	Disk Guide-L Assy.	45	GR152	Cord Holder	69		
22	EY182	Spindle Unit	46	UP512	Spindle Pulley	70		
23	GU127	Spindle Bearing	47	GT111	Tacho Disk	71	JS482	Pad Holder
24	UP533-A	Tension Pulley Assy.	48	QY112	D.C Motor	72	GS112	Pressure Pad
						73	2A151030	Screw

UNIT		SCALE	MODEL NO.	FDM2111 -B4
APPD.	CHKD.	DSCD.	TITLE	EXPLODED VIEW
Jan 18 '84	Jan 18 '84	Jan 18 '84	DOCUMENT NO.	(2/2)
ZONE	SYMB.	DATE	APPD.	CHKD.

1, specifications

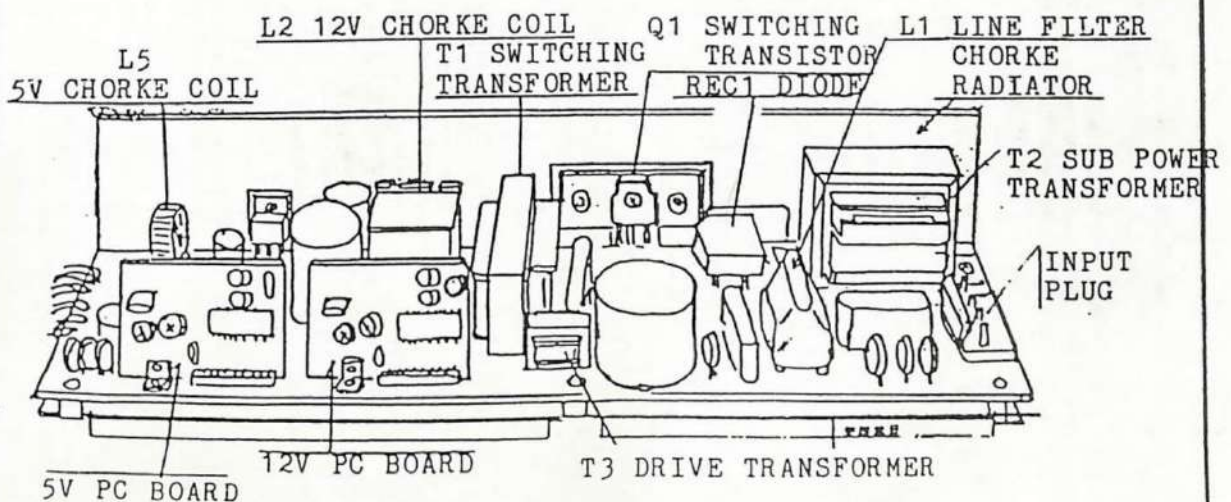
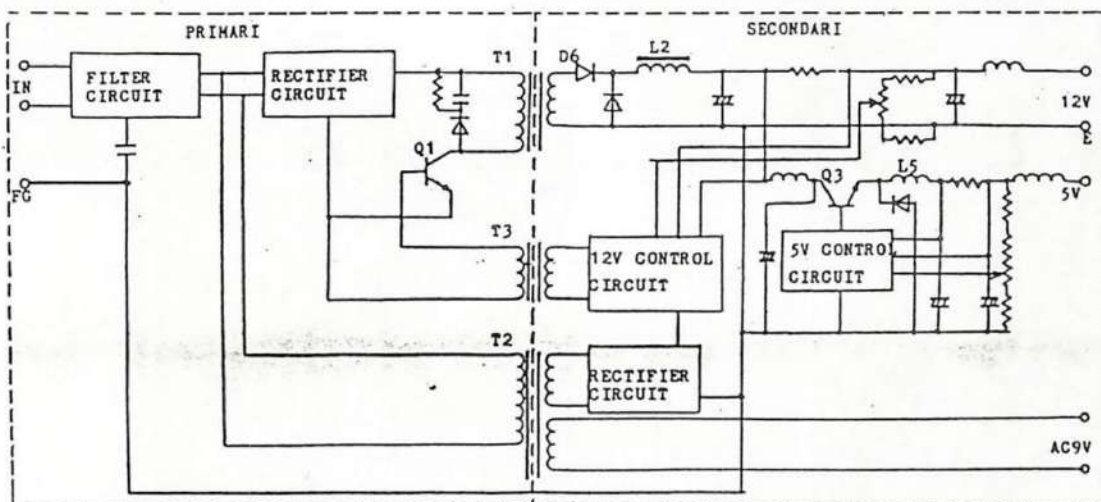
1-1 INPUT

1-1-1	VOLTAGE	AC 230V 10% 50.60Hz
1-1-2	POWER	75W typ
1-1-3	SURGE CURRENT	.25A max

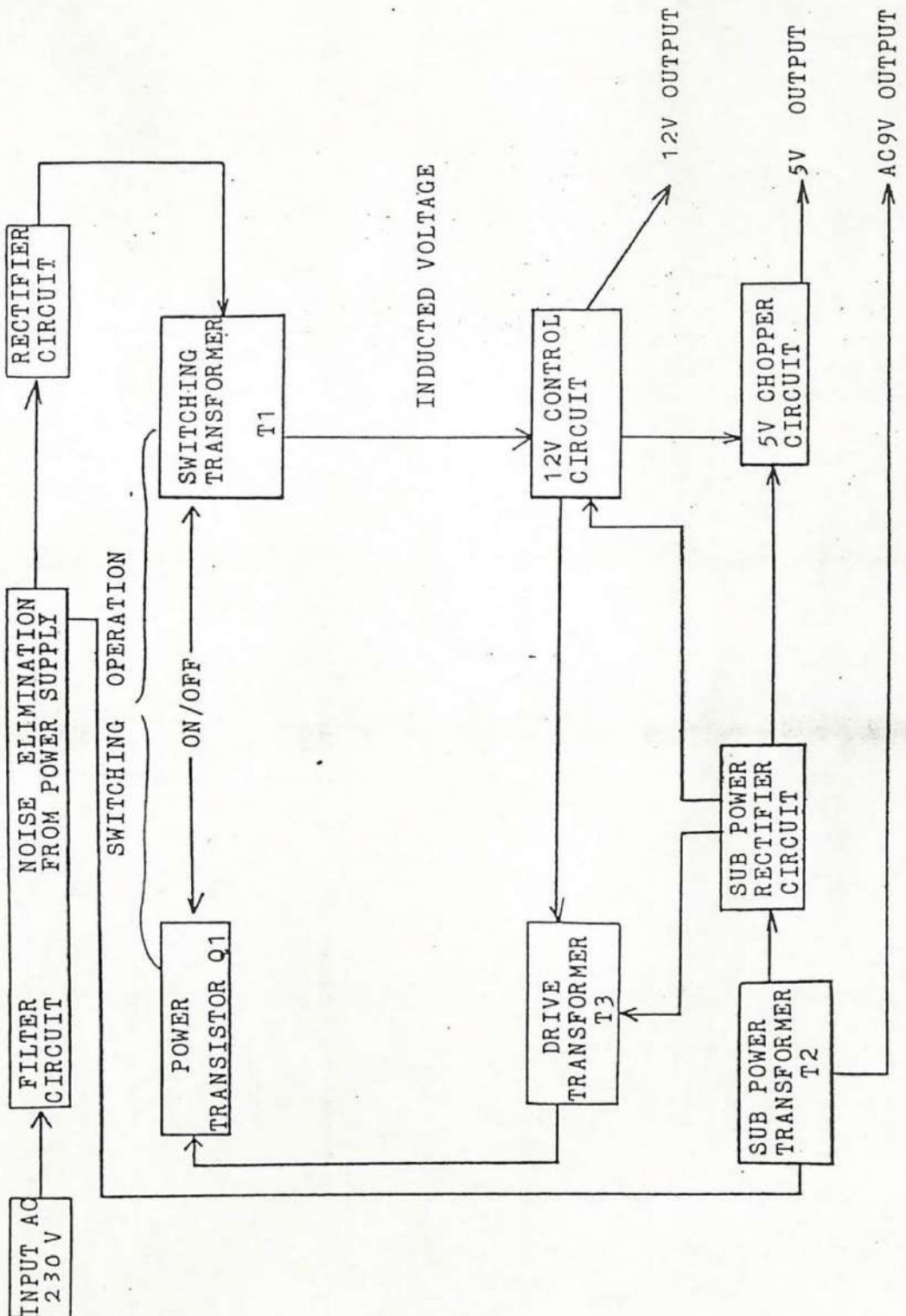
1-2 OUTPUT

1-2-1	VOLTAGE	5V 2% , 12V 2% , AC9V 3%
1-2-2	CURRENT	5V;3.15A , 12V;2.76A , AC9V;200mA
1-2-3	VARIATION	5V 3% , 12V 5% , AC9V 15%
1-2-4	RIPPLE	5V; 150mV(p-p) , 12V; 290mV(p-p)
1-2-5	OVER CURRENT PROTECTION	5V ; 3.6~4A 12V ; 3.6~4A

2, CIRCUIT



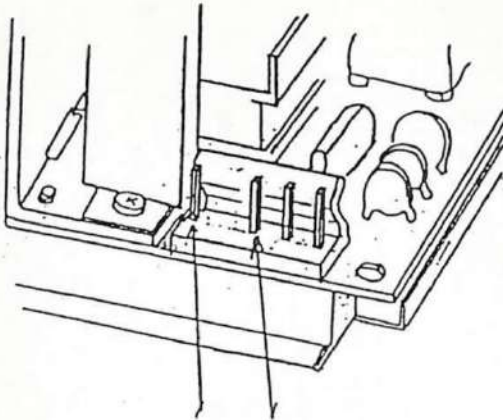
BLOCK DIAGRAM



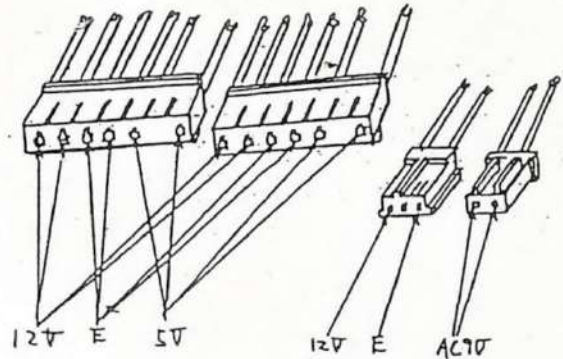
3, ALIGNMENT INSTRUCTION

1.INPUT OUTPUT CONNECTION

INPUT

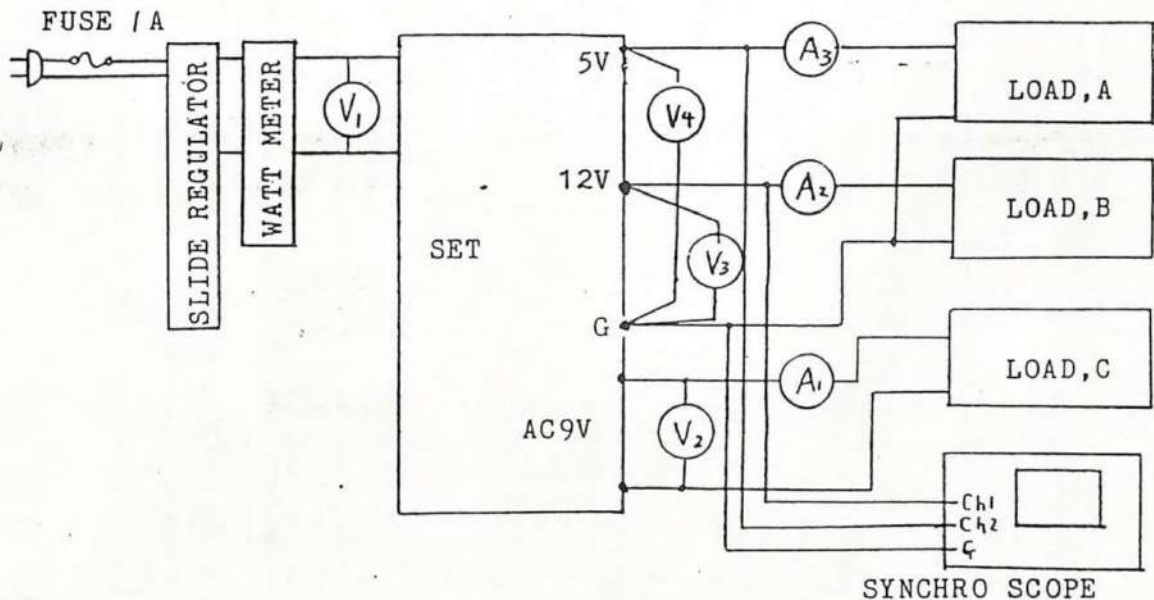


OUT PUT



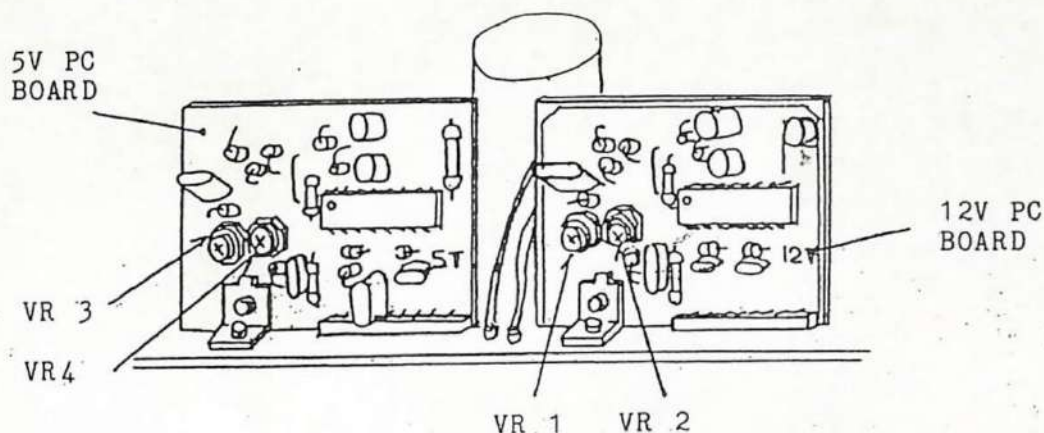
IN PUT 230V 50/60Hz

CONNECT :ON



- 1) SLIDE REGULATOR
- 2) WATT METER
- 3) LOAD A, B
- 4) V1
- 5) V2
- 6) V3
- 7) V4
- 8) A1
- 9) A2, 3
- 10) LOAD C

AC 220~240V
 AC WATT METER TYP 75W
 ELECTRONIC LOAD TYP 12V, 5A
 AC VOLTAGE METER TYP 120V 240V
 AC VOLTAGE METER TYP 9V
 DC VOLTAGE METER TYP 12V
 DC VOLTAGE METER TYP 5V
 AC CURRENT METER TYP 200mA
 DC CURRENT METER TYP 3A
 SLIDE RESISTOR TYP 45Ω

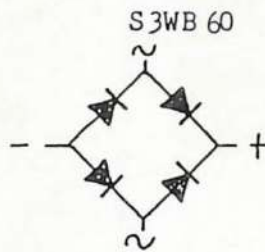


Step	Item	Remarks For Adjustment
1	Connection	Connect the SET as Per SKETCH 6
2	Volume (VR)	Turn VR1,VR2,VR3,VR4 on PC Board for 5V,12V Till the End in Clockwise Rotation
3	AC Power ON	Set Slide Reguleter at $\frac{1}{230}$ V and AC Power ON
4	Rated Current Setting	Set Circuit Loaded as Belows 1) Load A DC 5V 3.15A 2) Load B DC 12V 2.76A 3) Load C AC 9V 200mA
5	Output Voltage Adjustment	Adjust VR2 and VR4 then Set in the Range of the Following Voltage 1) DC 5V (VR4) 4.970~5.030V 2) DC 12V (VR2) 11.950~12.050V
6	Operation of Over-Current Protection and Adjustment of the Point	Adjust and Set VR1,VR3 to Operate Over-Current Protection at the Following Values 1) DC 5V (VR3) 3.6~4A 2) DC 12V (VR1) 3.6~4A

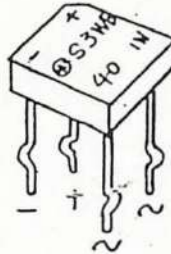
TRUBLE	CHECK POINT	CAUSES AND TEST	SOLUTION
NO OUTPUT	SOME SCRAP INSIDS	SHORT CIRCUIT BIY SCRAP <u>YES</u>	CLEANING
	OK		
NO AC 9V OUTPUT	SUPPLEMENTARY CIRCUIT	T2 TRANSFORMER SHORT OR OPEN <u>YES</u> T2 PRIMARY LEAD WHITE TO WHITE 160~200 Ω SECONDARY LEAD RED TO RED 9~12 Ω SECONDARY LEAD BLUE TO BLUE 3.2~3.7 Ω	CHANGE T2
	OK		
IN CASE OF REC1 SHORT FUSE IS CUT	CHECK BRIDGH DIODE	REC2 S1VB-10 DIODE RECTIFIED VOLTAGE DC 12~15V REC1 S3WB40 SHORT OR OPEN <u>YES</u>	CHANGE REC1
	OK		
IN CASE OF Q1 SHORT FUSE IS CUT	CHECK SWITCHING TRANSISTOR	Q1 2SC2792 SHORT OR OPEN <u>YES</u>	CHANGE Q1
	OK		
	CHECK HIGH-SPEED RECTIFY DIODE	D6 ESAC85-009 SHORT OR OPEN <u>YES</u>	CHANGE D6
	OK		
12V CONTROL CIRCUIT		CHECK BETWEEN COLLECTOR AND EMITTER OF 2SC2792 IN Q1 BY SYNCHRO-SCOPE <u>NO</u>	CHANGE A BOARD OF 12V CONTROL
		12V OUTPUT ADJUSTMENT SHIFT <u>YES</u>	RE-ALIGNMENT
5V output ONLY NO OUTPUT	CHECK SWITCHING TRANSISTOR	Q3 2SC2334 SHORT OR OPEN <u>YES</u>	CHANGE Q3
	OK		
	CHECK DRIVE TRANSISTOR	Q4 2SA1020-0orY SHORT OR OPEN <u>YES</u>	CHANGE Q4
	OK		
	CHECK HIGH-SPEED RECTIFY DIODE	D7 ESAC82-004 SHORT OR OPEN <u>YES</u>	CHANGE D7
	OK		
5V CONTROL CIRCUIT		CHEC BETWEEN EMITTER OF 2SC2334 AND GRUND IN Q4 BY SYNCHRO-SCOPE <u>NO</u>	CHANGE A BOARD OF 5V CONTROL
		5V OUTPUT ADJUSTMENT SHIFT <u>YES</u>	RE-ALIGNMENT

5, SEMICONDUCTOR OUTSIDE APPEARANCE

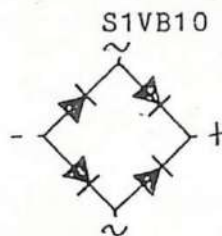
1, REC1



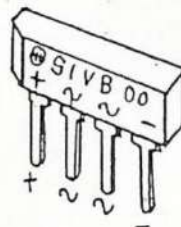
RECTIFIER STACKS DIODES



2, REC2



RECTIFIER STACKS DIODES



3, D1

ERB28-08

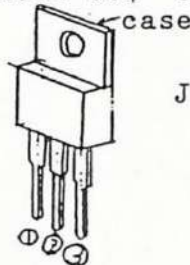
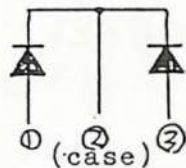


FAST RECOVERY DIODES



4, D6,7

ESAC85-009 , ESAC82-004 SCHOTTKY BARRIER DIODES

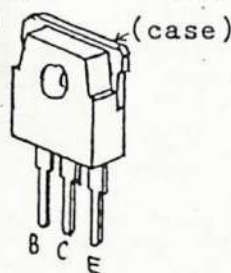
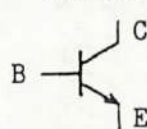


JEDEC:TO-220AB

5, Q1

2SC2C2792or3351

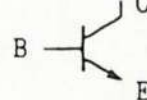
POWER TRANSISTOR



6, Q3

2SC2334

POWER TRANSISTOR



JEDEC:TO-220AB

7, Q4

2SA1012

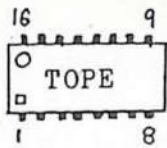
TRANSISTOR



8, IC1,2

MB3759

INTEGRATED CIRCUITS



Symbol	Part, No	Part Name	Description	Safety Part	Service Part
C21	68-0343F	CEE102A10V	CEE CAPACITOR		
C22	68-2701K	CMP224A63K-N	CMP CAPACITOR		
C23	68-27080	CPS104A50K-N	CPS CAPACITOR		
C24	68-0343F	CEE102A10V	CEE CAPACITOR		
C25	68-27080	CPS104A50K-N	CPS CAPACITOR		
C27	68-0341E	CEE479A50V	CEE CAPACITOR		
C28	68-2708I	CPS103A50K-N	CPS CAPACITOR		
C29	68-0341F	CEE100A50V	CEE CAPACITOR		
C30	68-2708F	CPS332A50K-N	CPS CAPACITOR		
C31	68-0341E	CEE479A50V	CEE CAPACITOR		
C32	68-2708I	CPS103A50K-N	CPS CAPACITOR		
C33	68-27080	CPS104A50K-N	CPS CAPACITOR		
C34	68-0341E	CEE479A50V	CEE CAPACITOR		
C36	68-2811G	CC472A2500Z	CC CAPACITOR		
C37	68-2811G	CC472A2500Z	CC CAPACITOR		
C40	68-0341F	CEE100A50V	CEE CAPACITOR		
C41	68-27080	CPS104A50K-N	CPS CAPACITOR		
RESISTORS					
Part Name.with RD:Carbon Resistor					
Part Name.with SRM:Metal Oxide Film Resistor					
R1	68-2503K	8D-13	POWER SHERMISTOR	!	0.5%
R2	68-4951Y	SRM15K-J3A	SRM RESISTOR	!	
R3	68-4943Y	SRM100-J2A	SRM RESISTOR	!	
R4	68-0332Y	RD22-J1/2A	RD RESISTOR	!	
R5	68-4937A	SRM10-J1A	SRM RESISTOR	!	
R9	68-4937A	SRM10-J1A	SRM RESISTOR		
R10	68-4937A	SRM10-J1A	SRM RESISTOR		
R11	68-0353A	MANGANEN WIRE			
R12	68-0299V	RD30K-J1/4D	RD RESISTOR		
R13	68-0298M	RD1K-J1/4D	RD RESISTOR		
R14	68-0299C	RD4.7K-J1/4D	RD RESISTOR	!	
R15	68-0298R	RD1.6K-J1/4D	RD RESISTOR	!	
R16	68-0297S	RD150-J1/4D	RD RESISTOR		
R17	68-0280S	RD820-J1/4B	RD RESISTOR		
R18	68-4937A	SRM10-J1A	SRM RESISTOR		
R19	68-0299V	RD30K-J1/4D	RD RESISTOR		
R20	68-0353A	MANGANEN WIRE			
R21	68-0298M	RD1K-J1/4D	RD RESISTOR		
R22	68-0298Y	RD3.3K-J1/4D	RD RESISTOR		
R24	68-0298V	RD2.4K-J1/4D	RD RESISTOR		
R25	68-0281K	RD4.7K-J1/4B	RD RESISTOR	!	
R26	68-0281S	RD10K-J1/4B	RD RESISTOR	!	
R27	68-0300Y	RD470K-J1/4D	RD RESISTOR	!	
R30	68-0299Q	RD18K-J1/4D	RD RESISTOR		
R31	68-0299G	RD6.8K-J1/4D	RD RESISTOR		
R32	68-0300I	RD100K-J1/4D	RD RESISTOR		
R33	68-4937A	SRM10-J1A	SRM RESISTOR		
R34	68-0298S	RD1.8K-J1/4D	RD RESISTOR		
R35	68-0281M	RD5.6K-J1/4B	RD RESISTOR		
R36	68-0281M	RD5.6K-J1/4B	RD RESISTOR		
R37	68-0300I	RD100K-J1/4D	RD RESISTOR		
R38	68-0299V	RD30K-J1/4D	RD RESISTOR		
R40	68-0299M	RD12K-J1/4D	RD RESISTOR		
R41	68-0298A	RD330-J1/4D	RD RESISTOR		

使用番号

/0, PARTS LIST

Symbol	Part, No	Parts Name	Description	Safety Parts	Service Parts
TRANSFORMERS & COILS					
T1	68-4090A	SWITCHING TRANSFORMER		!	0.5%
T2	68-1110A	SUB POWER TRANSFORMER		!	
T3	68-0854A	DRIVE TRANSFORMER		!	
L1	68-1606D	UF2327F	LINE FILTER CHORKE		
L2	68-1366D	SKU-33-B8	CHORKE COIL		
L3	68-0306A	5MH	CHORKE COIL		
L4	68-0013B	FN-R8S	CHORKE COIL		
L5	68-1351A	SK11-2-100	CHORKE COIL		
L6	68-0306A	5MH	CHORKE COIL		
TRANSISTORS & DIODES					
Symbol No. with Q: Transistor			Symbol No. with REC: Diode		
Symbol No. with D: Diode					
Q1	68-2056F	2SC2792 or 3551	SWITCHING TRANSISTOR	!	0.5%
Q3	68-0040C	2SC2334-K	SWITCHING TRANSISTOR		0.2%
Q4	68-2001A	2SA1020-0,Y	TRANSISTOR		0.1%
REC1	68-0345F	S3WB-60	DIODE	!	0.1%
REC2	68-2254A	S1VB-10	DIODE		0.1%
D1	68-2034C	ERB28-08	DIODE		0.1%
D6	68-0035D	ESAC-85-009	DIODE		0.1%
D7	68-0035B	ESAC-82-004	DIODE		0.1%
ICs					
IC1	68-1912A	MB3759	IC	!	0.1%
IC2	68-1912A	MB3759	IC	!	0.1%
CAPACITORS					
Part Name. with CC: Ceramic Capacitor					
Part Name. with CMP: Metallized Polyester Film Capacitor					
Part Name. with CPS: Polyester Film Capacitor					
Part Name. with CEE: Aluminum Electolytic Capacitor					
C1	68-2712I	CMP224A250K-N	CMP CAPACITOR	!	
C2	68-2811D	CC102A2500K	CC CAPACITOR	!	
C3	68-2811D	CC102A2500K	CC CAPACITOR	!	
C4	68-2811E	CC222A2500M	CC CAPACITOR	!	
C5	68-2811E	CC222A2500M	CC CAPACITOR	!	
C6	68-2712G	CMP104A250M	CMP CAPACITOR	!	
C7	68-2610D	CEE221D400R	CEE CAPACITOR	!	
C8	68-2709S	CMP104A630K-N	CMP CAPACITOR	!	
C9	68-2812A	CC221A1000K	CC CAPACITOR	!	
C11	68-0341R	CEE101A35V	CEE CAPACITOR		
C12	68-28140	CC222A2000K	CC CAPACITOR		
C13	68-28140	CC222A2000K	CC CAPACITOR		
C14	68-2610B	CEE472D25Q	CEE CAPACITOR		
C15	68-2701K	CMP224A63K-N	CMP CAPACITOR		
C16	68-27080	CPS104A50K-N	CPS CAPACITOR		
C17	68-0342R	CEE222A16V	CEE CAPACITOR		
C18	68-27080	CPS104A50K-N	CPS CAPACITOR		
C19	68-0342S	CEE332A16V	CEE CAPACITOR		

Symbol	Part, No	Part Name	Description	Safety Part	Service Part
R42	68-0300I	RD100K-J1/4D	RD RESISTOR	!	
R45	68-0299A	RD3.9K-J1/4D	RD RESISTOR		
R50	68-0336U	RD330K-J1/2A	RD RESISTOR		
SEMI FIXED RESISTOR					
VR1	68-0119B	RGS6-FAN500		!	0.2%
VR2	68-0119F	RGS6-FAN1K			0.2%
VR3	68-0119B	RGS6-FAN500			0.2%
VR4	68-0119F	RGS6-FAN1K			0.2%
MISCELLANEOUS					
M1	68-4114A	PC BOARD (A)		!	
M2	68-4115A	PC BOARD (B) 1/2		!	
M3	68-4505A	JOINT P=7.5mm			
M4	68-4505B	JOINT P=10mm			
M5	68-4505C	JOINT P=12.5mm			
M6	68-4505D	JOINT P=15mm			
M6	68-3521F	ANGLE PLUG, M34-09-30-134P		!	0.2%
M7	68-3514C	PLUG, 5285-04A			
M8	68-3516A	CONNECTOR 2P ASS			
M9	68-3519A	CONNECTOR 6P ASS			
M10	68-3519A	CONNECTOR 6P ASS		!	0.2%
M11	68-3517A	CONNECTOR 3P ASS			0.2%
M12	68-4003L	TUBING (UL)			0.5%
MECHANICAL PART					
M13	68-5086A	RADIATOR (A)		!	0.2%
M14	68-5087A	RADIATOR (B)			
M15	68-5082A	RADIATION SEAT (SARCON 45F)			
M16	68-0026B	RADIATION SEAT TO-220 (SARCON 45F)			
M17	68-0352A	RADIATION SEAT TO-3P (SARCON 45F)			
M18	68-0076A	BUSHING			
M19	68-0025A	BUSHING (C)			
M20	68-5078A	BAND (KM-85)			
M21	68-0069A	L ANGLE			
M22	68-5083A	SIIRUDO PLATE			
M23	68-5088A	LABEL			
SCREWS					
M24	68-5800C	BIND HEAD 3.0×6mm			
M25	68-5800D	BIND HEAD 3.0×8mm			
M26	68-0015E	BIND HEAD 3.0×6mm (SUS)			
M27	68-5802B	W-SEMS 3.0×6mm			
M28	68-5802D	W-SEMS 3.0×10mm			
M29	68-5089A	NYLON RIVET			
PCB ASS					
12V	68-5100	12V PC BOARD ASS		!	0.2
5V	68-5099	5V PC BOARD ASS			0.2
変更番号					

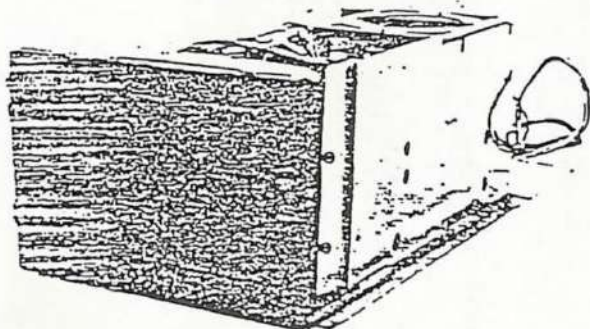
Commodore

SERVICE MANUAL

MODEL

25062 2-02

5" COLOR VIDEO MONITOR



No. 5463
Sept. 1983

CONTENTS

SPECIFICATIONS-----	2
1. SAFETY PRECAUTION FOR MONITOR.....	3
2. SERVICE ADJUSTMENT	4 ~ 7
3. REPLACEMENT PARTS LIST	8 ~ 11
[EXPLODED VIEW]	11
4. BLOCK DIAGRAM	12
* With 250622-02 SCHEMATIC DIAGRAM	

SPECIFICATIONS

Dimensions: 16.5cm(W) x 28.0cm(D) x 11.6cm(H)

Weight: 14.4 kg

Color System PAL

Horizontal resolution 220 Lines

Video/Sync Input 1Vp-p.

Chroma Input 1Vp-p.

Audio input 0.8Vp-p, High Impedance.

Scan frequency H. 15.63 kHz, V. 50 Hz

Power input DC 12V

Power Consumption 1.35A(max.), 1.18A(Avg.)

Picture tube S, 55 degree deflection, In-line gun Dot screen Quick Start.

Viewable picture size 7.9 cm(H) x 10.4 cm(W)

High voltage 14 kV $\pm$ 1 kV (at zero beam current)

Speaker 6.6cm round type, 16 Ω

Audio power output 0.45 W

Tube 1

IC 4

Transistor 25

(Design and specifications subject to change without notice.)

2. SERVICE ADJUSTMENTS

PURITY

1. Display a monochrome pattern.
 2. As viewed from the back (See Fig. 2-1), turn the magnet lock counter-clockwise to loosen it.
 3. Turn the green cutoff VR (R707) fully clockwise and the red and blue cutoff VRs (R704, R701) fully counter-clockwise. (Fig. 2-8)
Adjust the screen VR (Fig. 2-8) so that the vertical green band becomes easy to see.
 4. Loosen the deflection yoke securing screw and slide the yoke fully rearward to obtain color shading in the green disk.
 5. Overlap the two purity magnet tabs and set them to 12 o'clock position.
 6. Open and close the two purity magnets (scissor fashion) and adjust so that the green disk is positioned at the centre of the picture.
- If green disk is not obtained, adjust for uniform overall coloration.
7. Slide the deflection yoke forward and adjust its position so that the green color completely fills the picture area.
 8. Confirm that uniform overall rasters of both red and blue single color rasters can also be obtained in the same manner.
 9. Secure the deflection yoke retaining screw moderately so that the deflection yoke does not move back and forth.

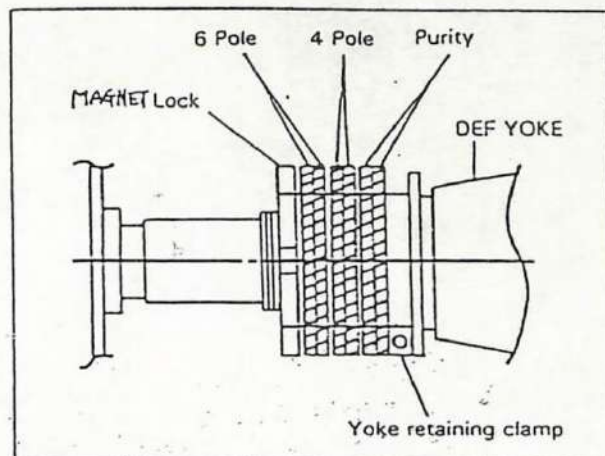


Fig. 2-1

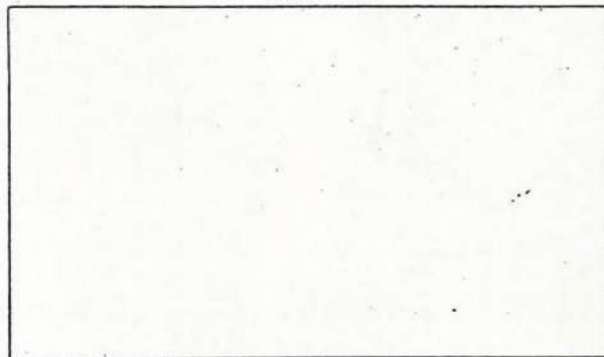


Fig. 2-2

STATIC CONVERGENCE (CENTER)

1. Employ a crosshatch pattern and adjust the brightness so that the image is clear, but slightly darkened.
2. Turn the red and blue cutoff VRs fully clockwise and the green cutoff VR fully counter-clockwise (Fig. 2-8). Adjust the screen VR (Fig. 2-8) for an easily seen image.
3. Adjust convergence roughly in the corner by tilting the deflection yoke vertically or horizontally, then insert a wedge between the yoke and CRT on top.
4. Turn the two 4 pole convergence magnets and adjust so that red and blue become overlapped throughout the picture area to yield magenta. (Fig. 2-4)
5. Turn the green cutoff VR full clockwise and adjust the two 6 pole convergence magnets so that the green and magenta become overlapped throughout the picture area to yield white. (Fig. 2-5)
6. Repeat steps 4 and 5.

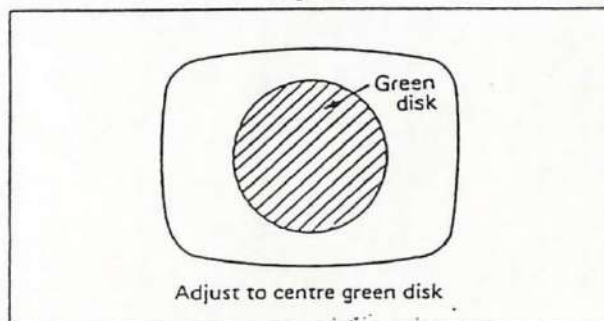


Fig. 2-3

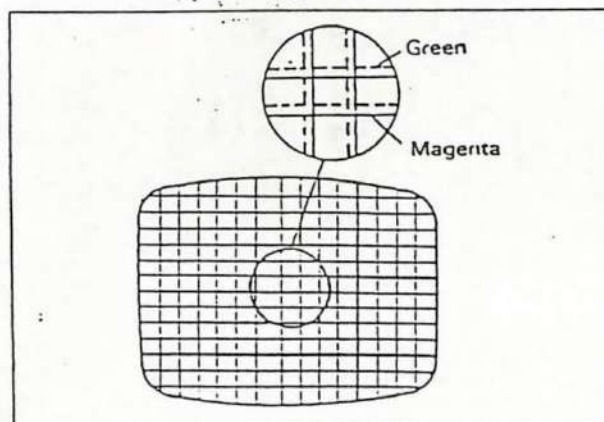


Fig. 2-4

1. SAFETY PRECAUTION FOR MONITOR

1. The design of this product contains special hardware, many circuits and components specially for safety purposes.
For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Service should be performed by qualified personnel only.
2. Alterations of the design or circuitry of receiver should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting therefrom.
3. Many electrical and mechanical parts in television sets have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the parts list of Service manual. Electrical components having such features are identified by shading on the schematics and by () on the parts list in Service manual. The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement part shown in the parts list in Service manual may create shock, fire, or other hazards.
4. If any repair has been made to the chassis, it is recommended that the B₁ setting should be checked or adjusted (See ADJUSTMENT OF B₁ VOLTAGE).
5. The high voltage applied to the picture tube must conform with that specified in Service manual. Excessive high voltage can cause an increase in X-Ray emission, arcing and possible component damage, therefore operation under excessive high voltage conditions should be kept to a minimum, or should be prevented. If severe arcing occurs, remove the AC power immediately and determine the cause by visual inspection (incorrect installation, cracked or melted high voltage harness, poor soldering, etc.). To maintain the proper minimum level of soft X-Ray emission, components in the high voltage circuitry including the picture tube must be the exact replacements or alternatives approved by the manufacturer of the complete product.
6. Do not check high voltage by drawing an arc. Use a high voltage meter or a high voltage probe with a VTVM. Discharge the picture tube before attempting meter connection, by connecting a clip lead to the ground frame and connecting the other end of the lead through a 10k Ω 2W resistor to the anode button.

7. When service is required, observe the original lead dress. Extra precaution should be given to assure correct lead dress in the high voltage circuit area. Where a short circuit has occurred, those components that indicate evidence of overheating should be replaced. Always use the manufacturer's replacement components.

8. ISOLATION CHECK

(SAFETY FOR ELECTRICAL SHOCK HAZARD)

After re-assembling the product, always perform an isolation check on the exposed metal parts of the cabinet (antenna terminals, channel selector knobs, metal cabinet, screwheads, earphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.

(1) DIELECTRIC STRENGTH TEST

The isolation between the AC primary circuit and all metal parts exposed to the user, particularly any exposed metal part having a return path to the chassis should withstand a voltage of 1,100 V AC (r.m.s.) for a period of one second.

This method of test requires a test equipment not generally found in the service trade.

(2) LEAKAGE CURRENT CHECK

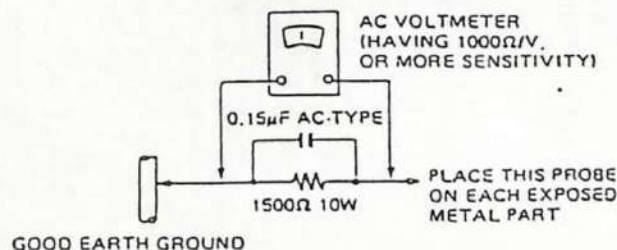
Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.) Using a "Leakage Current Tester", measure the leakage current from each exposed metal part of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground (water pipe, etc.). Any leakage current must not exceed 0.5mA AC (r.m.s.).

• ALTERNATE CHECK METHOD

Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Use an AC voltmeter having 1,000 ohms per volt or more sensitivity in the following manner. Connect a 1500 Ω 10W resistor parallelled by a 0.15 μ F AC-type capacitor between an exposed metal part and a known good earth ground (water pipe, etc.).

Measure the AC voltage across the resistor with the AC voltmeter.

Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement. Any voltage measured must not exceed 0.35V AC (r.m.s.). This corresponds to 0.5mA AC (r.m.s.).



DYNAMIC CONVERGENCE (CONER)

1. Remove the wedge.
2. Adjust convergence as shown in Fig. 2-7 by tilting the yoke up and down; then insert the wedges on top and bottom.
3. App'y (modeler's) glue on the wedges and magnets to fix.
4. Tighten the screw of the deflection yoke.
5. Turn the magnet lock and tighten securely.

WHITE BALANCE

1. Display a monochrome pattern.
2. After switching the cut off service SW. to SERVICE, short TP-35A and TP-35B with a jumper wire, and then display a single horizontal line.
3. Turn the red, blue and green cutoff VRs (R704, R701, R707) and the screen VR (Fig. 2-8) fully counter-clockwise to eliminate luminance.
4. Gradually turn the screen VR clockwise to where single line of one of the colors appears.
5. Turn the cutoff VR of this color clockwise about 10 degrees.
6. Again turn the screen VR so that this color appears only faintly.
7. Adjust the other cutoff VRs so that the horizontal line becomes white.
8. After removing a jumper wire which are shorted at step 2), return the cut off service SW. to NORMAL and then display a monochrome pattern.
9. With a dark picture, perform fine adjustment to obtain optimum white balance.
10. With a bright picture, adjust the red and green drive VRs for optimum white balance.

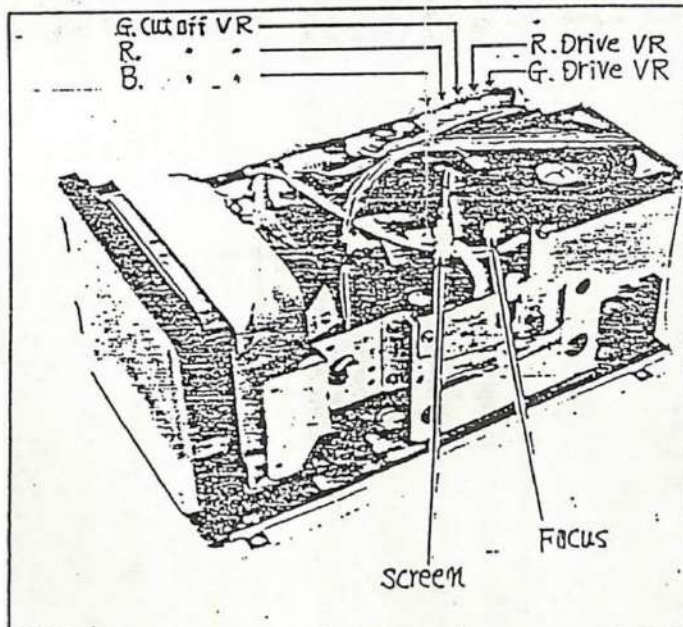


Fig. 2-8

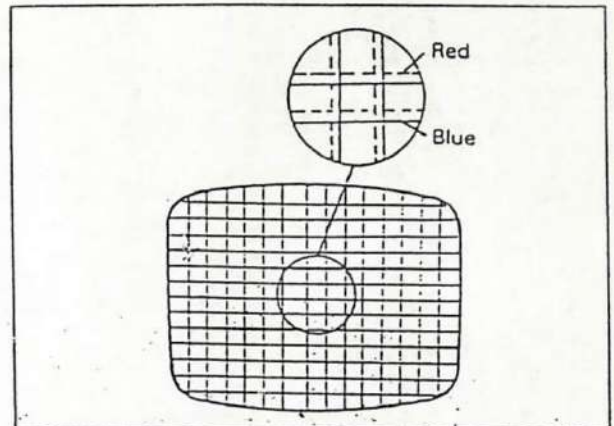


Fig. 2-5

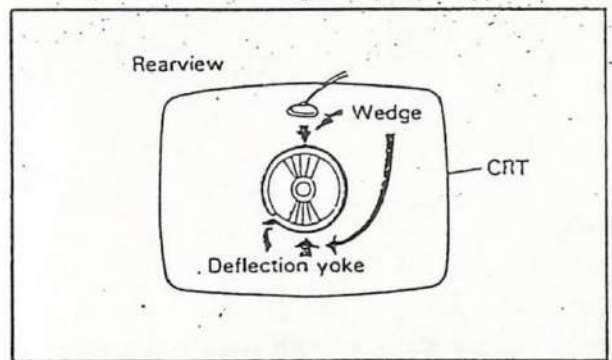


Fig. 2-6

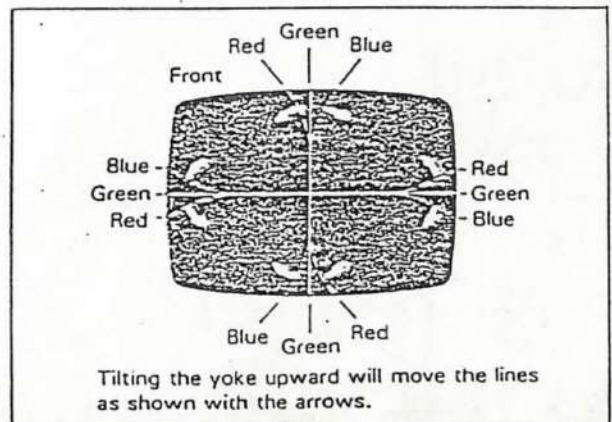
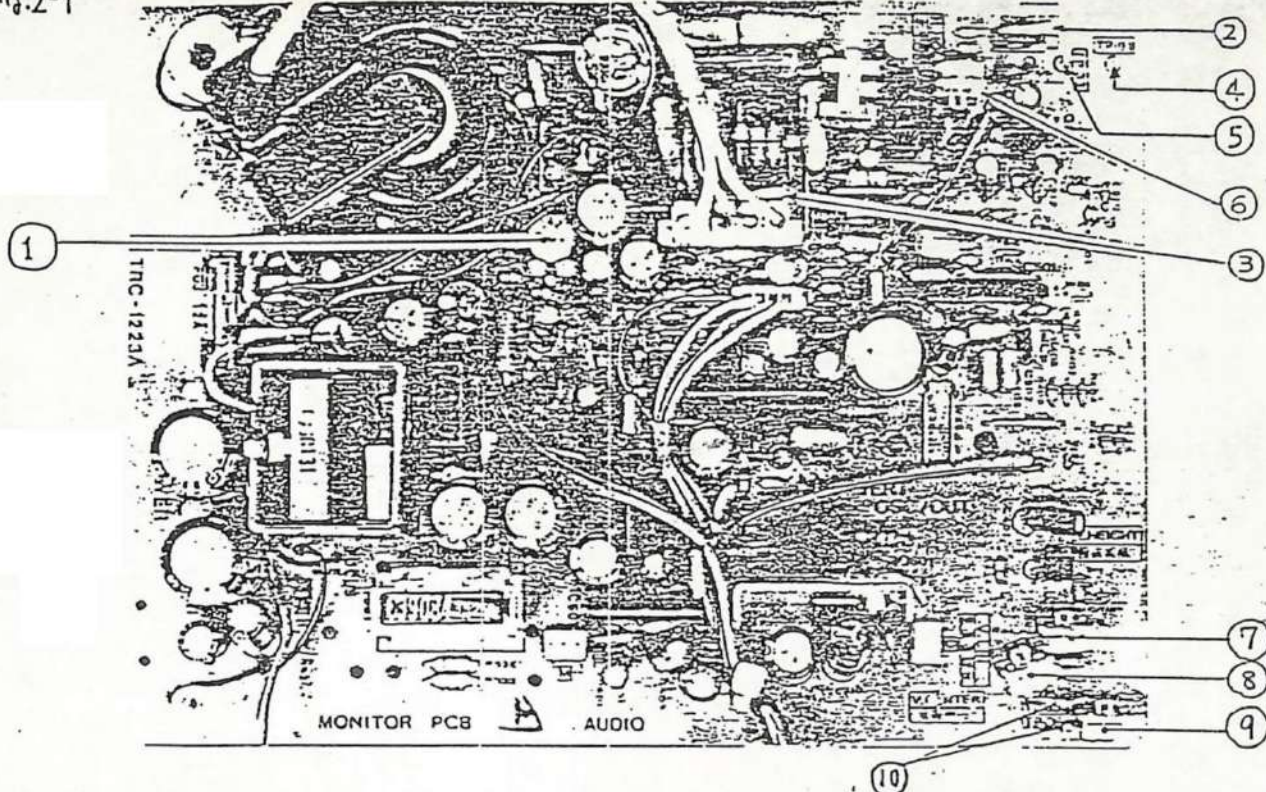


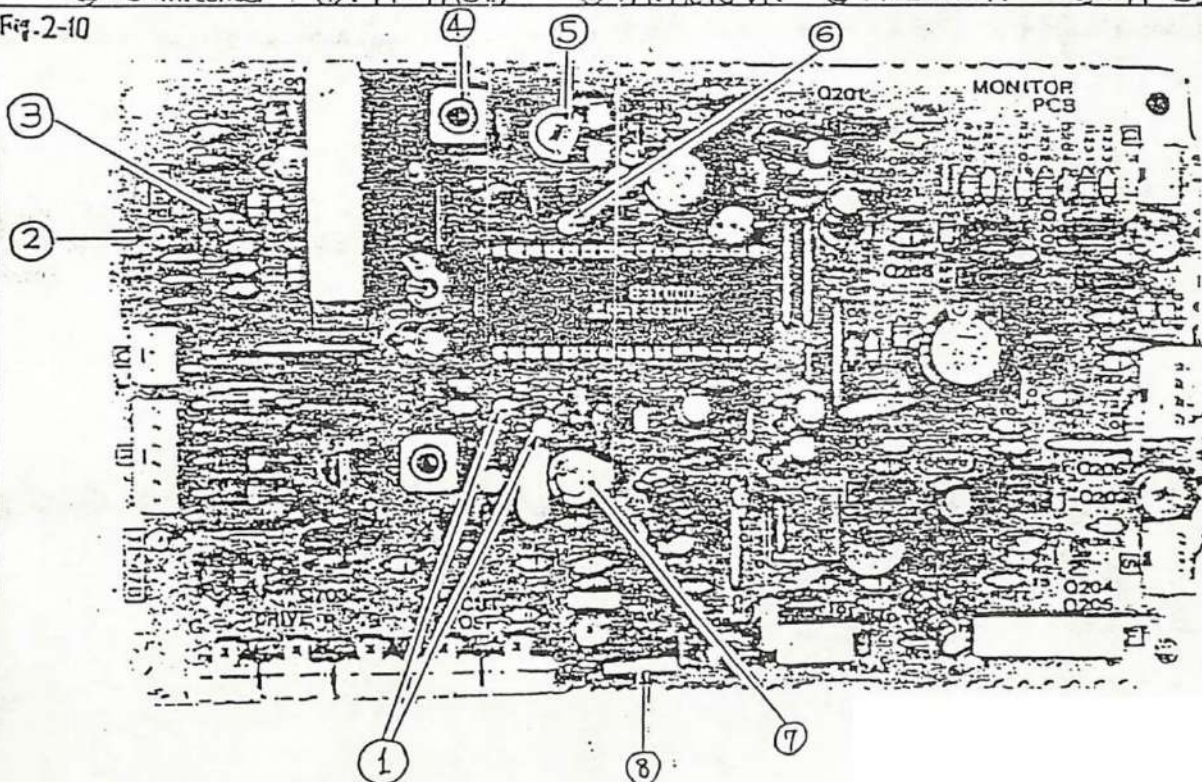
Fig. 2-7

Fig.2-9



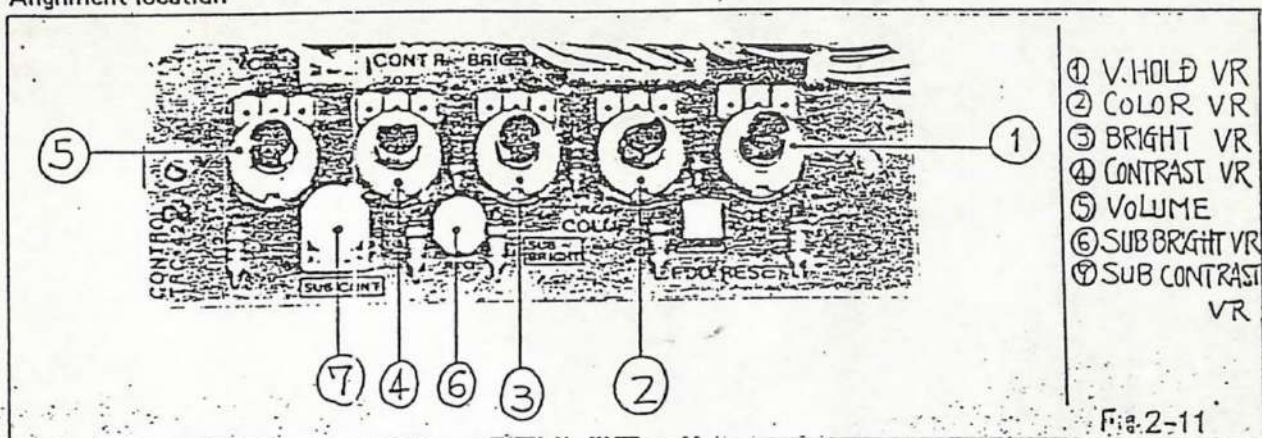
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|-----------------|-------------|--------------|----------------|----------------|
| ①: B1 ADJ. VR | ②: H.Center | ⑤: TP-33 | ⑦: V.Height VR | ⑨: V.Center VR |
| ③: Sub.H.Center | ④: TP-91(B) | ⑥: H.Held VR | ⑧: V.Lim.VR | ⑩: TP-35A/B |

Fig.2-10



- | | | | |
|-------------|--------------------------|-------------|-------------------------------|
| ①: TP-46A/B | ③: TP-48 | ⑤: DLAMP VR | ⑦: C324 (Trimmer) |
| ②: TP-49 | ④: T3G3 (D.L.P. Transf.) | ⑥: TP-45 | ⑧: S201 (Cut off Service SW.) |

Alignment location



B₁ VOLTAGE (28V)

Cutoff the picture by the bright VR (R4211) and sub bright VR (R4210).

Measure the voltage between TP-91 of the def. , power reg. and Audio out PB Assy and ground.
Adjust B₁ adj. VR (R902) to obtain 28V.

FOCUS

Adjust the FOCUS control for best overall definition and picture detail at normal brightness and contrast.

V. CENTER

Adjust the V. center VR (R417) to the optimum vertical picture position.

HORIZONTAL OSCILLATOR

1. Set the H. Hold VR to the mechanical center position.
2. Connect the jumper clip between TP-33 and earth.
3. While rotating the H. Hold VR, keep the picture stationary or slowly moving.
4. Remove the jumper clip.
5. Make sure that the set maintains horizontal sync, when signals are switched.

H. CENTER

Set the H. center switch (S85) and Sub-H. center switch (S86) to the optimum horizontal picture position.

VERTICAL HEIGHT AND LINEARITY

1. Display a pattern which allows easy confirmation of symmetry (such as a circle or crosshatch).
2. Reduce the vertical size with the V. HEIGHT VR.
3. Adjust the vertical symmetry with the V. LIN. VR.
4. Readjust the vertical height, so that the picture extends to normal size.

SUB CONTRAST AND SUB BRIGHT

1. Display a picture and set the contrast and bright VRs to the center click positions.
2. Adjust the sub contrast VR (R4206) and sub bright VR (R4210) for optimum display.

COLOR SYNC

1. Display a color video signal and apply bias +10V to TP-45.
2. Connect a jumper clip between TP-46A and TP-46B.
3. Use a nonmetallic driver to turn trimmer capacitor C324.
4. Adjust so that the rolling color stripes become thick and the rolling slows or stops.
5. Remove jumper wire.
6. Confirm that color sync, is not disrupted when signals are switched.

DL-MATRIX

1. Display a color video signal.
2. Set the oscilloscope to X-Y range, and connect its X-probe to TP-48 and its Y-probe to TP-49.
3. Connect a jumper clip between TP-46A and TP-46B. And apply bias +10V to TP-45.
4. Adjust the trimmer capacitor (C324) slightly so that the color becomes unlocked and the loops of the displayed lissajous figure appear on the scope. (Fig. 2-12)
5. Adjust the DL AMP control (R304) for the absence of loops and adjust the DL PHASE TRANSF. (T303) so that each pair of lines merge together.
6. Adjust the trimmer capacitor (C324) to just regain floating color synchronization.
7. Remove a jumper clip and bias +10V.

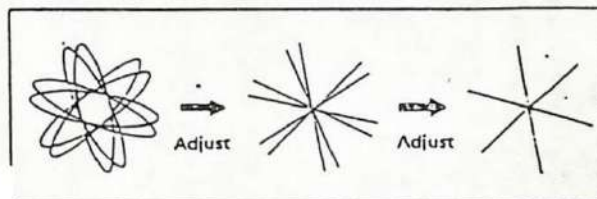


Fig. 2-12

TRC-1223A-1 (VIDEO & CHROMA PCB ASS'Y) 1/2

258622-82

SYMBOL No.	Δ	PART No.	PART NAME.	REMARK
VARIABLE RESISTOR				
R1304		CEX40053-053	VR (DL AMP)	5k Ω B
1701		A75557-103	" (B. CUT OFF)	10k Ω "
1704		" -103	" (R. CUT OFF)	" "
1706		" -221	" (R. DRIVE)	220 Ω "
1707		" -103	" (G. CUT OFF)	10k Ω "
1709		" -221	" (G. DRIVE)	220 Ω "
RESISTOR				
R1710		QRG019J-123S	OM R	12k Ω 1W J
1712		" -123S	"	" " "
1714		" -123S	"	" " "
CAPACITOR				
C1305		QEB51HM-224M	E Cap.	0.22 μ F 50V M
1324		QAT3001-010	Trimmer Cap.	"
COIL				
L1201		A76186-1.5	Peaking Coil	1.5 μ H
1202		A49468-562	"	5600 μ H
1203		" -101	"	100 μ H
1301		A76186-8.2	"	8.2 μ H
1302		" -68	"	68 μ H
TRANSFORMER				
T1302		CE40395-001	CW. Transf.	
1303		CE40396-001	DL P Transf.	
DIODE				
D1201		1SS133	Si. Diode	
~5				

TRC-1223A-2 (DEF. POWER REG. & AUDIO OUT PCB ASSY) V3

SYM ^{EQ} L No.	△	PART No.	PART NAME.	REMARK
VARIABLE RESISTOR				
R1409		QVZ3507-223	VR (V. HEIGHT)	22k Ω B
1413		" -222	" (V. LIN.)	2.2k Ω "
1417		" -102	" (V. CENT.)	1k Ω "
1508		A75557-222	" (H. HOLD)	2.2k Ω "
1902		CEX40054-023	" (B1 ADJ)	2k Ω "
RESISTOR				
R1917		QRG019J-152S	OMR	1.5K Ω 1W J
-1926		QRM024K-R22	MPR	0.22 Ω 2W K
CAPACITOR				
C1401		QENG1HM-105Z	BPE Cap.	1 μ F 50V M
1404		QEN51HM-105	"	" " "
1405		QFZ0083-104M	M. Cap.	0.1 μ F " K
1408		QEE51EK-105B	Tan. Cap.	1 μ F 25V "
1409		QEE51AK-226M	"	22 μ F 10V "
1410		" -226M	"	" " "
1412		QEU51EM-108M	E Cap.	1000 μ F 25V M
1413		QEB51HM-224M	"	0.22 μ F 50V "
1509		QFP31HJ-562S	PP Cap.	5600pF " J
1515	△	QFP42JJ-562S	"	" 630V "
1516	△	" -472M	"	4700pF " "
1517	△	" -472M	"	" " "
1518		QFH52AJ-155M	M.M Cap.	1.5 μ F 100V "
1519		QFP32DK-473M	PP Cap.	0.047 μ F 200V K
1520		" -473M	"	" " "
1528		QENG1HM-474Z	BPE Cap.	0.47 μ F 50V M
1601		QEN51HM-105	"	1 μ F " "

TRC-1223A-2 (DEF. POWER REG. & AUDIO OUT PCB ASS'Y) 3/3

SYM EQL No.	Δ	PART No.	PART NAME.	REMARK
COIL				
L1501		CE40024-002	Hor. Lin.	
1503		CJ30030-054	Coil	
1522		CE40140-000	W Coil	
1901		CJ30131-00A	Power Choke	
TRANSFORMER				
T1501		A76568-MA	H. Drive Transf.	
1502	Δ	CJ39587-00A	F. B. Transf.	
1531		C39084-A	Side Pin Transf.	
1901		A76567-MA	P. Drive Transf.	
DIODE				
D1501		HZS6.8E(B2)	Zener Diode	
1502		V19E	Si. Diode	
1504		V09E	"	
~7				
1508		U19B(V)	"	
1601		HZS10E(B3)	Zener Diode	
1902		U19B	Si. Diode	
1903		HZS6.8E(B2)	Zener Diode	
1904		HZS12E(B)	"	
1905		HZS6.8E(B2)	"	
1906		ISS133	Si. Diode	
1907		HZS13E(B1)	Zener Diode	
1908		ISS133	Si. Diode	
1909		"	"	
TRANSISTOR				
Q1401		2SA1015(Y,GR)	Transistor	
1501		2SC1685	Si. Transistor	
1502		2SA817A(O,Y)	"	
1503	Δ	2SC2335	"	
1601		2SD1133	Transistor	

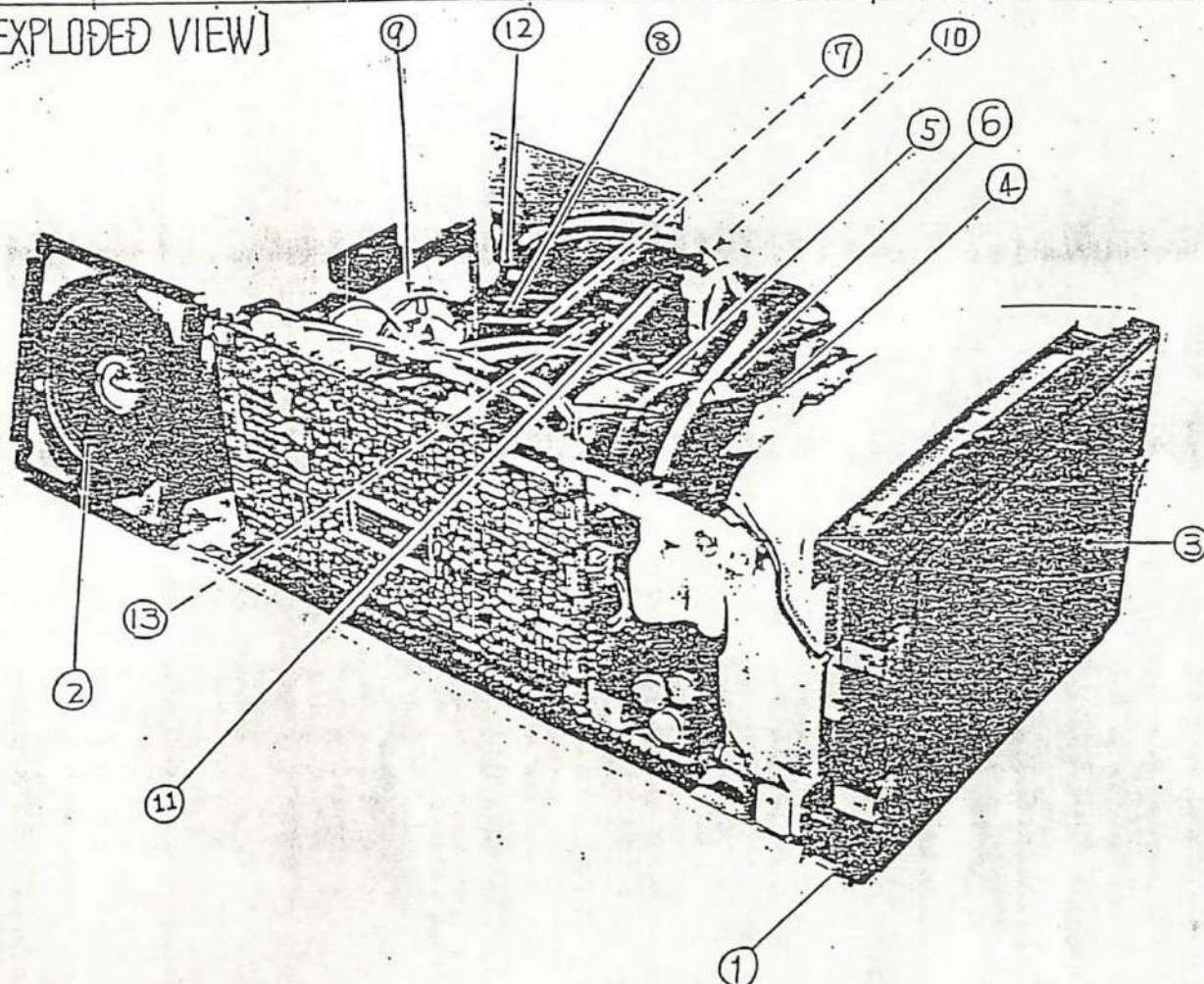
TRC-4223A (CONTROL PCB ASS'Y)

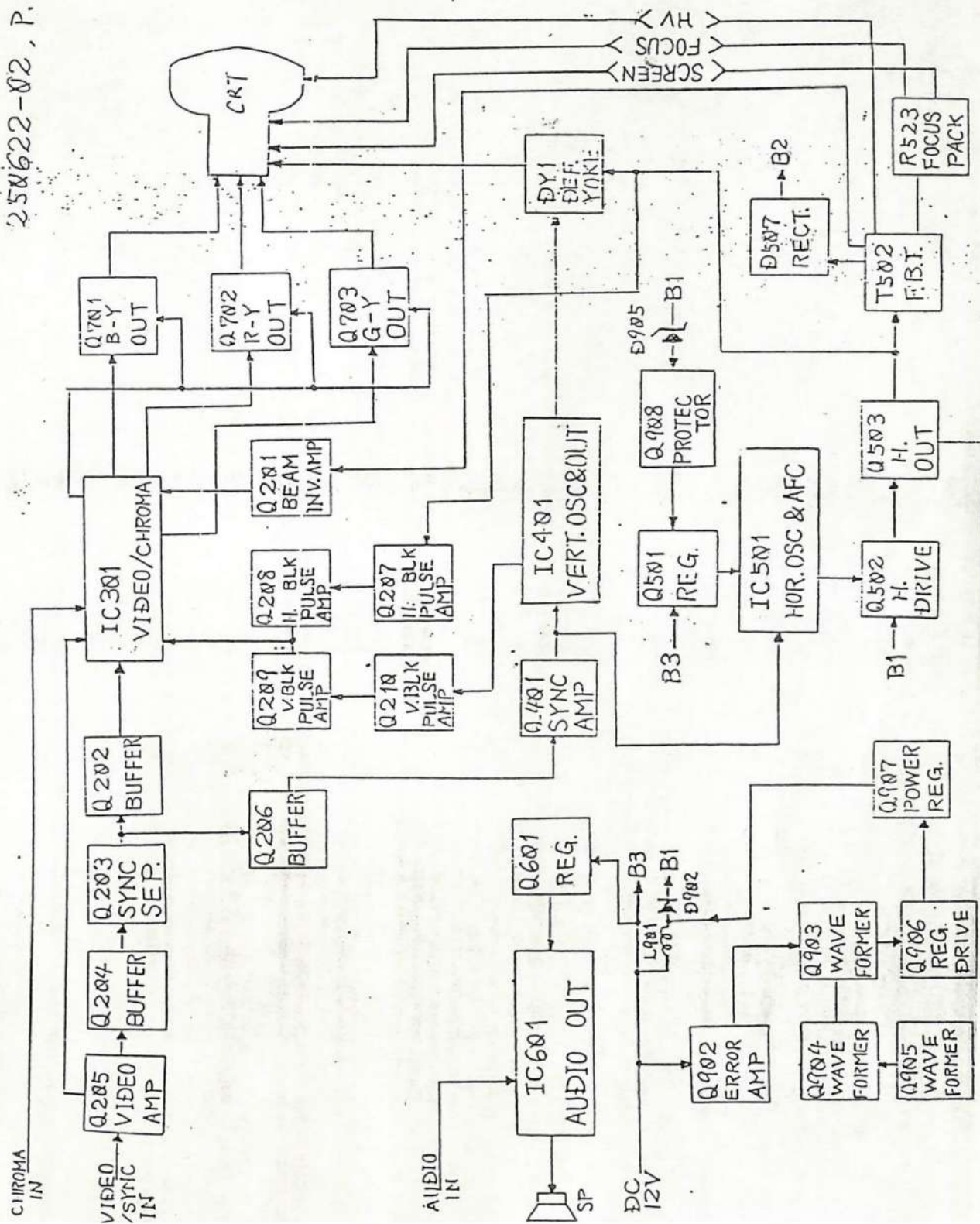
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SYM ECL No.	△	PART No.	PART NAME.	REMARK
VARIABLE RESISTOR				
R4003		CEX40088-B14	VR (COLOR)	10k Ω B
4006		CEX40304-B54	" (SUB CONTRAST)	50k Ω "
4007		CEX40089-B14	" (CONTRAST)	10k Ω "
4010		QVZ3506-223	" (SUB BRIGHT)	22k Ω "
4011		CEX40089-B14	" (BRIGHT)	10k Ω "
4014		CEX40088-B14	" (VOLUME)	" "
4016		" -B54	" (V.HOLD)	50k Ω "
OTHER				
S4001		CEX40306-001	Taca SW	FDD PRESET

VIEW No.	SYMBOL No.	A	PART No.	PART NAME	REMARK
1			CM18022-00D	Front Panel Ass'y	
2			HSA0799-01C	Speaker	
3			CM41779-A01	Protector Glass	
4	V01	A	150BMB22-AF	Picture Tube	
5	DY1	A	CJ26210-00A	Def. Yoke	
6			—	Wedge	
7			—	PC Magnet	
8	T1502	A	CJ39587-00A	F. B. Transf.	
9		A	C39158-D	CRT Socket	
10	Q1907		2SD1118	Si. Transistor	Power regulator
11	R1523	A	CJ49510-257-28	Focus Pack	Focus, Screen
12			A46445	Focus Cover	(X2.)
13	C001	A	QCZ9017-102M	C Cap.	1000p - 3kV P

[EXPLODED VIEW]







101



CK10168-B01

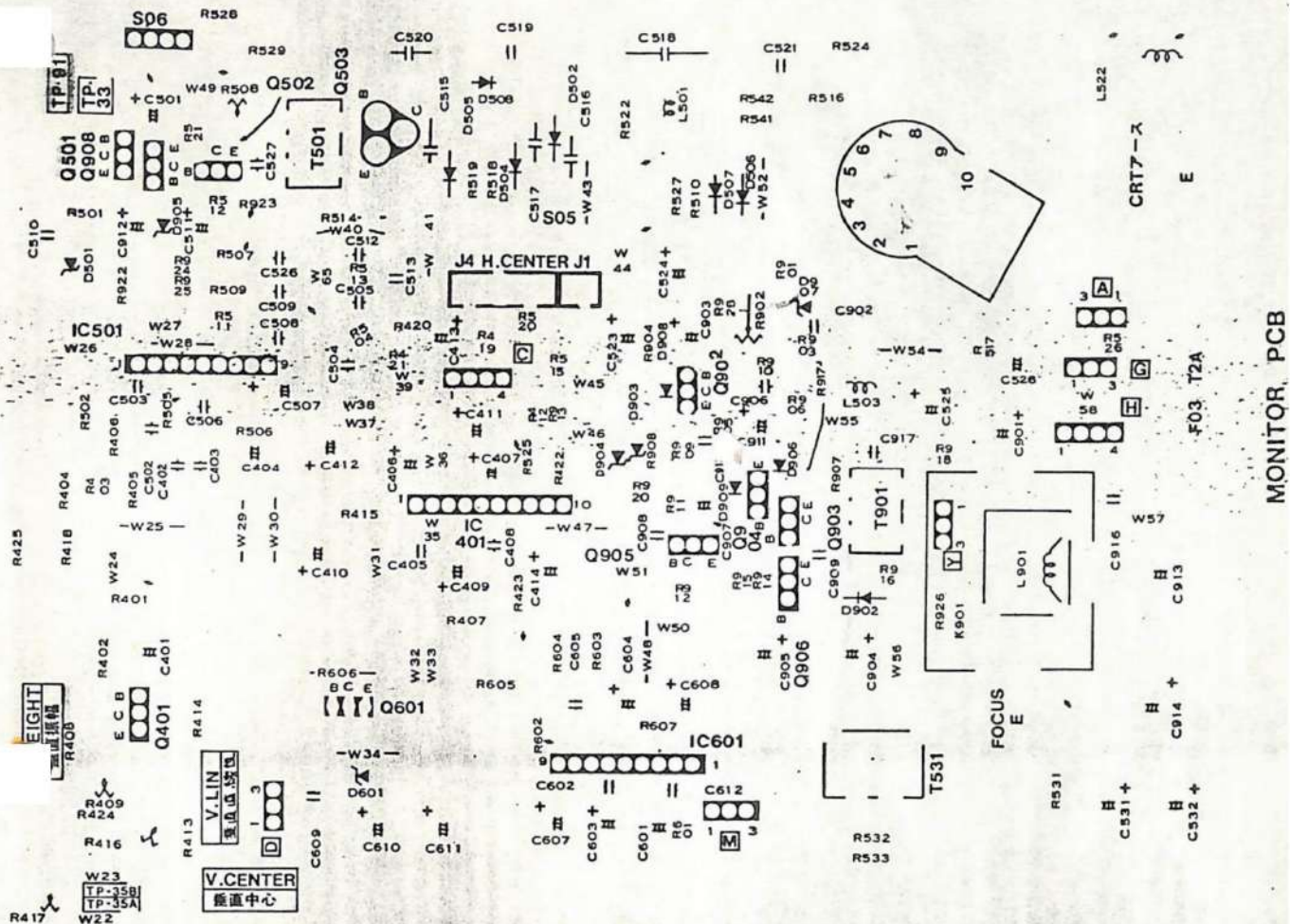
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CK10168-B01

GCMK-81X

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G1.1p



MONITOR PCB

