

SERVICE MANUAL

PENTRANIC

200-3138-P

ASSY PENTRANIC 38" VGA MONITOR

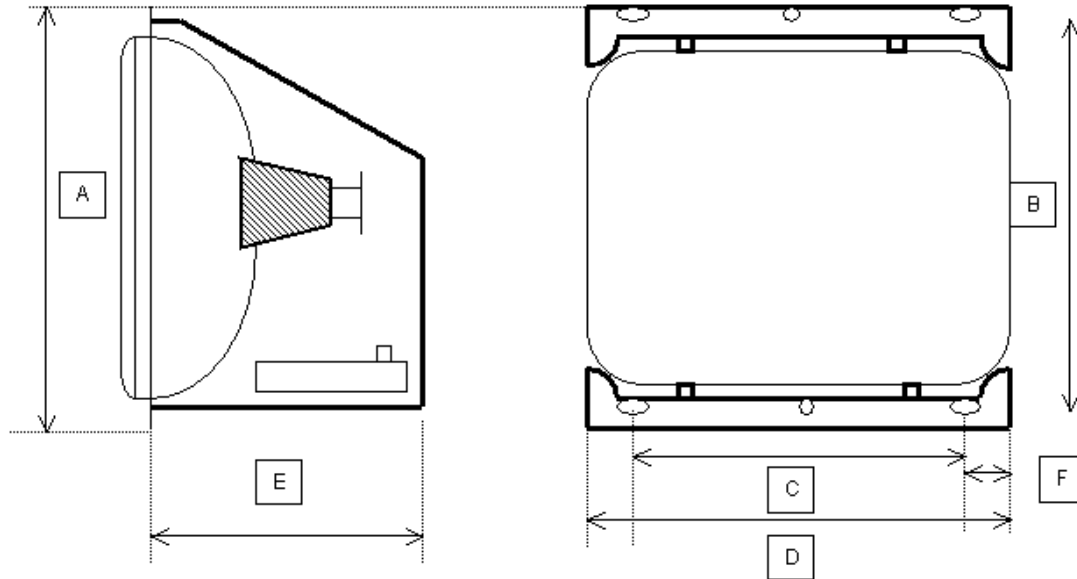
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1. SAFETY INSTRUCTIONS

1. Use only the proper type of power supply cord for this unit. It should be a detachable type: UL listed/CSA approved rated at 10 A, 250 volts IEC type
2. Do not attempt to service this monitor yourself, as you may be exposed to dangerous voltage points or other risks. Refer all servicing to qualified service personnel. Do not attempt to touch the inside of the monitor
3. If the monitor does not operate normally when the operating instructions are followed ,only adjust those controls that are covered by the user instructions since improper adjustment of other controls may result in damage and could cause a danger
4. Since the monitor is of open framed construction care must be taken when handling to avoid damage to the CRT neck and remote adjustment PCB. Do not allow the monitor frame to rest on the power cord or signal cable otherwise damage will occur and pose an electrical hazard. If the monitor has to be placed on a flat surface ensure adequate protection for the CRT face to prevent scratches
5. This product contains components, which are critical for X-radiation safety. Replaced only with the same type and rating of components

2. TECHNICAL SPECIFICATION
38" VGA display monitor (SEGA)



Frame Dimensions

FRAME	A	B	C	D	E	F
38"	698	673	710	810	460	50

Screen Size

1. 38" 4:3 (0.75 -1mm dot pitch black matrix dual focus CRT)

Display Features

1. 30 kHz- 38 kHz max horizontal frequency ,50-60 HZ Vertical frequency
2. Maximum resolution ,SVGA 1024 x 768 (non/interlaced)
3. Bandwidth 65 MHz
4. Video signal input ,analogue 0.7 volts P-P
5. Video connector, 15 way 'D' male

Power Requirements

1. 90-260 volts AC, 50/60Hz, automatic selection
2. Mains connector- IEC male
3. Automatic and manual degauss facility

Adjustment features

1. External Rotation, Vertical height, Vertical position, Width, Contrast, Brightness, manual degauss mounted on 0.5 metre extended remote PCB
2. Analogue adjustment
3. Pre-set sub-width, sub height, pincushion, trapezium, pincushion top, EHT, H-frequency

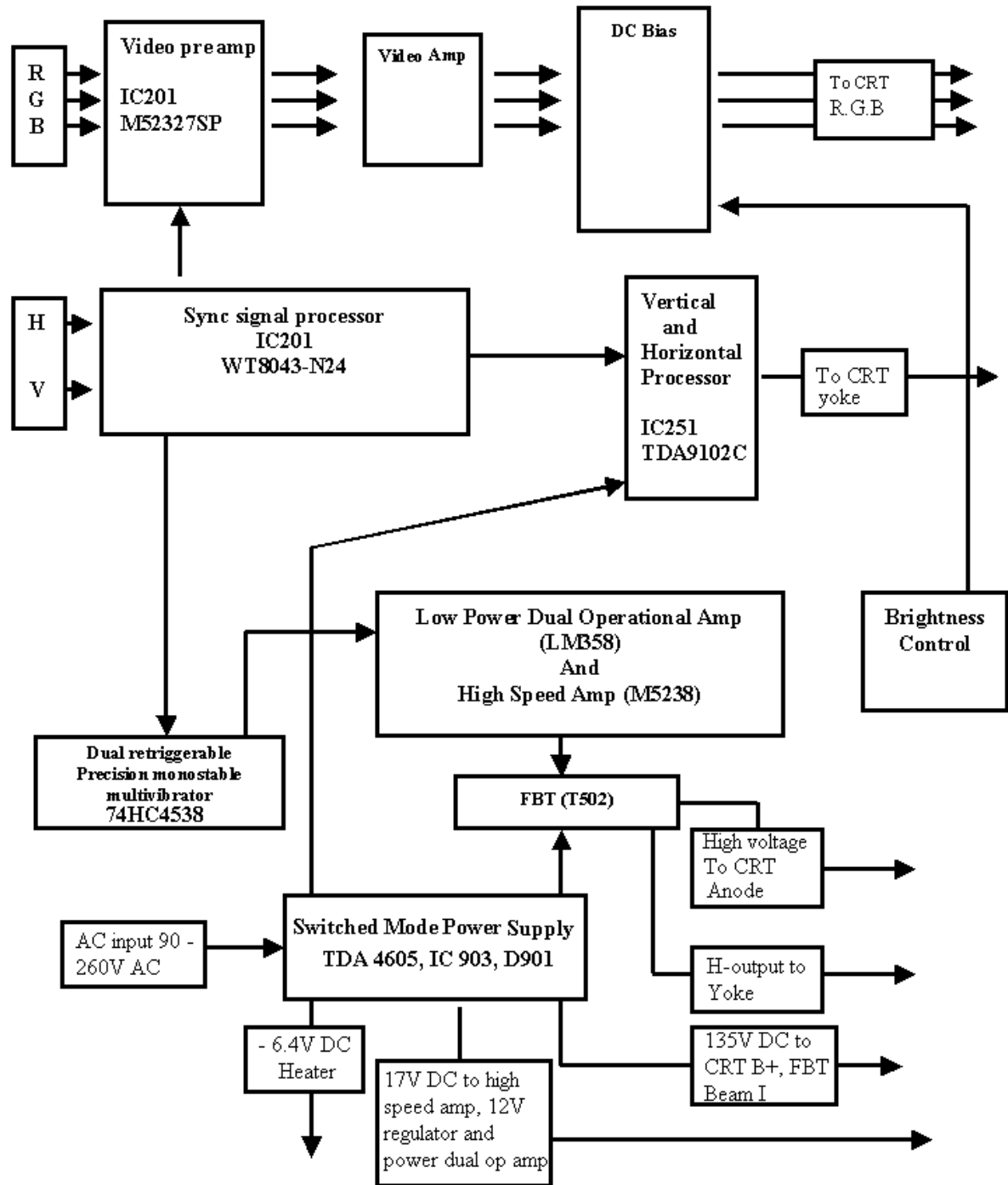
Frame specification

1. Open framed construction
2. Zintec material

3. OPERATION

1. **Power up** There is no power switch fitted to this monitor. Use the IEC to isolate from mains supply.
2. **LED** If the LED is lit the power is on. If the monitor power is off the LED is extinguished
3. **Brightness** To adjust the brightness of the display turn the brightness VR clockwise to increase
4. **Contrast** Turn the contrast knob clockwise to increase contrast. If no signal is applied to the monitor the raster will remain darkened. This is a normal feature of this monitor
5. **Degauss** Automatic degauss will take place each time power is applied. Manual degauss can also take place by pressing the degauss switch on the control PCB. Allow 10 minutes between each power up for automatic /manual degauss to be effective
6. **H-width** Adjustment of this control will increase the horizontal size of the picture
7. **H-phase** Adjustment of this control will shift the display left or right
8. **V-Centre** Adjustment of this control will shift the picture up or down
9. **Rotation** Adjustment of this control will rotate the complete raster a few degrees to correct for different terrestrial magnetic conditions

4. *PENTRANIC 38" MONITOR BLOCK DIAGRAM*



4.1. Power supply

The efficiency of the monitor is in part due to the specially designed switched mode power supply

The AC input between 90-260 V AC is automatically accepted by the regulator IC901. The resultant voltage is then rectified via bridge D901 to provide a DC voltage of around (-320V).

The power supply is also synchronised to the demands of the flyback transformer (FBT) to maintain the EHT under all conditions via a feedback loop.

The power supply feeds five main supplies, 180V dc, 135V dc, 27V dc, 17V dc and -6.4V dc for the CRT heater.

The power supply also supports the rotation circuitry as well as automatic and manual degaussing.

4.2. Video Amplifier

Housed on the CRT neckboard are the three analogue signal inputs (RGB).

IC101 provides pre-amplification via clamping pulse from Q201.

Main amplification is provided from transistors Q112, Q113, Q114, Q132, Q133, Q134, Q152, Q153, Q154.

4.3. Vertical Circuit

IC301 (TDA8177) provides the function for vertical deflection.

C306 is a pump up voltage generator for the circuit and with the help of IC251 the vertical size will remain constant irrespective of the input mode (31khz or 38Khz). Vr801 can be adjusted to correct the vertical position on the screen.

4.4. Horizontal Circuit

IC 251 (TDA9102C) is a frequency to current source generator providing horizontal oscillation and output square wave to the driver transformer T401. T501 provides current sawtooth waveform to the FBT (T502), which in turn provides the High Voltage for the CRT.

5. QUICK SERVICE GUIDE

Item	Problem	Possible causes	Recommended Action
1	Noise and LED flashes	Voltage not enough or horizontal transistor short or leaky	Q402,Q502,Q453 (always check)L501,L451,T402,D454,Q551,Q552
2	No power-dead	Power supply area	F901,D901,R909,R910,R911,Q901,IC902,IC903,IC951
3	Manual degauss-no function	Degauss circuit	Degauss button,Q971,Q972,R971 or RL901
4	Rotation –no function	Rotation circuit	Q981,982,983,984 or rotation coil O/C
5	No Raster	No heater or Horizontal voltage	D957,R958,IC231,IC201,IC232,IC233,IC251,Q453,L451,Q551,552,Q401,Q501,T401,T501,Q402,Q502,T402,FBT,IC501
6	No horizontal hold	Losing Sync or poor adjustment of TP21 (must be 3.5v DC when 38Khz signal applied)	Signal cable fail, IC201,IC231,IC232,IC233,IC251,Q231,Q201,Q251,IC501,C251,252,253
7	H-Width failure	IC failure of VR failure	VR804,IC421,IC551,IC451,Q451,Q452,Q551,Q552,IC351,
8	H-Phase failure	IC failure of VR failure	VR803,IC251,C257
9	Poor Linearity (horizontal)	S-Correction failure	IC201,R204,R205,Q403,C408,C409
10	Pincushion distortion	Pincushion circuit or change circuit between 31KHz and 38Khz modes	R351,R352,IC351,IC201,R204,R205,Q351,Q352,Q371
11	Poor focus	DBF circuit of FBT failure	R540,R414,T531,FBT,CRT
12	No Vertical output-frame collapse	Vert Circuit failure	IC301,D955,R315,D301,R310 or poor connection to DY
13	V-Centre failure	Transistor or VR failure	Q301,Q302,VR801
14	V-size failure	Vertical circuit failure	VR802,IC201,Q252,IC301
15	Power on spot	No Grid 1 voltage or CRT failure	CRT,R100,R511,Q511,D601,D602,D603,D604,D511,C511,R512
16	Brightness failure	Brightness circuit failure	R511,D511,C511,R512,Q602,VR806
17	Contrast failure	Contrast circuit failure	D541,(12v),Q601,IC601,VR805,R101,IC101
18	Colour overlay	Clamping signal or video circuit failure	IC201,Q201,R102,IC101,Q101,Q102,Q191,R191,CRT
19	Missing Colour	RGB signal or Video Circuit failure	Signal cable,R111,R131,R151,C111,C131,C151,IC101,Q111,Q131,Q151,Q102,Q132,Q152,Q113, poor soldering Q114,Q133,Q134,q153,Q154,r119,R139,R159,R120,R140,R160 or CRT
20	No Video	No 134 V or video circuit failure	L103,IC101
21	Blanking	Blanking circuit failure	IC301,C321,R511,Q571,C571,R100

6. KEY SPARE PARTS LIST

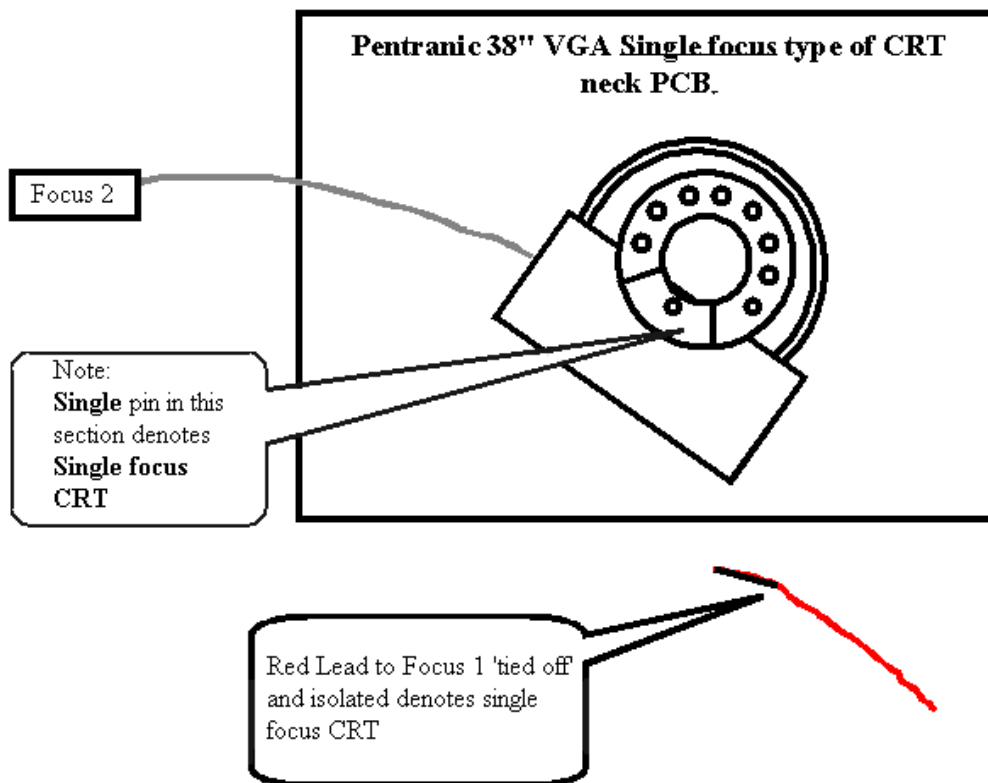
	Component	Type	Circuit Reference	Part no
1	430K 0.5Watt	Resistor	RX909	092-1434-50028
2	390K 0.5Watt	Resistor	R909	092-1394-50029
3	82.5KG 0.25Watt	Resistor	R960/961	084-8252-30010
4	TDA8177	IC	IC301	260-0817-70106
5	4.7 ohms 2Watt	Resistor	R315	002-1478-51300
6	IRF9640	FET	Q453	247-9640-00001
7	7 mH	Choke	L451	200-2703-60028
8	IRF630	FET	Q403	246-0630-00006
9	47 Ohm 5 watt	Resistor	R414	005-2470-51105
10	200mH	Transformer	T531	203-0019-00024
11	104/400V	Capacitor	C410	124-1045-14004
12	2SC5150	Transistor	Q402	242-5150-00001
13	2SD1090	Transistor	Q552	242-1090-00004
14	100 Ohm 0.5Watt	Resistor		092-5101-50020
15	M5238A	IC	IC451	260-0523-80006
16	TDA8146	IC	IC351	260-0814-60006
17	TDA9102C	IC	IC251	260-0910-20114
18	WT8043	IC	IC201	260-8043-24003
19	2904D	IC	IC551,IC232,IC421	260-0290-40000
20	74HC4538	IC	IC231	260-7445-38134
21	M5237SP	IC	IC101	260-5232-70002
22	2SC3955	Transistor	Q113,Q133,Q153	240-3955-00002
23	2SC3738	Transistor	Q114,Q134,Q154	240-3788-00001
24	2SA950	Transistor		241-0950-030005
25	2SC548	Transistor		240-0548-13001
26	RN1204	Transistor		240-1204-03047
27	RN2204	Transistor		240-2204-00006
28	2SC5148	Transistor	Q502	242-5148-00049
29	TDA4605	IC	IC902	260-0460-50000
30	LM431	IC	IC951	260-0043-100007
31	2SK1358	Transistor	Q901	246-1358-00003
32	REV406	Diode	D901	22-4020-40006
33	4N35	IC	IC903	260-0043-50009
34	5 A fuse	Fuse	F901	210-5023-10005
35	2SC2458	Transistor		240-2458-0042
36	BF422	Transistor		240-0422-00006
37	BF423	Transistor		241-0423-00006
38	4.0 mH	Transformer	T402	203-0009-00042
39	FBT	Transformer	T502	353-0032-33106

7. PIN DENOMINATION LAYOUT

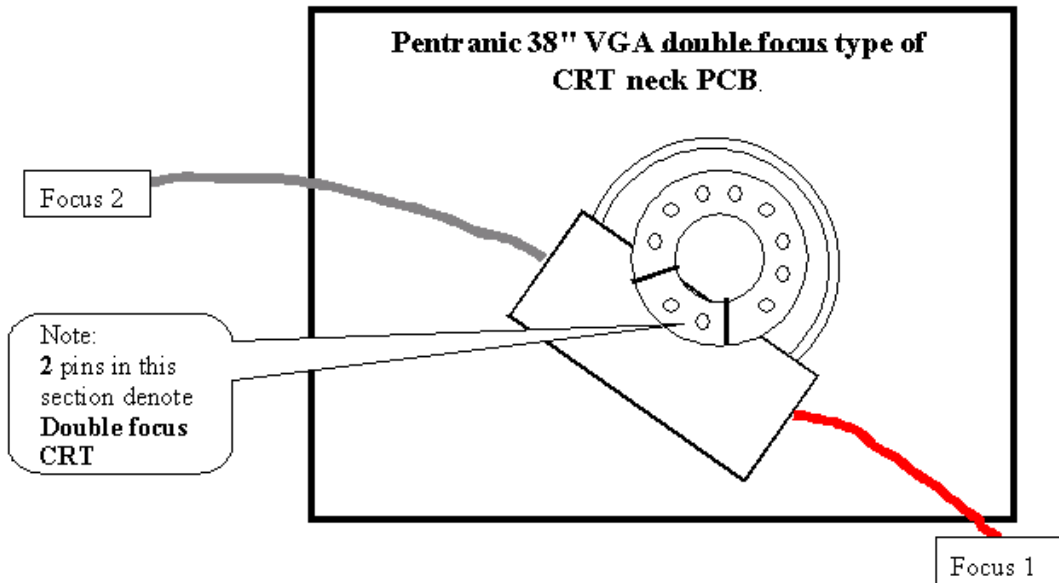
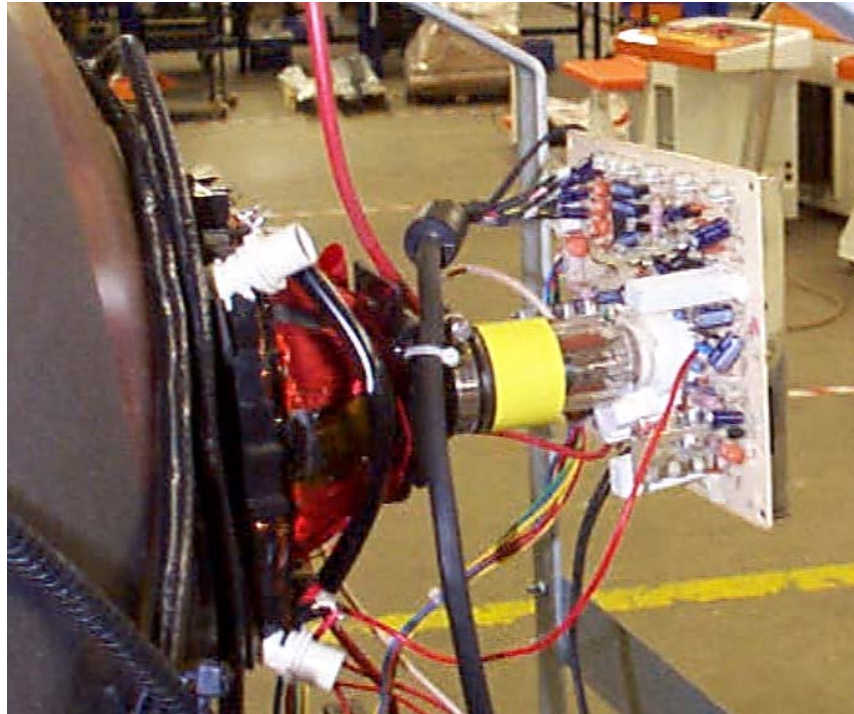
NOTE

Initial Sega machines were fitted with DUAL FOCUS TUBES. Therefore, **before ordering replacements**, it is CRITICALLY IMPORTANT to identify the MONITOR TYPE.

7.1. Pin Denomination for Single Focus CRT Neckboard

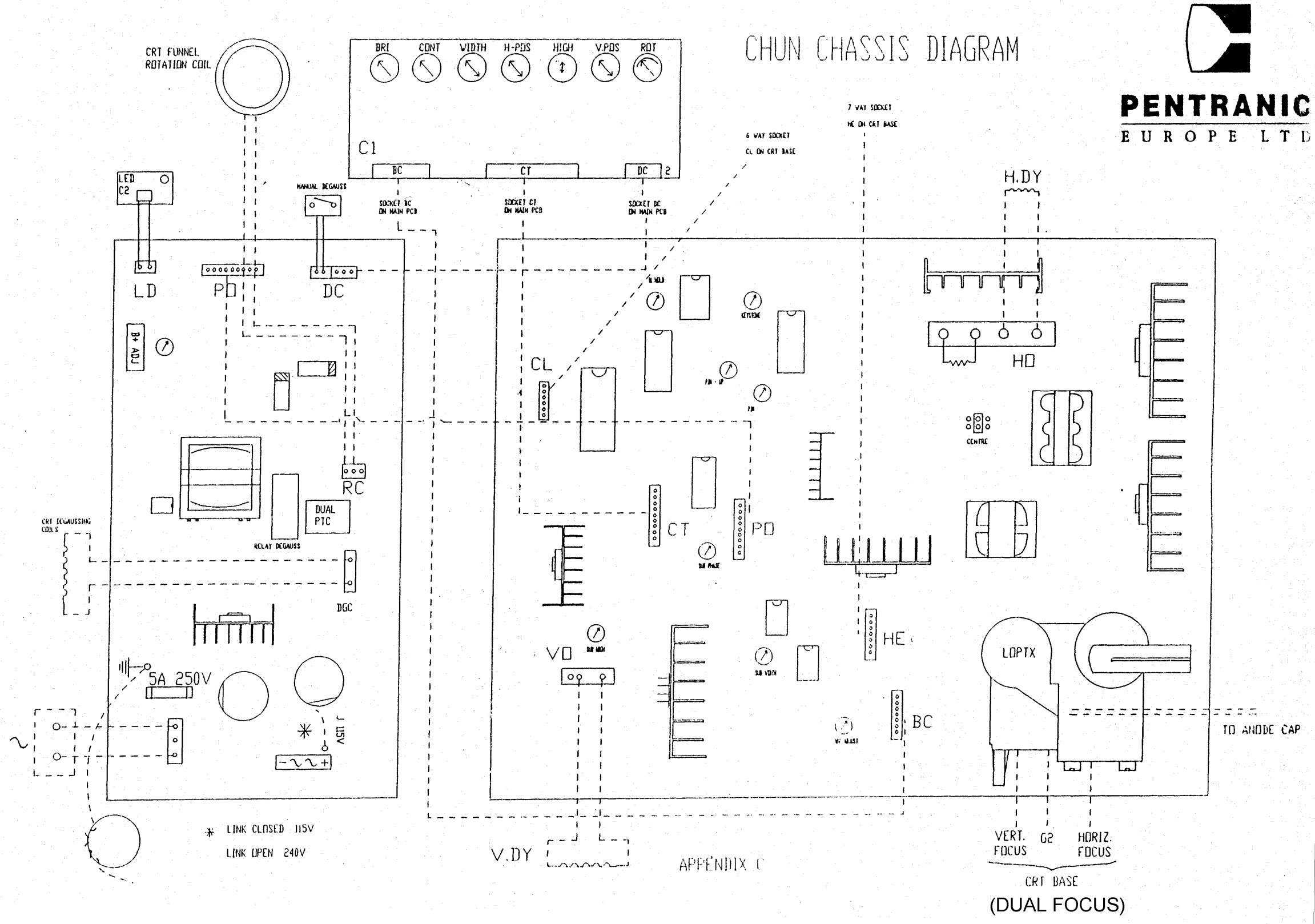


7.2. Pin Denomination for Double Focus CRT Neckboard



8. APPENDIX

8.1. CHUN CHASSIS DIAGRAM

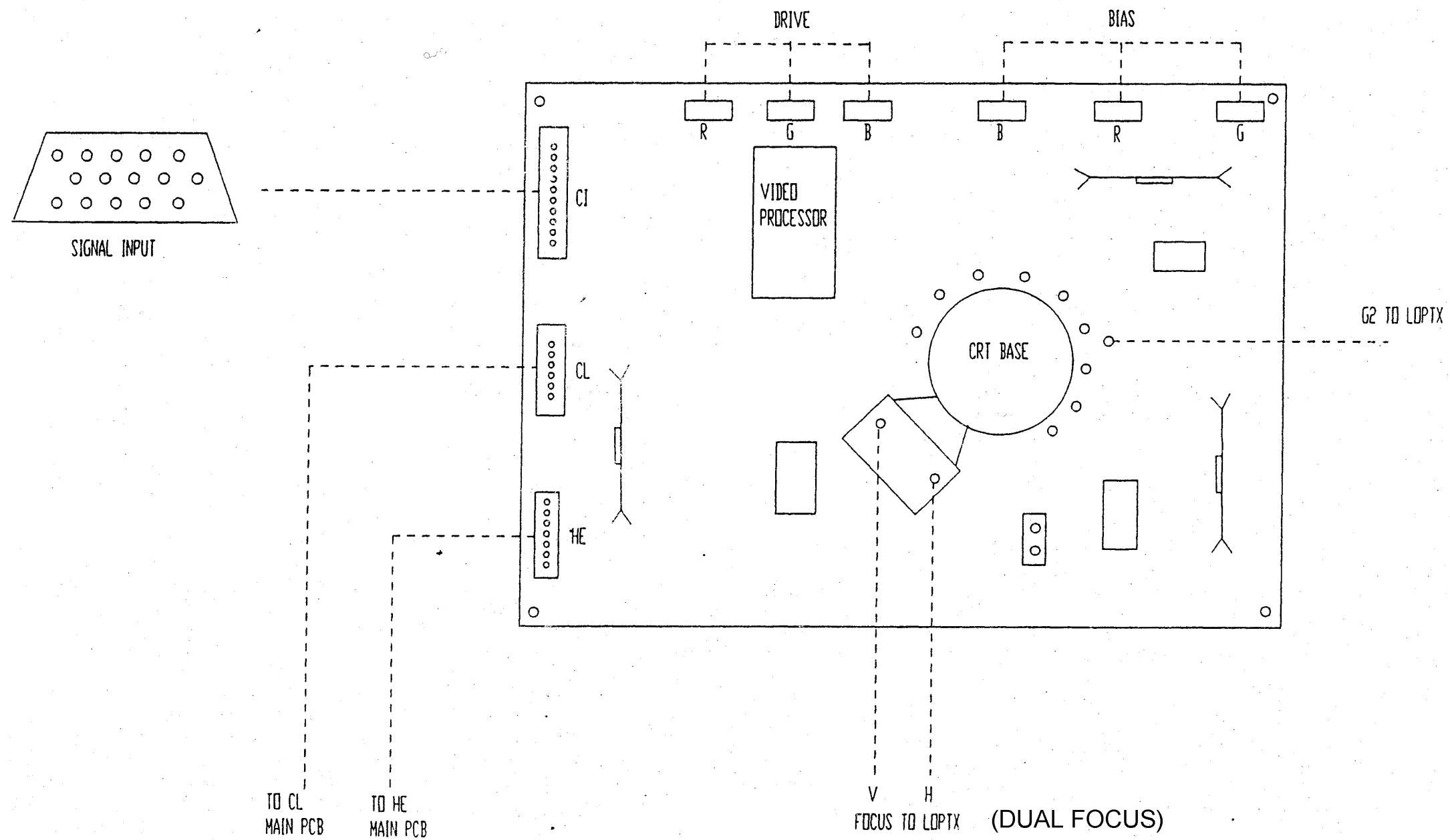


8.2. CRT NECK BOARD

CRT NECK BOARD

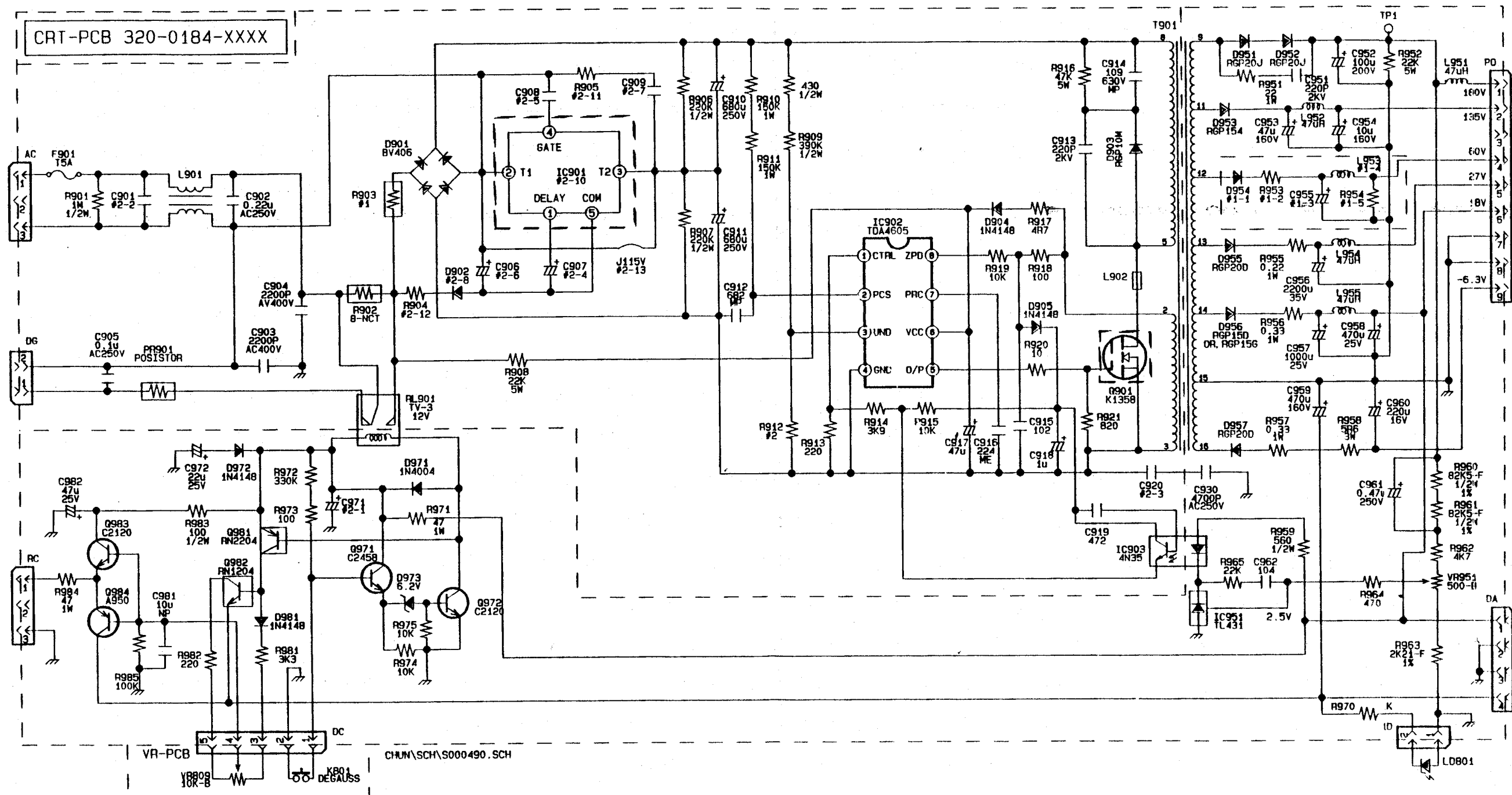


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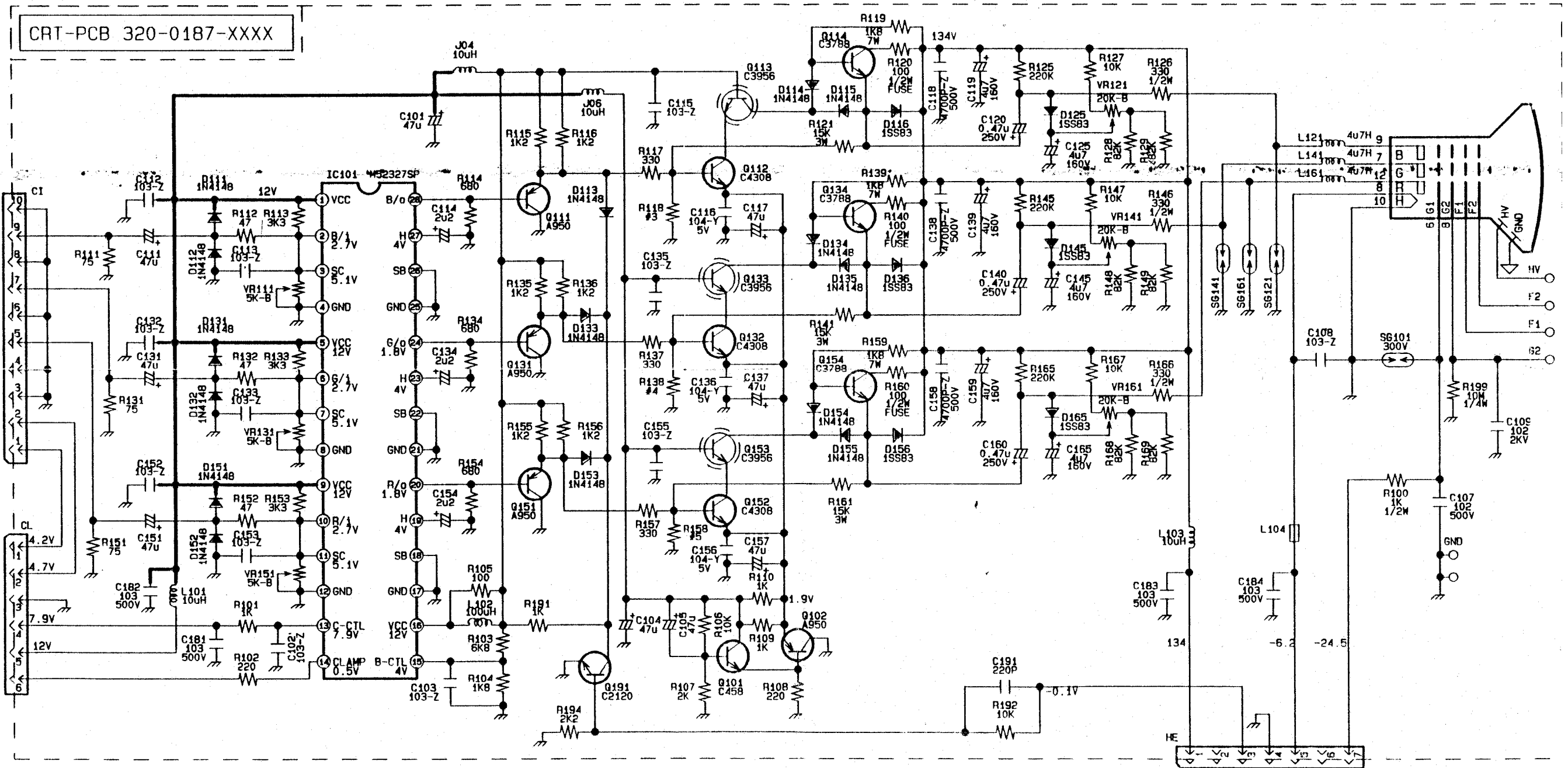


APPENDIX D

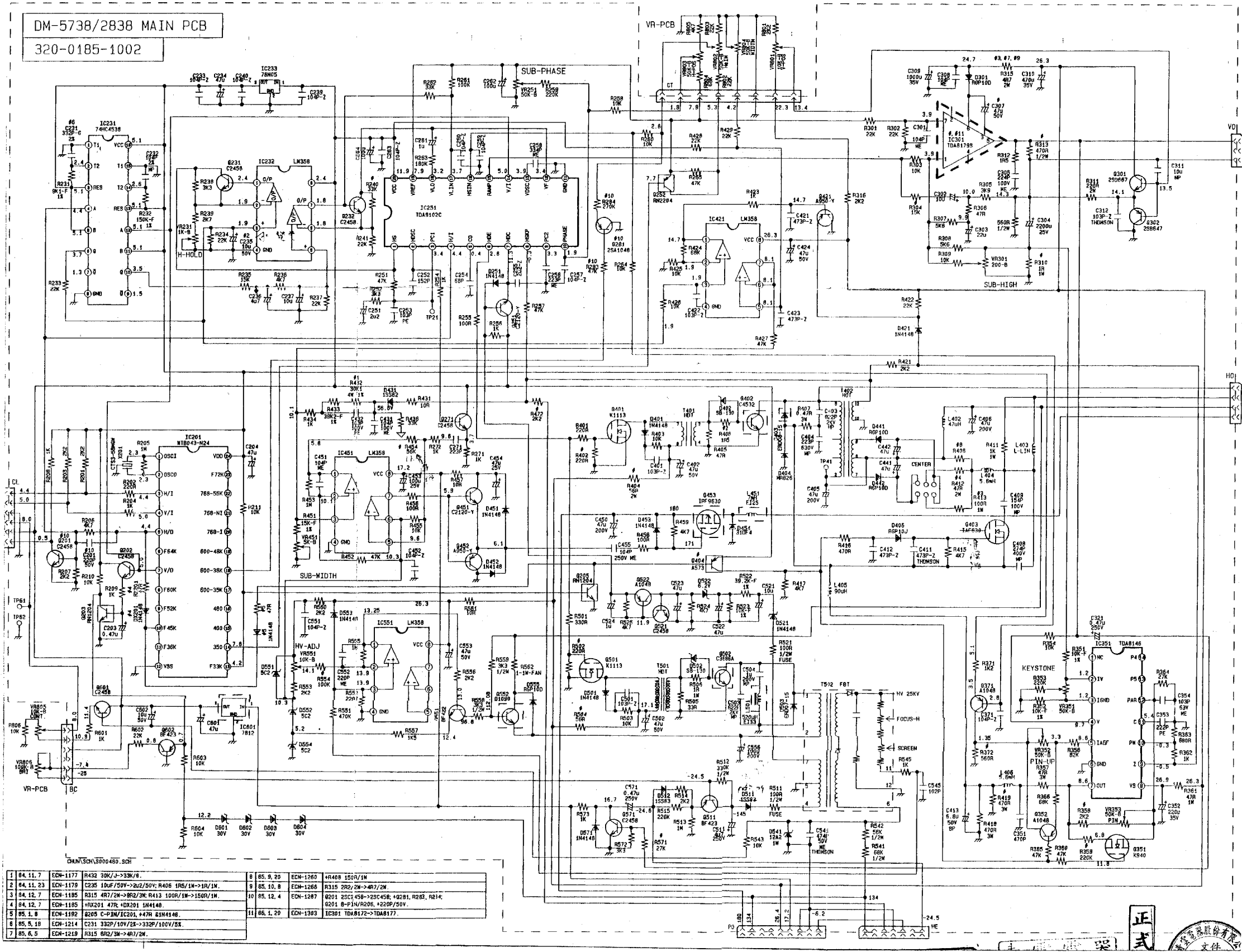
SCHEMATIC 1



SCHEMATIC 2



SCHEMATIC 3



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