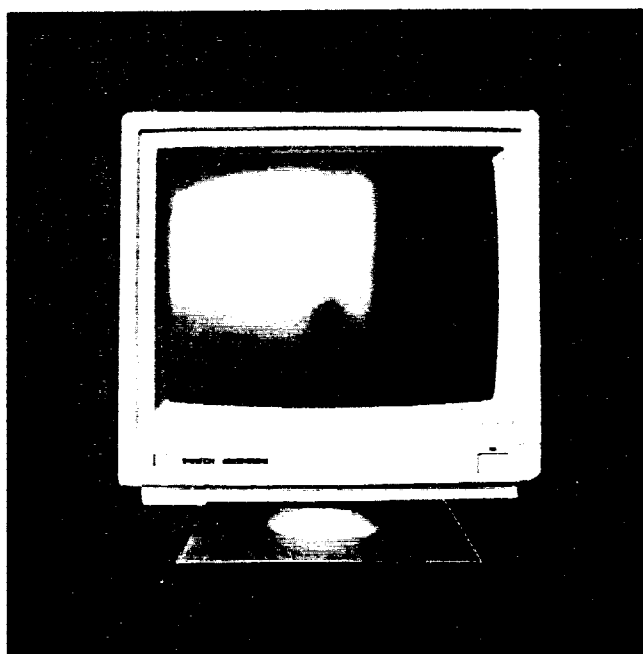


14" COLOR MONITOR

SERVICE MANUAL

SC-431V AND SC428V



SPECIFICATION

Picture tube	3709 B22
	14 Inches diagonal
	90 degree deflection, 0.31mm dot pitch, black matrix
Input signal	Video : 0.7Vp-p Amalog level positive
	Sync : TTL level
Display	
-colors	Any Colors
Synchro	
-nization	Horizontal : 31.5KHz
	Vertical : 60~70Hz
Resolution	640 dots(H)×350 lines(V) : 70Hz
	640 dots(H)×400 lines(V) : 70Hz
	640 dots(H)×480 lines(V) : 60Hz
Video band	
-width	30MHz
Display area	Horizontal : 245±3mm
	Vertical : 175±3mm
AC input	
-voltage	AC 115V / 60Hz, AC 230V / 50Hz(Optional)
Power	
-consumption	75W(Max)
Dimension	350(W)×393(H)×382(L)mm
Weight	13.0kg

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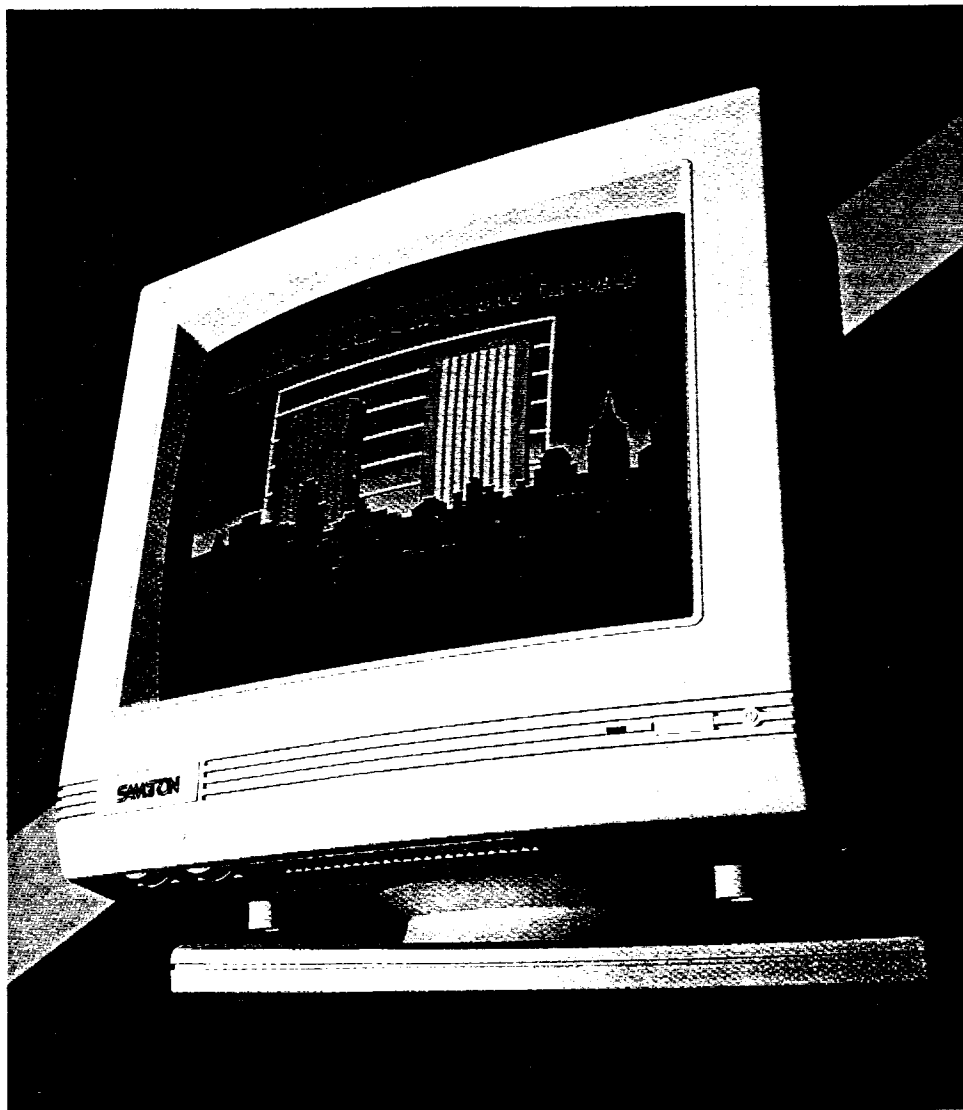
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SAMTRON

MONITORS BY SECO



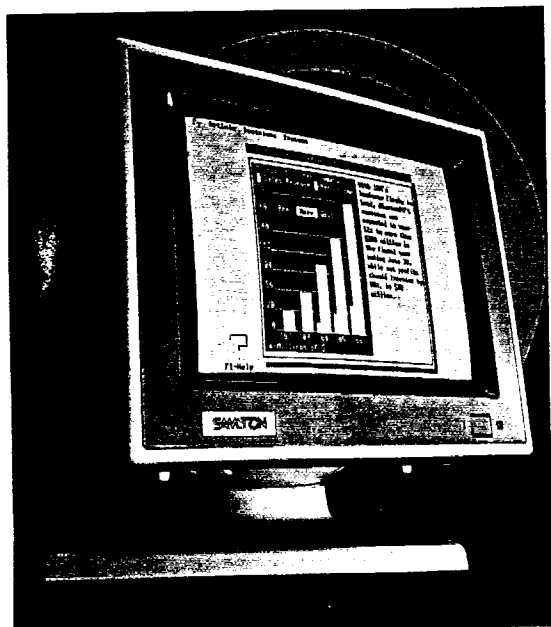
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We pledge to settle for nothing less than perfection in providing products and services to our valued customers. Perfection is standard in all decisions related to customer service, product quality and delivery. Perfect performance is the responsibility and pride of every member of Samsung.

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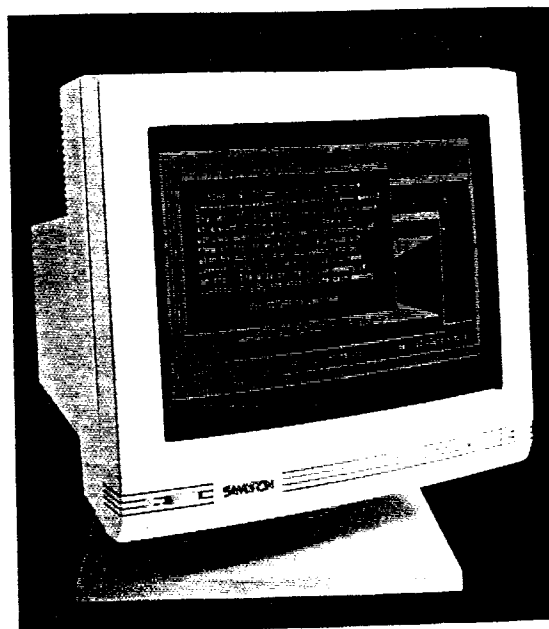
SAMSUNG ELECTRONIC COMPONENTS (UK) LTD

MONOCHROME MONITORS & TERMINALS



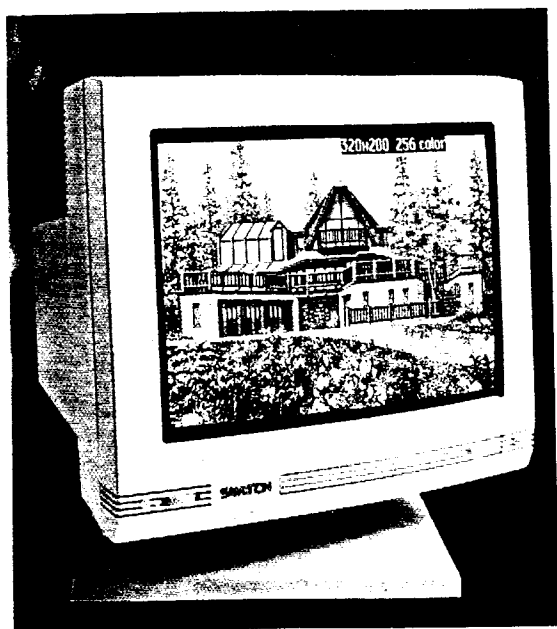
SM-12SF**A7

12" Monochrome monitor
IBM PC compatible
Flat screen display



SM-430/450*

14" Monochrome monitor
IBM PC, XT & AT compatible
Flat screen display
132 column spreadsheet available
SM-450: Dual mode (mode 1: MGA, mode 2: CGA)
inverse display



SM-440

14" Analog monochrome monitor
VGA compatible
Flat screen display



SD-220

14" Data display terminal
VT220 compatible

COLOUR MONITORS



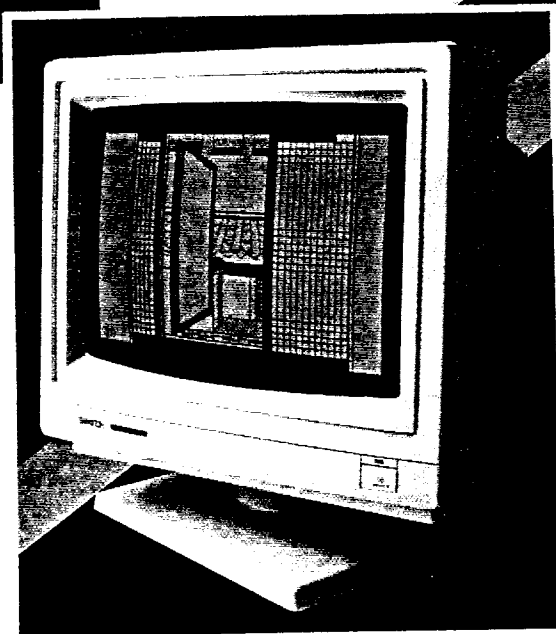
SC-431VII

14" Analog colour monitor
VGA compatible II
0.31mm dot



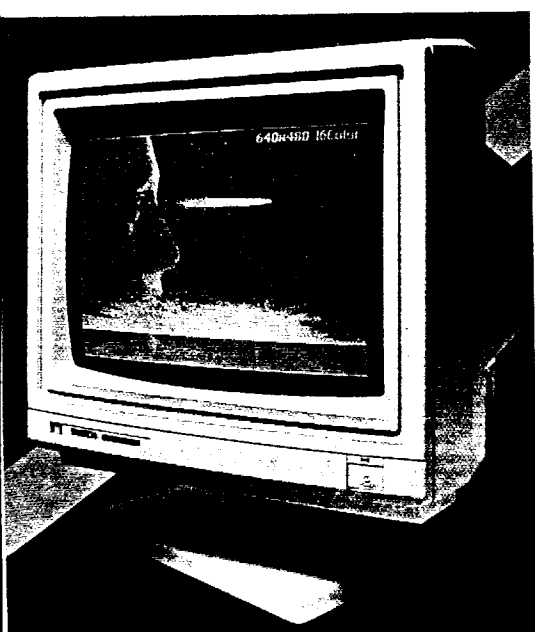
SC-431EII

14" Colour monitor
EGA compatible II
0.31mm dot



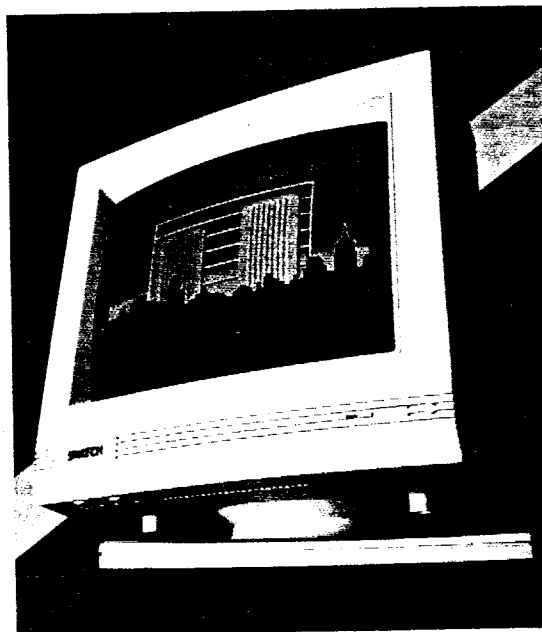
SC-442C/452C

14" TTL RGB colour monitor
CGA compatible
Text mode switch (green)
SC-442C: 0.42mm stripe
SC-452C: 0.52mm stripe



SC-431V

14" Analog colour monitor
VGA compatible
0.31mm dot



SC-431E

14" Colour monitor
EGA compatible
0.31mm dot

SPECIFICATIONS

MONOCHROME MONITORS

TERMINAL

REFERENCE	SM-12SF**A7	SM-430/450*	SM440
Size & Deflection	12" 90°	14" 90°	14" 90°
Phosphor	Green/Amber Paper white	Paper White Green/Amber	Paper White Amber/Green
Face	FST, Dark-Tint Non-Glare	FST, Dark-Tint Non-Glare	FST, Dark-Tint Non-Glare
H. Frequency	18.43 KHZ	18.43 (430) KHZ 15.75/18.43 (450)	31.5 KHZ
Input Signal	TTL	TTL	Analog
Video Bandwidth	18MHZ	18MHZ	30MHZ
Resolution	720(H)×350(L)	720×350	640(H)×480(V) 720×420 640×350
Input Connector	9 Pin D-Sub	9 Pin D-Sub	15 Pin D-Sub
Display Characters (C×R)	80×25	80×25	80×30
Dimensions (W×D×H)	385×360×375	403×388×416	403×388×416
Compatibility	MDA/Hercules	MDA/Hercules (SM430) MDA/Hercules CGA (SM450)	VGA
Input Power	115V/230V	97-264V Free Voltage	97-264V Free Voltage

REFERENCE	SD-220
Size & Deflection	14" 90°
Phosphor	Amber or Paper white
Face	FST Non-Glare
Format (CXL)	132×24, 80×24 25th Status Line
Interface	EIA RS-232C RS-422
Parity	Odd, Even, Mark, Space, or No Parity
Baud Rates	75 to 19.2K Bps
Character Length	7 or 8 data bits 1 or 2 stop bits
Mode	VT-200/100/52
Ergonomic Design	Tilt and Swivel
Display Dimension	403W×388D×416H
Keyboard Dimensions	533W×179D×38H
Character Formation	7×7 matrix in 9×12 Cell
Character Set	96 ASCII Characters, 16 Graphic Symbols, 16 Control Character Symbols
Attributes	Blink, Blank, Normal/Reverse Video, Underline, Half Intensity

COLOUR MONITORS

REFERENCE	SC-431 VII	SC-431E II	SC-442C/452C	SC-431V	SC-431E
Size & Deflection	14" 90°	14" 90°	14" 90°	14" 90°	14" 90°
Face	Non-Glare	Non-Glare	Glare	Non-Glare	Non-Glare
Frequency (KHZ)	31.5	15.75/21.85	15.75	31.5	15.75/21.85
Input Signal	RGB Analog	R/G/B/I/TTL	R/G/B/I/TTL	RGB Analog	R/G/B/I/TTL
Resolution	640×350 640×400 640×480	640×200 640×350	640×200	640×350 640×400 640×480	640×200 640×350
Input Connector	15 Pin D-Sub	9 Pin D-Sub	9 Pin D-Sub	15 Pin D-Sub	9 Pin D-Sub
Display Colours	Any colours	16/64	16	Any colours	16/64
Dot Pitch (mm)	0.31	0.31	0.42/0.52	0.31	0.31
Display Characters (C×R)	80×30	80×26		80×30	80×26
Dimensions (mm) (W×H×L)	400×444×440	400×444×440	420×444×460	420×444×460	431×473×450
Compatibility	VGA	EGA	CGA	VGA	EGA
Input Power	97-264V (Free Voltage)	97-264V (Free Voltage)	115V/230V	115V/230V	115V/230V

- Specifications are subject to change without notice.
- One year warranty.
- TVI-025 is a trademark of Televideo Systems, Inc.
- ADDS Viewpoint is a trademark of Applied Digital Systems, Inc.
- IBM PC, XT, AT are trademarks of International Business Machines, Inc.
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The International Division of Samsung Group

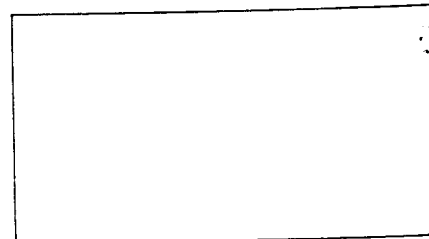
Samsung House, 3 Riverbank Way, Great West Road,

Brentford, Middx TW8 9RE

TEL: 01-862 9311/2 TLX: 25823 STARS L G FAX: 01-862 0096/7

SAMTRON

SAMSUNG ELECTRON DEVICES



GENERAL INFORMATION

(1) SAFETY PRECAUTION

WARNING: Service should not be attempted anyone unfamiliar with the necessary precautions on this unit.
The following precautions are necessary during servicing.

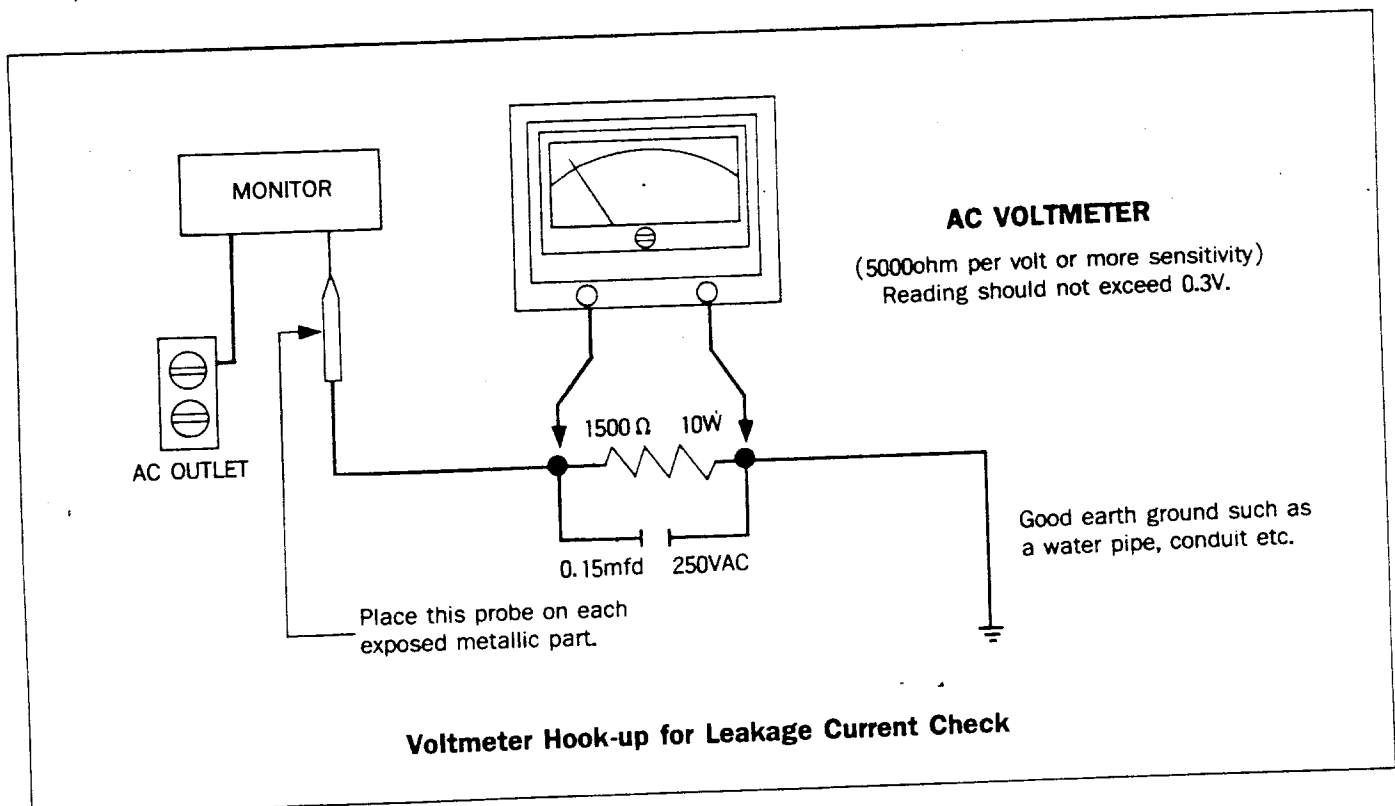
1. Some parts such as a picture tube in this unit have special safety-related characteristics for X-RAY RADIATION protection.
For continued safety, the parts replacement should be undertaken referring to item 2 below.
2. Many electrical mechanical parts in this unit have special safety-related characteristics for protection against shock hazard and others.
These characteristics are often passed unnoticed by a visual inspection and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage wattage, etc.
Replacement parts which have these special characteristics are identified in the manual and supplements by shading on the schematic diagram and the parts list.
Before replacing of these components read the parts list in this manual, carefully.
3. When replacing chassis in the cabinet, always be certain that all the protective devices are installed properly, such as insulating covers, strain relief, etc.
4. Before replacing the back cover of the set, thoroughly inspect inside the cabinet to see that no stray parts or

tools have been left inside.

5. Before returning the set to the customer always perform an AC leakage current check on the exposed metallic parts of the cabinet, such as terminal, screwheads, metal overlays, control shafts, etc. To be sure the set is safe to operate without danger of electrical shock. Plug the AC line cord directly into a 115V AC outlet (do not use a line isolation transformer during this check). Use an AC voltmeter having 5000 ohms per volt or more sensitivity in the following manner.

Connect a 1500 ohm, 10 watt resistor, paralleled by a 0.15mfd(μ F), 250V AC capacitor, between a known good earth ground (water pipe, conduit, etc.) and the exposed metallic parts, one at a time.

Measure the AC voltage across the combination of 1500 ohm resistor and 0.15 mfd(μ F) capacitor. Reverse the AC plug at the AC outlet and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 0.3V RMS. This corresponds to 0.2mA AC any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.



[2] DOCUMENT DESCRIPTION

This is technical specification for a SC-431V Color display monitor.

This document contains information on all technical details of the monitor.

[3] PRODUCT DESCRIPTION

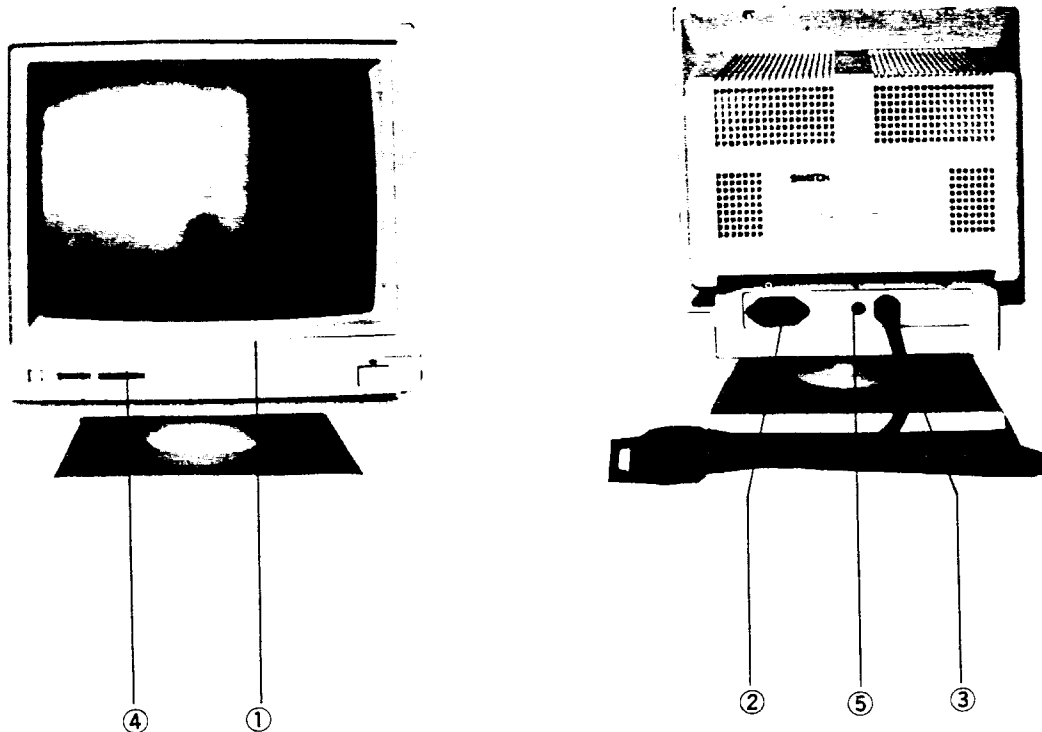
This SC-431V Color display monitor to be operated in Analog Drive mode in put a highlight of these is provided below.

- Resolution : 640 Dots×350 lines : 70Hz
640 Dots×400 lines : 70Hz
640 Dots×480 lines : 60Hz
- Display capability : 2400 Characters(80×30)
- Active display area : Horizontal~245±3mm
Vertical 170±4mm
- Horizontal frequency : 31.5KHz
- Vertical frequency : 60Hz / 70Hz

USING COLOR DISPLAY MONITOR

Meeting SC-431V Color display monitor.

Refer to the diagram below to be sure that your SC-431V package includes all the items in this picture.
Save the original box and packing materials in case you have to ship or transport



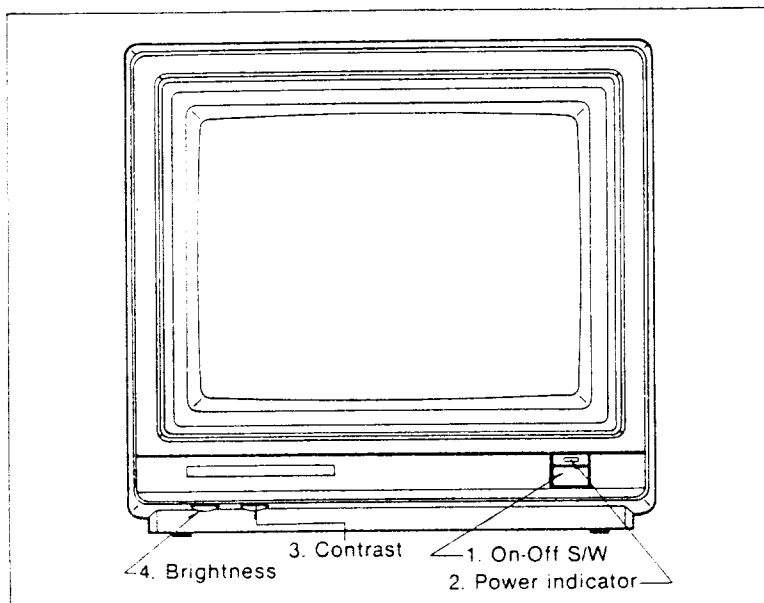
- ① Color display monitor(SC-431V)
- ② Power Input
- ③ Signal cable : Connects IBM PC or Compatibles
- ④ Swivel / Tilt stand
- ⑤ H-shift

[4] ADJUSTMENT

Apply power and Analog video signal to the data display

1. ADJUSTING THE FRONT CONTROLS

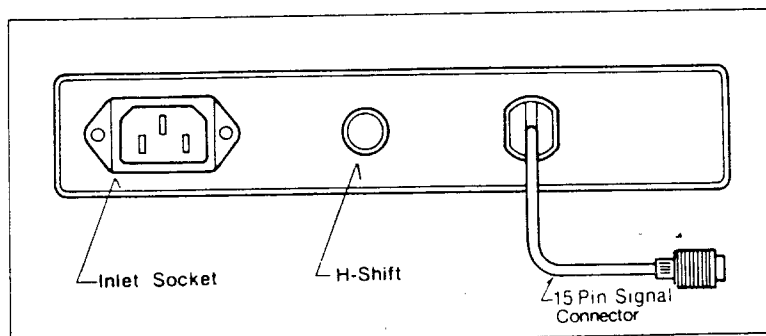
FRONT VIEW



- | | | |
|-------------------------|---|--------------|
| 1. The On-Off Switch | : The push-button on-off switch for the Monitor is in the lower right-hand corner. To turn the Monitor on push the button forward. You will see the light of the power indicator. To turn the Monitor off press the switch again. The power indicator | will go out. |
| 2. The Power Indicator | : Green light. | |
| 3. The Contrast Control | : Rotating it increases or decreases the degree of difference between the lightest and darkest sections on the screen. | |
| 4. Brightness Control | : Intensifies screen illumination. | |

2. ADJUSTING THE REAR CONTROLS

REAR VIEW



2. CHARACTERISTICS

(1) GENERAL CHARACTERISTICS

NO	Description	Nominal	Remark
1	CDT(Color Display Tube)	3709B22(ST)-TC06: 0.31P	Ref.CDT Spec.
2	CDT Phosphor	P 22 Dark Phosphor	
3	D.Y Deflection Angle	90°	Ref. CDT Spec.
4	Resolution	640×350, 640×400, 640×480	High Resolution
5	Horizontal Frequency	31.5KHz	Ref. Timing Chart Fig.1
6	Vertical Frequency	60 / 70Hz	
7	Input Signal	R.G.B Analog	
8	Power Consumption	Normal:60W, Max:70W	
9	Display Color	256 Colors	
10	Display Zone	245±3mm × 175 ±3mm	Ref. Fig.2
11	Display Character	2400 Character(80×30)	
12	Pitch	0.31mm Dot Pitch	
13	Weight	Approx. 14.8Kg	

(2) Electrical Characteristics

2-1. Input Power

NO	Description	Nominal	Remark
1	Power Source	AC 115V±15%(230V, 50Hz Option)	
2	Frequency	47~63Hz	
3	AC Input Current	1A±10%	

2-2. Input Signal

Section	Description	Nominal	Remark
Video Signal Red Green Blue	Video Input	0.7V Analog	
	Polarity	Positive	
	Pixel Rate	25.175MHz to 28.322MHz	
	Rise / Fall Time	Less than 20 nsec	
	Input impedance	75 ohms	
H-Sync.	TTL Level	High > 2.4V, Low < 0.8V	
	Pulse Width	3.8usec	
	Polarity	Positive or Negative	
	Frequency	31.5KHz	
	Front Porth	0.7usec	
	Back Porch	1.9usec	
V-Sync.	TTL Level	High > 2.4V, Low < 0.8V	
	Pulse Width	0.064msec	
	Polarity	Positive or Negative	
	Frequency	60 / 70Hz	
	Front Porch	0.064 ~ 0.985 msec	
	Back Porch	0.793 ~ 1.716 msec	

(2) CRT Electrode voltage

2-3. CRT Electrode voltage

NO	Description	Nominal	Remark
1	Heater	$6.3V \pm 0.5V$, $630mA \pm 30mA$	
2	Cathode(R.G.B)	$90V \pm 20V$	
3	Gride #1	$-10V \sim -40V \pm 20V$	
4	Gride #2	$500V \sim 50V$	
5	Gride #3	$6.5KV \pm 0.5KV$	
6	Anode Voltage	$25KV \pm 1KV$ @ 0uA	

2-4. Timing Characteristic

NO	Description		480Lines	400Lines	350Lines	Remark
1	Horizontal	Frequency	31.5KHz	31.5KHz	31.5KHz	
		Line Time	31.8usec	31.8usec	31.8usec	
		Active Time	25.4usec	25.4usec	25.4usec	
		Blanking Time	6.4usec	6.4usec	6.4usec	
		Front Porch	0.7usec	0.7usec	0.7usec	
		Back Porch	1.9usec	1.9usec	1.9usec	
2	Vertical	Frequency	60Hz	70Hz	70Hz	
		Line Time	16.683msec	14.268msec	14.286msec	
		Active Time	15.762msec	13.156msec	11.504msec	
		Blanking Time	0.921msec	1.112msec	2.264msec	
		Front Porch	0.064msec	0.159msec	0.985msec	
		Sync Pulse Width	0.064msec	0.064msec	0.064msec	
		Back Porch	0.793msec	0.890msec	1.716msec	

3 MECHANICAL CHARACTERISTICS

3-1. Weight

The total weight shall be less than approximate 14.8Kg.

3-2. External Dimensions(mm)

	Without Stand	With Stand
Width	350	350
Height	326	393
Length	382	382

3-3. Tilt/Swivel

The inclination of the surface of the screen shall be adjustable at least -5deg. and $+15\text{deg.}$ With a min. 20d from the vertical. The swivel must be min. 180deg.

3-4. Tool Resin

Tool	Resin	Color
Front	AF303(LUCKY)	NO.1738
Rear	-	-
Stand	-	-

3. DISPLAY ADJUSTMENT

[1] Front Panel Controls

- 1-1. Power Switch
Push button switch to supply the electric power to the set.
- 1-2. Brightness
This knob controls the brightness of the picture. It's normal position is mechanical center.
- 1-3. Contrast
This knob controls the contrast of the picture. Normal position is mechanical center.

[2] Rear Panel Control

- 2-1. H-Shift
this knob controls the picture position of the CDT screen.
Users set this knob so that the picture is positioned at almost the center of the CDT screen.

[3] Internal Controls

- 3-1. Red, Blue, Green Gain
This volume adjust the gain of RED, BLUE, GREEN video pre-amp.
Normal position is the mechanical center.
- 3-2. Red, Blue, Green Bias
This controls the bias voltage of RED, BLUE, GREEN amplifier.
Normal position is the mechanical center.
- 3-3. Screen Volume
this volume on the FBT controls the G2 voltage.
Normal position is the mechanical center.
- 3-4. Focus Volume
This volume on the FBT controls the focus of a picture.
Adjust this volume to get optimum focus.
- 3-5. Horizontal Hold
This volume controls the horizontal frequency.
Normal position is the mechanical center.
- 3-6. Horizontal Width
Adjust this volume so that the horizontal size of picture becomes 245mm at each mode.
- 3-7. Horizontal Center
This volume controls so that raster is positioned at the center of CDT screen.
- 3-8. Vertical Hold
This volume controls the vertical frequency.
Adjust this volume so that the picture becomes still at each mode.
- 3-9. Vertical Linearity
This volume controls the vertical linearity.
Adjust this volume so that mechanical center.
- 3-10. Vertical Shift
This controls the appropriate vertical position so that the picture is positioned at almost the center of the CDT screen.

3-11. Vertical Size

- 3-11-1. Adjust this volume so that the size of picture becomes 175mm at mode 1.
- 3-11-2. V-Size1
Adjust this volume so that the size of picture becomes 175mm at mode 2.
- 3-11-3. V-Size3
Adjust this volume so that the size of picture becomes 175mm at mode 3.

3-12. Sub-Brightness

This control adjust cut off point of the raster.

3-13. Side-Pin

This volume compensated the side-pincushion of the picture.

[4] White Balance Adjustment

- 4-1. Before the power switch on, all control volumes set mechanical center.
- 4-2. Operate the set for 15 minutes to warm up.
- 4-3. Degauss the CDT face fully with the degaussing rod.
- 4-4. Adjust brightness volume at max. point, sub-brightness volume at maximum position, and screen volume at minimum position.
- 4-5. Adjust screen volume slowly so that the raster begins to shine.
- 4-6. Adjust bias volume of appearing R.G.B until the raster begins to cut off.
- 4-7. Increase the screen volume slowly to shine the raster
And then adjust last two bias volume so the a white raster shines.
- 4-8. Now adjust the sub-brightness volume so that the raster begins to cut off.
- 4-9. Receive a white pattern signal.
- 4-10. Adjust R.G.B gain volume for specified white color.
Use the color analyzer, if necessary.
*Standard color coordinate.
 $X=0.281 \pm 0.02$
 $Y=0.311 \pm 0.02$ (@ 3F / L, 20F / L)
*Maximum brightness (at full white pattern)
Min. 30F / L
Max. 40F / L

[5] Flashover Protection

Due to high voltage within this tube, internal flashover occur.

Protection must be provided using spark to prevent flashover from destroying the cathode or other internal circuit.

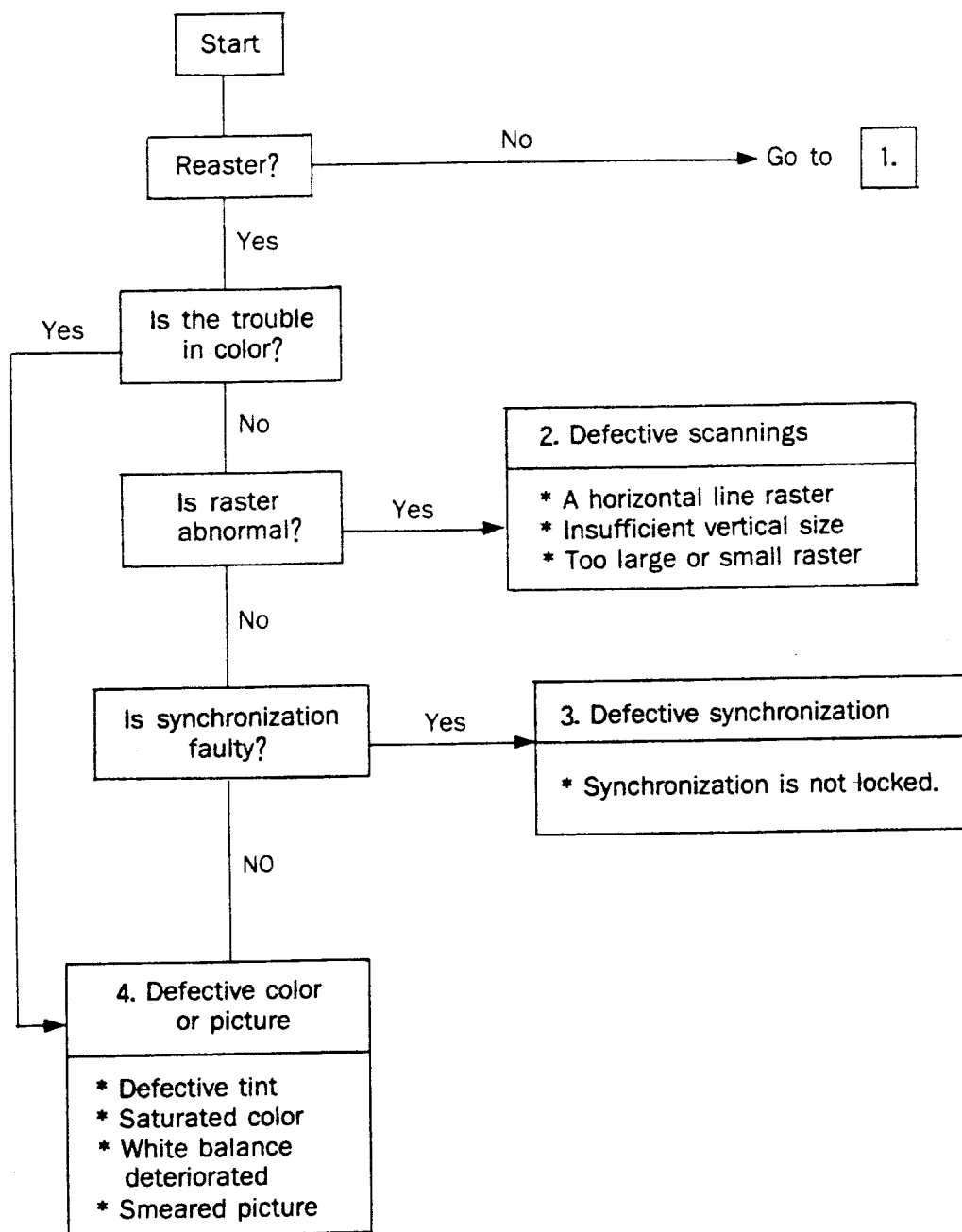
This spark gaps shall be connected with each electrode. All spark gaps shall be connected at the internal of socket assembly.

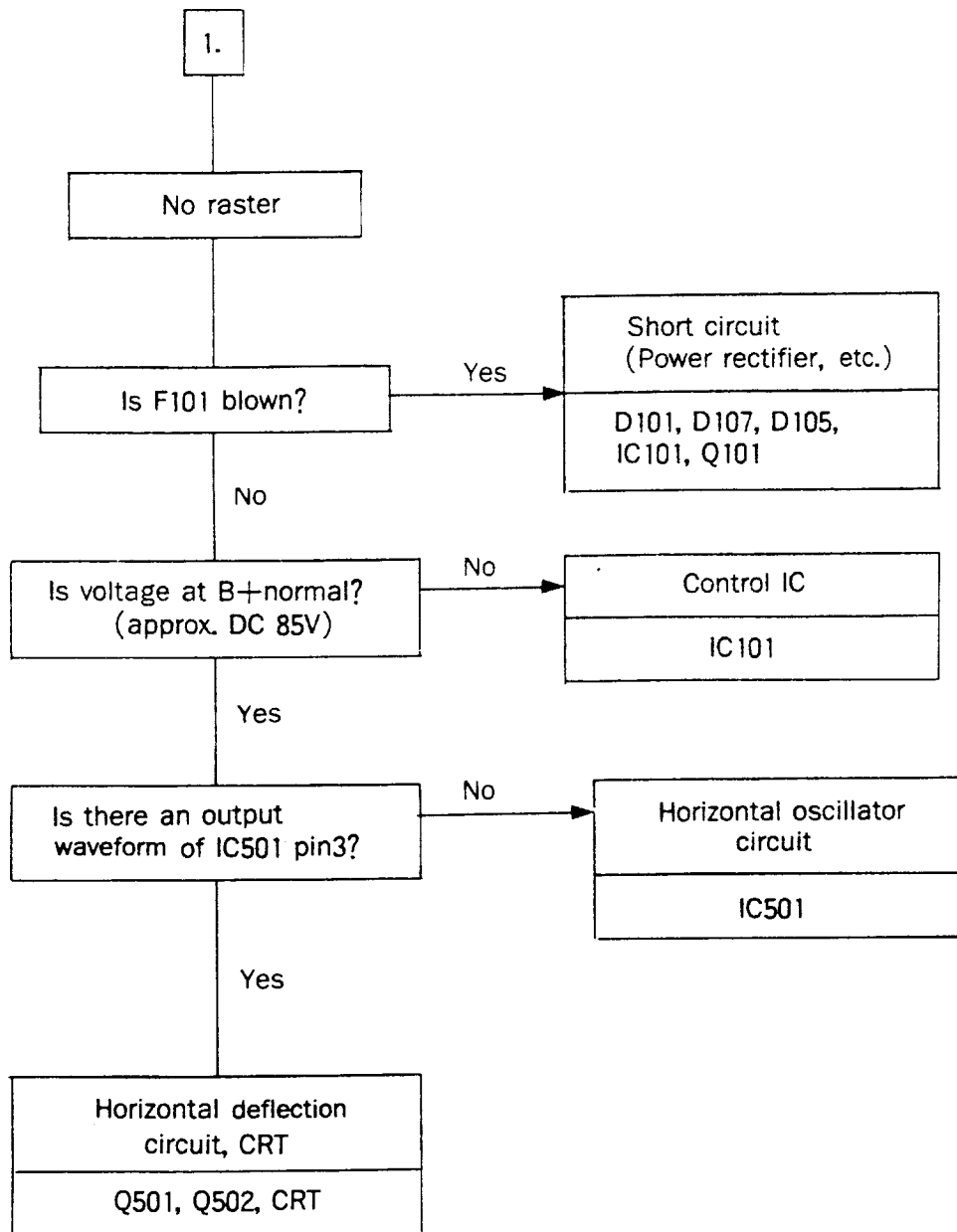
(6) X-Radiation Characteristics

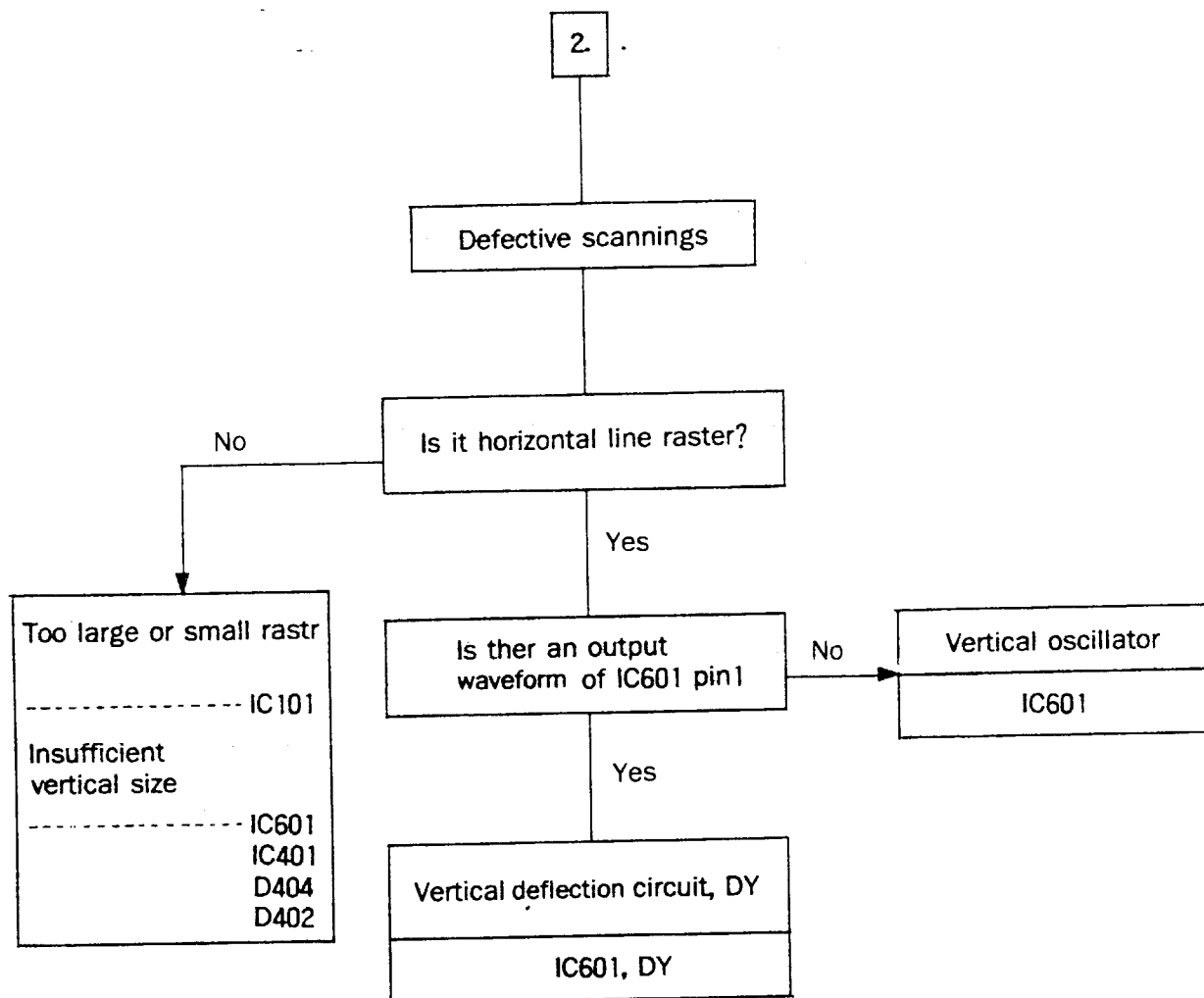
The x-radiation emitted from this picture tube will not exceed 0.5mR/h for anode current combinat-

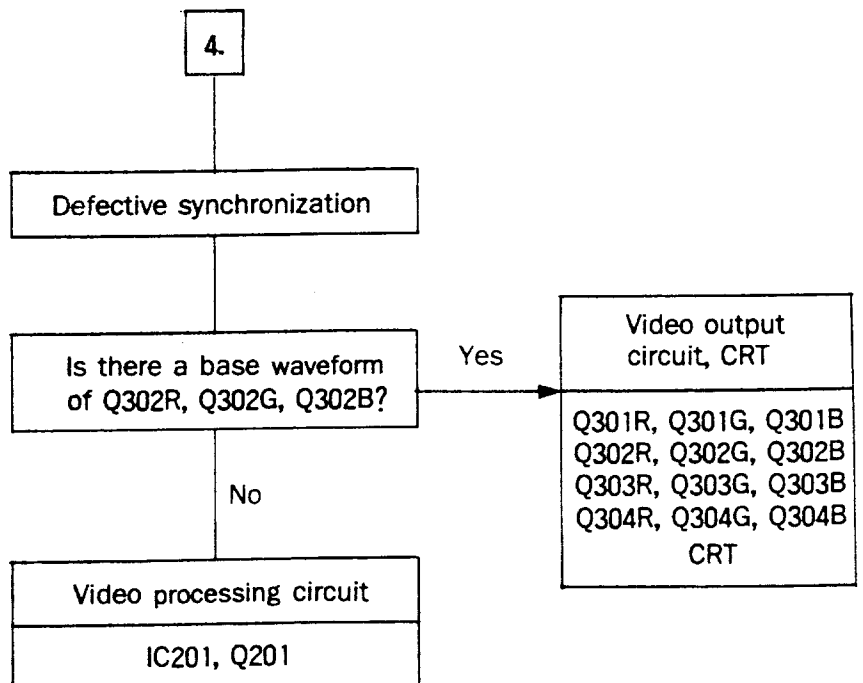
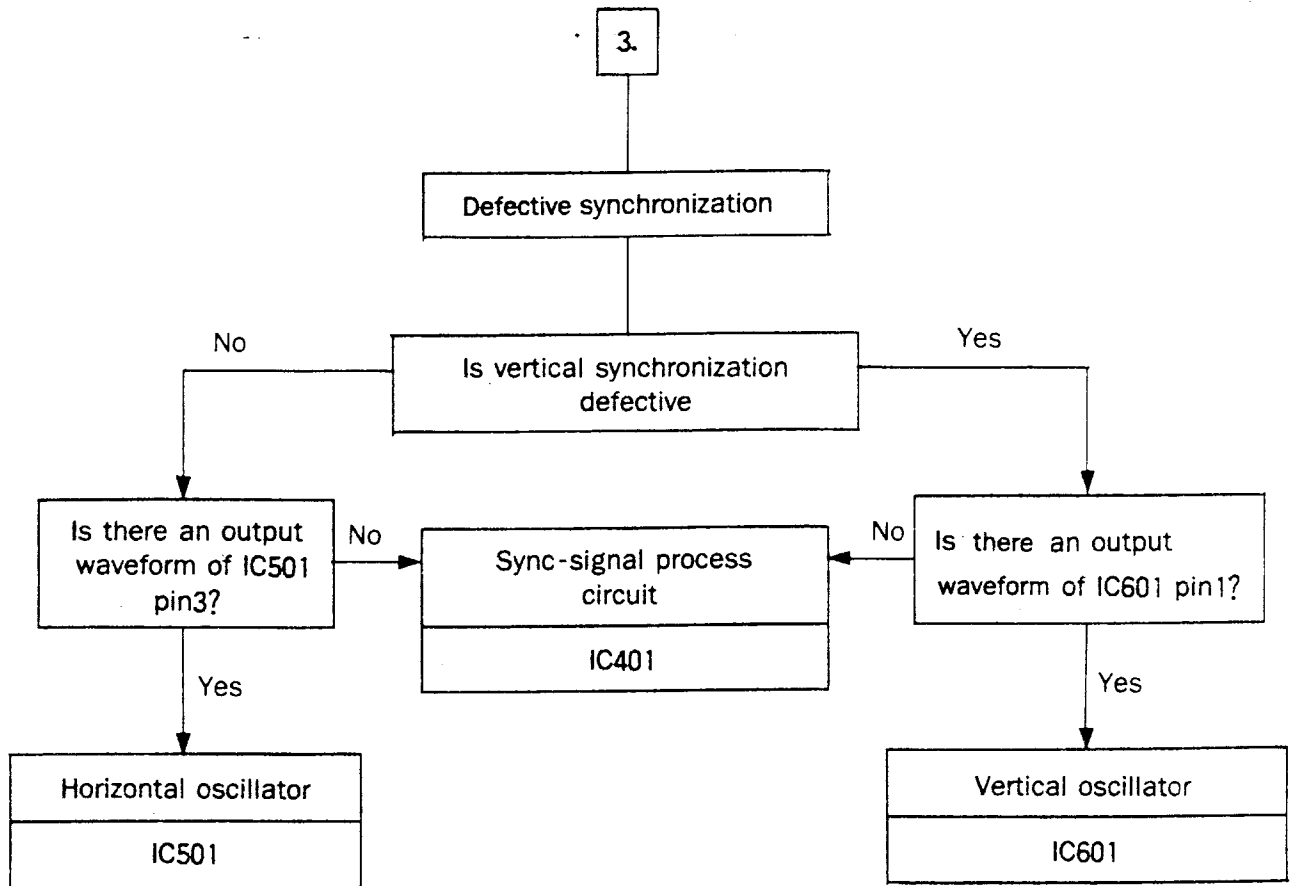
ions. X-radiation at a constant anode voltage varies linearly with anode current.

4. TROUBLE SHOOTING









5. THEORY OF OPERATION

[1] General

This monitor contains three independent circuits. One of them is power supply section, and the other is a sweep video CPT drive section.

[2] Power supply circuits

The chassis(secondary side) is insulated from the power source(primary side) by the transformer T101 for switching power source.

By the winding of the transformer T101 connected to the collector circuit and the other winding connected to the base circuit, the transistor Q101 is submitted to positive feed back and operates as blocking oscillator. Changes in the power source voltage and load current are detected by the winding and the voltage is applied to pin 2 of IC101.

When the voltage applied to pin 2 changes, the conducting time of transistor Q101 changes to compensate for the change in the secondary output voltage of T101 and to stabilize the output voltage.

[3] Video drive circuit

The R.G.B input signal with analog level is applied to the pre-amp.

This section amplifies the output signal of a generator to the level high enough to drive a video output circuit. Video gain is controlled by DC voltage of pin2 and DC bias is controlled by feed back level of output circuit.

[4] Video output circuit

The R.G.B signal is applied to the base of cascode amplifier transistor Q302R, Q302G, Q302B.

The R,G,B signal is amplified by output transistor Q301R, Q301G, Q301B.

Then the driven signal is applied to CRT cathode through an output complementary circuit.

[5] Vertical deflection circuit

We use vertical deflection monolithic IC(IC601).

This contains the function of oscillator, ramp generator and power amplifier.

The vertical sync. signal with positive polarity is applied to pin5 of the IC601.

Pin6 of IC601 is connected to the vertical oscillator circuit and the frequency of the oscillator can be controlled by the voltage of pin4 which can be varied V-HHEIGHT controlled by V-SIZE volume.

* VR604-MODE1, VR401-MODE2, VR402-MODE3

Linearity adjustment is done by integrating the saw-tooth voltage.

V-Linearity volume(VR603) is determined by the amount of D.C component flowing through the vertical deflection coil.

The amount can be varied by changing the position of V-shift volume(VR602).

[6] Horizontal deflection circuit

The horizontal sync. signal with positive polarity is applied to pin 8 of IC501 through IC401.

The saw-tooth wave of horizontal frequency is produced by integrating the horizontal pulse from FBT(T801), and is fed to pin6 of IC401 for AFC.

The phase of horizontal saw-tooth wave is compared with that of fly back pulse and horizontal sync.signal from pin5 at AFC circuit inside the IC501.

H-phase control (VR502) determines the relative position of raster and picture.

The horizontal oscillation frequency can be controlled by H-hold volume VR501 connected to pin 15.

The horizontal frequency oscillation is obtained from pin3 of IC501 and is fed to the next horizontal drive circuit.

The pulse switching mode of the driver transistor is on, the output transistor off.

In the horizontal output circuit, deflection current is supplied to the horizontal deflection coil and, at the same time, pulse for blanking, for CRT electrode voltages are generated in the flyback transformer(T801). The output transistor used for switching should be able to withstand the pulse voltage.

H-width control is varied D.C voltage of pin2(T801) which enables adjustment of horizontal raster size.

Horizontal position of the raster can be adjusted by changing the position of H-center(VR504).

Which can switch the direction of D.C current flow in the deflection yoke.

[7] High voltage hold-down circuit

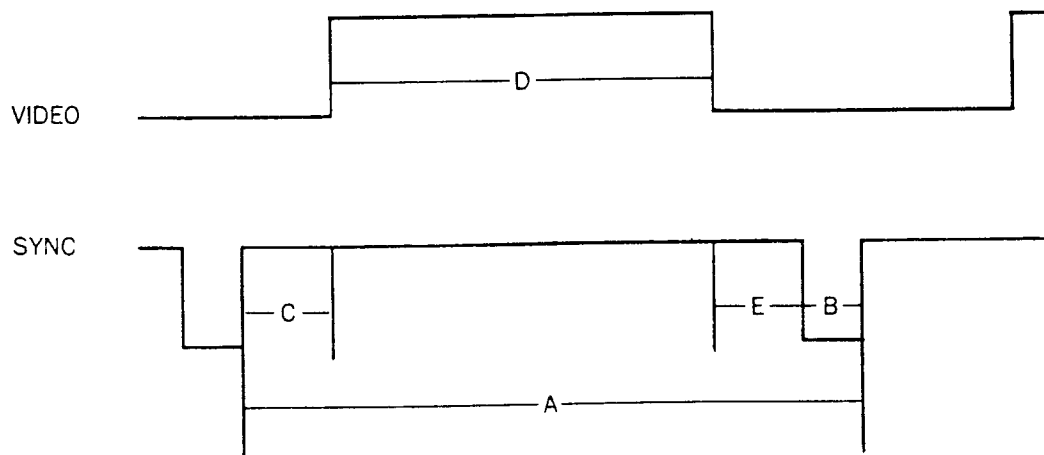
If a failure occurs which causes an increase in high voltage (such as an opened sweep capacitor or failed power regulator), then the base voltage of Q503 will increase through FBT(T801).

When this happens, the oscillator signal coming from IC501 through R517 can no longer drive Q501, turning off the high voltage.

Therefore to restart the oscillator and the high voltage, the monitor must be turned off and then turned on again.

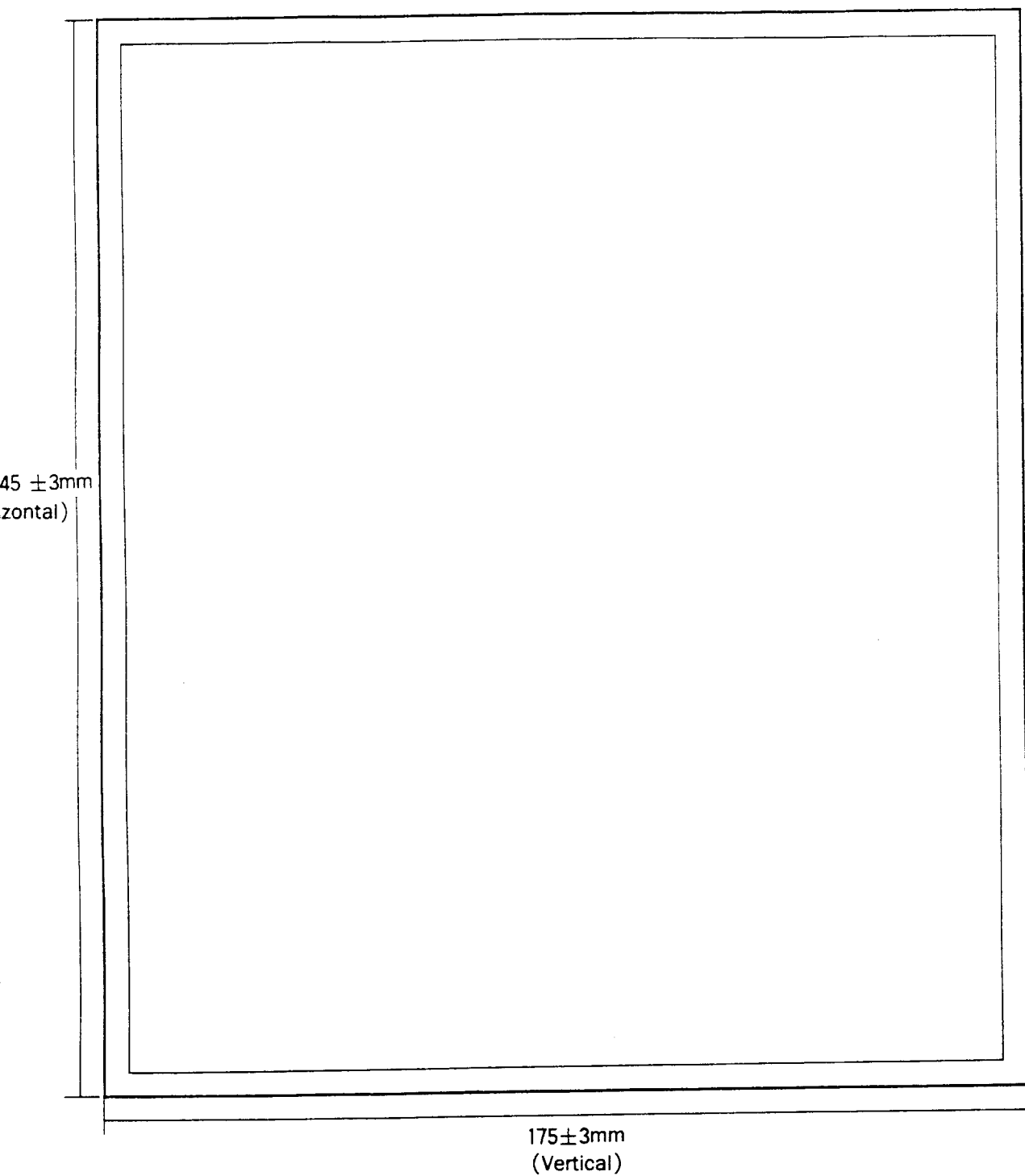
6. FIGURES

(1) Timing chart



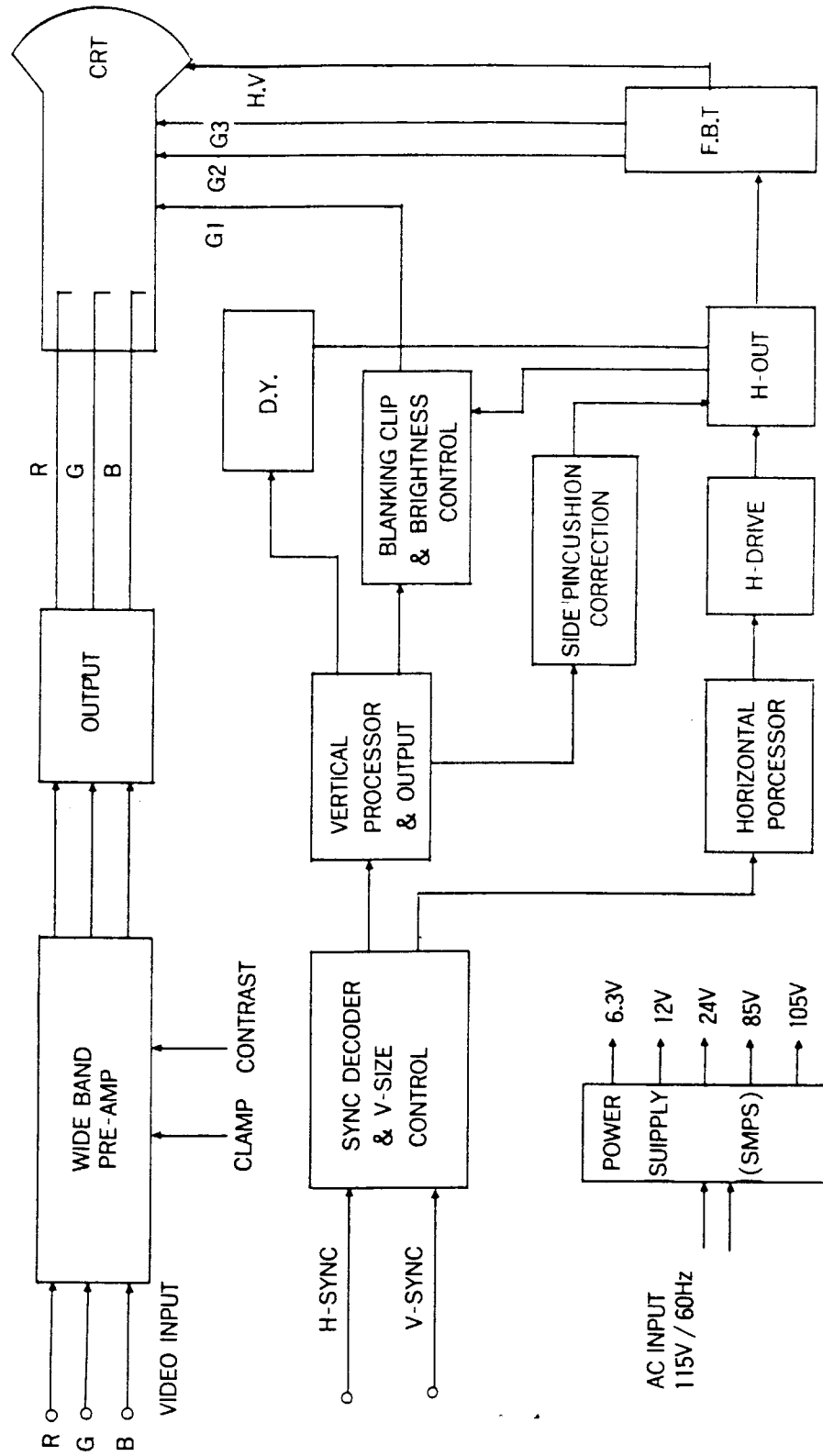
		MODE-1(480 LINES)	MODE-2(400 LINES)	MODE-3(350 LINES)
H	A	31.8uSEC	31.8uSEC	31.8uSEC
	B	3.8uSEC	3.8uSEC	3.8uSEC
	C	1.9uSEC	1.9uSEC	1.9uSEC
	D	25.4uSEC	25.4uSEC	25.4uSEC
	E	0.7uSEC	0.7uSEC	0.7uSEC
	SYNC.P	NEGATIVE	NEGATIVE	POSITIVE
V	A	16.683mSEC	14.268mSEC	14.286mSEC
	B	0.064mSEC	0.064mSEC	0.064mSEC
	C	0.793mSEC	0.890mSEC	1.716mSEC
	D	15.762mSEC	13.156mSEC	11.504mSEC
	E	0.064mSEC	0.159mSEC	0.985mSEC
	SYNC.P	NEGATIVE	POSITIVE	NEGATIVE
VIDEO		ANALOG	ANALOG	ANALOG

[2] Display zone



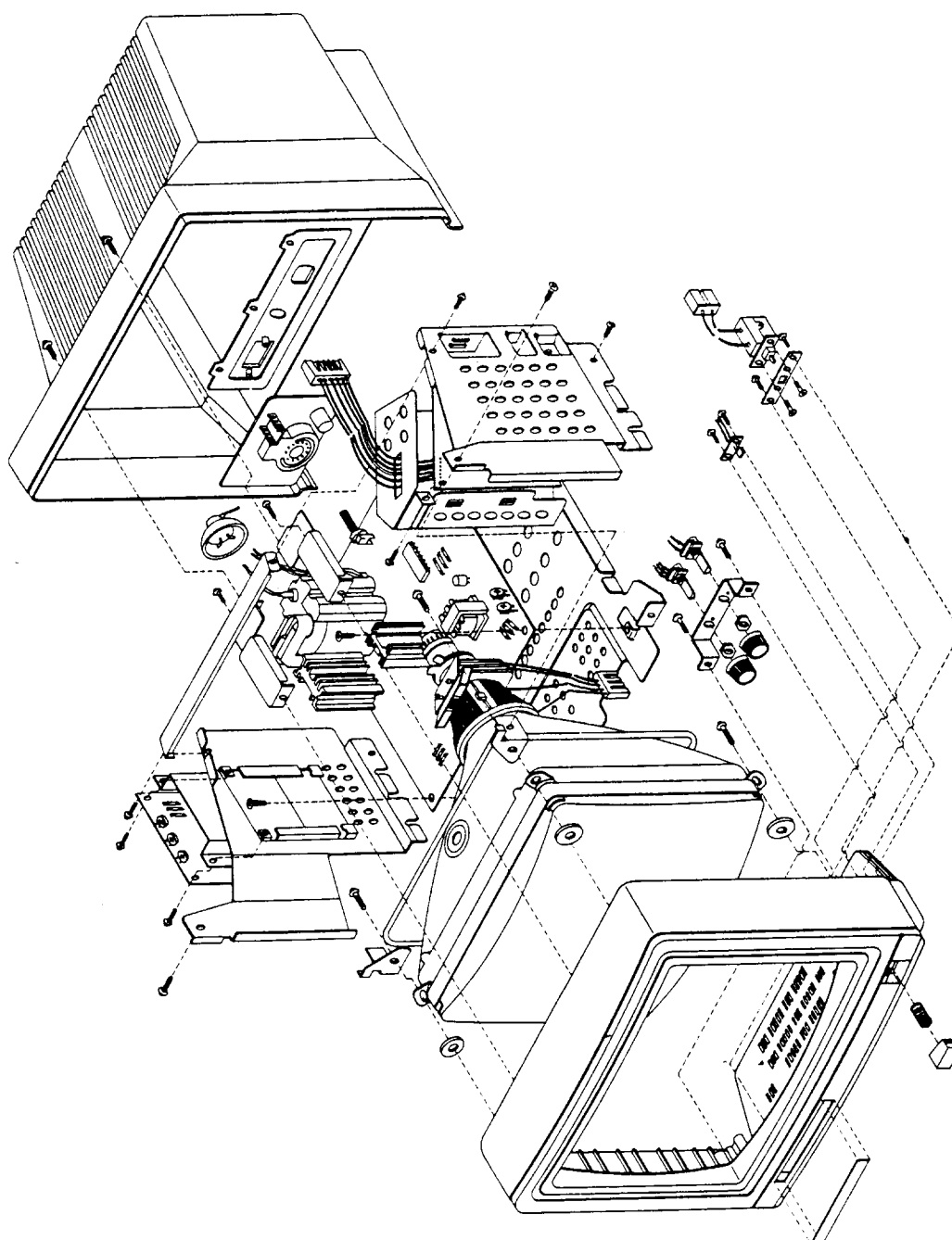
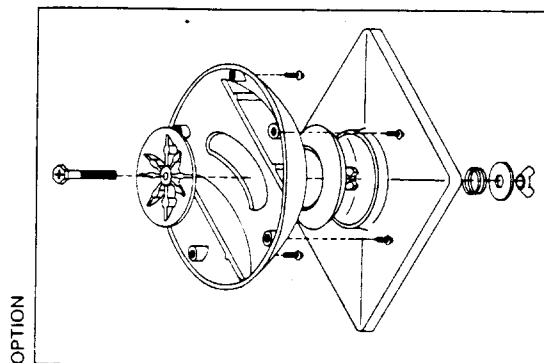
3 Block diagram

SC-431V BLOCK DIGRAM

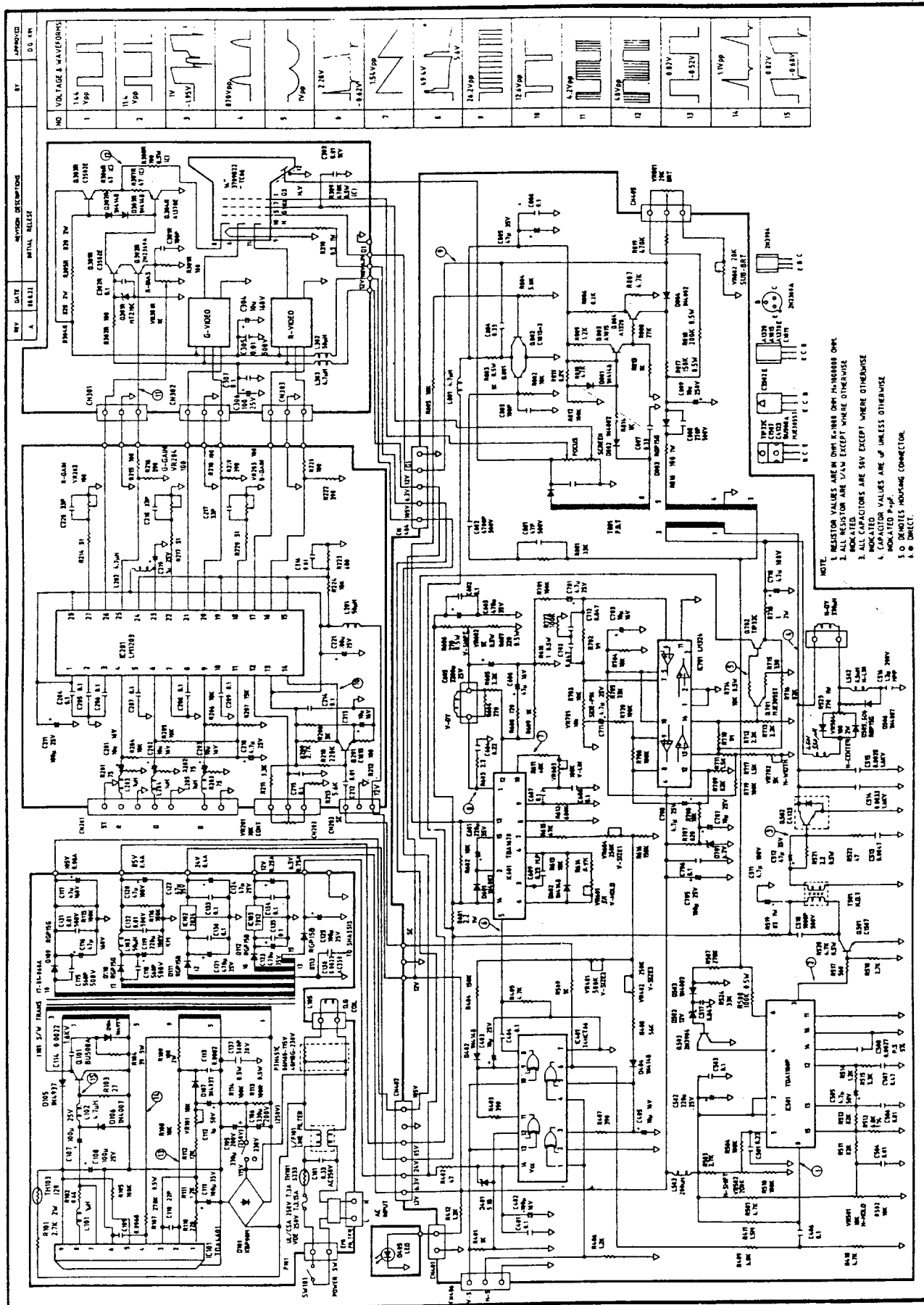


7. DRAWINGS

(1) Mechanical assembly drawings

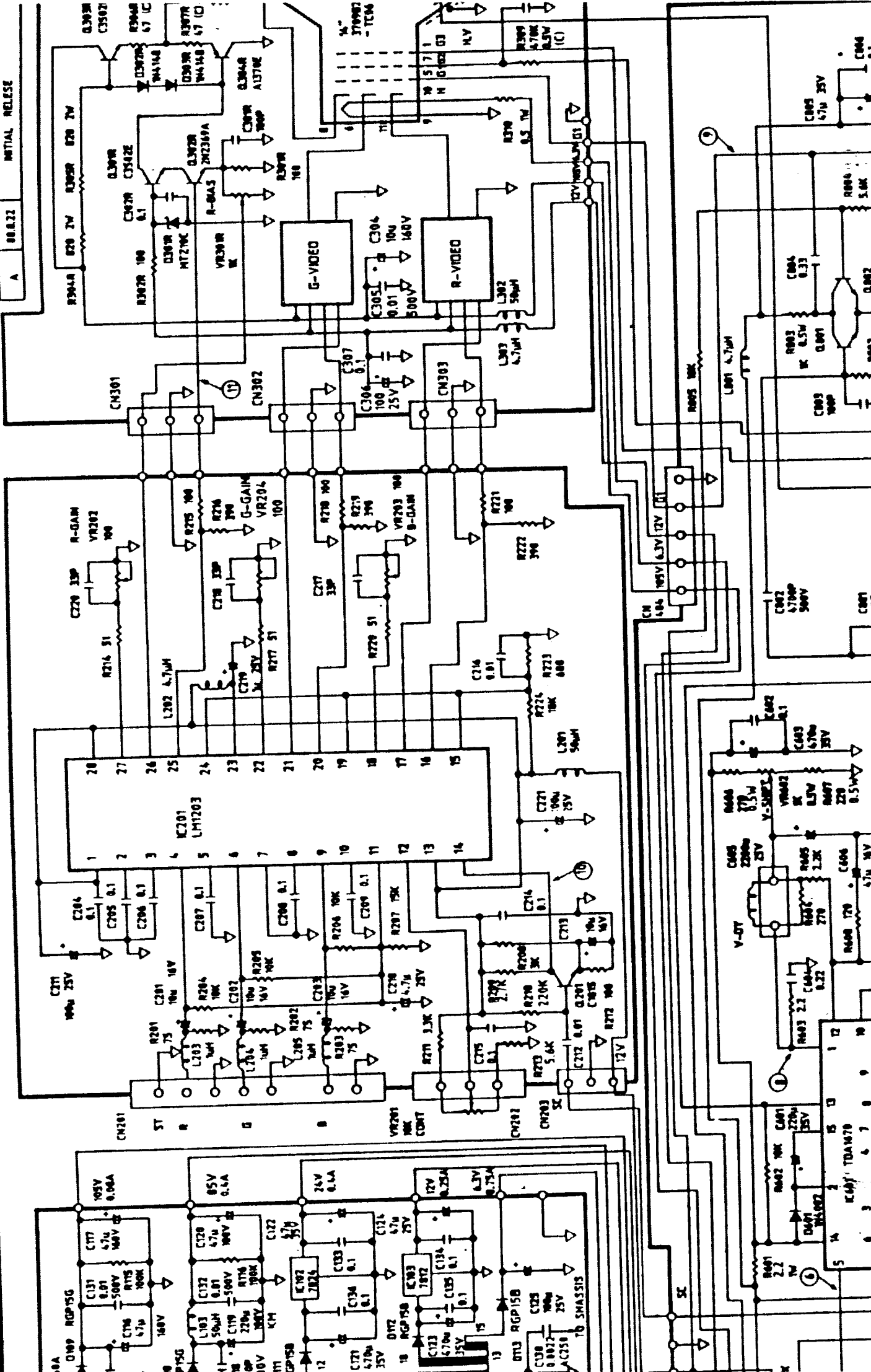


(2) Circuit diagram

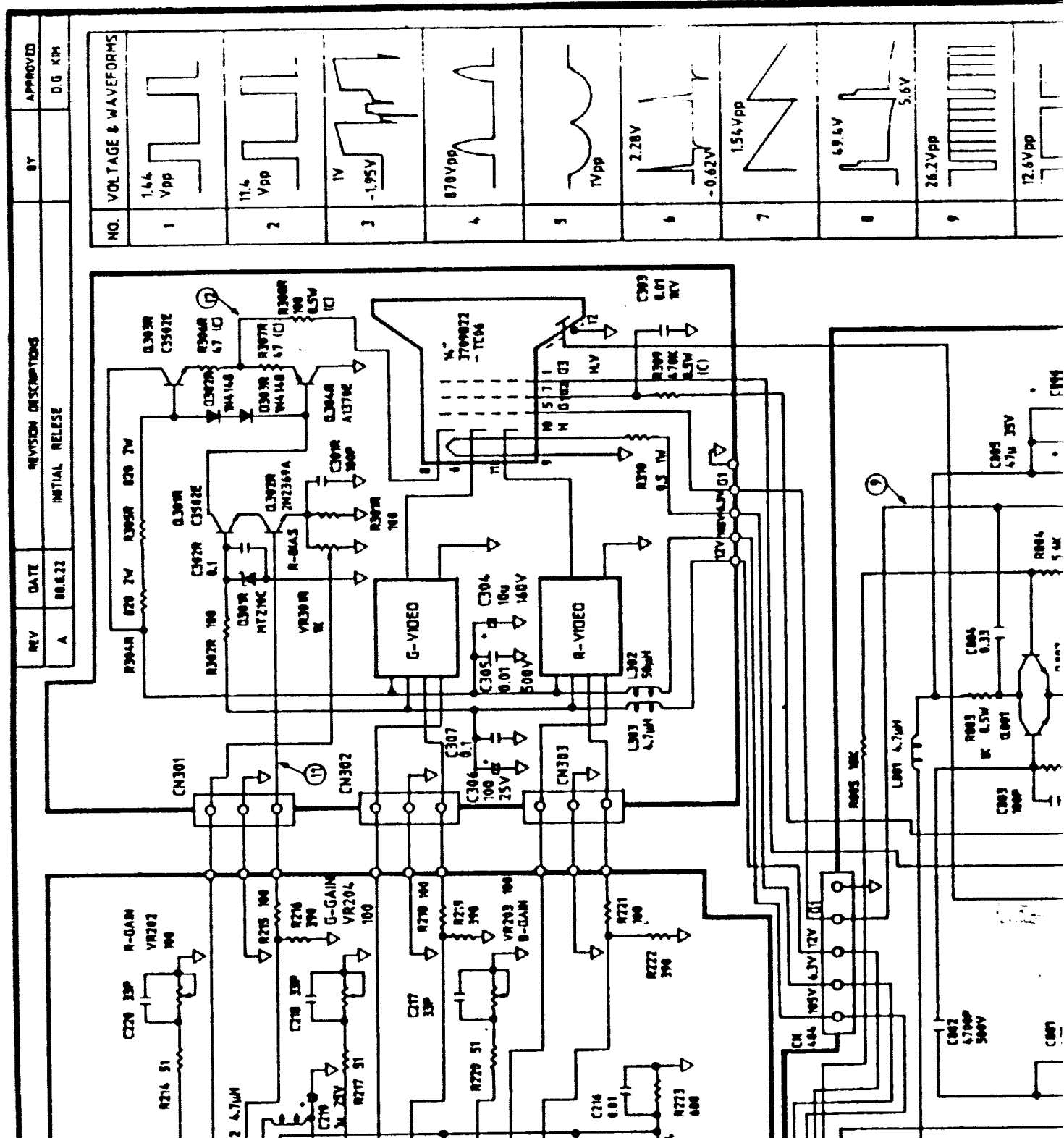


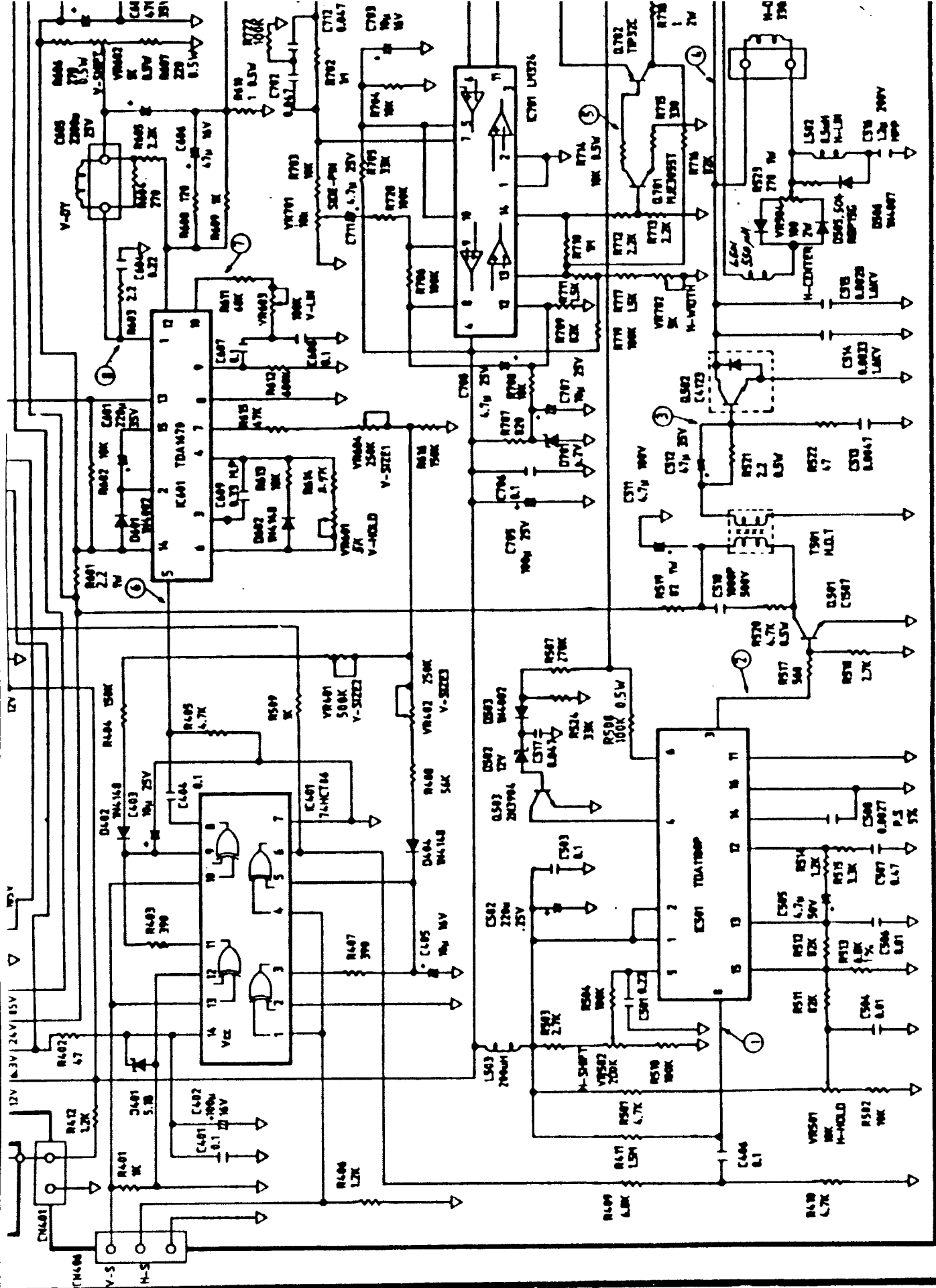


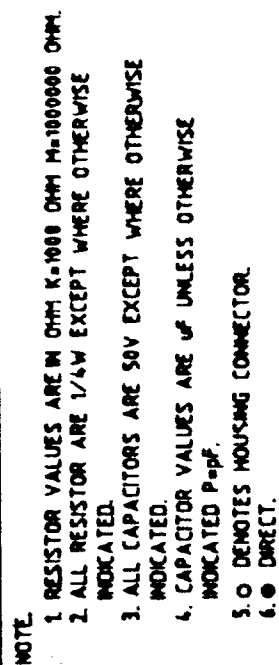
REVISION DESCRIPTIONS		
REV	DATE	INITIAL
A	08.02.72	RELEASE



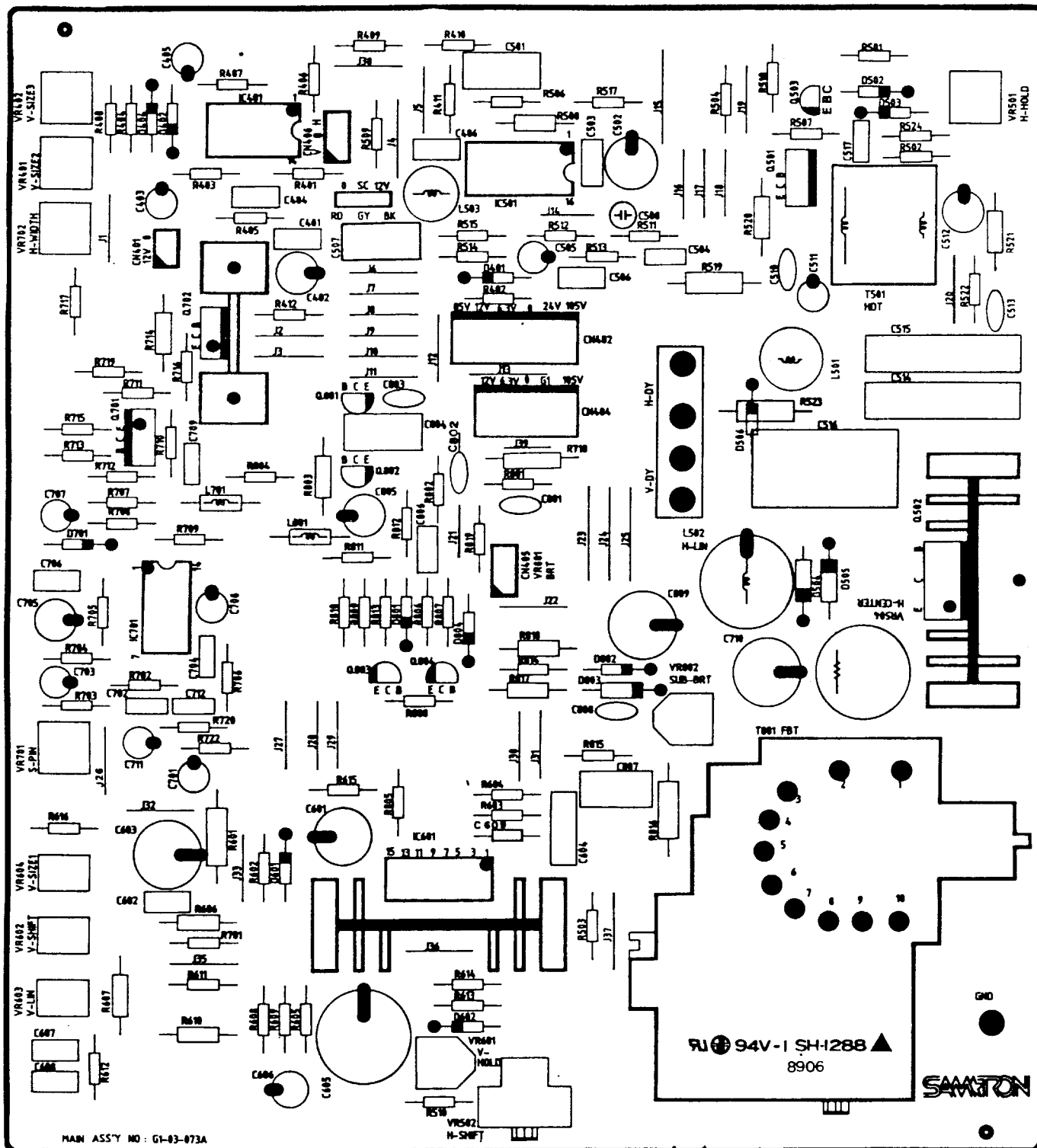
(2) Circuit diagram



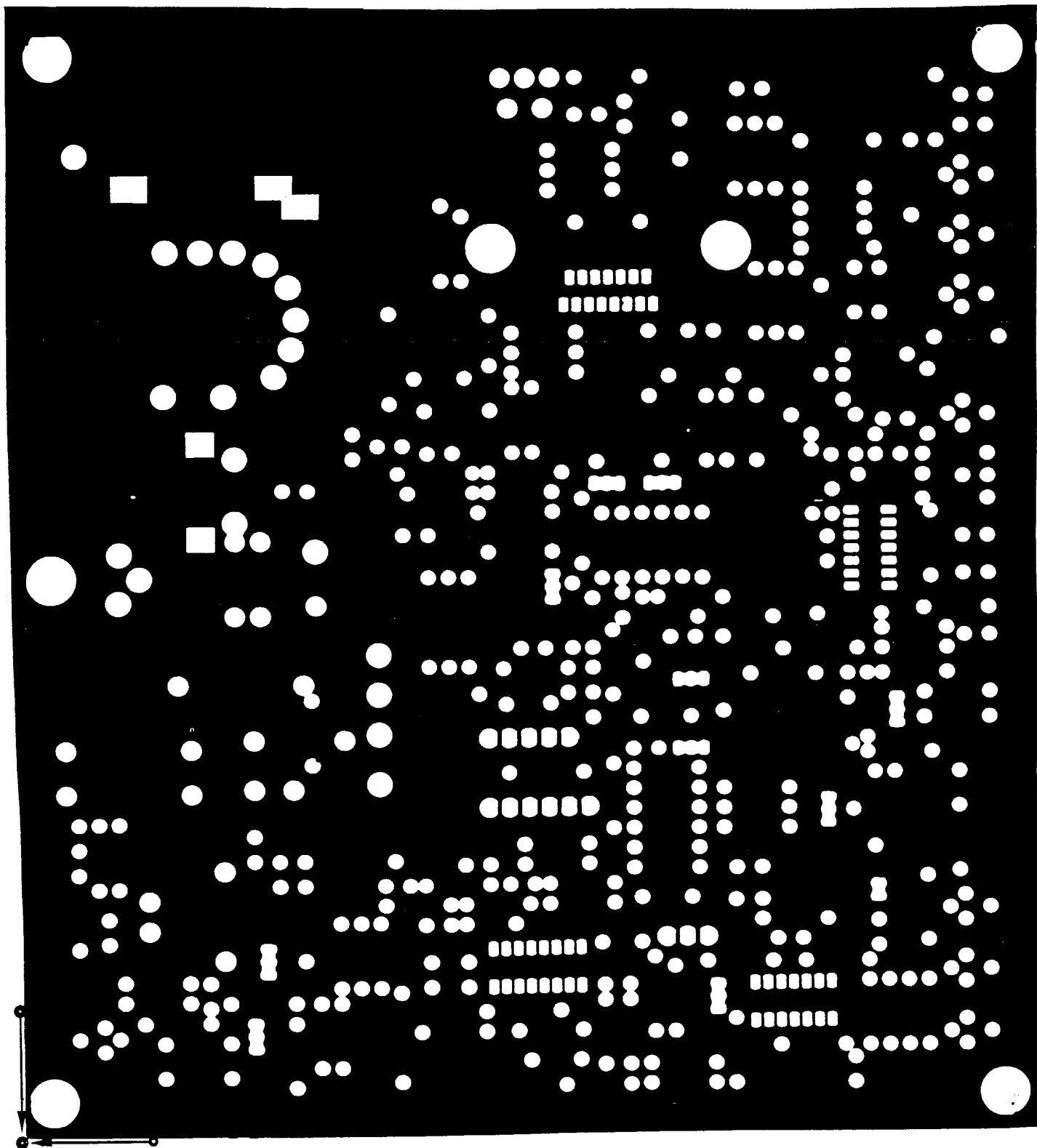




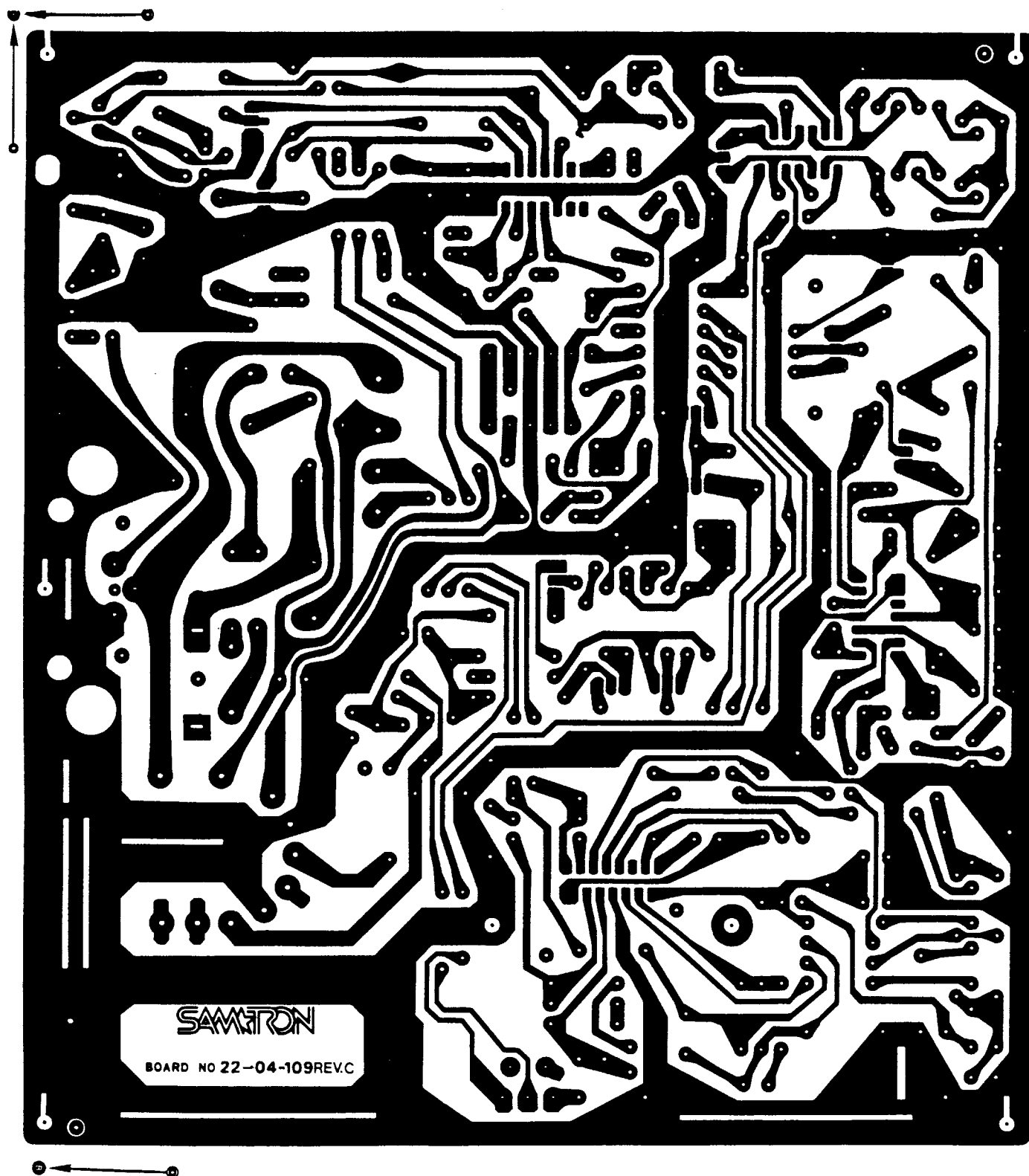
(3) PCB artwork drawings
3-1. Main PCB front marking



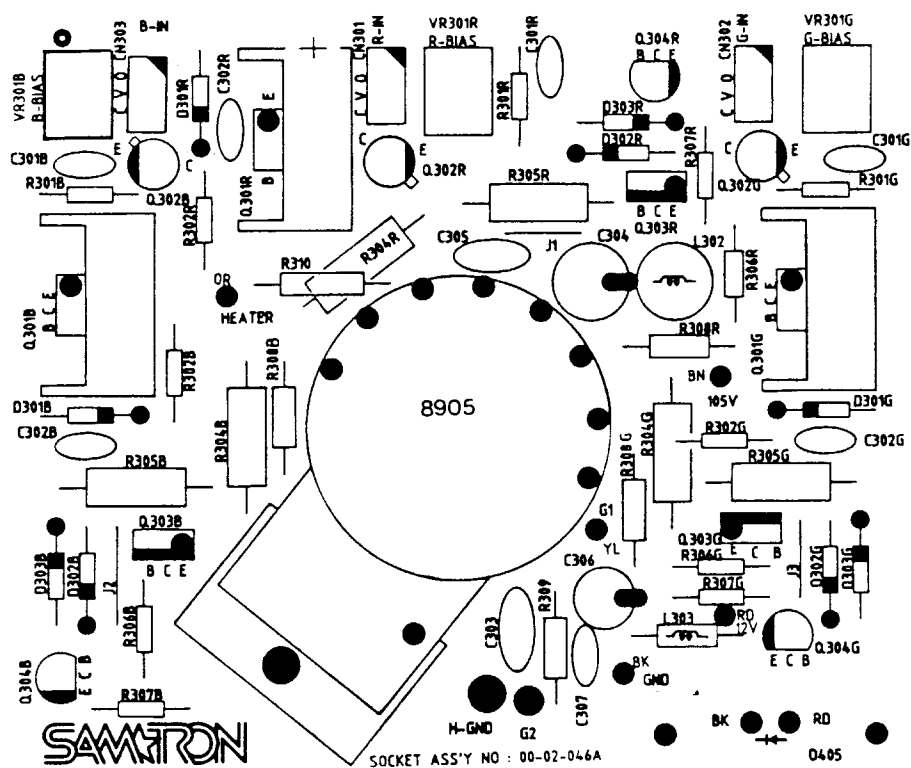
3-2. Main PCB solder mask



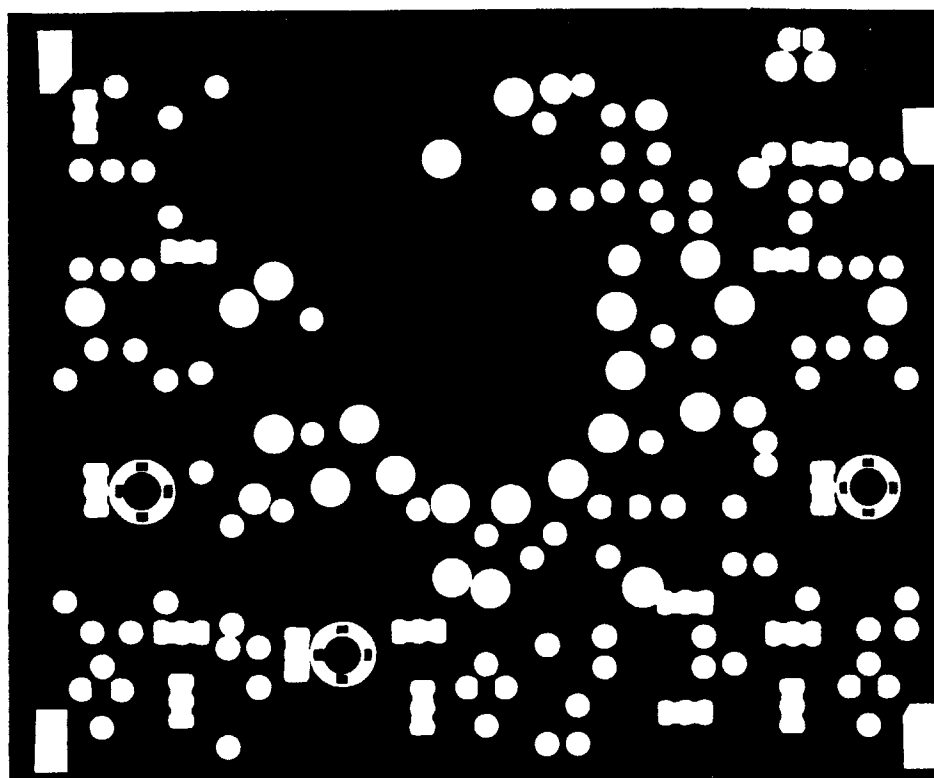
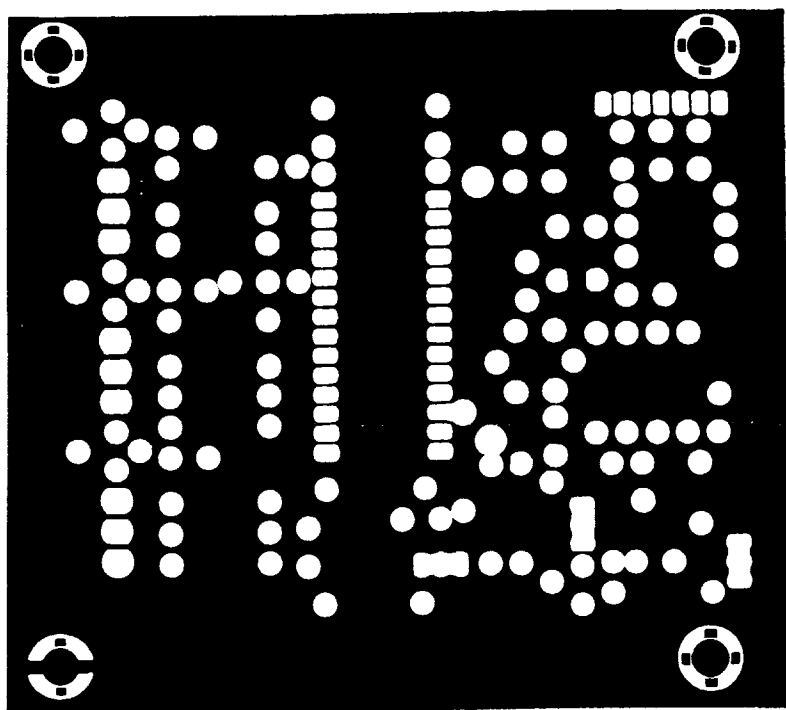
3-3. Main PCB pattern



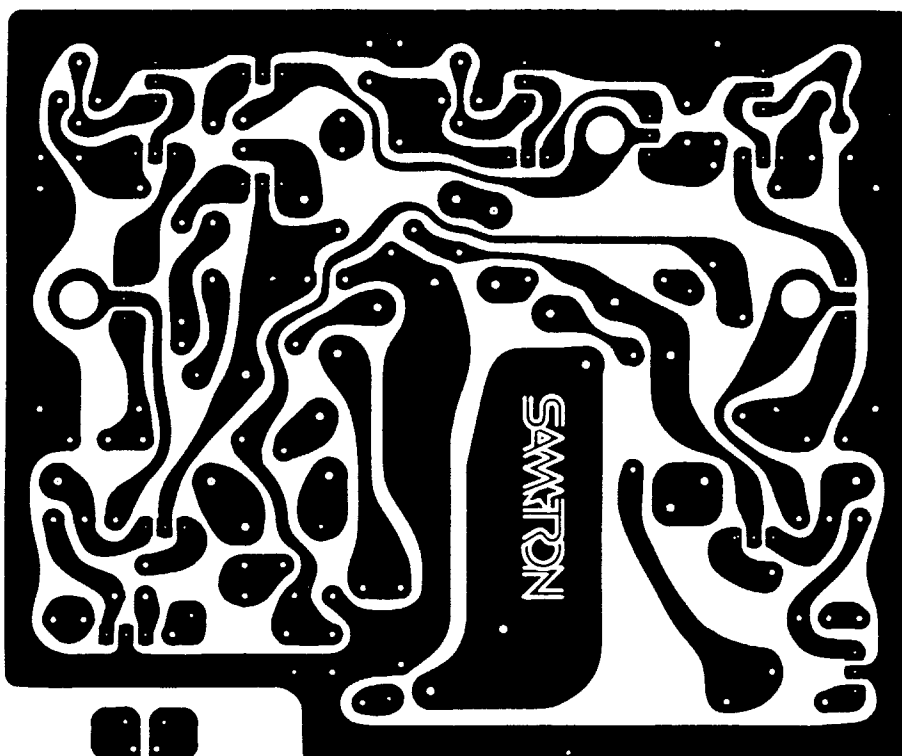
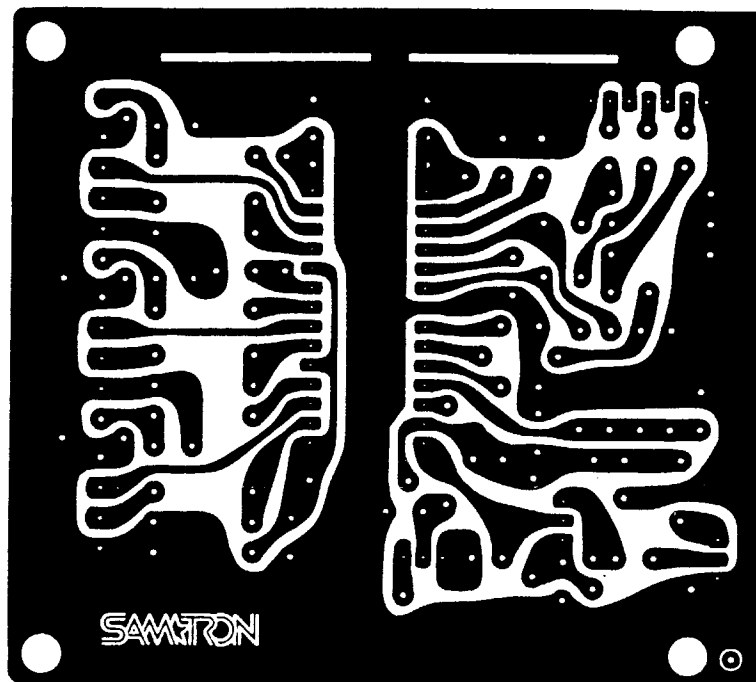
25



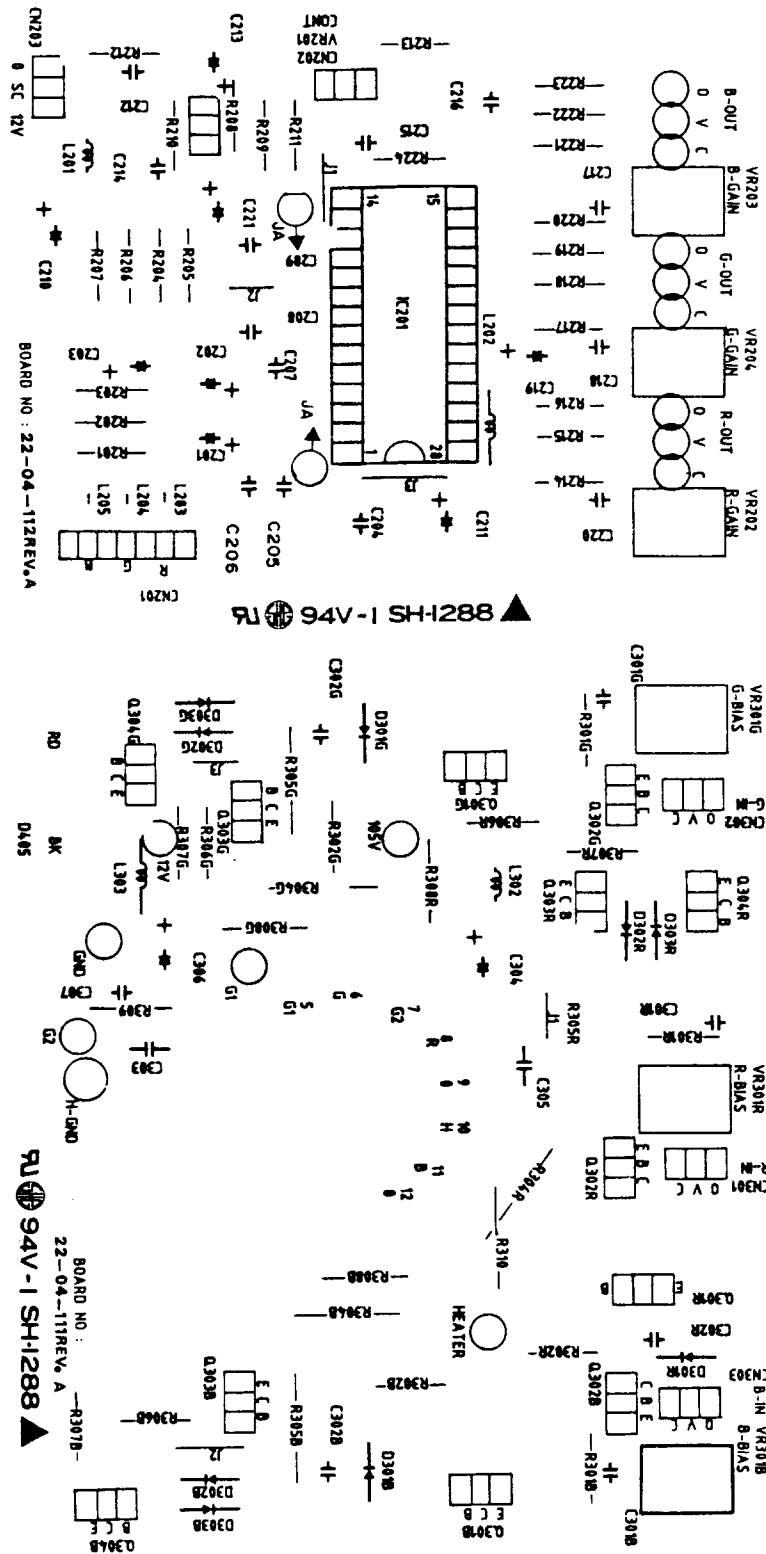
3-6. Video, Socket PCB solder mask



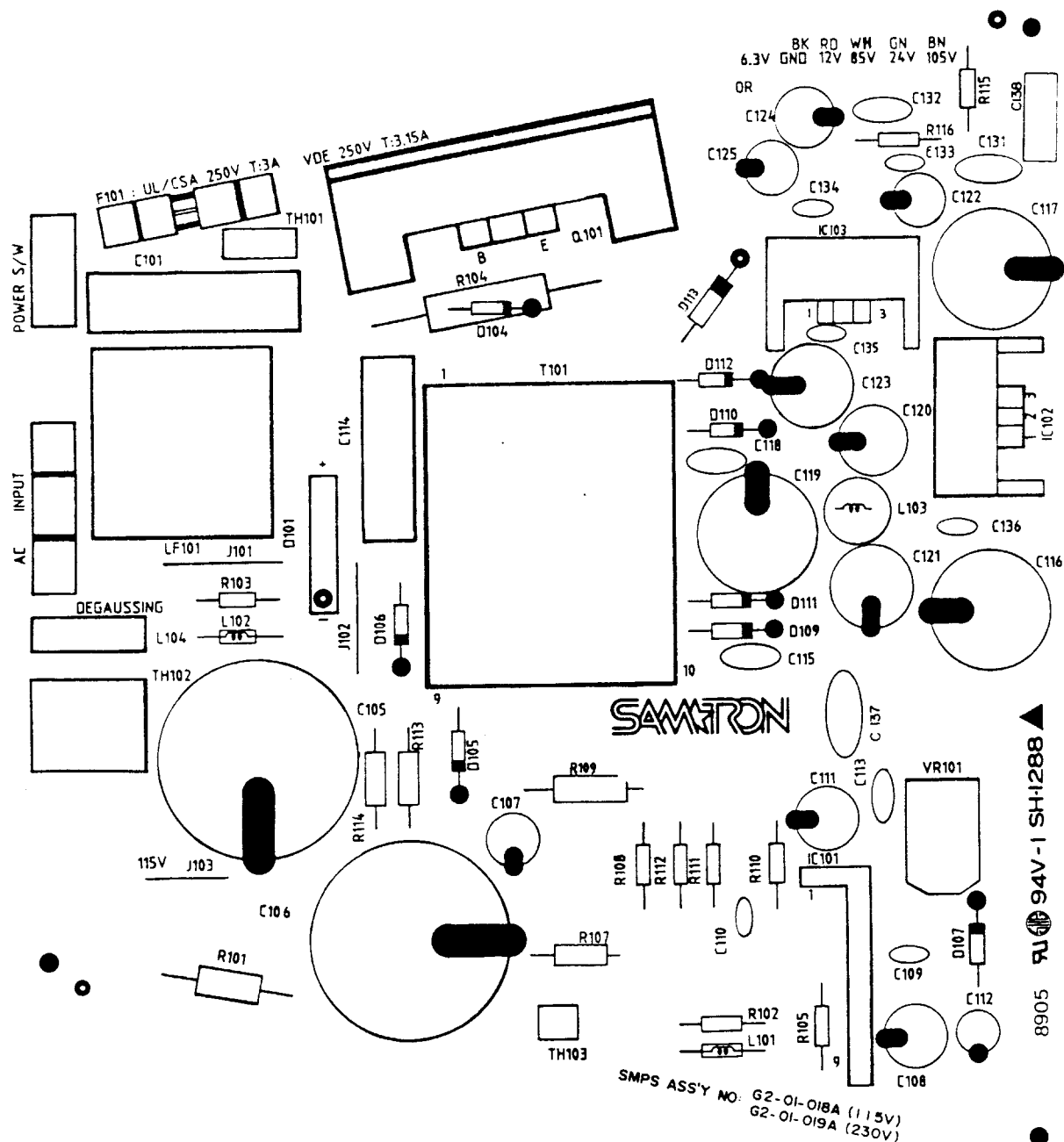
3-7. Video, Socket PCB pattern



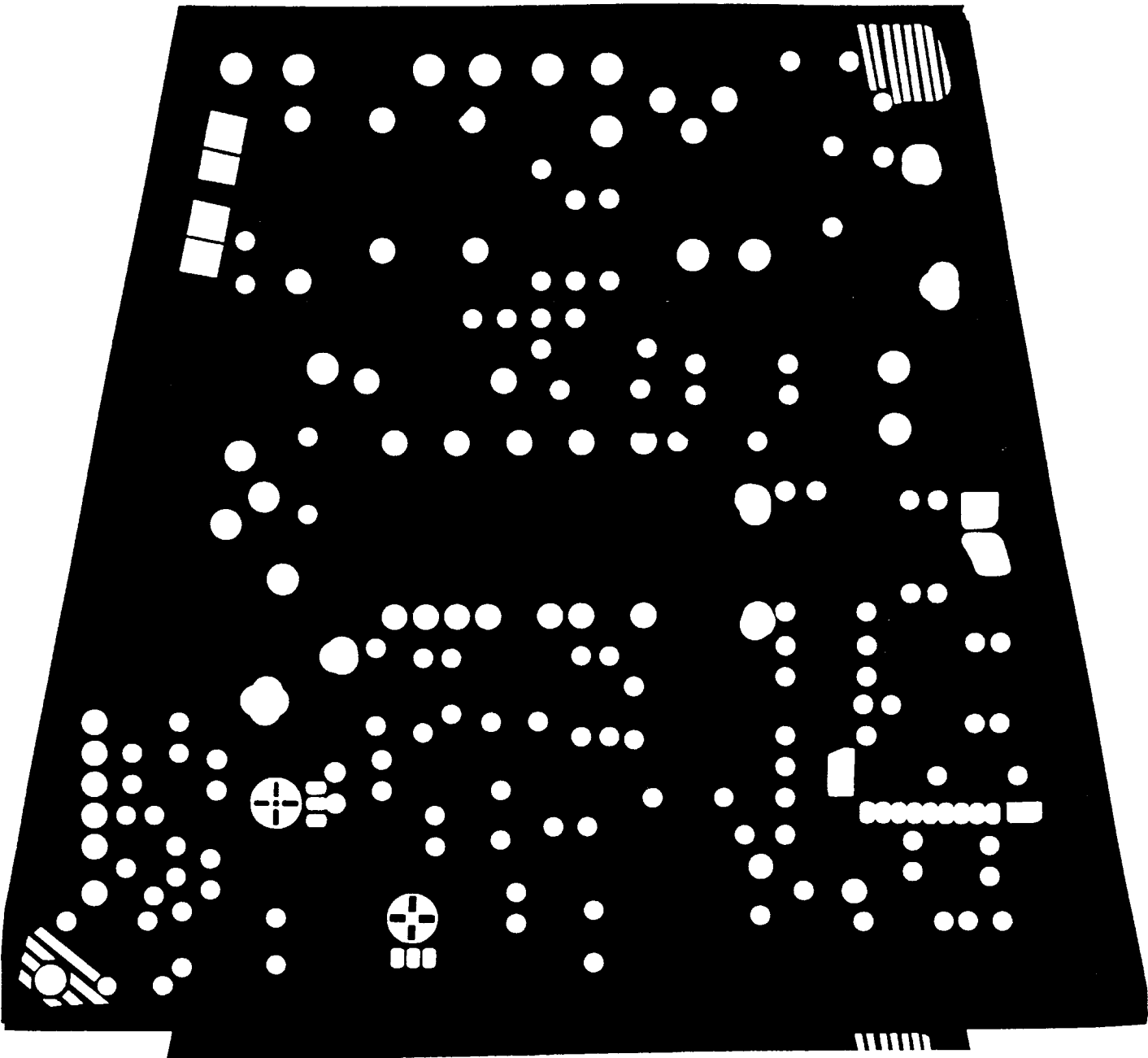
3-8. Video, Socket PCB back marking



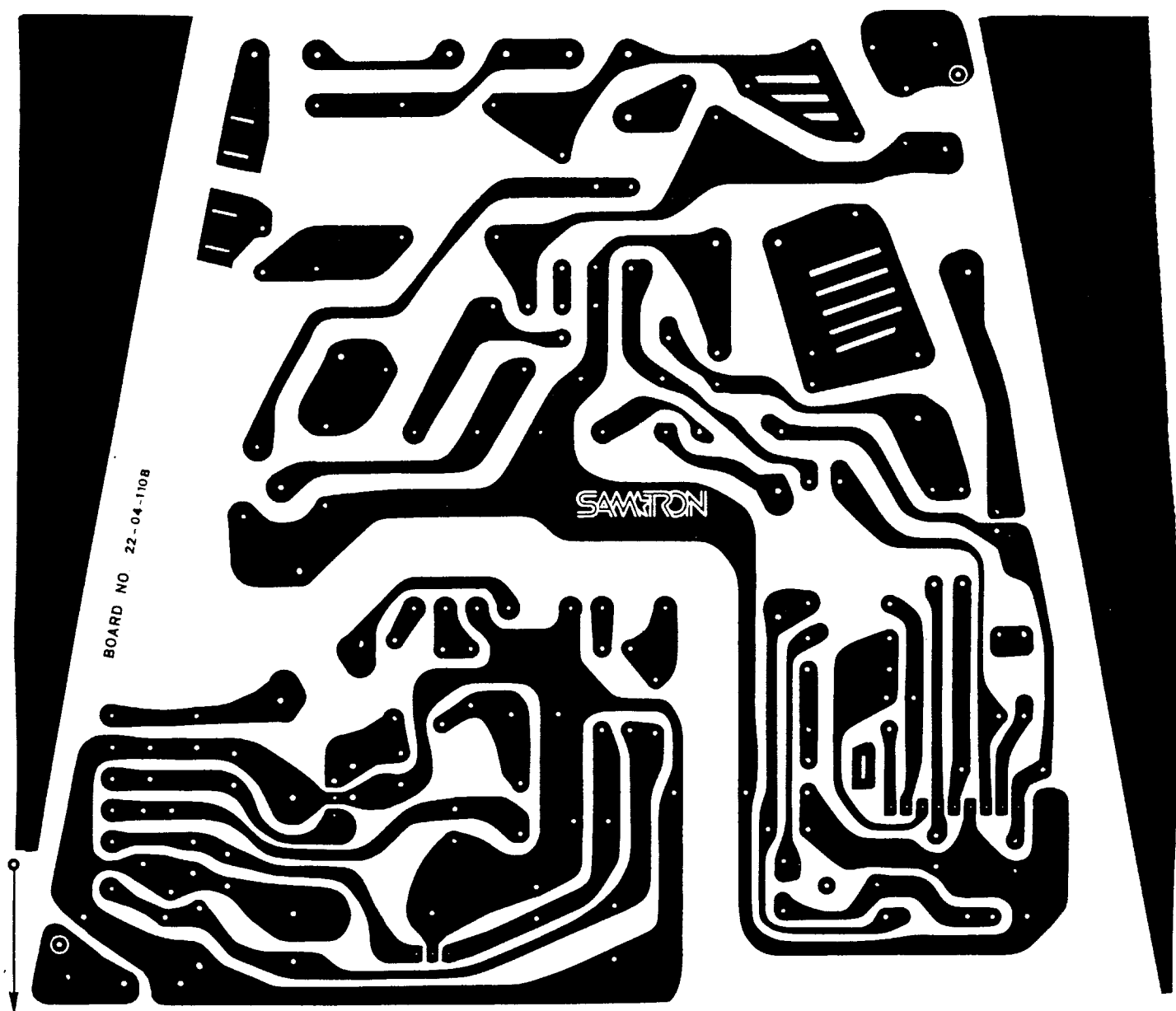
3-9. SMPS PCB front marking



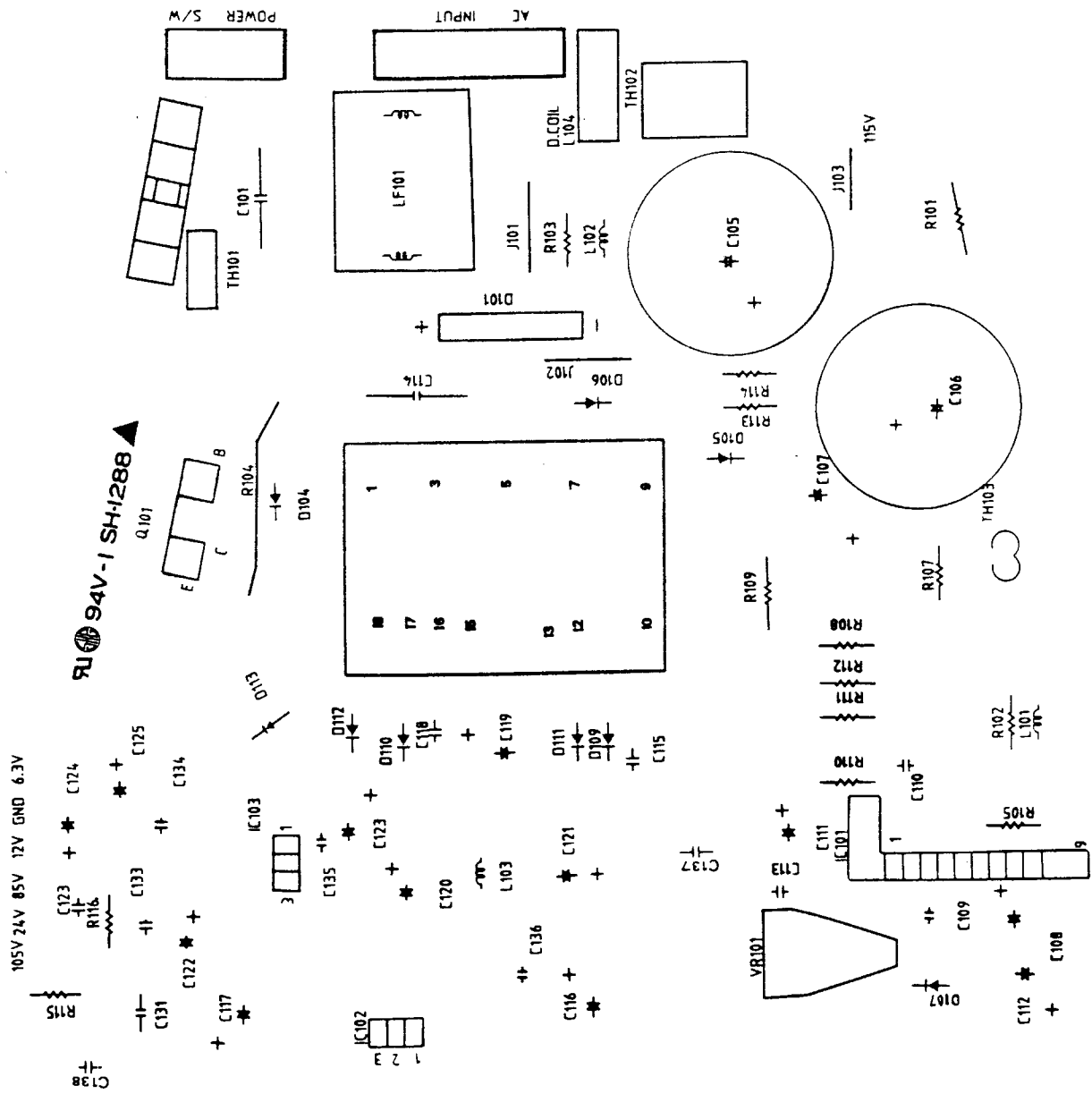
3-10. SMPS PCB solder mask



3-11. SMPS PCB pattern



3-12. SMPS PCB back marking



8. APPENDIX

(1) Part list

DIODES		
SYMBOL NO	DESCRIPTION	CODE NO
D109, 110, 504 505, 803	RGP15G	19-10-038A
D111, 112, 113	RGP15B	19-01-037A
D301R, 301G, 301B	MTZ10C	19-05-058A
D302R, 302G, 302B, 402, 404, 602, 801	1N4148	19-03-004A
D101	KBP08M	19-02-008B
D104, 105, 107	1N4937	19-01-009A
D106, 506	1N4007	19-01-006A
D4505	SE6221	19-06-003A
D503, 601, 802, 84	1N402	19-01-002A
D401	ZD5.1B	19-05-044A
D502	RD12EB	19-05-045A
D701	MTZ6.2N	19-05-026A

TRANSISTOR

Q101 Q201, 801, 802	BU508A 2S1815	18-14-005A 18-04-006A
Q303R, 303G, 303B, 301R, 301G, 301B	2SC3502E	18-19-003A
Q302R, 302G, 302B	2N2369A	18-03-006A
Q304R, 304R, 304B	2SA1370E	18-07-026A
Q501	2SC1507Y	18-07-116A
Q503	2N3904	18-04-001A
Q701	MJE3055T	18-07-109A

Q803	2SA1015	18-05-002A
Q804	2SA1320	18-05-001A
Q502	2SC4122	18-07-033A
Q702	TIP32C	18-08-007A

IC.

IC101	TDA4601	20-06-010A
IC102	MC7824CT	20-03-022A
IC103	MC7812CT	20-03-004A
IC201	LM1203N	20-06-038A
IC401	KS74HCTLS86	20-17-086A
IC501	TDA1180P	20-06-006A
IC601	TDA1872	20-06-020A
IC701	LM324	20-06-010A

RESISTOR

R102	0.68	1 / 4W	14-04-068A
R103	27	-	14-04-280A
R110	220	-	14-04-221A
R111, 406, 412 514, 809	1.2K	-	14-04-122A
R108, 204, 205 206, 502, 602, 613, 703, 704, 708, 802, 805	10K	-	14-04-103A
R112	12K	-	14-04-123A
R115, 116, 105 504, 701, 706, 719, 720, 722 812	100K	-	14-04-104A
R214 217 220	51	-	14-04-510A
R201 202 203	75	-	14-04-750A
R223	680	-	14-04-681A

	RESISTORS	
R202 215 218 221 302R 302G 302B	100 1 / 4W	14-04-101A
R216 219 222 403 407	390 -	14-04-391A
R209 503 518	2.7K -	14-04-272A
R208	3K -	14-04-302A
R211 515	3.3K -	14-04-332A
R213 804	5.6K -	14-04-153A
R207	15K -	14-04-153A
R24	18K -	14-04-183A
R210	220K -	14-04-224A
R301R 301G 301B	180 -	14-04-181A
R603	2.2 -	14-04-022A
R402 522	47 -	14-04-470A
R715	120 -	14-04-121A
R608	270 -	14-04-271A
R604	330 -	14-04-331A
R517	560 -	14-04-561A
R707	820 -	14-04-821A
R401509 609 813 814	1K -	14-04-152A
R711 717	1.5K -	14-04-152A
R605 712 713	2.2K -	14-04-222A
R405 410 501 506 807	4.7K -	14-04-472A
R614	6.2K -	14-04-622A
R409	6.8K -	14-04-682A
R806 811	8.2K -	14-04-822A

R617	15K 1 / 4W	14-04-153A
R808	27K -	14-04-273A
R524 705 801	33K -	14-04-333A
R615 810	47K -	14-04-473A
R408	56K -	14-04-563A
R611	68K -	14-04-683A
R511 512 709 716	82K -	14-04-823A
R404 616	150K -	14-04-154A
R510	180 -	14-04-184A
R507	270K -	14-04-274A
R819	470K -	14-04-474A
R612	680 -	14-04-684A
R702 710	1M -	14-04-105A
R411	1.5M -	14-04-155A
R107	270K 1 / 2W	14-06-274A
R113 114 508	100K -	14-06-104A
R610	1 -	14-06-010A
R521	2.2 -	14-06-022A
R607	220 -	14-06-221A
R606	270 -	14-06-271A
R803	1K -	14-06-102A
R520	4.7 -	14-06-472A
R714	10K -	14-06-103A
R817	150K -	14-06-154A
R818	200K -	14-06-204A
R308R 308G 308B	100 - (COMPOSITION)	14-32-002A
R309	470K -	14-32-001A

RESISTOR			
R306R 306G 306B 307R 307G 307B	47	1 / 4W (COMPOSITION)	14-32-003A
R310	0.5	1W (METAL-OXIDE)	14-09-005A
R601	1	-	14-09-010A
R519	82	-	14-09-820A
R816	100	-	14-09-101A
R523	270	-	14-09-271A
R101	2.7K	2W	14-10-272A
R109	100	-	14-10-101A
R304R 304G 304B 305R 305G 305B	820	-	14-10-820A
R718	1	-	14-10-010A
R104	39	5W	14-26-003A

CAPACITANCE

C112	1uF	50 V	16-04-001A
C124	47uF	25 V	16-01-019A
C112 512 805	47uF	37 V	16-04-016A
C120 710	47uF	100V	16-01-079A
C116 117	47uF	160V	16-01-076A
C107 108 125 211 221 306 705	100uF	25 V	16-04-007A
C111	100uF	35 V	16-01-026A
C121 123 603	470uF	35 V	16-01-078A
C119	220uF	100V	16-02-024A
C105 016	330uF	200V	16-01-104A
C105 106	330uF	250V	16-01-113A 230V SET

C219	1uF	25 V	16-01-004A
C210 701 711	4.7uF	25 V	16-04-003A
C213 405 703 210 202 203	10uF	16 V	16-04-023A
C304	10uF	160V	16-01-038A
C402	100uF	16 V	16-04-014A
C403 707	10uF	25 V	16-01-004A
C502	220uF	25 V	16-01-021A
C505 708	4.7uF	50 V	16-04-013A
C511	4.7uF	100V	16-04-008A
C601	220uF	35 V	16-01-019A
C605	2200uF	25 V	16-01-049A
C606	47uF	16 V	16-10-010A
C809	10uF	250V	16-01-098A
C110	22PF	50 V	16-11-008A
C115 118	560PF	500V	16-11-014A
C131 132 305	0.01uF	500V	16-10-046A
C131 132 135 136 204 205 206 207 208 209 214 215 302R 302G 302B 307	0.1uF	50 V	16-11-010A
C137	560PF	2KV	16-10-049A
C217 218 220	33PF	50 V	16-11-016A
C212 216	0.01uF	50 V	16-11-017A
C301R 301G 301B	180PF	50 V	16-11-042
C303	0.01uF	1KV	16-10-042A
C801	47PF	500V	16-01-065A
C803	100PF	50 V	16-11-002A

CAPACITANCE			
C808	270PF	500V	16-11-012A
C510	1000PF	500V	16-11-035A
C513	4700PF	50 V	16-11-056A
C802	4700PF	500V	16-10-104A
C109	0.0068uF	100V	16-14-021A
C113	0.0082uF	100V	16-14-036A
C501 604	0.22uF	100V	16-13-020A
C504 506	0.01uF	100V	16-14-008A
C401 404 406 503 602 607 608 706 806	0.1uF	100	16-14-008A
C804 807	0.33uF	100V	16-13-044A
C517 602 712	0.047uF	100V	16-14-017A
C507	0.47PF	100V	16-13-017A
C138	0.0022uF	AC250V	16-25-030A 115V SET
C101	0.33PF	AC250V	16-25-023A
C609	0.33PF	100V	16-25-023A
C114	2200PF	1.6V	16-28-010A
C514	0.0033uF	1.6V	16-25-029A
C515	0.0028F	1.6V	16-25-029A
C516	1.2PF	250V	16-28-011A
C508	2700PF	100V	16-16-015A

VR

VR101	10K	0.2V	15-02-045A
VR202 204 203	100 0.2W	15-05-054A, 055A, 056A	
VR301R 301G 301B	1K 0.2W	15-05-057A(R), 058A(G) 0598(B)	

VR702	5K	0.2W	15-05-061A
VR501 701	10K	0.2W	15-05-062A
VR603	100K	0.2W	15-05-063A
VR402 604	250K	0.2W	15-05-064A
VR401	500K	0.2W	15-05-066A
VR601	1K	0.2W	15-05-040A
VR802	20K	0.2W	15-05-041A
VR502	200K	0.2W	15-03-009A
VR602	1K	0.2W	15-05-053A
VR504	100K	2W	15-07-003A

TRANS, COIL

T101	TRANS SWITCHING	17-01-060A
LF101	LINE FILTER 4mH	17-08-021A
L101 203 204 205	CORE, BEAD 1uH	17-16-005A
L102 301 801	CORE, INDUCTOR 4.7uH	17-09-014A
L103 201 302	CHOKE 50uH	19-09-015A
L202	CORE, BEAD 4.7uH	17-16-006A
L501	H.D.T	17-07-023A
T801	FBT MSU1FDU61	17-02-041A
L502	H-LIN. COIL 8.5uH	17-05-060B
L503	CHOKE 200uH	17-09-024B

TUBE

3709B22-TC06	
F101 : 250V, 3A : 115 SET	23-01-038A
250V, 3.15A : 230V SET	23-01-034A
TH102 : PTH451C06M : 115V SET	15-08-001A
PTH451C40M : 230V SET	15-08-003A
TH101 : S231	15-06-014A
TH103 : J29	15-08-002A

(2) Reliabilities

1. Long Life.(MTBF)

The monitor shall have a 20.000hr MTBF when operated under any combination of conditions as detailed specification.

2. Environmental Testing.

The operating environment is the environment in which the monitor must operate without degradation or damage.

These are test that SED will perform on the monitor prior to its release.

The monitor is required to satisfactorily pass these tests prior to mass production.

These tests are detailed in SED environment specification. The monitor in the case shall operate within specification when subjected to the following environmental conditions.

3. Temperature.

- * Operating : 5°C To 40°C
- * Storage : -10°C TO +55°C

4. Humidity

- * Operating : 10% To 95%(Non condensing)
- * Storage : maximum 90%

5. Vibration

The level specified for vibration apply to three mutually perpendicular directions (principle monitor axis) with packing and non operation.

- * Frequency : 11~33Hz
- * Amplitude : 0~3mm
- * Sweep Time : 1Min.
- * Waveform : Sinewave
- * Deirection : Up / Down
- * Time : 1 hour

6. Altitude

- * Operating : 120000 ft at +20°C
7000 ft at +40°C
- * Non Operating : 4000 ft

7. Safety and approvals

1. Electromagnetic interference.

1-1. Radiated emission.

The monitor shall meet the requirments of FCC subpart J class B.

1-2. Conducted emission.

The monitor electronics shall not be customer accesable.

2. Safety regulations.

The monitor shall meet the requirements of safety regulation UL, CSA, TUV.

[3] Signal cable pin connection

* SIGNAL CABLE CONNECTION(15IN D-SUB SIGNAL CONNECTOR WITH CABLE)

NO	RGB/ANALOG SIGNAL	SIGNAL	WIRE COLOR	
1	RED	PIN # 1	WHITE	
2	GREEN	PIN # 2	WHITE	
3	BLUE	PIN # 3	WHITE	
4	N.C	PIN # 4		
5	SELF TEST	PIN # 5	BLUE	
6	RED GROUND	PIN # 6	SHIELD	
7	GREEN GROUND	PIN # 7	SHIELD	
8	GLUE GROUND	PIN # 8	SHIELD	
9	N.C	PIN # 9		
10	N.C	PIN # 10		
11	SYNC GROUND	PIN # 11		
12	N.C	PIN # 12		
13	H-SYNC	PIN # 13	ORANGE	
14	V-SYNC	PIN # 14	RED	
15	N.C	PIN # 15		