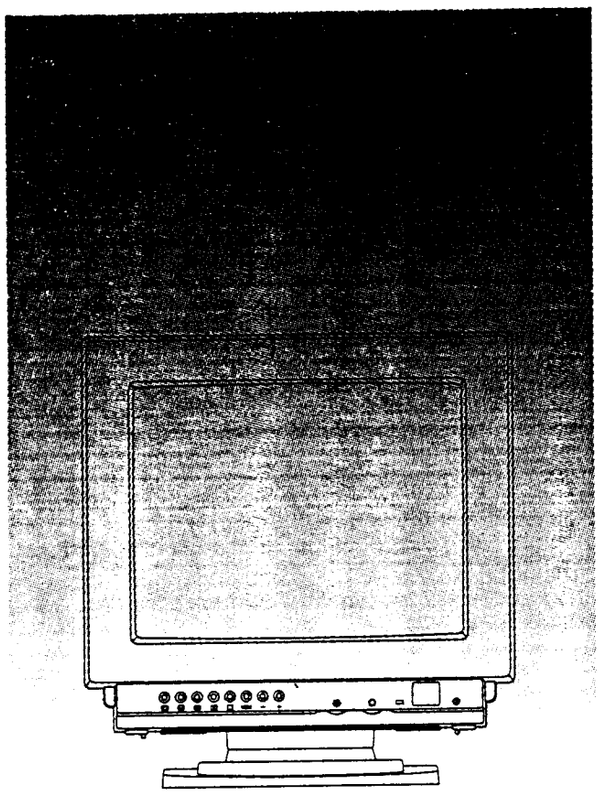
SAMSUNG

COLOR MONITOR

CSN5987

SERVICE Manual

COLOR MONITOR



CONTENTS

SPECIFICATION

Classification	Specifications
Picture Tube	15-inch (14" Visual) FST (Full Square/Flat face Tube), 90° deflection, 0.28 mm Dot pitch, Semi-tint, Glare.
Scanning Frequency Horizontal / Vertical	30 kHz to 50 kHz (Automatic)/50 Hz to 100 Hz (Automatic)
Display Colors Analog Input	Unlimited Colors
Maximum Resolution Horizontal Vertical	1024 Dots 768 Lines
Active Display Size	260 mm ±3 mm /195 mm ±3 mm (Active display size is changed by signal timing)
Input Signal Video Signal Separate Sync Composite Sync Sync on Green	Analog 0.714 Vp-p Positive at 75 Ω Terminated TTL Level, Positive or Negative TTL Level, Positive or Negative Composite Sync, 0.286 Vp-p Negative (Video 0.714 Vp-p Positive)
Video Band Width	65 MHz (MAX.)
Power Supply Power consumption	AC 90-132 Volt, 60 Hz ±3 Hz 90 Watts (MAX.)
Dimensions Unit (HxWxD) Carton (HxWxD)	15.2 x 14.6 x 15.6 Inches (385 x 370 x 395 mm) 17.7 x 18.3 x 19.5 Inches (450 x 465 x 495 mm)
Weight Net Gross	29.8 Lbs (13.5kg) 33.7 Lbs (15.3kg)
Environmental Considerations Operating Temperature Humidity Storage Temperature Humidity	32° F to 104° F (0° C to 40° C) 10% to 80% -4° F to 113° F (-20° C to 45° C) 5% to 95%

NOTE : DESIGNS and SPECIFICATIONS are subjected to change without prior NOTICE.

SAFETY PRECAUTIONS

Service work should be performed only by qualified service technicians who are thoroughly familiar with all of the following safety checks and servicing guidelines:

1. Warning

1) For continued safety, do not attempt to modify the circuit.
2) Disconnect the AC power before servicing.
3) Semiconductor heat sinks are potential shock hazards when the chassis is operating.

2. Servicing the High Voltage System and Picture Tube

When servicing the high voltage system, remove the static charge by connecting a 10kohm resistor in series with an insulated wire (such as a test probe) between the chassis and the anode lead. (The AC line cord should be disconnected from the AC outlet.)

1) The picture tube in this display monitor employs integral implosion protection.
2) Replace with a tube of the same type and number for continued safety.
3) Do not lift the picture tube by the neck.
4) Handle the picture tube only when wearing shatterproof goggles and after discharging the high voltage anode completely.

3. X-Radiation and High Voltage Limits

1) Be sure all service personnel are aware of the procedures and instructions covering X-radiation. The only potential source of X-ray in a current solid state display monitor is the tube. However, the picture tube does not emit measurable X-ray radiation if the high voltage is as specified in the "high voltage check" instruction. It is only when high voltage is excessive that X-radiation is capable of penetrating the shell of the picture tube, including the lead in glass material.The important precaution is to keep the high voltage below the maximum level specified.

2) It is essential that serviceman have available at all times an accurate high voltage meter. The calibration of this meter should be checked periodically.

3) High voltage should always be kept at the rated value-no higher. Operation at high voltages may cause a failure of the picture tube or high voltage circuitry and, also under certain conditions, may produce radiation in excess of desirable levels.

4) When the high voltage regulator is operating properly, there is no possibility of an X-radiation problem. Every time a color chassis is serviced, the brightness should be tested while monitoring the high voltage with a meter to be certain that the high voltage does not exceed the specified value and that it is regulating correctly.

5) Do not use a picture tube other than that specified, or make unrecommended circuit modifications to the high voltage circuitry.

6) When troubleshooting or taking test measurements on a display monitor with excessively high voltage, avoid being unnecessarily close to the display monitor. Do not operate the display monitor longer than is necessary to locate the cause of excessive voltage.

4. Fire and Shock Hazard

Before returning the display monitor to the user, do the following safety checks:

1) Inspect all lead dress to be certain that the leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the display monitor.

2) Inspect all protective devices such as nonmetallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacitor networks, mechanical insulators, etc.

3) To be sure that no shock hazard exists, checks for leakage current in the following manner:

① Plug the AC line cord directly into a 120 volt AC outlet. (Do not use an isolation transformer for this test)
② Using two clips leads, connect a 1.5 kohm, 10 watt resistor paralleled by a 0.15uF capacitor in series with all exposed metal cabinet parts and a known earth ground, such as electrical conduit or electrical ground connected to earth ground.
③ Use a SSVM or VOM with 1000 ohms per-volt or higher sensitivity to measure the AC voltage drop across the resistor. (See Figure 1.)

④ Connect the resistor to all exposed metal parts having a return path to the chassis (metal cabinet, screw heads, knobs and shafts, escutcheon, etc.) and measure the AC voltage drop across the resistor.

⑤ Any reading of 5.25 volts RMS (this corresponds to 3.5milliampere AC) or more is excessive and indicates a potential shock hazard which must be corrected before returning the display monitor to the user.

5. Product Safety Notices

Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by ⚠ on schematics and parts lists. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire and/or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

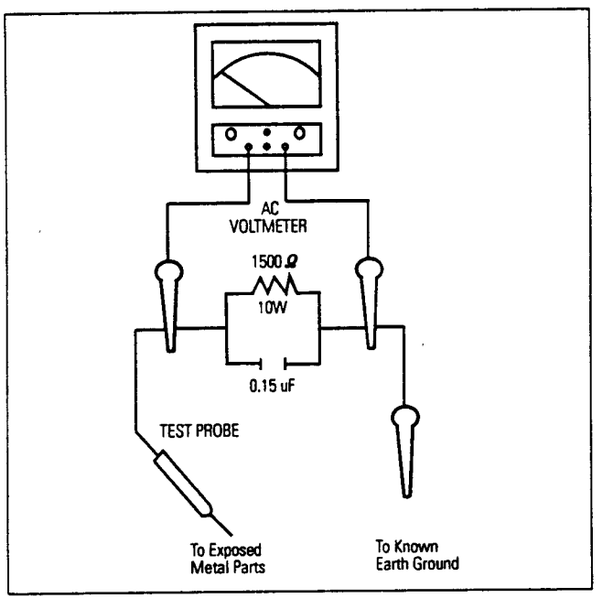


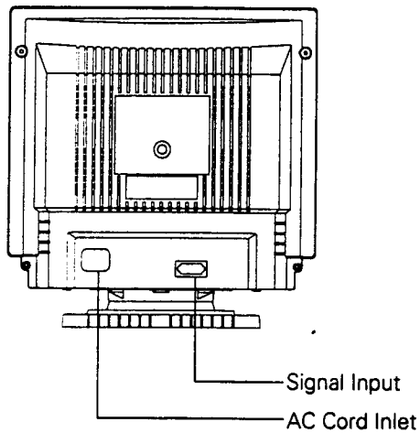
Figure1. Leakage Current Test Circuit

GENERAL INFORMATION

1. Features

1) 15-inch (14-inch visual) high performance CRT.
   - 0.28 mm dot pitch.
2) Glare CRT face treatment helps reduce eyestrain.
3) Automatically scans horizontal frequencies from 30-50 kHz, and vertical frequencies from 50-100 Hz.
4) Compatible with a variety of video standards including IBM VGA, XGA, super-VGA, and 1024x768 non interlaced and Apple.
5) Supports VESA flicker-free modes.
6) Microprocessor based digital control system saves up to 10 user definable display settings. Also, includes 11 factory preset display settings.
7) Power supply operates on AC 100-120 Volt, 60 Hz for use all over the world.
8) Your display has been designed to operate on all power systems, including "IT" power systems.
9) Power management system:
   Power management circuit, when signaled by the computer system, will reduce power consumption when the computer system is not in use.
10) Optional Feature:
    Please consult your dealer for information about these optional features.
11) Apple Macintosh Connector Adapter:
    Connector adapters are available for connecting this monitor to the Apple MacintoshII family, the Macintosh LC/LCII, and the Quadra series computers.

2. Installation



This monitor can be connected to any IBM compatible analog display adapter. Such adapters include VGA, XGA, XGAII and the built-in video system of IBM PS/2 computers.

To set up your display, follow these steps:

1) Be sure your computer is turned off.
2) Place the display on a flat, sturdy surface.
3) Connect the 15-pin D-sub connector on the video connector cable to the video connector on your computer and tighted the attachment screws. (Refer to the setting up manual for your computer for the location of the video connector.)
4) Connect the 9-pin D-sub connector on the video connector cable to the video connector at the back of the display and tighten the attachment screws.
5) Connect the power cable to the display and then plug the power cord into the power outlet.
6) Adjust the screen tilt and swivel to suit your needs.
7) Turn on your computer and then the display.

3. CONNECTION TO YOUR COMPUTER (MACINTOSHII FAMILY)

With the cable adapter, this monitor is compatible with Apple MacintoshII family, Macintosh LC/LCII/LCIII, Centris, and Quadra series computers.
(Please see Page 3-5 for the pin assignments.)

To attach the monitor to your system, follow these instructions:

1) Turn off the power to the monitor and computer.

2) Connect the cable adapter to the video output port of your video controller. Tighten the screws on the cable adapter.

3) Connect the 9-pin side of the signal cable to the 9-pin D-sub connector on the rear side of the monitor.

4) Connect the 15-pin side of the signal cable to the other end of the cable adapter. Tighten the screws of the signal cable to ensure proper connection.

5) Connect one end of the power cable to the monitor and the other end to the power outlet.

6) Turn on the monitor and the computer.

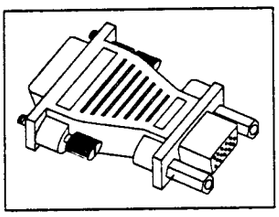


Fig. 1. Cable Adapter

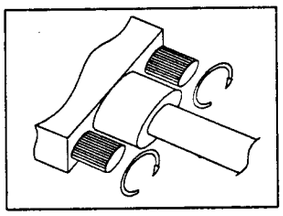


Fig. 2. Screw of the Signal Cable

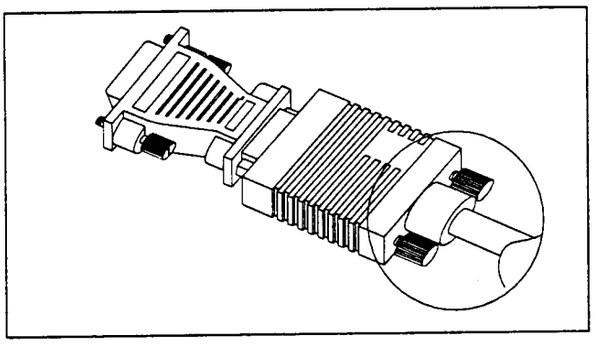
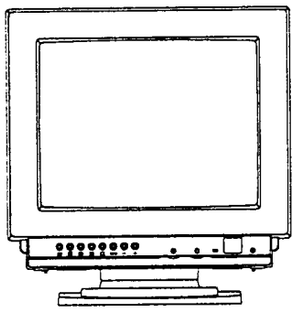
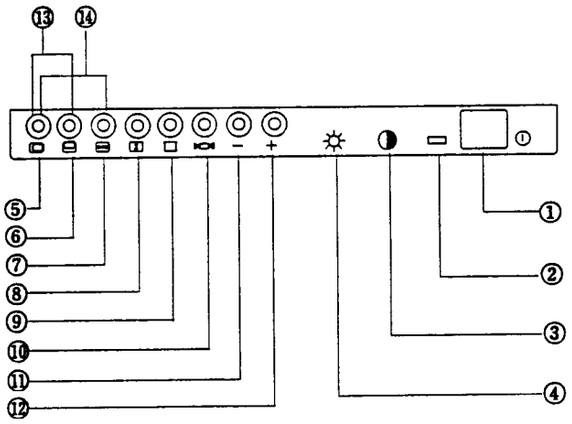


Fig. 3. Cable Adapter Installing Diagram

4. Control Location & Functions

4-1. Front View





1	Power Switch (PUSH)
2	Power Indicator
3	Contrast Control
4	Brightness Control
5	Horizontal Position Control
6	Vertical Position Control
7	Horizontal Size Control
8	Vertical Size Control
9	Side Pincushion Control
10	Recall Control
11	Down Control
12	Up Control
13	Parallelogram Control
14	Trapezoid Control

4-2. Basic Controls and LED Indicator Functions

1) Power switch:

Use to turn monitor power on and off. Push the power switch once to turn monitor power on. Power LED on indicator will also turn on. Push the switch again to turn monitor power off.

2) Power indicator (Dual color):

(Green/ Orange) The power indicator shows the state of your monitor.
- When the monitor is operated normally, the indicator LED becomes green.
- When the monitor is operated specially, the indicator LED becomes orange

3) Contrast control:

Use to adjust the contrast level of the displayed image. Contrast controls the difference between dark and light areas of the displayed image.

4) Brightness control:

Use to adjust the overall brightness of the displayed image.

Microprocessor Controls and Functions

General Description

The monitor has preset display settings for each of the standard signal timings listed on the timing chart. In other words, the monitor will automatically adjust itself to an optimum size and position when it senses one of the standard signal timings. However, some users wish to adjust the monitor to their preferred swtting rather than the factory preset. The microprocessor controlled adjustments will automatically memorize the display settings that you prefer for a specific signal timing and automatically adjust itself when the monitor senses that signal See Pages 5-1, 5-2 for the standard signal timing chart.

Control Function Buttons

Use these buttons to select adjustment functions. Press the desired function button once to select adjustment functions, and the power indicator's color is changed from green to orange. If the power indicator's color becomes orange you can use the Down (-) or Up (+) button to adjust the displayed image, but no adjustment is made when the indicator's color returns to green after about ten seconds.

5) Horizontal position control:

Use this button to adjust the horizontal position (centering) of the display.

6) Vertical position control:

Use this button to adjust the vertical position (centering) of the display.

7) Horizontal size control:

Use this button to adjust the horizontal size (width) of the display.

8) Vertical size control:

Use this button to adjust the vertical size (height) of the display.

9) Side pincushion control:

Use this button to correct vertical sides of the display from bowing out or in.

10) Recall:

Use this button to recall factory preset settings. If you push the recall button the indicator LED's color is changed from green to orange. Keep pressing the Recall button for 2-3 seconds until the indicator LED's color is changed from orange to green in order to recall the factory preset data for the standard signal.

Caution: This operation also resets the data in the user preset memory area and erases the data you have stored.

About burn-in mode: You can operate or disable power saving function if you need. In no signal state (video cable is disconnected from this monitor), the indicator's color is orange. Push horizontal position button, the power saving function is disabled and then you can warm up this monitor. This burn-in mode is removed when the power of monitor is off and on again.

Adjustment Buttons

Use these buttons to adjust the displayed image when a control function is enabled (the indicator's color is orange). But you cannot adjust the displayed image when a control function is disabled (the indicator's color is green).

Note: After 3-4 seconds from the last control using the Up or Down button, your preferred display adjustments are saved automatically, and then the indicator's color is changed to green and returned to orange.

Caution: The control range of a function except Vertical Position is subject to be restricted by programing of microprocessor in this monitor.

11) Down control:

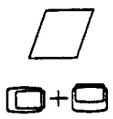
— Use this button to decrease the value of a function.

12) Up control:

\+ Use this button to increase the value of a function.

Technical Description
This monitor has some technical control functions for the correction of geometric distortion.

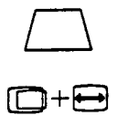
13) Parallelogram control:



- Keep pressing the horizontal position button and the vertical position button simultaneously for 4-5 seconds until the indicator's color is changed from green to orange.

- Use the Up or Down button to control the parallelogram of the display.

14) Trapezoid control:



- Keep pressing the horizontal position button and the horizontal size button simultaneously for 4-5 seconds until the indicator's color is changed from green to orange.

- Use the Up or Down button to control trapezoid (keystone) of the display.

6. Power Management System (Power Saving Function)

If your computer system features a display power management function, this monitor, when signaled, will enter power saving modes. The purpose of power management is to automatically reduce power consumption when the computer system is not in use. This monitor can enter 3 different power saving modes as described below.

Note 1: This monitor is Energy Star Compliant when used with a Computer equipped with DPMS (VESA).

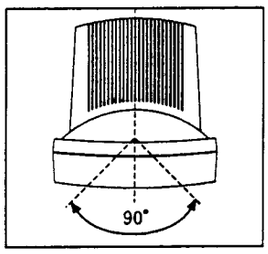
Table 1: Display Power Management Signaling(DPMS) standard

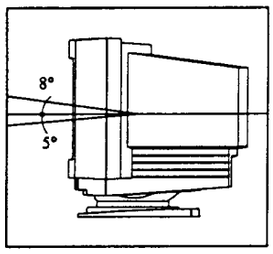
State / Sync	Normal Operation	Power Saving Function Mode		
		Stand-by Mode	Suspend Mode	Power Off Mode
Horizontal Vertical Video	Active Active Active	Inactive Active Blanked	Active Inactive Blanked	Inactive Inactive Blanked
Remark (LED color)	Green	Orange	Orange/Green Blinking (0.5 sec. interval)	Orange Blinking on-off (1 sec. interval)
Power Consumption	90W (Max.)	72W (Max.)	Less than 20 W	Less than 5 W

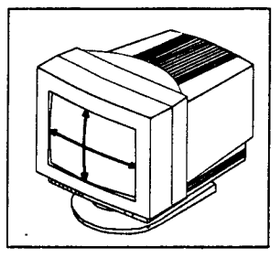
Note 2: This monitor automatically returns to normal operation state when horizontal and vertical sync returns. When you turn power off in power off mode, LED's indicator may continuously blink on-off for 4 to 5 seconds.

7. Use of the Tilt-Swivel

With the tilt-swivel, this unit can be adjusted to be viewed at your desired angle within 90° horizontally and 13° vertically. To turn the unit horizontally, hold it at the bottom with both your hands as illustrated below.







8. Pin Assignments

Sync Type / Pin No.	9 Pin Side of the Signal Cable (Figure 1)			15 Pin Side of the Signal Cable (Figure 2)			Cable Adapter (Figure 3)
	Separate	Composite	Sync on green	Separate	Composite	Sync on green	Apple MACII
1	Red	Red	Red	Red	Red	Red	Gnd-R
2	Green	Green	Green+Sync	Green	Green	Green+Sync	Red
3	Blue	Blue	Blue	Blue	Blue	Blue	H/V-Sync
4	H-Sync	H/V-Sync	Not Used	Gnd	Gnd	Gnd	Sense 0
5	V-Sync	Not Used	Not Used	NC	NC	NC	Green
6	Gnd-R	Gnd-R	Gnd-R	Gnd-R	Gnd-R	Gnd-R	Gnd-G
7	Gnd-G	Gnd-G	Gnd-G	Gnd-G	Gnd-G	Gnd-G	Sense 1
8	Gnd-B	Gnd-B	Gnd-B	Gnd-B	Gnd-B	Gnd-B	Reserved
9	Gnd-Sync	Gnd-Sync	Gnd-Sync	NC	NC	NC	Blue
10	-	-	-	Gnd-Sync	Gnd-Sync	Gnd-Sync	Sense 2
11	-	-	-	Gnd	Gnd	Gnd	Gnd
12	-	-	-	NC	NC	NC	V-Sync
13	-	-	-	H-Sync	H/V-Sync	Not Used	Gnd-B
14	-	-	-	V-Sync	Not Used	Not Used	Gnd
15	-	-	-	NC	NC	NC	H-Sync

Note: "NC" means no connection

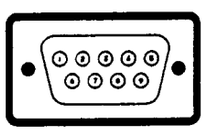


Figure 1: Male Type

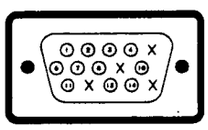


Figure 2: Male Type

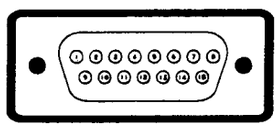


Figure 3: Male Type

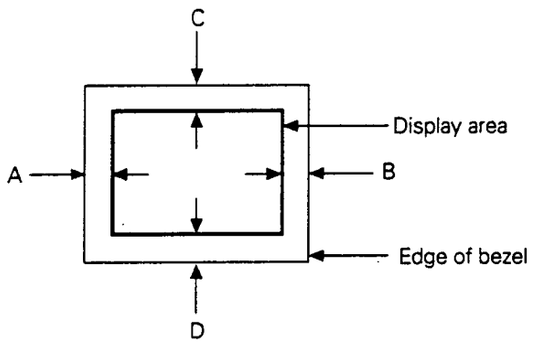
DISPLAY PERFORMANCE

1. Display Area

1) Width : 260 ±3 mm
2) Height : 195 ±3 mm

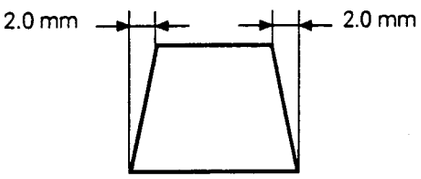
2. Centering

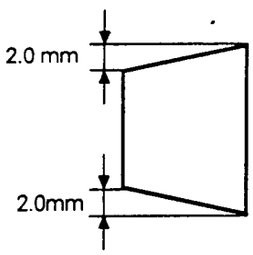
| A - B | ≤ 4.0 mm
| C - D | ≤ 4.0 mm



3. Distortion

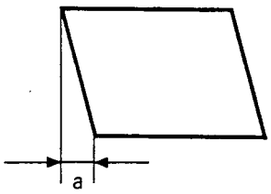
1) Trapezoid





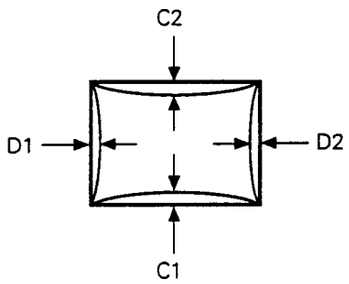
2) Parallelogram

| a | ≤ 2.0 mm



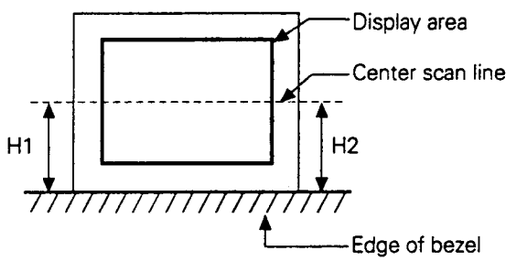
3) Pincushion

| C1 |, | C2 | ≤ 2.0 mm
| D1 |, | D2 | ≤ 2.0 mm



4) Rotation

| H1 - H2 | ≤ 2.0 mm



4. Linearity

1) Standard Mode : 48kHz/72Hz

Horizontal Linearity (HL) :

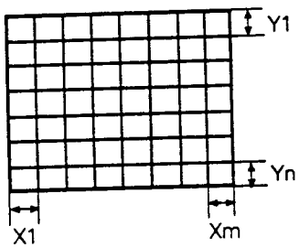
$$\frac{Xmax - \overline{X}}{\overline{X}} \times 100 \text{ or } \frac{\overline{X} - Xmin}{\overline{X}} \times 100 \leq 5\%$$

Vertical Linearity (VL) :

$$\frac{Ymax - \overline{Y}}{\overline{Y}} \times 100 \text{ or } \frac{\overline{Y} - Ymin}{\overline{Y}} \times 100 \leq 5\%$$

2) Other Modes

HL, VL ≤ 7% for other mode: VGA, 8514A, 36kHz,



m=16
n =12

3) Conditions

Display image: Crosshatch pattern
Maximum and minimum values should not be adjacent to each other.

Xmax is maximum value among X1 ~ Xm
Xmin is minimum value among X1 ~ Xm

$$\overline{X} = \frac{X1 + X2 ..... Xm}{m} \quad (m=16)$$

Ymax is maximum value among Y1 ~ Yn
Ymin is minimum value among X1 ~ Yn

$$\overline{Y} = \frac{Y1 + Y2 ..... Yn}{n} \quad (n=12)$$

5. Brightness Uniformity

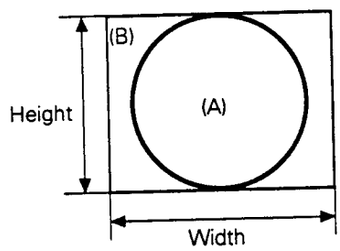
Value	70% (Min) Variation = $\frac{B}{A}$
Conditions	Display Image: White flat field Luminance : 20 F/L at the center of display area A: Luminance at position of the highest B: Luminance at position of lowest brightness

6. Color Point

Value	9300° K X = 0.283 ± 0.02, Y = 0.298 ±0.02
Conditions	Display Image : White flat field at the center of display area. Luminance Min: 5 fL, Max: 20 fL

7. Misconvergence

Center area of display ("A" circle is 195 mm (A): 0.3 mm
Peripheral area of display (B): 0.4 mm



1) Conditions
Display Image : Crosshatch pattern mixed with R,G,B colors.

8. Purity

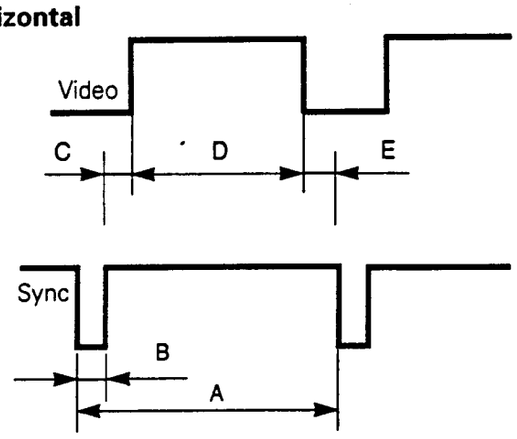
Conspicuous mislanding shall not be visible within display area at distance of 50 cm from CRT surface

1) Conditions
Display image: White flat field
Luminance : 15 f/L at the center of display area.

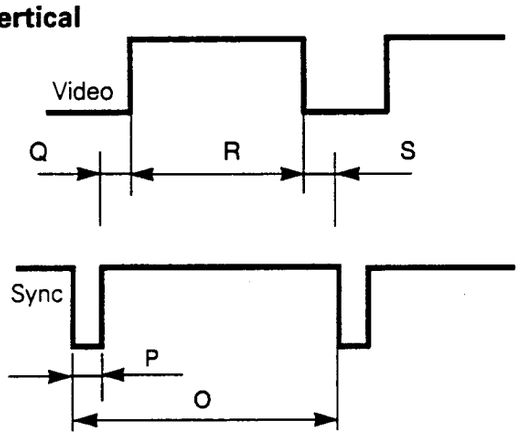
SIGNAL TIMING CHART

Mode / Timing	IBM				VESA
	VGA1/70	VGA2/70	VGA3/60	XGA/87i	640/72
	640X350	720X400	640X480	1024X768	640x480
fH (kHz)	31.469	31.469	31.469	35.522	37.861
A μsec	31.778	31.777	31.778	28.151	26.413
B μsec	3.813	3.813	3.813	3.920	1.270
C μsec	1.907	1.907	1.907	1.247	4.064
D μsec	25.422	25.422	25.422	22.806	20.317
E μsec	0.636	0.636	0.636	0.178	0.762
fv (Hz)	70.086	70.087	59.940	86.958	72.809
O msec	14.268	14.268	16.683	11.500	13.735
P msec	0.064	0.064	0.064	0.113	0.079
Q msec	1.907	1.080	1.048	0.563	0.739
R msec	11.122	12.711	15.253	10.810	12.678
S msec	1.176	0.413	0.318	0.014	0.237
Clock Fre. (MHz)	25.175	28.322	25.175	44.900	31.500
Polarity					
H. Sync.	Positive	Negative	Negative	Positive	Negative
V. Sync.	Negative	Positive	Negative	Positive	Negative
Remark	—	—	—	Interlaced	—

Horizontal



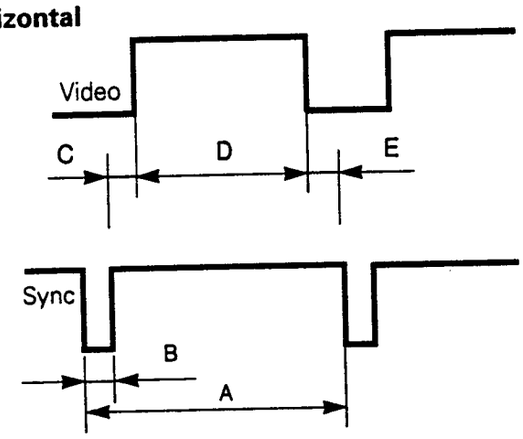
Vertical



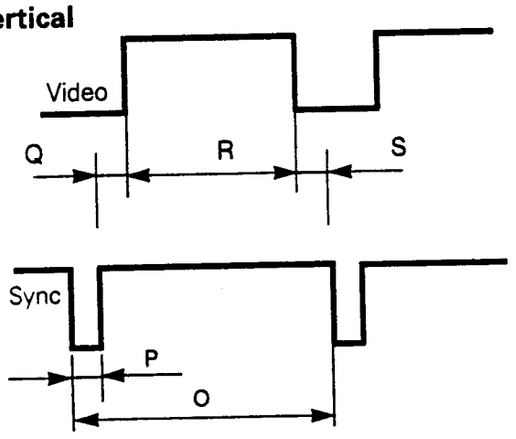
SIGNAL TIMING CHART

Mode / Timing	VESA				Apple Mac.	
	800/56	800/60	800/72	1024/60	640/67	832/75 Hz
	800x600	800x600	800x600	1024x768	640x480	832x624
fH (kHz)	35.156	37.879	48.077	48.363	35.000	49.726
A μsec	28.444	26.400	20.800	20.677	28.571	20.110
B μsec	2.000	3.200	2.400	2.092	2.116	1.117
C μsec	3.556	2.200	1.280	2.462	3.175	3.910
D μsec	22.222	20.000	16.000	15.754	21.164	14.524
E μsec	0.667	1.000	1.120	0.369	2.116	0.559
fv (Hz)	56.250	60.317	72.188	60.004	66.667	74.551
O msec	17.778	16.579	13.853	16.666	15.000	13.414
P msec	0.057	0.106	0.125	0.124	0.086	0.060
Q msec	0.626	0.607	0.478	0.600	1.114	0.784
R msec	17.067	15.840	12.480	15.880	13.714	12.549
S msec	0.028	0.026	0.770	0.062	0.086	0.020
Clock Fre. (MHz)	36.000	40.000	50.000	65.000	30.240	57.284
Polarity						
H. Sync.	Pos./Neg.	Positive	Positive	Negative	Negative	Negative
V. Sync.	Pos./Neg.	Positive	Positive	Negative	Negative	Negative
Remark	—	—	—	—	—	—

Horizontal

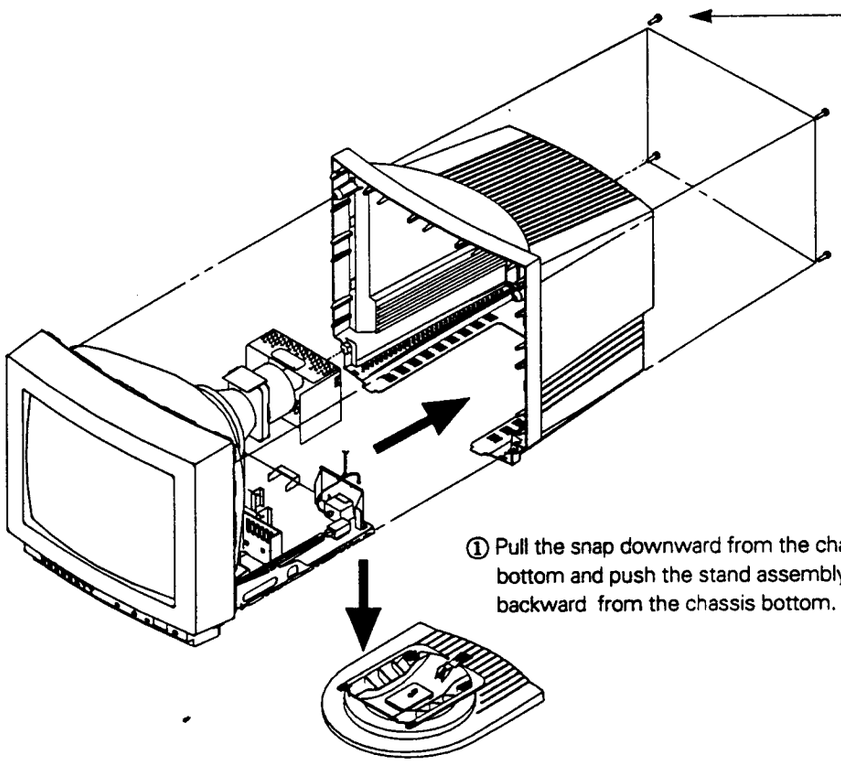


Vertical

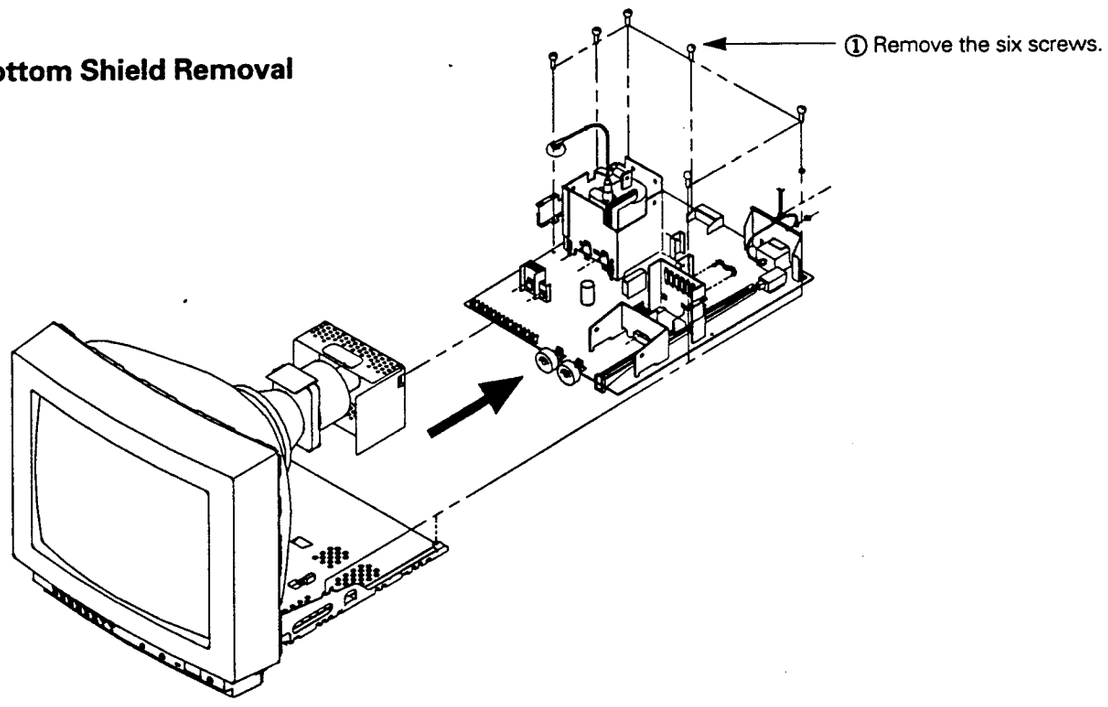


DISASSEMBLY

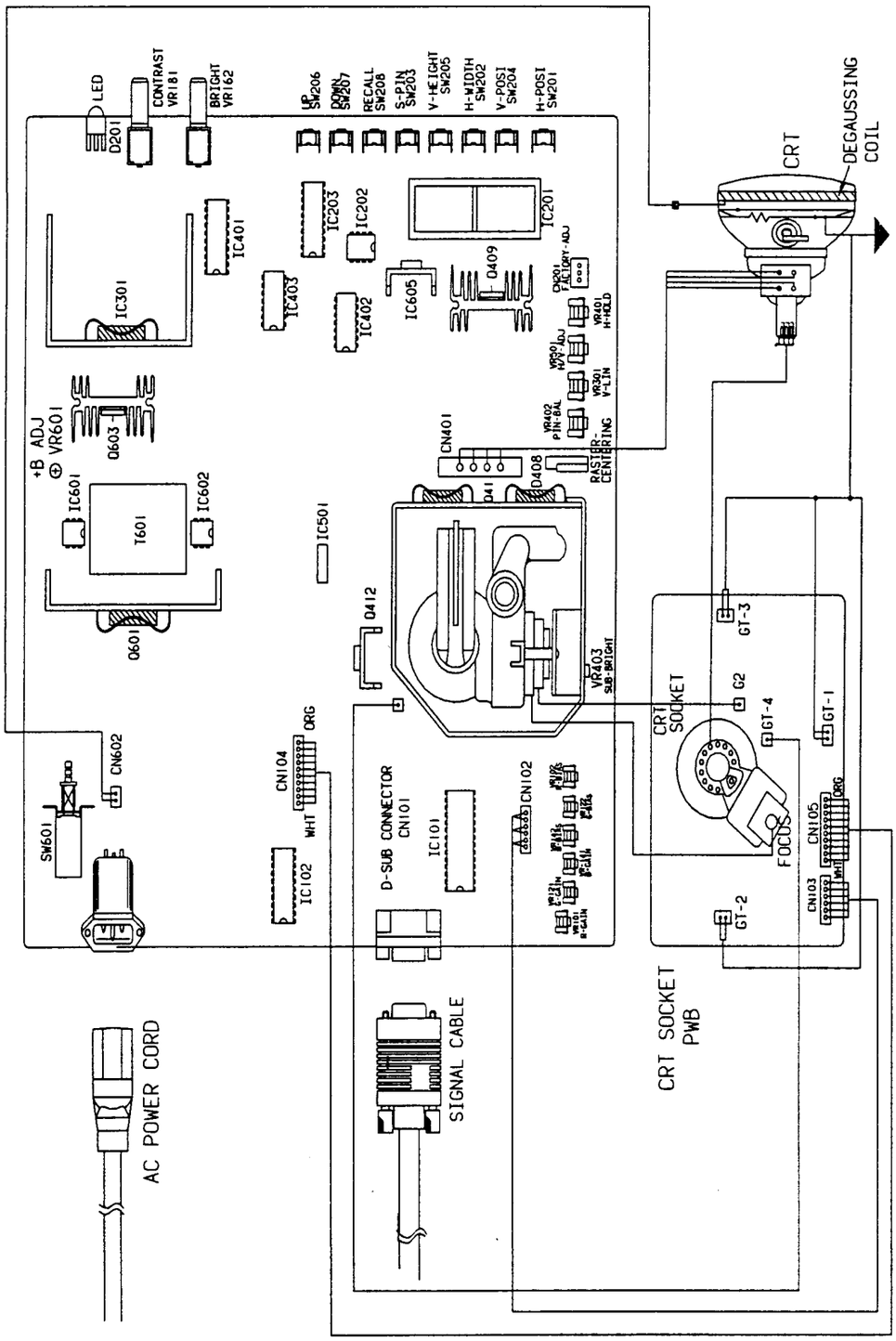
5-1. Stand & Cabinet Removal

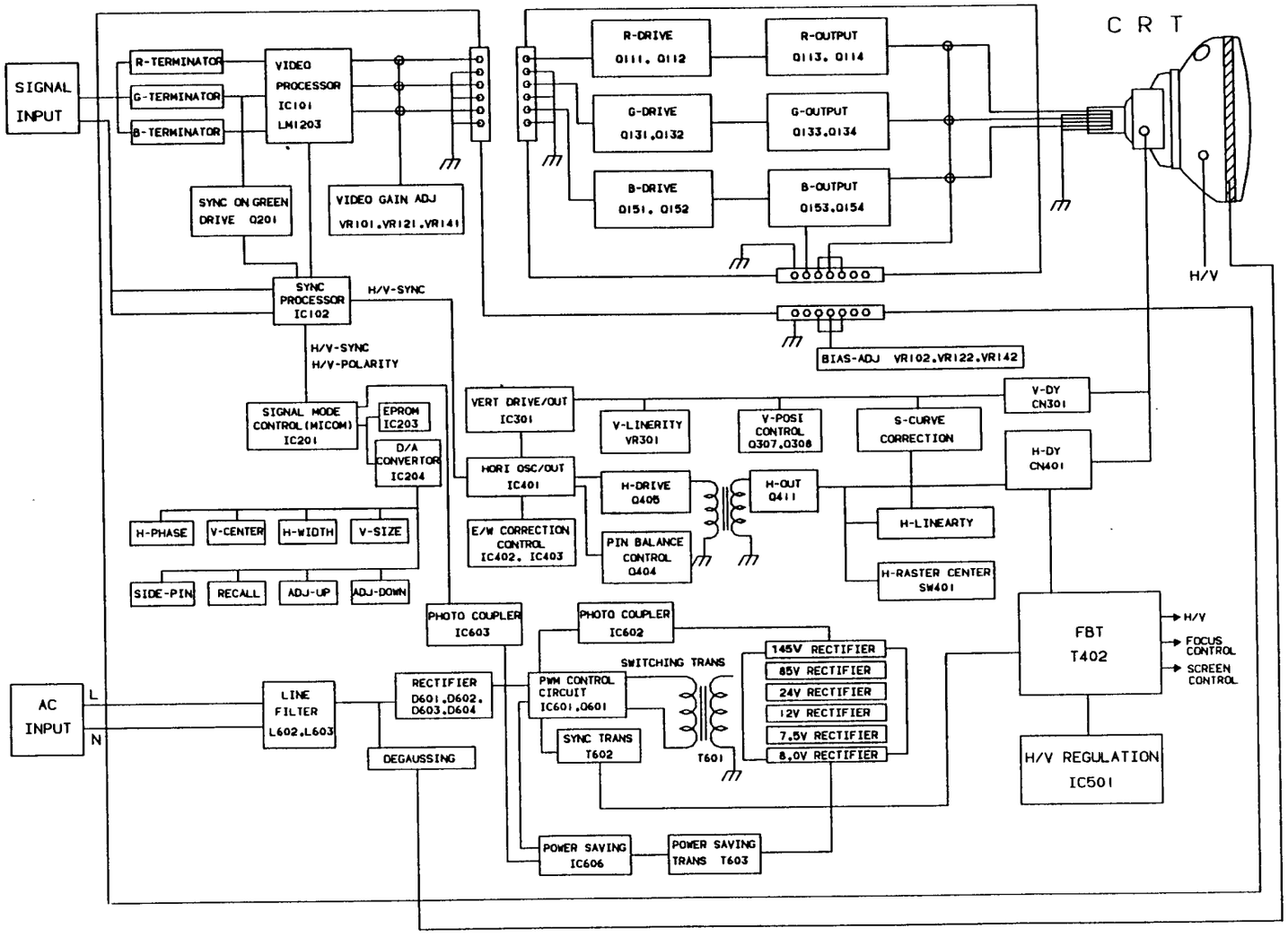


5-2. Bottom Shield Removal



WIRING DIAGRAM




SIGNAL INPUT
R-TERMINATOR
G-TERMINATOR
B-TERMINATOR
VIDEO PROCESSOR IC101 LM1203
SYNC ON GREEN DRIVE Q201
VIDEO GAIN ADJ VR101,VR121,VR141
SYNC PROCESSOR IC102
H/V-SYNC
H/V-SYNC H/V-POLARITY
SIGNAL MODE CONTROL (MICOM) IC201
EPROM IC203
D/A CONVERTOR IC204
H-PHASE
V-CENTER
H-WIDTH
V-SIZE
SIDE-PIN
RECALL
ADJ-UP
ADJ-DOWN
R-DRIVE Q111, Q112
G-DRIVE Q131,Q132
B-DRIVE Q151, Q152
R-OUTPUT Q113, Q114
G-OUTPUT Q133,Q134
B-OUTPUT Q153,Q154
CRT
H/V
BIAS-ADJ VR102,VR122,VR142
VERT DRIVE/OUT IC301
V-LINERITY VR301
V-POSI CONTROL Q307,Q308
S-CURVE CORRECTION
V-DY CN301
HORI OSC/OUT IC401
H-DRIVE Q406
H-OUT Q411
H-DY CN401
E/W CORRECTION CONTROL IC402, IC403
PIN BALANCE CONTROL Q404
H-LINEARTY
H-RASTER CENTER SW401
PHOTO COUPLER IC603
PHOTO COUPLER IC602
SWITCHING TRANS
PWM CONTROL CIRCUIT IC601,Q601
SYNC TRANS T602
T601
145V RECTIFIER
85V RECTIFIER
24V RECTIFIER
12V RECTIFIER
7.5V RECTIFIER
8.0V RECTIFIER
FBT T402
H/V
FOCUS CONTROL
SCREEN CONTROL
H/V REGULATION IC501
AC INPUT
L
N
LINE FILTER L602,L603
RECTIFIER D601,D602, D603,D604
DEGAUSSING
POWER SAVING IC606
POWER SAVING TRANS T603

ALIGNMENT PROCEDURE

1. Adjustment Conditions and Precautions

1) Power supply voltage
AC 120 volt (60 Hz)

2) Warm up time
The display must be on for 30 minutes before starting alignment. This is especially critical in color temperature and white balance adjustments.

3) Signal
Video analog 0.714 Vp-p positive at 75 ohm terminated.

Sync on green	:	Video 0.714 Vp-p positive.
	:	Sync 0.286 Vp-p negative.
Sync	:	TTL level negative / positive separate , composite.

4) Scanning Frequency

Horizontal	:	30 kHz - 50 kHz (Automatic).
Vertical	:	50 Hz - 100 Hz (Automatic).

✱ Unless otherwise specified, adjust at SVGA (fH : 48kHz, fv: 72Hz) signals.

CAUTION

☞ Alignment procedure without micom control jig: You can do adjust this step after set the monitor to the burn-in mode. (Refer Page 3-3)

☞ Alignment procedure with micom control jig: Before doing below steps,

① To apply standard timing (800X600/72 Hz) to a monitor.
② Press a button #⑳ (Memory Data Dump) on the Micom control jig to call the data of the all mode based 800X600/72 Hz.
③ Please refer to block diagram of the Micom control jig on the Page 9-3.

2. Main PWB Prepare Adjustment

1) +B 145V Line adjustment
Adjust VR601 to be 145 ±1 V DC at D622 cathode and GND.
(No Beam Contrast: Min., Brightness: Min.)

2) High Voltage Control
Adjust VR402 to be 25 kV ±0.2 kV.
(No Beam Contrast: Min., Brightness: Min.)

3. Main PWB Adjustment

- Unless otherwise specified, adjust the EXT-VR
Contrast : Max. (Fully clockwise)
Brightness : So that no background raste appears.

1) Horizontal Hold
Connect the plus pole of the scope probe to RED wire jacket of DY and the minus pole to chassis frame.
At self raster (disconnect the signal cable), adjust the horizontal frequency control (VR401) so that the horizontal frequency is 48 kHz.
(Free running frequency: 48 kHz ±0.1 kHz)

2) Vertical Linearity
Adjust VR301 so that vertical linearity is optimum when signal of 48 kHz is applied.

3) Horizontal Raster Center
Adjust SW401 so that back raster position to come center when signal of 48 kHz/72 Hz is applied.

4) Horizontal Position Adjustment
- Adjustment procedure without micom control jig:
After pushing the Horizontal Position button, push Up button or Down button so that the image (or the test pattern) is placed on the center of the raster.

- Adjustment procedure with micom control jig:
Push Horizontal Position Up button (#② button on the Micom Control Jig) or Horizontal Position Down button (#① button) so that the image (or the test pattern) is placed on the center of the raster.

5) Vertical Position Adjustment

- Alignment procedure with micom control jig:

Push Vertical Position Up button (#⑦ button) or Vertical Position Down button (# ⑧ button) so that the vertical image or pattern is placed on the center of the raster.

6) Horizontal Size Adjustment

- Adjustment procedure without micom control jig:

After pushing the Horizontal Size button push Up button or Down button so that the horizontal width of the displayed pattern is 260 mm.
(The tolerance is ±3 mm)

- Adjustment procedure with micom control jig:

Push Horizontal Size Up (#④ button) or Horizontal Size Down button (#③ button) so that the horizontal width of the displayed pattern becomes 260 mm.
(The tolerance is ±3 mm)

7) Vertical Size Adjustment

- Alignment procedure without micom control jig:

After pushing the Vertical Size push Up button or Down button so that the Vertical Size of the displayed pattern is 195 mm.
(The tolerance is ±3 mm)

- Adjustment procedure with micom control jig:

Push Vertical Size Up button (#⑨ button) or Vertical Size Down (#⑩ button) so that the vertical image or pattern becomes 195 mm.
(The tolerance is ±3 mm)

8) Side Pincushion Adjustment

- Alignment procedure without micom control jig:

After pushing the Side Pincushion button, push Up button or Down button so that each side of the pattern (or the image) becomes straight.

- Adjustment procedure with micom control jig:

Push Side Pincushion Up button (#⑤ button) or Side Pincushion Down button (#⑥ button) so that each side of the pattern or image becomes straight.

9) Parallelogram Adjustment

- Alignment procedure without micom control jig:

Keep pressing the Horizontal Position button and Vertical position button simultaneously for 4-5 seconds until the indicator's color is changed from orange to green. Use the Up or Down button to control parallelogram of the display.

- Adjustment procedure with micom control jig:

Push Parallelogram Up button (#⑬ button) or Parallelogram Down button (#⑭ button) so that the image or pattern becomes to rectangular.

10) Trapezoid Adjustment

- Alignment procedure without micom control jig:

Keep pressing the Horizontal Position button and Horizontal Size button simultaneously for 4-5 seconds until the indicator's color is changed from green to orange. Use the Up or Down button to control trapezoidal (keystone) of the display.

- Adjustment procedure with micom control jig:

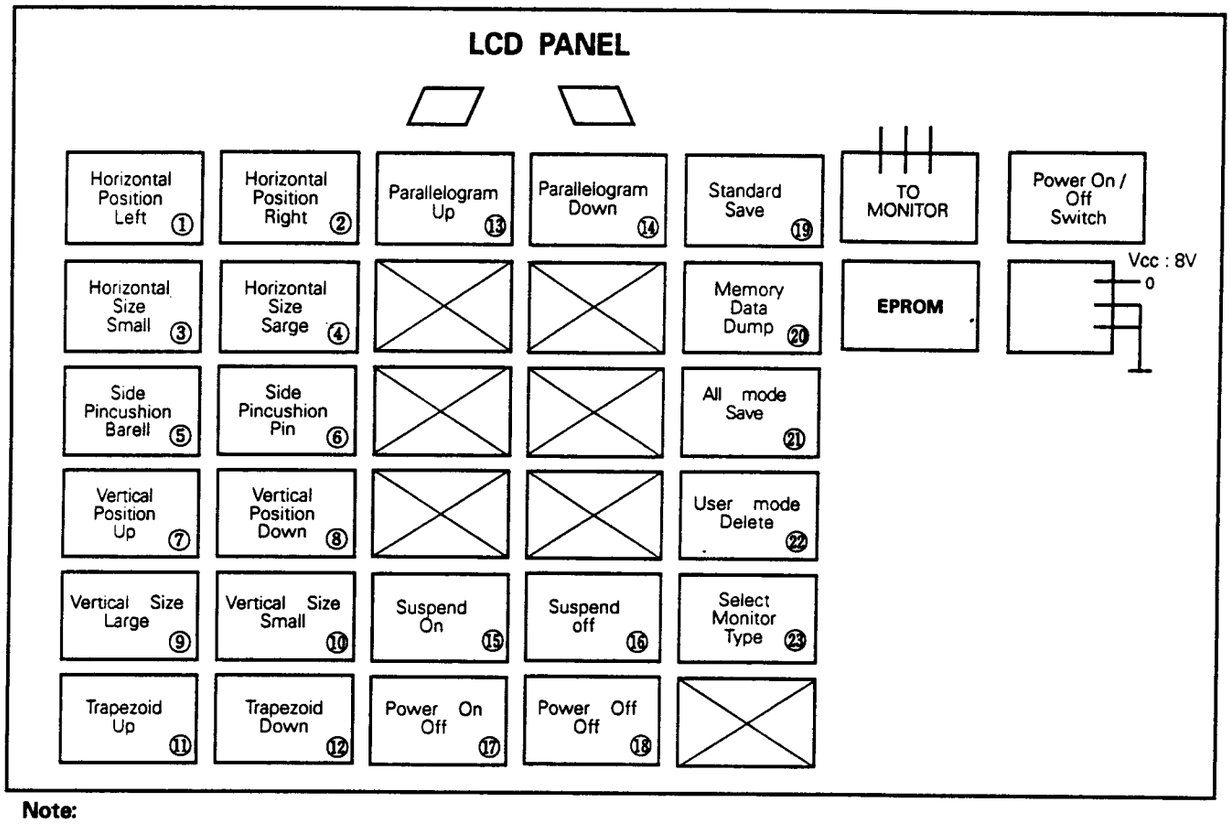
Push Trapezoidal Up button (#⑪ button) or Trapezoidal Down button (#⑫ button) so that the image or pattern becomes to rectangular.

11) To save the picture data to a monitor

- Alignment procedure with micom control jig:

To save the picture data of a mode, push Standard Save button. (#⑲ button on the Micom control)

The Block Diagram of the Micom control Jig (Alignment Procedure with micom control jig)



Note:

1) Standard save button (#⑲ button)
   - To save the picture data of a mode individually.
2) All mode save button (#㉑ button)
   - To save the picture data of all mode (13 modes) referring standard mode (1024x768/72Hz).
3) Memory dump button (#⑳ button)
   - To call the standard picture data from EPROM on the Micom Control Jig.
4) User delete button (#㉒ button)
   - To delete the data in the user mode. (Saved by a user)
5) Select monitor type button (#㉓ button)
   - To select the picture data which be dumped from EPROM on the Micom Control Jig by a CRT. Keep pressing for 2 seconds.
6) Suspend mode test button (#⑮, #⑯ buttons)
   - To test the suspend function among the power management function.
   - Push suspend on button (#⑮ button), then the monitor becomes to suspend mode.
   And push suspend off button (#⑯ button), then the monitor returns to normal operation status.
7) Power-Off mode test button (#⑰, #⑱ buttons)
   - To test the Power-Off function among the power management function.
   - Push Power-Off On button (#⑰ button), then the monitor becomes to Power-Off mode, and push Power-Off Off button (#⑱ button), then the monitor returns to normal operation status.

4. Adjustment of Video PWB

Note: Before performing this adjustment procedure, check that the video signals are as follows.

Video : Analog 0.714 Vp-p (at 75Ω Terminated).
SYNC : Synchronizing : Separate TTL level.
Unless otherwise specified,
use signal VGA (48 kHz) for the adjustments.

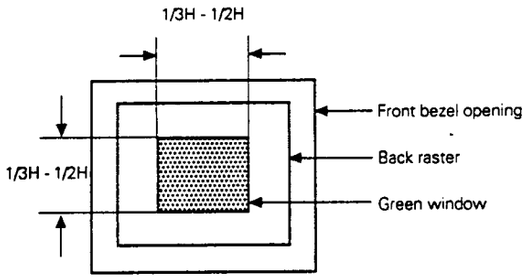
4-1. Adjustment of video amplitude and white balance of back raster

Locate VR101(R-Gain), VR121(G-Gain), VR141(B-Gain) controls on the main PWB to mechanically center position. Locate VR102(R-Bias), VR122(G-Bias), VR142(B-Bias) controls on the video PWB to mechanically center position.

4-2. Video Contrast Adjustment

Adjust of gain control (48kHz)
(White window pattern)

1) Display the green window pattern(within a range for which the ABL circuit does not active even though maximum contrast is set) preferably with a video range of 1/3 to 1/2H and 1/3 to 1/2V.



2) Turn the contrast and the brightness controls fully clockwise.

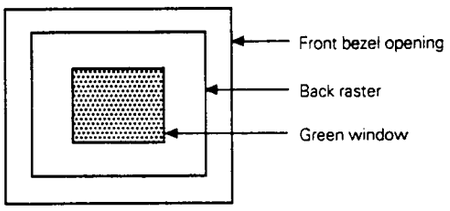
3) Adjust the screen VR of FBT so that the brightness of back raster is to be 0.5 to 1.5 Ft/L. (Typically 1.0 Ft/L)

4) Adjust the VR102(R-Bias), VR142(B-Bias) so that the back raster color is white.

5) Adjust the G-Gain control (VR121) so that the brightness of the green window is to be 38 ±1 Ft/L.

4-3. Adjustment of White Balance of Video

1) Display a full white pattern.



2) Turn the contrast and the brightness controls fully clockwised.

3) Adjust the contrast control so that the brightness of video is to be about 20 Ft/L.

4) Adjust the R-Gain control (VR101) and B-Grain control (VR141) so that the video is to be white.
(X = 0.283 ±0.02, Y = 0.298 ±0.02)

4-4. Fine Adjustment of White Balance

(X=0.283 ±0.02, Y=0.298 ±0.02)
Attention: do not touch VR121(G-Gain)

1) Display the full white pattern.

2) Turn the contrast control so that the brightness of video is to be about 5 Ft/L.

3) And check whether the white coordinate of video meets the above coordinate spec or not.

4) For the contrast control so that the brightness of video is about 20 Ft/L.

5) Check whether the white coordinate of video satisfy above spec or not.

6) If the white balance is off for the above spec, re-adjustment must be done. (Following procedure again)

5. Focus Adjustment

1) Display the character pattern so that adjust the focus can be done. (the highest resolution is recommended)

2) Turn the contrast and the brightness controls fully clockwised.

3) Adjust the focus control of FBT so that the focus is to be the best condition.

6. Purity Adjustment

1) Be sure that the display is not exposed to any external magnetic fields.

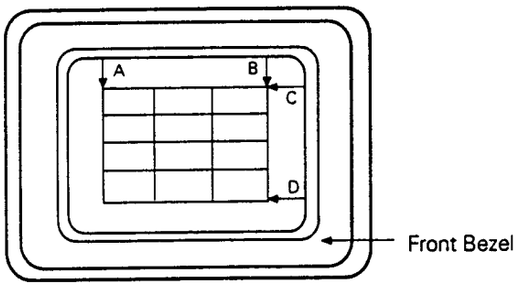
2) Ensure that the spacing between the purity convergence magnet (PCM) assembly and the CRT stem is 29mm ± 1mm

3) Produce a complete, red pattern on display. Adjust the purity magnet rings on the PCM assembly to obtain a complete field of the color red. This is done by moving the two tabs in such a manner that they advance is an opposite direction but at the same time to obtain the same angle between the two tags, which should be approximately 180°.

4) Check the complete blue and complete green patterns to observe their respective color purity. Make minor adjustment is needed.

7. CRT Tilt Adjustment

Reassembly the CRT with fastening screws so that the dimension A, B and C, D are separately equal.



8. Static(Center) Convergence

Switch the monitor on and warm up for 15 minutes. Operate the computer in such a way that the cross hatch pattern is displayed on screen. Convergence error should not be over than following table.

Position	Error In (mm)	CRT Dot pitch
Center	0.3	0.28
Corner	0.4	0.28

Proceed as follows:

1) Locate the pair of four pole magnet rings.

2) Rotate the individual rings (change spacing between tabs) to converge the vertical red and blue lines.

3) Rotate the pair of rings (maintaining spacing between tabs) to converge the horizontal red and blue lines.

4) After completing the red and blue center convergence, locate the pair of six pole magnet ring.

5) Rotate the individual rings (change spacing between tabs) to converge the vertical red and blue (magneta) and green lines.

6) Rotate the pair of rings (maintaining spacing between tabs) to converge the horizontal red and blue (magenta) and green lines.

7) Magnet position is 4pole / 6pole / 2pole (from the front of CRT).

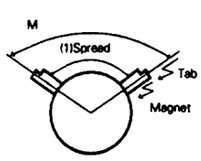
8) Don't rotate the 2pole magnet because it's object is to adjust the purity.

9. Dynamic Convergence

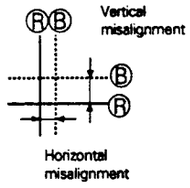
Dynamic convergence (convergence of the three color fields at the edge of the CRT screen) is accomplished by the proper insertion and positioning of the three wedges between the edge of deflection yoke and the funnel of the CRT.

9-1. Alignment of (R) and (B) with the 4pole magnet

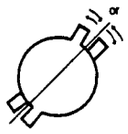
Movable in spread condition



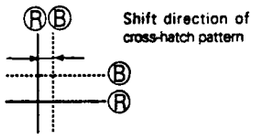
O-MAGNETIC FIELD



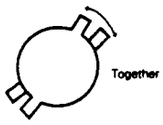
Vertical direction



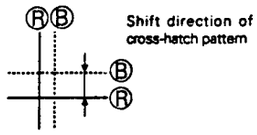
MOTION (1)



Horizontal direction

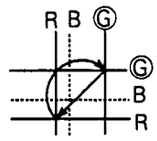


MOTION (2)

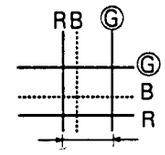


9-2. Alignment of (R) and (B) with (G) (6 pole magnet)

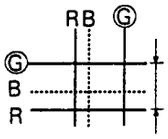
O-MAGNETIC FIELD



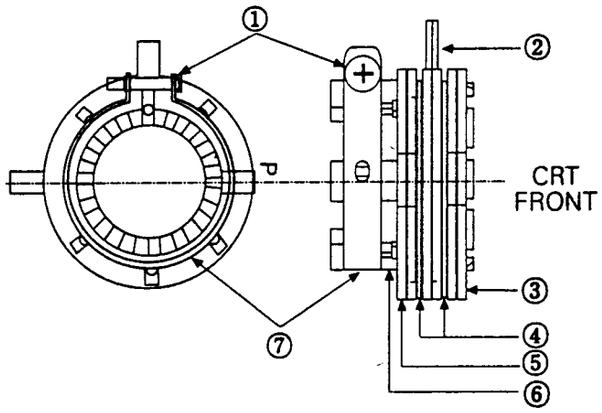
MOTION (1)



MOTION (2)



※ Convergence Purity Magnet

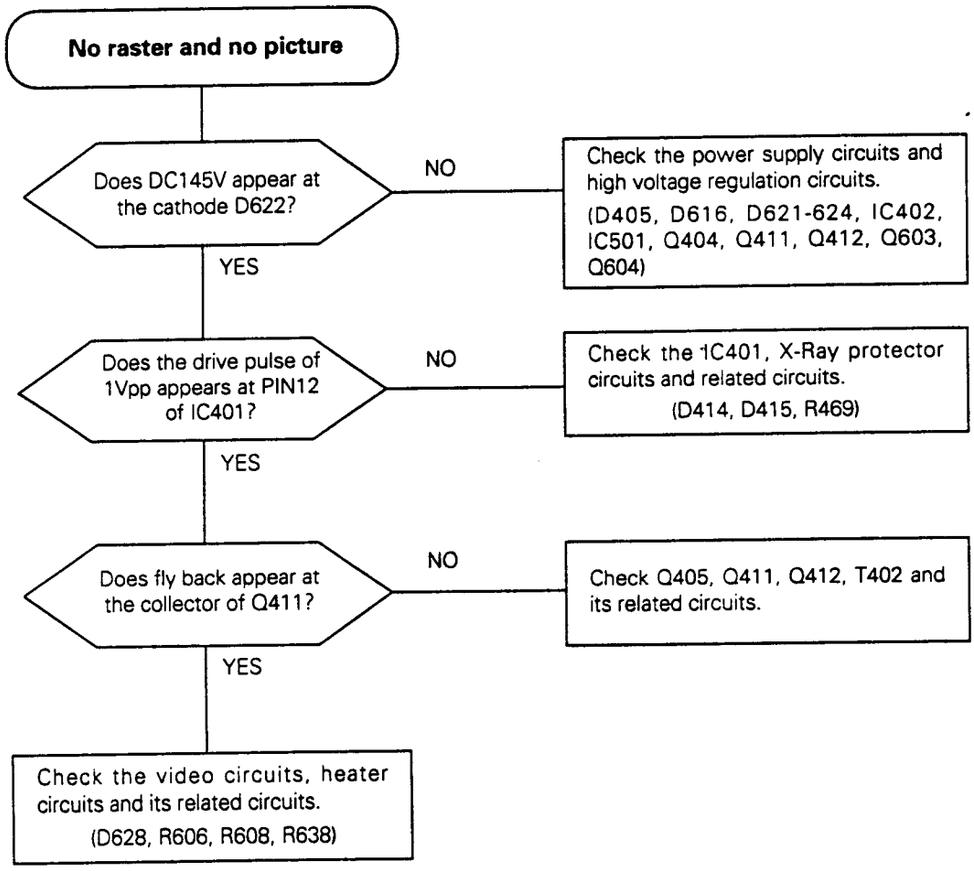


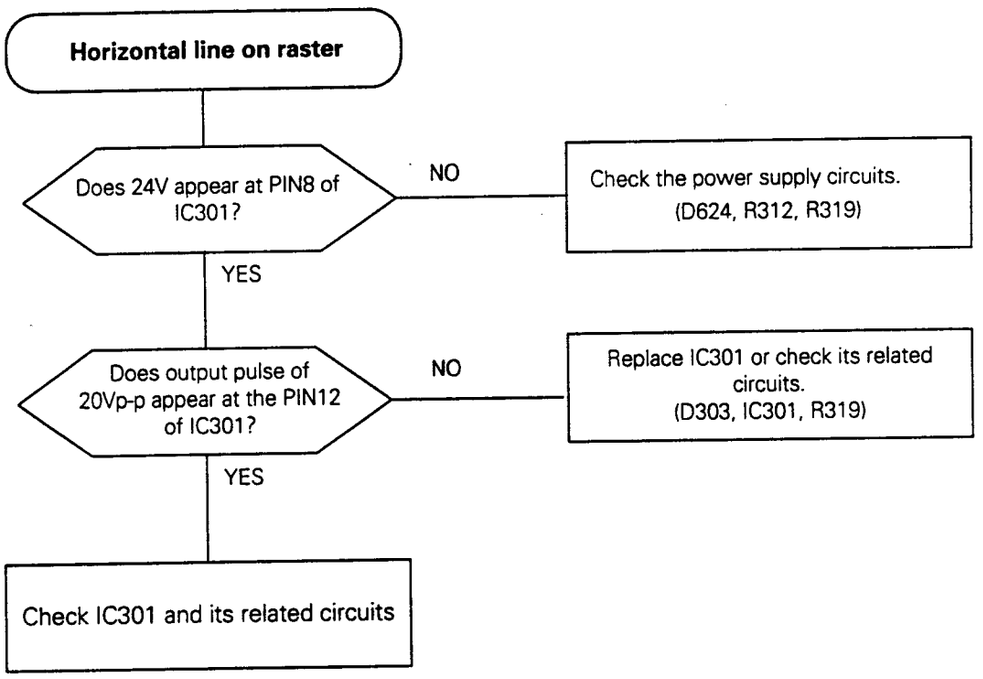
① Setup Bolt ② 4 pole Magnet ③ Purity Magnet (2 pole Magnet)
④ Spacers ⑤ 6 pole Magnet ⑥ Holder ⑦ Band

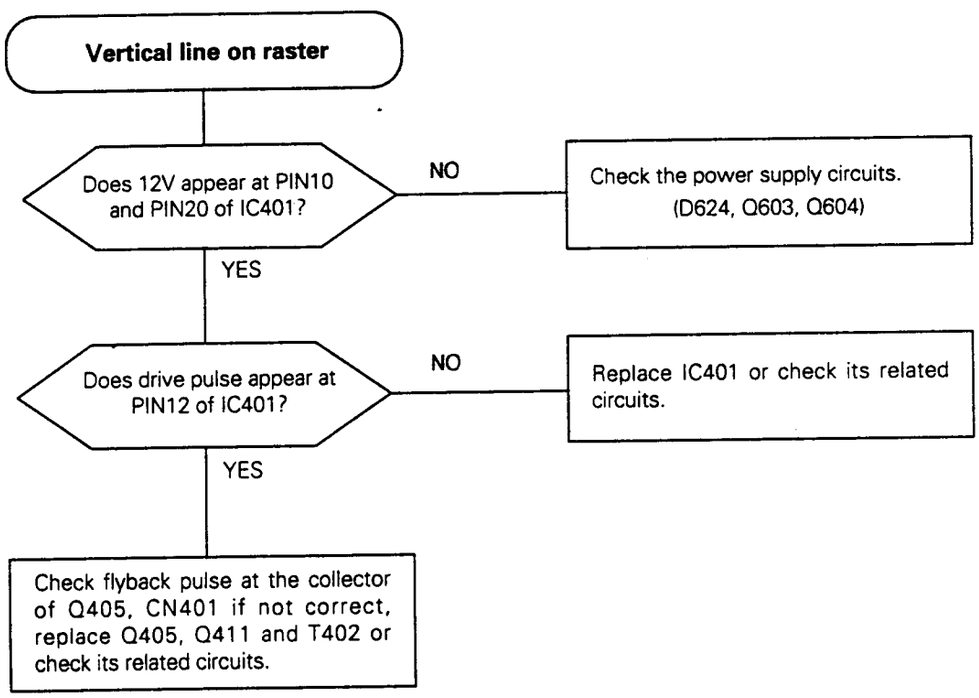
TROUBLESHOOTING GUIDE

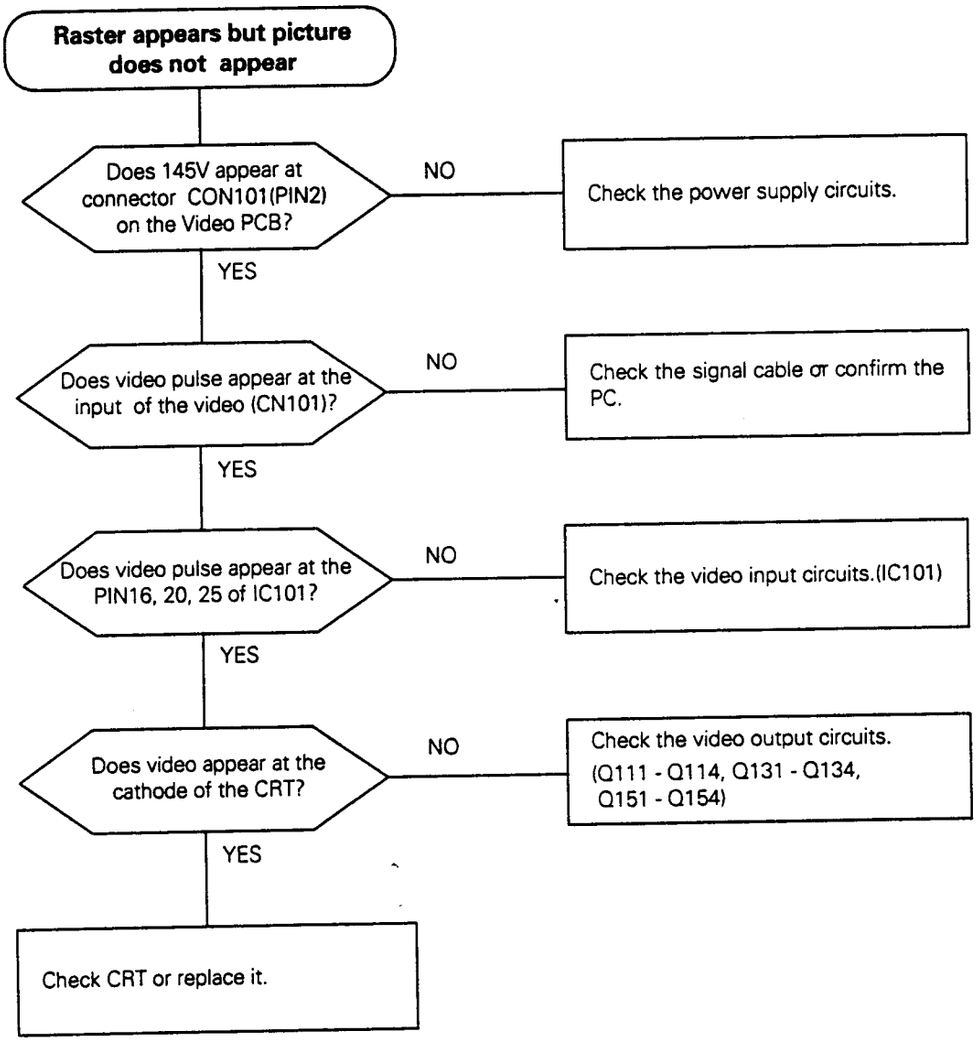
Note :

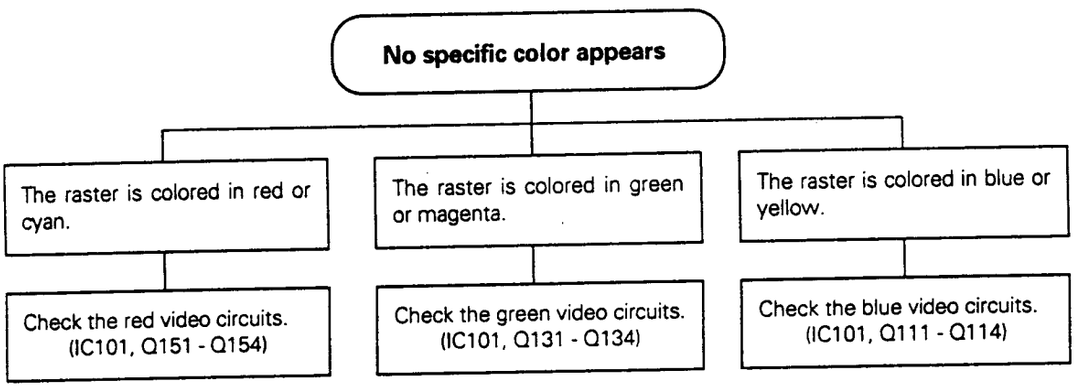
1. If picture does not appear, fully rotate the brightness and contrast control clockwise before inspection.
2. Circuit to be checked
   - ① No raster appears : Power circuits, Horizontal output circuits
   - ② A high voltage develops but no raster appears : Video output circuits
   - ③ A high voltage is not developed : Horizontal output circuits.

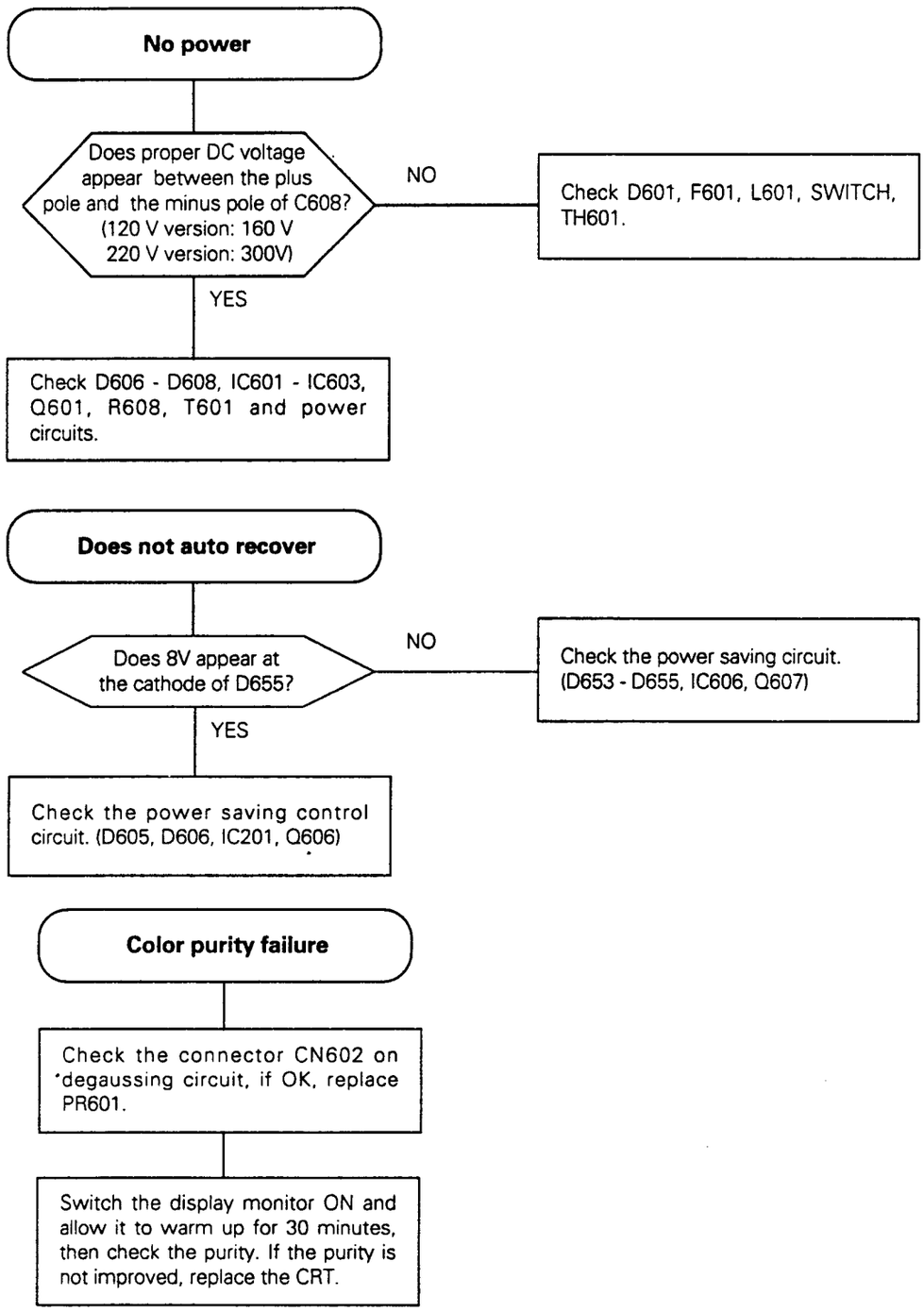



Horizontal line on raster
Does 24V appear at PIN8 of IC301?
NO
Check the power supply circuits. (D624, R312, R319)
YES
Does output pulse of 20Vp-p appear at the PIN12 of IC301?
NO
Replace IC301 or check its related circuits. (D303, IC301, R319)
YES
Check IC301 and its related circuits

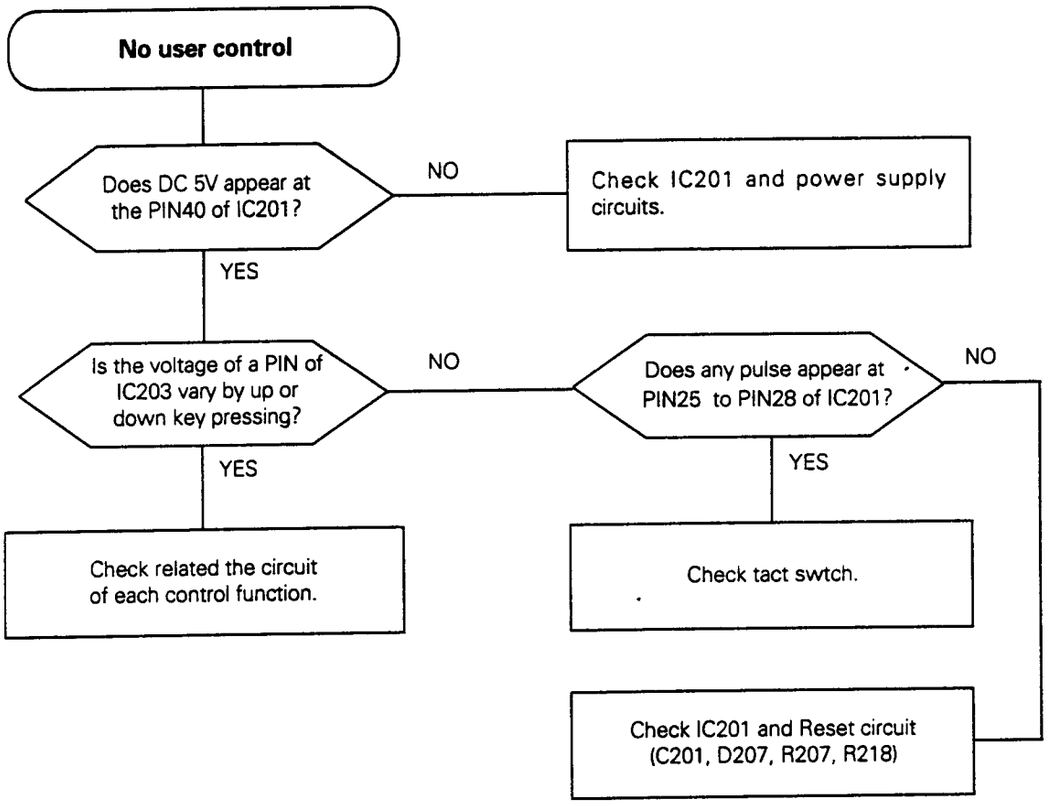

Vertical line on raster
Does 12V appear at PIN10 and PIN20 of IC401?
NO
Check the power supply circuits. (D624, Q603, Q604)
YES
Does drive pulse appear at PIN12 of IC401?
NO
Replace IC401 or check its related circuits.
YES
Check flyback pulse at the collector of Q405, CN401 if not correct, replace Q405, Q411 and T402 or check its related circuits.


Raster appears but picture does not appear
Does 145V appear at connector CON101(PIN2) on the Video PCB?
NO
Check the power supply circuits.
YES
Does video pulse appear at the input of the video (CN101)?
NO
Check the signal cable or confirm the PC.
YES
Does video pulse appear at the PIN16, 20, 25 of IC101?
NO
Check the video input circuits.(IC101)
YES
Does video appear at the cathode of the CRT?
NO
Check the video output circuits.
(Q111 - Q114, Q131 - Q134, Q151 - Q154)
YES
Check CRT or replace it.


No specific color appears
The raster is colored in red or cyan.
The raster is colored in green or magenta.
The raster is colored in blue or yellow.
Check the red video circuits. (IC101, Q151 - Q154)
Check the green video circuits. (IC101, Q131 - Q134)
Check the blue video circuits. (IC101, Q111 - Q114)

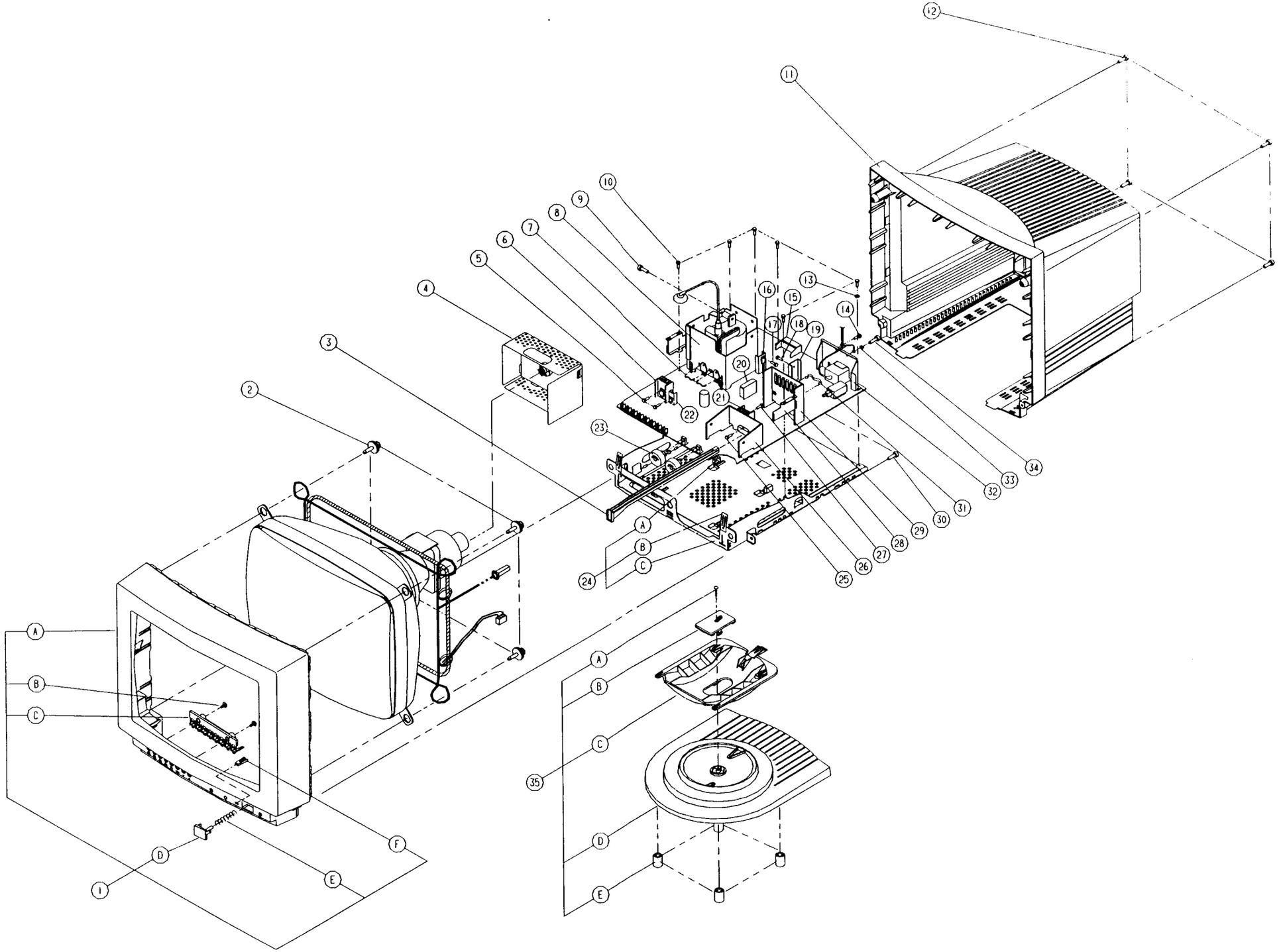


Note: If color purity is not normal, manual degaussing should be done by mandatory methode using the manual degaussing coil before inspection.



Note: If Save function does not operate, check IC203 (EEPROM)
Measure the voltage of IC203 when you push Up button or Down button.

Function	Pin No.	Control Range (Voltage at a PIN)	Remark
Horizontal Position	12	(X-3)V - (X+3)V	The "X" means the value which has been setted in the factory preset mode. (Refer to Page 5-1, 5-2)
Vertical Position	15	0V - 12V	
Horizontal Size	13	0V - (X+3)V	
Vertical Size	4	(X-3)V - (X+3)V	
Side Pincushion	14	(X-3)V - (X+3)V	
Parallelogram	6	(X-3)V - (X+3)V	
Trapezoid	5	(X-3)V - (X+3)V	

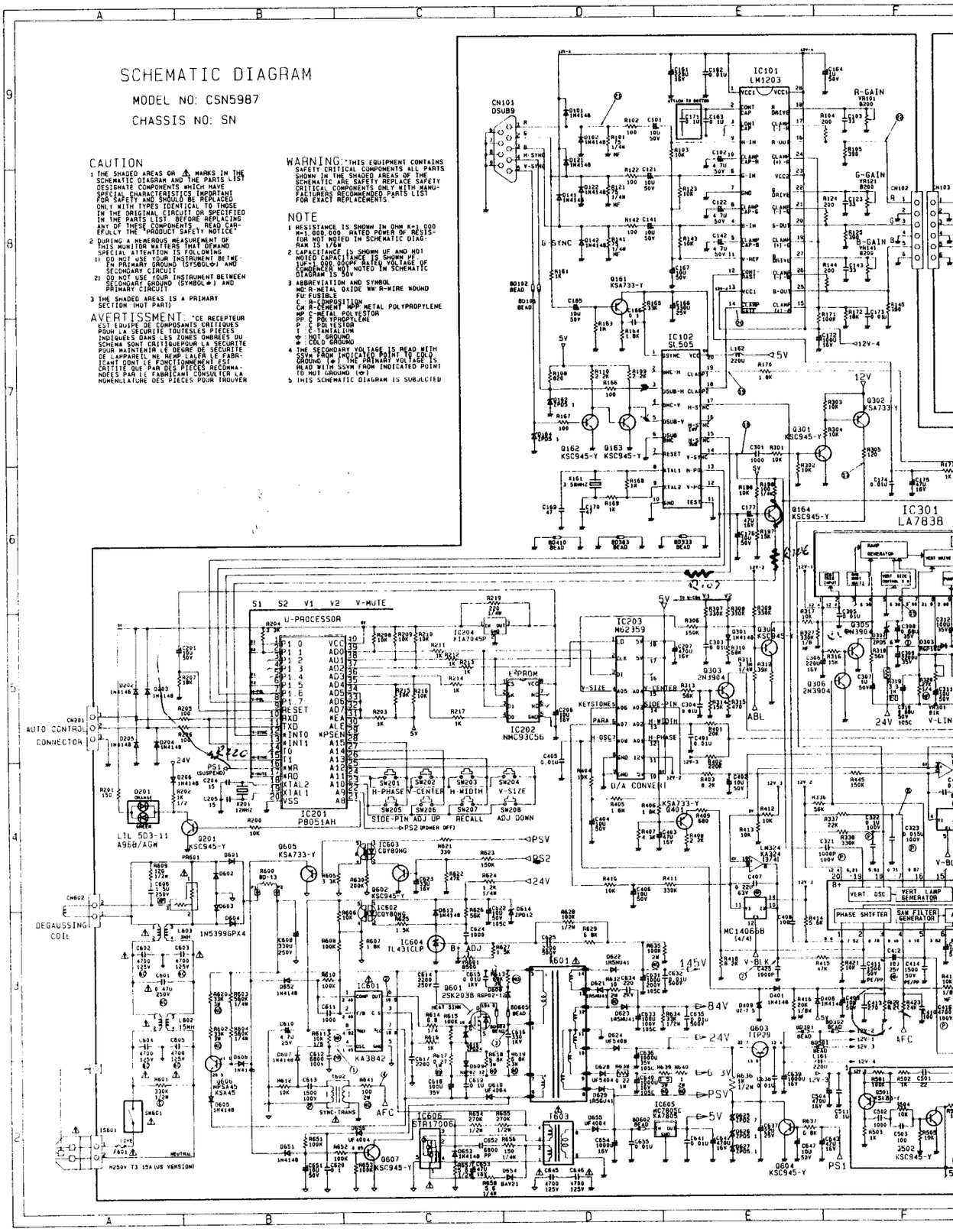

12
11
10
9
8
7
6
5
4
3
2
16
15
13
14
17
18
19
20
21
22
23
A
B
C
24
25
26
27
28
29
30
31
32
33
34
A
B
C
D
E
F
I
A
B
C
35
D
E

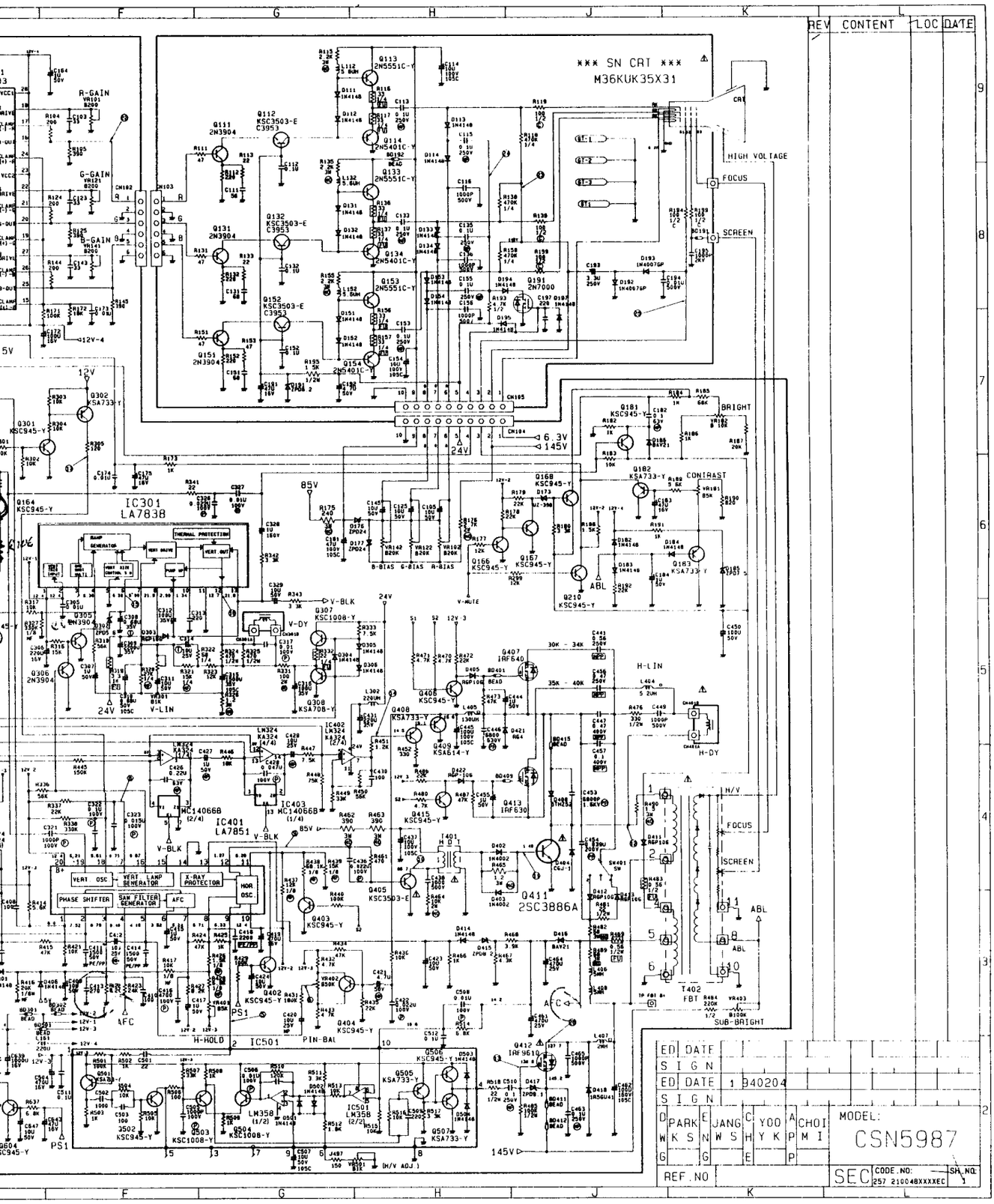
EXPLODED VIEW AND PARTS LIST

NO	DESCRIPTION	CODE NO.	SPECIFICATION	Q'TY	REMARK
1	COVER/FRONT ASSY	811 468017AF	CSN5987	1	
A	COVER FRONT	821 460342AF	ABS V0 VH-0800S #C7262	1	
B	SCREW TAPTITE	847 502005AB	B,BH,+,M4,L12,ZPC3,SWCH	2	
C	KNOB FUNCTION	821 469097AA	ABS V0 VH-0800S #C7262	1	
D	KNOB POWER	821 469098AA	ABS V0 VH-0800S #C7262	1	
E	SPRING COIL	831 522033AJ	SUS-304 WPA	1	
F	LENS LED	821 468251AA	ACRYL CLEAR	1	
2	TAPPING, CRT	842 840022BA	BH,+,1,M5,L30,ZPC3,2/2,W/W	4	
3	SHAFT POWER	821 468238AA	PBT G30% V0 NTR	1	
4	SHIELD-CRT, PCB	813 464199AA	SPTE T0.2	1	
5	SCREW TAPTITE	847 501007EG	B,BH,+,M3,L8,ZPC3,SWCH	2	
6	H/SINK-TR	831 511012AC	A6063 EXTR H35	1	
7	SPRING-TR	813 468062AC	SUS-304 1/2H 0.17/T0.5	2	
8	H/SINK-FBT	831 514509AA	A1050S H14 T1.0	1	
9	SCREW-TAPTITE	847 501007FC	B,BH,+,M4,L16,ZPC3,SWCH	1	
10	SCREW-TAPTITE	847 502005AA	B,BH,+,M3,L10,ZPC3,W/W	6	
11	COVER-REAR	821 460334AA	ABS V0 VH-0800S #C7262	1	
12	SCREW-TAPTITE	847 501007FC	B,BH,+,M4,L16,ZPC3,SWCH	4	
13	SPRING-WASHER	855 124001BB	M4,ID4.1,OD7.6,T1,ZPC3	1	
14	SCREW-TAPTITE	847 502005AA	B,BH,+,M3,L10,ZPC3,W/W	1	
15	SHIELD D-SUB	813 464193AA	SPTE T0.5	1	
16	H/SINK-TR	831 513021AA	SPC-1 T1.0	1	
17	SCREW-TAPTITE	847 501007EG	B,BH,+,M3,L8,ZPC3,SWCH	1	
18	H/SINK-TR	831 513023AC	SPC-1 T1.0	1	
19	SCREW-TAPTITE	847 502005AA	B,BH,+,M3,L10,ZPC3,W/W	1	
20	SHIELD-H, IC	813 464202AA	SPTE T0.5	1	
21	H/SINK-TR	831 513012AC	A6063 EXTR H35	1	
22	H/SINK-TR	831 513021AA	SPC-1 T1.0	1	
23	KNOB-CONTROL	831 171037BC	ABS V0 VH-0800D #C7262	2	
24	CHASSIS-ASSY	811 466021AA	CSQ4387	1	
A	RUBBER SUPPORT	821 468248AA	NEOPRENE V0 GRAY	2	
B	EARTH-PLATE	815 462021AA	PBS 3/4H T0.2	2	

EXPLODED VIEW AND PARTS LIST

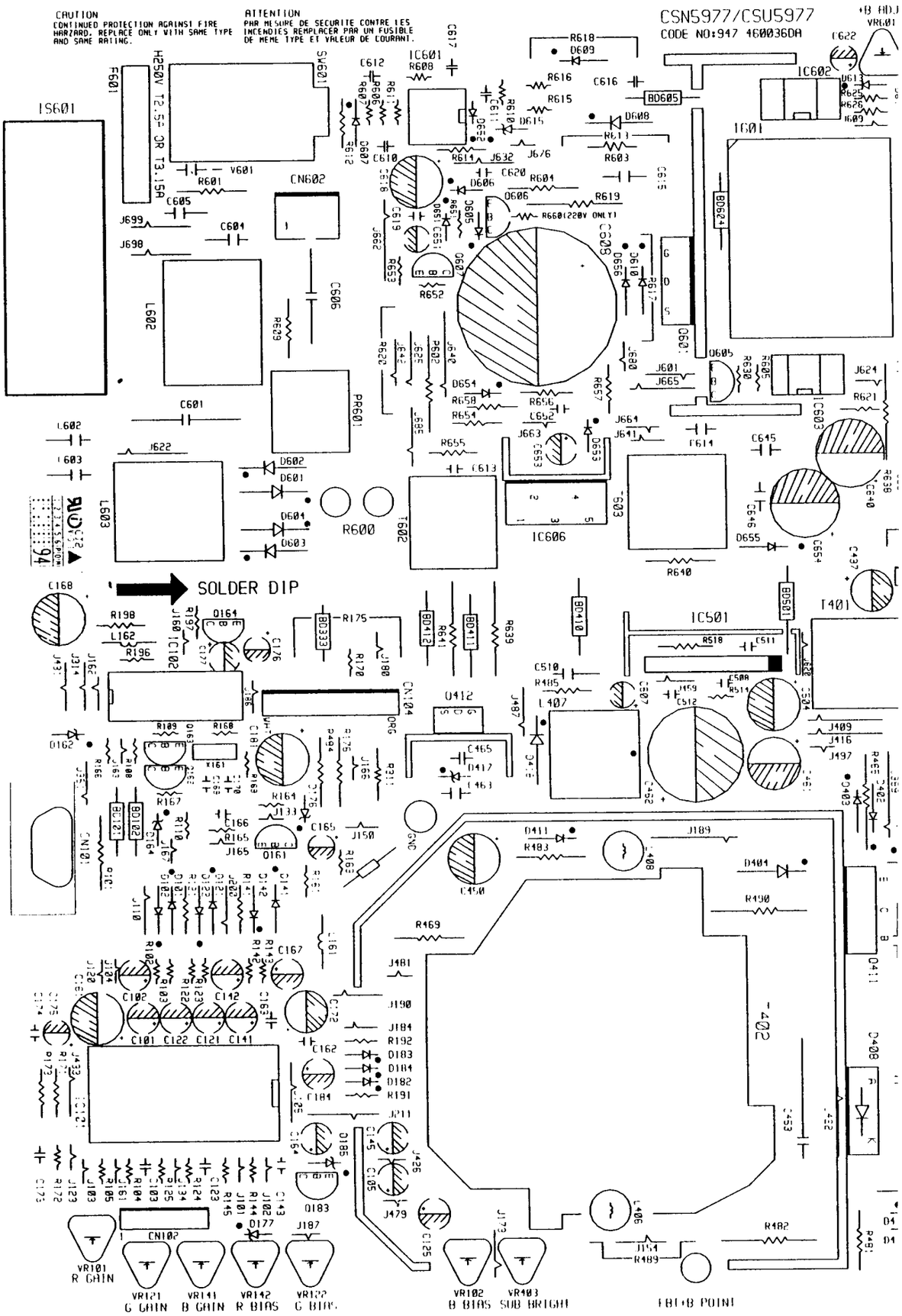
NO	DESCRIPTION	CODE NO.	SPECIFICATION	Q'TY	REMARK
C	CHASSIS BOTTOM	813 466084AA	SECC-1 T1.0	1	
25	SCREW TAPTITE	847 501007EG	B,BH,+,M3,L8,ZPC3,SWCH	1	
26	H/SINK-V,IC	831 513523CA	A1050S H14 T2.0	1	
27	SCREW-TAPTITE	847 501007EG	B,BH,+,M3,L8,ZPC3,SWCH	1	
28	BRACKET-PCB	813 460278AA	SECC-1 T0.8	2	
29	H/SINK-POWER	831 513523DA	A1050S H14 T1.6	1	
30	SCREW-TAPTITE	847 501007FC	B,BH,+,M4,L16,ZPC3,SWCH	2	
31	SPRING-TR	813 468062AC	SUS-304 1/2H 0.17/T0.5	1	
32	BRACKET-POWER	813 460277AB	SECC-1 T0.8	1	
33	SPRING-WASHER	855 124001BB	M4,ID4.1,OD7.6,T1,ZPC3	1	
34	SCREW-TAPTITE	847 501007FA	S,BH,+,M4,L10,ZPC3,SWCH	1	
35	STAND-ASSY	811 460043AC	CSN5987	1	
A	SCREW-TAPTITE	847 502005AC	B,BH,+,M3,L16,ZPC3,W/W	1	
B	STAND-STOPPER	821 463085AB	STAROY VB-1108R G8117	1	
C	STAND-TOP	821 463092AD	ABS V0 VH0800S C7262	1	
D	STAND-BASE	821 463091AA	ABS V0 VH0800S C7262	1	
E	RUBBER-FOOT	831 313024AB	NEPORENE V1 BGE	4	

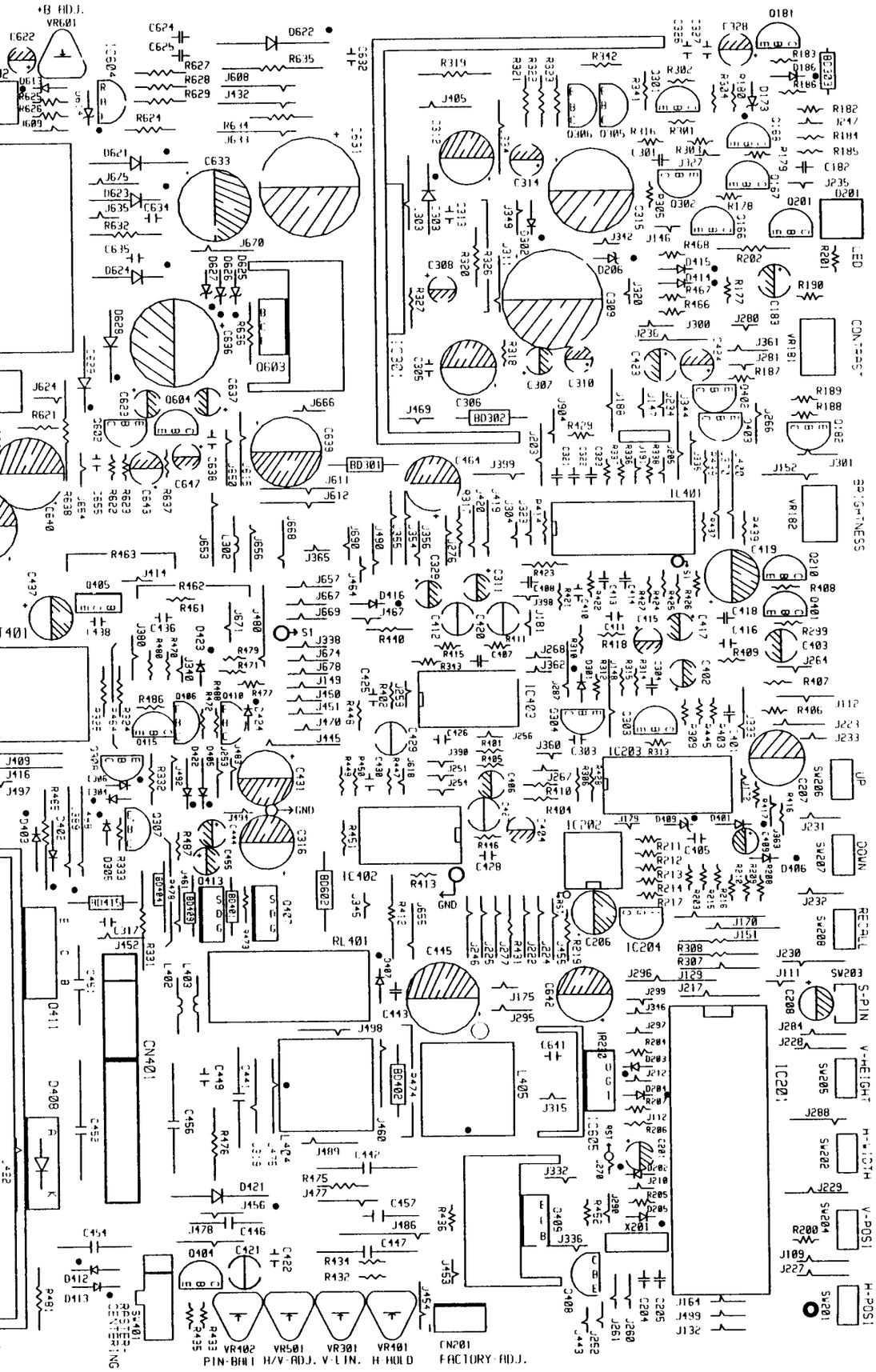

SCHEMATIC DIAGRAM
MODEL NO: CSN5987
CHASSIS NO: SN
CAUTION
WARNING:
NOTE
AVERTISSMENT:
IC101 LM1203
IC102 SL505
IC201 P8051AH
IC202 NMC93C56
IC203 M62359
IC204 KIA7045P
IC301 LA7838
IC601 KA3842
IC602 CQY80NG
IC603
IC604 TL431CLP
IC605 KA7805
IC606 STR17006
MC14066B (4/4)
R-GAIN
G-GAIN
B-GAIN
G-SYNC
H-PHASE
V-CENTER
H-WIDTH
V-SIZE
SIDE-PIN
RECALL
ADJ UP
ADJ DOWN
AUTO CONTROL CONNECTOR
DEGAUSSING COIL
V-PROCESSOR
EEPROM
KEYSTONE
PARA
V-BLK
VERT. OSC
PHASE SHIFTER
SAW FILTER GENERATOR
VERT. LAMP GENERATOR
AFC
SYNC-TRANS
B+ ADJ


*** SN CRT ***
M36KUK35X31
IC301
LA7838
IC401
LA7851
IC403
MC14066B
IC501
LM358
Q411
2SC3886A
T401
H.OUT
T402
FBT
CRT
HIGH VOLTAGE
FOCUS
SCREEN
BRIGHT
CONTRAST
ABL
H-LIN
H-DY
V-DY
V-BLK
V-LIN
H/V
SUB-BRIGHT
H-HOLD
PIN-BAL
V-MUTE
R-GAIN
G-GAIN
B-GAIN
B-BIAS
G-BIAS
A-BIAS
6.3V
145V
85V
24V
12V
VERT OSC
VERT LAMP GENERATOR
X-RAY PROTECTOR
HOR OSC
PHASE SHIFTER
SAW FILTER GENERATOR
AFC
THERMAL PROTECTION
REV
CONTENT
LOC
DATE
MODEL:
CSN5987
CODE.NO:
257 21004BXXXXEC
SH.NO:
1
REF.NO
SEC

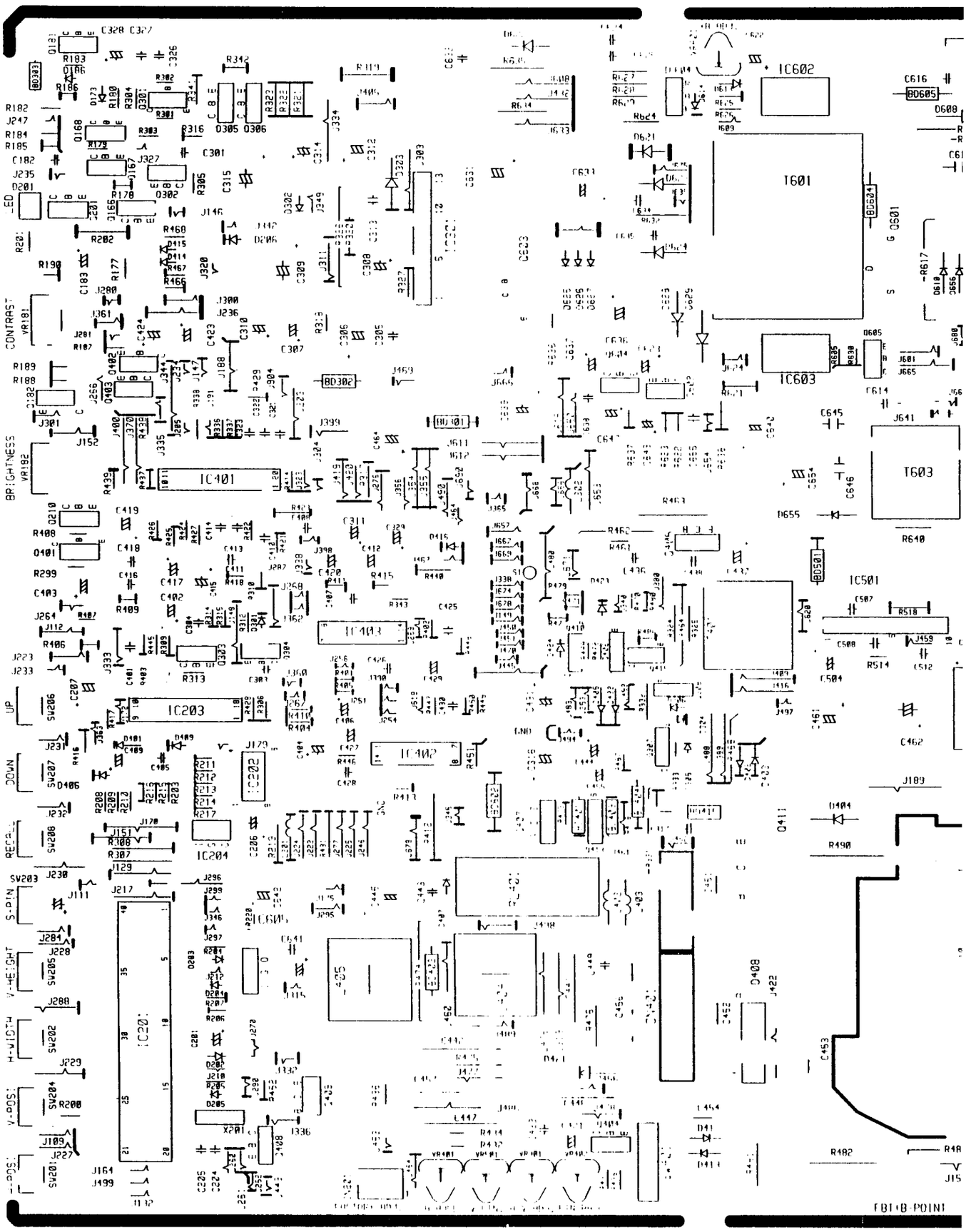
12-2

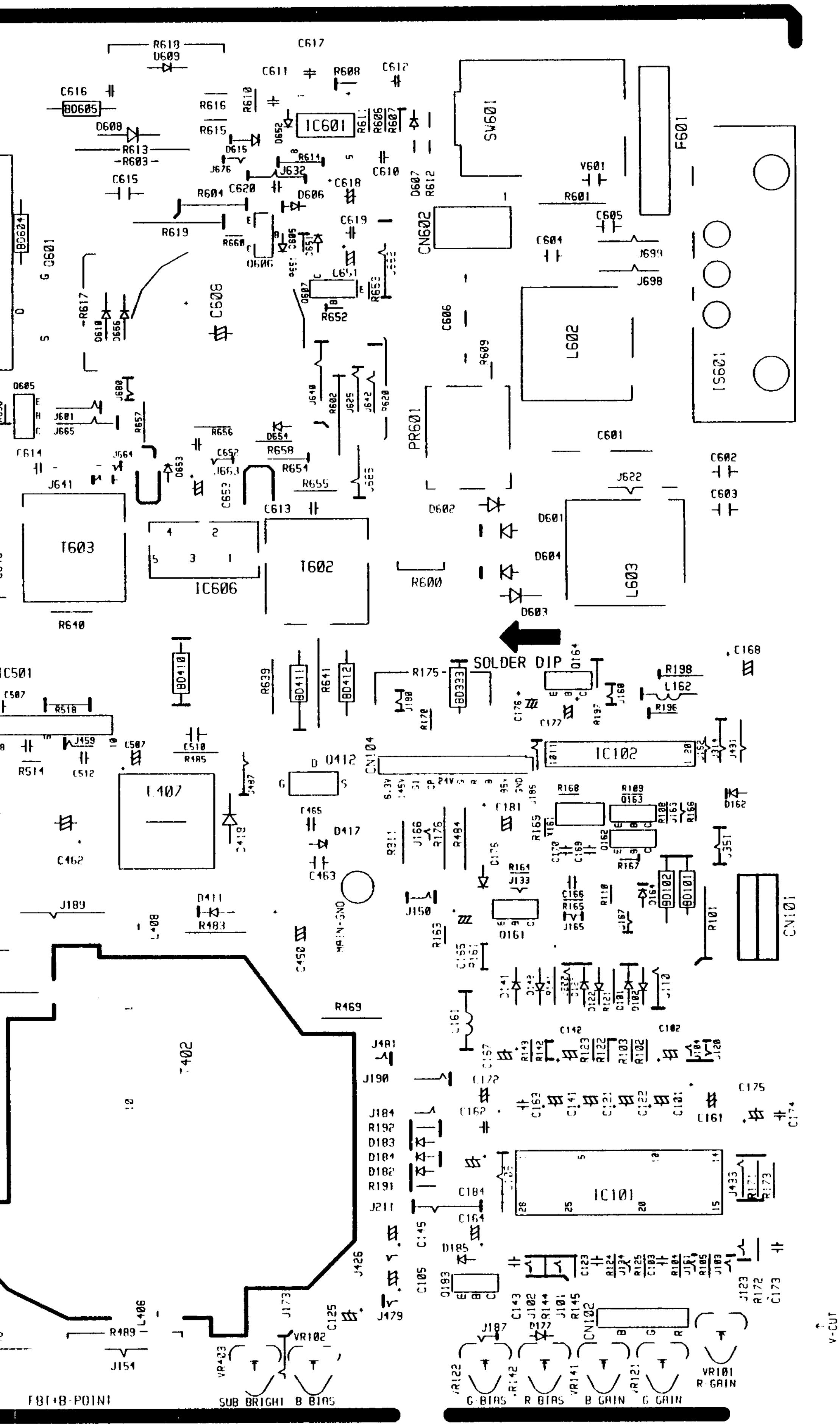
MAIN PCB (TOP VIEW)



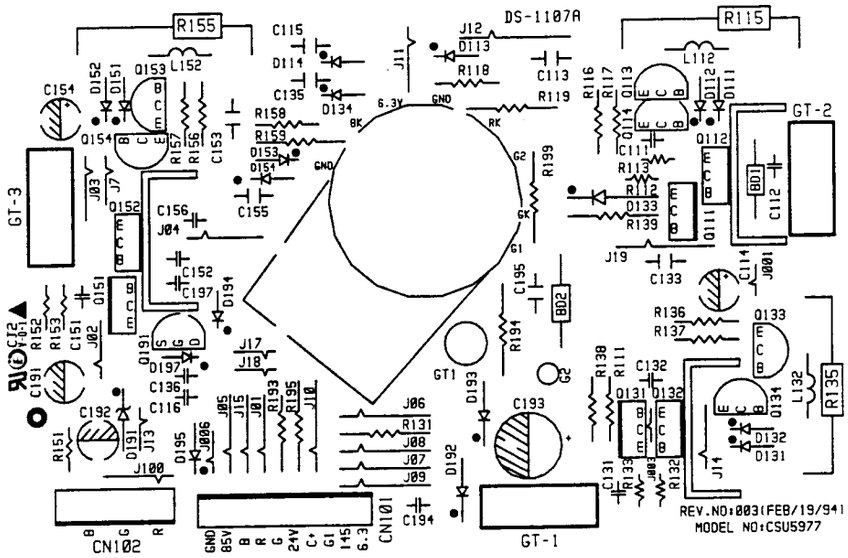

+B ADJ.
VR601
CONTRAST
BRIGHTNESS
UP
DOWN
RESET
S-PIN
V-HEIGHT
H-WIDTH
V-POSI
H-POSI
GND
PIN-BAL
H/V-ADJ.
V-LIN.
H-HOLD
FACTORY-ADJ.

MAIN PCB (BOTTOM VIEW)

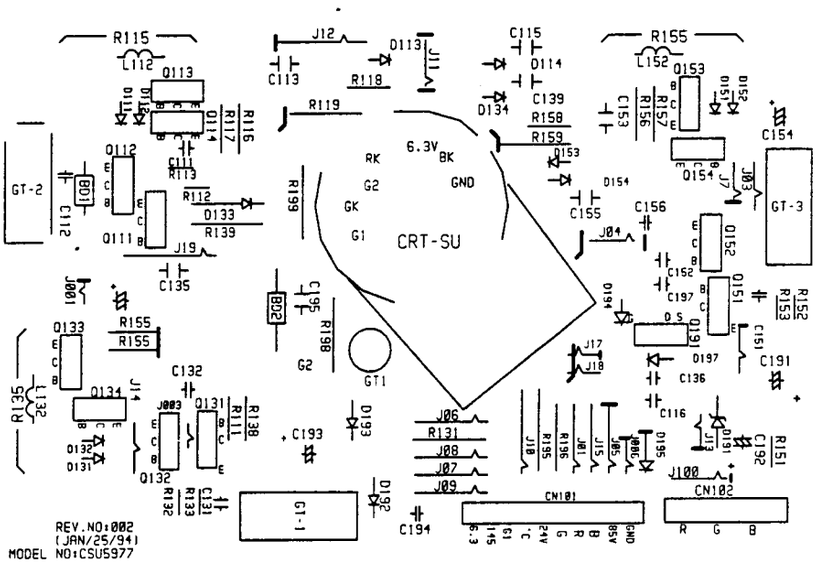



R618
D609
C617
C611
R608
C612
C616
BD605
R616
R610
IC601
R611
R606
R607
SW601
F601
D608
R615
D652
R613
D615
R603
R614
C610
C615
J676
J632
C618
D607
R612
V601
R604
C620
D606
R601
R619
R660
C619
CN602
C605
BD604
Q601
C604
J699
R617
C606
L651
R653
J698
D618
D656
R652
C686
L602
IS601
R609
D605
J680
J681
J665
R657
R656
D654
J640
R602
J625
J642
R628
PR601
C601
C614
J664
C652
R658
J663
R654
C602
D653
C653
R655
J683
J622
C603
J641
C613
D602
D601
T603
IC606
T602
D604
R600
L603
R640
D603
SOLDER DIP
C168
IC501
BD410
R639
BD411
R641
BD412
R175
BD333
Q164
R198
L162
C507
R518
J198
R170
C176
C177
R197
J160
R196
J459
C510
R514
C512
R185
D412
CN104
IC102
J431
L407
J497
C465
C181
R168
R189
Q163
D162
D417
D419
C462
R311
J166
R176
R494
R169
Q162
J351
C463
R167
R161
J133
BD102
BD101
CN101
J189
D411
J150
C166
R165
J165
R110
D164
R101
R403
J167
R163
Q161
C452
MAIN-GND
C155
T402
R469
J481
J190
C142
C102
C172
C175
J184
R192
D183
D184
D182
R191
C162
C161
C174
IC101
J433
R171
R173
J211
C184
C164
D185
J426
C145
C105
Q183
J173
J479
C125
C143
J102
R144
D177
J187
R145
CN102
J123
R172
C173
L406
R489
J154
VR102
VR423
VR122
VR142
VR141
VR121
VR101
R GAIN
FBT-B-POINT
SUB BRIGHT
B BIAS
G BIAS
R BIAS
B GAIN
G GAIN
V-CUT

CRT SOCKET PCB (TOP VIEW)



CRT SOCKET PCB (BOTTOM VIEW)



ELECTRICAL PARTS LIST

IMPORTANT SAFETY NOTICE

Component identified by the symbol ⚠ have special characteristic important to safety. When replacing any of these components, use only manufacturer's specified parts.

NOTE

- Tolerance : F; ±1%, J; ±5%, K; ±10%, M; ±20%, P; +100~0%, Z;+80~-20%
- Rated Voltage
  0J: 6.3V, 1A:10V, 1C:16V, 1D:20V, 1E:25V, 1F:35V, 1G:40V, 1H:50V, 1J:63V, 1K:75V, 2A:100V, 2B:125V, 2C:160V, 2D:200V, 2E:250V, 2V:350V, 2G:400V, 2W:450V, 2H:500V, 2J:630V, 3A:1KV, 3C:1.6KV, 3D:2KV.

LOC. NO	DESCRIPTION	CODE NO	REMARK
MAIN PCB PARTS			
	CAPACITORS		
C101	CAP-AL.ELEC,106M,1H	917 122100HM	
C102	CAP-AL.ELEC,475M,1H	917 121470HM	
C103	CAP-CERAMIC,330J,1H,NPO	915 312330HJXH	
C105	CAP-AL.ELEC,106M,1H	917 122100HM	
C121	CAP-AL.ELEC,106M,1H	917 122100HM	
C122	CAP-AL.ELEC,475M,1H	917 121470HM	
C123	CAP-CERAMIC,330J,1H,NPO	915 312330HJXH	
C125	CAP-AL.ELEC,106M,1H	917 122100HM	
C141	CAP-AL.ELEC,106M,1H	917 122100HM	
C142	CAP-AL.ELEC,475M,1H	917 121470HM	
C143	CAP-CERAMIC,330J,1H,NPO	915 312330HJXH	
C145	CAP-AL.ELEC,106M,1H	917 122100HM	
C161	CAP-AL.ELEC,227M,1C	917 123220CM	
C162	CAP-CERAMIC,103Z,1H,Y5V	915 325100HZVH	
C163	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C164	CAP-AL.ELEC,105M,1H	917 121100HM	
C165	CAP-AL.ELEC,106M,1H	917 122100HM	
C166	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C167	CAP-AL.ELEC,106M,1H	917 122100HM	
C168	CAP-AL.ELEC,337M,1E	917 123330EM	
C169	CAP-CERAMIC,47J,1H,SL	915 312470HJHH	
C170	CAP-CERAMIC,47J,1H,SL	915 312470HJHH	
C171	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C172	CAP-AL.ELEC,107M,1C	917 123100CM	
C173	CAP-CERAMIC,103Z,1H,Y5V	915 325100HZVH	
C174	CAP-CERAMIC,103Z,1H,Y5V	915 325100HZVH	

LOC. NO	DESCRIPTION	CODE NO	REMARK
C175	CAP-AL.ELEC,476M,1C	917 122470CM	
C181	CAP-AL.ELEC,476M,2A,105C	917 742470LM	
C182	CAP-MPETP,104J,1J,5P	916 566100JJAH	
C183	CAP-AL.ELEC,476M,1C	917 122470CM	
C184	CAP-AL.ELEC,105M,1H	917 121100HM	
C201	CAP-AL.ELEC,106M,1H	917 122100HM	
C202	CAP-AL.ELEC,106M,1H	917 122100HM	
C204	CAP-CERAMIC,150J,1H,N220	915 312150HJRH	
C205	CAP-CERAMIC,150J,1H,N220	915 312150HJRH	
C206	CAP-AL.ELEC,107M,1C	917 123100CM	
C207	CAP-AL.ELEC,100M,1C	917 123100CM	
C301	CERAMIC,102K,1H,Y5P	915 324100HKPH	
C303	CAP-CERAMIC,103Z,1H,Y5V	915 325100HZVH	
C304	CAP-CERAMIC,103Z,1H,Y5V	915 325100HZVH	
C305	CAP-CERAMIC,103Z,1H,Y5V	915 325100HZVH	
C306	CAP-AL.ELEC,227M,1C	917 123220CM	
C307	CAP-AL.ELEC,105M,1H	917 121100HM	
C308	CAP-TANTAL,684K,1V	917 310680FK	
C309	CAP-AL.ELEC,228M,1V	917 124220FM	
C310	CAP-AL.ELEC,684M,1H,105C	917 740680HM	
C311	CAP-AL.ELEC,106M,1H	917 122100HM	
C312	CAP-AL.ELEC,107M,1V	917 123100FMAX	
C313	CAP-CERAMIC,221K,1H,Y5P	915 323220HKPH	
C314	CAP-TANTAL,106K,1E	917 312100EK	
C315	CAP-AL.ELEC,158M,1V,105C	917 744150FM	
C316	CAP-AL.ELEC,107M,1V	917 123100FMAX	
C317	CAP-MYLAR,103J,2A,5P	916 165100LJAH	
C321	CAP-MYLAR,102J,2A,5P	916 164100LJAH	
C322	CAP-MYLAR,104J,2A,5P	916 166100LJAH	
C323	CAP-MYLAR,153J,2A,5P	916 165150LJAH	
C326	CAP-MYLAR,223J,2A,5P	916 165220LJAH	
C327	CAP-MYLAR,103J,2A,5P	916 165100LJAH	
C328	CAP-AL.ELEC,105M,2C	917 121100NM	
C329	CAP-AL.ELEC,106M,1H	917 122100HM	
C401	CAP-CERAMIC,103Z,1H	915 325100HZVH	
C402	CAP-AL.ELEC,106M,1H	917 122100HM	
C403	CAP-AL.ELEC,476M,1C	917 122470CM	
C404	CAP-AL.ELEC,106M,1H	917 122100HM	
C405	CAP-CERAMIC,103Z,1H,Y5V	915 325100HZVH	
C406	CAP-AL.ELEC,106M,1H	917 122100HM	
C407	CAP-MPETP,224K,1J,5P	916 566220JKAH	
C408	CAP-CERAMIC,101J,1H,SL	915 313100HJHH	
C409	CAP-AL.ELEC,106M,1H	917 122100HM	

LOC. NO	DESCRIPTION	CODE NO	REMARK
C410	CAP-CERAMIC,101J,1H,SL	915 313100HJHH	
C411	CAP-PE/PPF,152J,1H	916 934150HJAH	
C412	CAP-AL.ELEC,106M,1E,105'C	917 242100EM	
C413	CAP-CERAMIC,271K,1H,Y5P	915 323270HKPH	
C414	CAP-PE/PPF,152J,1H	916 934150HJAH	
C415	CAP-AL.ELEC,105M,1H	917 121100HM	
C416	CAP-MYLAR,472J,2A,5P	916 164470LJAH	
C417	CAP-AL.ELEC,105M,1H	917 121100HM	
C418	CAP-PE/PPF,222J,1H,5P	916 934220HJAH	
C419	CAP-AL.ELEC,477M,1C	917 123470CM	
C420	CAP-AL.ELEC,106M,1E,105'C	917 242100EM	
C421	CAP-AL.ELEC,475M,1H,105'C	917 241470HM	
C422	CAP-MYLAR,223J,2A,5P	916 165220LJAH	
C423	CAP-AL.ELEC,106M,1H	917 122100HM	
C424	CAP-AL.ELEC,106M,1H	917 122100HM	
C425	CAP-CERAMIC,102K,1H,Y5P	915 324100HKPH	
C426	CAP-MPETP,224K,1J,5P	916 566220JKAH	
C427	CAP-AL.NP-ELEC,105M,1H,6X	917 221100HMAH	
C428	CAP-MYLAR,473J,2A,5P	916 165470LJAH	
C429	CAP-AL.ELEC,106M,1E,105'C	917 242100EM	
C430	CAP-CERAMIC,101J,1H,NPO	915 313100HJXH	
C431	CAP-AL.ELEC,227M,1V	917 123220FM	
C436	CAP-MYLAR,223J,2A,5P	916 165220LJAH	
C437	CAP-AL.ELEC,106M,2A,105C	917 742100LM	
C438	CAP-CERAMIC,102K,2H,Y5P	915 324100VKPH	
C441	CAP-MPPF,564J,2G	916 656560TJAX	
C444	CAP-AL.ELEC,105M,1H	917 121100HM	
C445	CAP-AL.ELEC,107M,2A,105C	917 743100LM	
C446	CAP-PPF,682J,2J,15.5P	916 364680WJAX	
C447	CAP-MPPF,474J,2G	916 656470TJAX	
C449	CAP-CERAMIC,102M,2H,DISC	915 324410VKPH	
C450	CAP-AL.ELEC,107M,1H	917 123100HM	
C453	CAP-MPE/PP, 682J, 3C	916 944680YJ	
C454	CAP-PPF,393J,2D,	916 355390PJAX	
C455	CAP-AL.ELEC,105M,1H	917 121100HM	
C456	CAP-MPPF,474J,2E	916 656470QJAX	
C457	CAP-MPPF,104J,2G	916 656100TJAX	
C461	CAP-AL.ELEC,477M,1E	917 123470EM	
C462	CAP-AL,ELEC,107M,2C,105C	917 743100NMXH	
C463	CAP-MPETP,104J,2E,7.5P	916 556100QJAH	
C464	CAP-AL.ELEC,477M,1E	917 123470EM	
C465	CAP-CERAMIC,102K,2H,Y5P	915 324100VKPH	
C504	CAP-AL.ELEC,477M,1C	917 123470CM	

LOC. NO	DESCRIPTION	CODE NO	REMARK
C507	CAP-AL.ELEC,106M,1H,105C	917 742100HMBX	
C508	CAP-MYLAR,103J,2A,5P	916 165100LJAH	
C510	CAP-MPETP,104J,2E,7.5P	916 556100QJAH	
C511	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C512	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
⚠ C601	CAP-MPAPER,474K,250VAC	918 146470QK	
⚠ C602	CAP-CERAMIC,472M,2B,DISC	915 344470MMVH	
⚠ C603	CAP-CERAMIC,472M,2B,DISC	915 344470MMVH	
⚠ C604	CAP-CERAMIC,472M,2B,DISC	915 344470MMVH	
⚠ C605	CAP-CERAMIC,472M,2B,DISC	915 344470MMVH	
C606	CAP-MPETP,155J,2E,22.5P	916 557150QJAL	
C608	CAP-AL.ELEC,337M,2E,30X40	917 793330QMAX	
C610	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C611	CAP-CERAMIC,102K,1H,Y5P	915 324100HKPH	
C612	CAP-PPF,682J,2A	916 354680LJAH	
C613	CAP-MYLAR,152J,2A,3P	916 164150LJAH	
C614	CAP-CERAMIC,222Z,2E,DISC	915 374220QZEH	
C615	CAP-CERAMIC,103K,3A,Y5P	915 325100XKPX	
C616	CAP-CERAMIC,331K,3A,DISC	915 323330XKPX	
C617	CAP-CERAMIC,222K,1H,Y5P	915 324220HKPH	
C618	CAP-AL.ELEC,107M,1V	917 123100FMAX	
C619	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C620	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C622	CAP-AL.ELEC,106M,1H,105C	917 742100HMBX	
C623	CAP-AL.ELEC,336M,1C	917 122330CM	
C624	CAP-CERAMIC,102K,1H,Y5P	915 324100HKPH	
C625	CAP-CERAMIC,222K,2H,Y5P	915 324220VKPH	
C631	CAP-AL.ELEC,107M,2D,105C	917 743100PMAX	
C632	CAP-CERAMIC,103Z,2H,DISC	915 325100VZVH	
C633	CAP-AL.ELEC,107M,2A,105C	917 743100LM	
C634	CAP-CERAMIC,221K,3D,Y5P	915 323220YKPX	
C635	CAP-CERAMIC,103Z,2H,DISC	915 325100VZVH	
C636	CAP-AL.ELEC,108M,1V,105C	917 744100FM	
C637	CAP-AL.ELEC,226M,1E	917 122220EM	
C638	CAP-CERAMIC,103Z,1H,Y5V	915 325100HZVH	
C639	CAP-AL.ELEC,108M,1C	917 124100CM	
C640	CAP-AL.ELEC,108M,1C,105C	917 744100CM	
C641	CAP-CERAMIC,103Z,1H,Y5V	915 325100HZVH	
C642	CAP-AL.ELEC,477M,1C	917 123470CM	
C643	CAP-AL.ELEC,476M,1C	917 122470CM	
C645	CAP-CERAMIC,472M,2B,DISC	915 344470MMVH	
C646	CAP-CERAMIC,472M,2B,DISC	915 344470MMVH	
C647	CAP-AL.ELEC,106M,1H	917 122100HM	

LOC. NO	DESCRIPTION	CODE NO	REMARK
C651	CAP-AL.ELEC,106M,1H	917 122100HM	
C652	CAP-PPF,682J,2A	916 354680LJAH	
C653	CAP-AL.ELEC,476M,1C	917 122470CM	
C654	CAP-AL.ELEC,108M,1C	917 124100CM	
C655	CAP-CERAMIC,103Z,1H,Y5V	915 325100HZVH	
	DIODES		
D101	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D102	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D121	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D122	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D141	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D142	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D162	DIODE-ZEN,UZ-5.1B,DO-35	893 290031FB	
D164	DIODE-ZEN,UZ-5.1B,DO-35	893 290031FB	
D173	DIODE-ZEN,UZ-36B,DO-35	893 290035UA	
D176	DIODE-ZEN,UZ-16BM,DO-35	893 290031HB	
D177	DIODE-ZEN,UZ-24BH,DO-35	893 290031DC	
D182	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D183	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D184	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D185	DIODE-ZEN,UZ7.5BM,D0-35	893 290031KBNA	
D186	DIODE-SIG,BAV21,DO-35	893 190021AANA	
D201	LED,G/Y,ROUND,4.8MM	895 110048DA	
D202	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D203	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D204	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D205	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D206	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D207	DIODE-UZ7.5BM	893 290030KBNA	
D301	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D302	DIODE-ZEN,UZ-5.1B,DO-35	893 290031FB	
D303	DIODE-REC,RGP10G,DO-41	893 390010AD	
D304	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D305	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D306	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D401	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D402	DIODE-REC,1N4002,DO-41	893 314002AANE	
D403	DIODE-REC,1N4002,DO-41	893 314002AANE	
D404	DIODE-REC,CGJ-1,-	893 399001AA	
D405	DIODE-REC,RGP10G,DO-41	893 390010AD	
D406	DIODE-SIG,1N4148,DO-35	893 114148AANM	

LOC. NO	DESCRIPTION	CODE NO.	REMARK
D408	DIODE-REC,5THZ52,	893 399073AA	
D409	DIODE-ZEN,UZ-7.5V	893 290031KBNA	
D411	DIODE-REC,RGP10G,DO-41	893 390010AD	
D412	DIODE-REC,RGP10G,DO-41	893 390010AD	
D413	DIODE-REC,RGP10G,DO-41	893 390010AD	
D414	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D415	DIODE-ZEN,UZ-8.2BL,DO-35	893 290031AA	
D416	DIODE-SIG,BAV21,DO-35	893 190021AANA	
D417	DIODE-ZEN,ZPD9.1,DO-41	893 290002BC	
D418	DIODE-REC,1R5GU41,	893 399030AA	
D421	DIODE-REC,RG4,-	893 399017AA	
D422	DIODE-REC,RGP10G,DO-41	893 390010AD	
D601	DIODE-REC,1N5399GP,DO-15	893 315399AA	
D602	DIODE-REC,1N5399GP,DO-15	893 315399AA	
D603	DIODE-REC,1N5399GP,DO-15	893 315399AA	
D604	DIODE-REC,1N5399GP,DO-15	893 315399AA	
D605	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D606	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D607	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D608	DIODE, RGP02-12	02169-206-297	
D609	DIODE, RGP02-12	02169-206-297	
D610	DIODE-REC,UF4004,DO-41	893 394004AA	
D613	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D614	DIODE-ZEN,RD12EB2,DO-35	893 290031BB	
D615	DIODE-ZEN,UZ-24BH,DO-35	893 290031DC	
D621	DIODE-REC,UF5408	893 395408AA	
D622	DIODE-REC,UF5408	893 395408AA	
D623	DIODE-REC,1R5NU41	893 399032AB	
D624	DIODE-REC,UF5408,DO201AD	893 395408AA	
D625	DIODE-ZEN,ZPD2,7,DO-35	893 290002AC	
D626	DIODE-ZEN,UZ-5.1B,DO-35	893 290031FB	
D627	DIODE-ZEN,UZ-5.1B,DO-35	893 290031FB	
D628	DIODE-REC,UF5404,DO201AD	893 399044AA	
D629	DIODE-REC,1R5GU41,	893 399030AA	
D651	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D652	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D653	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D654	DIODE-SIG,BAV21,DO-35	893 190021AANA	
D655	DIODE-REC,UF4004,DO-41	893 394004AA	
D656	DIODE-REC,UF4004,DO-41	893 394004AA	
	ICS		
IC101	IC-LIN,1203,OP AMP	881 101203AA	

LOC. NO	DESCRIPTION	CODE NO.	REMARK
IC102	IC-CUS,SL506A,SYNC PROCES	885 460005AA	
IC201	IC-MPU,FOR SQ/SR	877 808751AA	
IC201	SCON-IC SOCKET,40P	935 155140DC	
IC202	IC-MEM,EPROM,93C56,-	883 609356AA	
IC203	IC-LIN,M62359P,D/A CONVE	881 462359AA	
IC204	IC-LIN,7045,REGULATOR	881 307045TA	
IC301	IC-LIN,7838,VERTICAL	881 707838SA	
IC401	IC-LIN,7851,VERTICAL	881 707851AA	
IC402	IC-LIN,324,OP AMP	881 100324AANB	
IC403	IC-MOS,14066,SWITCH	873 404066AANG	
⚠ IC501	IC-HYB,CVM4967,H/V REGUL	887 490023AA	
⚠ IC601	IC-LIN,3842,PWM CONTROL	881 903842AB	
IC602	OPT-COUPL,TR,CQY80NG	895 520080AA	
IC603	OPT-COUPL,TR,CQY80NG	895 520080AA	
IC604	IC-LIN,431,REGULATOR	881 300431TANB	
IC605	IC-LIN,7805,REGULATOR	881 307805KANE	
⚠ IC606	IC-HYB,CSQ4327,V-REGULATO	887 490042AA	
	COILS		
L161	INDUCTOR-AXIAL,220UH	925 001001AN	
L162	INDUCTOR-AXIAL,220UH	925 001001AN	
L201	INDUCTOR-AXIAL,220UH	925 001001AN	
L302	INDUCTOR-AXIAL,220UH	925 001001AN	
L404	COIL-H/LINEARITY,5.2MH	925 460185AA	
L405	COIL-CHOKE,130uH +/-15%	925 460183BA	
L406	COIL-CHOKE,5MH,+/-10%	925 460178KA	
L407	COIL-CHOKE,2mH +/-10%	925 460183AA	
L408	COIL-CHOKE,5MH,+/-10%	925 460178KA	
⚠ L602	COIL-LINE FILTER,15MH	925 460178JA	
⚠ L603	COIL-LINE FILTER,3mH	925 460185CA	
	TRANSISTORS		
Q161	TR-PNP,KSA733,TO-92	891 190733XC	
Q162	TR-NPN,KSC945,TO-92	891 390006XB	
Q163	TR-NPN,KSC945,TO-92	891 390006XB	
Q166	TR-NPN,KSC945,TO-92	891 390006XB	
Q167	TR-NPN,KSC945,TO-92	891 390006XB	
Q168	TR-NPN,KSC945,TO-92	891 390006XB	
Q181	TR-NPN,KSC945,TO-92	891 390006XB	
Q182	TR-PNP,KSA733,TO-92	891 190733XC	
Q168	TR-NPN,KSC945,TO-92	891 390006XB	
Q181	TR-NPN,KSC945,TO-92	891 390006XB	

LOC. NO	DESCRIPTION	CODE NO.	REMARK
Q182	TR-PNP,KSA733,TO-92	891 190733XC	
Q201	TR-NPN,KSC945,TO-92	891 390006XB	
Q210	TR-NPN,KSC945,TO-92	891 390006XB	
Q301	TR-NPN,KSC945,TO-92	891 390006XB	
Q302	TR-PNP,KSA733,TO-92	891 190733XC	
Q303	TR-NPN,2N3904,TO-92	891 323904XANC	
Q304	TR-NPN,KSC945,TO-92	891 390006XB	
Q305	TR-NPN,2N3904,TO-92	891 323904XANC	
Q306	TR-NPN,2N3904,TO-92	891 323904XANC	
Q307	TR-NPN,KSC1008,TO-92	891 391008XA	
Q308	TR-PNP,KSA708,TO-92	891 190708XC	
Q401	TR-PNP,KSA733,TO-92	891 190733XC	
Q402	TR-NPN,KSC945,TO-92	891 390006XB	
Q403	TR-NPN,KSC945,TO-92	891 390006XB	
Q404	TR-NPN,KSC945,TO-92	891 390006XB	
Q405	TR-NPN,KSC2688,TO-126	891 492688AA	
⚠ Q406	TR-NPN,KSC945,TO-92	891 390006XB	
Q407	FET-N,IRF640,TO-220AB	891 890021AB	
Q408	TR-PNP,KSA733,TO-92	891 190733XC	
Q409	TR-PNP,KSA614,TO-220	891 290614AB	
⚠ Q411	TR-NPN,2SC3886A,2-16E3A	891 463886AA	
⚠ Q412	FET-P,IRF9610,TO-220	891 799610AA	
Q413	FET-N,IRF630,TO-220	891 890630AA	
Q415	TR-NPN,KSC945,TO-92	891 390006XB	
Q601	FET-N,2SK2038,TO-3P	891 882038AA	
Q602	TR-NPN,KSC945,TO-92	891 390006XB	
Q603	TR-NPN,TIP29,TO-220	891 490029AA	
Q604	TR-NPN,KSC945,TO-92	891 390006XB	
Q605	TR-PNP,KSA733,TO-92	891 190733XC	
Q606	TR-NPN,KSP45,TO-92	891 390045XANA	
Q607	TR-NPN,KSC945,TO-92	891 390006XB	
	RESISTORS		
R101	REF-MF,75,1%,1/4W	911 427505DA	
R102	REF-CF,100,5%,1/6W	911 131007YA	
R103	REF-CF,10K,5%,1/6W	911 151007YA	
R104	REF-CF,200,5%,1/6W	911 132007YA	
R105	REF-CF,390,5%,1/6W	911 133907YA	
R106	REF-CF,1K,5%,1/6W	911 141007YA	
R107	REF-CF,1K,5%,1/6W	911 141007YA	
R108	REF-CF,820,5%,1/6W	911138207YA	
R109	REF-CF,2.2K,5%,1/6W	911 142207YA	

LOC. NO	DESCRIPTION	CODE NO	REMARK
R110	REF-CF,2.2K,5%,1/6W	911 142207YA	
R121	REF-MF,75,1%,1/4W	911 427505DA	
R122	REF-CF,100,5%,1/6W	911 131007YA	
R123	REF-CF,10K,5%,1/6W	911 151007YA	
R124	REF-CF,200,5%,1/6W	911 132007YA	
R125	REF-CF,390,5%,1/6W	911 133907YA	
R141	REF-MF,75,1%,1/4W	911 427505DA	
R142	REF-CF,100,5%,1/6W	911 131007YA	
R143	REF-CF,10K,5%,1/6W	911 151007YA	
R144	REF-CF,200,5%,1/6W	911 132007YA	
R145	REF-CF,390,5%,1/6W	911 133907YA	
R161	REF-CF,1K,5%,1/6W	911 141007YA	
R163	REF-CF,1M,5%,1/6W	911 171007YA	
R164	REF-CF,1.8K,5%,1/6W	911 141807YA	
R165	REF-CF,33K,5%,1/6W	911 153307YA	
R166	REF-CF,100,5%,1/6W	911 131007YA	
R167	REF-CF,100,5%,1/6W	911 131007YA	
R168	REF-CF,1M,5%,1/6W	911 171007YA	
R169	REF-CF,1K,5%,1/6W	911 141007YA	
R170	REF-CF,1.8K,5%,1/6W	911 141807YA	
R171	REF-CF,100K,5%,1/6W	911 161007YA	
R172	REF-CF,18K,5%,1/6W	911 151807YA	
R173	REF-CF,1K,5%,1/6W	911 141007YA	
R175	REF-MO,240,5%,3W(S)	911 332407LF	
R176	REF-MO,2.7K,5%,1W(S)	911 342707GF	
R177	REF-CF,12K,5%,1/6W	911 151207YA	
R178	REF-CF,22K,5%,1/6W	911 152207YA	
R179	REF-CF,22K,5%,1/6W	911 152207YA	
R180	REF-CF,3.3K,5%,1/6W	911 143307YA	
R182	REF-CF,1K,5%,1/6W	911 141007YA	
R183	REF-CF,10K,5%,1/6W	911 151007YA	
R184	REF-CF,1M,5%,1/6W	911 171007YA	
R185	REF-CF,68K,5%,1/6W	911 156807YA	
R186	REF-CF,1K,5%,1/6W	911 141007YA	
R187	REF-CF,20K,5%,1/6W	911 152007YA	
R188	REF-CF,1.5K,5%,1/6W	911 141507YA	
R189	REF-CF,5.6K,5%,1/6W	911 145607YA	
R190	REF-CF,820,5%,1/6W	911 138207YA	
R191	REF-CF,1K,5%,1/6W	911 141007YA	
R192	REF-CF,22K,5%,1/6W	911 152207YA	
R200	REF-CF,10K,5%,1/6W	911 151007YA	
R201	REF-CF,150,5%,1/6W	911 131507YA	
R202	REF-CF,1K,5%,1/2W(S)	911 141007FF	

LOC. NO	DESCRIPTION	CODE NO	REMARK
R203	REF-CF,1K,5%,1/6W	911 141007YA	
R204	REF-CF,3.3K,5%,1/6W	911 143307YA	
R205	REF-CF,100,5%,1/6W	911 131007YA	
R206	REF-CF,100,5%,1/6W	911 131007YA	
R207	REF-CF,18K,5%,1/6W	911 151807YA	
R208	REF-CF,10K,5%,1/6W	911 151007YA	
R209	REF-CF,10K,5%,1/6W	911 151007YA	
R210	REF-CF,10K,5%,1/6W	911 151007YA	
R211	REF-CF,1K,5%,1/6W	911 141007YA	
R212	REF-CF,1K,5%,1/6W	911 141007YA	
R213	REF-CF,1K,5%,1/6W	911 141007YA	
R214	REF-CF,1K,5%,1/6W	911 141007YA	
R215	REF-CF,10K,5%,1/6W	911 151007YA	
R216	REF-CF,10K,5%,1/6W	911 151007YA	
R217	REF-CF,1K,5%,1/6W	911 141007YA	
R218	REF-CF,10K,5%,1/6W	911 151007YA	
R219	REF-CF,220,5%,1/4W	911 132207DA	
R220	REF-CF, 10K,5%,1/6W	911 151007YA	
R299	REF-CF,12K,5%,1/6W	911 151207YA	
R301	REF-CF,10K,5%,1/6W	911 151007YA	
R302	REF-CF,10K,5%,1/6W	911 151007YA	
R303	REF-CF,10K,5%,1/6W	911 151007YA	
R304	REF-CF,10K,5%,1/6W	911 151007YA	
R305	REF-CF,120,5%,1/6W	911 131207YA	
R306	REF-CF,150K,5%,1/6W	911 161507YA	
R307	REF-CF,330K,5%,1/6W	911 163307YA	
R308	REF-CF,330K,5%,1/6W	911 163307YA	
R309	REF-CF,330K,5%,1/6W	911 163307YA	
R310	REF-CF,68K,5%,1/6W	911 156807YA	
R311	REF-CF,3.3M",5%,1/4W	911 173307DA	
R312	REF-CF,39K,5%,1/6W	911 153907YA	
R313	REF-CF,56K,5%,1/6W	911 155607YA	
R314	REF-CF,15K,5%,1/6W	911 151507YA	
R315	REF-CF,470,5%,1/6W	911 134707YA	
R316	REF-CF,15K,5%,1/6W	911 151507YA	
R317	REF-CF,10K,5%,1/6W	911 151007YA	
R318	REF-CF,56K,5%,1/6W	911 155607YA	
R319	REF-FUSIBLE,3.3,5%,1W	911 813307GA	
R320	REF-MF,27K,5%,1/4W	911 452707DA	
R321	REF-MF,15K,1%,1/4W	911 451505DA	
R322	REF-CF,68,5%,1/4W	911 126807DA	
R323	REF-CF,12K,5%,1/6W	911 151207YA	
R324	REF-CF,470,5%,1/2W(S)	911 134707FF	

LOC. NO	DESCRIPTION	CODE NO.	REMARK
R325	REF-CF,470,5%,1/2W(S)	911 134707FF	
R326	REF-MO,1.2,5%,3W(T)	911 311207LFXA	
R327	REF-MF,330K,1%,1/8W	911 463305CA	
R331	REF-MO,100,5%,2W(S)	911 331007JF	
R332	REF-FUSIBLE,22,5%,1/4W	911 822207DA	
R333	REF-CF,7.5K,5%,1/6W	911 147507YA	
R336	REF-CF,56K,5%,1/6W	911 155607YA	
R337	REF-CF,22K,5%,1/6W	911 152207YA	
R338	REF-CF,330K,5%,1/6W	911 163307YA	
R341	REF-CF,22,5%,1/6W	911 122207YA	
R342	REF-CF,3.3K,5%,1/6W	911 143307YA	
R343	REF-CF,3.3K,5%,1/6W	911 143307YA	
R401	REF-CF,20K,5%,1/6W	911 152007YA	
R402	REF-CF,680K,5%,1/6W	911 166807YA	
R403	REF-CF,8.2K,5%,1/6W	911 148207YA	
R404	REF-CF,10K,5%,1/6W	911 151007YA	
R405	REF-CF,1.8M,5%,1/6W	911 171807YA	
R406	REF-CF,1.8K,5%,1/6W	911 141807YA	
R407	REF-CF,4.3K,5%,1/6W	911 144307YA	
R408	REF-CF,2.2K,5%,1/6W	911 142207YA	
R409	REF-CF,680,5%,1/6W	911 136807YA	
R410	REF-CF,10K,5%,1/6W	911 151007YA	
R411	REF-CF,330K,5%,1/6W	911 163307YA	
R412	REF-CF,10K,5%,1/6W	911 151007YA	
R413	REF-CF,10K,5%,1/6W	911 151007YA	
R414	REF-CF,5.6K,5%,1/6W	911 145607YA	
R415	REF-CF,47K,5%,1/6W	911 154707YA	
R416	REF-MF,18K,5%,1/6W	911 151807YA	
R417	REF-MF,10K,1%,1/8W	911 451005CA	
R418	REF-CF,8.2K,5%,1/6W	911 148207YA	
R421	REF-CF,10K,5%,1/6W	911 151007YA	
R422	REF-CF,8.2K,5%,1/6W	911 148207YA	
R423	REF-CF,24K,5%,1/6W	911 152407YA	
R424	REF-CF,47K,5%,1/6W	911 154707YA	
R425	REF-CF,1K,5%,1/6W	911 141007YA	
R426	REF-MF,1.5K,1%,1/8W	911 441505CA	
R427	REF-CF,8.2K,5%,1/6W	911 148207YA	
R428	REF-MF,6.8K,1%,1/8W	911 446805CA	
R429	REF-CF,100K,5%,1/6W	911 161007YA	
R431	REF-CF,180K,5%,1/6W	911 161807YA	
R432	REF-CF,4.7K,5%,1/6W	911 144707YA	
R433	REF-CF,4.7K,5%,1/6W	911 144707YA	
R434	REF-CF,47K,5%,1/6W	911 154707YA	

LOC. NO	DESCRIPTION	CODE NO	REMARK
R435	REF-CF,22K,5%,1/6W	911 152207YA	
R436	REF-CF,10K,5%,1/6W	911 151007YA	
R437	REF-MF,12K,1%,1/8W	911 451205CA	
R438	REF-MF,68.1K,1%,1/8W	911 456815CA	
R439	REF-MF,15K,1%,1/8W	911 451505CA	
R440	REF-CF,100K,5%,1/6W	911 161007YA	
R445	REF-CF,150K,5%,1/6W	911 161507YA	
R446	REF-CF,18K,5%,1/6W	911 151807YA	
R447	REF-CF,7.5K,5%,1/6W	911 147507YA	
R449	REF-CF,33K,5%,1/6W	911 153307YA	
R450	REF-CF,56K,5%,1/6W	911 155607YA	
R451	REF-CF,1.2K,5%,1/6W	911 141207YA	
R452	REF-CF,330,5%,1/6W	911 133307YA	
R461	REF-CF,470,5%,1/6W	911 134707YA	
R462	REF-MO,390,5%,3W(S)	911 333907LF	
R463	REF-MO,390,5%,3W(S)	911 333907LF	
R464	REF-MO,10K,5%,2W(S)	911 351007JF	
R465	REF-MO,1.2,5%,3W(T)	911 311207LFXA	
R466	REF-CF,1K,5%,1/6W	911 141007YA	
R467	REF-CF,4.3K,5%,1/6W	911 144307YA	
R468	REF-CF,3.3K,5%,1/6W	911 143307YA	
R469	REF-FUSIBLE,0.56,5%,1/2W	911 805607FA	
R470	REF-CF,4.7K,5%,1/6W	911 144707YA	
R471	REF-CF,4.7K,5%,1/6W	911 144707YA	
R472	REF-CF,22K,5%,1/6W	911 152207YA	
R473	REF-CF,47K,5%,1/6W	911 154707YA	
R476	REF-CF,330,5%,1/2W	911 133307FA	
R480	REF-CF,4.7K,5%,1/6W	911 144707YA	
R481	REF-CF,4.7,5%,1/2W(S)	911 114707FF	
R482	REF-MO,68,5%,3W(T)	911 326807LFXA	
R483	REF-FUSIBLE,0.56,5%,1/2W	911 805607FA	
R484	REF-CF,180K,5%,1/2W	911 161807FA	
R485	REF-CF,100K,5%,1/2W(S)	911 161007FF	
R486	REF-CF,22K,5%,1/6W	911 152207YA	
R487	REF-CF,47K,5%,1/6W	911 154707YA	
R489	REF-MO,68,5%,3W(T)	911 326807LFXA	
R490	REF-MO,1.5,5%,3W(T)	911 311507LFXA	
R514	REF-CF,6.8K,5%,1/6W	911 146807YA	
R518	REF-CF,22,5%,1/2W(S)	911 122207FF	
R600	THER,8 OHM,DISK,13MM	897 110521AA	
R601	REF-CC,330K,10%,1/2W	911 263308FA	
R602	REF-MO,33K,5%,3W(S)	911 353307LF	
R603	REF-CF,560K,5%,1/2W	911 165607FF	

LOC. NO	DESCRIPTION	CODE NO	REMARK
R604	REF-CF,560K,5%,1/2W	911 165607FF	
R605	REF-CF,3.3K,5%,1/6W	911 143307YA	
R606	REF-CF,10K,5%,1/6W	911 151007YA	
R607	REF-CF,1.8K,5%,1/6W	911 141807YA	
R608	REF-CF,100K,5%,1/6W	911 161007YA	
R609	REF-CF,120,5%,1/2W(S)	911 131207FF	
R610	REF-CF,100K,5%,1/6W	911 161007YA	
R611	REF-MF,10K,1%,1/8W	911 451005CA	
R612	REF-CF,10K,5%,1/6W	911 151007YA	
R613	REF-MO,68K,5%,3W(S)	911 356807LF	
R614	REF-CF,6.8,5%,1/4W	911 116807DA	
R615	REF-CF,100K,5%,1/6W	911 161007YA	
R616	REF-CF,1K,5%,1/6W	911 141007YA	
R617	REF-WW,0.27,5%,1W(NON)	911 602707GV	
R618	REF-MO,6.8K,5%,3W	911 346807LF	
R619	REF-MO,6.8K,5%,3W	911 346807LF	
R620	REF-MO,33K,5%,3W(S)	911 353307LF	
R621	REF-CF,330,5%,1/6W	911 133307YA	
R622	REF-CF,47K,5%,1/6W	911 154707YA	
R623	REF-CF,150K,5%,1/6W	911 161507YA	
R624	REF-CF,1.2K,5%,1/4W	911 141207DA	
R625	REF-CF,1.5K,5%,1/6W	911 141507YA	
R626	REF-CF,56K,5%,1/6W	911 155607YA	
R627	REF-CF,1.5K,5%,1/6W	911 141507YA	
R628	REF-CF,100K,5%,1/2W(S)	911 161007FF	
R629	REF-CF,6.8K,5%,1/6W	911 146807YA	
R630	REF-CF,200K,5%,1/6W	911 162007YA	
R632	REF-MO,10,5%,2W(S)	911 321007JF	
R634	REF-CF,33K,5%,1/2W(S)	911 153307FF	
R635	REF-MO,100K,5%,2W(S)	911 361007JF	
R636	REF-CF,1K,5%,1/2W(S)	911 141007FF	
R637	REF-CF,6.8K,5%,1/6W	911 146807YA	
R638	REF-FUSIBLE,0.22,5%,1W	911 802207GA	
R639	REF-MO,1.5,5%,3W(T)	911 311507LFXA	
R640	REF-MO,1,5%,2W(S)	911 311007JF	
R641	REF-MO,100,5%,2W(S)	911 331007JF	
R651	REF-CF,100K,5%,1/6W	911 161007YA	
R652	REF-CF,100K,5%,1/6W	911 161007YA	
R653	REF-CF,100K,5%,1/6W	911 161007YA	
R654	REF-CF,270K,5%,1/2W(S)	911 162707FF	
R655	REF-CF,270K,5%,1/2W(S)	911 162707FF	
R656	REF-CF,150,5%,1/4W	911 131507DA	
R657	REF-CF,5.6,5%,1/2W(S)	911 115607FF	

LOC. NO	DESCRIPTION	CODE NO	REMARK
R658	REF-CF,5.6,5%,1/4W	911 115607DA	
J497	REF-CF,150,5%,1/6W	911 131507YA	
	SWITCHS		
SW201	SWITCH-TACT,6.2X6.2X4MM	933 210043AE	
SW202	SWITCH-TACT,6.2X6.2X4MM	933 210043AE	
SW203	SWITCH-TACT,6.2X6.2X4MM	933 210043AE	
SW204	SWITCH-TACT,6.2X6.2X4MM	933 210043AE	
SW205	SWITCH-TACT,6.2X6.2X4MM	933 210043AE	
SW206	SWITCH-TACT,6.2X6.2X4MM	933 210043AE	
SW207	SWITCH-TACT,6.2X6.2X4MM	933 210043AE	
SW208	SWITCH-TACT,6.2X6.2X4MM	933 210043AE	
SW401	SWITCH-TOGGLE,SP3T	933 110034TC	
⚠ SW601	SWITCH-KEY,SPST	933 217007AB	
	TRANSFORMERS		
⚠ T401	TRANS-HORIZ,DRIVE	923 460148BA	
⚠ T402	TRANS-FLYBACK	923 460156DA	
⚠ T601	TRANS-POWER,110/220V,FREE	923 460156CA	
⚠ T602	TRANS-SYNC,250UH	923 460082BA	
⚠ T603	TRANS-POWER(DPSM)	923 460156AA	
	VRS		
VR101	RES-VAR,SF-ROUND,200OHM	913 432008BF	
VR102	RES-VAR,SF-ROUND,20KOHM	913 452008BF	
VR121	RES-VAR,SF-ROUND,200OHM	913 432008BF	
VR122	RES-VAR,SF-ROUND,20KOHM	913 452008BF	
VR141	RES-VAR,SF-ROUND,200OHM	913 432008BF	
VR142	RES-VAR,SF-ROUND,20KOHM	913 452008BF	
VR181	RES-VAR,ROTARY,5K	913 145007AB	
VR182	RES-VAR,ROTARY,10K	913 151007AB	
VR301	RES-VAR,SF-ROUND,1KOHM	913 441008BF	
VR401	RES-VAR,SF-ROUND,5KOHM	913 445008BF	
VR402	RES-VAR,SF-ROUND,50KOHM	913 455008BF	
VR403	RES-VAR,SF-ROUND,100K	913 461008BF	
VR501	RES-VAR,SF-ROUND,1KOHM	913 441008BF	
VR601	RES-VAR,SF-ROUND,500OHM	913 435008BH	
	OTHERS		
CN401A	PIN-GT	03124-700-810	

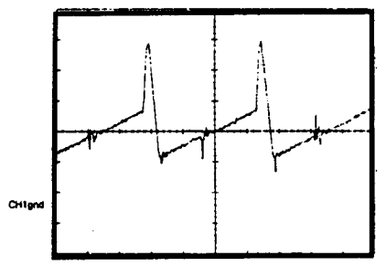
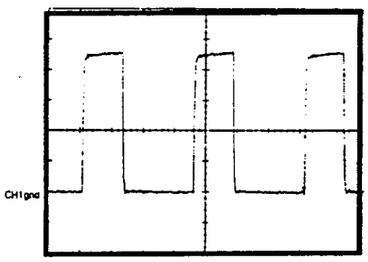
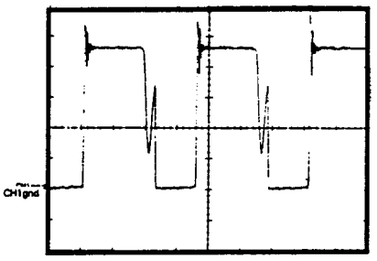
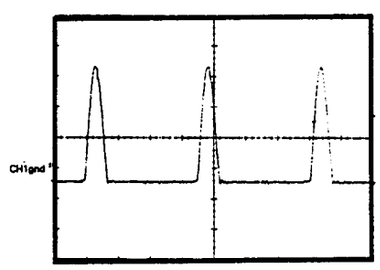
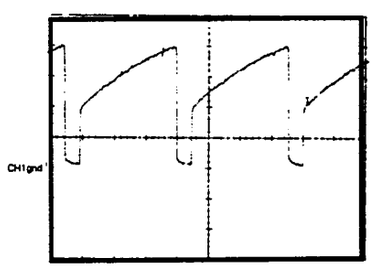
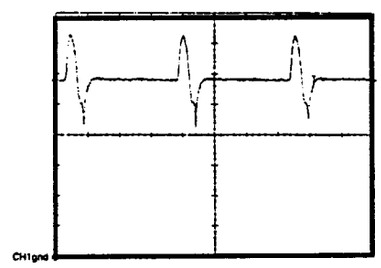
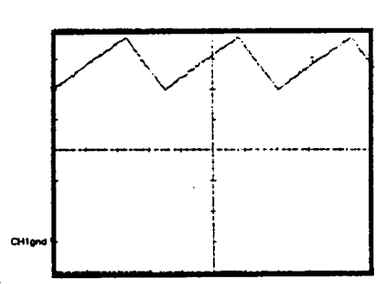
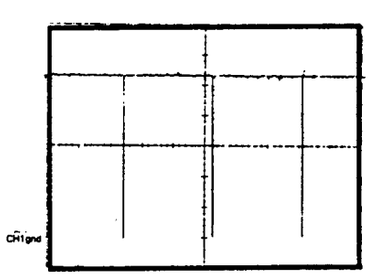
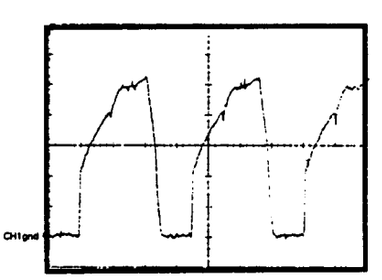
LOC. NO	DESCRIPTION	CODE NO	REMARK
P1	PIN-GT	03124-700-810	
CN301A	WALL,HEADER,3P	935 220103TE	
TP	PIN-GT	03124-700-810	
CN401	B PIN-GT	03124-700-810	
P2	PIN-GT	03124-700-810	
P/CASE	INC,LABEL-BLANK	825 119165AA	
⚠ PR601	POSI,20,SQUARE	897 110007AA	
D-COIL	COIL-DEGAUSSNG,7.5MH	925 460187AA	
GND	WIRE-TCWA,34X0.18	931 411821AE	
J2	WIRE-TCWA,7X0.254	931 412503BC	
CN101	CON-D-SUB,9P,RECEPTACLE	935 100109FG	
CN201	CON-WALL HEADER,3P,2.5MM	935 240903DW	
⚠ IS601	CON-SOCKET,AC,INLET	935 710008GA	
X201	CRYSTAL,12M,50	941 110067UBNA	
X161	C-RESO,3.58M,0.5%	941 210011TA	
MAIN	PCPCB-MAIN,CSQ4327,1LAYER	947 460036AB	
F601	FUSE-CERMIC TUBE,3.5,250	949 110029AF	
⚠ F601	FUSE-CLIP,5.2X20,30MOHM	953 260023BC	
CN102	CBF-CONN ASSY,200MM,6P	955 460035AAAA	
GT1(M)	CBF-LUG TERMINAL,250MM	955 460432AAAA	
VIDEO	GCBF-LUG TERMINAL,150MM	955 460444ZAAA	
VIDEO	GCBF-TBC WIRE,200MM	955 460497ZAAO	
CN104	CBF-CONN ASSY,200MM,10P	955 460501AAAA	
CRT-GND	GNDCBF-CRT GND ASSY	955 460502AAAB	

LOC. NO	DESCRIPTION	CODE NO	REMARK
CRT PCB PARTS			
	FERRITE-CORES		
BD191	FERRITE-CORE	02429-048-017	
BD192	FERRITE-CORE	02429-048-017	
	CAPACTORS		
C111	CAP-CERAMIC,560J,1H,SL	915 312560HJHH	
C112	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C113	CAP-MPETP,104J,2E,7.5P	916 556100QJAL	
C114	CAP-AL.ELEC,106M,2A,105C	917 742100LM	
C115	CAP-MPETP,104J,2E,7.5P	916 556100QJAL	
C116	CAP-CERAMIC,102K,2H,Y5P	915 324100VKPH	
C131	CAP-CERAMIC,680J,1H,NPO	915 312680HJXH	
C132	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C133	CAP-MPETP,104J,2E,7.5P	916 556100QJAL	
C135	CAP-MPETP,104J,2E,7.5P	916 556100QJAL	
C136	CAP-CERAMIC,102K,2H,Y5P	915 324100VKPH	
C151	CAP-CERAMIC,680J,1H,NPO	915 312680HJXH	
C152	CAP-CERAMIC,104Z,1H,Y5V	915 336100HZVH	
C153	CAP-MPETP,104J,2E,7.5P	916 556100QJAL	
C154	CAP-AL.ELEC,106M,2A,105C	917 742100LM	
C155	CAP-MPETP,104J,2E,7.5P	916 556100QJAL	
C156	CAP-CERAMIC,102K,2H,Y5P	915 324100VKPH	
C191	CAP-AL.ELEC,476M,1C	917 122470CM	
C192	CAP-AL.ELEC,475M,1H	917 121470HM	
C193	CAP-AL.ELEC,335M,2E	917 121330QM	
C194	CAP-CERAMIC,103Z,2H,DISC	915 325100VZVH	
C195	CAP-CERAMIC,102K,3D,DISC	915 324100YKPH	
C197	CAP-CERAMIC,221K,1H,Y5P	915 323220HKPH	
	DIODES		
D111	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D112	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D113	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D114	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D131	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D132	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D133	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D134	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D151	DIODE-SIG,1N4148,DO-35	893 114148AANM	

LOC. NO	DESCRIPTION	CODE NO	REMARK
D152	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D153	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D154	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D191	DIODE-ZEN,UZ-8.2BL,DO-35	893 290031AA	
D192	DIODE-REC,1N4007GP,DO-41	893 314007BA	
D193	DIODE-REC,1N4007GP,DO-41	893 314007BA	
D194	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D195	DIODE-SIG,1N4148,DO-35	893 114148AANM	
D197	DIODE-SIG,1N4148,DO-35	893 114148AANM	
	COILS		
L112	INDUCTOR-AXIAL,5.6UH	925 001002AK	
L132	INDUCTOR-AXIAL,5.6UH	925 001002AK	
L152	INDUCTOR-AXIAL,5.6UH	925 001002AK	
	TRANSISTORS		
Q111	TR-NPN,2N3904,TO-92	891 323904XANC	
Q112	TR-NPN,KSC3503,TO-	126 891 493503AA	
Q113	TRANSISTOR	02139-301-488	
Q114	TRANSISTOR	02139-101-158	
Q131	TR-NPN,2N3904,TO-92	891 323904XANC	
Q132	TR-NPN,KSC3503,TO-126	891 493503AA	
Q133	TRANSISTOR	02139-301-488	
Q134	TRANSISTOR	02139-101-158	
Q151	TR-NPN,2N3904,TO-92	891 323904XANC	
Q152	TR-NPN,KSC3503,TO-126	891 493503AA	
Q153	TRANSISTOR	02139-301-488	
Q154	TRANSISTOR	02139-101-158	
Q191	FET-N,(T)2N7000,TO-92	891 827000AA	
	RESISTORS		
R111	REF-CF,47,5%,1/6W	911 124707YA	
R112	REF-CF,220,5%,1/6W	911 132207YA	
R113	REF-CF,22,5%,1/6W	911 122207YA	
R115	REF-MO,2.2K,5%,3W(S)	911 342207LF	
R116	REF-FUSIBLE,33,5%,1/4W	911 823307DA	
R117	REF-FUSIBLE,33,5%,1/4W	911 823307DA	
R118	REF-CF,470K,5%,1/4W	911 164707DA	
R119	REF-CC,100,10%,1/2W	911 231008FA	
R131	REF-CF,47,5%,1/6W	911 124707YA	

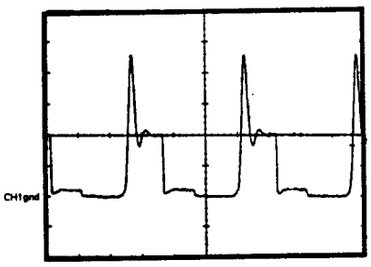
LOC. NO	DESCRIPTION	CODE NO	REMARK
R132	REF-CF,220,5%,1/6W	911 132207YA	
R133	REF-CF,22.5%,1/6W	911 122207YA	
R135	REF-MO,2.2K,5%,3W(S)	911 342207LF	
R136	REF-FUSIBLE,33,5%,1/4W	911 823307DA	
R137	REF-FUSIBLE,33,5%,1/4W	911 823307DA	
R138	REF-CF,470K,5%,1/4W	911 164707DA	
R139	REF-CC,100,10%,1/2W	911 231008FA	
R151	REF-CF,47,5%,1/6W	911 124707YA	
R152	REF-CF,220,5%,1/6W	911 132207YA	
R153	REF-CF,47,5%,1/6W	911 124707YA	
R155	REF-MO,2.2K,5%,3W(S)	911 342207LF	
R156	REF-FUSIBLE,33,5%,1/4W	911 823307DA	
R157	REF-FUSIBLE,33,5%,1/4W	911 823307DA	
R158	REF-CF,470K,5%,1/4W	911 164707DA	
R159	REF-CC,100,10%,1/2W	911 231008FA	
R193	REF-CF,4.7K,5%,1/2W(S)	911 144707FF	
R194	REF-CC,100,10%,1/2W	911 231008FA	
R195	REF-CF,1.5K,5%,1/2W(S)	911 141507FF	
R199	REF-CC,100,10%,1/2W	911 231008FA	
	OTHERS		
SOCKET	CON-JACK CRT SOCKET	935 720901AESA	
CN103	CON-WALL HEADER,6P,2.5MM	935 240906DW	
CN105	CON-WALL HEADER,10P,2.5	935 240910DZ	
CRT	PCBPCB-CRT,CSQ4327,1LAYER	947 460036BA	
GT-1	PIN-GT	03124-700-810	
GT-2	PIN-GT	03124-700-810	
GT-3	PIN-GT	03124-700-810	
GT1	PIN-GT	03124-700-810	
S/CABLE	CBF-SIGNAL CABLE 4FT	955 460504AAAA	
S/CABLE	CBF-SIGNAL CABLE 6FT	955 460511AAAA	
P/CORD	CBF-POWER CORD 6FT	955 001438AAAA	USA, CAP
P/CORD	CBF-POWER CORD 6FT	955 001434AAAA	USA, WALL
⚠ CRT	CRT 15" M36KUK35X31	897 250133AA	SED

WAVEFORMS

CH1 500mV A 5μs 1.73V VERT  CH1 P-P = 2.3800V CH1 RMS = 1.5909V	CH1 5V A 5μs 1.72V VERT  CH1 P-P = 23.400V CH1 RMS = 13.157V	CH1 50V A 5μs 60.9V VERT  CH1 P-P = 288.00V CH1 RMS = 171.88V
(1) 2.38 Vp-p (IC601 Pin 4)	**(2) 23.4 Vp-p (IC601 Pin 6)**	**(3) 288 Vp-p (T602 Pin 2)**
CH1 5V A 5μs 8.98V VERT  CH1 P-P = 19.200V CH1 RMS = 5.2931V	CH1 2V A 5μs 4.31V VERT  CH1 P-P = 7.9200V CH1 RMS = 5.8639V	CH1 1V A 5μs 6.02V VERT  CH1 P-P = 3.0800V CH1 RMS = 5.9809V
(4) 19.2 Vp-p (Feed Back Sync)	**(5) 7.92 Vp-p (IC504 Pin 2)**	**(6) 3.08Vp-p (Plin Balance Adj.)**
CH1 1V A 5μs 5.27V VERT  CH1 P-P = 1.7600V CH1 RMS = 5.8567V	CH1 5V A 5ms 5.97V VERT  CH1 P-P = 10.960V CH1 RMS = 10.512V	CH1 500mV A 5μs 1.27V VERT  CH1 P-P = 2.7200V CH1 RMS = 1.7170V
(7) 1.76 Vp-p (IC403 Pin 10)	**(8) 10.96 Vp-p (IC401 Pin 17)**	**(9) 2.72 Vp-p (IC401 Pin 12)**

WAVEFORMS

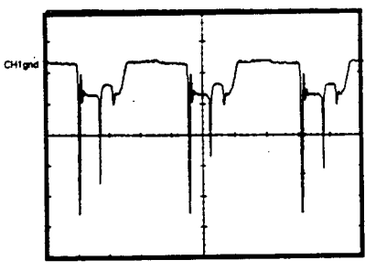
CH1 50V A 5μs 115V VERT



CH1 P-P = 236.00V
CH1 RMS = 69.869V

(10) 236 Vp-p (Q405 Collector)

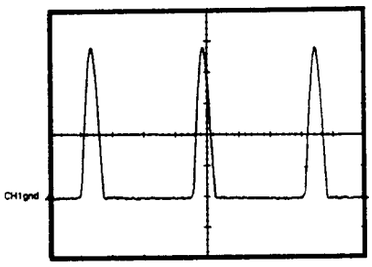
CH1 2V A 5μs -1.95V VERT



CH1 P-P = 10.320V
CH1 RMS = 1.3836V

(11) 10.32 Vp-p (Q411 Base)

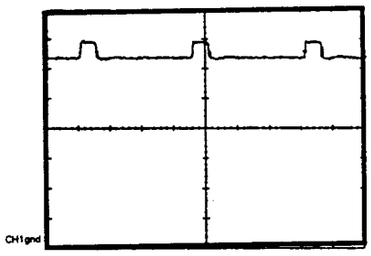
CH1 200V A 5μs 238V VERT



CH1 P-P = 984.00V
CH1 RMS = 285.98V

(12) 984 Vp-p (Q411 Collector)

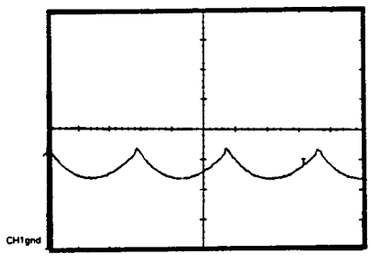
CH1 20V A 5μs 137V VERT



CH1 P-P = 13.600V
CH1 RMS = 128.22V

(13) 13.6 Vp-p (Q412 Gate)

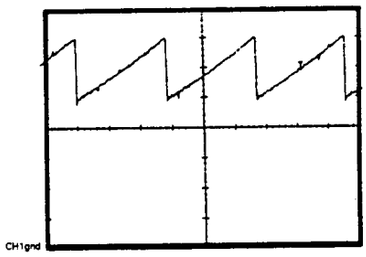
CH1 5V A 5ms 14.6V VERT



CH1 P-P = 5.2000V
CH1 RMS = 13.282V

(14) 5.2 Vp-p (Q408 Base)

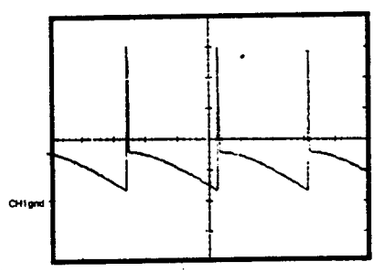
CH1 1V A 5ms 6.27V VERT



CH1 P-P = 2.3200V
CH1 RMS = 5.9247V

(15) 2.32 Vp-p (IC301 Pin 6)

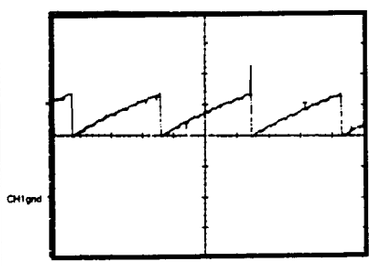
CH1 10V A 5ms 6.25V VERT



CH1 P-P = 47.200V
CH1 RMS = 12.920V

(16) 47.2 Vp-p (IC301 Pin 12)

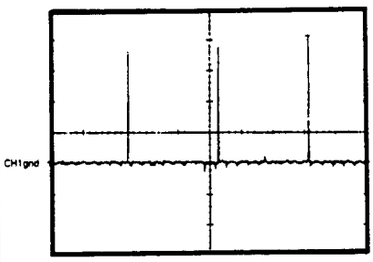
CH1 2V A 5ms 6.41V VERT



CH1 P-P = 4.800V
CH1 RMS = 5.3994V

(17) 4.8 Vp-p (IC401 Pin 18)

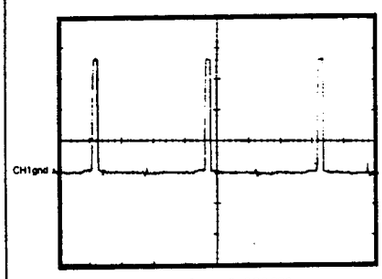
CH1 1V A 5ms 2.05V VERT



CH1 P-P = 4.2800V
CH1 RMS = 456.76mV

(18) 4.28 Vp-p (IC102 Pin14)

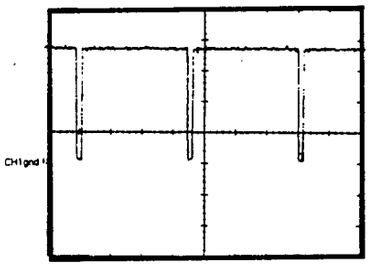
CH1 1V A 5μs 328mV VERT



CH1 P-P = 3.9200V
CH1 RMS = 795.45mV

(19) 3.92 Vp-p (IC102 Pin 19)

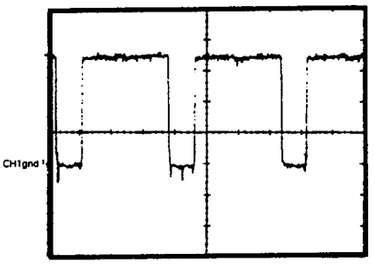
CH1 1V A 5μs 2.05V VERT



CH1 P-P = 3.8800V
CH1 RMS = 3.6166V

(20) 3.88 Vp-p (IC101 Pin 14)

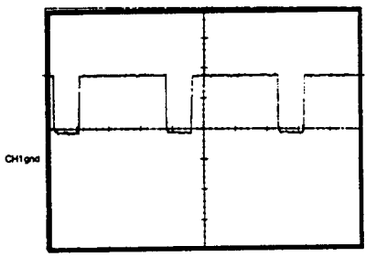
CH1 200mV A 5μs 305mV VERT



CH1 P-P = 872.00mV
CH1 RMS = 602.19mV

(21) 0.87 Vp-p (Video Input)

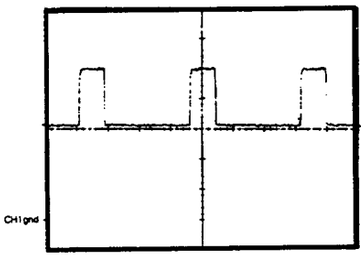
CH1 2V A 5μs 3.68V VERT



CH1 P-P = 4.0000V
CH1 RMS = 4.8946V

(22) 4.0 Vp-p (IC101 Pin 16)

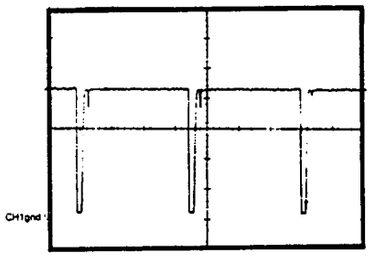
CH1 5V A 5μs 78.9V VERT



CH1 P-P = 41.600V
CH1 RMS = 71.694V

(23) 41.6 Vp-p (Video Output)

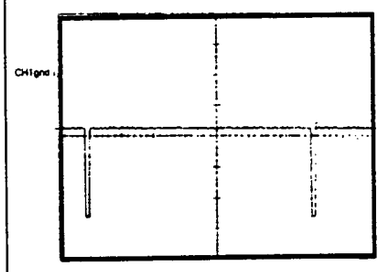
CH1 5V A 5μs 12.0V VERT



CH1 P-P = 20.800V
CH1 RMS = 20.576V

(24) 20.8 Vp-p (Back Porch Clamp)

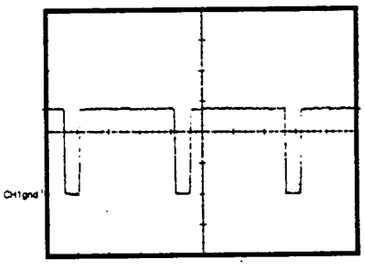
CH1 10V A 2ms -31.3V VERT



CH1 P-P = 29.600V
CH1 RMS = 18.281V

(25) 29.6 Vp-p (G1 Plus)

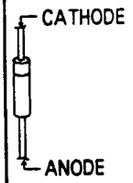
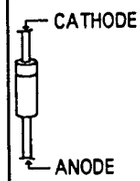
CH1 5V A 50μs 59.2V VERT

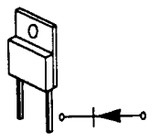


CH1 P-P = 152.00V
CH1 RMS = 123.75V

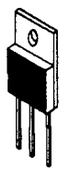
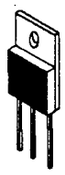
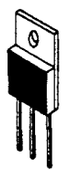
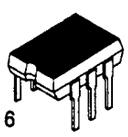
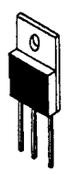
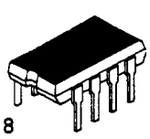
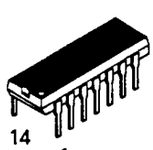
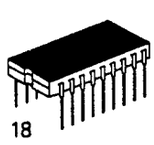
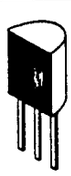
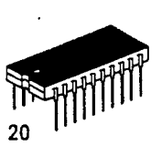
(26) 152.0 Vp-p (Q412 Drain)

SEMICONDUCTOR LEAD IDENTIFICATION

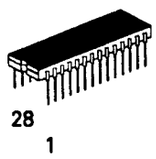
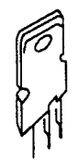
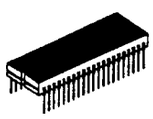
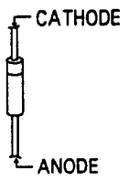
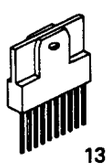
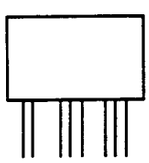
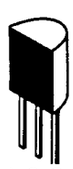
Parts	Type No.	Ref. No.
	1N4148	D101, D102, D111, D112, D113, D114, D121, D122, D131, D132, D133, D134, D141, D142, D151, D152, D153, D154, D182, D183, D184, D202, D203, D204, D205, D301, D304, D305, D306, D401, D406, D414, D605, D606, D607, D613, D651, D652, D653, D194, D195, D197, D206, D186, D416,
	BAV 21	D654
	RGP02-12	D608, D609
	CGJ-1	D404
	1N4002	D402, D403
	1N4007	D192, D193
	RGP10G	D303, D405, D411, D412, D413, D422
	UF4004	D610, D655, D656
	RG4	D421
	1R5GU41	D418, D629
	1R5NU41	D621, D622, D623
	1N5399GP	D601, D602, D603, D604
	UF5408	D624
	UF5404	D628

Parts	Type No.	Ref. No.
	5THZ52	D408
	KSC945-Y	Q162, Q163, Q164 Q166, Q167, Q168, Q181, Q201, Q210, Q301, Q304, Q402, Q403, Q404, Q406, Q415, Q602, Q604, Q607
	MPSA45	Q606
	KSA733-Y	Q182, Q183, Q302, Q401, Q408, Q605, Q161
	KSC1008	Q307
	2N3904	Q111, Q131, Q151, Q303, Q305, Q306
	KSA708	Q308
	2N5401C-Y	Q114, Q134, Q154
	2N5551C-Y	Q113, Q133, Q153
	2N7000	Q191

SEMICONDUCTOR LEAD IDENTIFICATION

Parts	Type No.	Ref. No.	Parts	Type No.	Ref. No.
 B C E	2SC3886A	Q411	 I G O	MC7805C	IC605
 B C E	KSA614 TIP29C	Q409 Q603	 6 1	CQY80NG	IC602, IC603
 G D S	IRF9610 IRF640 IRF630	Q412 Q407 Q413	 8 1	KA3842 93C56	IC601 IC202
 E C B	2SC2688-Y KSC3503-Y	Q405 Q112, Q132, Q152	 14 1	MC14066 LM324	IC403 IC402
 G D S	2SK2038	Q601	 18 1	M62359	IC203
 R A K	KA431	IC604	 20 1	LA7851 SL505	IC401 IC102

SEMICONDUCTOR LEAD IDENTIFICATION

Parts	Type No.	Ref. No.	Parts	Type No.	Ref. No.
	LM1203	IC101		STR17006	IC606
	8751BH	IC201		UZ-8. 2BL UZ-5. 1B UZ-9. 1BM UZ-36B UZ-24B UZ-7. 5B UZ-2. 7B UZ-16BM UZ-5. 6B ZPD12	D191, D415 D162, D164, D626, D627 D417 D173 D177 D185, D207, D409 D625 D176, D615 D302 D614
	LA7838	IC301			
	VM2	IC501			
	KIA7045P	IC204			

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