

# NEC

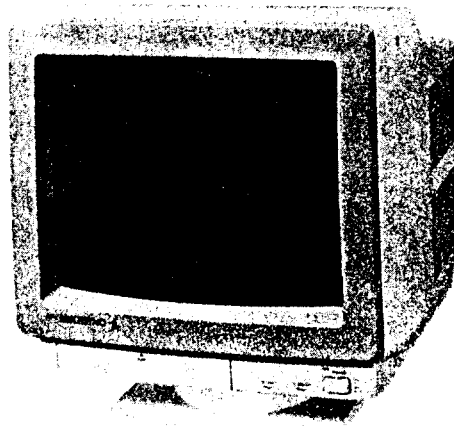
MODELS JC-1402HME/EE/ED/N/R

## MULTISYNC COLOR MONITOR SERVICE MANUAL

PART NO. 599910266



Better Service  
Better Reputation  
Better Profit



### A. Electrical Description

### SPECIFICATIONS

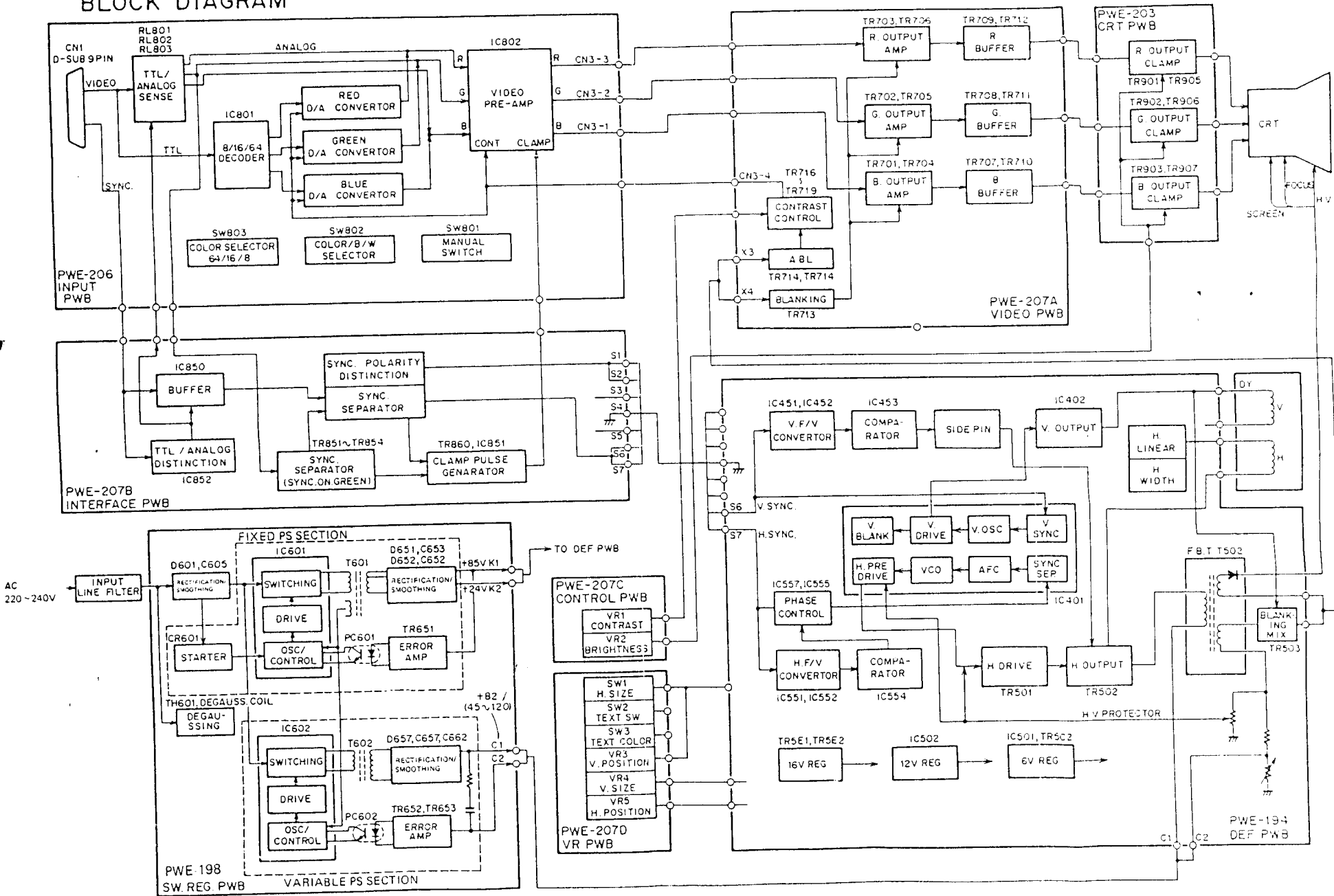
Picture Tube	13 Visual inches diagonal 90 degree deflection, 0.31 mm Trio dot pitch Dot type black matrix. Non-long persistence phosphor, Dark bulb, Direct each	Misconvergence	Less than 0.6mm
Input Signal	Video : TTL Level Positive ANALOG 0.7 Vp-p/75Ω Positive Sync. : Separate sync. TTL Level Horizontal 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)	Power Supply	AC220 ~ 240 V 50/60 Hz
Display Colors	TTL Input: 8/16/64 colors Analog Input: Unlimited colors	Power Consumption	85 W
Synchronization:	Horizontal: 15.5 kHz to 35 kHz (Automatically) Vertical: 50 Hz to 80 Hz (Automatically), Non-interlace	Environmental Considerations	Operating Temperature 0°C to +40°C Humidity 30% to 80% Storage Temperature -20°C to +60°C Humidity 10% to 90%
Resolution	Horizontal: 800 dots Vertical: 560 lines		
Video Band Width	30MHz		
Active Display Area	Horizontal: 250mm Vertical: 185mm (Active display area is changed by signal timing.)		

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

NEC Corporation

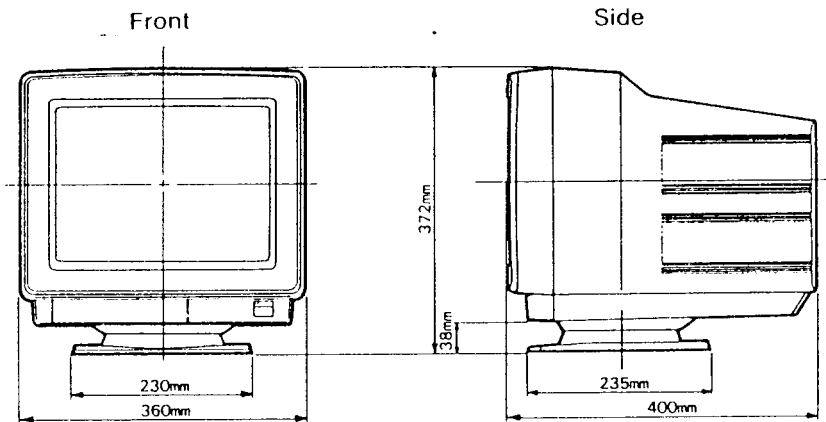
TOKYO, JAPAN

# BLOCK DIAGRAM

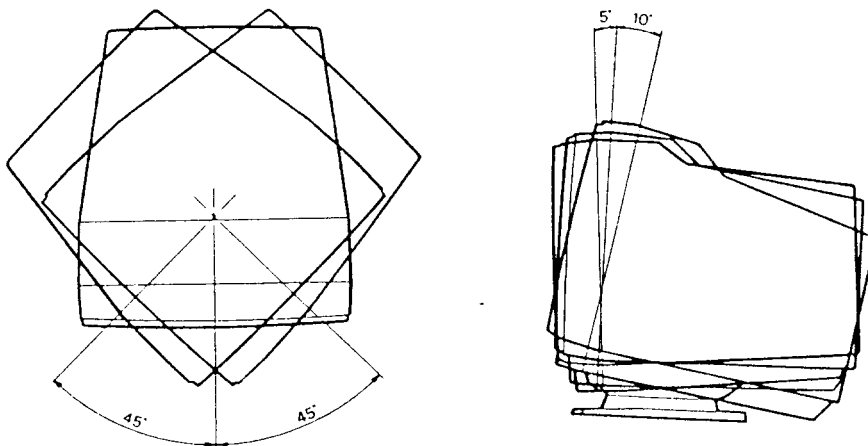


**B. Mechanical Description (See below diagrams)**

1. Cabinet: Molded plastic cabinet with attachable tilt swivel base.  
 2. Dimensions: 360(W)×372(H)×400(D) mm



**3. Tilt Swivel Range**



4. Weight: 16 kg

**5. Controls**

Rear Controls:

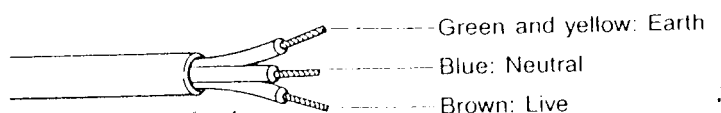
Front Controls:

- MANUAL SWITCH
  - MODE SWITCH
  - COLOR MODE SWITCH
  - POWER SWITCH
  - BRIGHTNESS CONTROL
  - CONTRAST CONTROL
  - V. POSITION CONTROL
  - V. SIZE CONTROL
  - H. POSITION CONTROL
  - H. SIZE SWITCH
  - TEXT SWITCH
  - TEXT COLOR SWITCH
- 9 PIN D-SUB CONNECTOR (FEMALE)  
 (SEE PAGE 2 FOR PIN ASSIGNMENTS)

**6. Input Signal Terminal:**

**7. Power cord**

In case of JC-1402HMEE, the end of power cord is as follows.



## GENERAL

MultiSync II, The Intelligent Monitor, from NEC, is a high resolution color monitor that automatically adjusts to graphics board scanning frequencies from 15.5kHz to 35kHz (Horizontal), 50Hz to 80Hz (Vertical). MultiSync II gives IBM PC, PC/XT, PC/AT, Personal System/2 (PS/2) and compatible computers users of crisp text and vivid color graphics displays when used with any of the IBM graphics adapters (the CGA, EGA, PGC, VGA or MCGA). MultiSync II can also be used with other IBM compatible graphics adapters to provide users with the widest range of color monitor compatibility and capability available in the market place.

## FEATURES

- MultiSync II automatically scans all horizontal frequencies between 15.5kHz and 35kHz, and all vertical frequencies between 50Hz and 80Hz.
- MultiSync II is compatible with the IBM PC, PC/XT, PC/AT, PS/2 and look-alikes.
- MultiSync II is compatible with the IBM Color Graphics Adapter, the IBM Enhanced Graphics Adapter, the IBM Professional Graphics Controller, the IBM MultiColor Graphics Array, the IBM Video Graphics Array and other IBM compatible graphics adapters.
- MultiSync II's wide compatibility makes it possible to upgrade boards or software without purchasing a new monitor.
- MultiSync II has a maximum horizontal resolution of 800 dots and a maximum vertical resolution of 560 lines for superior clarity of display.
- MultiSync II 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 II automatically adjusts to either a TTL signal input or an ANALOG signal input.
- MultiSync II features a TEXT SWITCH (TTL mode only) with a choice of three colors (paper white, amber and green) displaying word processing, spread sheets, databases or other software in crisp alphanumeric text on a black background.
- MultiSync II has a 14 inch diagonal display and a large, 13 inch viewing area.

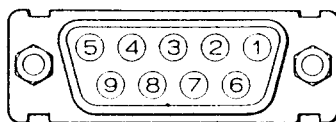
## CAUTIONS

When setting up and using the MultiSync II pay special attention to these points.

- To eliminate eye fatigue, don't use the MultiSync II against a bright background or where the sun or other lights can directly shine on it.
- For optimum viewing, the MultiSync II should be just below eye level.
- Allow adequate ventilation all around the MultiSync II so that heat from the monitor can properly dissipate.
- Don't rest the MultiSync II or other heavy objects on the power cord. A damaged power cord can cause fires or electrical shocks.
- Keep the MultiSync II away from high capacity transformers, electric motors and other strong magnetic fields.
- Don't drop the MultiSync II when transporting it.
- Don't use the MultiSync II in damp, dusty, or dirty places.

# PIN ASSIGNMENTS AND SIGNAL LEVELS

D-SUB Type 9-P



## MANUAL SWITCH OFF

SIGNAL	TTL		ANALOG	
	CGA/EGA COMPATIBLE		PGC COMPATIBLE	VGA/MCGA COMPATIBLE
	16 COLORS	64 COLORS		
PIN NO:				
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	PRIMATY BLUE	ΔMODE CONTROL	V.SYNC.
6	INTENSITY	SECONDARY GREEN	RED GROUND	RED GROUND
7	NO—CONNECTION	SECONDARY BLUE	GREEN GROUND	GREN GROUND
8	H.SYNC.	H.SYNC.	BLUE GROUND	BLUE GROUND
9	V.SYNC	V.SYNC.	GROUND	GROUND

## MANUAL SWITCH ON

SIGNAL	TTL				ANALOG		
	GRAY SCALE	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	ΔMODE CONTROL	
6	INTENSITY	—	INTENSITY	SECONDARY GREEN	GROUND		
7	VIDEO	—		SECONDARY BLUE			
8	H.SYNC						
9	V.SYNC.						

“—” means GROUND or NO—CONNECTION

“Δ” means mode control of vertical height

Normal vertical height at TTL high level or no-connection.

Approx. 20% increased vertical height at TTL low level or grounded.

## SIGNAL LEVEL

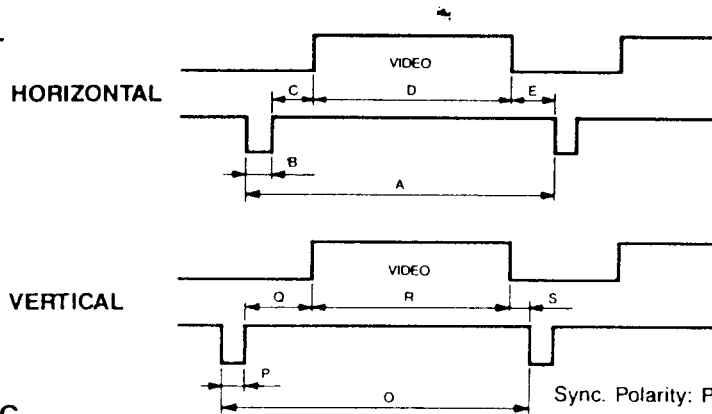
All signal levels, except for those listed below, are TTL

“•” means 0.7Vp-p (VIDEO)

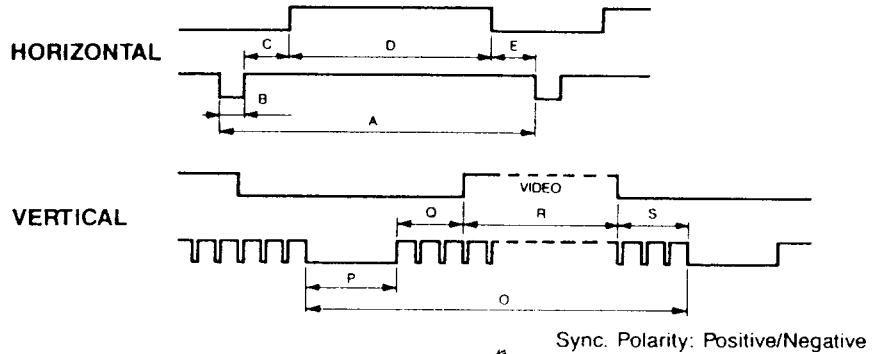
“\*\*\*” means 0.7Vp-p (VIDEO), 0.3Vp-p (SYNC.)

# TIMING CHARTS

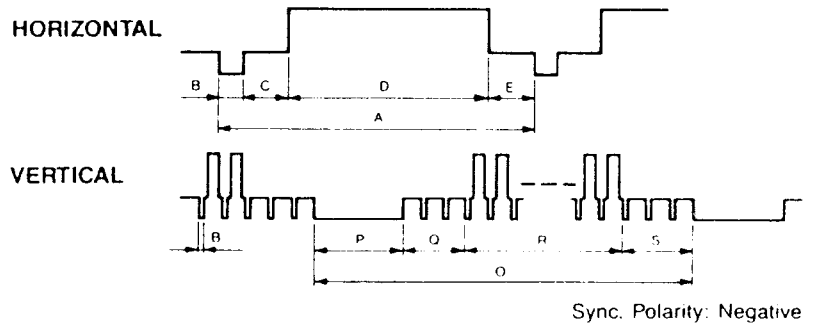
## SEPARATE SYNC.



## COMPOSITE SYNC.



## COMPOSITE SYNC. & VIDEO (SYNC. ON GREEN)

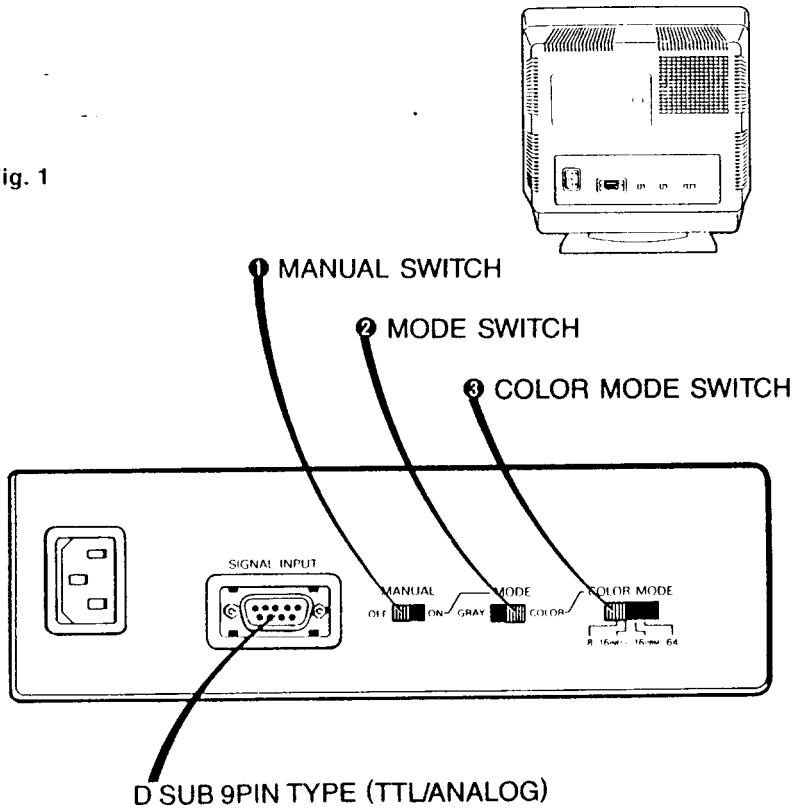


## PRESET TIMING

	CGA COMPATIBLE	EGA COMPATIBLE	PGC COMPATIBLE	VGA/MCGA COMPATIBLE		
fH	15.85kHz	22kHz	30.48kHz	31.5kHz		
A $\mu$ s	63	45.5	33	31.77		
B $\mu$ s	4.2	4.9	4.5	3.77		
C $\mu$ s	7.2	1.6	2.8	1.89		
D $\mu$ s	45	39	25.6	25.17		
E $\mu$ s	6.6	0	0.1	0.94		
fV	61 Hz	60 Hz	60 Hz	70Hz		60Hz
O ms	16.4	16.68	16.6	14.27	14.27	16.68
P ms	00.75	0.6	0.07	0.064	0.064	0.064
Q ms	1.525	0.08	2.12	1.88	1.08	1.02
R ms	12.6	16	13.05	11.126	12.716	15.246
S ms	2.2	0	1.36	1.2	0.41	0.35
REMARKS	SEPARATE SYNC. H. SYNC. POSITIVE V. SYNC. POSITIVE	SEPARATE SYNC. H. SYNC. POSITIVE V. SYNC. NEGATIVE	H/V COMPOSITE 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

# ADJUSTING THE REAR CONTROLS

Fig. 1



## 1 MANUAL SWITCH

This switch selects either the IBM mode when OFF or the manual mode when ON. When this switch is OFF, MultiSync II 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 mode (gray/color) and the number of colors (8/16/64) needed by the graphics adapter being used with the MODE SWITCH and COLOR MODE SWITCH. (see No. 2 3 below)

## 2 MODE SWITCH

This switch selects either the gray scale or color with a TTL signal input. (See APPENDIX B pin assignment of gray scale.)

Refer to the user manual accompanying the graphics adapter for information on the input signal.

## 3 COLOR MODE SWITCH

One of the four color configurations [8/16(NEC)/16(IBM)/64] must be selected when using non-IBM compatible graphics adapters. The proper configuration can be selected by using the COLOR MODE SWITCH as shown below.

COLOR MODE	COLOR MODE SWITCH
8 colors	8
16 colors with low intensity yellow	16 (NEC)
16 colors with IBM brown	16 (IBM)
64 colors	64

### Note

This switch should be set correctly in relation to the input signal of the graphics adapter used. Refer to the user manual accompanying the graphics adapter for information on the input signal.

# ADJUSTING THE FRONT CONTROLS

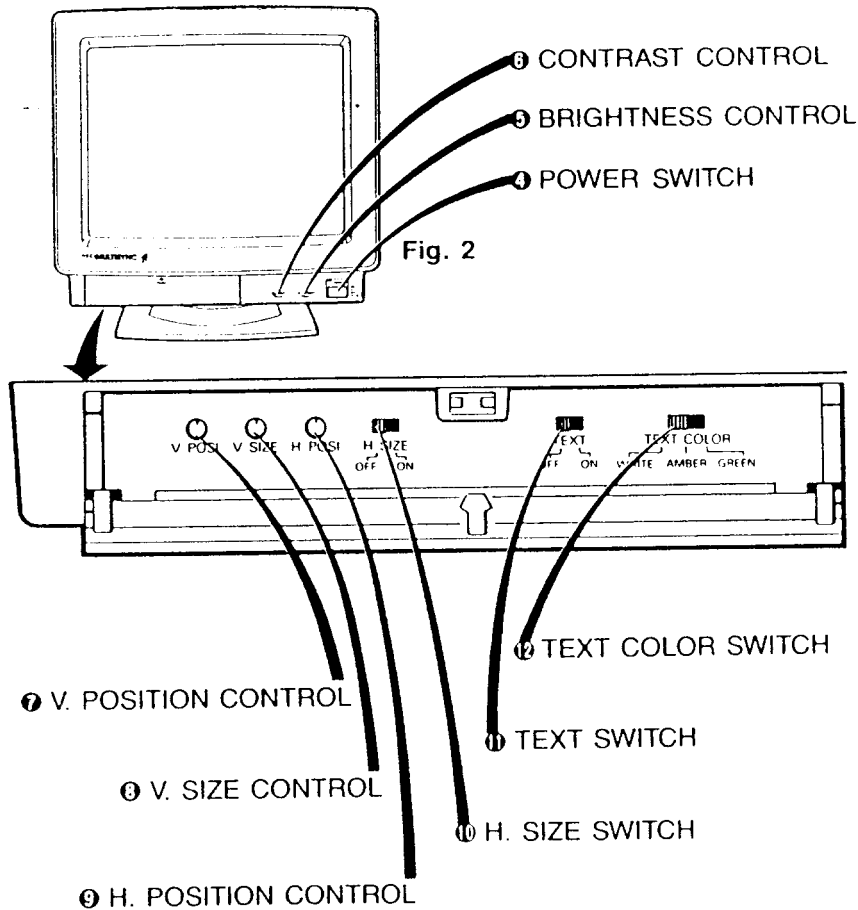


Fig. 2

## 4 POWER SWITCH

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

## 5 BRIGHTNESS CONTROL

Used to adjust the picture brightness of the screen.

## 6 CONTRAST CONTROL

Adjust the display to the contrast preferred by the user.

## 7 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.

## 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 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.



## **10 H. SIZE SWITCH**

Adjust this switch for the horizontal size of display preferred. When this switch is ON, the width of the display can be made wider.

## **11 TEXT SWITCH**

This switch controls the text mode of the MultiSync II.

When it is ON, the text will appear in the color displayed by the TEXT COLOR SWITCH (see No.12 below), regardless of the colors of the software program being used.

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

### **Note**

The TEXT SWITCH works only in the TTL mode.

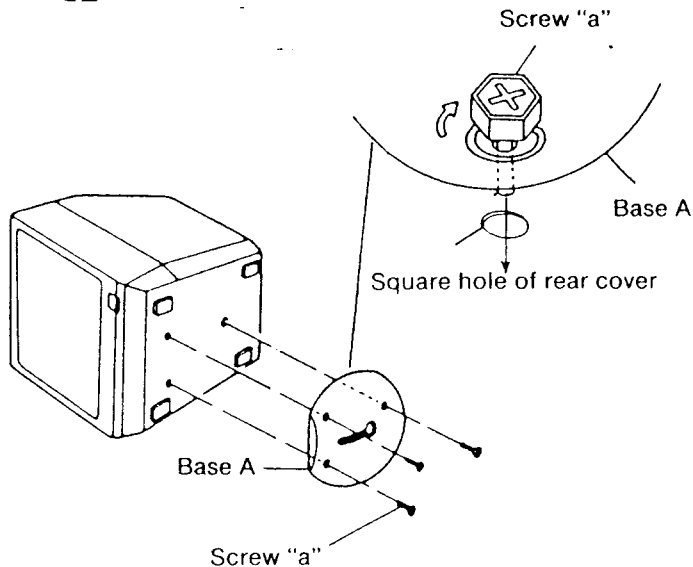
## **12 TEXT COLOR SWITCH**

Use this switch to select the text color-green, amber or paper White-when the TEXT SWITCH is ON.

Also use this switch to select the gray scale color-green, amber or paper white-when the gray scale mode is selected (see No.2) regardless of the position of the TEXT SWITCH.

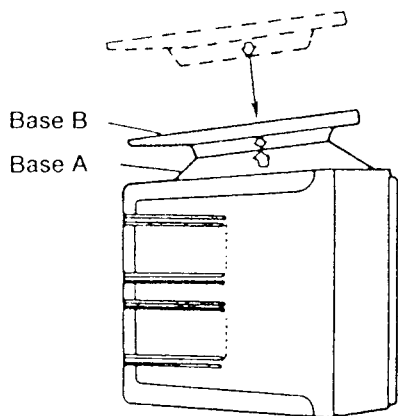
# THE METHOD FOR REMOVING AND MOUNTING THE TILT SWIVEL BASE

1



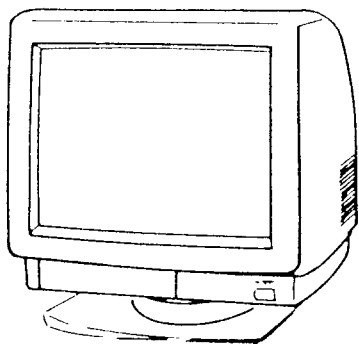
- 1 Insert 3 mounting screws "a" into holes on the turning table A.
- 2 Arrange the 3 male screws "a" into the female Screws on the bottom of the Set in correct. Screw the table A to the set driving 3 screws "a" with a philips head screwdriver.

2



- 1 Align the arrow of both tables A and B, and put the table B, into the table A as shown on the left.
- 2 Both tables are fixed firmly by turning the table B 180° degrees clockwise.

3



After completing the attachment of the turning table in Sequence 1 - 2, place the set in its proper position. It is recommended that the Set should be used with its face coming to the printing side on the turning table.

### NOTE:

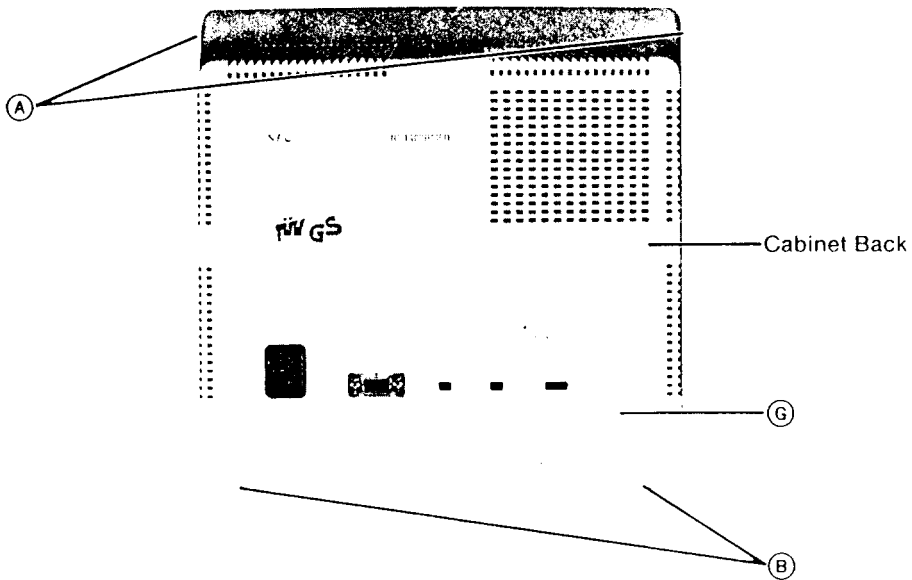
Please avoid a harsh handling to turn the Set vertically or horizontally.

- 4 In case you remove the turning table, take a reverse Sequence from 2 - 1.

## DISASSEMBLY OF THESE MODELS

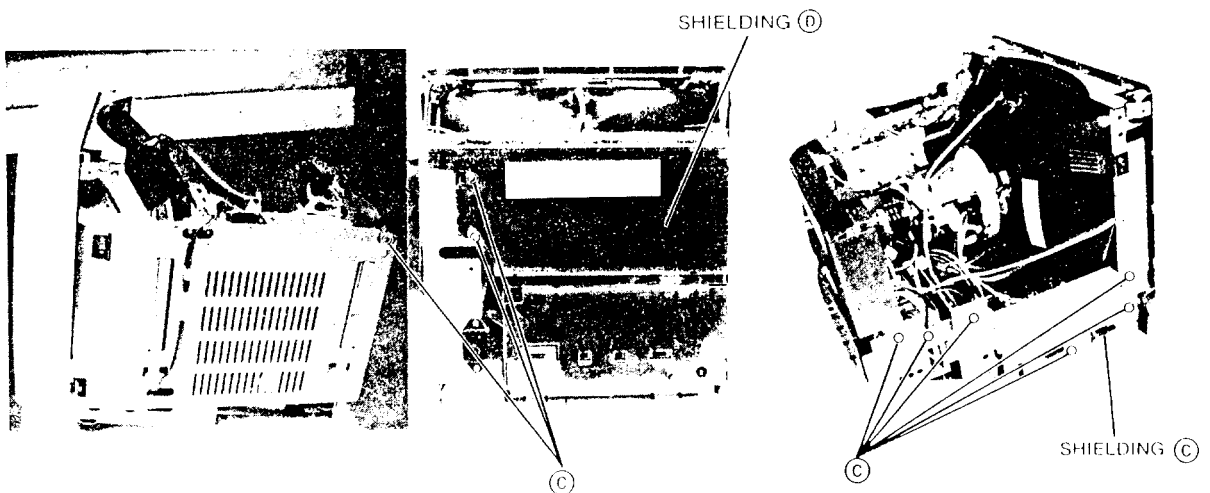
**Warning;** This equipment generates and used radio frequency energy and if not reconstructed properly, ie., in strict accordance with the following instruction, it may cause interference to radio or television reception.

1. Remove the two screws (A), the two screws (B) and one screw (G) pull the Cabinet Back bakcward to the rear.



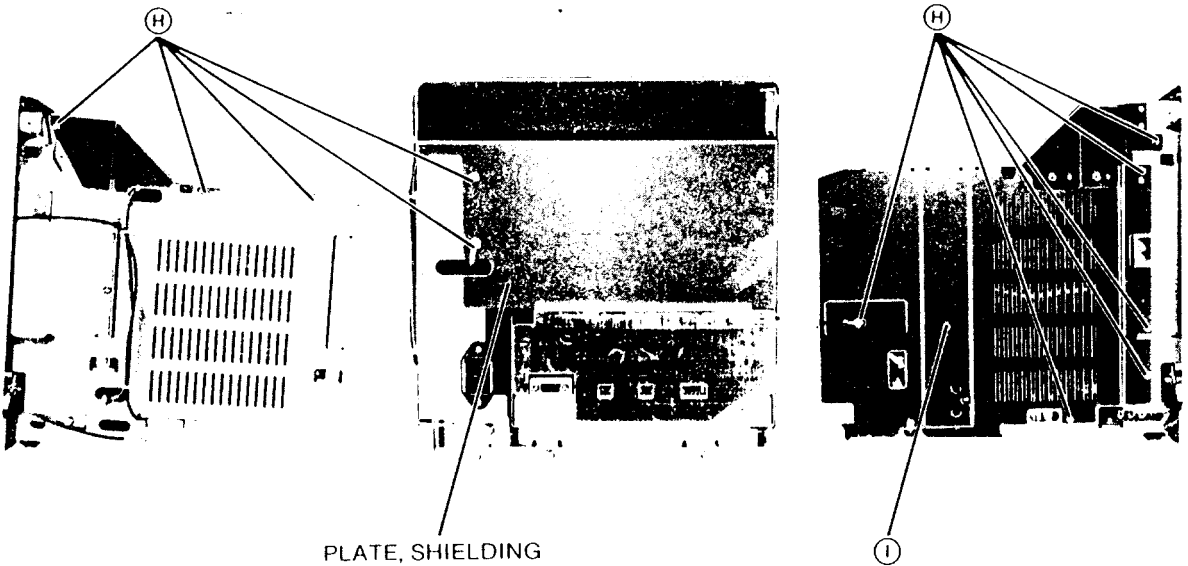
**Note:** To prevent the occurrence of a gap between the Cabinet Front and the Cabinet Back when attaching the Cabinet Back, be sure to tighten the screws in the order of (A) to (B).

2. Remove the 9 screws (C), then take off SHIELDING (C) and (D).



## 2' As for model JC-1402HMED

Remove the 11 screws (H) and one screw (I), then take off PLATE, SHIELDING.

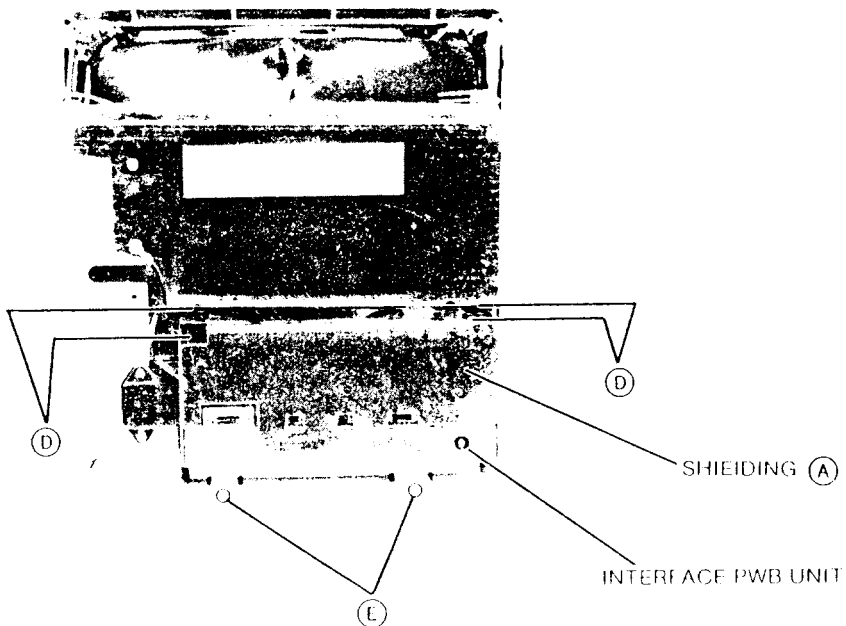


## 3. INTERFACE PWB UNIT DISASSEMBLY

Remove the 4 screws (D), then take off the SHIELDING (A).

Disconnect the connectors from the INTERFACE PWB UNIT.

Remove the 2 screws, (E) then take off the INTERFACE PWB UNIT.



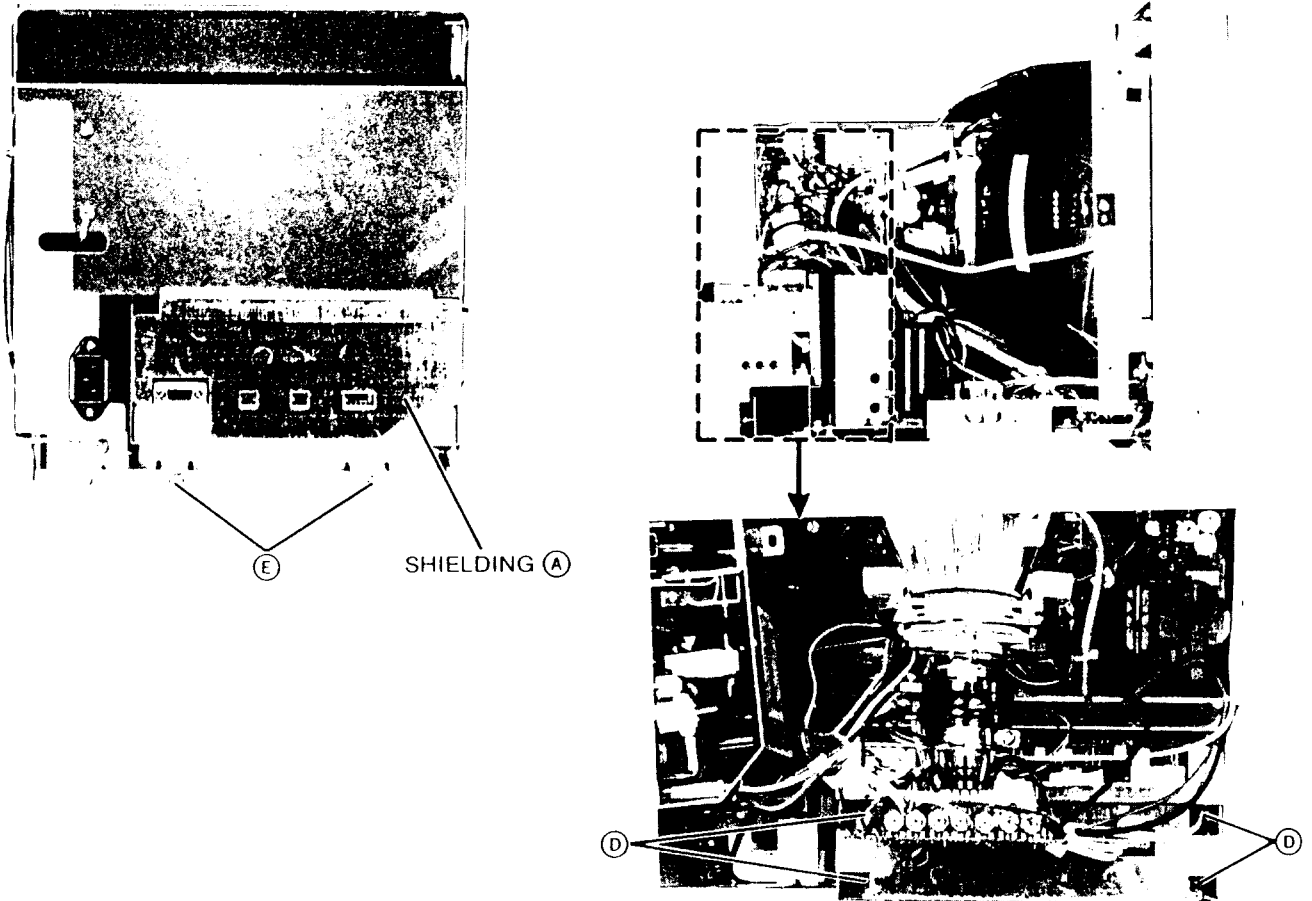
### 3' As for model JC-1402HMED

Remove PLATE, SHIELDING (A) and then take out the INTERFACE PWB UNIT as the instructions bellow.

Remove the 4 screws (D), then take off the SHIELDING (A).

Disconnect the connectors from the INTERFACE PWB UNIT.

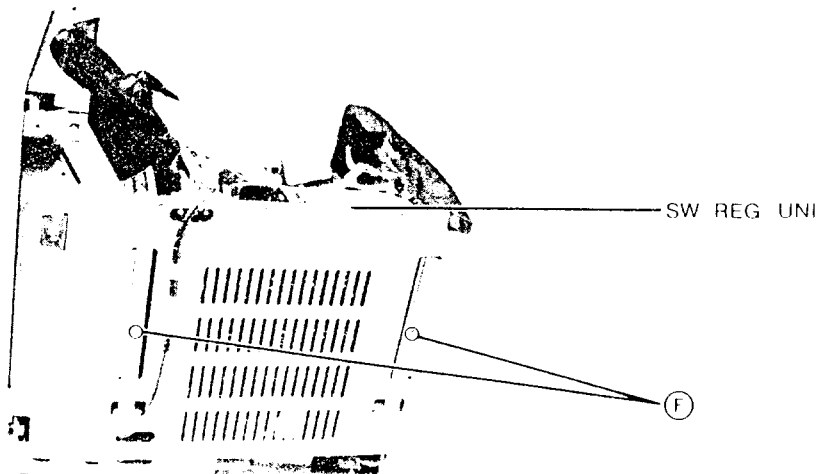
Remove the 2 screws, (E) then take off the INTERFACE PWB UNIT.



### 4. SW. REG. UNIT. DISASSEMBLY.

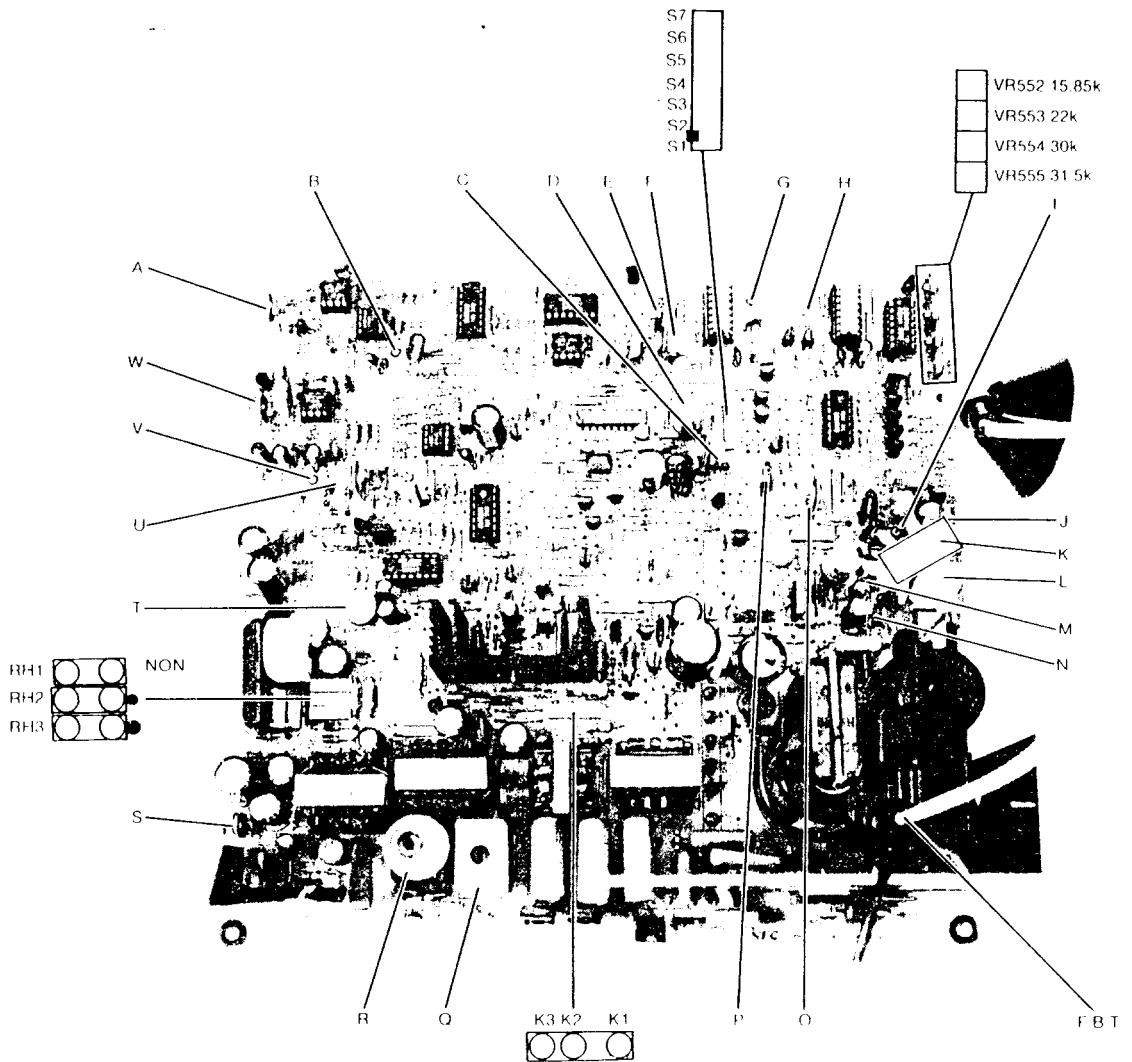
Disconnect the connectors C. K. SW and DEGAUSSING COIL from the SW. REG. UNIT.

Remove the 2 screws (F), then take off the SW. REG. UNIT.



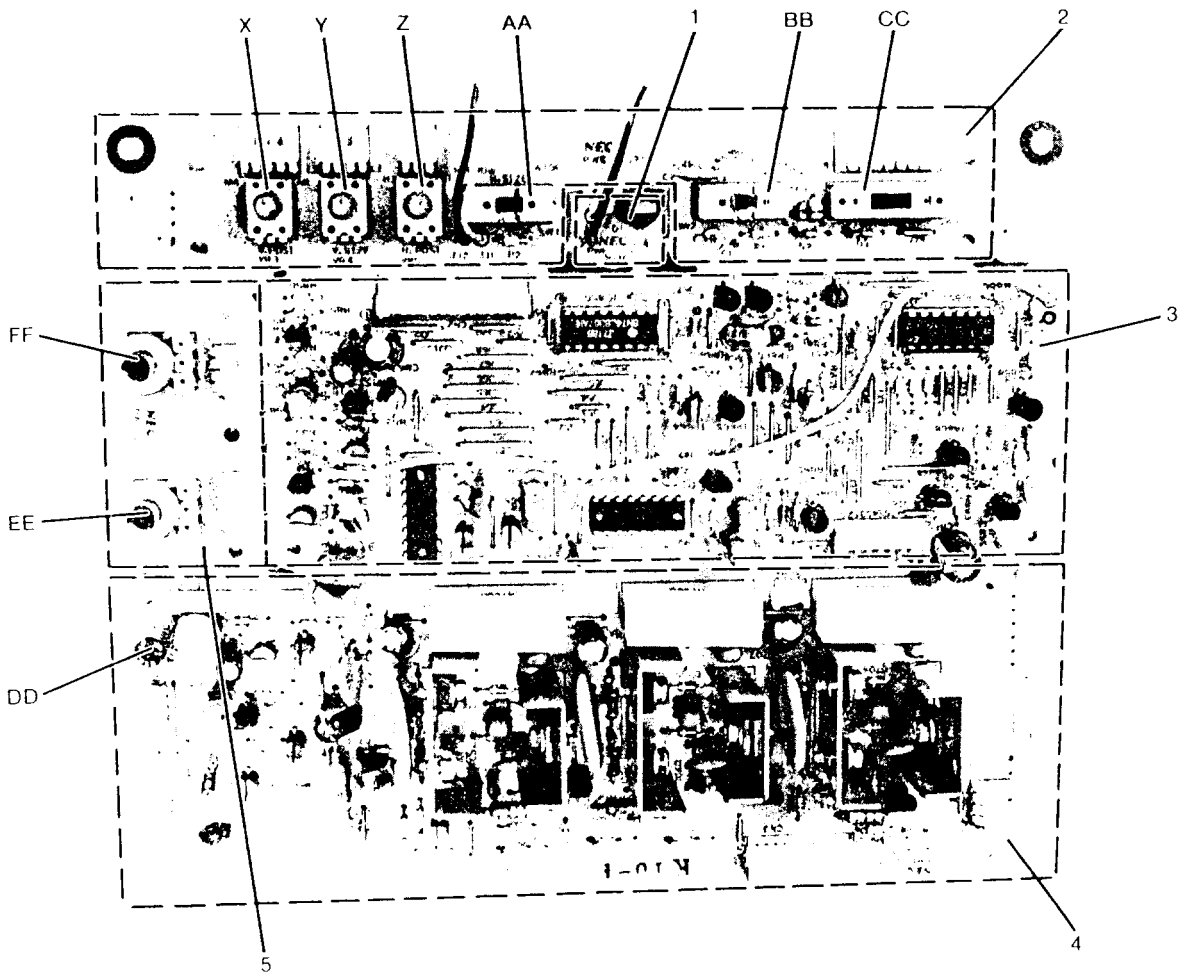
# PARTS LOCATION DIAGRAMS

## DEF PWB ASSY (PWE-194)



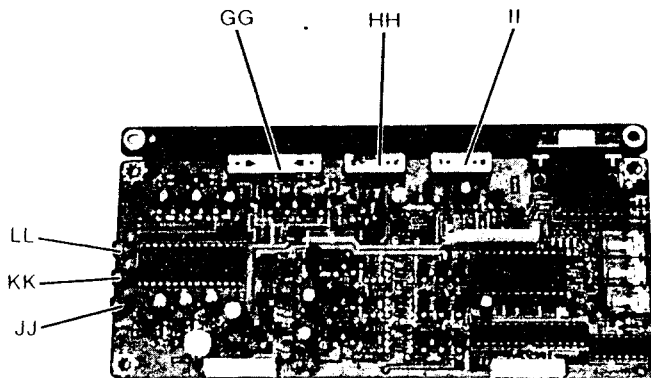
A	VR551 H. F-V ADJ	M	TP2002A
B	TP551 H. F-V	N	TP2001A
C	VR401 V. HOLD	O	VR402 SUB V. HEIGHT
D	TP501 H. HOLD	P	VR405 V. LIN
E	VR502 H. HOLD 2	Q	L506
F	VR501 H. HOLD 1	R	L505 H. WIDTH COIL
G	TP503 (GND)	S	VR5C1 TP502 6V ADJ.
H	TP5E1 (16V)	T	VR403 SIDE PIN
I	TP2001C	U	VR5E1 +16V
J	TP2002C	V	TP451 V.F-V
K	VR2001 VR2002 HV. PROTECTOR	W	VR451 V.F-V ADJ
L	VR2003 HV. ADJ.		

1	LED PWB ASSY	PWE-207E
2	VR PWB ASSY	PWE-207D
3	INTERFACE PWB ASSY	PWE-207B
4	VIDEO PWB ASSY	PWE-207A
5	CONTROL PWB ASSY	PWE-207C



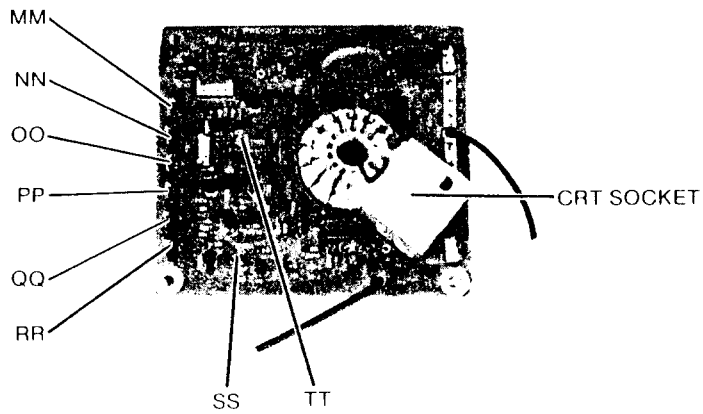
X	VR3 V. POSITION	CC	SW3 TEXT COLOR
Y	VR4 V. SIZE	DD	VR701 SUB. CONT
Z	VR5 H. POSITION	EE	VR2 BRIGHT
AA	SW1 H. SIZE	FF	VR1 CONTRAST
BB	SW2 TEXT		

### INPUT PWB ASSY (PWE-206)



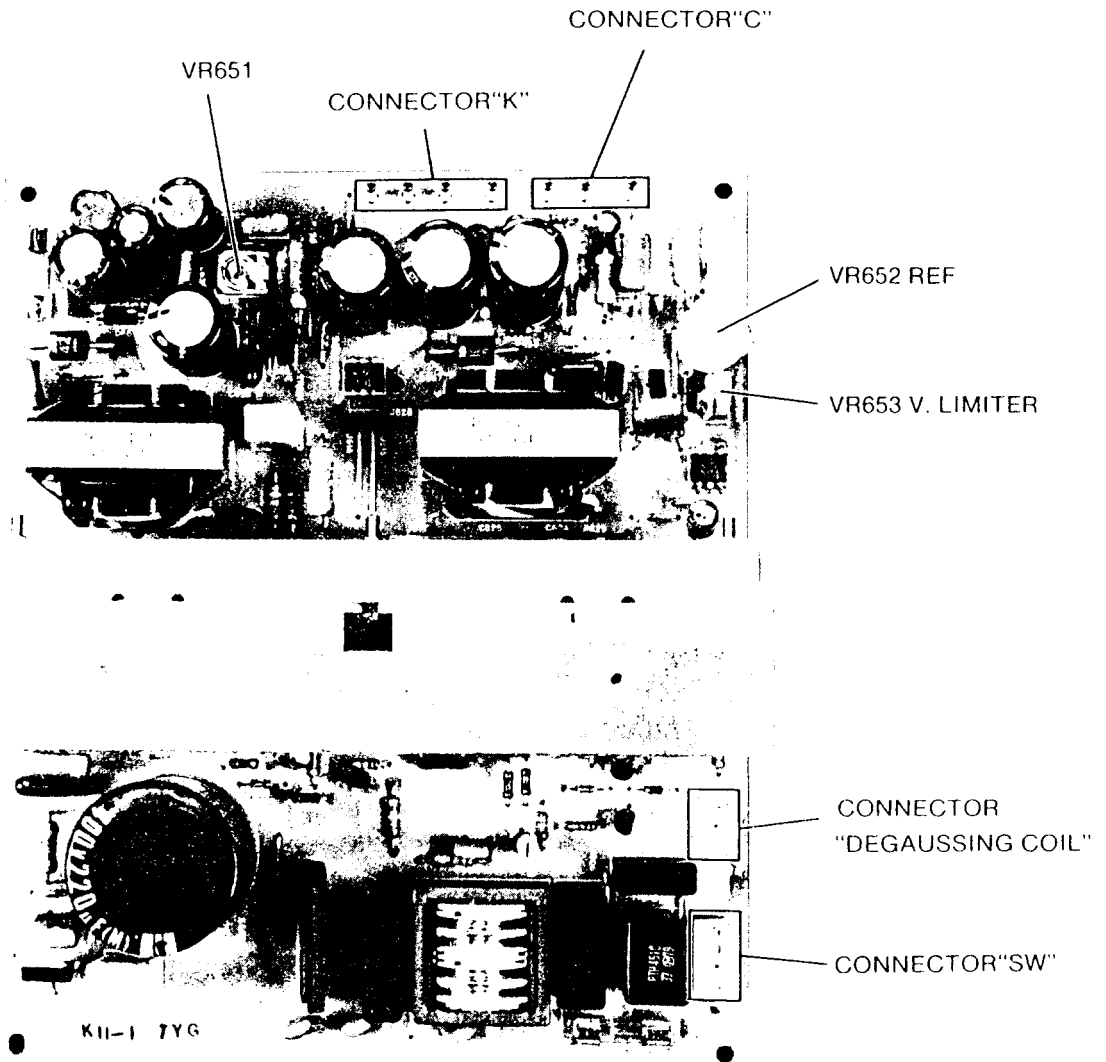
GG	SW803 COLOR MODE	JJ	VR803
HH	SW802 MODE	KK	VR802
II	SW801 MANUAL	LL	VR801

### CRT PWB ASSY (PWE-203)



MM	VR904	QQ	VR902
NN	VR905	RR	VR903
OO	VR906	SS	TP901
PP	VR901	TT	TP902





# ADJUSTMENT PROCEDURE

## Standard Adjustment Conditions

- 1) Power source voltage: AC220V~240V 50 Hz.
- 2) Aging: Adjust after leaving power on for 20 minutes or more.
- 3) Signals:
  - Video: Analog 0.6Vp-p 75Ω terminal Positive polarity
  - Analog Sync. on green
    - Video: 0.6Vp-p
    - Synchronizing: 0.3Vp-p
  - Synchronizing: TTL level Negative polarity/positive polarity
  - Separate/composite
  - Deflection frequency: H. 15kHz - 35kHz
  - V. 50 Hz - 80 Hz

Unless otherwise specified, use signal 14 (22kHz EGA mode).

## 1. SW. REG. UNIT

- 1) +B<sub>1</sub> (VR651) +85V LINE  
Adjust VR651 to be 85 VDC
- 2) +B<sub>LIM</sub> (VR653) V.limit (C1-Gnd Voltage)  
Remove C-connector.  
Adjust VR653 to be 122 Volts.

Note: Do not operate the SW. Reg. unit itself without any load.

- 3) +B<sub>H</sub> (VR652) High Voltage control  
This control is permanently sealed at factory.  
Do not attempt to readjust.

## 2. Pre-adjustment of DEF PWB

Apply 24V DC between K2 and K3.

For sections 3) and 4), the JC-1402HMA INTERFACE PWB ASSY S connector output can also be used as a TESTING EQUIPMENT.

- 1) +16V adjustment  
Adjust VR5E1 for 16V ±0.05V DC between TP5E1 and the ground.
- 2) +6V adjustment  
Apply a resistance load of 10Ω10W between HC2 and HC3.  
Adjust VR5C1 for 6 ±0.05V DC between TP502 and the ground.
- 3) Horizontal F/V convertor adjustment (signal 17)  
Input fH = 25kHz horizontal synchronizing negative polarity 5Vp-p between S7 and the ground.  
Adjust VR551 for 10 ±0.05V DC between TP551 and the ground.

4) Vertical F/V convertor adjustment (signal 17)

Input fv = 60Hz vertical synchronizing positive polarity 12Vp-p between S6 and the ground.

Adjust VR45I for  $5.95 \pm 0.05V$  DC between TP451 and the ground.

5) High voltage protector setting

High voltage protector 1

With  $32.0 \pm 0.1V$  DC applied between TP2001A and the ground, adjust VR2001 for  $0.3 \pm 0.05V$  DC between TP2001C and the ground.

High voltage protector 2

With  $31.8 \pm 0.1V$  DC applied between TP2002A and the ground, adjust VR2002 for  $0.3 \pm 0.05V$  DC between TP2002C and the ground.

Due to DHHS, after adjusting VR2001 and VR2002 seal with an adhesive (TSE-385RTV) or cap (74007891).

### 3. Main Adjustment

Set the external VRs and switches as follows unless otherwise specified.

Front controls (as seen from front)

VR1 CONTRAST:	Max. (fully clockwise)
VR2 BRIGHTNESS:	At point where back luster disappears.
VR3 V.POSITION:	Mechanical center
VR4 V.SIZE:	Center click position
VR5 H.POSITION:	Center click position
SW1 H.SIZE:	Off (small)(left side)
SW2 TEXT:	Off (left side)
SM3 TEXT COLOR:	Paper white (left end)

Rear controls (as seen from rear)

SW801 MANUAL:	Off (left side)
SW802 MODE:	Color (right side)
SW803 COLOR MODE:	8 colors (left end)

#### 3-1) DEF PWB Adjustment

(1) Horizontal Hold

a) Short TP501 and TP503 (GND).

b) Receive signal 16 (fH: 30kHz) and adjust horizontal hold (1) VR501 so that there is one screen.

c) Receive signal 18 (fH: 20kHz) and adjust horizontal hold (2) VR502 so that there is one screen.

(2) Vertical Hold

Receive signal 14 (fv: 60Hz), turn vertical hold VR401 and set to the mechanical center within the indented range.

(3) High Voltage Adjustment

Receive signal 16 (fH: 30.48kHz) and adjust high voltage adjustment VR2003 so that the high voltage is 23.5kV with the the CRT anode current cut off.

Due to DHHS, after adjusting seal with an adhesive (TSE—385RTV) or cap (74007891).

(4) Horizontal Raster Centering Signal 14 (Adjust at VGA H: 31.5kHz/V: 60Hz, 350 line mode)

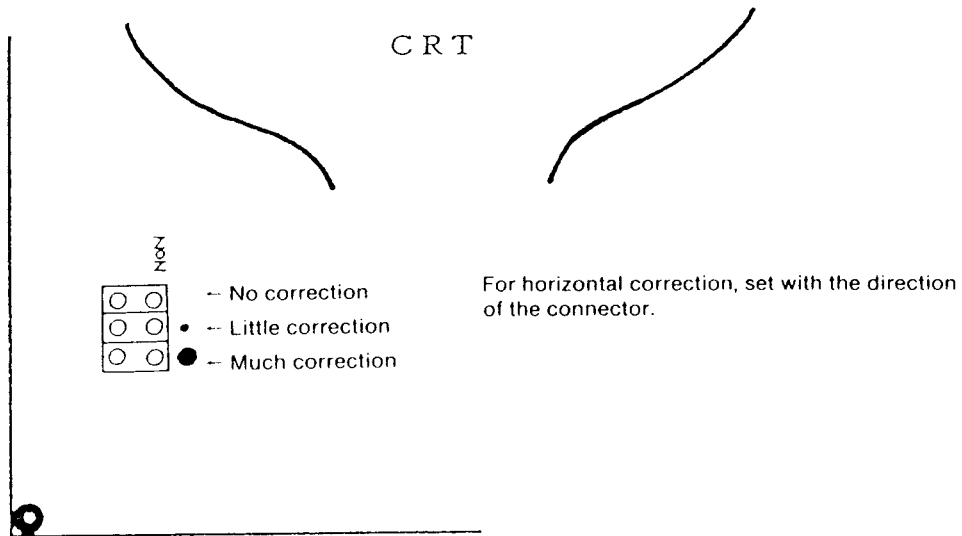
Check that the horizontal linearity is suitable. If it is extremely bad, adjust to a suitable point with L506.

If the screen is rolling, centering can be adjusted with horizontal position VR5, but after return VR5 to the center click position.

Turn the brightness control fully clockwise so that back raster appears, then reinsert connector RH so that the back raster is in the center of the CRT screen.

Reinsert connector RH where there is no extreme lack of or break in the raster.

Set the luster centering with the manual switch off (to the left as seen from the back) and the horizontal size switch on (widened).



**NOTE:** Due to overscanning, signals of fH: 18kHz or lower cannot be set.

(5) Horizontal Position (Adjust to the raster center)

Input the signals below and adjust so to the center of the raster. The order is not important.

Signal			VR
CGA fH:	15.85kHz	TTL signal 10	VR552
EGA fH:	22 kHz	TTL signal 14	VR553
PGC fH:	30.48kHz	TTL signal 16	VR554
PS/2 fH:	31.5 kHz	TTL signal 1	VR555

**NOTE:** The TTL/analog setting should be correct.  
The manual switch should be off.

(6) Vertical Linearity

- a) Receive signal 12 (fH: 18kHz) and adjust VR402 for the suitable vertical screen size.
- b) Adjust VR405 for the optimum vertical linearity.

(7) Vertical Sub Height

Receive EGA signal 14 (fH: 22kHz) and adjust VR402 for a vertical screen size of 180mm.

- (8) Side Pin Cushion  
Adjust VR403 for the optimum side pin cushion distortion.
- (9) Horizontal Linearity  
Adjust L506 for the optimum horizontal linearity.
- (10) Horizontal Width  
Receive EGA signal 14 (fH: 22kHz) and adjust width coil L505 for a horizontal screen size of  $250 \pm 2\text{mm}$ .  
The horizontal size switch should be off.  
If correction is not sufficient with L505, turn the L506 linearity coil slightly and adjust within a range so that the linearity does not get worse.

### 3-2) Adjustment of Video Amplitude and White Balance

**NOTE:** Check that the video signals are as shown below before performing the main adjustment. In particular, for LVG—1600, the video signal output level varies according to the signal pattern, so check the level with the signal to be adjusted.

Video: Analog 0.6Vp-p

Synchronizing: Separate TTL level

Unless otherwise specified, use signal 10 for video adjustments.

#### (1) Initial Settings of Adjustment VRs

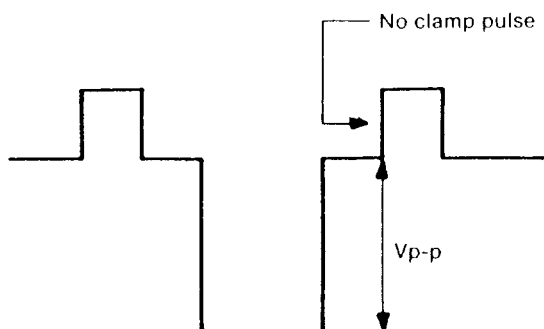
VR801 - 803	GAIN VR	Fully counterclockwise
VR701	SUB CONT VR	Fully clockwise
VR901 - 903	BIAS VR	Fully clockwise
VR904 - 906	SUB BRIGHT VR	Fully clockwise

#### (2) Video Contrast Adjustment (Signal 11: Window pattern)

##### a) GAIN VR adjustment

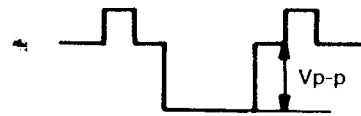
- ① Receive the window pattern (the video area of  $1/3 - 1/2\text{H} \times 1/2\text{V}$  in which there is no ABL even with contrast at maximum is preferable).
- ② Contrast control Fully clockwise  
Brightness control Fully counterclockwise
- ③ Adjust VR801, VR802, and VR803 so that the R, G, and B outputs on the VIDEO PWB are 40Vp-p.

After adjusting, check the Vp-ps again and readjust if they do not conform to the settings.



b) SUB-CONT. VR adjustment

- ① Contrast control Fully counterclockwise  
Brightness control Fully clockwise



- ② Adjust VR701 so that the G output on the video PWB is 10Vp-p.

After adjusting, check that the R and B outputs are 10Vp-p  $\pm 0.5$ Vp-p.

If not, fine-adjust VR701 so that the R, G, and B outputs are within the range of 10Vp-p  $\pm 0.5$ Vp-p.

(3) Cut-off Adjustment (All black signal)

Set the contrast control fully counterclockwise.

- a) ① Short TP901 and TP902.

- ② Short TP401 and TP5E1 (16V) at 12k $\Omega$ .

(Be sure to perform step ① before step ②.)

As the screen VR is turned gradually clockwise, a single color will appear as a horizontal line.

Turn the bias VR for that color fully counterclockwise. Turn the screen VR further clockwise, and turn the bias VR for the next color to appear fully counterclockwise. Next turn the screen VR further clockwise and set the screen VR at the point where the third color is just slightly visible. This color is the reference color for the cut-off adjustment.

- b) Turn the bias VRs for the colors other than the reference color clockwise for that they are about as bright as the reference color.

- c) Undo the shorts between TP401 and TP5E1 ② and between TP901 and TP902 ① in that order.

**NOTE:** Perform the cut-off adjustment in as dark a place as possible to make the white tracking which follows better.

(4) SUB—BRIGHT. VR Adjustment

- a) Receive signal 10 (15.75kHz) H gray scale (16 gradations).

- b) Contrast control Fully clockwise  
Brightness control Fully counterclockwise

- c) Adjust SUB BRIGHT. VR905 so that the 4/16 gradation is just slightly visible.  
Do not touch VR905 after this.

- d) Contrast control Fully counterclockwise  
Brightness control Fully clockwise

- e) Receive an all black signal.

- f) Turn VR904 and VR906 so that the back raster is white.

Following procedure can be used instead of above. [Regarding quantum 801C]

(4)' Adjustment of sub-brightness VR

Turn the contrast control fully counter clockwise, the brightness control fully clockwise and sub-brightness control VR905 mechanical center.

- a) Receive the signal 8 (15.75 kHz) all black signal.

- b) Adjust VR904 and VR906 so that the background raster becomes white. If retrace lines appear, readjust the VR905 counter clockwise so that the retrace lines disappear, and readjust white balance.

- c) Receive the all white pattern.

(5) Fine Adjustment of White Balance

Color temperature: Center X = 0.310

Y = 0.325

The color should be white with a slightly blue tinge.

a) Receive signal 11 (15.75kHz, pattern window) H gray scale (16 gradations).

(Window pattern - within a range in which there is no ABL.)

b) Contrast control Fully counterclockwise

Brightness control Fully clockwise

Check that the white balance is proper for all gradations.

If not, fine adjust the sub bright VR, VR904 and VR906 to make it white.

**NOTE:** Do not move VR905: G. sub bright.

c) Set the contrast control fully clockwise and the brightness control so that there is no back raster.

Check that the white balance is proper for all gradations.

If not, fine adjust the gain VR, VR801 and VR803 to make it white.

**NOTE:** Do not move VR802: G. gain.

(6) Focus Adjustment

(100% white or 4-dot missing signal)

Contrast control Fully clockwise

Brightness control To sufficient brightness

Turn the focus control and adjust for the optimum focus.

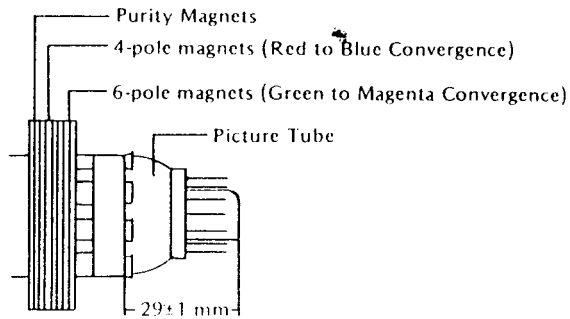
(7) Purity Adjustment

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

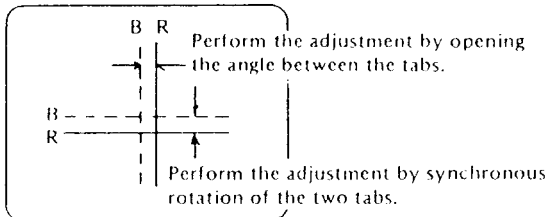
b) Ensure that the spacing between the Purity, Convergence Magnet. (PCM), assembly and the CRT stem is 29 mm  $\pm$  1 mm. (See below diagram)

c) 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°.

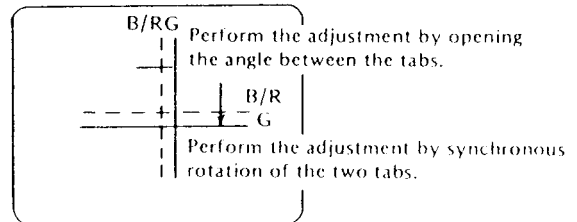
d) Check the complete blue and complete green patterns to observe their respective color purity. Make minor adjustments if needed.



Purity, Convergence Magnet Assembly (PCM)



Red to Blue Convergence  
(Magenta)



Green to Magenta Convergence  
(White)

### (8) Convergence Adjustment

- Produce a magenta crosshatch on the display.
- Adjust the focus for the best overall focus on the display.  
Also adjust the brightness to the desired condition.
- 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)
- Horizontal red and blue lines are converged by varying the two tabs together, keeping the angle between them constant.
- Produce a white crosshatch pattern on the display.
- Vertical green and magenta lines are converged by varying the angle between the two tabs of the 6-pole magnets.
- Horizontal green and magenta lines are converged by varying the two tabs together, keeping the angle between them constant.



Indication address	Abbreviation	Unit	ROM address	BY LVG-1600								
				01	02	03	04	05	06	07	08	09
0	CLOCK	MHz	X00	28.320F	28.320F	28.320F	28.320F	28.320F	28.320F	28.320F	28.320F	14.160F
1	H FREQ	kHz	X03	31.470F	31.470F	31.470F	31.470F	31.470F	31.470F	31.470F	31.470F	31.470F
2	V FREQ	Hz	X06	50.032F	60.057F	70.089F	50.032F	60.057F	70.089F	50.032F	60.057F	60.057F
3	CHR-SIZE	DOT	X09	09X14	09X14	09X14	09X16	09X16	09X16	09X16	09X16	09X16
4	Nht	CHR	X0B	F100	F100	F100	F100	F100	F100	F100	F100	F050
5	Nhd	CHR	X0D	F080	F080	F080	F080	F080	F080	F080	F080	F042
6	Nhsp	CHR	X0F	F082	F082	F082	F082	F082	F082	F082	F082	F042
7	Vpw-Hpw	V.-RASTER H-CHR	X11	02X12	02X12	02X12	02X12	02X12	02X12	02X12	02X12	02X06
8	Nadj	RASTER	X13	13	07	01	05	13	01	05	13	12
9	Nvt	LINE	X14	F044	F037	F032	F039	F032	F028	F039	F032	F032
10	Nvd	LINE	X16	F025	F025	F025	F025	F025	F025	F030	F030	F031
11	Nvsp	RASTER	X18	F034	F030	F027	F031	F028	F025	F033	F030	F031
12	Nvspdj	RASTER	X1A	01	05	09	06	02	12	14	10	01
13	INT		X1B	00	00	00	00	00	00	00	00	00
14	OUT		X1C	F00011	F00011	F00011	F10011	F10011	F10011	F00011	F00011	F00011

# DATA FORMAT FOR USING Quantum 801C

## TIMING PARAMETERS:

### Real Time Parameters

Dot Rate	MHz
Horizontal Rate	KHz
Vertical Rate	Hz

### Non-Real Time Parameters

Horizontal	Vertical
Dots/Character	Lines/Character
Total	Total
Characters	Rows
Drive Delay	Drive Delay
Drive Width	Drive Width
	Step Width

### Signal No.

### Description

1.	H: 31.47KHz V: 50Hz (350 Lines)
2.	H: 31.47KHz V: 60Hz (350 Lines)
3.	H: 31.47KHz V: 70Hz (350 Lines)
4.	H: 31.47KHz V: 50Hz (400 Lines)
5.	H: 31.47KHz V: 60Hz (400 Lines)
6.	H: 31.47KHz V: 70Hz (400 Lines)
7.	H: 31.47KHz V: 50Hz (480 Lines)
8.	H: 31.47KHz V: 60Hz (480 Lines)
9.	H: 31.47KHz V: 60Hz (496 Lines)
10.	H: 15.85KHz
11.	H: 15.85KHz WINDOW PATTERN
12.	H: 18.43KHz
13.	H: 22KHz
14.	H: 22 KHz
15.	H: 30.48KHz (400 Lines)
16.	H: 30.48KHz (480 Lines)
17.	H: 25KHz
18.	H: 20KHz

## 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

OP 10.—0=monochrome 1=color

### Duty Cycle

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

### Horizonatal Skew

OP14.—skew right 0-3 dots

### Vertical Skew

OP 15.—skew down 0-9 lines

### Cursor

OP 16.—0:off  
1=fast blink  
2=slow blink  
3=on continuous

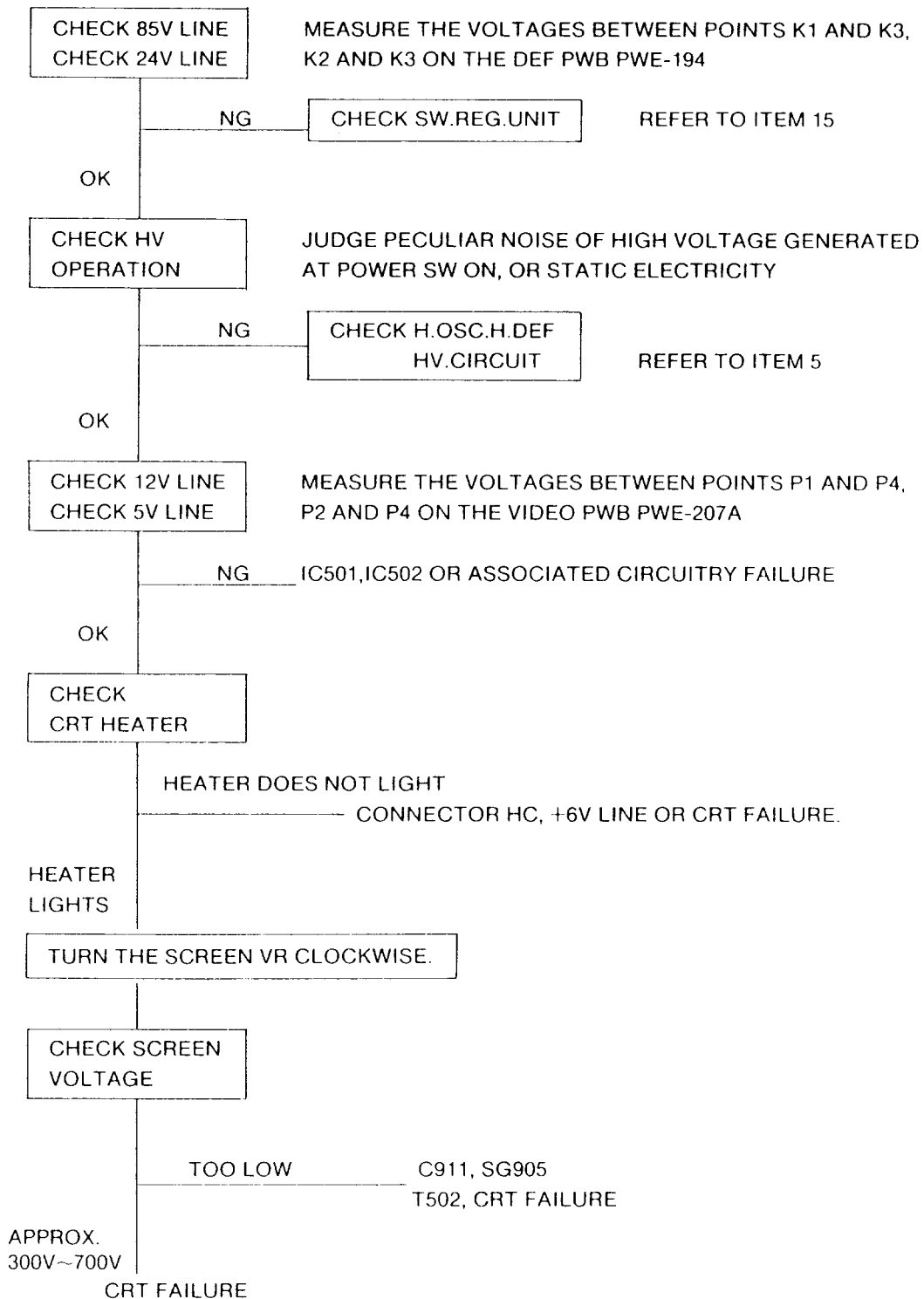




# TROUBLE SHOOTING

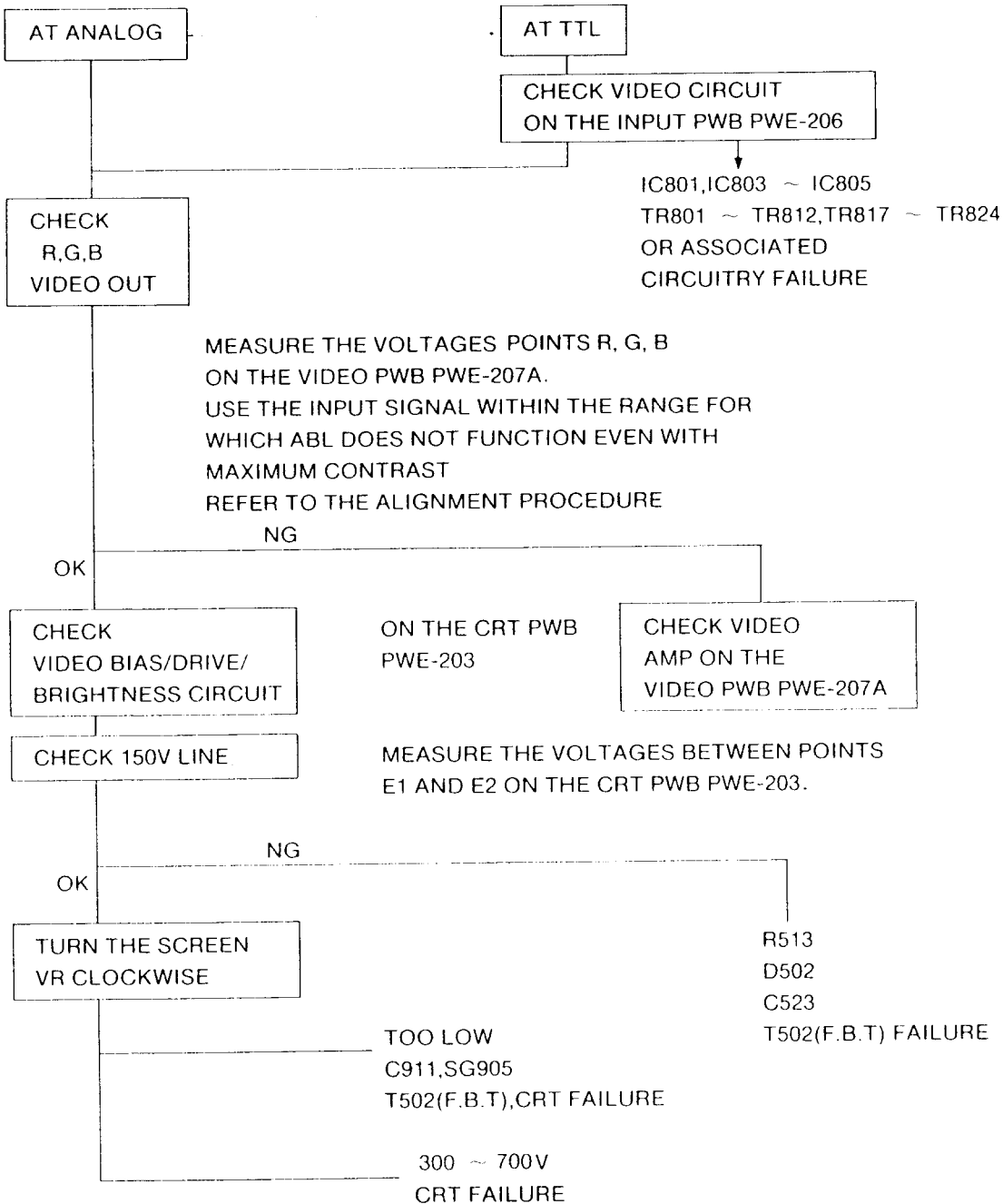
BEFORE USING THIS CHART, PLEASE REFER TO THE TROUBLE SHOOTING THE USER'S MANUAL.

## 1. NO RASTER

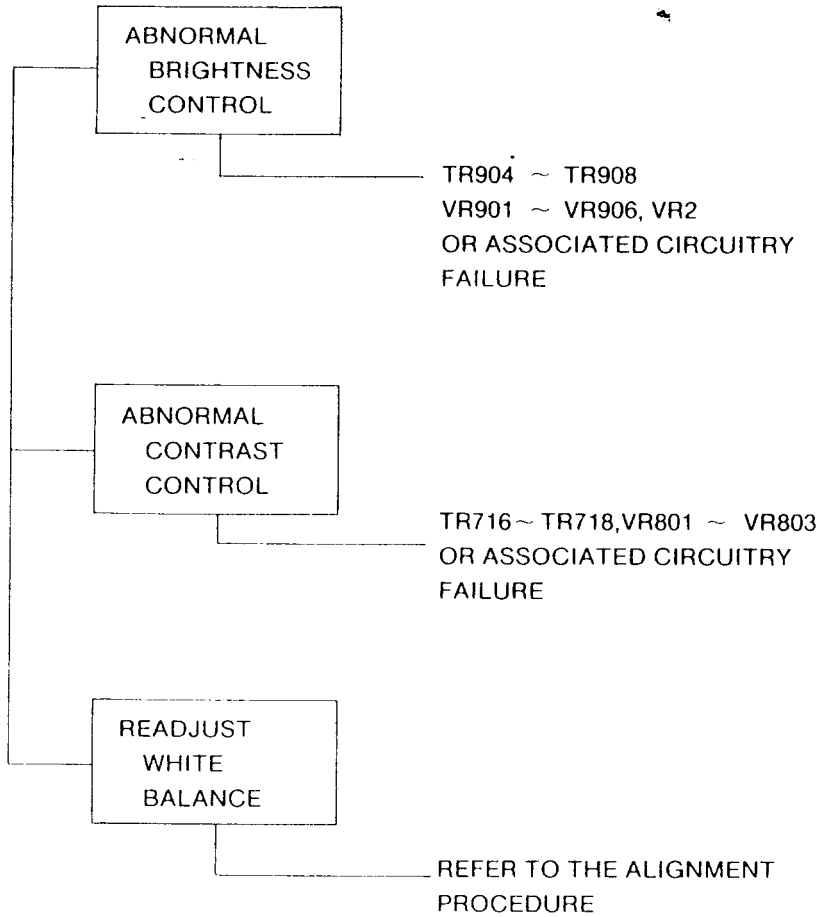


## 2. ABNORMAL VIDEO ON CRT SCREEN

TOO BRIGHT  
TOO DARK

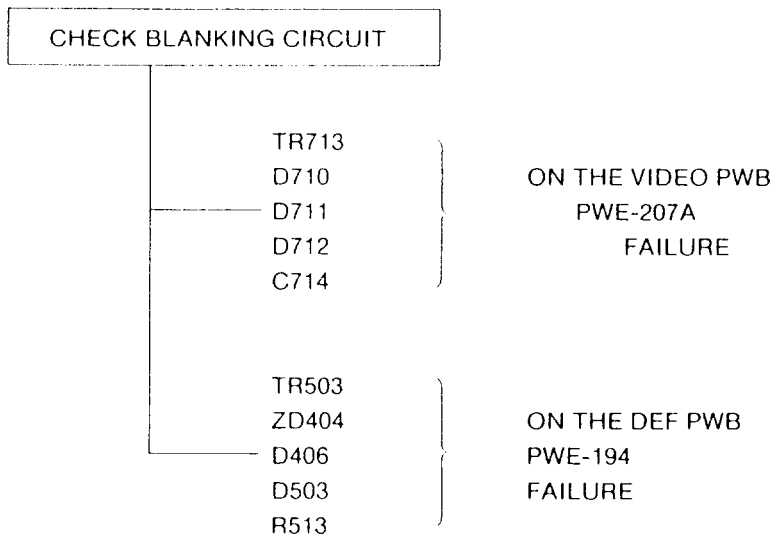


### 3. ABNORMAL WHITE BALANCE AND TRACKING



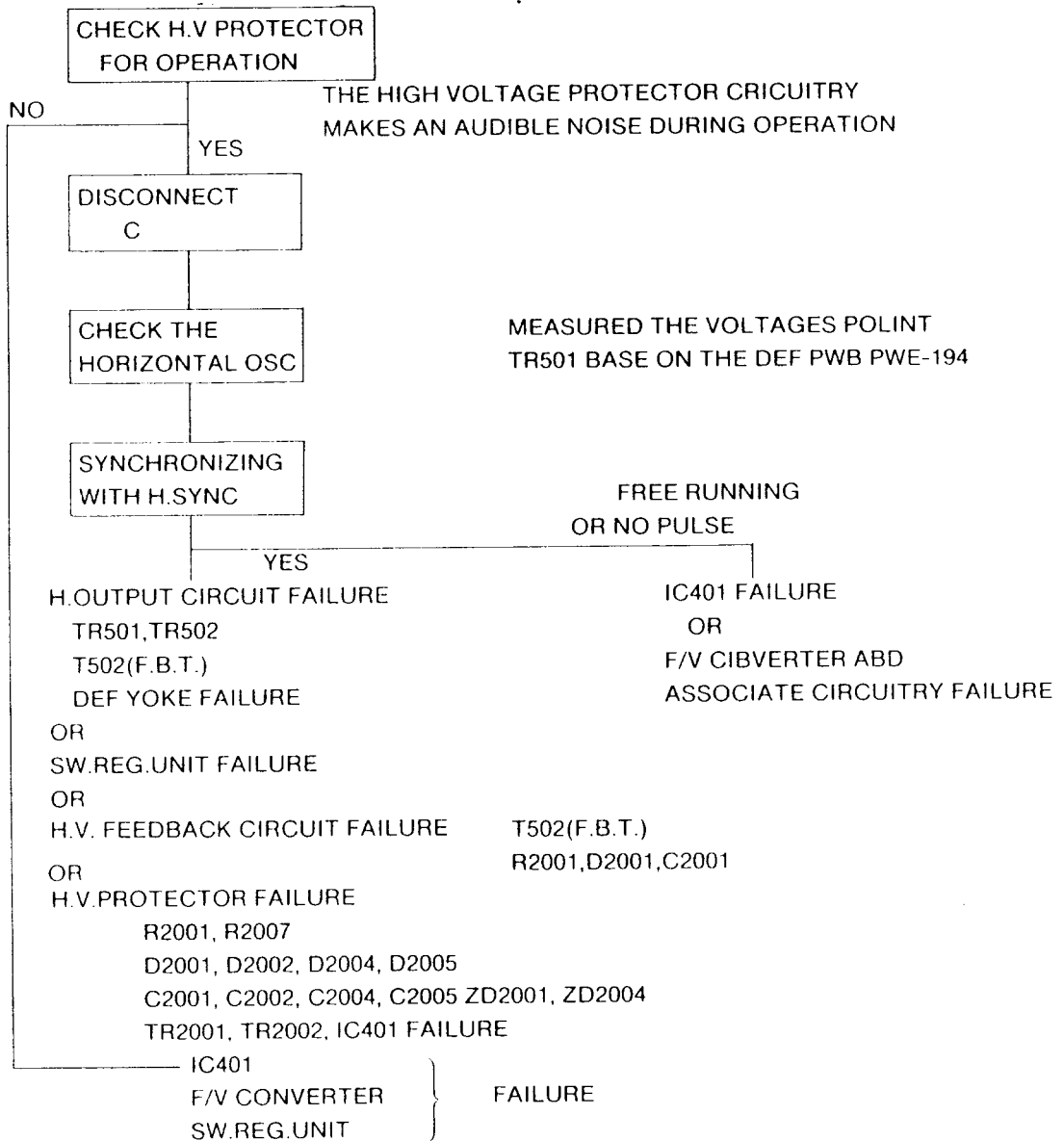
### 4. NO BLANKING WORKS

VISIBLE RETRACE LINE ON THE BACK RASTER



## 5. H.OSC/DEF/HV.CIRCUIT FAULT

NO RASTER  
 ABNORMAL PICTURE SIZE  
 ABNORMAL VIDEO ON THE CRT SCREEN





# 6.A H-F/V CONVERTER AND ASSOCIATED CIRCUITRY

CHECK H.SYNC ON THE DEF PWB PWE-194 POINT S7

NG → CHECK SYNC CIRCUIT ON THE INTERFACE PWB PWE-207B

OK → CHECK TP5E1 AND TP551 VOLTAGE

MEASURE THE VOLTAGES ON THE DEF PWB PWE-194. SIGNAL CONDITION: SEE ALIGNMENT PROCEDURE

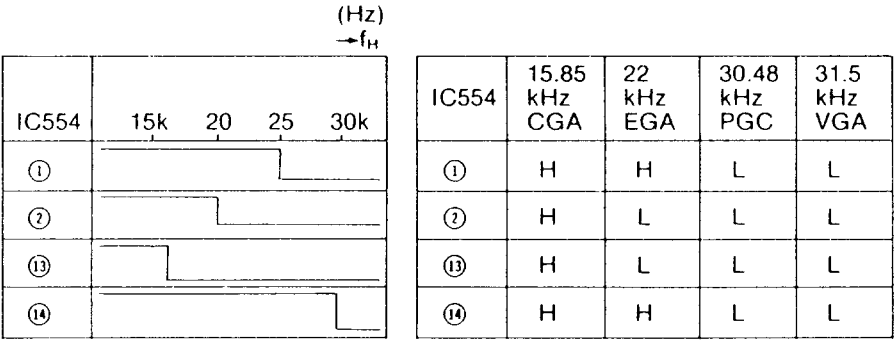
TP5E1=16V  
TP551=10V AT 25kHz HORIZONTAL FREQUENCY

NG → READJUST

OK → IC551 IC552 FAILURE

CHECK THE IC554 OUTPUT

MEASURE THE VOLTAGES ON THE DEF PWB PWE-194



NG → IC557 IC555 FAILURE      IC554 FAILURE

## 6.B V-F/V CONVERTER AND ASSOCIATED CIRCUITRY

CHECK V.SYNC.  
ON THE DEF PWB  
PWE-194  
POINT S6

OK

NG

CHECK SYNC. CIRCUIT  
ON THE INTERFACE PWB  
PWE-207B

CHECK TP5E1  
AND TP451  
VOLTAGE

MEASURE THE VOLTAGES  
ON THE DEF PWB PWE-194.  
SIGNAL CONDITION: SEE ALIGNMENT PROCEDURE

TP5E1=16V  
TP451=5.95V AT 60Hz VERTICLA FREQUENCY

NG

OK

READJUST

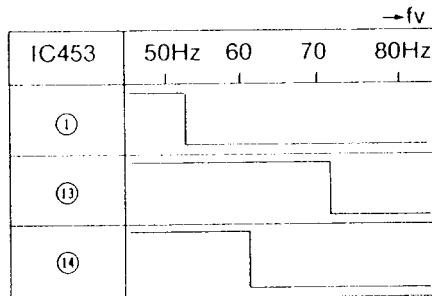
OK

NG

IC451  
IC452 FAILURE

CHECK THE  
IC453 OUTPUT

MEASURE THE VOLTAGES ON THE DEF PWB PWE-194



NG

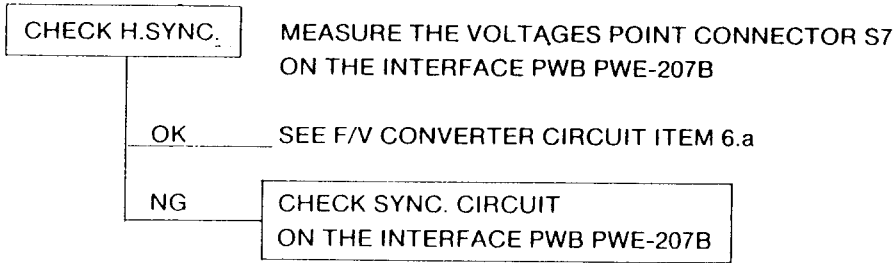
IC456 FAILURE

IC452  
IC453

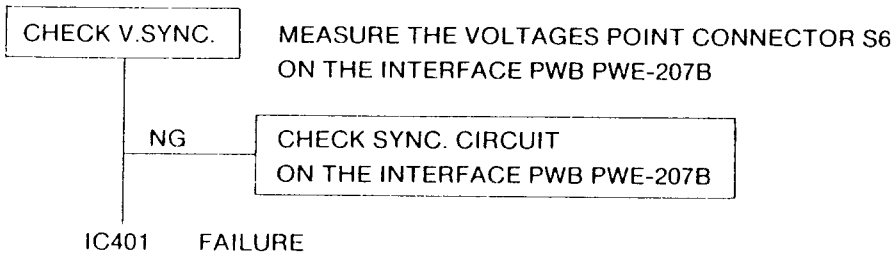
FAILURE

## 7. LACK OF STABLE SYNCHRONIZATION

### • HORIZONTAL

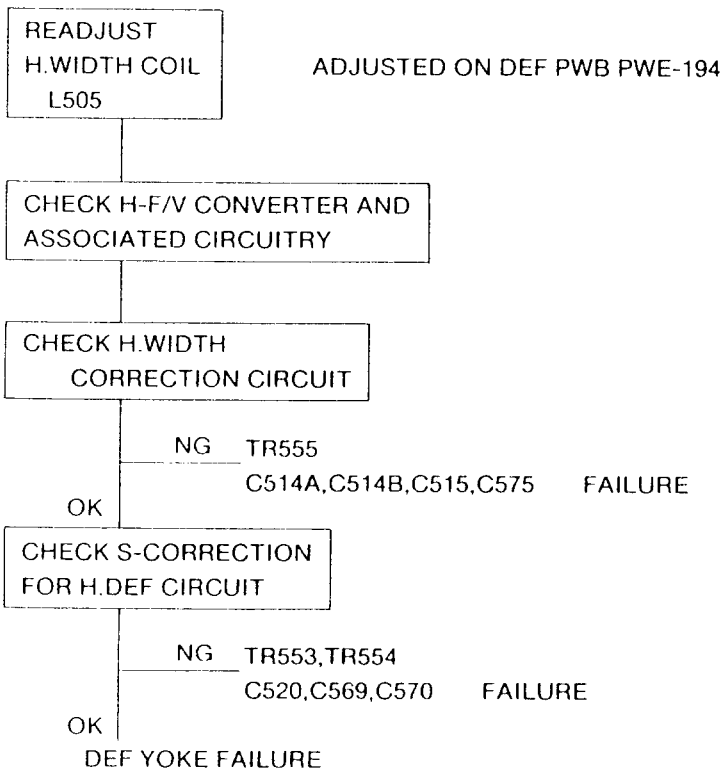


### • VERTICAL



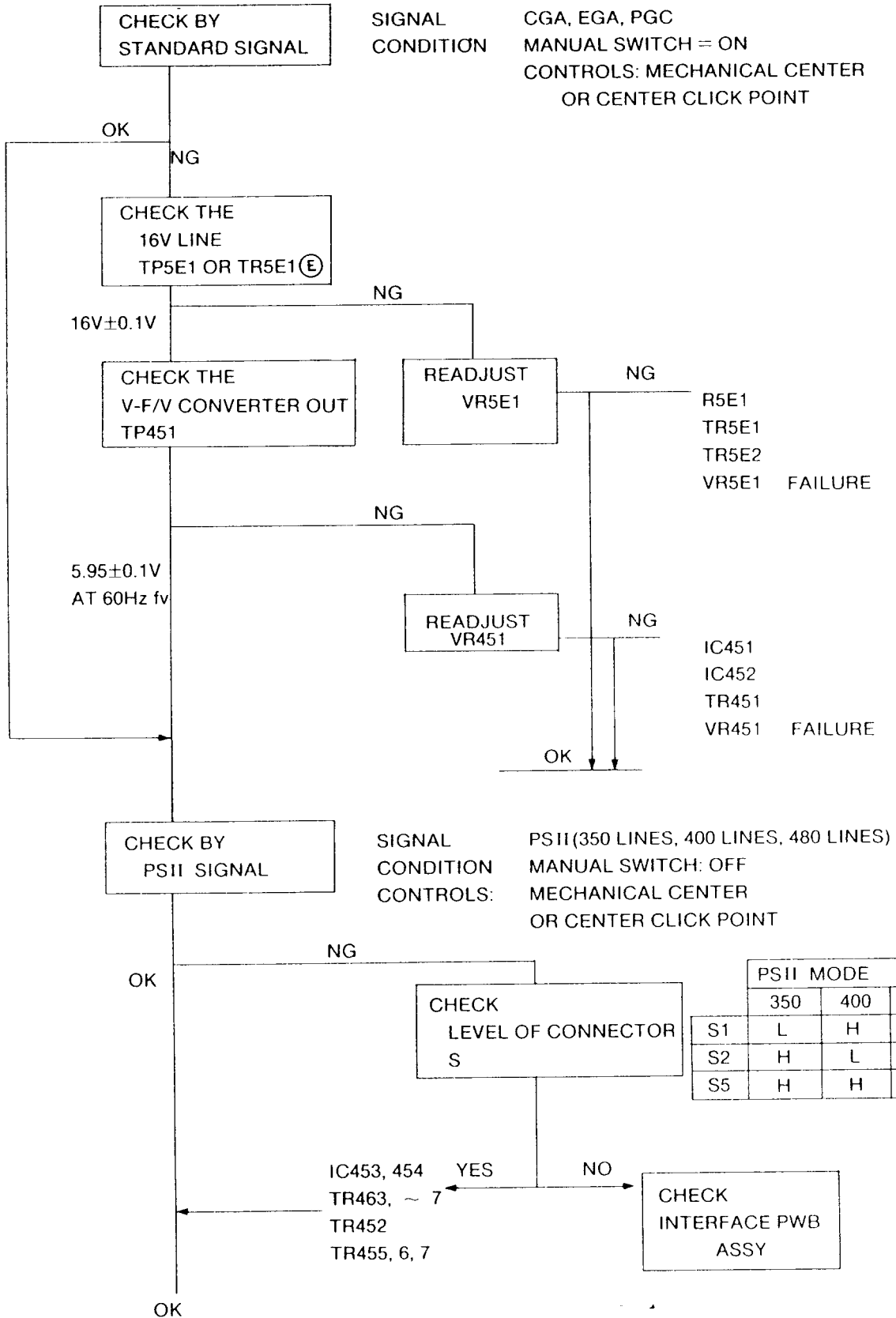
## 8. PICTURE SIZE

### ABNORMAL HORIZONTAL WIDTH



ABNORMAL  
VERTICAL HEIGHT

TOO LARGE OR SMALL  
PICTURE SIZE



1) NO CHANGE  
WITH V.SIZE CONTROL

LOOSE CONNECTOR L

2) UNDERSCANNING OF  
RASTER WITH CGA

TR453, TR459

IC551

IC552

IC554

16V LINE CIRCUIT FAILURE

3) SMALL AT PGC  
400 LINES MODE

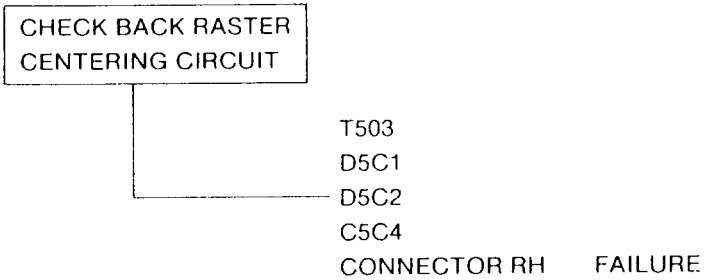
TR454

TR462 FAILURE

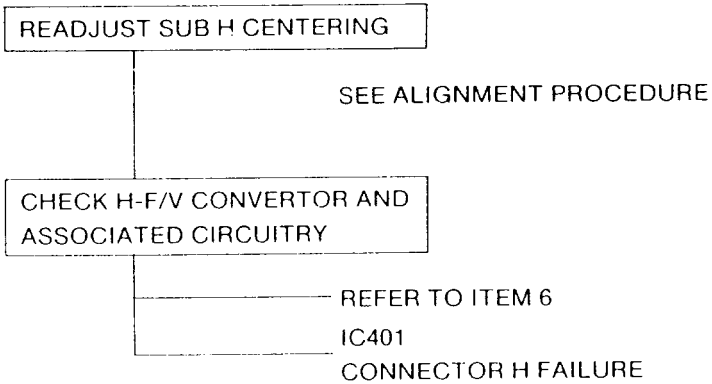
## 9. CENTERING

### 9.1. HORIZONTAL

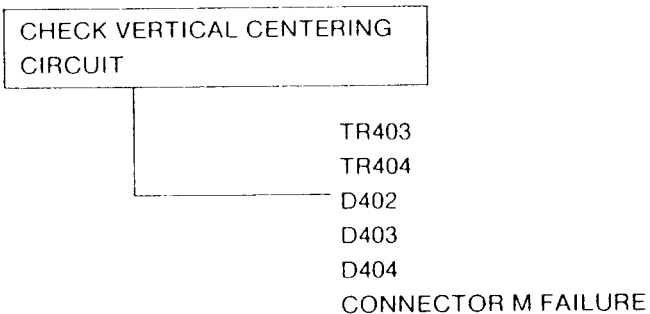
#### a) BACK RASTER CENTERING



#### b) PICTURE CENTERING



### 9.2. VERTICAL



## 10. SIDE PINCUSHION DISTORTION FAILURE

READJUST  
VR403 ON THE  
DEF PWB PWE-194

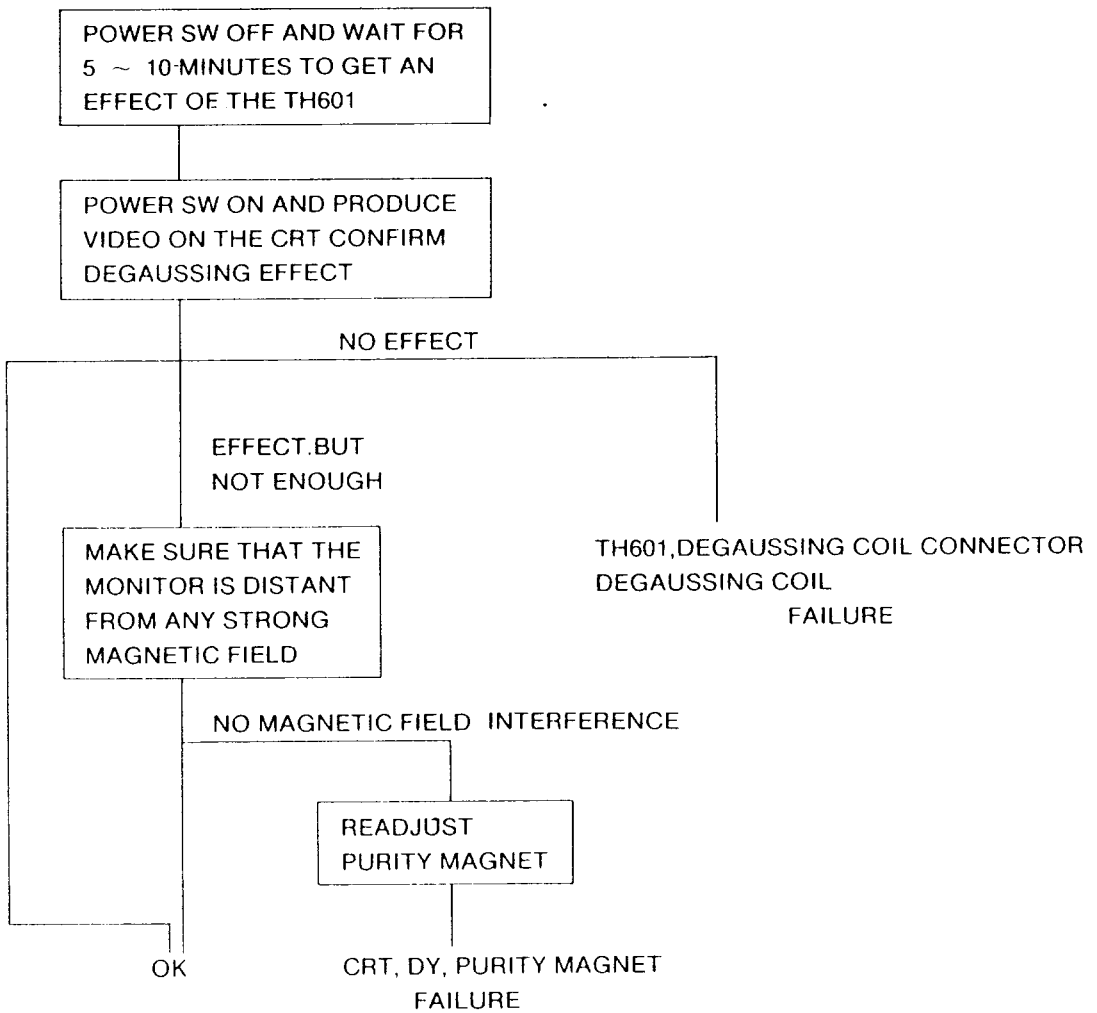
T401  
C425, C424, C423  
TR408  
D405            FAILURE

## 11. POOR FOCUS

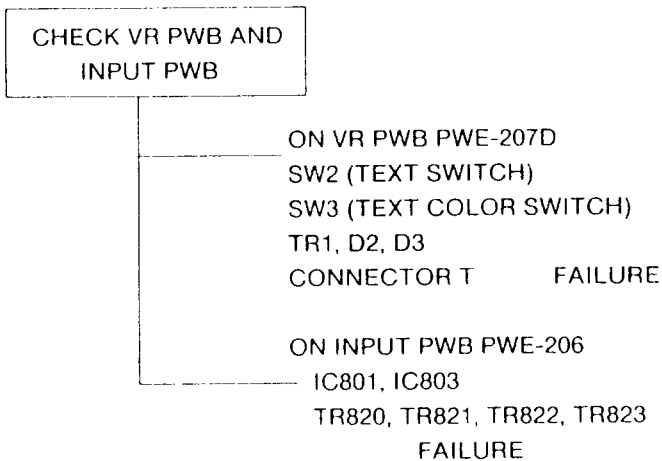
READJUST  
FOCUS CONTROL

FOCUS CONTROL UNIT (T502:F.B.T.)  
FOCUS LEAD, CRT SOCKET  
CRT                    FAILURE

## 12. IMPURITY ON CRT SCREEN



## 13. ABNORMAL TEXT MODE OPERATION





#### 14. ABNORMAL COLOR AT TTL MODE

CHECK INPUT PWB  
PWE-206

```
graph TD; A["CHECK INPUT PWB  
PWE-206"] --- B["NO EFFORT BY CONTRAST CONTROL  
TR801 ~ TR806 FAILURE"]; A --- C["OTHERS  
MANUAL SWITCH SW801  
MODE SWITCH SW802  
COLOR MODE SWITCH SW803  
IC801  
TR807 ~ TR812, TR817 ~ TR822 FAILURE"]; style B fill:none,stroke:none; style C fill:none,stroke:none;
```

NO EFFORT BY CONTRAST CONTROL  
TR801 ~ TR806 FAILURE

OTHERS

MANUAL SWITCH SW801

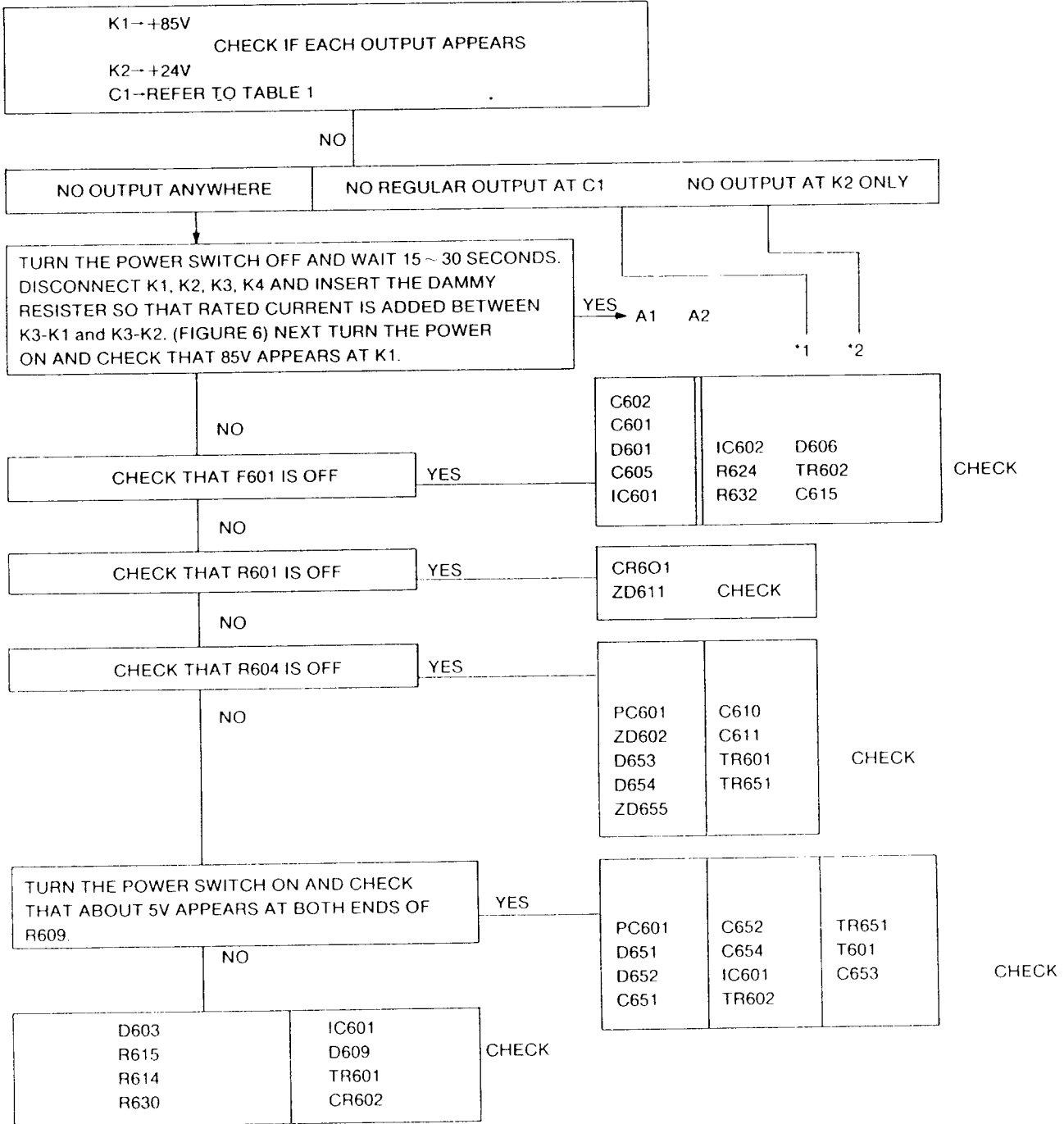
MODE SWITCH SW802

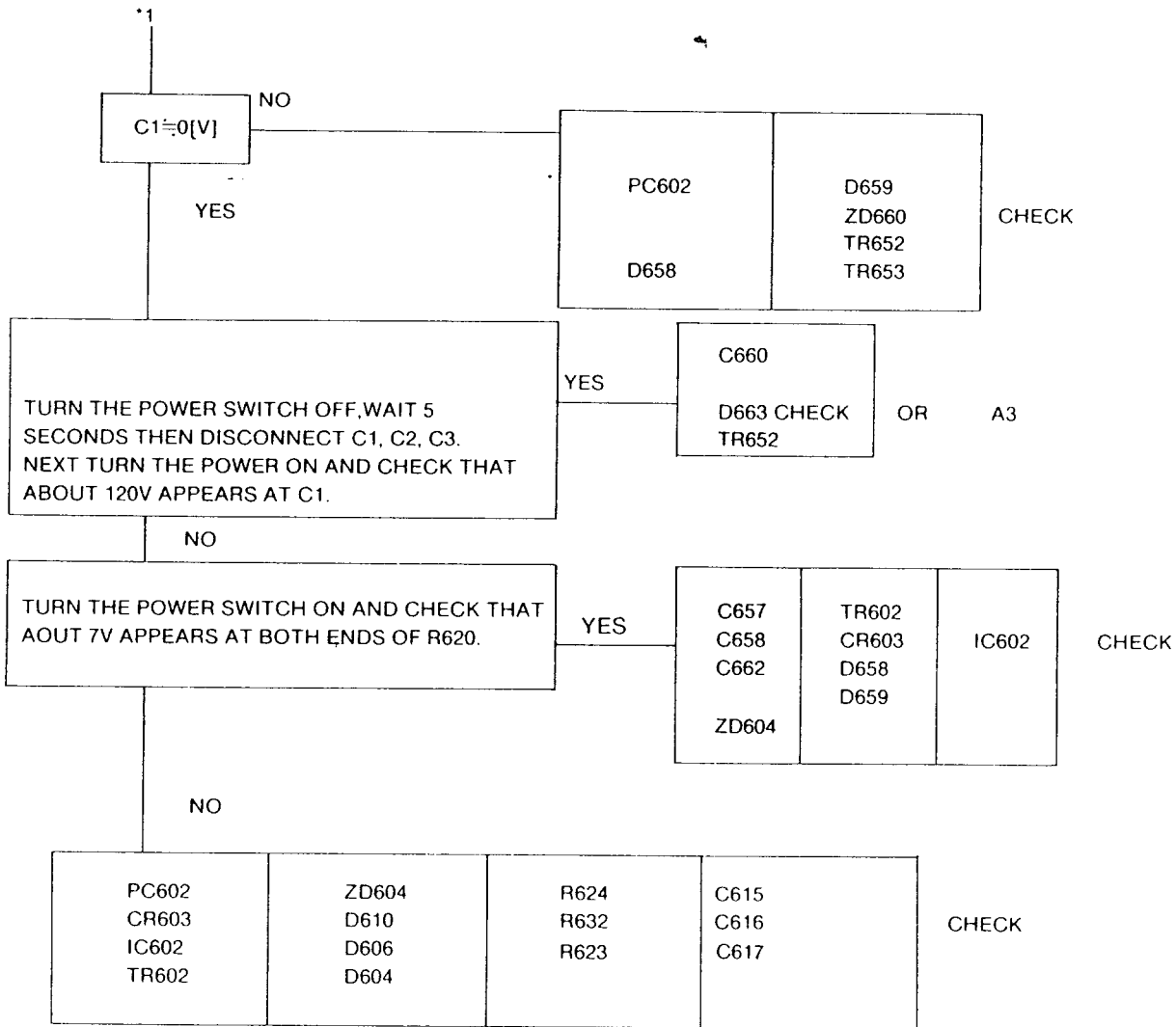
COLOR MODE SWITCH SW803

IC801

TR807 ~ TR812, TR817 ~ TR822 FAILURE

# 15. SWITCHING REGULATOR UNIT





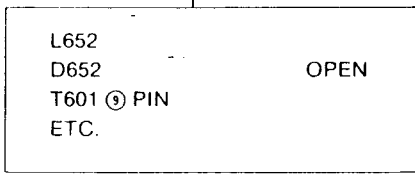
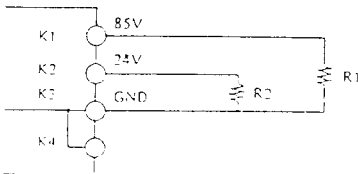


TABLE 1. C1 OUTPUT VOLTAGE

HORIZONTAL FREQUENCY [kHz]	C1 VOLTAGE [V]
15.85 (CGA)	53
22 (EGA)	65
30.48 (PGC)	94
31.5 (VGA)	98

WITH NO INPUT SIGNAL, ABOUT 45V SHOULD APPEARS AT C1.

FIGURE 6. RATED LOAD CURRENT AT K1 AND K2 TERMINAL



+85V	0.015 ~ 0.18A R1 (5.67KΩ ~ 472Ω)
+24V	0.4 ~ 1.0A R2(60Ω ~ 24Ω)

ATTENTION) DO NOT POWER ON SW.REG. UNIT ITSELF WITHOUT THE LOAD AT K1,K2,  
OR IT MAY MISOPERATE PROTECTOR.

**MAIN VOLTAGE LINE FAILURE EXCEPT SW.REG.UNIT**

VOLTAGE LINE		FAILURE PARTS	PWB ASSY	REMARKS
85V CONNECTOR K1 ~ K3		D554,D555 TR553, TR554	DEF PWB PWE-194	
		C708 ~ C709 TR707 ~ TR712	VIDEO PWB PWE-207A	
24V K2 ~ k3 AND ASSOCI- ATED VOLTAGE LINE	24V CONNECTOR K2 ~ K3	C413, C5C3 IC402,IC502	DEF PWB PWE-194	
	16V POINT TP5E1	R5E1,C5E1,ZD5E1 TR5E1,TR5E2 IC451 ~ IC454,IC456 IC551 ~ IC557, IC559	DEF PWB PWE-194	
	12V CONNECTOR P1 ~ P4	C5C5, C5C6, C5C7 R5C9, IC502	DEF PWB  PWE-194	
	6V CONNECTOR HC2 ~ HC1	C5C1 ~ C5C3 CR5C1, ZD5C1, TR5C2 IC501	DEF PWB PWE-194	
45 ~ 120V CONNECTOR C1 ~ C3		C516,C514A,C514B,C515,C575 D501, TR502, T502(F.B.T) DEFLECTION YOKE	DEF PWB PWE-194	
HIGH VOLTAGE FEEDBACK VOLTAGE CONNECTOR C2 ~ C3		R2001,D2001,C2001	DEF PWB PWE-194	

# REPLACEMENT PARTS LIST

Note: The components identified by  $\Delta$  mark are critical for safety. Replace only with parts Number specified.

All components are common for models: JC-1402HME/EE/N/R except for the parts identified by model name in symbol part.

SYMBOL	PARTS NO.	DESCRIPTION	QTY
*** CRT & TUNER ***			
$\Delta$ CRT(JC-1402HME/EE/N/R)	33014137	CRT M34JUP23XX158	1
$\Delta$ CRT(JC-1402HMR)	33014140	CRT M34JUP 23XX158 (R)	1

*** ICS ***				
IC453	IC454	IC554	37011054 IC UPC339C (COMP)	3
IC456	IC557	IC559	37051034 MOS UPD40668C (ESD)	3
IC850			37051034 IC SN74LS067AN (FLFF)	1
IC851	IC852		37051179 IC SN74LS123N (MONO MLT)	2
IC803	IC804	IC805	37052011 IC SN74LS136N (EX-OR)	4
IC853				
IC451	IC551		37056178 IC UPC1555C	2
IC452	IC552	IC553	37056207 IC UPC358	3
IC555	IC556		37056217 MOS TC4538BP	2
IC501			37056219 IC STR2009	1
IC502			37056220 IC STR2012	1
IC802			37056249 IC M51387P	1
$\Delta$ IC602			37056250 IC STK-74C4H-105	1
$\Delta$ IC601			37056353 IC STK74C6H	1
$\Delta$ IC401			37056408 IC HA11423DP-18	1
IC801			37056421 MOS PC28C-4C	1
IC402			37056427 IC UPC1499H	1

*** TRANSISTORS ***				
TR5E2			350D7217 TR,2SC945-T G	1
TR403	TR408		350E3218 TR,2SC2202-T L	2
$\Delta$ TR2002	TR401	TR405	350E6518 TR,2SC174C-T R	24
TR407	TR409	TR458		
TR459	TR462	TR5E2		
TR503	TR552	TR719		
TR718	TR810	TR811		
TR812	TR851	TR852		
TR857	TR859	TR860		
TR8A3	TR904	TR908		
TR905	TR906	TR907	350H4417 TR,2SC1473-TA G	3
TR558	TR704	TR705	351H5017 TR,2SC3811-TA G	14
TR706	TR804	TR805		
TR806	TR807	TR808		
TR809	TR825	TR853		
TR854	TR858			
TR404			350K4417 TR,2SA952 L	1
$\Delta$ TR2001	TR402	TR406	350K4519 TR,2SA933-T H	12
TR410	TR461	TR713		

SYMBOL	PARTS NO.	DESCRIPTION	QTY
TR714	TR716	TP717	
TR801	TR802	TR803	
TR901	TP902	TP903	350K5217 TR,2SA1018-TA G
TR710	TR711	TP712	350K6804 TR,2SA153F-PA D
$\Delta$ TP601	$\Delta$ TP602		350L7218 TR,2SC945 P
$\Delta$ TR651	$\Delta$ TR652	$\Delta$ TR657	350S3011 TR,2SC1541 K
TR501			350S6311 TR,2SC248E K
TR5F1			350A5414 TR,2SD822 P
TR502	TF813		350A5912 TR,2SD471 L
$\Delta$ TR502			350P2401 TR,2SC3486-YE
TR701	TR702	TR703	350P2505 TR,2SC3502 E
TR707	TR708	TR709	350E6004 TR,2SC3453-PA L
TR453	TR454	TR455	351G0500 TR,AA1A4M-T
TR456	TR457		
TR463	TR464	TR856	351G0501 TR,AA1A4M-T
TR868	TR869		
TR452	TR465	TR466	351G0531 TR,AA1L4M-T
TR467	TR557	TR861	
TR862			
TR817	TR818	TR819	351G0600 TR,DTA114ES-T
TR821	TR822	TR826	
TR1	TR451	TR719	351G0601 TR,DTC114ES-T
TR823	TR824	TR827	
TR828	TR829	TR855	
TR864	TR865	TR866	
TR867			
TR814	TR815	TR816	351G0613 TR,DTC123YS-T
$\Delta$ TR553	$\Delta$ TR554		35122100 TR,2SK703
$\Delta$ TR555			35122200 TR,2SK854
CR501	$\Delta$ CR602	$\Delta$ CR603	35595010 THYRISTOR C3F4M-L
$\Delta$ CR601			35595015 TRIAC AC1CFGM

*** DIODES ***				
D701	D702	D703	360X1009 DIODE,S1.1S2473	9
D704	D705	D706		
D707	D708	D709		
$\Delta$ D609	$\Delta$ D610	$\Delta$ D657	360X1010 DIODE,S1.1S2472	10
$\Delta$ D654	$\Delta$ D658	$\Delta$ D659		
$\Delta$ D661	$\Delta$ D662	$\Delta$ D667		
D713				
D2	D3	D402	360X1027 DIODE 1SS132	44
D403	D404	D405		
D406	D407	D451		
D452	D453	D454		
D503	D551	D552		
D553	D710	D711		
D712	D801	D802		
D803	D804	D805		

SYMBOL	PARTS NO	DESCRIPTION	QTY
D8C6	D8C7	D8C8	
D8C9	D810	D811	
D812	D813	D814	
D815	D816	D817	360K1027
D818	D819	D820	DIODE 1SS132
D821	D822	D823	44
D824	D850		
△D6C7	△D6C8	D9C1	360K1032
D9C2	D9C3	DIODE 1SS82-TA	5
ZD4C2	ZD85C	ZD851	360K3100
ZD5C1			DIODE PD5.1EB (2)-T4
ZD4C4			360K3121
ZD7C1			DIODE PD6.8EB(3)-T4
△ZD6C4			360K3124
			DIODE PD6.2EB (3)-T4
			360K3129
			DIODE PD27EB(4)-T4
△ZD6C5			360K3137
			DIODE PD7.5EB(2)-T4
△ZD2C1	△ZD2C2		360K3143
			DIODE PD6.2J5B(1)-T4
△ZD6C2			360K3149
			DIODE PD10EB(2)-T4
△ZD655	△ZD66C		360K3151
			DIODE PD6.8EB(2)-T4
ZD5C2			360K3160
			DIODE PD6.2EB(2)-T4
△ZD611			360K3162
			DIODE PD2.7EB(1)-T4
ZD5C3			360K3189
			DIODE PD3.9EB(2)-T4
ZD5C1			360K3400
			DIODE PD12J5B-T4
ZD4C1			360K3401
			DIODE PD20J5B-T4
ZD8C2			360K3635
			DIODE PD5.1ESB(2)-T4
ZD8C1			360K3660
			DIODE PD9.1ESB(3)-T4
ZD5E1			360Q3170
			RECTIFIER,SI,PD6.2J5B(2)
△D2C1	△D2C4	D4C1	361K7160
D5C1	D5C2	D5C3	RECTIFIER,SI, TVR-C6G G23
△D554	△D555		
D5C2			361K7505
			RECTIFIER,SI,ERR44-C6V1
△D6C3	△D6C6		36107174
			RECTIFIER,SI, RU1P
△D651			36107305
			DIODE RL2B
△D5C1			36107509
			DIODE RH4F
△D652			36107511
			RECTIFIER,SI, RL4Z,LFK2
△D657			36107512
			RECTIFIER,SI, RG4C,LFK2
FD8C2			36108092
			DIODE ARRAY 1S2473X9A
FD8C1			36108093
			DIODE 1S2473X9K
△D6C1			36108201
			DIODE,NETWORK D5SPA6CS
D1			36801023
			DIODE,LIGHT-E SEL132CG
△D2C2	△D2C5		38005011
			VARIATOR,VD1220
△TH6C1			38112031
			THERMISTOR,POSITIVE
△PC6C1	△PC6C2		38200233
			IC TLP634(NHE-LF2)

\*\*\* TRANSFORMERS \*\*\*

T5C1	4580300P	TRANS,H,DRIVE	1
T5C3	46305101	TRANS,CONVERTER	1

SYMBOL	PARTS NO	DESCRIPTION	QTY
△T6C1	46308407	TRANS,SWITCHING	1
△T6C2	46308408	TRANS,SWITCHING	1
△T5C2	47105637	F.B.T.(JC-1402HME/EE/R/N)	1
△T5C2	47105640	F.B.T.(JC-1402HME)	1
△T4C1	47502042	TRANS,SIDE PINCLUSION	1

\*\*\* VARIABLE RESISTORS \*\*\*

VP4		41011270	R,VARIABLE B500-V(M)	1	
VP3		41011273	R,VARIABLE B20K-V(M)	1	
VP5		41011275	R,VARIABLE B20K-V(M)	1	
VR1	VR2	41023603	R,VARIABLE E10K-V	2	
VP4C3		41041009	R,VARIABLE B47K	1	
VP4C2		41067003	R,VARIABLE 300H 0.1W	1	
VP5E1		41067005	R,VARIABLE 1K 0.1W	1	
VP4C1	VP5C1	41067008	R,VARIABLE 5K	2	
VR2C1	VR2C2	VR2C3	41071161	R,VARIABLE B4.7K	3
VP7C1		41071210	R,VARIABLE B3.3K	1	
VR4C5		41085004	R,VARIABLE B500H	1	
VR5C1		41085005	R,VARIABLE B5K	1	
VR551		41085009	R,VARIABLE E10K	1	
VR451	VR552	VR553	41085010	R,VARIABLE B20K	5
VR554	VR555				
VR9C1	VR9C2	VR9C3	41085013	R,VARIABLE E100K	6
VR9C4	VR9C5	VR9C6			
VR5C2		41085014	R,VARIABLE B200K	1	
△VR651		41087058	R,VARIABLE B5K	1	
△VR2C1	△VR2C2	△VR652	41505005	R,VARIABLE B2K	3
△VR2C3	△VR653		41505008	R,VARIABLE B10K	2

\*\*\* RELAYS & SWITCHES \*\*\*

SW3		65161021	SWITCH,SLIDE	1
SW8C3		65161029	SWITCH,SLIDE	1
SW1	SW2	65161034	SWITCH,SLIDE	2
SW8C1	SW8C2	65161035	SWITCH,SLIDE	2
△SW1		65360006	SWITCH,PUSH BUTTON	1
△RL1		65602501	RELAY G6B-1114P	1
RL2C2		65602551	RELAY	1
RL8C1	RL8C3	65699012	RELAY RY120W (2T)	2

\*\*\* COILS & FILTERS \*\*\*

LC7C2		60999015	FILTER 2J5C-2R2-101	1
L5C5		60908043	COIL,VARIABLE WIDTH	1
△L5C3		60908047	COIL,WIDTH	1
△L5C6		60918101	COIL,H,LIN	1

SYMBCL			PARTS NO	DESCRIPTION	QTY
ΔL507			6099004	COIL,CHCKE	1
L7C1	L7C2	L7C3	610E1711	COIL,FILTER 3.3UH	6
L9C1	L9C2	L9C3			
L7C4	L7C5	L7C6	610E1712	COIL,FILTER 3.9UH	3
L8C1	L8C2		610E1714	COIL,FILTER 5.6UH	2
L5C2			610F7C10	COIL,FILTER 2.7UH	1
L5C2			61022C22	FILTER CHCKE	1
ΔL6C1			61062C54	LINE FILTER	1
L5C1	L5C1		61064C06	COIL,FILTER 50UH	2
ΔL6C2	ΔL651	ΔL652	61099C11	COIL,CHCKE 33UH	3
ΔL652			61099C14	COIL 33CK1.8	1
L5C3	L5C5		61099C19	COIL,CHCKE	2
ΔDEG			61314210	COIL,DEGAUSSING	1
LC7C1			61606C21	NOISE FILTER DSS-271*	1
LC8C1			61606C23	FILTER DSS-223S	1

\*\*\* PWB ASSYS \*\*\*

	84K10C04	INPUT PWB ASSY	1
	84K10C04	DEF PWB ASSY	1
	84K10J01	CRT PWB ASSY	1
	84K10K03	INTERFACE PWB ASSY	1
	84K11AC2	SW.REG.PWB ASSY	1

\*\*\* ELECTRICAL PARTS & MISCELLANEOUS PARTS \*\*\*

	SG9C1	SG9C2	SG9C3	32500C22	ADAPTER (9P-15P)	1
				32990C47	ARRESTER	3
ΔF6C1	ΔF651			66699C07	FUSE ET T2A,250V-S,B SOC	2
SG9C5				66706C01	SPARK GAP 1.2KV	1
Δ				70032026	SG/CRT SOCKET	1
CN1				70056352	D SUR CONNECTOR 9PL	1
				70102147	IC SOCKET 24P	1
Δ				70800322	LINE CORD(JC-1402HMEE)	1
Δ				70800031	LINE CORD(JC-1402HME/R/N)	1
Δ				73513006	LINE CORD SAA L2.0(JC-1402HMR)	1
				71205C37	HOLDER,FUSE	4
CN-RH	CN-RH1	CN-RH2		73721C03	CONNECTOR PIN 2P	5
CN-RH3				73893C29	CABLE 9P-9P	1

\*\*\* APPEARANCE PARTS \*\*\*

				24514752	COIL SPRING	1
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SYMBOL	PARTS NO	DESCRIPTION	QTY
	25307951	CABINET FRONT ASSY	1
	25307972	CABINET BACK	1
	25402441	REVOLVING STAND T	1
	25405971	REVOLVING STAND(B) ASSY	1
	25407321	CONTROL LID ASSY	1
(JC-1402HME)	25765502	NAME PLATE,INSTRUCTION	1
(JC-1402HMR)	25765681	NAME PLATE, INSTRUCTION	1
(JC-1402HMEE)	25766011	NAME PLATE, INSTRUCTION	1
(JC-1402HMN)	25766591	NAME PLATE, INSTRUCTION	1

\*\*\* KNOBS & PUSH BUTTONS \*\*\*

	25451821	KNOB,CONTROL	2
	254523C1	PUSH BUTTON	1

\*\*\* PRINTED & PACKING MATERIALS \*\*\*

(JC-1402HMEE)	24813501	BAG ,POLYETHYLENE	1
(JC-1402HME/R/N)	24806961	BAG,POLYETHYLENE(270*370)	1
(JC-1402HME/R/N)	24813191	BAG,POLYETHYLENE(150*370)	1
	25280161	GUIDE RAIL	1
	25601551	CUSHION SHEET	4
	25603511	BARRIER (SW.REG.PWB)	1
(JC-1402HMEE)	25815061	BAG, POLYETHYLENE(270*370)	1
	25605021	CUSHION SHEET	2
(JC-1402HME/R/N)	25804991	BAG,POLYETHYLENE	1
	25813912	FILLER(L),CARTON	1
	25813922	FILLER(R),CARTON	1
(JC-1402HME)	25813932	CARTON BOX	1
(JC-1402HMR)	25814182	CARTON BOX	1
(JC-1402HMEE)	25814451	CARTON BOX	1
(JC-1402HMN)	25814971	CARTON BOX	1
(JC-1402HMR)	78043392	WARRANTY CARD	1
	78034401	MONITOR SALES OFFICE LIST	1
	78120214	INSTRUCTION BOOK	1
	599910266	SERVICE MANUAL	1
	599910271	CIRCUIT DESCRIPTION	1

\*\*\* RESISTORS \*\*\*

R5E1	4C1C6637	R,CARBON 33H 5% 1/4W	1
R503	4C1C6667	R,CARBON 56OH 5% 1/4W	1
R501	4C1C6673	R,CARBON 1.0K 5% 1/4W	6
ΔR611	ΔR619	ΔR663	
ΔR609	ΔR620	4C1C6675	R,CARBON 1.2K 5% 1/4W
ΔR662		4C1C6679	R,CARBON 1.8K 5% 1/4W
R5E2	4C1C6681	R,CARBON 2.2K 5% 1/4W	1
R527	4C1C6683	R,CARBON 2.7K 5% 1/4W	2



SYMBOL			PARTS NO	DESCRIPTION	QTY
R5A2	R598	R599	401C6685	R,CARBON 3.3K 5% 1/4W	6
△R62E	△R633	△P656	401C6691	R,CARBON 5.6K 5% 1/4W	4
R49C	△R636	△P655			
△R666			401C6697	R,CARBON 6.8K 5% 1/4W	1
R585					
R467			401C6701	R,CARBON 15K 5% 1/4W	1
R448			401C6703	R,CARBON 18K 5% 1/4W	1
△R664			401C6705	R,CARBON 22K 5% 1/4W	1
△R627			401C6707	R,CARBON 27K 5% 1/4W	1
R482	R488		401C6721	R,CARBON 100K 5% 1/4W	2
△R657			401C6723	P,CARBON 120K 5% 1/4W	1
R473			401C6757	R,CARBON 3.3M 5% 1/4W	1
R47E	R5A6	R574	401C6761	R,CARBON 4.7M 5% 1/4W	5
R57E	P582				
R510			401H5627	R,CARBON 8.2H 5% 1/2W	1
R451			401H5646	R,CARBON 75H 5% 1/2W	1
R904	R905	R906	401H5649	R,CARBON 100H 5% 1/2W	3
R704E	R704G	R704R	401H5651	R,CARBON 120H 5% 1/2W	3
R823			401H5655	R,CARBON 180H 5% 1/2W	1
R828			401H5661	R,CARBON 330H 5% 1/2W	1
R450			401H5663	R,CARBON 390H 5% 1/2W	1
R526			401H5669	R,CARBON 680H 5% 1/2W	1
R4A1	R4E4		401H5673	R,CARBON 1.0K 5% 1/2W	2
R5B2	R5E3		401H5683	R,CARBON 2.7K 5% 1/2W	2
R509	R936		401H5689	R,CARBON 4.7K 5% 1/2W	2
△R605	△R606		401H5735	R,CARBON 390K 5% 1/2W	2
△R603			401H5747	R,CARBON 820K 5% 1/2W	1
△R618			401H5753	R,CARBON 2.2M 5% 1/2W	1
R710	R915		401K5625	R,CARBON 10H 5% 1/6W	2
R702E	R702C	R702R	401K5647	R,CARBON 22H 5% 1/6W	6
R705E	R705G	R705R			
R413	R503		401K5649	R,CARBON 100H 5% 1/6W	2
R414			401K5651	R,CARBON 120H 5% 1/6W	1
R724	R853		401K5657	R,CARBON 220H 5% 1/6W	2
R807C			401K5659	R,CARBON 270H 5% 1/6W	1
R935			401K5661	R,CARBON 330H 5% 1/6W	1
R50E	R817E	R817C	401K5665	R,CARBON 470H 5% 1/6W	4
R817R					
R417H	R496	R567	401K5667	R,CARBON 560H 5% 1/6W	6
R701E	R701C	R701P			
R712	R807E		401K5669	R,CARBON 680H 5% 1/6W	2
R4A8	R4E3	R423	401K5673	R,CARBON 1.0K 5% 1/6W	20
R502	R507	R534			
R536	R720	R721			
R722	R832	R833			
R834	R835	R836			
R837	R901	R902			

SYMBOL			PARTS NO	DESCRIPTION	QTY
R903	R934				
R827			401K5675	R,CARBON 1.2K 5% 1/6W	1
R495	R516	R711	401K5677	R,CARBON 1.5K 5% 1/6W	11
R801E	R801C	R801R			
R802E	R802C	R802P			
R895	R896				
△R2002	P447		401K5679	R,CARBON 1.8K 5% 1/6W	2
R2	R4A7	R436	401K5681	R,CARBON 2.2K 5% 1/6W	25
R456	R457	R45E			
R5E3	R529	R814			
R852	R854	R857			
R85E	R860	R861			
R867	R873	R874			
R884	R885	R886			
R88E	R890	R893			
R931					
△R2003	R411	R71E	401K5687	R,CARBON 2.7K 5% 1/6W	6
R723	R863	R881			
△R2005	△R2009	R437	401K5685	P,CARBON 3.3K 5% 1/6W	12
R494	P584	R812E			
R812C	R812R	R856	401K5685	R,CARBON 3.3K 5% 1/6W	12
R87C	R922	R930			
R439	R522	R533	401K5687	R,CARBON 3.9K 5% 1/6W	4
R557					
R403	P415	R424	401K5689	R,CARBON 4.7K 5% 1/6W	8
R551	R808E	R808G			
R808R	R879				
R1	R5E0	R5E5	401K5691	R,CARBON 5.6K 5% 1/6W	10
R502	R826	R865			
R866	R872	R823			
R929					
R402	R484	R515	401K5697	R,CARBON 6.8K 5% 1/6W	7
R703E	R703C	R703R			
R825					
△R2004	△P200E	R401	401K5695	R,CARBON 8.2K 5% 1/6W	12
R506	R506	R552			
R709	R715	R719			
R868	R869	R875			
△R2006	△R201C	R48E	401K5697	R,CARBON 10K 5% 1/6W	23
R412	R452	R453			
R455	R504	R553			
R555	R556	R563			
R595	R725	R813			
R816	R832	R851			
R862	R871	R891			
R897	R920				
△R2011	R400	R449	401K5699	P,CARBON 12K 5% 1/6W	11
R514	R527	R713			
R714	R864	R877			
R882	R921				
R4E1	R4E2	R4E6	401K5701	R,CARBON 15K 5% 1/6W	18