

NEC

MODELS JC-2001VME/EE/R

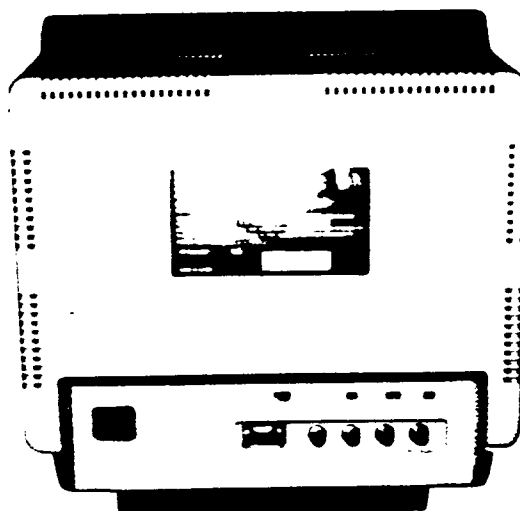
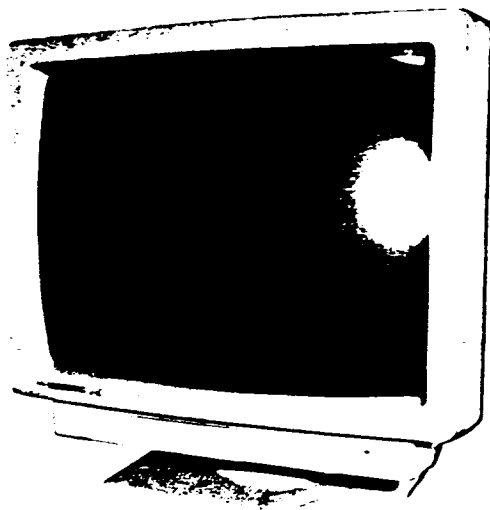
COLOR MONITOR MULTISYNC *xl* SERVICE MANUAL

PARTS NO. 599910273



10633

Better Service
Better Reputation
Better Profit



SPECIFICATIONS

A. Electrical Description

Picture Tube	19 Visual inches diagonal 90 degree deflection, 0.31 mm Trio dot pitch Dot type black matrix Non-long persistence phosphor, Dark bulb, Direct etch
Input Signal	Video : TTL Level Positive : ANALOG 0.7 or 1.0 Vp-p/75Ω Positive Sync. : Separate sync. TTL Level Horizontal sync. Positive/Negative Vertical sync. Positive/Negative : Composite sync. TTL Level Positive/Negative : Composite sync. on Green Video sync. 0.3 Vp-p Negative (Video 0.7 Vp-p Positive) or sync. 0.43 Vp-p Negative (Video 1.0 Vp-p Positive)
Display Colors	TTL Input : 8/16/64 colors Analog Input : Unlimited colors

Synchronization	Horizontal : 21.8 KH to 50 kHz (Automatically) Vertical : 56 Hz to 80 Hz (Automatically), Non-interlace
Resolution	Horizontal : 1024 dots Vertical : 768 lines
Video Band Width	65 MHz on BNC, 30 MHz on D-Sub
Maximum Display Area	Horizontal : 350 mm (Active display area is changed) Vertical : 260 mm by signal timing
Misconvergence	Less than 0.7 mm
Power Supply	AC 220-240V 50/60Hz
Power Consumption	130 W
Dimensions	480 (W) × 476.5 (H) × 545 (D) mm
Weight	27 kg
Environmental Consideration	Operating Temperature 0°C to +40°C Humidity 30% to 80% Storage Temperature -20°C to +60°C Humidity 10% to 90%

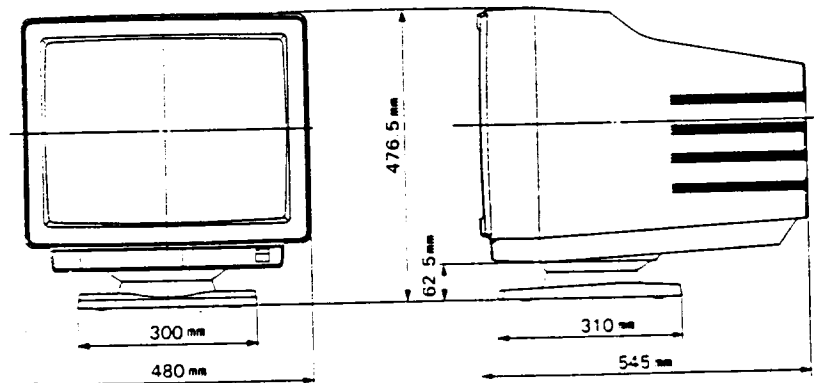
NOTE: The above specifications are subject to change without notice for further improvement.

NEC Corporation
TOKYO, JAPAN

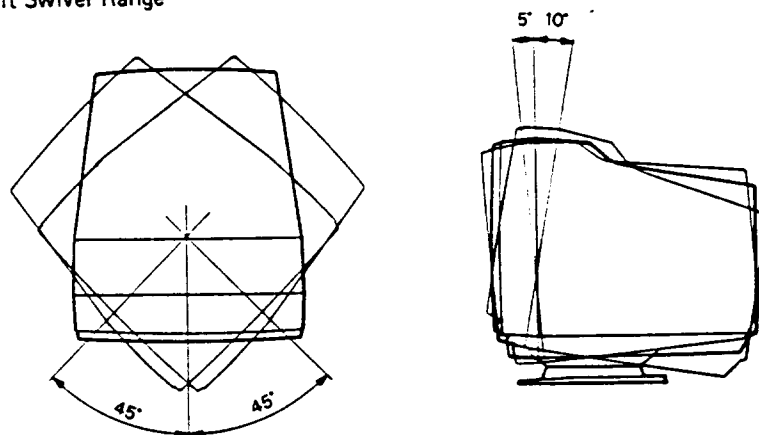
B. Mechanical Description (See below diagrams)

- | | |
|---------------|--|
| 1. Cabinet | Molded plastic cabinet with attachable tilt swivel base. |
| 2. Dimensions | 480(W) x 476.5(H) x 545(D) mm |
| 3. Weight | 27 kg |

Dimensions



Tilt Swivel Range



4. Controls

BRIGHTNESS CONTROL
 CONTRAST CONTROL
 HORIZONTAL POSITION CONTROL
 HORIZONTAL SIZE CONTROL
 VERTICAL POSITION CONTROL
 VERTICAL SIZE CONTROL
 POWER SWITCH
 DEGAUSSING SWITCH

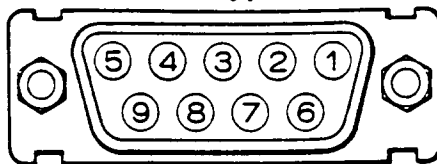
INPUT SWITCH
 TEXT SWITCH
 TEXT COLOR SWITCH
 TTL/ANALOG SWITCH
 BNC INPUT VOLTAGE SWITCH
 COLOR SWITCH
 MANUAL SWITCH

5. Input Signal Terminal:

9 PIN D-SUB CONNECTOR (FEMALE)
 (SEE PAGE 2 FOR PIN ASSIGNMENTS)
 BNC CONNECTOR (FEMALE)
 (SEE PAGE 3 FOR CONNECTION ASSIGNMENTS)

PIN ASSIGNMENTS AND SIGNAL LEVELS

D-SUB Type 9-P

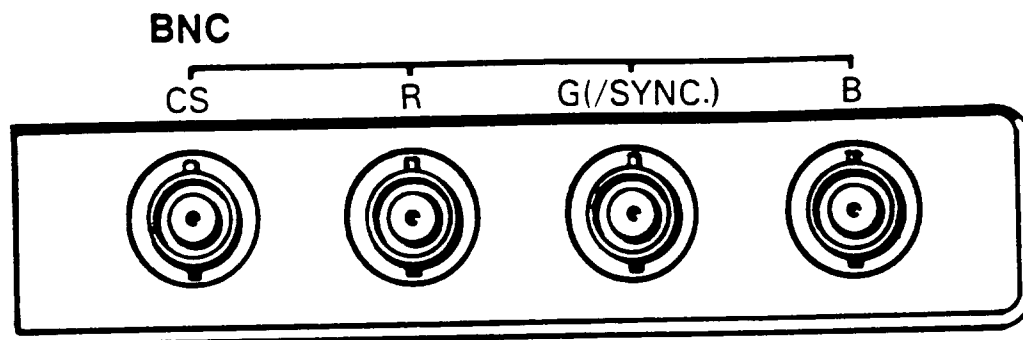


MANUAL SWITCH OFF

SIGNAL PIN No.	TTL		ANALOG	
	EGA COMPATIBLE		PGC COMFATIBLE	VGA/MCGA COMPATIBLE
	16 COLORS	64 COLORS		
1	GROUND	GROUND	● RED	● RED
2	GROUND	SECONDARY RED	● GREEN	● GREEN
3	RED	PRIMARY RED	● BLUE	● BLUE
4	GREEN	PRIMARY GREEN	COMPOSITE SYNC.	H. SYNC.
5	BLUE	PRIMARY BLUE	MODE CONTROL	V. SYNC.
6	INTENSITY	SECONDARY GREEN	RED GROUND	RED GROUND
7	NO-CONNECTION	SECONDARY BLUE	GREEN GROUND	GREEN GROUND
8	H. SYNC.	H. SYNC.	BLUE GROUND	BLUE GROUND
9	V. SYNC.	V. SYNC.	GROUND	GROUND

MANUAL SWITCH ON

SIGNAL PIN No.	TTL			ANALOG		
	8 COLORS	16 COLORS	64 COLORS	SEPARATE SYNC.	COMPOSITE SYNC.	SYNC. ON GREEN
1	GROUND			● RED		
2	—		SECONDARY RED	● GREEN		◎ H/V SYNC. ON GREEN
3	RED		PRIMARY RED	● BLUE		
4	GREEN		PRIMARY GREEN	H. SYNC.	H/V SYNC.	—
5	BLUE		PRIMARY BLUE	V. SYNC.	—	
6	—	INTENSITY	SECONDARY GREEN	GROUND		
7	—		SECONDARY BLUE			
8	H. SYNC.					
9	V. SYNC.					



CONNECTOR	SYNC. ON GREEN	COMPOSITE SYNC.
R	* RED	* RED
G	♣ H/V SYNC. ON GREEN	* GREEN
B	* BLUE	* BLUE
CS	—	H/V SYNC.

"—" means GROUND or NON-CONNECTION

"H" means HORIZONTAL

"V" means VERTICAL

"H/V" means COMPOSITE SYNC.

SIGNAL LEVEL

All signal leveles, except for those listed below, are TTL.

"•" means 0.7Vp-p (VIDEO)

"◎" means 0.7Vp-p (VIDEO), 0.3Vp-p (SYNC.)

"*" means 0.7Vp-p or 1.0Vp-p (VIDEO)

"♣" means 0.7Vp-p (VIDEO), 0.3Vp-p (SYNC.) or 1.0Vp-p (VIDEO), 0.43Vp-p (SYNC.)

Power Supply Cord

The plug and the cord you will use depend upon the power supply voltage (AC 110-120V or AC 200-240V). If you operate the monitor with AC110-120V, use a power supply cord with the Safety Standard Approval of your country.

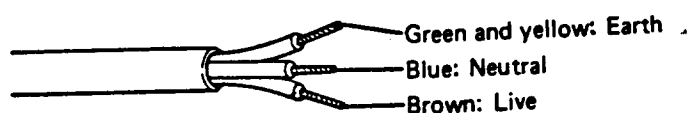
Plug form different by model.

JC-2001VMEE

Warning: This apparatus must be earthed.

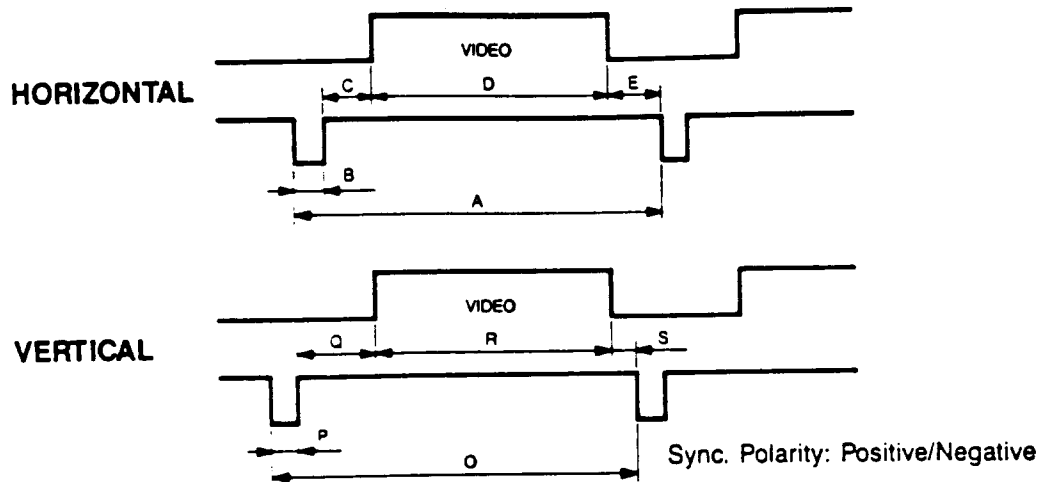
Important

The wires in this mains lead are colored in accordance with following code:

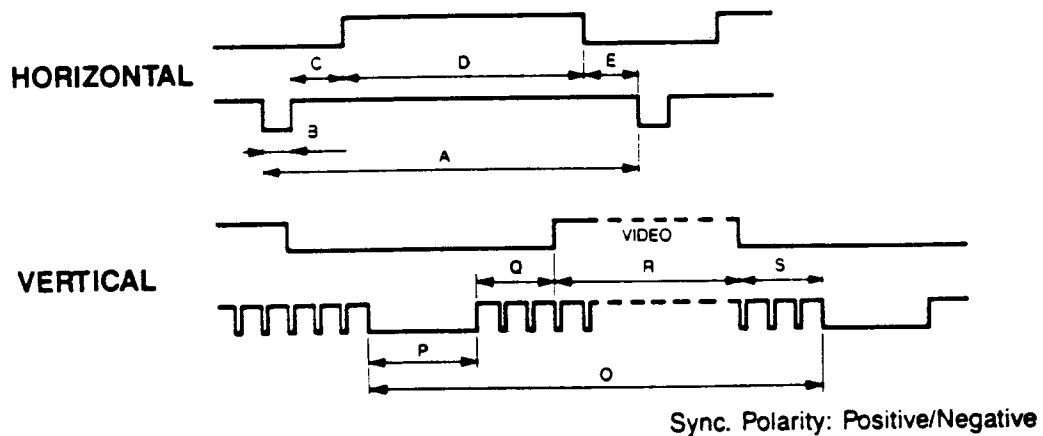


TIMING CHARTS

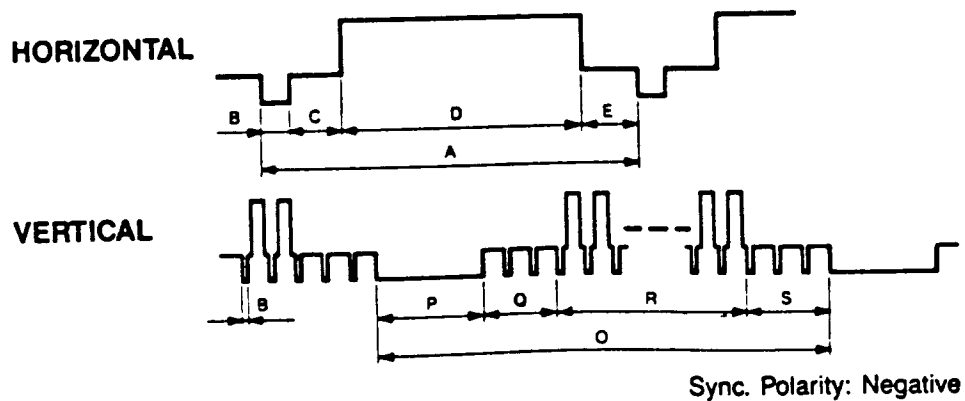
SEPARATE SYNC.



COMPOSITE SYNC.



COMPOSITE SYNC. & VIDEO (SYNC. ON GREEN)



PRESET TIMING

	EGA COMPATIBLE	VGA/MCGA COMPATIBLE			768 LINES
f_H	22 kHz	31.5 kHz			48.5 kHz
A μs	45.5	31.77			20.625
B μs	4.9	3.77			1.0
C μs	1.6	1.89			2.875
D μs	39	25.17			16.0
E μs	0	0.94			0.75
f_v	60 Hz	70 Hz		60 Hz	60 Hz
O ms	16.68	14.27	14.27	16.68	16.665
P ms	0.6	0.064	0.064	0.064	0.083
Q ms	0.08	1.88	1.08	1.02	0.66
R ms	16	11.126	12.716	15.246	15.84
S ms	0	1.2	0.41	0.35	0.082
REMARKS	SEPARATE SYNC.	SEPARATE SYNC. H. SYNC. Positive V. SYNC. Negative	SEPARATE SYNC. H. SYNC. Negative V. SYNC. Positive	SEPARATE SYNC. H. SYNC. Negative V. SYNC. Negative	COMPOSITE SYNC. or COMPOSITE SYNC & VIDEO (Sync. on Green)

GENERAL

MultiSync XL, the Intelligent Monitor, from NEC, is a high resolution color monitor that automatically adjusts to graphics board scanning frequencies from 21.8 kHz to 50 kHz. MultiSync XL gives IBM PC, PC/XT, PC/AT, Personal System/2 and PC compatibles users crisp text and vivid color graphics displays when used with any of the IBM graphics adapters (the MCGA, VGA, EGA or PGC). MultiSync XL can also be used with other IBM compatible graphics adapters to provide IBM users with the widest range of color monitor compatibility and capability available in the market place.

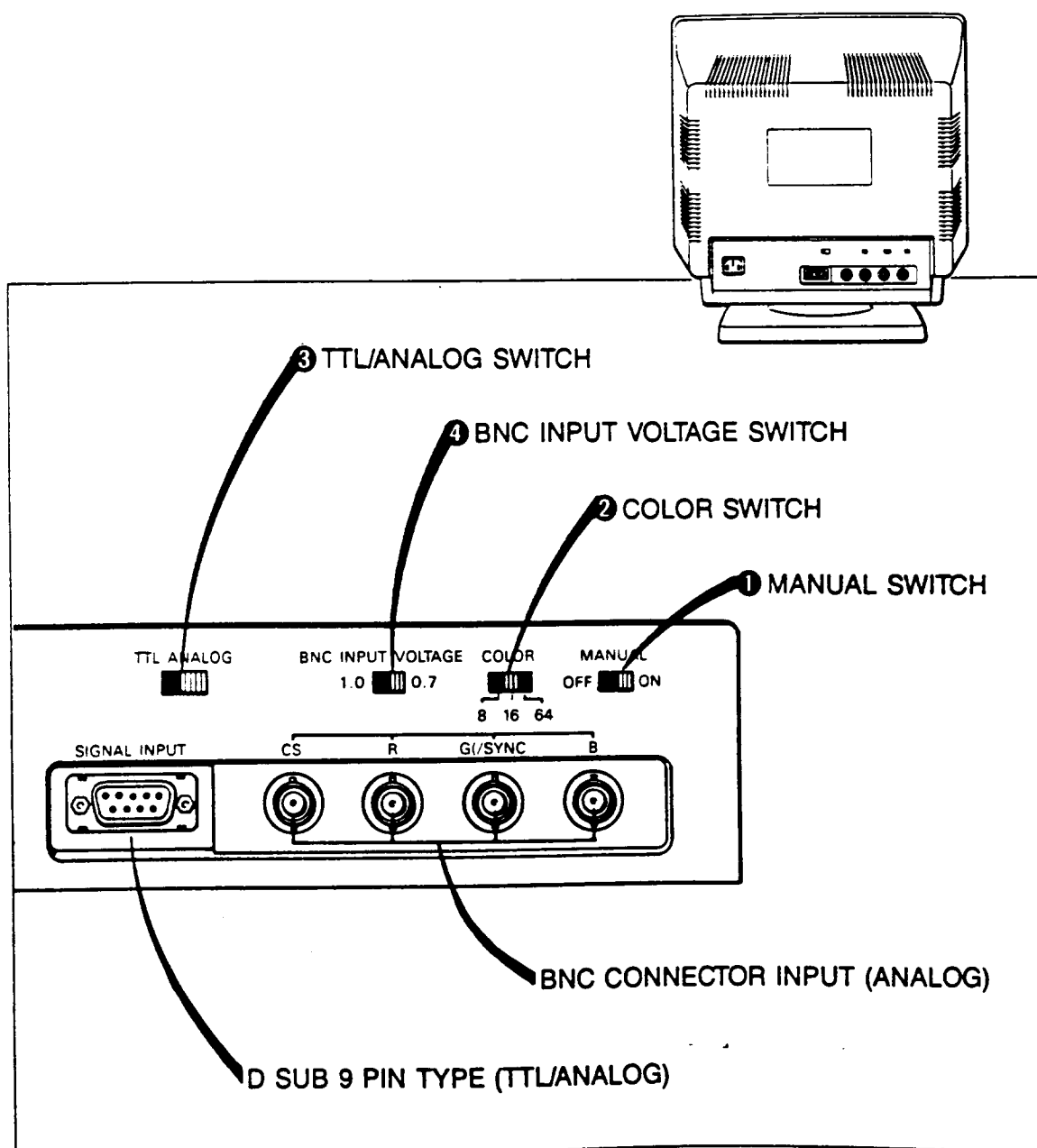
FEATURES

- MultiSync XL automatically scans all frequencies between 21.8 kHz and 50kHz.
- MultiSync XL is compatible with the IBM PC, PC/XT, PC/AT and look-alikes.
- MultiSync XL is compatible with the IBM Professional Graphics Controller, the IBM Enhanced Graphics Adapter, the IBM Video Graphics Array, the IBM Multi Color Graphics Array, and other IBM compatible graphics adapters.
- MultiSync XL's wide compatibility makes it possible to upgrade boards or software without purchasing a new monitor.
- MultiSync XL has a maximum horizontal resolution of 1024 dots and a maximum vertical resolution of 768 lines for superior clarity of display.
- MultiSync XL offers both TTL and ANALOG signal inputs, and in the ANALOG mode can display an unlimited palette of colors depending on the graphics board and software being used.
- MultiSync XL features a TEXT SWITCH (TTL mode only) with a choice of three colors (green, amber and paper white) displaying word processing, spread sheets, databases or other software in crisp alphanumeric text on a dark-bulb black background.
- MultiSync XL has a 20 inch diagonal display and a large 19 inch viewing area.

ADJUSTING THE MULTISYNC XL CONTROLS

Before connecting the MultiSync XL with IBM personal computers or compatibles and IBM graphics adapters, take time to familiarize yourself with the switches and controls that give the MultiSync XL all its capabilities. Chapters 1 and 2 outline the control and switches of the MultiSync XL Chapter Page 11 shows you how to connect the MultiSync XL with your IBM personal computer and graphics adapter.

1. ADJUSTING THE REAR CONTROLS



① MANUAL SWITCH

This switch selects either the IBM mode when OFF or the manual mode when ON. When this switch is OFF, MultiSync XL automatically works in the IBM mode and adjusts itself to the scanning frequency, resolution and color requirements of the IBM compatible graphics adapter being used.

When this switch is ON, the user must manually select the number of colors (8/16/64) needed by the graphics adapter being used with the COLOR SWITCH (see No. ② below). Refer to instructions accompanying the graphics adapter being used for information on how many colors the adapter can display.

② COLOR SWITCH

One of the three color configurations (8/16/64 colors) must be selected when using non-IBM compatible graphics adapters. The proper configuration can be selected by using the COLOR SWITCH as shown below. Refer to user manual accompanying the graphics adapter being used for information on how many colors the adapter can display.

COLOR MODE	COLOR SWITCH
8 colors	8
16 colors	16
64 colors	64

NOTE

This switch should be set correctly in relation to the input signal of the graphics adapter being used. Refer to user manual accompanying the graphics adapter for information on the input signal and refer to No. 3 below.

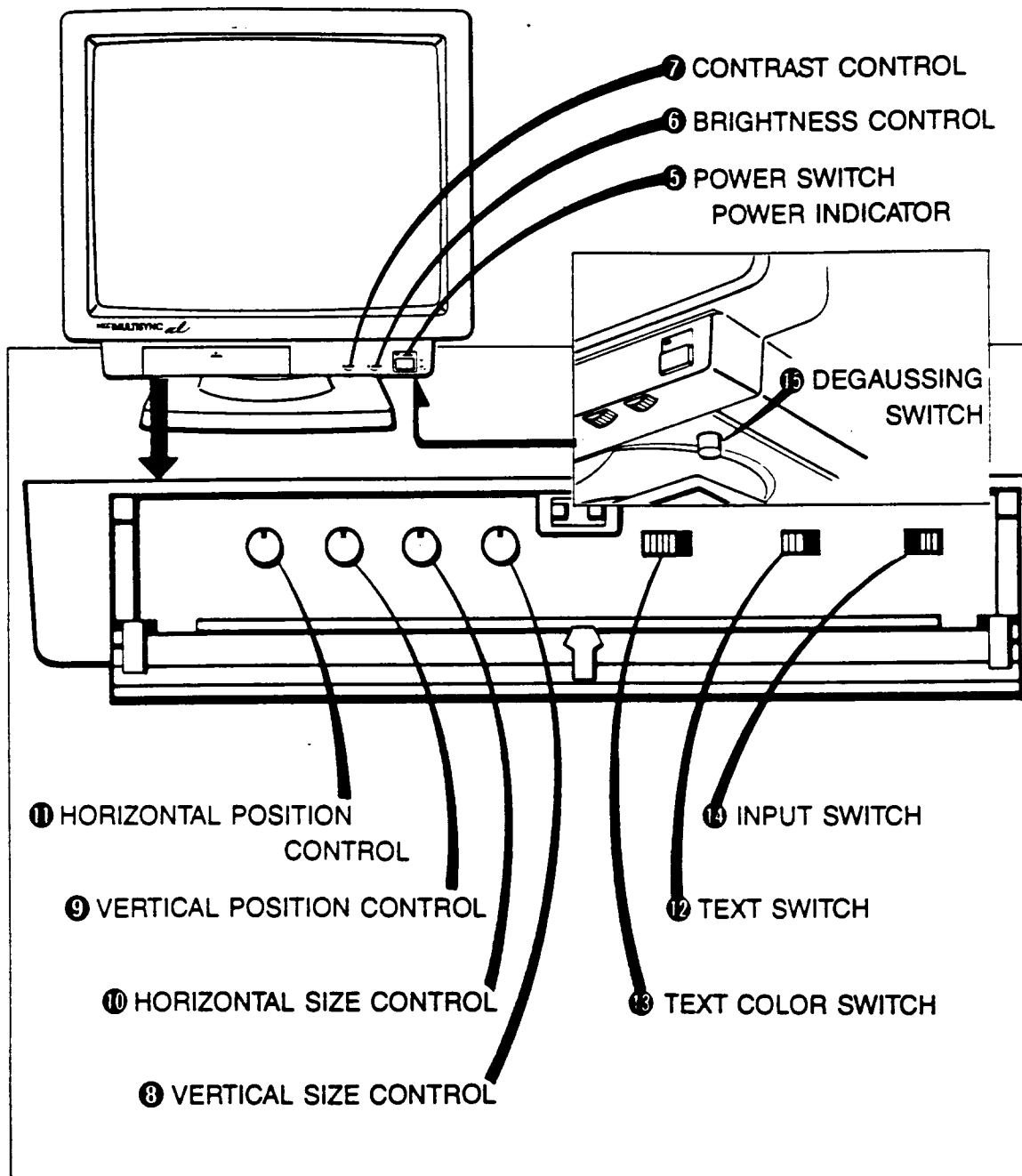
③ TTL/ANALOG SWITCH

Used to select an input video signal—either TTL or ANALOG—of the graphics adapter. It is important to determine whether the input signal of the graphics adapter being used is ANALOG or TTL prior to connecting the adapter with the MultiSync XL. Refer to instructions accompanying the graphics adapter for information on the input signal.

④ BNC INPUT VOLTAGE SWITCH

Used to select an input video voltage—either 1.0Vp-p or 0.7Vp-p—of the graphics adapter. Refer to user manual accompanying the graphics adapter for information on the input video voltage.

2. ADJUSTING THE FRONT CONTROLS



⑤ POWER SWITCH

Used to turn power ON or OFF. When the power is ON the power indicator LED is lit.

⑥ BRIGHTNESS CONTROL

Used to adjust the picture brightness of the screen.

⑦ CONTRAST CONTROL

Adjusts the display to the contrast preferred by the user.

⑧ V. SIZE CONTROL

Adjust this knob for the proper vertical size of the display. Turn the knob clockwise for a larger display; turn it counterclockwise for a smaller display.

⑨ V. POSITION CONTROL

Adjust this knob for the proper vertical position of the display. Turn the knob clockwise for a higher display position; turn it counterclockwise for a lower display position.

⑩ H. SIZE CONTROL

Adjust this knob for the proper horizontal size of the display.

⑪ H. POSITION CONTROL

Adjust this knob for the proper horizontal position of the display. Turn the knob clockwise to reposition display to the right; turn it counterclockwise to reposition to the left.

⑫ TEXT SWITCH

This switch controls the text mode of the MultiSync XL.

When it is ON, the text will appear in the color displayed by the TEXT COLOR SWITCH (See No. ⑬ below), regardless of the colors of the software program being used.

When it is OFF, the color of the software program being used will again be displayed.

NOTE

The text switch works only in the TTL mode.

⑬ TEXT COLOR SWITCH

Use this switch to select text color—green, amber, or paperwhite—when the text switch is on.

⑭ INPUT SWITCH

Use this switch to select input connector—either D-Sub or BNC.

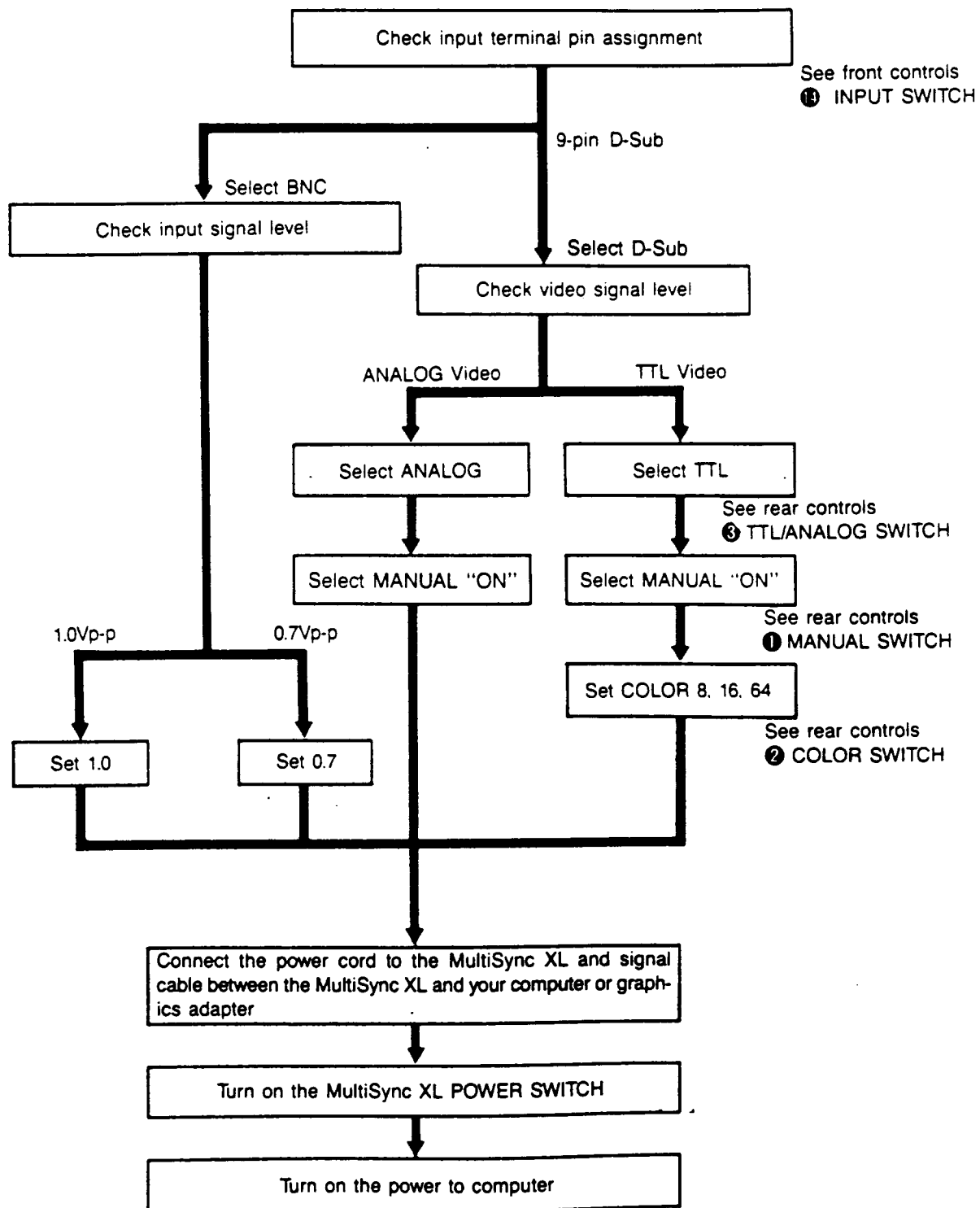
⑮ DEGAUSSING SWITCH

In order to eliminate the color impurity, push in and hold the degaussing switch for a few seconds.

CONNECTING THE MULTISYNC XL

1. WITH YOUR COMPUTER OR GRAPHICS ADAPTER

To connect the MultiSync XL with your computer or graphics adapter, refer to the diagram below.



2. WITH EGA, PGC OR COMPATIBLE ADAPTER

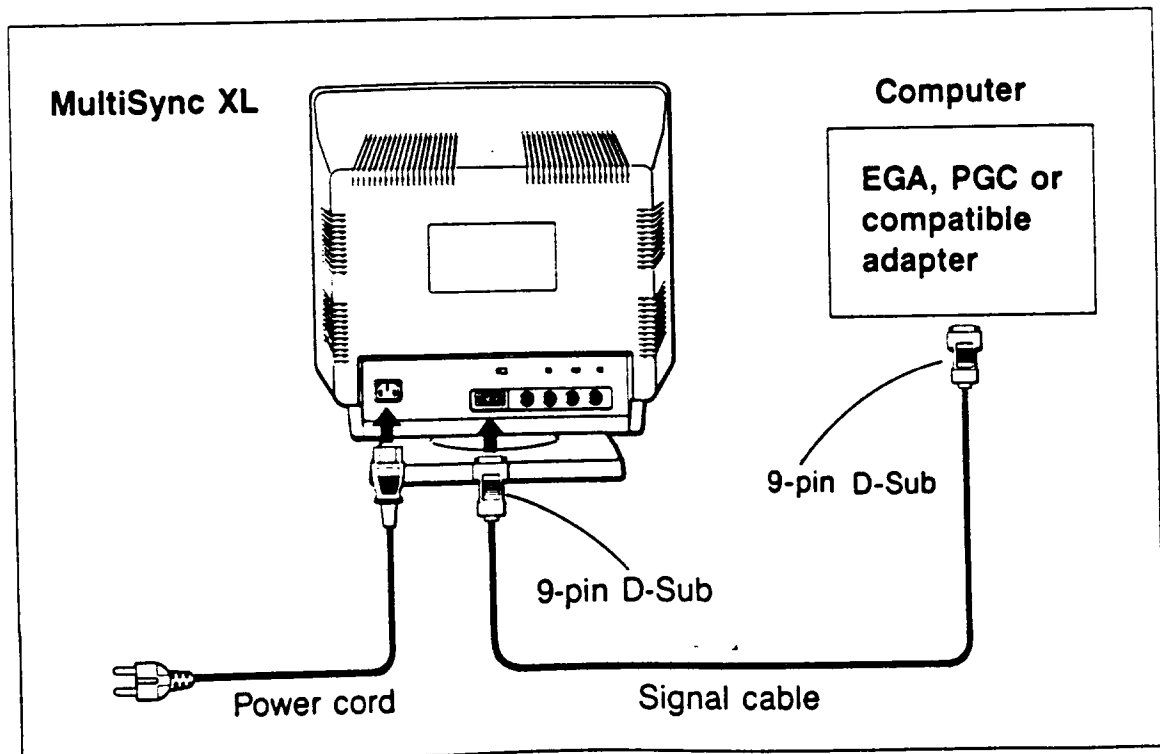
Using IBM PC, PC/XT, PC/AT or compatible computer equipped with the IBM Enhanced Graphics Adapter (EGA) or the IBM Professional Graphics Controller (PGC) or compatible adapter.

- 1 Make sure the power to the MultiSync XL and the computer is off.
- 2 Make sure the INPUT switch on the front of the MultiSync XL is at "D-Sub".
- 3 Make sure the TTL/ANALOG switch and the MANUAL switch on the rear are at appropriate position.

EGA or EGA compatible [TTL INPUT]		BNC INPUT VOLTAGE 10 3.7	COLOR 8 16 54	MANUAL OFF ON
PGC or PGC compatible [ANALOG INPUT]		BNC INPUT VOLTAGE 10 3.7	COLOR 8 16 54	MANUAL OFF ON

- 4 Connect the power cord and the signal cable to the MultiSync XL

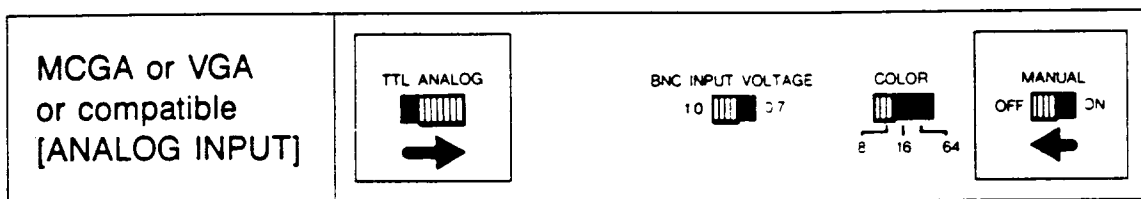
Use the signal cable with the "9-pin D-Sub to 9-pin D-Sub."



3. WITH PERSONAL SYSTEM/2 OR COMPATIBLE SYSTEM

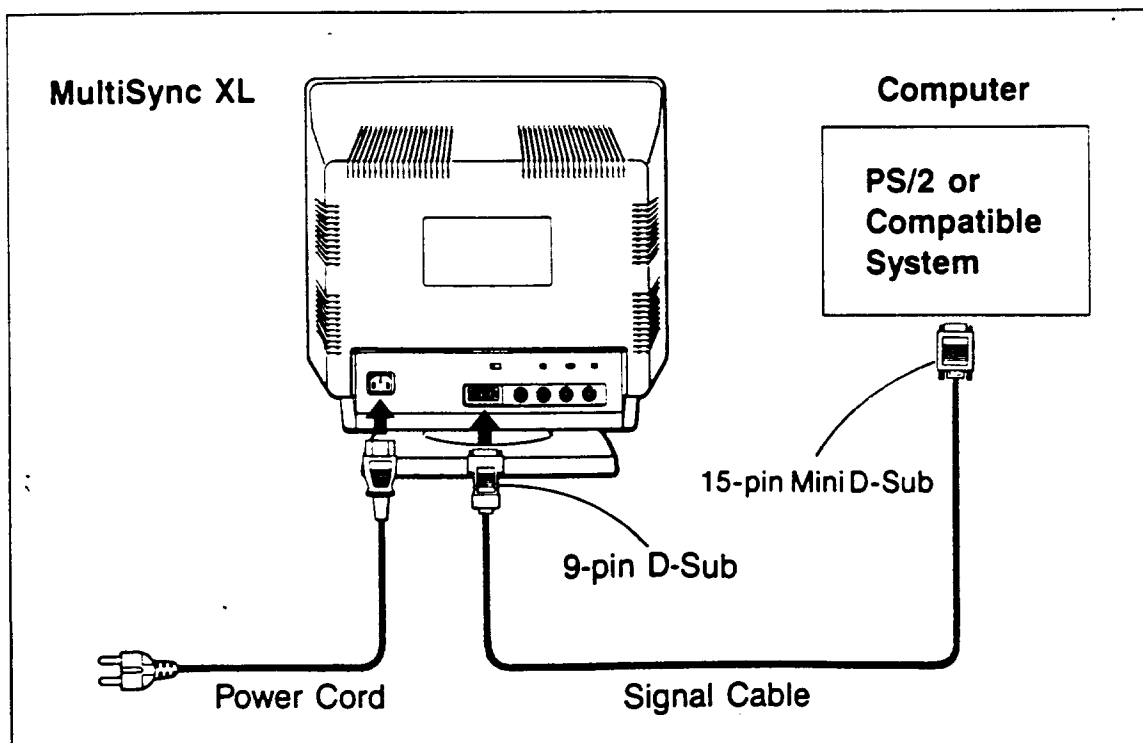
Using IBM Personal System/2 (PS/2) with Multi Color Graphics Array (MCGA) or Video Graphics Array (VGA) or compatible system.

- 1** Make sure the power to the MultiSync XL and the computer is off.
- 2** Make sure the INPUT switch on the front of the MultiSync XL is at "D-Sub".
- 3** Make sure the TTL/ANALOG switch and the MANUAL switch on the rear are at appropriate position.



- 4** Connect the power cord and the signal cable to the MultiSync XL.

Use the SIGNAL CABLE with the "9-pin D-Sub to 15-pin Mini D-Sub"

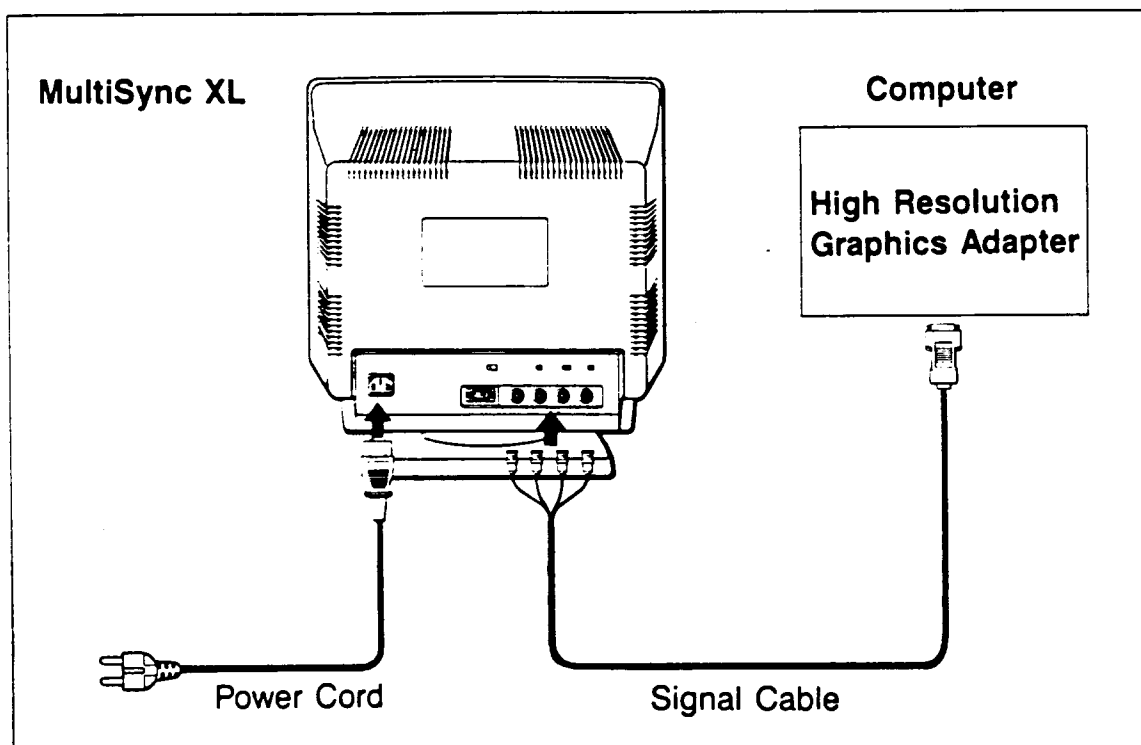


4. WITH A HIGH RESOLUTION GRAPHICS ADAPTER

Using a high resolution graphics adapter or a high resolution graphics system (ex. 960 × 720 resolution)

- 1** Make sure the power to the MultiSync XL and the computer is off.
- 2** Make sure the INPUT switch on the front of the MultiSync XL is at "BNC".
- 3** Make sure the BNC INPUT VOLTAGE switch on the rear is at appropriate position for the maximum video output voltage from your adapter. (1.0:1V peak to peak, 0.7:0.7V peak to peak)
- 4** Connect the power cord and the signal cable to the MultiSync XL.

Use the optional signal cable or the signal cable supplied with your adapter.



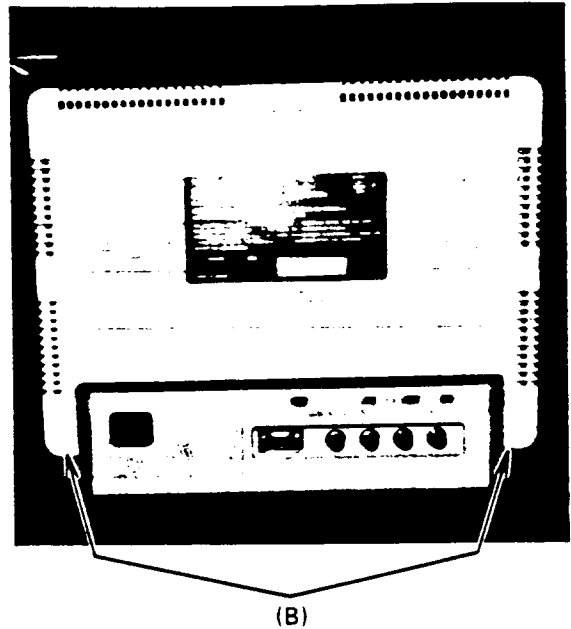
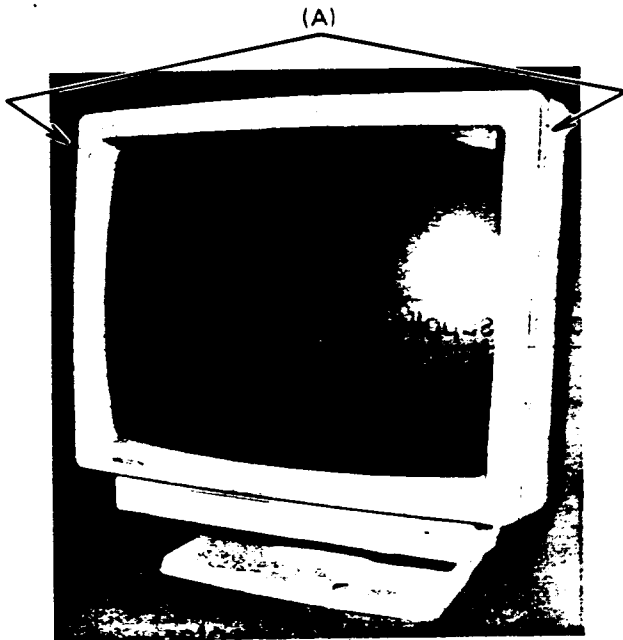
- 5** The red BNC cable should be connected to the BNC connector "R".
The green BNC cable should be connected to the BNC connector "G (/SYNC.)".
The blue BNC cable should be connected to the BNC connector "B".
The black BNC cable should be connected to the BNC connector "CS".

For the optional signal cable, please contact your authorized NEC Home Electronics dealer.

DISASSEMBLY

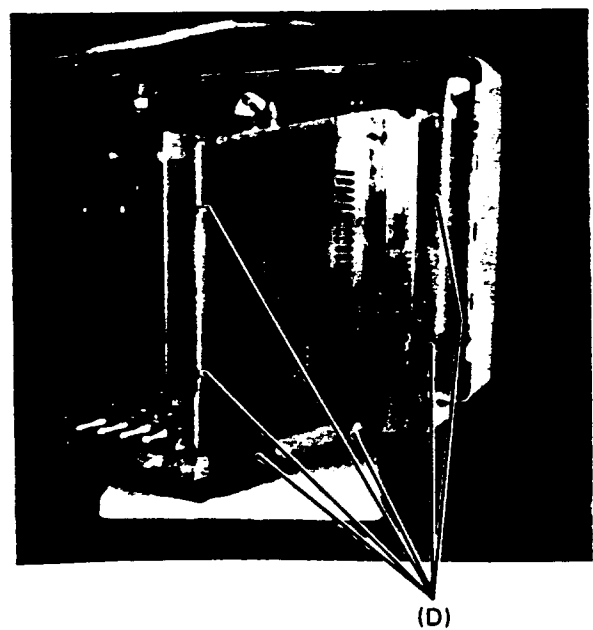
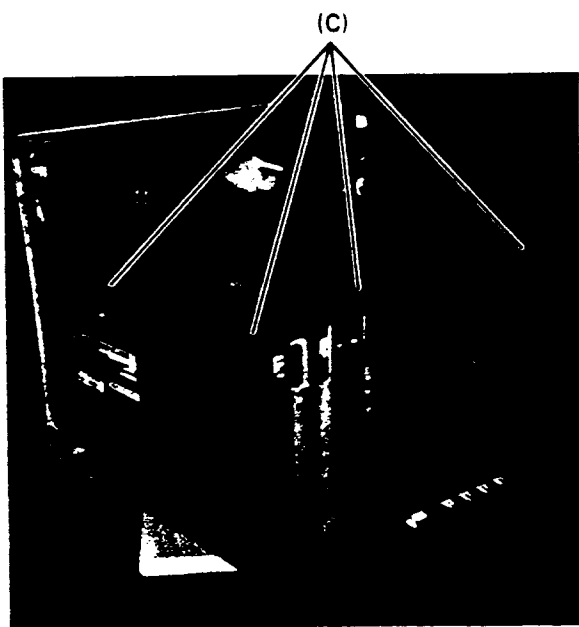
BACK COVER REMOVAL

Remove two back cover mounting screws (A) and (B) then take off back cover.



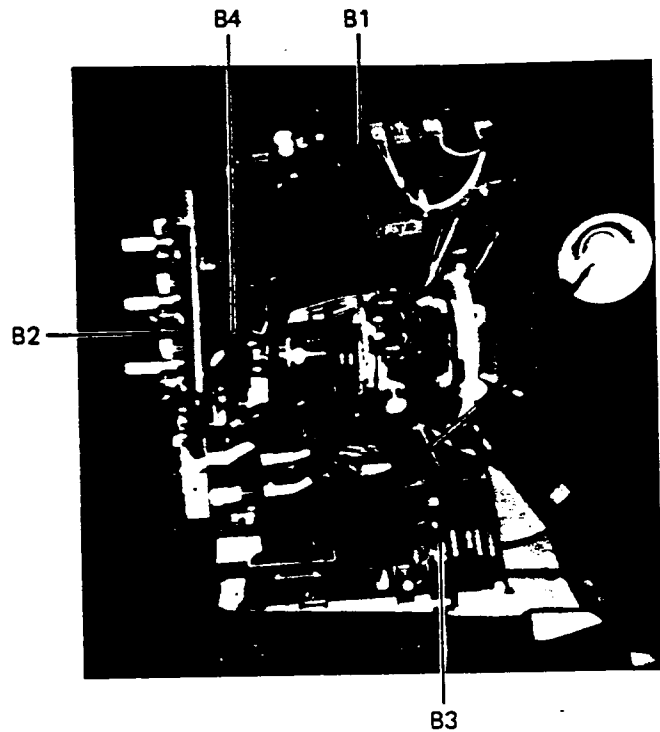
CASE SHIELDING (TOP) REMOVAL

Remove two case, shielding (TOP) mounting screws (C) and (D) then take off case shielding (TOP).



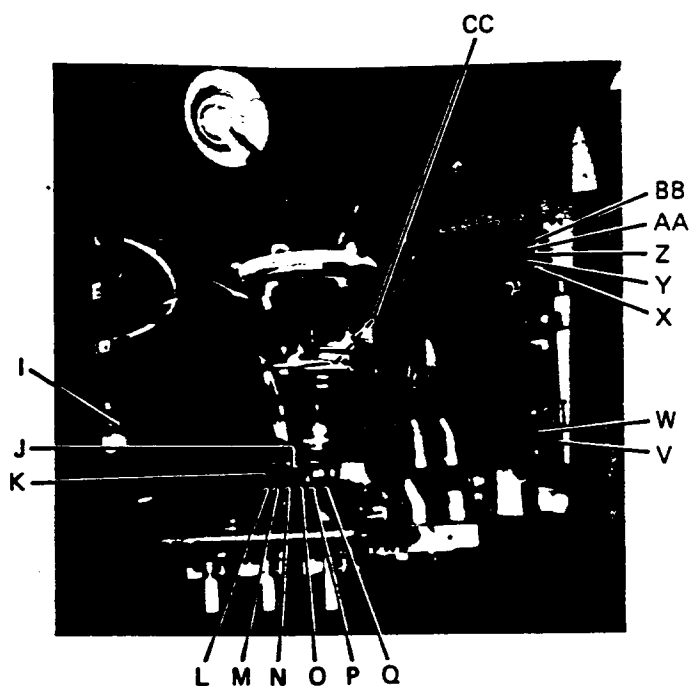
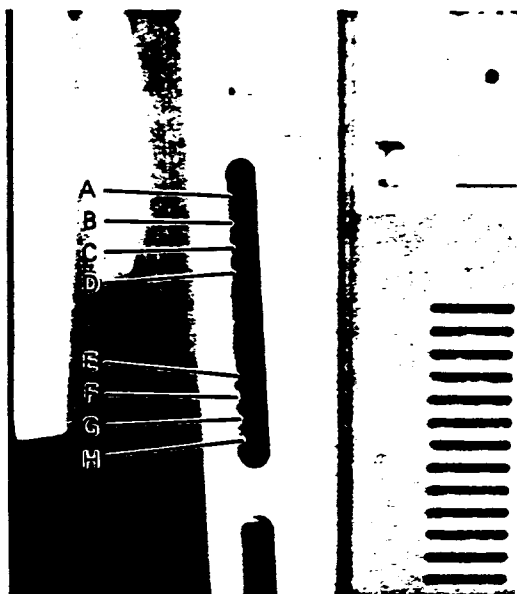
PART LOCATIONS

BOARD LAYOUT



BOARDS

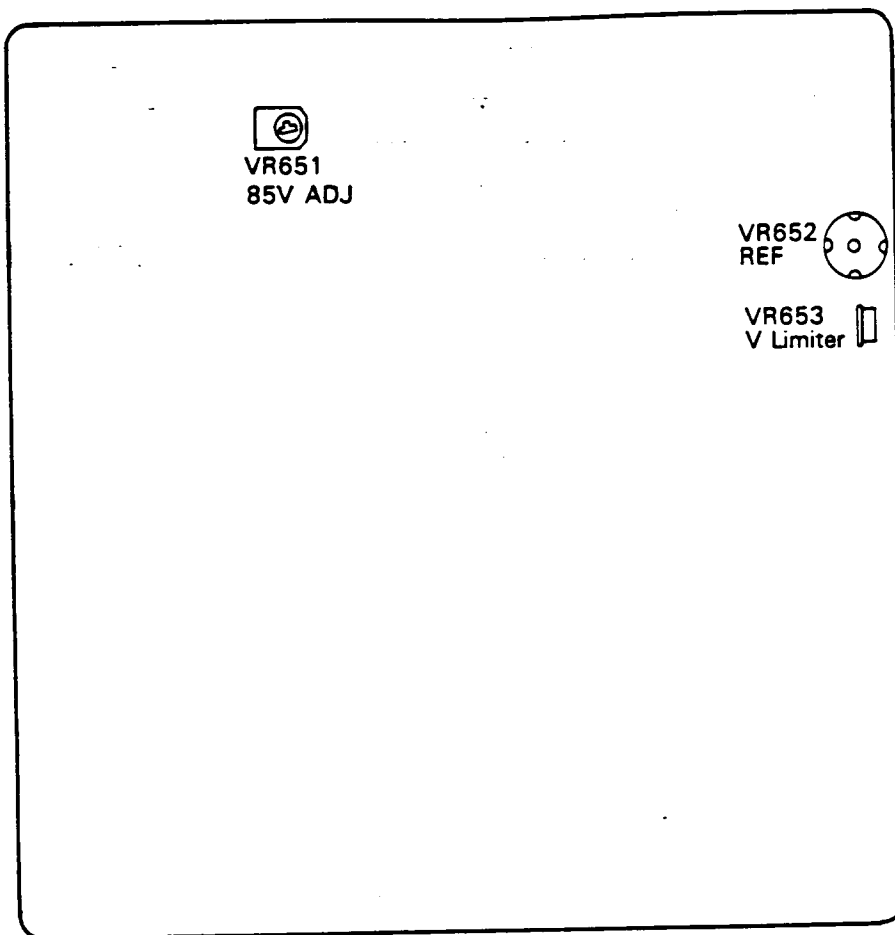
B1	SW. REG. PWB ASSY	PWE-199
B2	VIDEO PWB ASSY	PWE-174
B3	DEF PWB ASSY	PWE-173
B4	CRT PWB ASSY	PWE-177



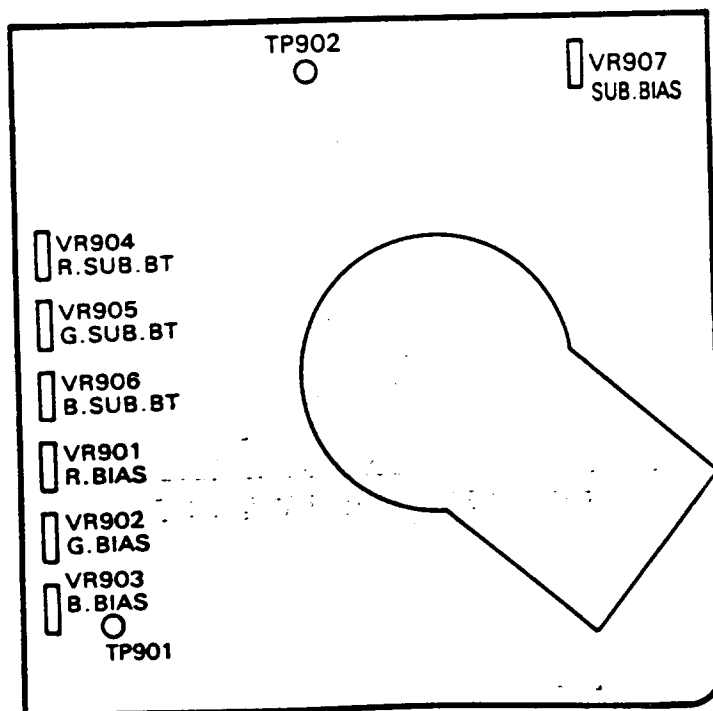
ADJUSTMENT CONTROLS

A	V. HOLD (VR401)	P	G. BIAS (VR902)
B	V. SUB HEIGHT (1) (VR440)	Q	B. BIAS (VR903)
C	V. SUB HEIGHT (2) (VR441)	R	G. GAIN (VR702)
D	V. SIZE LIMITER (VR443)	S	SUB. CONT (VR704)
E	SIDE-PIN (VR470)	T	B. GAIN (VR703)
F	V. BIAS (VR402)	U	R. GAIN (VR701)
G	V. LIN (S) (VR404)	V	SCREEN
H	V. LIN (C) (VR403)	W	FOCUS
I	CI VOLTAGE LIMITER (VR653)	X	SUB H. CENTER 2(27~35KHz)(VR504)
J	+6V ADJ (VR509)	Y	SUB H. CENTER 3(20~27KHz)(VR505)
K	SUB BIAS (VR907)	Z	SUB H. CENTER 1(42KHz~)(VR503)
L	R. SUB BRIGHT (VR904)	AA	H. HOLD 2 (27KHz) (VR502)
M	G. SUB BRIGHT (VR905)	BB	H. HOLD 1 (42KHz) (VR501)
N	B. SUB BRIGHT (VR906)	CC	H. SIZE CONTROL (VR510)
O	R. BIAS (VR901)		

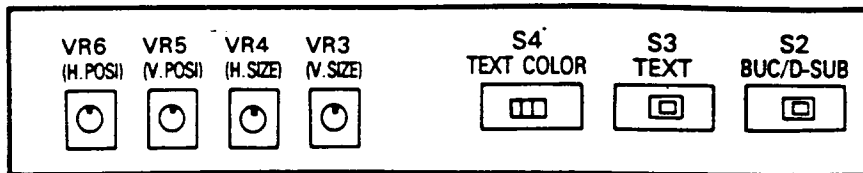
ADJUSTMENT CONTROLS LAYOUT



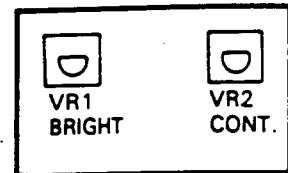
PWE-199 SW. PEG PWB ASSY



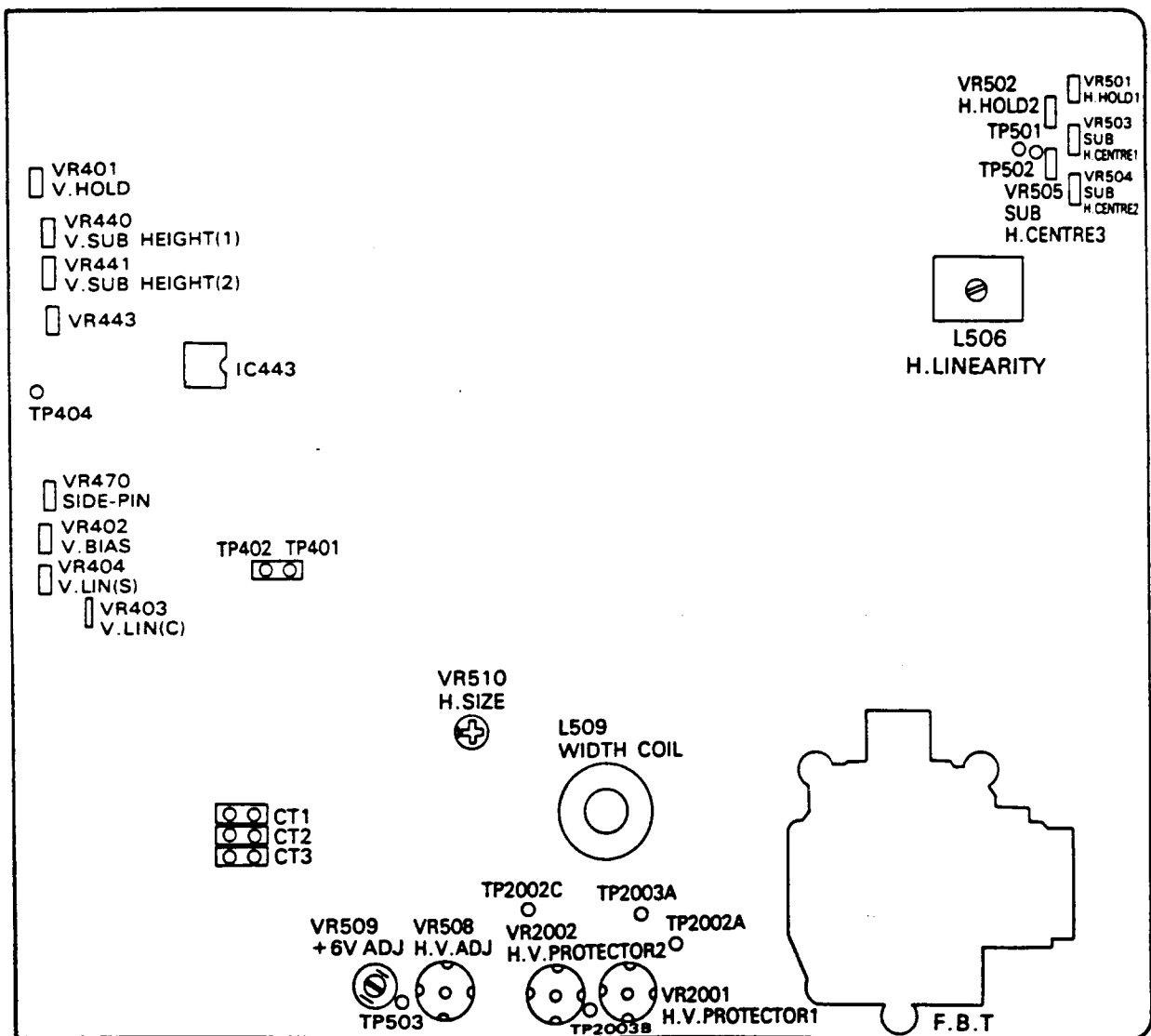
PWE-177A
CRT PWB ASSY



**PWE-173C
CONTROL PWB ASSY**



**PWE-173B
CONTROL PWB ASSY**



PWE-173A DEF PWB ASSY

  
VR701 VR702 VR703
R.GAIN G.GAIN B.GAIN


VR704
SUB CONT


Sw801


Sw802

PWE-174 VIDEO PWB ASSY

ALIGNMENT PROCEDURE

Adjustment conditions and Precautions

1. Power supply voltage: AC220–240V, 50/60Hz
2. Warm up time
The display must be on for at least 20 minutes before starting alignments.
This is especially critical in color temperature and white balance adjustments.
3. Signals
Video: Analog 0.7 Vp-p, 75 Ω , positive
analog sync. on green
video: 0.7 Vp-p
synchronizing: 0.3 Vp-p
Synchronizing: TTL level negative/positive
separate/composite
Scanning Frequency: H 21.8 kHz ~ 50 kHz
V 56 Hz ~ 80 Hz
Unless otherwise specified, adjust at signal (48.5 kHz).
Unless otherwise specified, input at D-sub 9 Pin.
Unless otherwise specified, adjust at separate sync.

1. SW. REG. UNIT

- 1-1. +B₁ (VR651) +85V LINE (K1 — Gnd Voltage)
Adjust VR651 to be 85 VDC
 - 1-2. +B_H (VR652) High Voltage control
This control is permanently sealed at factory.
Do not attempt to readjust.
 - 1-3. +B_{LIM} (VR653) V. limit (C1 — Gnd Voltage)
Remove C-connector.
Adjust VR653 to be 122 VDC.
- Note: Do not operate the SW. Reg. unit itself without any load.

2. Main Adjustments

2-1) Settings of the Controls

VR2 Contrast: Max.
VR1 Brightness: Position where the back resters are latent.
VR3 V. size: Center click position
VR4 H. size: Center click position
VR5 V. posi.: Center
VR6 H. posi.: Center click position
VR508 H.V. ADJ: Position where the high-voltage protector does not operate.
SW3 TEXT: OFF
SW2 BNC ↔ D-sub: D-sub
SW802 MANUAL: OFF
SW801 ANALOG/TTL: ANALOG

2-2) Adjustment of Raster Centering

Adjust the Screen VR and Brightness VR so that the back rasters are faintly illuminated, then connect the "CT" connector to the position that enables the back rasters to be centered on the CRT screen.

CT1: No correction

CT2: Little correction

CT3: Much correction

* By changing the orientation in which the connector is inserted, the displacement direction of the screen can be changed from side to side.

2-3) Adjustment of Horizontal Oscillation, Horizontal Width, Horizontal Linearity, and Side Pincushion

(H. HOLD, H. WIDTH, H. LINEARITY, and SIDE PINCUSHION)

(1) H. HOLD

- a) Create a short-circuit between TP501 and TP502.
- b) During reception of Signal 2 (42 kHz), use H. HOLD 1 VR501 to adjust the image into a single screen.
- c) During reception of Signal 3 (27 kHz), use H. HOLD 2 VR502 to adjust the image into a single screen.

(2) H. WIDTH [Receive Signal 1 (48.5 kHz)]

Perform centering of H. SIZE (VR4), then use SUB H. SIZE (VR510) to adjust H. WIDTH to 350mm.

(3) H. LINEARITY [Signal 1 crosshatch pattern]

Visually check H. LINEARITY, then use L506 to adjust it if necessary. Avoid rotating L506 unless absolutely necessary.

(4) SIDE PINCUSHION [Receive Signal 1 (48.5 kHz) All white pattern]

Use VR470 so that the optimum SIDE PINCUSHION is obtained. When SIDE PINCUSHION is set to its optimum value, the right and left edges of the screen each form a straight line. Because each of the four settings above will affect the other three settings, repeated confirmation is required.

(5) H. POSITION (Centering adjustment of rasters)

- a) During input of Signal 1 (48.5 kHz), use SUB. H. CENTER 1 VR503 to adjust the screen to center.
- b) During input of Signal 4 (31.5 kHz), use SUB. H. CENTER 2 VR504 to adjust the screen to center.
- c) During input of Signal 5 (21.85 kHz), use SUB. H. CENTER 3 VR505 to adjust the screen to center.

During the signal input of steps a), b), and c) above, make sure that the screen is centered.

**2-4) Adjustment of Vertical Linearity, Vertical Height, and Vertical Bias
(V. LINEARITY, V. SIZE, and V. BIAS)**

(1) V. LINEARITY

During reception of the crosshatch pattern of Signal 1 (48.5 kHz, 60 Hz), use VR404 (V. LIN (S)) fully to the right.

(A) Top/Bottom Adjustment

Adjust VR403 (V. LIN (C)) so that the top and bottom linearity is equal.

(B) Top/Center/Bottom Adjustment

a) If the center is elongated, rotate VR404 slightly to the left until the elongation is corrected (but do not rotate it fully to the point where top elongation occurs).

b) Adjust VR403 so that the top and bottom linearity is equal.

(C) Confirmation

a) Repeat steps a) and b) of (B) until the linearity is approximately 6%.

b) Receive Signal 7 (31.5 kHz, 70 Hz, 350 lines), and check that the linearity is within 8%.

(D) Compensation

If the linearity is not within 8%, receive Signal 1.

For top elongation: Rotate VR403 slightly to the right until top elongation is eliminated, then perform (B) and (C).

For bottom elongation: Rotate VR403 slightly to the left until top elongation is eliminated, then perform (B) and (C).

For center elongation: Rotate VR404 slightly to the left until center elongation is corrected, then perform b) and c) of (B).

(E) Confirmation

Based on the reception of Signals 1 and 7, check that the linearity is within 8%.

(2) V. SIZE

Set the MANUAL switch (SW802) to ON, and perform centering of VR3 (V. SIZE).

a) Receive Signal 1 (60 Hz), then use VR440 to adjust Signal 1 to 260mm.

b) Receive Signals 2, 4, and 9, then check that the back rasters are practically filling the screen.

c) Set the MANUAL switch to OFF.

Receive Signal 6 (60 Hz, 480 lines), then use VR441 to adjust Signal 6 to 240mm.

d) Receive Signal 4, and check that it is $220\text{mm} \pm 7\text{mm}$.

Receive Signal 7, and check that it is $230\text{mm} \pm 7\text{mm}$.

Receive Signal 8, and check that it is $250\text{mm} \pm 7\text{mm}$.

*When receiving Signal 8, be sure to set V. MODE to LOW.

(3) V. BIAS

Receive Signal 1, then use VR402 (V. BIAS) to adjust Signal 1 to $13.5\text{V} \pm 0.2\text{V}$.

The measurement point is the VDY 3 terminal of the deflection yoke (the terminal connected to the yellow lead wire of the deflection yoke).

Set V. POSITION (VR5) to the position where the screen is centered.

Set V. SIZE (VR3) to the center position.

2-5) Adjustment of Video Amplitude and White Balance

NOTE: Before performing this adjustment, make sure that the VIDEO signal is as follows:

VIDEO signal: Analog 0.7 Vp-p

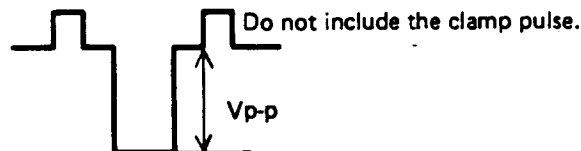
(1) Default Settings of the Adjustment VRs

VR701 ~ VR703	GAIN VR	Fully left
VR704	SUB CONT VR	Fully right
VR901 ~ VR903	BIAS VR	Fully left
VR904 ~ VR906	SUB BRIGHT VR	Fully right
VR907	SUB BIAS VR	Fully right
Screen VR		Fully left

(2) Video Contrast Adjustment

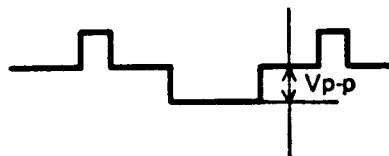
2-1) GAIN VR Adjustment: Signal 10 (Window white signal)

- Receive the window pattern of Signal 10. (A video range of $1/3 \sim 1/2$ H x $1/2$ V within the range where the ABL circuit is not applied despite maximum Contrast is desirable.)
- Rotate the Contrast VR fully to the right.
Rotate the Brightness VR fully to the left.
- Adjust VR701, VR702, and VR703 so that the R OUT, G OUT, and B OUT terminals on the VIDEO PWB are each set to 45 Vp-p. After adjustment, confirm the Vp-p value of each terminal and perform readjustment if necessary.



2-2) SUB CONT VR Adjustment

- Rotate the Contrast VR fully to the left.
Rotate the Brightness VR fully to the left.
- Adjust VR704 so that G OUT on the VIDEO PWB becomes 10 Vp-p. After adjustment, confirm that both R OUT and B OUT are within the range of $10 \text{ Vp-p} \pm 0.5 \text{ Vp-p}$.



If the R, B OUT is not within the limits mentioned above, adjust finely VR704 so the R, G, B OUT is within $10 \text{ Vp-p} \pm 0.5 \text{ Vp-p}$.

(3) Cutoff Adjustment (All-black signal)

Rotate the Contrast VR fully to the left.

- Perform the two steps below in the (1) → (2) sequence.
 - Create a short-circuit between TP901 and TP902.
 - Create a short-circuit between TP401 and TP402.
- Turn the Screen Control clockwise gradually and set to the position at which a single horizontal color appears faintly.
Use this color as the reference color for the cutoff adjustment.
- Turn the Bias Controls for a color other than the reference color clockwise until it is as bright as the reference color.

- d) Sequentially cancel the short-circuit created between TP401 and TP402 and between TP901 and TP902.

NOTE: The darker the environment where cutoff adjustment is performed, the better white tracking can be achieved later. Be sure to perform cutoff adjustment in as dark a place as possible.

(4) Adjustment of SUB. BRIGHT VR

- a) Receive Signal 1 (48.5 kHz) H gray scale (16 gradations).
- b) Rotate the Contrast VR fully to the right.
Rotate the Brightness VR fully to the left.
- c) Use the SUB. BRIGHT VR (VR905) to adjust the 4/16th grade so that it is faintly illuminated.
After this step, do not change the setting of VR905.
- d) Rotate the Contrast VR fully to the left.
Rotate the Brightness VR fully to the right.
- e) Receive all-black signals.
- f) Rotate VR904 and VR906 to adjust the back rasters until they are all white.

(5) Fine Adjustment of White Balance

Color temperature: Center $X = 0.260$
 $Y = 0.275$

Hue: A slightly bluish white.

- a) Receive Signal 1 (48.5 kHz) H gray scale (16 gradations). (the window pattern should be in the range where the ABL circuit is not applied.)
- b) Rotate the Contrast VR fully to the left.
Rotate the Brightness VR fully to the right.
Check that the white balance is satisfactory at each gradation. If the white balance is not satisfactory, perform fine adjustment of the SUB. BRIGHT VRs (VR904 and VR906).

NOTE: Do not change the setting of VR905 (GSUB. BRIGHT).

- c) Rotate the Contrast VR fully to the right.
Rotate the Brightness VR to the position where no back rasters appear.
Check that the white balance is satisfactory at each gradation. If the white balance is not satisfactory, perform fine adjustment of the GAIN VRs (VR701 and VR703).

NOTE: Do not change the setting of VR702 (G GAIN).

If the back rasters and the white balance at each gradation are not satisfactory, perform fine adjustment of the SUB. BRIGHT VRs (VR904 and VR906).

NOTE: Do not change the setting of VR905 (G SUB. BRIGHT).

(6) Focus Adjustment: Use Signal 1

[All-white signals or those with four dots missing]

- a) Rotate the Contrast VR fully to the right.
Rotate the Brightness VR to an appropriate position.
- b) If the focus is markedly weak and if the moire effect appears, rotate the SUB BIAS VR (VR907) fully to the left and perform readjustment of (3), (4), and (5).

NOTE: After turning VR907 fully to the left and performing readjustment, confirm the following:

All-white signals of Signal 1 (48.5 kHz) are being received.

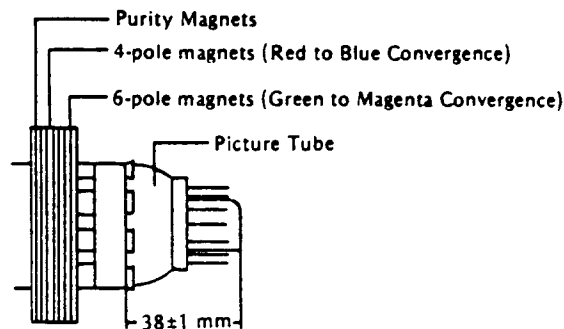
Brightness VR: Rotated fully to the left (MIN)

Contrast VR: Rotated fully to the right (MAX)

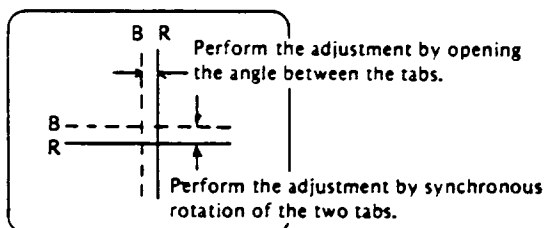
Confirm that the entire screen is free from any distortion.

(7) Purity Adjustment

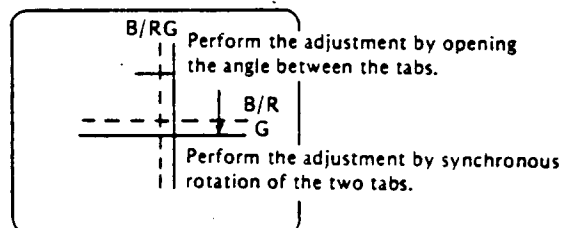
- 1) Be sure that the display is not being exposed to any external magnetic fields.
- 2) Ensure that the spacing between the Purity, Convergence Magnet, (PCM), assembly and the CRT stem is $38 \text{ mm} \pm 1 \text{ mm}$. (See below diagram)
- 3) Produce a complete, red pattern on the display. Adjust 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 in an opposite direction but at the same time to obtain the same angle between the two tabs, which should be approximately 180°
- 4) Check the complete blue and complete green patterns to observe their respective color purity. Make minor adjustments if needed.



Purity, Convergence Magnet Assembly (PCM)



Red to Blue Convergence
(Magenta)



Green to Magenta Convergence
(White)

(8) Convergence Adjustment

- 1) Produce a magenta crosshatch on the display.
- 2) Adjust the focus for the best overall focus on the display.
Also adjust the brightness to the desired condition.
- 3) Vertical red and blue lines are converged by varying the angle between the two tabs of the 4-pole magnets on the PCM assembly. (See above diagrams)
- 4) Horizontal red and blue lines are converged by varying the two tabs together, keeping the angle between them constant.
- 5) Produce a white crosshatch pattern on the display.
- 6) Vertical green and magenta lines are converged by varying the angle between the two tabs of the 6-pole magnets.
- 7) Horizontal green and magenta lines are converged by varying the two tabs together, keeping the angle between them constant.

TIMING OF REFERENCE SIGNALS																
①	LVG-1600		④	⑤	DATA Signal 1 48.5 kHz				DATA Signal 2 42 kHz							
	②	③			4	0.	0	0	0	0	F	3	4.	4	0	F
0	CLOCK	DOT CLOCK FREQUENCY	0	MHz												
1	H FREQ	HORIZONTAL FREQUENCY	1	KHz												
2	V FREQ	VERTICAL FREQUENCY	2	Hz												
3	CH	CHARACTOR CELL SIZE	3	DOT												
4	Nht	4	4	CHR												
5	Nht	5	5	CHR												
6	Nhsp	6	6	CHR												
7	Vpw-Hpw	7	7	V (LASTER) H (CHR)												
8	Nadj	8	8	H (LASTER)												
9	Nvt	9	9	LINE												
10	Nvd	10	10	LINE												
11	Nvsp	11	11	LINE												
12	Nvsadj	12	12	H (LASTER)												
13	INT	13	13													
14	OUT	14	0	Sync NEGA	Hsync	Sync OFF	TTL	RZ								
			1	POS	H/Vsync	Sync ON	ANA	NRZ								
					F	0	1	0	1	1	F	0	1	1	1	1

TIMING OF REFERENCE SIGNALS

LVG-1600				④	⑤	DATA Signal 3 27 kHz						DATA Signal 4 PS-II MODE 2					
①	②	③	2			2.	1	4	0	F	2	8.	6	1	0	F	
0	CLOCK	DOT CLOCK FREQUENCY	0	MHz													
1	H FREQ	HORIZONTAL FREQUENCY	1	KHz	2	7.	0	0	0	F	3	1.	4	7	4 F		
2	V FREQ	VERTICAL FREQUENCY	2	Hz	7	5.	0	0	0	F	7	0.	0	9	5 F		
3	CH	CHARACTOR CELL SIZE	3	DOT	/	/	H	0	V	9	/	/	H	9	V 0		
4	Nht	4	4	CHR	/	/	F	0	8	2	/	/	F	1	0 1		
5	Nht	5	5	CHR	/	/	F	0	6	4	/	/	F	0	8 0		
6	Nhsp	6	6	CHR	/	/	F	0	6	7	/	/	F	0	8 3		
7	Vpw-Hpw	7	7	V (LASTER) H (CHR)	/	/	V	5	H	1	/	/	V	2	H 2		
8	Nadj	8	8	H (LASTER)	/	/	/	/	0	0	/	/	/	/	0 9		
9	Nvt	9	9	LINE	/	/	F	0	4	0	/	/	F	0	4 4		
10	Nvd	10	10	LINE	/	/	F	0	3	2	/	/	F	0	4 0		
11	Nvsp	11	11	LINE	/	/	F	0	3	7	0	0	F	0	4 1		
12	Nvsadj	12	12	H (LASTER)	/	/	/	/	0	8	/	/	/	/	0 3		
13	INT	13	13		/	/	/	/	0	0	/	/	/	/	0 0		
14	OUT	14			F	0	1	1	1	1	F	1	0	0	1 1		

TIMING OF REFERENCE SIGNALS																					
①	LVG-1600		④	⑤	DATA					DATA											
	②	③			Signal 5 EGA					Signal 6 PS-II MODE 17											
0	CLOCK	DOT CLOCK FREQUENCY	0	MHz						1	6.	3	7	0	F	2	5.	4	3	0	F
1	H FREQ	HORIZONTAL FREQUENCY	1	KHz						2	2.	0	0	3	F	3	1.	4	7	3	F
2	V FREQ	VERTICAL FREQUENCY	2	Hz						5	9.	9	5	3	F	5	9.	9	4	8	F
3	CH	CHARACTOR CELL SIZE	3	DOT						/	/	H	8	V	0	/	/	H	8	V	0
4	Nht	4	4	CHR						/	/	F	0	9	3	/	/	F	1	0	1
5	Nht	5	5	CHR						/	/	F	0	8	0	/	/	F	0	8	0
6	Nhsp	6	6	CHR						/	/	F	0	8	0	/	/	F	0	8	3
7	Vpw-Hpw	7	7	V (LASTER) H (CHR)						/	/	V	3	H	0	/	/	V	2	H	2
8	Nadj	8	8	H (LASTER)						/	/	/	/	0	6	/	/	/	/	0	5
9	Nvt	9	9	LINE						/	/	F	0	3	6	/	/	F	0	5	2
10	Nvd	10	10	LINE						/	/	F	0	3	5	/	/	F	0	4	8
11	Nvsp	11	11	LINE						/	/	F	0	3	5	/	/	F	0	4	9
12	Nvsadj	12	12	H (LASTER)						/	/	/	/	0	1	/	/	/	/	0	1
13	INT	13	13							/	/	/	/	0	0	/	/	/	/	0	0
14	OUT	14								F	1	0	0	0	1	F	0	0	0	1	0

TIMING OF REFERENCE SIGNALS																			
LVG-1600			④	⑤	DATA						DATA								
①	②	③			Signal 7 PS-II MODE 15						Signal 8 PGA 400								
0	CLOCK	DOT CLOCK FREQUENCY	0	MHz	2	5.	4	3	0	F	2	5.	1	1	0	F			
1	H FREQ	HORIZONTAL FREQUENCY	1	KHz	3	1.	4	7	3	F	3	0.	4	7	3	F			
2	V FREQ	VERTICAL FREQUENCY	2	Hz	7	0.	0	9	5	F	5	9.	9	8	7	F			
3	CH	CHARACTOR CELL SIZE	3	DOT	/	/	H	8	V	0	/	/	H	8	V	0			
4	Nht	4	4	CHR	/	/	F	1	0	1	/	/	F	1	0	3			
5	Nht	5	5	CHR	/	/	F	0	8	0	/	/	F	0	8	0			
6	Nhsp	6	6	CHR	/	/	F	0	8	3	/	/	F	0	8	0			
7	Vpw-Hpw	7	7	V (LASTER) H (CHR)	/	/	V	2	H	2	/	/	V	2	H	4			
8	Nadj	8	8	H (LASTER)	/	/	/	/	0	9	/	/	/	/	0	8			
9	Nvt	9	9	LINE	/	/	F	0	4	4	/	/	F	0	5	0			
10	Nvd	10	10	LINE	/	/	F	0	3	5	/	/	F	0	4	0			
11	Nvsp	11	11	LINE	/	/	F	0	4	3	/	/	F	0	4	4			
12	Nvsadj	12	12	H (LASTER)	/	/	/	/	0	1	/	/	/	/	0	1			
13	INT	13	13		/	/	/	/	0	0	/	/	/	/	0	0			
14	OUT	14			F	0	0	0	1	1	F	1	1	0	1	1			

TIMING OF REFERENCE SIGNALS																
LVG-1600			④	⑤	DATA Signal 11 PGA 480						DATA Signal 12 60 Hz, 40 kHz					
①	②	③			2	5.	1	1	0	F	1	6.	3	7	0	F
0	CLOCK	DOT CLOCK FREQUENCY	0	MHz	3	0.	4	7	3	F	2	2.	0	0	3	F
1	H FREQ	HORIZONTAL FREQUENCY	1	KHz	5	9.	9	8	7	F	5	9.	9	5	3	F
2	V FREQ	VERTICAL FREQUENCY	2	Hz	/	/	H	8	V	0	/	/	H	8	V	0
3	CH	CHARACTOR CELL SIZE	3	DOT	/	/	0	1	1	0	/	/	0	1	1	0
4	Nht	4	4	CHR	/	/	F	1	0	3	/	/	F	0	9	3
5	Nht	5	5	CHR	/	/	F	0	8	0	/	/	F	0	8	0
6	Nhsp	6	6	CHR	/	/	F	0	8	0	/	/	F	0	8	0
7	Vpw-Hpw	7	7	V (LASTER) H (CHR)	/	/	V	2	1	H	4	/	V	1	1	0
8	Nadj	8	8	H (LASTER)	/	/	/	/	0	8	/	/	/	/	0	6
9	Nvt	9	9	LINE	/	/	F	0	5	0	/	/	F	0	3	6
10	Nvd	10	10	LINE	/	/	F	0	4	8	/	/	F	0	3	5
11	Nvsp	11	11	LINE	/	/	F	0	4	8	/	/	F	0	3	5
12	Nvsadj	12	12	H (LASTER)	/	/	/	/	0	1	/	/	/	/	0	3
13	INT	13	13		/	/	/	/	0	0	/	/	/	/	0	0
14	OUT	14	14		F	1	1	0	1	1	F	0	0	0	1	0

① Indication address

② Abbreviation

③ Description

④ Contents

⑤ Unit

Description of each address

add.	Description	Condition
0	Total dots	05.000 ~ 40.000 MHz, 5- or 6-digit
1	Horizontal Frequency	Reference data, 5-digit
2	Vertical Frequency	Reference data, 5-digit
3	Character cell SIZE	(H direction) x (V direction), 02 to 16 01 to 32 each 2-digit
4	Total number of characters, horizontal	255 characters or less, 3-digit
5	Number of indication characters, horizontal	N_{ht} or less, 3-digit
6	Horizontal synchronization position	N_{ht} or less, 3-digit
7	Vertical/horizontal pulse width	V: 1 to 16 H/H:1 to 15 chr.
8	Total raster adjustment	31 H or less
9	Total number of characters, vertical	127 rows or less, 3-digit
10	Number of indication characters, vertical	N_{vt} or less
11	Vertical synchronization position	N_{vt} or less
12	Vertical indication position correction	0 ~ 16 H (Synchronization position moves in the form of $N_{vsp} + N_{vsadj}$)
13	Interlace select	00: non-interlace 02: interlace + video 01: interlace
14	Output condition setting	

Likewise, when significant data is a single digit, do not forget to enter 0.

DATA FORMAT FOR USING Quantum 801C

TIMING PARAMETERS:

Real Time Parameters		Signal No.	Description
Dot Rate	MHz	1.	H: 48.48 kHz
Horizontal Rate	kHz	2.	H: 42.00 kHz
Vertical Rate	Hz	3.	H: 27.00 kHz
		4.	H: 31.47 kHz V: 70 Hz (400 Lines)
Non-Real Time Parameters		5.	H: 22.00 kHz
Horizontal	Vertical	6.	H: 31.47 kHz V: 60 Hz (480 Lines)
Dots/Character	Lines/Character	7.	H: 31.47 kHz V: 70 Hz (350 Lines)
Total Characters	Total Lines	8.	H: 30.48 kHz (400 Lines)
Displayed Characters	Displayed Rows Lines	9.	H: 31.47 kHz V: 50 Hz (350 Lines)
Drive Delay	Drive Delay (Rows)	10.	H: 48.48 kHz WINDOW PATTERN
Drive Width	Drive Width (Lines)		
	Step Width		

OPTION PARAMETERS

Signal Gating

Composit Sync.	OP 1.—0=off 1=on
Vertical Step	OP 2.—0=off 1=on
Horizontal Drive	OP 3.—0=off 1=on
Vertical Drive	OP 4.—0=off 1=on

Signal Polarity

Composite Sync.	OP 5.—0=non-inverted 1=inverted
Vertical Step	OP 6.—0=non-inverted 1=inverted
Horizontal Drive	OP 7.—0=non-inverted 1=inverted
Vertical Drive	OP 8.—0=non-inverted 1=inverted
Video	OP 13.—0=non-inverted/positive 1=inverted/positive 2=non-inverted/negative 3=inverted/negative

Interlace Mode

OP 9.—0=non-interlace 1=interlaced sync only 3=interlaced sync & video
--

Video Mode

Duty Cycle

OP 10.—0=monochrome 1=color
OP 11.—0=50% 1=100% (OP 12.0) 0 or 1=100% (OP 12.2)

Character Clocking Mode

OP 12.—0=single-phase 2=dual-phase

Horizontal Skew

Vertical Skew

Cursor

OP 14.—skew right 0-3 dots	1=fast blink
OP 15.—skew down 0-9 lines	2=slow blink
OP 16.—0:off	3=on continuous

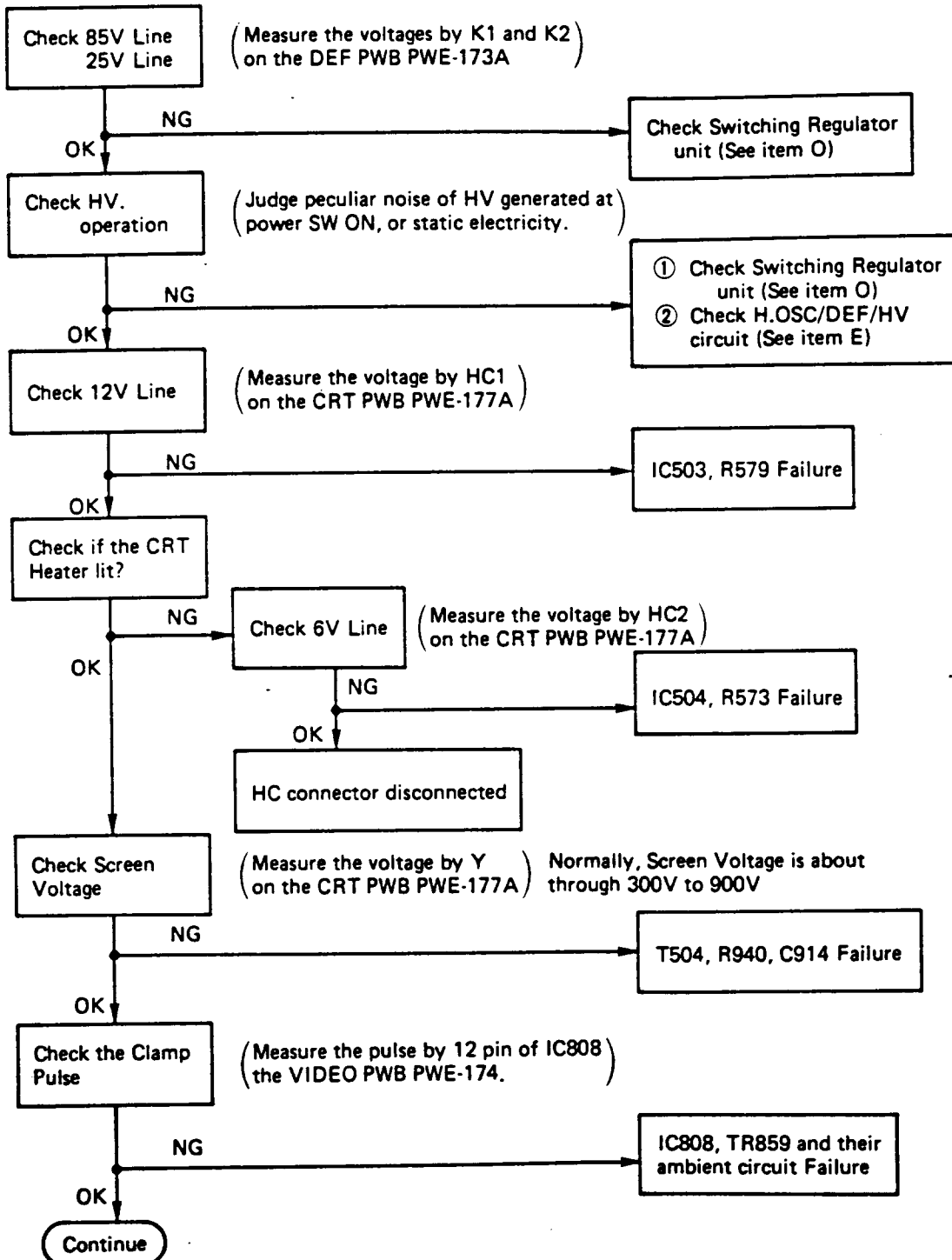
TEST SIGNALS FOR USING Quantum 801C

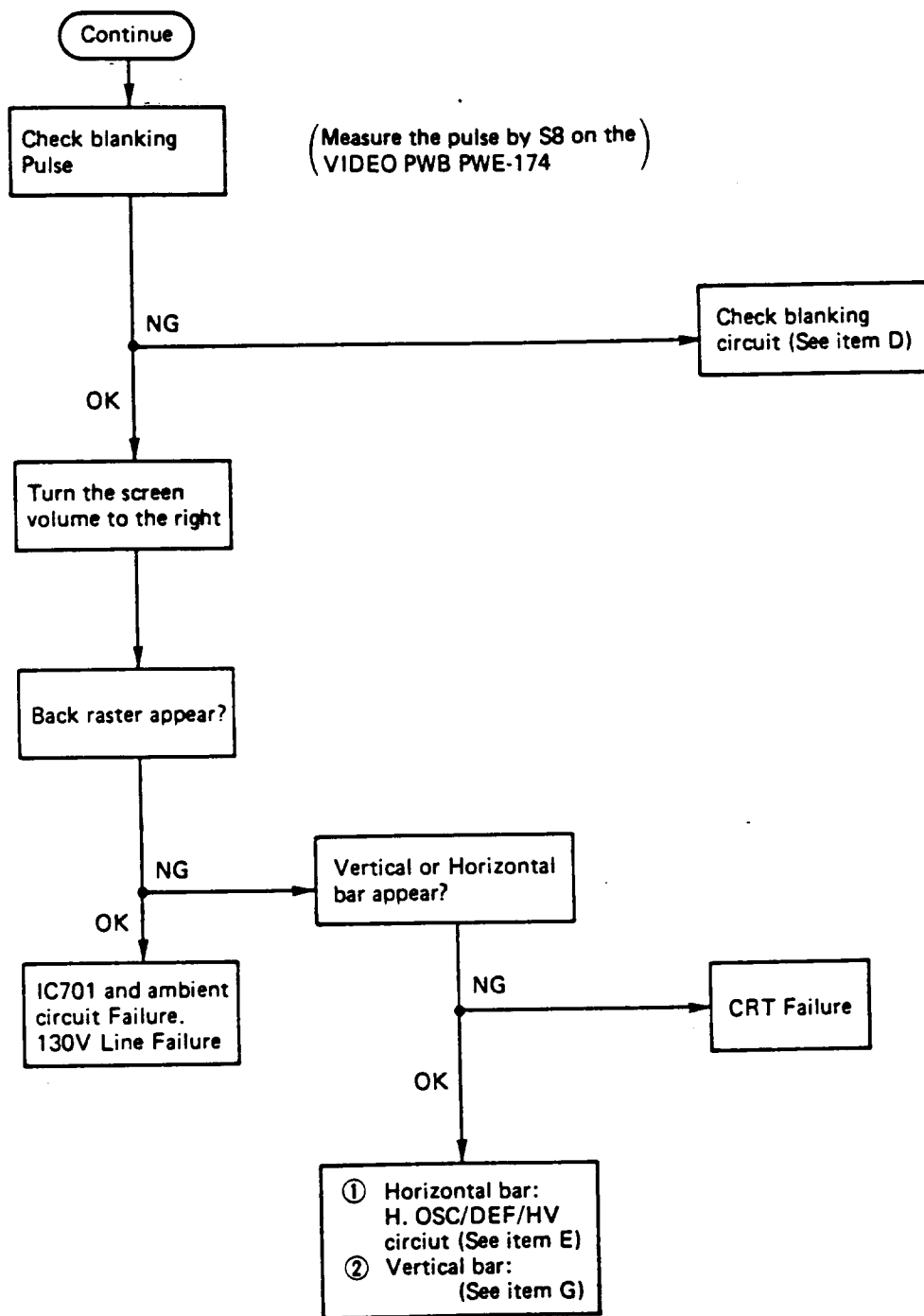
SIGNAL No.	1	2	3	4	5
Real Time Parameters					
Dot Rate (MHz)	25.888	29.400	22.136	25.432	16.368
Horizontal Rate (kHz)	48.479	42.000	26.995	31.475	22.000
Vertical Rate (Hz)	60.00	80.00	74.99	70.10	60.11
Non-Real Time Parameters					
H: Dots/Character	6	10	10	8	8
Total Characters	89	70	82	101	93
Displayed Characters	69	55	64	80	80
Drive Delay	72	62	67	83	80
Drive Width	3	3	11	12	10
V: Lines/Character	12	9	9	10	10
Total Lines	808	525	360	449	366
Displayed Rows	64	55	32	40	35
Drive Delay (Rows)	64	55	37	41	35
Drive Width (Lines)	4	2	8	2	13
Step Width	-	-	-	-	-
Signal Gating					
Composite Sync.	1	1	1	1	1
Vertical Step	0	0	0	0	0
Horizontal Drive	1	1	1	1	1
Vertical Drive	1	1	1	1	1
Signal Polarity	1	1	1	1	1
Composite Sync.	-	-	-	-	-
Vertical Step	1	1	1	1	1
Horizontal Drive	1	1	1	1	1
Vertical Drive	0	0	0	0	0
Video	0	0	0	0	0
Interlace Mode	1	1	1	1	1
Video Mode	0	0	0	0	0
Duty Cycle	0	0	0	0	0
Character Clocking Mode	0	0	0	0	0
Horizontal Skew	-	-	-	-	-
Vertical Skew	-	-	-	-	-
Cursor	-	-	-	-	-

SIGNAL No.	6	7	8	9	10
Real Time Parameters					
Dot Rate (MHz)	25.432	25.432	25.112	25.432	25.888
Horizontal Rate (kHz)	31.475	31.475	30.475	31.475	48.479
Vertical Rate (Hz)	59.95	70.10	59.99	50.04	60.00
Non-Real Time Parameters					
H: Dots/Character	8	8	8	8	6
Total Characters	101	101	103	101	89
Displayed Characters	80	80	80	80	25
Drive Delay	83	83	80	83	50
Drive Width	12	12	14	12	3
V: Lines/Character	10	10	10	10	8
Total Lines	525	449	508	629	808
Displayed Rows	48	35	40	36	30
Drive Delay (Rows)	49	39	44	48	60
Drive Width (Lines)	2	2	2	2	4
Step Width	-	-	-	-	-
Signal Gating					
Composite Sync. OP 1.-	1	1	1	1	1
Vertical Step OP 2.-	0	0	0	0	0
Horizontal Drive OP 3.-	1	1	1	1	1
Vertical Drive OP 4.-	1	1	1	1	1
Signal Polarity					
Composite Sync. OP 5.-	1	1	1	1	1
Vertical Step OP 6.-	-	-	-	-	-
Horizontal Drive OP 7.-	1	0	0	0	1
Vertical Drive OP 8.-	1	1	0	1	1
Video OP 13.-	0	0	0	0	0
Interlace Mode OP 9.-	0	0	0	0	0
Video Mode OP 10.-	1	1	1	1	1
Duty Cycle OP 11.-	0	0	0	0	0
Character Clocking Mode OP 12.-	0	0	0	0	0
Horizontal Skew OP 14.-	-	-	-	-	-
Vertical Skew OP 15.-	-	-	-	-	-
Cursor OP 16.-	-	-	-	-	-

TROUBLE SHOOTING

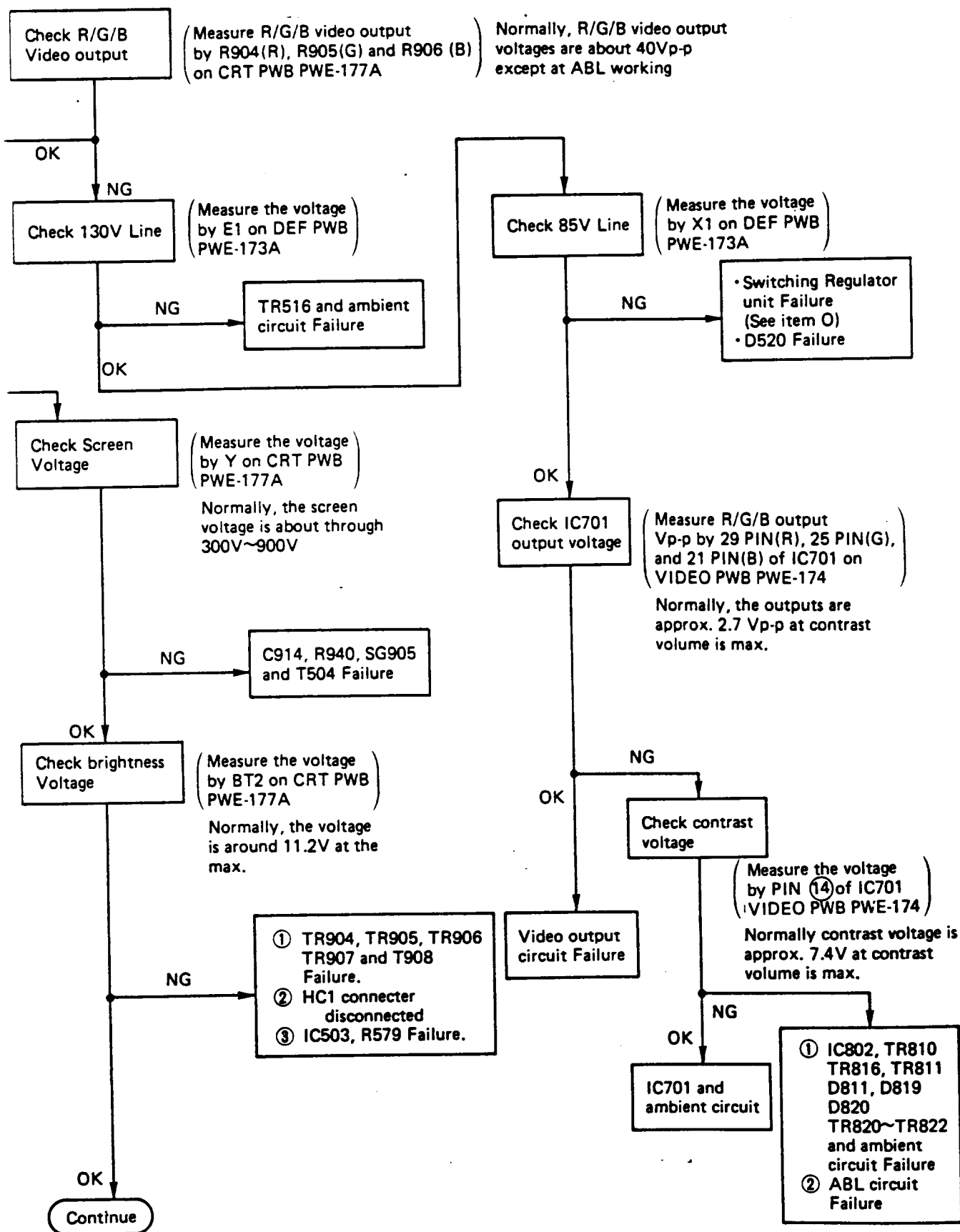
A. No Raster

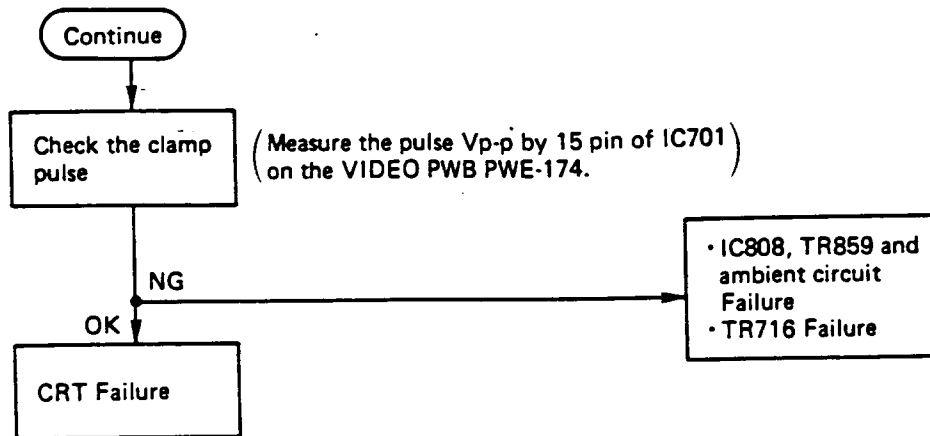




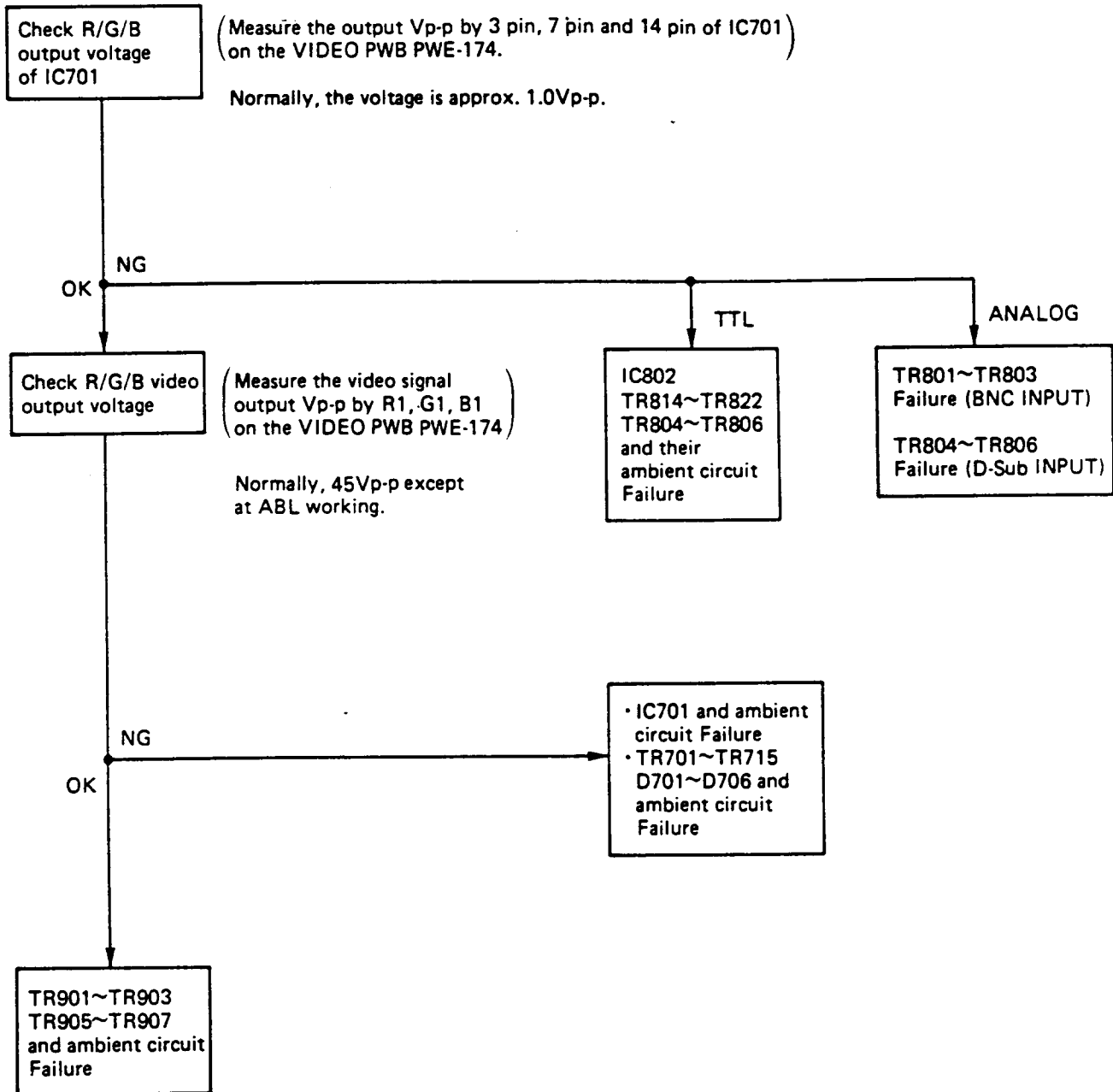
B. Abnormal Video on CRT Screen

Too dark or Too bright

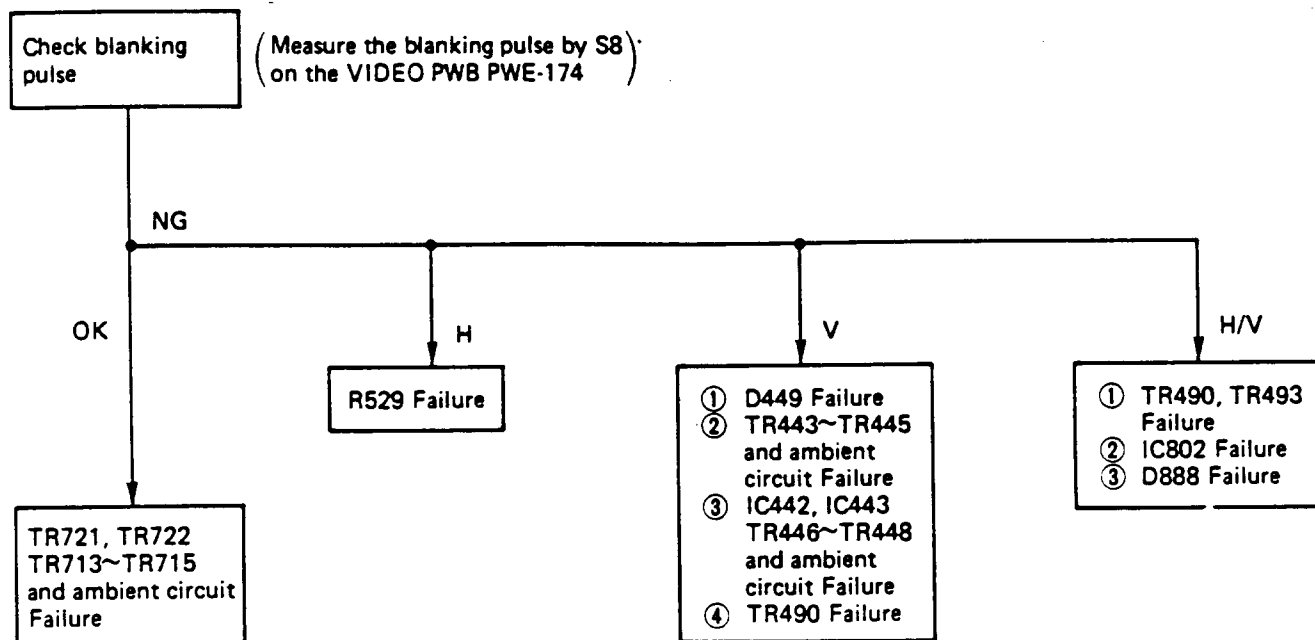




C. Abnormal White Balance

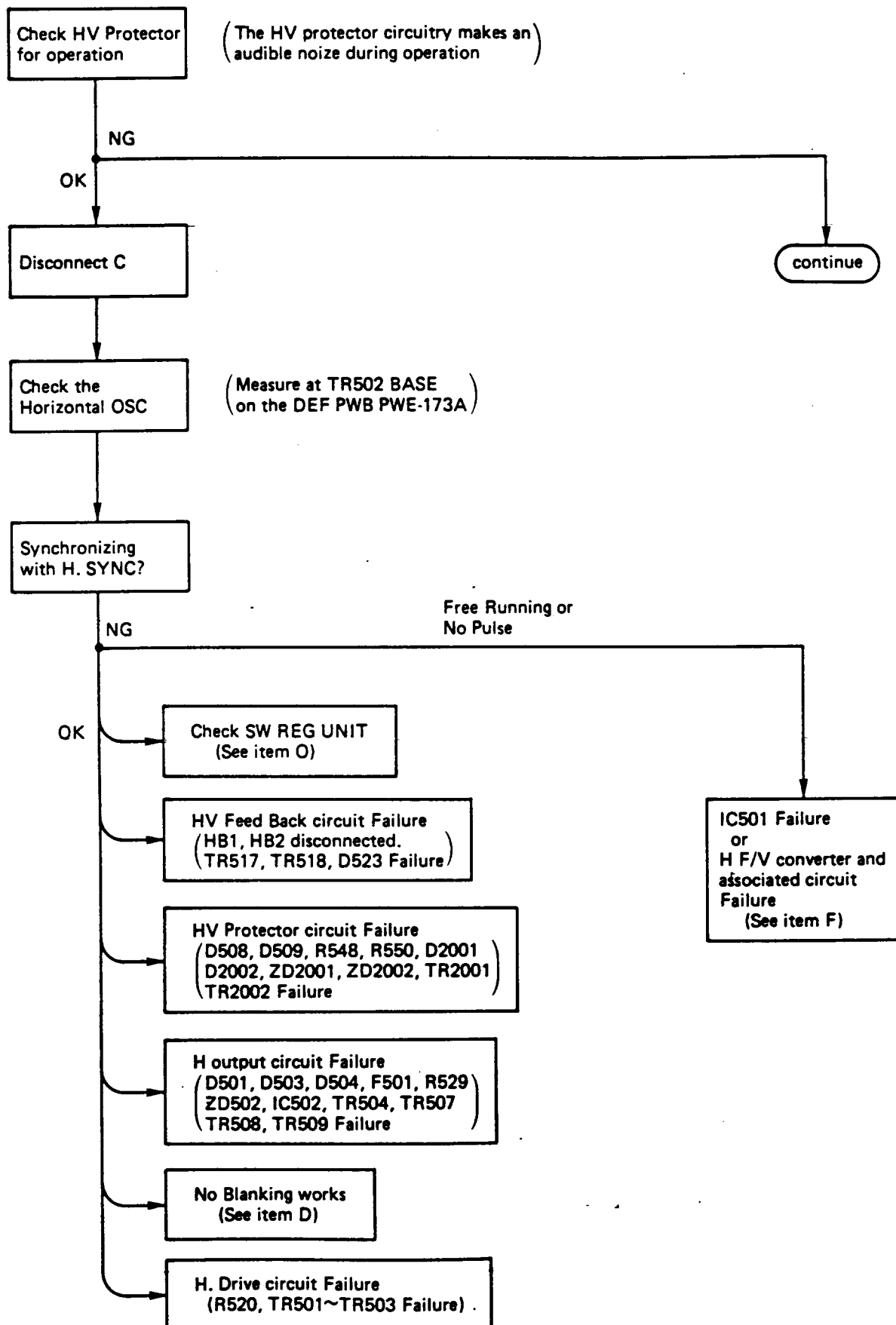


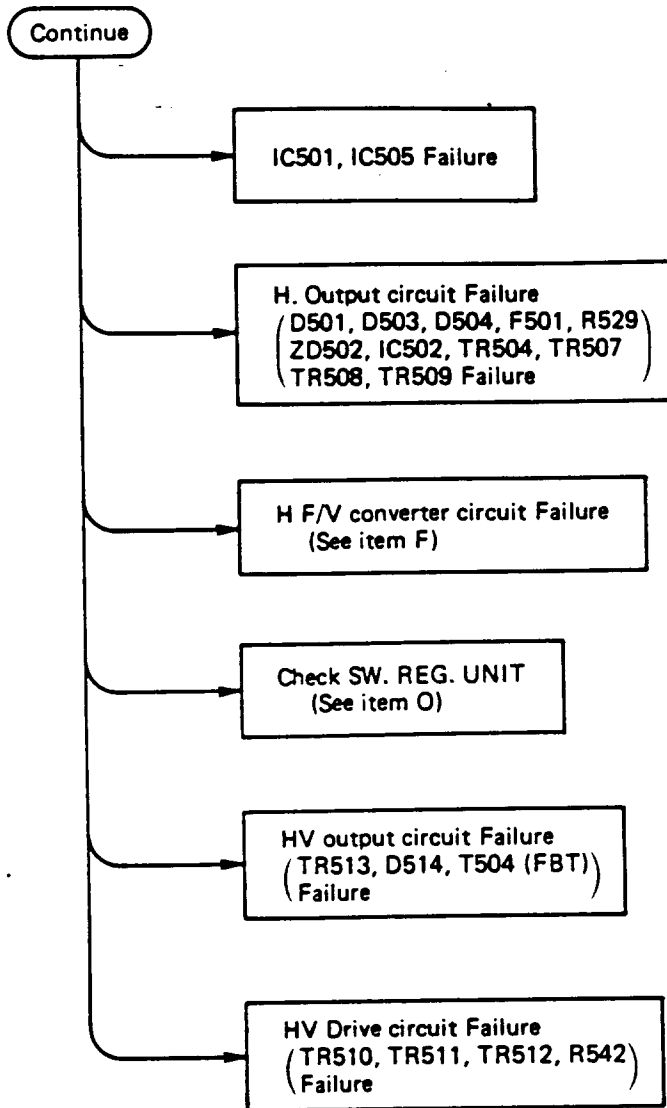
D. No Blanking works



E. H.OSC/DEF/HV Circuit Fault

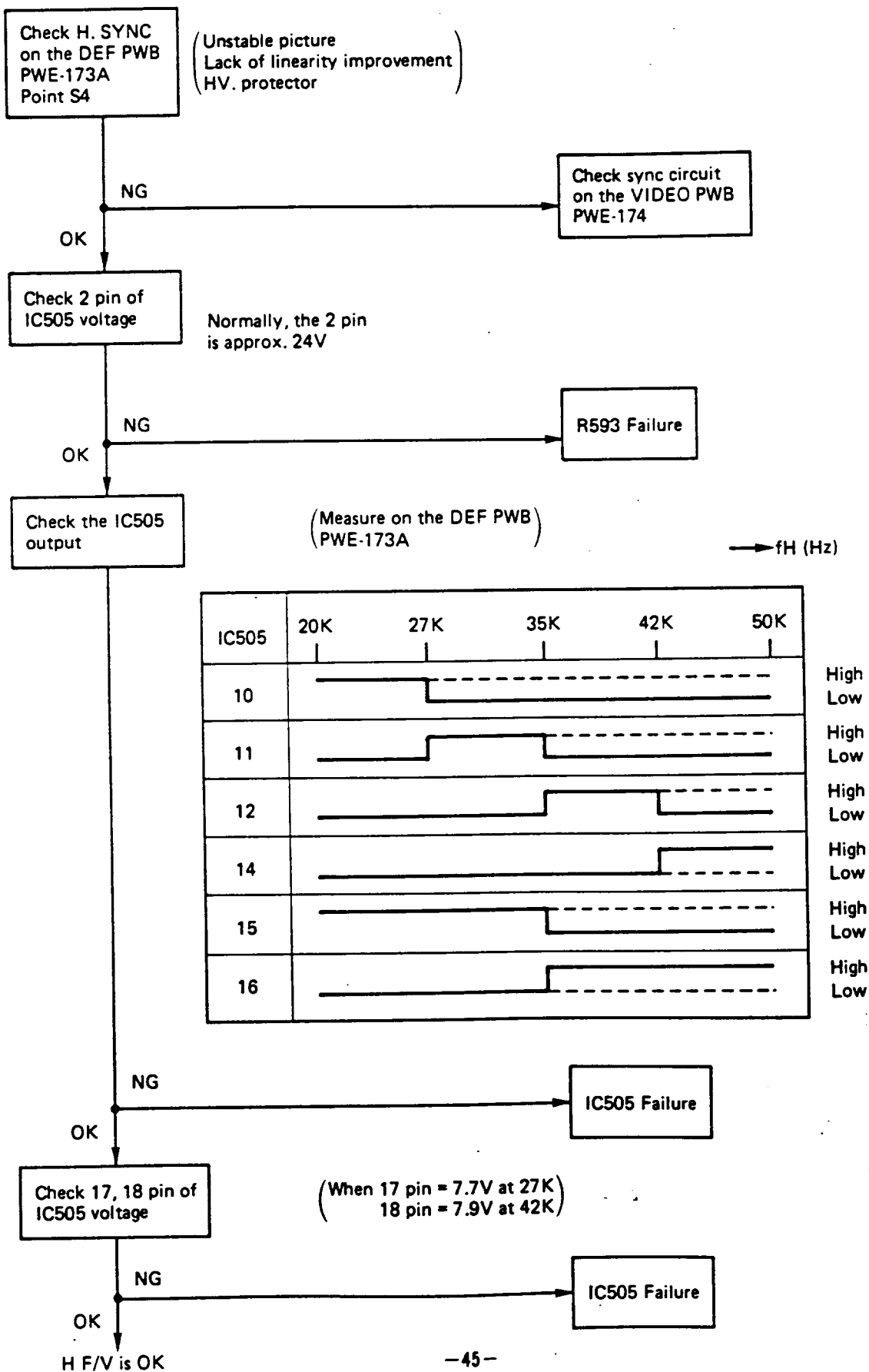
No Raster
Abnormal Picture Size
Abnormal Picture



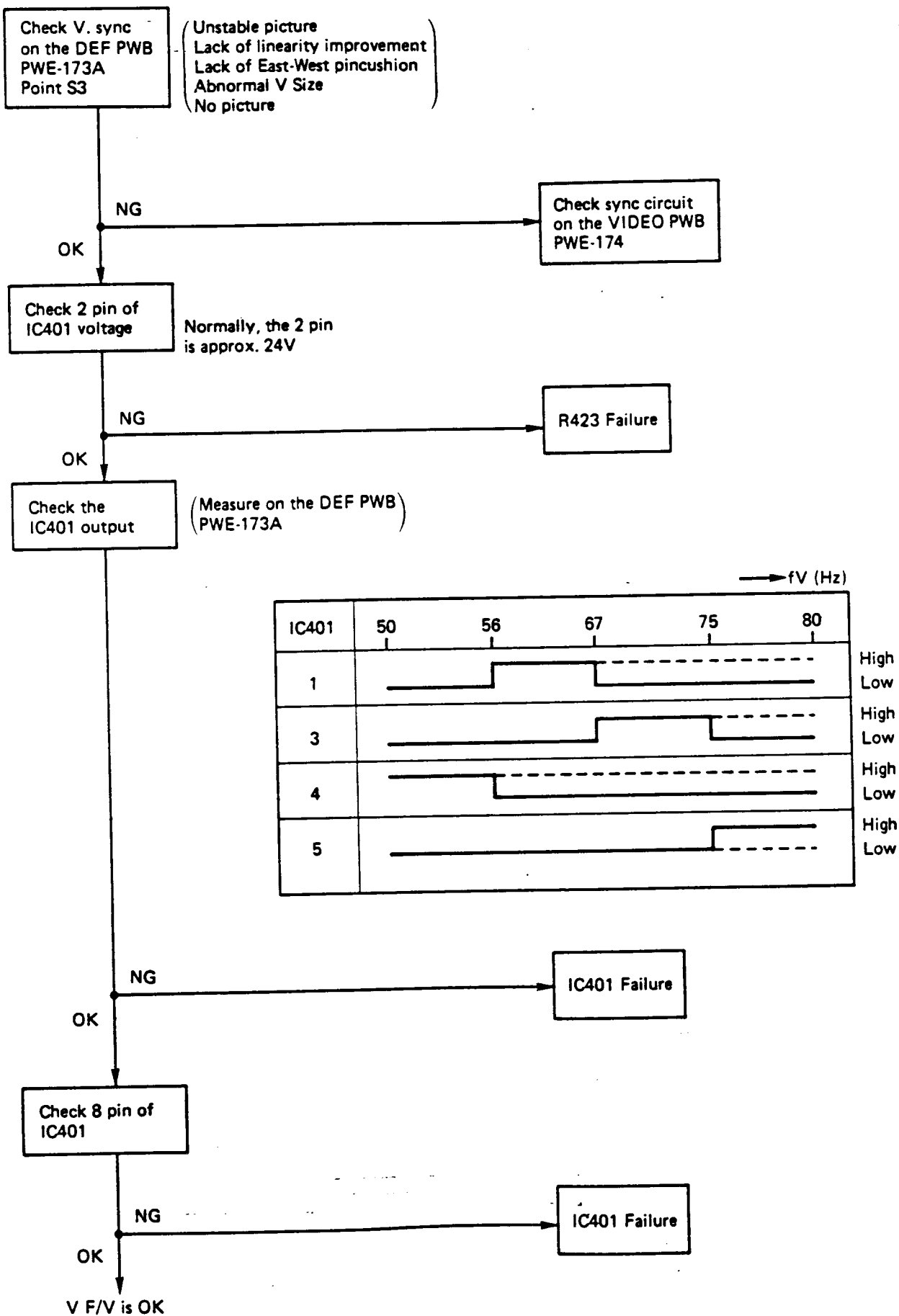


F. H/V F-V converter and associated circuit

①

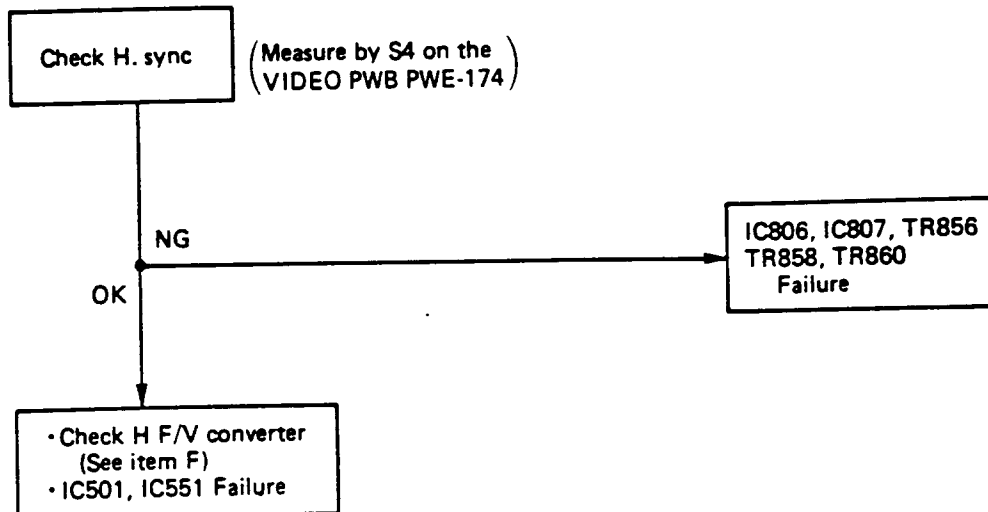


①

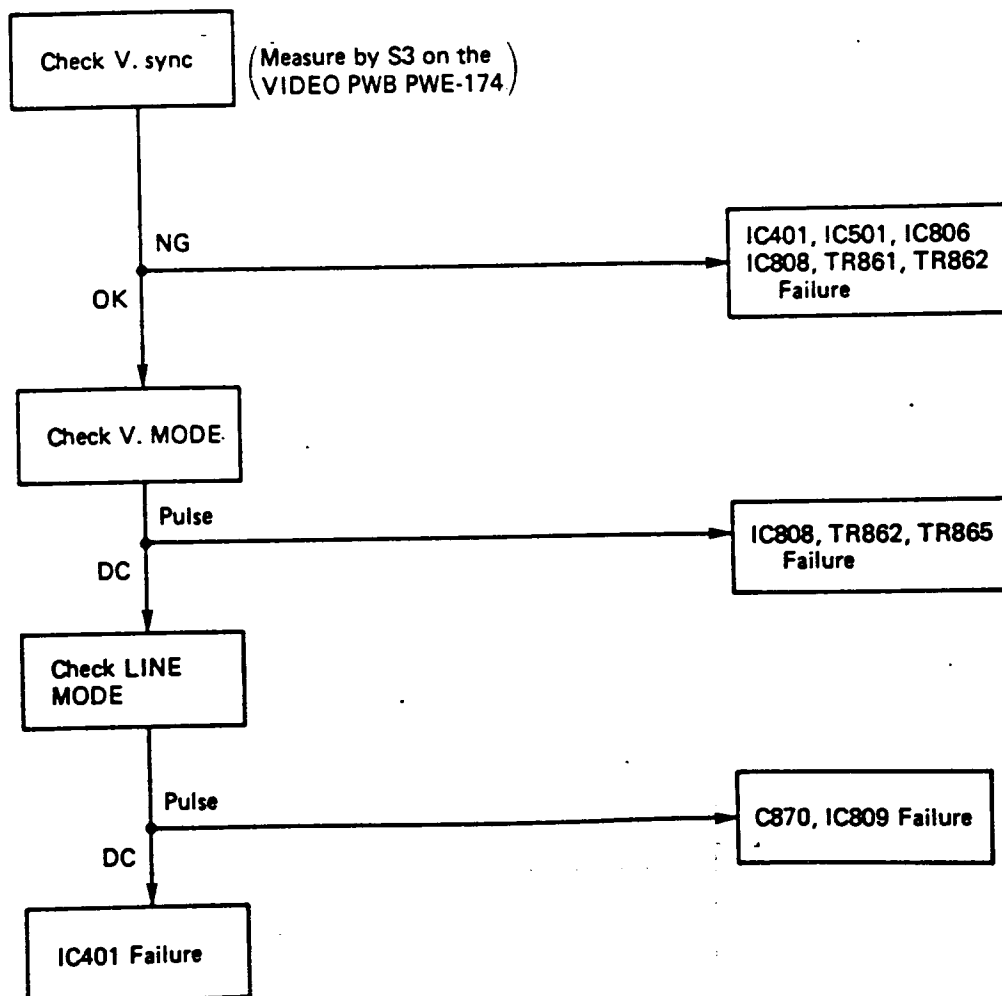


G. Unstable Picture

Horizontal

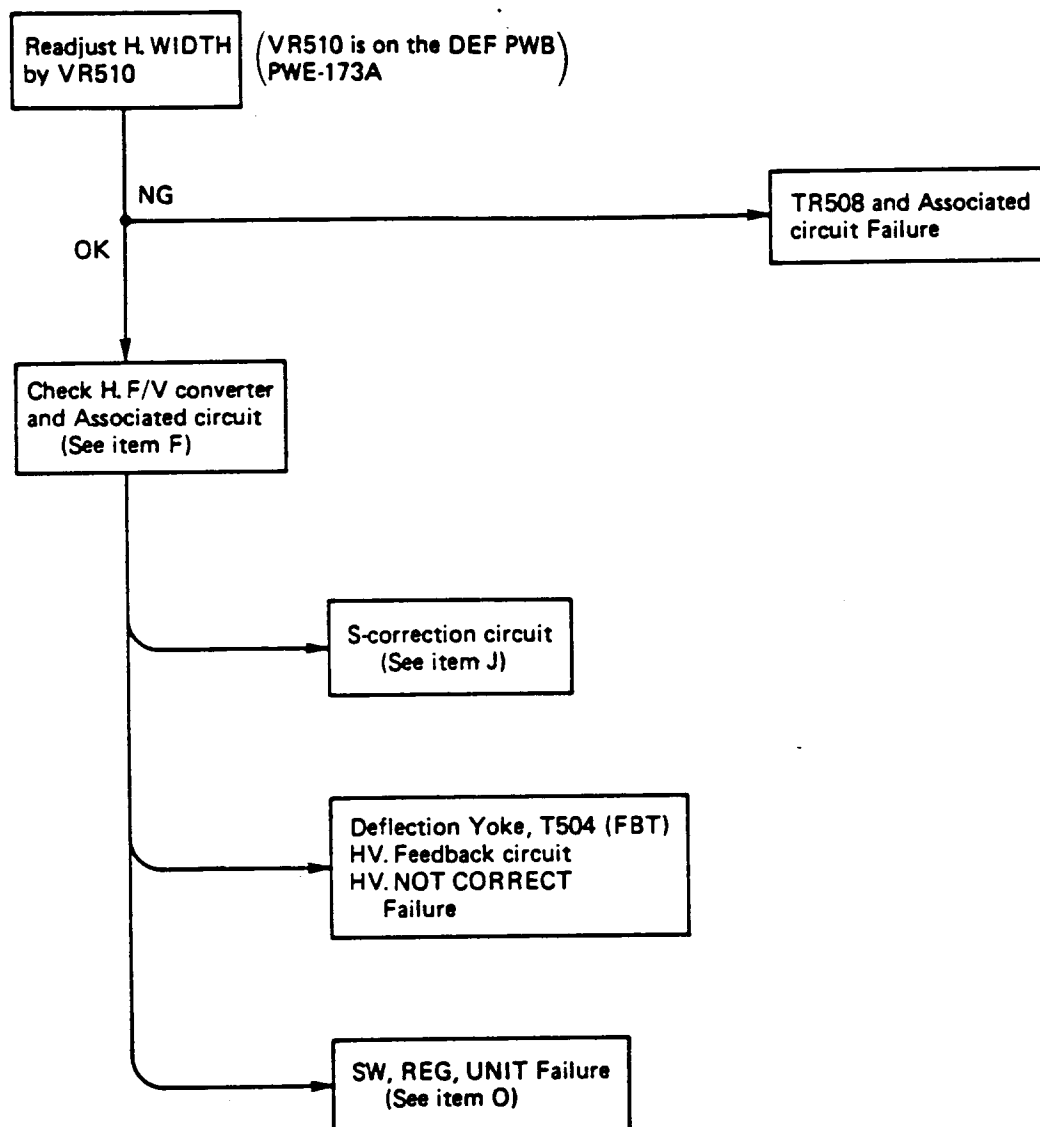


Vertical

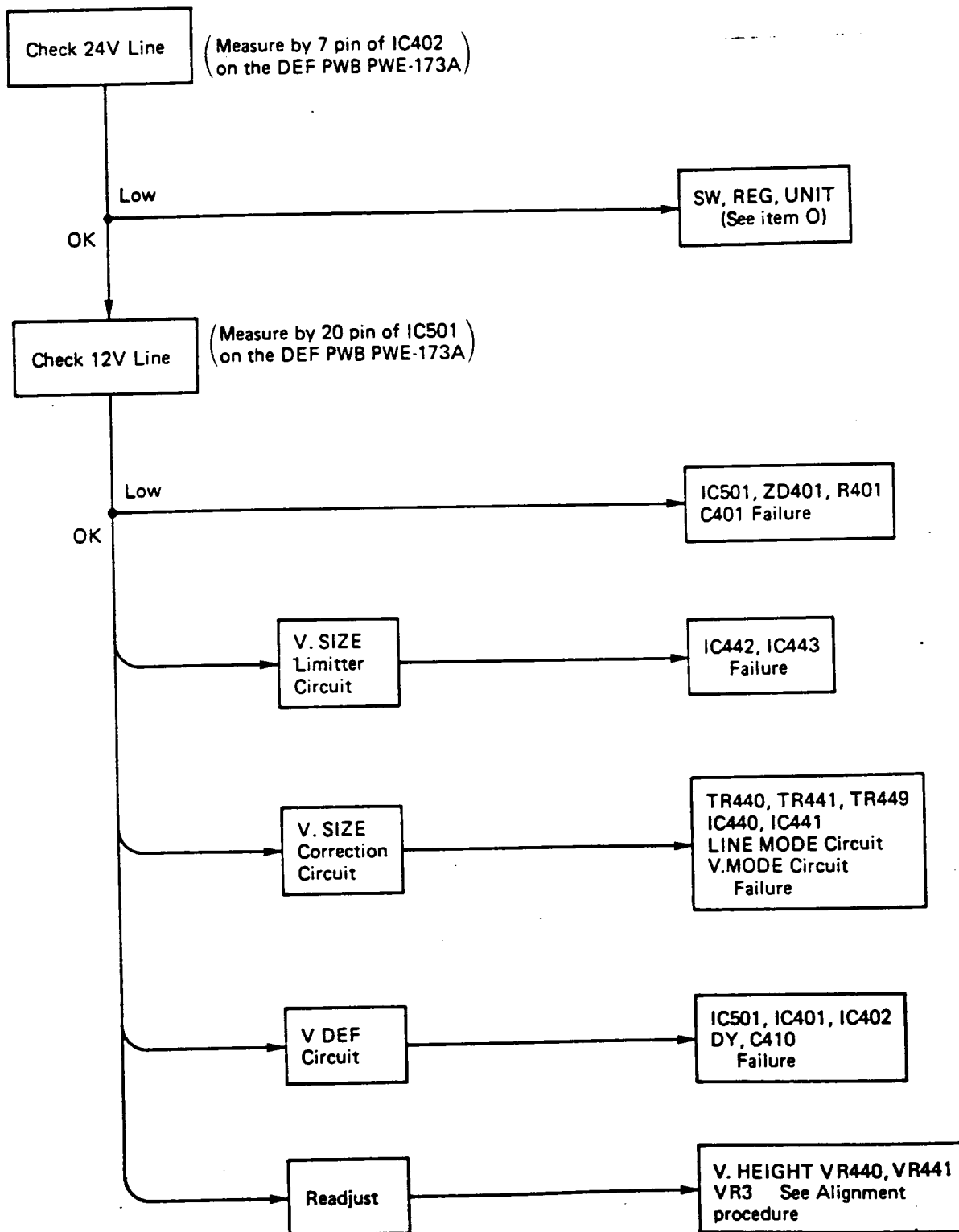


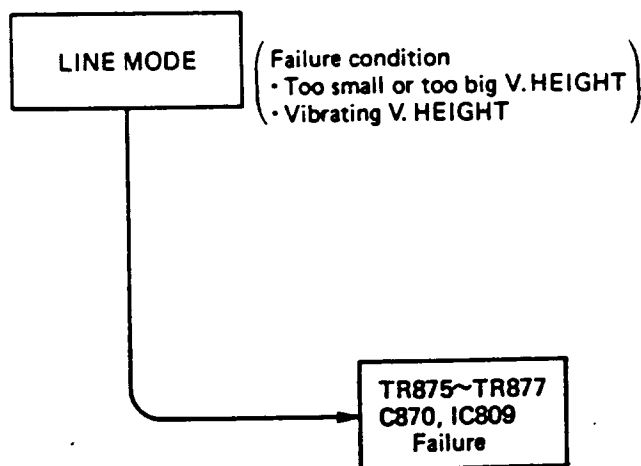
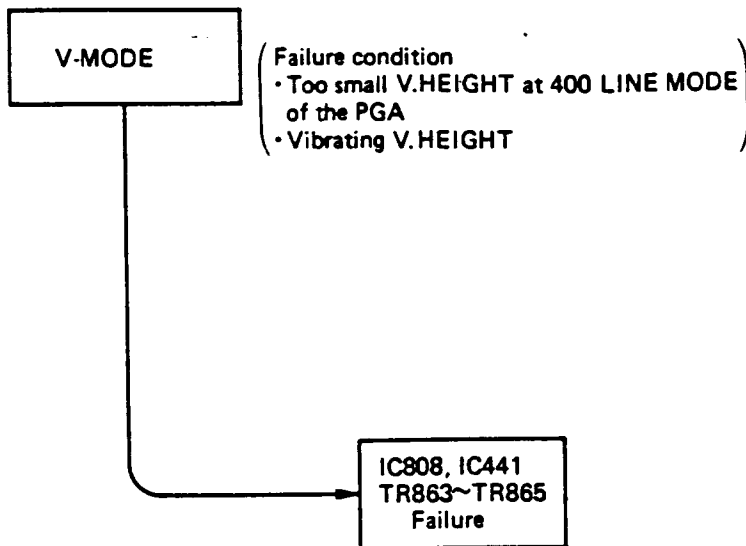
H. Abnormal Picture Size

1. Horizontal WIDTH



2. Vertical HEIGHT

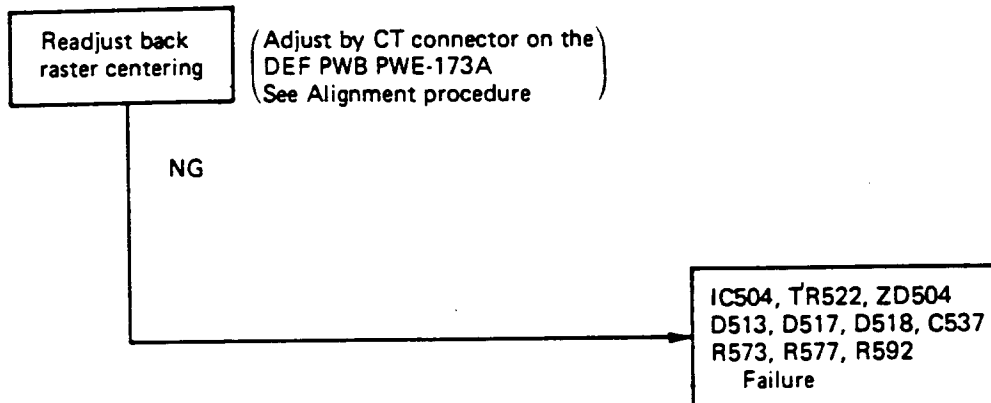




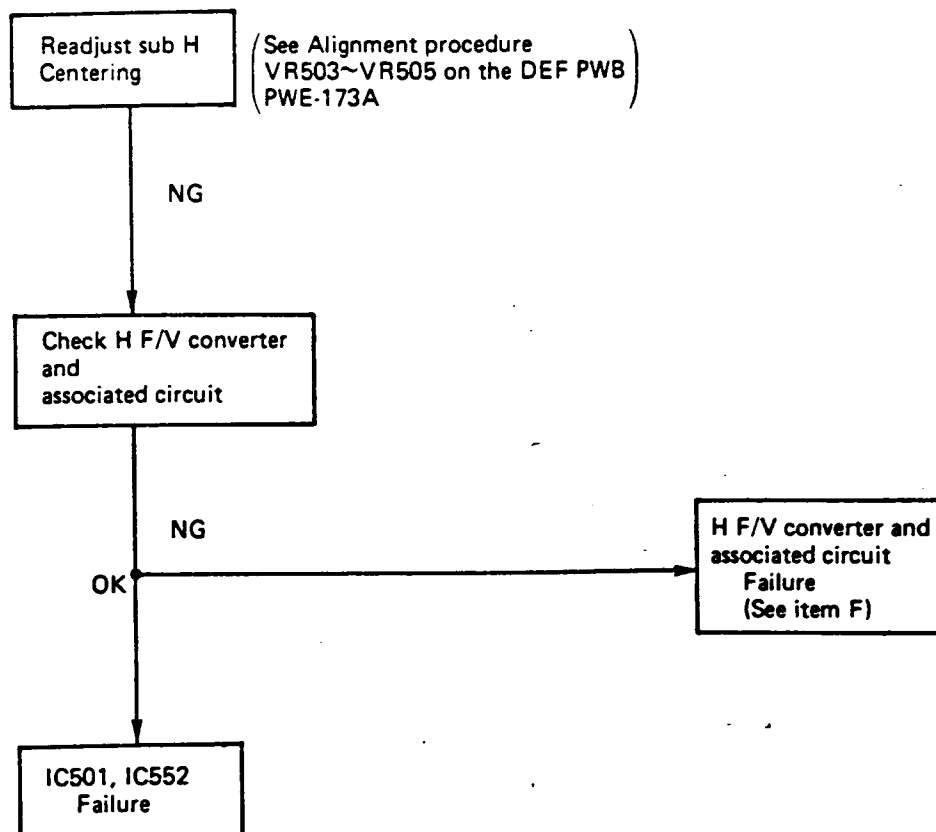
I. Centering

Horizontal

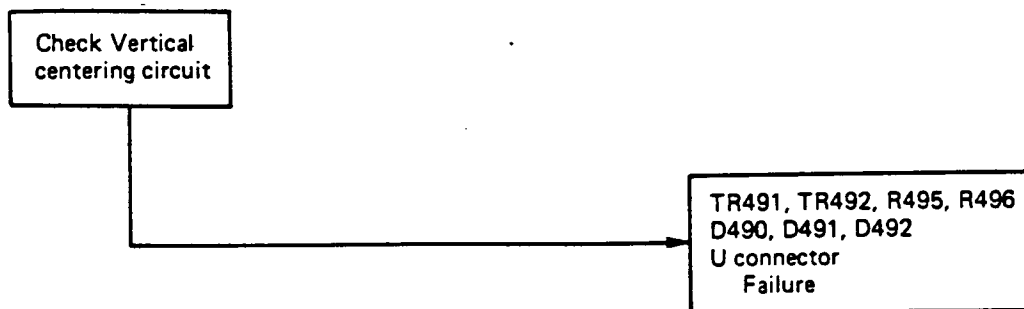
a) BACK RASTER CENTERING



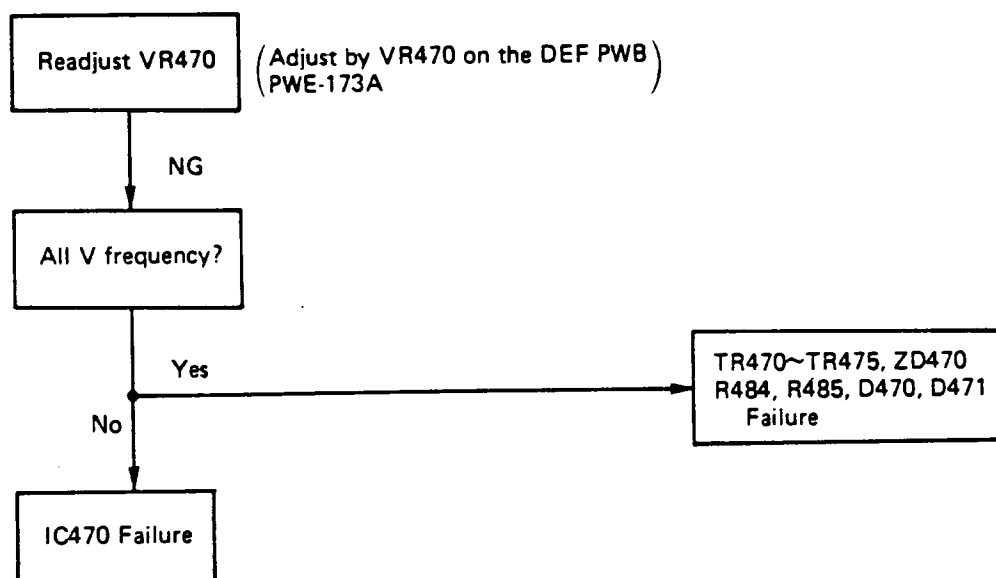
b) PICTURE CENTERING



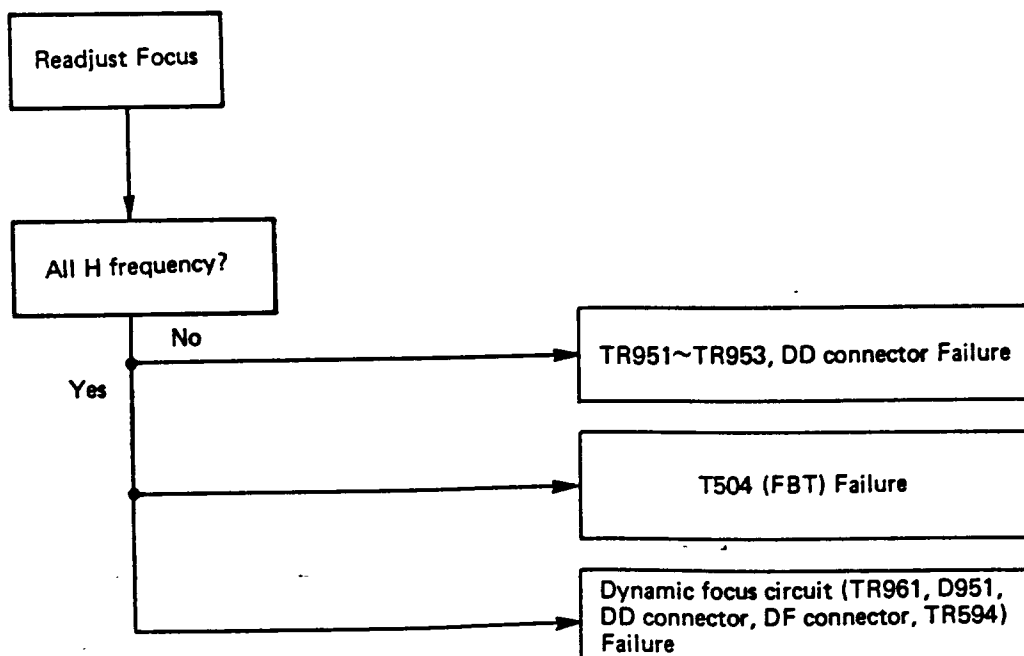
VERTICAL



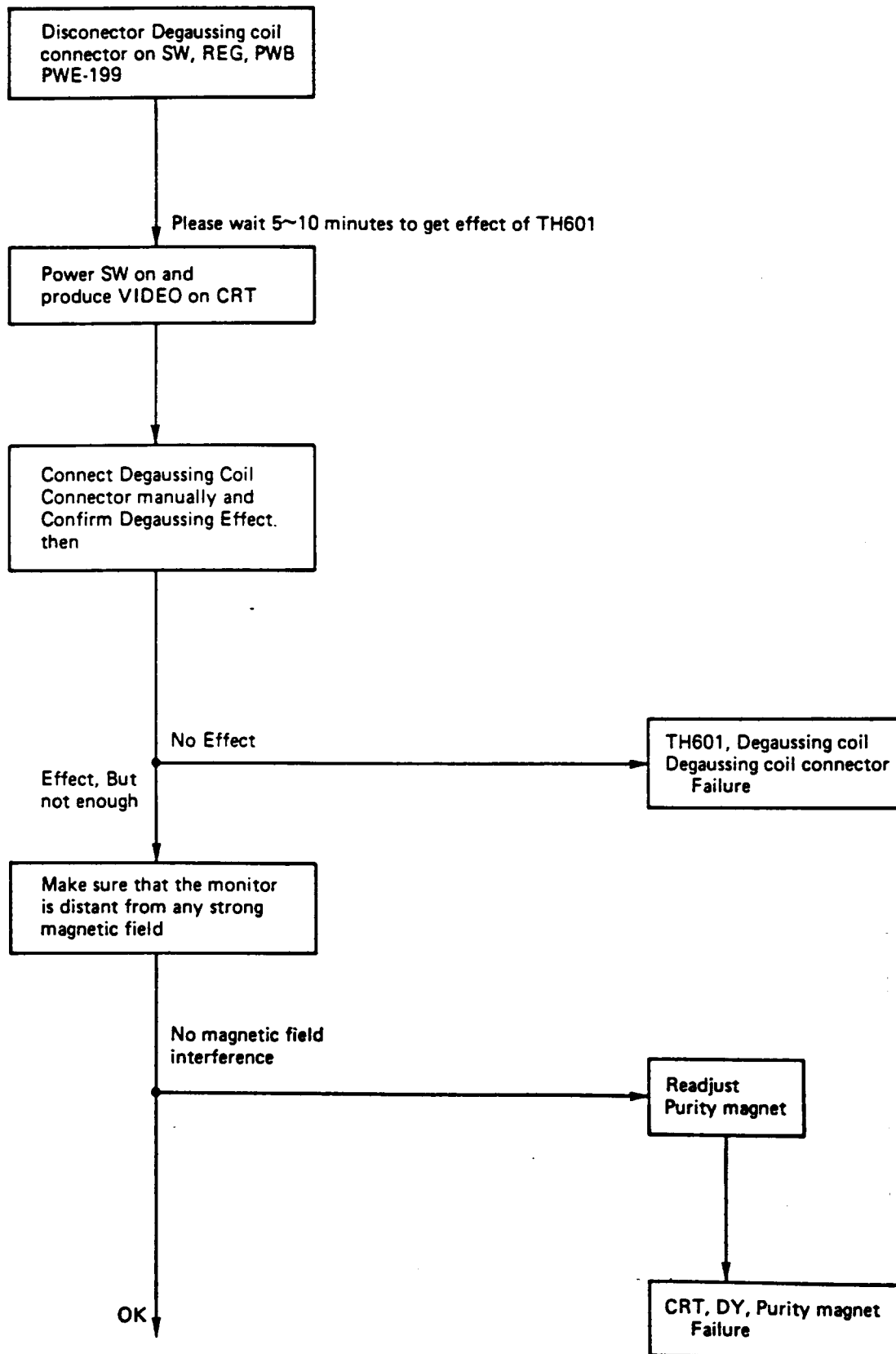
J. Side pincushion distortion correction Failure



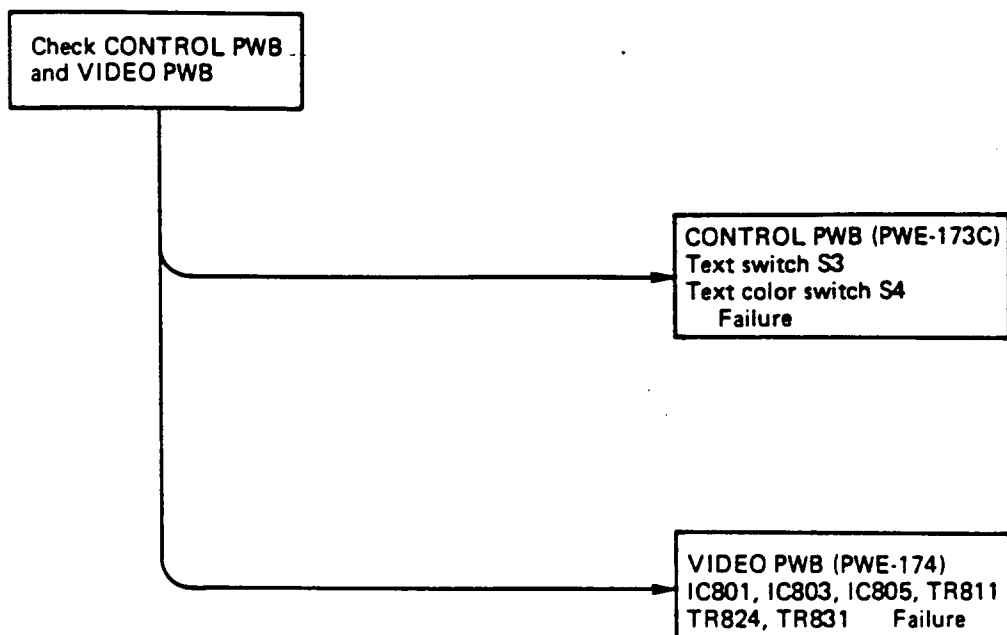
K. Poor focus



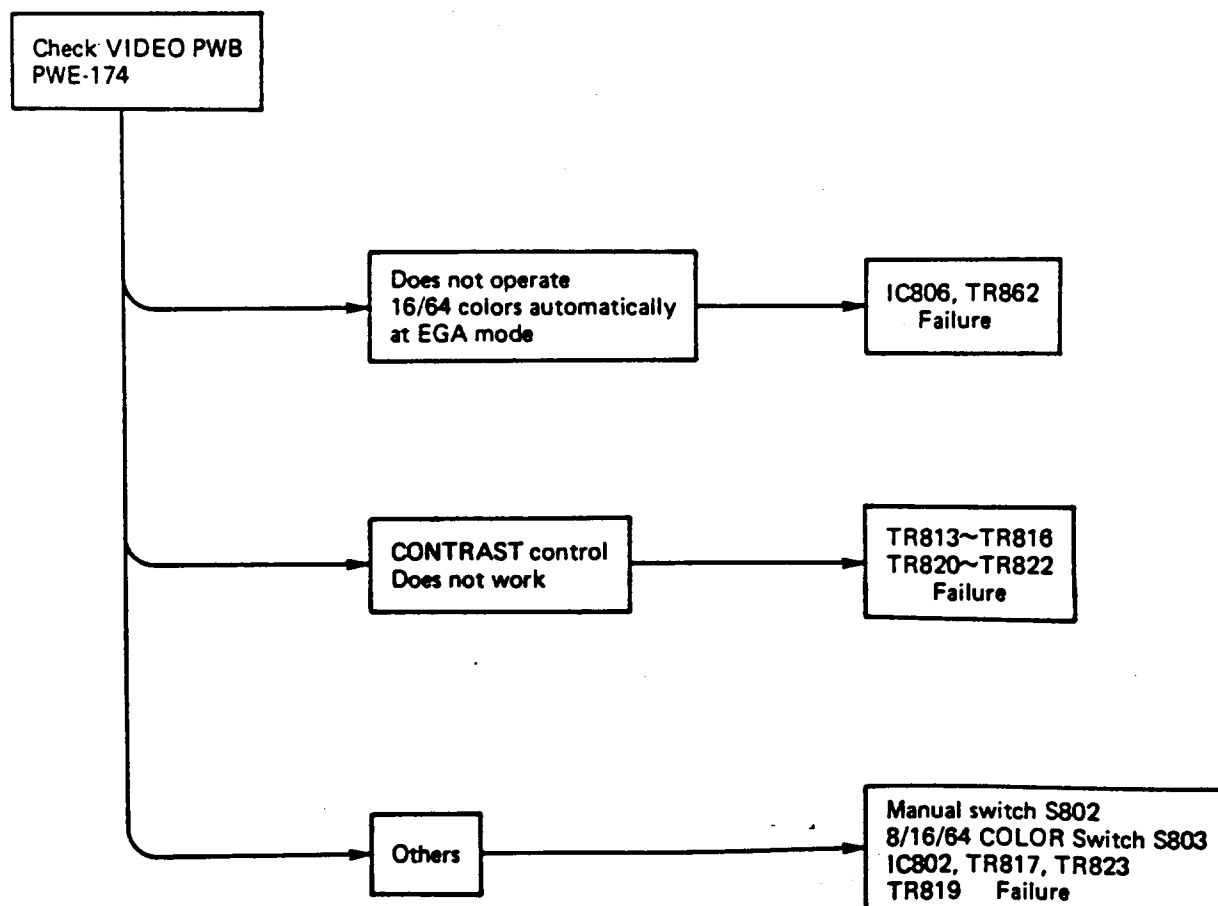
L. Impurity on CRT screen



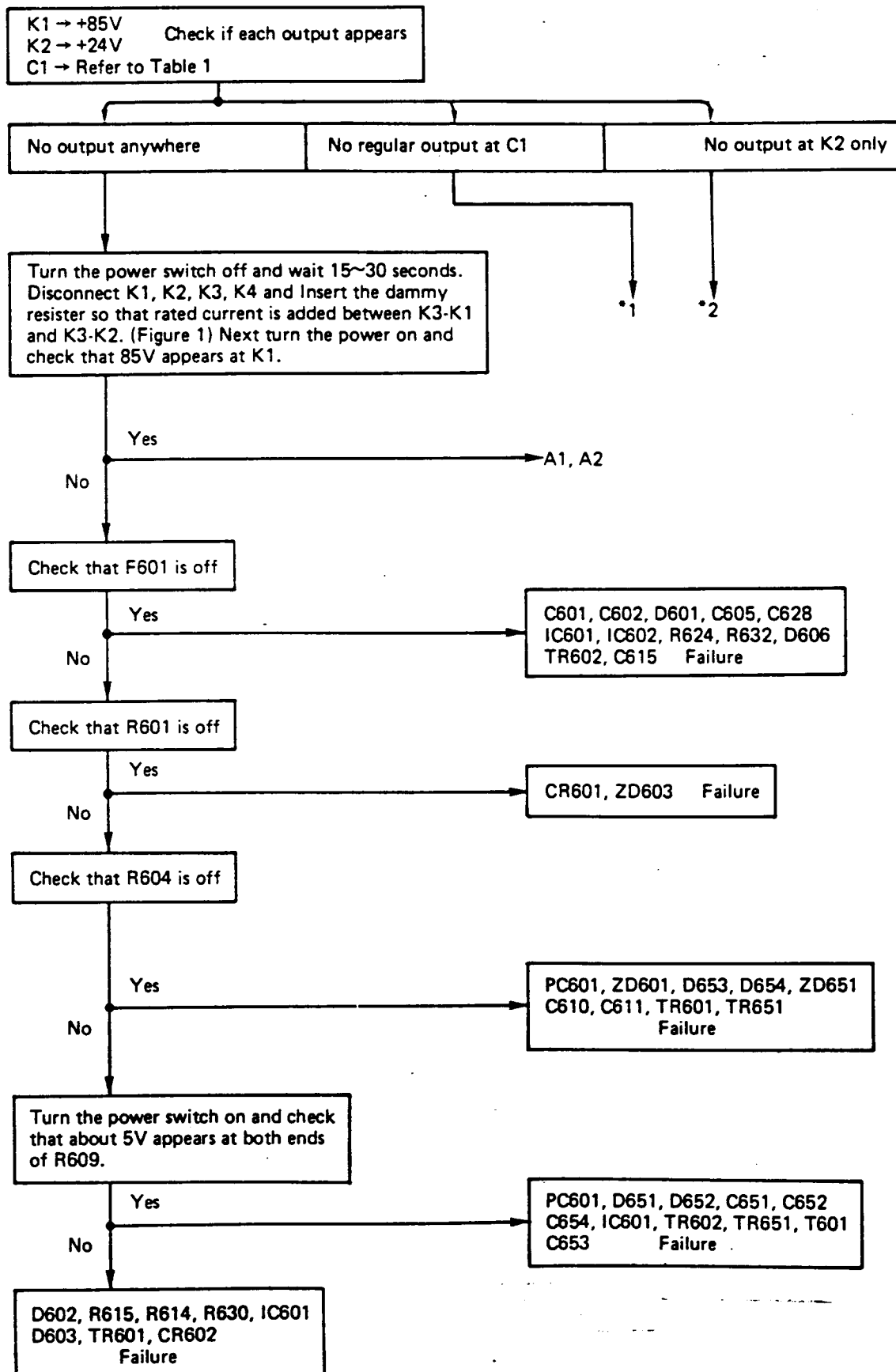
M. Abnormal Text mode operation

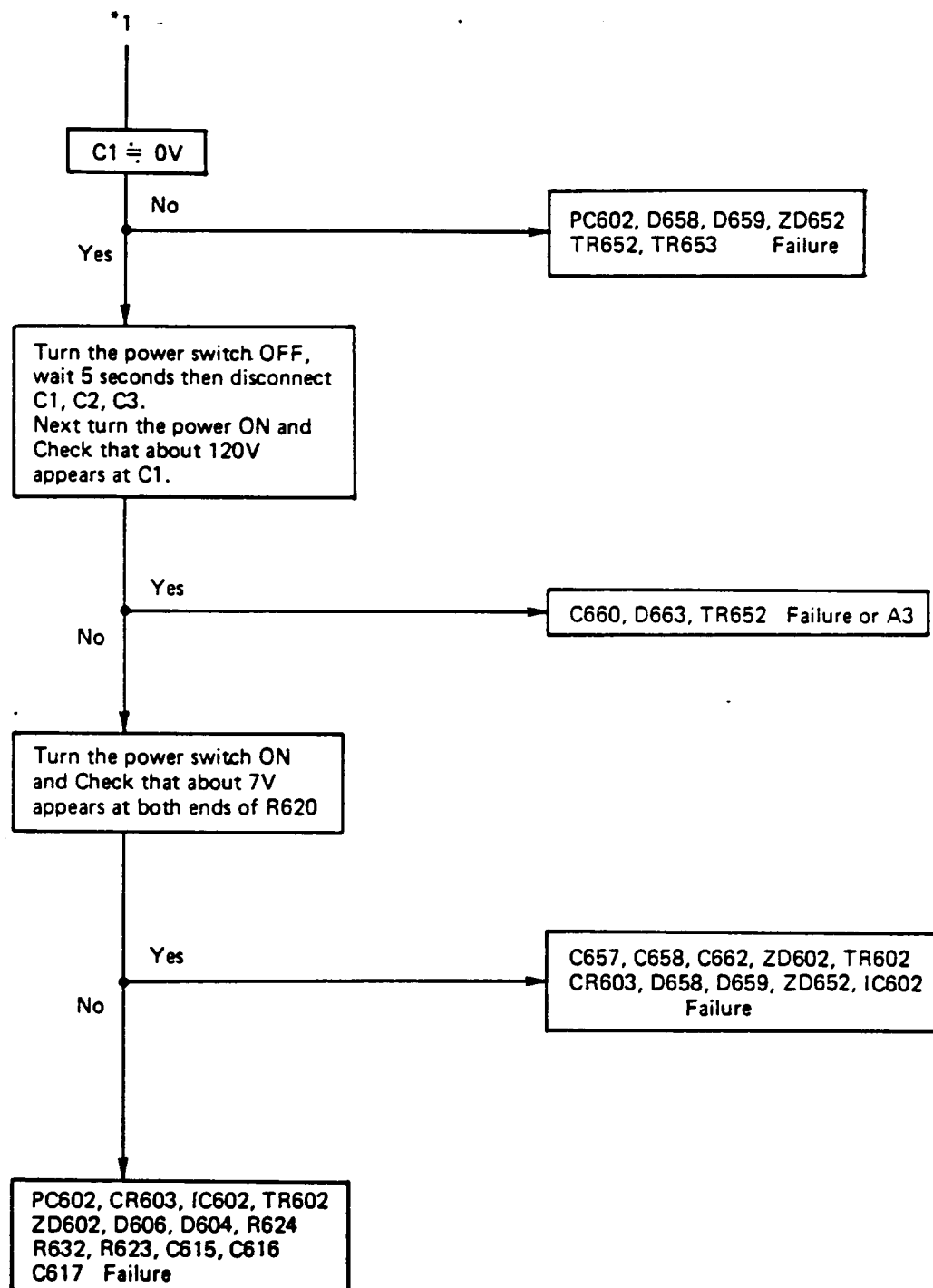


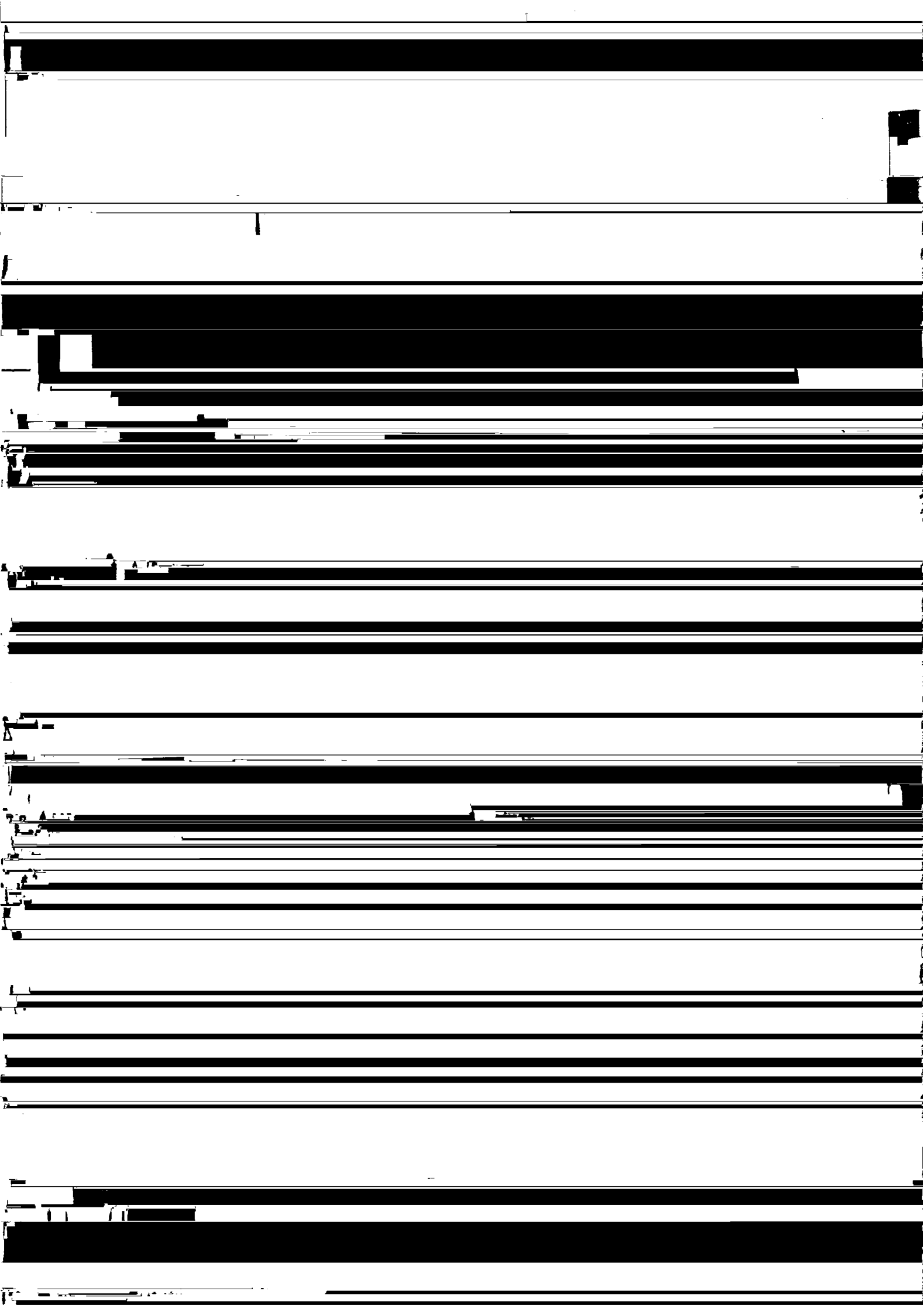
N. Abnormal Color at TTL MODE



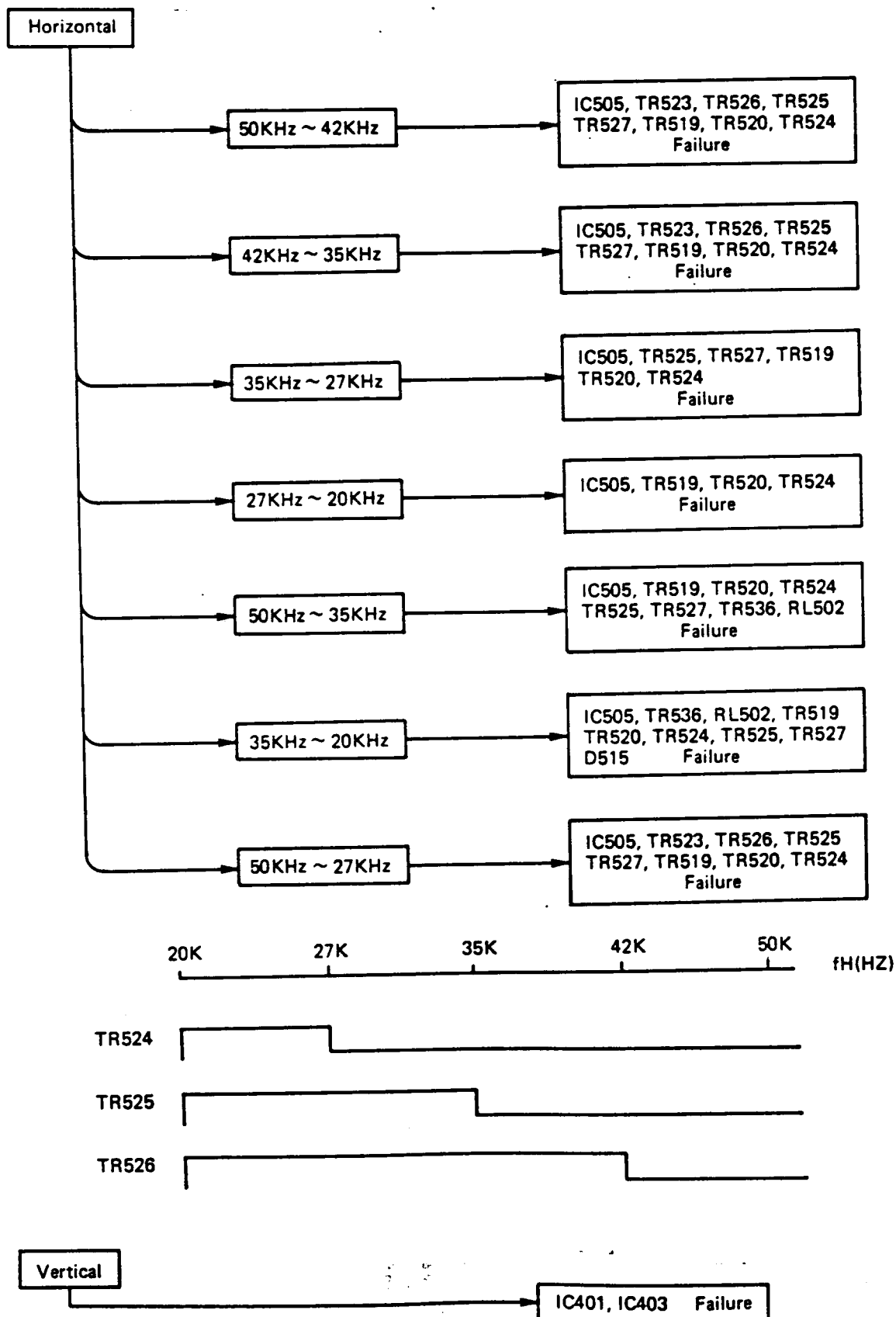
O. Switching Regulator Unit







P. H/V Linearity not improved



REPLACEMENT PARTS LIST

Note: The components identified by Δ make are critical for safety. Replace only with Parts Number Specified.

SYMBOL	PARTS NO	DESCRIPTION	QTY
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*** TRANSISTORS ***

	***	CRT & TUNER	***
CRT (2001VME/VMEE)	33020131	CRT AT20A9SPB22-A-1C88	1
CRT (2001VMR)	33020134	CRT AT20A9SPB22-A-1C88(R)H	1

*** ICS ***

IC809	IC440	37011054	IC UPC339C (COMP)	1
IC470	IC551	37051036	MOS UPD4066BC (ESD)	6
IC403	IC552			1
IC801		37051081	IC SN74LS32N (OR)	1
IC808		37051096	IC SN74LS367AN (BUFF)	1
		37051179	IC SN74LS123N (MONO MLT)	1
				1
IC806	IC805	37052011	IC SN74LS136N (EX-OR)	2
IC804	IC502	37052179	IC SN74LS07N	2
IC443		37056207	IC UPC358	1
IC504		37056219	IC STR2005	1
IC503		37056220	IC STR2012	1
				1
△IC802		37056233	IC PCD-016MI	1
△IC701		37056245	IC M51387P	1
△IC501		37056295	IC LA7851	1
△IC601	△IC602	37056353	IC STR7406M	2
IC505		37056405	IC 56405	1
				1
IC401		37056406	IC 56406	1
IC402		37056415	IC LA7835	1
IC442	IC807	37101127	IC UPC-393C	2

TRANSISTORS

TR2002	TR440	TR441	350D7217	TR-25C945-T 0	5C
TR442	TR444	TR445			
TR447	TR449	TR470			
TR471	TR473	TR474			
TR501	TR510	TR514			
TR515	TR519	TR523			
TR527	TR531	TR536			
TR718	TR720	TR721			
TR801	TR802	TR803			
TR804	TR805	TR806			
TR810	TR820	TR821			
TR822	TR824	TR825			
TR831	TR832	TR851			

TR852	TR856	TR857	TR,25C3811-TA Q	13
TR858	TR859	TR862		
TR870	TR871	TR872		
TR904	TR908	TR714		
TR493	TR713	TR814		
TR715	TR716	TR817		
TR818	TR819	TR853		
TR860				
△TR2001	TR443	TR446	TR,25A733/25A733A-T Q	13
TR448	TR472	TR490		
TR502	TR511	TR520		
TR717	TR722	TR811		
TR813				
TR492				
TR901	TR902	TR903	TR,25A952 L,AT	1
TR710	TR711	TR712	TR,25A1C18 Q	3
TR509			TR,25A1538-RA D	3
△TR601A	TR602		TR,25B546/546A L	1
△TR651A	TR652	△TR653	TR,25C945 P	2
			TR,25C1941 K	3
TR507	△TR517	△TR518		
△TR951	TR952	TR953	TR,25C1941 L	6
TR491				
TR508			TR,25C2001 L	1
TR475			TR,25D401A L	1
TR522			TR,25D882 P	1
			TR,25D882 Q	1
TR809				
TR701	TR702	TR703	TR,25D471 L	1
TR905	TR906	TR907	TR,25C2408/25C2408A	3
TR954			TR,25C1473 Q	3
△TR504			TR,25C3675	1
			TR,25C3688	1
TR704	TR705	TR706		
TR707	TR708	TR709	TR,25C3953-RA D	6
△TR513				
TR823	TR854	TR874	TR,25C3685	1
TR834	TR834	TR861	TR,AN1A4M-T	3
TR863	TR864	TR865	TR,AA1A4M-T	11
TR866	TR875	TR877		
TR878	TR879			
TR808	TR876		TR,DTC123YS-T	2
TR503	TR512	TR516		
TR524	TR525	TR526	TR,25K430	3
CR602	CR603		TR,25K754	3
CR601			THYRISTOR 03P4M-L	2
			TRIAC AC10FGM	1

SYMBOL	PARTS NO	DESCRIPTION	QTY
*** DIODES ***			
ΔD603 ΔD606 ΔD653	360K1009	DIODE SI-1S2473	16
ΔD654 ΔD658 ΔD659			
ΔD661 ΔD662 ΔD663			
D701 D702 D703			
D704 D705 D706			
D707	D441 D442	DIODE 1SS132	86
D440	D443 D444 D445		
D446	D447 D448		
D449	D451 D452	DIODE 1SS132	86
D471 D490 D491			
D492 D499A D499B			
D499C D499D D499E			
D499F D504 D506			
D515 D519 D520			
D521 D522 D523			
D802 D803 D804			
D805 D806 D807			
D808 D809 D810			
D811 D812 D813			
D814 D815 D816			
D817 D818 D819			
D820 D821 D822			
D823 D824 D825			
D826 D827 D828			
D829 D830 D831			
D832 D851 D852			
D853 D854 D855			
D856 D860 D861			
D871 D872 D873			
D874 D875 D876			
D880 D881 D882			
D883 D884 D885			
D886 D887 D888			
D889 D951 D952			
ΔD605 ΔD609 ΔD602	360K1032	DIODE 1SS82-TA	4
	360K3098	DIODE RD12EB(3)-T4	1
	360K3123	DIODE RD20EB(3)	1
ΔD653	360K3132	DIODE ZENER RE3-0EB(2)-T4	1
ΔD2001A ΔD2002	360K3143	DIODE RD8-2JSB(1)-T4	2
D470 ΔD601	360K3149	DIODE RD10EB(2)-T4	2
ΔD651 ΔD652 D701	360K3151	DIODE RD6-8EB(2)-T4	3
	360K3160	DIODE RD8-2EB(2)-T4	1
D401	360K3161	DIODE RD12EB(2)-T4	1
D501	360K3162	DIODE RD2-7EB(1)-T4	1
ΔD603	360K3188	DIODE RD3-9EB(2)-T4	1
D402	360K3403	DIODE RD5-1JSB(1)-T4	1
D502			

SYMBOL	PARTS NO	DESCRIPTION	QTY
*** DIODES ***			
ZD851	360K3635	DIODE RD5-1ESB(2)-T4	1
ZD504	360K3647	DIODE RD6-8ESB(2)-T4	1
ZD803	360K3660	DIODE RD9-1ESB(3)-T4	1
D401	361K7160	RECTIFIER SI-TVR-06G G23	11
ΔD508 ΔD509 ΔD510			
D513 D516 D517			
D518 ΔD523			
D505	361K7505	RECTIFIER SI-ERB44-06V1	3
ΔD602 ΔD604	36107174	RECTIFIER SI- RU1P	2
ΔD514	36107300	DIODE ERD07-15	1
ΔD607	36107303	DIODE EU02	1
ΔD657	36107304	DIODE CT6-G3CR	1
ΔD651	36107305	DIODE RU2B	1
ΔD501	36107515	RECTIFIER SI- CTU-63DR	1
ΔD652	36108072	D-NETWORK D5LCA20	1
ΔD601	36108201	DIODE-NETWORK D5SBA60S	1
D599	36801023	DIODE LIGHT-E SEL13206	1
ΔD2001 ΔD2002	38005011	VARIATER VD1220	2
ΔTH602	38112025	THERMISTOR 451A12B0180	1
ΔTH601	38112031	THERMISTOR POSITIVE	1
ΔPC601 ΔPC602	38200233	IC TLP634(NHE-LF2)	2

*** TRANSFORMERS ***			
T503	45804002	TRANS-M-DRIVE	1
T501	45804004	TRANS-M-DRIVE	1
T505	46305101	TRANS-CONVERTER	1
ΔT601	46308409	TRANS-SWITCHING W098B	1
ΔT602	46308410	TRANS-SWITCHING W098B	1
ΔT504	47105636	F-B-T	1
ΔT506	47502053	TRANS-SIDE PINCUSHION	1
ΔT502	47710003	TRANS-M-OUTPUT	1
*** VARIABLE RESISTORS ***			
ΔC955	39510019	N-V CR BLOCK	1
VR5	41011273	R-VARIABLE B20K-V(M)	1
VR3	41011275	R-VARIABLE B20K-V(M)	3
VR1	41023603	R-VARIABLE B10K-V	2
VR509	41061511	R-VARIABLE B4-7K	1

SYMBOL	PARTS NO	DESCRIPTION	QTY
*** VARIABLE RESISTORS ***			
VR440	VR441	VR443	4
VR501		41071161	R-VARIABLE B4.7K
VR402		41071165	R-VARIABLE B22K
VR404	VR470	41071167	R-VARIABLE B47K
VR401		41071169	R-VARIABLE B100K
VR503	VR504	41071171	R-VARIABLE B220K
VR502		41071173	R-VARIABLE B470K
VR704		41071210	R-VARIABLE B3.3K
VR701	VR702	41071211	R-VARIABLE B4.7K
VR403		41085008	R-VARIABLE B5K
VR901	VR902	41085013	R-VARIABLE B100K
VR904	VR905	VR906	
VR907		41085014	R-VARIABLE B200K
VR651		41087058	R-VARIABLE B5K
VR652		41505005	R-VARIABLE B2K
VR2001	VR2002	41505006	R-VARIABLE B3K
VR653		41505007	R-VARIABLE B5K
VR508		41505009	R-VARIABLE B20K
VR510		41505208	R-VARIABLE B50K
*** RELAYS & SWITCHES ***			
ASW4		65161021	SWITCH-SLIDE
ASW802	ASW804	65161022	SWITCH-SLIDE
ASW803		65161023	SWITCH-SLIDE
ASW801		65161024	SWITCH-SLIDE
ASW2	ASW3	65163062	SWITCH-SLIDE
ASW1		65360006	SWITCH-PUSH BUTTON
RL501		65360009	SWITCH-PUSH BUTTON
RL502		65602551	RELAY
		65660004	RELAY
*** COILS & FILTERS ***			
LC802B	LC802G	LC802R	3
LC702	LC703B	LC703G	5
LC703R	LC801		
AL509		60908056	COIL-WIDTH
AL506		60918105	COIL-M-LIN
AL502		60919608	COIL-M-LIN
L511		60999004	COIL-CHOKE

SYMBOL	PARTS NO	DESCRIPTION	QTY
*** COILS & FILTERS ***			
L802		610E1714	COIL-FILTER 5-6UH
L501	L801	610F6014	COIL-FILTER 5-6UH
L503		610F7019	COIL-FILTER 15UH
L901	L902	610F7504	COIL-FILTER PR68MAT(S)
L704	L705	610F7507	COIL-FILTER P1R5MAT(S)
L701	L702	610F7551	COIL-FILTER 0.82UH
L508		61022081	COIL-CHOKE
AL601		61062044	LINE FILTER
AL601		61062054	LINE FILTER
AL504	L515	61064006	COIL-FILTER 50UH
L707		61067045	COIL-FILTER
AL651		61099011	COIL-CHOKE 33UH
AL652	AL653	61099014	COIL 330K1.8
L507	L510	61099019	COIL-CHOKE
AL602		61099027	FILTER CHOKE 101KR66
AL602		61320205	COIL-DEGAUSSING
AL602		61605008	FERRITE BEADS 3.5*5*1.3
L514		61605032	FERRITE BEADS
L904		61606021	NOISE FILTER DSS-271M
LC701			
LC705	LC706	LC707	NOISE FILTER 2A222M
LC901	LC902	LC903	NOISE FILTER 1H223X
*** PWB ASSYS ***			
ASW4		84K21A01	SW-REG-PWB ASSY
		84K21C02	VIDEO PWB ASSY
		84K21D01	DEF PWB ASSY
		84K21J01	CRT PWB ASSY
*** ELECTRICAL PARTS & MISCELLANEOUS PARTS ***			
HS402B		31709202	SHEET-INSULATOR
		31709203	INSULATOR (150*37,TR85)
S6901	S6902	S6903	SHEET-INSULATOR
S6904		32990047	ARRESTER
AL505		49801006	INDUCTOR-DUMMY(610UH)
AF501		66699011	FUSE SSFR-630MA-F005
AF601		66699013	FUSE ET T4A-250V-S.B SOC
S6905		66706001	SPARK GAP 1-2KV

SYMBOL	PARTS NO	DESCRIPTION	QTY
*** ELECTRICAL PARTS & MISCELLANEOUS PARTS ***			
IS802	70032026	SG/CRT SOCKET	1
	70102147	IC SOCKET 24P	1
	71205037	HOLDER, FUSE	2
IS701	70102152	IC SOCKET 30P	1
Δ(2001VME)	70800031	LINE CORD (E)	1
Δ(2001VME)	70800322	LINE CORD (BS)	1
Δ(2001VMR)	75513006	LINE CORD SAA L20	1
*** PRINTED & PACKING MATERIALS ***			
(2001VME)	25813001	FILLER(T), CARTON	1
(2001VME)	25813013	FILLER(B), CARTON	1
(2001VMR)	25814151	FILLER T, CARTON	1
	25814531	CARTON BOX	1
	25814891	CARTON BOX	1
	25814901	CARTON BOX	1
*** RESISTORS ***			
RS94	401C6601	R, CARBON 1-0M 5X 1/4W	1
ΔRSFF	401C6617	R, CARBON 4.7M 5X 1/4W	1
RS44	401C6631	R, CARBON 18M 5X 1/4W	1
R722	401C6637	R, CARBON 33M 5X 1/4W	1
R723	401C6639	R, CARBON 39M 5X 1/4W	2
ΔRS86	401C6641	R, CARBON 47H 5X 1/4W	1
R499B	401C6657	R, CARBON 220M 5X 1/4W	2
ΔRS68	401C6669	R, CARBON 680H 5X 1/4W	1
ΔR602	ΔR608	ΔR619	1
ΔR663	ΔR620	ΔR658	4
ΔR609	ΔR627		3
R495C	ΔR611	ΔR627	3
ΔR662	ΔR633	ΔR666	1
ΔR636	ΔR661		2
ΔR656			2
R940			1
ΔR655	R963		2
R461			1
R962			1
ΔR636	ΔR664		2
ΔR672			1
ΔR631			1
R584			1
ΔR657			1
R469J	ΔR564		2
R458			1
R524	R720	R721	1
R719	R905	R906	3
R904			3
R523			1
R499A			1
R757			1
*** KNOBS & PUSH BUTTONS ***			
	25451871	PUSH BUTTON	1
	25451881	KNOB, CONTROL	2
*** PRINTED & PACKING MATERIALS ***			
	24806961	BAG, POLYETHYLENE (270*370)	1
	24813191	BAG, POLYETHYLENE (150*370)	1
	24826313	BAG, PROTECTION	1
	25280111	HOLDER, PWB	2
	25280711	CLAMPER, WIRE	1
	25280811	HOLDER, PWB	1
	25281421	PWB HOLDER	1
	25281521	GROMMET	2
	25600711	CUSHION, SHEET	1
	25605431	HOLDER, PWB	1
	78120822	INSTRUCTION BOOK	1

SYMBOL	PARTS NO	DESCRIPTION	QTY
*** RESISTORS ***			
R583	401H5667	R-CARBON 560H 5X 1/2W	1
R586	401H5669	R-CARBON 680H 5X 1/2W	1
R543	401H5671	R-CARBON 820H 5X 1/2W	1
R538	401H5679	R-CARBON 1.8K 5X 1/2W	1
R599	401H5681	R-CARBON 2.2K 5X 1/2W	1
R942	401H5697	R-CARBON 10K 5X 1/2W	1
R539	401H5707	R-CARBON 27K 5X 1/2W	1
ΔR605	401H5735	R-CARBON 390K 5X 1/2W	2
ΔR603	401H5747	R-CARBON 1.2M 5X 1/2W	2
R770	401K5637	R-CARBON 33H 5X 1/6W	1
R575	401K5641	R-CARBON 47H 5X 1/6W	4
R766	R764		
R716	R717		
R486	R574		
R569	R570		
R8A38	R8A36		
R8C78	R8C76		
R854	R8C7R		
R713	R715		
R832			
R866	R931		
R864			
R738	R740		
R901	R902		
R5B8			
R849			
R725	R837		
ΔR2004	ΔR2007A		
R441	R5A1		
R508	R535		
R748	R754		
R819	R823G		
R823R	R861		
R930			
R416	R519		
ΔR566	R726		
R742	R743		
R480	R827B		
R827R	R829B		
R829R	R834		
R863	R865		
R421	R452		
R727	R881		
R408	R462		
R771	R817		
R421	R493		
R747			
R818			
401K5679			
401K5681			
R-CARBON 1.2K 5X 1/6W			8
R-CARBON 1.5K 5X 1/6W			11
R-CARBON 1.8K 5X 1/6W			5
R-CARBON 2.2K 5X 1/6W			13

SYMBOL	PARTS NO	DESCRIPTION	QTY
*** RESISTORS ***			
R855	R859		
R873	R879		
R932	R744		
R444	R755		
R750	R928		
R869	R710		
R487	R856		
R712	R921		
R876			
R456	ΔR567		
R820	R821		
R4FF	R448		
R469F	R516		
R830B	R830G		
R877	R878		
R929			
R477	R492		
R591	R737		
R810	R811		
R813	R814		
R835	R836		
R840	R843		
R871	R872		
R893	R895		
R478	R517		
R509	R578		
R756	R803E		
R803R	R808E		
R808R	R868		
R875	R882		
ΔR2002	ΔR2004		
R411	R420		
R463	R469D		
R481	R5B5		
R746	R8A4		
R8A6	R8C1		
R8C5	R8C6		
R804G	R804R		
R809G	R809B		
R891	R892		
R952	R953		
ΔR2001	ΔR2007		
R501	R802		
R870	R884		
R443	R446		
R454	R476		
R561	R590		
401K5681			
401K5683			
R-CARBON 2.2K 5X 1/6W			13
R-CARBON 2.7K 5X 1/6W			8
R-CARBON 3.3K 5X 1/6W			8
R-CARBON 3.9K 5X 1/6W			6
R-CARBON 4.7K 5X 1/6W			13
R-CARBON 5.6K 5X 1/6W			24
401K5693			
401K5695			
R-CARBON 6.8K 5X 1/6W			3
R-CARBON 8.2K 5X 1/6W			15
401K5697			
R-CARBON 10K 5X 1/6W			32
401K5699			
R-CARBON 12K 5X 1/6W			9
401K5701			
R-CARBON 15K 5X 1/6W			12

SYMBOL	PARTS NO	DESCRIPTION	QTY
*** RESISTORS ***			
R831B R8316	R831R		
R41C R469A	401K5703	R-CARBON 18K 5% 1/6W	2
R4FE R453	401K5705	R-CARBON 22K 5% 1/6W	14
R475 R502			
R531 AR563			
R894 R941			
R955 R956			
R505 R858	401K5707	R-CARBON 27K 5% 1/6W	2
R439 R440	401K5709	R-CARBON 33K 5% 1/6W	19
R494 R581			
R552 R553			
R588 R596			
R916 R917			
R922 R923			
R960 R960			
R474 R486	401K5711	R-CARBON 39K 5% 1/6W	1
R404 R404	401K5713	R-CARBON 47K 5% 1/6W	2
R402 R418	401K5715	R-CARBON 56K 5% 1/6W	4
R851 AR589			
R455 R473	401K5717	R-CARBON 68K 5% 1/6W	9
R5A7 R5A8			
R925 R926			
R442 R533			
R405 R449	401K5719	R-CARBON 82K 5% 1/6W	2
R451 R469B	401K5721	R-CARBON 100K 5% 1/6W	26
R471 R582			
AR521 AR522			
R530 R536			
R589 R8A7			
R881 R882			
R884 R886			
R889 R860			
R513 R914			
R913 R915			
R885 R888	401K5723	R-CARBON 120K 5% 1/6W	1
R899 R907	401K5727	R-CARBON 180K 5% 1/6W	3
R909 R908			
R910 R912			
R958 R959	401K5731	R-CARBON 270K 5% 1/6W	3
R482 R554	401K5735	R-CARBON 390K 5% 1/6W	2
R537 R537	401K5737	R-CARBON 470K 5% 1/6W	3
	401K5739	R-CARBON 560K 5% 1/6W	1
R556 R556			
AR2003 AR2006	401K5745	R-CARBON 1.0M 5% 1/6W	1
R506 R506	40107185	R-CARBON 3.3K 5% 1/6W	2
AR2005 AR2005	40107195	R-CARBON 8.2K 5% 1/6W	1
R510 R510	40107197	R-CARBON 10K 5% 1/6W	1
	40107209	R-CARBON 33K 5% 1/6W	1

SYMBOL	PARTS NO	DESCRIPTION	QTY
*** RESISTORS ***			
R495	40175133	R-CARBON 22M 5% 1/4W	1
AR630 AR630	40175143	R-CARBON 56M 5% 1/4W	2
AR626 AR626	40175157	R-CARBON 220M 5% 1/4W	1
AR612 AR612	40175181	R-CARBON 2.2K 5% 1/4W	1
AR614 AR623	40175183	R-CARBON 2.7K 5% 1/4W	2
AR731 AR732	40177137	R-CARBON 33M 5% 1/4W	6
AR734 AR735			
AR579 AR579	40178117	R-CARBON 4.7M 5% 1/2W	1
AR637 AR637	40216013	R-WIRE 150M 10% 5W	1
AR546 AR546	40216026	R-WIRE 68M 5% 5W	1
AR534 AR534	40299108	R-WIRE 240M 5% 7W	1
AR601 AR601	40299109	R-WIRE 15M 5% 7W	1
R728 R728	40318273	R-METAL 1.0K 5% 7W	3
AR573 AR573	40371115	R-METAL 3.9M 5% 1W	1
AR545 AR545	40371119	R-METAL 5.6M 5% 1W	1
AR5A3 AR5A3	40371125	R-METAL 10M 5% 1W	1
AR5A2 AR5A2	40371133	R-METAL 22M 5% 1W	1
R592 R592	40371147	R-METAL 82M 5% 1W	1
R484 R484	40371151	R-METAL 120M 5% 1W	1
R406 R406	40371161	R-METAL 330M 5% 1W	2
R401 R401	40371165	R-METAL 470M 5% 1W	1
R957 R957	40371197	R-METAL 10K 5% 1W	1
R585 R585	40371337	R-METAL 47M 5% 1W	1
R525 R525	40372101	R-METAL 1.0M 5% 2W	3
R407 R407	40372105	R-METAL 1.5M 5% 2W	1
AR667 AR667	40372137	R-METAL 33M 5% 2W	1
AR613 AR613	40372141	R-METAL 47M 5% 2W	3
AR607 AR607	40372147	R-METAL 82M 5% 2W	1
AR625 AR625	40372149	R-METAL 100M 5% 2W	1
R581 R581	40372151	R-METAL 120M 5% 2W	1
AR496 AR496	40372157	R-METAL 220M 5% 2W	1
AR423 AR423	40372159	R-METAL 270M 5% 2W	2
AR634 AR634	40372161	R-METAL 330M 5% 2W	1
AR652 AR652	40372203	R-METAL 18K 5% 2W	1
AR654 AR654	40372205	R-METAL 22K 5% 2W	1
AR665 AR665	40372209	R-METAL 33K 5% 2W	1
R961 R961	40372217	R-METAL 68K 5% 2W	1
AR617 AR617	40372221	R-METAL 100K 5% 2W	2
R485 R485	40373157	R-METAL 220M 5% 3W	1
AR610 AR610	40373181	R-METAL 2.2K 5% 3W	1
AR653 AR653	40373195	R-METAL 8.2K 5% 3W	1
AR660 AR660	40373197	R-METAL 10K 5% 3W	1

SYMBOL	PARTS NO	DESCRIPTION	QTY
*** RESISTORS ***			
ΔR659	ΔR670	40373203 R-METAL 18K 5% 3W	2
ΔR604		40399034 R-METAL 2-2K 5% 2W	1
R807B	R807R	404C1646 R-METAL 75H 1% 1/6W	3
R8A1B	R8A1R	404C1647 R-METAL 82H 1% 1/6W	3
R824B	R824R	404C1653 R-METAL 150H 1% 1/6W	3
R801B	R801R	404C1659 R-METAL 270H 1% 1/6W	3
R707	R826B	404C1669 R-METAL 680H 1% 1/6W	7
R826R	R828B		
R828R			
R8A2B	R8A2R	404C1670 R-METAL 75CH 1% 1/6W	6
R825B	R825R		
R469H	R833B	404C1673 R-METAL 1-0K 1% 1/6W	4
R833R			
R832B	R832R	404C1675 R-METAL 1-2K 1% 1/6W	3
R709		404C1691 R-METAL 5-6K 1% 1/6W	1
R708		404C1694 R-METAL 7-5K 1% 1/6W	1
R469E	R702	404C1697 R-METAL 10K 1% 1/6W	7
R703	R705	404C1697 R-METAL 10K 1% 1/6W	7
R706			
R432	R582	404C1703 R-METAL 18K 1% 1/6W	3
R433		404C1705 R-METAL 22K 1% 1/6W	2
R437		404C1707 R-METAL 27K 1% 1/6W	2
R431		404C1709 R-METAL 33K 1% 1/6W	1
R430	R464	404C1711 R-METAL 39K 1% 1/6W	2
R512		404C1714 R-METAL 51K 1% 1/6W	1
R403		404C1719 R-METAL 82K 1% 1/6W	1
R468		404C1721 R-METAL 100K 1% 1/6W	1
R434	R555	404C1723 R-METAL 120K 1% 1/6W	2
R580		404C1725 R-METAL 150K 1% 1/6W	1
R467	R469	404C1731 R-METAL 270K 1% 1/6W	3
R436	R465	404C1733 R-METAL 330K 1% 1/6W	3
R438		404C1741 R-METAL 680K 1% 1/6W	1
ΔR529	ΔR577	40405109 R-METAL 2-2H 5% 1/4W	2
ΔR527	ΔR548	40405117 R-METAL 4-7H 5% 1/4W	5
ΔR550	ΔR551		
ΔR520	ΔR542	40405137 R-METAL 33H 5% 1/4W	2
ΔR593		40801051 R-FUSE 100H 5% 1/4W	1

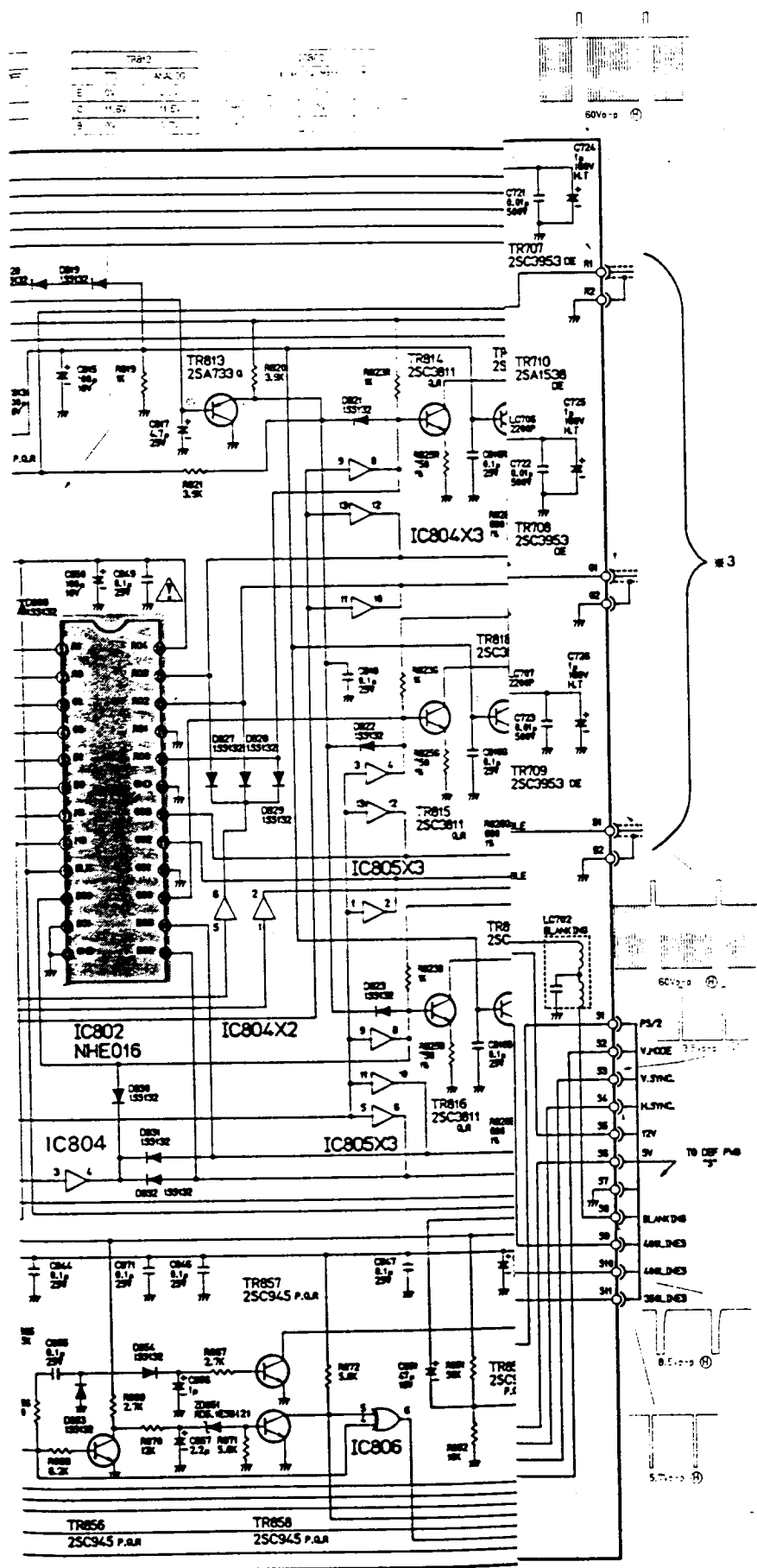
SYMBOL	PARTS NO	DESCRIPTION	QTY
*** CAPACITORS ***			
C956	420C9560	C-CERAMIC 500V 560PF	1
C840	420C9562	C-CERAMIC 500V 820PF	1
C909	420C9563	C-CERAMIC 500V 0-001UF	3
C520	420C9565	C-CERAMIC 500V 1500PF	1
C906	420C9567	C-CERAMIC 500V 2200PF	4
C917			
C545	420G5001	C-CERAMIC 50V 0-22UF	4
C563			
C4FF	420J9069	C-CERAMIC 50V 0-1UF	1
C721	4201J575	C-CERAMIC 500V 0-01UF	3
C914	42019175	C-CERAMIC 2KV 0-01UF	2
ΔC565	4203J553	C-CERAMIC 500V 150PF	1
ΔC626	4203J554	C-CERAMIC 500V 180PF	1
ΔC528	4203J555	C-CERAMIC 500V 220PF	1
C513	4203J571	C-CERAMIC 500V 4700PF	1
ΔC603	42053013	C-CERAMIC 400V 1000PF	2
ΔC606	42053067	C-CERAMIC 400V 2200PF	1
ΔC663	42099082	C-CERAMIC 2KV 1500PF	1
ΔC622	42099085	C-CERAMIC 2KV 560PF	3
ΔC612	42099088	C-CERAMIC 2KV 220PF	2
C519	421C0213	C-CERAMIC 5CV 1000PF	5
C728			
C440	421C0217	C-CERAMIC 50V 0-0022UF	1
C499A			
C953	421C0221	C-CERAMIC 50V 4700PF	4
C854	421C0225	C-CERAMIC 50V 4700PF	4
C571	421C0701	C-CERAMIC 50V 0-01UF	1
C544	421D5201	C-CERAMIC 50V 100PF	1
C443	421J9001	C-CERAMIC 50V 0-1UF	5
C912			
C913	421J9006	C-CERAMIC 16V 0-1UF	1
C5FE	421J9036	C-CERAMIC 25V 0-1UF	32
C559			
C705			
C706			
C715			
C716			
C717			
C810			
C812			
C816B			
C816R			
C818			
C832			
C834			
C836			
C837			
C842			
C843			
C844			
C845			
C846			
C847			
C849			
C855			
C871			
C501			
C502			
423A1053		C-CERAMIC 50V 220PF	2
423A1055		C-CERAMIC 50V 270PF	1

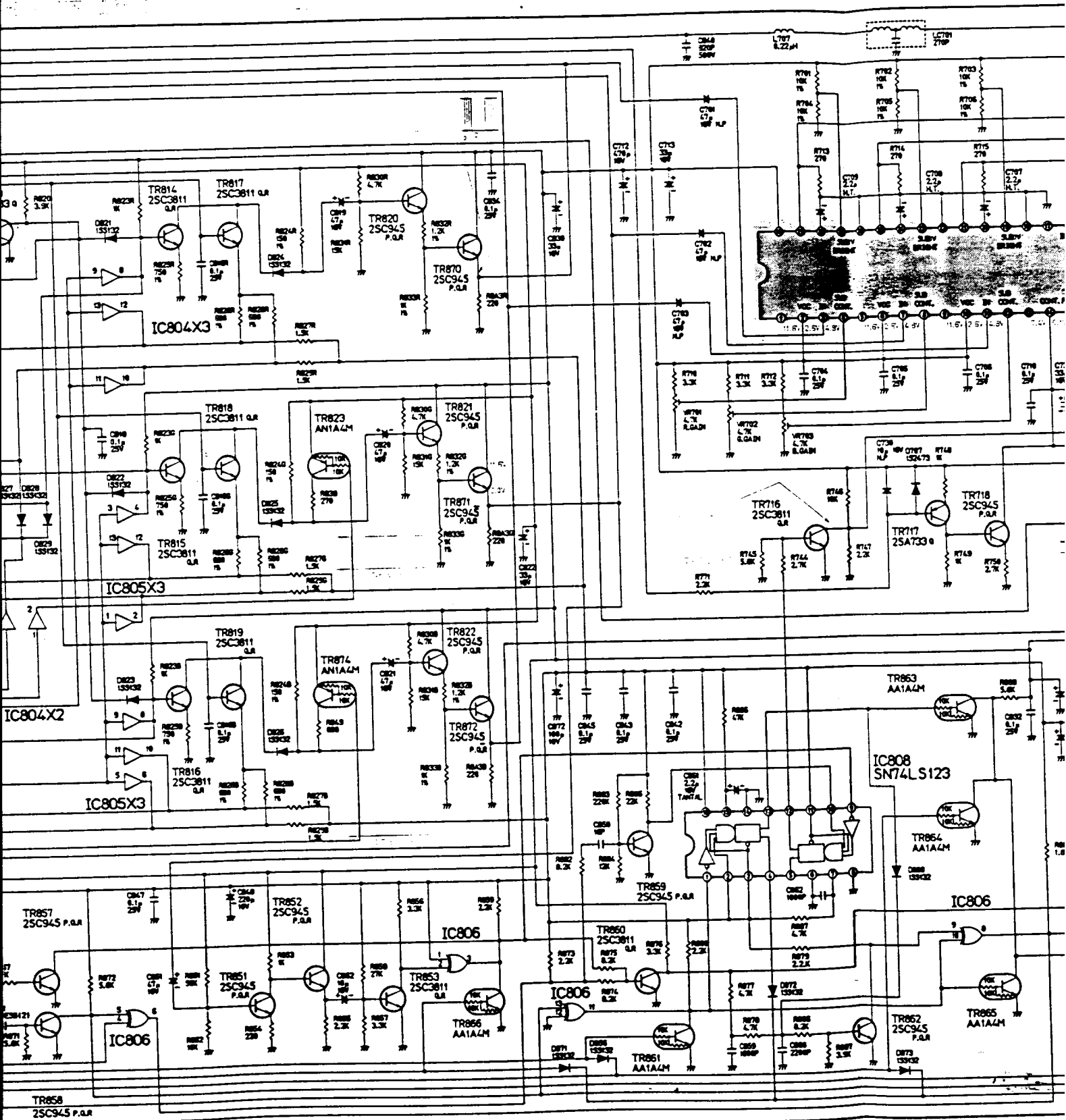
SYMBOL	PARTS NO	DESCRIPTION	QTY
*** CAPACITORS ***			
C508	423A1101	C-CERAMIC 50V 470PF	1
C858	423A2027	C-CERAMIC 50V 18PF	1
C891	423A2041	C-CERAMIC 50V 68PF	3
C719	423A2043	C-CERAMIC 50V 82PF	2
C718	423A2045	C-CERAMIC 50V 100PF	1
C409	423A2104	C-CERAMIC 50V 220PF	1
C509	423J8102	C-CERAMIC 50V 560PF	1
C507	427A7005	C-FILM 100V 0-0022UF	1
C506	427A7006	C-FILM 100V 0-0027UF	1
C564	427F4001	C-FILM 50V 1000PF	1
C510	427F4002	C-FILM 50V 1200PF	1
C503	427F4006	C-FILM 50V 2700PF	1
C402	427F4015	C-FILM 50V 0-015UF	2
C404	427F4025	C-FILM 50V 0-1UF	2
C862	427F4051	C-FILM 50V 1000PF	1
C859	427F4054	C-FILM 50V 1800PF	1
C860	427F4055	C-FILM 50V 2200PF	1
C905	427F4075	C-FILM 50V 0-1UF	1
ΔC552	42704567	C-FILM 200V 0-022UF	1
C541	42760011	C-FILM 50V 6800PF	1
ΔC630	42760017	C-FILM 50V 0-022UF	1
ΔC608	42760069	C-FILM 50V 0-033UF	2
ΔC656	42760073	C-FILM 50V 0-068UF	1
ΔC607	42760075	C-FILM 50V 0-1UF	1
ΔC613	42799099	C-MYLAR 400V 0-033UF	3
C445	4282C013	C-ELEC 50V 0-1UF	2
C442	4282C017	C-METAL FILM 50V 0-2U	1
C406	4282C025	C-METAL FILM 50V 1UF	3
ΔC602	42824325	C-FILM 250V 0-1UF	1
ΔC601	42824329	C-FILM 250V 0-22UF	1
ΔC655	42839021	C-METAL FILM 250V 0-068UF	1
ΔC666	42839022	C-METAL FILM 250V 0-1UF	1
C901	42840097	C-FILM 250V 0-22UF	3
ΔC661	42840133	C-METAL FILM 250V 0-1UF	1
C516	42840173	C-FILM 400V 0-1UF	1
ΔC515	42842502	C FILM 1600V 3000PF	2
ΔC522	42842504	C-FILM 1600V 1900PF	1
ΔC529	42843502	C-FILM 200V 12UF	1
C518	42899010	C-METAL FILM 250V 0-22UF	1
ΔC530	42899014	C-METAL FILM 400V 0-39UF	1
C532	42899027	C-METAL FILM 400V 0-36UF	1
C531	42899080	C-FILM 400V 0-24UF	1

SYMBOL	PARTS NO	DESCRIPTION	QTY
*** CAPACITORS ***			
C414	430A4101	C-ELEC 50V 0-22UF	1
ΔC2001	430B3047	C-ELEC 16V 22UF	1
C405	430B3050	C-ELEC 16V 100UF	1
C408	430B3090	C-ELEC 35V 100UF	1
C407	430B3091	C-ELEC 35V 220UF	1
C707	430B3103	C-ELEC 50V 2-2UF	3
C558	430B3182	C-ELEC 160V 1UF	4
C726	430B6016	C-ELEC 10V 100UF	5
C807	430B6016	C-ELEC 10V 100UF	5
C850	430B6017	C-ELEC 10V 220UF	3
C538	430B6025	C-ELEC 16V 10UF	3
C825	430B6026	C-ELEC 16V 22UF	1
ΔC2002	430B6027	C-ELEC 16V 33UF	5
C713	430B6030	C-ELEC 16V 22UF	5
C822	430B6032	C-ELEC 16V 470UF	1
C420	430B6037	C-ELEC 25V 4-7UF	1
C821	430B6039	C-ELEC 25V 22UF	4
C401	430B6029	C-ELEC 16V 100UF	5
C835	430B6030	C-ELEC 16V 22UF	2
C512	430B6032	C-ELEC 16V 470UF	1
C712	430B6037	C-ELEC 25V 4-7UF	1
C817	430B6039	C-ELEC 25V 22UF	4
C472	430B6041	C-ELEC 25V 47UF	1
C475	430B6044	C-ELEC 25V 330UF	1
C548	430B6053	C-ELEC 35V 47UF	2
C540	430B6053	C-ELEC 35V 47UF	2
C419	430B6054	C-ELEC 35V 100UF	2
C490	430B6061	C-ELEC 50V 1UF	2
C403	430B6062	C-ELEC 50V 2-2UF	2
C415	430B6063	C-ELEC 50V 3-3UF	1
C505	430B6065	C-ELEC 50V 10UF	4
C470	430B6066	C-ELEC 50V 22UF	1
C526	430B6068	C-ELEC 50V 47UF	1
ΔC525	430B6516	C-ELEC 160V 10UF	1
C562	430B6552	C-ELEC 250V 1UF	1
C916	4302C034	C-ELEC 10V 1000UF	1
C537	4302C094	C-ELEC 35V 1000UF	1
ΔC652	4302C101	C-ELEC 50V 0-47UF	1
ΔC660	4302C102	C-ELEC 50V 1UF	1
ΔC665	4302C170	C-ELEC 100V 100UF	1
ΔC653	4302C172	C-ELEC 100V 330UF	1
ΔC651			

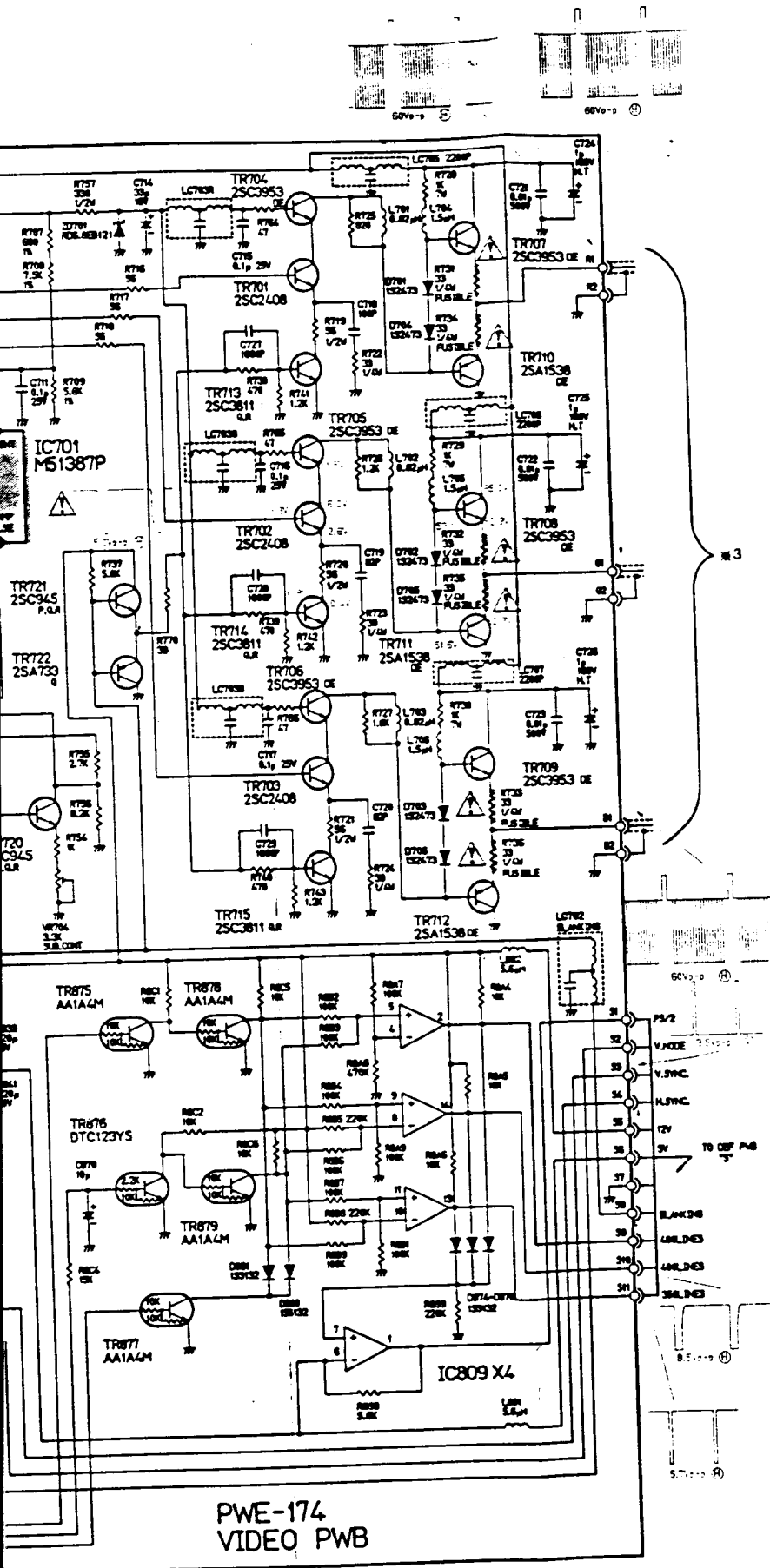
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*** CAPACITORS ***			
ΔC664	4302C182	C-ELEC 160V 1UF	1
ΔC650	4302C190	C-ELEC 160V 100UF	4
ΔC662			
ΔC611	4302E051	C-ELEC 16V 220UF	2
ΔC610	4302E053	C-ELEC 50V 470UF	2
ΔC668	4302E069	C-ELEC 25V 47UF	1
ΔC654	4302E090	C-ELEC 35V 100UF	1
ΔC609	4302E105	C-ELEC 50V 4.7UF	2
ΔC620	4302E107	C-ELEC 50V 22UF	1
C536	4302F056	C-ELEC 35V 33CUF	1
C527	4302F536	C-ELEC 200V 10UF	1
ΔC629	4302J032	C-ELEC 16V 470UF	1
C410	43026073	C-ELEC 50V 1000UF	1
ΔC523	43041001	C-ELEC 160V 47UF	1
ΔC605	43108312	C-ELEC 400V 220UF	2
C556	43201013	C-ELEC 25V 22UF	2
C730	433A3022	C-ELEC 16V 10UF	1
C701	433A3025	C-ELEC 16V 47UF	5
C801			
C804			
C514	43315001	C-ELEC 25V 10UF	2
C504	435A5071	C-TANTALUM 35V 1UF	1
C861	435A7051	C-TANTALUM 16V 2.2UF	1
C412	435J9007	C-TANTALUM 35V 10UF	1
C511	4351H313	C-TANTLM 35V 10UF	1

RUN NO.1





RUN NO.1



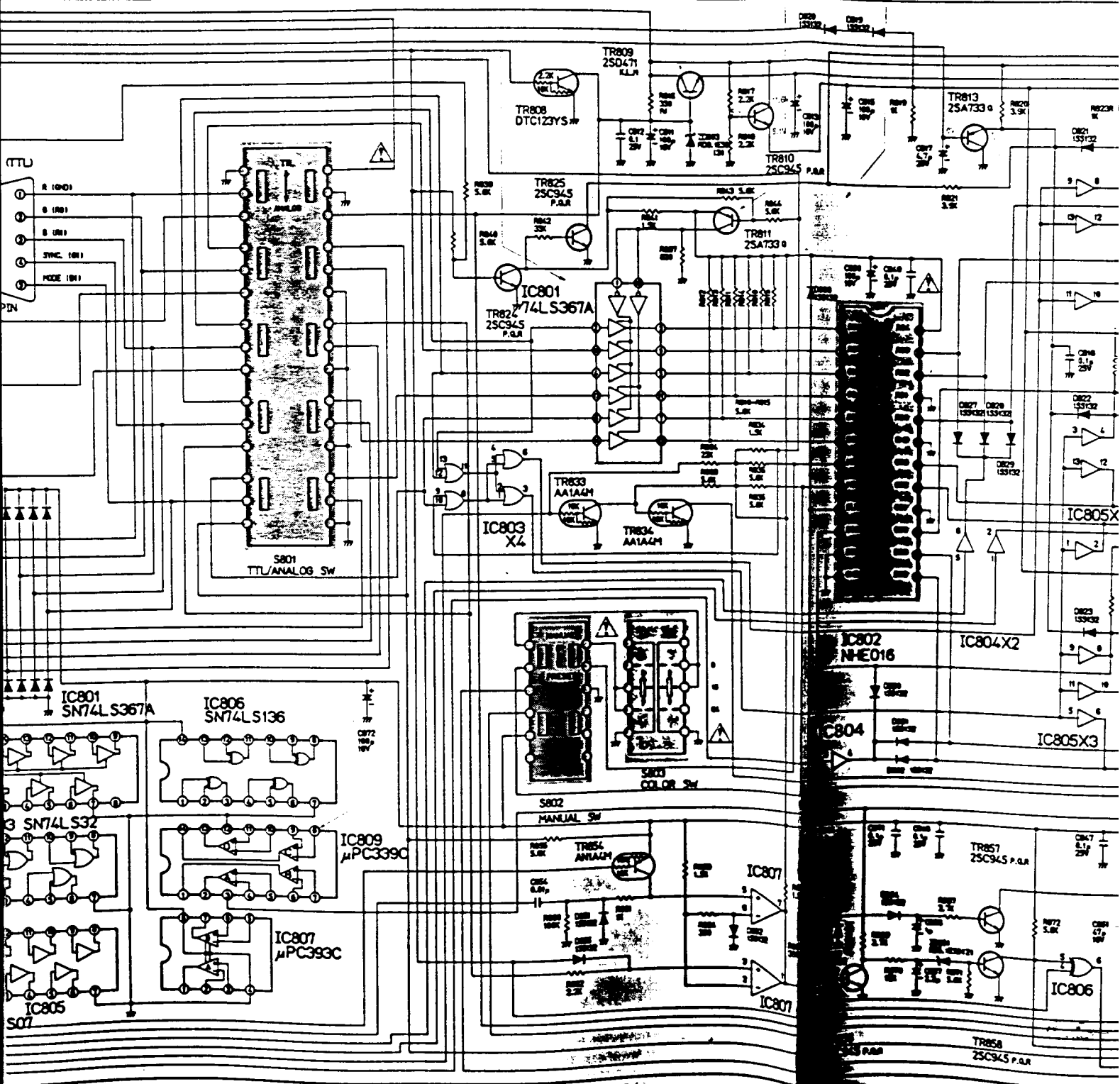
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1	1.0V	1.0V	1.0V	8	1.0V	1.0V
2	1.0V	1.0V	1.0V	9	1.0V	1.0V
3	1.0V	1.0V	1.0V	10	1.0V	1.0V
4	1.0V	1.0V	1.0V	11	1.0V	1.0V
5	1.0V	1.0V	1.0V	12	1.0V	1.0V
6	1.0V	1.0V	1.0V	13	1.0V	1.0V
7	1.0V	1.0V	1.0V	14	1.0V	1.0V
8	1.0V	1.0V	1.0V	15	1.0V	1.0V
9	1.0V	1.0V	1.0V	16	1.0V	1.0V
10	1.0V	1.0V	1.0V	17	1.0V	1.0V
11	1.0V	1.0V	1.0V	18	1.0V	1.0V
12	1.0V	1.0V	1.0V	19	1.0V	1.0V
13	1.0V	1.0V	1.0V	20	1.0V	1.0V
14	1.0V	1.0V	1.0V	21	1.0V	1.0V
15	1.0V	1.0V	1.0V	22	1.0V	1.0V
16	1.0V	1.0V	1.0V	23	1.0V	1.0V
17	1.0V	1.0V	1.0V	24	1.0V	1.0V
18	1.0V	1.0V	1.0V	25	1.0V	1.0V
19	1.0V	1.0V	1.0V	26	1.0V	1.0V
20	1.0V	1.0V	1.0V	27	1.0V	1.0V
21	1.0V	1.0V	1.0V	28	1.0V	1.0V
22	1.0V	1.0V	1.0V	29	1.0V	1.0V
23	1.0V	1.0V	1.0V	30	1.0V	1.0V
24	1.0V	1.0V	1.0V	31	1.0V	1.0V
25	1.0V	1.0V	1.0V	32	1.0V	1.0V
26	1.0V	1.0V	1.0V	33	1.0V	1.0V
27	1.0V	1.0V	1.0V	34	1.0V	1.0V
28	1.0V	1.0V	1.0V	35	1.0V	1.0V
29	1.0V	1.0V	1.0V	36	1.0V	1.0V
30	1.0V	1.0V	1.0V	37	1.0V	1.0V
31	1.0V	1.0V	1.0V	38	1.0V	1.0V
32	1.0V	1.0V	1.0V	39	1.0V	1.0V
33	1.0V	1.0V	1.0V	40	1.0V	1.0V
34	1.0V	1.0V	1.0V	41	1.0V	1.0V
35	1.0V	1.0V	1.0V	42	1.0V	1.0V
36	1.0V	1.0V	1.0V	43	1.0V	1.0V
37	1.0V	1.0V	1.0V	44	1.0V	1.0V
38	1.0V	1.0V	1.0V	45	1.0V	1.0V
39	1.0V	1.0V	1.0V	46	1.0V	1.0V
40	1.0V	1.0V	1.0V	47	1.0V	1.0V
41	1.0V	1.0V	1.0V	48	1.0V	1.0V
42	1.0V	1.0V	1.0V	49	1.0V	1.0V
43	1.0V	1.0V	1.0V	50	1.0V	1.0V
44	1.0V	1.0V	1.0V	51	1.0V	1.0V
45	1.0V	1.0V	1.0V	52	1.0V	1.0V
46	1.0V	1.0V	1.0V	53	1.0V	1.0V
47	1.0V	1.0V	1.0V	54	1.0V	1.0V
48	1.0V	1.0V	1.0V	55	1.0V	1.0V
49	1.0V	1.0V	1.0V	56	1.0V	1.0V
50	1.0V	1.0V	1.0V	57	1.0V	1.0V
51	1.0V	1.0V	1.0V	58	1.0V	1.0V
52	1.0V	1.0V	1.0V	59	1.0V	1.0V
53	1.0V	1.0V	1.0V	60	1.0V	1.0V
54	1.0V	1.0V	1.0V	61	1.0V	1.0V
55	1.0V	1.0V	1.0V	62		

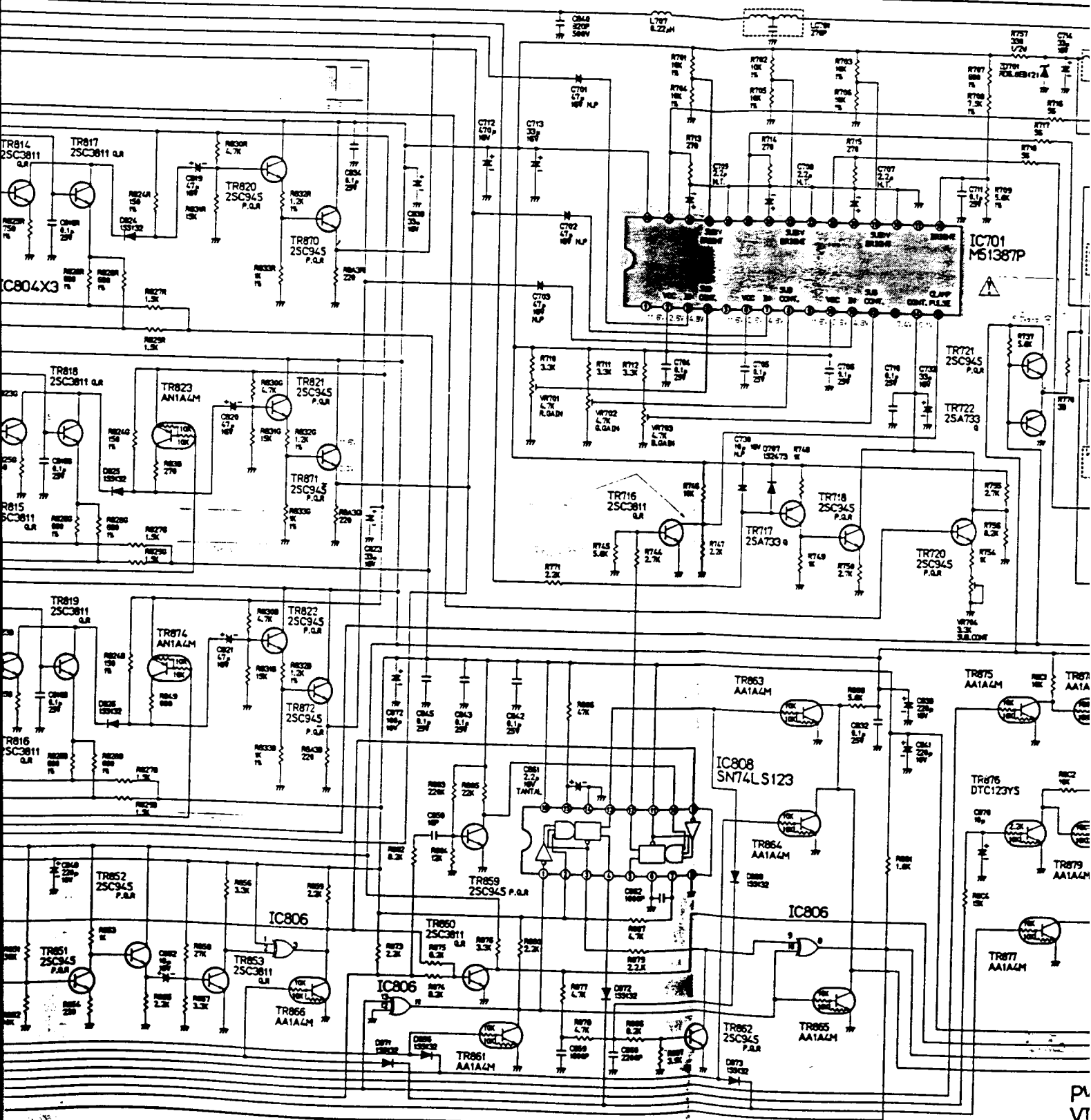
	OFF	ON	OFF	ON
2	2.3%	2.3%	10	2.3%
3	2.4%	5.1%	11	2.4%
4	2.5%	7.8%	12	2.5%
5	2.6%	5.1%	13	2.6%
6	2.3%	2.3%	14	2.3%

E	
C	
B	

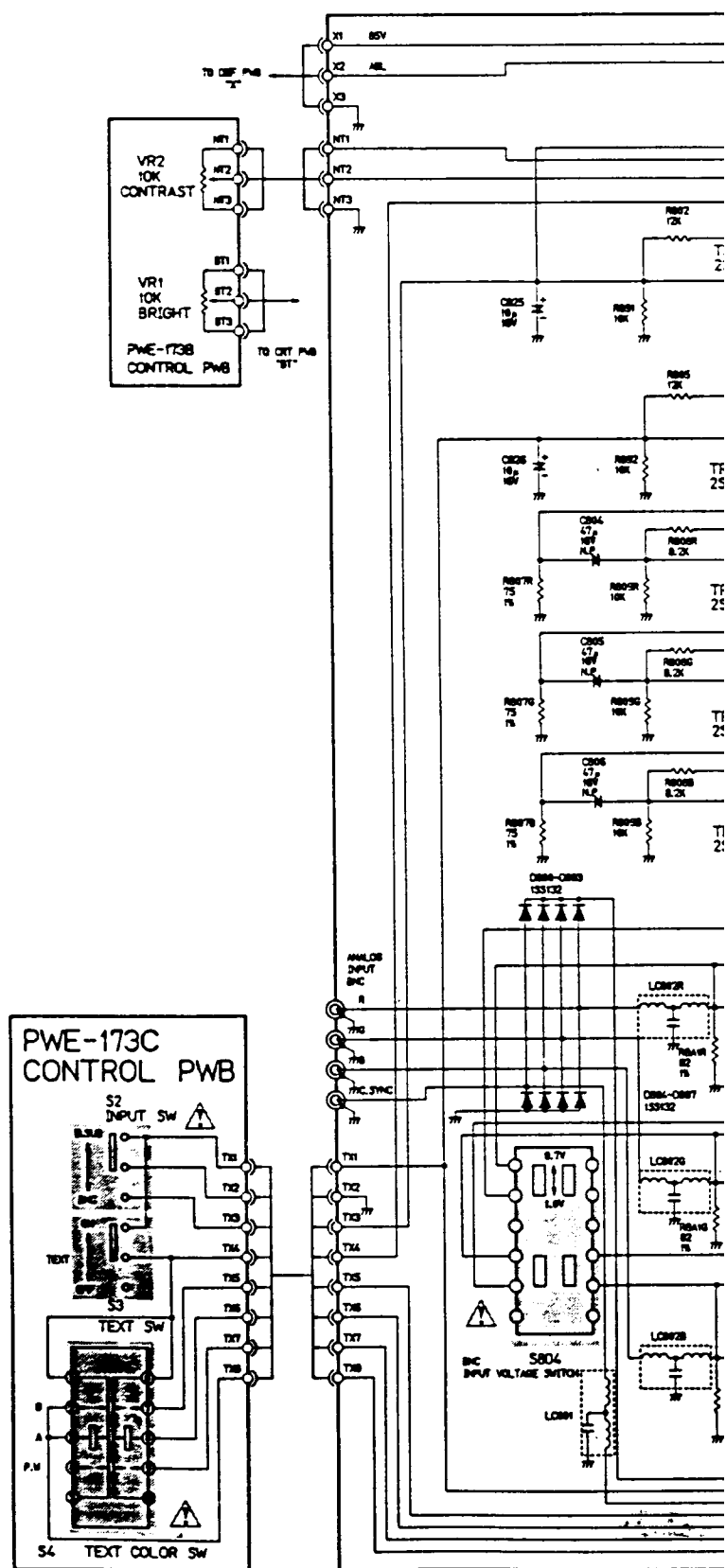
TR8		
TEST ON	TEST RE	
E	5.7V	5.1V
C	5.0V	0V
B	-0.2V	4.0V

	TR62	
	TR	ANALOG
E	0V	0.0V
C	11.6V	11.5V
B	0V	0.0V





SCHEMATIC DIAGRAM



THIS SCHEMATIC DIAGRAM IS FUNDAMENTAL AND SUBJECT TO CHANGE.

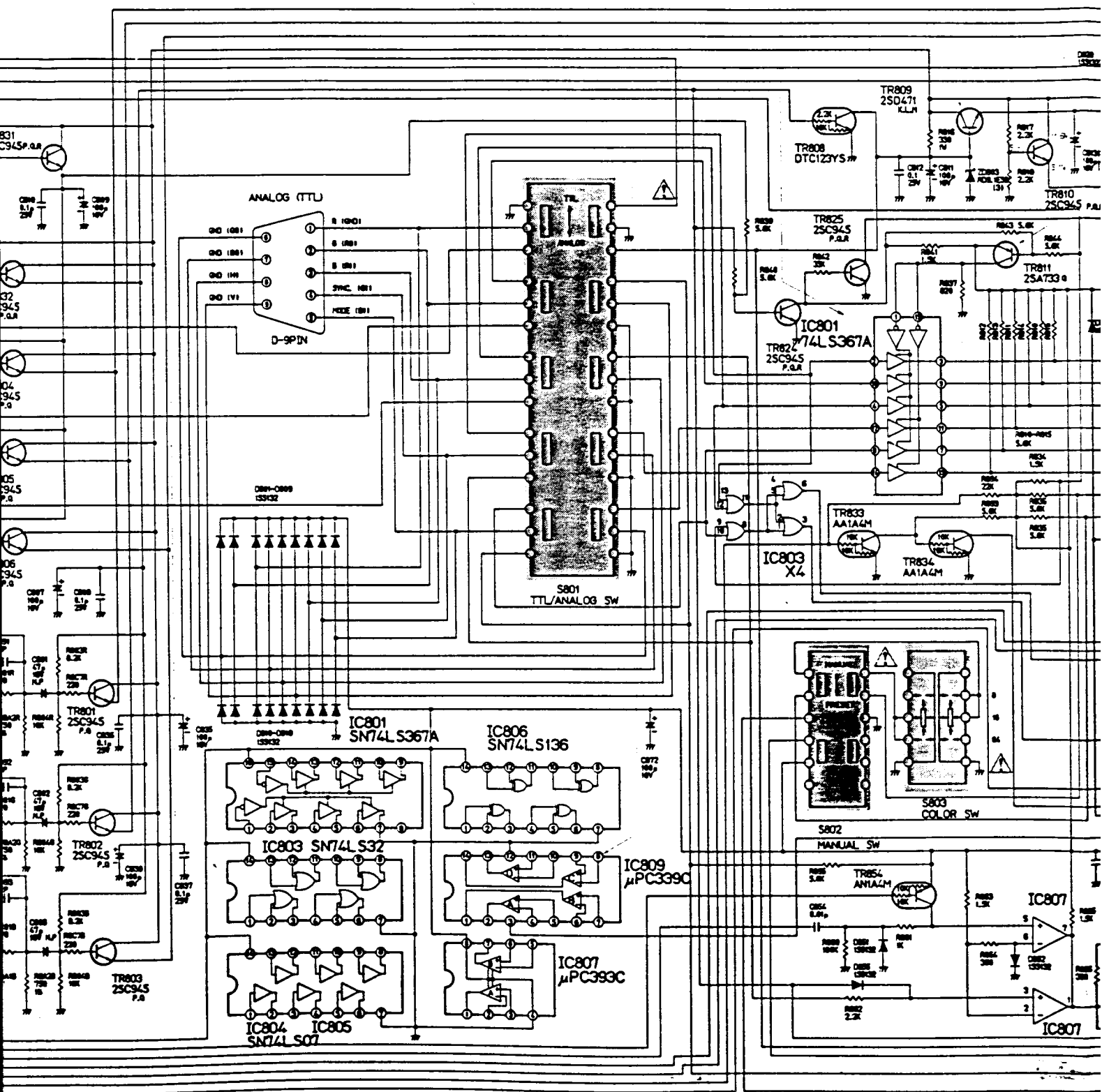
TEST POINT	TEST ON	TEST OFF	TEST ON	TEST OFF	TEST ON
1	2.3V	2.2V	10	2.2V	2.3V
2	2.3V	2.2V	11	2.2V	2.3V
3	2.4V	2.3V	12	2.2V	2.3V
4	2.3V	2.2V	13	2.2V	2.3V
5	2.3V	2.2V	14	2.2V	2.3V
6	2.3V	2.2V	15	2.2V	2.3V

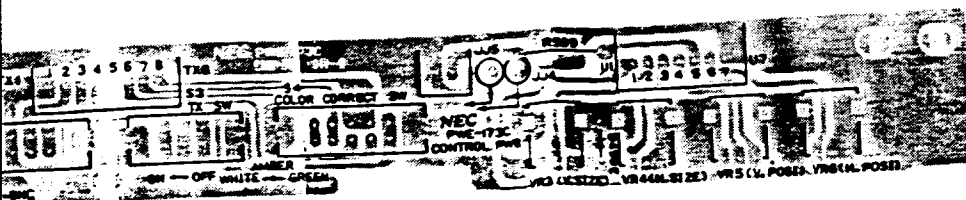
TEST POINT	TEST ON	TEST OFF	TEST ON	TEST OFF	TEST ON
1	2.3V	2.2V	10	2.2V	2.3V
2	2.3V	2.2V	11	2.2V	2.3V
3	2.4V	2.3V	12	2.2V	2.3V
4	2.3V	2.2V	13	2.2V	2.3V
5	2.3V	2.2V	14	2.2V	2.3V
6	2.3V	2.2V	15	2.2V	2.3V

TEST POINT	TEST ON	TEST OFF	TEST ON	TEST OFF	TEST ON
1	2.3V	2.2V	10	2.2V	2.3V
2	2.3V	2.2V	11	2.2V	2.3V
3	2.4V	2.3V	12	2.2V	2.3V
4	2.3V	2.2V	13	2.2V	2.3V
5	2.3V	2.2V	14	2.2V	2.3V
6	2.3V	2.2V	15	2.2V	2.3V

TEST POINT	TEST ON	TEST OFF	TEST ON	TEST OFF	TEST ON
1	2.3V	2.2V	10	2.2V	2.3V
2	2.3V	2.2V	11	2.2V	2.3V
3	2.4V	2.3V	12	2.2V	2.3V
4	2.3V	2.2V	13	2.2V	2.3V
5	2.3V	2.2V	14	2.2V	2.3V
6	2.3V	2.2V	15	2.2V	2.3V

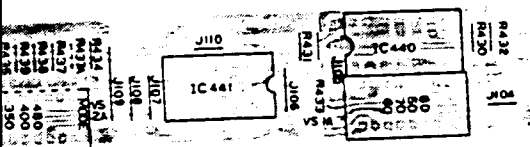
TEST POINT	TEST ON	TEST OFF	TEST ON	TEST OFF	TEST ON
1	2.3V	2.2V	10	2.2V	2.3V
2	2.3V	2.2V	11	2.2V	2.3V
3	2.4V	2.3V	12	2.2V	2.3V
4	2.3V	2.2V	13	2.2V	2.3V
5	2.3V	2.2V	14	2.2V	2.3V
6	2.3V	2.2V	15	2.2V	2.3V





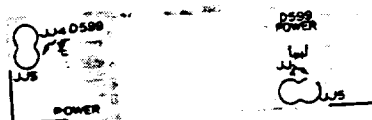
CONTROL PWB ASSY (PWE-173C)

— Solder Side —



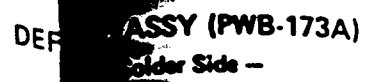
V-SIZE PWB ASSY (PWE-173D)

— Solder Side —



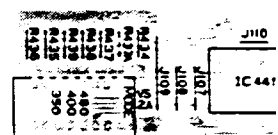
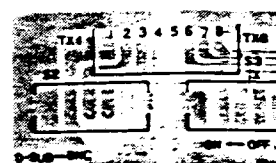
LED PWB ASSY (PWE-173E/F)

— Solder Side —



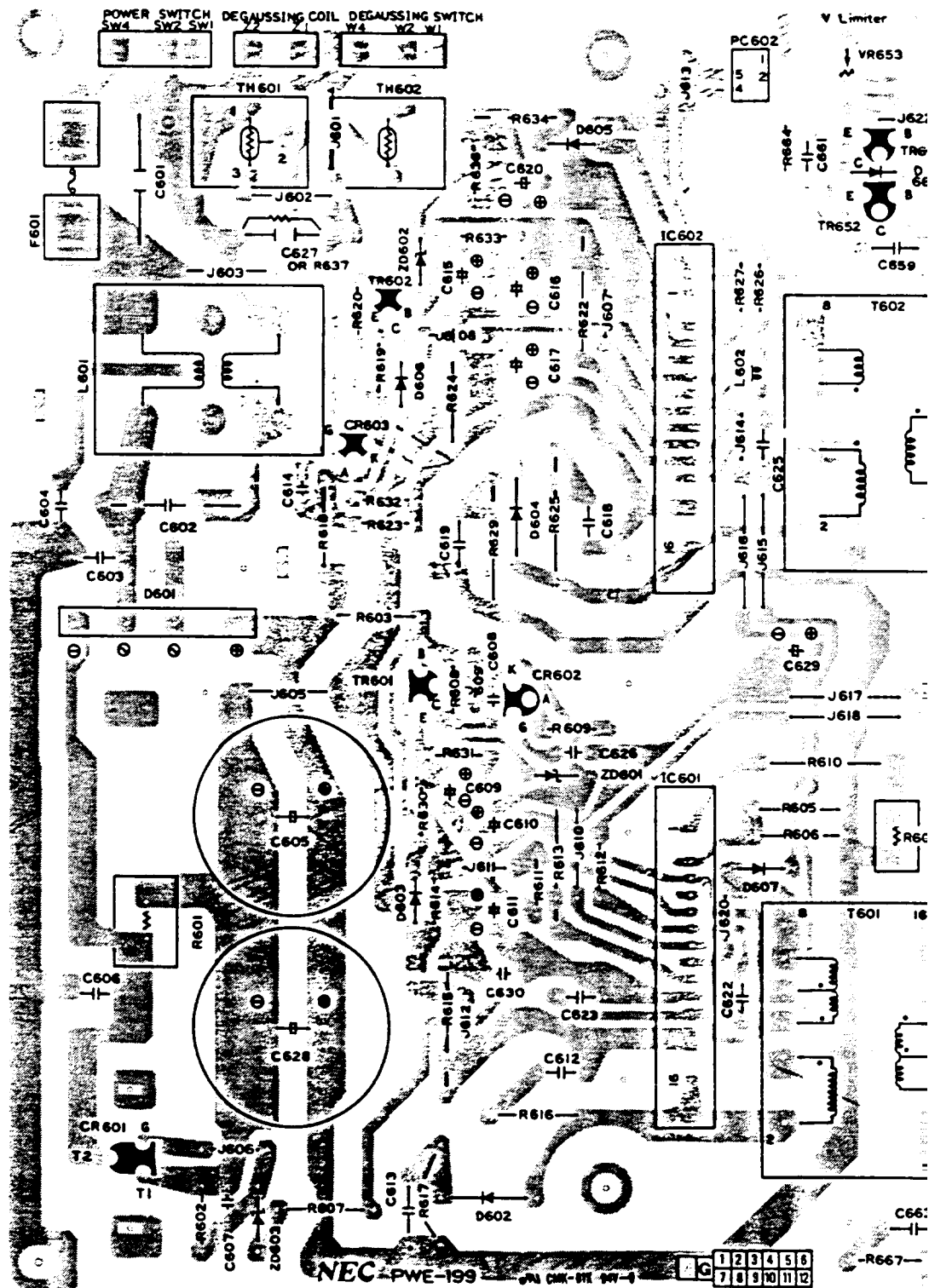


— Solder Side —



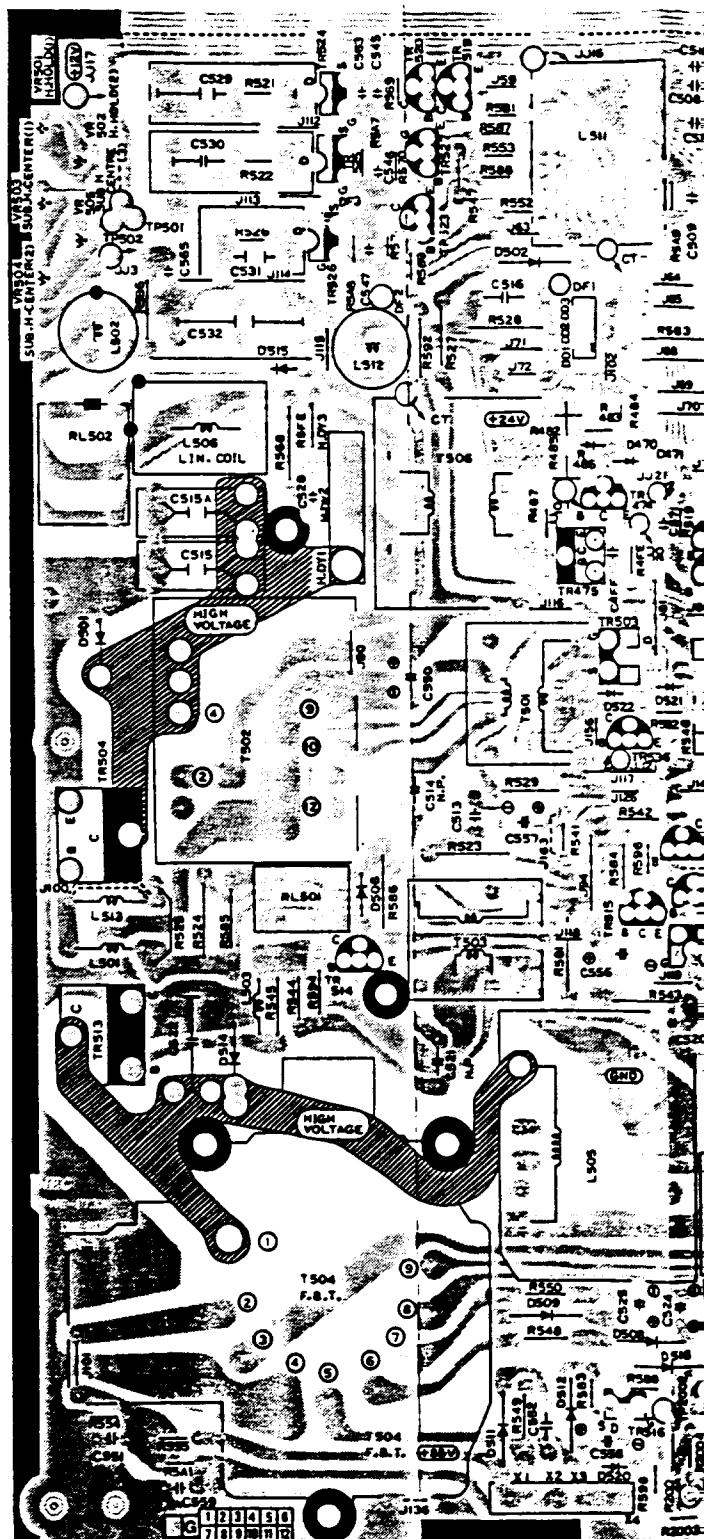
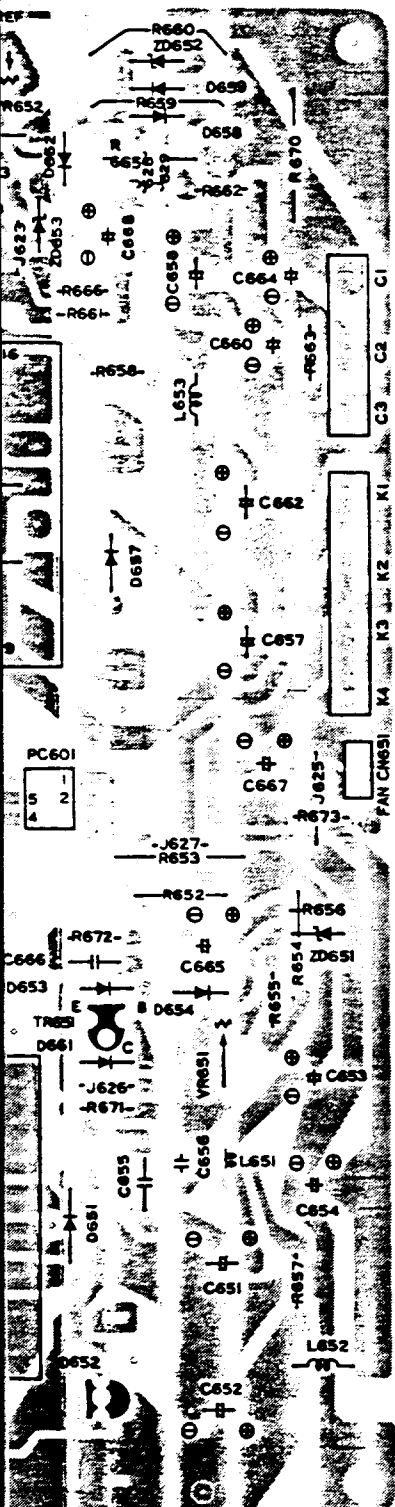
– Sold

PRINTED WIRING BOARDS

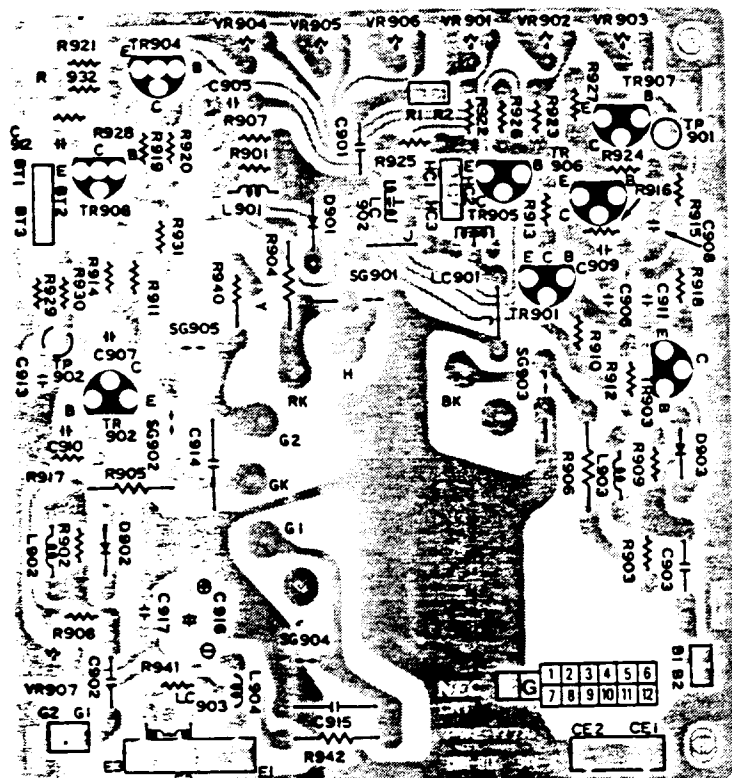
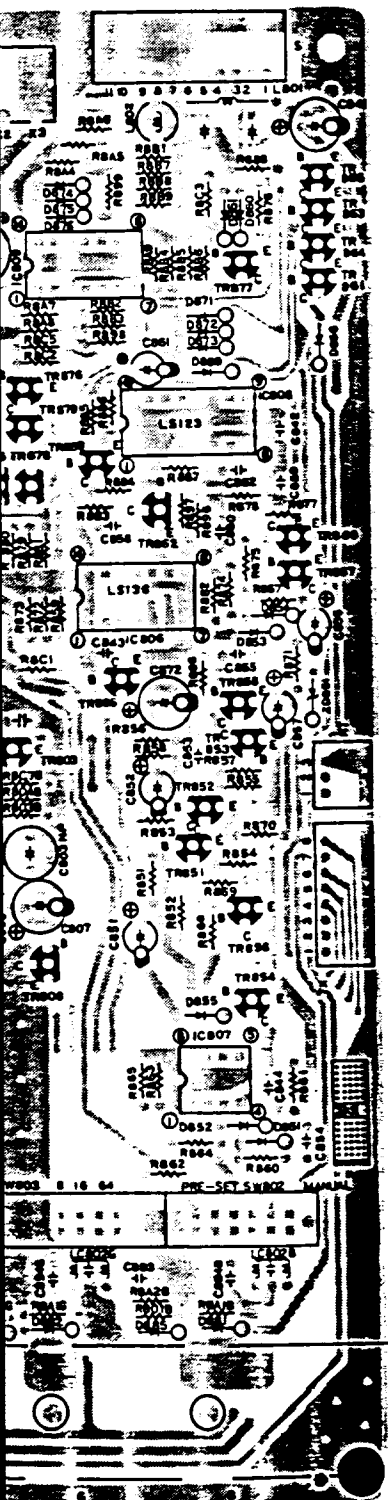


SW. REG PWB ASSY (PWE-199)

- Solder Side -

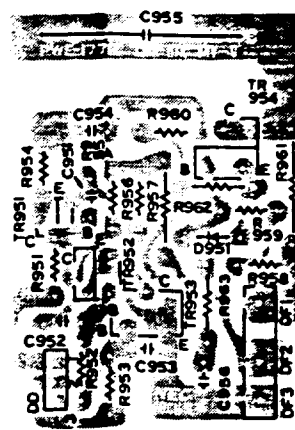


DEF P1



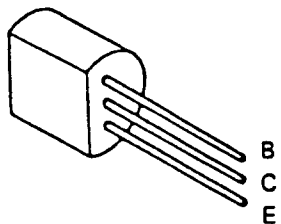
CRT PWB ASSY (PWE-177A)

— Solder Side —

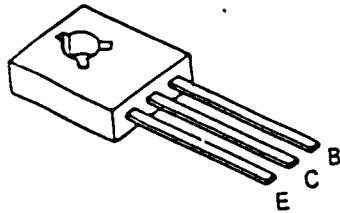


FOCUS PWB ASSY (PWE-177B)

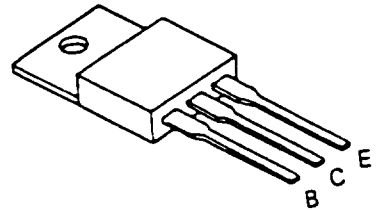
— Solder Side —



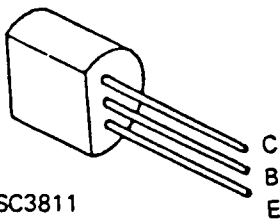
2SA733
2SA952
2SA1018
2SC945
2SC1473
2SC2001
AA1A4M
AN1A4M



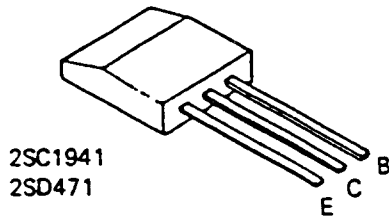
2SA1538
2SC3953
2SD882



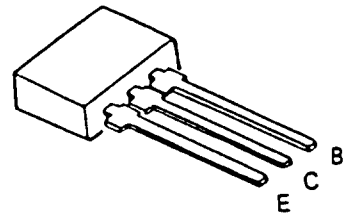
2SB546
2SD401
2SC3675



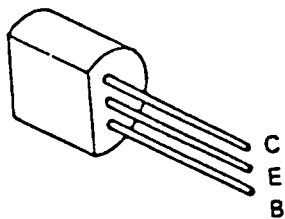
2SC3811



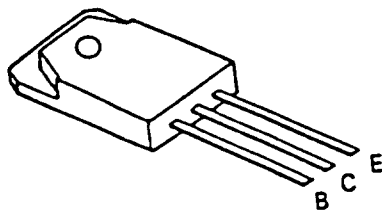
2SC1941
2SD471



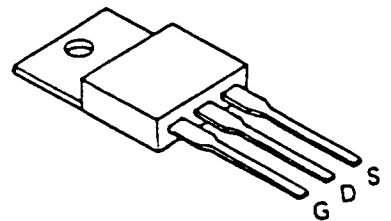
DTC123YS



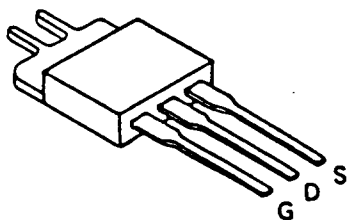
2SC2408



2SC3685
2SC3688



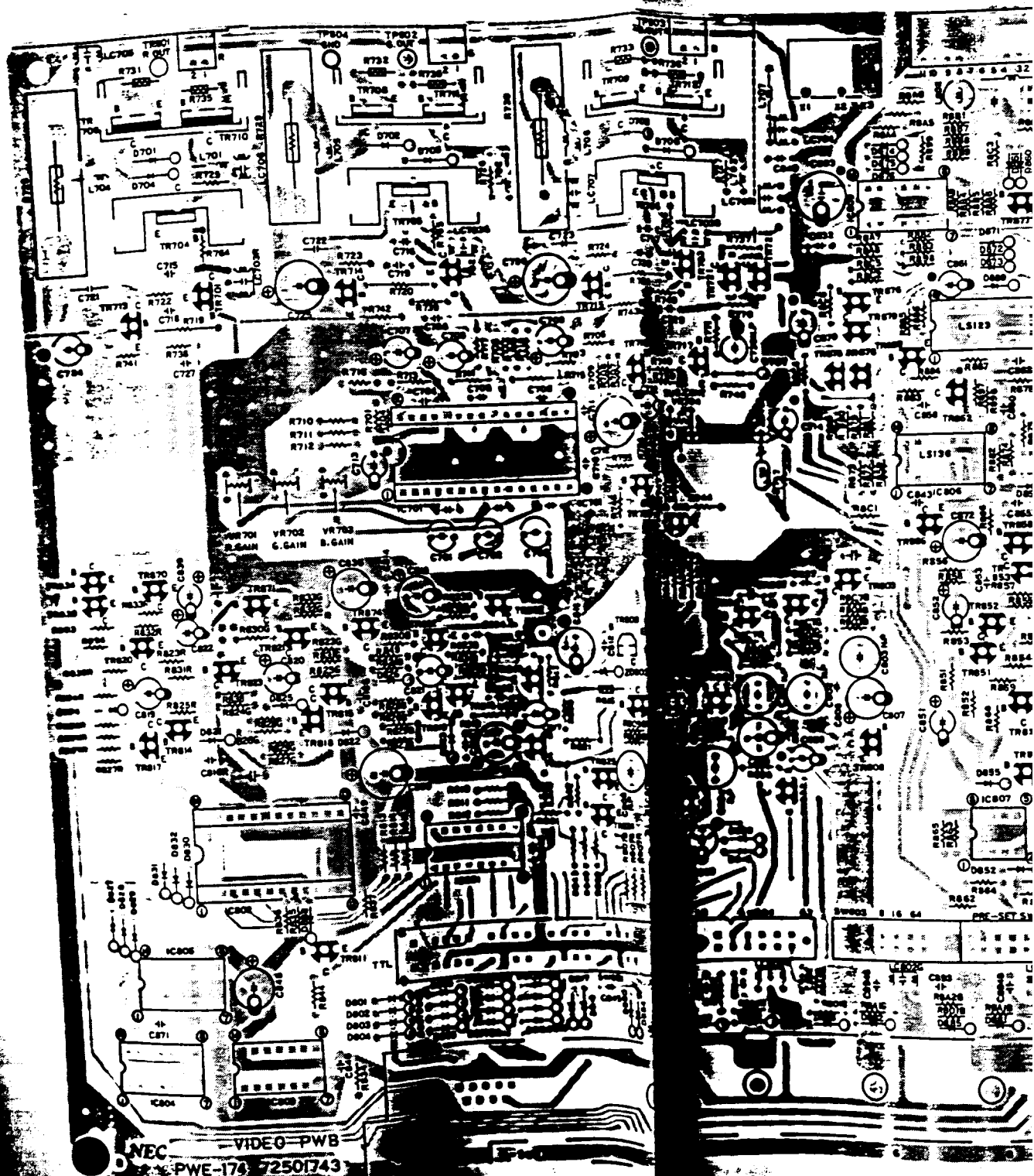
2SK754



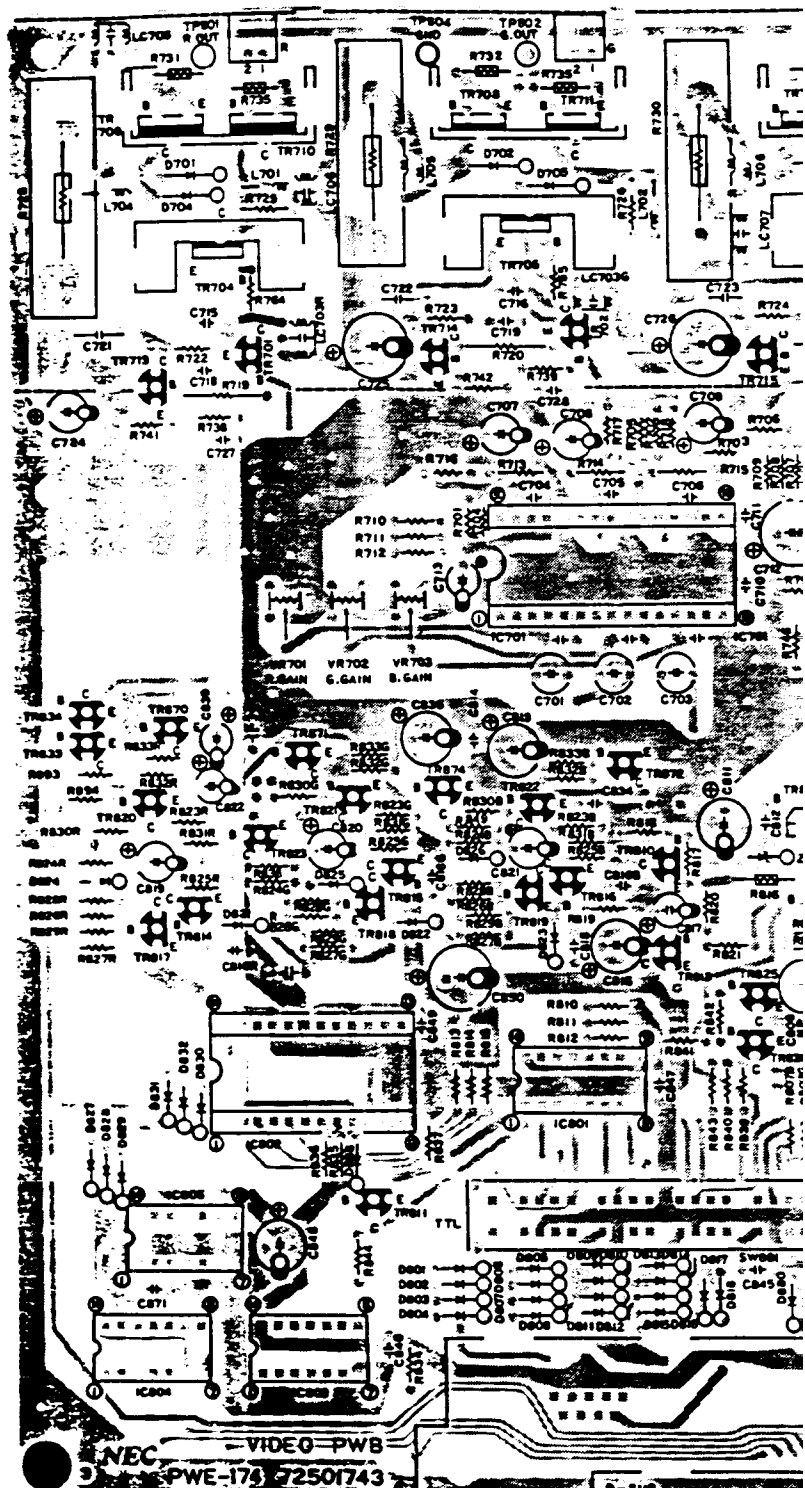
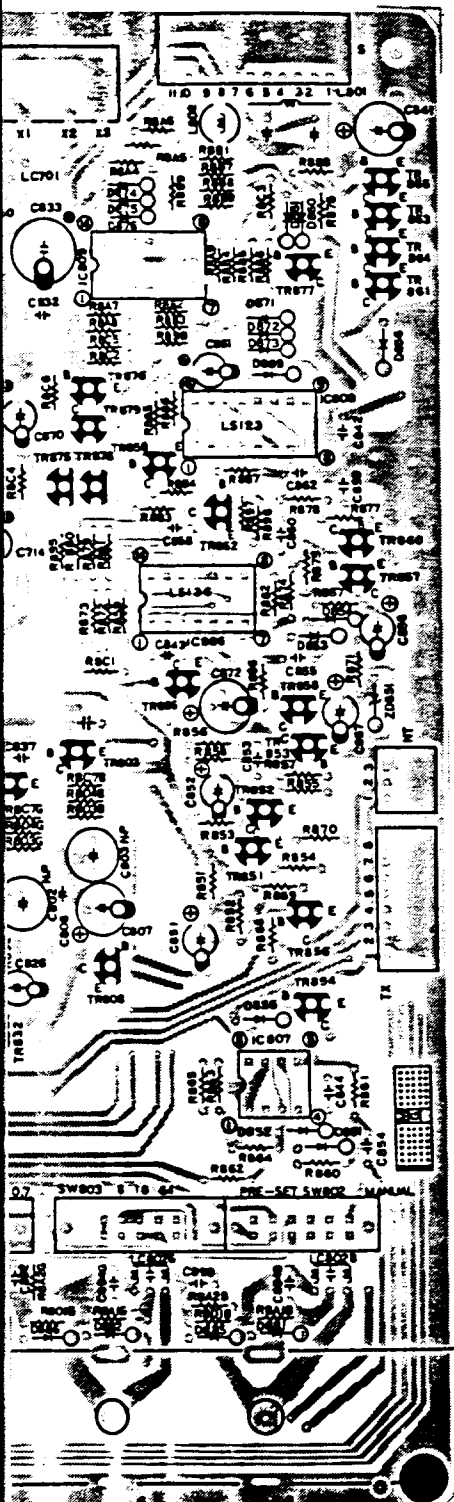
2SK430

NOTE:

E: EMITTER
B: BASE
C: COLLECTOR
G: GATE
D: DRAIN
S: SOURCE

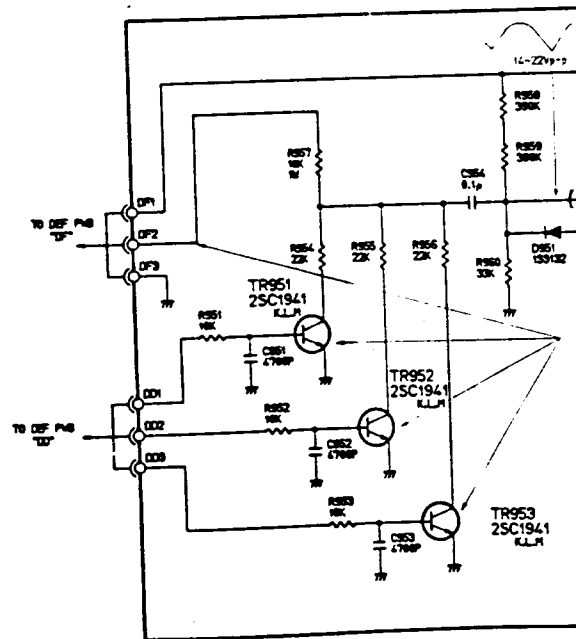
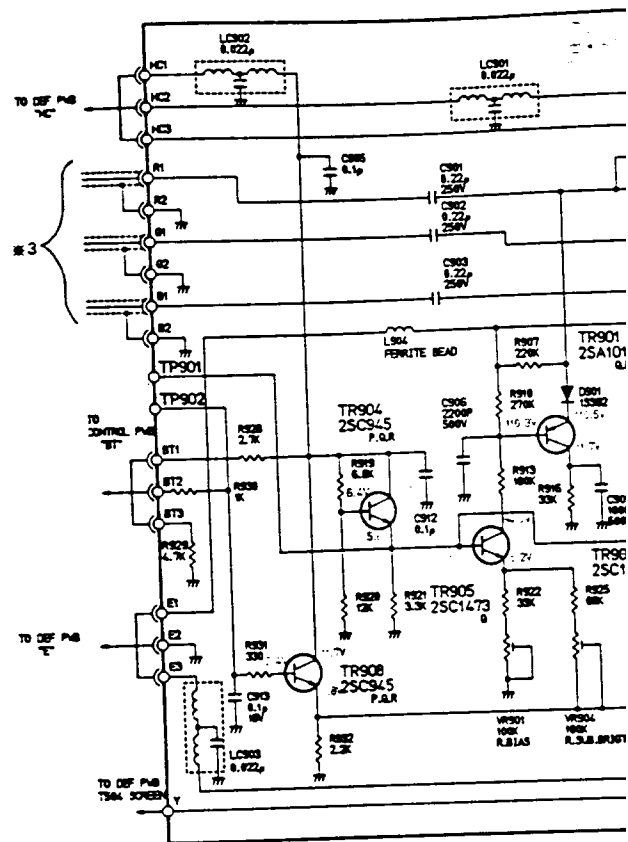
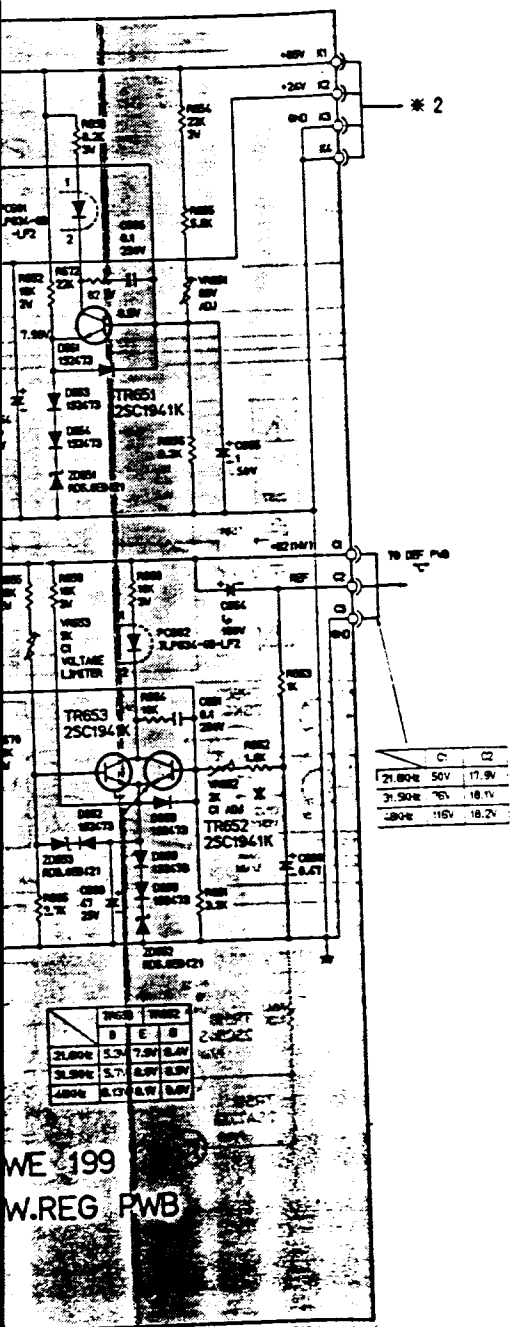


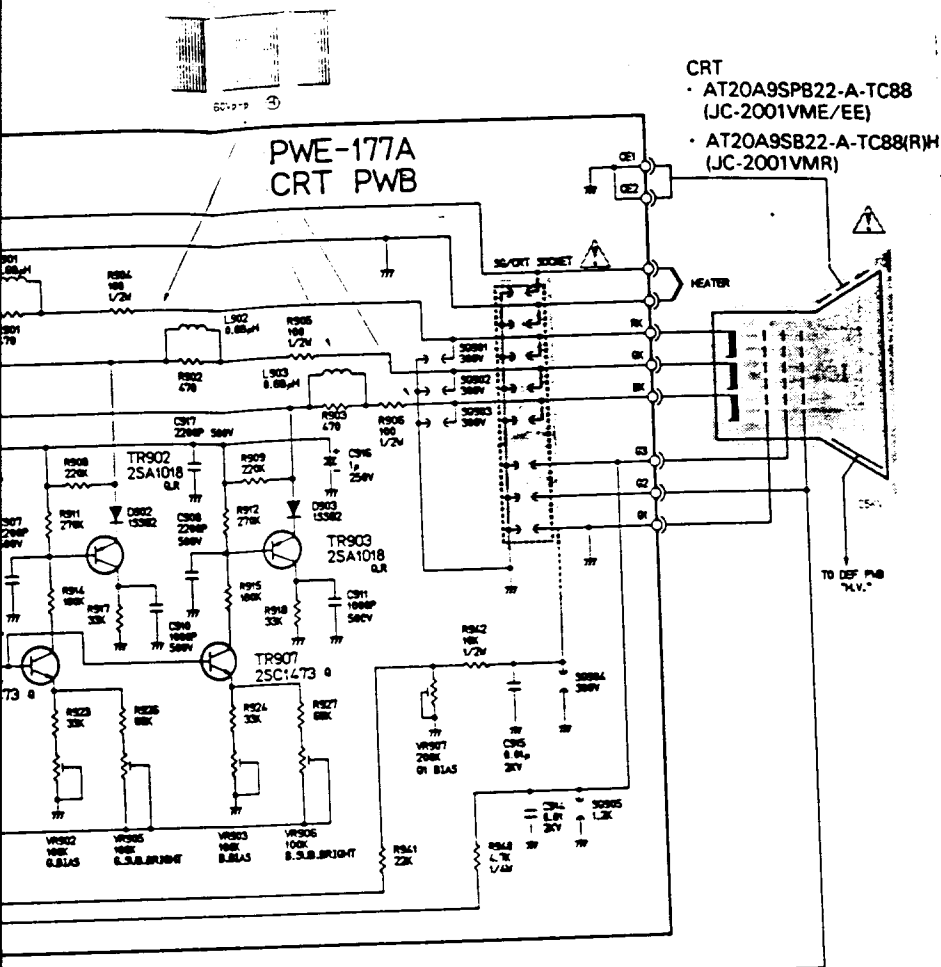
See-through view of video components



NEC ~~VIDEO~~ PWB
PWE-174 72501743

See-through view a





NOTES

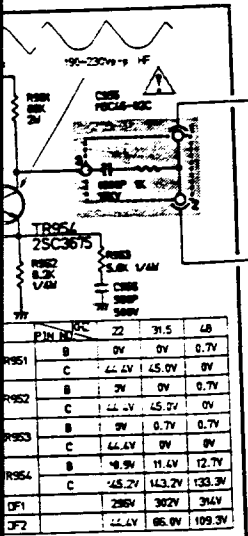
1. RESISTOR VALUES ARE IN Ω 10 Ω K = 1,000 Ω M = 1,000,000 Ω
2. ALL RESISTORS ARE 1/8WATT EXCEPT WHERE OTHERWISE INDICATED.
3. CAPACITOR VALUES ARE IN μ F UNLESS OTHERWISE INDICATED. P = PF
4. ALL CAPACITORS ARE 50VOLTS EXCEPT WHERE OTHERWISE INDICATED.
5. VOLTAGES AND WAVEFORMS ARE MEASURED UNDER THE INVERTED "H" CHARACTER SIGNALS. THE CONTRAST CONTROL IS MAXIMUM. THE BRIGHTNESS CONTROL IS MINIMUM AND ALL OTHER CONTROLS ARE NORMAL OPERATION.
6. VOLTAGES AND WAVEFORMS ARE MEASURED UNDER THE FOLLOWING SYNC AND VIDEO EXCEPT WHERE OTHERWISE INDICATED.

INTERFACE PWB	SYNC: HORIZONTAL RATE-230HZ
VIDEO PWB	SEPARATE SYNC. TTL LEVEL POSITIVE
CR1 PWB	VIDEO: TTL LEVEL POSITIVE
	PHASE: 0 COLOR MODE
SHIELD PWB	SYNC: HORIZONTAL RATE-230HZ
DEF PWB	SEPARATE SYNC. TTL LEVEL NEGATIVE
	VIDEO: AMPLITUDE 0.7Vp-p POSITIVE
	PHASE: 0 MODE

7. (H) means value of V_{pp} to be used with Horizontal Prog
- (V) means value of V_{pp} to be used with Vertical Prog
- (S) means value of V_{pp} to be used with Vertical Size
- (F) means value of V_{pp} to be used with Vertical Freq

WARNING

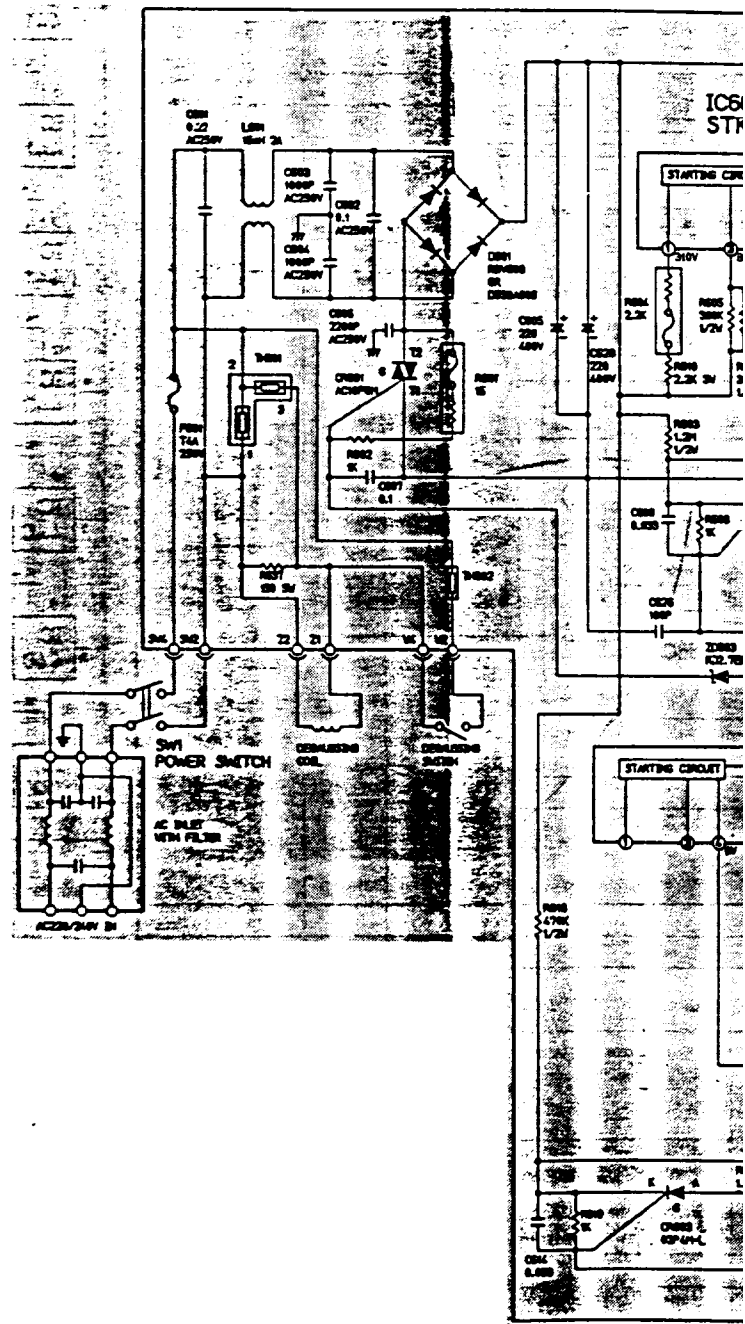
REPLACE PARTS WHICH HAVE SPECIAL SAFETY CHARACTERISTICS AS IDENTIFIED BY SHADING IN THE SCHEMATICS. REPLACE THESE CRITICAL COMPONENTS WITH RECOMMENDED REPLACEMENT PARTS. DON'T DEGRADE THE SAFETY OF THE SET THROUGH IMPROPER SERVICE. CONTROL IS1 PARTS ARE PERMANENTLY PROTECTED. DO NOT ATTEMPT TO REPAIR OR REPLACE.



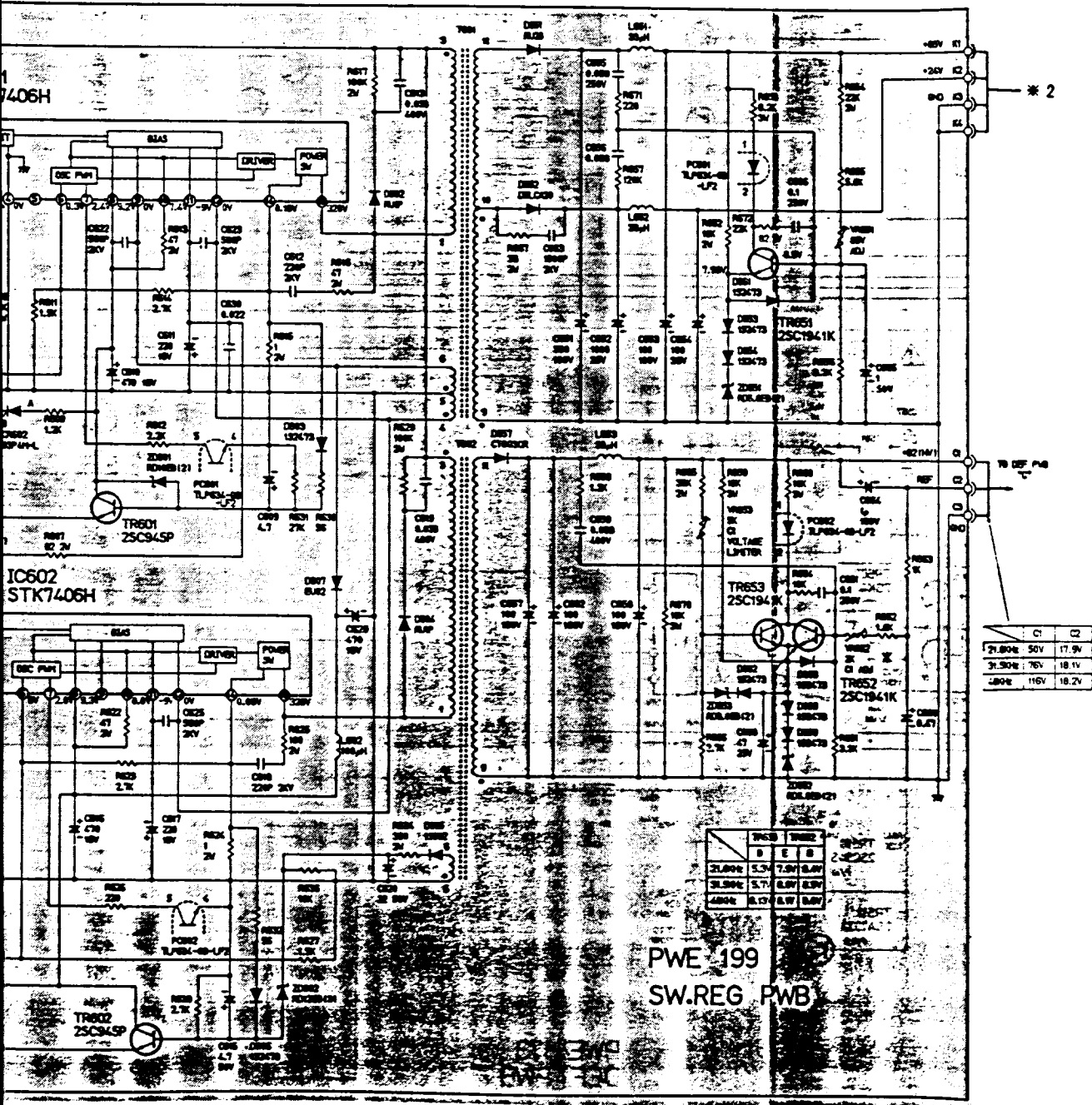
PWE-177B
FOCUS PWB

PIN NO.	DC	AC	22	31.5	48
B	0V	0V	0.7V		
C	44.4V	45.0V	0V		
B	0V	0V	0.7V		
C	44.4V	45.0V	0V		
B	0V	0.7V	0.7V		
C	44.4V	0V	0V		
B	44.4V	11.4V	12.7V		
C	45.2V	143.2V	133.3V		
DF1	280V	302V	314V		
DF2	44.4V	85.9V	105.3V		

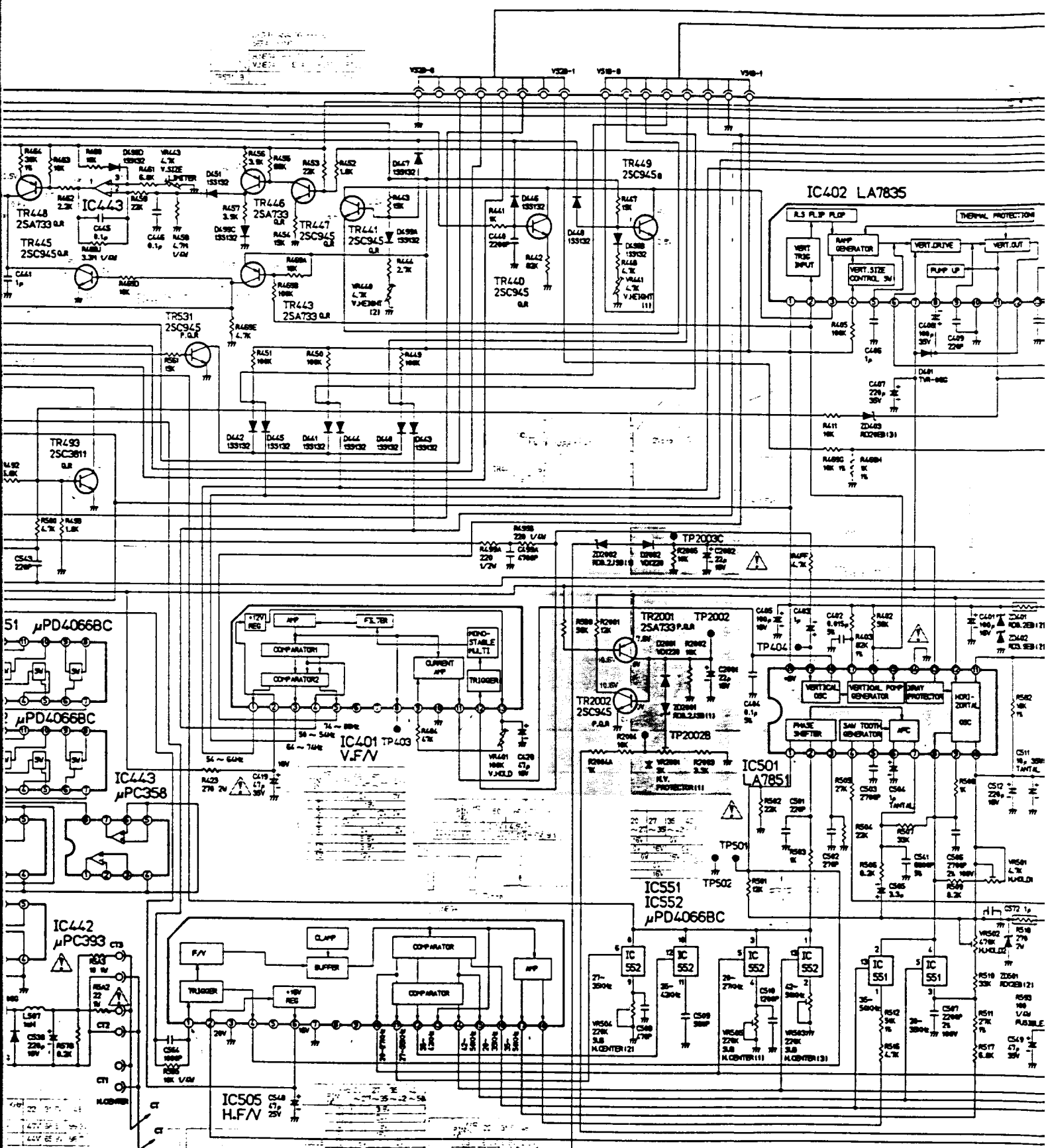
NEC JC-2001VME/EE/R
SCHEMATIC DIAGRAM

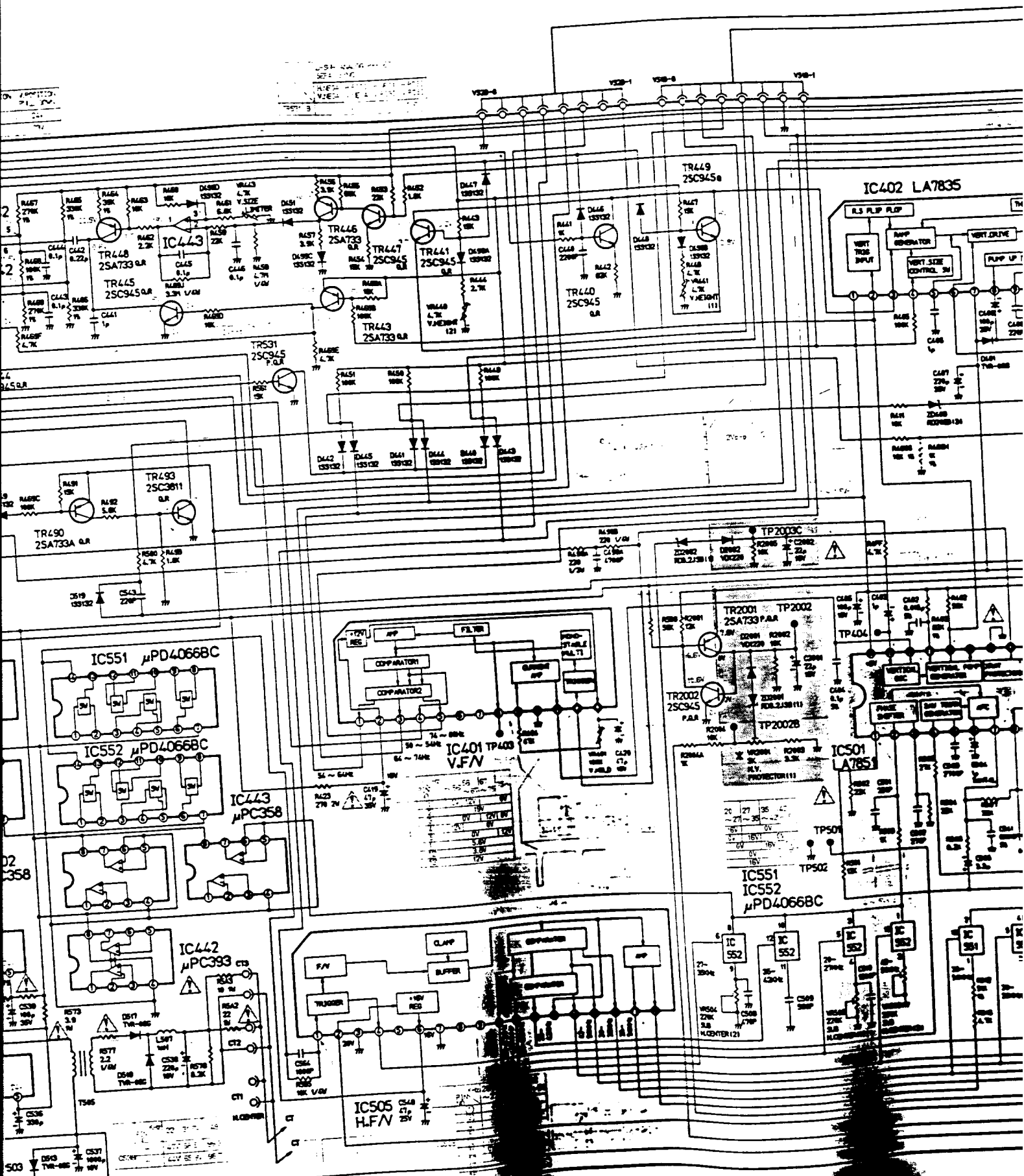


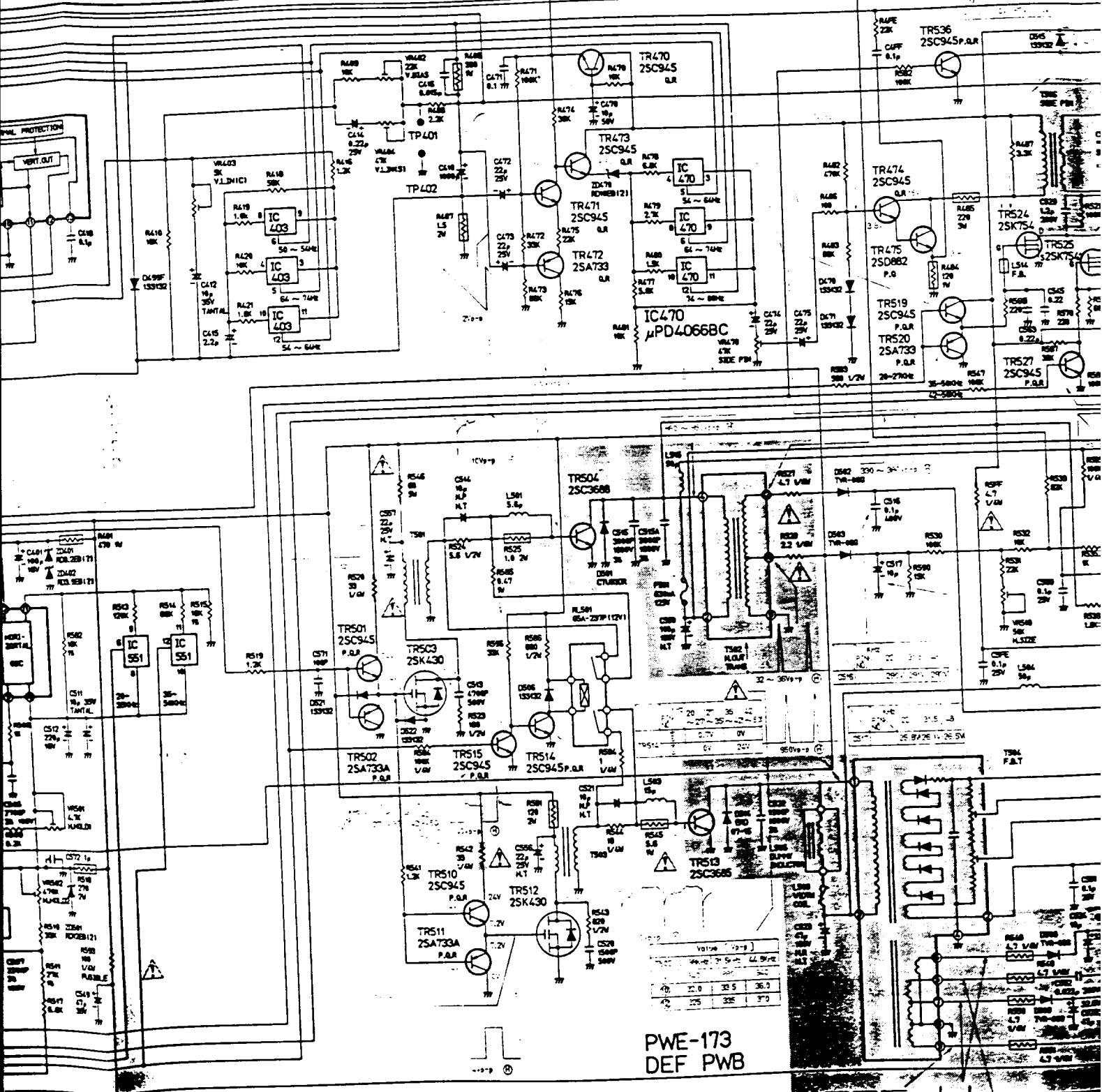
GRAM IS FUNDAMENTAL AND SUBJECT TO CHANGE.











PWE-173
DEF PWB

	100	1000	10000
1	100	1000	10000
2	200	2000	20000
3	300	3000	30000
4	400	4000	40000
5	500	5000	50000
6	600	6000	60000
7	700	7000	70000
8	800	8000	80000
9	900	9000	90000

