

**FUJITSU GENERAL** TELETON

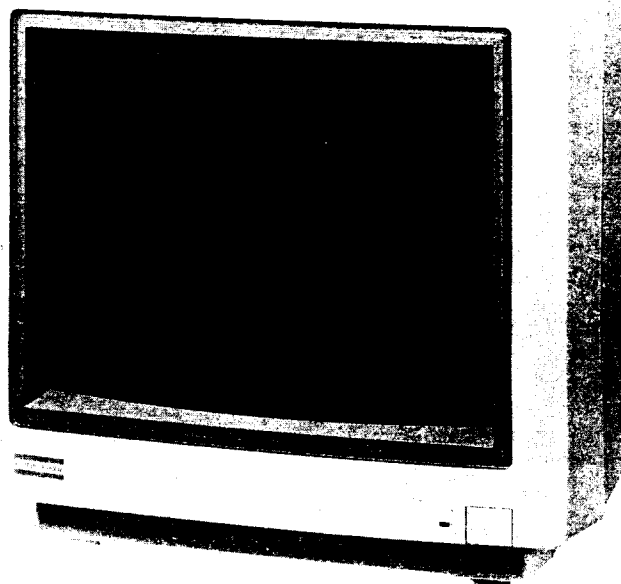
33.5cm COLOUR  
DISPLAY MONITOR

# ME-503series

ME-503B CHASSIS NO. ECC-14292

ME-503C CHASSIS NO. ECC-14295

ME-503G CHASSIS NO. ECC-14293



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mPC

Table 1 IC/TR Failure and Symptoms

(Applied to ME-503B / ME-503C)

PCB NAME	REF. NO.	OPERATION	SYMPTOM
Power Board 6BI	IC521	Power output	No power output.
	Q521	Current protector	No power output.
	Q522	Power drive	No power output.
Interface Board 6BFA	IC7201	Sync. processor	Unstable picture. No picture.
	IC7202/IC7203	D/A converter	No picture. Incorrect color.
	IC7204	Video amp.	No picture. Incorrect color/picture.
	Q7201	Sync. sep.	Unstable picture at composite sync. (in case of pin No. 7 Video input used) receiving mode.
	Q7202/Q7203/ Q7215	Sync. detector	Unstable picture. No picture.
	Q7216	Switch	Incorrect color.
	Q7204 ~ Q7212	Video amp.	Incorrect color.
	Q7213	ABL	Dark or too bright picture.
	Q7214	Gate pulse amp.	No picture. Unnormal picture.
Neck Board 6BG	Q251 ~ Q253	Video output	Incorrect color. Unnormal picture.
	Q254	DC restore	Dark or bright picture. Incorrect color.
Main Board 6BH	IC401	Switch	Improper vertical size. Improper horizontal position. Improper horizontal size.
	IC451	Sync. sep./Vert. osc./ V. Drive/Horiz. osc./ Horiz. drive/OVP.	Unstable picture. No raster Horizontal line only.
	IC452	Switch	No raster. Improper horizontal size. Vertical line only.
	IC501	+8V AVR	Abnormal operation.
	IC502	+5V AVR	Poor picture. No picture.
	IC7301	Pulse width control	Improper horizontal size. Incorrect relay operation. No raster blanking at horizontal scanning change.
	IC7302	Pulse width control	Incorrect horizontal scanning. Unstable picture.
	IC7303	Comparator	Improper horizontal size. (Incorrect relay operation.)
	IC7304	Ope. amp.	Incorrect horizontal scanning. (Unstable picture.)

Table 1 IC/TR Failure and Symptoms (Continued)

(Applied to ME-503B / ME-503C)

PCB NAME	REF. NO.	OPERATION	SYMPTOM
Main Board 6BH	IC7305	Decoder	Improper horizontal size. (Incorrect relay operation.) No raster.
	IC7306	Pulse width control	Unstable picture. Improper horizontal position.
	Q401	Vertical position	Improper vertical position.
	Q402 Q403, Q404	Vertical drive Vertical out	Horizontal line only or improper vertical size.
	Q405 ~ Q407	PCC amp., switch	Picture distortion at left/right side.
	Q409, Q410	Blanking amp.	No picture. Vertical line on the picture.
	Q451, Q454, Q455	Horiz. drive	No raster.
	Q456	Switch	Improper horizontal size.
	Q452	Horiz. output	No raster. Power unit utters high sound.
	Q453	Switch	Improper horizontal size.
	Q501 Q502	+73V AVR Error amp.	Improper horizontal size.
	Q532, Q533	Heater voltage control	Incorrect heater voltage.
	Q701, Q702	Raster blanking	Dark picture. No raster blanking operation at horizontal scanning change.
	Q7301, Q7312, Q7313	Horiz. osc. control	Unstable picture.
	Q7303 ~ Q7305, Q7307	Color mode control	Incorrect color at digital RGB reception.
	Q7308 ~ Q7311, Q7317	H. sync. phase control	Improper horizontal position.
	Q7314	HD buffer	Unstable picture.
	Q7315	HD buffer	Unstable picture.
	Q7316	Switch	Incorrect color. Improper horizontal size.

Table 1 IC/TR Failure and Symptoms

(Applied to ME-503G)

PCB NAME	REF. NO.	OPERATION	SYMPTOM
Power Board 6BI	IC521	Power output	No power output.
	Q521	Current protector	No power output.
	Q522	Power drive	No power output.
Interface Board 6BFA	IC7201	Sync. processor	Unstable picture. No picture.
	IC7202/IC7203	D/A converter	No picture. Incorrect color.
	IC7204	Video amp.	No picture. Incorrect color/picture.
	Q7201	Sync. sep.	Unstable picture at composite sync. (in case of pin No. 7 Video input used) receiving mode.
	Q7202/Q7203/ Q7215	Sync. detector	Unstable picture. No picture.
	Q7216	Switch	Incorrect color.
	Q7204 ~ Q7212	Video amp.	Incorrect color.
	Q7213	ABL	Dark or too bright picture.
	Q7214	Gate pulse amp.	No picture. Unnormal picture.
Neck Board 6BG	Q251 ~ Q253	Video output	Incorrect color. Unnormal picture.
	Q254	DC restore	Dark or bright picture. Incorrect color.
Main Board 7AW	IC401	Switch	Improper vertical size. Improper horizontal position. Improper horizontal size.
	IC451	Sync. sep./Vert. osc./ V. Drive/Horiz. osc./ Horiz. drive/OVP.	Unstable picture. No raster Horizontal line only.
	IC452	Switch	No raster. Improper horizontal size. Vertical line only.
	IC501	+8V AVR	Abnormal operation.
	IC502	+5V AVR	Poor picture. No picture.
	IC7301	Pulse width control	Improper horizontal size. Incorrect relay operation. No raster blanking at horizontal scanning change.
	IC7302	Pulse width control	Incorrect horizontal scanning. Unstable picture.
	IC7303	Comparator	Improper horizontal size. (Incorrect relay operation.)
	IC7304	Ope. amp.	Incorrect horizontal scanning. (Unstable picture.)

Table 1 IC/TR Failure and Symptoms (Continued)

(Applied to ME-503G)

PCB NAME	REF. NO.	OPERATION	SYMPTOM
Main Board 7AW	IC7305	Decoder	Improper horizontal size. (Incorrect relay operation.) No raster.
	IC7306	Pulse width control	Unstable picture. Improper horizontal position.
	Q401	Vertical position	Improper vertical position.
	Q402 Q403, Q404	Vertical drive Vertical out	Horizontal line only or improper vertical size.
	Q405 ~ Q407	PCC amp., switch	Picture distortion at left/right side.
	Q409, Q410	Blanking amp.	No picture. Vertical line on the picture.
	Q451, Q454 Q455	Horiz. drive	No raster.
	Q456	Switch	Improper horizontal size.
	Q452	Horiz. output	No raster. Power unit utters high sound.
	Q453	Switch	Improper horizontal size.
	Q501 Q502	+73V AVR Error amp.	Improper horizontal size.
	Q532, Q533	Heater voltage control	Incorrect heater voltage.
	Q701, Q702	Raster blanking	Dark picture. No raster blanking operation at horizontal scanning change.
	Q7301, Q7312, Q7313	Horiz. osc. control	Unstable picture.
	Q7303 ~ Q7305, Q7307	Color mode control	Incorrect color at digital RGB reception.
	Q7308 ~ Q7311, Q7317	H. sync. phase control	Improper horizontal position.
	Q7314	HD buffer	Unstable picture.
	Q7315	HD buffer	Unstable picture.
	Q7316	Switch	Incorrect color. Improper horizontal size.

# SERVICE ADJUSTMENT

## 1. Focus adjustment

- 1) Receive all white "H" characters.
- 2) Set the contrast and brightness controls at the normal viewing level.
- 3) Adjust the focus control so that the entire screen is focused clearly.

## 2. Vertical size adjustment

Adjust the vertical size control corresponding to the scanning frequency of the signal to be received.  
Refer table below:

Table 2

Horiz. scanning frequency	Control to be adjusted	Remarks
15 ~ 17 KHz	VR405 (V. size 2)	{ This control also affects the vertical sizes 2 and 3. This control should be adjusted first.
21 ~ 25 KHz	VR402 (V. size 1)	
29 ~ 34 KHz	VR406 (V. size 3)	

## 3. Horizontal size adjustment

Adjust the size coil corresponding to the horizontal scanning frequency, according to the following table.

Table 3

Horiz. Scanning frequency	Coil to be adjusted
15 ~ 17 KHz	L455
21.85 KHz (IBM EGA)	L457
29 ~ 34 KHz	L456

## 4. Circuit protection

A 4.0A pigtail fuse, mounted on the power pc board has been provided to protect the power output circuit.

## 5. +B (73V line) adjustment

- 1) Receive all "H" white characters (2,000 characters) of IBM CGA (15.7 KHz).
- 2) Connect the digital voltmeter between the Q501 emitter and the earth ground.
- 3) Turn the +B adjust control (VR501) to adjust the digital voltmeter to 73.0V.
- 4) Turn the horizontal size coil (L455) to set the horizontal size to 246mm.
- 5) Verify that the +B (73V line) has been set to  $73 \pm 0.5V$ . If the value is not within this range, repeat the above steps 3) to 5).

This adjustment is necessary when the AVR (+73V line) circuit and the HV unit are replaced.

## 6. High voltage check

High voltage is not adjustable but must be checked to verify the monitor is operating within safe and efficient design limitations as specified.

1. Remove cabinet back.
2. Operate monitor for at least 15 minutes at rated AC line with signal.
3. Rotate brightness and contrast controls to maximum clockwise position.

4. Connect accurate high voltage meter to CRT anode. Reading should be between 22 and 25 KV at the following scanning frequency.

Horizontal scanning frequency = 15.7 KHz  
= 21.85 KHz  
= 31 KHz

## 7. Overvoltage protector control (VR451) adjustment

The over voltage protector control (VR452) is factory adjusted and sealed with epoxy glue.  
However, if readjustment should be required, proceed as follows.

1. Connect the signal at the following conditions.  
Scanning frequency : Horizontal = 15.7 KHz  
Vertical = 60 Hz  
Display pattern : White  
Contrast, brightness controls: Maximum position
2. Jumper IC521 pin No. 1 and pin No. 5 with a clip.
3. Connect the digital voltmeter to +73V DC line.
4. Adjust AC line voltage so that +B (+73V) line becomes 82VDC.
5. Adjust OVP VR (VR451) so that the raster on the CRT is just disappeared.
6. After OVP VR adjusted, remove a jumper clip.
7. AFTER ADJUSTMENT, VR451 MUST BE SEALED WITH EPOXY GLUE.

### Note:

Readjust overvoltage protector control (VR451) in the following case:

When parts marked "★" as X-ray relative critical components in the connection diagram and parts list, are replaced.

## 8. Vertical position control (VR404) adjustment

Vertical position control is the VR which controls the vertical position of the picture. If the vertical position of the picture is not at the center of the picture tube, adjust the vertical position by turning this control.

### 9. PCC control (VR404) adjustment

The PCC control is used to adjust the amount of distortion on both sides.

Receive all white "H" characters, and adjust this control so that the distortion is least on both sides.

### 10. Vertical hold control (VR401) adjustment

Adjust the vertical hold control so that picture is stable.

### 11. Vertical linearity control (VR410) adjustment

Receive the cross-hatch signal.

Adjust the vertical linearity control so that good vertical linearity is obtained.

### 12. Horizontal position controls (VR407, VR7303, VR7304) adjustment

Table 4

Step	Control to be adjusted	Input signal/ computer	Horiz. scanning frequency	Adjusting method
1.	H. Pos. balance (VR407)	IBM PC/XT CGA mode (Standard) (Signal A)	15.70 KHz	Adjust VR407 to balance the horizontal position control (VR203, front control) on both sides.
2.	H. Pos. 22 KHz (VR7303)	IBM PC/XT EGA mode (Standard) (Signal B)	21.85 KHz	Adjust this control so that the horizontal picture position is in the center of CRT.
3.	H. Pos. 31 KHz (VR7304)	IBM PC/XT PGA mode (Standard) (Signal C)	30.48 KHz	Same as the above.

Pattern signal = All "H" characters (2,000 characters).

Timing chart for this adjustment:

If the computer specified above is not used, generate signal with a signal pattern generator using Table 6 "Standard signal timing chart".

### 13. Pulse width adjusting capacitor (C7302) adjustment

- 1) Connect the Q455 collector to the ground.
- 2) Connect the digital voltmeter between IC7303, (2) and the ground.

3) Receive the EGA mode signal (or standard signal B) using the IBM PC/XT.

4) Adjust C7302 so that the digital voltmeter reads  $3.3 \pm 0.1V$  DC, using the insulating adjusting driver.

#### Note:

This adjustment is necessary when IC7301 and its peripheral parts are replaced.

### 14. Horizontal oscillator tracking adjustment [L. fo (VR7301), H. fo (VR7302)]

These controls are used to adjust the horizontal oscillator frequency to the value corresponding to the input signal. Adjust these controls in the following procedure.

Table 5

Step	Control to be adjusted	Computer/ input signal	Horiz. scanning frequency	Adjusting method
1.				Connect the Q455 collector to the ground.
2.				Connect the frequency counter to the IC451, pin 10.
3.	L. fo (VR7301)	IBM PC/XT CGA mode (Standard) (Signal A)	15.70 KHz	Adjust this control to 15.70 KHz.
4.	H. fo (VR7302)	IBM PC/XT PGA mode (Standard) (Signal C)	30.48 KHz	Adjust this control to 30.48 KHz.
5.				Repeat steps 3 and 4 until the following specifications are met: L. fo = $15.70 \pm 0.05$ KHz H. fo = $30.48 \pm 0.05$ KHz

**Note:**

This adjustment is necessary when the following parts or circuits are replaced:

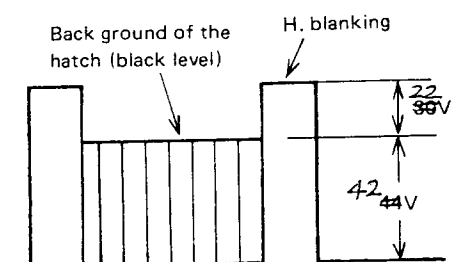
IC501, IC7302, IC7304, IC451, Q7301, Q7312, Q7313 and their peripheral parts and circuits

**15. Sub brightness control (VR7202),  
Sub contrast control (VR7201) adjustment**

These controls are factory adjusted.

When readjustment is required, proceed as follows.

- 1) Receive the cross-hatch signal (Digital RGB mode).
- 2) Set the contrast and brightness control at the maximum position.
- 3) Connect the oscilloscope to the Q253 collector. (Neck PCB)
- 4) Adjust the sub-contrast and sub-brightness controls so that the following waveform is obtained.



**16. Black and white tracking adjustment  
[R. Drive (VR7203), G. Drive (VR7204),  
R. Cut-off (VR251), G. Cut-off (VR252),  
B. Cut-off (VR253)]**

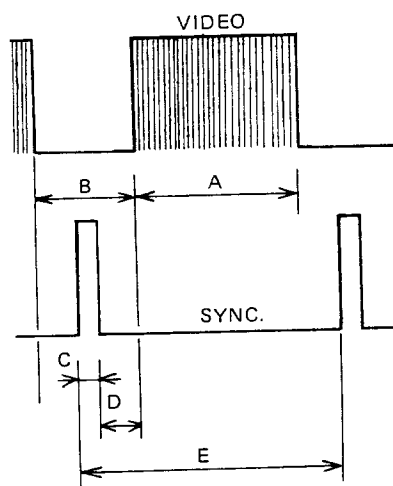
The purpose of this procedure is to optimize the picture tube to obtain a good black and white picture at all brightness levels, while at the same time achieving maximum usable brightness.

When picture tube, neck PCB or interface PCB are replaced, proceed as follows.

- 1) Set the brightness control at 90° from the maximum position (turned fully clockwise).
- 2) Rotate the red, green and blue cut-off controls fully counter-clockwise.
- 3) Rotate the R. Drive and G. Drive controls midrange.

- 4) Rotate the screen VR, fully counter-clockwise.
  - 5) Receive the black signal (Digital RGB mode).
  - 6) Short circuit TP402 and TP452 with a jumper clip to produce a horizontal line.
  - 7) Slowly turn the screen control on the HV unit clockwise until color (colors) appears faintly on the screen.
  - 8) Adjust the each cut-off control so that color becomes lightest and horizontal lines are turned to white color.
  - 9) Remove the jumper clip.
  - 10) Receive the white signal.
  - 11) Adjust R/G drive controls to produce a hi-lite white screen.
  - 12) Set the brightness and contrast controls to minimum. Then, the raster should appear dark.
  - 13) Move the brightness control until a dim raster is obtained.
  - 14) If necessary, touch-up adjustment of the three cut off controls to obtain best white uniformity on the CRT screen.
  - 15) Set the brightness and contrast controls at the maximum position.
- If necessary, adjust the R. drive and G. drive controls to produce a uniform black and white picture.

**Table 6 Standard Signal Timing Chart**



- A ..... Display time  
B ..... Blanking time  
C ..... Pulse width  
D ..... Back porch  
E ..... Period

**Horizontal**

Mode		A μ sec.	B μ sec.	C μ sec.	D μ sec.	E μ sec./KHz	H. sync. polarity
A	15 KHz (CGA)	44.5	19.2	4.5	8.2	63.5/ 15.75 KHz	Positive
B	22 KHz (EGA)	39.5	6.3	5.0	1.7	45.77/ 21.85 KHz	Positive
C	31 KHz (PGA)	25.0	7.8	2.4	4.5	32.81/ 30.48 KHz	Negative (H/V combined)



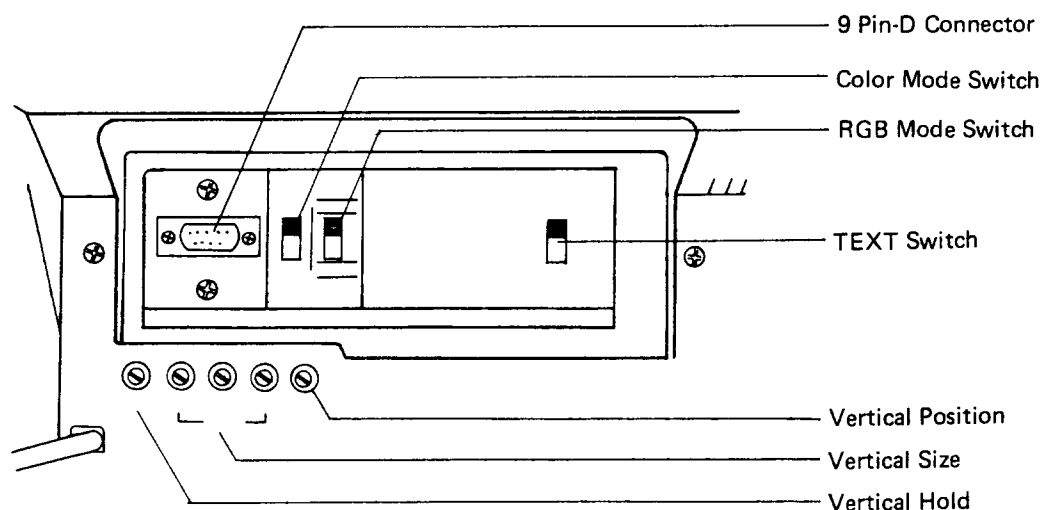
## Vertical

Mode		A msec.	B msec.	C msec.	D msec.	E msec./Hz	V. sync. polarity
A	15 KHz (CGA)	12.4	4.3	0.2	2.1	16.67 60 Hz.	Positive
B	22 KHz (EGA)	15.4	1.3	0.6	0.1	16.67 60 Hz	Negative
C	31 KHz (PGA)	12.8	3.9	0.5	1.8	16.67 60 Hz	Negative (H/V combined)

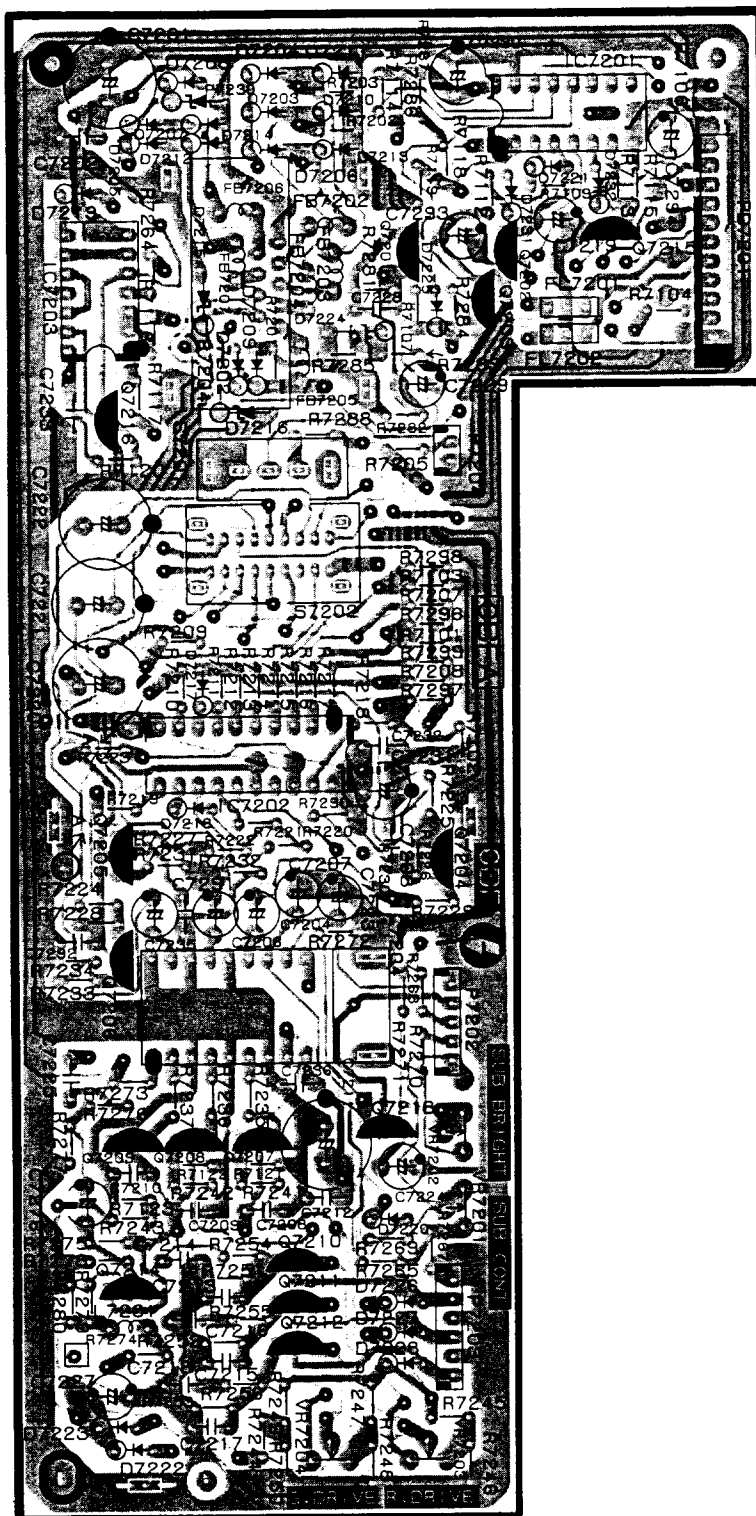
# SERVICE INFORMATION

## RGB CONNECTION

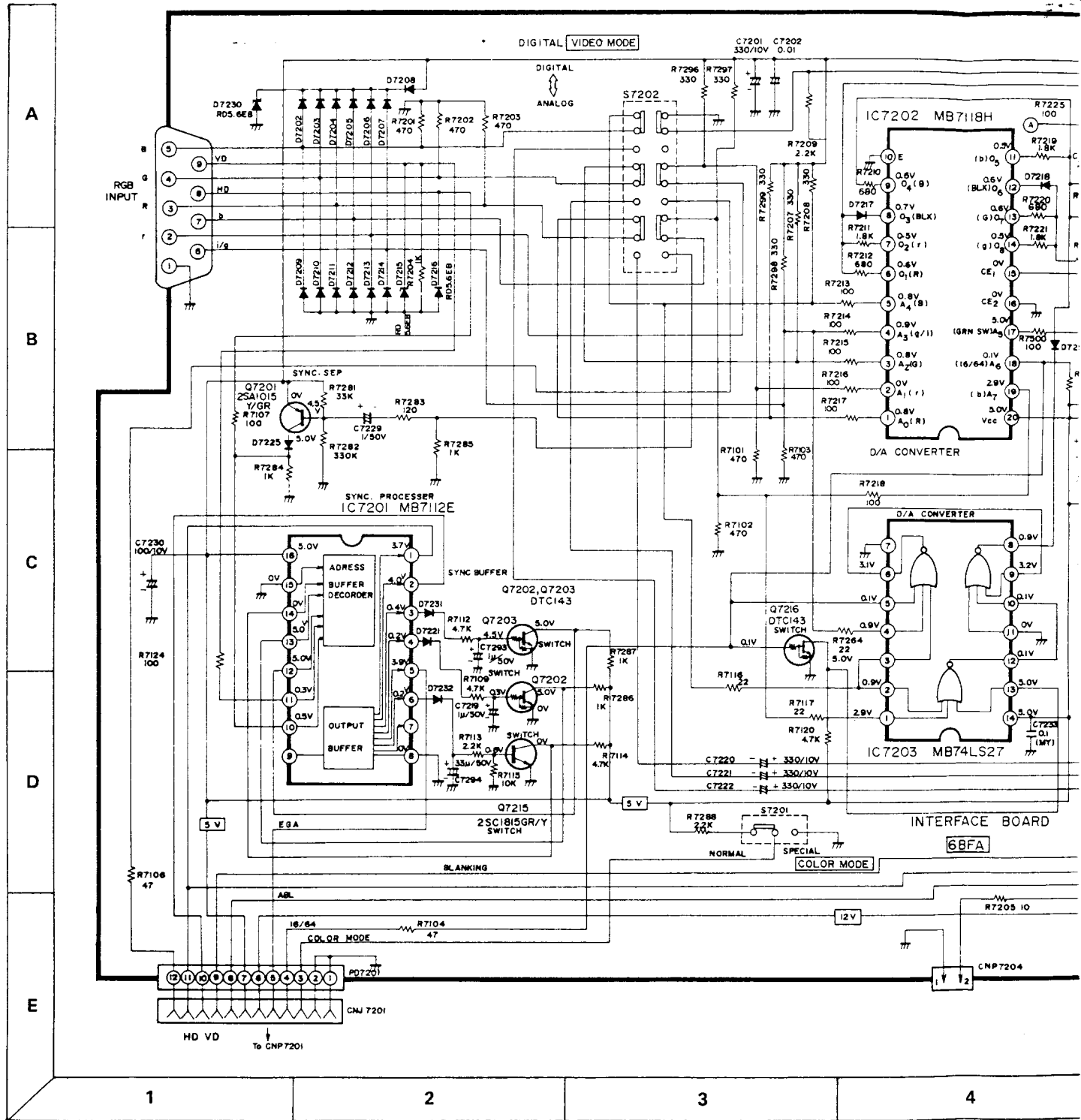
PIN NO.	DIGITAL RGB		ANALOG RGB
	16 Colors	64 Colors	
1	Ground	Ground	Ground
2	—	2nd Red	—
3	Red	1st Red	Red
4	Green	1st Green	Green
5	Blue	1st Blue	Blue
6	Intensity	2nd Green	—
7	Composite Sync. (0.3 ~ 1Vp-p/75Ω; Negative)	2nd Blue	Composite Sync. (0.3 ~ 1Vp-p/75Ω; Negative)
8	Horizontal Sync./ Composite Sync. TTL	Horizontal Sync./ Composite Sync. TTL	Horizontal Sync./ Composite Sync. TTL
9	Vertical Sync. TTL	Vertical Sync. TTL	Vertical Sync. TTL



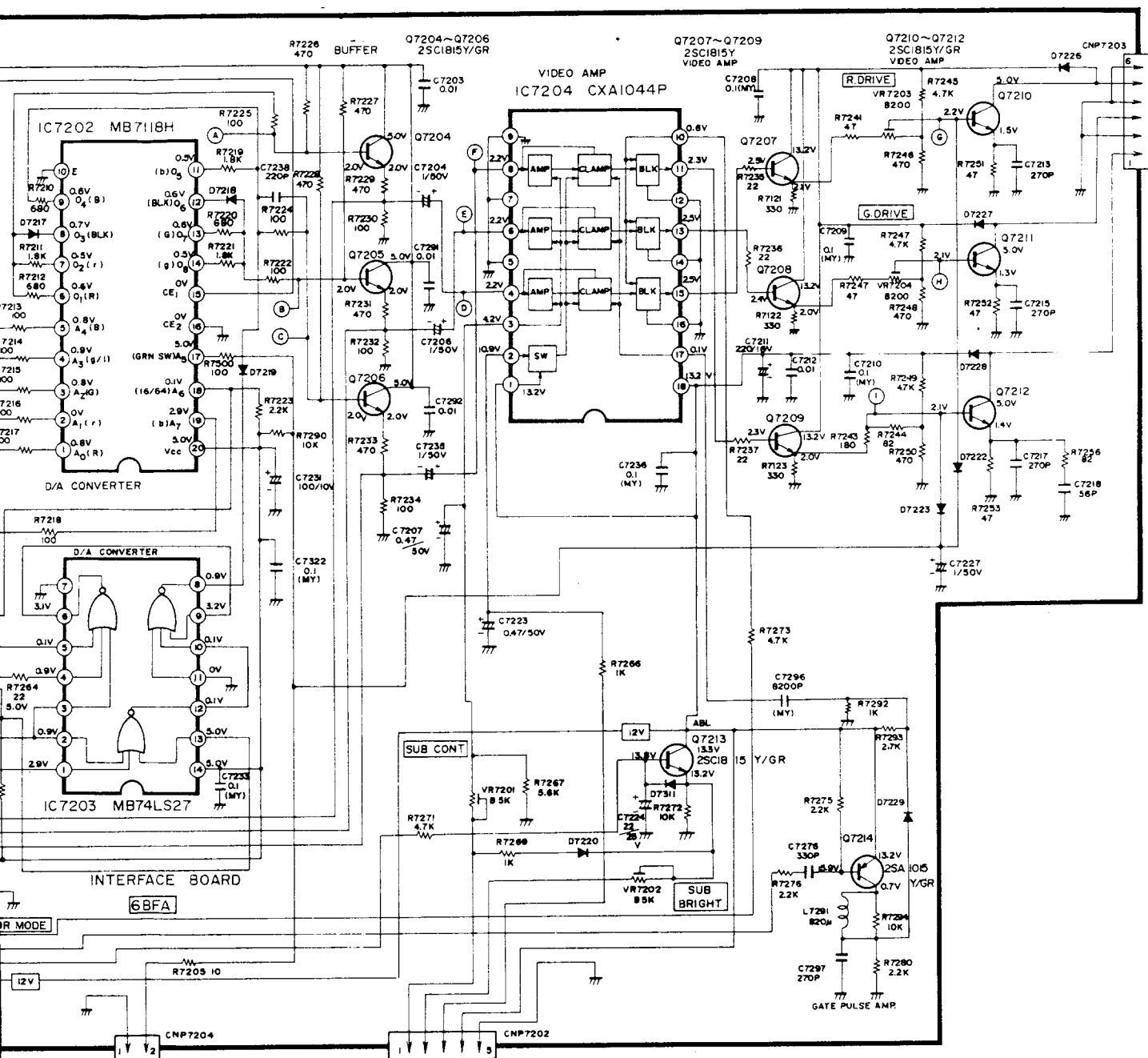
(VIEWED FROM THE COMPONENT SIDE)



## INTERFACE BOARD SCHEMATIC



# BOARD SCHEMATIC DIAGRAM



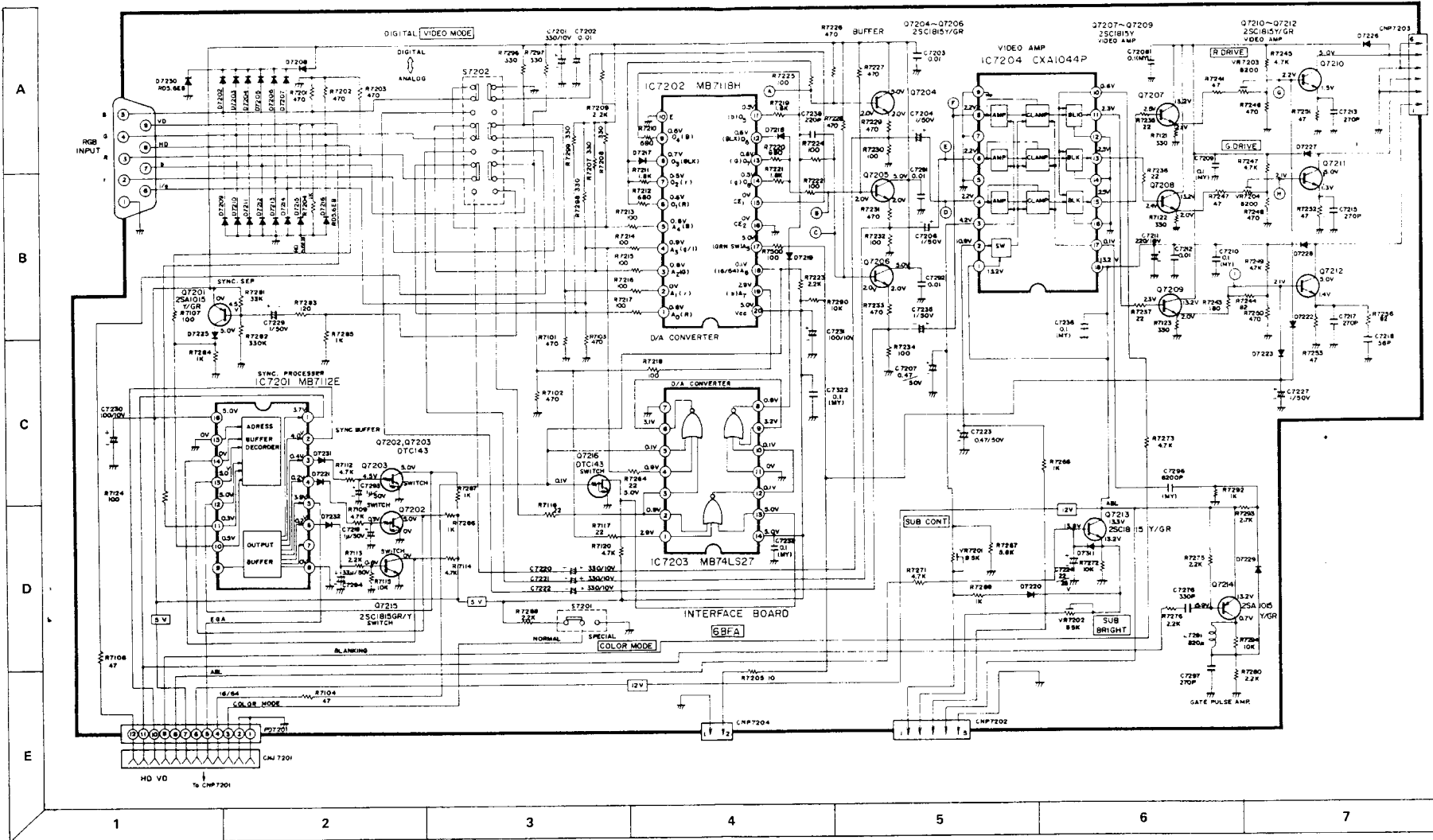
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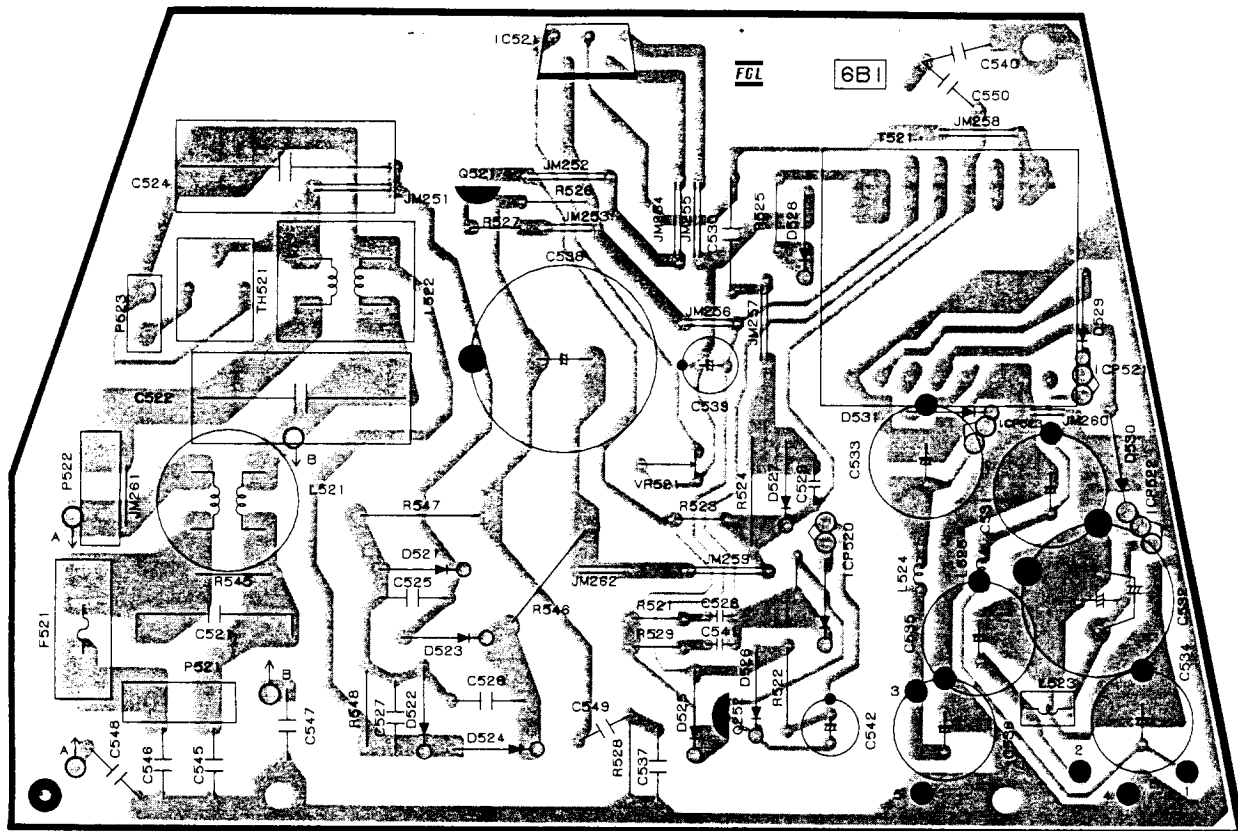
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## INTERFACE BOARD SCHEMATIC DIAGRAM

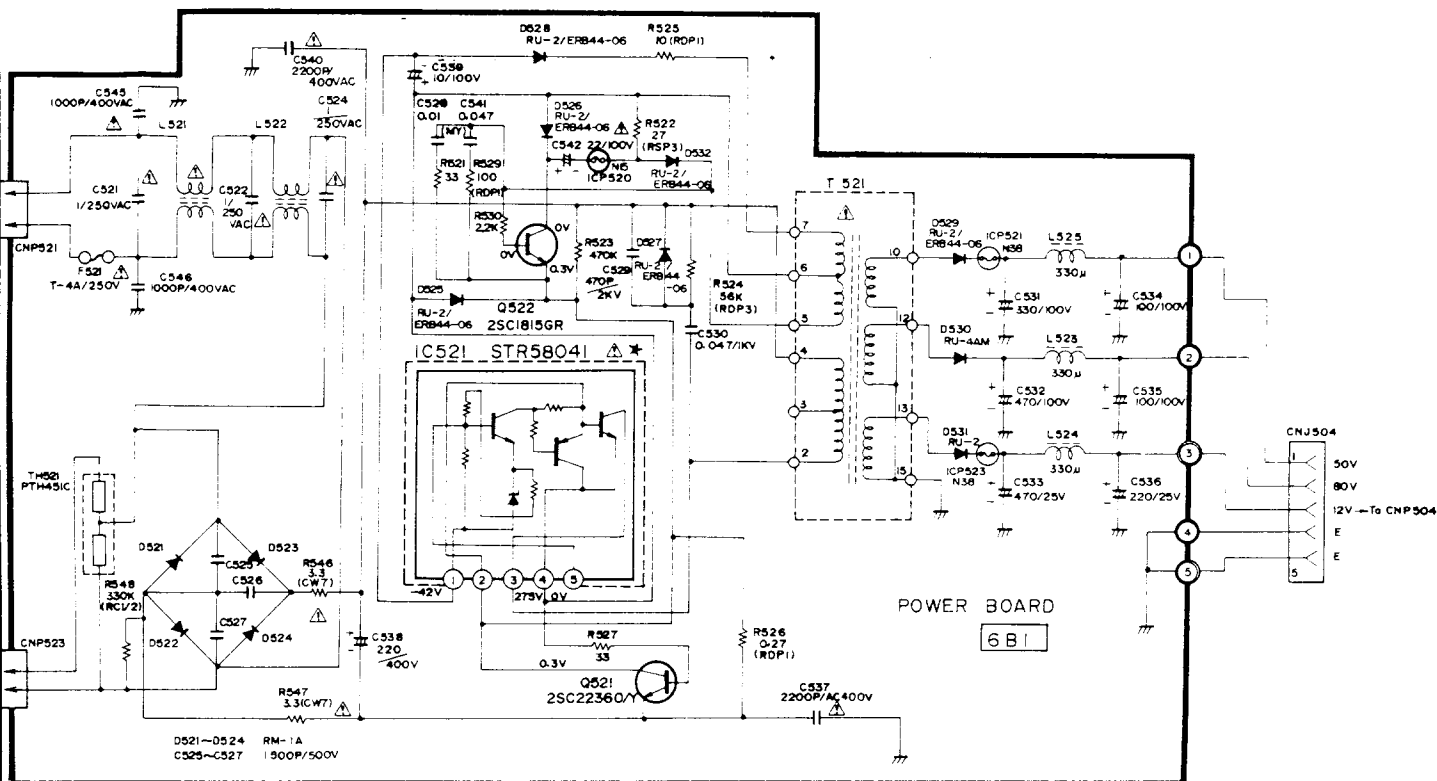


# 6BI POWER BOARD MODULE P.C. BOARD OVERLAY

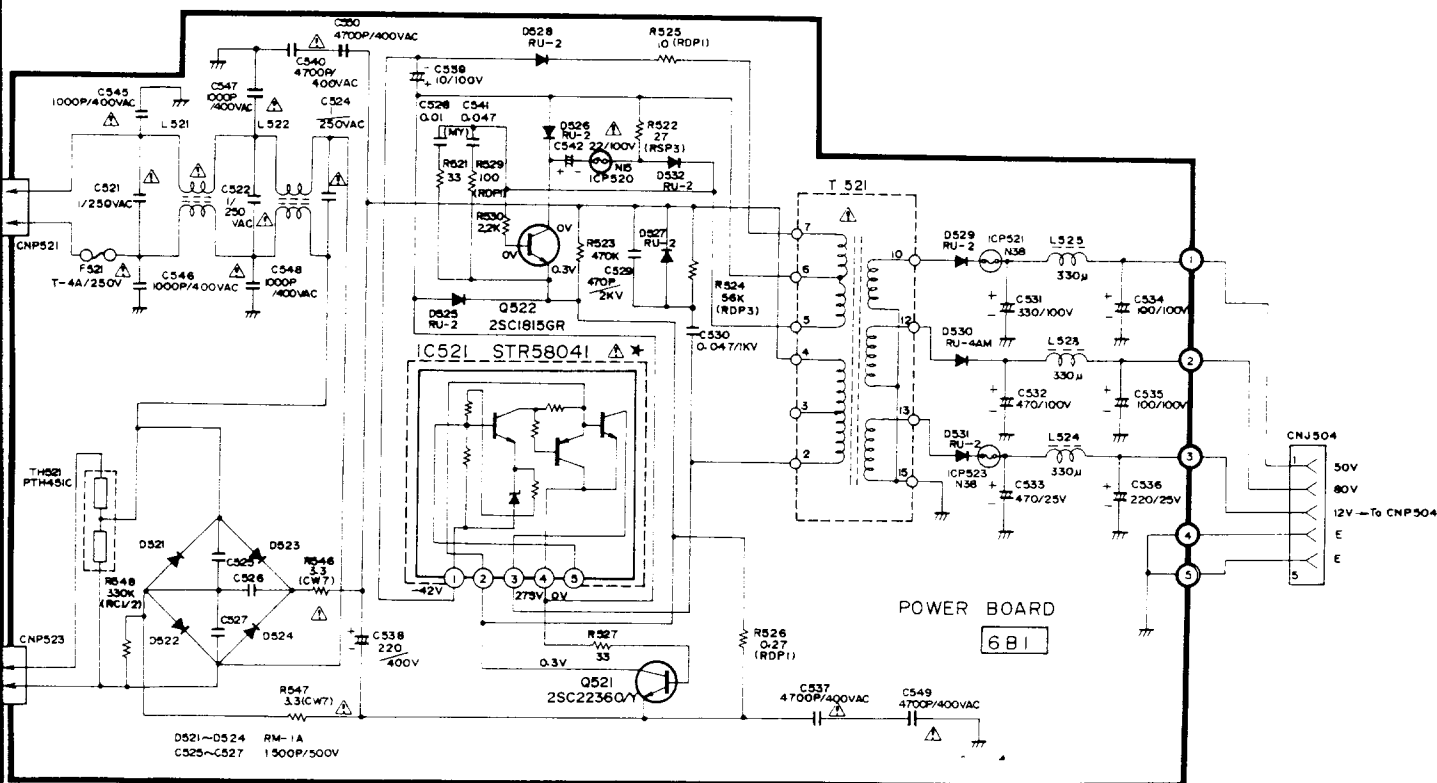
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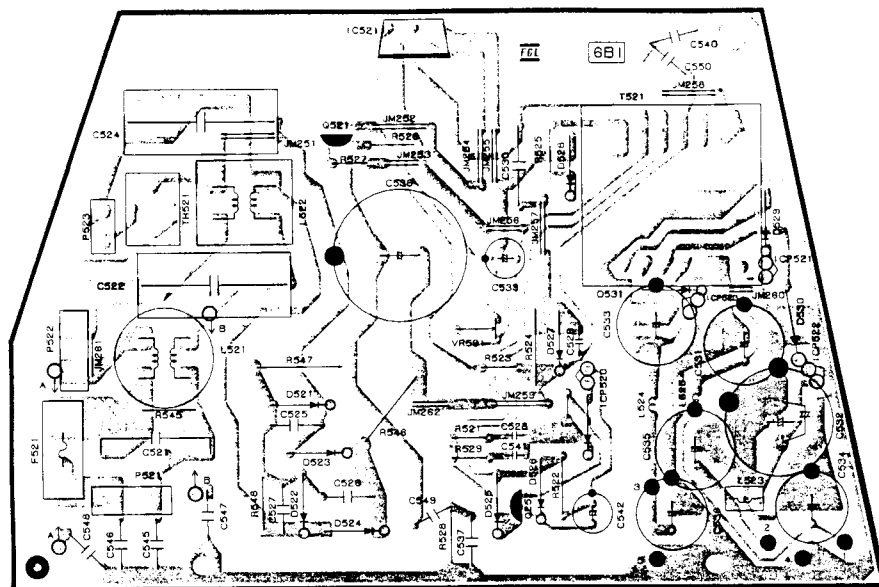
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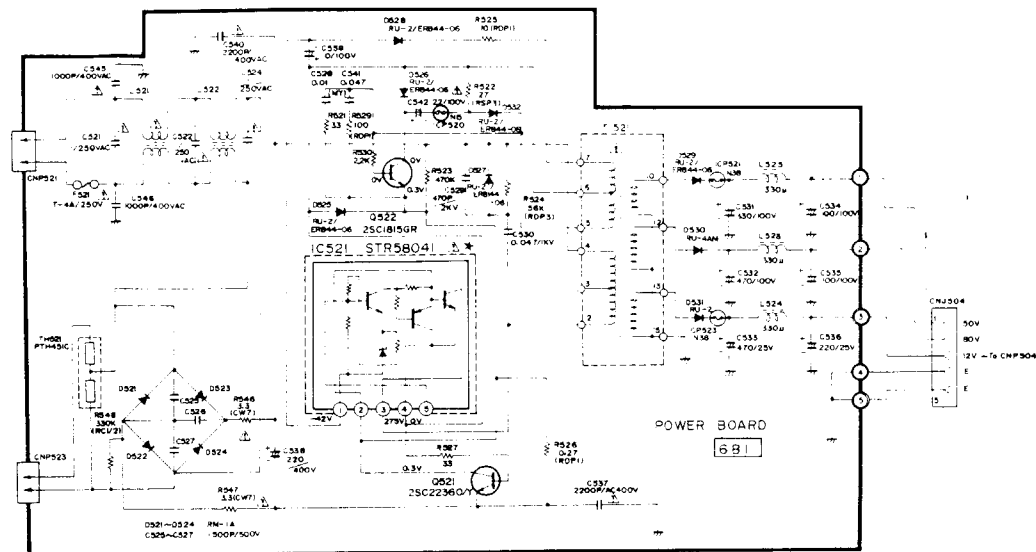
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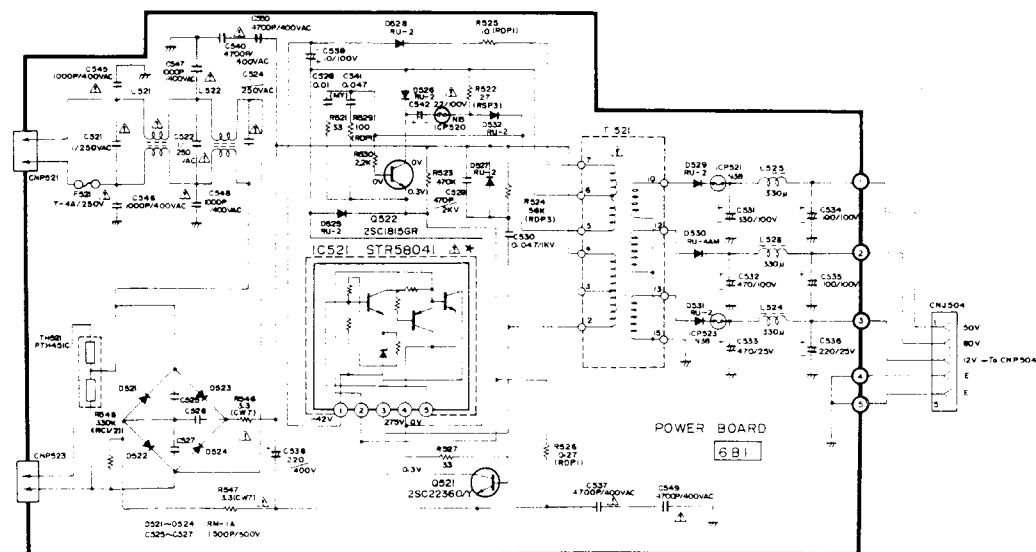
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*(Applied to ME-503B / ME-503C)*



*(Applied to ME-503G)*

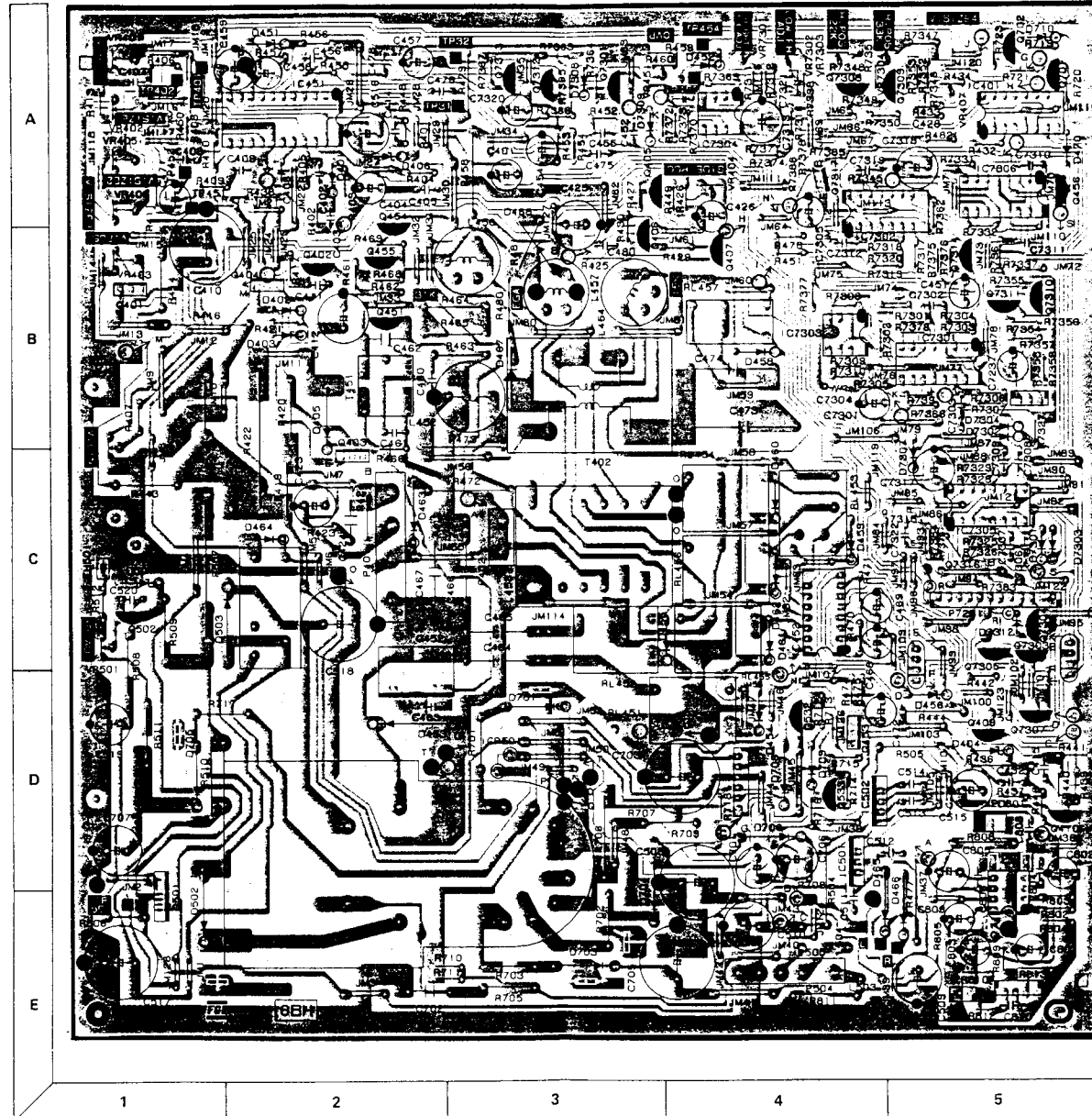




## 6BH MAIN CHASSIS BOARD OVERLAY

(VIEWED FROM THE COMPONENT SIDE)

CHASSIS NO. ECC-14292(ME-503B)  
CHASSIS NO. ECC-14295(ME-503C)

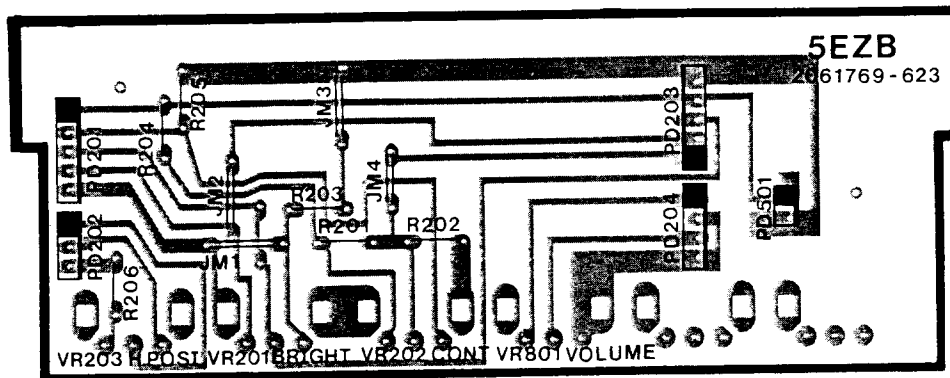


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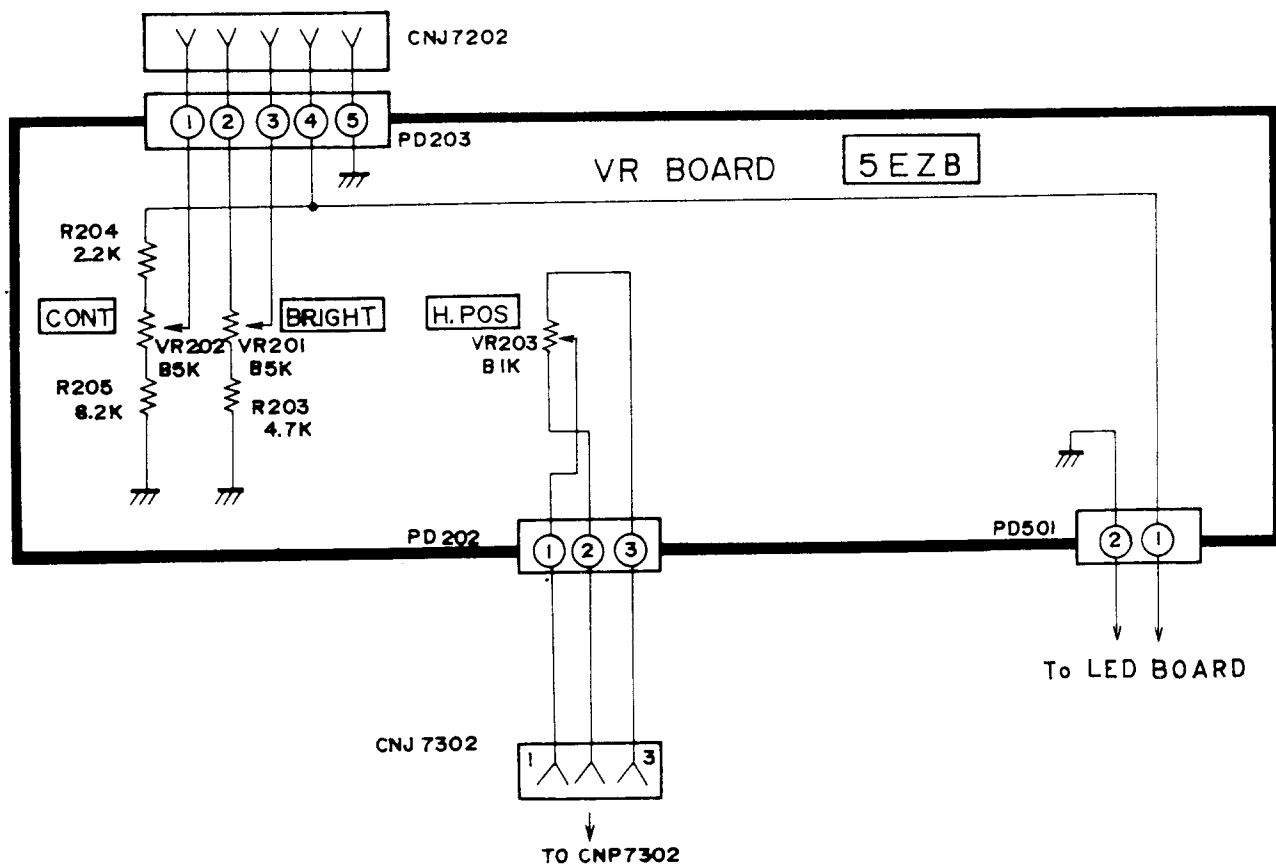


# 5EZB VR BOARD MODULE P.C. BOARD OVERLAY

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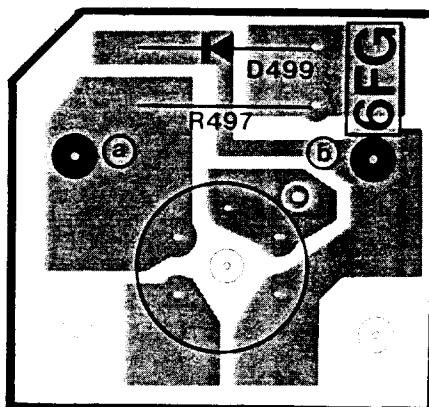


## VR BOARD SCHEMATIC DIAGRAM

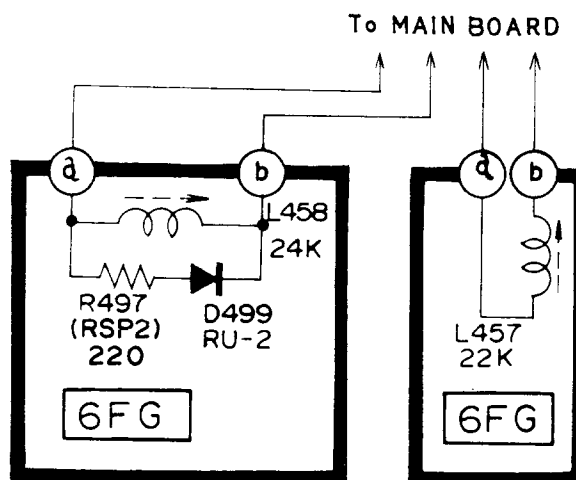


# 6FG SIZE COIL BOARD MODULE P.C. BOARD OVERLAY

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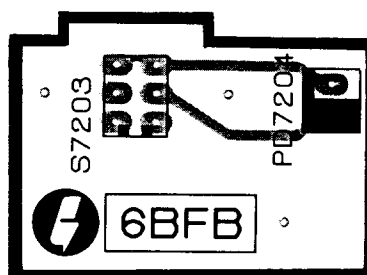


## SIZE COIL BOARD SCHEMATIC DIAGRAM

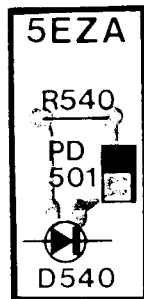


# 6BFB SWITCH BOARD MODULE P.C. BOARD OVERLAY

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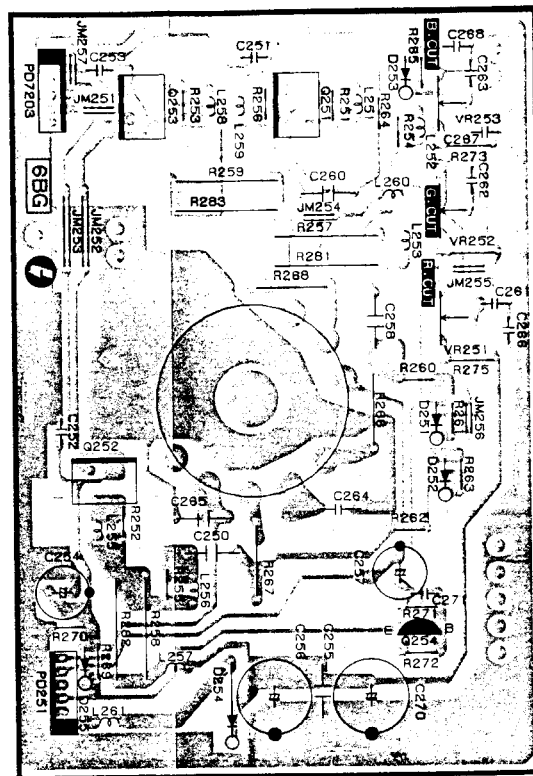
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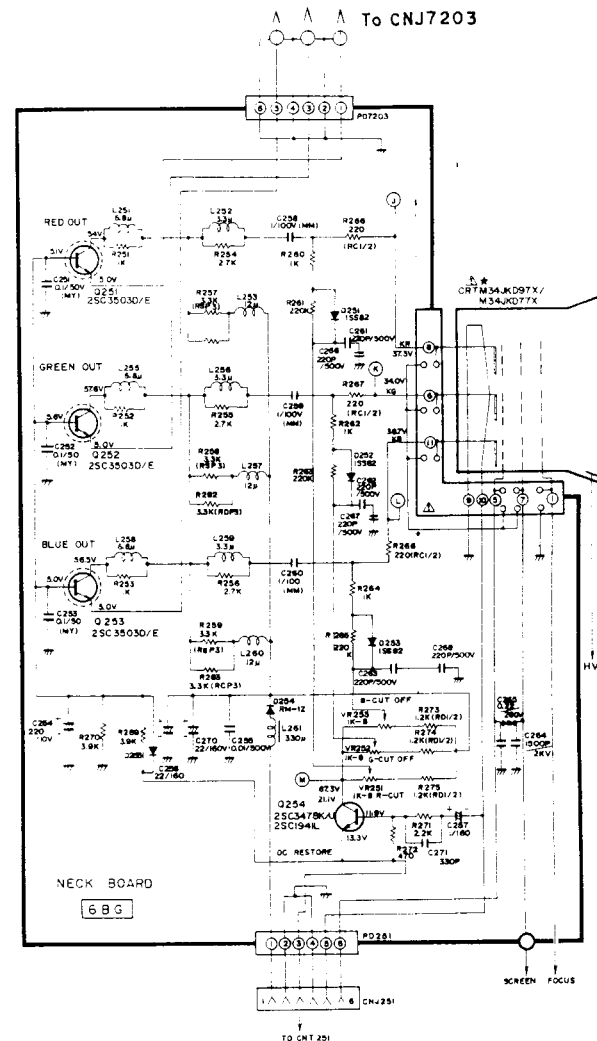
LED BOARD

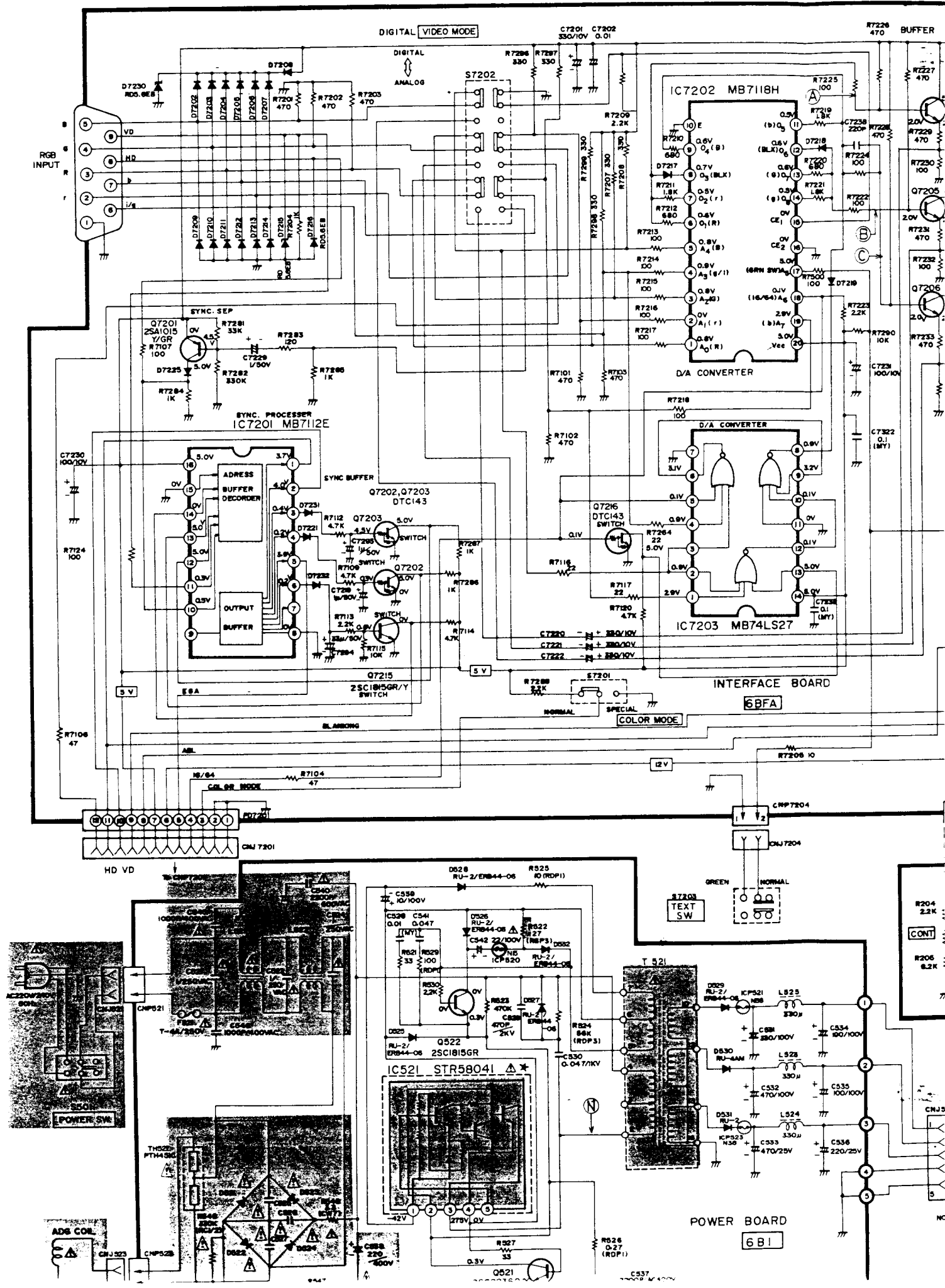
5EZA

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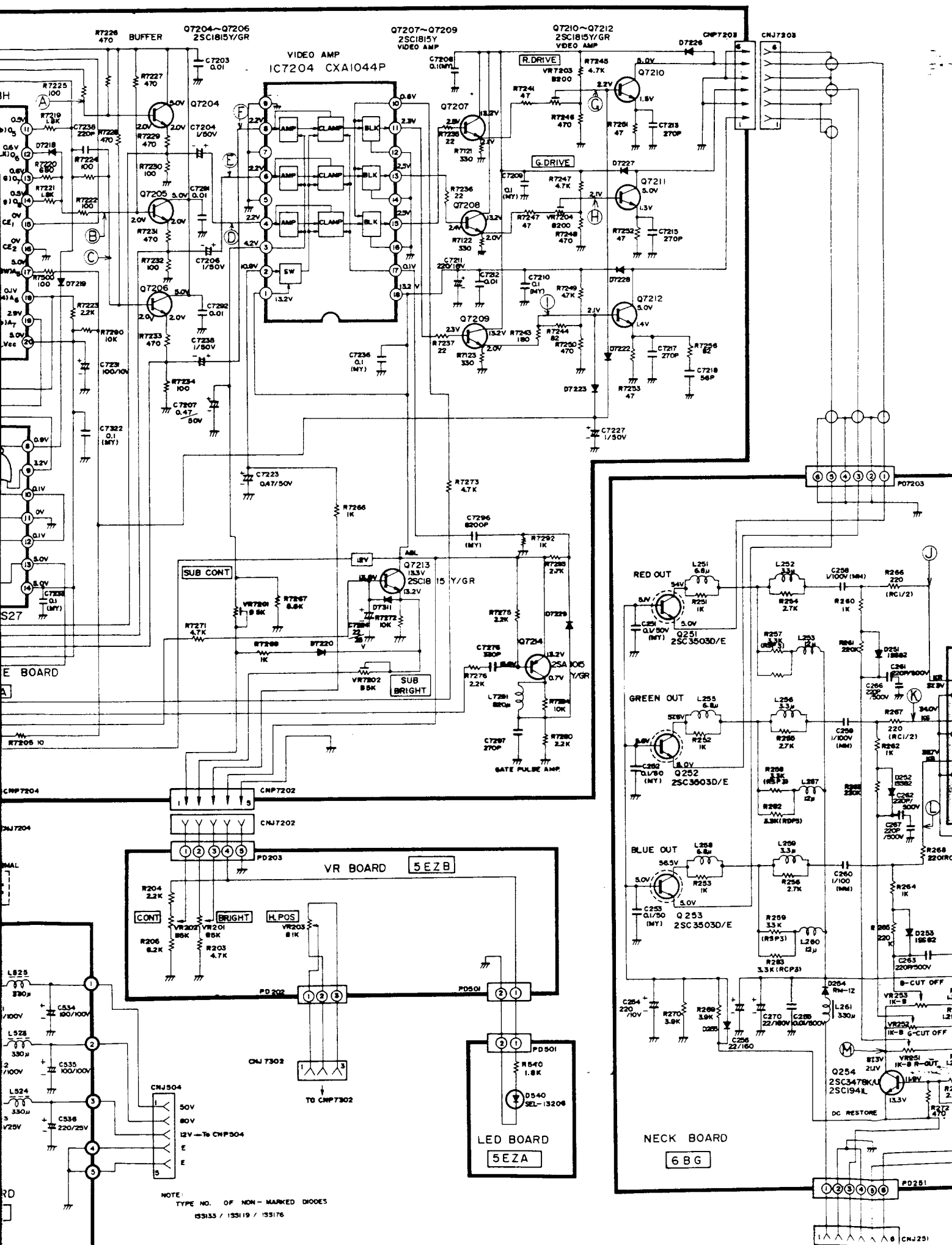


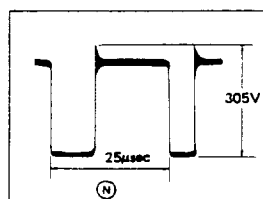
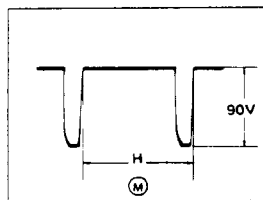
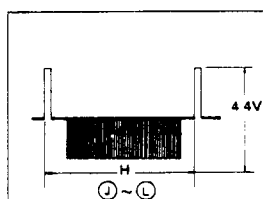
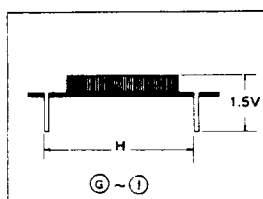
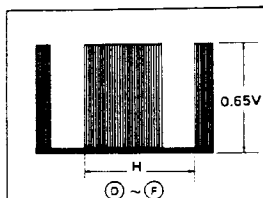
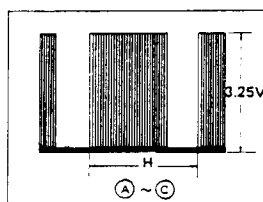
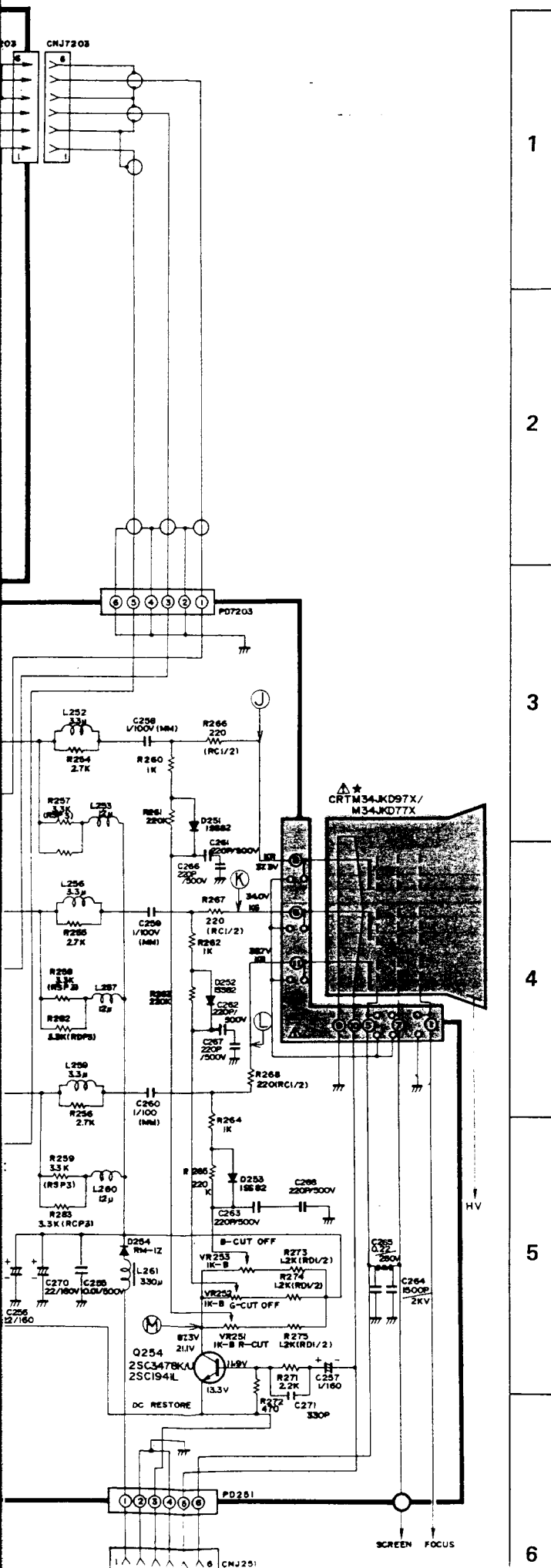
## NECK BOARD SCHEMATIC DIAGRAM



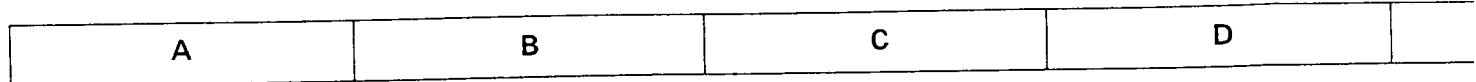


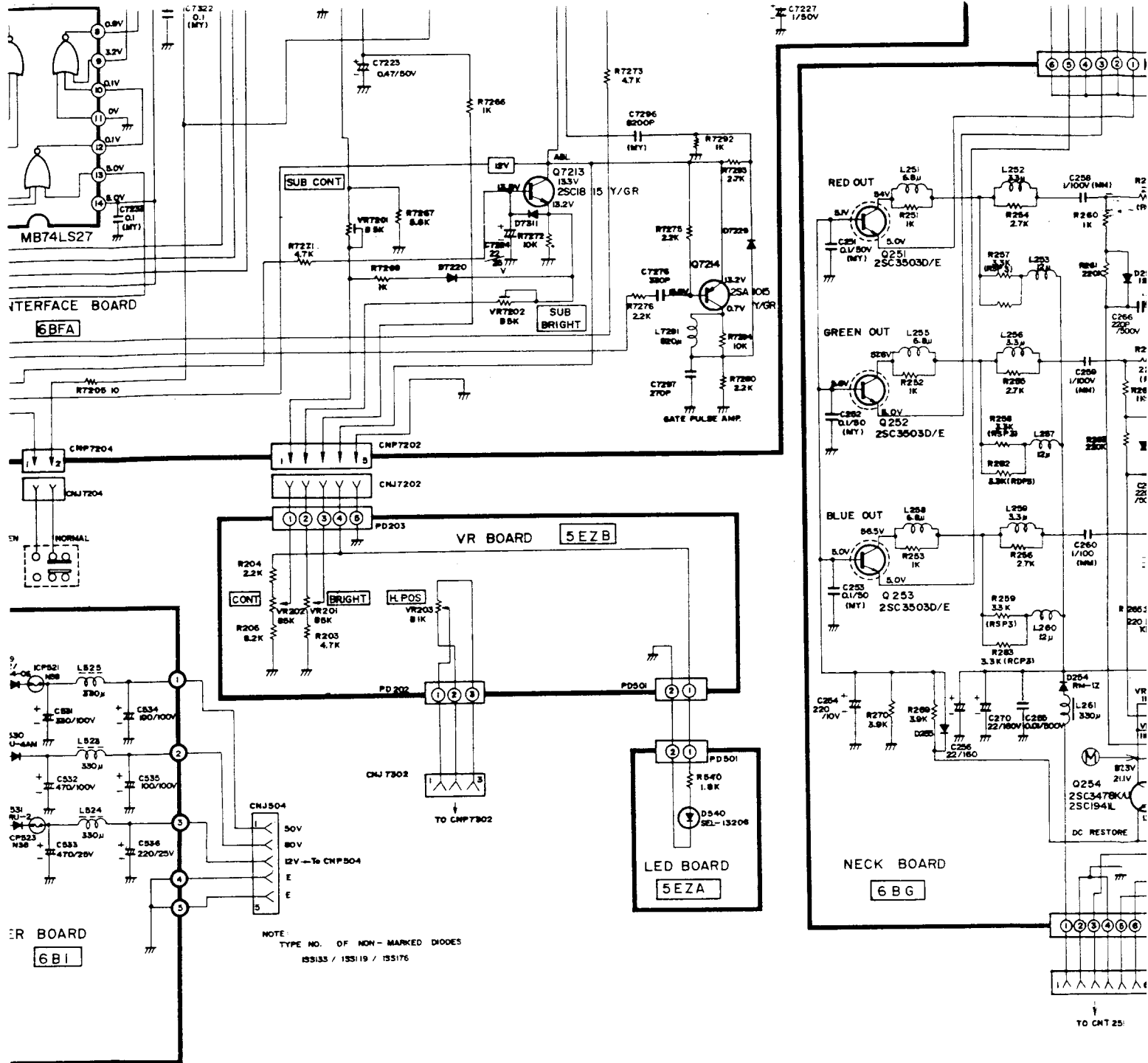
(Applied to ME.





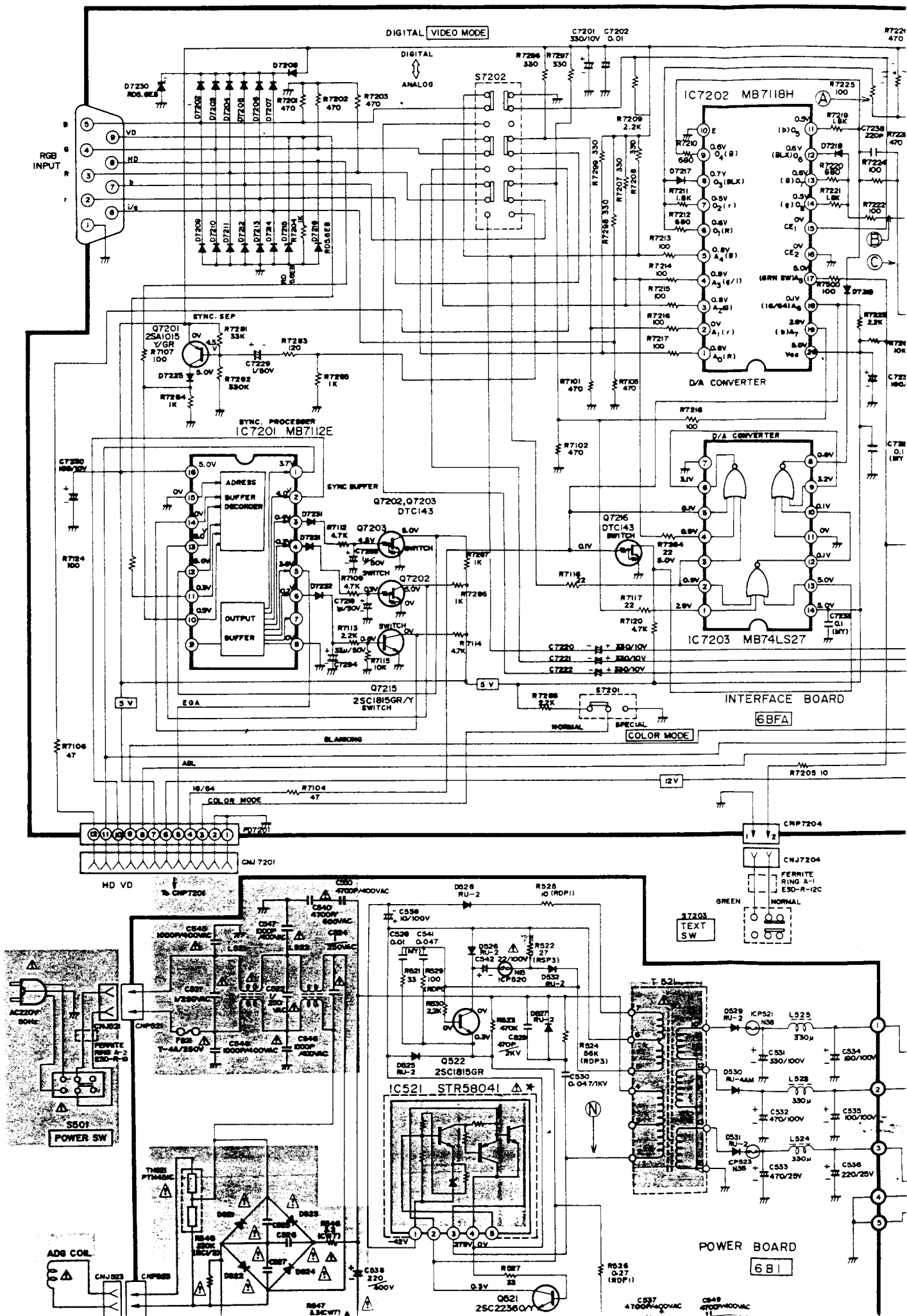




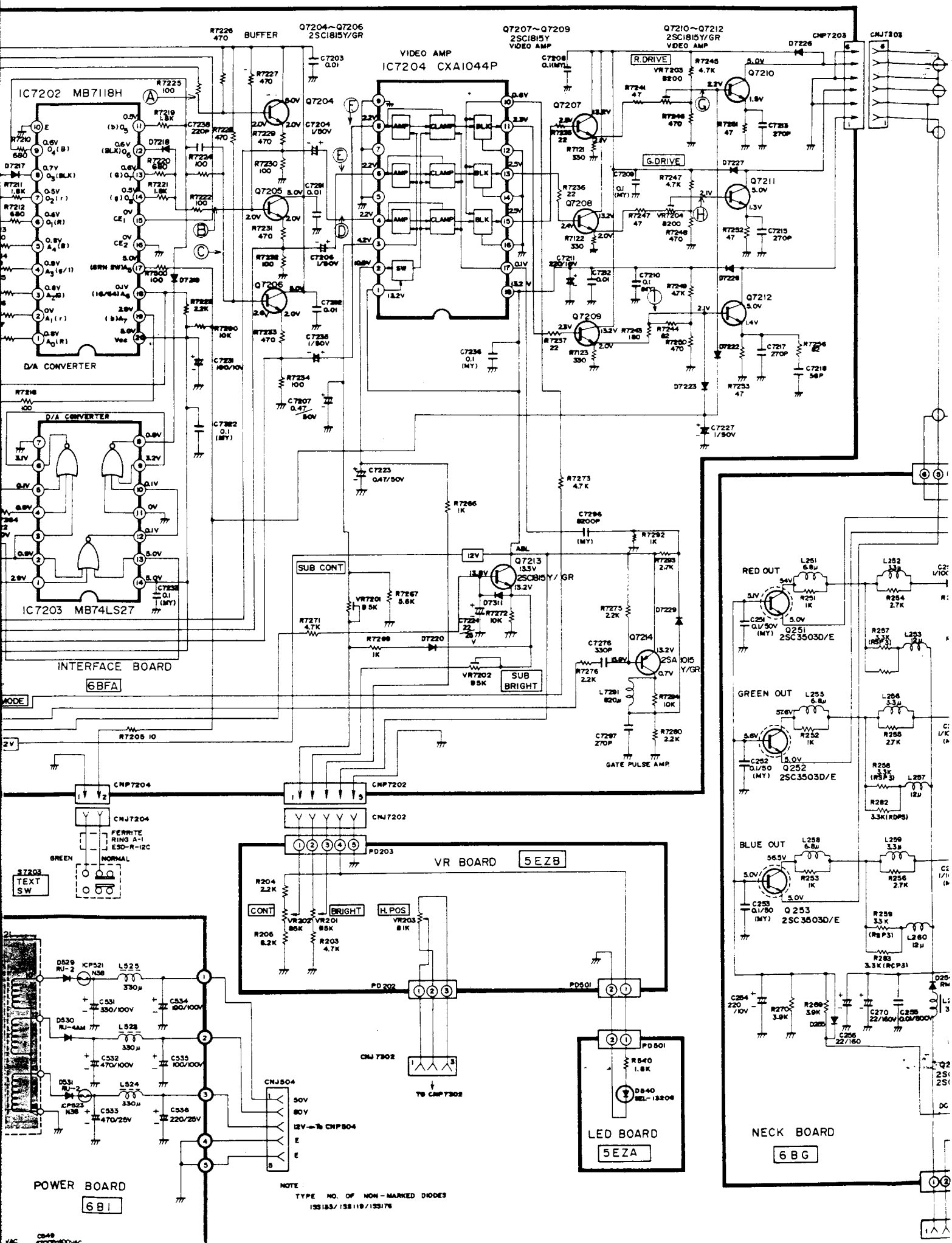


D	E	F	G	H
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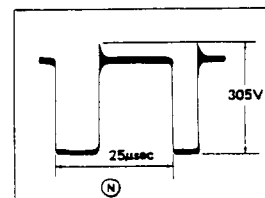




# POWER/VIDEO SECTION SCHEMATIC DIAGRAM



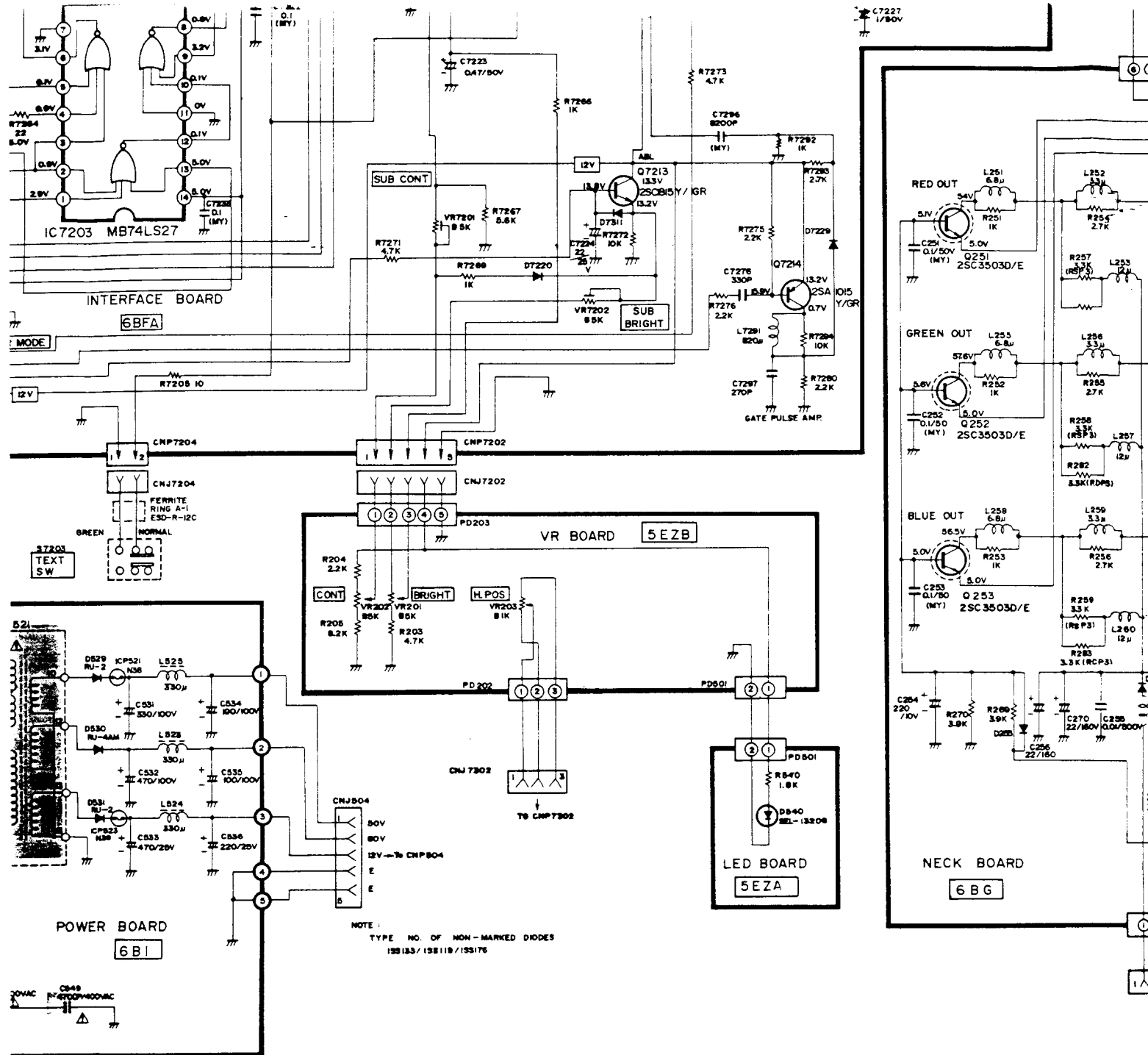
*(Applied to ME-503G)*



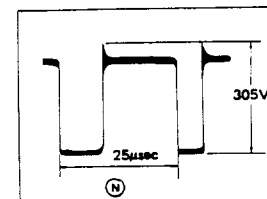
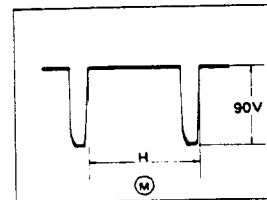
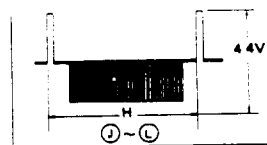
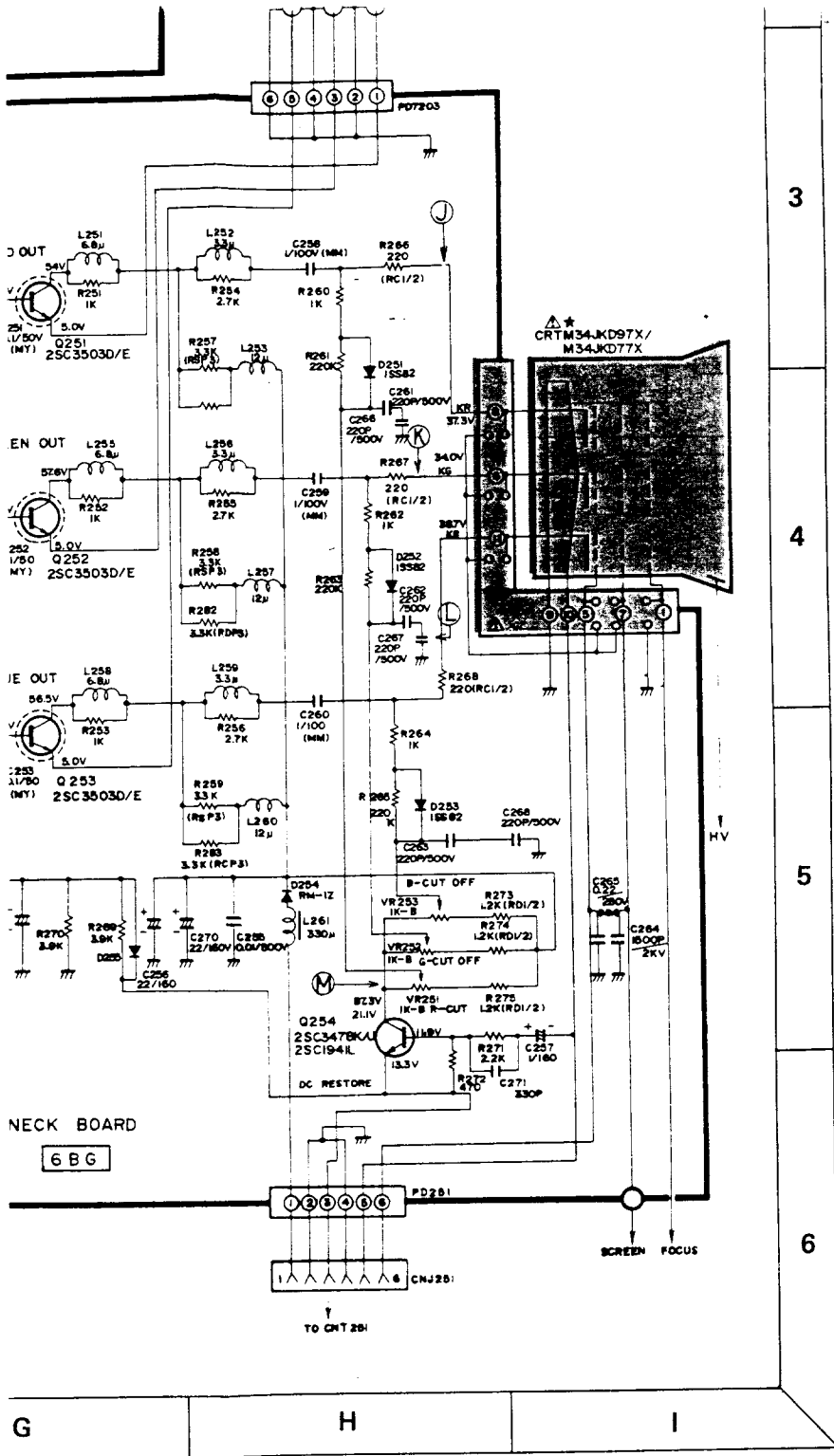
6



D







3

4

5

6

G

H

I

MAIN BOARD

PULSE WIDTH CONTROL  
IC 7301  
HD14538BP

7 A W

IC 7303  
μPC4558C

COMPARATOR

IC 7305  
μPD4555BC

DECODER

IC 7302  
HD14538BP

PULSE WIDTH CONTROL

IC 501  
μPC78M08H  
A.V.R

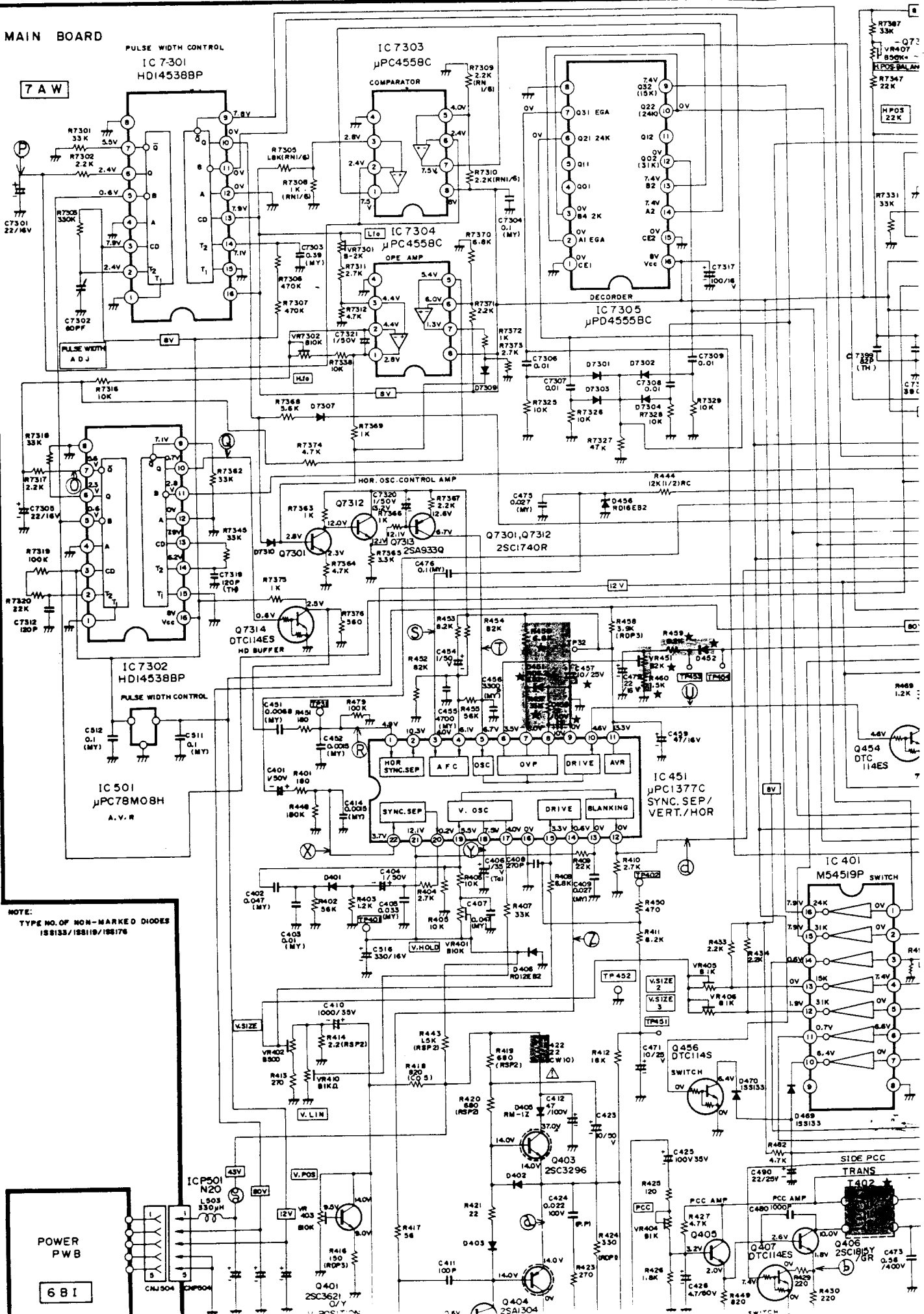
IC 451  
μPC1377C  
SYNC. SEP/  
VERT./HOR

IC 401  
M54519P  
SWITCH

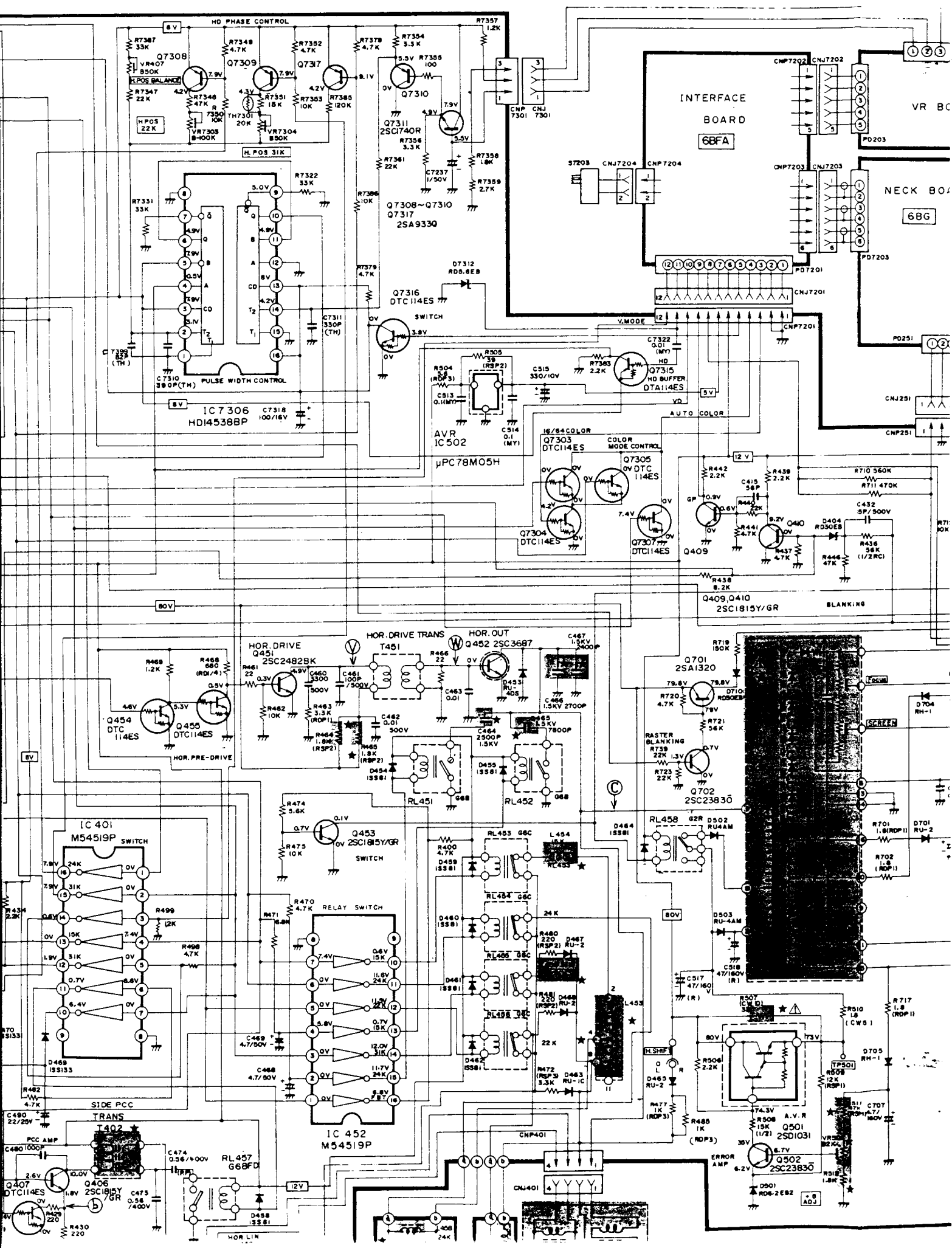
NOTE:  
TYPE NO. OF NON-MARKED DIODES  
1S8133/1S8119/1S8176

POWER  
PWB

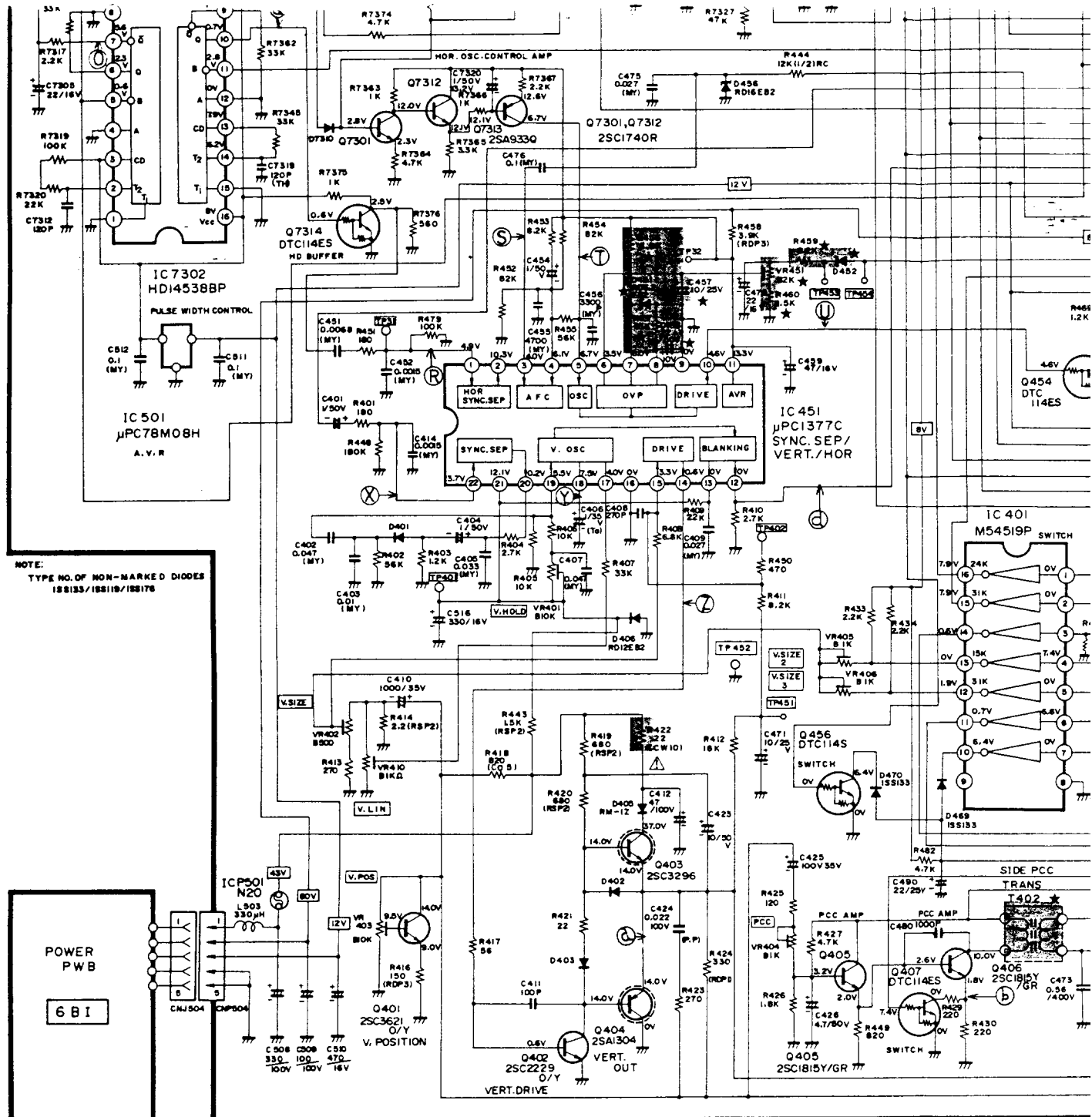
6 B I



**(Applied**







**SERVICE TECHNICAL WARNING**  
X-RAY RADIATION PRECAUTION:  
THIS PRODUCT CONTAINS CRITICAL  
ELECTRICAL AND MECHANICAL  
PARTS ESSENTIAL FOR X-RAY  
RADIATION PROTECTION.  
FOR REPLACEMENT PURPOSES,  
USE ONLY TYPE PARTS SHOWN IN  
THE PARTS LIST.

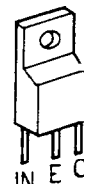
**PRODUCT SAFETY NOTICE:**  
THE PARTS IDENTIFIED BY SHAD-  
ING AND BY (Δ) ON THE SCHE-  
MATIC DIAGRAM ARE SAFETY  
CRITICAL COMPONENTS.  
FOR REPLACEMENT PURPOSES,  
USE ONLY SAME TYPE PARTS  
SHOWN IN THE PARTS LIST.



2SC3621



2SC3503



1N5400



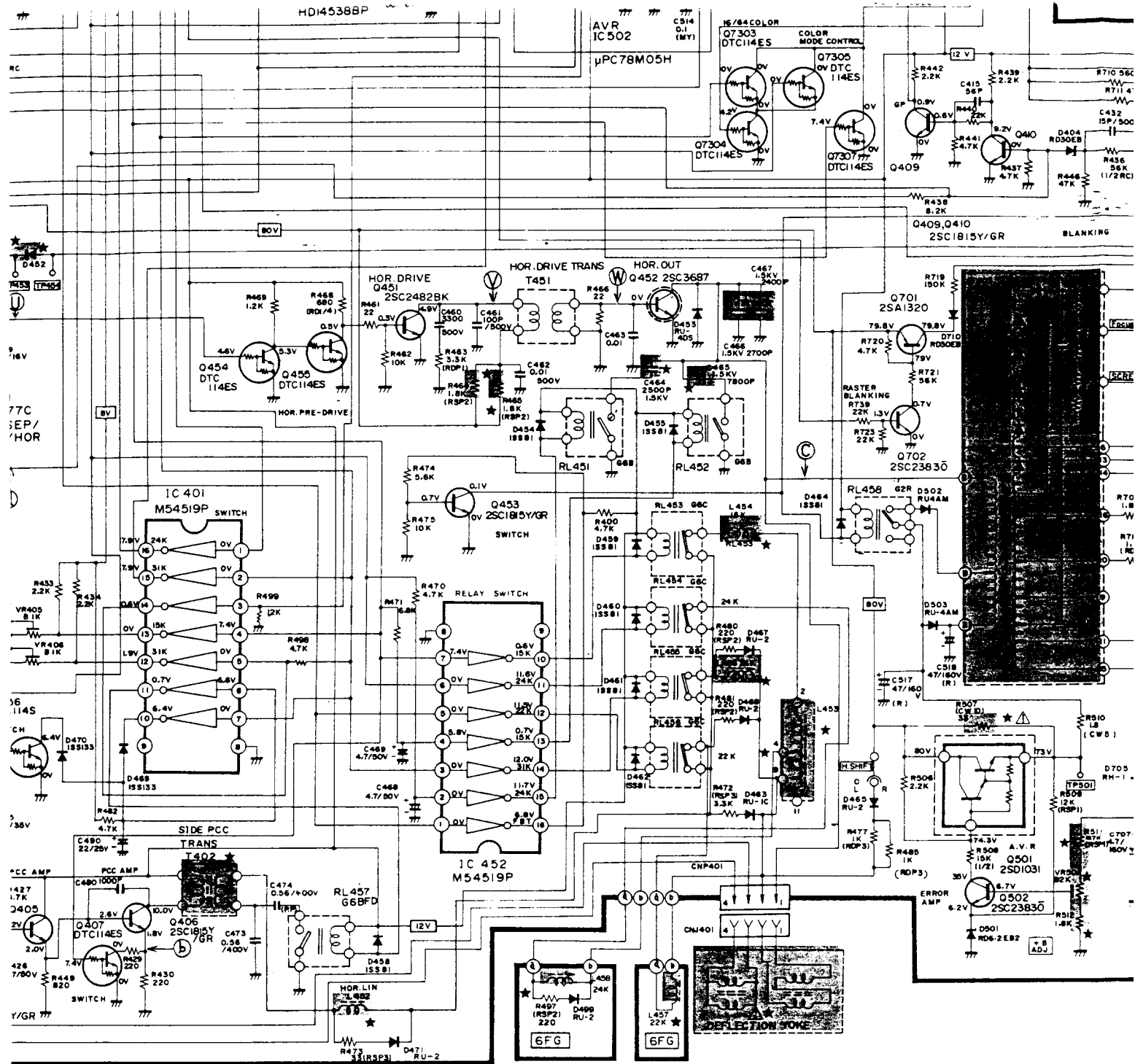
DTA114S  
DTC143S

### WARNING:

Over Voltage Protector Adjust control (VR451) has been sealed with Epóxy glue after proper adjustment at the factory so as not to be influenced at over-radiation of X-Rays.

Accordingly, do not move it unreasonably.

Also for replacement, seal it securely with epoxy glue after adjusting it properly with reference to 4. SERVICE ADJUSTMENT in the service manual.



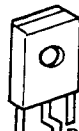
D

E

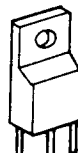
F

G

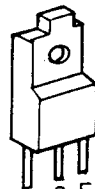
H



2SC3503  
E C



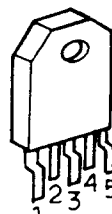
μPC78M05H  
μPC78M08H



2SA1304  
2SC3296  
B C E



2SC3687  
BCE



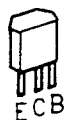
STR53087  
1 2 3 4 5



2SC1815 2SA1304  
2SA1015 2SC2383  
2SC2482 2SC3478  
2SC2610 2SC1941  
2SC2229  
2SC1740  
2SA933



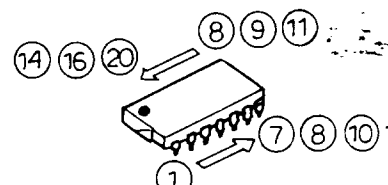
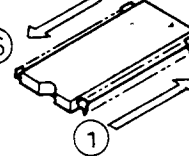
μPC575



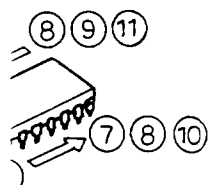
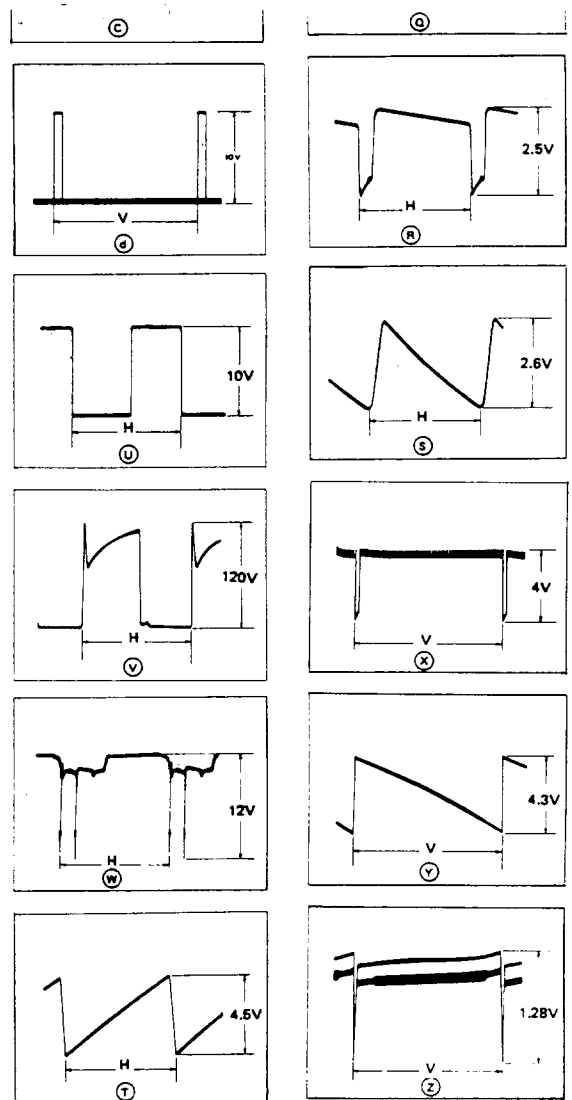
DTC114S DTA114S  
DTC143S



HD4538BP μPC1377C  
μPC4555BC M54519P  
μPD4555BC



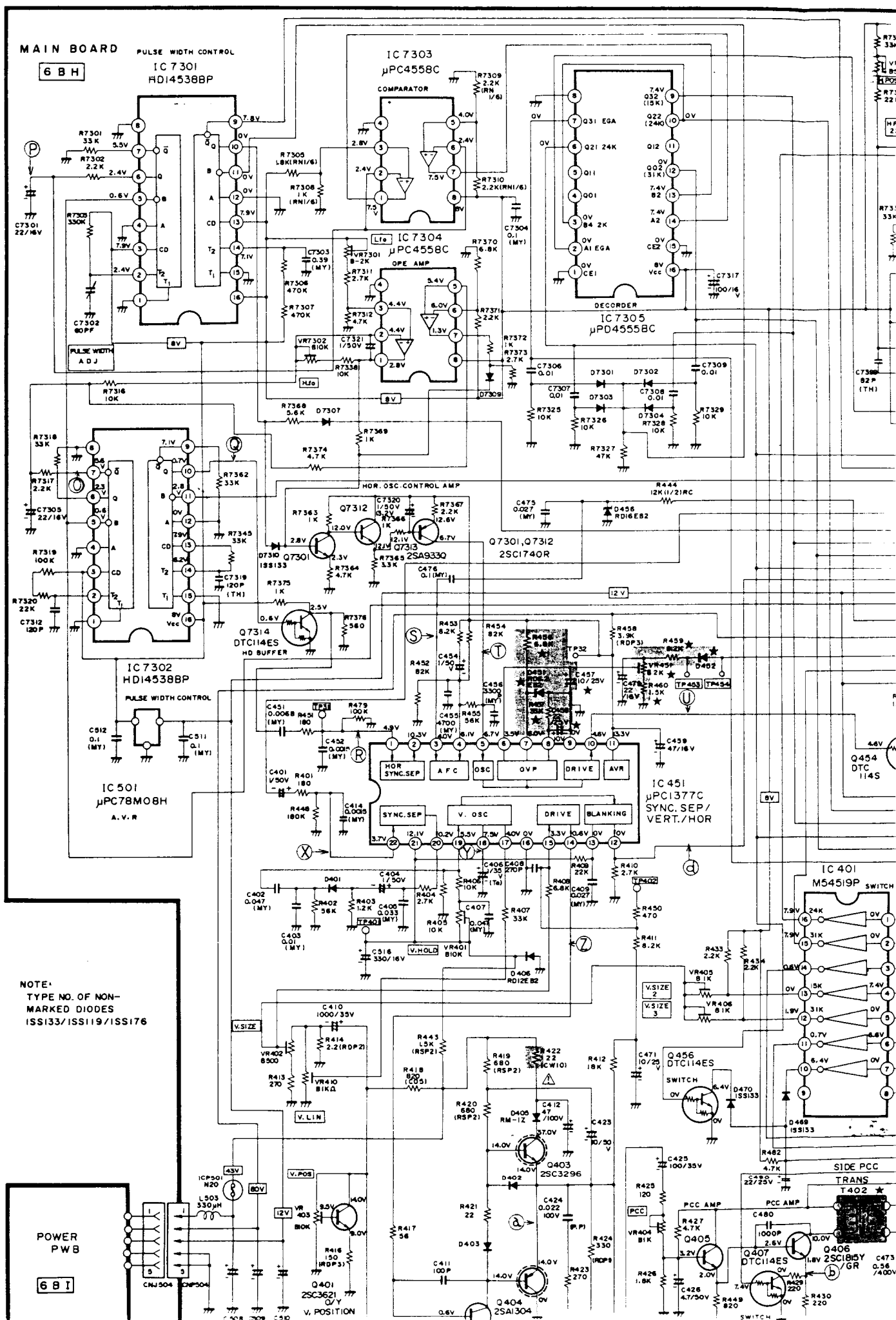
MB7118H  
MB7112E  
MB74LS27



The voltage and waveform shown in the connection diagram were measured under the following conditions.

Display pattern = All white "H" characters  
Measuring instrument = Voltage . . . . . Digital Voltmeter  
Waveform . . . Oscilloscope

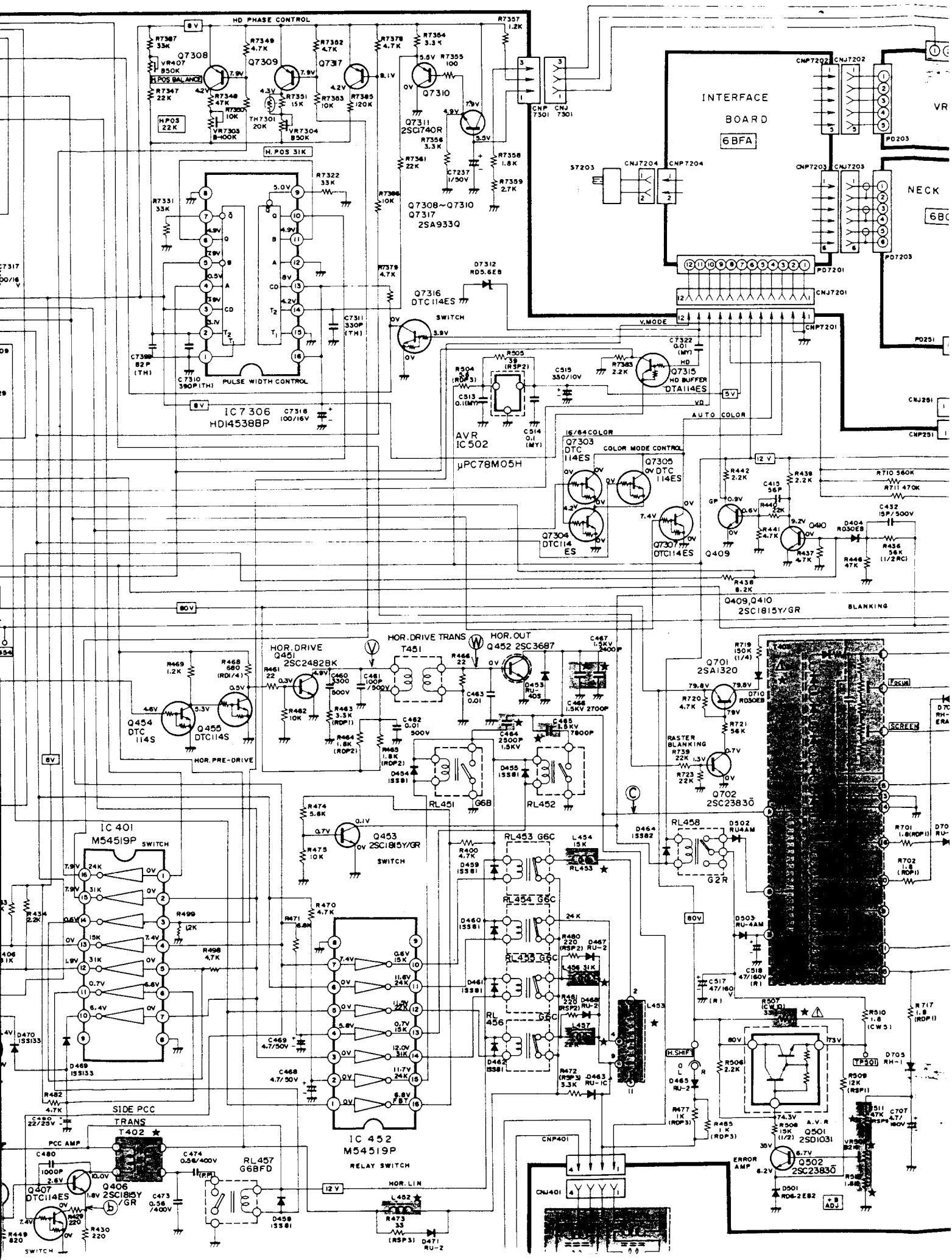
PULSE WIDTH CONTROL  
IC 7301  
HD145388P

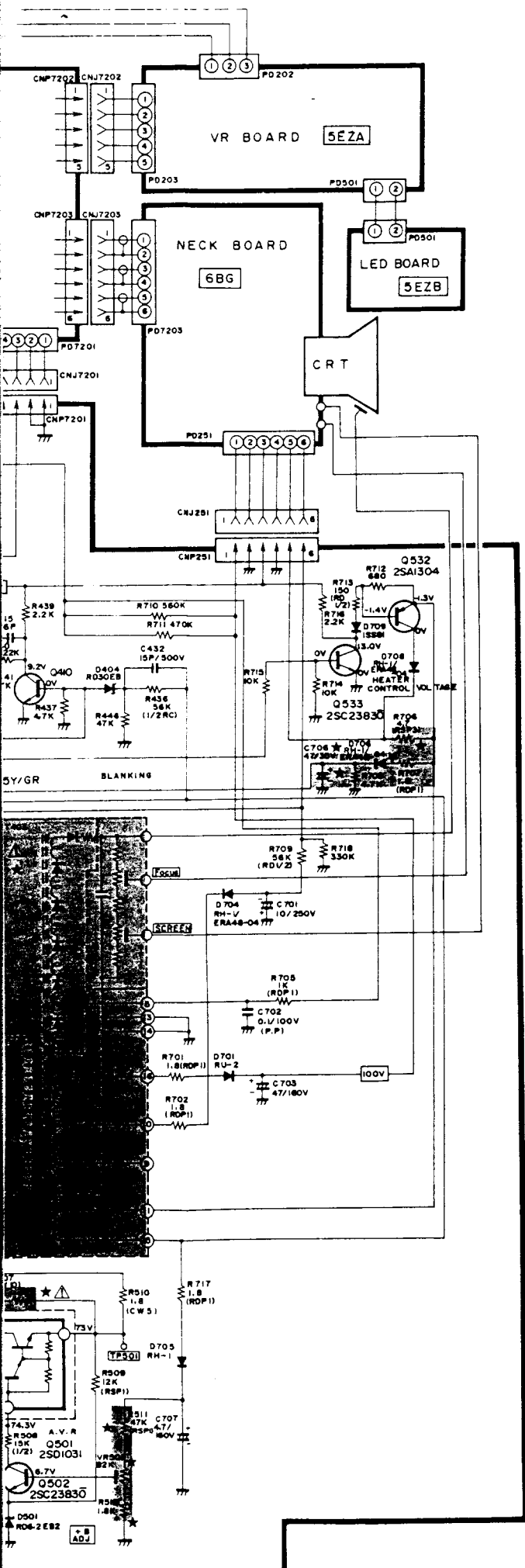




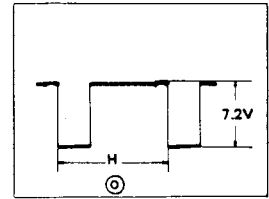
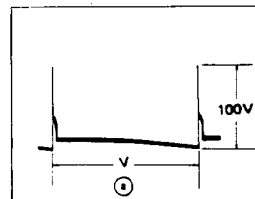
# MAIN CHASSIS BOARD SCHEMATIC DIAGRAM

(Applied)

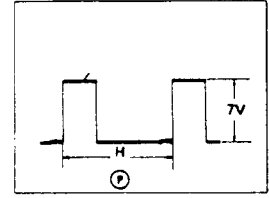
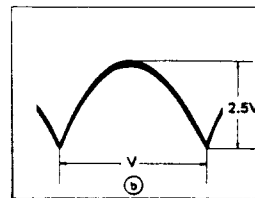




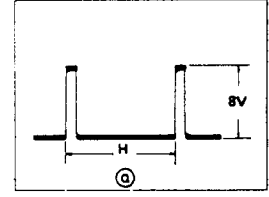
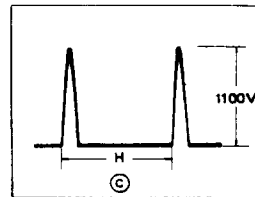
1



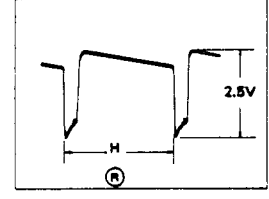
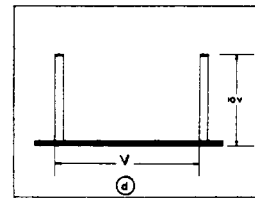
2



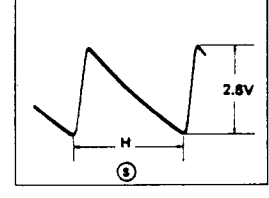
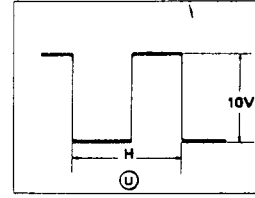
3



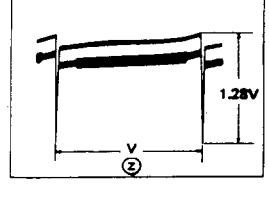
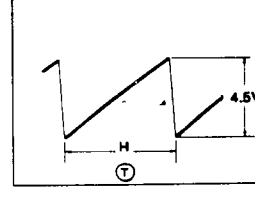
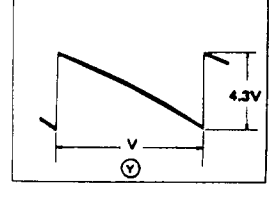
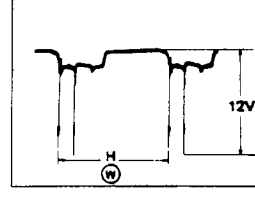
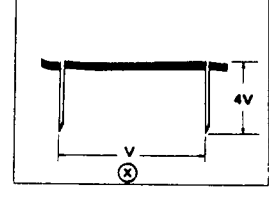
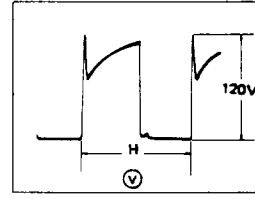
4

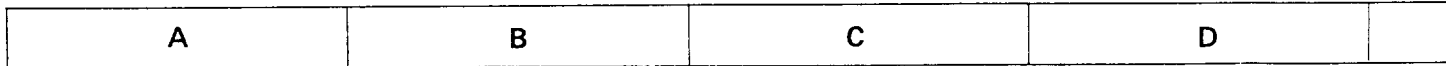


5



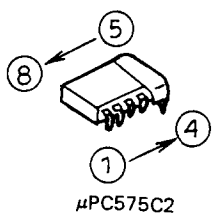
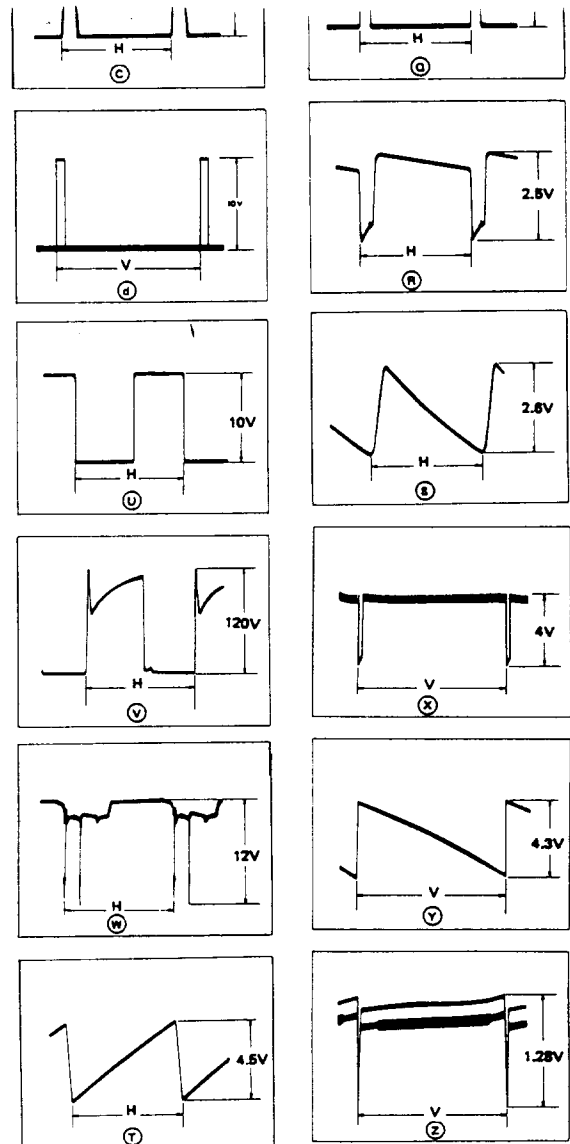
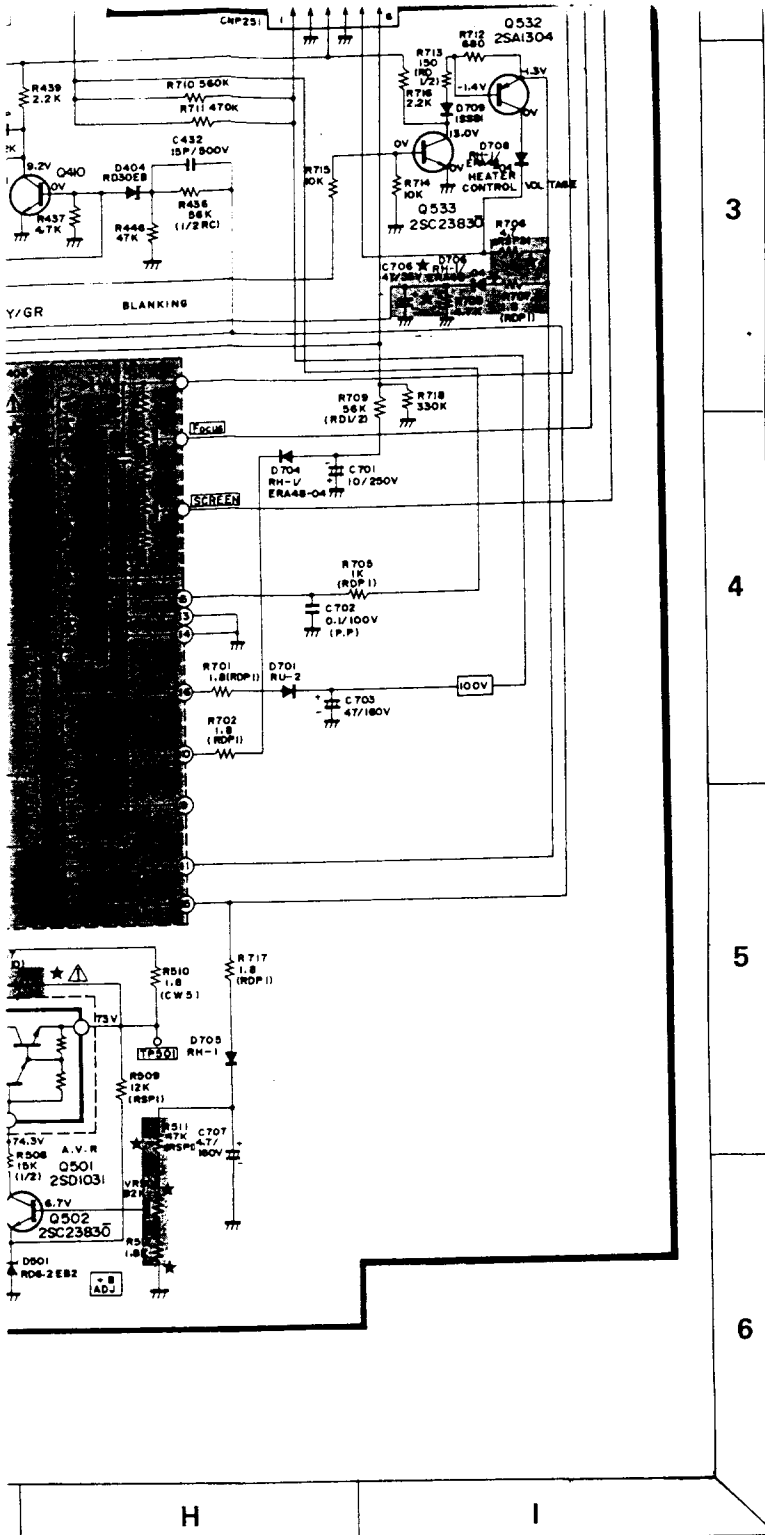
6





DTC114S DTA114S  
DTC143S





### Measurement Conditions

The voltage and waveform shown in the connection diagram were measured under the following conditions.

- Scanning frequency = Horizontal 15.7kHz  
Vertical 60Hz
- Display pattern = All white "H" characters
- Measuring instrument = Voltage . . . . . Digital Voltmeter  
Waveform . . . . Oscilloscope

