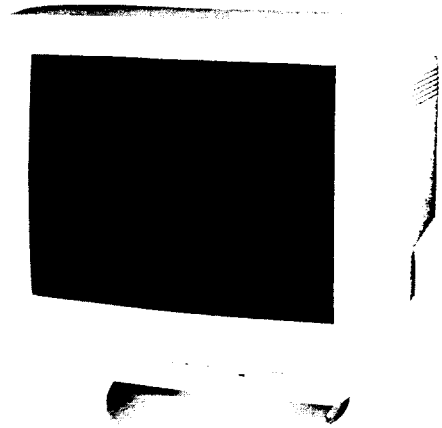
ORDER NO. FTD94025286C

Service Manual

Multi-Scan Color CRT Display
TX-D1732 Series
Chassis No. 17HV3
Chassis Family No. HV3



MODEL No.

TX-D1732-U	TX-D1732-G
TX-D1732-SW	TX-D1732B
TX-D1732-K	TX-D1732-A
TX-D1732N	TX-D1732-J
TX-D1732NM	TX-D1732NE

CONTENTS

Panasonic

Matsushita Electric Industrial Co., Ltd.
Central P.O. Box 288, Osaka 530-91, Japan

SERVICE WARNING

TO PREVENT RISK OF ELECTRIC HAZARD, TEST BEFORE TOUCHING. Where, after operation of the fuse in the live side of the mains supply, some components of the equipment that remain under voltage might represent a hazard during servicing.

GENERAL INFORMATION

1. OUTLINE

This is a 17 inch (16"V) color FS (flat square) CRT display with cabinet which has good focus using sophisticated gun and 0.28 mm dot pitch CRT, and suitable for graphic display terminals.
Digital Control System is employed in this model, which automatically synchronizes with multi-modes.

2. FEATURES

2-1 Digital adjustment by On-Screen Display
- Adjustment is easy and speedy using four buttons on the front panel and screen menus.
- Even subtle adjustments can be easily made referring to numeric values and bars on the screen.

2-2 Power management function
- A power management circuit conforming to the VESA standard is employed so that the power consumption of the display unit can be lowered by using it in combination with a computer that meets the DPMS standard.

2-3 Low-leak flux (Static prevention)
- The display unit meets the Swedish standard MPRII on low-frequency field and low-frequency field static so it is safe to use.

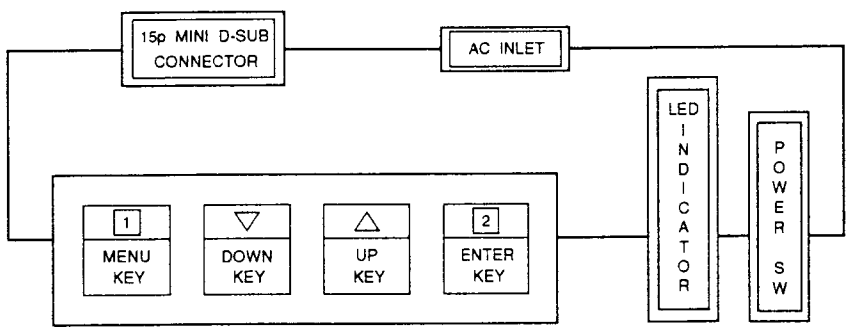
2-4 Color temperature adjusting function
- The white of the image can be adjusted as desired by individual adjustment of the red, blue signals (except for the green which is fixed).
  This produces images in colors closer to the real colors in color print, etc.
- The white reference color temperature of 9300K/6550K/user color can be selected.

2-5 Digital multi-scan (11 kinds of timing stored)
- Horizontal frequencies of 30 to 64 kHz and vertical frequencies of 50 to 160 Hz can be automatically tracked. The display unit is suited to VGA, SVGA, VESA, and high-resolution video boards of 1280 (H) x 1024 (V).
- The three kinds of timing specified in the manual have already been set for image size and position in the factory.
  The other eight kinds of timing can be registered by the user as desired.

2-6 DBF electron gun with hyperbolic focus compensation circuit
- The exclusive DBF electron gun with hyperbolic focus compensation circuit that controls the electron beams is combined with an invar mask to display fine images over he entire area of the 17-inch, 0.28-dot pitch, flat and square screen.

SPECIFICATION

1. DIAGRAM



3.1 POWER SW, LED, [1]-key (MENU), ▽-key (DOWN), △-key (UP), and [2]-key (ENTER) are located on the front panel.

3.2 Signal connector and AC inlet are located on the back side of the cabinet.

3.3 OSD menu includes the following function.
BRIGHTNESS, H/V SIZE, H/V POSITION, PIN-CUSHION, TRAPEZOID, DEGAUSS, PARALLELOGRAM, COLOR SELECT, USER COLOR, VIDEO INPUT LEVEL, DISPLAY FREQUENCY.

3.4 CONTRAST can be directly controlled with ▽/△-key.

3.5 With sync signal, OSD menu appears by pushing [1]-key.
Without sync signal, self test menu appears by pushing [1]-key.

2. MECHANICAL SPECIFICATIONS

..... refer to the attached drawing

2.1 Dimension Height : 422 mm (16.6") typ.
Width : 410 mm (16.1") typ.
Depth : 438 mm (17.2") typ.

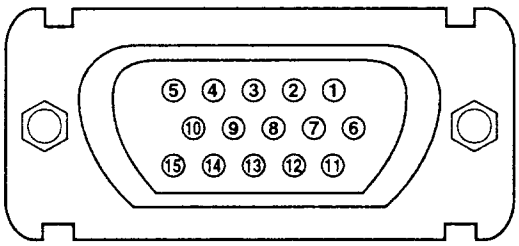
2.2 Net Weight : 17.1 kg (37.6 lbs) typ.

3. CONNECTORS

3.1 Signal connector: 15P Mini D-Sub X 1

3.2 AC inlet: CEE 22 typed connector

15P Mini D-Sub Pin assignment



1 ... RED	6 ... GROUND	11 ... GROUND
2 ... GREEN	7 ... GROUND	12 ... – (OPEN)
3 ... BLUE	8 ... GROUND	13 ... H.SYNC.
4 ... GROUND	9 ... – (OPEN)	14 ... V.SYNC.
5 ... – (OPEN)	10 ... GROUND	15 ... – (OPEN)

4. CRT SPECIFICATIONS

Part No.	M41KXH900X
Type	17", 90°, 29ø, in-line gun
Dot Pitch	0.28 mm
Phosphor	R, G, B Short Persistence
Bulb	TINT
Face	Anti-Glare, Anti-Static Coating (AR COAT)
Total Transmission	52%

5. ELECTRICAL SPECIFICATIONS

5.1 Standard conditions ... Except special items

Display image	Green, full "H" characters with a border line. (7 x 9 dots) Video Signal: 100% duty Display area: 300 mm x 225 mm
Ambient Temperature	20±5°C (68±9°F)
Input voltage	AC120V, 60 Hz
Terrestrial magnetism	Vertical field: northern hemisphere field (40μT) Horizontal field: no field
Viewing direction	Parallel to the CRT axis
Measurements	After an initial warming up time of more than 30 minutes.
Ambient light	200 ± 50 lux

5.2 Power supply ... Commercial power source

Input voltage	AC90 - 264V
Power frequency	50/60 Hz
Input current	1.5A (Max.) at AC 100V
Inrush current (at 20°C)	40 Aop (Max.) at AC 240V
Power consumption	120W max./<30W stand-by

5.3 Standard timing

- Following total 3 modes are preset in the memory as standard timing at the factory.
- Refer to Fig. 2 as a definition of timing and signal level.
- This SPECIFICATION is specified at STD (1024 x 768) mode unless otherwise mentioned.

TIMING CHART

A	Period
B	Blanking
C	Sync Width
D	Back Porch
E	Active
F	Front Porch

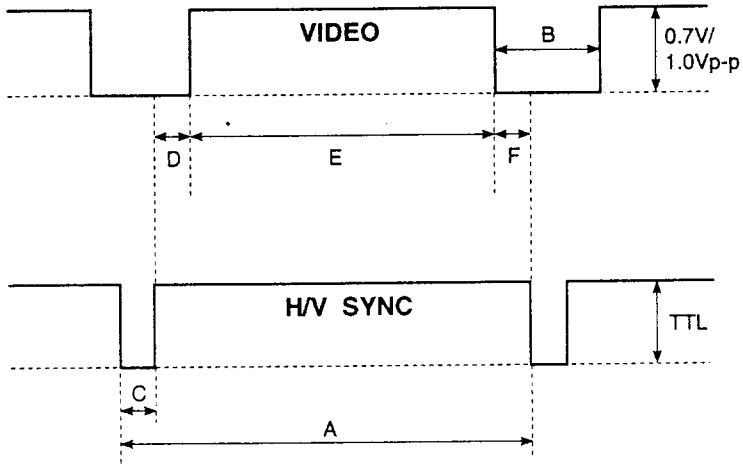


Fig.2

FOR PRESET

		MODE-3	MODE-9	MODE-12
	DOT CLOCK	25.1745 MHz	40.0000 MHz	65.0000 MHz
H O R I Z	fH	31.4681 kHz	37.8788 kHz	48.3631 kHz
	A-Period	31.778 us (800 Dots)	26.400 us (1,056 Dots)	20.677 us (1,344 Dots)
	B-Blanking time	6.356 us (160 Dots)	6.400 us (256 Dots)	4.923 us (320 Dots)
	C-Sync width	3.813 us (96 Dots)	3.200 us (128 Dots)	2.092 us (136 Dots)
	D-Back porch	1.907 us (48 Dots)	2.200 us (88 Dots)	2.462 us (160 Dots)
	E-Active time	25.423 us (640 Dots)	20.000 us (800 Dots)	15.754 us (1,024 Dots)
	F-Front porch	0.636 us (16 Dots)	1.000 us (40 Dots)	0.369 us (24 Dots)
V E R T	fV	59.9393 Hz	60.3165 Hz	60.0038 Hz
	A-Period	16.684 ms (525 lines)	16.579 ms (628 lines)	16.666 ms (806 lines)
	B-Blanking time	1.431 ms (45 lines)	0.739 ms (28 lines)	0.786 ms (38 lines)
	C-Sync width	0.064 ms (2 lines)	0.106 ms (4 lines)	0.124 ms (6 lines)
	D-Back porch	1.049 ms (33 lines)	0.607 ms (23 lines)	0.600 ms (29 lines)
	E-Active time	15.254 ms (480 lines)	15.840 ms (600 lines)	15.880 ms (768 lines)
	F-Front porch	0.318 ms (10 lines)	0.026 ms (1 lines)	0.062 ms (3 lines)
Sync polarity (H/V)		Negative/Negative	Positive/Positive	Negative/Negative

	DOT CLOCK			
H O R I Z	fH			
	A-Period			
	B-Blanking time			
	C-Sync width			
	D-Back porch			
	E-Active time			
	F-Front porch			
V E R T	fV			
	A-Period			
	B-Blanking time			
	C-Sync width			
	D-Back porch			
	E-Active time			
	F-Front porch			
Sync polarity (H/V)				

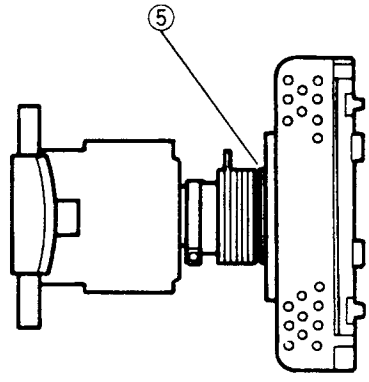
FOR ADJUSTMENT

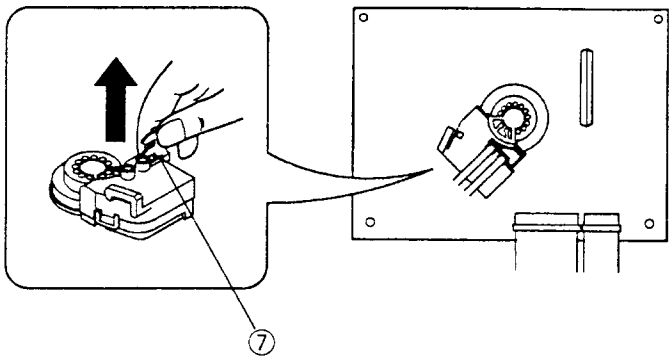
		HV3-1	HV3-2	HV3-3
	DOT CLOCK	22.60 MHz	40.25 MHz	64.04 MHz
HORIZ	fH	29.50 kHz	39.00 kHz	54.00 kHz
	A-Period	33.90 us (766 Dots)	25.64 us (1,032 Dots)	18.52 us (1,186 Dots)
	B-Blanking time	6.02 us (136 Dots)	5.74 us (231 Dots)	4.51 us (288 Dots)
	C-Sync width	4.12 us (93 Dots)	2.83 us (114 Dots)	1.72 us (110 Dots)
	D-Back porch	1.28 us (29 Dots)	2.31 us (93 Dots)	2.19 us (140 Dots)
	E-Active time	27.88 us (630 Dots)	19.90 us (801 Dots)	14.01 us (897 Dots)
	F-Front porch	0.62 us (14 Dots)	0.60 us (24 Dots)	0.60 us (38 Dots)
VERT	fV	48.00 Hz	77.10 Hz	105.00 Hz
	A-Period	20.815 ms (614 lines)	12.974 ms (506 lines)	9.519 ms (514 lines)
	B-Blanking time	0.916 ms (27 lines)	0.744 ms (29 lines)	0.482 ms (26 lines)
	C-Sync width	0.102 ms (3 lines)	0.103 ms (4 lines)	0.037 ms (2 lines)
	D-Back porch	0.712 ms (21 lines)	0.513 ms (20 lines)	0.352 ms (19 lines)
	E-Active time	19.899 ms (587 lines)	12.230 ms (477 lines)	9.038 ms (488 lines)
	F-Front porch	0.102 ms (3 lines)	0.128 ms (5 lines)	0.093 ms (5 lines)
Sync polarity (H/V)		Negative/Negative	Negative/Negative	Negative/Negative

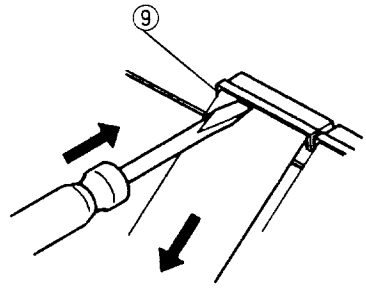
		HV3-4	HV3-2A	HV3-4A
	DOT CLOCK	86.06 MHz	40.25 MHz	86.06 MHz
HORIZ	fH	64.52 kHz	39.00 kHz	64.52 kHz
	A-Period	15.50 us (1,334 Dots)	25.64 us (1,032 Dots)	15.50 us (1,334 Dots)
	B-Blanking time	3.60 us (309 Dots)	5.74 us (231 Dots)	3.60 us (309 Dots)
	C-Sync width	1.19 us (102 Dots)	2.83 us (114 Dots)	1.19 us (102 Dots)
	D-Back porch	1.98 us (170 Dots)	2.31 us (93 Dots)	1.98 us (170 Dots)
	E-Active time	11.90 us (1,024 Dots)	19.90 us (801 Dots)	11.90 us (1,024 Dots)
	F-Front porch	0.43 us (37 Dots)	0.60 us (24 Dots)	0.43 us (37 Dots)
VERT	fV	165.00 Hz	77.10 Hz	165.00 Hz
	A-Period	6.060 ms (391 lines)	12.974 ms (506 lines)	6.060 ms (391 lines)
	B-Blanking time	0.465 ms (30 lines)	12.846 ms (501 lines)	5.998 ms (387 lines)
	C-Sync width	0.046 ms (3 lines)	0.103 ms (4 lines)	0.046 ms (3 lines)
	D-Back porch	0.341 ms (22 lines)	6.359 ms (248 lines)	2.976 ms (192 lines)
	E-Active time	5.596 ms (361 lines)	0.128 ms (5 lines)	0.062 ms (4 lines)
	F-Front porch	0.078 ms (5 lines)	6.384 ms (249 lines)	2.976 ms (192 lines)
Sync polarity (H/V)		Negative/Negative	Negative/Negative	Negative/Negative

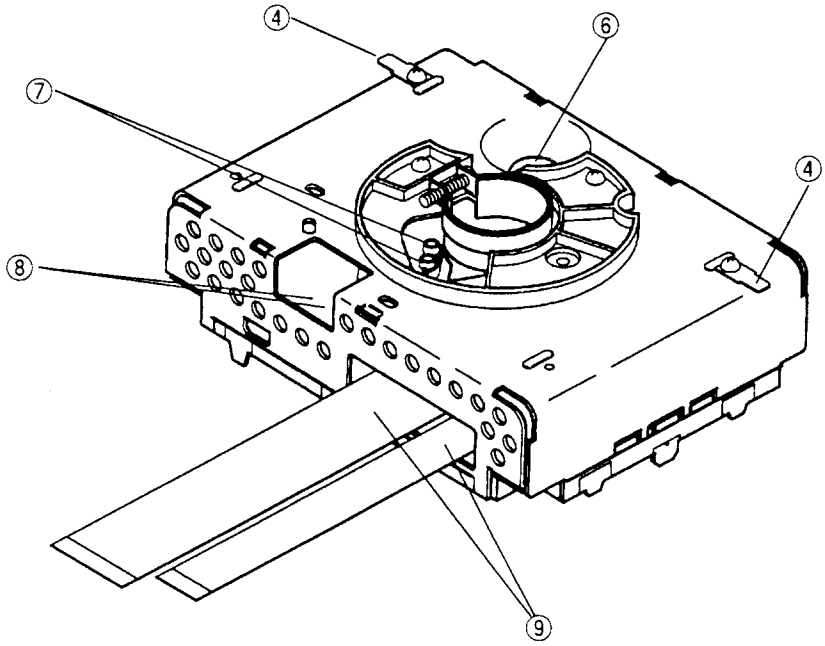
	DOT CLOCK			
HORIZ	fH			
	A-Period			
	B-Blanking time			
	C-Sync width			
	D-Back porch			
	E-Active time			
	F-Front porch			
VERT	fV			
	A-Period			
	B-Blanking time			
	C-Sync width			
	D-Back porch			
	E-Active time			
	F-Front porch			
Sync polarity (H/V)				

4) Remove the connector ④ of the CRT ground connected to the left and right of the shield case.
5) Loosen the screws ⑤ securing the CRT neck and the shield case.
6) Remove the PWB block from the CRT.
7) Remove the N382 connector ⑥.
8) Remove two focus leads ⑦ after pulling up the focus lead securing lever.
9) Remove two ground connectors ⑧ (N105 and N106) connected to the PWB.
10) Remove two flexible PWBs ⑨.
11) Remove the PWB from the shield case.



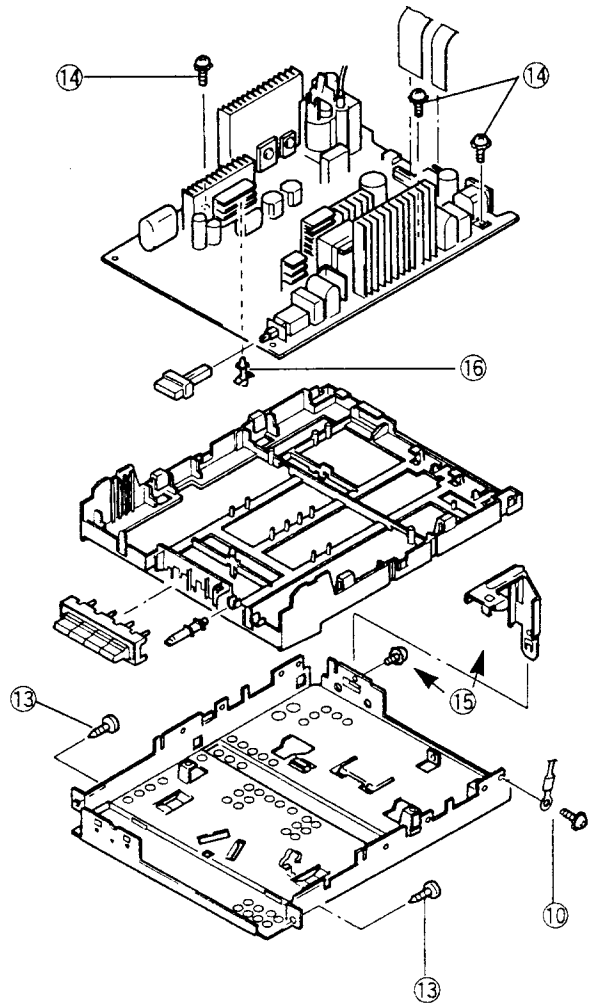


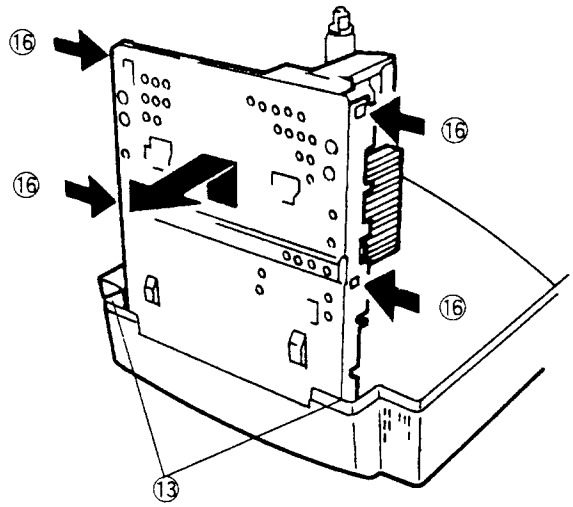


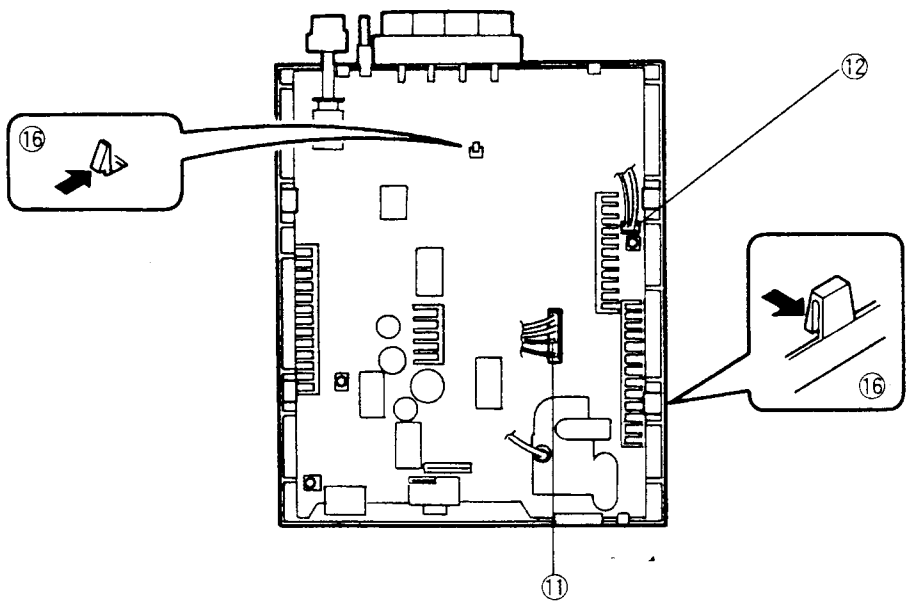


3. Main PWB Removal

1) Remove the ground wire ⑩ from the AC inlet.
2) Remove the connector ⑪ (N802) of the degauss coil.
3) Remove the DY connector ⑫.
4) Remove the anode cap.
5) Move the CRT face down and remove two screws ⑬ securing the bottom fitting metal.
6) Remove the fitting metal and the PWB from the cabinet.
7) Remove three screws ⑭ securing the fitting metal and the PWB.
8) Remove the FBT securing fitting metal ⑮.
9) Remove the holder ⑯ from the fitting metal with the figure referenced.
10) Remove the PWB from the holder with the figure referenced.

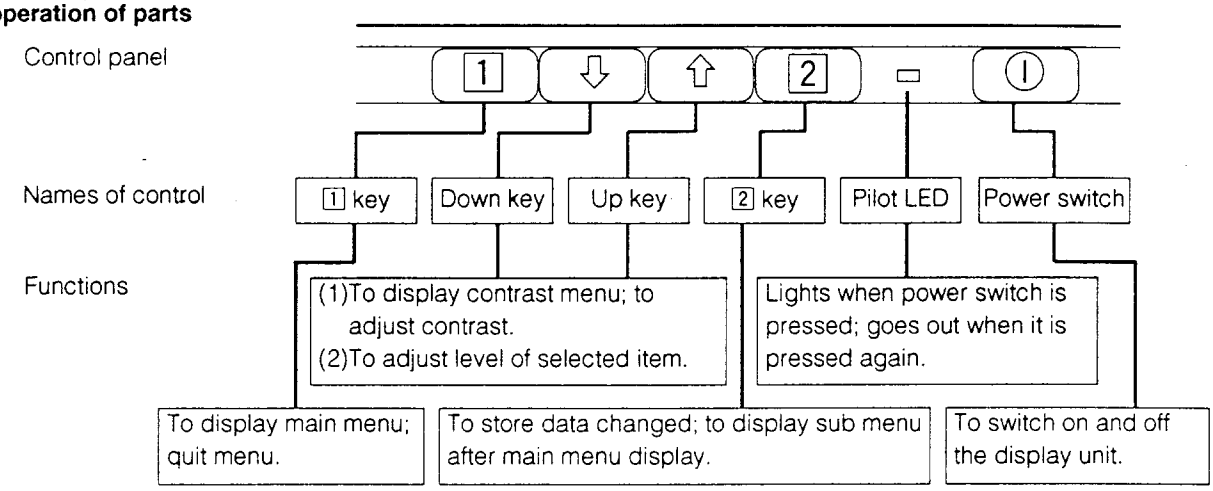






CONTROL LOCATION

Basic operation of parts

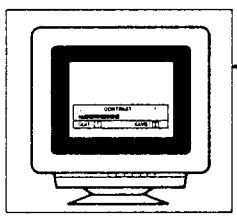


* For a detailed description of the functions of the 1 key, down key, up key, and 2 key, refer to the next section onward.

Examples of on-screen operation

A. Contrast adjustment

Display changes

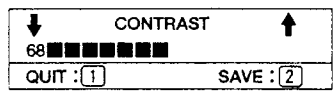


Steps of operation

1. Press ↓ key or ↑ key to call contrast adjustment menu on the screen.
2. Set the desired state using cursor buttons ↓ and ↑. When the 2 key is pressed, the setting is stored in the memory. If the 1 key is pressed, the screen returns to the main menu without storing it.

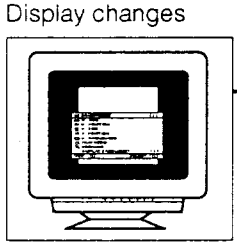
On-screen display changes

< Contrast menu >



B. H. size adjustment

Display changes

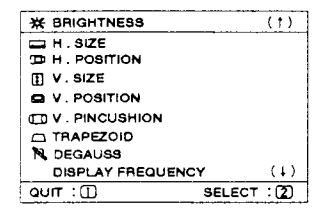


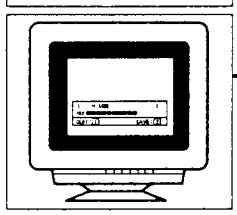
Steps of operation

1. Press 1 key to call main menu on the screen.
2. Move cursor to H. SIZE using ↓ and ↑ keys, and press 2 key to select it.

On-screen display changes

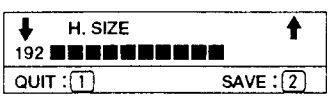
< Main menu >

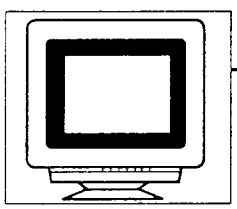




3. Adjust H. SIZE as desired using ↓ and ↑ keys. The set H. SIZE is registered in memory when 2 key is pressed. When 1 key is pressed, the screen it in memory.

< Sub menu >

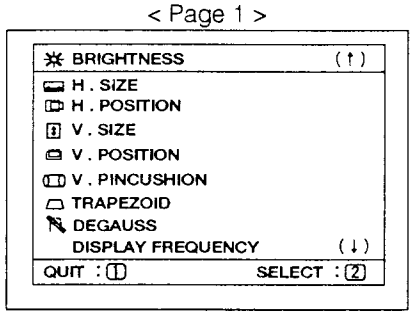




4. Press 1 key to quit main menu. The screen is now blank.

Main menu

< Page 1 >



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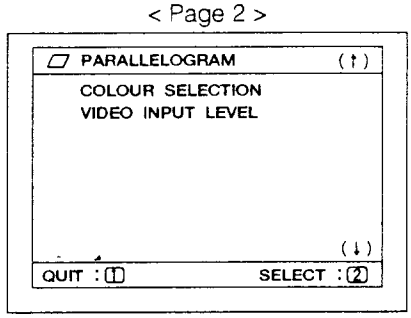


CAUTION FOR ADJUSTMENT AND REPAIR

1. Degaussing is inevitably required at purity adjustment or convergence adjustment.
2. If you check or adjust electrical specification or function, more than 20 minutes burn-in is required.
3. Reforming of the leadwire is required after your repair work.
4. Prior to starting work, be sure check that the input signal is at the specified timing and that the polarity is as specified in all modes.
5. Brightness control: brightness tends to decrease about 5 cd/m² at the white window and about 1 cm/m2 in the white raster after mounting the rear cover in position. This should be taken into consideration.
6. Brightness stabilizing time: It takes about 20 to 50 seconds for the brightness to stabilize after turning the power off for 5 seconds (AC). Therefore, care should be taken to this.
7. Aging should be made in white raster of 30 ~ 50 cd/m2 and raster size, 373 x 289 mm before adjusting the ITC.
8. Contrast: When both of CONTRAST switches (UP and DOWN SW) are simultaneously pressed, the contrast increases to a maximum.
9. Brightness: When both of BRIGHT switches (UP and DOWN SW) are simultnaneously pressed, the brightness lights at the center point.

CAUTION FOR SERVICING

When servicing or replacing the CRT, high voltage sometimes remains on the anode. So, completely discharge high voltage before servicing or replacing the CRT so as to prevent a shock to the serviceman.

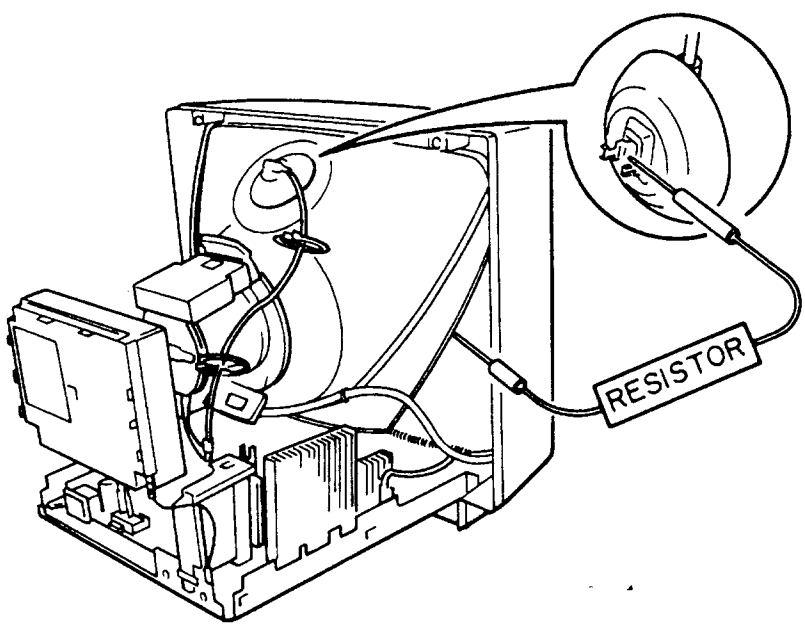
CRT Anode Discharge

1. When you check the CRT anode or replace the CRT, discharge the CRT anode to the external conductive coating (aquadag) of CRT, especially when checked right after power turn-off.
2. Ground one end of a jumper wire which has a resistor (30kV < resisting pressure 100MΩ) and connect the other point to the CRT anode.

Note: Grounding must be done first.

This model has a section that does not share a common ground with the power supply section. The different sections are referred to as the HOT section and the COLD section in the precautions below.

1. Do not touch the HOT section and the COLD section at the same time. You may receive an electric shock.
2. Do not short the HOT section to the COLD section. This could blow the fuse or damage parts.
3. Never measure the HOT section and the COLD section at the same time when using tools such as oscilloscopes or multimeters.
4. Always unplug the unit before beginning any operation such as removing the chassis.



ADJUSTMENT AND CHECK PROCEDURE

INTRODUCTION

- This monitor is controlled by microcomputer. With the exception of a part of purity/convergence/tilt direction/focus, all is digitally adjusted.
  Therefore, the computer/dedicated control software/interface/12V power supply/signal generator are required for servicing.

TOOL REQUIRED

- **Computer**
  Control software is compatible with IBM PC.
  Therefore, it is suggested to use a computer which has compatibility with IBM PC.

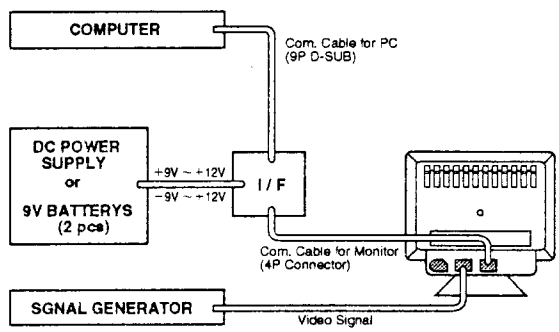
- **Control Software**
  The control software uses a 3.5" floppy disk. Therefore, the HV3 chassis can only use "HV3 control program disk" and no other disk can be used on this chassis.

- **Interface**
  Just as in the case of the control software, this interface is not commercially available on the market. You are requested to obtain this interface by writing or cabling directly to our Monitor Production Sales Division.

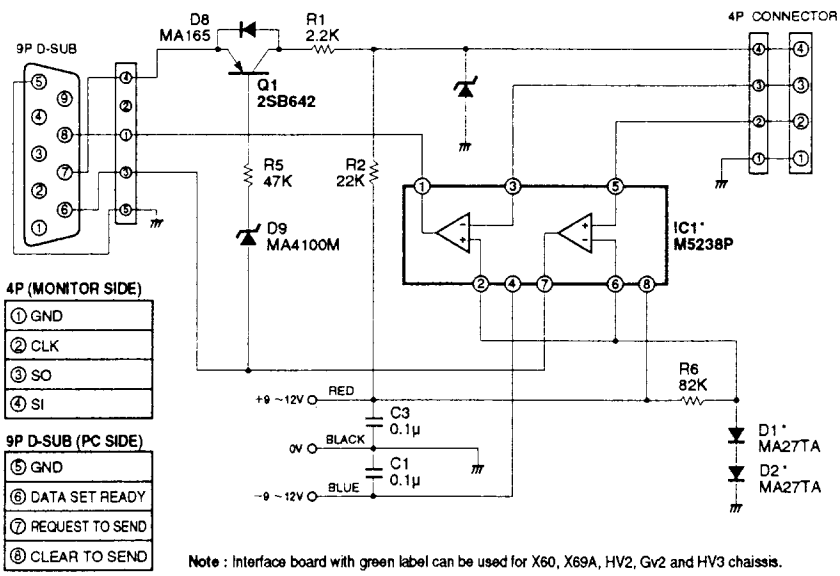
- **Power Supply**
  A DC 9~12V (+9~12V/-9~12V) power supply is required for operating the interface.

- **Signal Generator**
  It is necessary for you to use a signal generator which operates on fH 64 KHz, fv 160 Hz, and fc 86 MHz bands.

INTERFACE CONNECTION



INTERFACE SCHEMATIC DIAGRAM



Note : Interface board with green label can be used for X60, X69A, HV2, Gv2 and HV3 chaissis.

Parts No.	No. green label	with green label
IC1*	M5223	M5238P
D1*	MA162	MA27TA
D2*	MA162	MA27TA

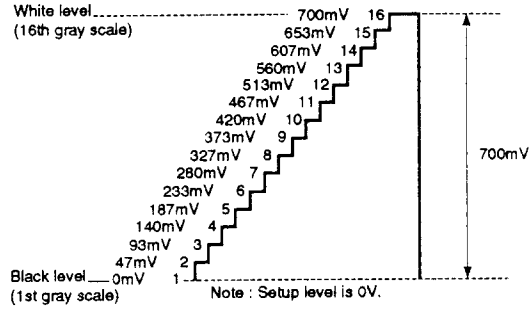
OTHER TOOLS

- Oscilloscope (dual trace)
- Scope probe – Attenuation: 100:1
  Attenuation: 10:1
- Digital Voltmeter – Range: 0 to 1000V DC
  Accuracy: 0.1%
- TV color Analyzer II – that reads luminance and chromaticity X and Y coordinates.
- Digital High Voltmeter
- AC power supply – Output voltage : 0 to 300V
- Degaussing coil
- Convergence meter
- Scale
- Double-faced scale
- Microscope – Scale factor: 50
- Screwdriver – Tip width: 1/10" (2.5 mm)
  One with extremely narrow tip-end
  Length: 6" (15 cm)
- Screwdriver – Cross recessed head
  Length: 14" (35 cm)
- Tool–for hexagon socket set screw of Deflection Yoke
- White racquer (Paint)

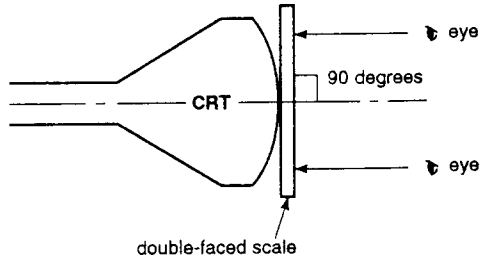
STANDARD CONDITION OF ADJUSTMENT PROCEDURE

- Signal timing : Standard timing 1024 x 768 (See page 5)
- Display pattern : White, full "H" character
- Signal level : V/H: TTL level video: 700mV
- Input source : AC 120V, 60 Hz
- Ambient temperature : Room temperature
- Warm-up time : More than 30 minutes
- Brightness control : Center
- Contrast control : Max.
- Magnetic field : Vertical: 40 μT
  Horizontal: 0 μT
- Signal cable : Attached

Video input signal from PC.



- Use a Helmholtz device to adjust an unit with no horizontal magnetic field and a vertical field of 40 μT. Inspect the unit under the same conditions.
- The ambient illuminance must be 200 lux.
- Use an external degaussing coil any time the DEGAUSS switch does not remove color shading.
- To check the image width, height, linearity and distortion, proceed as below.



Measure level with respect to tube axis.

HV3 Chassis Adjusting Program Description

- Use the PC (IBM AT or compatible) and a communications cable in combination with the control program to make communications between PC and the monitor possible. Adjustment is possible with operations from the keyboard.
- The HV dedicated program is required for control of this monitor.
  Never attempt to use those for other chassis.
  As an important control program, there is the address control of memory in the monitor set.
  This much varies depending upon the chassis. Therefore, if a program of other chassis is used, the operation may be rendered erratic, and parts destruction may result in an extreme case.
- Also, to operate the HV3 control program properly and correctly, use in ENGLISH MS-DOS environment is absolutely necessary.
  Be sure to check the following points before starting the control.

1. The computer operates in ENGLISH MS-DOS.
2. Display is made by the program main menu <HV3 ADJUST>.

Main Menu of Control Program

<<HV3 ADJUST PROGRAM MAIN MENU>> (e: exit) <Ver *.*>

1) Load data from FILE	6) Clear User preset
2) Adjust H.OSC freerun	7) Save data to FILE
3) Adjust VSR setting	8) Special ADJUST
4) Adjust OTHER setting	9) Information Service
5) Adjust Factory preset	10) Show Version & Error

Description of Function of Each Menu (Read the image description manual on 29~32 page also.)

1) Load Data from File
   Transfer the contents of the data file of the disc to the monitor and update the contents of EEPROM forcedly.
   When the data of the EEPROM is damaged for some reason or other, a return to the initial state can be made easily by using the function from the original data.
2) Adjust H. OSC Freerun
   To guarantee the operation in the follow-up possible horizontal frequencies, the reference oscillation frequency can be automatically set by making the microcomputer reference it.
3) Adjust VSR Setting
   To guarantee the operation in the follow-up possible horizontal frequency, the reference voltage to be referenced by the microcomputer and the distortion offset reference data should be set.
4) Adjust Other Setting
   This is used to control the brightness and color.
5) Adjust Factory Preset
   Makes the control at the time of preset mode, and the microcomputer is referenced when operating the partial data in modes other than the preset mode.
6) Clear User Preset
   Clear the data written in the user preset domain. Nothing is written in this domain when shipping the product from factory.
7) Save Data to File
   Transfer the data of the EEPROM of the monitor set to prepare a data file in a desired file name.
8) Information Service
   Displays the H/V frequencies of the signal fed to the monitor set and the operation status on the monitor set of the PC side.
10) Show Version and Error
   ① Return the microcomputer version to the PC model.
   ② If there is an error in monitor operation and the microcomputer sensing is in error, the contents of that error are returned to the PC.

Required Adjustment Items after Repair

Applicable Repair Parts	Adjustment item
CRT, DY (ITC)	Items B-R and Purity/Comvergence
MAIN PCB	Items B-R
Video PCB	Items N/P/Q/R
FBT	Items C/D/E/G/H/I/J/K/L/M/N (N4/N5/N10)/P
IC902 (EEPROM)*	Items A-R
IC1302 (Video Out)	Items N/P/Q
IC1301 (Video Amp)	Items N/P/Q
IC501 (H/V Process)	Items B/F
IC301 (DAF Control)	Items G/H
IC850, Q853 (Chopper)	Items C/D
Q550 (H.Out)	Items C/D/E/I/J/K/L/M/N (N4/N5/N10)/P
IC762, Q761 (V.PCC)	Items J/K/L/M
Q586, Q587 (H.Center)	Items I
Q650 (EHT)	Items E/J (J3)/L/M/N (N4/N5/N10)
IC901 (Micro Computer)	Check Only

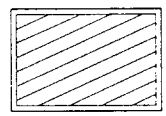
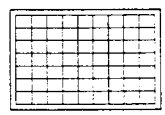
Note: When the EEPROM is replaced, or when a trouble leading to the destruction of the ROM data is suspected, report the serial number to the factory.*
If the data is saved at the time of shipment from factory, send the contents by facsimile.
After receiving the facsimile, write the data by the procedure given below.
The data can be returned to the state at the time of shipment from factory.

1. *Load the "VER8 2.DAT" written in the program floppy disc by the editor.*
2. *Update the data to the facsimile contents by using the editor.*
3. *Save the file in the serial number name. (EXAMPLE : FF4111732 = "4111732.DAT")*
4. *Start the control program.*
5. *Select 1) Load data from file from the main menu.*
6. *Feed the file prepared in 3 and transfer the data to the monitor set.*
7. *Turn the power of the monitor set off and turn it on once again. (Reset)*

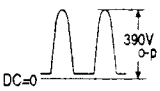
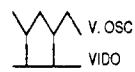
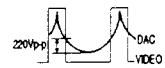
FAX NUMBER
81-466-35-5922 *Display Monitor Division*
Sales Engineering Section

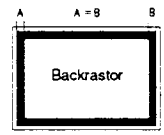
ADJUSTMENT PROCEDURE WITH COMPUTER

1. Description of Adjustment Method

	Item Program Menu	◇ Test Meter ▼ Test Point ☐ Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
A	DATA SETTING 1) Load data from FILE		A1 A2 A3 A4	OFF	Turn the power on, but do not connect the signal cable. Press [↵] by setting the cell to the menu at left. A message FILE -> EEPROM FILE NAME (G or Q escape) [ ]: is displayed. So. key in the **VER8_2.DAT** (when using the standard data) and press [↵]. **Note:** To make the transferred data effective, turn the power of the monitor set off once and turn it on once again.	
B	H. FREE RUN 2) Adjust H. OSC freerun	☐ Crosshatch	B1 B2 B3 B4 B5 B6 B7 BE	HV3-1 HV3-2 HV3-3 HV3-4	Press [↵] by setting the cell to the menu shown at left. Set the cell to the adjusting mode INTP[0] and press the [↵]. Check to be sure that the input signal to the monitor set is [fH 29.5kHz] and [fV 48.0Hz] and press the [↵]. When the screen image has stabilized, press [E] and return the image to the screen image of B2. <The same as B2, B3, and B4 except for the adjusting mode/signal.> Adjusting mode INTP[1]: Input signal [fH 39.0kHz] [fV 77.1Hz] Adjusting mode INTP[2]: Input signal [fH 54.0kHz] [fV 105.0Hz] Adjusting mode INTP[3]: Input signal [fH 64.5kHz] [fV 165.0Hz] Press [E] to return to the main menu.	 ↓ (Automatic adjustment) 
C	H. DRIVE 3) Adjust VSR setting	◇ Digital voltmeter ▼ TP503 - GND ☐ Crosshatch	C1 C2 C3 C4 C5 C6 C7 C8 CE	HV3-1 HV3-2 HV3-3 HV3-4	Set the cell to the menu at left and press the [↵]. Set the cell to the adjusting mode INTP[0] and press the [↵]. Check to be sure that the input signal to the monitor set is at given at left [fH 29.5Hz] and [fV 48.0Hz] and press the [↵]. Set the cell to H.DRIVE +B and press the [↵]. Then, move the cell to the data side. Make adjustment to as shown at right using the [←] and [→]. Register with the [↵] after adjustment and return to the menu if C2 using the [E]. <The same as C2, C3 C4, and C5 except for the adjusting mode/signal/Adjusting value.> Adjusting mode INTP[1]: Input signal [fH 39.0kHz] [fV 77.1Hz] Adjusting mode INTP[2]: Input signal [fH 54.0kHz] [fV 105.0Hz] Adjusting mode INTP[3]: Input signal [fH 64.5kHz] [fV 165.0Hz] Press the [E] to return to the main menu.	18.9 ±0.3V 17.8 ±0.3V 18.2 ±0.3V 14.0 ±0.3V

Note 1: Check to be sure that the program disc name is TXD1732 before making necessary adjustment.
Note 2: Unless otherwise specified, the monitor set state is as given at right.
Note 3: The underlined places indicate the adjustment items on the screen of the PC.

	Item Program Menu	◇ Test Meter ▼ Test Point ☐ Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
D	H. +B		D1		Set the cell to the menu at left and press the [↵].	
		◇ Digital voltmeter	D2		Set the cell to the adjusting mode INTP[0] and press the [↵].	
			D3	HV3-1	Check to be sure that the input signal to the monitor set is [fH 29.5Hz] and [fV 48.0Hz] and press the [↵].	
		▼ TP502 (H-OUT) - GND	D4		Set the cell to H.OUT.B and press the [↵]. Then, move the cell to the data side.	
	3) Adjust VSR setting		D5		Make adjustment to as shown at right using [←] and [→]. Make registration using the [↵] after adjustment and press the [E] to return to the menu of D2. <The same as D2, D3, D4, and D5 after setting the adjusting mode/signal and adjustment.	62.2 ±0.5V
		☐ Crosshatch	D6	HV3-2	Adjusting mode INTP[1]: Input signal [fH 39.0kHz] [fV 77.1Hz]	86.2 ±0.5V
			D7	HV3-3	Adjusting mode INTP[2]: Input signal [fH 54.0kHz] [fV 105.0Hz]	122.3 ±0.5V
			D8	HV3-4	Adjusting mode INTP[3]: Input signal [fH 64.5kHz] [fV 165.0Hz]	145.5 ±0.5V
			DE		Return to the main menu by pressing the [E].	
E	EHT	◇ Oscilloscope	E1	HV3-1	Check to be sure that the input signal is as shown at left and set the cell to the menu at left. Then, press the [↵].	
		▼ TP3 - GND	E2		Move the cell to EHT and press the [↵].	
	4) Adjust OTHER setting	☐ Sync signal only (RGB OFF)	E3		Make adjustment to as shown at right using the [→] and [←]. (390Vp-p $^{+20V}_{-40V}$)	
			EE		Press the [E] to return to the main menu.	
F	V. OSC	◇ Oscilloscope	F1		Set the cell to the menu at left and press the [↵].	
		◇ 10:1 probe x 2	F2		Select 4:V. OSC using 4 [↵].	
		▼ TP401 (V. OSC) - GND	F3		Set the cell to the adjusting mode VSR2 and press the [↵].	
	8) Special ADJUST	▼ N101 ③ (G. IN) - GND	F4	HV3-2A	Check to be sure that the signal is as shown at left and press the [↵].	
		☐ White flat field pattern	F5		Make adjustment to as shown at right using the [←] and [→]. After adjustment, press the [E] to return to the menu of F3.	The bottom of the M waveform coincides with the video phase.
			F6		Set the cell to the adjusting mode VSR4 and press the [↵].	
			F7	HV3-4A	Check to be sure that the signal is as shown at left, press the ENTER key, and make same adjustment as F4.	
			FE		Return to the menu of F3 using and F4 using [E] and return to the main menu using [E] and [↵].	
G	DAF	◇ Oscilloscope	G1		Set the cell to the menu at left and press the [↵].	Waveform of G4 (H. DAF)
		◇ 100:1 probe	G2		Select the 2:DAF ADJUST using 2 [↵].	
		◇ 10:1 probe	G3	HV3-4	Check to be sure that the signal is as shown at left.	
	8) Special ADJUST	▼ TP301 - GND (100:1)	G4		Adjust the time axis of the oscilloscope so that the DAF waveform becomes as shown at right.	
		▼ N101 ③ (G. IN) - GND	G5		Move the cell to H. DAF GAIN, H. DAF POS! and adjust as shown at right using [←] and [→]. (220Vp-p ±10V)	
		☐ White flat field pattern	G6		Adjust the time axis of the oscilloscope so that the DAF waveform becomes as shown at right.	Waveform of G6 (V. DAF)
			G7		Move the cell to the V. DAF GAIN, V.DAF POS! and adjust as shown at right using [←] and [→]. (100Vp-p ±10V)	
			GE		Return to the menu of G2 using [E] and return to the main menu using the [E] and [↵].	

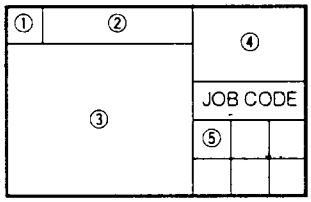
	Item Program Menu	◇ Test Meter ▼ Test Point ☐ Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
H	FOCUS	☐ Crosshatch	H1	HV3-4	Turn the FOCUS H VR of the FBT to make the focus of the peripheral section optimum.	
		☐ Character pattern	H2		Turn the FOCUS V VR of the FBT to make the focus of the center section optimum. (Repeat H1 and H2 to make it optimum.)	
			H3		Switch to the character pattern and check to be sure that the focus is at its best. (Note: This adjustment should be done by turning the VR using a screwdriver.)	
I	H. CENTER	☐ RGB OFF (Sync signal only)	I1		Set the cell to the menu at left and press the [↵].	
			I2		Set the cell to the adjusting mode INTP[0] and press the [↵].	
			I3	HV3-1	Check to be sure that the input signal to the monitor set is as shown at left [fH 29.5kHz] and [fV 48.0Hz] and press the [↵].	
			I4		Set the cell to the H. CENTER and press the [↵] .and move the cell to the data side.	Set the RASTER to the center with respect to the bezel.
	3) Adjust VSR setting		I5		Make adjustment as shown at right using [←] and [→]. Register using the [↵] after adjustment, press the [E], and return to the menu of 12. <The same as 12, 13, 14, and 15 except for the adjusting mode and signal.>	
			I6	HV3-2	Adjusting mode INTP[1]: Input signal [fH 39.0kHz] [fV 77.1Hz]	
			I7	HV3-3	Adjusting mode INTP[2]: Input signal [fH 54.0kHz] [fV 105.0Hz]	
			I8	HV3-4	Adjusting mode INTP[3]: Input signal [fH 64.5kHz] [fV 165.0Hz]	
			IE		Return to the main menu by pressing the [E].	
J	HV. SIZE/HV. POSI/ V. PCC (1)	☐ Crosshatch	J1		Set the cell to the menu at left and press the [↵].	
			J2	MODE-12	Check to be sure that the input signal is as shown at left and press the [↵]. <Set the cell to the following items, press the [↵], and make J3 and J4.>	
	5) Adjust Factory preset		J3		Adjust the H. SIZE, V. SIZE, H. POSI and V. POSI to the left using [←] and [→].	H. SIZE 300mm ±5mm V. SIZE 225mm ±5mm HV. POSI CENTER
			J4		Set the V. PCC, V. PCC TRAPEZOID and V. PCC PARALLEL to the best using [←] and [→].	
			JE		Press the [E] and [N] to return to the main menu.	
K	V. PCC	☐ Crosshatch	K1	MODE-12	Check to be sure that the input signal is as shown at left. Set the cell to the menu at left and press the [↵]. <Set the cell to the following items , press the [↵], and make necessary adjustment.>	
	3 Adjust OTHER setting		K2		Set the V. PCC CORNER, V. PCC CNTER and V. PCC BALANCE to the best using the [←] and [→].	
			KE		Press the [E] to return to the main menu.	

	Item Program Menu	◇ Test Meter ▼ Test Point ☐ Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
L	HV. SIZE, HV. POSI, V. PCC (2) 3) Adjust VSR setting	☐ Crosshatch	L1		Set the cell to the menu at left and press the [↵].	H. SIZE 300mm ±5mm V. SIZE 225mm ±5mm HV. POSI CENTER V. PCC best point
			L2		Set the cell to the adjusting mode INTP[0] and press the [↵].	
			L3	HV3-1	Check to be sure that the input signal to the monitor set is as shown at left [fH 29.5kHz] and [fV 48.0Hz] and press the [↵].	
			L4		Set the cell to the following items, press the [↵], and make necessary adjustment using the [←] and [→]. ① H. SIZE, ② V. SIZE, ③ H. POSI, ④ V. POSI, and ⑤ V. PCC	
			L5		After adjusting ① - ⑤, press the [E] and return to the menu of L2. <Same as L2, L3, L4, and L5 except for the adjusting mode/signal.>	
			L6	HV3-2	Adjusting mode INTP[1]: Input signal [fH 39.0kHz] [fV 77.1Hz]	
			L7	HV3-3	Adjusting mode INTP[2]: Input signal [fH 54.0kHz] [fV 105.0Hz]	
			L8	HV3-4	Adjusting mode INTP[3]: Input signal [fH 64.5kHz] [fV 165.0Hz]	
			LE		Press the [E] to return to the main menu.	
M	HV. SIZE, HV. POSI, V. PCC (3) 5) Adjust Factory preset	☐ Crosshatch	M1		Set the cell to the menu at left and press the [↵].	H. SIZE 300mm ±5mm V. SIZE 225mm ±5mm HV. POSI CENTER V. PCC best point
			M2	MODE-3	Check to be sure that the input signal to the monitor set is as shown at left [fH 31.5kHz] and [fV 60Hz] and press the [↵].	
			M3		Set the cell to the following items, press the [↵], and make adjustment as shown at right using the [←] and [→]. ① H.SIZE, ② V. SIZE, ③ H. POSI, ④ V. POSI, ⑤ V. PCC, ⑥ PARALLEL and ⑦ TRAPEZOID **Note:** H. POSI and V. SIZE should use both modes, MSB and LSB. For details, refer to the description of adjusting screen image.	
			M4		After adjusting ① - ⑦, go to M5 using the [E] and [Y]. <Same as M2, M3, and M4 except for the input signal below.>	
			M5	MODE-9	Input signal [fH 37.8kHz] and [fV 60Hz]	
			M6		After adjustment, go to M7 using the [E] and [Y].	
			M7	MODE-12	Input signal [fH 48.3kHz] and [fV 60Hz]	
			ME		Return to the main menu after adjustment using the [E] and [N].	

	Item Program Menu	◇ Test Meter ▼ Test Point ☐ Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
	BRIGHTNESS, COLOR		N1		Set the CONTRAST···MAX, BRIGHTNESS···CENTER and COLOR···9300K using the OSD of the monitor set.	
			N2		Set the cell to the menu at left and press the [↵].	
		☐ Sync signal only	N3	MODE-12	Feed the signal at left/pattern to the monitor set.	
		(RGB OFF)	N4		Set the cell to the following items, press the [↵], and move the cell to the data side. Then, make adjustment using [←] and [→] so that the point at which the back raster of each R, G or B glitters. R. LOW LIGHT 9300K, G. LOW LIGHT 9300K and B. LOW LIGHT 9300K	
	4) Adjust OTHER setting		N5		Move the cell to G2 9300K and adjust to the point where the back raster went off.	
			N6		Switch over to the pattern at left and check to be sure that the 2nd gradation vaguely glitters.	
			N7		Switch over to the pattern at left and bring the sensor of the analyzer to the center of the screen image. (CONTRAST MAX)	
N		☐ 16 gradation grayscale ☐ Totally white pattern	N8	MODE-12	Move the cell to the following items and make adjustment as shown at right using the [←] and [→]. R. SUBCONT 9300K, G. SUBCONT 9300K and B. SUBCONT 9300K	(CONT MAX) Y=120cd/m² ±5 x=0.281 ±0.020 y=0.311 ±0.020
		◇ TV COLOR ANALYZER II	N9	MODE-12	Set the CONTRAST of the monitor set to the MINI and move the cell to the following item. Then, make adjust as shown at right. R. LOW LIGHT 9300K, G. LOW LIGHT 9300K and B. LOW LIGHT 9300K	(CONT MINI) Y≦20cd/m² x=0.281 ±0.020 y=0.311 ±0.020
			N10		Change the following data value to the same as 9300K using the [←] and [→]. G2 6550K, R. SUBCONT 9300K, G. SUBCONT 9300K and B. SUBCONT 9300K R. LOW LIGHT 6550K, G. LOW LIGHT 6550K and B. LOW LIGHT 6550K	
			N11		Press the [E] to return to the main menu.	
	8) Special ADJUST		N12		Set the cell (Special ADJUST) to the menu at left and press the [↵].	
			N13		Select 3: Color ADJUST from the menu.	
			N14		Automatically convert with press [Y].	
			NE		Press [↵] to return to N13 menu then press [E] to return to main menu.	
	ABL	☐ Totally white pattern	P1		Set the CONTRAST···MAX, BRIGHTNESS···MAX, COLOR··· 9300K using the OSD of the monitor set.	
		◇ TV COLOR ANALYZER II	P2		Set the cell to the menu at left and press the [↵].	
			P3	MODE-12	Feed the signal at left and bring the sensor of the analyzer to the screen image center.	
			P4		Move the cell to ABL 9300K and adjust as shown at right.	Y=140cd/m² ±10
P	4) Adjust OTHER setting		P5		Change the ABL 6550K data values the same as ABL 9300K using the [←] and [→].	
			PE		Press the [E] to return to the main menu.	

	Item Program Menu	◇ Test Meter ▼ Test Point ☐ Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
Q	INPUT 1.0V SETTING 8) Special ADJUST	☐ Totally white pattern	Q1 Q2 Q3 Q4 Q5 QE	MODE-12	Set the cell to the menu at left and press the [↵]. Select 1: VIDEO 1.0V ADJUST from the menu. Set the CONTRAST MAX and VIDEO INPUT 1.0V using the OSD of the monitor set. Press the [↵] against the message of "hit return key". Press the [↵] as other message is displayed. Press the [E] to return to the menu of Q2 and return to the main menu using the [E].	
R	FINAL SETTING 8) Special ADJUST		R1 R2 R3 R4 RE	MODE-12	Set the cell to the menu at left and press the [↵]. Select the 9: FINAL TUNE from the menu. Press either Y or N when the message of "CANCEL USER PRESET DATA (y/n) ->" has been output after a while. Key in 1 against the message of SELECT FLAG ->. Press the [E] to return to the menu of R2 and then return to the main menu using the [E].	
T	DATA SAVING 7) Save data to FILE		T1 T2		Set the cell to the menu at left and press the [↵]. Key in the file name after [ ]:. Use SERIAL No. as a file name. (EXAMPLE : FF4111732 = "4111732. DAT")	

2. Control Program Screen Image Description



① Screen image No. (S-1 - S-19) on this manual
② Screen image name
③ Screen image of control-side PC
④ Description of method of use
(↵ ← → E Q N Y : indicate key operation)
(⇒S-□ : indicates that an advance is made to the S-□ screen.)
⑤ JOB CODE given on the control description corresponding to this manual.

S-1 Main Menu

```
<< HV3 ADJUST PROGRAM MAIN MENU >>      ( e:exit)      <Ver8.2>
1) Load data from FILE        6) Clear User preset
2) Adjust H. OSC freerun      7) save data to FILE
3) Adjust VSR setting         8) Special ADJUST
4) Adjust OTHER setting       9) Information Service
5) Adjust Factory preset     10) Show Version & Error
```

Move the cell with the cursor key. ↵
E => MS-DOS

JOB CODE						
A2	B1	C1	D1	E1	F1	G1
I1	J1	K1	L1	M1	N2	P2
Q1	R1	T1				

S-2 Operation screen of 1) Load data from FILE

```
FILE -> EEPROM FILE NAME (q or Q escape) [ ] : _
```

File name ↵ DATA is displayed. => S-1
When the fed file does not exist. => S-1
Q => S-1
<<Note: Be careful as the data in the monitor tends to vary!>>

JOB CODE	A3				

S-3 Adjusting mode setting screen of 2)/3) Adjust H. OSC/VSR

```
<< HV3 ADJUST PROGRAM  H. OSC/VSR MENU >>   ( E:exit)      <Ver8.2>
INTP [0]                                    INTP [2]
INTP [1]                                    INTP [3]
```

Move the cell with the cursor key. ↵ => S-4 or S-5
E => S-1

JOB CODE	B2	B5	B6	B7	BE
C2	C6	C7	C8	CE	D2	D6
D7	D8	DE	I2	I6	I7	I8
IE	L2	L6	L7	L8	LE	

S-4 Operation screen of 2) Adjust H. OSC freerun

```
1 fH = ( 29.50 kHz)  fV ( 48.0 Hz) ..... In case of INTP[0]
Please Input 'this' timing . Then HIT RETURN key !!
If picture was stopped . HIT RETURN key !! ..... Adjustment is completed.

<<WARNING !!>> NO □□□□□ sync ..... Error display
```

If the input signal is as displayed, ↵.
When not HV3-* is not TIMING: Error display E => S-3
When the screen movement stops, adjustment (automatic adjustment) is completed.
E => S-3

JOB CODE					
B3	B4	B5	B6	B7		

S-5 Input signal confirmation screen after selection of INTP[0] - INTP[4].

```
1 fH ( 29.50kHz)   fV ( 48.0Hz) ..... In case of INTP[0]
2 fH ( 39.00kHz)   fV ( 77.1Hz) ..... In case of INTP[1]
3 fH ( 54.00kHz)   fV ( 105.0Hz) ..... In case of INTP[2]
4 fH ( 64.50kHz)   fV ( 165.0Hz) ..... In case of INTP[3]
Please Input "this" timing . Then HIT RETURN key !!

<<WARNING !!>> NO □□□□□ sync ..... Error display
```

If the input signal is as displayed, ↵ => S-3.
If HV3 -* is not TIMING: Error display ↵ => S-3

JOB CODE						
C3	C6	C7	C8	D3	D6	D7
D8	I3	I6	I7	I8	L3	L6
L7	L8					

Note 1: Control items underlined are not needed.
Note 2: Refer to the control description for the method of adjustment and adjusting values.

S-6 Main Menu

<< HV3 ADJUST PROGRAM INTP MENU >> (e:exit . q:quit) <Ve.r8.2>

H. OSC	□□	V. OSC	□□
H. DRIVE +B	□□	V. SIZE	□□
H. OUT +B	□□	V. POSI	□□
H. CENTER	□□	V. PCC	□□
H. SIZE	□□	V.LIN (S)	□□
H.POSI	□□	V.DAF GAIN	□□
H. DAF GAIN	□□		

All data will be written in EEPROM when you hit 'e' key !

Select mode:
① The cell moves items with the cursor key.
② Adjusting mode of that item is selected by [↵].
Adjusting mode:
③ Adjust with [←] and [→].
④ Return to ① by [↵].
Adjusting completed: [E] => S-3
[Q] => S-3 (Data is not registered.)

JOB CODE						
C4	C5	C6	C7	C8	D4	D5
D6	D7	D8	I4	I5	I6	I7
I8	L4	L5	L6	L7	L8	

S-7 Adjusting screen of 4) Adjust OTHER setting

<< HV3 ADJUST PROGRAM OTHER MENU >> (e:exit . q:quit) <Ve.r8.2>

G2 9300K	*1A	G2 6500K	*1B
ABL 9300K	*2A	ABL 6500K	*2B
R SUBCONT 9300K	*3A	R SUBCONT 6500K	*3B
G SUBCONT 9300K	*4A	G SUBCONT 6500K	*4B
B SUBCONT 9300K	*5A	B SUBCONT 6500K	*5B
R LOW LIGHT 9300K	*6A	R LOW LIGHT 6500K	*6B
G LOW LIGHT 9300K	*7A	G LOW LIGHT 6500K	*7B
CONTRAST	□□	V. CPCC	□□
BRIGHTNESS	□□	V. PCC CENTER	□□
G1	□□	V. PCC TRAPEZOID	□□
H. DAF GAIN	□□	V. PCC PARALLEL	□□
H. DAF POSI	□□	V. PCC CORNER	□□
V. DAF GAIN	□□	V. PCC BALANCE	□□
V.DAF POSI	□□	EHT	□□

All datas (except *) are memorized.

Selection mode:
① The cell moves the item with the cursor key.
② The adjusting mode of the item is selected by [↵].
Adjusting mode:
③ Adjust with [←] and [→].
④ Return to ① with [↵].
Adjustment is completed: [E] => S-1
[Q] => S-1 (Adjusting data is not registered.)
Note: Data of *1A - *8A, *1B - *8B
With the job code N11 of the adjusting manual operated, make as follows:
*1A=*1B *2A=*2B *3A=*3B *4A=*4B
*5A=*5B *6A=*6B *7A=*7B *8A=*8B

JOB CODE						
E2	E3	EE	K2	KE	N4	N5
N8	N9	N10	NE	P4	P5	PE

S-8 Input signal confirmation screen after selection of 4) Adjust Factory preset

Input any PRESET timing that you want to adjust.
Then hit RETURN key.

It's not PRESET timing !! Check your timing !!! ..... Error display
Hit RETURN key.

Signal of MODE-3/-9/-12: [↵] => S-9
Signals other than MODE-3/-9-/12: [↵] Error display
[E] => S-1

JOB CODE						
J2	M2	M5	M7			

S-9 Adjusting screen of 4) Adjust Factory preset

<< HV3 ADJUST PROGRAM PRESET MENU >> (e:exit . q:quit) <Ve.r8.2>

H. SIZE	□□	V. PCC	□□
H. POSI MSB	□□	V.PCC TRAPEZIDO	□□
H. POSI LSB	□□	V. PCC PARALLEL	□□
V. SIZE MSB	□□	H. DAF GAIN	□□
V. SIZE LSB	□□	H. DAF POSI	□□
V. POSI	□□	V. DAF GAIN	□□
H. MOIRE	□□	V. DAF POSI	□□
V. MOIRE	□□		

Select mode:
① The cell moves the item with an arrow key.
② The adjusting mode of the item is selected by [↵].
Adjusting mode:
① Adjust with [←] and [→].
② Return to ① with [↵].
After completing adjustment: [E] => S-10
[Q] => S-1 (Adjusting data is not registered.)
Note:
H PSI/V.SIZE MSB on the screen varies largely, and LSB little.
Make adjustment in combination of MSB and LSB.

JOB CODE						
J3	J4	M3	M5	M7		

S-10 Screen after adjustment of 4) Adjust Factory preset

Another timing adjust ? (y/n)

[Y] => S-9 [N] => S-1

JOB CODE						
JE	J4	M6	ME			

S-11	Operating screen of 6) Clear User preset

Erase All 'User Preset DATA' . Okay ? (y/n) _

Cleared [Y] => S-1
Not cleared [N] => S-1

JOB CODE					

S-12	Operating screen of 7) Save data to FILE

EEPROM -> FILE NAME (q or Q escape) [ ] : _

Key in the file name after [ ]:.
Data display => S-1

JOB CODE	T2				

S-13	Adjusting mode setting menu of 7) Special ADJUST

<< SPECIAL ADJUST MENU >>
1: VIDEO 1.0Vp-p ADJUST
2: DAF ADJUST
3: COLOR ADJUST
4: V. OSC ADJUST
5: 6: 7: 8:
9: Final TUNE
Which data do you wanna change (1 - 9 . e:exit) ? -> _

Key-in the No. of adjusting item.
After completing adjustment: [E] [↵] => S-1

JOB CODE						
F2	FE	G2	GE	Q2	QE	R2
RE						

S-14	Setting menu of 1:VIDEO 1.0Vp-p ADJUST

<< VIDEO LEVEL ADJUST MODE >>
Please set video level at 1.0Vpp
then hit return key ! ..... (1)
Please adjust CONTRAST (1.0Vpp) using CURSOR KEY.

If you finished adjustment HIT RETURN KEY ! ..... (2)

Contrast (1.0Vpp) = Contrast (0.7Vpp) x a7/ff ..... (3)

(Method of use)
1) Set the video level to 1.0V with the OSD, [↵].
2) Adjustment is automatic. When this message appears, [↵].
3) When this message has appeared, [↵] => S-13.

JOB CODE	Q4	Q5			

S-15	Adjusting screen of 2:DAF ADJUST

Adjust DAF data. Then hit 'E' key.
H. DAF GAIN : □□
H. DAF POSI : □□
V. DAF GAIN : □□
V. DAF POSI : □□

Select mode:
① The cell moves the item with an arrow mark key.
② The item is set in the adjusting mode by [↵].
Adjusting mode:
③ Adjust with [←] and [→].
④ Return to ① with [↵].
After completing adjustment: [E] => S-13

JOB CODE	G5	G7			

S-16	Mode setting screen of 4:V. OSC ADJUST

<< HV3 ADJUST PROGRAM V.OSC MENU >> (e:exit) <Ve.r8.2>
VSR2 VSR4

The cell moves VSR2 and VSR4 with [←] and [→].
[↵] => S-17
[E] => S-13

JOB CODE	F3	F6	FE		

S-17	Input signal confirmation screen of 4:V. OSC ADJUST

fH = (39.00 kHz fV (77.1Hz) .....When WSR2 is selected.
fH = (64.50 kHz fV (165.0Hz) .....When WSR4 is selected.
Please input 'THIS' timing . Then HIT RETURN key !!

<< WARNING !! >> □□□□ sync Error !! ..... Error display

After confirming that the displayed signal is fed, [↵].
Note: VSR2 requires the signals of HV3-2A and VSR4 requires the signal of HV3-4A.
When the signal is different. Error display [↵] => S-13

JOB CODE	F4	F7			

S-18	Adjusting screen of 4:V. OSC ADJUST

<< HV3 ADJUST PROGRAM V.OSC MENU >> (e:exit) <Ve.r8.2>
V. OSC □□

Move the cell to the data side by [↵] and adjust with [←] and [→].
Data is adjusted by [↵] after adjustment, and the cell returns to V. OSC.
[E] => S-16

JOB CODE	F5	F7			

S-19	Operating screen of 9: Final TUNE

tuning start !
< loading EEPROM data >
wait a moment .. end ..... (1)
< tuning EEPROM data >
wait a moment .. end ..... (2)
< saving data to EEPROM >
wait a moment .. end ..... (3)
CANCEL USER PRESET DATA (y/n)? -> _ ..... (4)
< SET FLAG >
1 : SET
2 :
SELECT FLAG ->_ ..... (5)

① - ③ Automatic processing
④ Selects either Y or N, [↵].
⑤ Select 1, [↵] => S-13

JOB CODE	R3	R4			

S-20	Operating screen of 10) Show Version & error

ID DATA = □□ Version No. 8
err code = □□
□□□□□□□□□□□□□□ ..... Error contents
Hit any key >

When the display of microcomputer version is made and when an error is generated, the error code and the error contents are displayed.

□ => S-1

JOB CODE					

S-21	Operating screen of 8: Color ADJUST

Calculate COLOR 6550k data automatically, OK (y/n)?
finished, (Hit return key)_ ..... Completion display

[Y] => S-13 (nothing happened)
[N] => S-13 (data convert)

JOB CODE	N14	NE			

3. Purity adjustment

The CRT is an ITC assembly, however, here is the explanation for readjustment just in case.

If color shading is apparent, make the following adjustment.

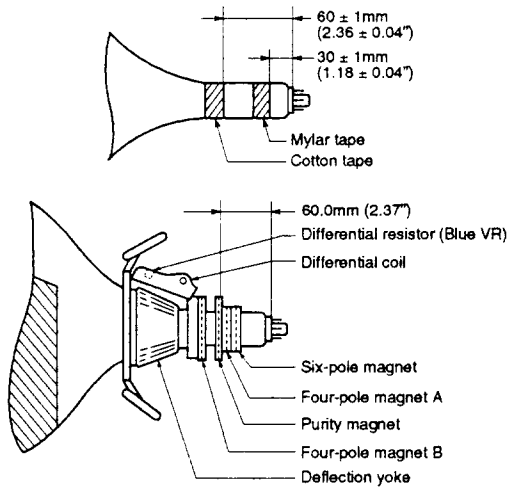
3.1.

(1) Verify that no unusual magnetic fields are near the Display unit (magnetic screwdrivers, table magnets, etc.). If possible, use a wooden workbench for this procedure.
(2) Degauss the magnetism of chassis and CRT with external degaussing coil.
(3) Adjust the purity magnet until each of the red, green and blue channels is free of color shading.

Make the following adjustment if color shading cannot be corrected by the above, or if the CRT or deflection yoke has been replaced.

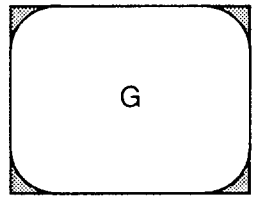
3.2.

(1) Keep the convergence yoke and deflection yoke in the positions shown below.

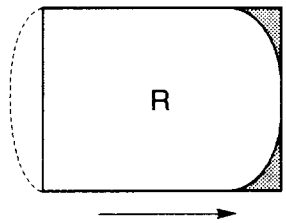


CY tightening torque: 8^{+2}_{-1} kgf·cm
DY tightening torque: 18 ±2 kgf·cm

(2) Make sure that this adjustment is done later than 30 minutes after power on.
(3) Degauss the magnetism of chassis and CRT with an external degaussing coil.
(4) Verify that static convergence is roughly matched. If it is misaligned, adjust static convergence of Red color and Blue color with Four-pole magnet A.
For this adjustment Four-pole magnet B which is with deflection yoke must be put together.
(5) Remove the wedge from the deflection yoke, and pull the deflection yoke fully to the front.
(6) Display green color solely with the signal generator. Adjust the purity magnet so that the center of the screen displays a pure green disk. Slide the deflection yoke rearward until the four corners shaded and check its area's uniformity.



(7) After the adjustment of step 5, readjust the static convergence if some gap was found.
Static convergence alignment for this step is to be performed with Four-pole magnet A and Six-pole magnet.
(8) Display red disk. Adjust the purity magnets so as that red disk is as the center of the screen simultaneously. If red shifted, move a little its position in opposite direction.



(9) Green again.
Slide the deflection yoke rearward until the screen appears green on the whole, and fasten it there.
(10) Confirm purity in each direction by rotating the set to direction of East, West, South, and North after degauss by external degaussing coil.
(11) If magnetism remains even after the adjustment, use the compensation magnet to obtain purity.

The final confirmation method for purity

In the natural magnetic field, rotate the monitor in the direction of East, West, South and North.

Earth's magnetic field may cause magnetism on the monitor. Confirm that the automatic degaussing circuit built in the monitor can erase the amount of magnetism which was introduced with above rotation.

4. Convergence adjustment

The CRT is an ITC assembly, however, here is the explanation for readjustment just in case.

(1) Make sure that this adjustment is done later than 30 minutes after power on. Check general ability coarse adjustment and purity adjustment finished.

(2) Degauss the magnetism of chassis and CRT with degaussing coil. (CRT board also)

(3) Apply mixed crosshatch signals of red and blue from the signal generator. Nugde the deflection yoke to equal its inclanation up and down, right and left with a temporary wedge between CRT and the top of the yoke

(4) Match the red and blue images at the center of the screen by rotating the Four-pole magnet A (See STEP-1 in figure for examples). For this adjustment Four-pole magnet B be put together.

(5) Apply mixed crosshatch signal consists of red, blue and green from the signal generator.

(6) Match the red, green and blue images at the center of the screen by rotating the Six-pole magnet. (See STEP-2 in figure for examples)

(7) If lines are twisted either lefthand or righthand (See the STEP-3 in figure for examples) perform the following:

a. Use Four-pole magnet B to shift convergence of horizontal lines by 5 to 6 mm at the center of the screen. (For twisted lefthand lines shift blue line downward and red line upward. For twisted righthand lines shift red line downward and blue line upward. Do not shift convergence of vertical lines.)

b. Then realign convergence with Four-pole magnet A.

(8) Loosen the deflection yoke fastening screw and gently nudge the yoke up and down to achieve the best overall convergence on the edges of the screen (See STEP-4 in figure for examples).
Insert wedge at the top of the deflection yoke so that the convergence will not deviate due to an unsteady deflection yoke.

(9) Gently nudge the yoke from side to side to achieve the best overall convergence on the edges of the screen (See STEP-5 in figure for examples).
Insert wedges at the left side and right side of the deflection yoke so that the convergence will not deviate due to an unsteady deflection yoke. (Do not apply silicon adhesive to the wedges to prevent them from slipping out).

(10) Check that the image is horizontal.
If needed, rotate the deflection yoke.

(11) Recheck the purity adjustment. If purity was adversely affected repeat the purity adjustment, then recheck convergence when finished.

(12) Retighten the deflection yoke fastening screw. Do not overtighten the screw, as this can damage the CRT.
Tightening torque: 18 ±2 kgf·cm

(13) Align the horizontal line convergence at the center of the screen with the Differential coil (See STEP-6 in figure for examples).

(14) Align the horizontal line convergence at the top and bottom of the screen with the Differential resistor VR. (See STEP-7 in figure for examples). (blue one)

(15) Recheck convergence at the center of the screen. If needed, realign with the Four-pole magnet A and the Six-pole magnet. Fasten up the magnet stopper for the inside magnets not to move.

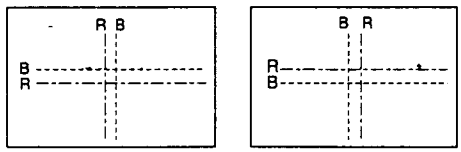
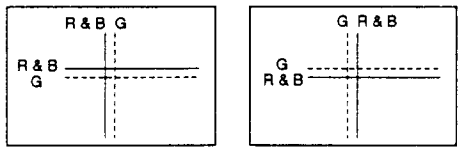
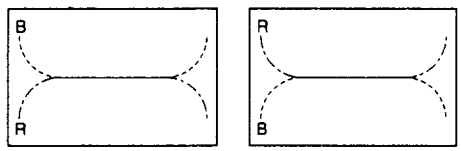
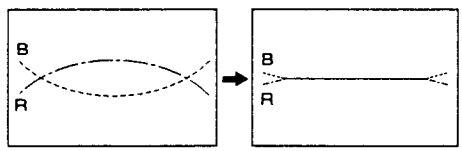
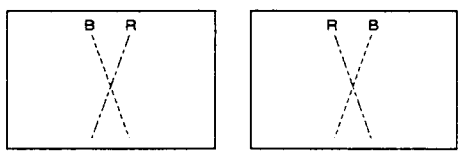
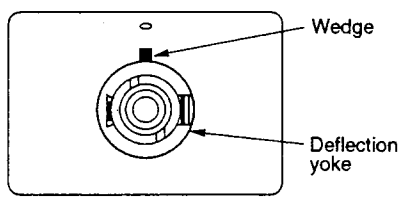
(16) Insert wedges as shown in STEP-8 of figure (at the left bottom, right bottom, left top, right top, and top of the deflection yoke).
Secure them with silicon adhesive and polyester tape. Remove any temporary wedges while keeping convergence aligned.

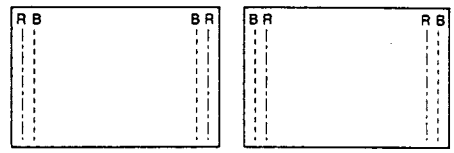
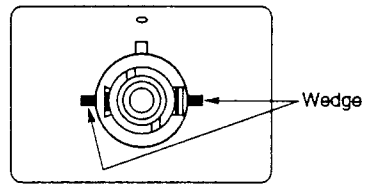
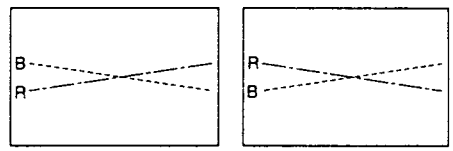
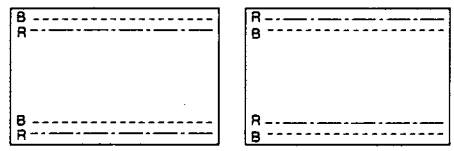
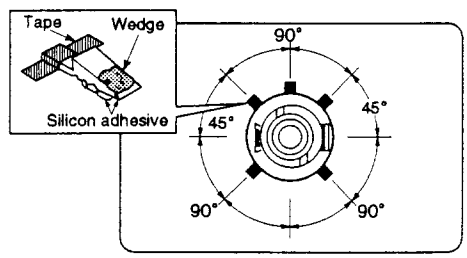
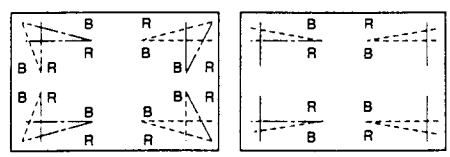
(17) If the convergence on the fringe areas in still not acceptable, place one or more Permalloys around the funnel to achieve the best effect. Then press these Permalloys onto the funnel. Verify convergence around all edges of the screen. Secure them with polyester tape. (See STEP-9 in figure for examples.)

NOTE

In the above step, do not place the Permalloys closer than 20 mm from the HV anode cap. Do not tape them over any paper labels or secure them with silicon adhesive.

(18) After completion of adjustment, apply white racquer to the movable portions of the deflection and convergence yokes to secure them.

Adjustment part	Misconvergence pattern Wedge inserting position
Four-pole magnet B	**STEP-1** 
Six-pole magnet	**STEP-2** 
Four-pole magnet B	**STEP-3**  Beams are twisted lefthand Beams are twisted rightand **for example (lefthand)**  with four-pole magnet B with four-pole magnet A
Deflection yoke	**STEP-4**  Tilting the yoke up Tilting the yoke down  Rear view of the CRT

Adjustment part	Misconvergence pattern Wedge inserting position
Deflection yoke	**STEP-5**  Tilting the yoke left Tilting the yoke right  Rear view of the CRT
Differential coil	**STEP-6** 
Differential resistor VR3	**STEP-7** 
	STEP-8  Wedge spacing and how to tape
Permalloy	**STEP-9** 

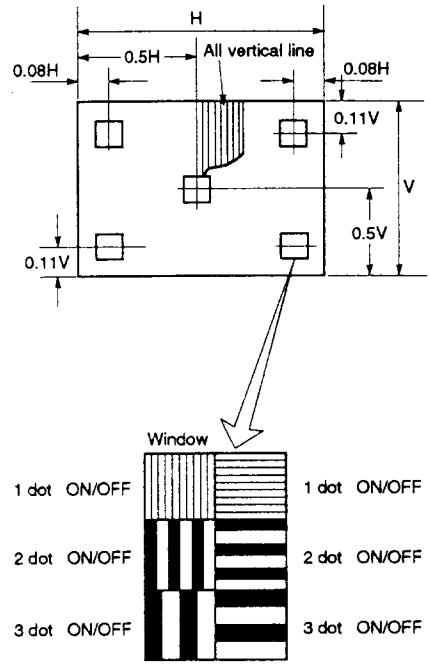
CHECK ITEM

These items are intended for a recheck after adjustment and for a check of the following function operations:

1. Resolution check
2. Brightness variation check
3. Gradation check
4. Brightness check
5. Deflection linearity check
6. Distortion check
7. Image stability check
8. Blinking image check
9. Circuit operation check
10. Specific function check
11. Power save function check

1. Resolution Check

(1) Apply resolution check pattern.



(2) Check with the normal signal and inverted signal. Check to be sure that display color between dots is uniform and that there are no color difference and spotty display color.

(3) Check the entire image quality including resolution.

2. Brightness Variation Check

(1) Cause the white full dot pattern to be displayed with the Mode-12 signal.

(2) Set the contrast to a maximum.
Set the brightness to the center.

(3) Make sure that a brightness difference between the center and periphery is <65% with the horizontal magnetic field in the condition of ±30 μT.

3. Gradation Check

(1) Cause the 16 grayscale to be displayed with the Mode-3 signal. (White gradation waves.)

(2) Set the contrast to a maximum and the brightness to the center.

(3) At this time, the 1st gradation (black level) cannot be seen and the 2nd gradation must be barely lit.

(4) With the brightness set to the center, vary the contrast from the maximum point and the gradation tracking must be good at that time.

Note: If hint (particularly the gray, which is a middle color) is different, make adjustment of the white balance once again.

(5) With the contrast set to a maximum, vary the brightness from the maximum point to the minimum point and check to be sure that the brightness of the low gradation portion changes.

Note: Check both the color select 9300K and 6550K.

4. Brightness Check

(1) Cause the white full-flat field pattern to be displayed with the Mode-3 signal.

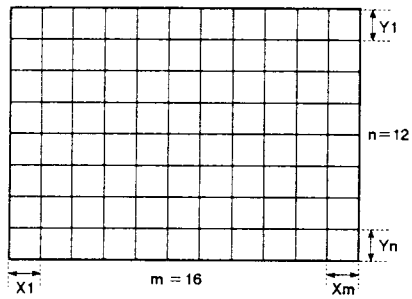
(2) Make sure that the brightness value is < 15 cd/m² when the contrast is set to a minimum and the brightness to the center.

5. Deflection Linearity Check

(1) Display the green only crosshatch pattern.

$$\text{Horizontal linearity} = \frac{X\ max. - X\ min.}{X\ max. + Ymin.} \times 100\%$$

$$\text{Vertical linearity} = \frac{Ymax. - Ymin.}{Ymax. + Ymin.} \times 100\%$$



(2) To confirm the horizontal deflection linearity, proceed in the next input signal modes:

Mode-1 ≤ 6%
Mode-2 ≤ 5%
Mode-3 ≤ 5%

To confirm the vertical deflection linearity, proceed in the following input signal modes:

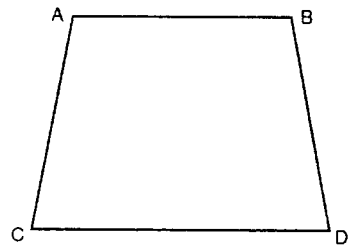
HV3-1 HV3-4
Mode-1 Mode-2 } ≤ 5%
Mode-3

6. Distortion Check

(1) Apply the signal of the following mode and supply the green crosshatch pattern.
Mode-1
Mode-2
Mode-3

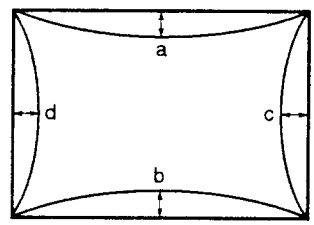
(2) Make sure that each value comes within the value indicated above.

• Total distortion



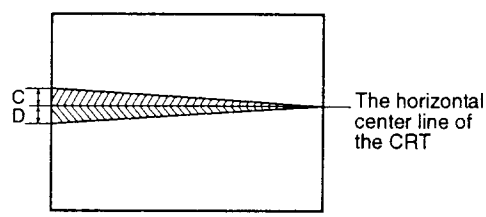
|AB – CD| ≤ 3.0 mm
|AC – BD| ≤ 3.0 mm

• Pincushion



a, b, c, d ≤ 1.5 mm

• Rotation



C, D ≤ 3.0 mm

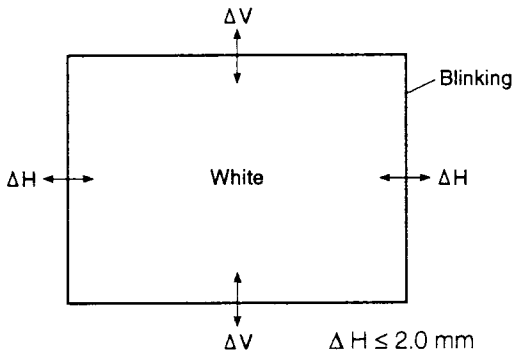
7. Image Stability Check

(1) Check to be sure that the size variations are < 2 mm for horizontal size and < 1.5 mm for vertical size when the white full dot pattern of Mode-3/Mode-12 is displayed and the AC voltage is changed to 90 ~ 264 V.

(2) Make sure that the size-variations are < 2 mm for horizontal size and < 1.5 mm for vertical size when contrast is changed to a minimum from maximum at the AC voltage of 120 V/240V.

8. Blinking Image Check

(1) Apply blinking pattern signal. (100%)



(2) Check the image stability at Mode-1 and Mode-3. Check if image changes due to blinking meets the standards below using the microscope.

9. Circuit Operation Check

(1) Check the protection operation at fH not covered in the specifications.

(2) Apply fH = 28 KHz and 66 KHz signal and check to be sure that sync flows.

10. Specific Function Check

(1) Create the crosshatch pattern using the Mode-3 signal of the preset timing.

(2) Vary the variations of the vertical size and the deviation of the horizontal size and check to be sure that the horizontal size and horizontal position variations meet the values given below.

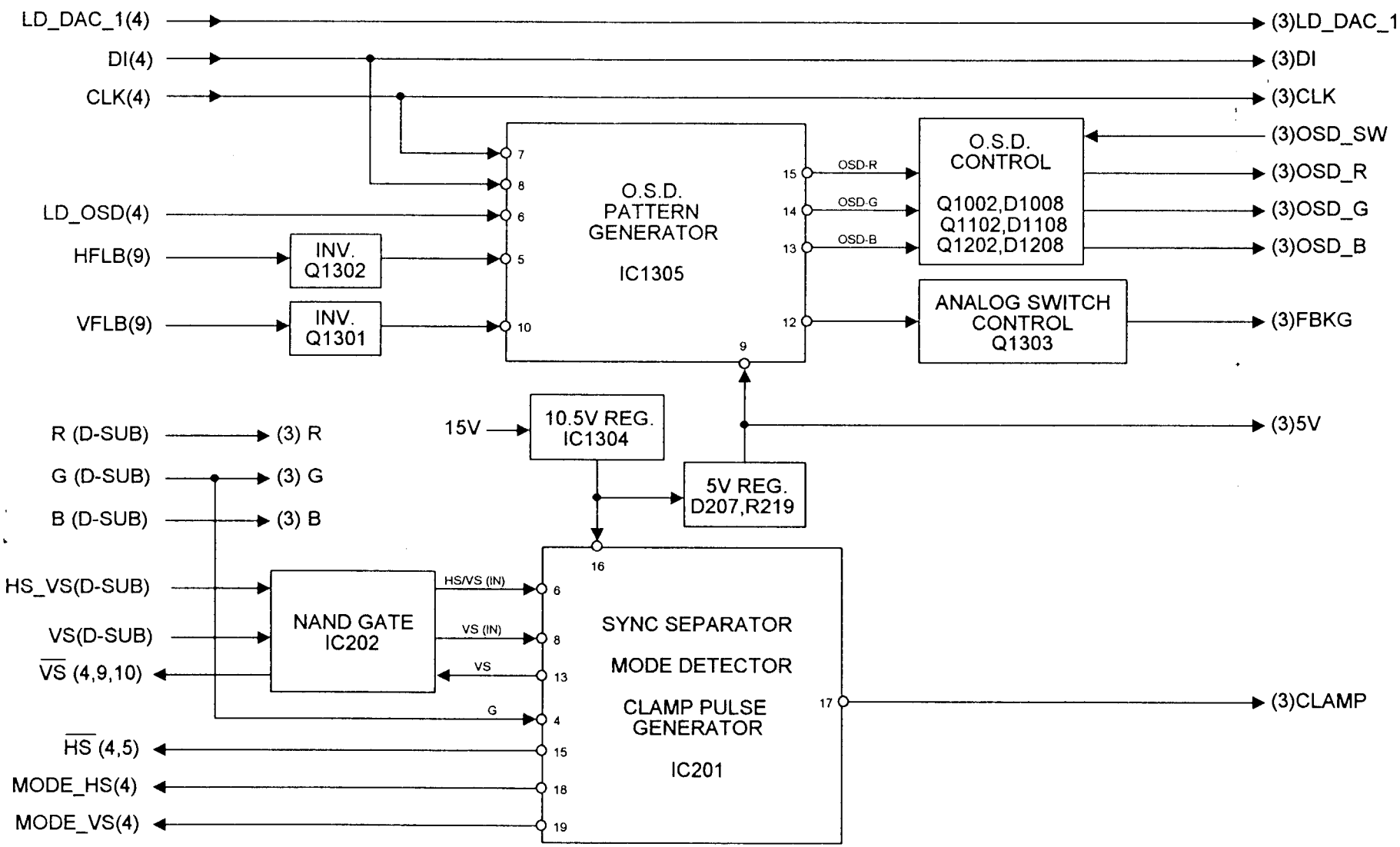
Vertical size	→	+/– 20 mm or more
Vertical position	→	up and down 5 mm or more
Horizontal size	→	MIN. < 280 mm MAX. > 316 mm
Horizontal position	→	left 40 mm or more
Horizontal position	→	right 40 mm or more

11. Power Save Function Check

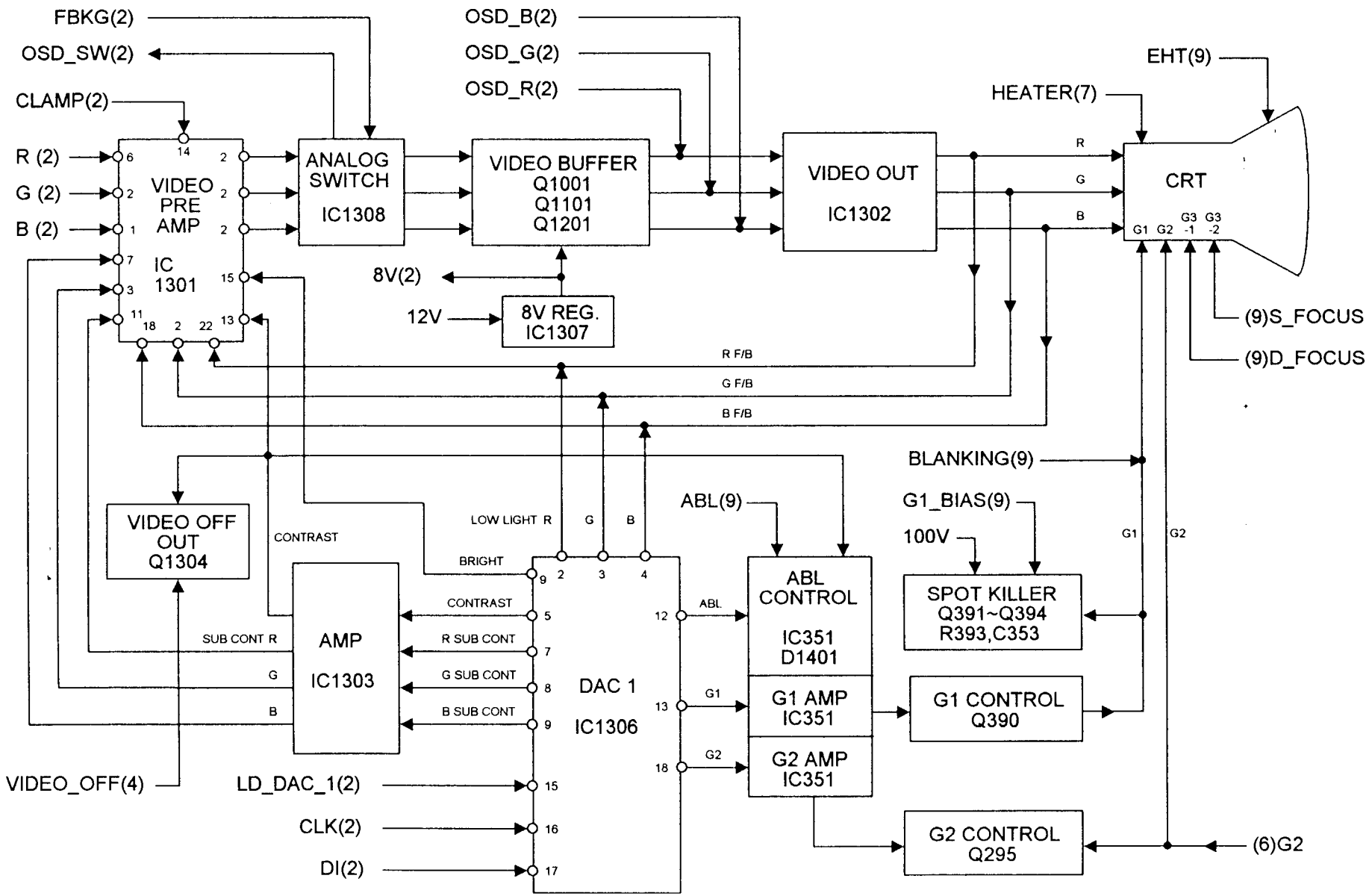
The power consumption must meet the specifications when the horizontal/vertical sync signals are changed as shown below.

H. SYNC	OFF	ON	OFF
V. SYNC	ON	OFF	OFF
SPEC	< 30W	< 30W	< 8W

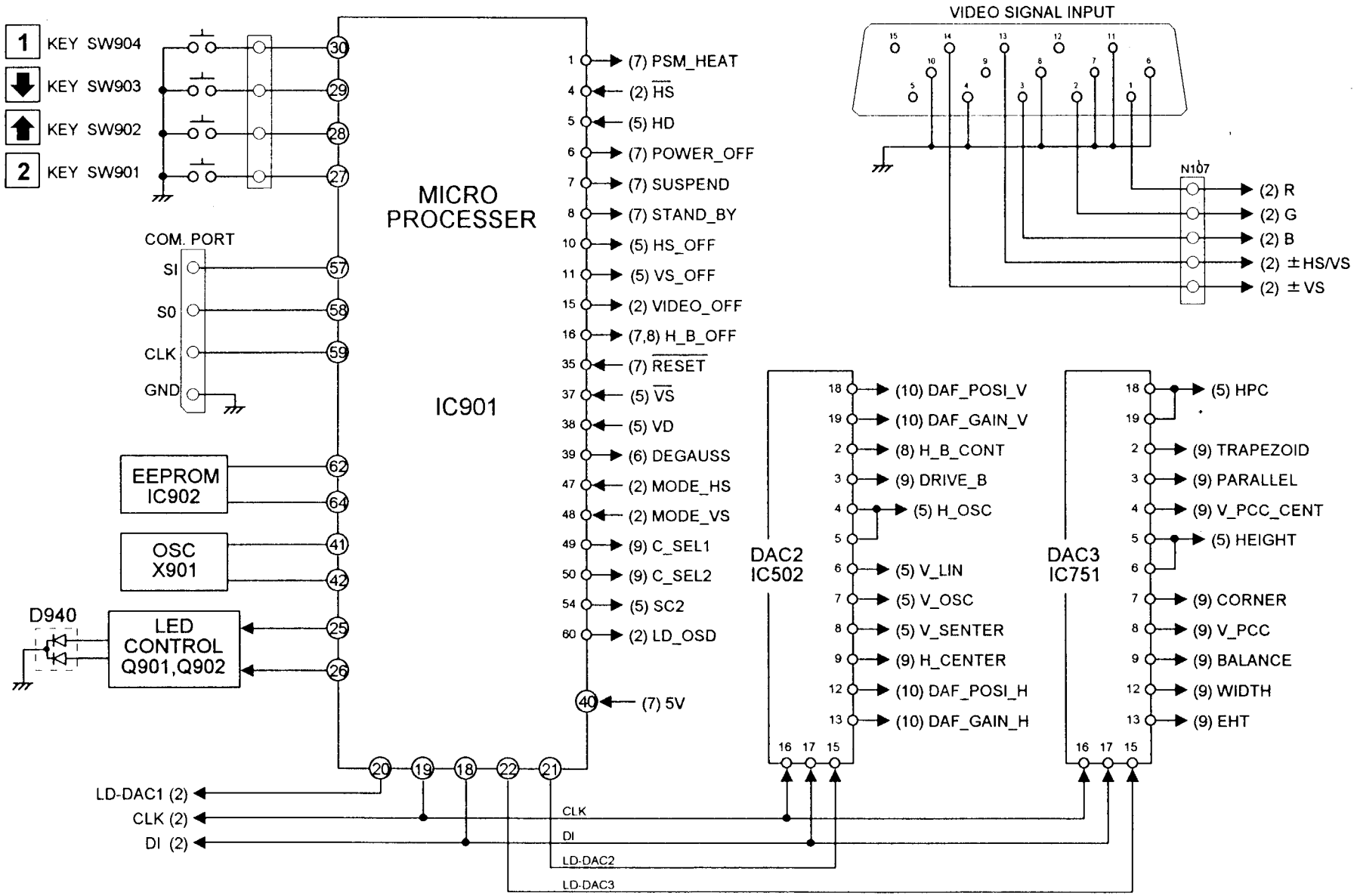
SHEET (2) H/V SYNC / ON SCREEN DISPLAY CONTROL



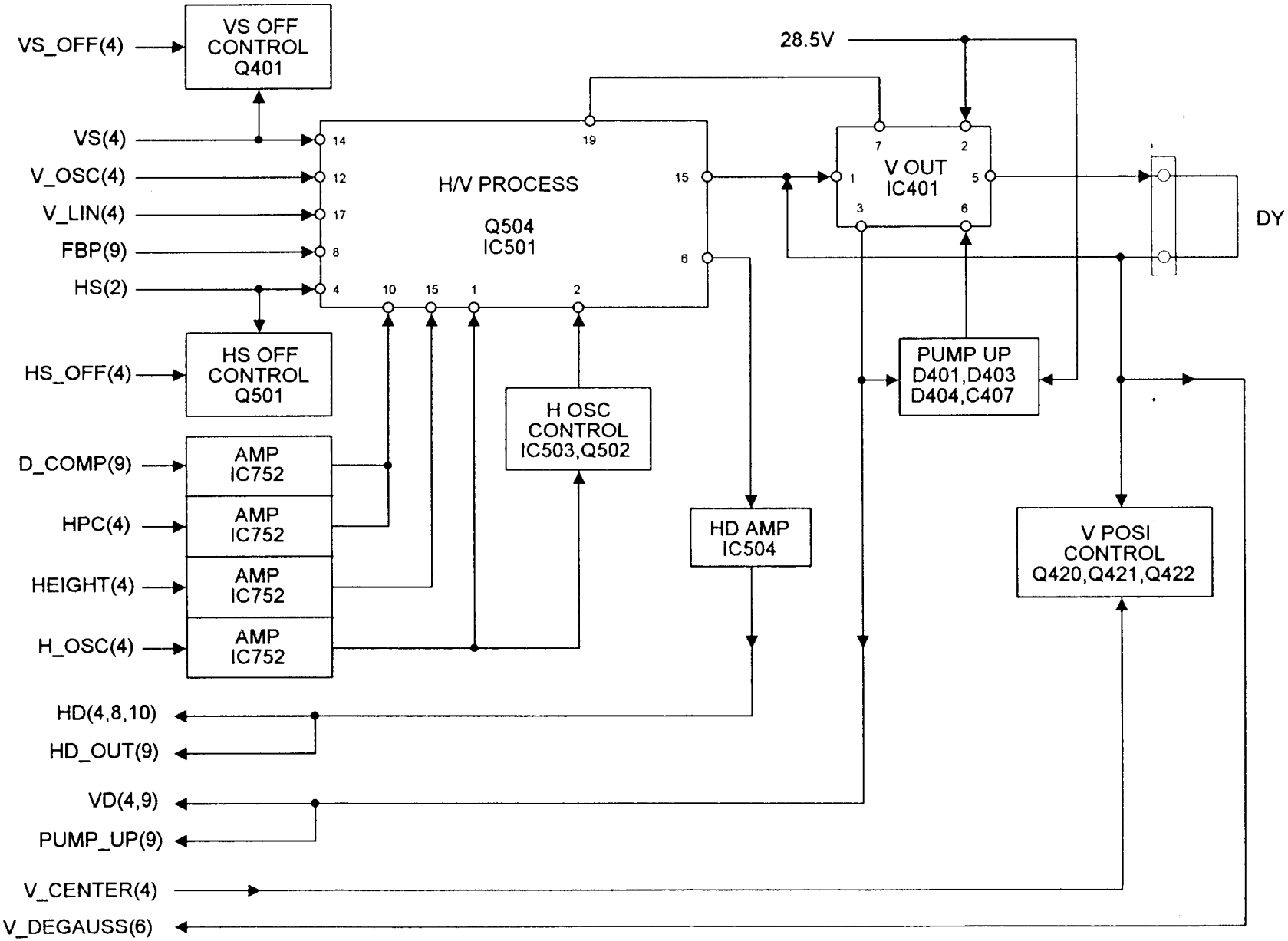
SHEET (3) VIDEO OUT



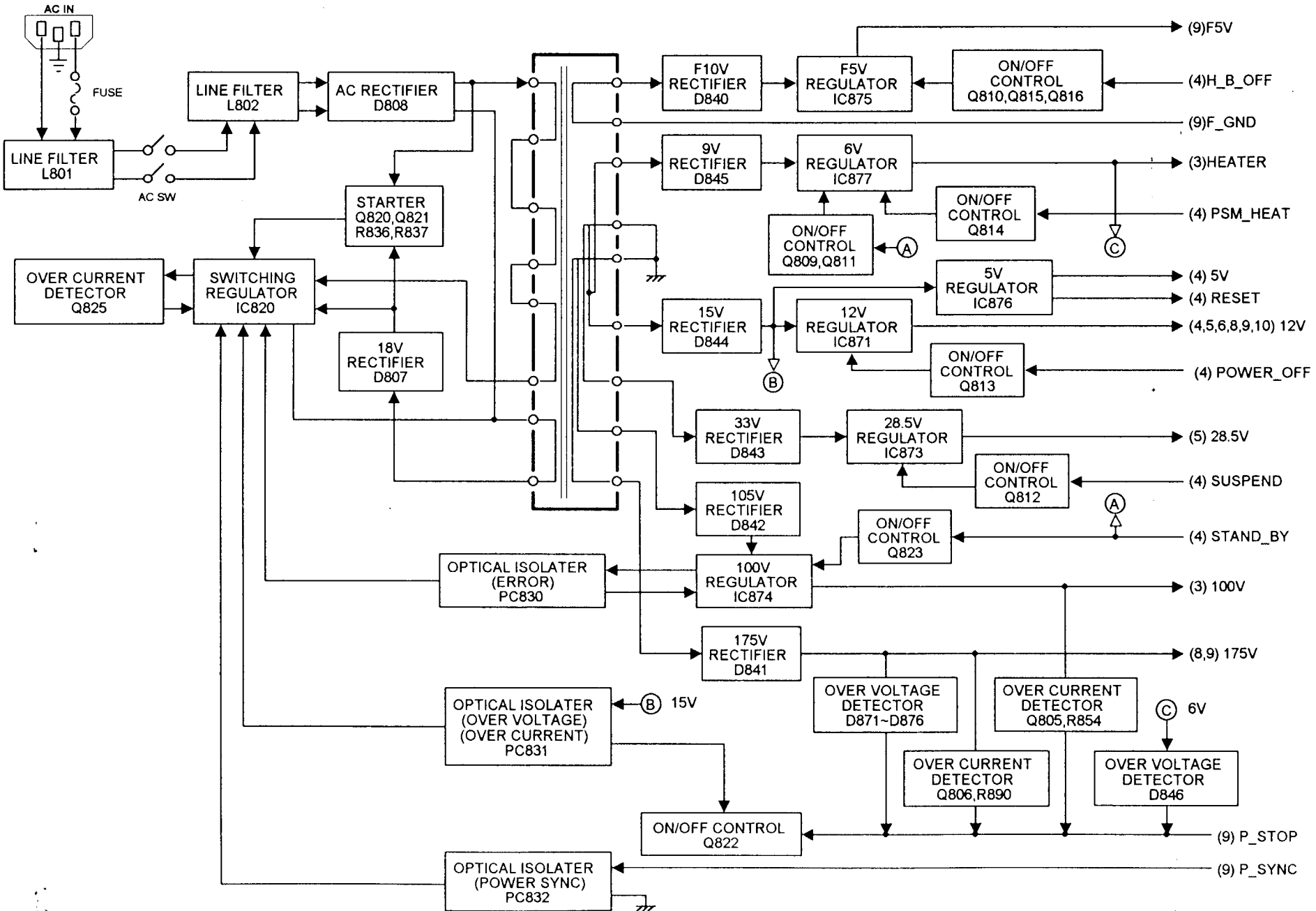
SHEET (4) MICRO PROCESSER / DIGITAL ANALOG CONVERTER / SIGNAL IN



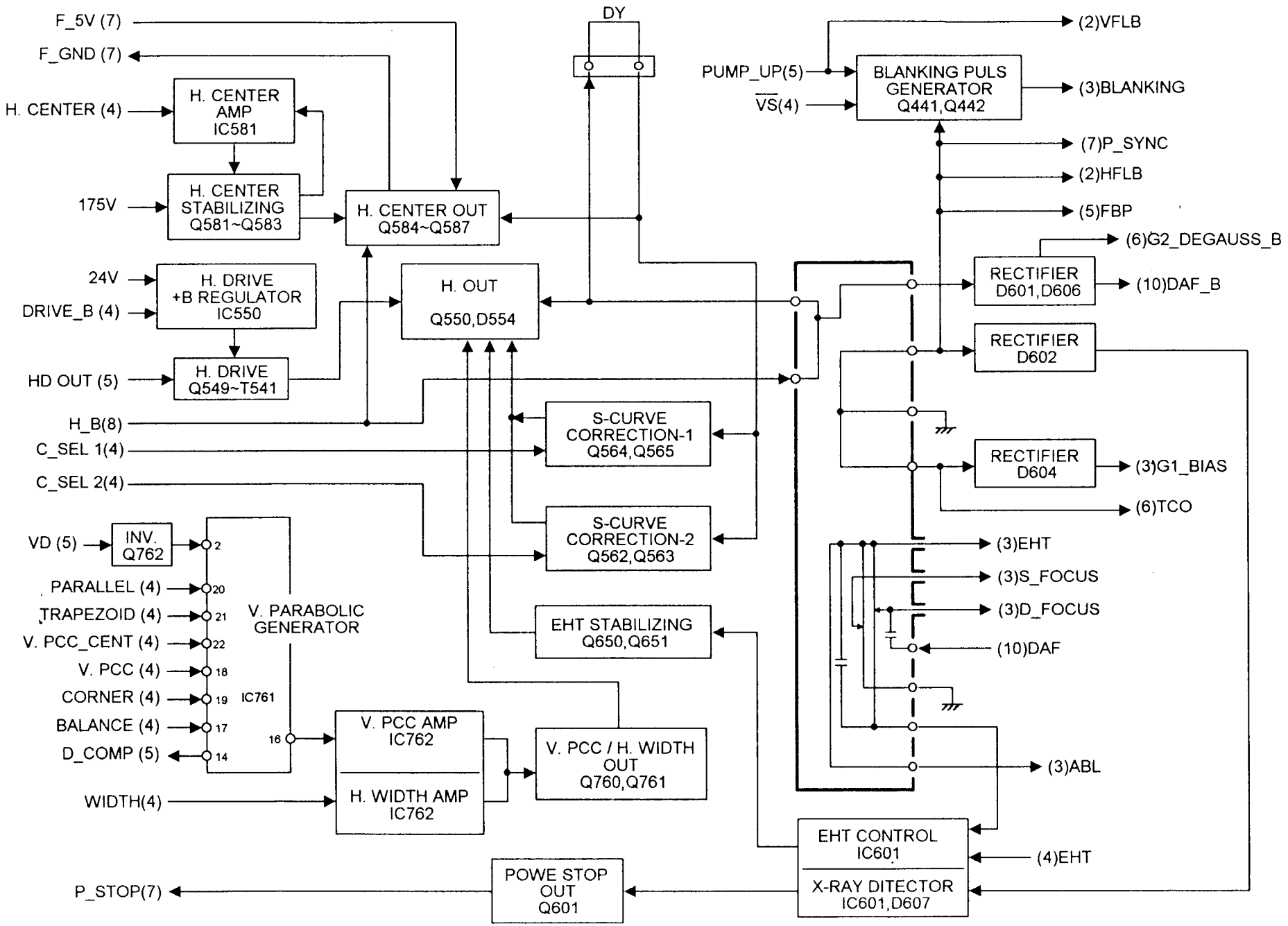
SHEET(5) H OSC / V OSC,OUTPUT

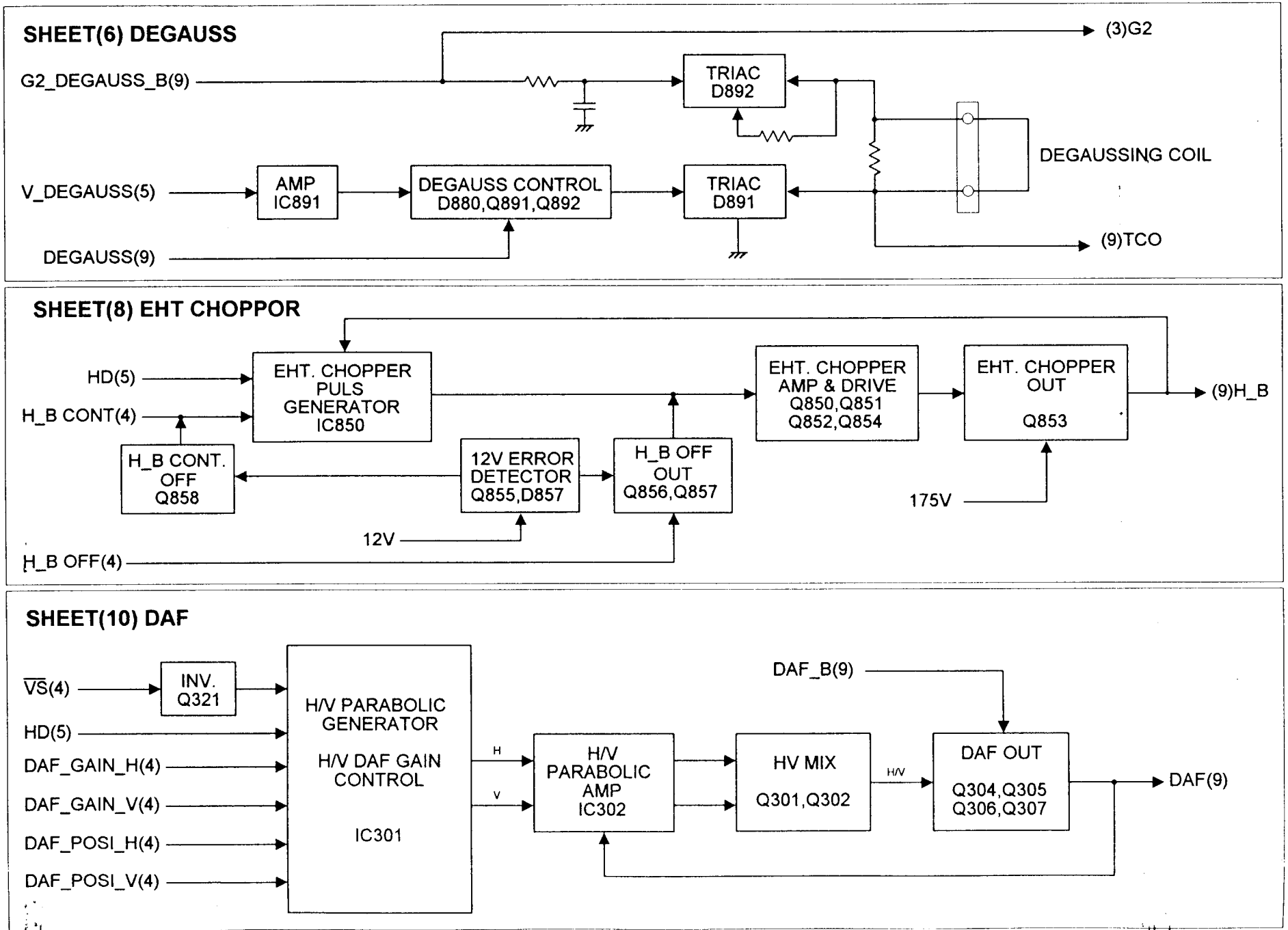


SHEET (7) POWER SUPPLY

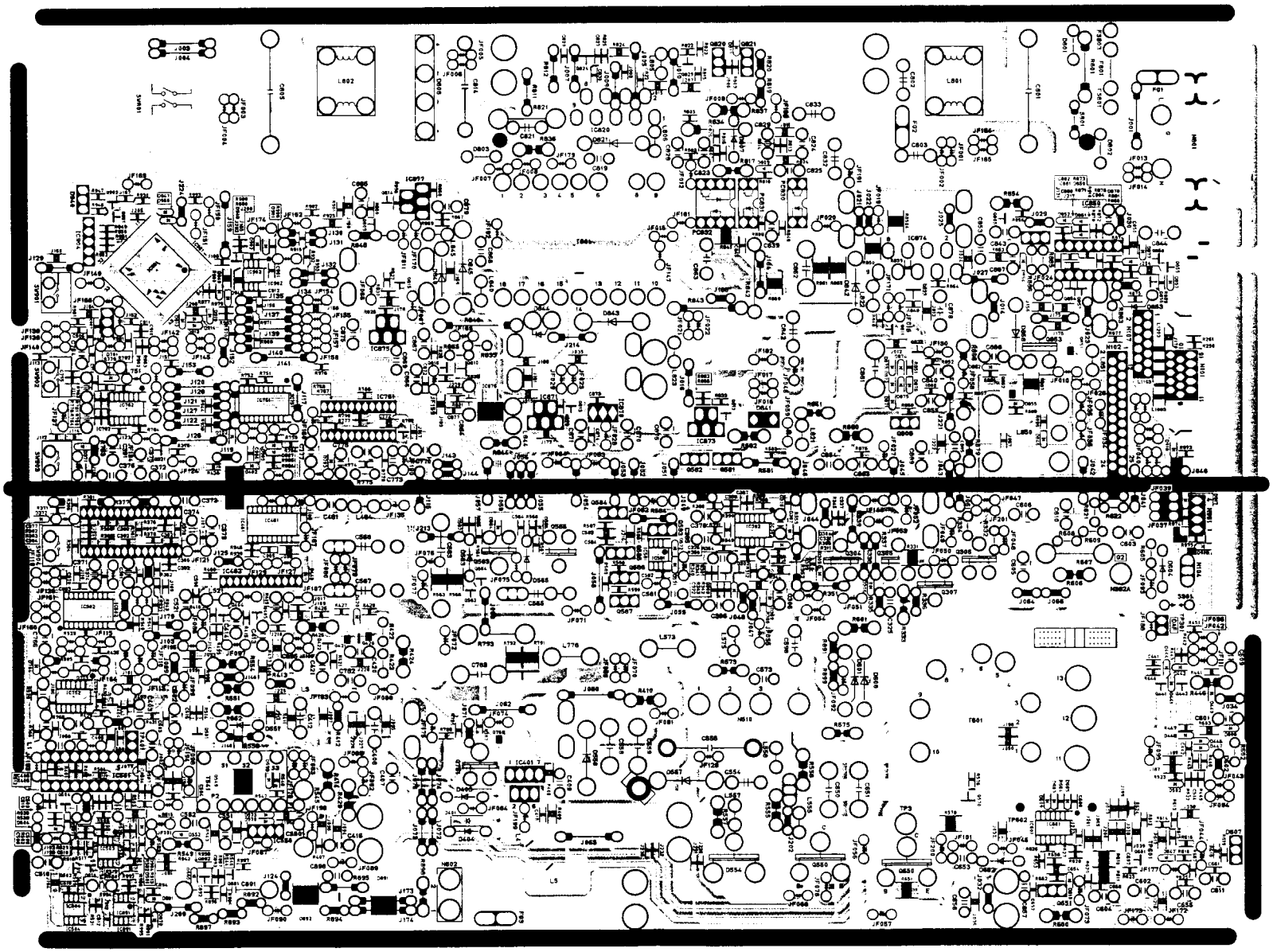


SHEET (9) H OUTPUT / GEOMETRY CONTROL

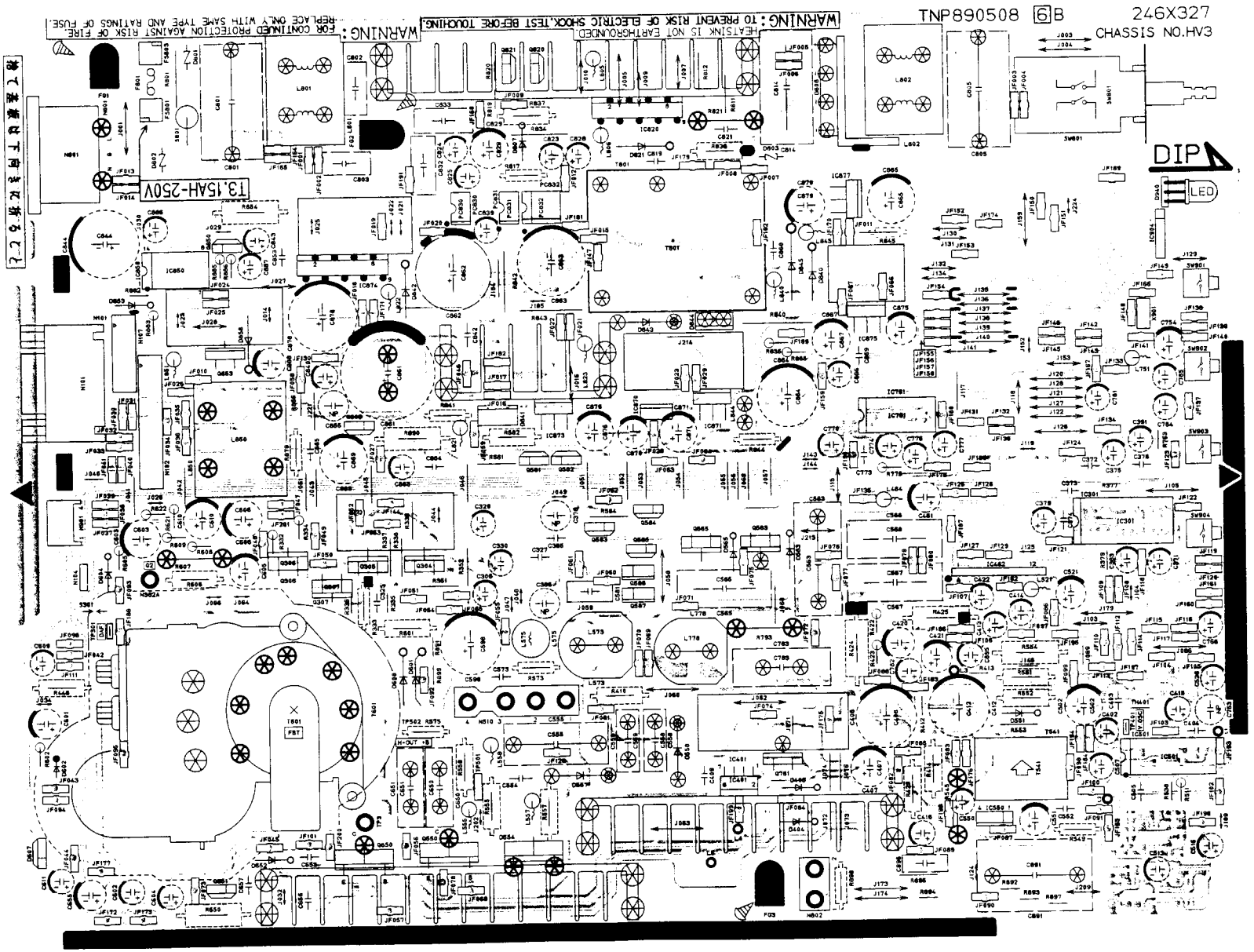



SHEET(6) DEGAUSS
G2_DEGAUSS_B(9)
(3)G2
TRIAC
D892
DEGAUSSING COIL
V_DEGAUSS(5)
AMP
IC891
DEGAUSS CONTROL
D880,Q891,Q892
TRIAC
D891
DEGAUSS(9)
(9)TCO
SHEET(8) EHT CHOPPOR
HD(5)
H_B CONT(4)
EHT. CHOPPER
PULS
GENERATOR
IC850
EHT. CHOPPER
AMP & DRIVE
Q850,Q851
Q852,Q854
EHT. CHOPPER
OUT
Q853
(9)H_B
H_B CONT.
OFF
Q858
12V ERROR
DETECTOR
Q855,D857
H_B OFF
OUT
Q856,Q857
175V
12V
H_B OFF(4)
SHEET(10) DAF
VS(4)
INV.
Q321
H/V PARABOLIC
GENERATOR
H/V DAF GAIN
CONTROL
IC301
HD(5)
DAF_GAIN_H(4)
DAF_GAIN_V(4)
DAF_POSI_H(4)
DAF_POSI_V(4)
H
V
H/V
PARABOLIC
AMP
IC302
HV MIX
Q301,Q302
H/V
DAF_B(9)
DAF OUT
Q304,Q305
Q306,Q307
DAF(9)

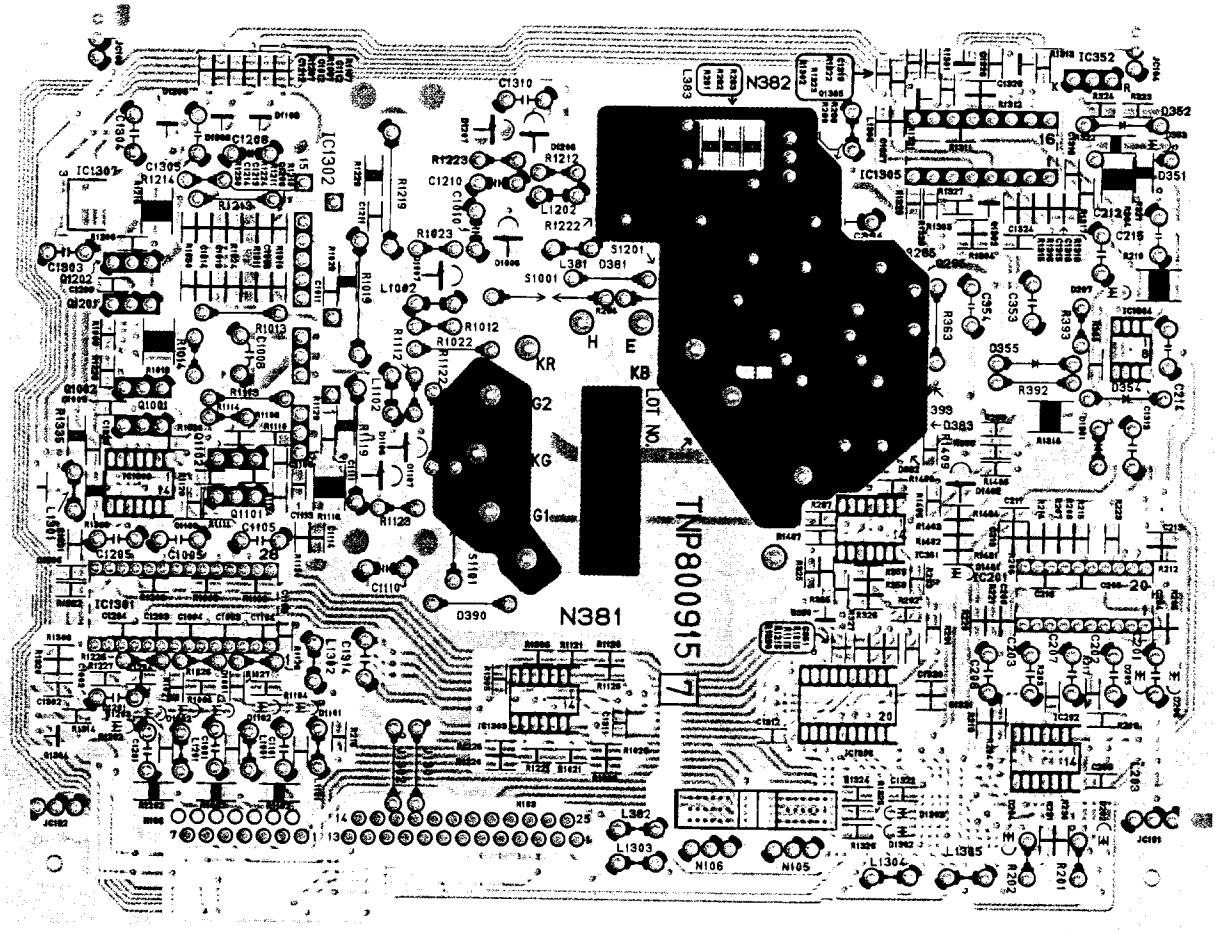
MAIN BOARD (Solder side)



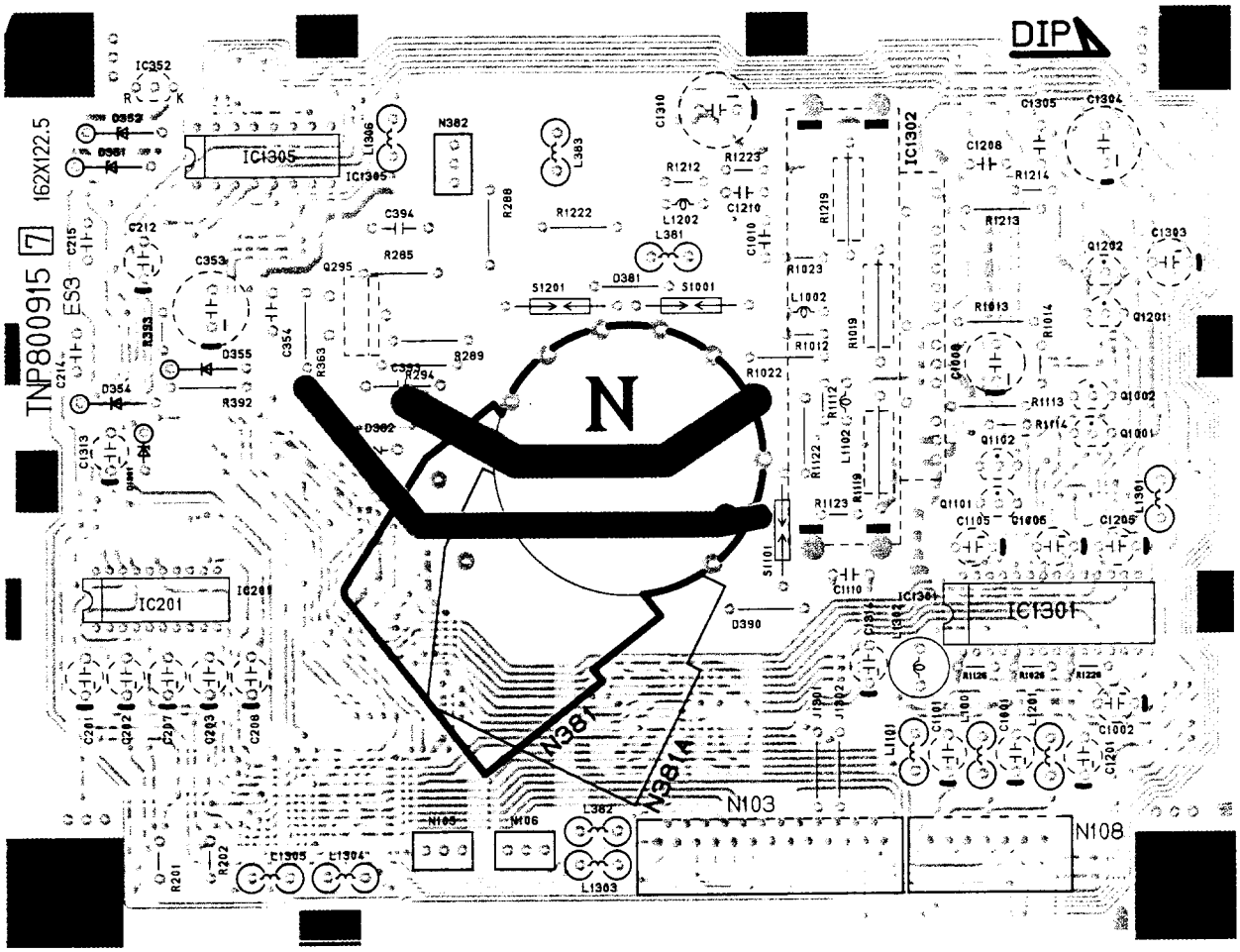
MAIN BOARD (Parts side)



VIDEO BOARD (Solder side)



VIDEO BOARD (Parts side)



IMPORTANT SAFETY NOTICE

The component identified by shading or international symbol ⚠ on the following schematic diagrams incorporate specialfeatures important for protection from X-Radiation, fire and electrical shock hazards. When servicing it is essential that only manufacturer's specified parts be used for those critical components.

NOTES:

1. RESISTOR

All resistors are carbon 1/4W resistor,unless otherwise noted by the following marks.
Unit of resistance is ohm (Ω), (K= 1,000, M = 1,000,000)

- ◯ : Non Flammable
- ☒ : Metal Oxide
- □ : Wire Wound
- ⊗ : Fusible
- ▨ : Flame Proof Rectangular
- △ : Solid
- ◎ : Metal (Precision and high stability)
- ▬ : Thermistor
- ▭ : Positive coefficient Thermistor

2. CAPACITOR

All capacitors are ceramic 50V capacitor, unless otherwise noted by the following marks.
Unit of capacitance is μF, unless otherwise noted.

- ⊣⊢ : Electrolytic
- Ⓣ : Tantalum
- NP : Bipolar
- Ⓢ : Polystyrene
- ⊗ : Temperature Compensation
- Ⓜ : Polyester
- Ⓜ : Metallized Polyester
- ☒ : Polypropylene
- △ : Mica
- ◯ : Ceramic
- ◎ : Ceramic (SL)

3. COIL

Unit of inductance is μH, unless otherwise noted.

4. VOLTAGE MEASUREMENT

Voltage is measured by a digital meter receiving normal signal.

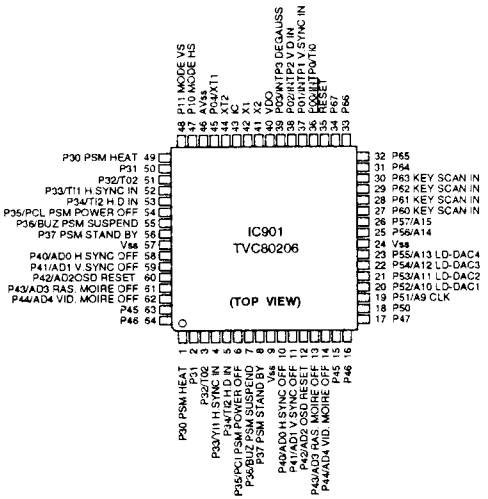
5. This schematic diagram is the latest at the time of printing and is subject to change without notice.

SERVICE NOTES :

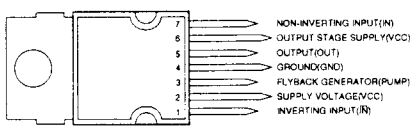
This model has a section that does not share a common ground with the power supply section. The different sections are referred to as the HOT section and the COLD section in the precautions below.

1. Do not touch the HOT section and the COLD section at the same time. You may receive an electric shock.
2. Do not short the HOT section to the COLD section. This could blow the fuse or damage parts.
3. Never measure the HOT section and the COLD section at the same time when using tools such as oscilloscopes or multi-meters.
4. Always unplug the unit before beginning any operation such as removing the chassis.

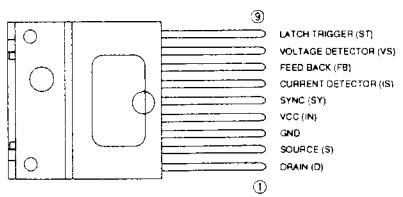
TVC80206 (IC901)



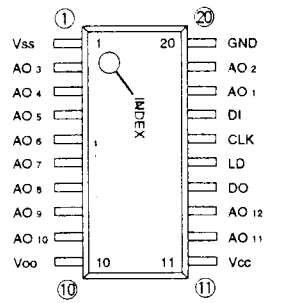
TDA9302H (IC401)



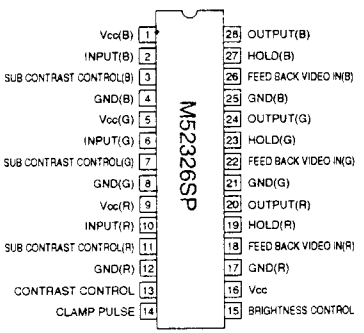
STR-S6533 (IC820)



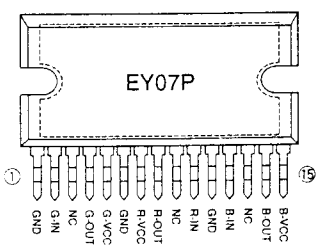
MB88346BPFTF (IC502,IC751,IC1306)

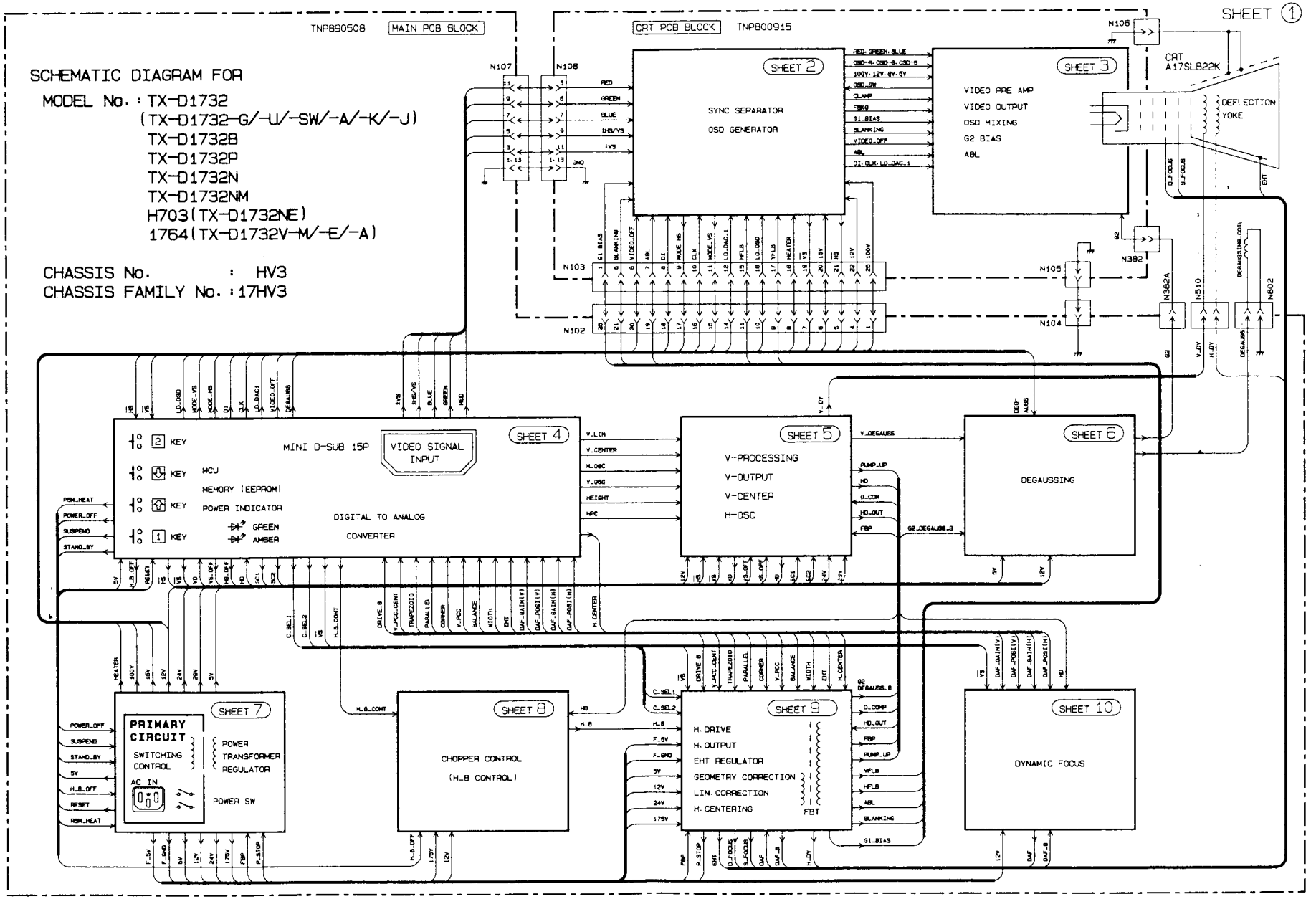


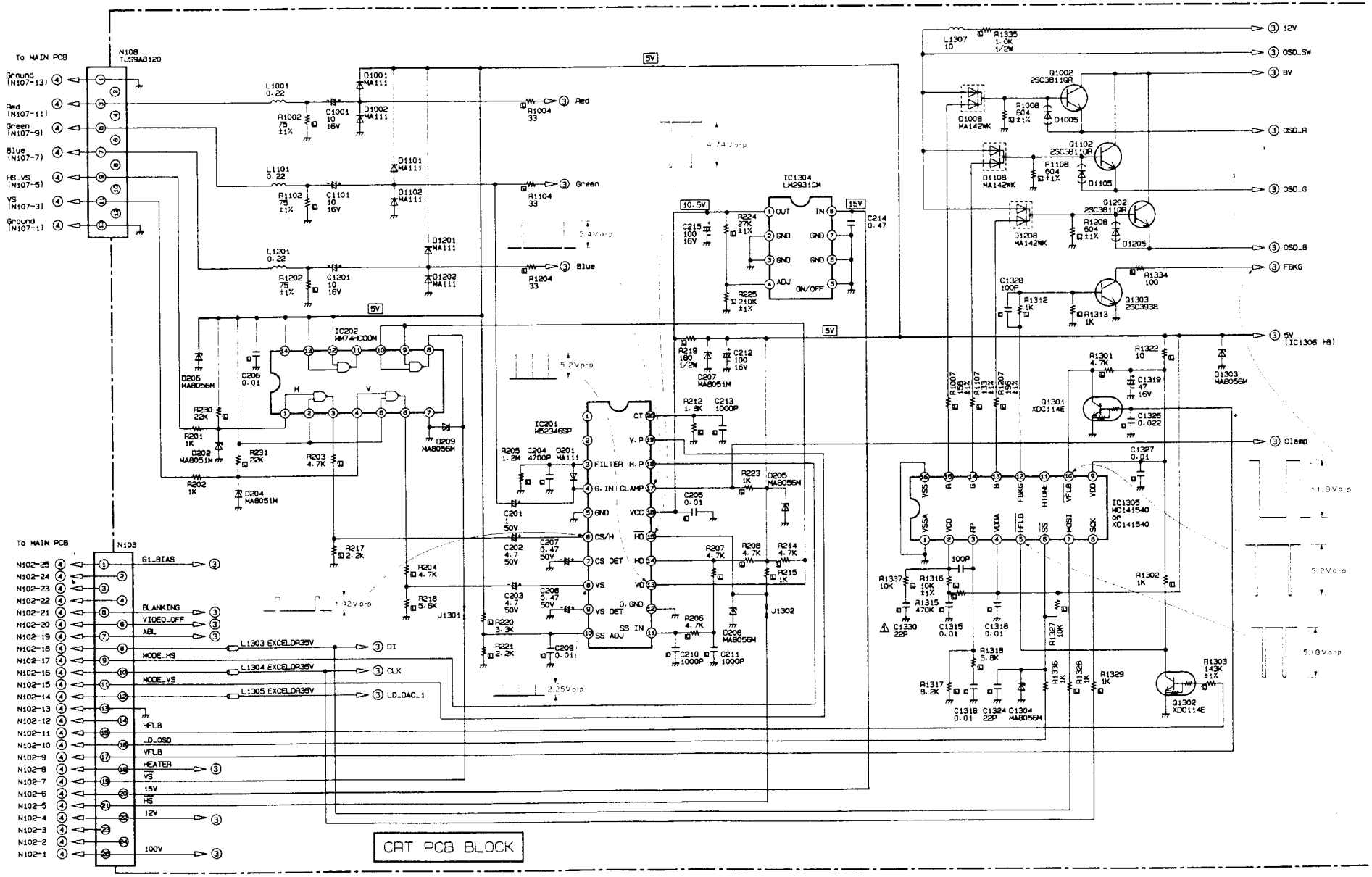
M52326SP (IC201)



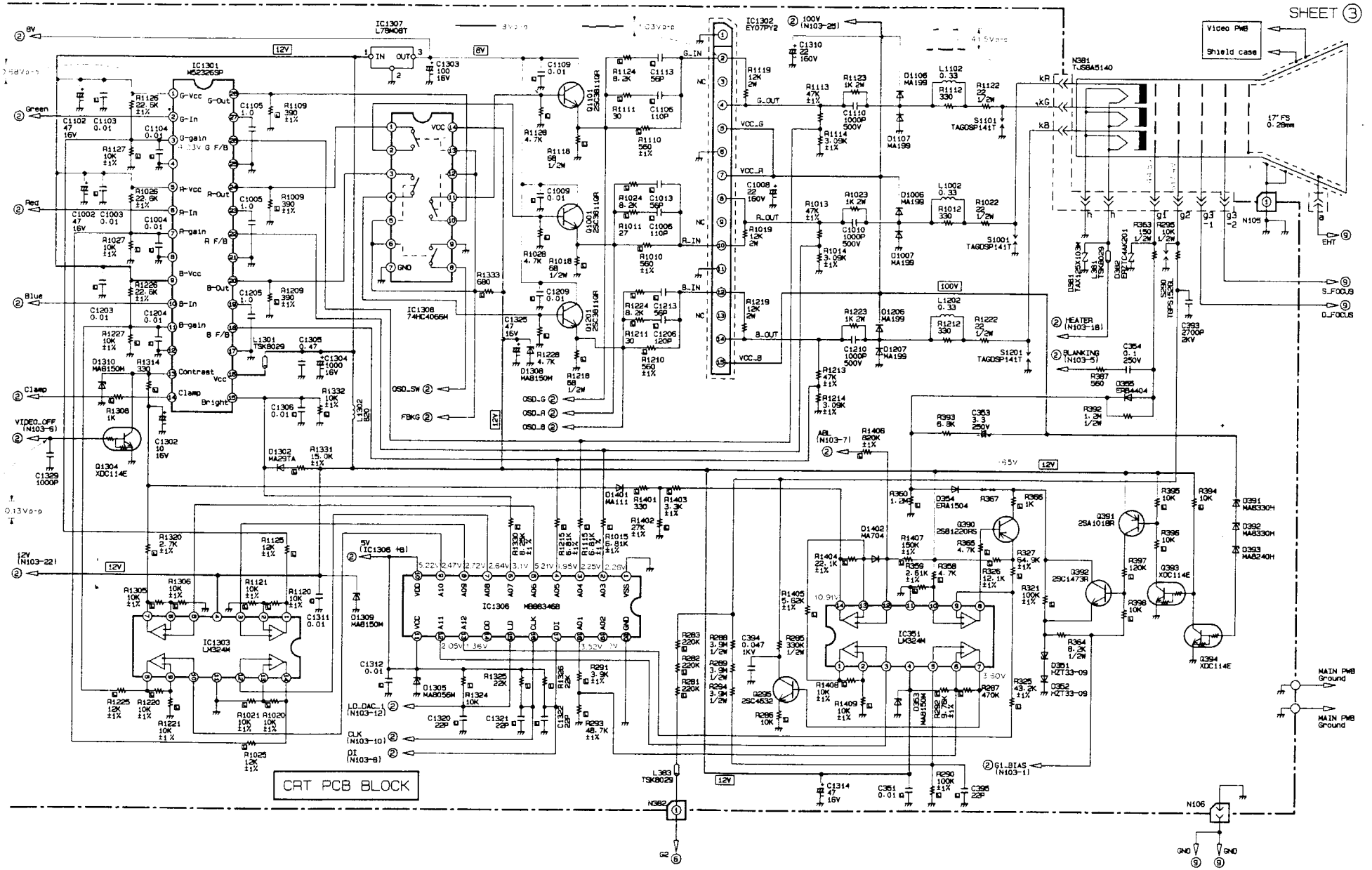
EY07P (IC1302)

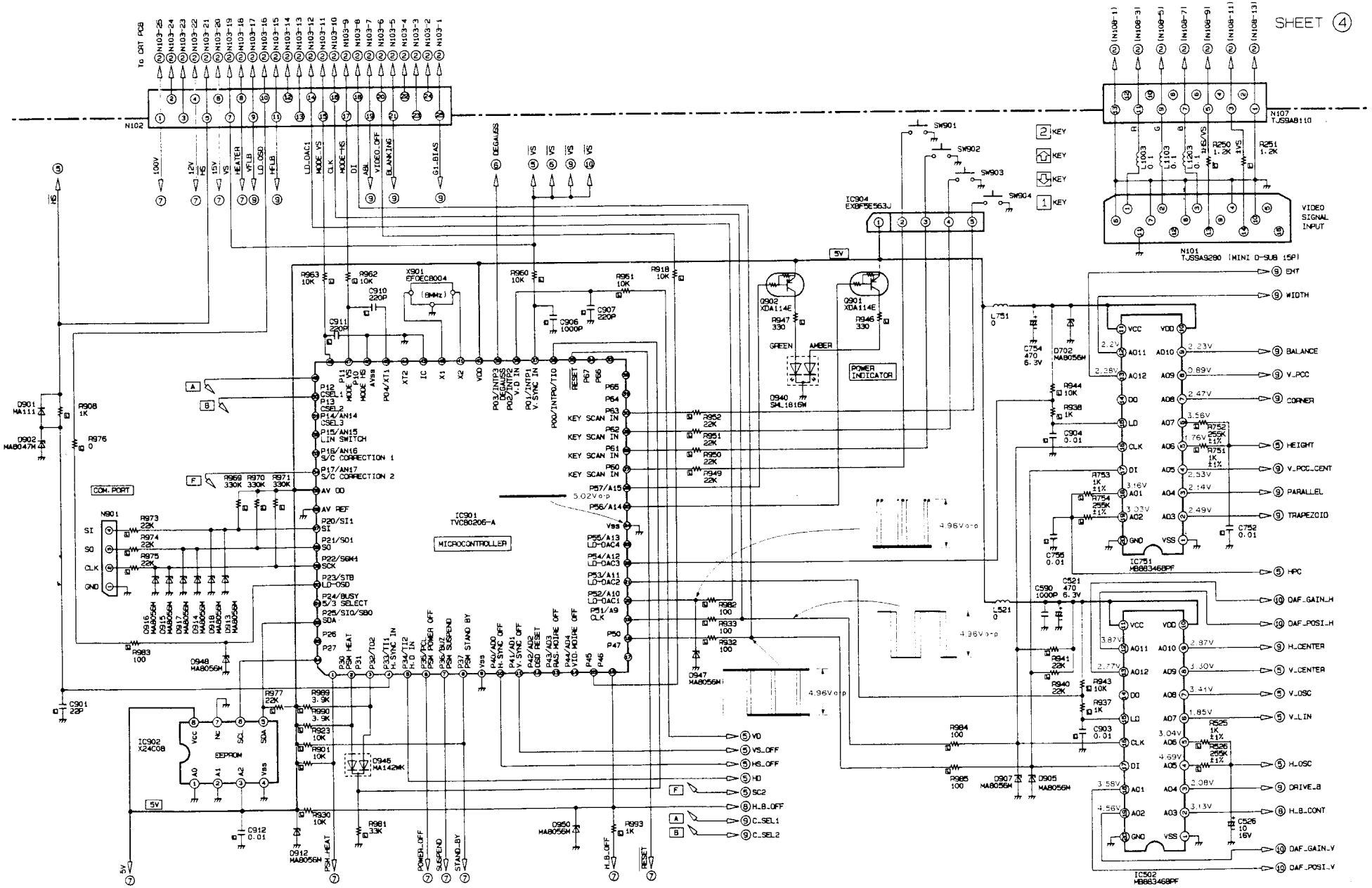


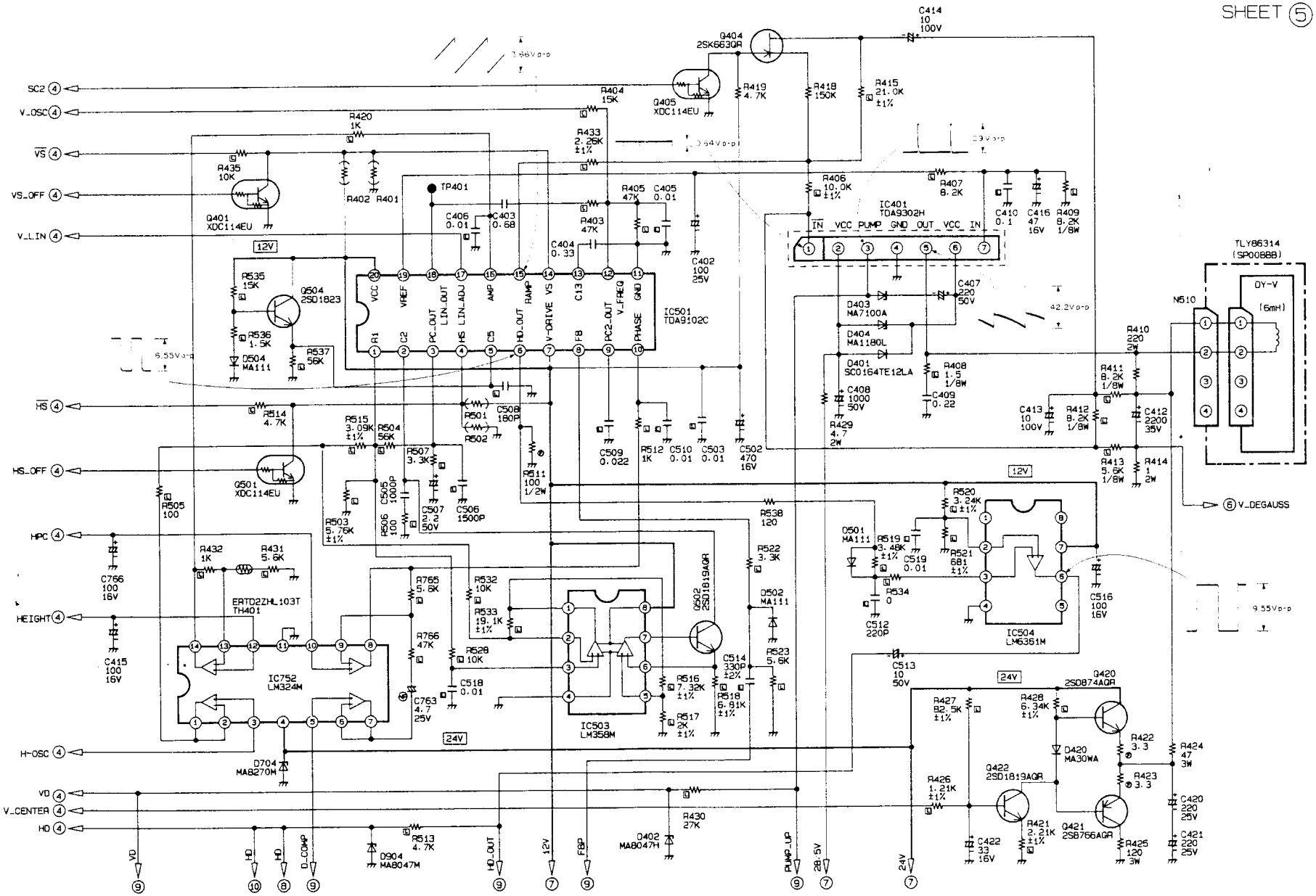

SCHEMATIC DIAGRAM FOR
MODEL No. : TX-D1732
(TX-D1732-G/-U/-SW/-A/-K/-J)
TX-D1732B
TX-D1732P
TX-D1732N
TX-D1732NM
H703(TX-D1732NE)
1764(TX-D1732V-M/-E/-A)
CHASSIS No. : HV3
CHASSIS FAMILY No. : 17HV3
TNP890508 MAIN PCB BLOCK
CRT PCB BLOCK TNP800915
SHEET 1
SHEET 2
SYNC SEPARATOR
OSD GENERATOR
SHEET 3
VIDEO PRE AMP
VIDEO OUTPUT
OSD MIXING
G2 BIAS
ABL
CRT A17SLB22K
DEFLECTION YOKE
SHEET 4
MINI D-SUB 15P
VIDEO SIGNAL INPUT
KEY
MCU
MEMORY (EEPROM)
POWER INDICATOR
GREEN
AMBER
DIGITAL TO ANALOG CONVERTER
SHEET 5
V-PROCESSING
V-OUTPUT
V-CENTER
H-OSC
SHEET 6
DEGAUSSING
SHEET 7
PRIMARY CIRCUIT
SWITCHING CONTROL
POWER TRANSFORMER REGULATOR
AC IN
POWER SW
SHEET 8
CHOPPER CONTROL
(H.B CONTROL)
SHEET 9
H. DRIVE
H. OUTPUT
EHT REGULATOR
GEOMETRY CORRECTION
LIN. CORRECTION
H. CENTERING
FBT
SHEET 10
DYNAMIC FOCUS



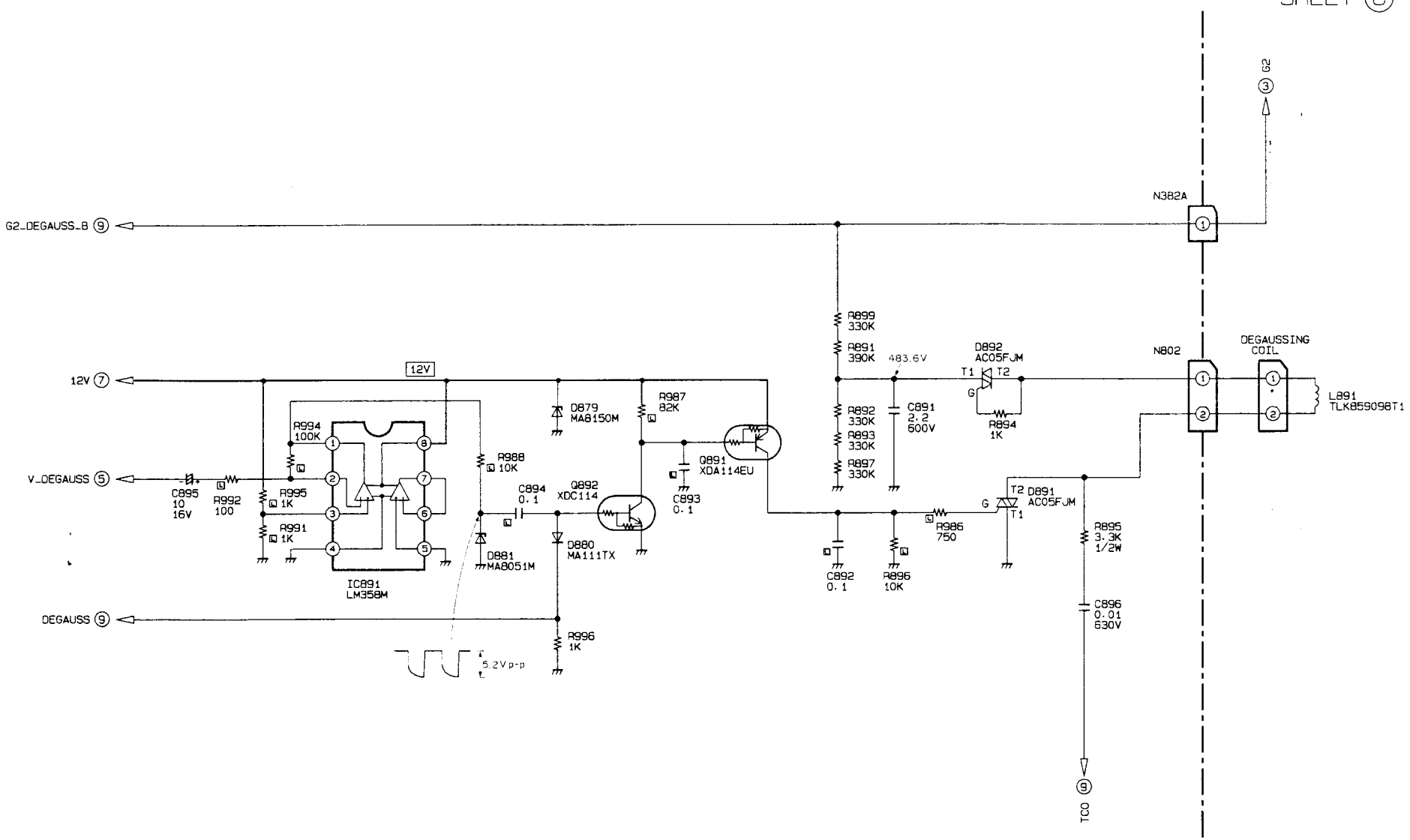
CRT PCB BLOCK

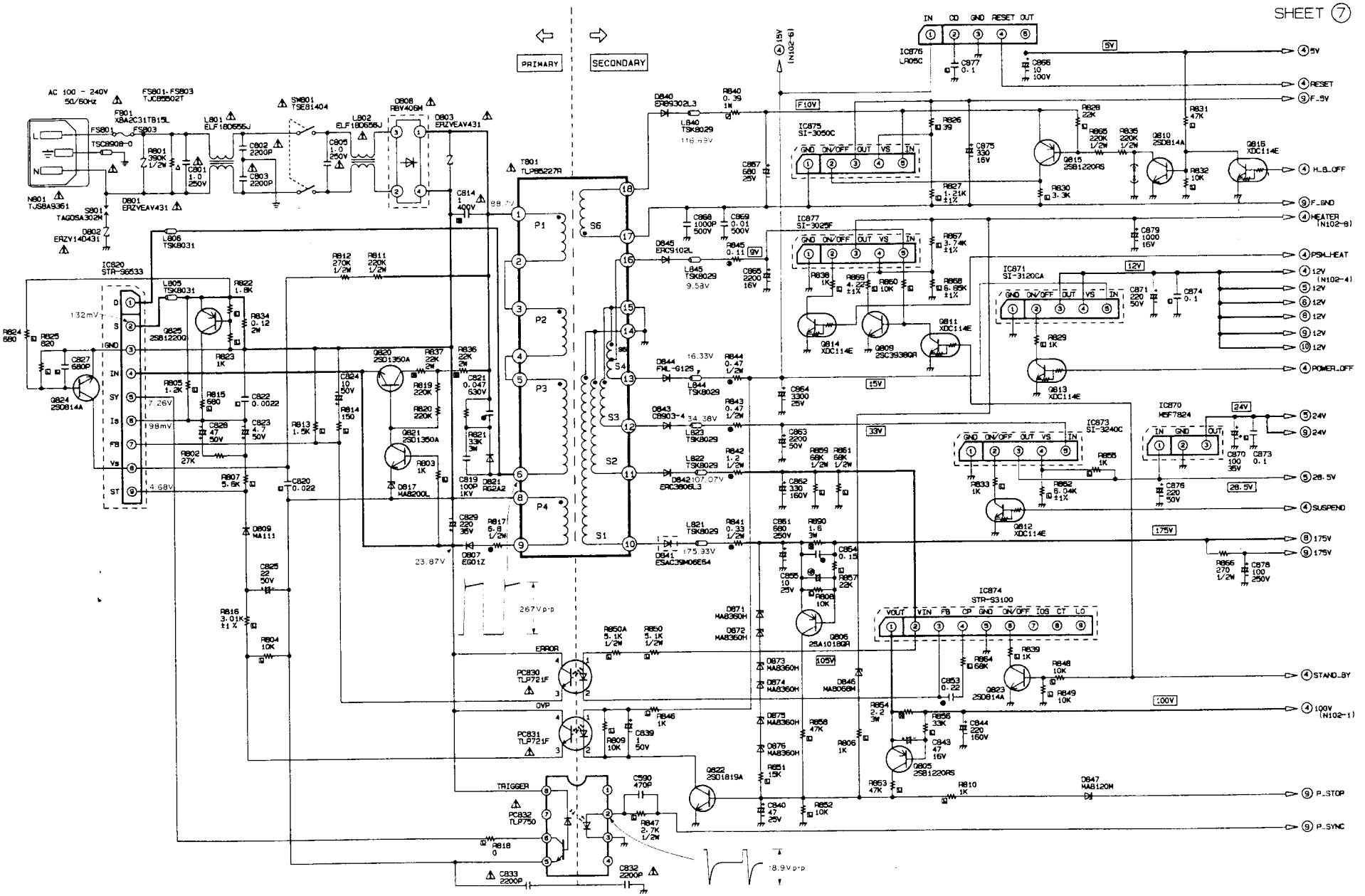

SHEET ③
CRT PCB BLOCK
Video PWB
Shield case
17" FS
0.26mm
IC1307
L7806CT
IC1301
M52326SP
IC1306
74HC4066M
IC1306
M38834M8
IC1303
LM324M
IC1302
EY07PY2
IC1306 +5V
N381
TJS8A5140
N105
N106
L383
TSK8029
N382
G2
EHT
S_FOCUS
D_FOCUS
HEATER (N103-18)
BLANKING (N103-5)
ABL (N103-7)
G1_BIAS (N103-1)
VIDEO_OFF (N103-6)
CLK (N103-10)
DI (N103-8)
LD_DAC_L (N103-12)
OSD_SW
FBKG
OSD_G
OSD_A
OSD_B
MAIN PWB Ground
MAIN PWB Ground
GND
GND

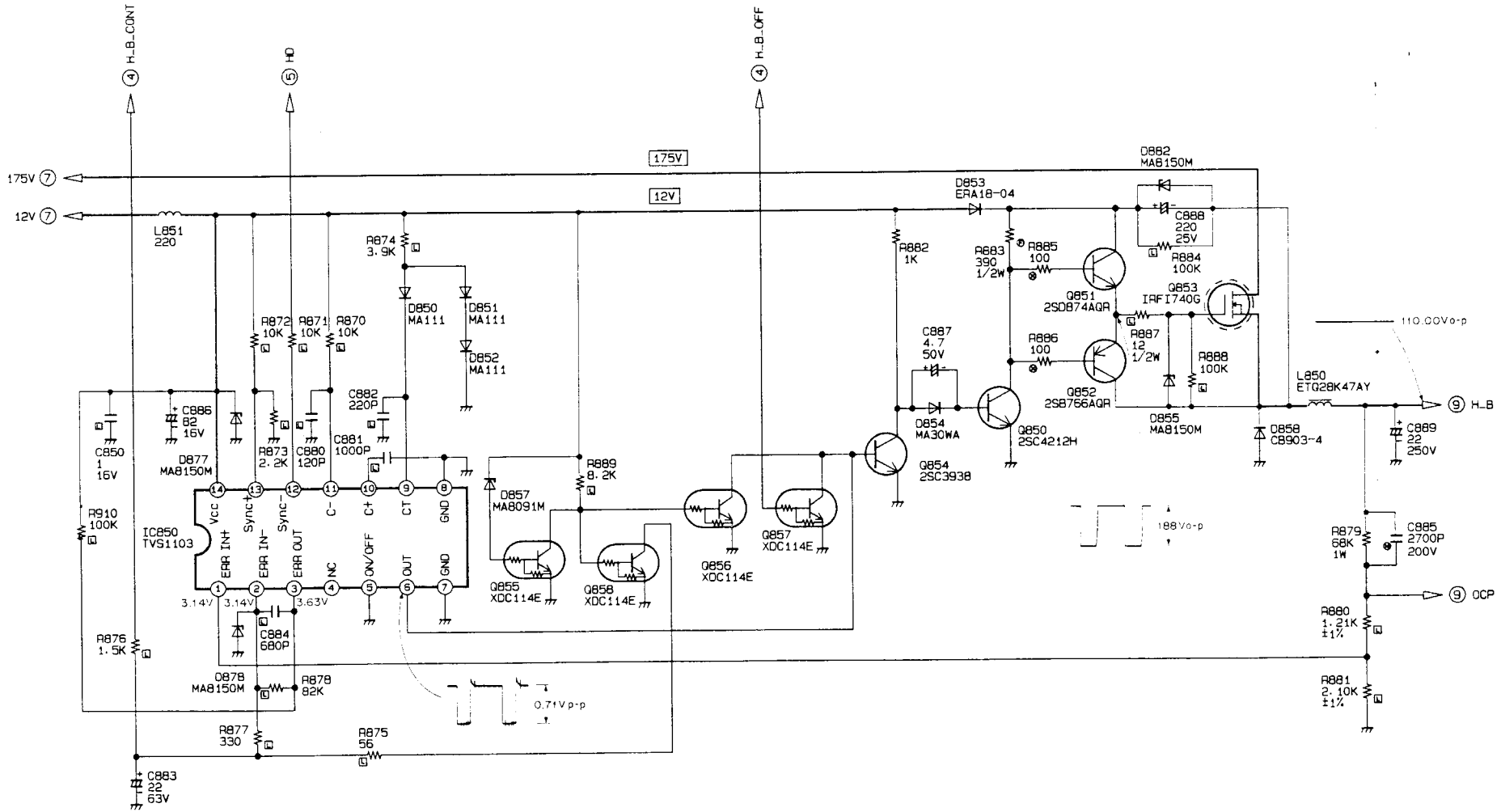

SHEET 4
IC901
TVC80206-A
MICROCONTROLLER
IC902
X24C08
EEPROM
IC751
MB88346BPF
IC502
MB88346BPF
N101
TJSSA9280 (MINI D-SUB 15P)
N102
N107
TJSSA8110
VIDEO SIGNAL INPUT
POWER INDICATOR
GREEN
AMBER
COM. PORT
SW901
SW902
SW903
SW904
IC904
EXBF5E563J
X901
EFOECB004
(8MHz)
Q902
XDA114E
Q901
XDA114E
Q940
SML1816W
D940
MA142WK
D901
MA111
D902
MA8047H
D702
MA8056M
D907
MA8056M
D905
MA8056M
D947
MA8056M
D948
MA8056M
D950
MA8056M
D912
MA8056M
D915
MA8056M
D916
MA8056M
D917
MA8056M
D918
MA8056M
D913
MA8056M
L751
L521
L1003
L1103
L1203
R250
1.2K
R251
1.2K
R908
1K
R976
0
R963
10K
R962
10K
R960
10K
R961
10K
R918
10K
R910
220P
R911
220P
R906
1000P
R907
220P
R947
330
R946
330
R944
10K
R938
1K
R904
0.01
R903
0.01
R902
0.01
R901
0.01
R912
0.01
R754
470
6.3V
R752
255K
±1%
R751
1K
±1%
R753
1K
±1%
R754
255K
±1%
R755
0.01
R752
0.01
R590
1000P
6.3V
R521
0
R941
22K
R940
22K
R943
10K
R937
1K
R525
1K
±1%
R526
255K
±1%
R526
10
16V
R973
22K
R974
22K
R975
22K
R983
100
R977
22K
R989
3.9K
R990
3.9K
R923
10K
R901
10K
R930
10K
R981
33K
R993
1K
R982
100
R933
100
R932
100
R984
100
R985
100
R969
330K
R970
330K
R971
330K
R952
22K
R951
22K
R950
22K
R949
22K
C901
22P
C912
0.01
C526
10
16V
C752
0.01
C755
0.01
C904
0.01
C903
0.01
C590
1000P
6.3V
C521
470
6.3V
C910
220P
C911
220P
C906
1000P
C907
220P
5.02Vp-p
4.96Vp-p
4.96Vp-p
4.96Vp-p
2.2V
2.38V
3.56V
1.76V
2.53V
3.16V
3.33V
2.49V
2.23V
0.89V
2.47V
3.87V
2.77V
2.87V
3.30V
3.41V
1.85V
3.04V
4.69V
3.58V
2.08V
4.56V
3.13V
N102
N103-25
N103-24
N103-23
N103-22
N103-21
N103-20
N103-19
N103-18
N103-17
N103-16
N103-15
N103-14
N103-13
N103-12
N103-11
N103-10
N103-9
N103-8
N103-7
N103-6
N103-5
N103-4
N103-3
N103-2
N103-1
N108-1
N108-3
N108-5
N108-7
N108-9
N108-11
N108-13
100V
12V
HS
15V
VS
HEATER
VFLB
LO_OSD
HFLB
LD_DAC1
MODE_VS
CLK
MODE_HS
DI
ABL
VIDEO_OFF
BLANKING
G1_BIAS
DEGAUSS
EHT
WIDTH
BALANCE
V_PCC
CORNER
HEIGHT
V_PCC_CENT
PARALLEL
TRAPEZOID
HPC
DAF_GAIN_H
DAF_POSI_H
H_CENTER
V_CENTER
V_OSC
V_LIN
H_OSC
DRIVE_B
H_B_CONT
DAF_GAIN_V
DAF_POSI_V
VD
VS_OFF
HS_OFF
HD
SC2
H_B_OFF
C_SEL1
C_SEL2
POWER_OFF
SUSPEND
STAND_BY
PSH_HEAT
RESET
2 KEY
KEY
KEY
1 KEY
SI
SO
CLK
GND
SDA
SCL
A0
A1
A2
Vss
Vcc
NC
5V

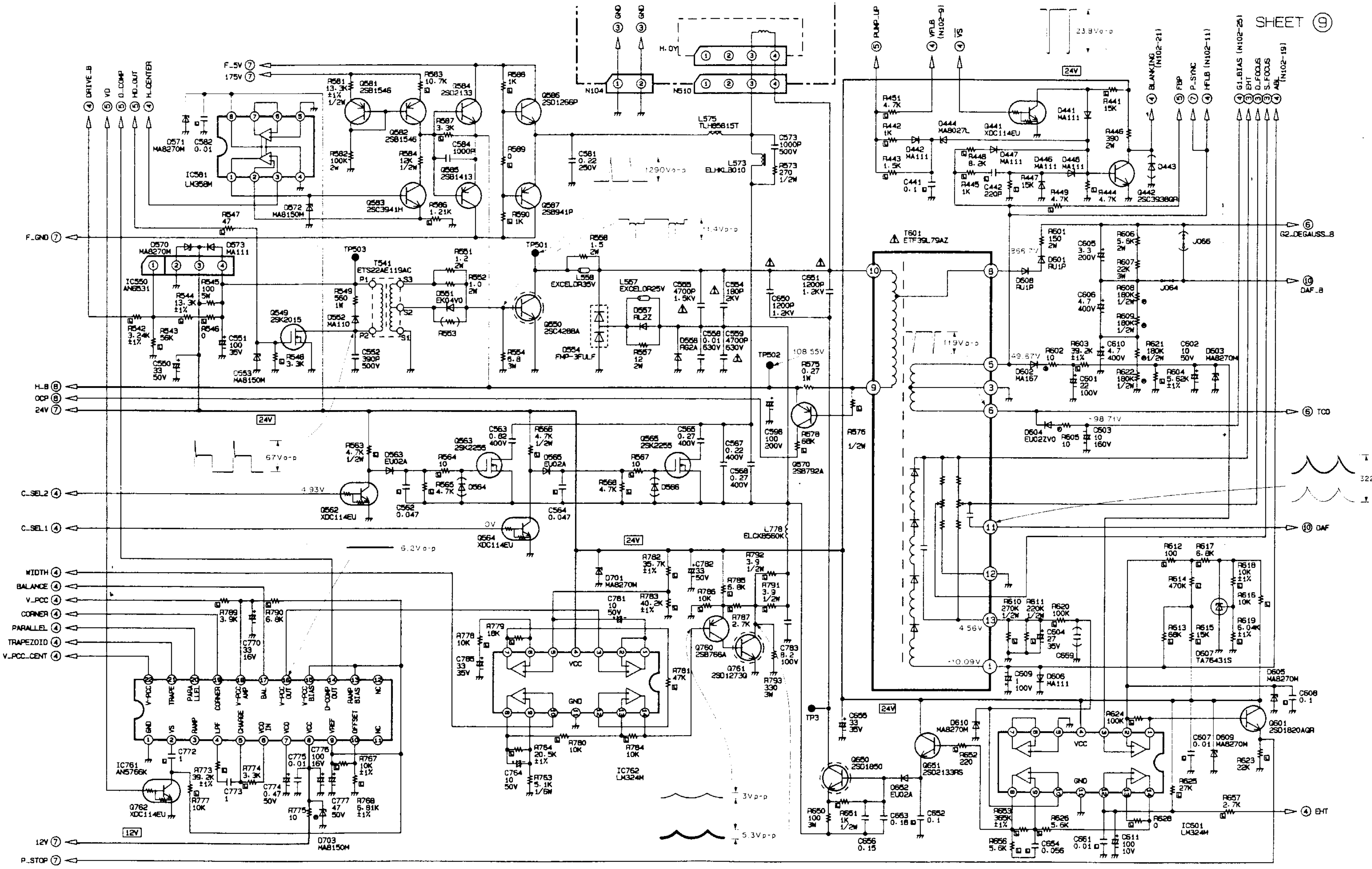

SC2 ④
V_OSC ④
VS ④
VS_OFF ④
V_LIN ④
HS ④
HS_OFF ④
HPC ④
HEIGHT ④
H-OSC ④
VD ④
V_CENTER ④
HD ④
12V
24V
IC501 TDA9102C
IC401 TDA9302H
IC503 LM358M
IC504 LM6361M
IC752 LM324M
Q401 XDC114EU
Q404 2SK663QR
Q405 XDC114EU
Q501 XDC114EU
Q502 2SD1819AQR
Q504 2SD1823
Q420 2SD874AQR
Q421 2SB766AQR
Q422 2SD1819AQR
TP401
ERTD2ZHL103T TH401
TLY86314 (SP00888)
DY-V (6mH)
N510
⑥ V_DEGAUSS
D504 MA111
D501 MA111
D502 MA111
D704 MA8270M
D904 MA8047M
D402 MA8047H
D403 MA7100A
D404 MA1180L
D401 SC0164TE12LA
D420 MA30WA
PUMP_UP
28.5V
FBP
D_COMP

SHEET (6)

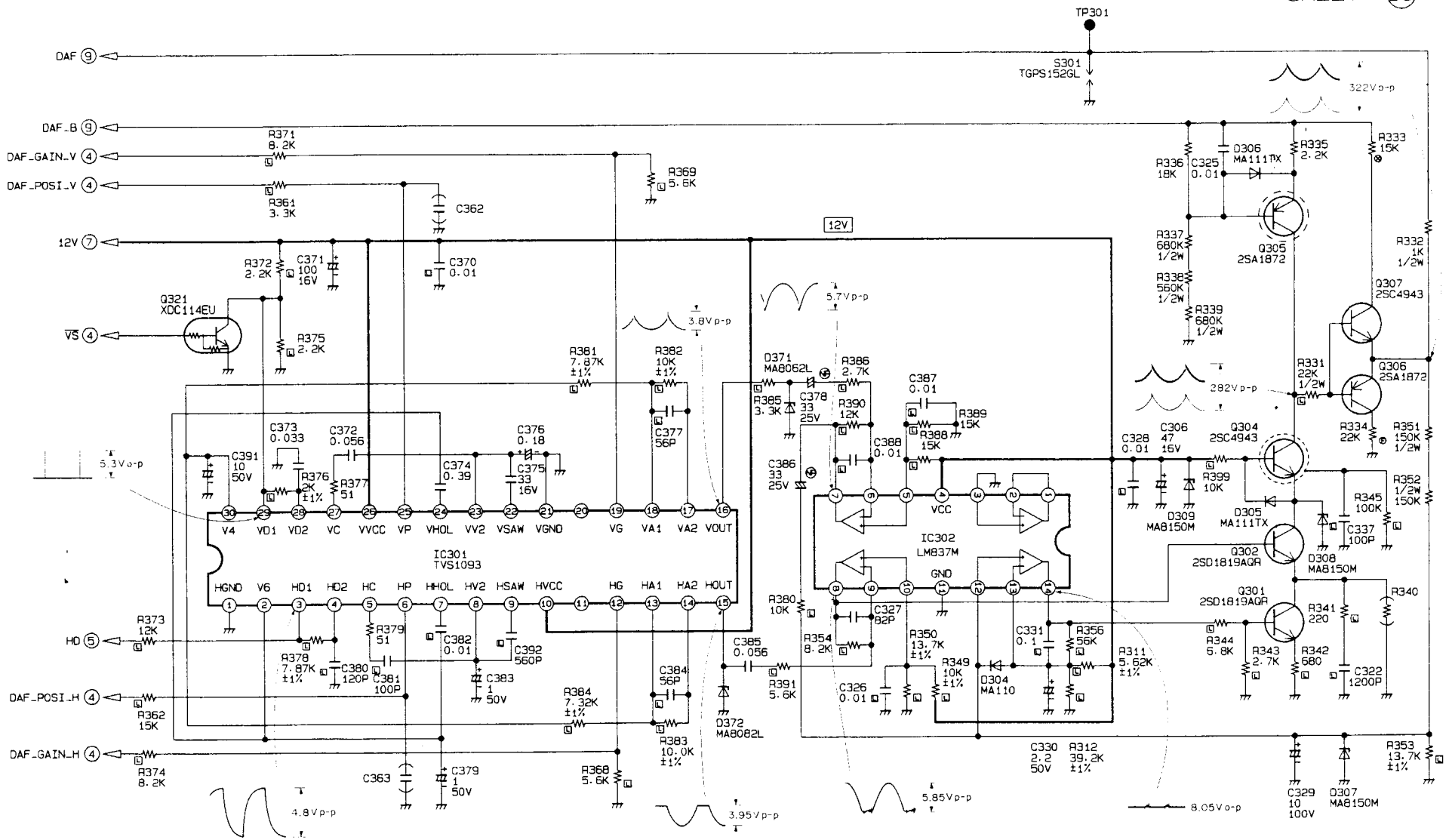

G2_DEGAUSS_B (9)
12V (7)
V_DEGAUSS (5)
DEGAUSS (9)
12V
C895 10 16V
R992 100
R994 100K
R995 1K
R991 1K
IC891 LM358M
R988 10K
C894 0.1
D881 MA8051M
D879 MA8150M
R987 82K
Q892 XDC114
D880 MA111TX
Q891 XDA114EU
C893 0.1
R996 1K
5.2Vp-p
R899 330K
R891 390K
483.6V
R892 330K
R893 330K
R897 330K
C891 2.2 600V
D892 AC05FJM
T1 T2
G
R894 1K
C892 0.1
R896 10K
R986 750
T2 D891 AC05FJM
G T1
R895 3.3K 1/2W
C896 0.01 630V
TCO (9)
G2 (3)
N382A
N802
DEGAUSSING COIL
L891 TLK859098T1


SHEET 7
PRIMARY
SECONDARY
AC 100 - 240V 50/60Hz
FS801-FS803 TJC855027
F801 X8A2C31TB15L
SW801 TSE81404
T801 TLP85227R
IC820 STR-S6533
IC875 SI-3050C
IC877 SI-3025F
IC871 SI-3120CA
IC873 SI-3240C
IC870 M5F7824
IC876 LA05C
IC874 STR-S3100
Q825 2SB1220Q
Q824 2SD814A
Q820 2SD1350A
Q821 2SD1350A
Q822 2SD1819A
Q805 2SB1220RS
Q815 2SB1220RS
Q810 2SD814A
Q816 XDC114E
Q811 XDC114E
Q814 XDC114E
Q809 2SC3938QR
Q813 XDC114E
Q812 XDC114E
Q823 2SD814A
Q805 2SA1018QR
PC830 TLP721F
PC831 TLP721F
PC832 TLP750
D809 MA111
D807 ERA01Z
D817 MA8200L
D871 MA8360H
D872 MA8360H
D873 MA8360H
D874 MA8360H
D875 MA8360H
D876 MA8360H
D846 MA8068M
D847 MA8120M
D840 ERB9302L3
D845 ERC9102L
D844 FML-G12S
D843 ERB903-4
D842 ERC3806L3
D841 ESAC39M06E64
L840 TSK8029
L845 TSK8029
L844 TSK8029
L843 TSK8029
L822 TSK8029
L821 TSK8029
L805 TSK8031
L806 TSK8031
F10V
5V
15V
33V
24V
28.5V
175V
105V
100V
12V
P1
P2
P3
P4
S1
S2
S3
S4
S6
ERROR
OVP
TRIGGER
267Vp-p
18.9Vp-p
5V
RESET
F_5V
H_B_OFF
F_GND
HEATER (N102-8)
PSK_HEAT
12V (N102-4)
POWER_OFF
24V
28.5V
SUSPEND
175V
STAND_BY
100V (N102-1)
P_STOP
P_SYNC

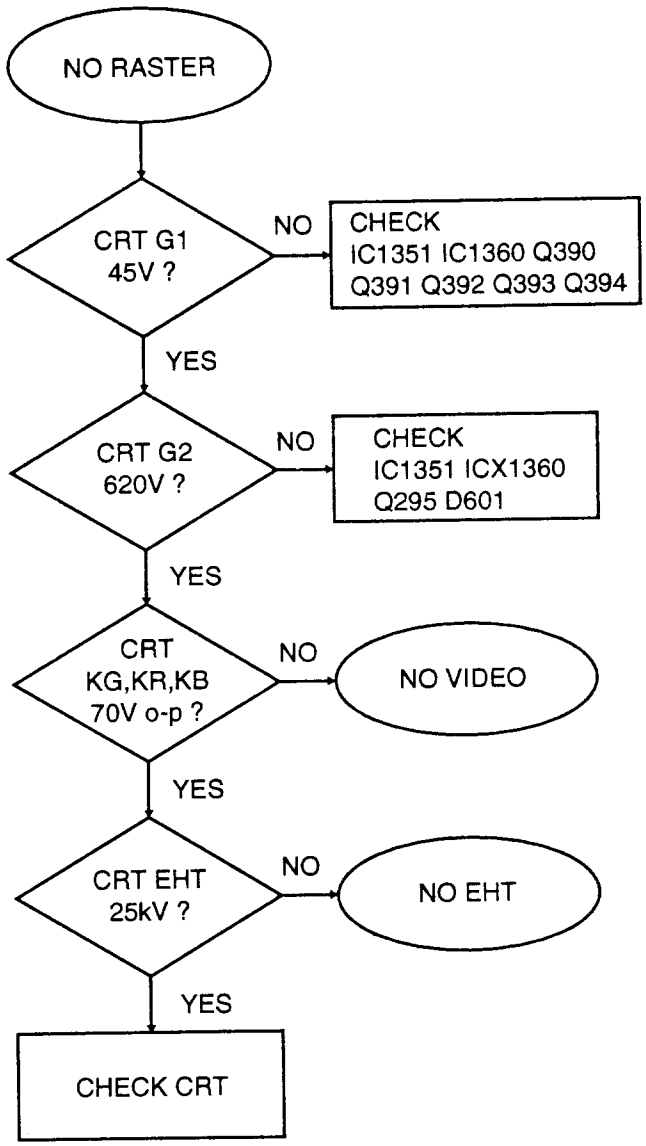

④ H_B_CONT
⑤ HD
④ H_B_OFF
175V ⑦
12V ⑦
175V
12V
L851 220
D853 ERA18-04
D882 MA8150M
C888 220 25V
R884 100K
R874 3.9K
D850 MA111
D851 MA111
D852 MA111
R872 10K
R871 10K
R870 10K
R882 1K
R883 390 1/2W
R885 100
Q851 2SD874AQR
Q853 IRFI740G
C887 4.7 50V
R886 100
Q852 2SB766AQR
R887 12 1/2W
R888 100K
110.00Vp-p
L850 ETQ28K47AY
⑨ H_B
C850 1 16V
C886 82 16V
D877 MA8150M
C882 220P
C881 1000P
R873 2.2K
C880 120P
D854 MA30WA
Q850 2SC4212H
D855 MA8150M
D858 C8903-4
C889 22 250V
R910 100K
IC850 TVS1103
Vcc
Sync+
Sync-
C-
C+
CT
GND
ERR IN+
ERR IN-
ERR OUT
NC
ON/OFF
OUT
GND
3.14V
3.14V
3.63V
D857 MA8091M
R889 8.2K
Q855 XDC114E
Q858 XDC114E
Q856 XDC114E
Q857 XDC114E
Q854 2SC3938
188Vp-p
R879 68K 1W
C885 2700P 200V
⑨ OCP
R880 1.21K ±1%
R881 2.10K ±1%
C884 680P
R876 1.5K
D878 MA8150M
R878 82K
0.71Vp-p
R877 330
R875 56
C883 22 63V

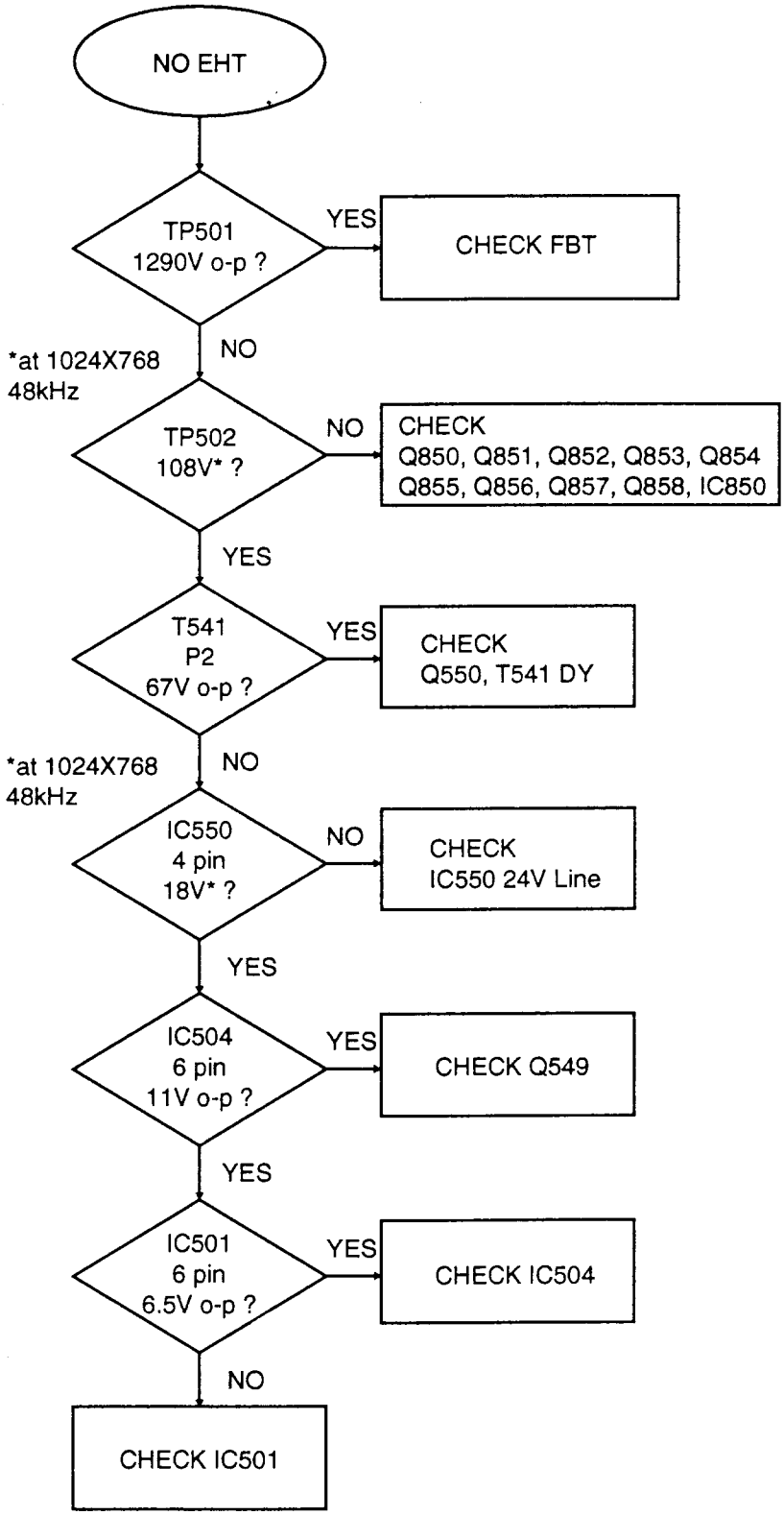


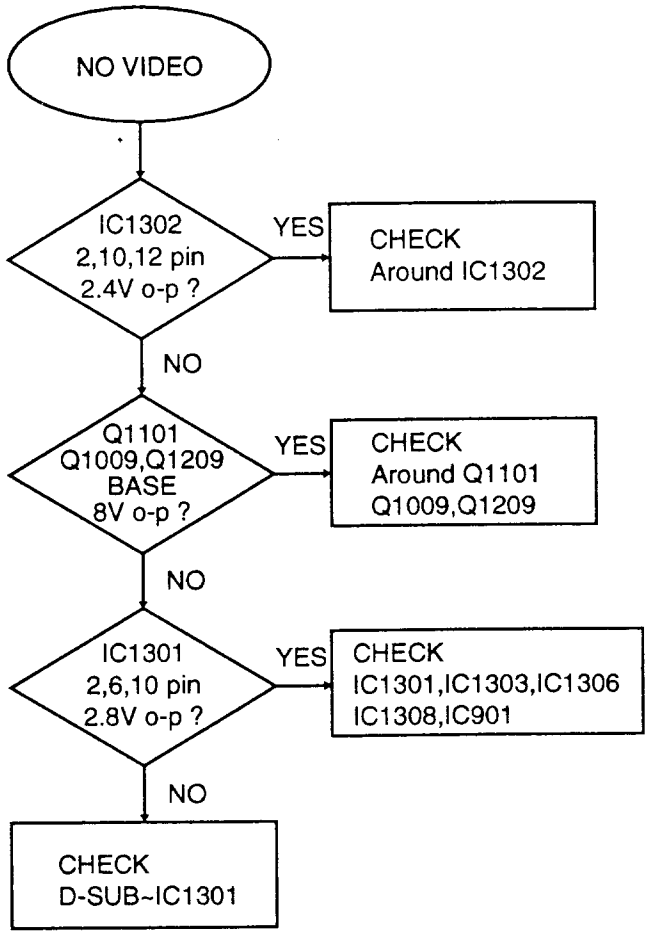
SHEET 9


TP301
S301
TGPS152GL
DAF (9)
DAF_B (9)
DAF_GAIN_V (4)
DAF_POSI_V (4)
12V (7)
VS (4)
HD (5)
DAF_POSI_H (4)
DAF_GAIN_H (4)
R371 8.2K
R361 3.3K
R369 5.6K
C362
C370 0.01
R372 2.2K
C371 100 16V
Q321 XDC114EU
R375 2.2K
12V
322Vp-p
R336 18K
C325 0.01
D306 MA111TX
R335 2.2K
R333 15K
R337 680K 1/2W
R338 560K 1/2W
R339 680K 1/2W
Q305 2SA1872
R332 1K 1/2W
Q307 2SC4943
Q306 2SA1872
R331 22K 1/2W
282Vp-p
R334 22K
R351 150K 1/2W
C328 0.01
C306 47 16V
Q304 2SC4943
R399 10K
D309 MA8150M
R352 1/2W 150K
R345 100K
C337 100P
D305 MA111TX
Q302 2SD1819AQR
D308 MA8150M
Q301 2SD1819AQR
R340
R341 220
R344 6.8K
R343 2.7K
R342 680
C322 1200P
C329 10 100V
D307 MA8150M
R353 13.7K ±1%
C330 2.2 50V
R312 39.2K ±1%
8.05Vp-p
5.7Vp-p
3.8Vp-p
5.3Vp-p
R381 7.87K ±1%
R382 10K ±1%
C377 56P
D371 MA8062L
R385 3.3K
C378 33 25V
R386 2.7K
C387 0.01
R390 12K
R389 15K
R388 15K
C388 0.01
C386 33 25V
C391 10 50V
C373 0.033
C372 0.056
C376 0.18
R376 2K ±1%
R377 51
C374 0.39
C375 33 16V
IC301 TVS1093
V4 VD1 VD2 VC VVCC VP VHOL VV2 VSAW VGND VG VA1 VA2 VOUT
HGND V6 HD1 HD2 HC HP HHOL HV2 HSAW HVCC HG HA1 HA2 HOUT
IC302 LM837M
VCC
GND
R373 12K
R378 7.87K ±1%
C380 120P
R379 51
C381 100P
C382 0.01
C383 1 50V
C392 560P
R380 10K
C327 82P
R354 8.2K
C385 0.056
R391 5.6K
D372 MA8082L
R350 13.7K ±1%
R349 10K ±1%
D304 MA110
C326 0.01
C331 0.1
R356 56K
R311 5.62K ±1%
C384 56P
R383 10.0K ±1%
R384 7.32K ±1%
R368 5.6K
C363
C379 1 50V
R362 15K
R374 8.2K
R358 1K
4.8Vp-p
3.95Vp-p
5.85Vp-p

TROUBLE SHOOTING HINTS




NO EHT
TP501
1290V o-p ?
YES
CHECK FBT
NO
*at 1024X768
48kHz
TP502
108V* ?
NO
CHECK
Q850, Q851, Q852, Q853, Q854
Q855, Q856, Q857, Q858, IC850
YES
T541
P2
67V o-p ?
YES
CHECK
Q550, T541 DY
NO
*at 1024X768
48kHz
IC550
4 pin
18V* ?
NO
CHECK
IC550 24V Line
YES
IC504
6 pin
11V o-p ?
YES
CHECK Q549
YES
IC501
6 pin
6.5V o-p ?
YES
CHECK IC504
NO
CHECK IC501


NO VIDEO
IC1302
2,10,12 pin
2.4V o-p ?
YES
CHECK
Around IC1302
NO
Q1101
Q1009,Q1209
BASE
8V o-p ?
YES
CHECK
Around Q1101
Q1009,Q1209
NO
IC1301
2,6,10 pin
2.8V o-p ?
YES
CHECK
IC1301,IC1303,IC1306
IC1308,IC901
NO
CHECK
D-SUB~IC1301