

Monitor 5x64

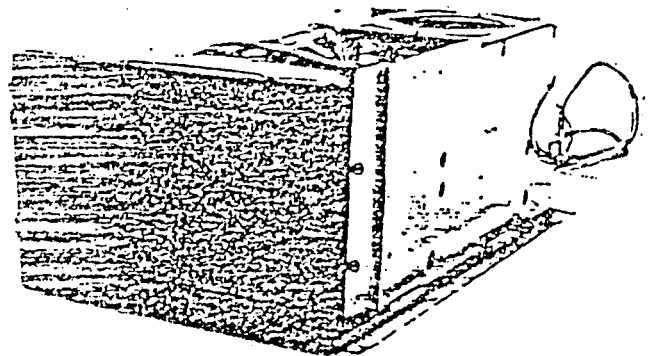
**Commodore**

# SERVICE MANUAL

MODEL

250622-02 . PAL

5" COLOR VIDEO MONITOR



No. 5463  
Sept. 1983

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\* With 250622-02 SCHEMATIC DIAGRAM

# SPECIFICATIONS

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

Weight: 14.4kg

Color System	PAL
Horizontal resolution	220 Lines
Video/Sync Input	1V <sub>p-p</sub>
Chroma Input	1V <sub>p-p</sub>
Audio input	0.8V <sub>p-p</sub> , 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	5", 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 ± 1 kV (at zero beam current)
Speaker	5.6cm round type, 16 Ω
Audio power output	0.45W
Tube	1
IC	4
Transistor	25

(Design and specifications subject to change without notice.)

# 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 (  $\Delta$  ) 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 B<sub>1</sub> setting should be checked or adjusted (See ADJUSTMENT OF B<sub>1</sub> 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 provided 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 $\Omega$  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

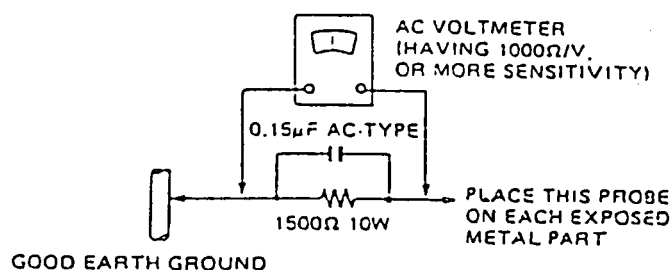
Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.) Using a "Leakage Current Tester", measure the leakage current from each exposed metal part of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known 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 $\Omega$  10W resistor paralleled by a 0.15 $\mu$ 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.).



## 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.

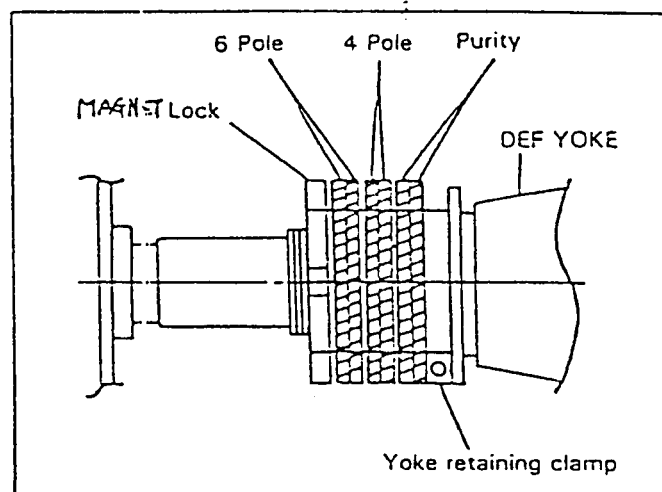


Fig. 2-1

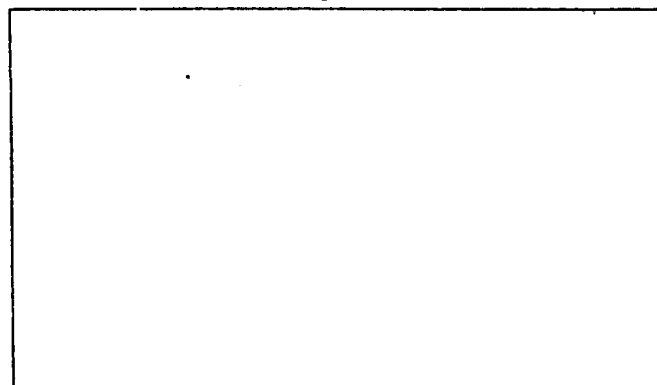


Fig. 2-2

### 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.

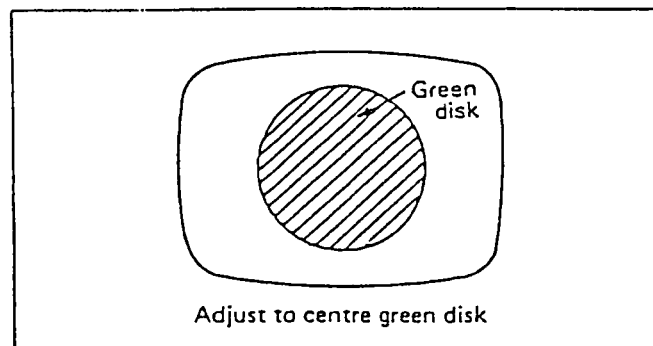


Fig. 2-3

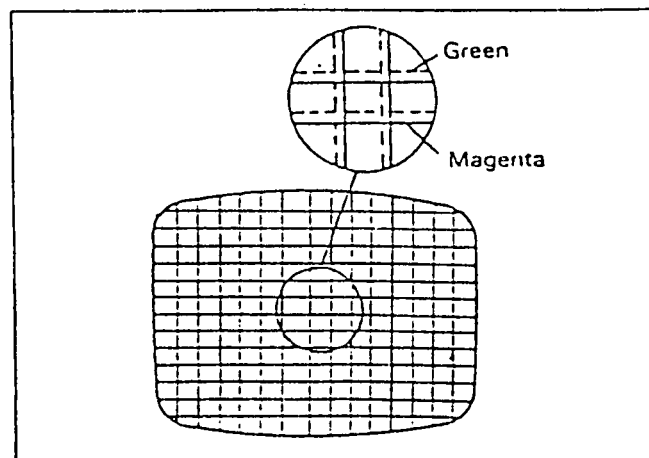


Fig. 2-4

### 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.

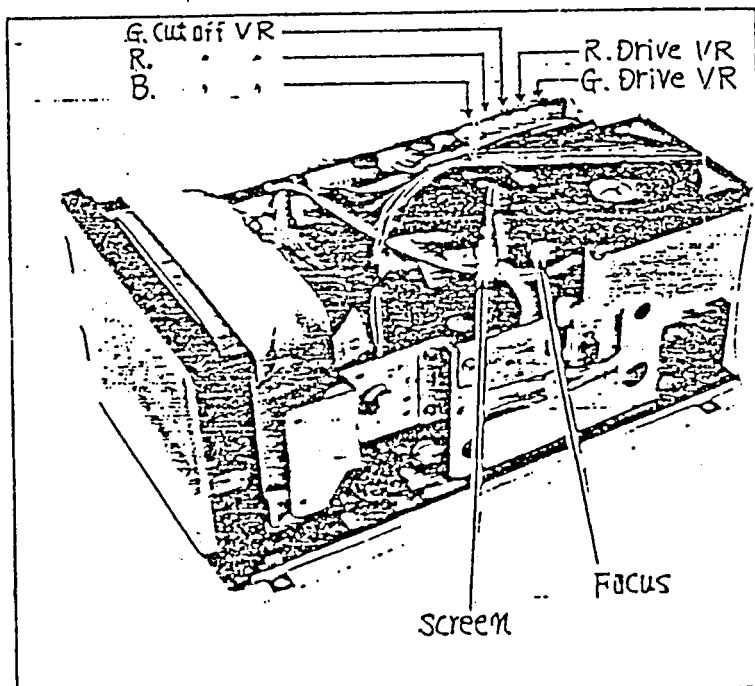


Fig. 2-8

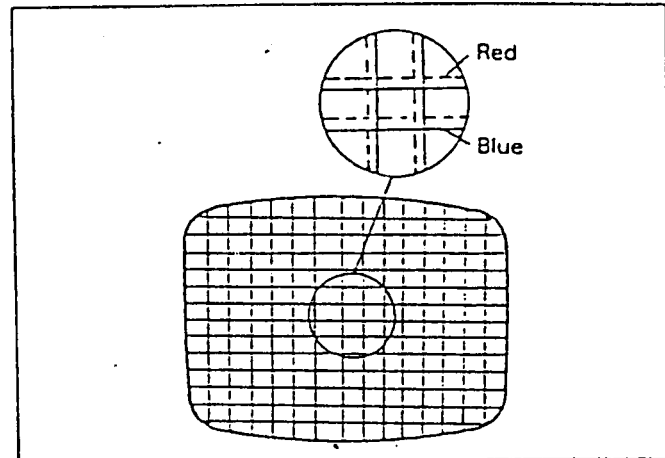


Fig. 2-5

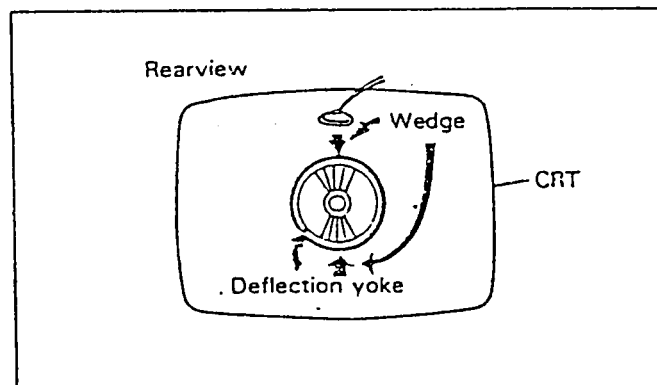


Fig. 2-6

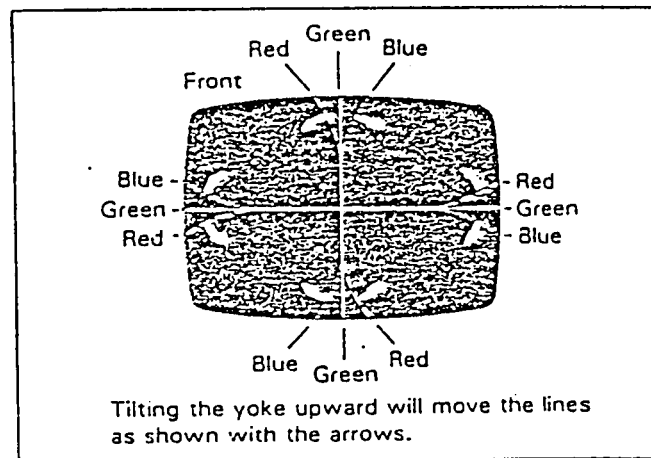
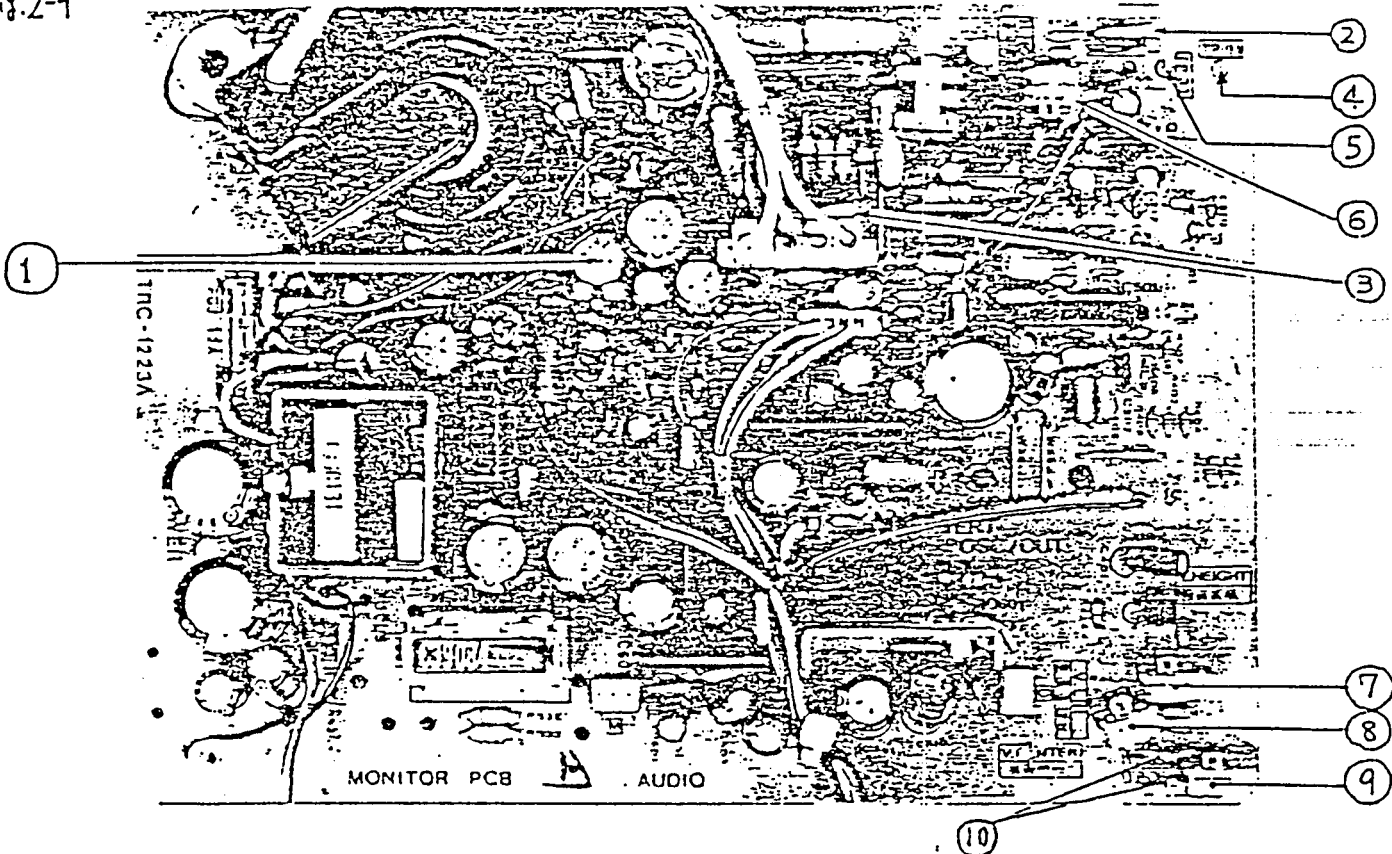


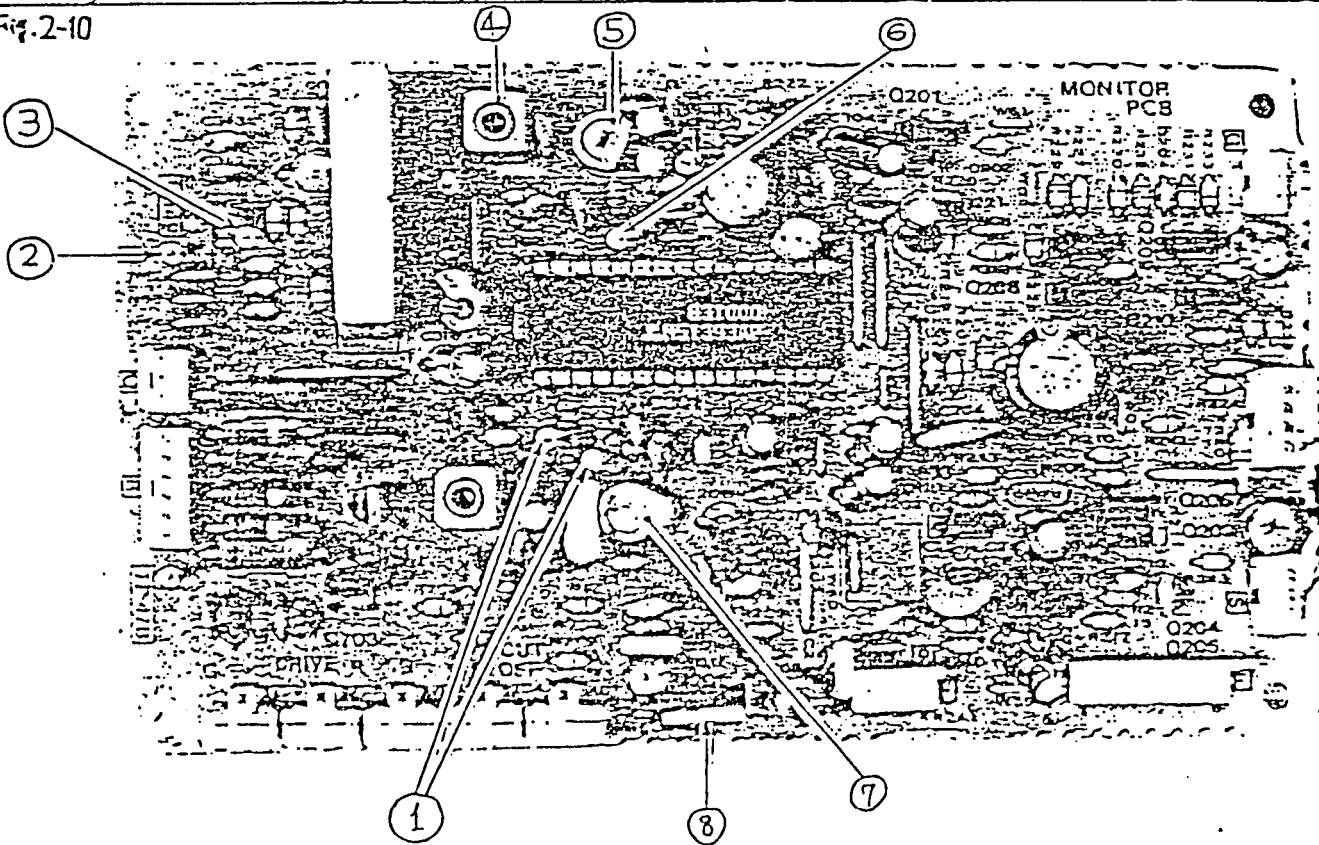
Fig. 2-7

Fig. 2-9



- ①: B1 ADJ. VR      ③: H.Center      ⑤: TP-33      ⑦: V.Height VR      ⑨: V.Center VR
- ②: Sub.H.Center      ④: TP-91(B1)      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: T303 (DLP Transf.)      ⑧: TP-45      ⑧: S201 (Cut off Service SW.)

## Alignment location

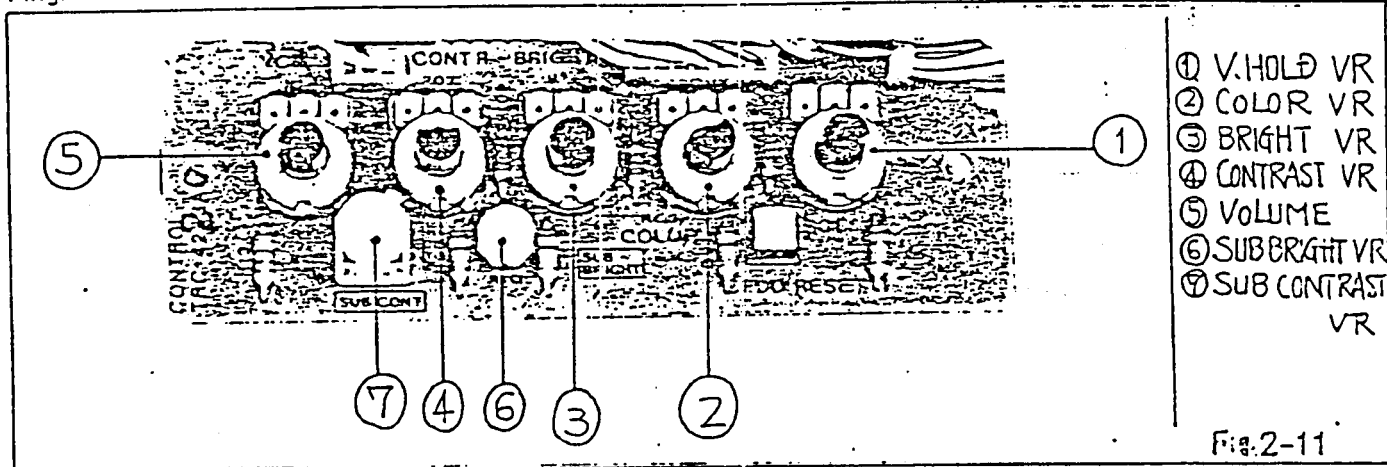


Fig. 2-11

**B<sub>1</sub> 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 B<sub>1</sub> 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 (S05) and Sub-H. center switch (S06) 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. (Flt. 2-i2)
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.

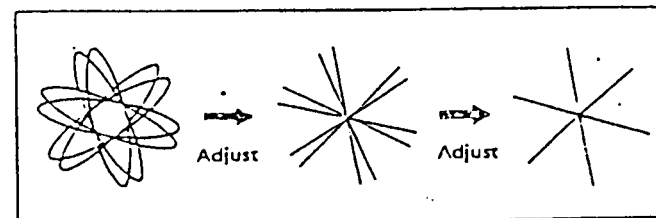


Fig. 2-12


### 3. REPLACEMENT PARTS LIST

**PRODUCT SAFETY NOTE**  
 Components identified by the  $\Delta$  symbol in the PARTS LIST and the shaded areas on the Schematic have special characteristics important to safety. Before replacing any of these components read carefully the SAFETY PRECAUTION on Page 3 of this Service Manual. DO NOT degrade the safety of the set through improper servicing.


#### 1. ABBREVIATED WORD OF RESISTORS AND CAPACITORS

- |                                    |                                 |   |
|------------------------------------|---------------------------------|---|
| <b>RESISTOR</b>                    | FR : Fusible Resistor           | BPE Cap. : Bi-Polar (or Non-Polar) Electrolytic Capacitor |
| CR : Carbon Resistor               | UNFR : Nonflammable Resistor    | MV Cap. : Metalized Mylar Capacitor                       |
| Comp. R : Composition Resistor     |                                 | PP Cap. : Polypropylene Capacitor                         |
| OMR : Oxide Metal Film Resistor    | <b>CAPACITOR</b>                | MP <sup>2</sup> Cap. : Metalized PP Capacitor             |
| VR : Variable Resistor             | C Cap. : Ceramic Capacitor      | PS Cap. : Polystyrol Capacitor                            |
| MFR : Metal Film Resistor          | M Cap. : Mylar Capacitor        | Tan. Cap. : Tantal Capacitor                              |
| CMFR : Coating Metal Film Resistor | E Cap. : Electrolytic Capacitor |   |


2. FOLLOWING RESISTORS AND CAPACITORS OF STANDARD ELECTRICAL COMPONENTS ARE OMITTED FROM THIS PARTS LIST. EACH PART NUMBER OF THESE STANDARD REPLACEMENT COMPONENTS IS DEFINED AS FOLLOWS.

Carbon Resistor (C R): Lead form (  )


Rating	Part No.
$\frac{1}{4}W$	QRD141J-□□□ CR   $\frac{1}{4}W$   Tolerance   Constant term
$\frac{1}{2}W$	QRD121J-□□□

Ceramic Capacitor (C Cap.): Lead form (  )


Withstand Voltage	Parts No.
25V	QCS11EJ-□□□ C Cap.   25V   Tolerance   Constant term
50V	QCS11HP-□□□
500V	QCS12HP-□□□

Composition Resistor (Comp. R): Lead form (  )

Rating	Part No.
$\frac{1}{4}W$	QRC121K-□□□ Comp. R   $\frac{1}{4}W$   Tolerance   Constant term

Electrolytic Capacitor (E Cap.): Lead form (  )

Withstand Voltage	Parts No.
6.3V	QET40JR-□□□ E Cap.   6.3V   Tolerance   Constant term
10V	QET41AR-□□□
16V	QET41CR-□□□
25V	QET41ER-□□□
50V	QET41HR-□□□

Mylar Capacitor (M Cap.): Lead form (  )

Withstand Voltage	Part No.
50V	QFM41HK-□□□ M Cap.   50V   Tolerance   Constant term
100V	QFM42AK-□□□
200V	QFM42DM-□□□

#### 3. DECODING OF TOLERANCE AND CONSTANT TERM

J:  $\pm 5\%$    K:  $\pm 10\%$    M:  $\pm 20\%$    N:  $\pm 30\%$    H:  $\begin{matrix} +50\% \\ -10\% \end{matrix}$    Z:  $\begin{matrix} +80\% \\ -20\% \end{matrix}$    P:  $\begin{matrix} +100\% \\ -0\% \end{matrix}$    A:  $\begin{matrix} +100\% \\ -10\% \end{matrix}$    R:  $\begin{matrix} +30\% \\ -10\% \end{matrix}$

##### CONSTANT TERM

• Carbon Resistor ( $\frac{1}{4}W$ ,  $\pm 5\%$  Tolerance)

QRD141J-□□□

CONSTANT TERM.

- □ □ □	$2.7\Omega$	- QRD141J-2R7
1 R 0	$1.0\Omega$	$47k\Omega \rightarrow 47 \times 10^3 \rightarrow$ QRD141J-473
9 R 7	$9.7\Omega$	

---

1 0 □ -  $10\Omega$  means  $10 \times 10^3 (\Omega)$

8 2 □ -  $82\Omega$  means  $82 \times 10^3 (\Omega)$

• Ceramic Capacitor (50 Volts,  $\pm 5\%$  Tolerance)

QCS11HJ-□□□

CONSTANT TERM.

- □ □ □	$50pF$	$\rightarrow$ QCS11HJ-5R0
1 R 0	$1.0pF$	$680pF \rightarrow 68 \times 10^1 \rightarrow$ QCS11HJ-682
8 R 0	$8.0pF$	$33\mu F \rightarrow 33 \times 10^1 \rightarrow$ QCS11HJ-333

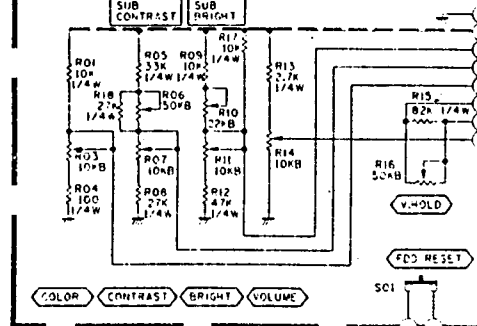
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1 0 □ -  $10\Omega$  means  $10 \times 10^3 (pF)$

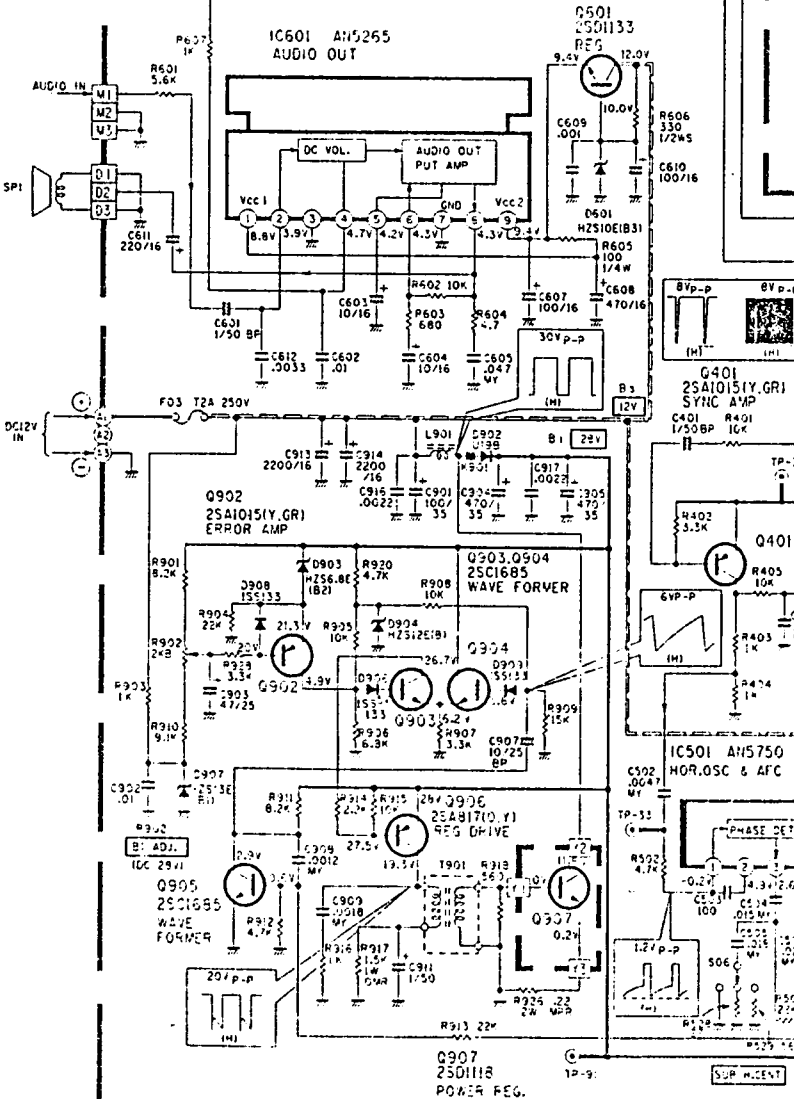
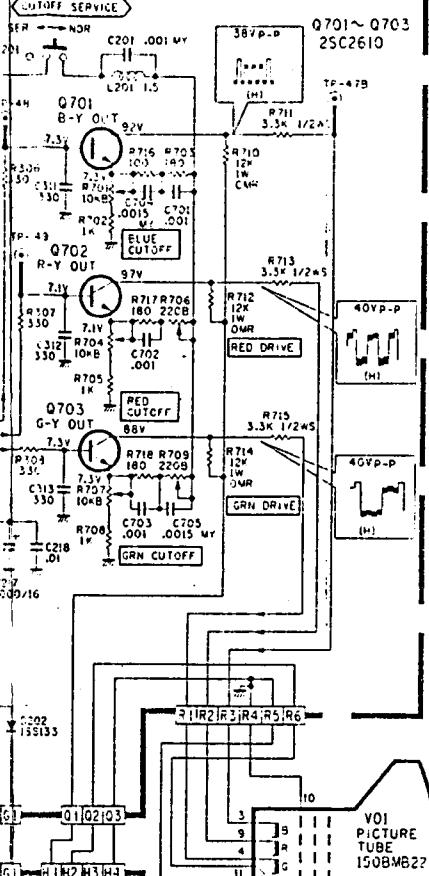
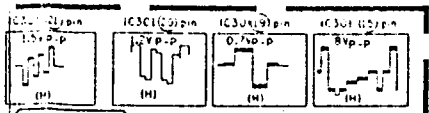
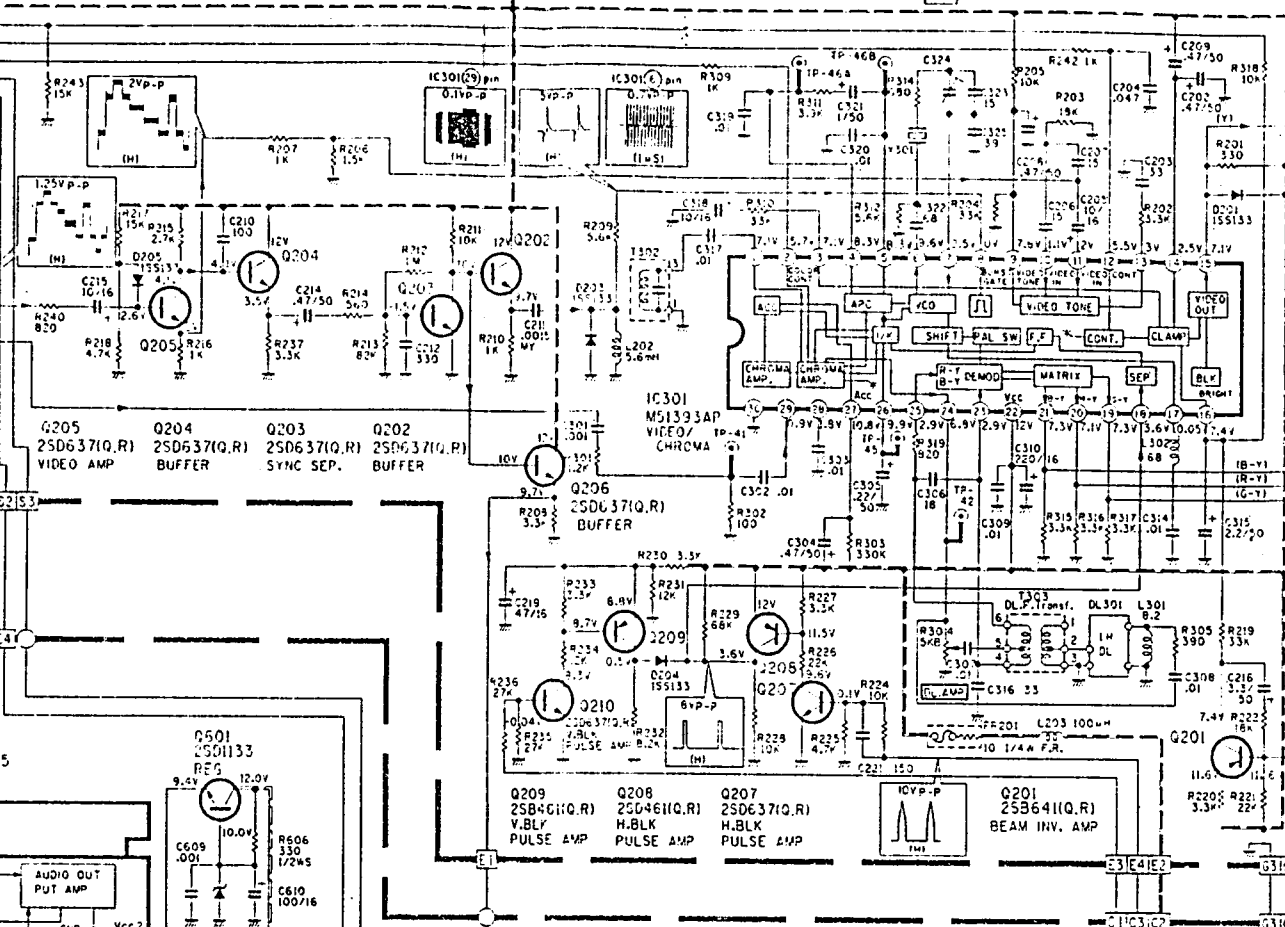
8 8 □ -  $88\Omega$  means  $88 \times 10^3 (pF)$



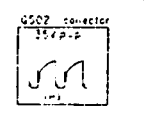
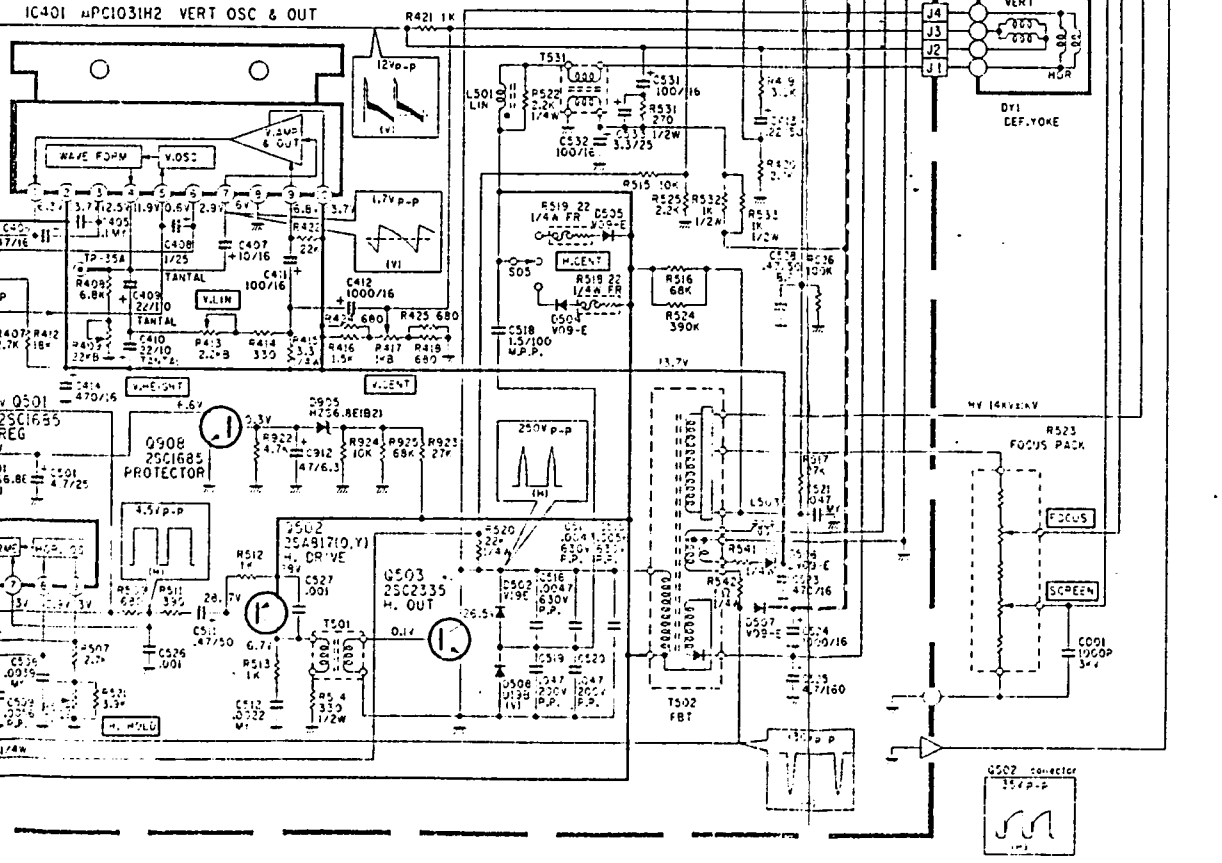
TRC-4223A CONTROL PCB

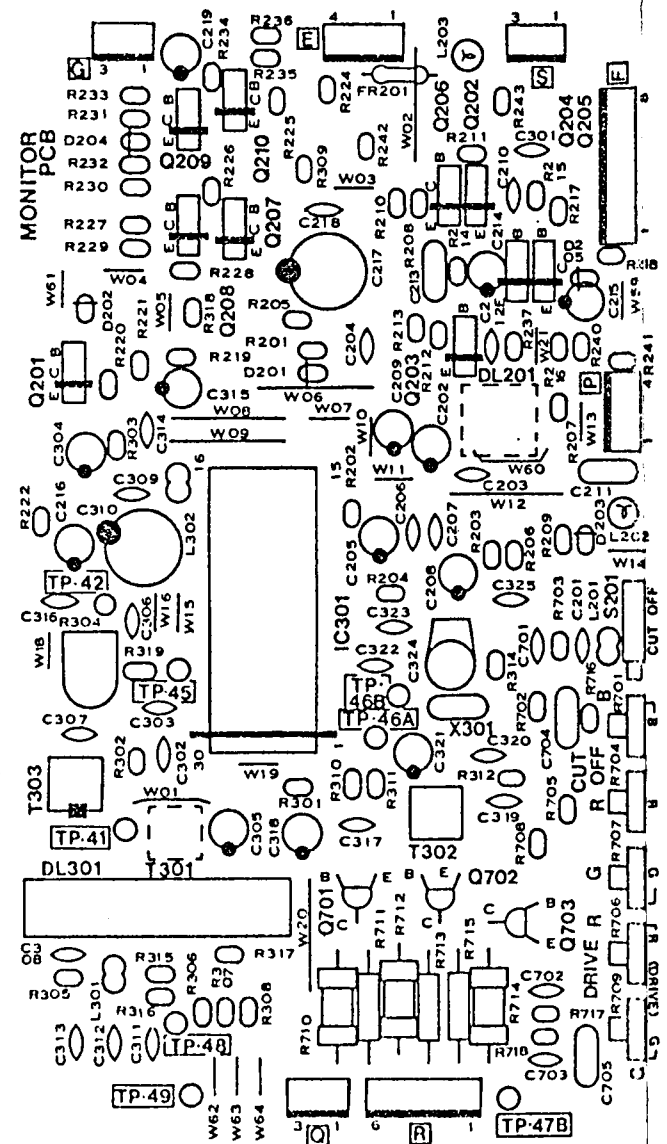
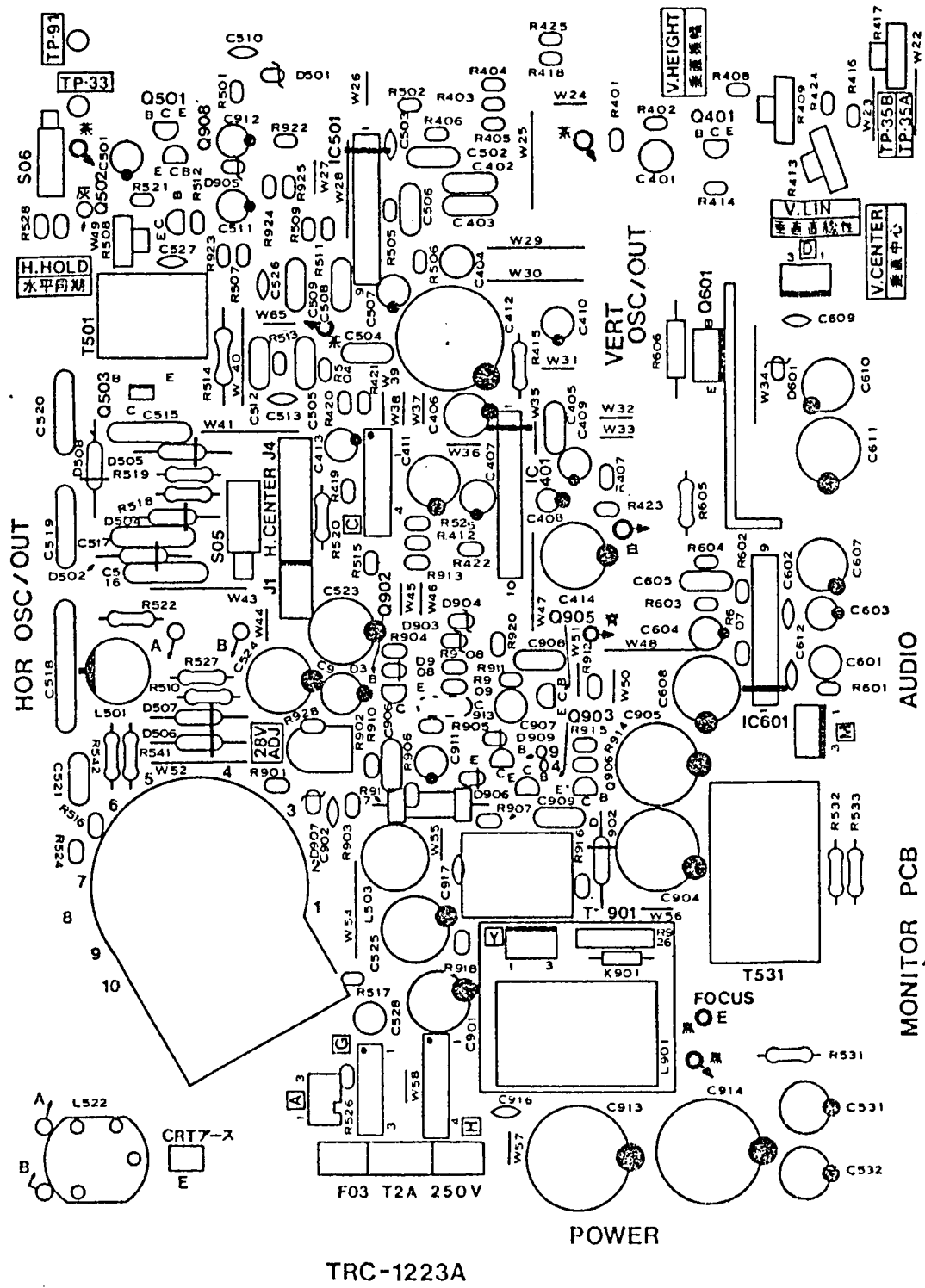


TRC-1223A(1/2) VIDEO & CHROMA PCB



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





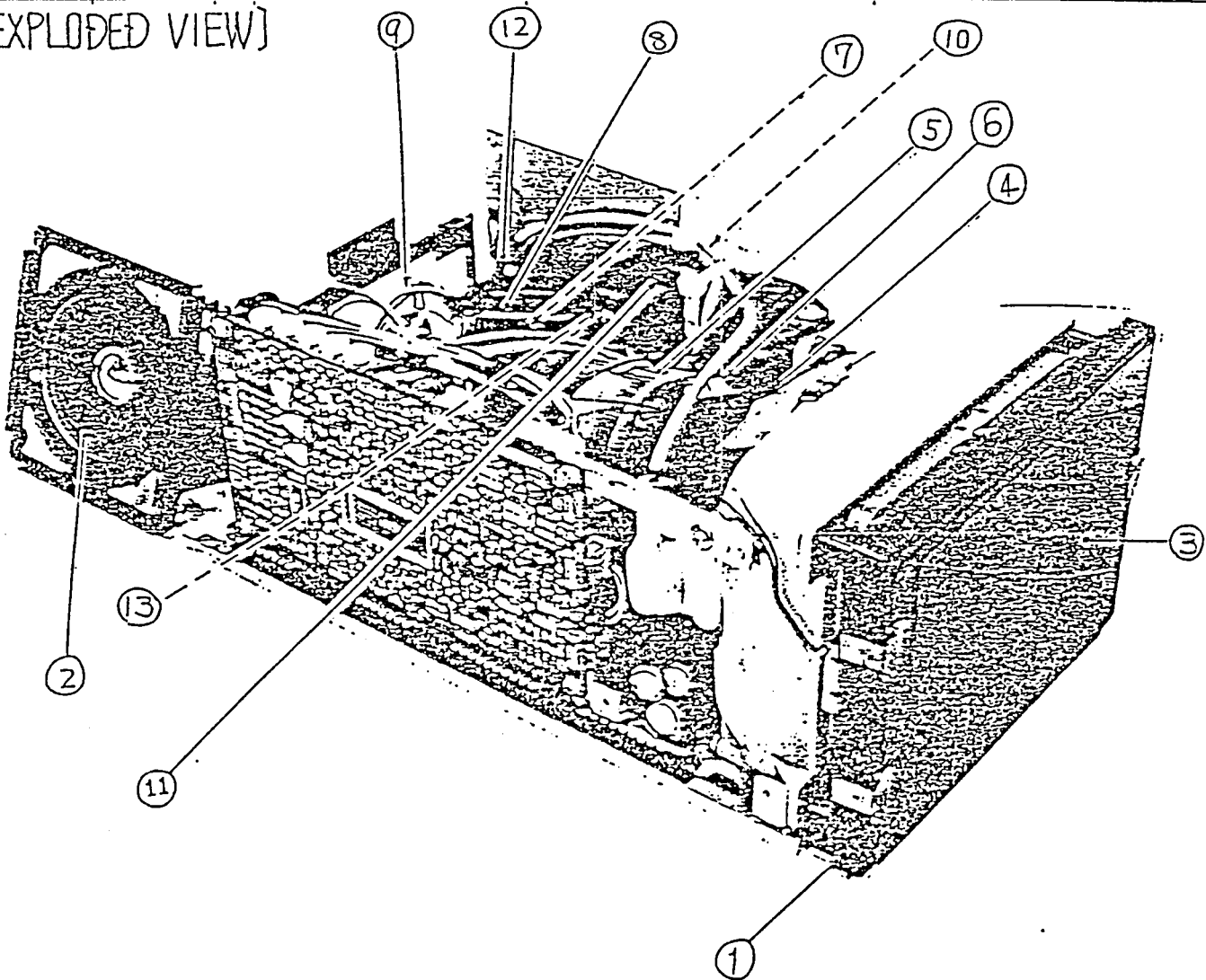
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# CHASSIS AND CABINET PARTS LIST

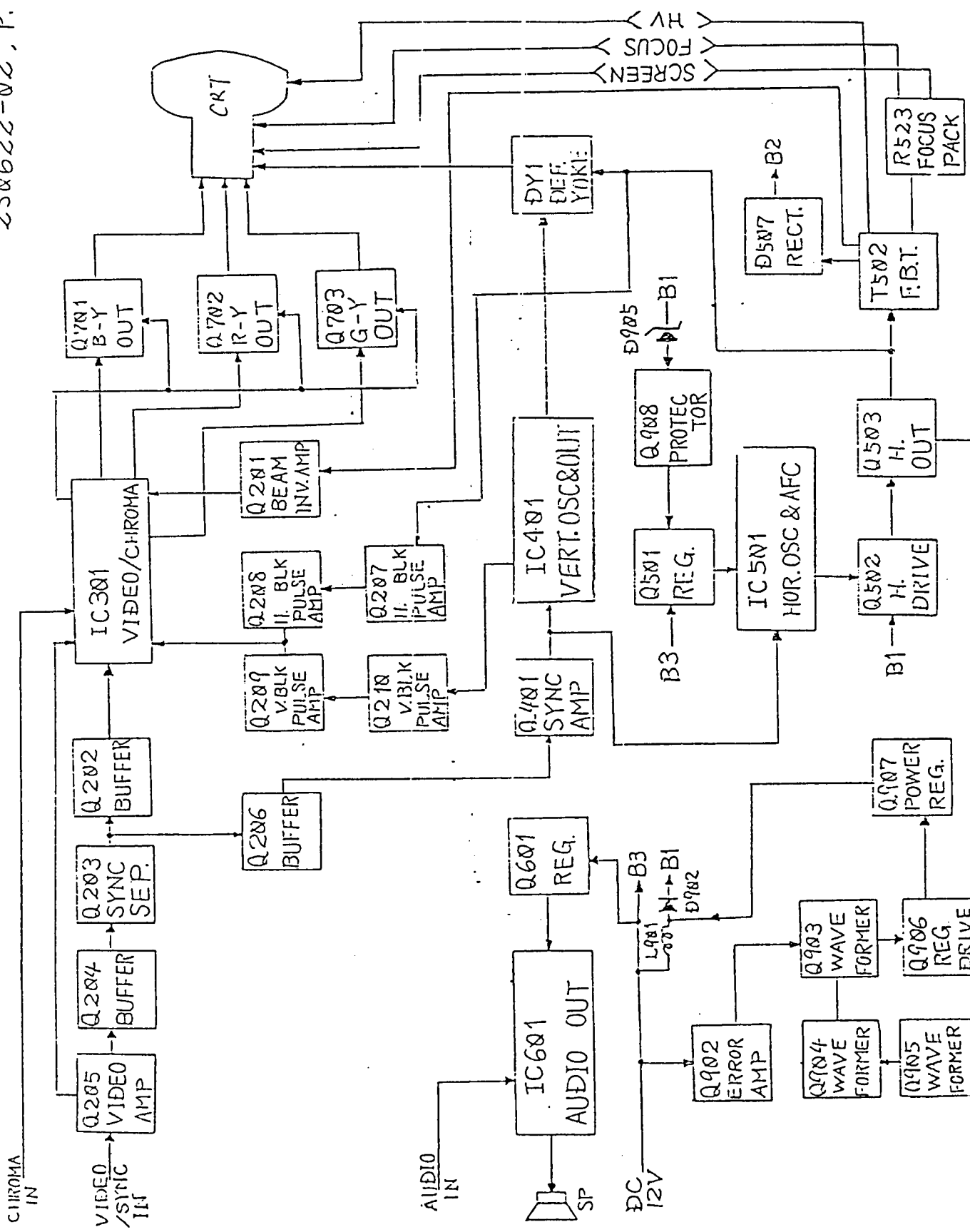
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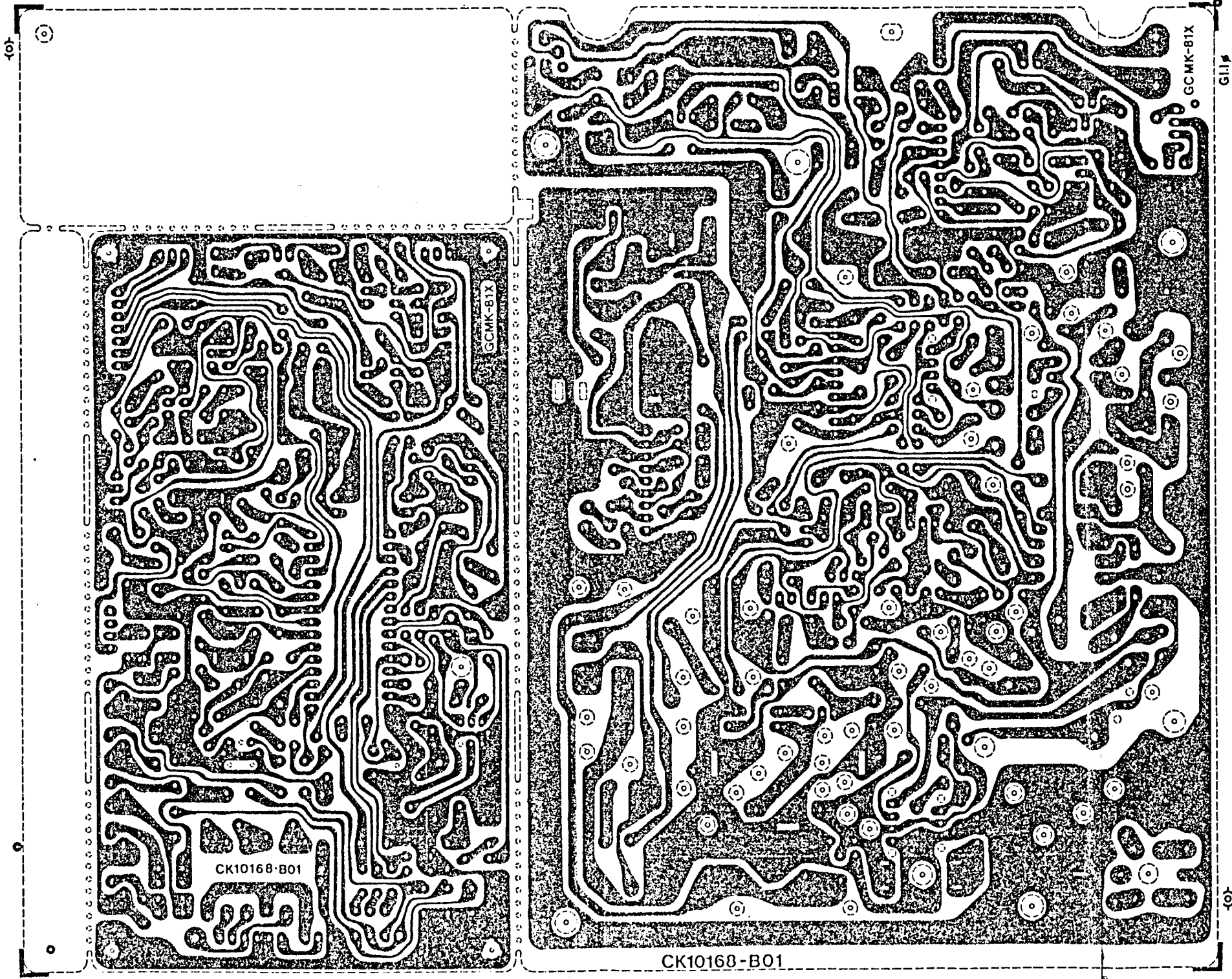
VIEW No.	SYMBOL No.	A	PART No.	PART NAME	REMARK
1			CM10022-00D	Front Panel Assy	
2			HSA0799-01C	Speaker	
3			CM41779-A01	Protector Glass	
4	V01	△	150BMB22-AF	Picture Tube	
5	DY1	△	CJ26210-00A	Def. Yoke	
6			—	Wedge	
7			—	PC Magnet	
8	T1502	△	CJ39587-00A	F. B. Transf.	
9		△	C39158-D	CRT Socket	
10	Q1907		2SD1118	Si. Transistor	Power regulator
11	R1523	△	CJ49510-257-28	Focus Pack	FOCUS screen
12			A46445	Focus Cover	(X2)
13	C001	△	QCZ9017-102M	C Cap.	1000p 3KV P

(EXPLODED VIEW)



(No. 5443) 11





101

101

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CK10168-B01









## TRC-1223A-2 (DEF. POWER REG. &amp; AUDIO OUT PCB ASS'Y) 1/3

SYMBOL No.	△	PART No.	PART NAME.	REMARK
VARIABLE RESISTOR				
R1409		QVZ3507-223	VR (V. HEIGHT)	22k $\Omega$ B
1413		" -222	" (V. LIN.)	2.2k $\Omega$ "
1417		" -102	" (V. CENT.)	1k $\Omega$ "
1508		A75557-222	" (H. HOLD)	2.2k $\Omega$ "
1902		CEX40054-023	" (B1 ADJ)	2k $\Omega$ "
RESISTOR				
R1917		QRG019J-152S	OM R	1.5K $\Omega$ 1W J
1926		QRM024K-R22	MP R	0.22 $\Omega$ 2W K
CAPACITOR				
C1401		QEN61HM-105Z	BP E Cap.	1 $\mu$ F 50V M
1404		QEN51HM-105	"	" " "
1405		QFZ0083-104M	M. Cap.	0.1 $\mu$ F " K
1408		QEE51EK-105B	Tan. Cap.	1 $\mu$ F 25V "
1409		QEE51AK-226M	"	2.2 $\mu$ F 10V "
1410		" -226M	"	" " "
1412		QEU51EM-108M	E Cap.	1000 $\mu$ F 25V M
1413		QEB51HM-224M	"	0.22 $\mu$ F 50V "
1509		QFP31HJ-562S	P.P Cap.	5600pF " J
1515	△	QFP42JJ-562S	"	" 630V "
1516	△	" -472M	"	4700pF " "
1517	△	" -472M	"	" " "
1518		QFH52AJ-155M	MM Cap.	1.5 $\mu$ F 100V "
1519		QFP32DK-473M	P.P Cap.	0.047 $\mu$ F 200V K
1520		" -473M	"	" " "
1528		QEN61HM-474Z	BP E Cap.	0.47 $\mu$ F 50V M
1601		QEN51HM-105	"	1 $\mu$ F " "

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

SYM. ECL No.	△	PART No.	PART NAME.	REMARK
COIL				
L1501		CE40024-002	Hor. Lim.	
1503		CJ30030-054	Coil	
1522		CE40140-000	W Coil	
1901		CJ30131-00A	Power Choke	
TRANSFORMER				
T1501		A76568-MA	H. Drive Transf.	
1502	△	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	△	2SC2335	"	
1601		2SD1133	Transistor	





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

250622-32

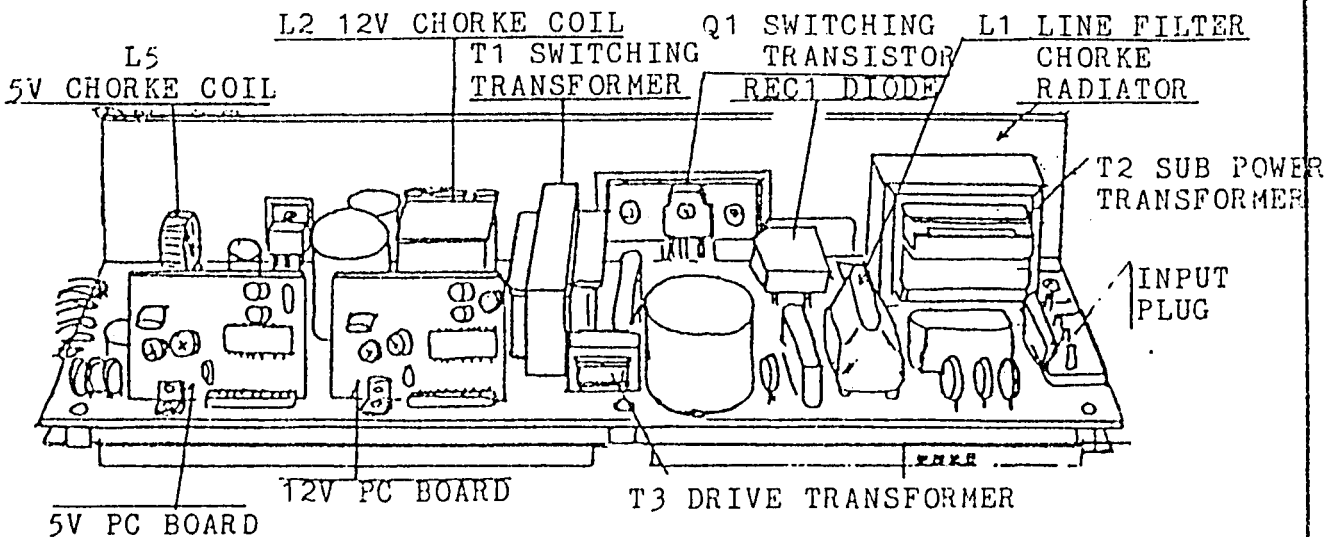
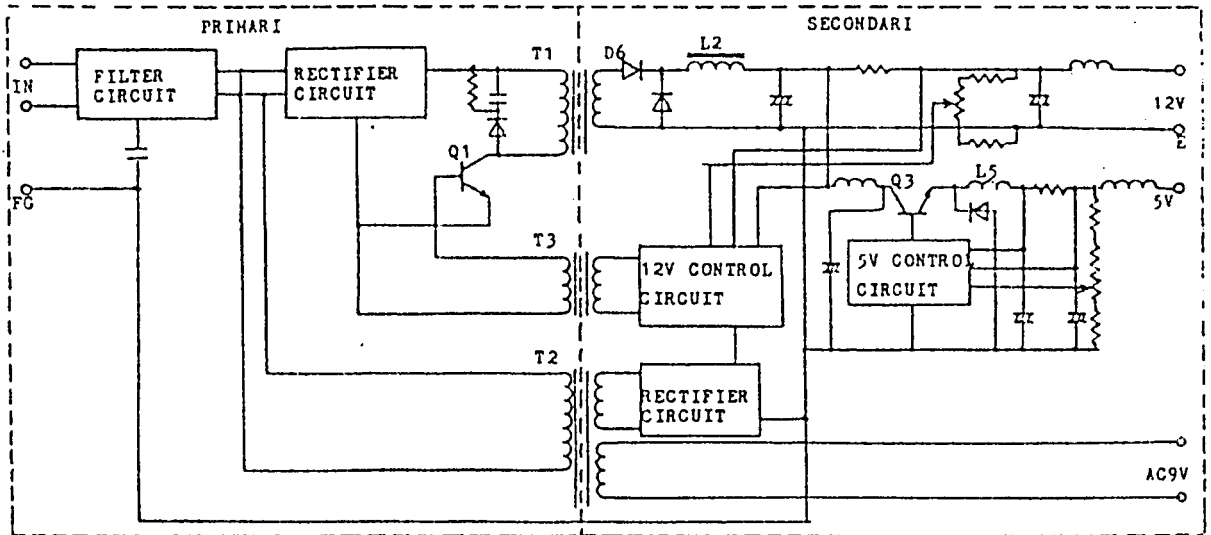
SYMBO <sup>L</sup> NO.	Δ	PART No.	PART NAME.	REMARK
VARIABLE RESISTOR				
R1304		CEX40053-053	VR(OL AMP)	5k $\Omega$ B
1701		A75557-103	" (B. CLT OFF)	10k $\Omega$ "
1704		" -103	" (R. CLT OFF)	" "
1706		" -221	" (R. DRIVE)	220 $\Omega$ "
1707		" -103	" (G. CLT OFF)	10k $\Omega$ "
1709		" -221	" (G. DRIVE)	220 $\Omega$ "
RESISTOR				
R1710		QRG019J-123S	OMR	12k $\Omega$ . 1W J
1712		" -123S	"	" " "
1714		" -123S	"	" " "
CAPACITOR				
C1305		QEB51HM-224M	E Cap.	0.22 $\mu$ F 50V M
1324		QAT3001-010	Trimmer Cap.	
COIL				
L1201		A76186-1.5	Peaking Coil	7.5 $\mu$ H
1202		A49468-562	"	5600 $\mu$ H
1203		" -101	"	100 $\mu$ H
1301		A76186-8.2	"	8.2 $\mu$ H
1302		" -68	"	68 $\mu$ H
TRANSFORMER				
T1302		CE40395-001	CW. Transf.	
1303		CE40396-001	DL P Transf.	
DIODE				
D1201		1SS133	Si. Diode	
~5				



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



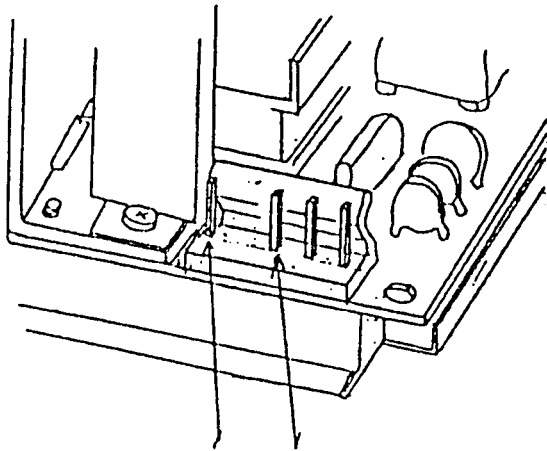




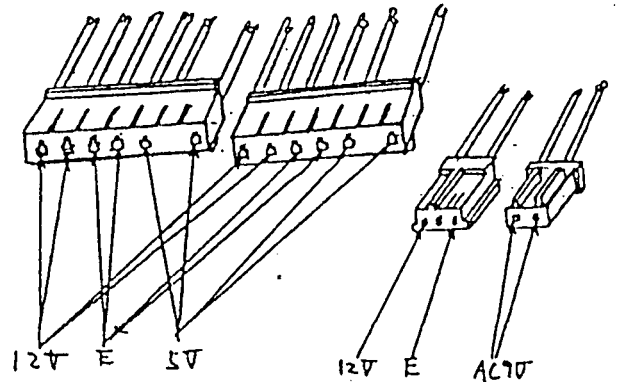
### 3, ALIGNMENT INSTRUCTION

#### 1. INPUT OUTPUT CONNECTION

INPUT

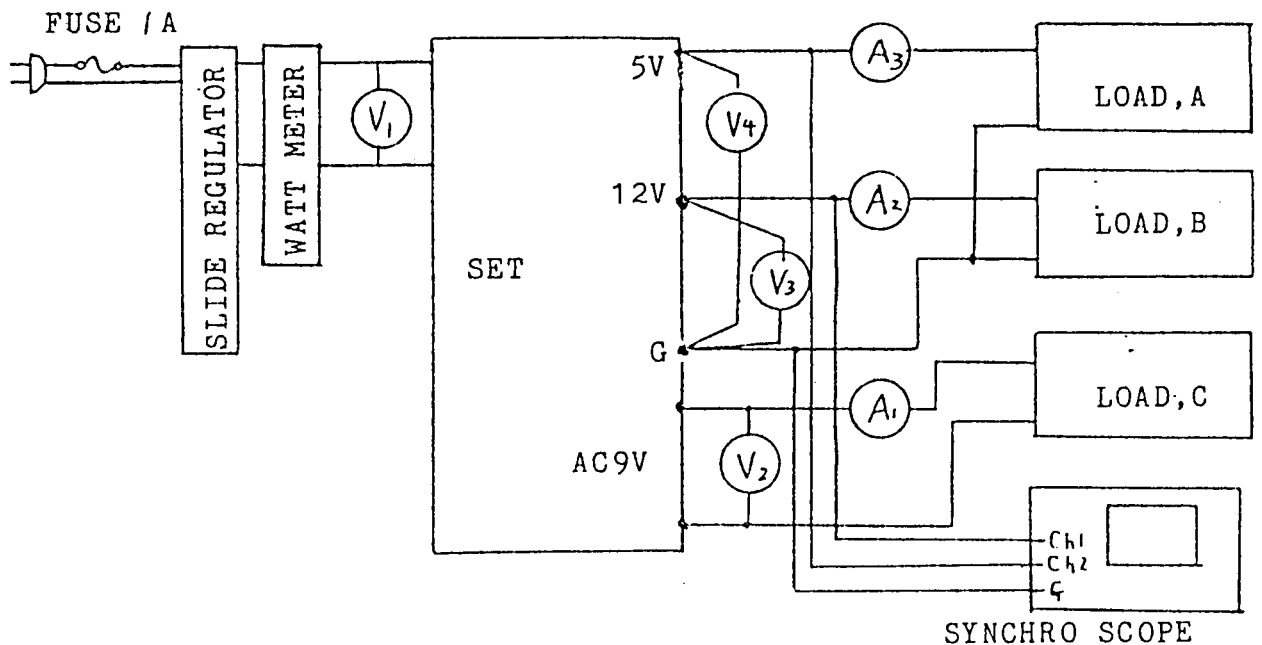


OUT PUT



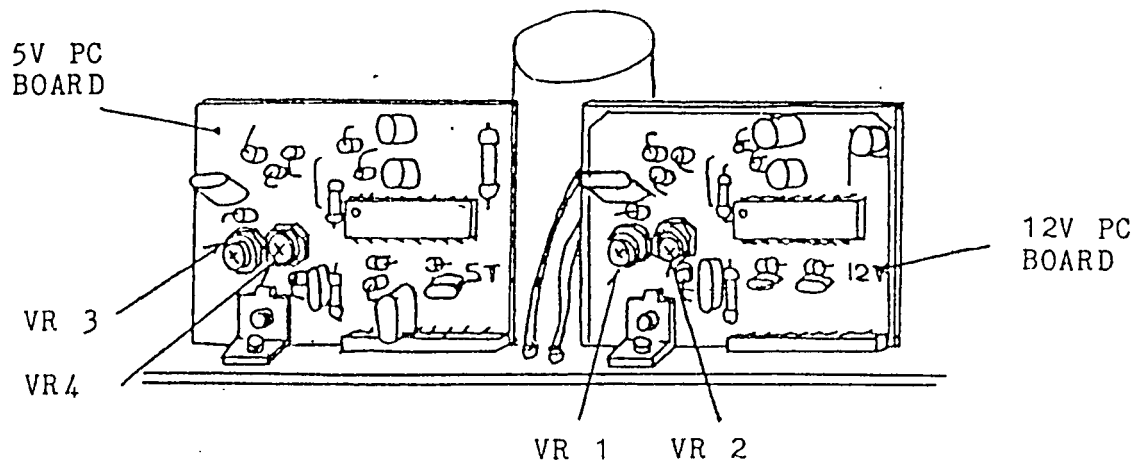
IN PUT 230V 50/60Hz

CONNECT : ON


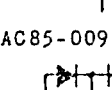
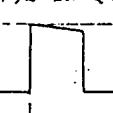
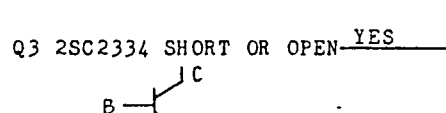
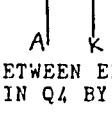
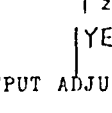




- 1) SLIDE REGULATER
- 2) WATT METER
- 3) LOAD A, B
- 4) V1
- 5) V2
- 6) V3
- 7) V4
- 8) A1
- 9) A2, 3
- 10) LOAD C

- AC 220~240V
- AC WATT MATER TYP 75W
- ELECTRONIC LOAD TYP 12V , 5A
- AC VOLTAGE METER TYP 200V 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 $230^V$ 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

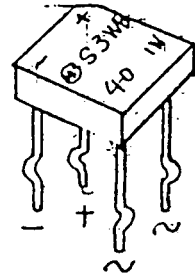
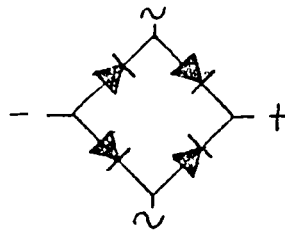
TROUBLE	CHECK POINT	CAUSES AND TEST	SOLUTION
NO OUTPUT	SOME SCRAP INSIDS OK	SHORT CIRCUIT BIY SCRAP <u>YES</u>	CLEANING
NO AC 9V OUTPUT	SUPPLEMENTARY CIRCUIT OK	T2 TRANSFORMER SHORT OR OPEN <u>YES</u> T2 PRIMARY LEAD WHITE TO WHITE 160~200Ω SECONDARY LEAD RED TO RED 9~12Ω SECONDARY LEAD BLUE TO BLUE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

S3WB40

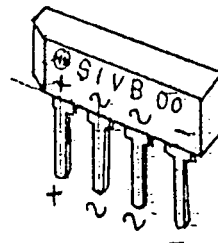
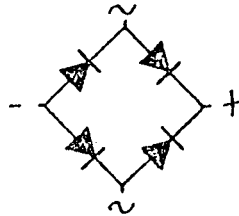
RECTIFIER STACKS DIODES



2, REC2

S1VB10

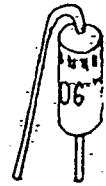
RECTIFIER STACKS DIODES



3, D1

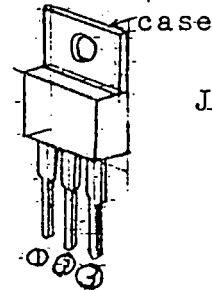
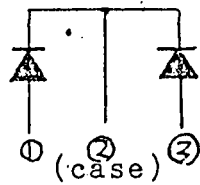
ERB24-06C

FAST RECOVERY DIODES



4, D6,7

ESAC85-009 , ESAC82-004 SCHOTTKY BARRIER DIODES

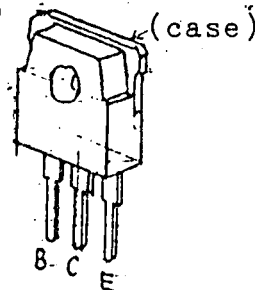
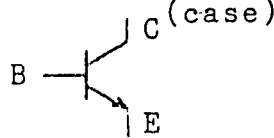


JEDEC:TO-220AB

5, Q1

2SC2625

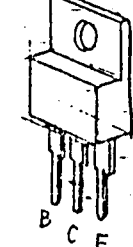
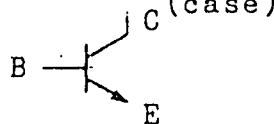
POWER TRANSISTOR



6, Q3

2SC2334 (case)

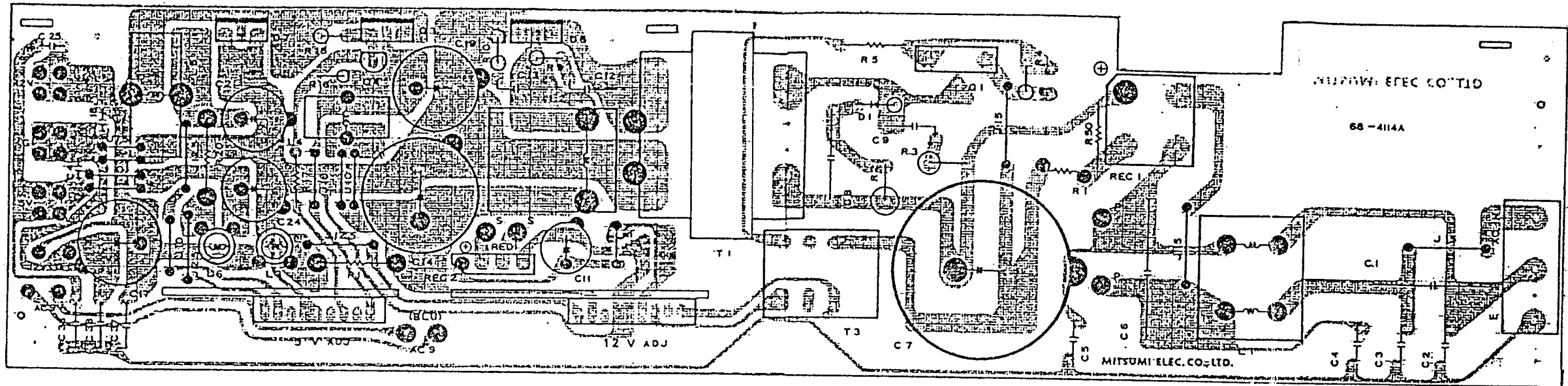
POWER TRANSISTOR



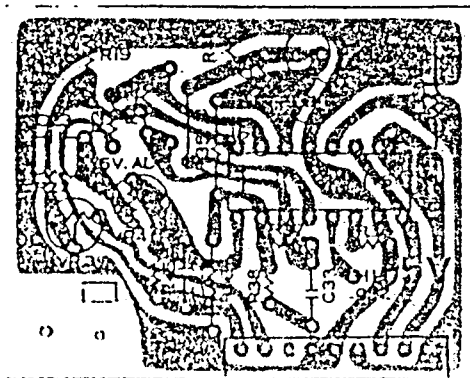
JEDEC:TO-220AB

登録番号

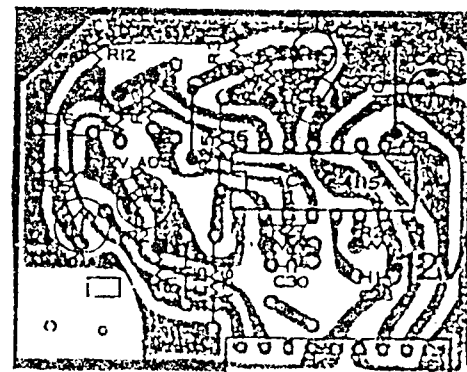
8, PRINTED CIRCUIT BOARD



MAIN PC BOARD

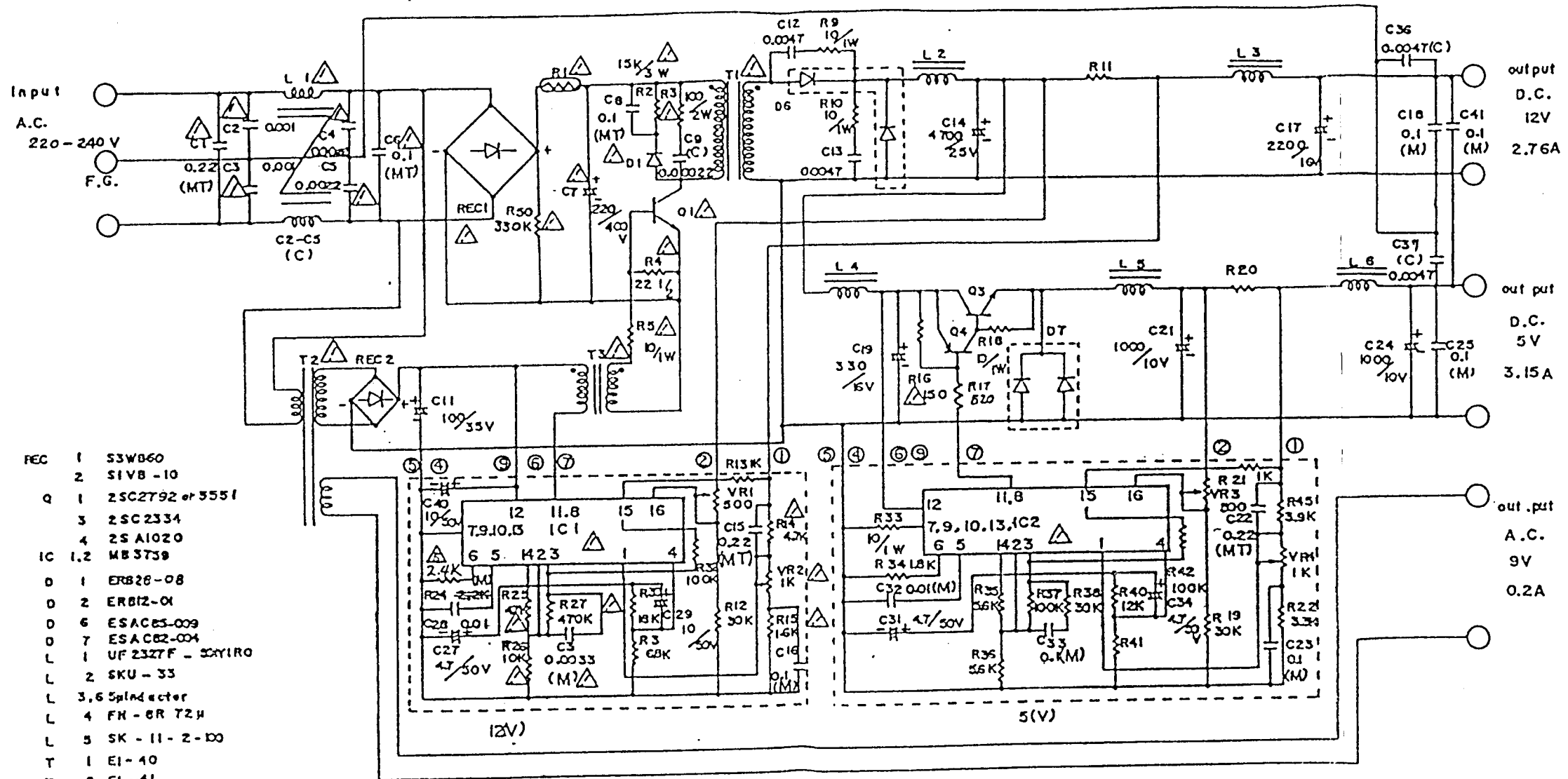


5V PC BOARD



12V PC BOARD

# 7. SCHEMATIC DIAGRAM



- REC 1 S3WB60
- 2 S1VB-10
- Q 1 2SC2792 or 5551
- 3 2SC2334
- 4 2S A1020
- IC 1,2 MB3759
- D 1 ERB28-08
- D 2 ERB12-01
- D 6 ESAC65-009
- D 7 ESAC62-004
- L 1 UF 2327F - 30Y1R0
- L 2 SKU-33
- L 3,6 Splnductor
- L 4 FK-6R 72μ
- L 5 SK-11-2-100
- T 1 EI-10
- T 8 EI-41
- T 3 EI-22
- R 1 60-13
- R 11,20manganin resistor

### CAPACITOR

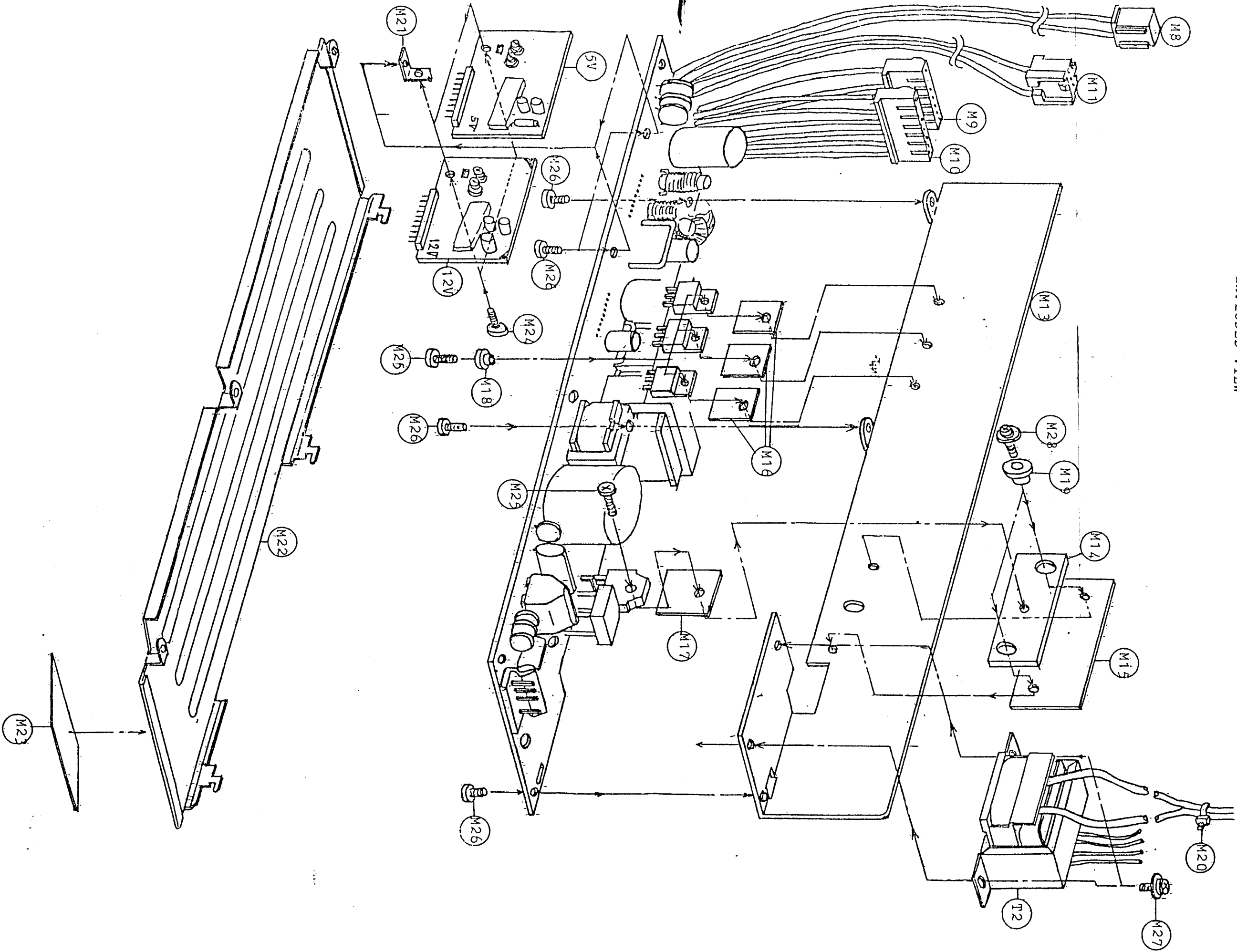
- (M) POLYESTER FILM CAPACITOR
- (MT) METALLIZED POLYESTER FILM CAPACITOR
- (C) CERAMIC CAPACITOR

### NOTE

ALL CAPACITANCE ARE IN MICROFARADS  
 ALL RESISTANCE VALUES ARE IN OHMS 1/4W,  
 UNLESS OTHERWISE SPECIFIED IN THE DIAGRAM.

△ CRITICAL COMPONENT

9. EXPLODED VIEW AND PARTS LISTS  
EXPLODED VIEW



10. PARTS LIST					
Symbol	Part, No	Parts Name	Description	Safety Parts	Service Parts
TRANSFORMERS & COILS					
T1	68-4070A	SWITCHING TRANSFORMER		!	0.5%
T2	68-1109A	SUB POWER TRANSFORMER		!	
T3	68-0853A	DRIVE TRANSFORMER		!	
L1	68-1606A	UF2327	LINE FILTER CHORKE		
L2	68-1366D	SKU-33-B8	CHORKE COIL		
L3	68-0306A	5 $\mu$ H	CHORKE COIL		
L4	68-0013B	FN-R8S	CHORKE COIL		
L5	68-1351A	SK11-2-100	CHORKE COIL		
L6	68-0306A	5 $\mu$ H	CHORKE COIL		
TRANSISTORS & DIODES					
Symbol No. with Q: Transistor		Symbol No. with REC: Diode			
Symbol No. with D: Diode					
Q1	68-0130C	2SC2625	SWITCHING TRANSISTOR	!	0.5%
Q3	68-0040C	2SC2334-K	SWITCHING TRANSISTOR		0.2%
Q4	68-2001A	2SA1020-0,Y	TRANSISTOR		0.1%
REC1	68-0345A	S3WB-40	DIODE	!	0.1%
REC2	68-2254A	S1VB-10	DIODE		0.1%
D1	68-0036C	ERB24-06C	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 Electrolytic Capacitor					
C1	68-2702L	CMP103A125K-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	68-2702R	CMP104A125K-N	CMP CAPACITOR	!	
C7	68-2610A	CEE471D200R	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
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		

実印番号

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	68-3007Q	RD100K-J1/4B	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)					
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	68-0064A	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	68-5079	5V PC BOARD ASS			0.2		
<div style="border: 1px solid black; width: 100px; height: 20px; display: inline-block;"></div>							