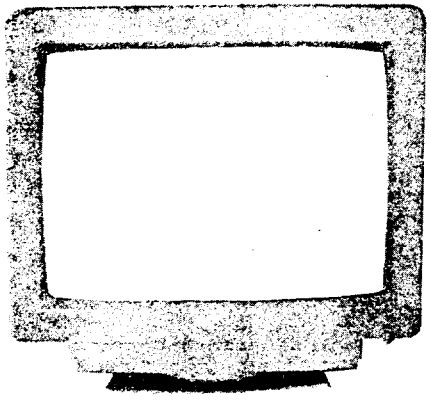
NEC

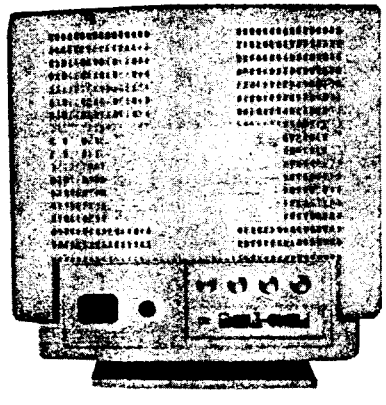
MODEL JC-1601VME/EE/R

COLOR MONITOR MultiSync 4D
SERVICE MANUAL

PARTS NO 599910294

Better Service
Better Reputation
Better Profit





SPECIFICATIONS

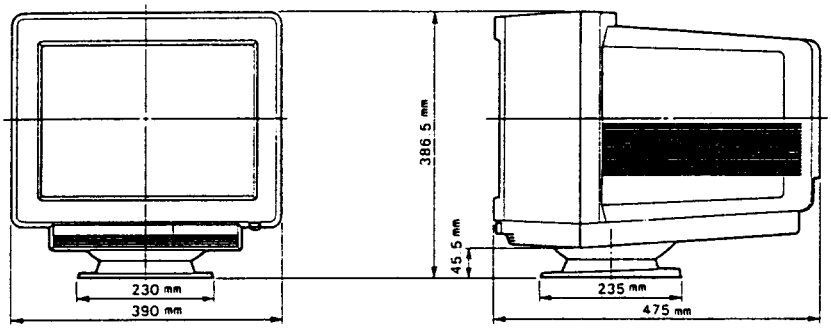
A. Electrical Description

Picture Tube	16 inches, 15 inches visual diagonal measurement 90 degree deflection, 0.28mm Trio dot pitch Dot type black matrix, Non-long persistence phosphor, Dark bulb Non-glare
Input Signal	Video : 0.7 or 1.0Vp-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 0.3Vp-p Negative (Video 0.7Vp-p Positive) 0.43Vp-p Negative (Video 1.0Vp-p Positive)
Display Colors	Analog input Unlimited colors
Synchronization	Horizontal : 30kHz to 57kHz (Automatically) 50Hz to 90Hz (Automatically) Non-Interlaced/Interlaced
Resolution	Horizontal : 1024 dots maximum Vertical : 768 lines maximum
Video Band Width	75MHz
Maximum Display Area	Horizontal : 290mm Active display area is Vertical : 217mm changed by signal timing.
Misconvergence	Less than 0.5mm
Power Supply	AC220V−240V, 50/60Hz
Power Consumption	130W
Environmental Consideration	Operating Temperature 0°C to +40°C Humidity 30% to 80% Storage Temperature −20°C to +60°C Humidity 10% to 90%

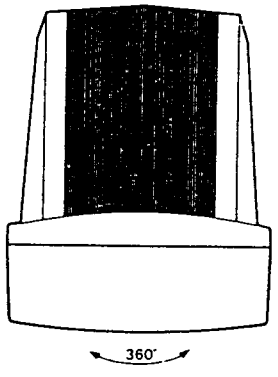
Mechanical Description (See below diagrams)

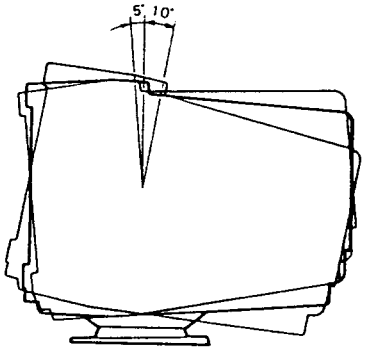
1. Cabinet	Molded plastic cabinet with attachable tilt swivel base.
2. Dimensions	390(W) × 386.5(H) × 475(D) mm
3. Weight	19.5 kg

Dimensions



Tilt Swivel Range





4. Controls	POWER SWITCH BRIGHTNESS CONTROL CONTRAST CONTROL MEMORY RECALL BUTTON INPUT SWITCH INPUT VOLTAGE SWITCH MODE SWITCH HORIZONTAL SIZE CONTROL HORIZONTAL POSITION CONTROL VERTICAL SIZE CONTROL VERTICAL POSITION CONTROL DEGAUSSING SWITCH SYNC. SWITCH
5. Input Signal Terminal:	15 PIN MINI D-SUB CONNECTOR (FEMALE) (SEE PAGE 13 FOR PIN ASSIGNMENTS) 15 PIN D-SUB CONNECTOR (FEMALE) (SEE PAGE 13 FOR PIN ASSIGNMENTS) BNC CONNECTOR (FEMALE) (SEE PAGE 15 FOR PIN ASSIGNMENTS)

GENERAL

The MultiSync 4D Color Monitor, an Intelligent Monitor from NEC, is a microprocessor based digital controlled multiple frequency color monitor. The MultiSync 4D Color Monitor automatically adjusts to the graphics adapters' scanning frequencies between 30 kHz and 57 kHz (Horizontal), and between 50 Hz and 90 Hz (Vertical).

The MultiSync 4D Color Monitor was designed with microprocessor based intelligence, allowing it to operate at each mode with the precision of a fixed frequency monitor.

The MultiSync 4D Color Monitor gives IBM PC, PC/XT, PC/AT, Personal System/2 (PS/2), Apple Macintosh II, and compatible users crisp text and vivid color graphics displays when using the following graphics adapters: (PGC, MCGA, VGA, and 8514/A and the Apple Macintosh II Video Card.)

The MultiSync 4D Color Monitor can also be used with other "non-standard" graphics adapters to provide users with an extremely wide range of color monitor compatibility.

FEATURES

— The MultiSync 4D Color Monitor is microprocessor controlled with a resident memory base of pre-programmed screen and input configurations and also digital user controls.
— The MultiSync 4D Color Monitor automatically scans all horizontal frequencies between 30 kHz and 57 kHz, and all vertical frequencies between 50 Hz and 90 Hz.
— The MultiSync 4D Color Monitor supports the IBM PC, PC/XT, PC/AT, PS/2, Apple Macintosh II, and compatibles.
— The MultiSync 4D Color Monitor supports the IBM Professional Graphics Controller, the IBM MultiColor Graphics Array, the IBM Video Graphics Array, the IBM 8514/A, the Apple Macintosh II Video Card, and other compatible graphics adapters.
— The MultiSync 4D Color Monitor's wide compatibility makes it possible to upgrade adapters or software without purchasing a new monitor.
— The MultiSync 4D Color Monitor has a maximum horizontal resolution of 1024 dots and a maximum vertical resolution of 768 lines for superior clarity of display.
— By accepting analog signal inputs, the MultiSync 4D Color Monitor can display an unlimited palette of colors depending on the graphics adapter and the software being used.
— The MultiSync 4D Color Monitor has a 16" diagonally measured, non-glare CRT that yields a 15" viewing area.
— The MultiCable: A signal cable with a 15 pin mini D-sub to a 15 pin D-sub connector that is configured for IBM MCGA, VGA, 8514/A, and the Apple Macintosh II video graphics cards. See PIN ASSIGNMENTS (page 14) for more detail information.

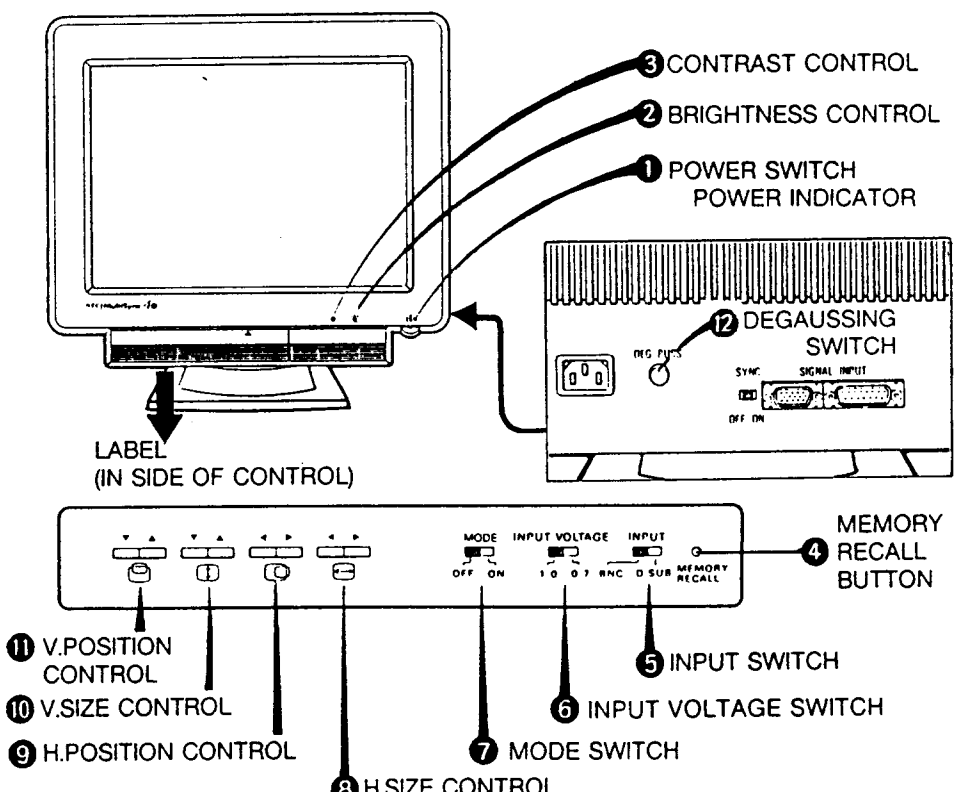
CAUTIONS

When setting up and using your MultiSync 4D Color Monitor, special attention to the following.

— To eliminate eye fatigue, do not use your MultiSync 4D Color Monitor against a bright background or where sunlight or other light sources will shine directly on the monitor.
— Your MultiSync 4D Color Monitor should be placed just below eye level for optimum viewing.
— Allow adequate ventilation around the monitor so that the heat from the monitor can properly dissipate.
— Neither the monitor itself, nor any other heavy object, should rest on the power cord. Damage to a power cord can cause fire or electrical shock.
— Keep the monitor away from high capacity transformers, electric motors, and other strong magnetic fields.
— Your MultiSync 4D Color Monitor should not be used in damp, dusty, or dirty areas.
— Handle your MultiSync 4D Color Monitor with care when transporting it.
— Do not connect the signal cables to D-sub 15 pin and Mini D-sub 15 pin inputs on your MultiSync 4D Color Monitor at same time.

ADJUSTING THE MULTISYNC 4D CONTROLS

Before connecting the MultiSync 4D Color Monitor with the IBM personal computers, the IBM Personal System/2, the Apple Macintosh II computer, or compatibles take time to familiarize yourself with the controls that you can adjust for the optimum display from the MultiSync 4D Color Monitor.



① POWER SWITCH

Used to turn the power ON or OFF. When the power is ON, the LED power indicator, located on the front of the monitor, is lit.

② BRIGHTNESS CONTROL

Used to adjust the picture brightness of the screen.

③ CONTRAST CONTROL

Adjust the display to the preferred contrast level.

④ MEMORY RECALL BUTTON

For the standard signals, this button resets the data in the user controlled memory area and recalls the factory preset data. For non-standard signals, this switch only erases the data in the user controlled memory area.

⑤ INPUT SWITCH

Use this switch to select either D-sub or the BNC video input.

⑥ INPUT VOLTAGE SWITCH

Use to match the an input video voltage (either 1.0 Vp-p or 0.7 Vp-p) of the graphics adapter. Refer to the user manual accompanying the graphics adapter for information on the input video voltage.

⑦ MODE SWITCH

In the OFF position, the microprocessor will automatically adjust the monitor to the standard signals stored in the memory at the factory.

With the MODE SWITCH ON, the monitor will give the user four additional user programmable memory area.

MODE SWITCH	MODE
OFF	Pre-set modes (PGC, VGA, 8514/A, Macintosh II, 800 × 600 mode, 1024 × 768 mode)
ON	User Programmable Memory Area

For more details, see the signal identification flowchart

⑧ H. SIZE CONTROL

Adjust this control for the preferred horizontal display size.

⑨ H. POSITION CONTROL

Adjust this control for the proper horizontal display position.

⑩ V. SIZE CONTROL

Adjust this control for the preferred vertical display size.

⑪ V. POSITION CONTROL

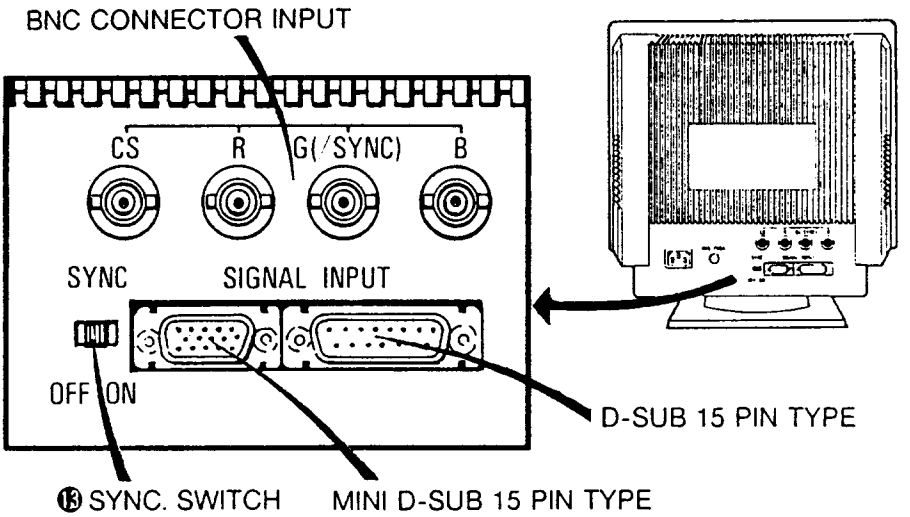
Adjust this control for the proper vertical display position.

⑫ DEGAUSSING SWITCH

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

⑬ SYNC. SWITCH

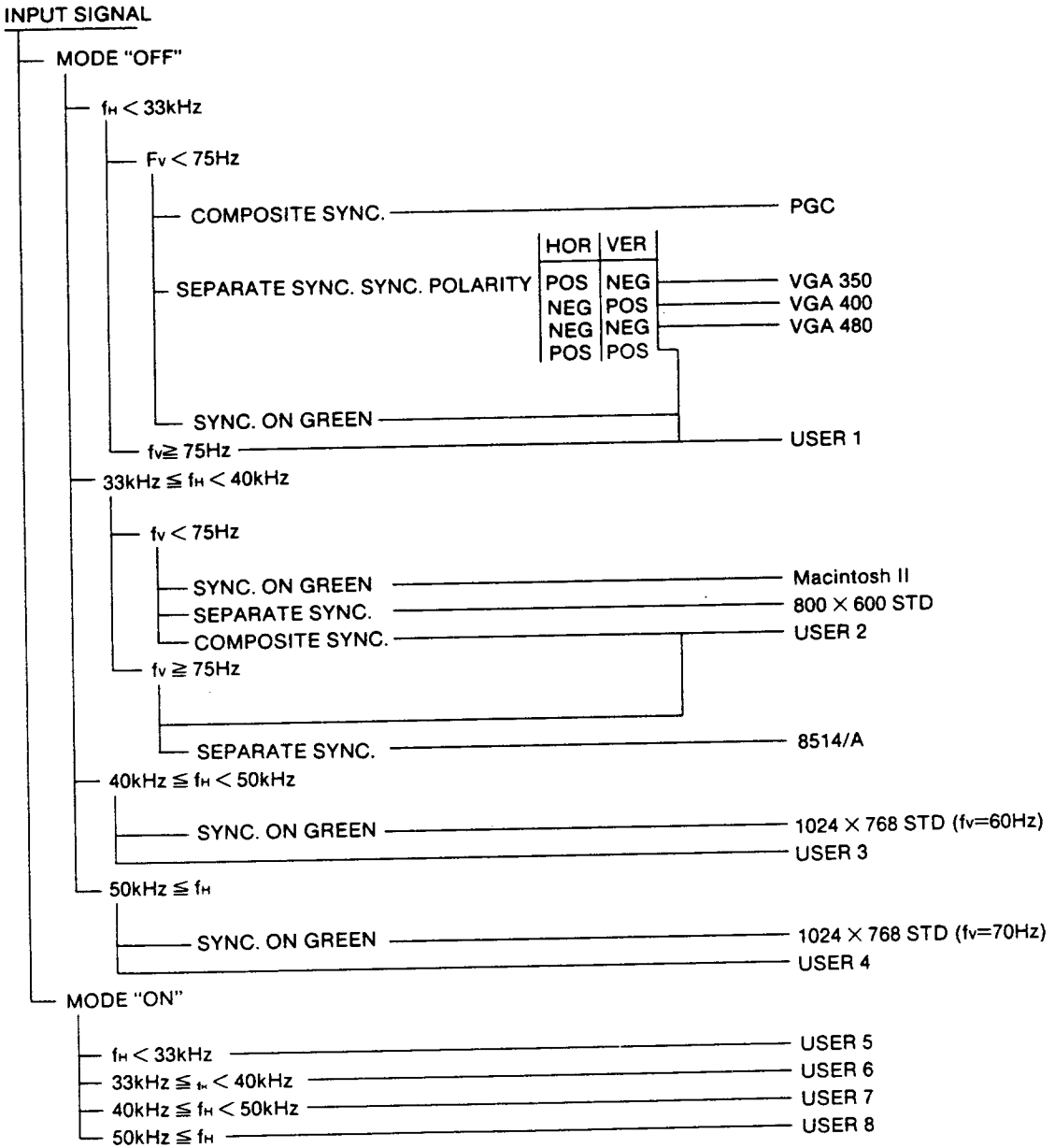
Set this switch to the "OFF" position when, using the MultiSync 4D Color Monitor with an Apple Macint osh II Video Board. When using other computers with separate sync. equipped with a 15 pin Mini D-sub connector on the monitor input, this switch should be set to the "ON" position.



NOTE:

A few seconds after the user adjusts the size and/or position of the image, the monitor's CPU will autom-atically save the new control data into the memory. Therefore, when the monitor is powered ON again, it will recall the new settings and display the image as set by the user control.

SIGNAL IDENTIFICATION FLOWCHART



PLEASE NOTE:
USER MEMORIES HAVE NOT BEEN SET BY FACTORY.

Horizontal Frequency Range (kHz)	MODE SWITCH "OFF"		"ON"
	STANDARD SIGNALS	NON-STANDARD SIGNALS	
	Factory PRESET Memories (Preset Modes)	(User Modes)	
$f_H < 33$	PGC VGA 350 VGA 400 VGA 480	USER 1	USER 5
$33 \leqq f_H < 40$	Macintosh II 8514/A 800 × 600 STD	USER 2	USER 6
$40 \leqq f_H < 50$	1024 × 768 STD (fv=60Hz)	USER 3	USER 7
$50 \leqq f_H$	1024 × 786 STD (fv=70Hz)	USER 4	USER 8

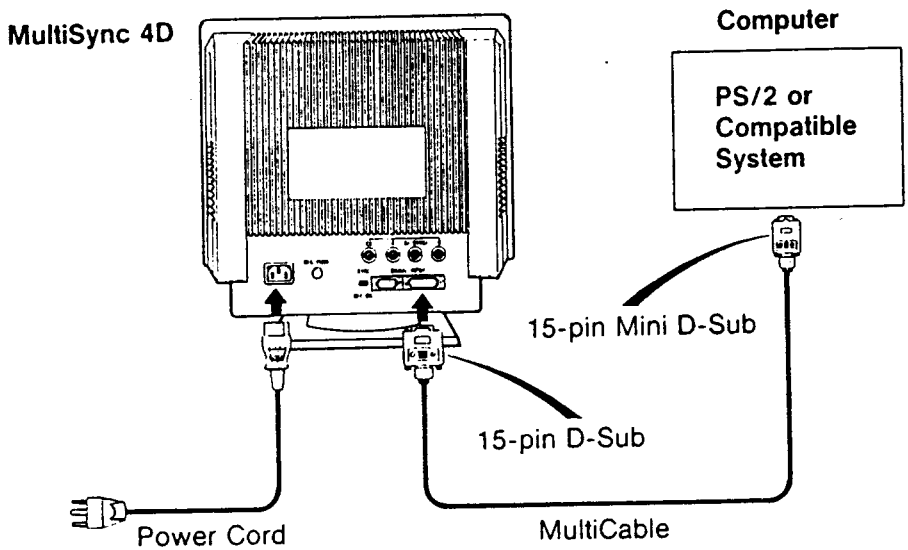
You may use the user memories with the MODE SWITCH "OFF" mode only if user signal is non-standard signal. For more details, please see the signal identification flowchart.
The user may choose the Factory PRESET mode by setting the MODE SWITCH to the "OFF" position. Four additional user memory location may be accessed by setting the MODE SWITCH to the "ON" position.

CONNECTIONS

1 WITH THE IBM PS/2

The MultiSync 4D Color Monitor can be used with the IBM MultiColor Graphics Array (MCGA), the IBM Video Graphics Array (VGA), or the IBM 8514/A adapter for IBM Personal System/2 Model 50, 60, 70, and 80 in the following configuration:

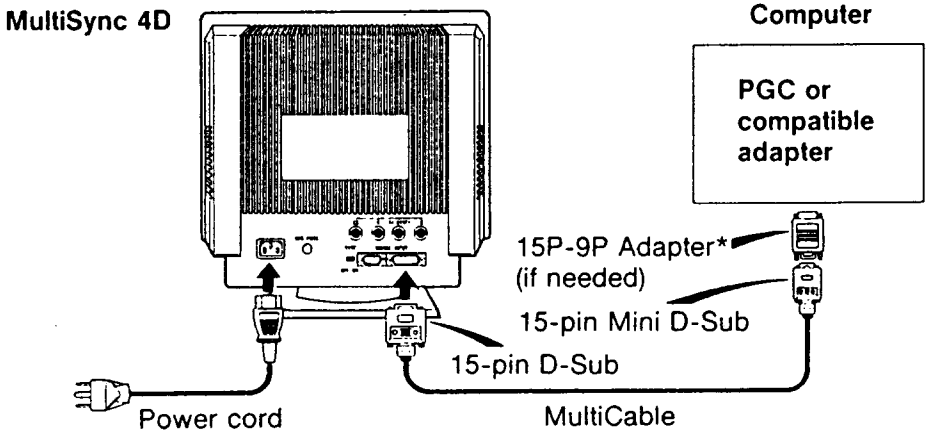
1. Make sure the power to the MultiSync 4D Color Monitor and the IBM PS/2 is tuned OFF.
2. Make sure the INPUT SWITCH on the front of the MultiSync 4D Color Monitor is set to the "D-sub" position.
3. Make sure the MODE SWITCH is set to the OFF position.
4. Connect the 15 pin mini-sub end of the MultiCable to the connector of the PS/2 or 8514/A adaptor.
5. Connect the 15 pin D-sub to the MultiSync 4D Color Monitor.
6. Connect one end of the power cable to the MultiSync 4D Color Monitor and the other end to a power outlet.
7. Turn on the POWER SWITCH of the MultiSync 4D Monitor.
8. Depress the Memory Recall button.



2 WITH THE IBM PC, PC/XT AND PC/AT

The MultiSync 4D Color Monitor can be used with the IBM PC, PC/AT, or compatible computer equipped with a non-IBM VGA adapter, Super VGA graphics adapter, IBM PGC, or compatible graphics adapter in the following configuration:

1. Be sure the power to the MultiSync 4D Color Monitor and the computer is turned OFF.
2. Make sure the INPUT SWITCH on the front of the MultiSync 4D Color Monitor is set to the "D-sub" position.
3. Make sure the MODE SWITCH is set to the OFF position.
4. Install the graphics adapter according to the instructions accompanying it.
5. If the graphics adapter gives you the option of installing for a multiple frequency monitor, set the dip switch on the adapter accordingly.
6. If your graphics adapter is the IBM PGC or compatible adapter, which has a 9 pin output connector, attach a 15 pin – 9 pin adapter*(This adapter is not provided with monitor.) to the output connector of the graphics adapter.
   This does not apply for the 9 pin connectors on VGA adaptor.
7. Connect the 15 pin mini D-sub end of the MultiCable to the graphics adapter and the 15 pin D-sub end of the MultiCable to the MultiSync 4D Color Monitor.
8. Connect one end of the power cable to the MultiSync 4D Color Monitor and the other end to a power outlet.
9. Turn on the POWER SWITCH of the MultiSync 4D Color Monitor and the computer.
10. Depress the MEMORY RECALL BUTTON.

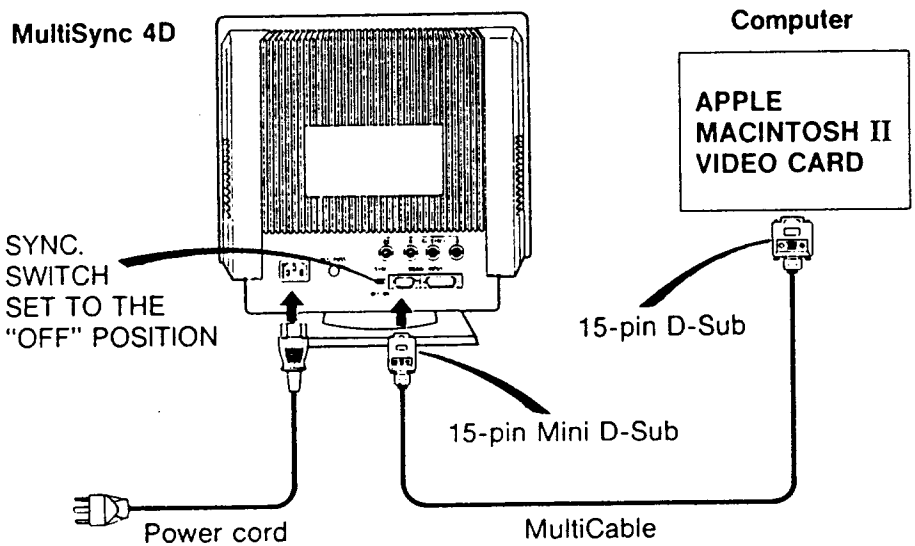


*For the optional signal adapter (15p-9p) please contact your authorized NEC dealer.

3 WITH THE APPLE MACINTOSH II VIDEO CARD

The MultiSync 4D Color Monitor can be used with the Apple Macintosh II or compatible computer equipped the Apple Macintosh II Video Card in the following configuration:

1. Make sure the power to the MultiSync 4D Color Monitor is turned OFF.
2. Make sure the INPUT SWITCH on the front of the MultiSync 4D Color Monitor is to the "D-sub" position.
3. Make sure the MODE SWITCH is set to the OFF position.
4. Make sure the SYNC. SWITCH is OFF.
5. Install the Apple Macintosh II Video Card according to the instructions accompanying it.
6. Connect the pin D-sub end of the MultiCable to the Video Card and the 15 pin mini D-sub to the MultiSync 4D Color Monitor.
7. Connect one end of the power cable to the MultiSync 4D Color Monitor and the other end to a power outlet.
8. Turn on the power switch of the MultiSync 4D Color Monitor and depress the MEMORY RECALL BUTTON.



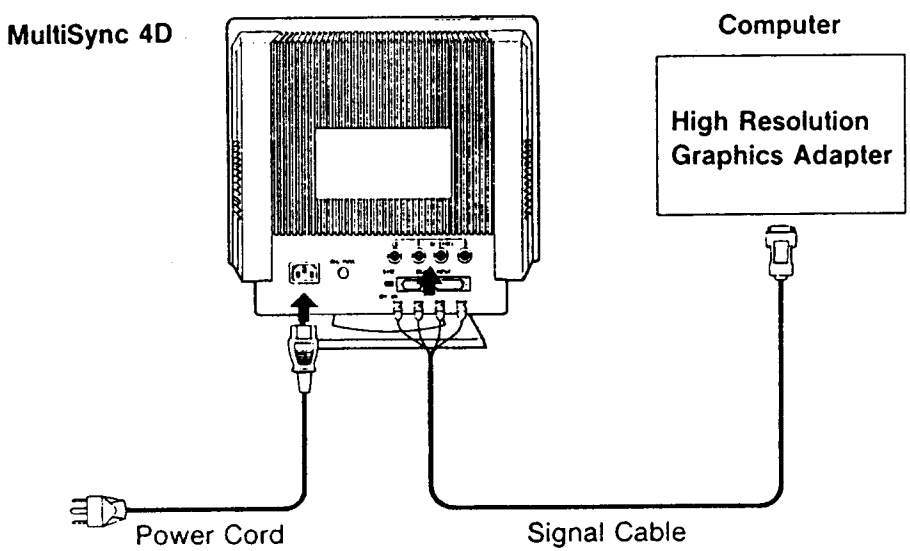
4 WITH HIGH RESOLUTION GRAPHICS ADAPTER

Using a high resolution graphics adapter or high resolution graphics system (eg. 1024 × 768 resolution).

1. Make sure the power to the MultiSync 4D Color Monitor is turned OFF.
2. Make sure the INPUT SWITCH on the front of the MultiSync 4D Color Monitor is set to the "BNC" position.
3. Make sure the BNC INPUT VOLTAGE SWITCH is set to the appropriate position to match the maximum video output voltage from our adapter. (1.0:1.0Vp-p, 0.7:0.7Vp-p)
4. Make sure the MODE SWITCH is set to the OFF position.
5. Connect the power cord and signal cable* (This cable is not provided with the monitor.) to the MultiSync 4D Color Monitor.

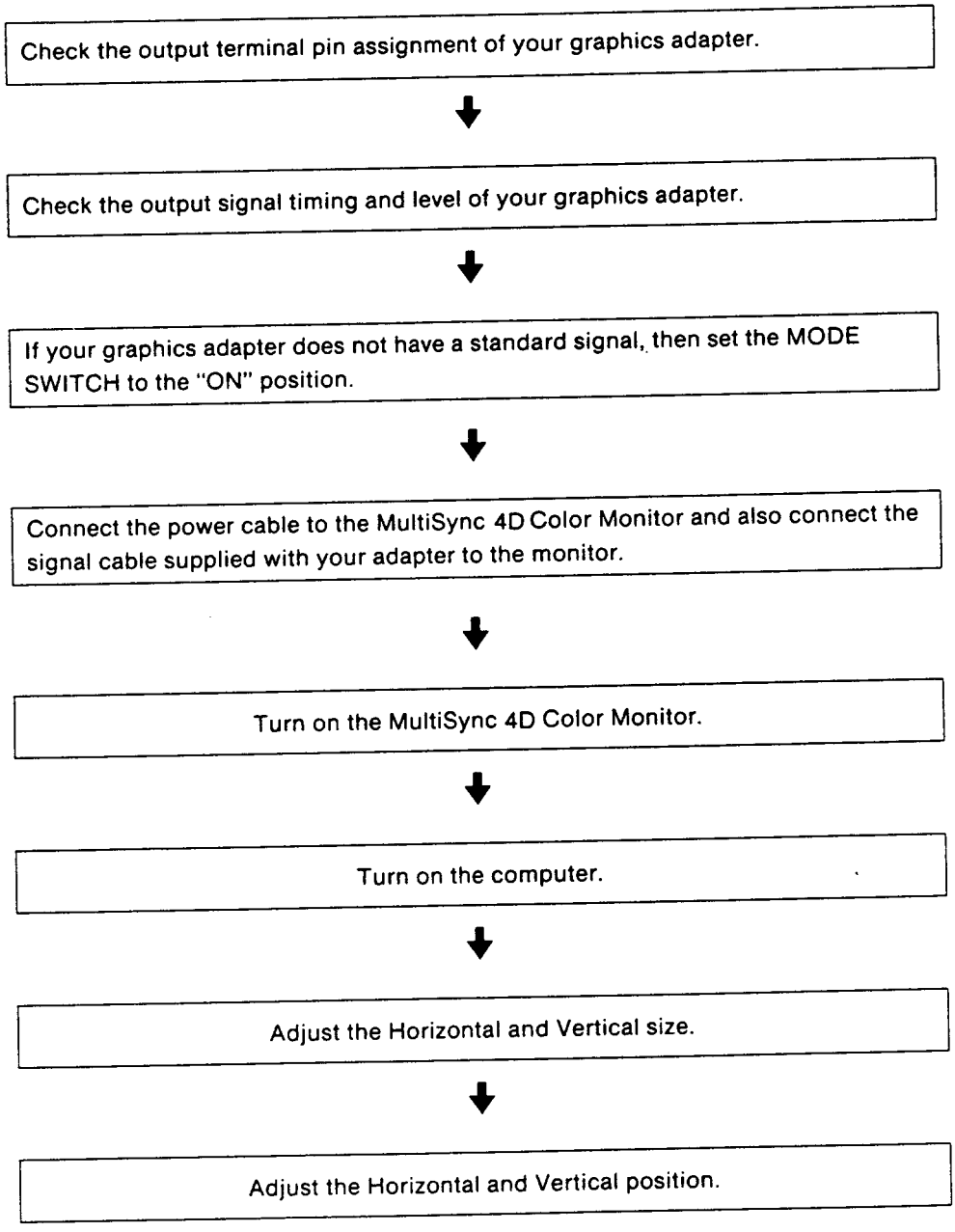
6. The red BNC cable should be connected to the BNC connector "R". The green BNC cable should be connected to BNC connector "G (/SYNC.)". The blue BNC cable should be connected to the BNC connector "B".
7. Turn on the power of the MultiSync 4D Color Monitor.

*For the optional signal cable please contact your authorized NEC Dealer.



5 WITH OTHER COMPUTERS OR GRAPHICS ADAPTERS

If your computer or graphics adapter is not compatible with the PRESET signals (see Signal Identification flowchart), refer to the diagram below to determine to correct compatibility or consult your authorized NEC Dealer.

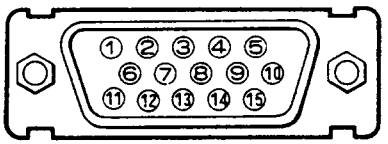


PIN ASSIGNMENTS

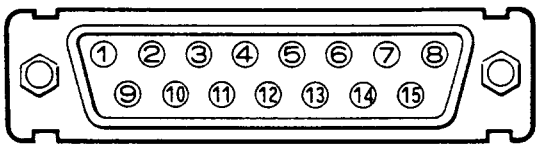
D-SUB INPUT

MULTICABLE'S PIN ASSIGNMENTS

MINI D-SUB 15P



D-SUB 15P



1) PIN ASSIGNMENT OF PRE-SET SIGNALS

ADAPTERS PIN-ASSIGNMENTS	PGC MINI D-SUB 15P	VGA/8514A MINI D-SUB 15P	MAC II D-SUB 15P
1	RED*	RED	GROUND
2	GREEN*	GREEN	RED
3	BLUE*	BLUE	—
4	GROUND	GROUND	GROUND
5	—	—	GREEN/W.SYNC.△
6	GROUND	GROUND	GROUND
7	GROUND	GROUND	—
8	GROUND	GROUND	—
9	—	—	BLUE
10	GROUND	GROUND	—
11	GROUND	GROUND	GROUND
12	—	—	—
13	H/V COMP.SYNC.	H.SYNC.	GROUND
14	V-MODE	V.SYNC.	GROUND
15	—	—	—

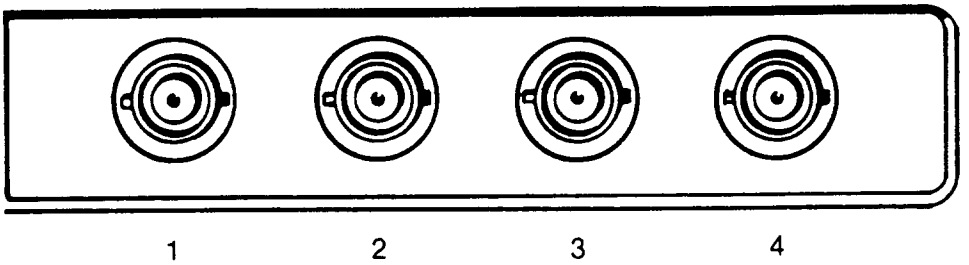
2) PIN ASSIGNMENT FOR OTHER COMPUTERS

SIGNALS / PIN-ASSIGNMENTS	MINI D-SUB 15P			D-SUB 15P		
	SEPARATE SYNC.	COMPOSITE SYNC.	SYNC.ON GREEN	SEPARATE SYNC.	COMPOSITE SYNC.	SYNC.ON GREEN
1	RED			GROUND		
2	GREEN		GREEN WITH SYNC.△	RED		
3	BLUE			—		
4	GROUND			GROUND		
5	—			GREEN		GREEN WITH SYNC.△
6	GROUND			GROUND		
7	GROUND			H.SYNC.	H/V SYNC.	—
8	GROUND			V.SYNC.	—	
9	—			BLUE		
10	GROUND			—		
11	GROUND			GROUND		
12	—			—		
13	H.SYNC.	H/V SYNC.	—	GROUND		
14	V.SYNC.			GROUND		
15	—			—		

3) MULTICABLE'S PIN ASSIGNMENTS

SIGNAL	MINI D-SUB 15P	D-SUB 15 PIN
RED	1	2
GREEN/SYNC. ON GREEN	2	5
BLUE	3	9
H.SYNC./H/V.SYNC.	13	7
V.SYNC./V-MODE	14	8
GROUND	4 6 7 8 10 11	1 4 6 11 13 14
NO CONNECTION	5 9 12 15	3 10 12 15

BNC INPUT



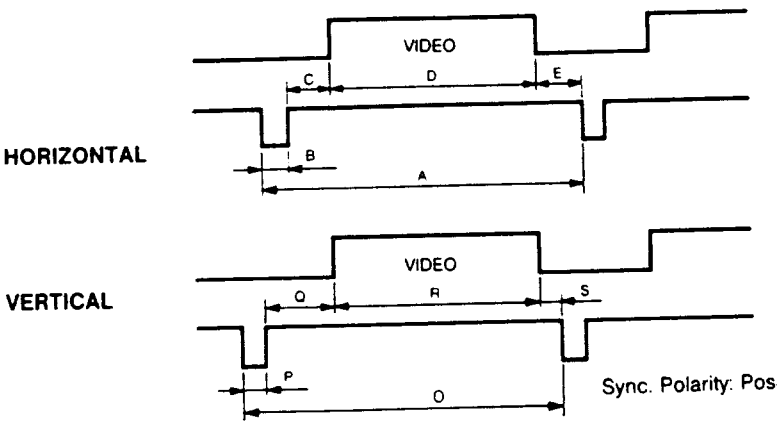
SIGNALS / PIN-ASSIGNMENTS	COMPOSITE SYNC.	SYNC. ON GREEN
1	H/V COMP.SYNC.	—
2	RED	RED
3	GREEN	GREEN/W.SYNC.△
4	BLUE	BLUE

REMARKS:

1. VIDEO SIGNAL LEVEL IS 0.7/1.0Vp-p (SELECTABLE), AND SYNC. SIGNAL LEVEL IS TTL.
2. "*" MEANS 0.6Vp-p VIDEO.
3. "△" MEANS SYNC. ON GREEN, 0.7Vp-p VIDEO AND 0.3Vp-p H/V SYNC.
4. "—" MEANS NO CONNECTION.

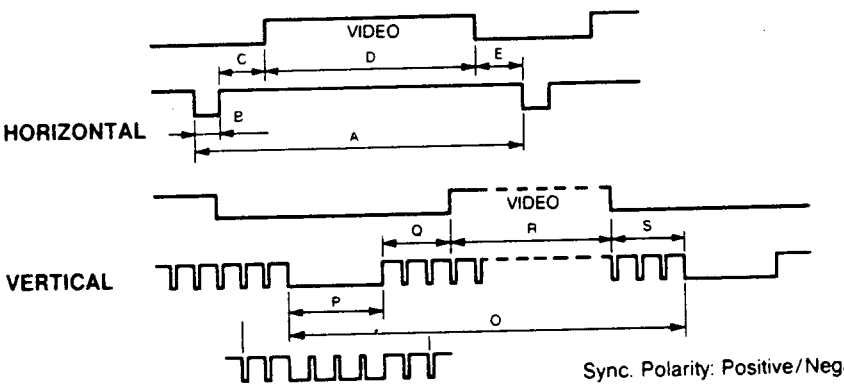
TIMING CHARTS

SEPARATE SYNC.



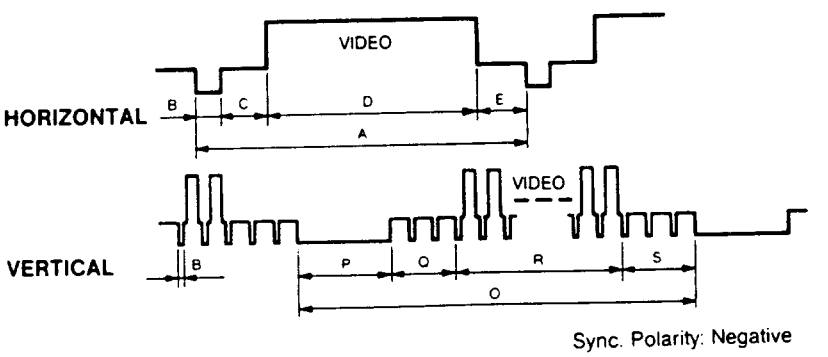
Sync. Polarity: Positive/Negative

COMPOSITE SYNC.



Sync. Polarity: Positive/Negative

COMPOSITE SYNC. & VIDEO (SYNC. ON GREEN)

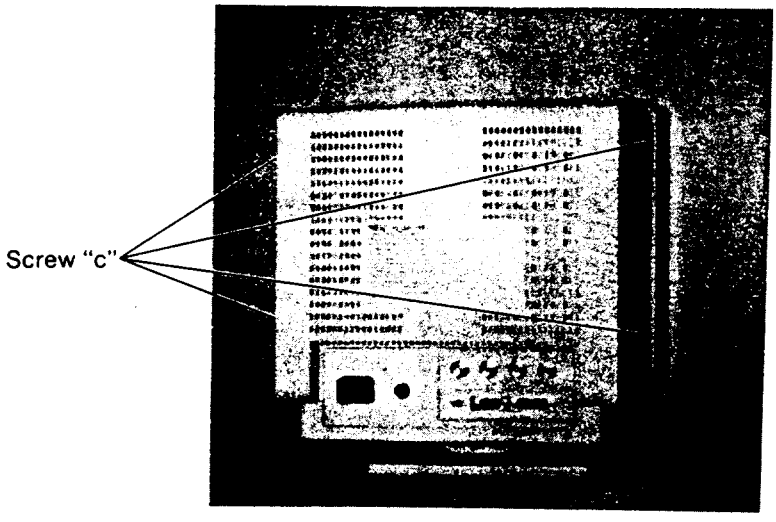


Sync. Polarity: Negative

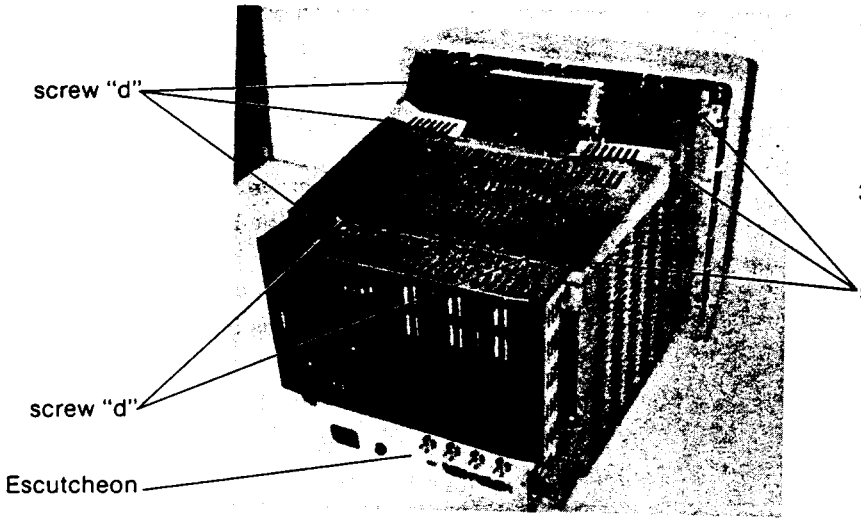
PRESET TIMING

	VGA/MCGA COMPATIBLE			PGC COMPATIBLE	8514/A COMPATIBLE	Machintosh II Video Card	800 × 600	1024×768 fv=60Hz	1024×768 fv=70Hz
f_H	31.5kHz			30.48kHz	35.52kHz	35kHz	35.16kHz	48.37kHz	56.67kHz
$A_{\mu s}$	31.77			32.8	28.15	28.57	28.44	20.675	17.65
$B_{\mu s}$	3.77			4	3.92	2.1	2	1	1
$C_{\mu s}$	1.89			2.8	1.25	3.2	3.56	2.957	1.8
$D_{\mu s}$	25.17			25.6	22.8	21.5	22.22	15.95	13.64
$E_{\mu s}$	0.94			0.4	0.18	2.1	0.67	0.75	1.0
f_v	70Hz		60Hz	60Hz	87Hz	67Hz	56Hz	60.5Hz	70.1Hz
O_{ms}	14.27	14.27	16.68	16.67	11.5	15	17.78	16.52	14.26
P_{ms}	0.064	0.064	0.064	0.07	0.113	0.086	0.06	0.08	0.04
Q_{ms}	1.88	1.08	1.02	0.79	0.563	1.12	0.6	0.54	0.67
R_{ms}	11.126	12.716	15.246	15.74	10.81	13.7	17.07	15.88	13.55
S_{ms}	1.2	0.41	0.35	0.07	0.014	0.086	0.03	0.02	0
REMARKS	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.	INTERLACED SEPARATE SYNC. H.SYNC. Positive V.SYNC. Positive	COMPOSITE SYNC. & VIDEO (Sync. on Green)	SEPARATE SYNC.	COMPOSITE SYNC. & VIDEO (Sync. on Green)	COMPOSITE SYNC. & VIDEO (Sync. on Green)

DISASSEMBLY

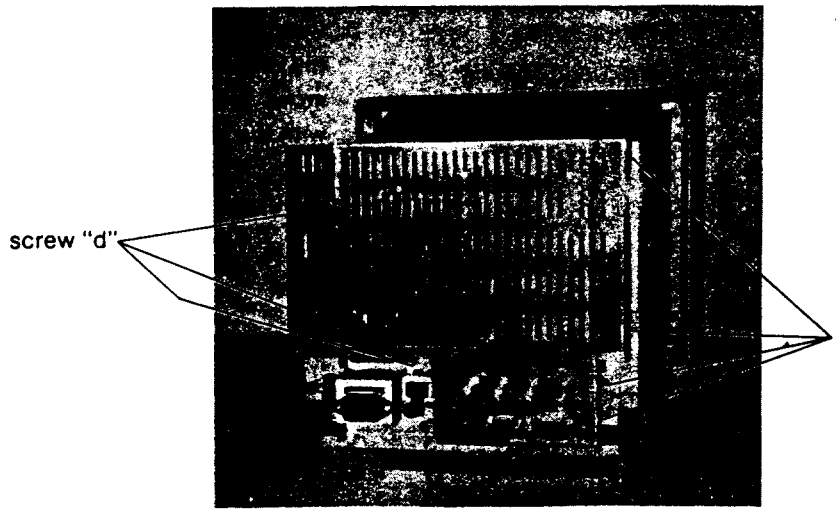


1. Remove the four screws "c" Remove the CABINET BACK.

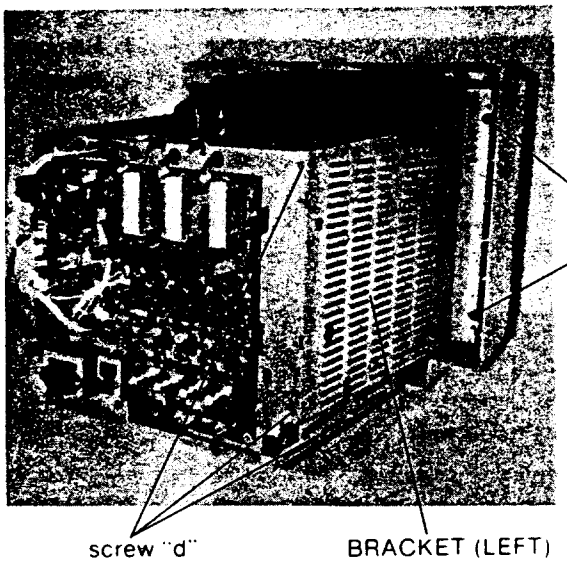


2. Remove the eight screws "d" from the case, shielding (TOP), and remove the case, shielding (TOP).

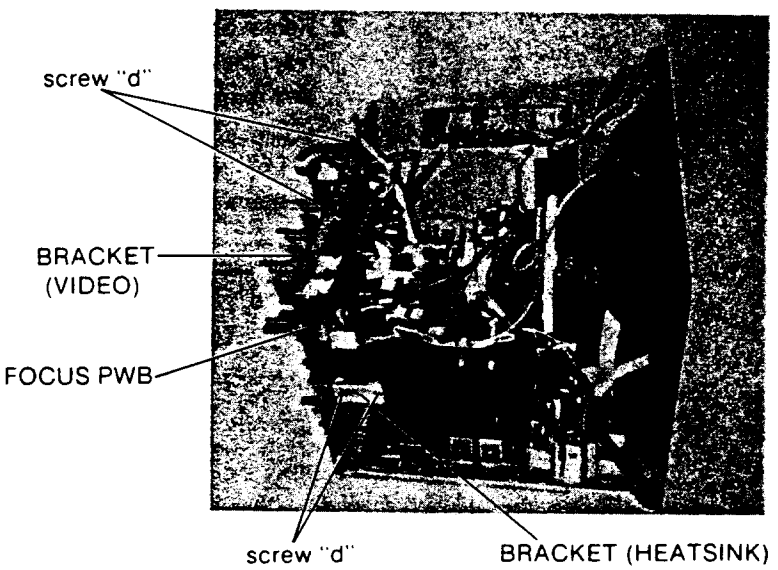
3. Remove the Escutcheon.



4. Remove the eight screws "d" from the case, shielding (BACK), and remove the cade, shielding (BACK).



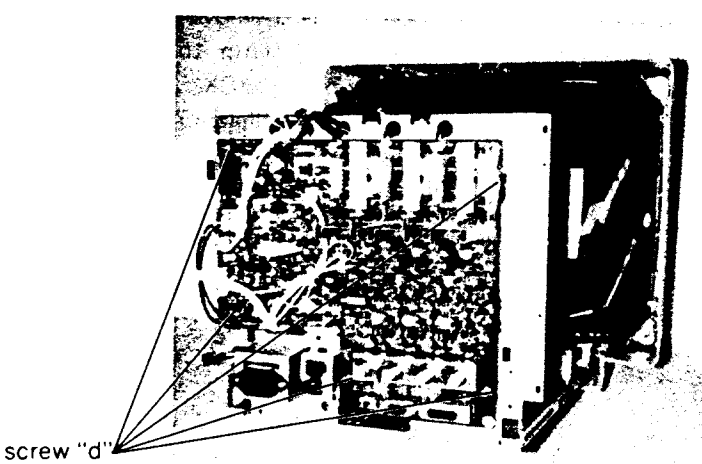
5. Remove the three screws "d" and two screws "e" from the BRACKET (LEFT), and remove the BRACKET (LEFT).



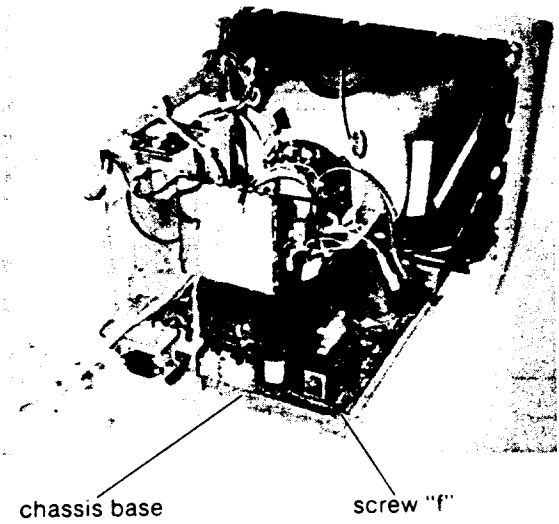
6. Remove the two screws "d" from the BRACKET (HEATSINK), and remove the BRACKET (HEATSINK).

7. Remove the two screws "d" from the BRACKET (VIDEO).

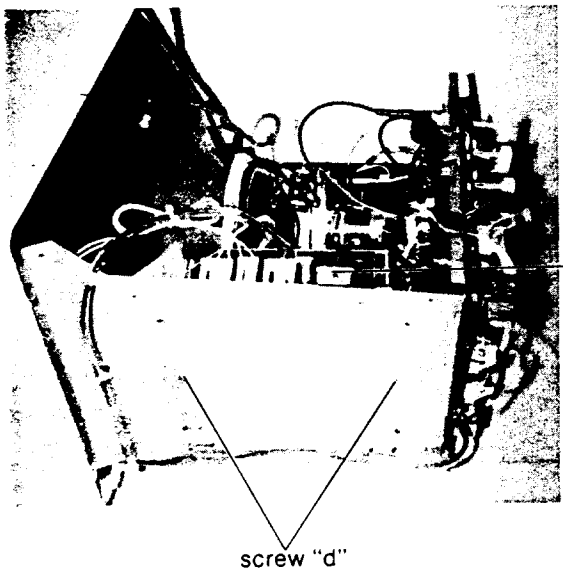
8. Remove the FOCUS PWB ASSY from the BRACKET (VIDEO).



9. Remove the 5 screws "d" from the BRACKET (VIDEO), and remove the BRACKET (VIDEO) with the video PWB ASSY.

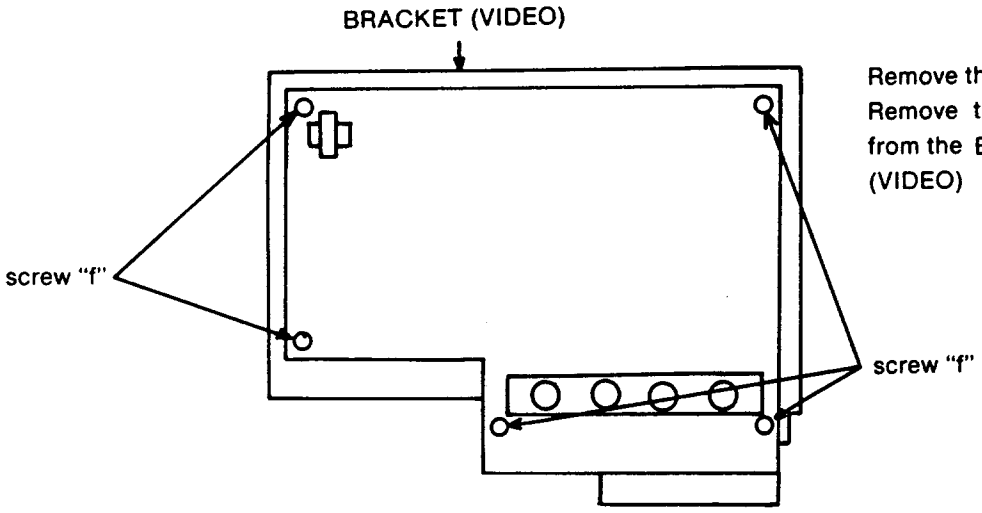


10. Remove the screw "f" from the chassis base, and remove the CRT PWB ASSY and Auode chip from the CRT.
    Pull out the DEF PWB ASSY and CRT PWB ASSY and FOCUS PWB ASSY from the chassis base.



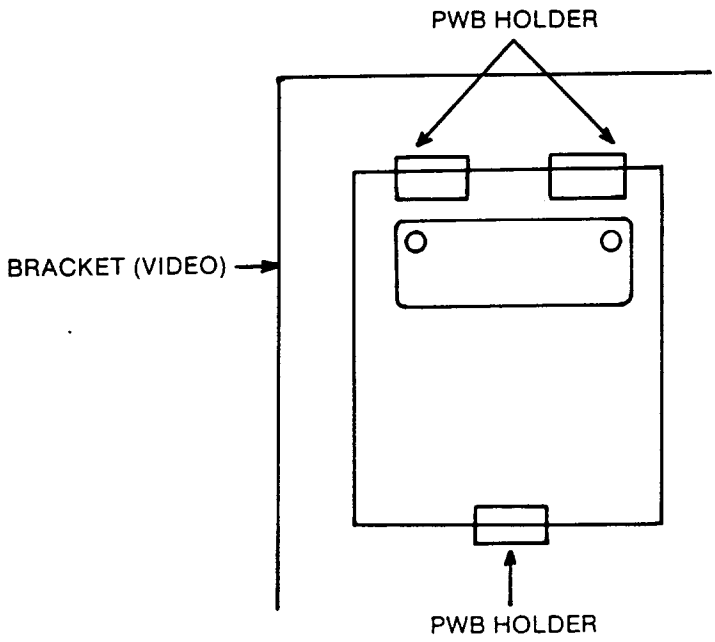
11. Remove the two screws "d" and lift up the SW. REG. UNIT.

VIDEO PWB ASSY DISASSEMBLY



Remove the five screws "f".
Remove the VIDEO PWB ASSY from the BRACKET. (VIDEO)

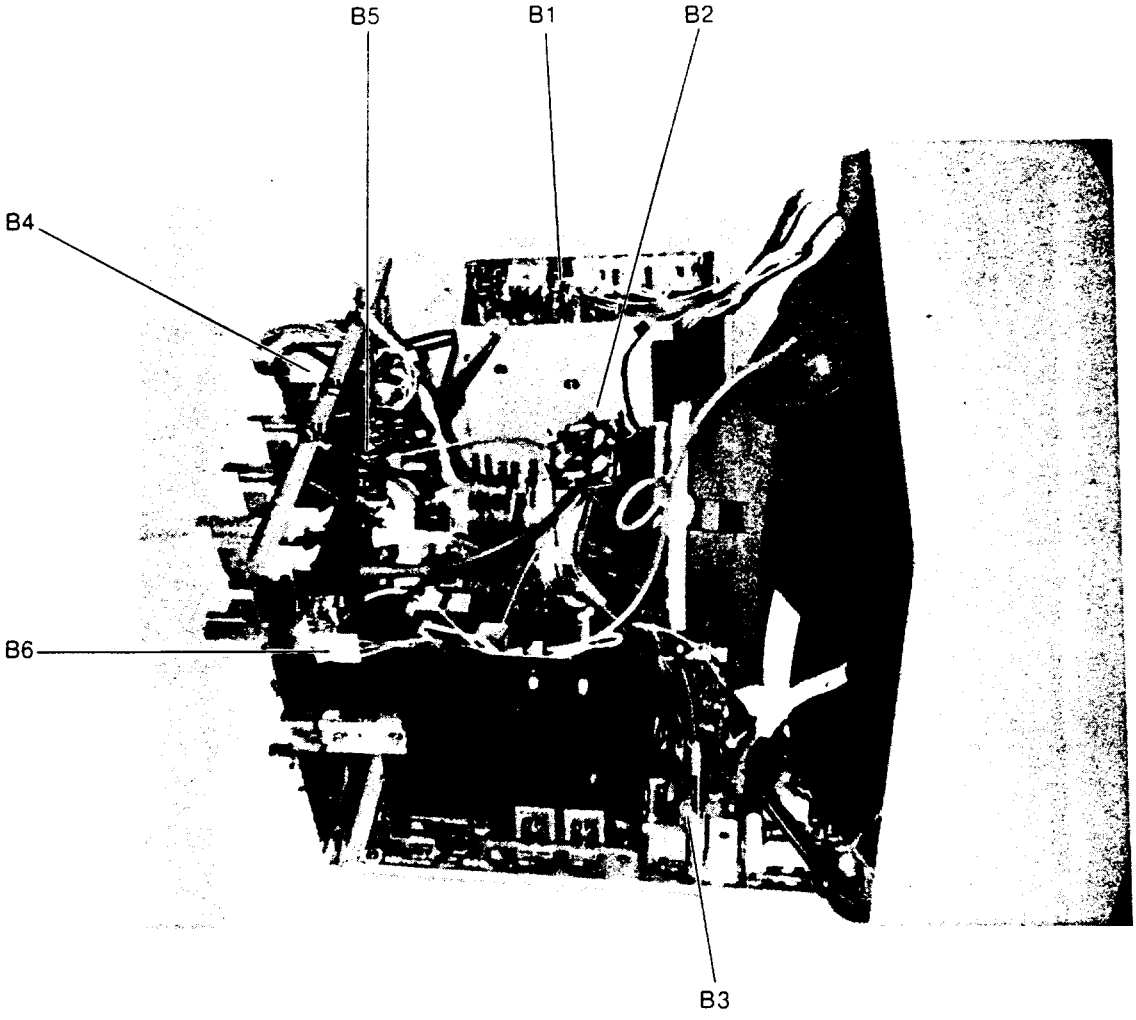
FOCUS PWB ASSY DISASSEMBLY



Release the FOCUS PWB ASSY from the PWB HOLDER of the PWB BRACKET.

BOARD LAYOUT

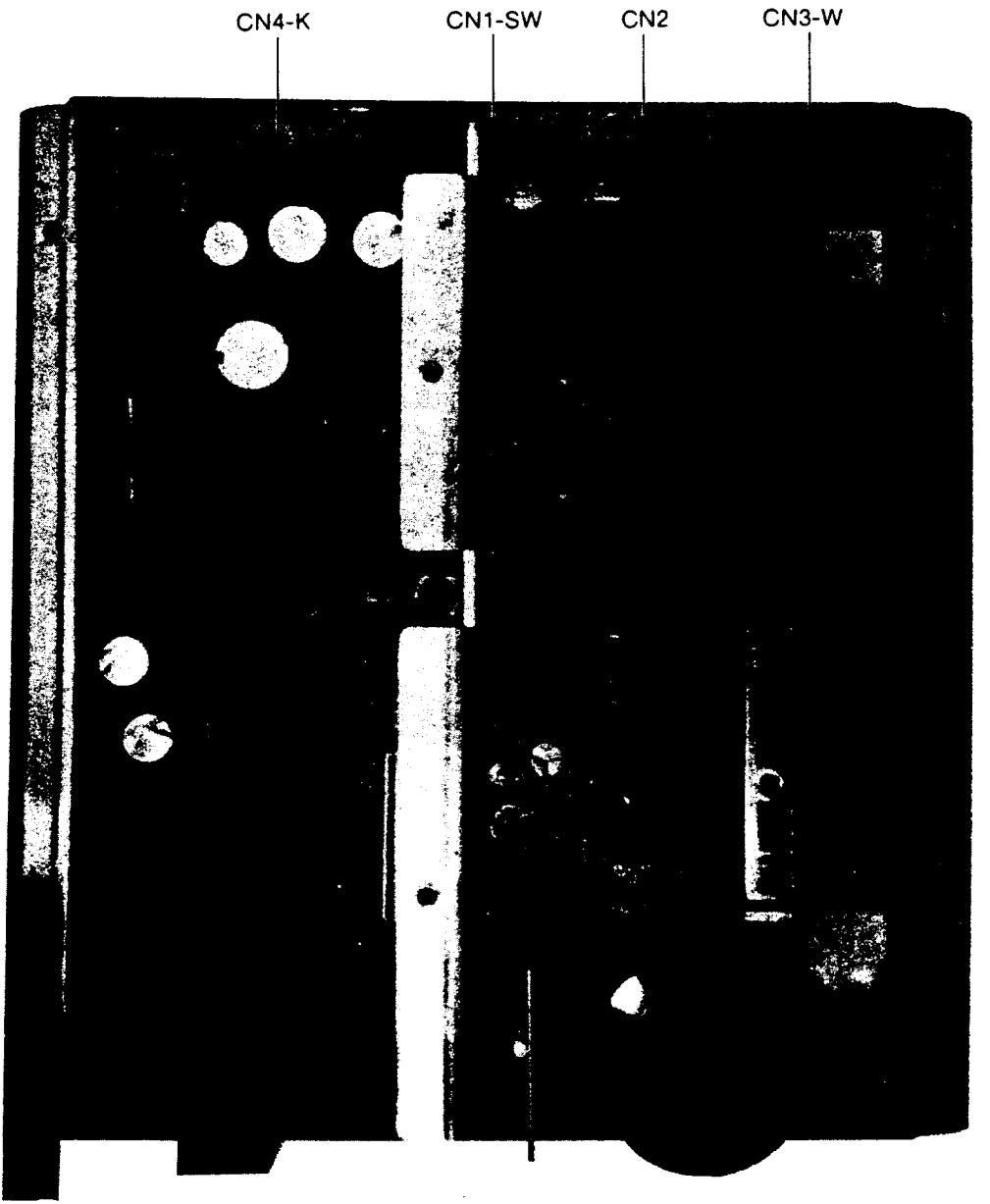
PARTS LOCATIONS BOARD LAYOUT



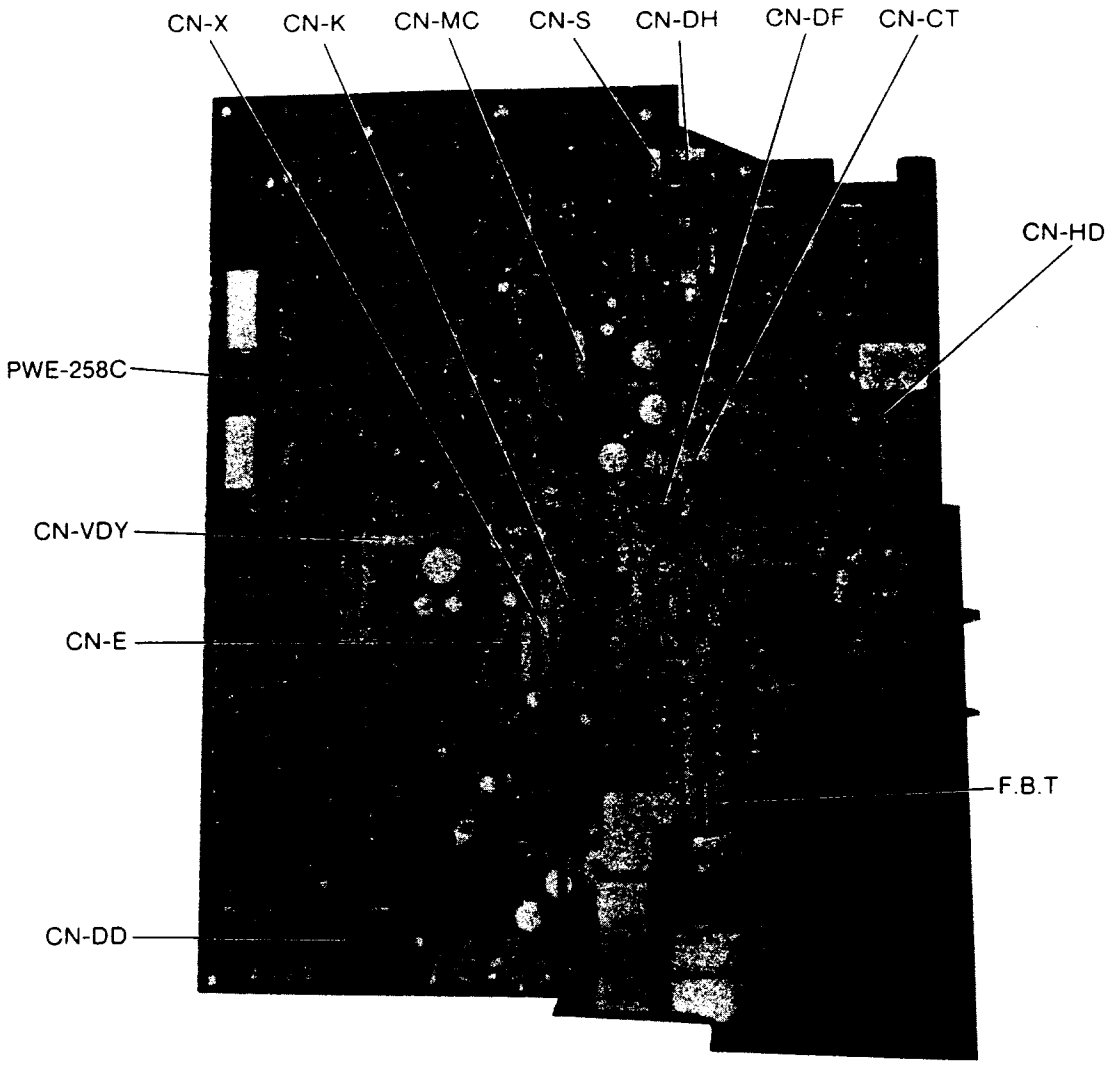
BOARDS

B1	SW. REG. UNIT	
B2	CPU PWB ASSY	PWE-257
B3	DEF PWB ASSY	PWE-258
B4	VIDEO PWB ASSY	PWE-264A
B5	CRT PWB ASSY	PWE-272
B6	FOCUS PWB ASSY	PWE-264B

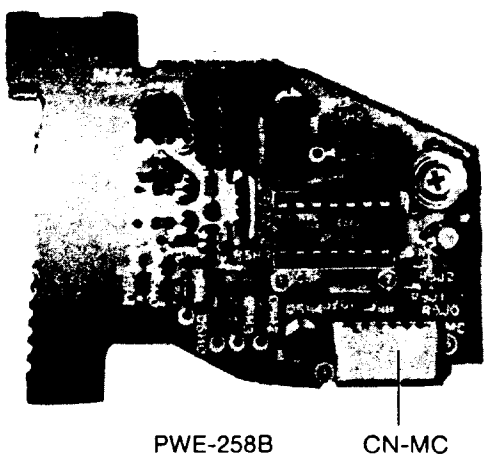
CONNECTORS

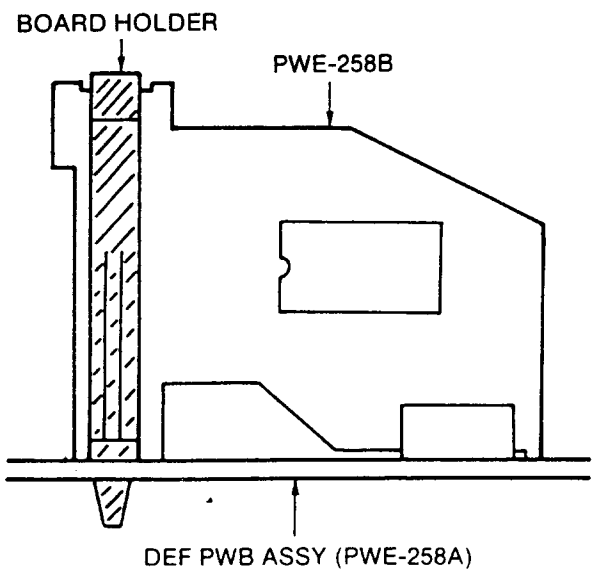


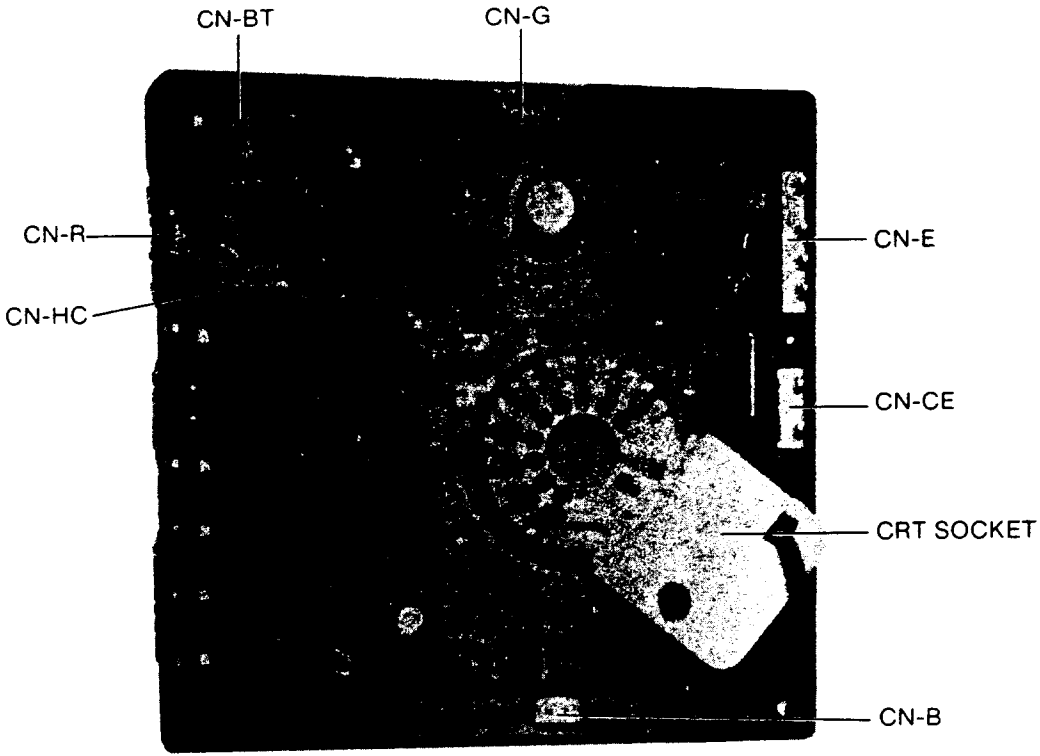
SW. REG. UNIT



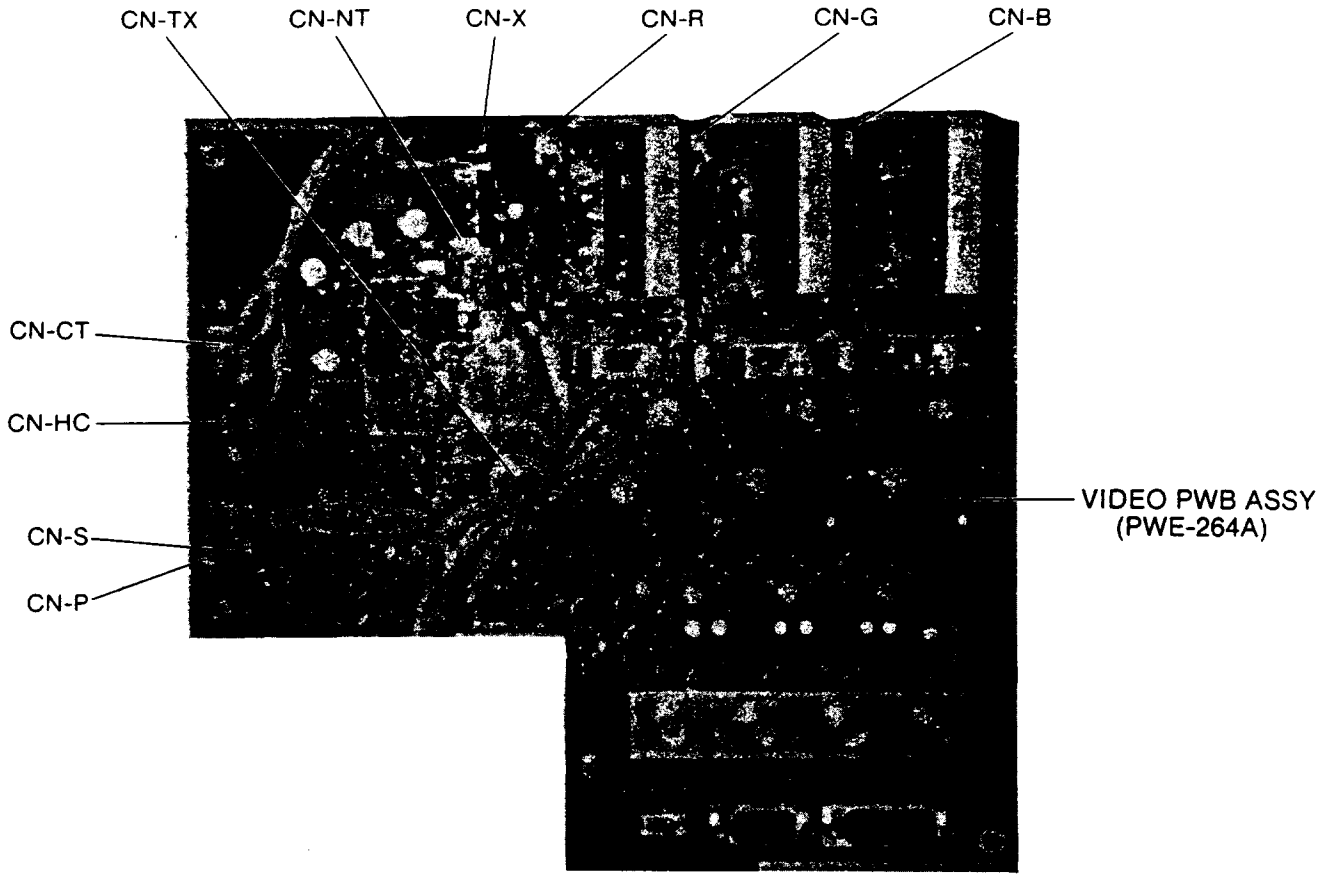
DEF PWB ASSY (PWE-258A)

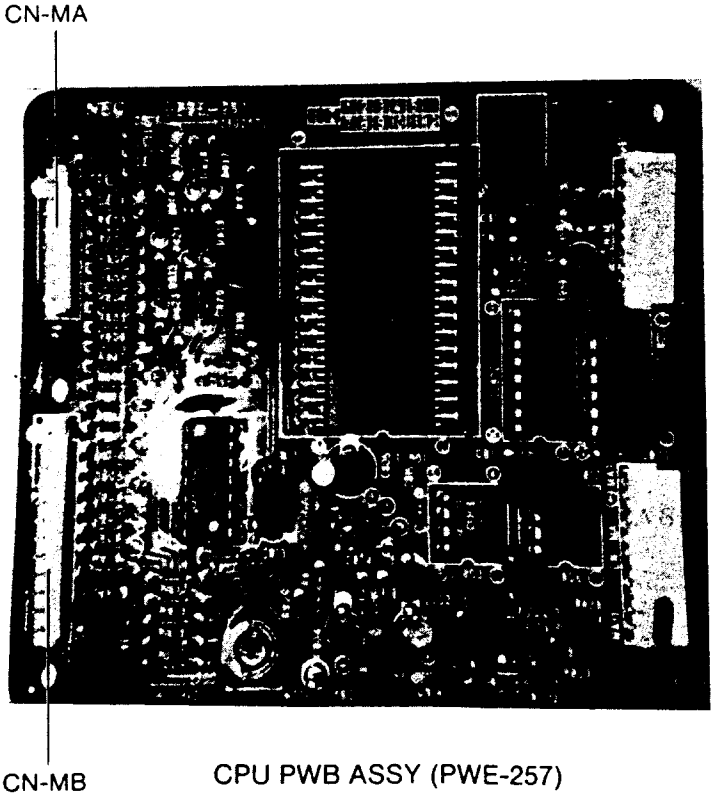




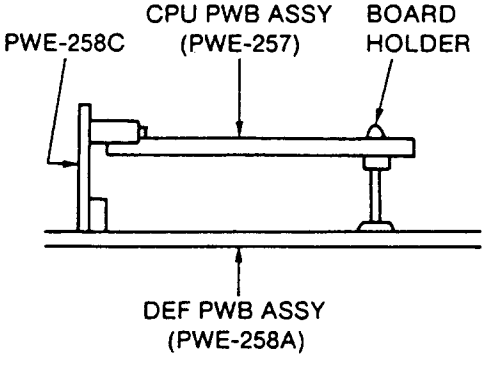


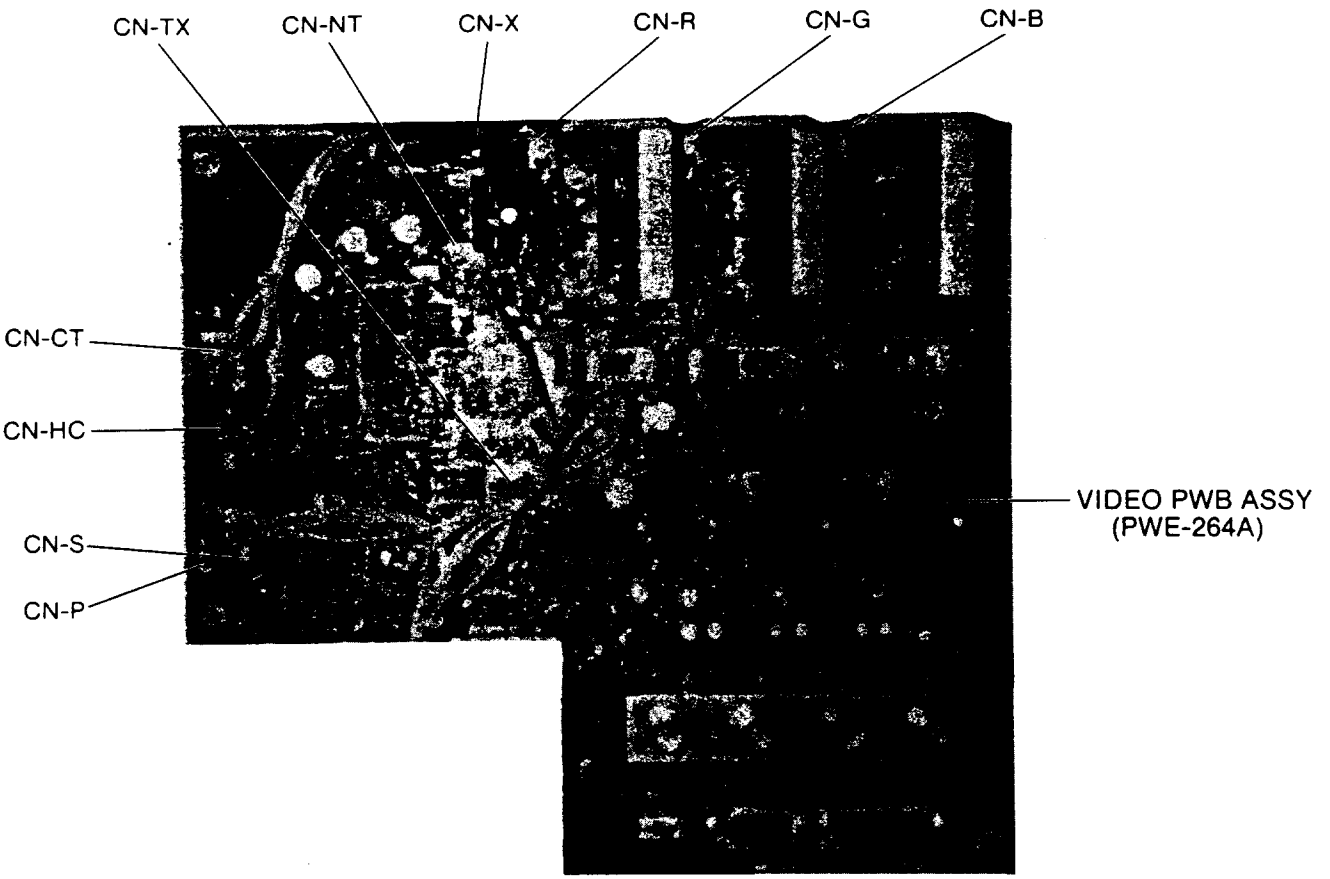
CRT PWB ASSY (PWE-272)

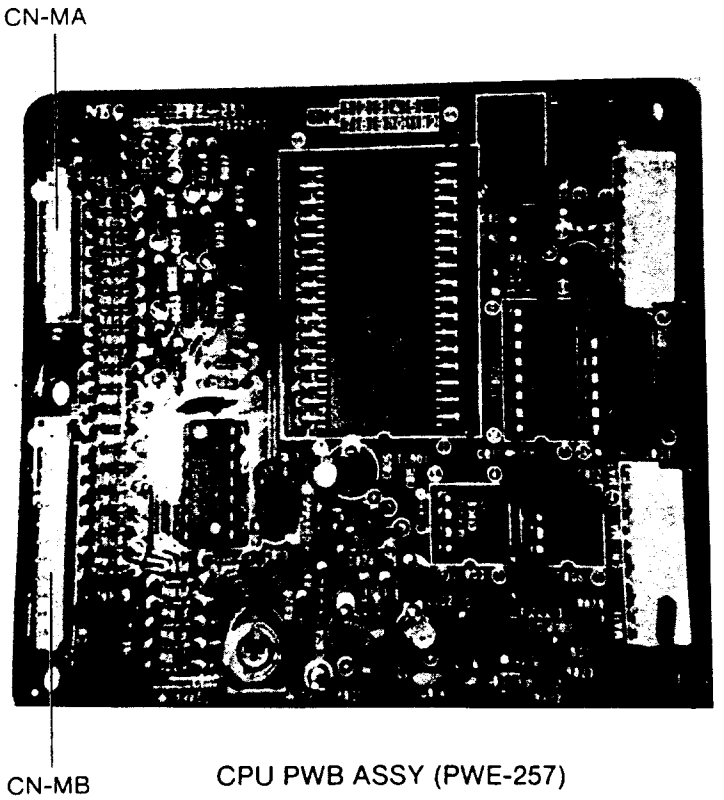




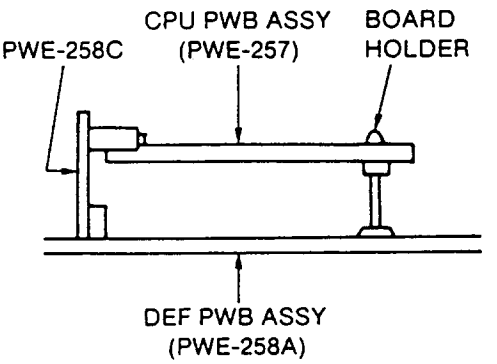
CPU PWB ASSY (PWE-257)



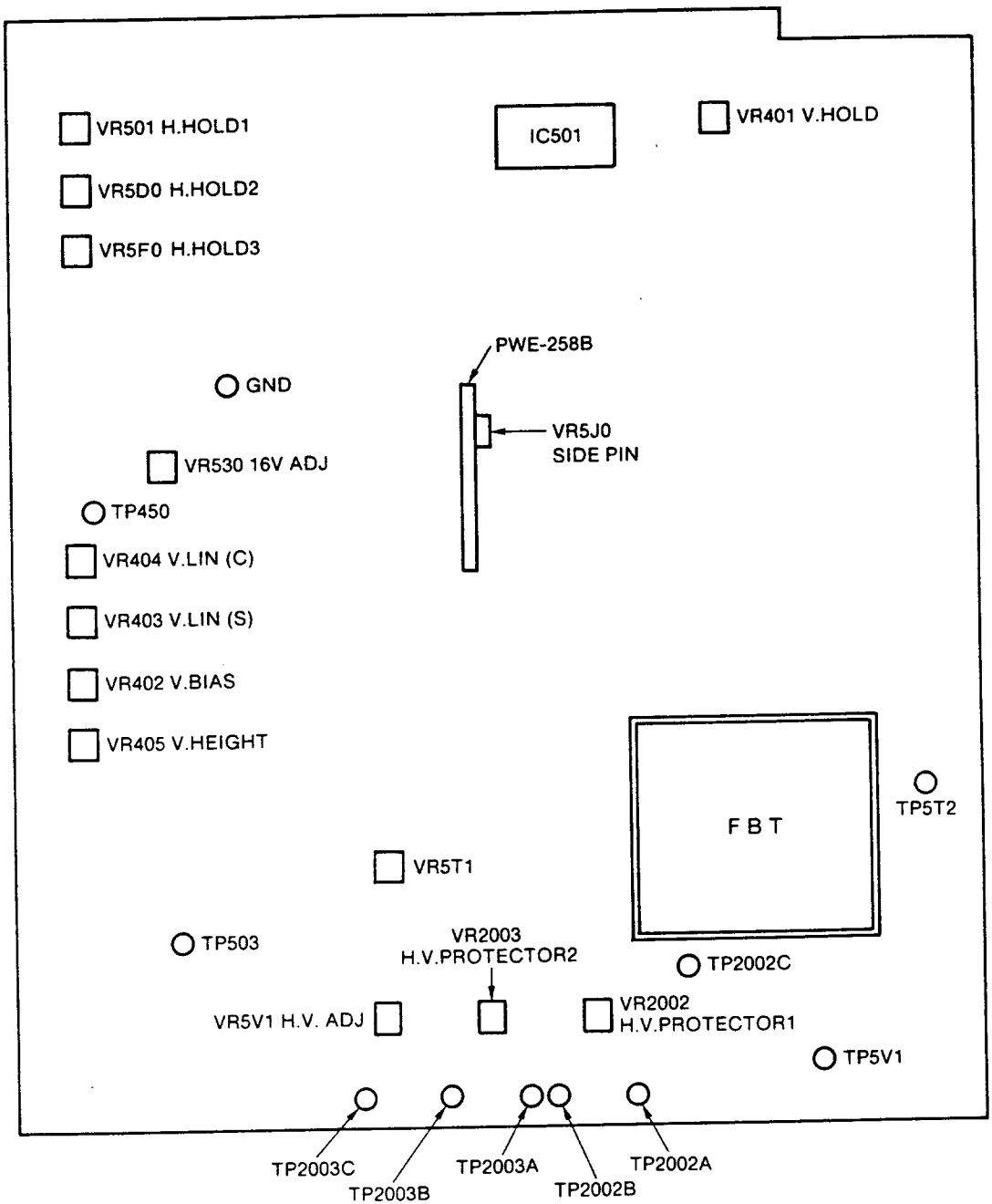




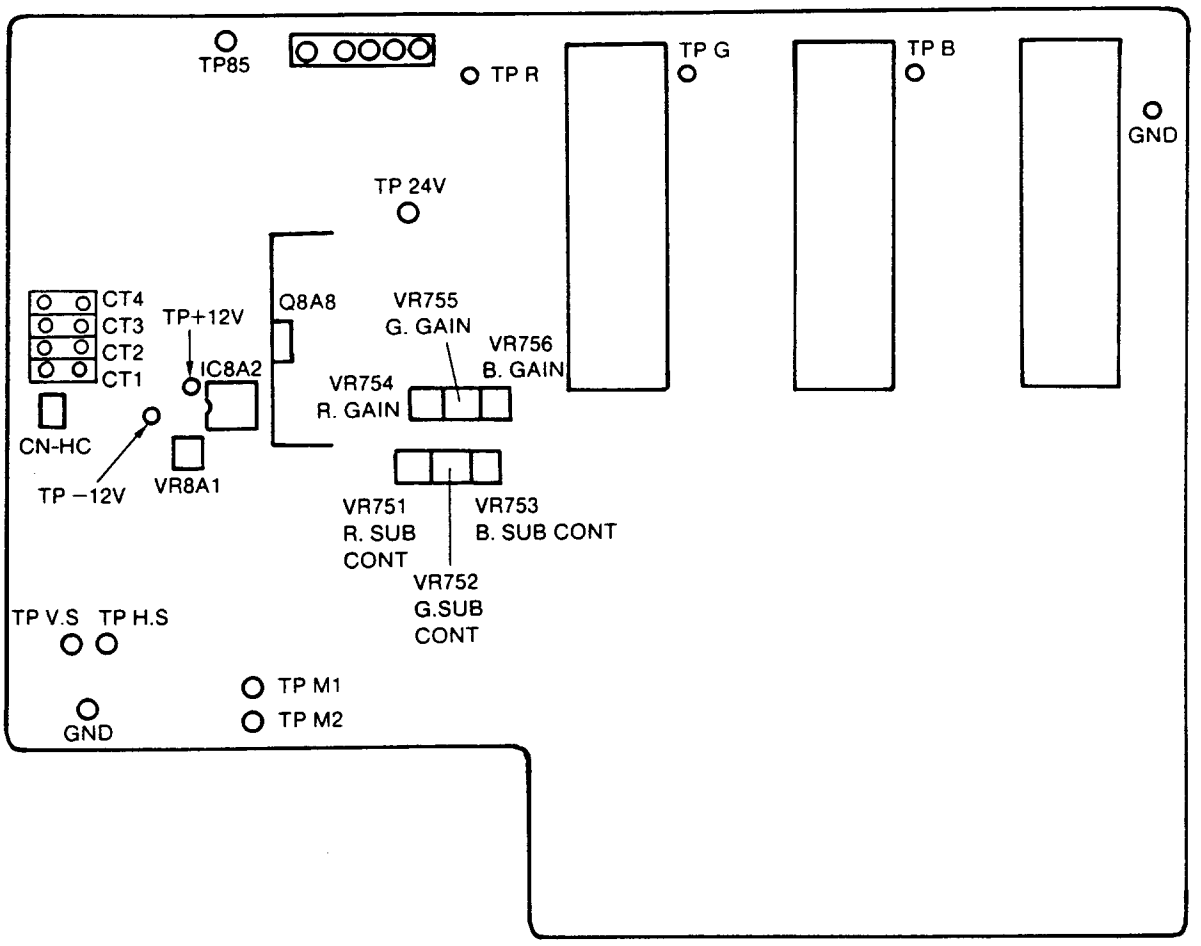
CPU PWB ASSY (PWE-257)



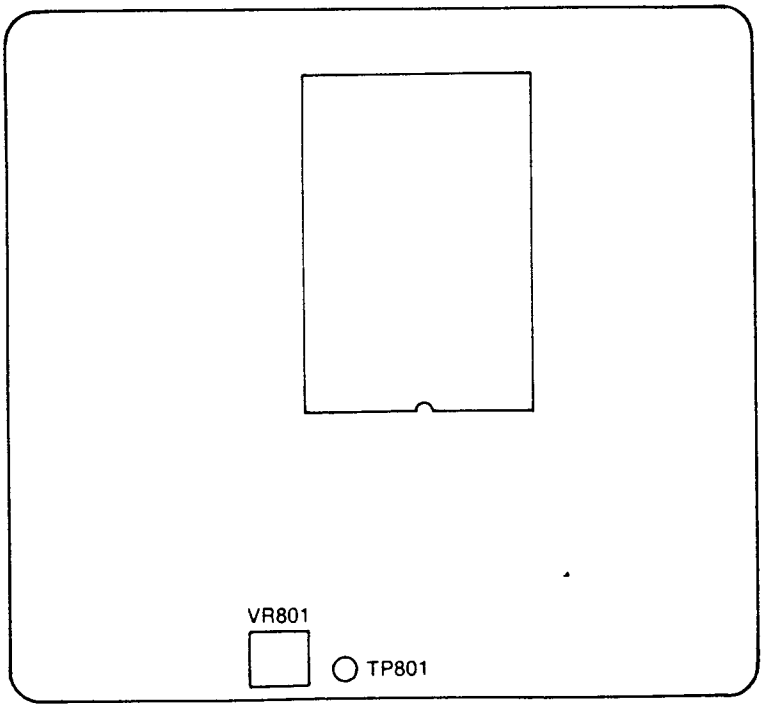
ADJUSTMENT CONTROLS LAYOUT



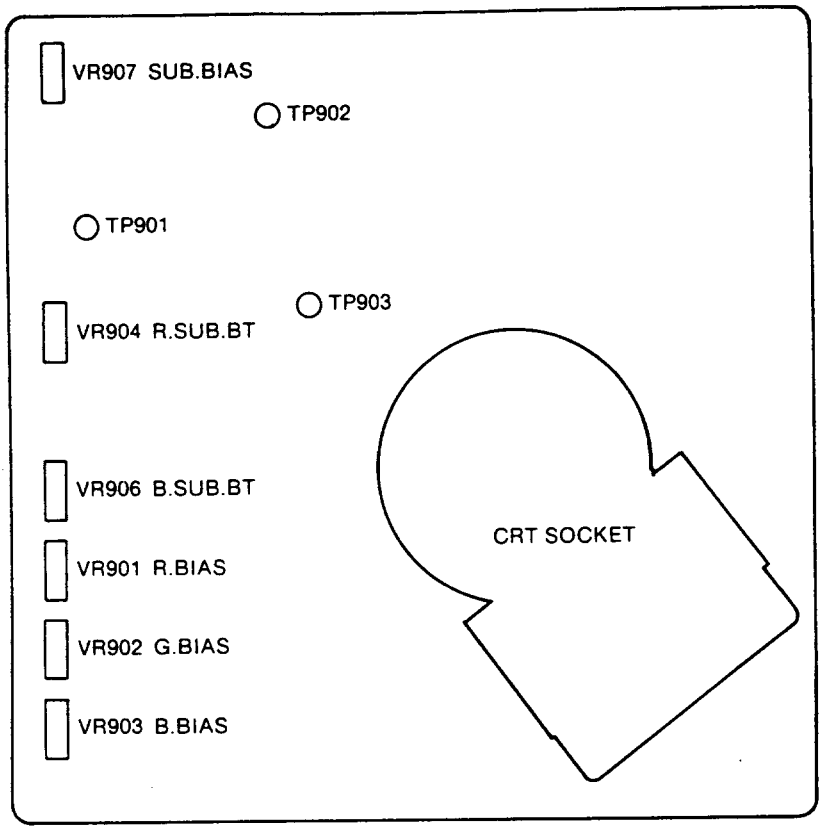
DEF PWB ASSY (PWE-258A)



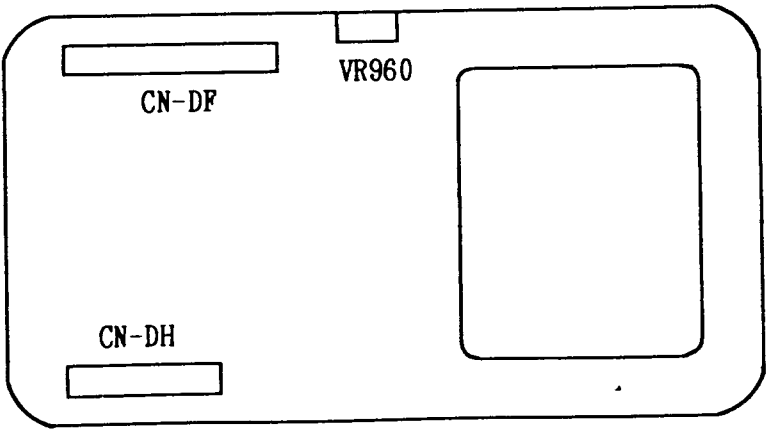
VIDEO PWB ASSY (PWE-264A)



CPU PWB ASSY (PWE-257)



CRT PWB ASSY (PWE-272)



FOCUS PWB ASSY (PWE-264B)

ALIGNMENT PROCEDURE

Standard Adjustment Conditions

1) Power source voltage: AC220-240 50/60Hz
2) Aging:Adjust after leaving power on for a minimum of twenty minutes.
3) Signals:

Video	: Analog 0.7Vp-p 75Ω terminal positive polarity
	Analog sync. on green
	Video : 0.7Vp-p
	Synchronizing : 0.3Vp-p
Synchronizing	: TTL level Negative polarity/positive polarity
	Separate/composite
Deflection frequency	: H.30kHz~66kHz
	V.50Hz~90Hz

Attention) Do not turn on the power SW or manual degaussing SW without degaussing coil, or it may cause R641's break on the SW. REG. UNIT.

1. Pre-adjustment of DEF PWB

1) Take out CPU PWB and disconnect CN-K.
2) Apply 24V±0.1V DC between K3 and K4 (GND).
3) +16V adjustment
   Adjust VR530 for 16V±0.05V DC between TP503 and the ground.

2. Pre-adjustment of VIDEO PWB

1) Adjust VR8A1 for 12V±0.1VDC between TP (+12V) and the ground.

3. Pre-adjustment of CPU PWB

1) Adjust VR801 for 12V±0.05V DC between TP801 and the ground.

4. Main Adjustment.

(1) Settings of the controls.

Set the external VRs and switches as follows unless otherwise specified

VR11 BRIGHTNESS	: At point where back raster disappears
VR12 CONTRAST	: Max.(fully clock wise)
S11 MODE SWITCH	: off (left side)
S12 INPUT VOLTAGE SWITCH	: 0.7V (right side)
S13 INPUT SWITCH	: D-Sub (right side)

(2) DEF PWB Adjustment

2-1) V.BIAS (rough adjustment)

a) Receive signal 12 (fv:60Hz)
b) Adjust V.BIAS VR402 for 13.5±0.5V DC between V.DY3 and the ground

2-2) Vertical Hold

a) Receive signal 11 (fv: 60Hz).
b) Short TP (VS) and TP (GND) (on the VIDEO PWB),
c) Adjust VR401 so that the vertical free-run frequency is 50HZ±1Hz.
(measuring the point V.DY1 or #18pin of IC501 with a frequency counter).

2-3) Horizontal Hold

a) Short TP (HS) and TP (GND)(on the VIDEO PWB).
b) Receive signal 12 (f_H: 56.7kHz) and adjust H. HOLD (1) VR501 so that there is one screen.
c) Receive signal 2 (f_H: 47.1kHz) and adjust H. HOLD (2) VR5D0 so that there is one screen.
d) Receive signal 3 (f_H: 35.4kHz) and adjust H. HOLD (3) VR 5F0 so that there is one screen.

2-4) Horizontal Raster Centering

a) Receive signal 12 (f_H: 56.7kHz).
b) 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
CR2 : About 3mm correction
CR3 : About 6mm correction
CR4 : About 10mm correction
* By changing the orientation in which the connector is inserted, the displacement direction of the screen can be changed from side to side.

2-5) Horizontal Width pre-adjustment

a) Receive signal 9 (f_H:35kHz)
b) Adjust H. SIZE SWITCH S803 to maximize the horizontal size.
c) Adjust H. SIZE VR VR570 for the horizontal video size of 275mm±2mm.

2-6) Horizontal Linearity

a) Receive a crosshatch pattern of signal 12 (f_H: 56.7kHz).
b) Visually check the H. Linearity.
If adjustment is needed, use the L506 so that the linearity is equal.
Avoid rotating L506 unless absolutely necessary.

2-7) Side Pin Cushion

a) Receive a all white pattern of signal 12 (f_H: 56.7kHz).
b) Adjust VR5J0 so that pin distortion is less than 1mm.
* Before adjusting 2-7), adjust S807, S808 and VR450 so that the vertical size is about 217mm.
* Repeat confirming settings from 2-4) to 2-7), because the above four setting affect each other.

2-8) Vertical Linearity

a) Receive a crosshatch pattern of signal 11 (fv: 60Hz)
b) Adjust S807, S808 and VR405 so that the vertical size is about 200mm.
c) Turn V. LIN(C) VR404 fully clockwise.
d) Adjust V. LIN(S) VR403 so that the top and bottom linearity is equal.
e) If the center is elongated, turn VR404 slightly counterclockwise until the elongation is corrected. And adjust VR403 so that the top and bottom linearity is equal.
f) Repeat adjusting step e) so that the linearity is within 5%.

g) Receive signal 5 (fv: 70Hz) and confirm the linearity is within 8%.
   * Before confirming step g), adjust S807, S808 and VR405 so that the vertical size is about 250mm.

h) If the linearity is not within 8% on step g), receive signal 12 (fv: 60Hz) again.
   For top elongation:
   Turn VR403 slightly clockwise until the top elongation is eliminated, then perform e) to g).
   For bottom elongation:
   Turn VR403 slightly counterclockwise until the bottom elongation is eliminated, then perform e) to g).
   For center elongation:
   Turn VR404 slightly counterclockwise until the center elongation is eliminated, then perform e) to g).
   For center shortening:
   Turn VR404 slightly clockwise until the center shortening is eliminated, then perform e) to g).

i) Visually check the top of the back raster when the brightness control is max.
   For elongation or shortening, adjust h).

2-9) Vertical size pre-adjustment

a) Receive a all white pattern of signal 6(fv: 70Hz)
b) Adjust V.SIZE SWITCH S807 to minimize the vertical size.
c) Adjust V.SIZE VR VR405 for the vertical video size 180mm±3mm.

2-10) Vertical Bias

a) Receive a all white pattern of signal 11(fv: 60Hz)
b) Adjust V. SIZE SWITCH S807 or S808 so that the vertical size is about 80% of CRT size.
c) Adjust V. POSITION SWITCH S805 or S806 that the screen is centered.
d) Adjust V.BIAS VR402 for 12.5±0.5V DC between DY3 and the ground
   (Measurement point is where the yellow lead is connected of the deflection yoke).

(3) PRESET Adjustment

3-1) Adjustment

a) Short TPM1 and TPM2 (on the VIDEO PWB)
b) Set MODE SWITCH S11 "OFF".
c) Receive a reverse "H" pattern of one of the signals shown in table 1.
d) Adjust H. POSITION SWITCH S801 or S802 and V.POSITION SWITCH S807 or S808 so that the screen is centered.
e) Adjust H. SIZE SWITCH S803 or S804 and V. SIZE SWITCH S805 or S806 so that the horizontal and the vertical size are them shown in the table 1.
f) Push MEMORY RECALL SWITCH S809 for more than 2 seconds.
g) Repeat steps c)~f) with all of the signals in the table 1.
h) Open TPM1 and TPM2

3-2) Confirmation

a) Receive one of the signals shown in the table 1.
b) MEMORY RECALL SWITCH S809 for more than 2 second.
c) Confirm that the H/V position and size are correct by visual check.
d) If incorrect position and size, perform the steps 3-1)-a) to 3-1)-f) and the steps 3-2)-a) to 3-2)-c) with the signal which the incorrectness appear.

Signal No.	f_H, fv and other conditions	H.SIZE	V.SIZE
5	31.5kHz 70Hz (Separate Sync H: POSI V: NEGA)	280±2mm	200±2mm
6	31.5kHz 70Hz (Separate Sync H: NEGA V: POSI)	280±2mm	205±2mm
7	31.5kHz 60Hz (Separate Sync H: NEGA V: NEGA)	280±2mm	205±2mm
8	35kHz 87Hz (Separate Sync Interace)	290±2mm	210±2mm
9	35kHz 67Hz (Sync on Green)	275±2mm	210±2mm
10	35kHz 56Hz (Separate sync)	290±2mm	217±2mm
11	48.5kHz 60Hz (Sync on Green)	290±2mm	217±2mm
12	56.7kHz 70Hz (Sync on Green)	290±2mm	217±2mm
14	30.5kHz 60Hz (Composite Sync V.MODE: LOW)	280±2mm	205±2mm

Table 1. Preset Signals

(4) Adjustment of Video Amplitude and White Balance

NOTE: Before performing this adjustment, make sure the VIDEO signal is as follows
VIDEO signal:Analog 0.7Vp-p±5% (75Ω ±1% termination)

4-1) Default Setting of the Adjustment VRs

VR754~VR756	GAIN VR	Fully left
VR751~VR753	SUB CONT VR	Fully right
VR901~VR903	BIAS VR	Fully left
VR904~VR906	SUB BRIGHT VR	Fully right
VR907	SUB BIAS VR	Fully left
Sceen VR		Fully left

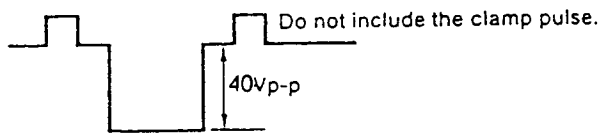
4-2) Video Contrast Adjustment

a) GAIN VR Adjustment: Signal 13 (Window white pattern)

① Receive the window pattern of Signal 13.
(A video range of 1/3~1/4H x 1/3V within the range where the ABL circuit is not applied despite maximum Contrast is desirable).

② Rotate the Contrast VR fully to the right.
Rotate the Brightness VR fully to the left.

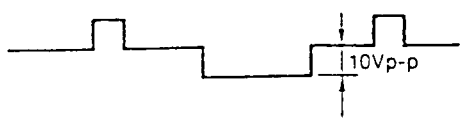
③ Adjust VR754, VR755 and VR756 so that the TP R, TP G, and TP B terminals on the VIDEO PWB are each set to 40 Vp-p. After adjustment, confirm the Vp-p value of each terminal and perform readjustment if necessary.



b) SUB CONT Adjustment

① Rotate the Contrast VR fully to the left.
Rotate the Brightness VR fully to the left.

② Adjust VR751, VR752, VR753 so that the TP R, TP G, and TP B terminals on the VIDEO PWB becomes 10Vp-p. After adjustment, confirm the Vp-p value of each terminal and perform readjustment if necessary.



4-3) Cutoff Adjustment (All-black signal)

Rotate the Contrast VR fully to the left.

a) Perform the two steps below in the (1)→(2) sequence.
   (1) Create a short-circuit between TP901 and TP902.
   (2) Create a short-circuit between TP450 and the ground.

b) Turn the screen Control clockwise until the voltage value between TP903 and the ground becomes 550VDC (using a high voltage meter whose Max. Voltage is more than 1.5kV and input resistance is more than 1000MΩ).

c) Turn the SUB BIAS VR907 clockwise gradually and set to the position of which a horizontal bar color appears faintly.

d) Turn the BIAS VRs for a color other than the reference color clockwise until it is as bright as the reference color.

e) Sequentially cancel the short-circuit created between TP450 and the ground 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.

4-4) Adjustment of SUB. BRIGHT VR

a) Receive Signal 12 (56.7kHz)

b) Rotate the Contrast VR fully to the left.
   Rotate the Brightness VR fully to the right.

c) Receive all-black signals.

d) Rotate VR904 and VR906 to adjust the back raster until they are white.

4-5) Fine Adjustment of White Balance

color temperature: Center X=0.300
Y=0.315

Hue: A slightly bluish white.

a) Receive Signal 13 (56.7kHz) H gray scale (16 gradations).(the window pattern should be in the range where the ABL circuit is not applied).

b) Short TP901 and TP902.

c) Rotate the contrast 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 GAIN VRs (VR754 AND VR756).
   NOTE: Do not change the setting of VR755.(G.GAIN)

d) Rotate the Contrast VR fully to the left.
   Check that the white balance is satisfactory at each gradation. If the white balance is not satisfactory, perform fine adjustment of the SUB.CONT VRs (VR751 and VR753)
   NOTE: Do not change the setting of VR752.(G.SUB. CONT).

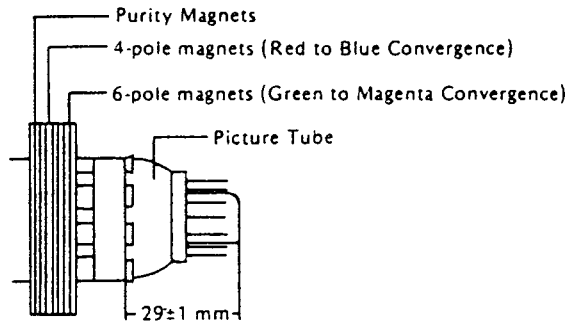
e) Open TP901 and TP902.
   Rotate the Contrast VR fully to the left.
   Rotate the Brightness VR fully to the right.
   Check that the white balance is satisfactory at each gradation, and at each position of the Brightness VR (From Max to Min). If the white balance is not satisfactory, perform fine adjustment of the SUB BRIGHT VRs (VR904 and VR906).
   NOTE: Do not change the setting of VR905 (G SUB BRIGHT).

(5) Focus Adjustment

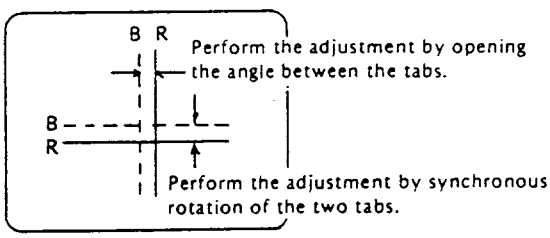
1) Receive the signal 7 (f_H:31.5kHz) "$" character pattern with four dots missing.
2) Rotate the contrast VR fully to the right.
   Rotate the Brightness VR at point where back raster disappears.
3) Adjust the Focus control of FBT so that every "$" character is the same.
4) If its not equal between center and corner, use VR960 for correction.

(6) Purity Adjustment

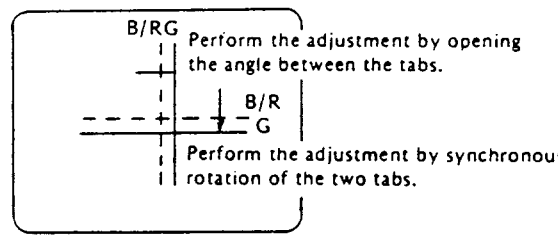
1) Be sure that the display is not being exposed to any external magnetic fields.
2) Ensure that the spacing between the Purity Convergence Magnet (PCM) assembly and the CRT stem is 29 mm±1mm.(See below diagram)
3) Produce a complete, red pattern on the display. Adjust the purity magnet rings on the 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)

(7) 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 diagrams above)
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.

SIGNALS FOR USING QUANTUM 801C

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	59.4 kHz	47.1 kHz	35.4 kHz	PGC 480	VGA 350	VGA 400	VGA 480	8514A	MAC-2	800×600	48.5kHz	56.7kHz	56.7kHz WINDOW	PGC 400
Real Time Parameters														
Dot Rate (MHz)	31.832	31.792	28.320	24.960	28.320	28.320	28.320	31.968	30.240	31.960	31.848	30.936	30.936	24.963
Horizontal Rate (kHz)	59.388	47.099	35.400	30.476	31.467	31.467	31.467	35.520	35.000	35.160	48.475	56.659	56.659	30.476
Vertical Rate (Hz)	80.04	90.06	50.00	59.99	70.08	70.08	60.06	86.96	66.67	56.26	59.99	70.04	70.04	59.99
Non-Real Time Parameters														
H: Dots/Character	8	9	8	9	9	9	9	9	8	9	9	6	6	9
Total Characters	67	75	100	91	100	100	100	100	108	101	73	91	91	91
Displayed Characters	43	54	80	71	80	80	80	81	80	79	57	70	18	71
Drive Delay	51	61	83	71	82	82	82	82	88	81	59	77	51	71
Drive Width	9	10	12	12	12	12	12	14	8	7	4	6	6	12
V: Lines/Character	12	10	10	10	10	10	10	12	10	10	12	8	8	10
Total Lines	742	523	708	508	449	449	524	817	525	625	808	809	809	508
Displayed Rows	54	45	60	48	35	40	48	64	48	60	64	96	24	40
Drive Delay (Rows)	54	46	61	48	39	41	49	64	48	60	64	96	60	44
Drive Width (Lines)	2	2	2	2	2	2	2	4	3	2	4	2	2	2
Step Width	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Signal Gating														
Composite Sync. OP.1	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Vertical Step OP.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Horizontal Drive OP.3	1	1	1	0	1	1	1	1	1	1	1	1	1	0
Vertical Drive OP.4	1	1	1	0	1	1	1	1	1	1	1	1	1	0
Signal Polarity														
Composite Sync. OP.5	—	—	—	0	—	—	—	—	—	—	1	1	1	0
Vertical Step OP.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Horizontal Drive OP.7	1	1	1	—	0	1	1	0	1	0	1	1	1	—
Vertical Drive OP.8	1	1	1	—	1	0	1	0	1	0	1	1	1	—
Video OP.13	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Interlace Mode OP.9	0	0	0	0	0	0	0	3	0	0	0	0	0	0
Video Mode OP.10	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Duty Cycle OP.11	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Character Clocking Mode OP.12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Horizontal Skew OP.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Vertical Skew OP.15	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cursor OP.16	—	—	—	—	—	—	—	—	—	—	—	—	—	—

TIMING OF REFERENCES SIGNALS

SIGNALS FOR USING LVG-1603

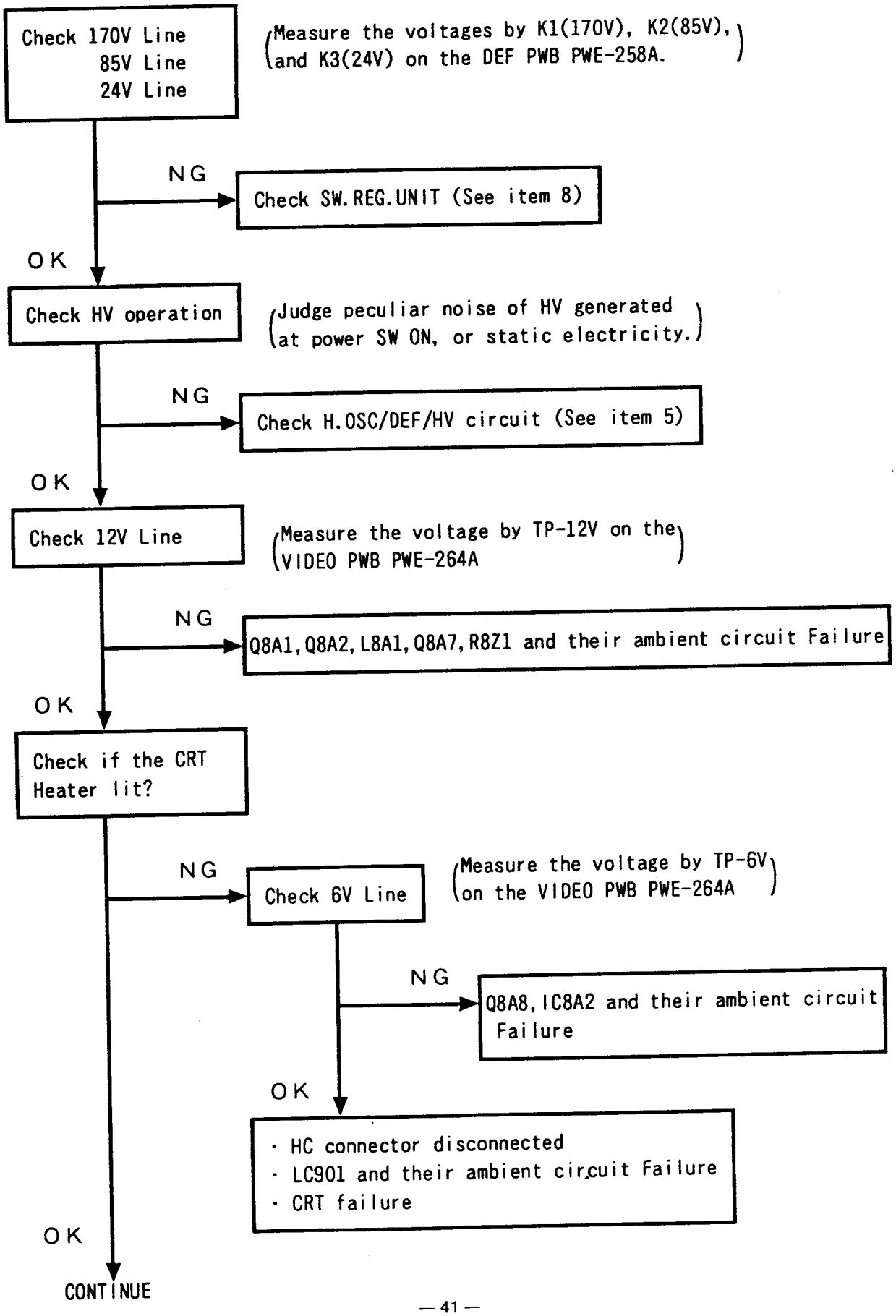
Abbreviation		Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14
			59.4 kHz	47.1 kHz	35.4 kHz	PGC 480	VGA 350	VGA 400	VGA 480	8514A	MAC II	800× 600	48.5 kHz	56.7 kHz	56.7 kHz (W)	PGC 400
HORIZONTAL	Total	DOT	1000	0900	0800	0820	0900	0900	0900	1264	0864	1024	1228	1058	1058	0820
	Rate	kHz	059400	047100	035400	030480	031470	031470	031470	035520	035000	035160	048485	056660	056660	030480
	Dots/Character	DOT	08	08	08	08	09	09	09	08	08	08	08	08	08	08
	Characters	CHR	F080	F080	F080	F080	F080	F080	F080	F128	F080	F100	F119	F102	F026	F080
	Drive Delay	DOT	0750	0728	0664	0640	0738	0738	0738	1032	0704	0824	0997	0894	0512	0640
	Drive Width	DOT	0136	0120	0096	0112	0108	0108	0108	0176	0064	0072	0060	0071	0071	0112
VERTICAL	Total	RASTER	0742	0523	0708	0508	0449	0449	0524	0409	0525	0625	0808	806	806	0508
	Rate	Hz	080000	090000	050000	060000	070000	070000	060000	087000	066700	056200	060000	070298	070298	060000
	Lines/Character	RASTER	15	15	15	10	14	16	16	12	16	15	—	—	—	10
	Rows	RASTER	0645	0450	0600	0480	0350	0400	0480	0384	0480	0600	0768	0768	0192	0400
	Drive Delay	RASTER	0650	0455	0605	0481	0387	0412	0489	0384	0483	0601	0772	0768	0480	0441
	Drive Width	RASTER	0002	0002	0002	0002	0002	0002	0002	0004	0003	0002	0004	0002	0002	0002
DOT RATE		MHz	059400	042390	028320	024994	028323	028323	028323	044897	030240	036004	059540	059833	059833	024994
Scan Mode			F0	F0	F0	F0	F0	F0	F0	F1	F0	F0	F0	F0	F0	F0
Character Font			F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1
Character Code			46	48	48	—	—	—	—	—	—	—	—	—	20	—
Pattern Key Code			F2	F2	F2	F	F	F	F	F	F	F	F	F	F2	F
Video Output			1110	1110	1110	1110	1110	1110	1110	1110	1110	1110	1110	1110	1110	1110
Add Sync/Inverse			0001	0001	0001	0001	0001	0001	0001	0001	0101	0001	0101	0101	0101	0001
Dot Duty			00	00	00	01	00	00	00	00	00	00	00	00	00	01
Polarity			00	00	00	—	10	01	00	11	00	11	00	00	00	

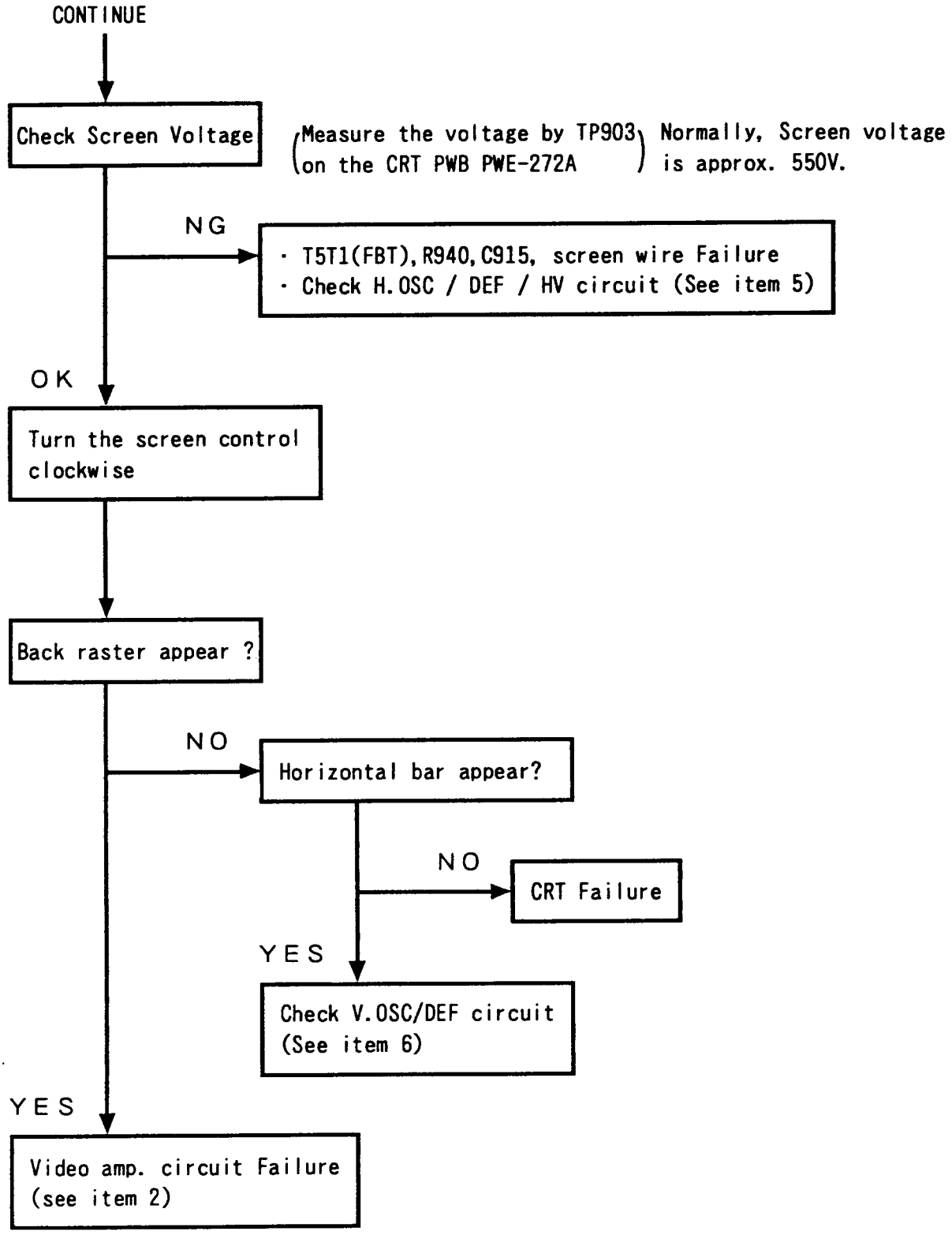
TROUBLE SHOOTING

Before using this chart, please refer to the trouble shooting section in the user's manual.

TABLE OF CONTENTS

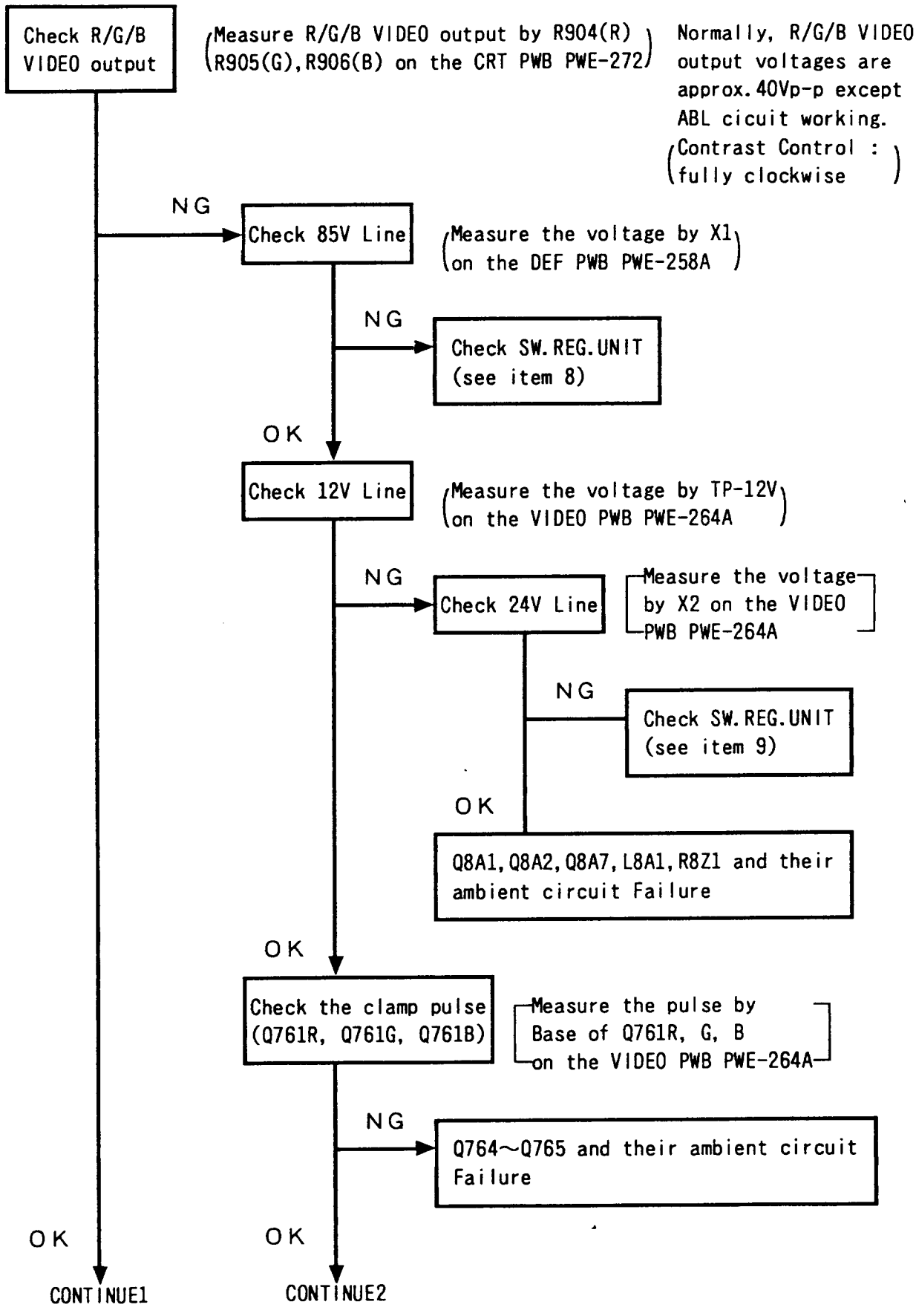
1. NO RASTER

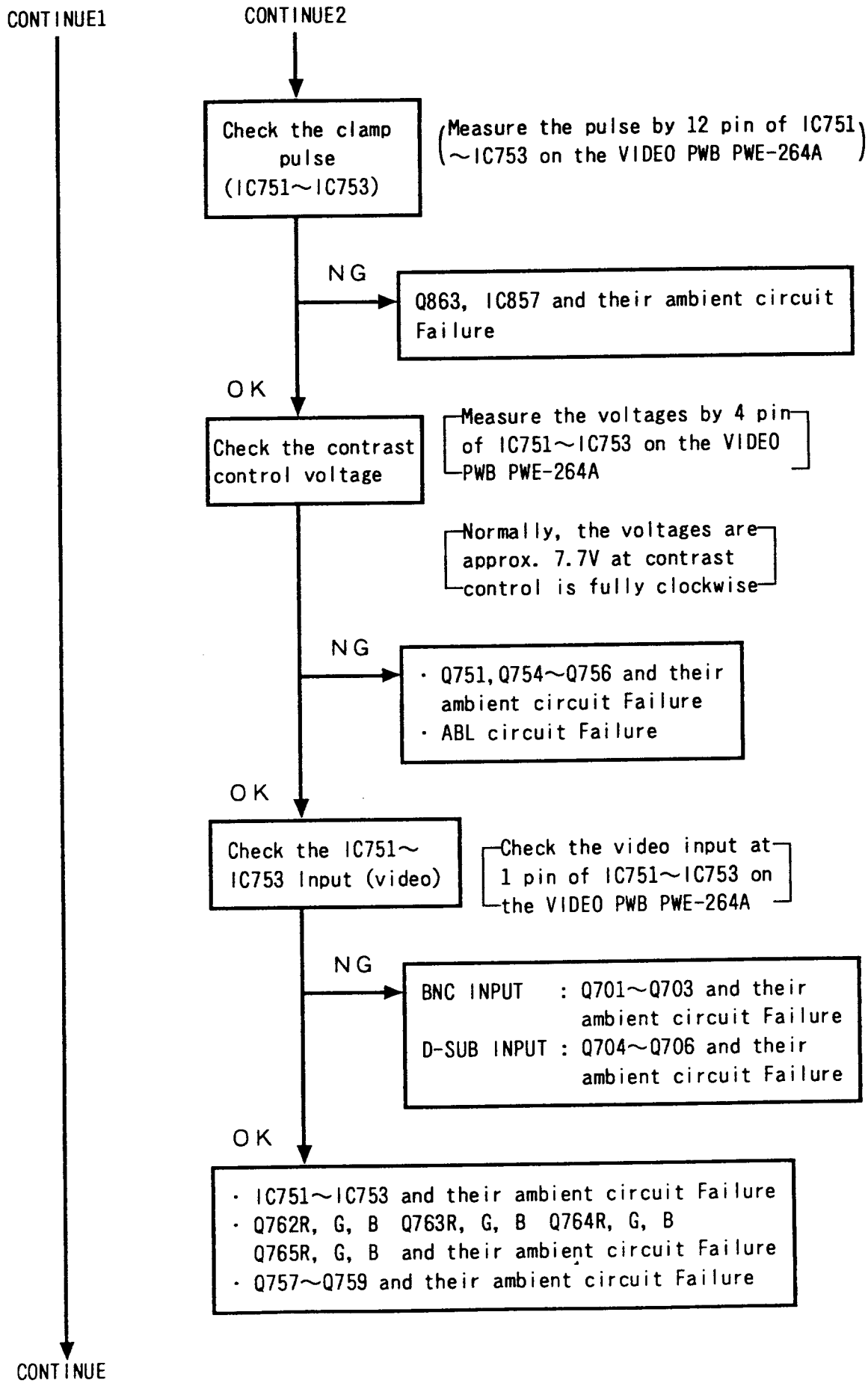

Check 170V Line
85V Line
24V Line
(Measure the voltages by K1(170V), K2(85V), and K3(24V) on the DEF PWB PWE-258A.)
NG
Check SW.REG.UNIT (See item 8)
OK
Check HV operation
(Judge peculiar noise of HV generated at power SW ON, or static electricity.)
NG
Check H.OSC/DEF/HV circuit (See item 5)
OK
Check 12V Line
(Measure the voltage by TP-12V on the VIDEO PWB PWE-264A)
NG
Q8A1, Q8A2, L8A1, Q8A7, R8Z1 and their ambient circuit Failure
OK
Check if the CRT Heater lit?
NG
Check 6V Line
(Measure the voltage by TP-6V on the VIDEO PWB PWE-264A)
NG
Q8A8, IC8A2 and their ambient circuit Failure
OK
· HC connector disconnected
· LC901 and their ambient circuit Failure
· CRT failure
OK
CONTINUE

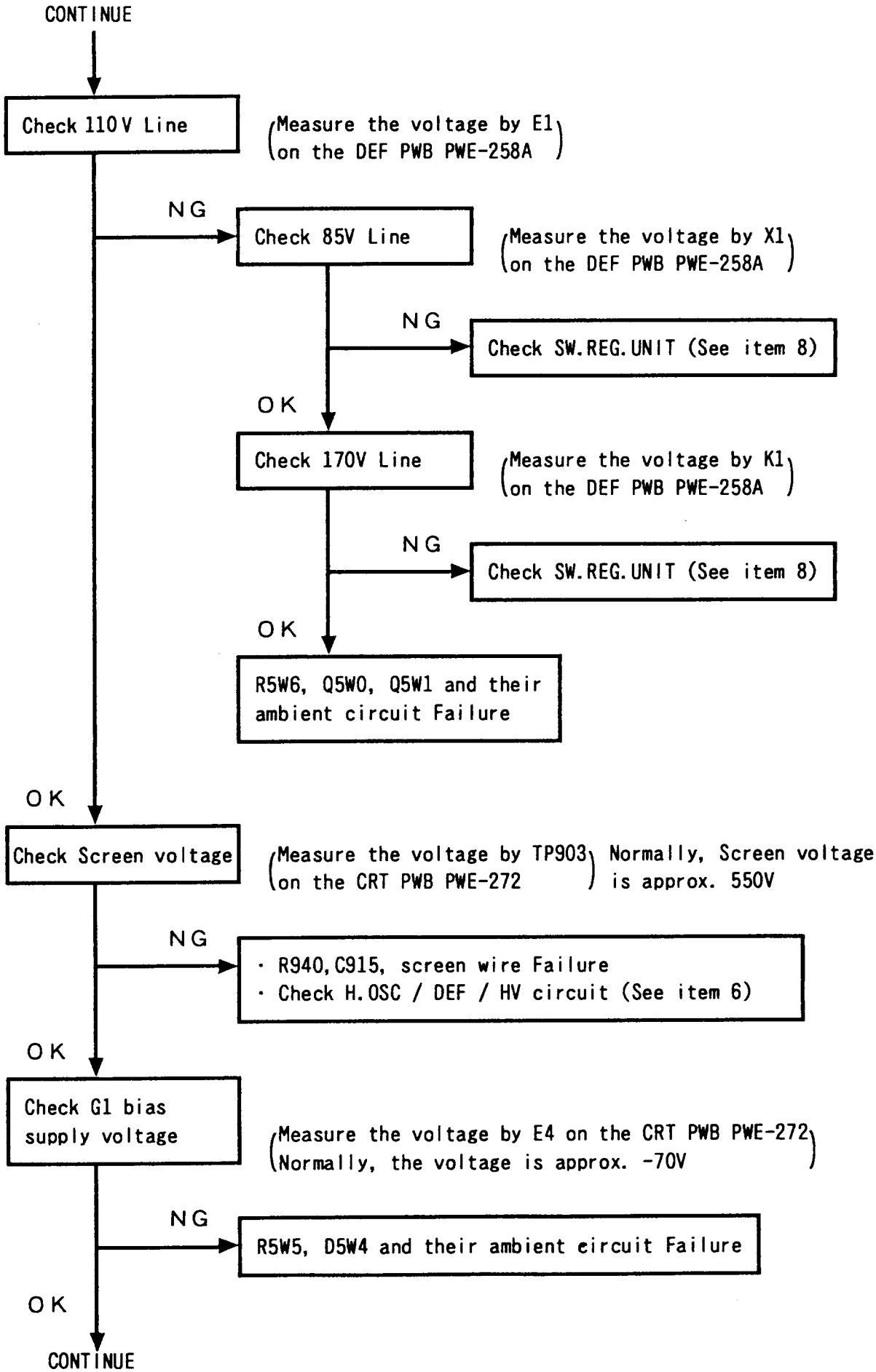

CONTINUE
Check Screen Voltage
(Measure the voltage by TP903 on the CRT PWB PWE-272A)
Normally, Screen voltage is approx. 550V.
NG
· T5T1(FBT), R940, C915, screen wire Failure
· Check H.OSC / DEF / HV circuit (See item 5)
OK
Turn the screen control clockwise
Back raster appear ?
NO
Horizontal bar appear?
NO
CRT Failure
YES
Check V.OSC/DEF circuit (See item 6)
YES
Video amp. circuit Failure (see item 2)

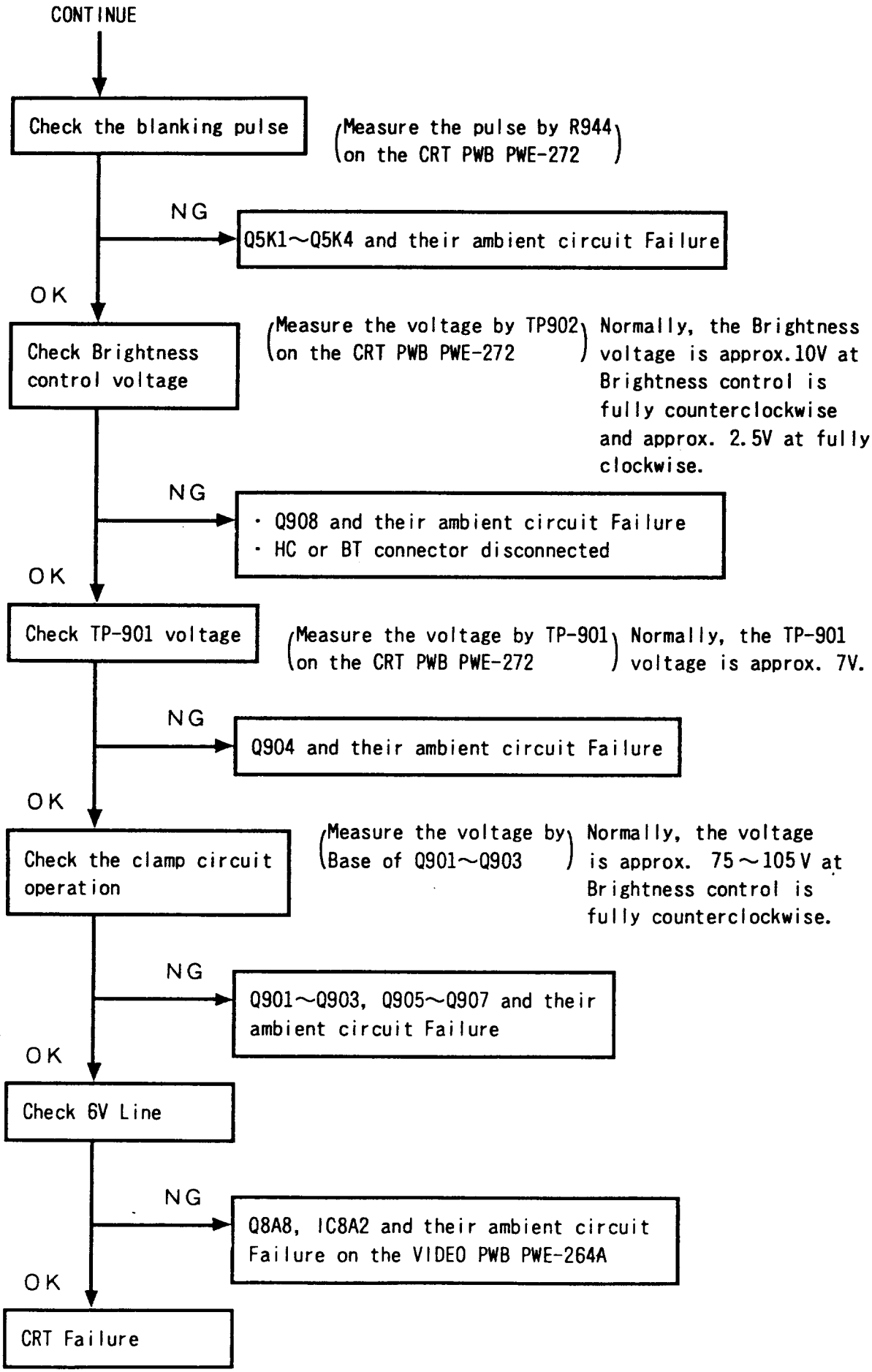
2. ABNORMAL VIDEO ON CRT SCREEN

Too dark or too bright



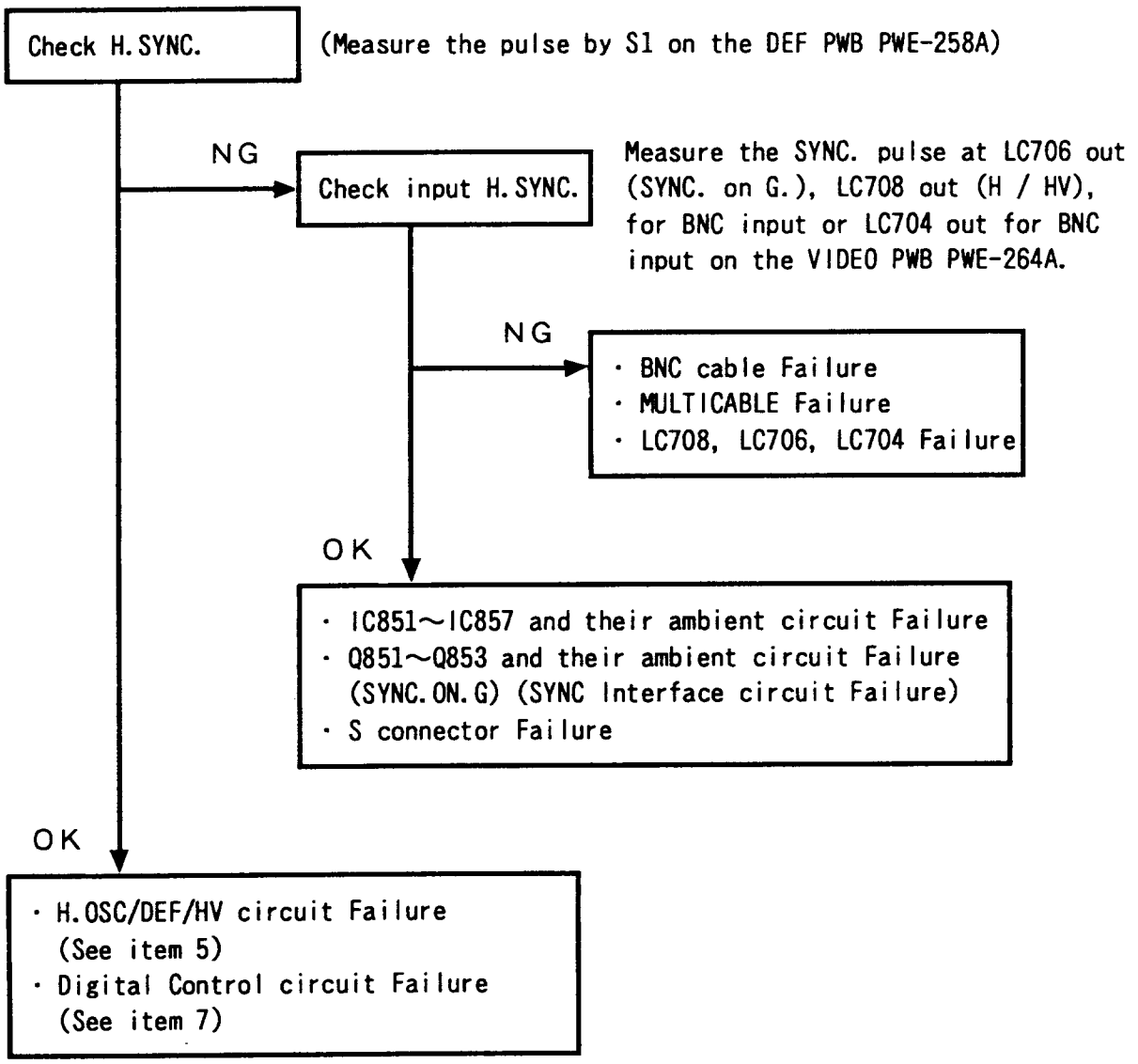

CONTINUE1
CONTINUE2
Check the clamp pulse (IC751～IC753)
(Measure the pulse by 12 pin of IC751～IC753 on the VIDEO PWB PWE-264A)
NG
Q863, IC857 and their ambient circuit Failure
OK
Check the contrast control voltage
Measure the voltages by 4 pin of IC751～IC753 on the VIDEO PWB PWE-264A
Normally, the voltages are approx. 7.7V at contrast control is fully clockwise
NG
· Q751, Q754～Q756 and their ambient circuit Failure
· ABL circuit Failure
OK
Check the IC751～IC753 Input (video)
Check the video input at 1 pin of IC751～IC753 on the VIDEO PWB PWE-264A
NG
BNC INPUT : Q701～Q703 and their ambient circuit Failure
D-SUB INPUT : Q704～Q706 and their ambient circuit Failure
OK
· IC751～IC753 and their ambient circuit Failure
· Q762R, G, B Q763R, G, B Q764R, G, B Q765R, G, B and their ambient circuit Failure
· Q757～Q759 and their ambient circuit Failure
CONTINUE


CONTINUE
Check 110V Line
(Measure the voltage by E1 on the DEF PWB PWE-258A)
NG
Check 85V Line
(Measure the voltage by X1 on the DEF PWB PWE-258A)
NG
Check SW.REG.UNIT (See item 8)
OK
Check 170V Line
(Measure the voltage by K1 on the DEF PWB PWE-258A)
NG
Check SW.REG.UNIT (See item 8)
OK
R5W6, Q5W0, Q5W1 and their ambient circuit Failure
OK
Check Screen voltage
(Measure the voltage by TP903 on the CRT PWB PWE-272)
Normally, Screen voltage is approx. 550V
NG
· R940, C915, screen wire Failure
· Check H.OSC / DEF / HV circuit (See item 6)
OK
Check G1 bias supply voltage
(Measure the voltage by E4 on the CRT PWB PWE-272
Normally, the voltage is approx. -70V)
NG
R5W5, D5W4 and their ambient circuit Failure
OK
CONTINUE

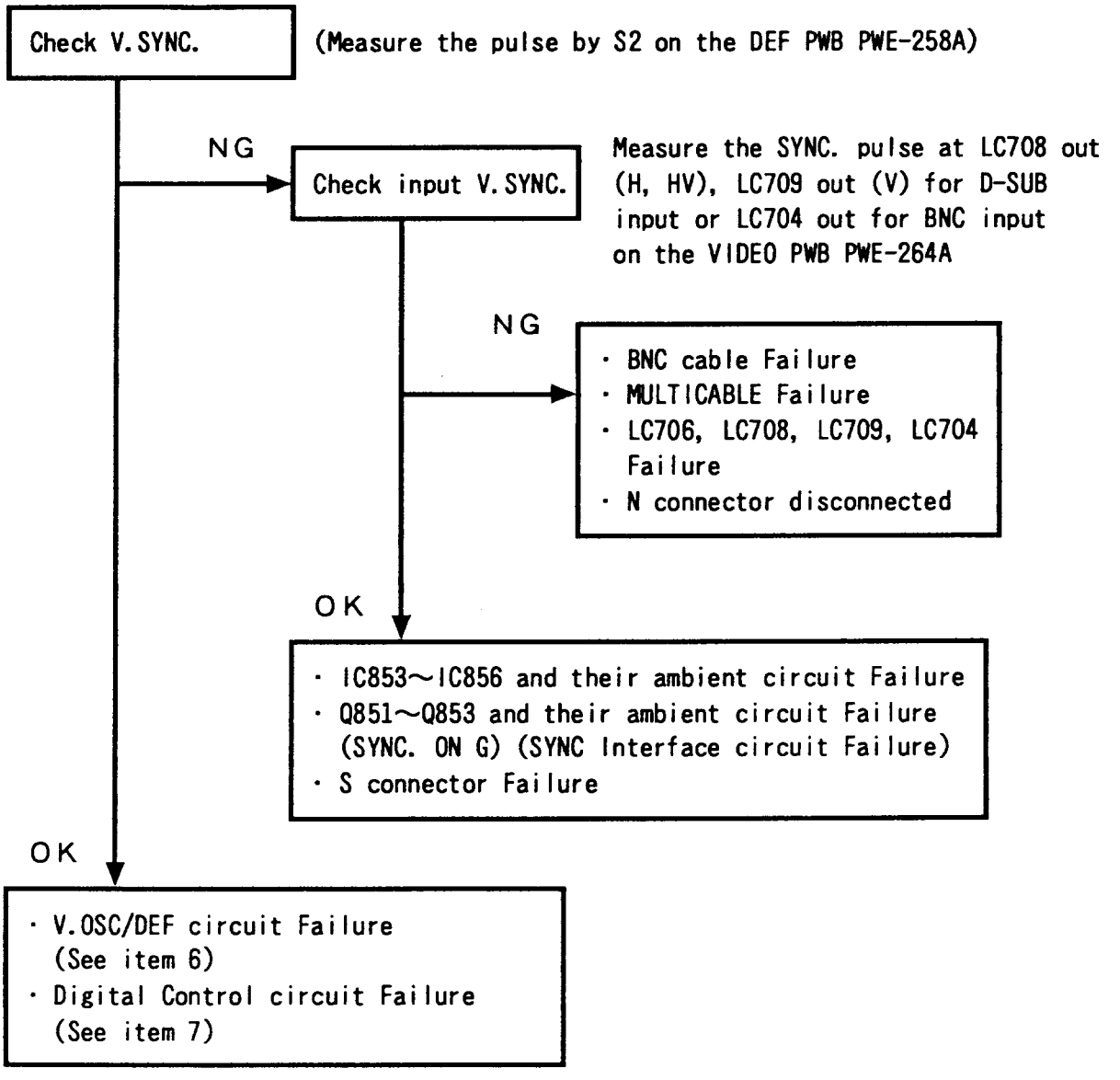

CONTINUE
Check the blanking pulse
(Measure the pulse by R944 on the CRT PWB PWE-272)
NG
Q5K1～Q5K4 and their ambient circuit Failure
OK
Check Brightness control voltage
(Measure the voltage by TP902 on the CRT PWB PWE-272)
Normally, the Brightness voltage is approx.10V at Brightness control is fully counterclockwise and approx. 2.5V at fully clockwise.
NG
・ Q908 and their ambient circuit Failure
・ HC or BT connector disconnected
OK
Check TP-901 voltage
(Measure the voltage by TP-901 on the CRT PWB PWE-272)
Normally, the TP-901 voltage is approx. 7V.
NG
Q904 and their ambient circuit Failure
OK
Check the clamp circuit operation
(Measure the voltage by Base of Q901～Q903)
Normally, the voltage is approx. 75～105V at Brightness control is fully counterclockwise.
NG
Q901～Q903, Q905～Q907 and their ambient circuit Failure
OK
Check 6V Line
NG
Q8A8, IC8A2 and their ambient circuit Failure on the VIDEO PWB PWE-264A
OK
CRT Failure

3. UNSTABLE PICTURE

3-1) Horizontal



3-2) Vertical


Check V.SYNC.
(Measure the pulse by S2 on the DEF PWB PWE-258A)
NG
Check input V.SYNC.
Measure the SYNC. pulse at LC708 out (H, HV), LC709 out (V) for D-SUB input or LC704 out for BNC input on the VIDEO PWB PWE-264A
NG
· BNC cable Failure
· MULTICABLE Failure
· LC706, LC708, LC709, LC704 Failure
· N connector disconnected
OK
· IC853~IC856 and their ambient circuit Failure
· Q851~Q853 and their ambient circuit Failure (SYNC. ON G) (SYNC Interface circuit Failure)
· S connector Failure
OK
· V.OSC/DEF circuit Failure (See item 6)
· Digital Control circuit Failure (See item 7)

4. ABNORMAL PICTURE

4-1) Horizontal Size

Check HV Voltage (Measure at Anode of CRT)Normally, HV voltage is approx.25kV

NG → HV circuit Failure (See item 5)

OK

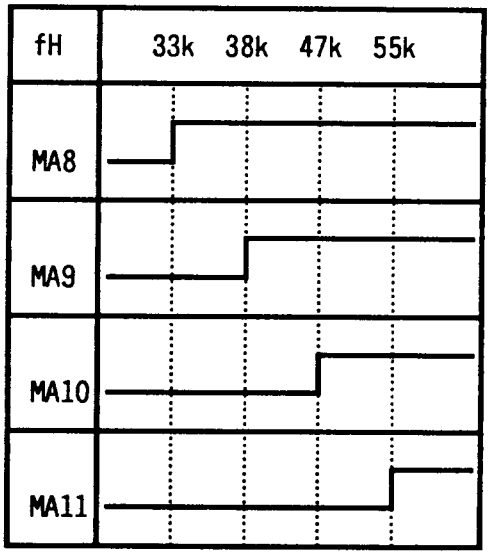
Check 12V Line (Measure the voltage by TP-801 on the CPU PWB PWE-257)

NG → R822, Q801, Q802, ZD801 and their ambient circuit

OK

Check Digital Control circuit output (MA8～MA11) See Fig.1

NG → Digital Control circuit Failure (See item 7)



(TTL level output)
Fig. 1

OK

Check S-correction capacitor switching circuit (Check the Q564, Q565, Q568, Q569 operation)

NG → Q564, Q565, Q568, Q569, C566, C567 and their ambient circuit Failure

CONTINUE

CONTINUE

Check if MB9 voltage is changeable by S803, S804

NG → Digital Control circuit Failure (See item 7)

OK

Check Q560 F.B.P See Fig.2

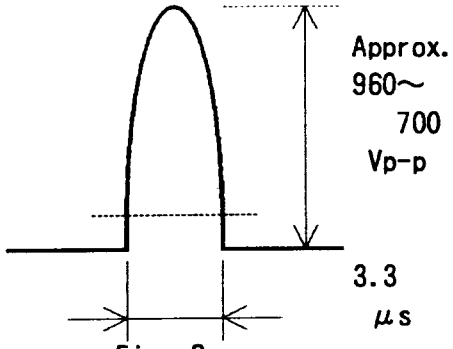


Fig. 2

NG → · Q560, C560, C561 and their ambient circuit Failure
· T560, IC5Q0, IC5P0 and their ambient circuit Failure

OK

Check Horizontal Linearity correction circuit (See item 4-5-1)

OK

Check Side-pin correction circuit (See item 4-6)

OK

H.OSC/DEF/HV circuit Failure (See item 5)

4-2) Vertical Size

Check if MB7 voltage is changeable by S807, S808

NG → Digital Control circuit Failure (See item 7)

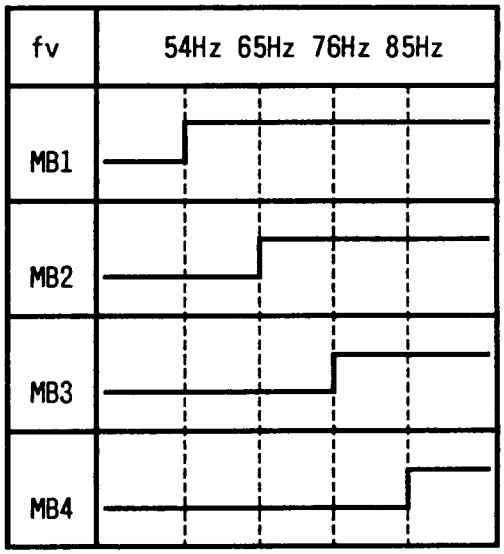
OK

Check Digital Control circuit output (MB1~MB5) See Fig. 3, 4

NG → Digital Control circuit Failure (See item 7)

OK

· V.OSC/DEF circuit Failure (See item 6)

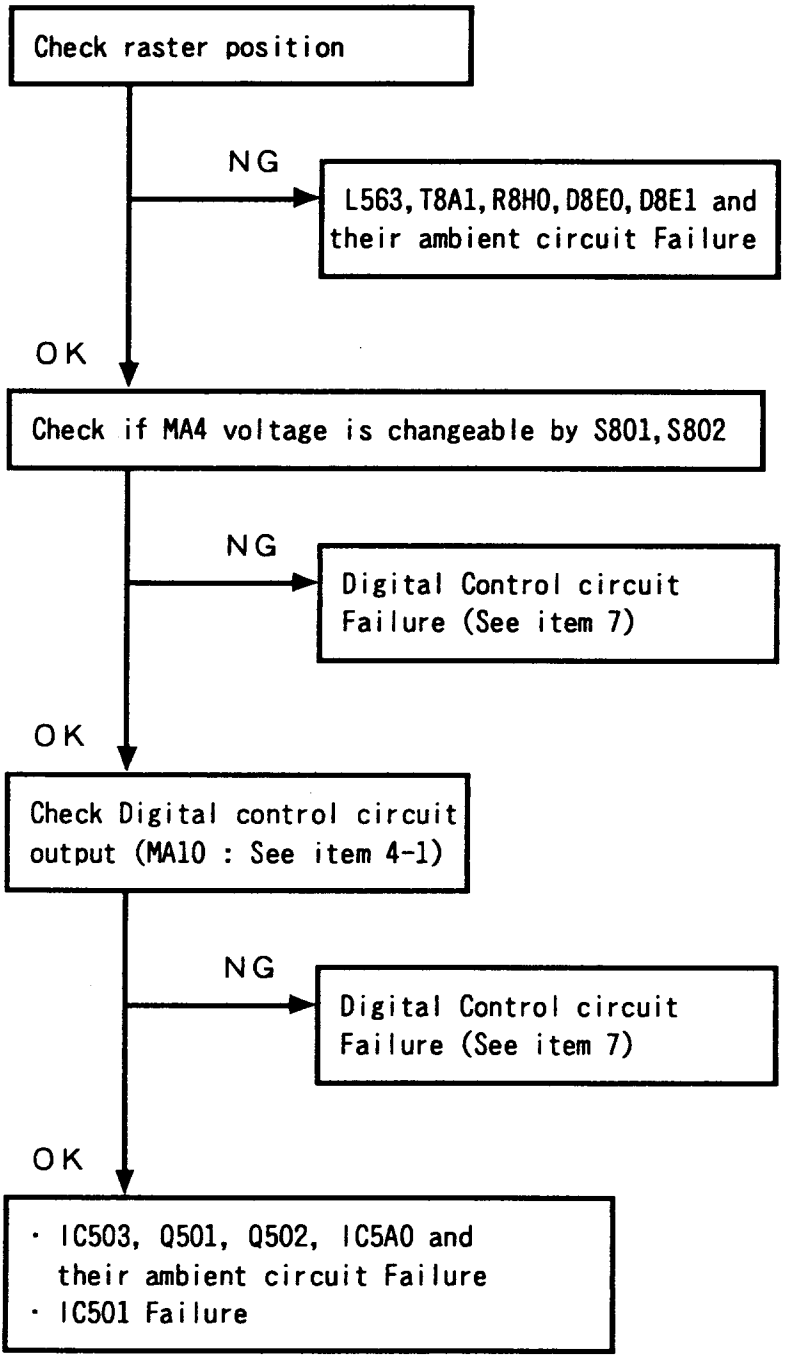


(TTL level output)
Fig. 3

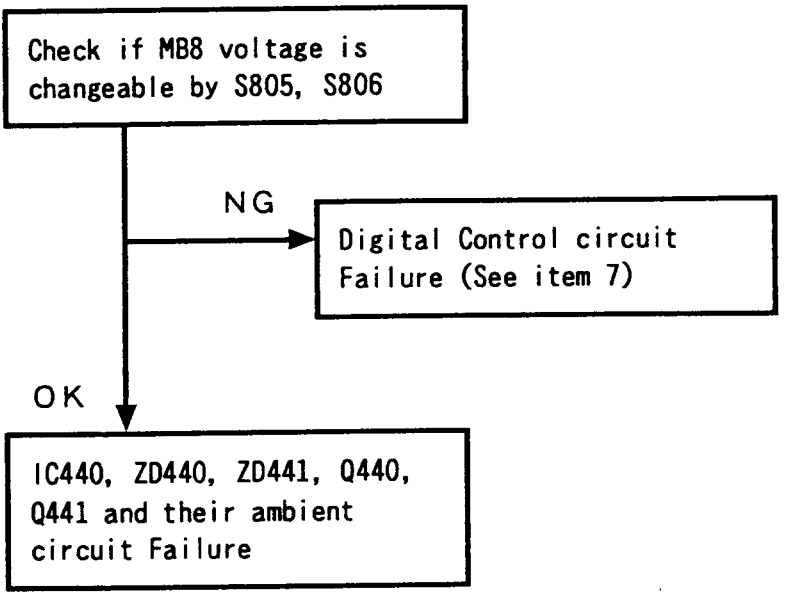
	PGC400	PGC480
MB5	H	L

(TTL level output)
Fig. 4

4-3) Horizontal position

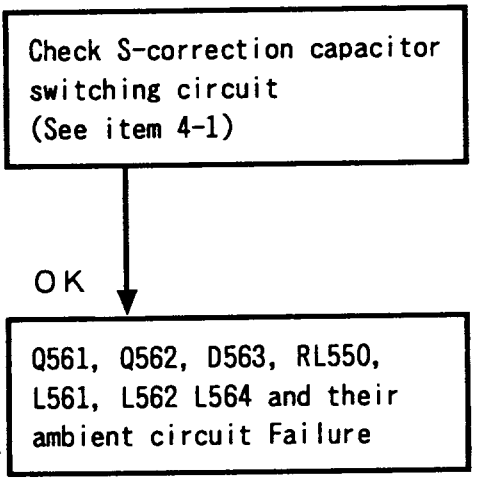


4-4) Vertical Position

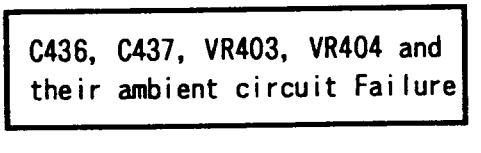


4-5) Poor Linearity

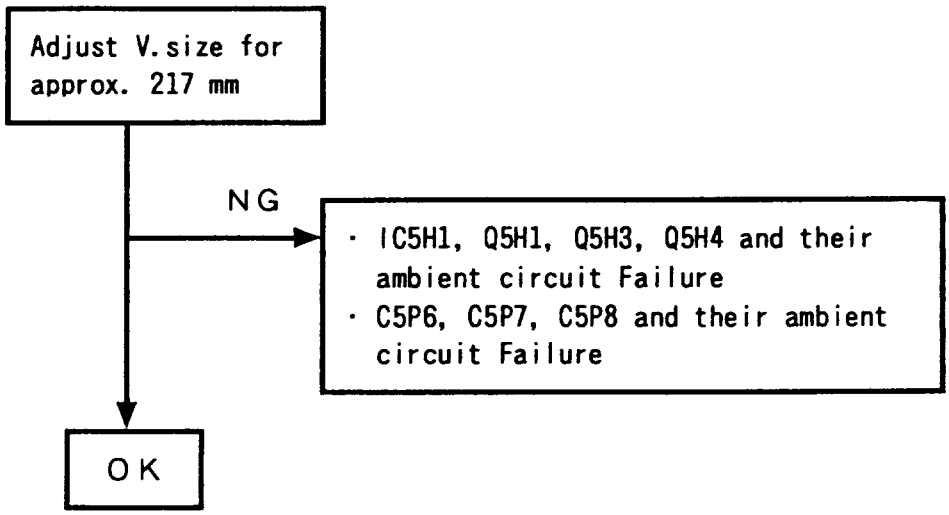
4-5-1) Horizontal



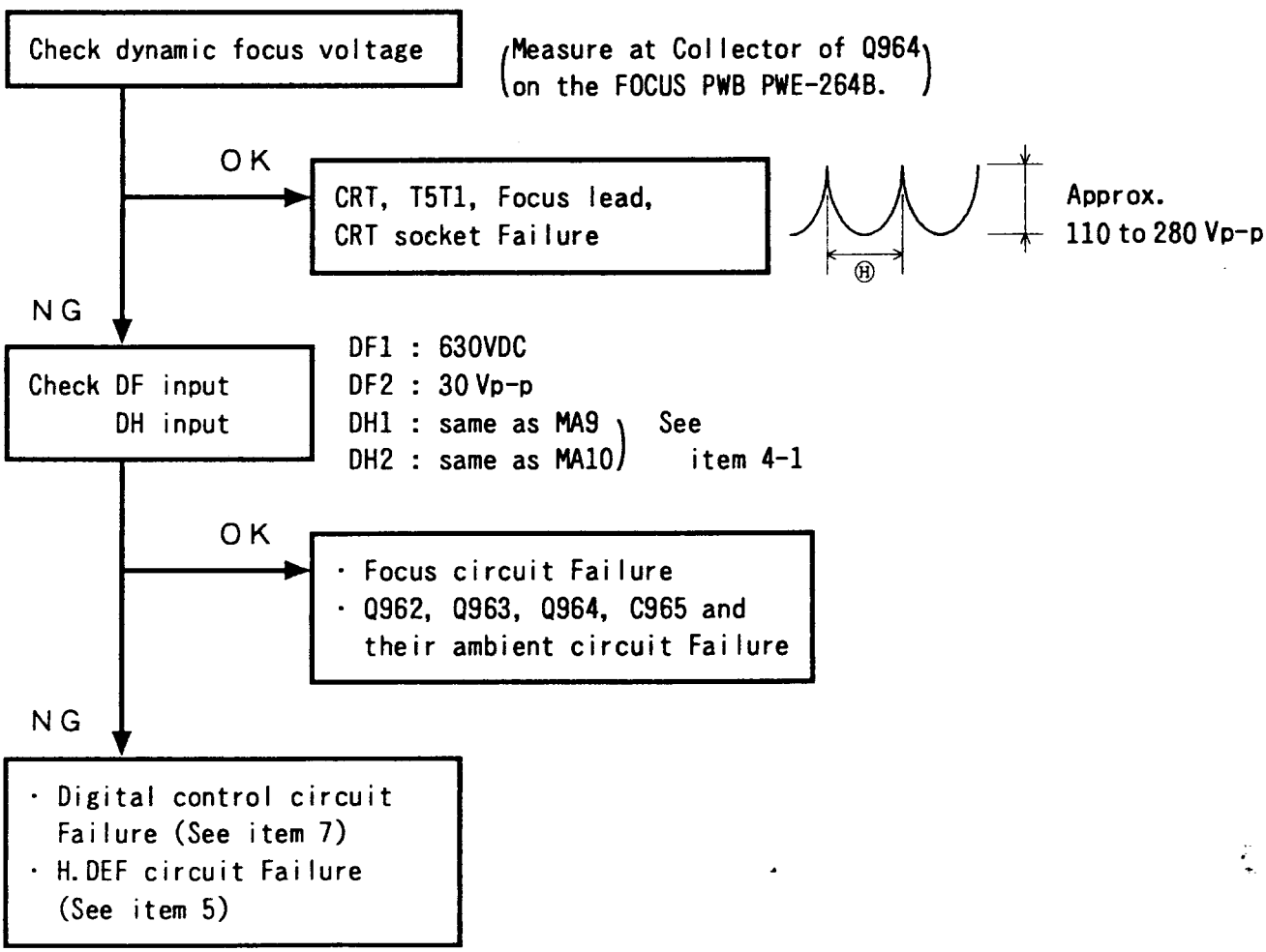
4-5-2) Vertical



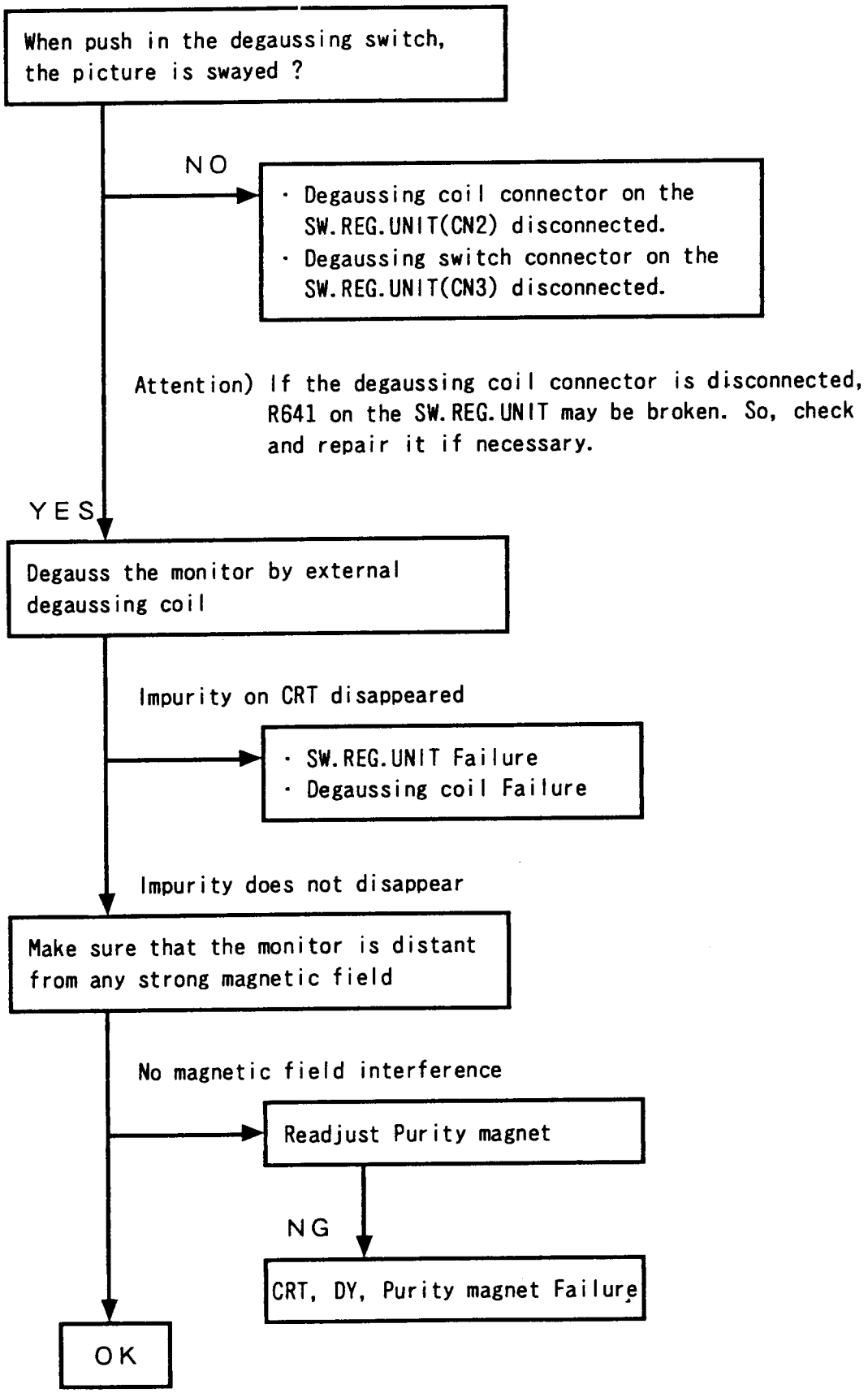
4-6) Side-pin cushion Distortion Fault



4-7) Poor Focus

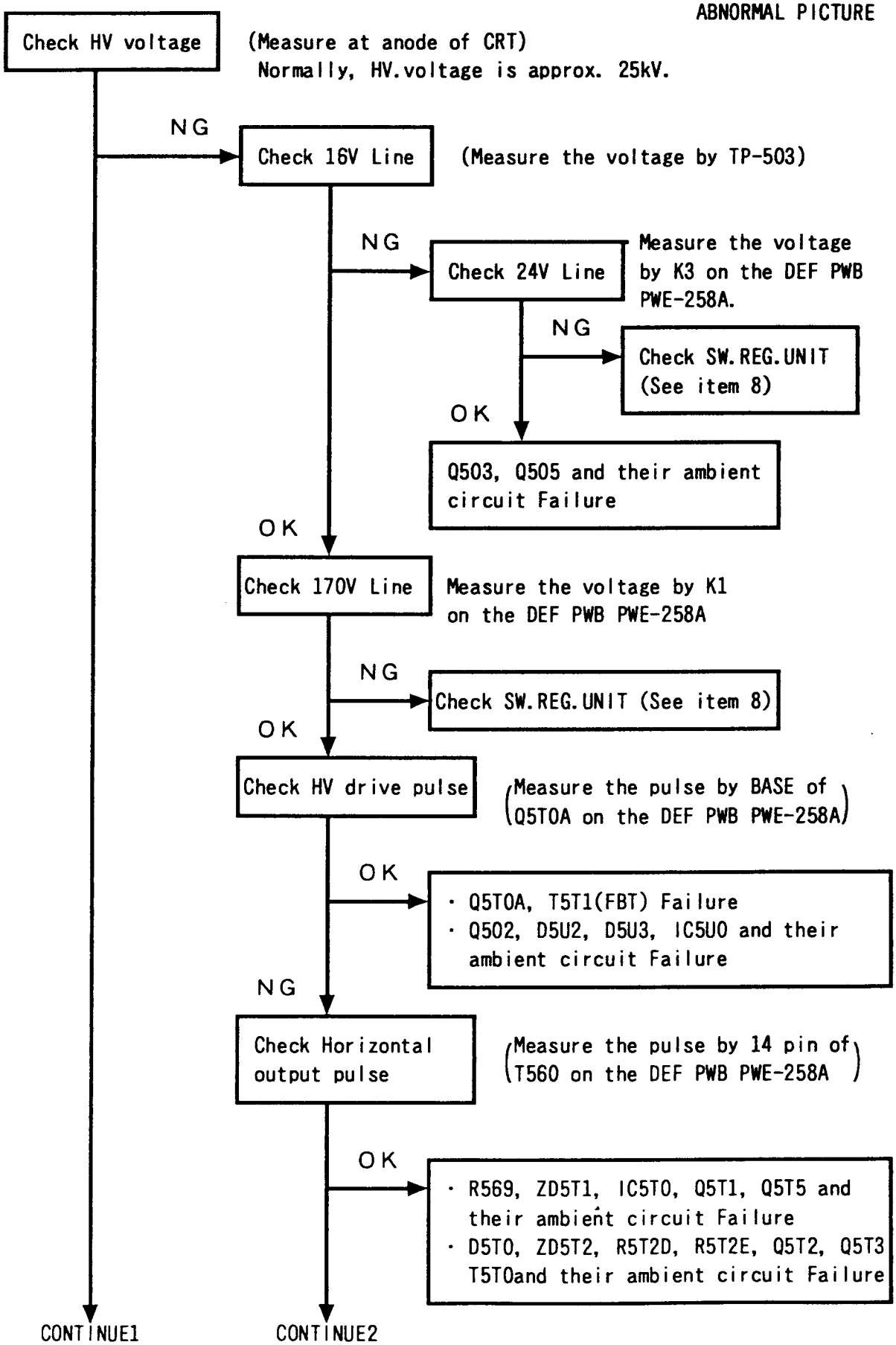


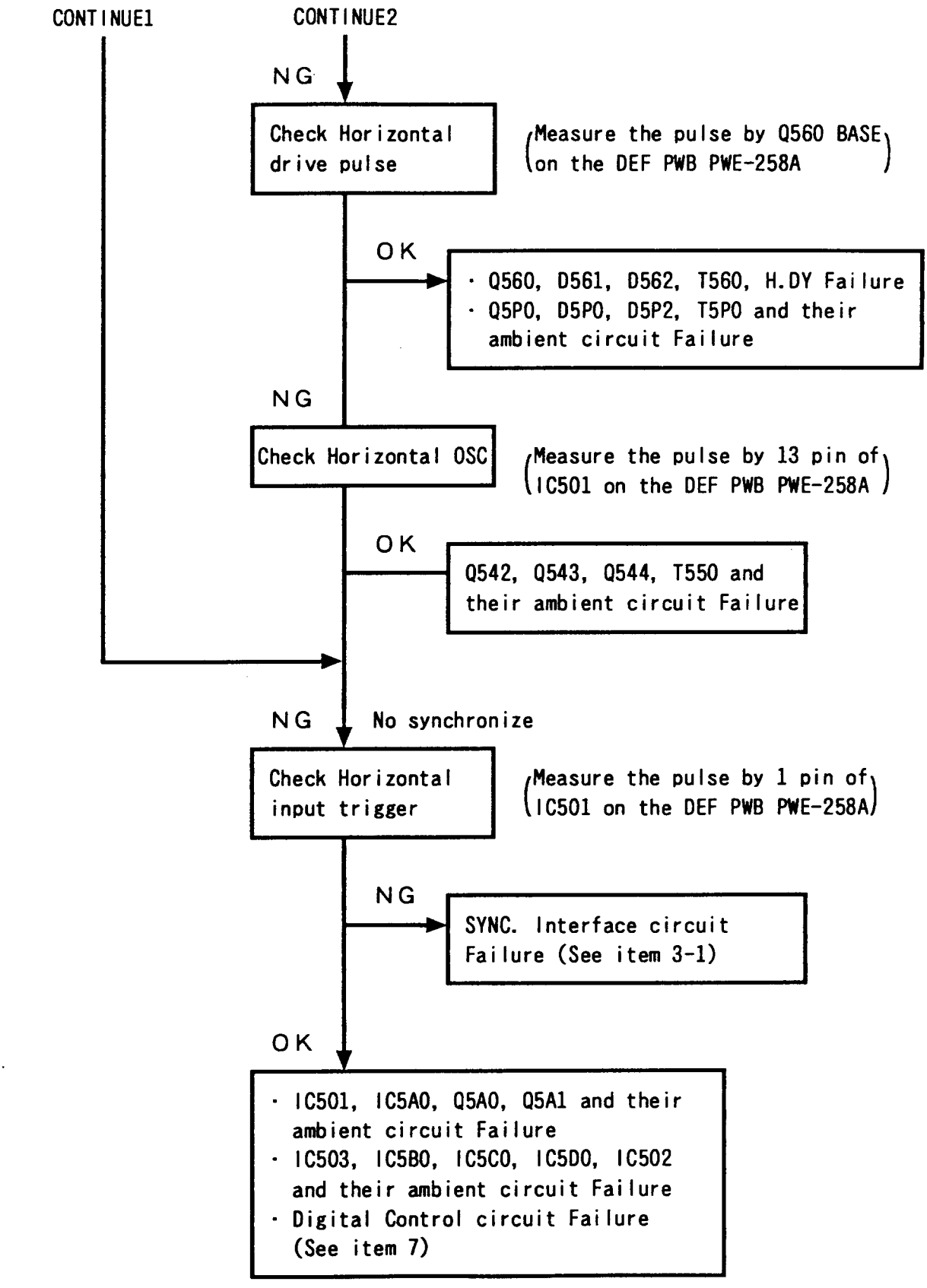
4-8) Impurity On CRT Screen



5. H. OSC/DEF/HV CIRCUIT FAULT

NO RASTER
UNSTABLE PICTURE
ABNORMAL PICTURE

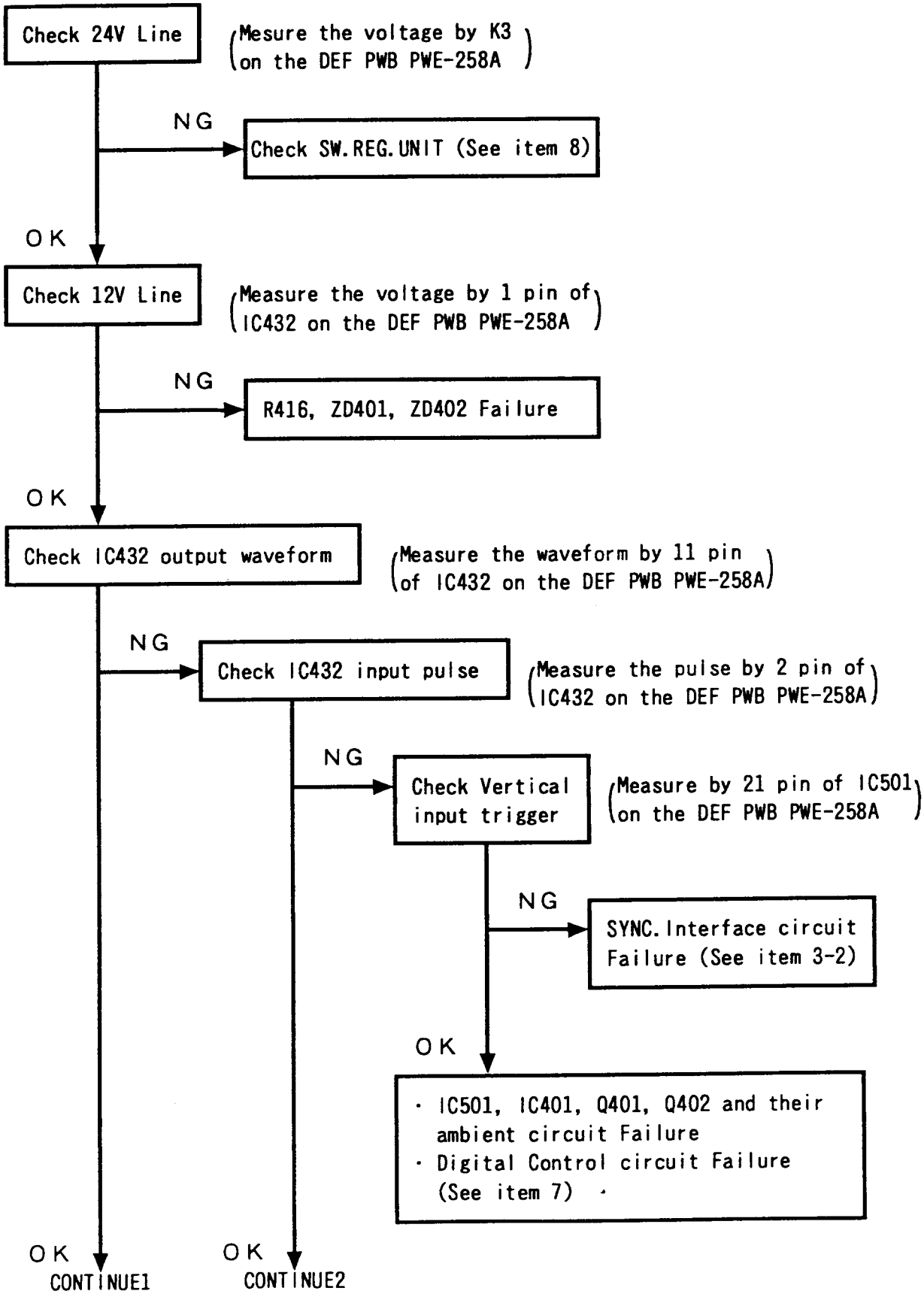


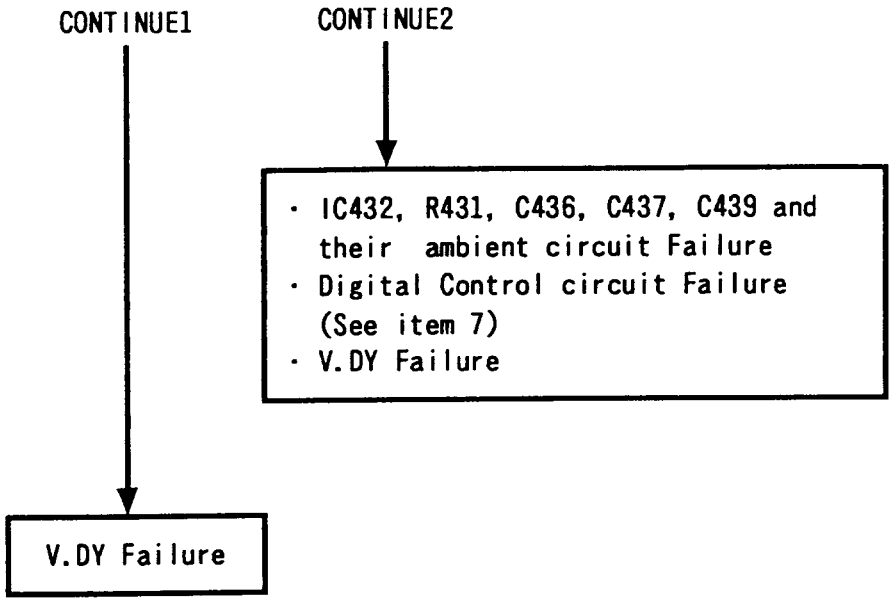


NOTE 1. Q5T0A or D5T2 and Q5U2 will be broken at same time.
2. Q560, D560, D561 or D562 and Q5P0 will be broken at same time.

6. V. OSC/DEF CIRCUIT FAULT

NO RASTER
UNSTABLE PICTURE
ABNORMAL PICTURE

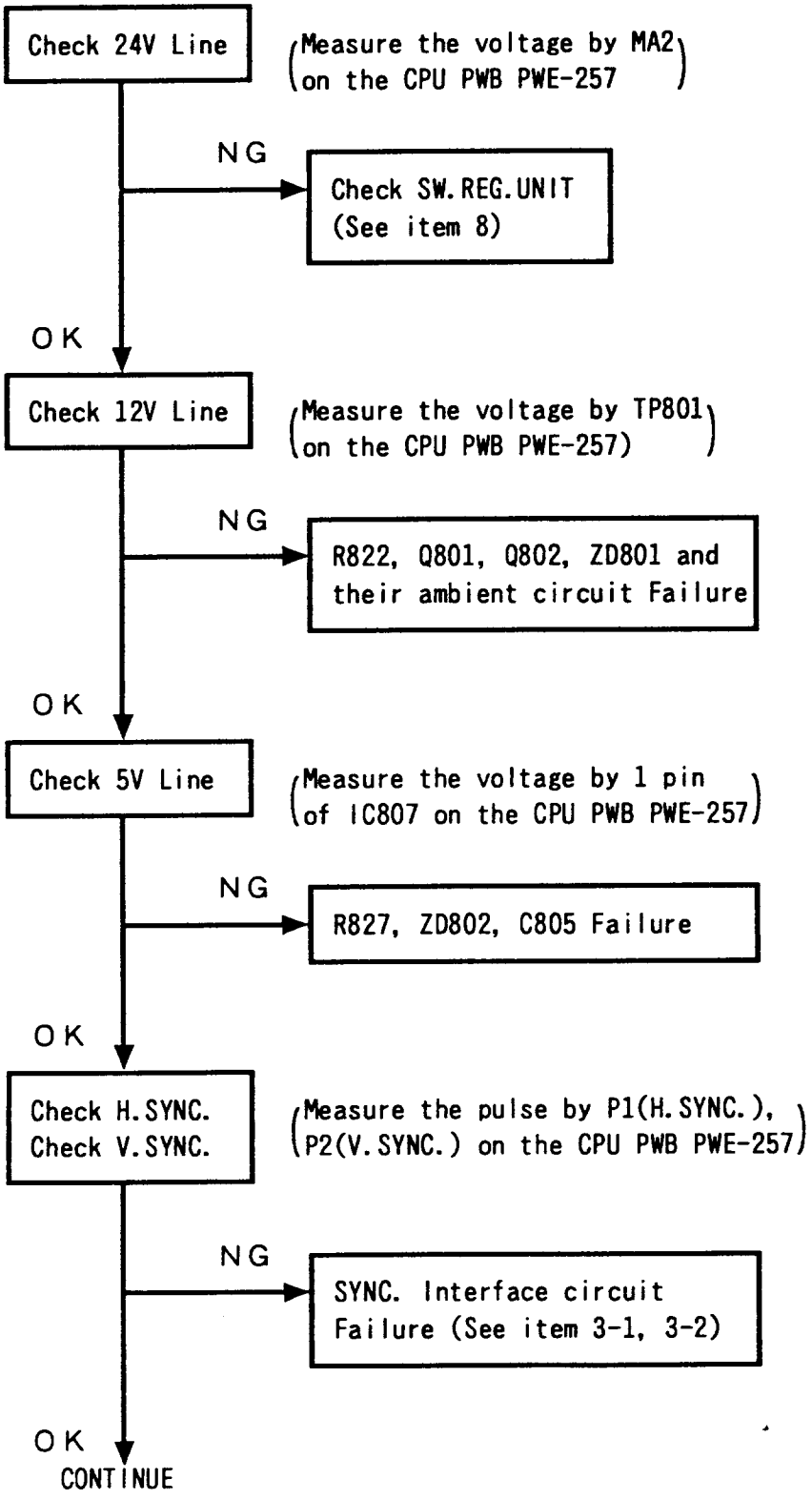



CONTINUE1
CONTINUE2
· IC432, R431, C436, C437, C439 and their ambient circuit Failure
· Digital Control circuit Failure (See item 7)
· V.DY Failure
V.DY Failure

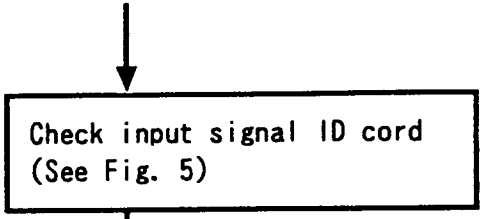
7. DIGITAL CONTROL CIRCUIT FAULT

UNSTABLE PICTURE
ABNORMAL PICTURE

7-1) Digital Control Error



CONTINUE



N.G

INPUT SIGNAL	P3 (HP)	P4 (VP)	P5 (HE)	P6 (VE)	U11 MODE	P1 (fH)	P2 (fV)
PGC	—	—	H	L	H	(1)	0
VGA350	L	H	H	H	H	(1)	0
VGA400	H	L	H	H	H	(1)	0
VGA480	H	H	H	H	H	(1)	0
8514A	—	—	H	H	H	(2)	1
MAC-2	—	—	L	—	H	(2)	0

CONTINUE

↓

IC801, IC802, IC803, IC805, IC806, IC807, X1 and their ambient circuit Failure

7-2) User Control Error

Check user control ID (See Fig. 6)

NG →

- D801~D823, IC804 Failure
- CONTROL PWB PWE-260D Failure

	IC801		
	55pin	56pin	57pin
H.POSI	L	H	H
H.SIZE	H	L	L
V.POSI	H	L	H
V.SIZE	H	H	L
DISABLE	H	H	H

Note) TTL level

	IC801	
	58pin	59pin
U P	H	L
DOWN	L	H
DISABLE	H	H

Note) TTL level

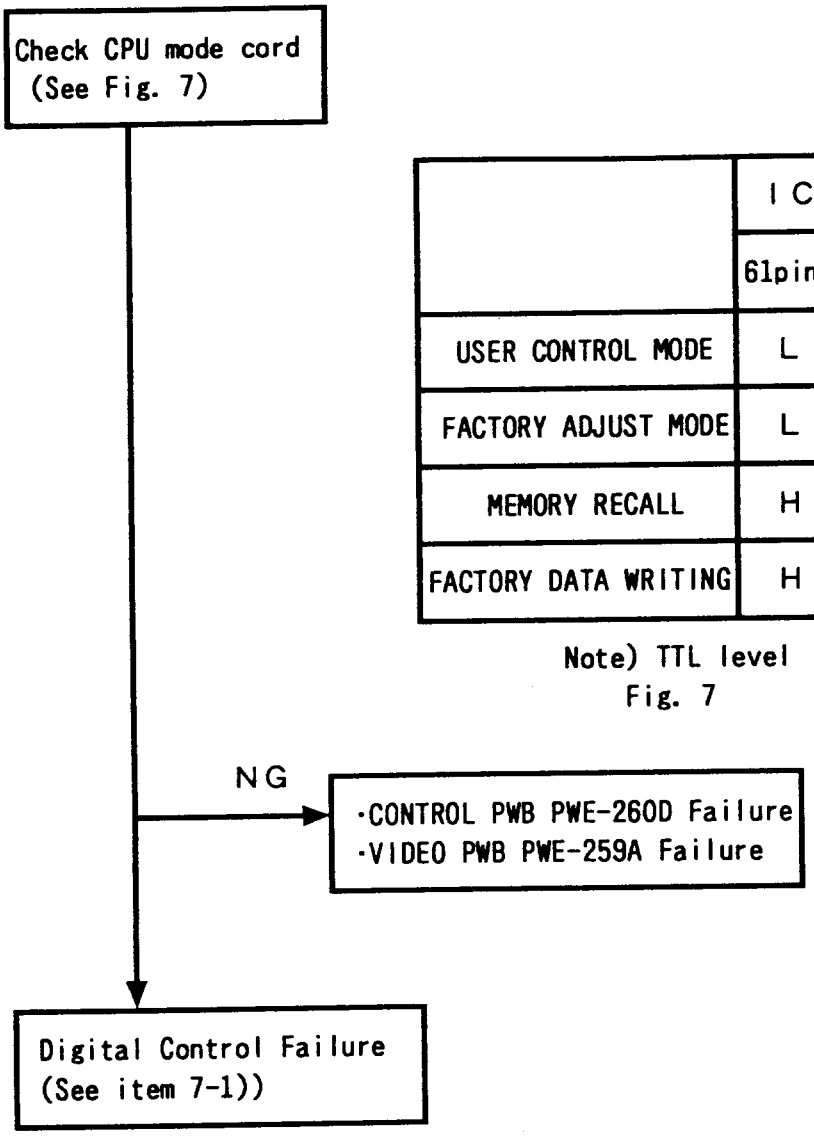
Fig. 6

OK

Digital Control Failure (See item 7-1))

Cf). If two switches are pushed simultaneously, the monitor will become disabled and therefore the user controls will not function.

7-3) Memory Access Error



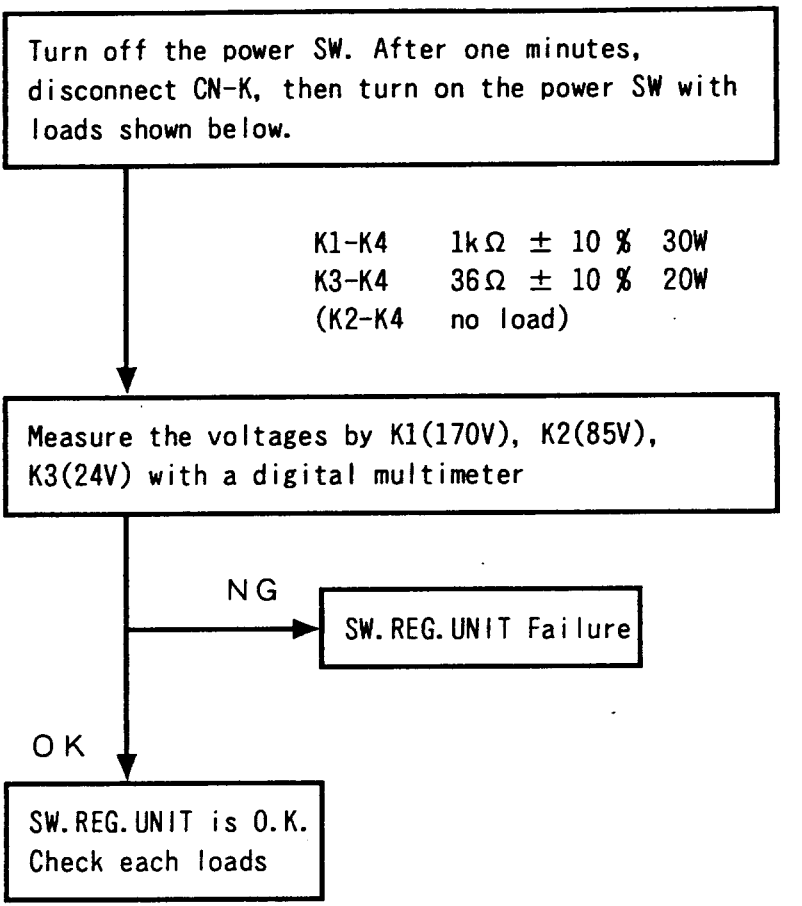
	IC801	
	61pin	62pin
USER CONTROL MODE	L	L
FACTORY ADJUST MODE	L	H
MEMORY RECALL	H	L
FACTORY DATA WRITING	H	H

Note) TTL level

Fig. 7

(Cf). If two different signals are put into this same memory location, the most recent signal will be written to this memory and the previous signal erased. Therefore, an error could occur when the microprocessor will have the same ID cord for two different signals.

8. SWITCHING REGULATOR UNIT



Attention) Do not power on SW.REG.UNIT itself without the loads at K1,K3, or it may misoperate protector.
Do not power on SW.REG.UNIT itself without degaussing coil, or it may cause R641's break.

REPLACEMENT PARTS LIST

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

The components specified for Model JC-1601VME/EE/R

SYMBOL	PARTS NO	DESCRIPTION
*** CRT & TUNER ***		
⚠CRT(JC-1601VME/EE)	33016023	CRT M38KBG26XX18(4)(8)
⚠CRT(JC-1601VMR)	33016024	CRT M38KBG26XX18(4)(8)(R)
*** ICS ***		
IC807	370E6005	IC PST518A
IC432	37006015	IC LA7838 (V OUT)
IC851 IC852	37011018	IC UPC311C (COMP)
IC5B0 IC5H1 IC805	37011048	IC UPC324C (OP-AMP)
IC433 IC5C0 IC804	37011054	IC UPC339C (COMP)
IC853		
IC434 IC5A0 IC5D0	37051036	MOS UPD4066BC
IC502		
IC857	37051179	IC SN74LS123N (MONO MLT)
IC854	37052011	IC SN74LS136N (EX-OR)
IC855	37052129	IC SN74LS05N
IC5T0	37052260	IC SN74LS122N (M-MULTIVI)
IC802	37053266	MOS UPD6336C (D/A CONVERT
IC803	37055216	EEPROM MSM16911RS E-094
IC401 IC430 IC431	37056207	IC UPC358
IC440 IC5Q0 IC5U0		
IC503 IC540 IC8A2		
IC806		
IC751 IC752 IC753	37056433	IC M51399P
⚠IC501	37056494	IC LA7853
IC801	37056680	
IC5P0 IC8A1 IC856	37101127	IC UPC-393C
*** TRANSISTORS ***		
Q802	350D7217	TR 2SC945-T Q
Q5H3	350E3217	TR 2SC1740S-T Q
⚠Q2002 ⚠Q2004 Q401	350E3218	TR 2SC1740S-T R
Q431 Q5K2 Q5P2		
Q5Q2 Q5T2 Q5U0		
⚠Q505 Q542 Q704		
Q705 Q706 Q710		
Q712 Q751 Q754		
Q755 Q756 Q764		
Q8A4 Q8A6 Q851		
Q852 Q858 Q904		
Q908		
Q701 Q702 Q703	350H1811	TR,2SC2901 K-T
Q707 Q708 Q709		
Q853		
Q5H1	350H4417	TR,2SC1473-TA Q
Q5K1 Q5T1 Q5T5	350H5018	TR,2SC3811-TA R
Q7613 Q761G Q761R		
Q766 Q860 Q863		
Q752 Q765 Q8A5	350K4517	TR 2SA933-T Q

SYMBOL	PARTS NO	DESCRIPTION
⚠Q2001 ⚠Q2003 Q402	350K4518	TR 2SA933-T R
Q5K3 Q5P1 Q5P3		
Q5Q0 Q5Q1 Q5T3		
Q5U1 Q501 Q543		
Q5H2 Q901 Q902	35005217	TR 2SA1018 Q
Q903		
Q765B Q765G Q765R	35006804	TR,2SA1538-RA D
Q540	35024812	TR,2SB536 L
Q440	35026217	TR,2SB772 Q
Q8A2	35026218	TR,2SB772 R
Q962 Q963	35053012	TR,2SC1941 L
Q5W0	35056312	TR,2SC2688 L
Q5W1	35058905	TR,2SC1841 E
Q441 ⚠Q503 Q8A1	35065416	TR,2SD882 P
Q8A8		
Q801	35065417	TR,2SD882 Q
Q757 Q758 Q759	35080200	TR 2SC2407/2407A
Q905 Q906 Q907	35084417	TR,2SC1473 Q
Q964	35084600	TR,2SC3675
⚠Q560	35084700	TR,2SC3688
Q763B Q763G Q763R	35086004	TR,2SC3953-RA D
Q764B Q764G Q764R		
Q762B Q762G Q762R	35086504	TR 2SC3950-RA D
Q5T0A	35087700	TR 2SC3685
Q5K0	351G0500	TR,AN1A4M-T
Q432 Q5A0 Q5A1	351G0501	TR,AA1A4M-T
Q5D0 Q5K4 Q5P4		
Q561 Q8A3		
Q5A2 Q5H4 Q502	351G0531	TR,AA1L4M-T
Q504 Q562 Q568		
Q569 Q711 Q854		
Q855 Q856 Q857		
Q564 Q565	35121800	TR,2SK754
Q5P0 Q5U2	35122500	TR 2SK758
Q8A7	35122600	TR 2SK701
Q5T4 Q544	35122700	TR 2SK699
*** DIODES ***		
⚠D2004 ⚠D2005 D401	360K1027	DIODE 1SS132
D431 D432 D433		
D434 D5B0 D5B1		
D5E0 D5E1 D5H0		
D5H1 D5H2 D5H3		
D5H4 D5K0 D5K1		
D5P0 D5P2 D5P5		
D5P6 D5P7 D5Q0		
D5Q1 D5U0 D5U1		
D5V0 D501 D502		
D563 D701 D702		
D703 D704 D705		
D706 D707 D708		
D709 D710 D711		
D712 D713 D714		

SYMBOL	PARTS NO	DESCRIPTION
D715 D716 D717	360K1032	DIODE 1SS82-TA
D718 D719 D720		
D721 D722 D723		
D751 D752 D753		
D760 D761 D8A1		
D8A2 D8A3 D8A4		
D8A5 D8A6 D801		
D802 D803 D804		
D805 D806 D807		
D808 D809 D810		
D811 D812 D813		
D814 D815 D816		
D817 D818 D819		
D820 D821 D822		
D823 D824 D851		
D852 D853 D854		
D855 D857 D859		
D862 D863 D904		
D961		
D5W7 D754 D755	360K1032	DIODE 1SS82-TA
D756 D757 D758		
D759 D901 D902		
D903	360K1032	DIODE 1SS82-TA
ZD5P1	360K3039	DIODE RD12EB-T4
ZD560	360K3056	DIODE RD16EB-T4
ZD751	360K3061	DIODE RD6.8EB-T4
ZD430 ZD752 ZD753	360K3087	DIODE RD3.0EB-T4
ZD754 ZD803		
ZD5K1 ZD802	360K3100	DIODE RD5.1EB (2)-T4
ZD5K0	360K3123	DIODE RD20EB(3)
⚠ZD2001 ⚠ZD2010 ZD5P0	360K3143	DIODE,RD8.2JSB(1)-T4
ZD402 ZD8A3 ZD801	360K3160	DIODE RD8.2EB(2)-T4
ZD501	360K3161	DIODE RD12EB(2)-T4
ZD8A1	360K3169	DIODE RD6.2EB(2)-T4
ZD440	360K3181	DIODE RD11EB(2)-T4
ZD401	360K3188	DIODE RD3.9EB(2)-T4
ZD5T0	360K3403	DIODE RD5.1JSB(1)-T4
ZD5T2 ZD8A2	360K3683	DIODE RD16ESB(2)-T4
ZD441	36003140	DIODE RD9.1EB (2)
⚠ZD502	36003170	DIODE RD6.2JSB(2)
D430 D5P4 D5U3	361K7160	RECTIFIER,SI. TVR-06G G23
D5W4 D5W6 D565		
D566 D567 D8A8		
D8E0 D8E1		
D8A7	36107293	RECTIFIER,SI. RK14
D5T2	36107300	DIODE ERD07-15
D5P3 D5U2	36107507	RECTIFIER,SI RG4
⚠D560	36107515	RECTIFIER,SI. CTU-G3DR
D550	36107527	DIODE,RK14,LF-B2
D564	36107541	DIODE EG01A
⚠D561 ⚠D562	36107560	DIODE RG2A2
D5T0 ⚠D5W1 ⚠D5W3	36107562	DIODE EGP10G
D1	36801023	DIODE,LIGHT-E SEL1320G
⚠D2001 ⚠D2010 D724	38005025	VARISTOR KB-262
D725 D726 D727		
D728 D729 D905		

SYMBOL	PARTS NO	DESCRIPTION
*** TRANSFORMERS ***		
T5T0 T550	45804007	TRANS,H.DRIVE
T5P0 T5U1	46302102	TRANS FERRITE
T8A1	46305103	TRANS CONVERTER
⚠T5T1	47105655	F.B.T
⚠T560	47710010	TRANS,H.OUT
*** VARIABLE RESISTORS ***		
C965	39510019	H.V CR BLOCK
VR11 VR12	41023603	R,VARIABLE B10K-V
VR751 VR752 VR753	41071207	R,VARIABLE B1.0K
VR754 VR755 VR756		
VR8A1		
VR403 VR405 VR501	41085008	R,VARIABLE B5K
VR570 VR960		
VR402	41085010	R,VARIABLE B20K
VR404	41085012	R,VARIABLE B50K
VR401 VR901 VR902	41085013	R,VARIABLE B100K
VR903 VR904 VR906		
VR5D0 VR5F0 VR907	41085014	R,VARIABLE B200K
⚠VR530	41085055	R,VARIABLE B1K
VR801	41085057	R,VARIABLE B3K
VR5T1	41085059	R,VARIABLE B10K
VR5J0	41085063	R,VARIABLE B100K
⚠VR2002 ⚠VR2003 ⚠VR5V1	41505008	R,VARIABLE B10K
*** RELAYS & SWITCHES ***		
SW1 (SYNC)	65161048	SWITCH,SLIDE
S11 S12 S13	65163002	SWITCH,SLIDE
SW1 (POWER)	65260002	SWITCH,SEE-SAW
(DEGAUSSING)	65360009	SWITCH,PUSH BUTTON
S801 S802 S803	65361008	SWITCH,PUSH BUTTON
S804 S805 S806		
S807 S808		
S809	65361012	PUSH SWITCH
RL550	65602521	RELAY G6C-1114P
*** COILS & FILTERS ***		
LC705 LC706 LC707	39099014	FILTER
LC704 LC708 LC709	39099015	FILTER ZJSC-2R2-101
LC701 LC702 LC703	39099027	FILTER ZJSC-R12-100
⚠L564	60918109	COIL,H.LIN
L560 ⚠L561	60919112	COIL,H.LIN
L751 L752 L753	610F6014	COIL,FILTER 5.6UH
L901	610F8002	COIL,FILTER PR33MAT

SYMBOL	PARTS NO	DESCRIPTION
L754 L755 L756	610F8009	COIL,FILTER
L902 L903	610F8035	COIL,FILTER PR27MAT
L757 L758 L759	610F8038	COIL,FILTER PR82MAT
L8A1 L8A2	61055003	COIL,FILTER 50UH
	61062080	POWER LINE FILTER
L5P1 L5P2 L5U0	61064006	COIL,FILTER 50UH
L5U2		
L5T1	61067009	COIL,FILTER 2.2UH
L563	61070135	FILTER CHOKE 4MH
L5U1	61070136	FILTER CHOKE 4MH
L5P0	61070137	FILTER CHOKE 2.5MH
L562	61099019	COIL,CHOKE
L8A3	61099047	FILTER CHOKE
DEG	61316201	COIL,DEGAUSSING
L904	61605032	FERRITE BEADS
LC710 LC711 LC712	61606027	NOISE FILTER 2A222M
LC903		
LC901 LC902 LC904	61606028	NOISE FILTER 1H223X

*** PWB ASSYS ***

	84K99C01	VIDEO PWB ASSY
	84K99D01	DEF PWB ASSY
	84K99J01	CRT PWB ASSY
	84K99K01	CPU PWB ASSY
	84K99L01	CONTROL PWB ASSY

*** ELECTRICAL PARTS & MISCELLANEOUS PARTS ***

CN-D1	70056384	MINI,D-SUB SOCKET 15PV
CN-D2	70056385	D-SUB SOCKET 15PV
	31104012	SW REG UNIT DL398H
IC432	31709202	SHEET,INSULATOR
D560 Q5T0A Q560	31709503	SHEET,INSULATOR
SG901 SG902 SG903	32990047	ARRESTER
SG904		
⚠L5T0	49801008	INDUCTOR DUMMY
X1	64098031	X'TAL 12000KHZ
SG905	66706001	SPARK GAP 1.2KV
	70032026	SG/CRT SOCKET
CN-CE CN-CT CN-CT1	73721003	CONNECTOR PIN 2P
CN-CT2 CN-CT3 CN-CT4		
	73893068	SIGNAL CABLE 15P-15P
⚠F601 ⚠F651	79P03536	FUSE 250V3.15A
	74004891	CAP
(JC-1601VME)	70800031	LINE CORD(E)
(JC-1601VMEE)	70800322	LINE CORD BS
(JC-1601VMR)	75513006	LINE CORD SAAL2.0

*** KNOBS & PUSH BUTTONS ***

	25453142	KNOB,SLIDE CONTROL
	25453171	PUSH BUTTON(A)

SYMBOL	PARTS NO	DESCRIPTION

*** APPEARANCE PARTS ***

	24514792	COIL SPRING
	25310952	CABINET FRONT ASSY
	25310961	CABINET BACK
	25411171	ESCUTCHEON
	25408201	SPINDLE
	25413581	LID,CONTROL ASSY
	25411741	REVOLING STAND(T)
	25411751	REVOLING STAND(B)

*** PRINTED & PACKING MATERIALS ***

(JC-1601VME/R)	24806961	BAG,POLYETHYLENE(270*370)
(JC-1601VME/R)	24813191	BAG,POLYETHYLENE(150*370)
	25815061	BAG,POLYETHYLENE (270X370
(JC-1601VMEE)	24813501	BAG,POLYETHYLENE
	25817571	FILLER T,CARTON
	25817582	FILLER B,CARTON
	78122661	INSTRUCTION BOOK
	78034401	MONITOR SALES OFFICE LIST
	599910294	JC-1601VME/EE/R S/M
(JC-1601VME)	25818631	CARTON BOX
(JC-1601VMEE)	25818861	CARTON BOX
(JC-1601VMR)	25818851	CARTON BOX
(JC-1601VME)	25770981	NAME PLATE, INSTRUCTION
(JC-1601VMEE)	25770581	NAME PLATE, INSTRUCTION
(JC-1601VMR)	25770571	NAME PLATE, INSTRUCTION

*** RESISTORS ***

⚠R528	401C6681	R,CARBON 2.2K 5% 1/4W
⚠R2008 ⚠R2009	401K5649	R,CARBON 100H 5% 1/6W
⚠R529	401K5673	R,CARBON 1.0K 5% 1/6W
⚠R530	401K5681	R,CARBON 2.2K 5% 1/6W
⚠R2002 ⚠R2012	401K5685	R,CARBON 3.3K 5% 1/6W
⚠R5V6 ⚠R532	401K5691	R,CARBON 5.6K 5% 1/6W
⚠R5V5	401K5693	R,CARBON 6.8K 5% 1/6W
⚠R531	401K5694	R,CARBON 7.5K 5% 1/6W
⚠R2001 ⚠R2010	401K5695	R,CARBON 8.2K 5% 1/6W
⚠R2003 ⚠R2011	401K5697	R,CARBON 10K 5% 1/6W
⚠R2004 ⚠R2006 ⚠R501	401K5699	R,CARBON 12K 5% 1/6W
⚠R2005 ⚠R2007	401K5707	R,CARBON 27K 5% 1/6W
⚠R5V4	401K5753	R,CARBON 2.2M 5% 1/6W
R788B R788G R788R	40216281	R,WIRE 820H 5% 10W
⚠R8Z1	40371101	R,METAL 1.0H 5% 1W
⚠R8H0	40371109	R,METAL 2.2H 5% 1W
R8H2	40371127	R,METAL 12H 5% 1W
R8H1	40371137	R,METAL 33H 5% 1W
⚠R8A1	40809937	R,FUSE 33H 5% 1/4W
⚠R789B ⚠R789G ⚠R789R ⚠R790B ⚠R790G ⚠R790R	40177133	R,CARBON 22H 5% 1/4W

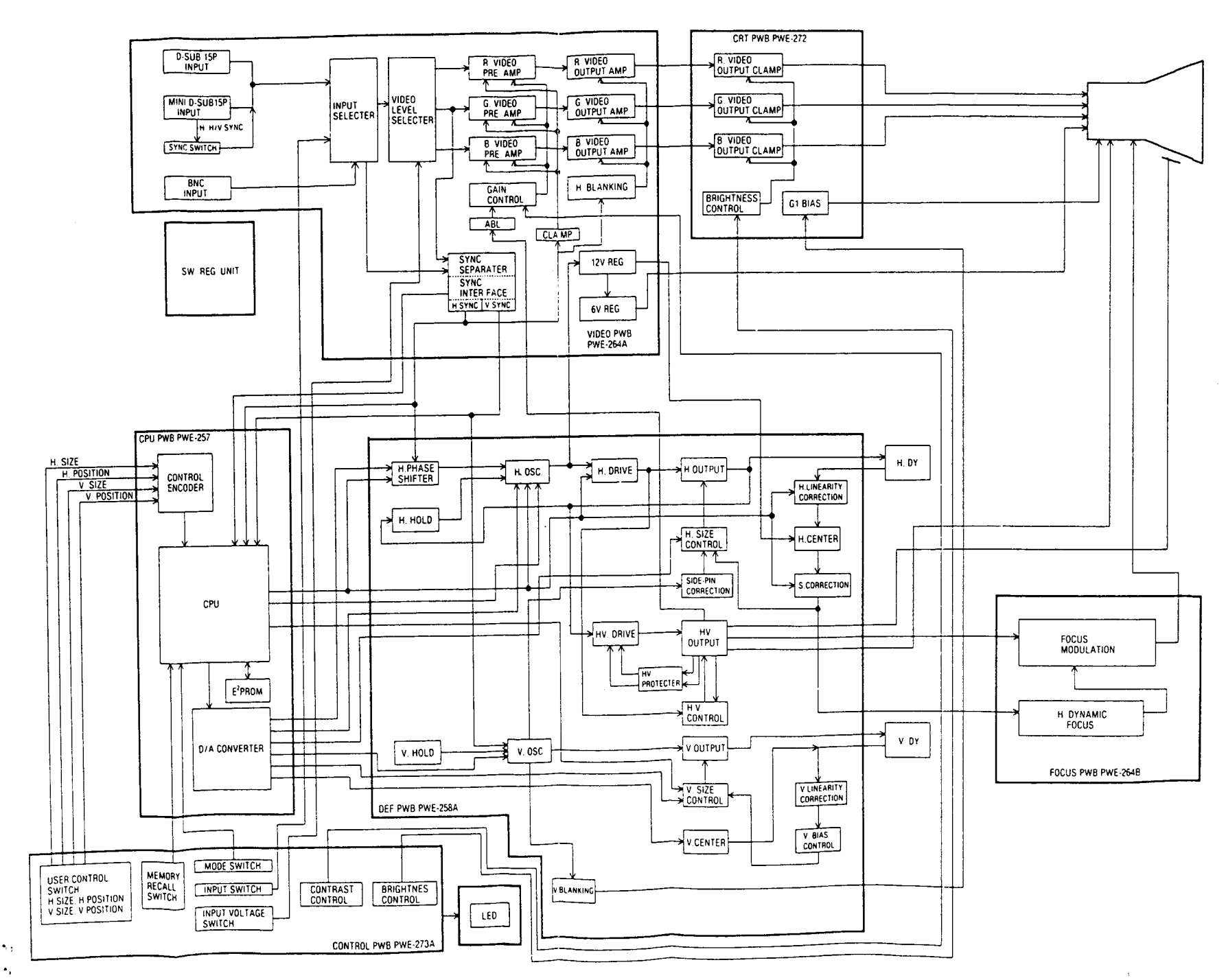
SYMBOL	PARTS NO	DESCRIPTION
R784B R784G R784R R798 R827	40371141 40371153	R,METAL 47H 5% 1W R,METAL 150H 5% 1W
R828	40371155	R,METAL 180H 5% 1W
R416	40371165	R,METAL 470H 5% 1W
R967	40371197	R,METAL 10K 5% 1W
R431	40372103	R,METAL 1.2H 5% 2W
R512F	40372107	R,METAL 1.8H 5% 2W
R551	40372108	R,METAL 2.0H 5% 2W
R8H3	40372119	R,METAL 5.6H 5% 2W
R555	40372133	R,METAL 22H 5% 2W
R440	40372149	R,METAL 100H 5% 2W
R441	40372153	R,METAL 150H 5% 2W
R430	40372157	R,METAL 220H 5% 2W
R513	40372159	R,METAL 270H 5% 2W
R5T9	40372201	R,METAL 15K 5% 2W
R971A R971B	40372209	R,METAL 33K 5% 2W
R510A	40373125	R,METAL 10H 5% 3W
R542	40373151	R,METAL 120H 5% 3W
R5T3 R5T4	40373153	R,METAL 150H 5% 3W
R536 R536A	40373197	R,METAL 10K 5% 3W
R504	40373219	R,METAL 82K 5% 3W
⚠R5V2	404C1731	R,METAL 270K 1% 1/6W
⚠R5V3	404C1735	R,METAL 390K 1% 1/6W
⚠R5W3 ⚠R5W4 ⚠R5W5	40405109	R,METAL 2.2H 5% 1/4W
⚠R569		
⚠R527 ⚠R568 ⚠R8G9	40405117	R,METAL 4.7H 5% 1/4W
⚠R5W6	40405133	R,METAL 22H 5% 1/4W
⚠R540	40405137	R,METAL 33H 5% 1/4W
⚠R5P3	40405141	R,METAL 47H 5% 1/4W
⚠R541	40801004	R,FUSE 1H 500MA
⚠R574	40812649	R,FUSE 100H 5% 1/2W
⚠R554	40812661	R,FUSE 330H 5% 1/2W

*** CAPACITORS ***

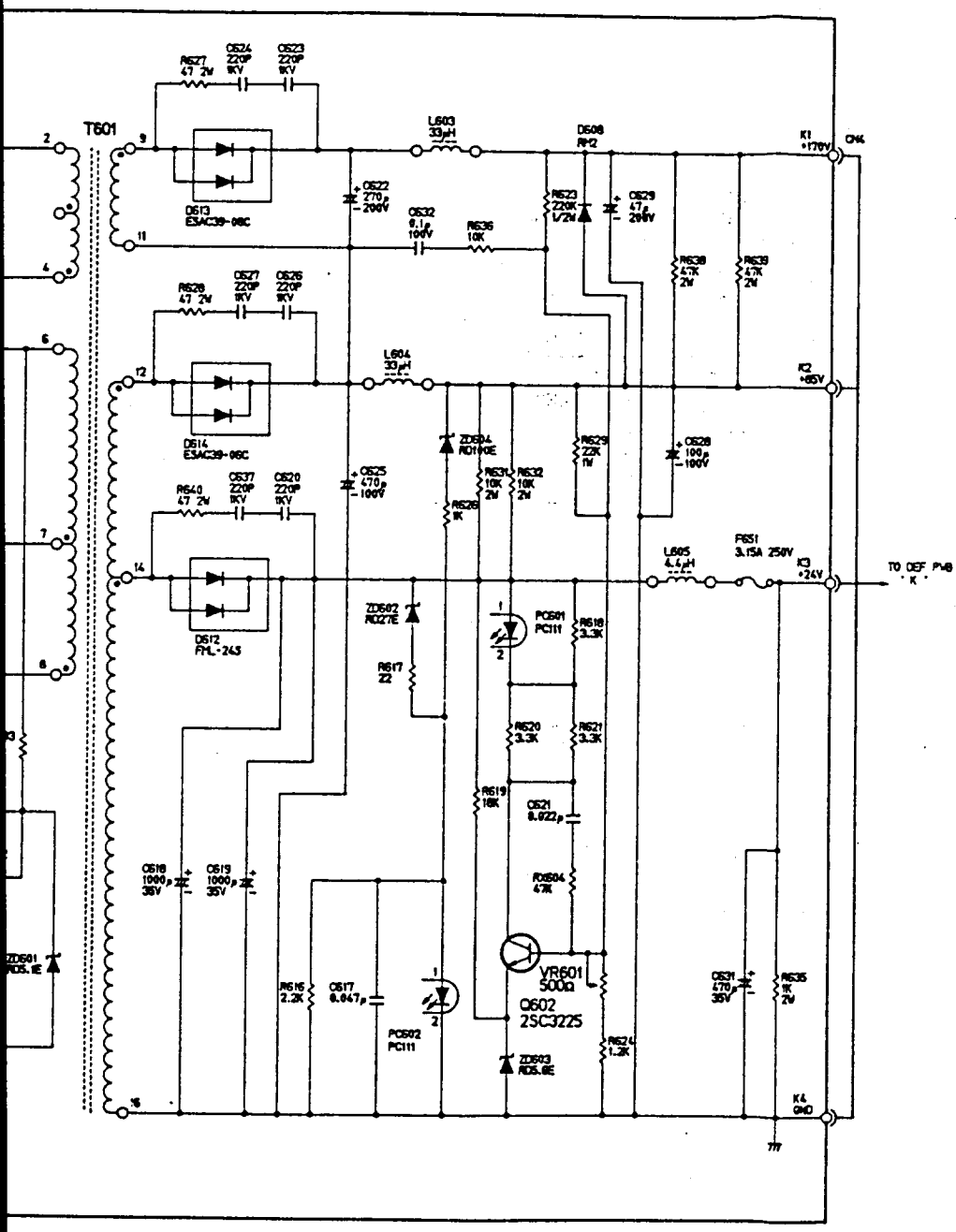
C566A C567A C918	420B9525 420C9551	C,CERAMIC 50V 0.01UF C,CERAMIC 500V 100PF
C5P7 C562 ⚠C571 ⚠C563	420C9560 420C9561	C,CERAMIC 500V 560PF C,CERAMIC 500V 680PF
C5W9 C909 C910 C911 C919	420C9563	C,CERAMIC 500V 0.001UF
C5T5	420C9565	C,CERAMIC 500V 1500PF
C542 C917	420C9567	C,CERAMIC 500V 2200PF
C788B C788G C788R	420C9569	C,CERAMIC 50V 3300PF
C8A9 C5A1 C814 C915	420J9069 42040108	C,CERAMIC 50V 0.1UF C,CERAMIC 2KV 0.01UF
C540 C816 C817 C818 C819 C820 C821	421A0425	C,CERAMIC 50V 0.01UF
C434 C5K1 C968 C966 C5Q7	421C0205 421C0207 421C0209	C,CERAMIC 50V 220PF C,CERAMIC 50V 330PF C,CERAMIC 50V 470PF

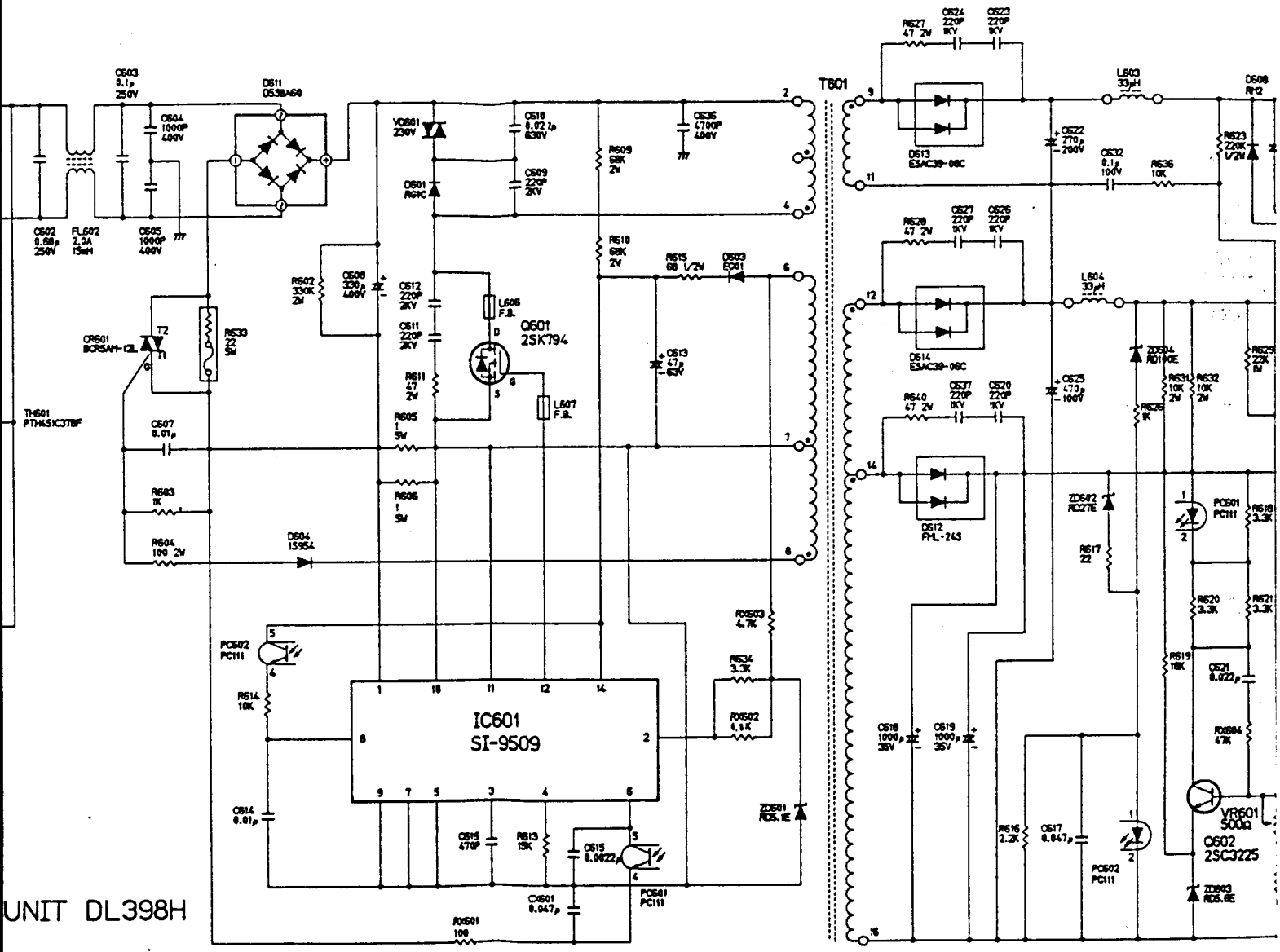
SYMBOL	PARTS NO	DESCRIPTION
C5B2 C524 C751 C752 C753 C779 C780 C781 C8A5 C815	421C0213	C,CERAMIC 50V 1000PF
C962 C963	421C0221	C,CERAMIC 50V 4700PF
C5P2 C5U2 C766	421C0225	C,CERAMIC 50V 0.01UF
C767 C768 C774 C8A8		
C5H0 C5H2 C5K0 C5W0 C5W1 C508 C523 C8Z2 C912 C964	421J9001	C,CERAMIC 50V 0.1UF
C462	4213K210	C,CERAMIC 50V 560PF
C8A1	423A1028	C,CERAMIC 50V 20PF
C967	423A1049	C,CERAMIC 50V 150PF
C862 C863	423A1101	C,CERAMIC 50V 470PF
C808 C809	423A2015	C,CERAMIC 50V 10PF
C5R0	423A2028	C,CERAMIC 50V 20PF
C5Q5	423A2029	C,CERAMIC 50V 22PF
C5Q4	423A2031	C,CERAMIC 50V 27PF
C8Z8	423A2033	C,CERAMIC 50V 33PF
C501 C511	423A2045	C,CERAMIC 50V 100PF
C785B C785G C785R	423A2102	C,CERAMIC 50V 150PF
C512	423A2103	C,CERAMIC 50V 180PF
C502	423A2105	C,CERAMIC 50V 270PF
C5D0	427A7001	C,FILM 100V 0.001UF
C507	427A7003	C,FILM 100V 0.0015UF
C5F0	427A7004	C,FILM 100V 0.0018UF
C402 C5Q2 C860 C861	427F4001	C,FILM 50V 1000PF
C5V0	427F4002	C,FILM 50V 1200PF
C503 C8A2	427F4004	C,FILM 50V 1800PF
C461 C8A3	427F4009	C,FILM 50V 4700PF
C506	427F4011	C,FILM 50V 6800PF
C5B1 C5P9 C855 C856	427F4013	C,FILM 50V 0.01UF
C403	427F4015	C,FILM 50V 0.015UF
C438	427F4017	C,FILM 50V 0.022UF
C5P1 C5U1 C5U8	427F4021	C,FILM 50V 0.047UF
C5P8	427F4022	C,FILM 50V 0.056UF
C401 C439 C440	427F4025	C,FILM 50V 0.1UF
C450 C5H1 C5H4 C5Q6 C5U6 C854 C5U1A	427F4063	C,FILM 50V 0.01UF
C905	427F4075	C,FILM 50V 0.1UF
C451	42701127	C,FILM 50V 0.22UF
C920	42754163	C,FILM 100V 0.01UF
C5H3	4276D029	C,FILM 50V 0.22UF
C5T1	4276H225	C,FILM 50V 1000PF
⚠C5T7	42808503	C,METAL 1600V 1200PF
⚠C5T6	42808505	C,METAL FILM 1.6KV 1500PF
C431 C509	4282C025	C,METAL FILM 50V 1UF
C901 C902 C903	42840097	C,FILM 250V 0.22UF
C569	42840229	C,FILM 630V 47000PF
⚠C560 ⚠C561	42842502	C FILM 1600V 3000PF
⚠C567	42843501	C,FILM 200V 0.82UF

SYMBOL			PARTS NO	DESCRIPTION
C914			42899010	C,METAL FILM 250V 0.22UF
⚠C566			42899015	C,METAL FILM 400V 0.47UF
⚠C564			42899042	C,METAL FILM 400V 0.64UF
C5W6			430B3166	C,ELEC 100V 10UF
C787B	C787G	C787R	430B3182	C,ELEC 160V 1UF
C5P5			430B5107	C,ELEC 50V 22UF
⚠C2001			430B6026	C,ELEC 16V 22UF
C756			430B6041	C,ELEC 25V 47UF
C5Q0	C522		430B6061	C,ELEC 50V 1UF
C5J0	C760	C761	430B6063	C,ELEC 50V 3.3UF
C762				
C5B0			430B6064	C,ELEC 50V 4.7UF
C405	C5Q3	⚠C5W3	430B6065	C,ELEC 50V 10UF
⚠C5W5	C505	C804		
C807				
⚠C2010	C5U0		430B6066	C,ELEC 50V 22UF
C5U9			430B6532	C,ELEC 200V 1UF
C8E4			430B9061	C,ELEC 50V 1UF
⚠C519	C801	C805	430B9065	C,ELEC 50V 10UF
C813				
⚠C520			430B9068	C,ELEC 50V 47UF
C906			430B9512	C,ELEC 160V 1UF
C916			430B9556	C,ELEC 250V 10UF
C776	C777	C778	430C2344	C,ELEC 16V 470UF
C570			4302C182	C,ELEC 160V 1UF
C5T4			4302J066	C,ELEC 50V 22UF
C5W8			4302J532	C,ELEC 200V 10UF
C436			43029073	C,ELEC,50V 1000UF
C5P6	C907	C908	43029512	C,ELEC,160V 1UF
C5T8			43029515	C,ELEC,160V 4.7UF
C5P0	C5U3	C5U4	4304A012	
C5U5			43041001	C,ELEC 160V 47UF
C5P3			4309J021	C,ELEC 160V 3.3UF
C5P4			4309J040	C,ELEC 160V 10UF


D-SUB 15P INPUT
MINI D-SUB15P INPUT
H. H/V SYNC
SYNC SWITCH
BNC INPUT
INPUT SELECTER
VIDEO LEVEL SELECTER
R VIDEO PRE AMP
G VIDEO PRE AMP
B VIDEO PRE AMP
R VIDEO OUTPUT AMP
G VIDEO OUTPUT AMP
B VIDEO OUTPUT AMP
GAIN CONTROL
H BLANKING
ABL
CLAMP
SW REG UNIT
SYNC SEPARATER
SYNC INTER FACE
H SYNC
V SYNC
12V REG
6V REG
VIDEO PWB PWE-264A
CRT PWB PWE-272
R VIDEO OUTPUT CLAMP
G VIDEO OUTPUT CLAMP
B VIDEO OUTPUT CLAMP
BRIGHTNESS CONTROL
G1 BIAS
CPU PWB PWE-257
H. SIZE
H. POSITION
V. SIZE
V. POSITION
CONTROL ENCODER
CPU
E²PROM
D/A CONVERTER
H PHASE SHIFTER
H. OSC
H. DRIVE
H OUTPUT
H. DY
H. HOLD
H.LINEARITY CORRECTION
H.CENTER
H. SIZE CONTROL
SIDE-PIN CORRECTION
S.CORRECTION
HV DRIVE
HV OUTPUT
HV PROTECTER
H V CONTROL
V. HOLD
V. OSC
V OUTPUT
V DY
V. SIZE CONTROL
V LINEARITY CORRECTION
V CENTER
V BIAS CONTROL
V BLANKING
DEF PWB PWE-258A
FOCUS MODULATION
H DYNAMIC FOCUS
FOCUS PWB PWE-264B
USER CONTROL SWITCH
H SIZE H POSITION
V SIZE V POSITION
MEMORY RECALL SWITCH
MODE SWITCH
INPUT SWITCH
INPUT VOLTAGE SWITCH
CONTRAST CONTROL
BRIGHTNES CONTROL
LED
CONTROL PWB PWE-273A

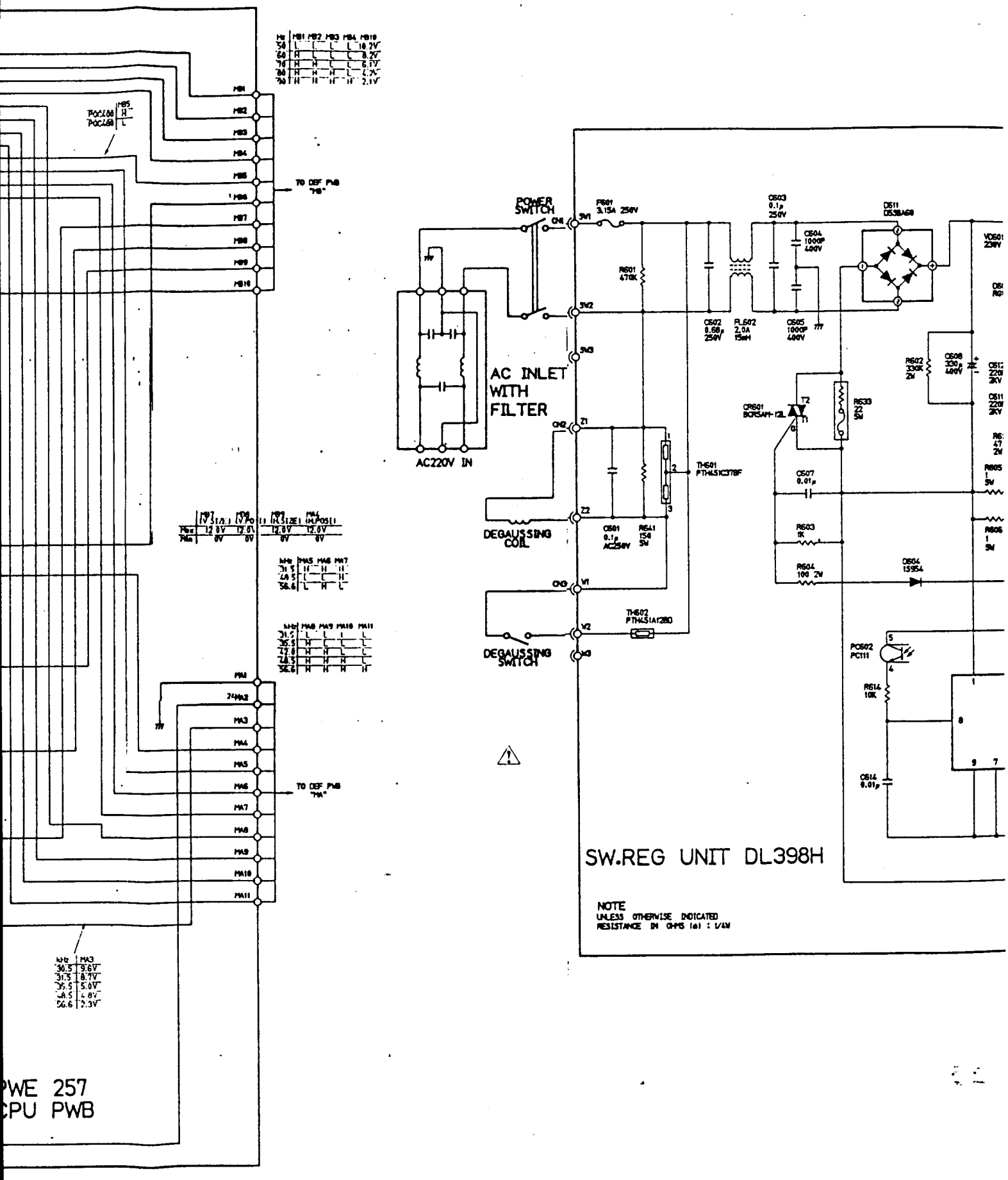
RUN NO.1

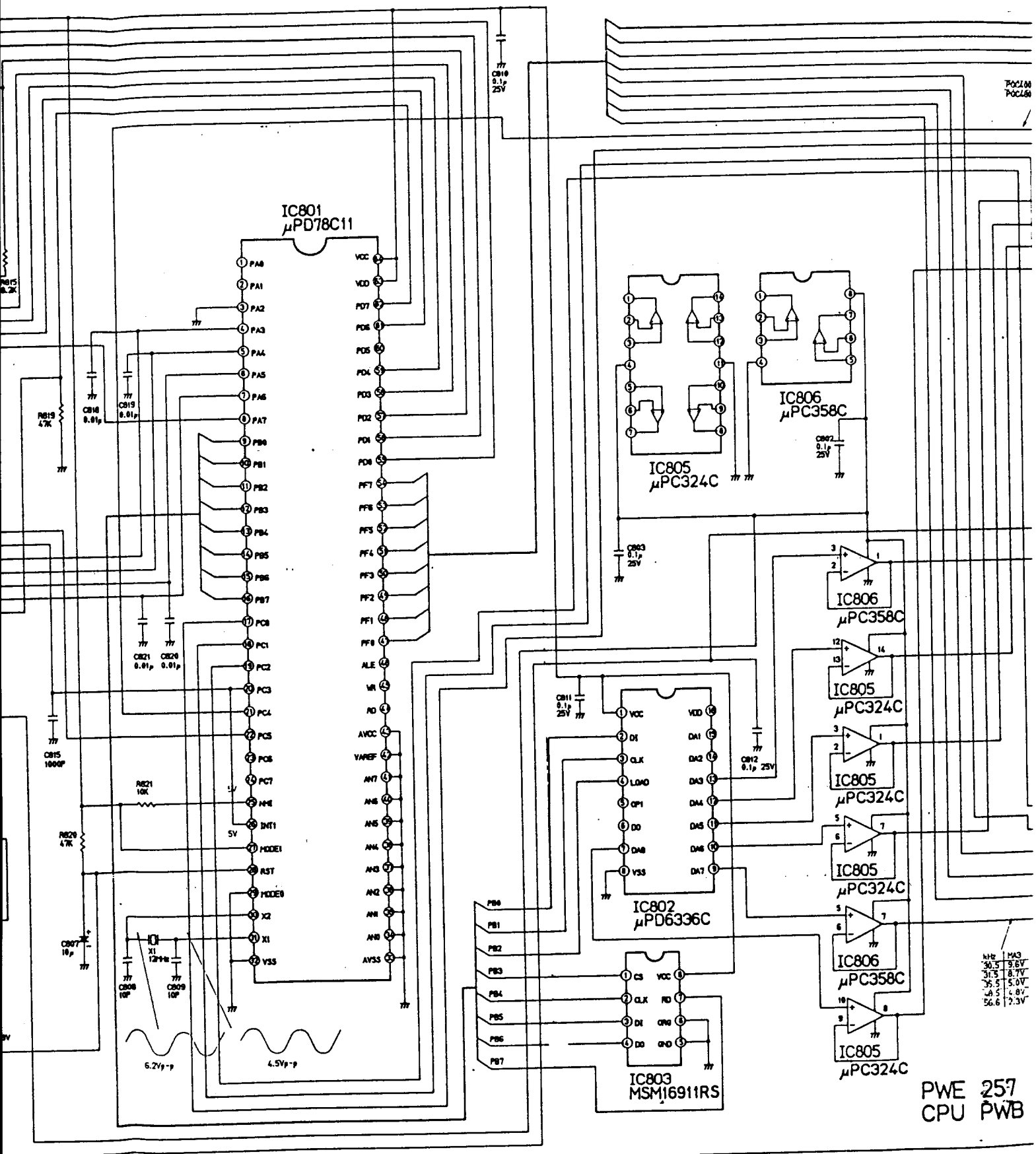

T601
D513 ESAC39-06C
D514 ESAC39-06C
D512 FYL-245
L603 33μH
L604 33μH
L605 4.4μH
D508 RM2
K1 +170V
K2 +65V
K3 +24V
K4 GND
CN4
TO DEF PWB "K"
FR51 3.15A 250V
ZD604 RD100E
ZD602 RD27E
ZD603 RD5.6E
PC601 PC111
PC602 PC111
VR601 500Ω
Q602 2SC3225
R627 47 2W
R628 47 2W
R640 47 2W
R636 10K
R638 47K 2W
R639 47K 2W
R623 220K 1/2W
R629 22K 1W
R631 10K 2W
R632 10K 2W
R626 1K
R617 22
R618 3.3K
R620 3.3K
R621 3.3K
R619 18K
R604 47K
R616 2.2K
R624 1.2K
R635 1K 2W
C524 220P 1KV
C523 220P 1KV
C527 220P 1KV
C526 220P 1KV
C637 220P 1KV
C620 220P 1KV
C622 270μ 200V
C632 0.1μ 100V
C629 47μ 200V
C625 470μ 100V
C628 100μ 100V
C618 1000μ 35V
C619 1000μ 35V
C621 0.022μ
C617 0.047μ
C631 470μ 35V



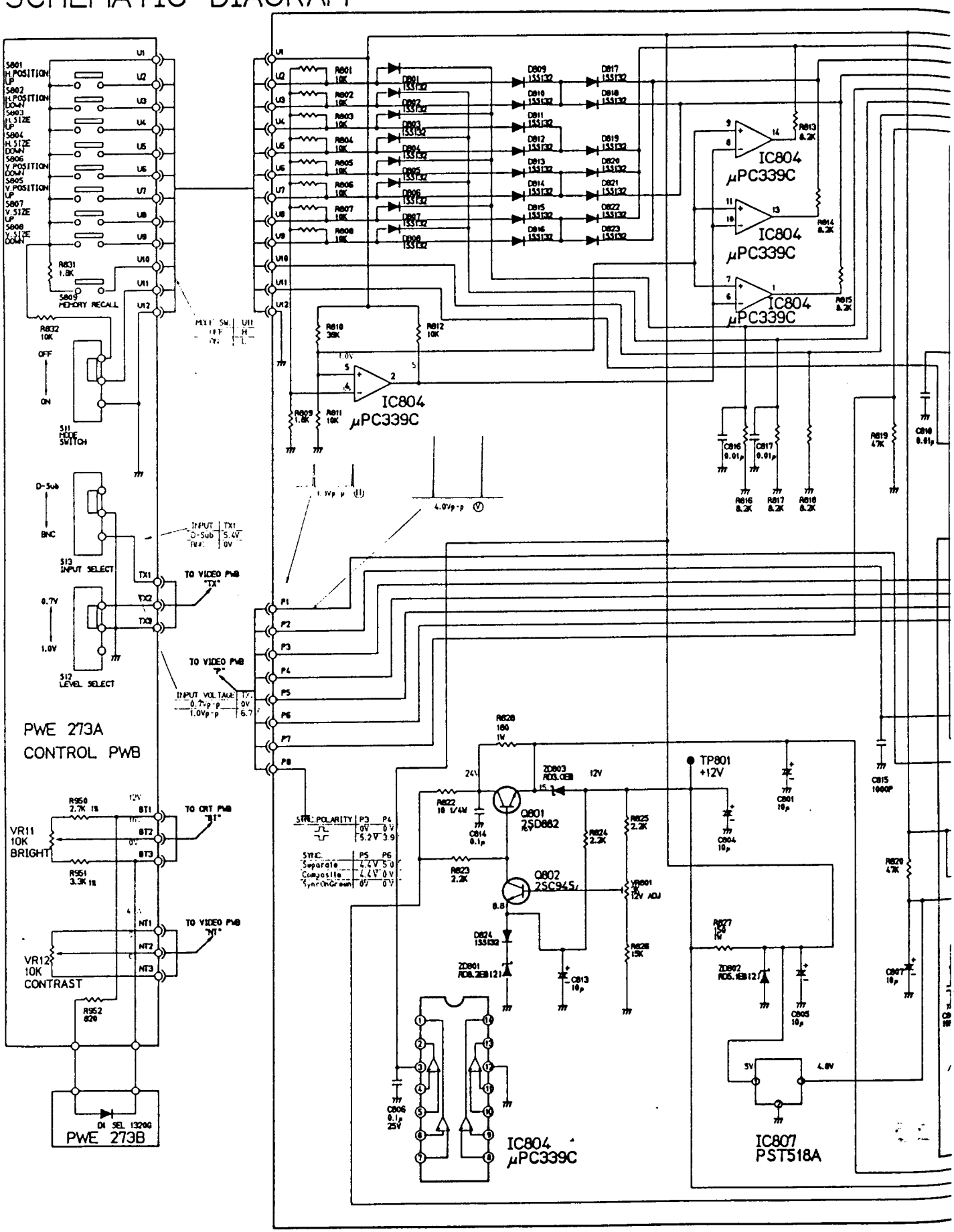
UNIT DL398H

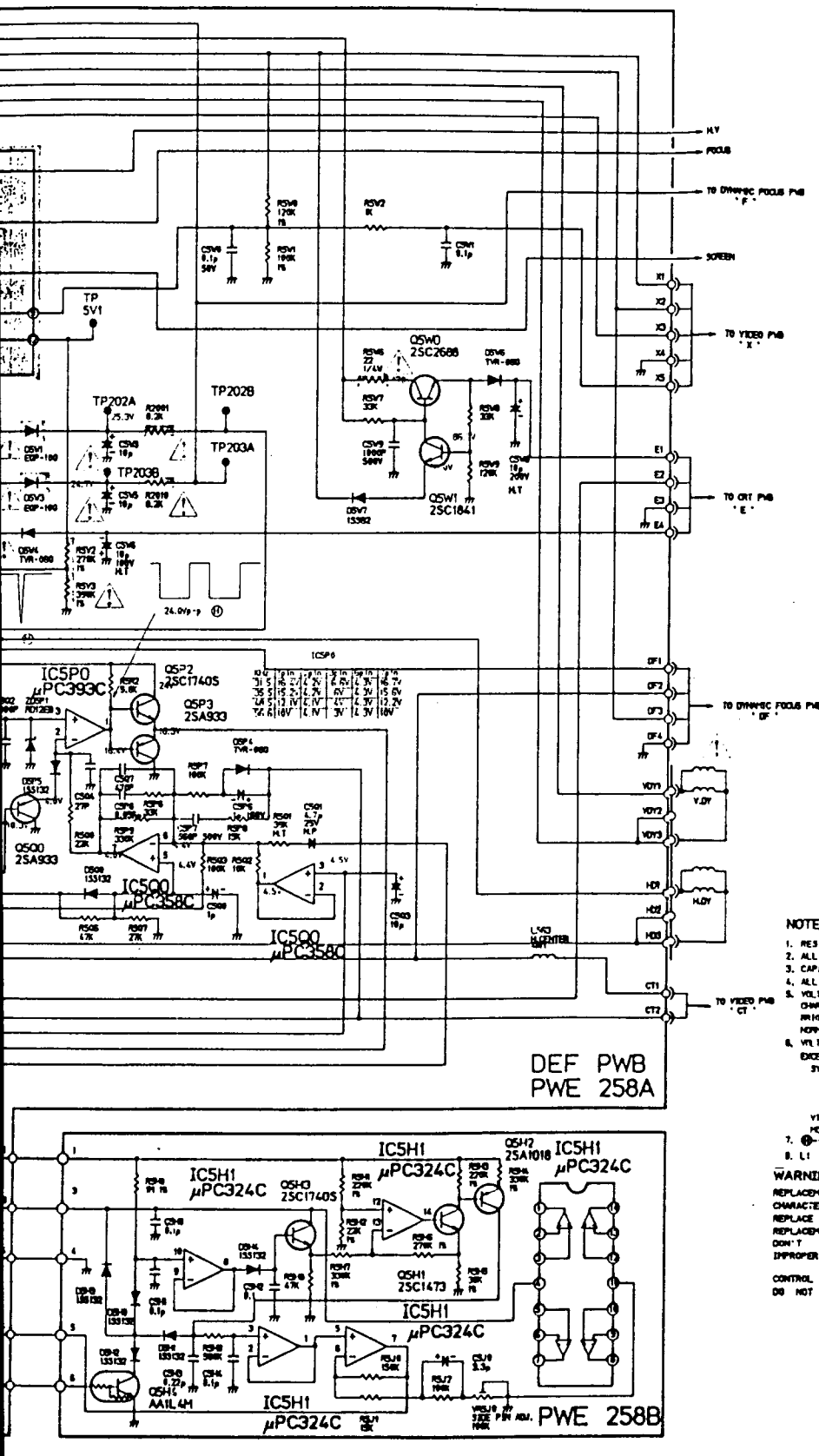
INDICATED
5 (a) : 1/4W


POWER SWITCH
AC INLET WITH FILTER
AC220V IN
DEGAUSSING COIL
DEGAUSSING SWITCH
TO DEF PWB "MB"
TO DEF PWB "MA"
SW.REG UNIT DL398H
NOTE
UNLESS OTHERWISE INDICATED
RESISTANCE IN OHMS (Ω) : 1/4W
PWE 257
CPU PWB


IC801
μPD78C11
IC805
μPC324C
IC806
μPC358C
IC802
μPD6336C
IC803
MSM16911RS
6.2Vp-p
4.5Vp-p
PWE 257
CPU PWB

MODEL JC-1601VME/EE/R
CPU/SW PWB
SCHEMATIC DIAGRAM





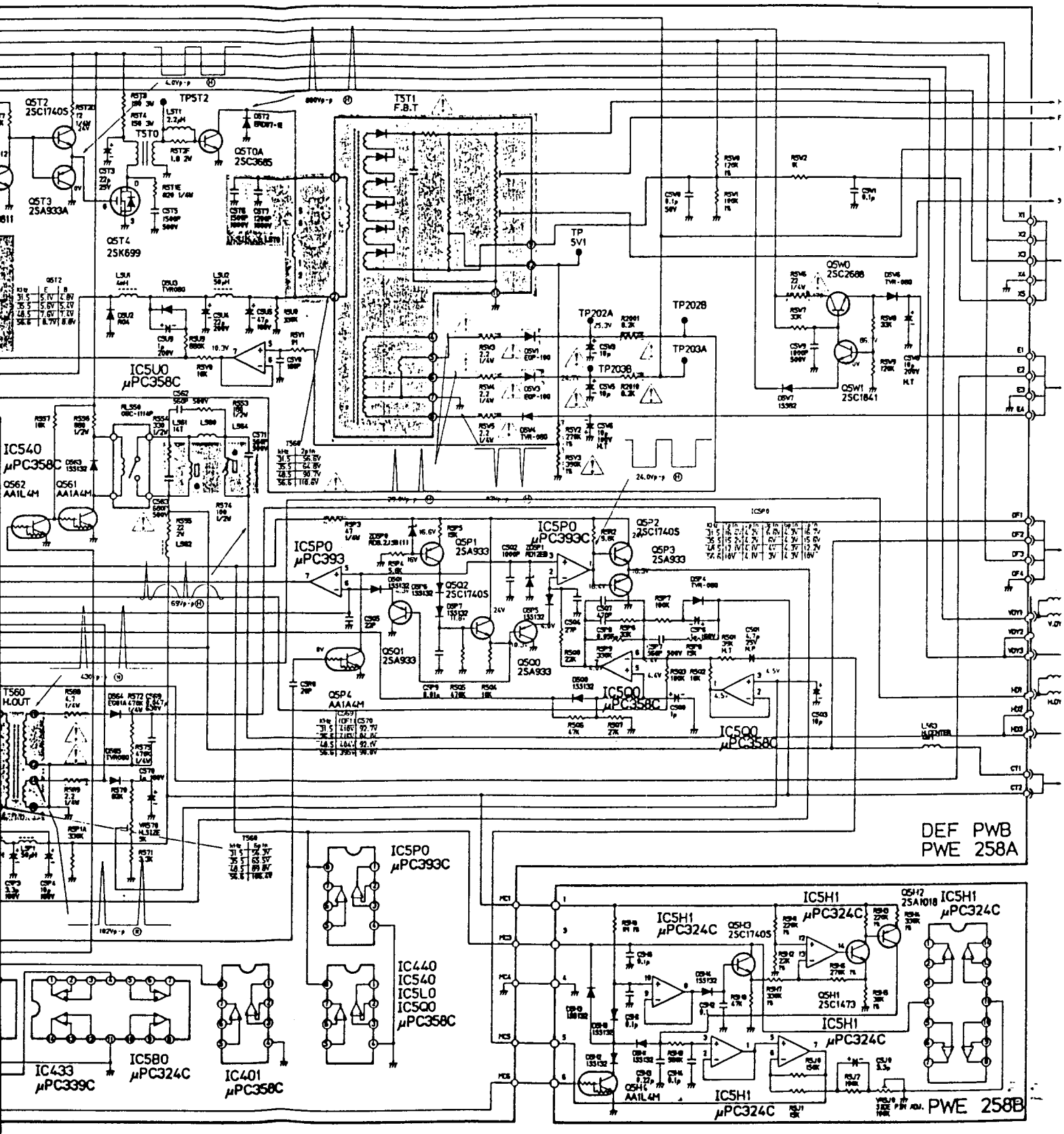
NOTES

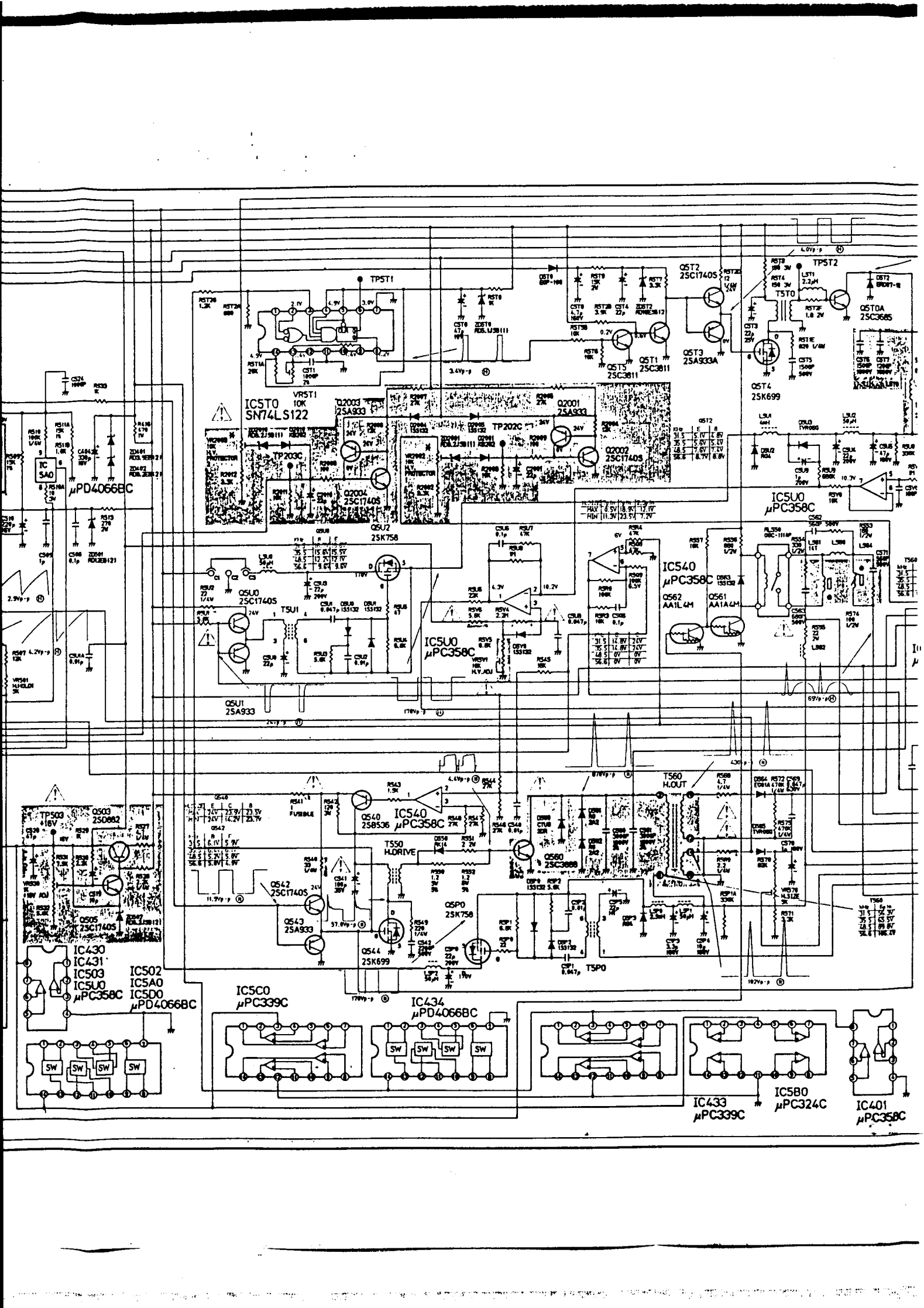
1. RESISTOR VALUES ARE IN Ω (OHM) K = 1,000Ω M = 1,000,000Ω
2. ALL RESISTORS ARE 1/8WATT EXCEPT WHERE OTHERWISE INDICATED.
3. CAPACITOR VALUES ARE IN μF UNLESS OTHERWISE INDICATED. P = PF
4. ALL CAPACITORS ARE 50VOLTS EXCEPT WHERE OTHERWISE INDICATED.
5. VOLTAGES AND WAVEFORMS ARE MEASURED UNDER THE 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.
   SYNC : HORIZONTAL RATE-31.5kHz VERTICAL RATE-70Hz
   SEPARATE SYNC. TTL LEVEL
   HORIZONTAL SYNC. NEGATIVE
   VERTICAL SYNC. POSITIVE
   VIDEO : ANALOG 0.7V p-p POSITIVE.
   MODE SW : OFF
7. ⊖----- HORIZONTAL RATE. ⊕----- VERTICAL RATE.
8. LI TTL LOW LEVEL HI TTL HIGH LEVEL

WARNING

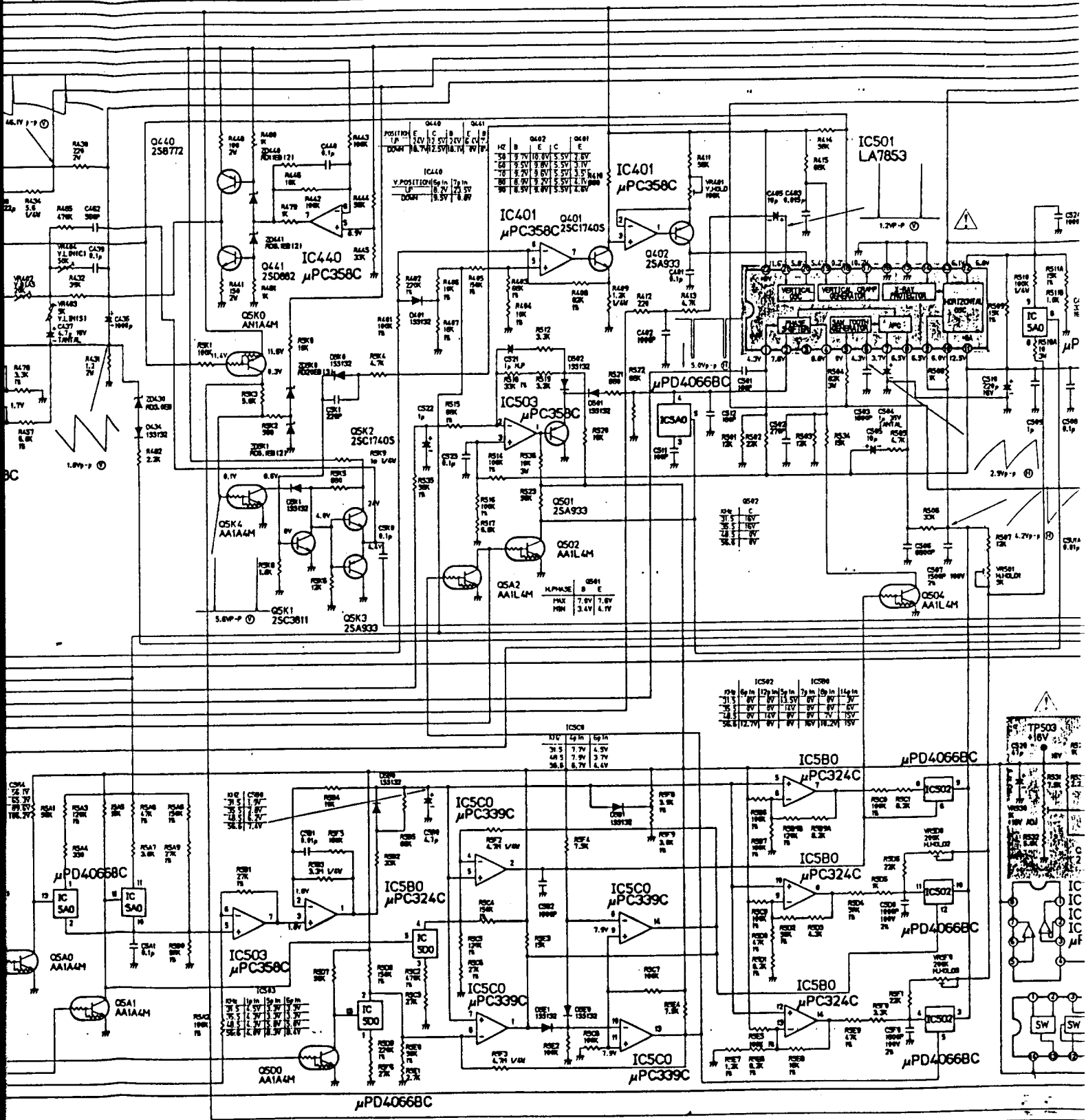
REPLACEMENT PARTS WHICH HAVE SPECIAL SAFETY CHARACTERISTICS ARE IDENTIFIED BY ⚠ SHADING ON THE SCHEMATICS. REPLACE THESE CRITICAL COMPONENTS WITH RECOMMENDED REPLACEMENT PARTS.
DON'T DEGRADE THE SAFETY OF THE SET THROUGH IMPROPER SERVICING.

CONTROL (S) MARKED ✱ IS PERMANENTLY FROZEN.
DO NOT ATTEMPT TO DEFEAT OR IMPROPERLY REPLACE.

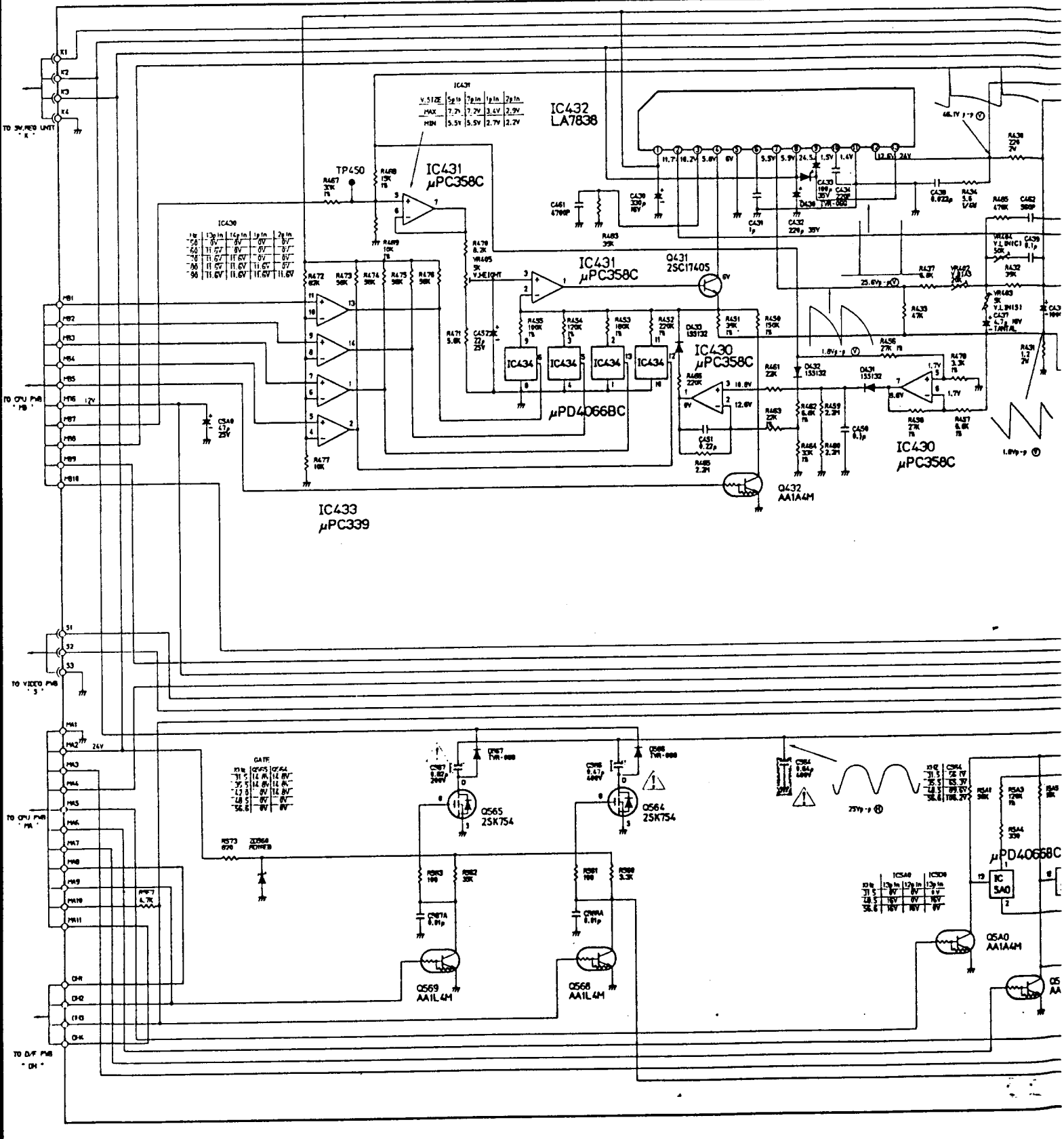

Q5T2
2SC1740S
TP5T2
T5T1
F.B.T
T5T0
Q5T0A
2SC3685
Q5T3
2SA933A
Q5T4
2SK699
TP
5V1
TP202A
TP202B
TP203A
TP203B
Q5W0
2SC2688
Q5W1
2SC1841
IC5U0
μPC358C
IC540
μPC358C
Q562
AA1L4M
Q561
AA1A4M
IC5P0
μPC393
IC5P0
μPC393C
Q5P1
2SA933
Q5P2
2SC1740S
Q5P3
2SA933
Q5Q2
2SC1740S
Q5Q1
2SA933
Q5Q0
2SA933
Q5P4
AA1A4M
IC500
μPC358C
IC500
μPC358C
T560
H.OUT
DEF PWB
PWE 258A
IC5P0
μPC393C
IC440
IC540
IC5L0
IC5Q0
μPC358C
IC433
μPC339C
IC580
μPC324C
IC401
μPC358C
IC5H1
μPC324C
Q5H3
2SC1740S
IC5H1
μPC324C
Q5H2
2SA1018
IC5H1
μPC324C
Q5H1
2SC1473
IC5H1
μPC324C
Q5H0
AA1L4M
IC5H1
μPC324C
PWE 258B

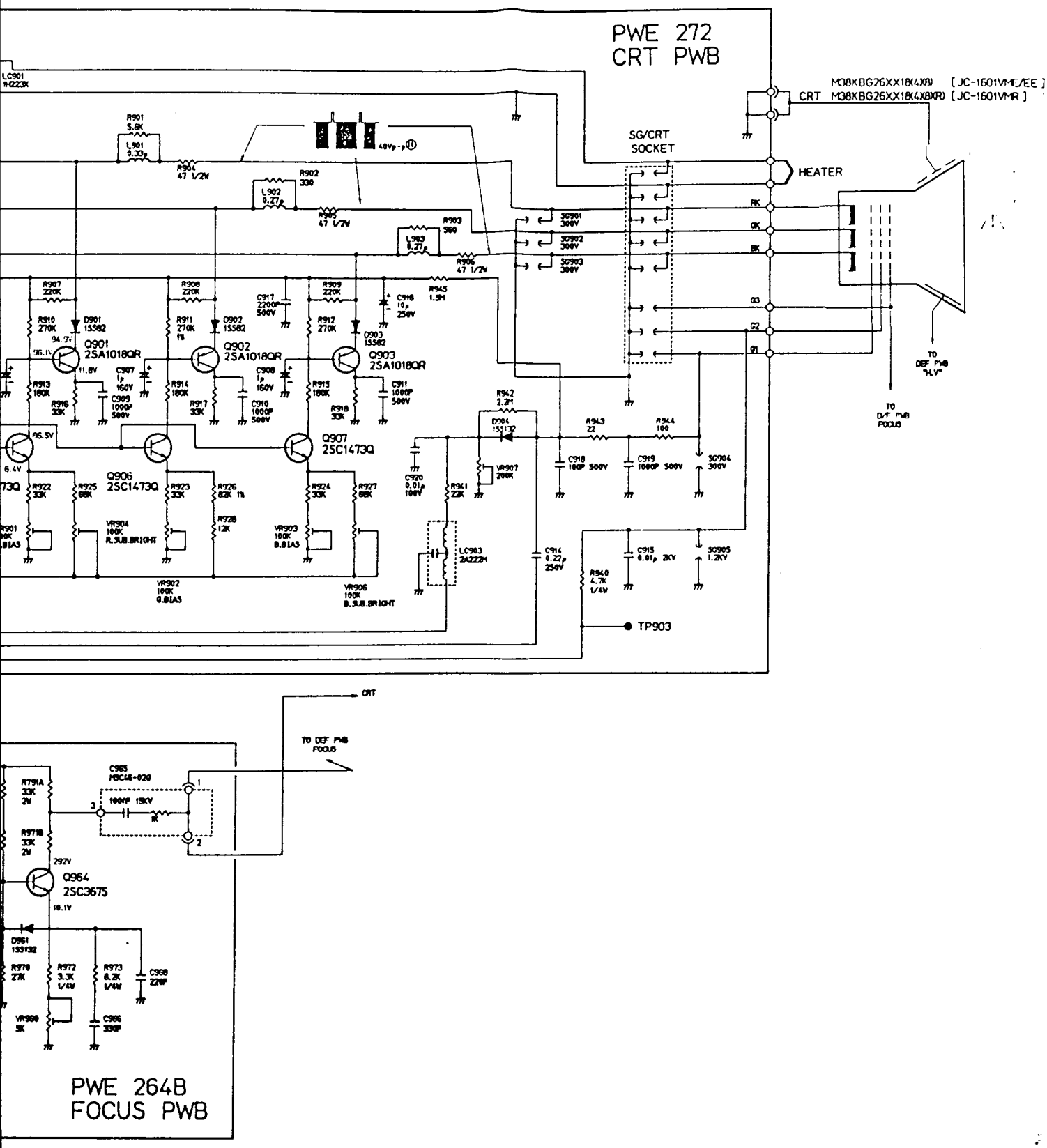

TP5T1
TP5T2
IC5T0
SN74LS122
VR5T1
10K
Q5T1
2SC3811
Q5T2
2SC1740S
Q5T3
2SA933A
Q5T4
2K699
Q5T5
2SC3811
T5T0
Q5T0A
2SC3685
Q2003
2SA933
Q2001
2SA933
Q2004
2SC1740S
Q2002
2SC1740S
TP202C
TP203C
IC5U0
μPC358C
Q5U2
2SK758
Q5U0
2SC1740S
T5U1
Q5U1
2SA933
IC540
μPC358C
Q562
AA1L4M
Q561
AA1A4M
IC5U0
μPC358C
VR5V1
10K
H.V.ADJ
IC
SA0
μPD4066BC
TP503
Q503
2SD882
Q505
2SC1740S
IC430
IC431
IC503
IC5U0
μPC358C
IC502
IC5A0
IC5D0
μPD4066BC
Q540
2SB536
IC540
μPC358C
T550
H.DRIVE
Q542
2SC1740S
Q543
2SA933
Q544
2SK699
Q5P0
2SK758
T5P0
Q560
2SC3688
T560
H.OUT
IC5C0
μPC339C
IC434
μPD4066BC
IC433
μPC339C
IC580
μPC324C
IC401
μPC358C
SW

AM

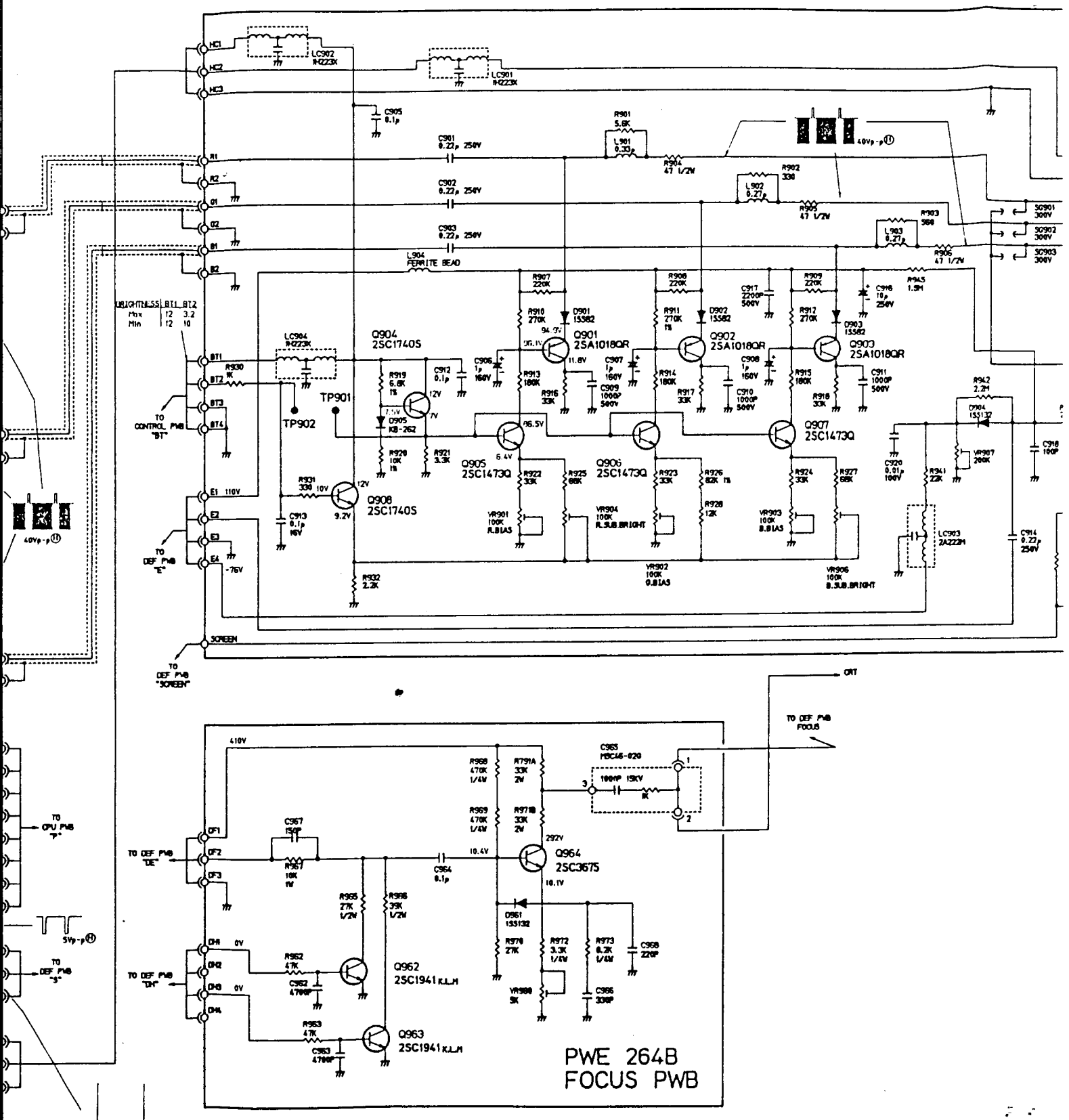

Q440
2SB772
IC440
Q441
2SD882
μPC358C
IC401
μPC358C
Q401
2SC1740S
Q402
2SA933
IC501
LA7853
VERTICAL OSC
VERTICAL GRAMP GENERATION
X-RAY PROTECTION
HORIZONTAL OSC
APC
IC 5A0
μPD4066BC
IC503
μPC358C
Q501
2SA933
Q502
AA1L4M
Q504
AA1L4M
Q5K0
AN1A4M
Q5K1
2SC3811
Q5K2
2SC1740S
Q5K3
2SA933
Q5K4
AA1A4M
Q5A2
AA1L4M
IC5B0
μPC324C
IC5C0
μPC339C
IC 5D0
Q5A0
AA1A4M
Q5A1
AA1A4M
Q5D0
AA1A4M
TP503
+16V
SW
SW

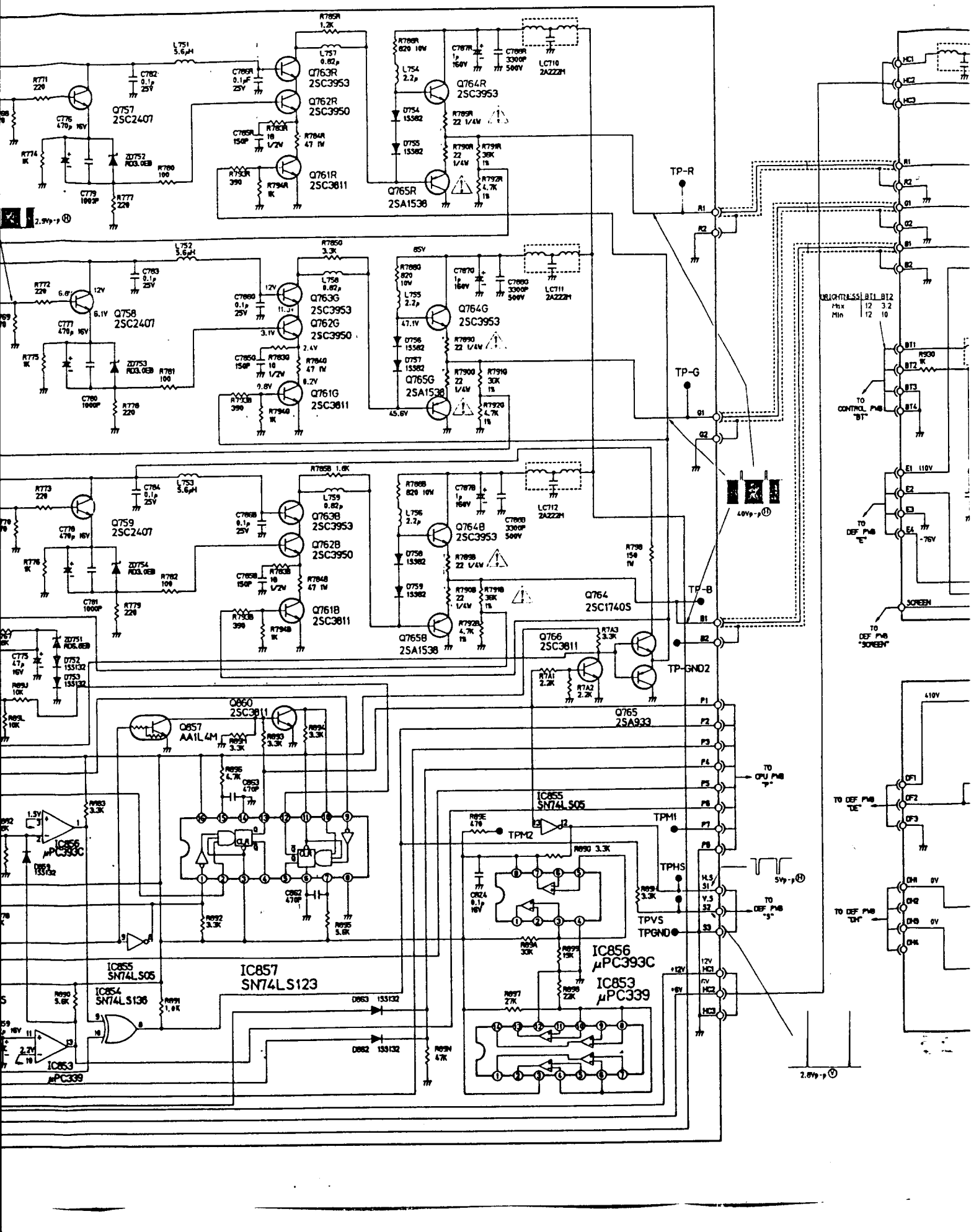
MODEL JC-1601VME/EE/R DEF PWB SCHEMATIC DIAGRAM

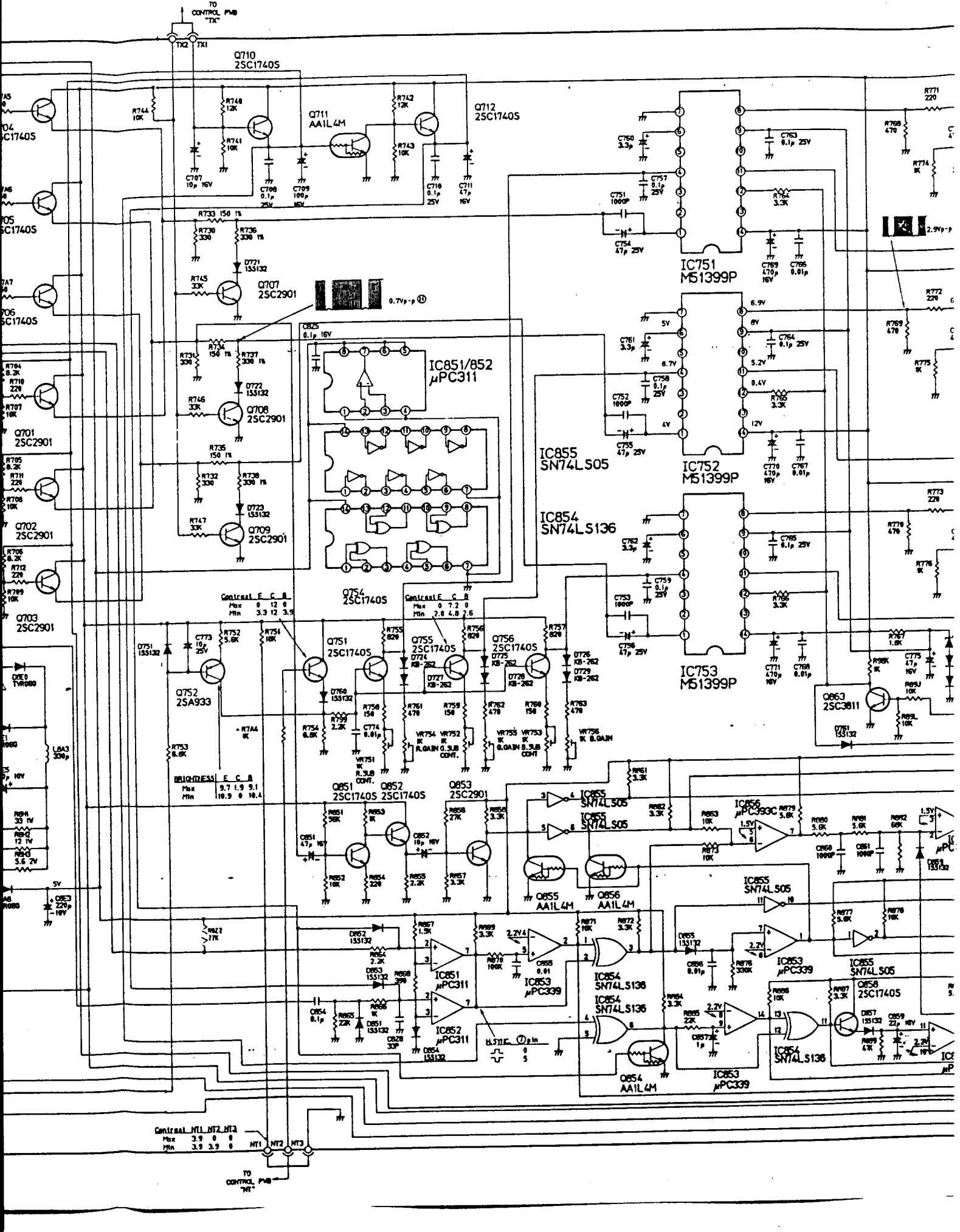



PWE 272
CRT PWB
SG/CRT
SOCKET
HEATER
M38KBG26XX18(4X3) [JC-1601VMC/EE]
CRT M38KBG26XX18(4X3XR) [JC-1601VMR]
Q901
2SA1018QR
Q902
2SA1018QR
Q903
2SA1018QR
Q907
2SC1473Q
Q906
2SC1473Q
TO DEF PWB "HV"
TO D/F PWB FOCUS
TP903

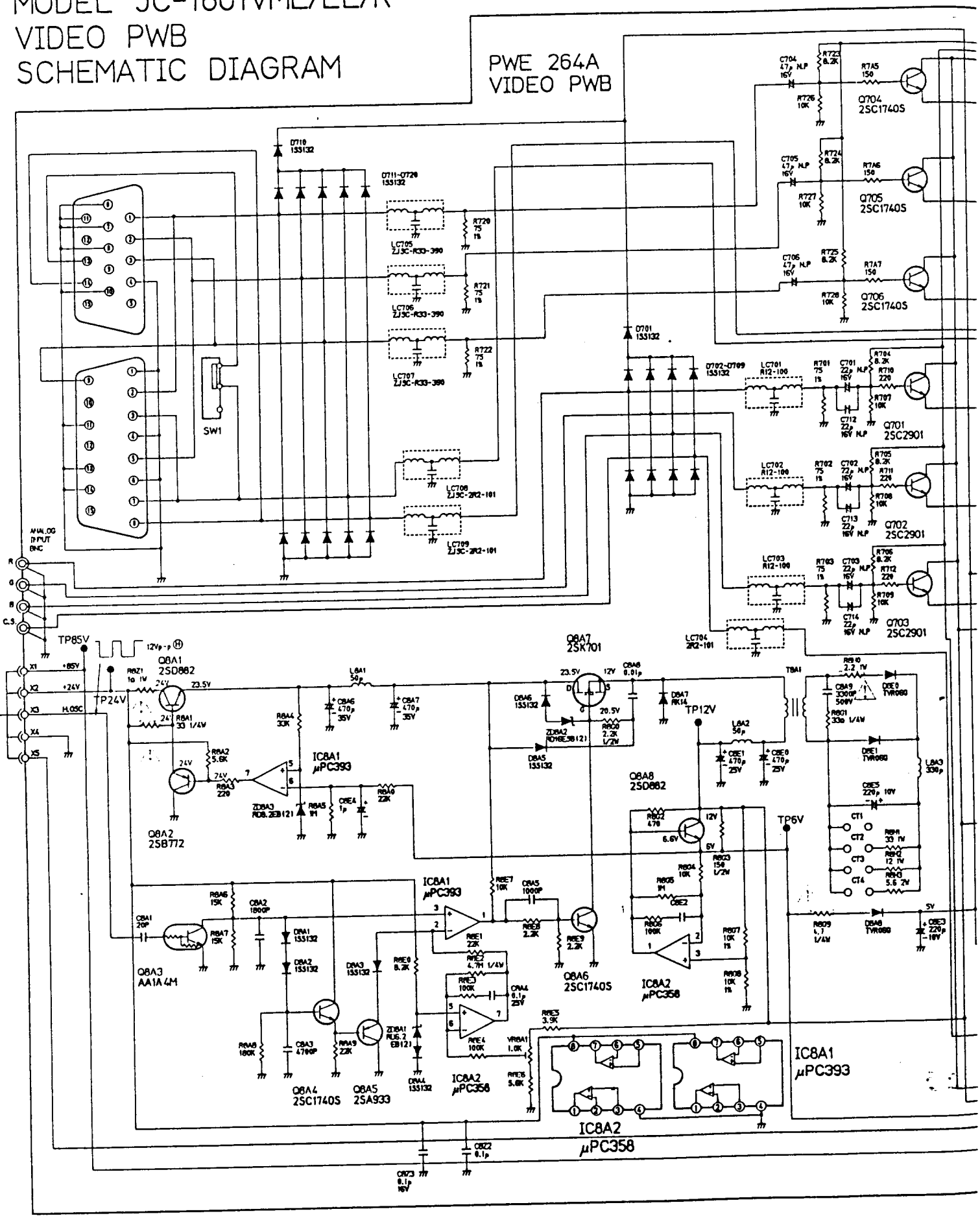
CRT
TO DEF PWB FOCUS
Q964
2SC3675
PWE 264B
FOCUS PWB

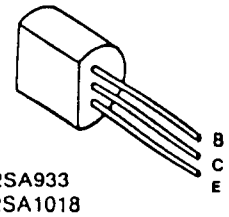

HC1
HC2
HC3
R1
R2
G1
G2
B1
B2
BT1
BT2
BT3
BT4
E1
E2
E3
E4
SCREEN
LC902 R-222K
LC901 R-222K
LC904 R-222K
L904 FERRITE BEAD
Q904 2SC1740S
Q901 2SA1018QR
Q902 2SA1018QR
Q903 2SA1018QR
Q905 2SC1473Q
Q906 2SC1473Q
Q907 2SC1473Q
Q908 2SC1740S
TP901
TP902
D901 1S362
D902 1S362
D903 1S362
D905 KB-262
D904 1S3132
LC903 2A222M
VR901 100K R.BIAS
VR904 100K R.SUB.BRIGHT
VR903 100K B.BIAS
VR902 100K G.BIAS
VR906 100K B.SUB.BRIGHT
VR907 200K
SD901 300V
SD902 300V
SD903 300V
TO CONTROL PWB "BT"
TO DEF PWB "E"
TO DEF PWB "SCREEN"
40Vp-p (11)
2.6Vp-p (V)
CRT
TO DEF PWB FOCUS
410V
C965 MSC46-020
1000P 15KV
DF1
DF2
DF3
DH1
DH2
DH3
DH4
TO DEF PWB "DE"
TO DEF PWB "DH"
TO CPU PWB "P"
TO DEF PWB "S"
5Vp-p (H)
Q962 2SC1941 K,L,M
Q963 2SC1941 K,L,M
Q964 2SC3675
D961 1S3132
VR908 5K
PWE 264B
FOCUS PWB


Q763R 2SC3953
Q762R 2SC3950
Q761R 2SC3811
Q764R 2SC3953
Q765R 2SA1538
Q757 2SC2407
Q758 2SC2407
Q763G 2SC3953
Q762G 2SC3950
Q761G 2SC3811
Q764G 2SC3953
Q765G 2SA1538
Q759 2SC2407
Q763B 2SC3953
Q762B 2SC3950
Q761B 2SC3811
Q764B 2SC3953
Q765B 2SA1538
Q764 2SC1740S
Q766 2SC3811
Q765 2SA933
Q860 2SC3811
Q857 AA1L4M
IC855 SN74LS05
IC856 μPC393C
IC857 SN74LS123
IC854 SN74LS136
IC853 μPC339
TP-R
TP-G
TP-B
TP-GND2
TPM1
TPM2
TPHS
TPVS
TPGND
TO CONTROL PWB "BT"
TO DEF PWB "E"
TO DEF PWB "SCREEN"
TO CPU PWB "P"
TO DEF PWB "DE"
TO DEF PWB "DH"
TO DEF PWB "S"
BRIGHTNESS BT1 BT2
Max 12 3.2
Min 12 10

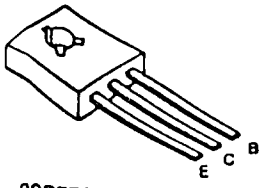

TO CONTROL PWB "TX"
TX2
TX1
Q710 2SC1740S
Q711 AA1L4M
Q712 2SC1740S
Q707 2SC2901
Q708 2SC2901
Q709 2SC2901
Q701 2SC2901
Q702 2SC2901
Q703 2SC2901
Q754 2SC1740S
Q751 2SC1740S
Q755 2SC1740S
Q756 2SC1740S
Q752 2SA933
Q851 2SC1740S
Q852 2SC1740S
Q853 2SC2901
Q855 AA1L4M
Q856 AA1L4M
Q854 AA1L4M
Q863 2SC3811
IC851/852 μPC311
IC855 SN74LS05
IC854 SN74LS136
IC751 M51399P
IC752 M51399P
IC753 M51399P
IC856 μPC393C
IC853 μPC339
0.7Vp-p
2.9Vp-p
Contrast F C B
Max 0 12 0
Min 3.3 12 3.9
Contrast F C B
Max 0 7.2 0
Min 2.0 4.8 2.6
BRIGHTNESS F C B
Max 9.7 1.9 9.1
Min 10.9 0 10.4
Contrast NT1 NT2 NT3
Max 3.9 0 0
Min 3.9 3.9 0
NT1
NT2
NT3
TO CONTROL PWB "NT"

MODEL JC-1601VME/EE/R
VIDEO PWB
SCHEMATIC DIAGRAM

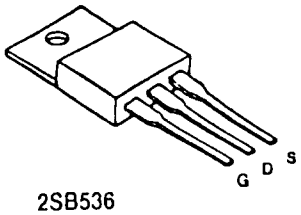




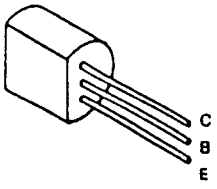
2SA933
2SA1018
2SC945
2SC1473
2SC1841
AA1A4M
AN1A4M
AA1L4M



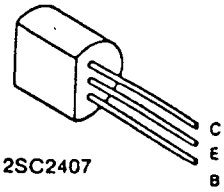
2SB772
2SC2688
S2SD882
2SC3953



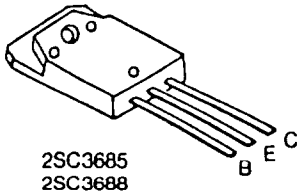
2SB536
2SC3675



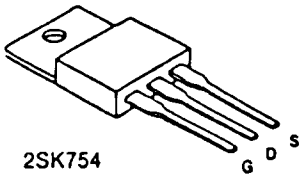
2SC2901
2SC3811



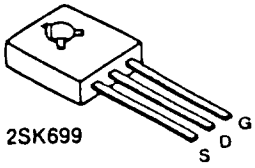
2SC2407



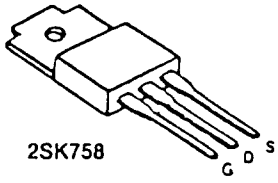
2SC3685
2SC3688



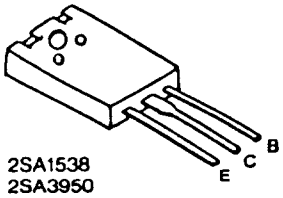
2SK754



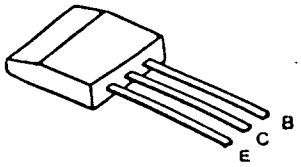
2SK699



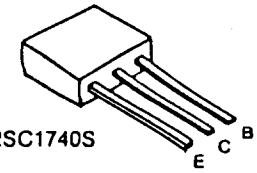
2SK758



2SA1538
2SA3950



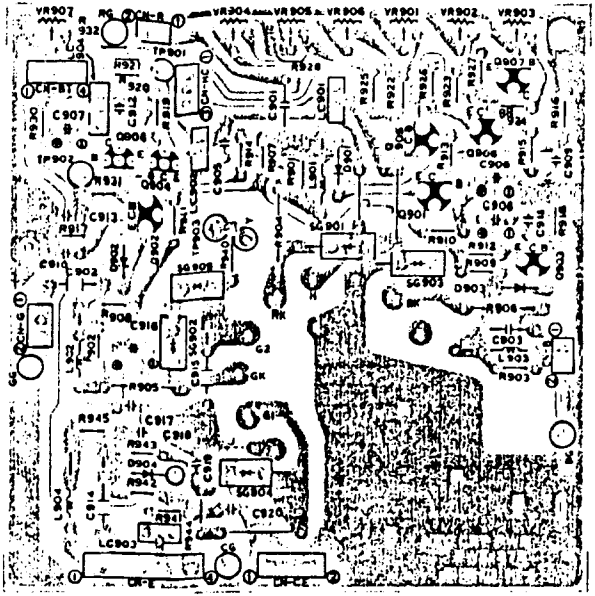
2SC1841



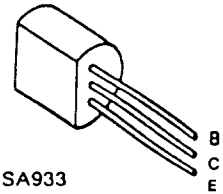
2SC1740S

NOTE:

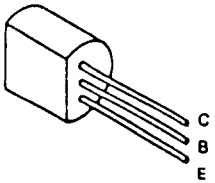
E: EMITTER
B: BASE
C: COLLECTOR
G: GATE
D: DRAIN
S: SOURCE



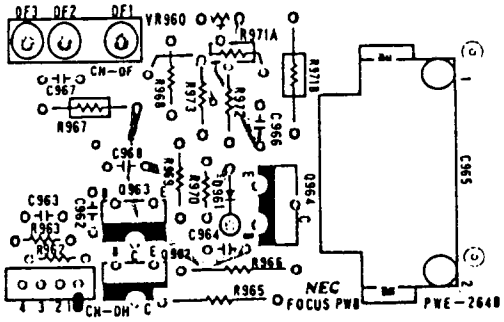
FOCUS PWB ASSY (PWE-264B)
—Component Side—



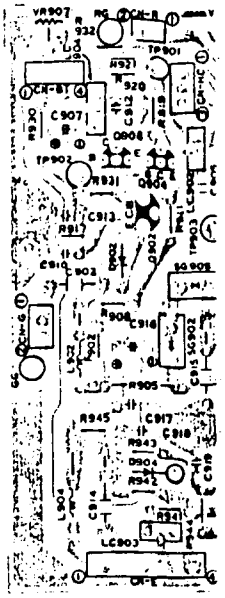
2SA933
2SA1018
2SC945
2SC1473
2SC1841
AA1A4M
AN1A4M
AA1L4M



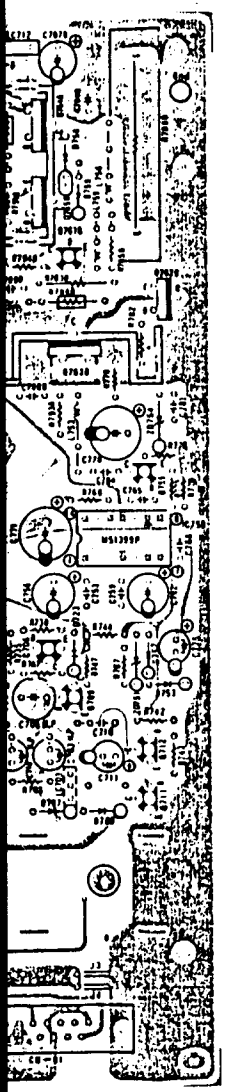
2SC2901

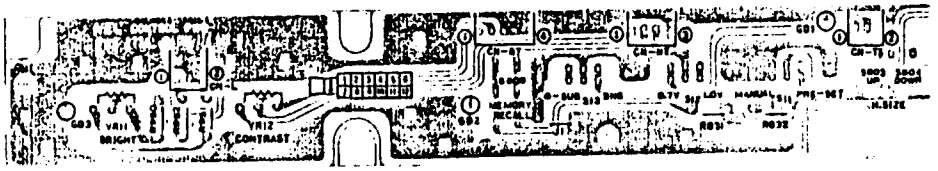


CRT PWB ASSY (PWE-272)
—Solder Side—



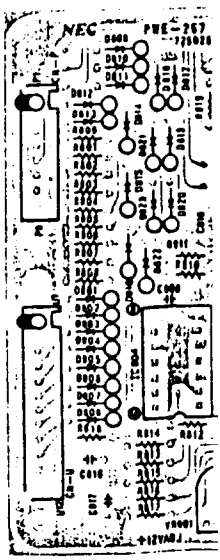
FOCUS PW
—Co



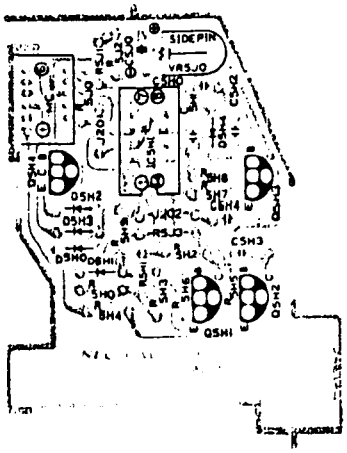


CONTROL PWB ASSY (PWE-273A)
—Solder Side—

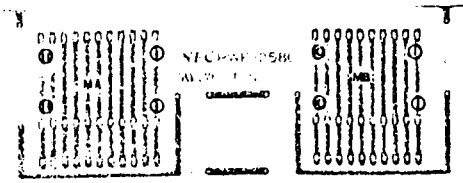
LED PWB ASSY (PWE-273B)
—Solder Side—



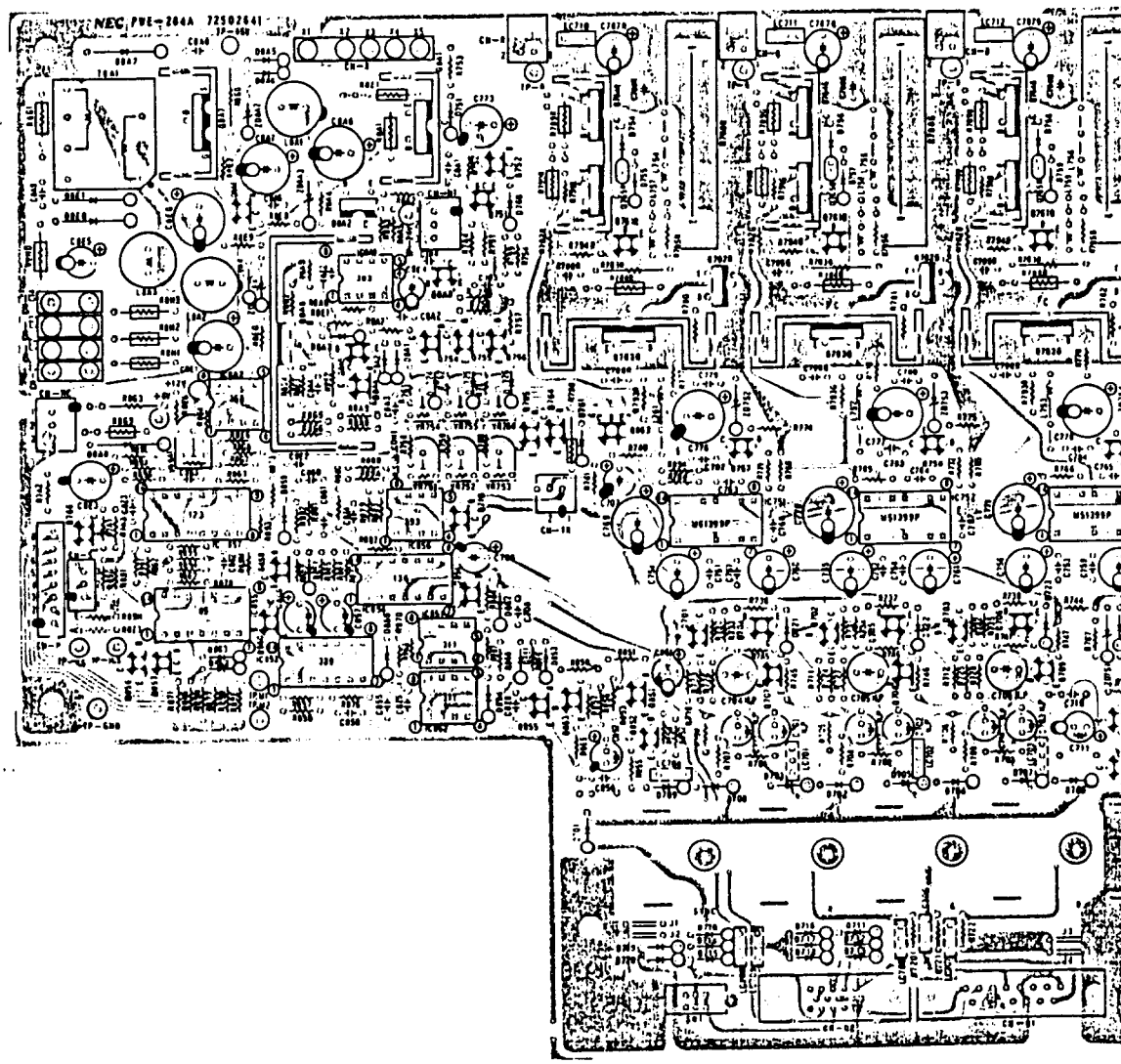
CPU PW
—C



PWE 258B
—Solder Side—



PWE 258C
—Solder Side—



VIDEO PWB ASSY (PWE-264A) —Component Side—