

ML1450PD Service Manual

ALSO COVERS

M 4050 PD

M 1450

L 1450

L 4050

3. SPECIFICATIONS

PICTURE TUBE	Non-glare, anti-static (for L/AL model) Phosphor P22, 0.28mm dot pitch
DISPLAY AREA	250mm (H) x 185mm (V) recommended
COMPATIBILITY	VGA, SVGA, 8514/A, VESA
RESOLUTION	VGA: 640 x 480 / 640 x 400 / 640 x 350 SVGA: 800 x 600 8514/A: 1024 x 768 (interlaced) VESA: 800 x 600 / 1024 x 768 (non-interlaced, 48KHz)
POWER MANAGEMENT	ON mode: 85W Standby mode: <30W Suspend mode: <5W
SYNCHRONIZATION (SCAN FREQUENCY)	Horizontal: 30KHz~50KHz Vertical: 50~90Hz
VIDEO-BANDWIDTH	65MHz
INPUT SIGNAL	Video: RGB analog, 0.7Vp-p/75Ω Sync: TTL separate, positive/negative
INPUT CONNECTOR	15-pin D-type connector
POWER REQUIREMENTS	Universal power supply: 100~240V AC, 50/60Hz, 85 Watts maximum consumption
GROSS WEIGHT	14kg

6. INPUT SIGNAL TIMING

This monitor has been manufactured with 8 standard timing modes for different video resolutions. You can hold down STATUS and press SELECT to use the preset mode.

	mode 1	mode 2	mode 3	mode 4
H FREQUENCY (KHz)	31.47	31.47	35.52	48.0
V FREQUENCY (Hz)	60	70	86.962	72
H FRAME BORDER (μ s)	0	0	0	0
H TOTAL SIZE (μ s)	31.778	31.778	28.15	20.8
H DISPLAY SIZE (μ s)	26.058	26.058	22.8045	16
H REAR PORCH (μ s)	1.907	1.907	1.2471	1.28
H SYNC WIDTH (μ s)	3.83	3.83	3.9195	2.4
H SYNC POLARITY	-	-	+	+
V FRAME BORDER (ms)	0	0	0	0
V TOTAL SIZE (ms)	16.65	14.268	11.499	13.853
V DISPLAY SIZE (ms)	15.253	12.711	10.8096	12.48
V REAR PORCH (ms)	1.048	1.111	0.577	0.478
V SYNC WIDTH (ms)	0.064	0.064	0.113	0.125
V SYNC POLARITY	-	+	+	+
VIDEO DOT CLOCK (MHz)	25.17	28.32	44.9	50.0
RESOLUTION	640x480	720x400	1024x768	800x600

(to be continued)

H: horizontal

V: vertical

	mode 5	mode 6	mode 7	mode 8
H FREQUENCY (KHz)	31.47	31.5	35.2	48.363
V FREQUENCY (Hz)	70	70	56	60
H FRAME BORDER (μ s)	0	0	0	0
H TOTAL SIZE (μ s)	31.778	31.776	28.4	20.677
H DISPLAY SIZE (μ s)	26.058	25.42	22.7	15.754
H REAR PORCH (μ s)	1.907	1.59	2.27	2.462
H SYNC WIDTH (μ s)	3.83	3.81	2.84	2.092
H SYNC POLARITY	+	-	-	-
V FRAME BORDER (ms)	0	0	0	0
V TOTAL SIZE (ms)	14.268	14.269	17.84	16.667
V DISPLAY SIZE (ms)	11.122	12.716	17.0	15.880
V REAR PORCH (ms)	1.906	0.89	0.74	0.6
V SYNC WIDTH (ms)	0.064	0.064	0.057	0.124
V SYNC POLARITY	-	+	-	-
VIDEO DOT CLOCK (MHz)	25.17	25.172	35.2	65.0
RESOLUTION	640x350	640x400	800x600	1024x768

(continued)

*H: horizontal V: vertical

**Model 5~8: for reference only

This monitor is also provided with 10 blank storage areas for saving timings. If you are not satisfied with the standard mode, you can define your own timings following this procedure:

1. Use SELECT $\blacktriangleright/\blacktriangleleft$ on the control panel to select the option you want to adjust.
2. Use ADJUST $+/-$ on the control panel to adjust the value of that option.
3. Press STATUS or SELECT $\blacktriangleright/\blacktriangleleft$ to save this mode.

7. THEORY OF OPERATION

Switch Mode Power Supply

The current mode control IC is U901. To avoid the screen being interfered, its circuit applies SYNC trigger.

- Pin 6 of U901 directly drives MOSFET Q901 and oscillates T902 transformer, so that energy will be transferred from the primary voltage to the secondary voltage. The secondary voltage is rectified by D906, D915, D918, D919 and D920, to obtain output voltage by way of the π filter circuit.
- Pin 3 of U901 offers over current protection, which detects the source current of Q901 via R908. When the output is over the limit, the voltage will be cut to zero volts. The 22V input will be regulated to 12V output via regulator U702.
- TH901 is a positive temperature coefficient resistance. It performs degaussing function when the power is on.
- The power saving circuit consists of C912, C913, Q911, Q912, R914, R950, T903, and ZD903. If the vertical SYNC signal doesn't appear, the voltage on pin 1 of U901 will shut down, and the SMPS (Switch Mode Power Supply) will be OFF.

See figure SD640012100102 (page 37).

Input Circuit

From the SYNC signal of U103, we know the shaping and polarity status. We also get positive horizontal SYNC output from pin 11, and positive vertical SYNC output from pin 8.

In order to make sure that the horizontal SYNC output has the same pulse width, we use U101.

See figure SD640012100102 (page 37).

Horizontal Process Circuit

The horizontal process IC is U501.

- Pin 3 of U501 is the horizontal SYNC input point.
- AFC pulse comes from FBT pin 6, which goes through pin 4 of U501.
- Pin 8 controls the duty cycle of pin 8.
- C533, Q321, R553, R557 and U101 apply the F-V voltage.

See figure SD640012100102 (page 37).

Vertical Process Circuit

The vertical process IC is U201.

- Pin 5 is the input point of the vertical SYNC.
- Pin 13 is the output point of the blanking pulse .
- The vertical size is controlled by the current which passes through pin 7, the vertical free running is controlled by C209, C210, D202, R219, R220, ZD201, and the vertical linearity is controlled by C206, C207, R210.
- The output point of vertical pulse is U201 pin 1.

See figure SD640012100102 (page 37).

Horizontal Driver Circuit

- The output point of the horizontal driver pulse is pin 1 of U501.
- T502 increases the horizontal driver pulse current to drive Q501.
- T502 is an FBT. B+ parabolic wave flows into L502, Q504 and Q505 to modify a pinchushion.
- C506 is controlled by Q502, Q519 and Q522 to get the horizontal linearity.

See figure SD640012100102 (page 37).

Step-down B+ Circuit

- U601 is adopted to be a monostable circuit, triggered by pin 6 of T501. The square wave comes out from pin 3.
- Q612, D609, L601 and C510 generate the step-down B+.

See figure SD640012100102 (page 37).

Video Amplifier Circuit

U701 is a pre-amplifier IC.

- R-gain and B-gain are separately sent into pin 8 and pin 27.
- The video amplifier circuit uses the traditional cascade circuit.
- RGB BIOS is controlled by pin 15, pin 19, and pin 24.

See figure SD640012100102 (page 37).

Microprocessor Circuit

U4 is a 8-bit microprocessor.

- U1 is the EPROM which can hold 10 preset modes and 10 user-defined modes.
- U4 is a PWM converter with 6 pins to provide HORIZONTAL PHASE, HORIZONTAL WIDTH, VERTICAL CENTERING, VERTICAL SIZE, PINCUSHION, and TRAPEZOID function.

See figure SD640012100102 (page 37).

Power Management

- Standby mode: cut off the 22V DC via C918, Q905, Q907, R942, R943
- Suspend mode: cut off the main power by coupling T903 and the vertical pulse

8. CONTROLS AND ADJUSTMENTS

Turn all of the variable resistors to the mid-position. Warm up for at least twenty minutes.

1. B⁺ ADJUSTMENT

<a> 145V DC ADJUSTMENT

input timing: 31KHz 480L
input pattern: crosshatch
test point: R924
test value: 145 ± 0.5 V DC
ADJ VR: VR902

 86V DC ADJUSTMENT (for M/AM model)

90V DC ADJUSTMENT (for L/AL model)

input timing: 31KHz 480L
input pattern: crosshatch
test point: TP5 (to get a maximum horizontal width)
test value: 86 ± 1 V DC (for M/AM model)
 90 ± 1 V DC (for L/AL model)
ADJ VR: VR601 (to get a full-scan screen)

2. HORIZONTAL FREE-RUNNING ADJUSTMENT

input timing: 48KHz
input pattern: full white
test point: TP1 (GND)
test result: the image is stable
ADJ VR: VR501

3. CUT-OFF VLOTAGE ADJUSTMENT

input timing: 31KHz 480L
input pattern: raster only
test point: brightness=max. (external control panel)
contrast=min. (external control panel)
test value: Y=0.8~1F.L.
VR706 - $x=281\pm10\%$
VR705 - $y=311\pm10\%$
ADJ VR: G2, VR702, VR705, VR706

4. WHITE BALANCE ADJUSTMENT

input timing: 31KHz 480L
input pattern: circle
test point: brightness=medium (external control panel)
contrast=maximum (external control panel)
test value: 1. VR703 - $x=281\pm10\%$
VR704 - $y=311\pm10\%$
(if you cannot get the precise value, repeat the process from step 1.)
2. VR701- Y=45F.L.
ADJ VR: VR701, VR703, VR704

5. FOCUS ADJUSTMENT

input timing: 48KHz
input pattern: text mode
test value: the image is sharp
ADJ VR: G4

6. MICROPROCESSOR SETTING

You can define your own timings: (refer to page 12)

<a>HORIZONTAL WIDTH ADJUSTMENT

test point: $250 \pm 4 \text{ mm}$
 ADJ SW: **horizontal width** and +/- buttons

HORIZONTAL PHASE ADJUSTMENT

test point: the image is on the center of the raster ($\pm 3 \text{ mm}$)
 ADJ SW: **horizontal phase** and +/- buttons

<c>VERTICAL SIZE ADJUSTMENT

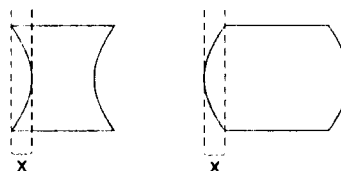
test point: $185 \pm 4 \text{ mm}$
 ADJ SW: **vertical size** and +/- buttons

<d>VERTICAL CENTERING ADJUSTMENT

test point: the image is on the center of the raster ($\pm 3 \text{ mm}$)
 ADJ SW: **vertical centering** and +/- buttons

<e>PINCUSHION ADJUSTMENT

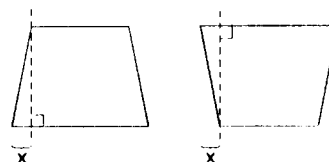
test point: $x \leq 1.5 \text{ mm}$



ADJ SW: **pincushion** and +/- buttons

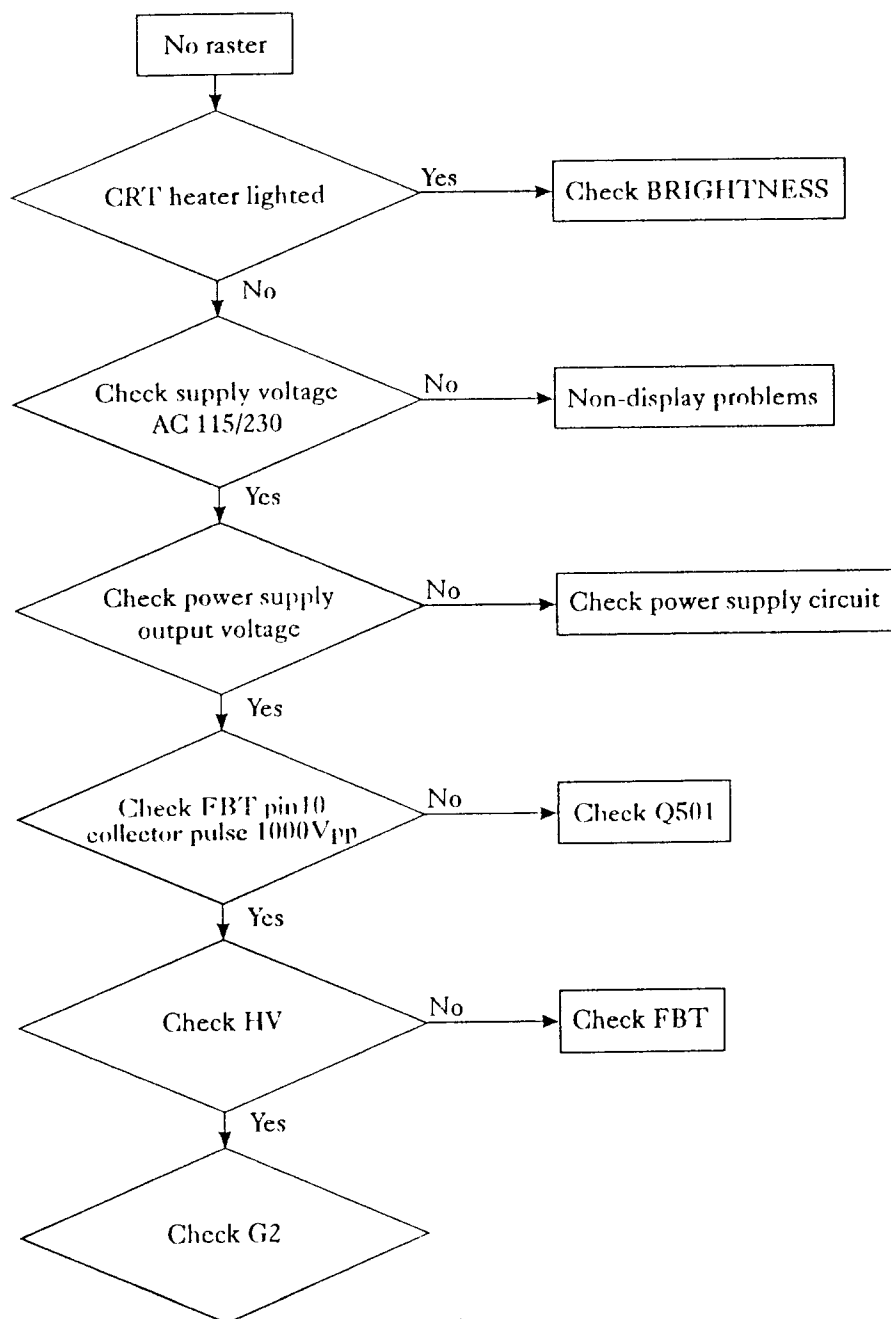
<f>TRAPEZOID ADJUSTMENT

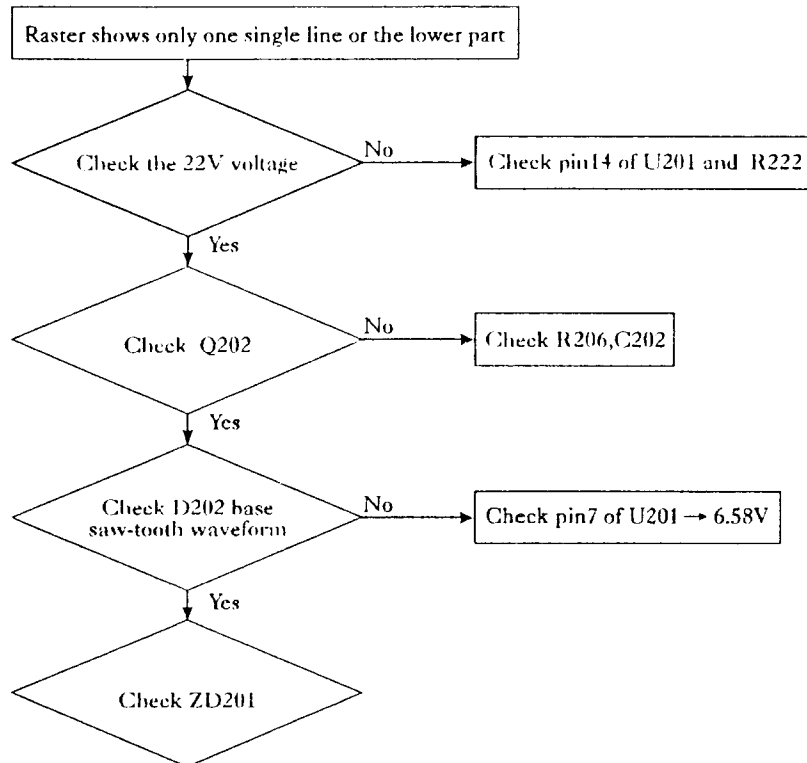
test point: $x \leq 3 \text{ mm}$

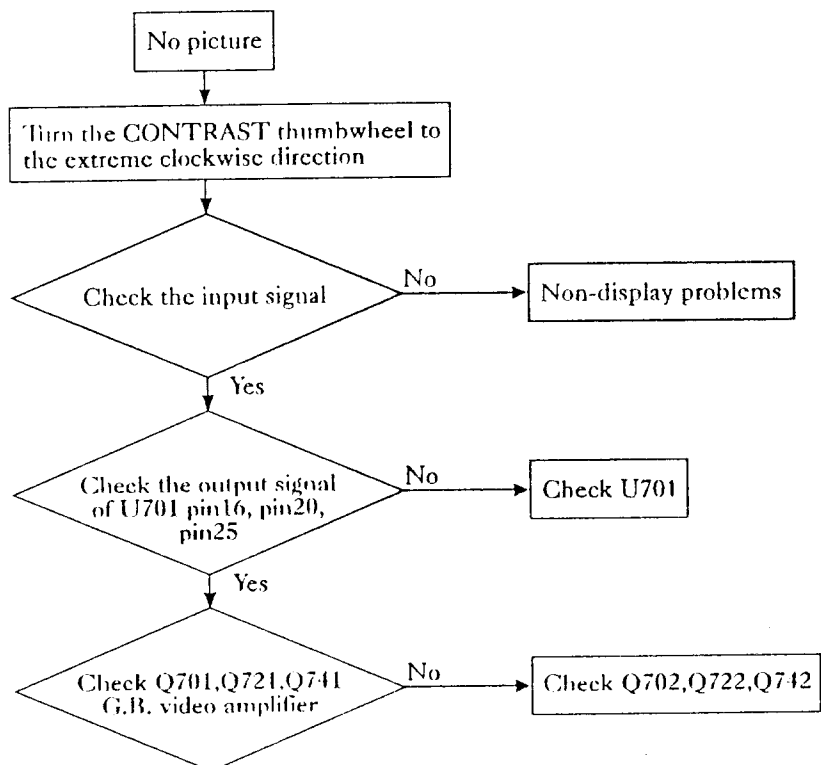


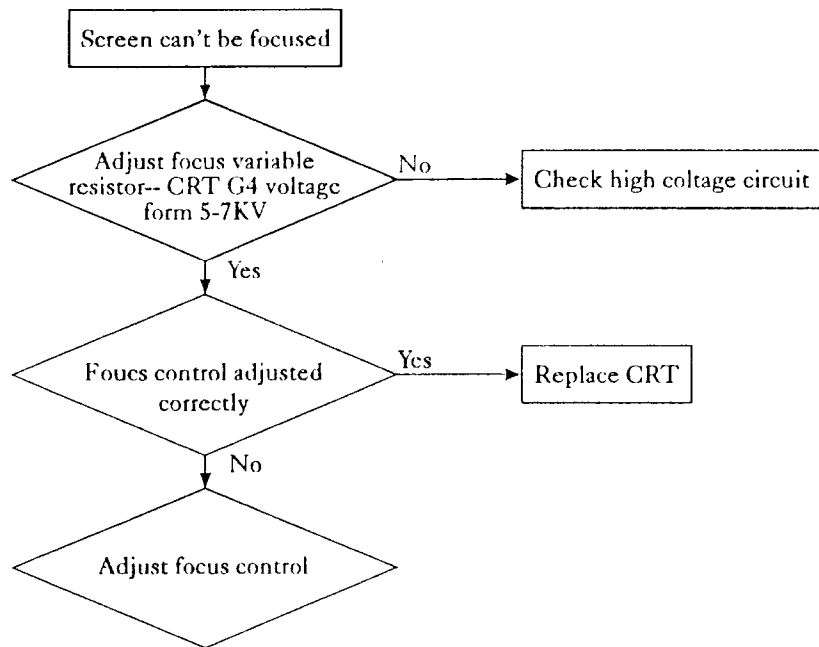
ADJ SW: **trapezoid** and +/- buttons

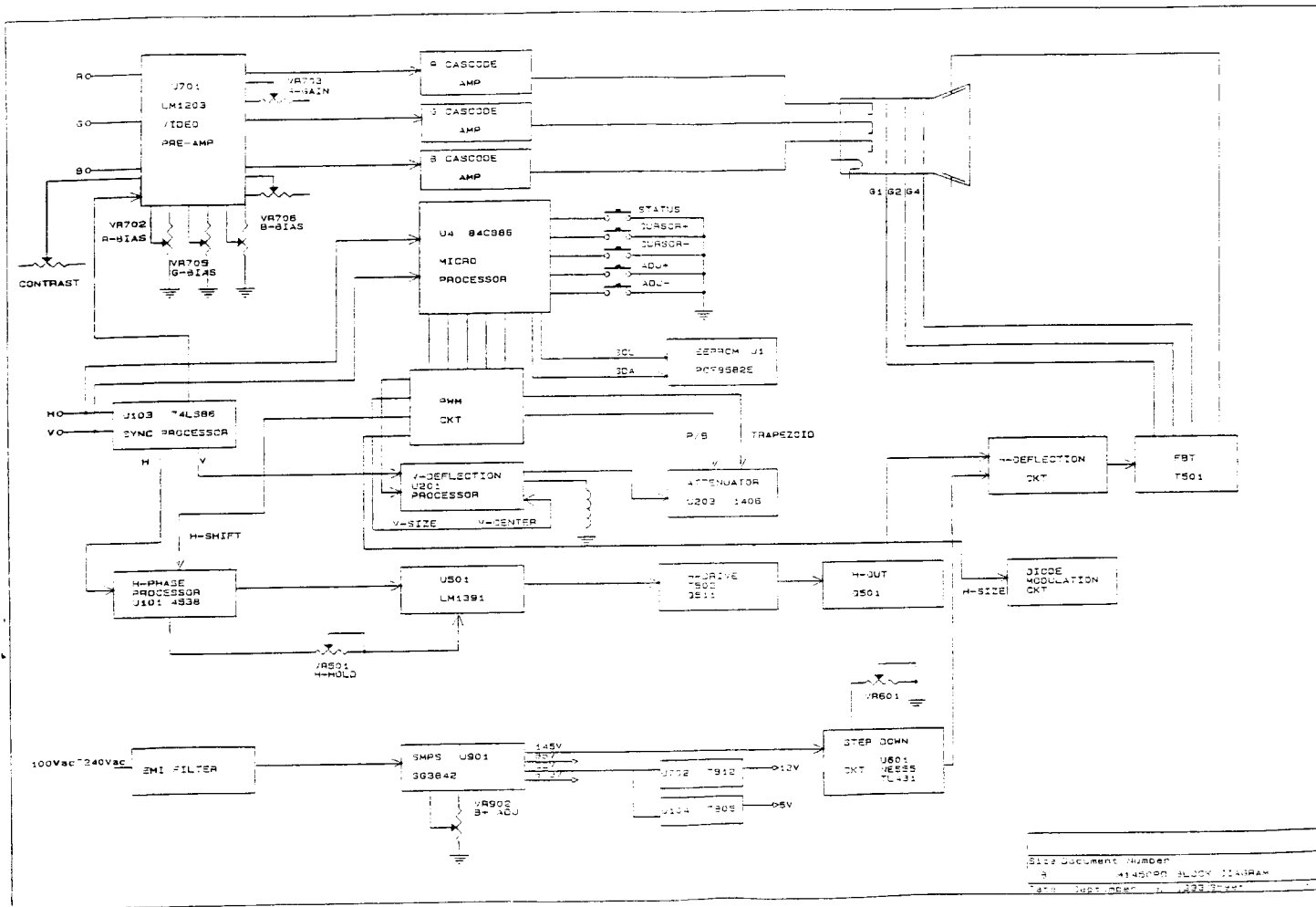
9. TROUBLESHOOTING











10. BLOCK DIAGRAM

11. PARTS LIST

CRT BOARD

Name	Description	Part Number
PWA	PWA-M1450PD CRT BD	640012100105
CRT SOCKET	M1564P	633100050005

RES

Location	Description	Part Number
R719, 759, 738	100, 5%, 1/2W, CF, AX	631100220101
R766	470, 5%, 1/2W, CF, AX	631100220471
R767	56K, 5%, 1/2W, CF, AX	631100220563

CAP

Location	Description	Part Number
C769	.01U, +80-20%, 1KV, HI-K, Z5U	631204157103
C770	1000P, 20%, 1KV, HI-K, Z5U	631204155102

DIODE

Location	Description	Part Number
D706	UF4003, VRRM200V	632001014003

CON

Location	Description	Part Number
J705	HDR, MA, 6P*1, 2MM,ST	633100110035

PIN HOLDER

Location	Description	Part Number
J703	D2.36MM, L14.2MM, H10.25MM	633100990001

MAIN BOARD

Name	Description	Part Number
PCB	PWA-M1450PD MAIN BD	630012100021

RES

Location	Description	Part Number
R559	300, 5%, 1/4W, CF, AX	631100210301
R762	15, 5%, 2W, MOF, F, MINI	631101140150
R206	1.5, 5%, 2W, MOF, F, MINI, M1450PD 2.0, 5%, 2W, MOF, F, MINI, L1450PD	631101140159 631101140209
R111	180, 5%, 2W, MOF, F, MINI	631101140181
R222	2.2, 5%, 2W, MOF, F, MINI	631101140229
R904, 905	47K, 5%, 2W, MOF, F, MINI	631101140473
R516	100, 5%, 3W, MOF, F, MINI	631101150101
R903	3.3K, 5%, 3W, MOF, F, MINI	631101150332
R709, 710, 729, 730, 749, 750	560, 5%, 3W, MOF, F, MINI	631101150561
R906	.15, 5%, 3W, WW, AX	631103020158
R14	10.7K, 1%, 1/4W, MF, AX	631100011072
R551	15K, 1%, 1/4W, MF, AX	631100011502
R210	200K, 1%, 1/4W, MF, AX, M1450PD 142K, 1%, 1/4W, MF, AX, L1450PD	631100012003 631100011433
R12	1.33K, 1%, 1/4W, MF, AX	631100011331
R219	22.1K, 1%, 1/4W, MF, AX	631100012212
R220	25.5K, 1%, 1/4W, MF, AX	631100012552
R11	5.6K, 1%, 1/4W, MF, AX	631100015601
R15, 110	7.5K, 1%, 1/4W, MF, AX	631100017501
R925	10, 5%, 1/4W, CF AX	631100210100
R030, 032, 570	1.0K, 5%, 1/4W, CF AX	631100210102
R020, 223, 545, 546, 577, 942	10K, 5%, 1/4W, CF AX	631100210103
R501	1.0, 5%, 1/4W, CF AX	631100210109
R517	1.8, 5%, 1/4W, CF AX	631100210189
R533	1.8K, 5%, 1/4W, CF AX	631100210182
R909, 917	22, 5%, 1/4W, CF AX	631102100220
R620	2.0K, 5%, 1/4W, CF AX	631100210202
R114, 511, 606	3.3K, 5%, 1/4W, CF AX	631100210332
R503	47, 5%, 1/4W, CF AX	631100210470
R572	4.7K, 5%, 1/4W, CF AX	631100210472
R72	5.1K, 5%, 1/4W, CF AX	631100210512
R216	560, 5%, 1/4W, CF AX	631100210561
R949	68K, 5%, 1/4W, CF AX	631100210683
R212	75K, 5%, 1/4W, CF AX	631100210753
R915	8.2K, 5%, 1/4W, CF AX	631100210822
R947, 948	10, 5%, 1/2W, CF, AX	631100220100
R529	1K, 5%, 1/2W, CF, AX	631100220102

Location	Description	Part Number
R901, 907	1M, 5%, 1/2W, CF, AX	631100220105
R614	120K, 5%, 1/2W, CF, AX	631100220124
R556	2K, 5%, 1/2W, CF, AX	631100220202
R201	2.2, 5%, 1/2W, CF, AX	631100220229
R202	330, 5%, 1/2W, CF, AX	631100220331
R554	560, 5%, 1/2W, CF, AX	631100220561
R521	680, 5%, 1/2W, CF, AX	631100220681
R101, 104	10, 5%, 1/6W, CF, AX	631100230100
R209, 536, 569, 706, 726, 746, 756	100, 5%, 1/6W, CF, AX	631100230101
R40, 051, 060, 065, 070, 075, 080, 085, R106, 112, 207, 508, 518, 534, 547, R576, 578~581, 601, 602, 757, 760, R779 908, 910, 912	1K, 5%, 1/6W, CF, AX	631100230102
R007, 121, 228, 230, 231, 234, R513, 524, 527, 530, 537, 539, 540, R544, 553, 603, 605, 702, 712, 722, R742, 911, 916, 931, 944	10K, 5%, 1/6W, CF, AX	631100230103
R502	100K, 5%, 1/6W, CF, AX	631100230104
R211, 504	1M, 5%, 1/6W, CF, AX	631100230105
R225	120, 5%, 1/6W, CF, AX	631100230121
R205	1.2K, 5%, 1/6W, CF, AX	631100230122
R215	12K, 5%, 1/6W, CF, AX	631100230123
R510, 552, 565	13K, 5%, 1/6W, CF, AX	631100230133
R240, 933	150, 5%, 1/6W, CF, AX	631100230151
R519	15, 5%, 1/6W, CF, AX	631100230150
R016~019, 548, 604	1.5K, 5%, 1/6W, CF, AX	631100230152
R080, 233, 621	15K, 5%, 1/6W, CF, AX	631100230153
R707, 727, 747	18, 5%, 1/6W, CF, AX	631100230180
R21, 22	6.2M, 5%, 1/6W, CF, AX	631100230625
R64	1.8K, 5%, 1/6W, CF, AX	631100230182
R061, 066, 067, 071, 076, 081, 086, 87, R541, 609, 616	2K, 5%, 1/6W, CF, AX	631100230202
R77, 214, 531	20K, 5%, 1/6W, CF, AX	631100230203
R704, 744, 765	22, 5%, 1/6W, CF, AX	631100230220
R703, 714, 717, 723, 731, 734, 735, R748, 770	220, 5%, 1/6W, CF, AX	631100230221
R716, 763, 946	2.2K, 5%, 1/6W, CF, AX	631100230222
R005, 034, 035, 542	22K, 5%, 1/6W, CF, AX	631100230223
R203	2.4K, 5%, 1/6W, CF, AX, M1450PD 2.2K, 5%, 1/6W, CF, AX, L1450PD	631100230242 631100230222
R764	2.4K, 5%, 1/6W, CF, AX	631100230242
R538, 563, 732	2.7K, 5%, 1/6W, CF, AX	631100230272
R119	3K, 5%, 1/6W, CF, AX	631100230302
R615, 725, 743, 768	33, 5%, 1/6W, CF, AX	631100230330
R943	33K, 5%, 1/6W, CF, AX	631100230333
R557, 713	3.9K, 5%, 1/6W, CF, AX	631100230392
R705, 728, 745	390, 5%, 1/6W, CF, AX	631100230391
R522, 535	39K, 5%, 1/6W, CF, AX	631100230393

Location	Description	Part Number
R543, 914, 930, 932	47, 5%, 1/6W, CF, AX	631100230470
R950	470, 5%, 1/6W, CF, AX	631100230471
R13, 062, 105, 221, 523, 532, 549, 550	4.7K, 5%, 1/6W, CF, AX	631100230473
R25	47K, 5%, 1/6W, CF, AX, M1450PD 10K, 5%, 1/6W, CF, AX, L1450PD	631100230473 631100230103
R84, 512, 618	47K, 5%, 1/6W, CF, AX	631100230473
R724	51, 5%, 1/6W, CF, AX	631100230510
R945	910, 5%, 1/6W, CF, AX	631100230911
R063, 232	5.1K, 5%, 1/6W, CF, AX	631100230512
R107, 108, 560, 561	560, 5%, 1/6W, CF, AX	631100230561
R213, 507	56K, 5%, 1/6W, CF, AX	631100230563
R509, 515, 608	6.8K, 5%, 1/6W, CF, AX	631100230682
R921	68K, 5%, 1/6W, CF, AX	631100230683
R701, 721, 741	75, 5%, 1/6W, CF, AX	631100230750
R74	750, 5%, 1/6W, CF, AX	631100230751
R015	7.5K, 5%, 1/6W, CF, AX	631100230752
R715, 733, 736	82, 5%, 1/6W, CF, AX	631100230820
R505	82K, 5%, 1/6W, CF, AX	631100230823
R502	100, 5%, 1W, MOF, F, MINI	631101130101
R920	1.0K, 5%, 1W, MOF, F, MINI	631101130102
R224	150, 5%, 1W, MOF, F, MINI	631101130151
R924	47K, 5%, 1W, MOF, F, MINI	631101130473
R940	470K, 5%, 1W, MOF, F, MINI	631101130474
R208	47, 5%, 1W, MOF, F, MINI	631101130470
R902	47K, 5%, 5W, CMNT, V	631121010473

VR

Location	Description	Part Number
VR501	3000, 20%, .1W, B, V, 6MM, CARB	631120073021
VR601	5000, 20%, .1W, B, V, 6MM, CARB	631120075021
VR703, 704	100, 30%, .1W, B, H, 6MM, CARB	631120141011
VR701	10K, 20%, .1W, B, H, 6MM, CARB	631120141031
VR702, 705, 706	3000, 20%, .1W, B, H, 6MM, CARB	631120143021
VR902	500, 20%, .1W, B, H, 6MM, CARB	631120145011

NTCR

Location	Description	Part Number
TH902	50HM, 15%, DISK, 08SP005L	631120510509

PTCR

Location	Description	Part Number
TH901	200HM, 270V	631120550201

CAP

Location	Description	Part Number
C008	100P, 5%, 50V, CD, NPO	631200013101
C503, 504	390P, +80-20%, 1KV, HI-K, Y5V	631204247391
C209	330P, 5%, 50V, CD, NPO	631200013331
C110, 949	680P, 20%, 50V, HI-K, Y5V	631204375681
C610	4700P, +80-20%, 50V, HI-K, Z5V	631204017472
C506	.68U, 5%, 250V, MPP	631201803684
C501	4700P, 5%, 2KV, MPP	631201853472
C505	.33U, 5%, 250V, PP, F	631202043334
C502	.015U, 5%, 400V, PP, F	631202053153
C541	.1U, 5%, 250V, MEF, F	631202163104
C202	2200U, 20%, 16V, ALU, 85°C	631202535228
C107	33.0U, 20%, 16V, ALU, 85°C	631202535336
C526, 920	470U, 20%, 25V, ALU, 85°C	631202545477
C919	1000U, 20%, 35V, ALU, 85°C	631202555108
C509	10U, 20%, 50V, ALU, 85°C	631202560106
C746	10.0U, 20%, 100V, ALU, 85°C	631202595106
C510, 917, 923	47.0U, 20%, 160V, ALU, 85°C	631202605476
C915	47.0U, 20%, 200V, ALU, 85°C	631202615476
C511	10.0U, 20%, 250V, ALU, 85°C	631202625106
C927	150U, 20%, 400V, ALU, 85°C	631202785157
C906	100P, 20%, 1KV, HI-K, Z5U	631204155101
C507	1000P, 20%, 1KV, HI-K, Z5U	631204155102
C924, 929, 930	220P, 20%, 1KV, HI-K, Z5U	631204155221
C905	4700P, 20%, 1KV, HI-K, Z5U	631204155472
C904	.22U, 20%, 250VAC, X2 CAP	631209010224
C941	4700P, 20%, 250VAC, SFTY, Y-CAP, UL	631209210472
C112, 601	1000P, 5%, 50V, PE, F	631202243102
C604, 911	.01U, 5%, 50V, PE, F	631202243103
C206, 207, 211, 530	.1U, 50V, 5%, MEF, RA, F	631202203104
C115	2200P, 5%, 50V, PE, F	631202243222
C001	2700P, 5%, 50V, PE, F	631202243272
C532, 543, 907	3300P, 5%, 50V, PE, F	631202243332
C536	.033U, 5%, 50V, PE, F	631202243333
C210	.33U, 50V, 5%, MEF, RA, F	631202203334
C531	6800P, 5%, 50V, PE, F	631202243682
C528	5600P, 5%, 50V, PE, F	631202243562
C928	8200P, 5%, 50V, PE, F	631202243822
C201	.22U, 50V, 10%, MEF, RA, F	631202204224

Location	Description	Part Number
C20, 508, 512, 768	100U, 20%, 16V, ALU, 85°C	631202535107
C208	22.0U, 20%, 16V, ALU, 85°C	631202535226
C771	330U, 20%, 16V, ALU, 85°C	631202535337
C111, 203, 215, 216, 220, 223, 521, C524, 912, 918, 951	47.0U, 20%, 16V, ALU, 85°C	631202535476
C763, 932	470U, 20%, 16V, ALU, 85°C	631202535477
C514	47U, 16V, 205, ALU, 85°C	631202530476
C926	100U, 20%, 25V, ALU, 85°C	631202545107
C212, 540	220U, 20%, 25V, ALU, 85°C	631202545227
C213	330U, 20%, 25V, ALU, 85°C	631202545337
C515	.047U, +80-20%, 50V, SEMI, Y5V	631201547473
C606	.047U, 5%, 250V, MEF, F	631202163473
C009, 527, 534, 544, 607, 744, 931	1.0U, 20%, 50V, ALU, 85°C	631202565105
C007, C010~016, 103, 218, 533, 602, C701, 715, 721, 741, 760, 908	10.0U, 20%, 50V, ALU, 85°C	631202565106
C205, 522	.47U, 20%, 50V, ALU, 85°C	631202565474
C134, 516	4.7U, 20%, 50V, ALU, 85°C	631202565475
C542	4.7U, 20%, 100V, ALU, 85°C	631202595475
C916	47.0U, 20%, 100V, ALU, 85°C	631202595476
C219, 703, 723, 743, 910, 950	.1U, +80-20%, 50V, HI-K, Z5V	631204015104
C004, 113, 513, 520, 525, 537, 605, C704, 714, 724, 913, 914	.1U, +80-20%, 50V, HI-K, Z5V	631204017103
C713	.1U, +80-20%, 500V, HI-K, Z5V	631204057103
C6, 105, 106, 764	1000P, 10%, 50V, HI-K, Y5P	631204374102
C705, 725, 745	270P, 20%, 50V, HI-K, Y5P	631204375221
C750~752	270P, 20%, 50V, HI-K, Y5P	631204375271

COIL

Location	Description	Part Number
L601	CHOKE, 3MH, D.45, 227.5T	631300020021
L903~905, 908	CHOKE, 60UH, 10%, 8*10	631300020023
T904	CHOKE, 3MH, UU-18	631300020026
L502	CHOKE, 100UH, 16*18	631300020027
L501	LINEARITY, 11.5UH, M1450PD	631300030009
L701, 721, 741	PEAKING 3.3UH, 10%	631300010001

FBT

Location	Description	Part Number
T501	M1450PD	631360010023

XSFORMER

Location	Description	Part Number
T502	HOR, DRIVE, EE-19, M1564P	631360030001
T903	POWER SAVING, UU10.5	631360070013
T902	PWR, ER-35, TUV, M1450PD	631360070012

XTAL

Location	Description	Part Number
X001	10MHZ, 50PPM, HC-49/U	631411000401

DIODE

Location	Description	Part Number
D901~904	20D10, VRRM1000V	632001010020
D201	1N4002, ID1A, VRRM100V, D041	632001014001
D509	UF4002, VRRM100V	632001014002
D504	UF4003, VRRM200V	632001014003
D001, 002, 004, 104, 202, 505, 506, D508, 510, 512, 701~704, 910, 911	1N4148	632001014148
ZD210, 903	HZ3B2, ZENER, 3V, .1V, 0.5W	632002010032
ZD504	HZ5C2, ZENER, 5V, 5%	632002010005
ZD205	HZ7B2, ZENER, 7V, .5W	632002010073
ZD503, 601	HZ11B2, ZENER, 10.6V, .2V, 0.5W	632002010112
ZD501, 502	HZ12A2, ZENER, 12.2V, .2V, 0.5W	632002010122
ZD602	HZ18-2, ZENER, 17.9V, .4V, 0.5W	632002010182
ZD904	HZ20-2, ZENER, 20V, .4V, 0.5W	632002010202
ZD901	ZENER, 5.1V, 1W	632002010085
D609, 906, 914, 919, 920	BYV36A, VRRM200V, AX, SOD-57	632010003601
D905, 915, 918	BYV36C, VRRM600V, AX, SOD-57	632010003602
D501~503	MR856, VRRM600V, AX	632010085601

TRANS

Location	Description	Part Number
Q708, 710, 720	PH2369, NPN, TO-92	632030236901
Q512	BF423, PNP, 830MW	632031010423
Q012~017, 505, 516, 520, 530, 540, Q 604, 705, 903	2SA733Q, PNP	632031000733
Q010, 011, 101, 102, 105, 201, 202, Q205, 506, 507, 509, 510, 513, 515, Q517~519, 521, 524~526, 529, Q601~603, 701, 703, 704, 721, 723, Q731, 741, 902, 905, 911, 912	2SC945Q, NPN	632031010945

Location	Description	Part Number
Q612	IRF9620, P-MOSFET, TO-220	632010962001
Q522	BF422, TO-92	632030042201
Q501	BU2508DF NPN, SOT199	632030250801
Q511	2SD669AC, NPN	632031010669
Q504	2SD1138C, NPN	632031011138
Q702, 722, 742	2SC3953D, NPN, TO126	632031013953
Q502	2SK1221, MOSFET, N-CHNL, TO220AB	632032011221
Q901	2SK1507-01, MOSFET, TO-220F	632032150701
Q907	2SK2160, N-MOSFET, TO-220ML	632032216001

OPTOCOUPLER

Location	Description	Part Number
U902	CNX82A	632033150082

IC

Location	Description	Part Number
U103	74LS86A, QUAD 2I/P XOR GATES	632100090086
U202	LM358, DUAL OP/AMP	632200010358
U602, 906	TL431CLP	632200310431
U601	NE555, TIMER, 8P	632200310555
U501	MC1391P, HOR, PROCESSOR, 8P	632200311391
U901	3842, CURRENT-MODE PWM CTLR	632200313842
U101	HEF4538B, DUAL PMM, 16P	632230453801
U702	7812, VOLT REGULATOR, TO-220, 3P	632200110080
U104	VOLT REGULATOR, TO-220	632200110082
U701	LM1203, VIDEO PROCESSOR	632200211203
U201	TDA1675A, VERTICAL PROCESSOR, 15P	632200311675
U203	UPC1406HA, ATTENUATOR, 9P	632230140601
U001	EEPROM, 256*8, 8P, PCF8582	632340090103
U004	PCE84C886, MOCROCONTORLLER, 42P	632418488601

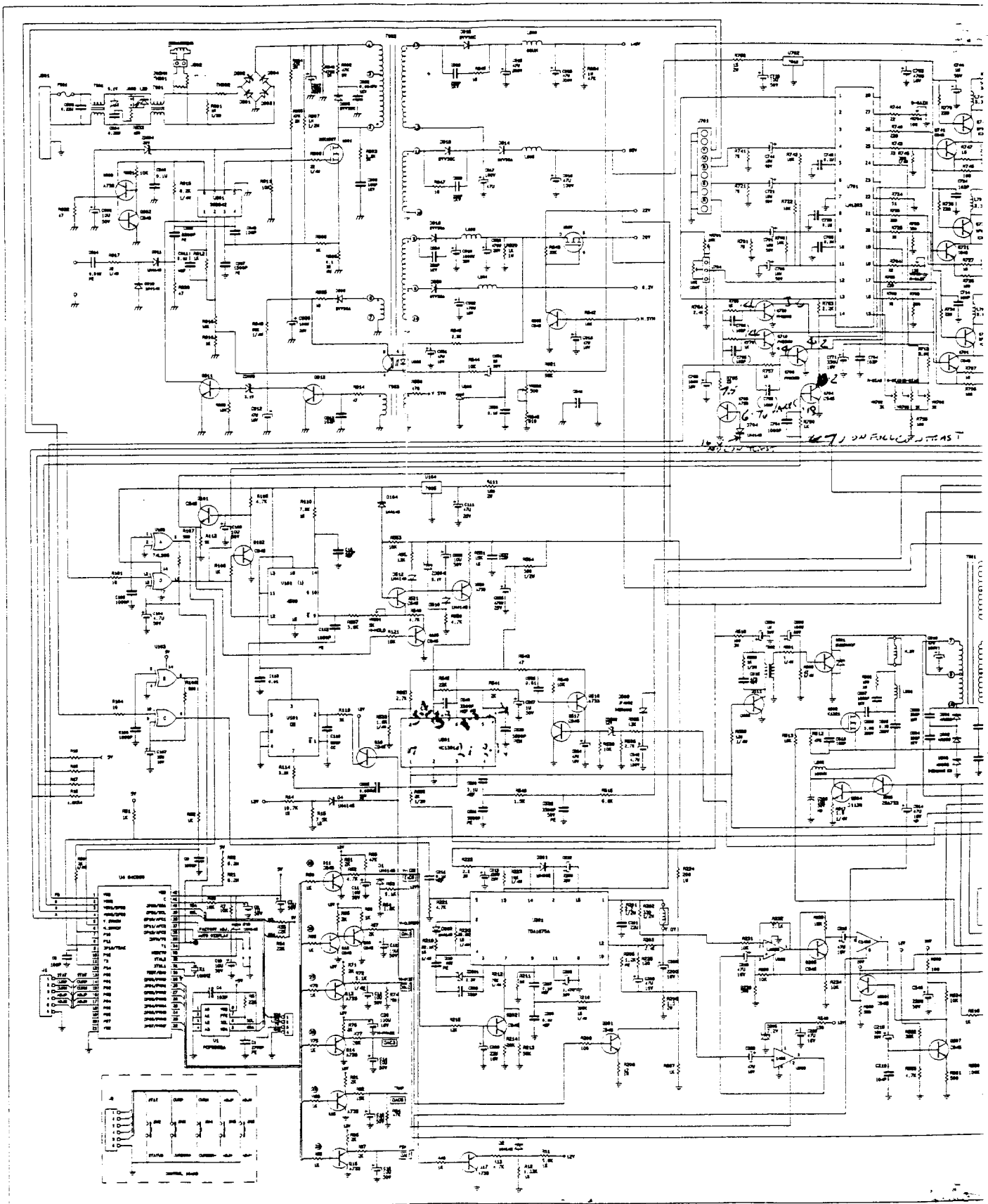
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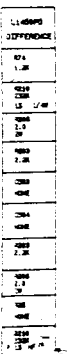
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J902	HDR, MA, 2P*1, ST, TIN, 7.5MM	633100110002
DY	HDR, MA, 4P*1, ST, TIN PIN2.36MM	633100110024
J001	HDR, MA, 6P*1, 2MM, ST	633100110035
J903, TP2	HDR, SHROUDED, MA, 2P*1, ST, TIN	633100110202
J502, 704	HDR, SHROUDED, MA, 3P*1, ST, TIN	633100110203
J701	HDR, SHROUDED, MA, 10P*1, ST, TIN	633100110210
J901	WFR, MA, 3P*1, ST	633100110303

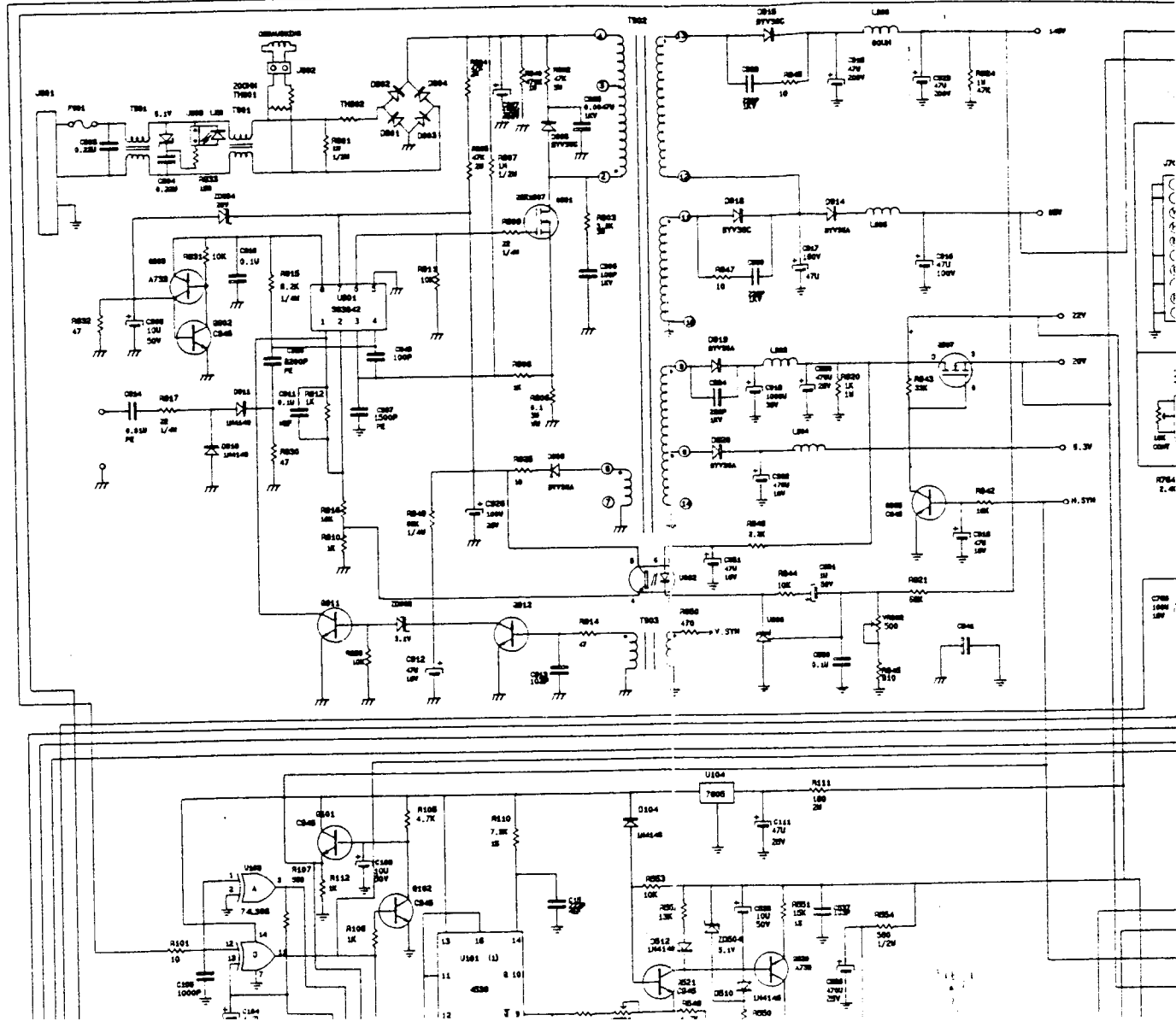
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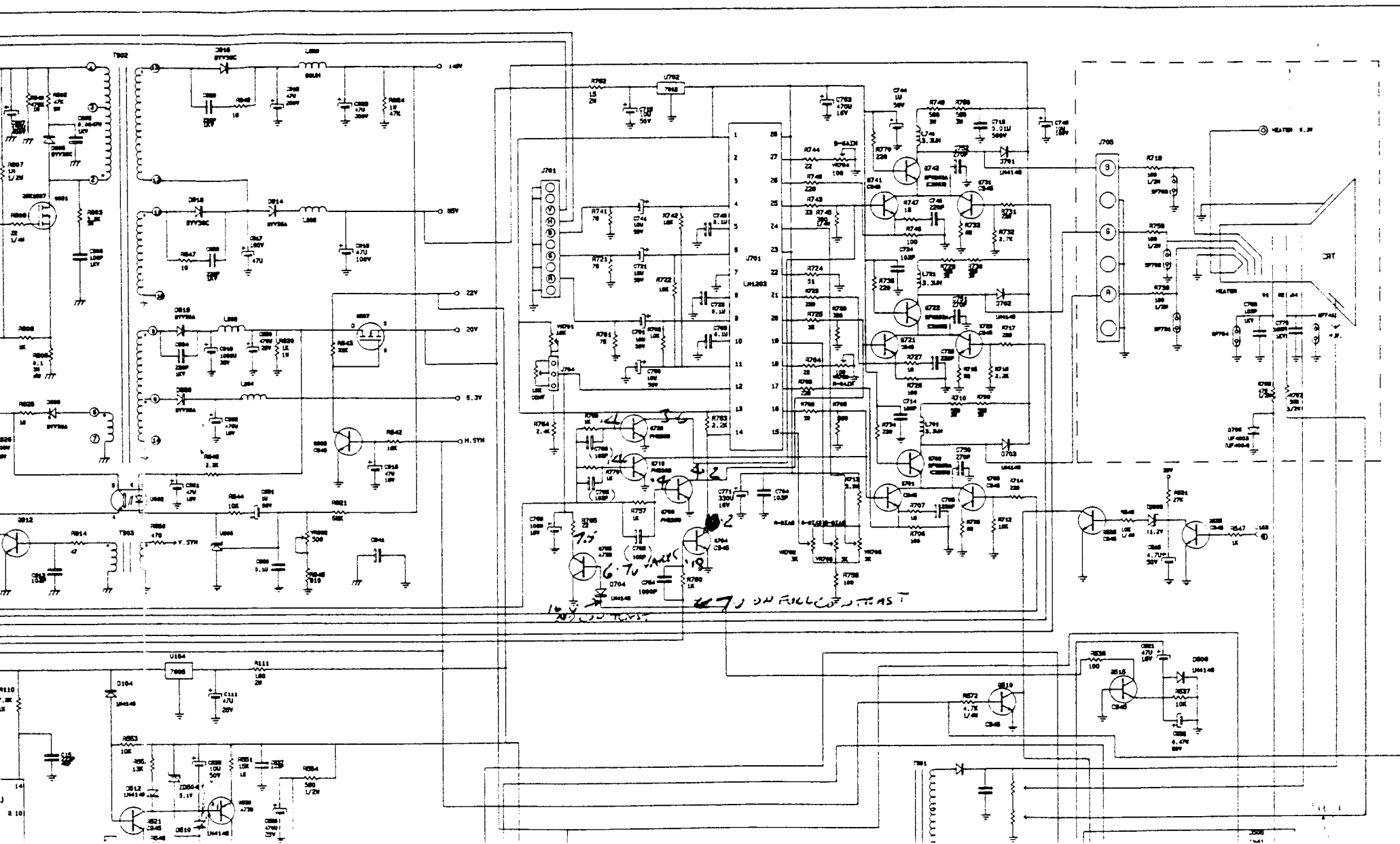
Location	Description	Part Number
G1	WIRE; 1007, #24, BRN, 310MM, 7/7	633200012416
HEATER	WIRE; 1007, #24, RED, 225MM, 7/7	633200012421
D1138	HEATSINK; VIDEO, M1420 COMM	634312000002
TDA1675, K1507	HEATSINK; VERTICAL O/P, M1564P	634312100002
FOR Q702, 722, 742	HEATSINK; CRT BD, Q701, 731, 761, M1564P	634312100003
BU2508DF	HEATSINK; HORIZ, M1450PD	634312100031
FOR IRF9620	HEATSINK; 20H, M1450PD	634312100032

Name	Description	Part Number
LED	RECT, GRN, 2*5, .1	633400010001
FUSE	250V/3A, SLO, UL/CSA	633500010001
FUSE HOLDER	5*20MM, FC-04-01	633500020001
SHIELD	VIDEO, M1450PD	634112100001
BRKT	ARM, M1420 COMM	634212000006
ETO SCREW	M3L8, FLANGE HEAD	634212000019
BRKT	PCB MOUNTING, RIGHT, M1564P	634212100001
BRKT	PCB MOUNTING LEFT, M1564P	634212100002
REAR PANEL	M1564P	634212100004

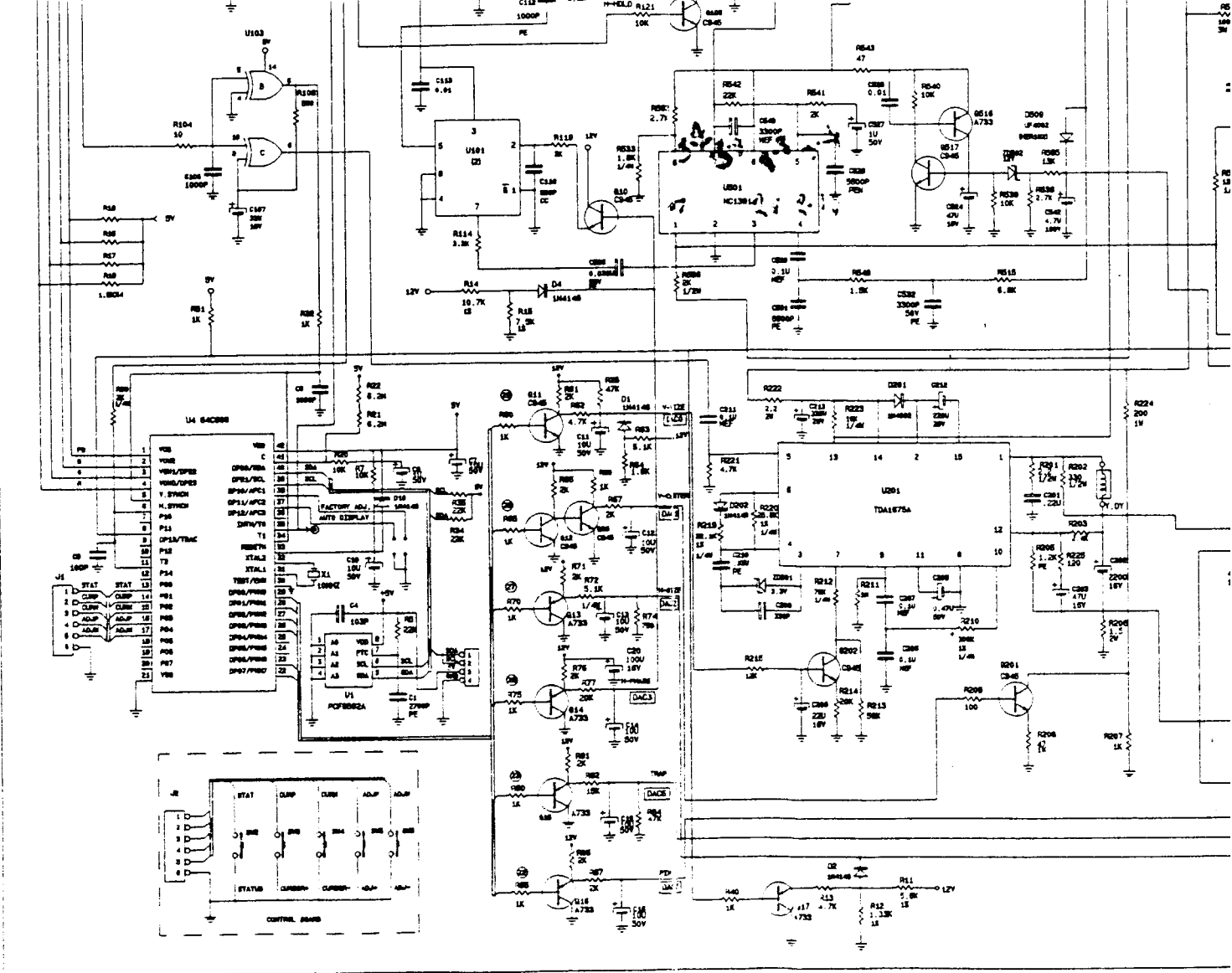


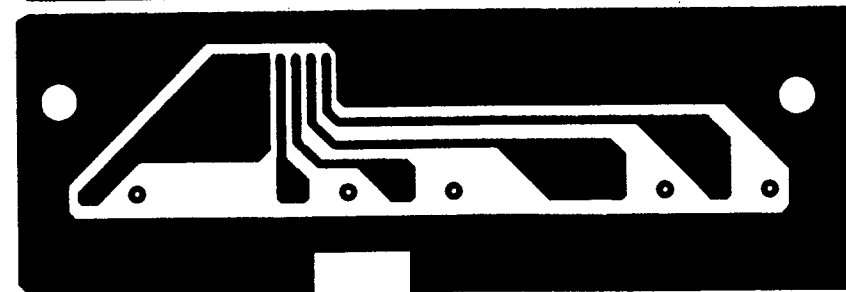
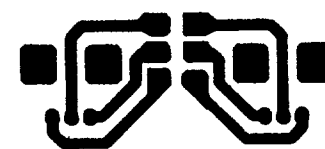
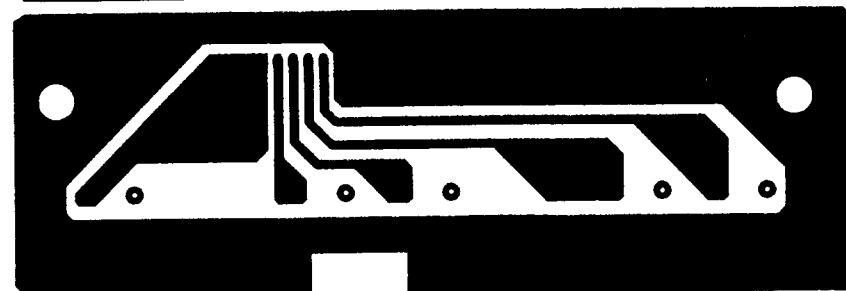
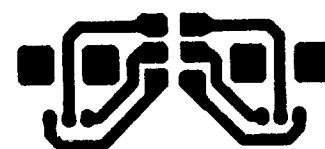
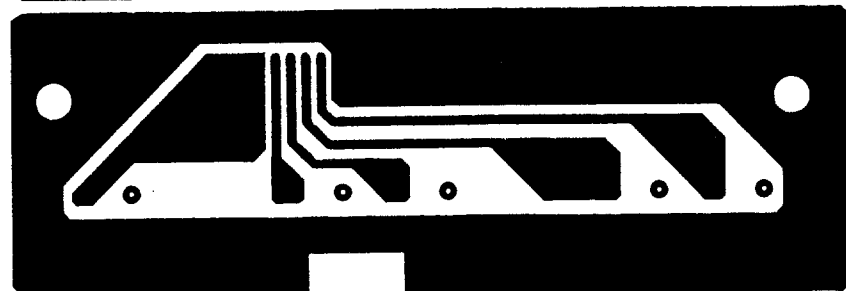
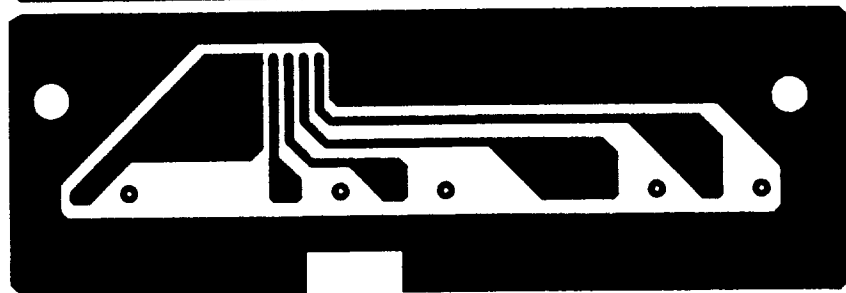
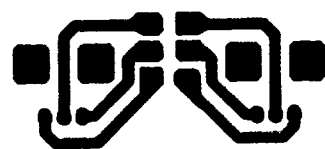
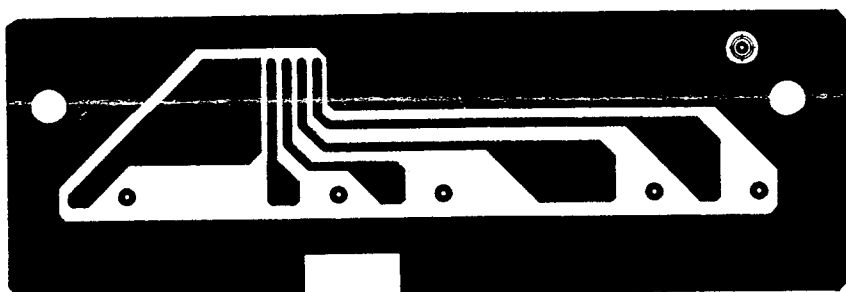
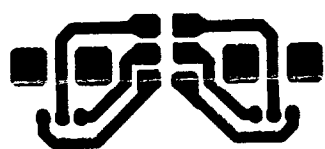




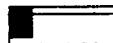


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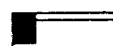


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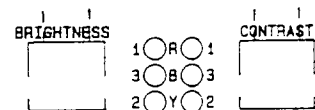
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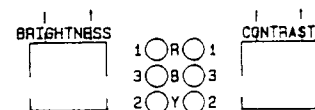
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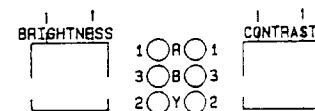
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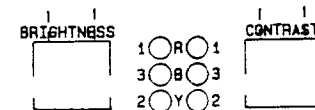
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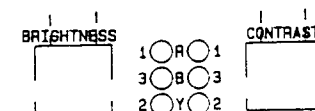
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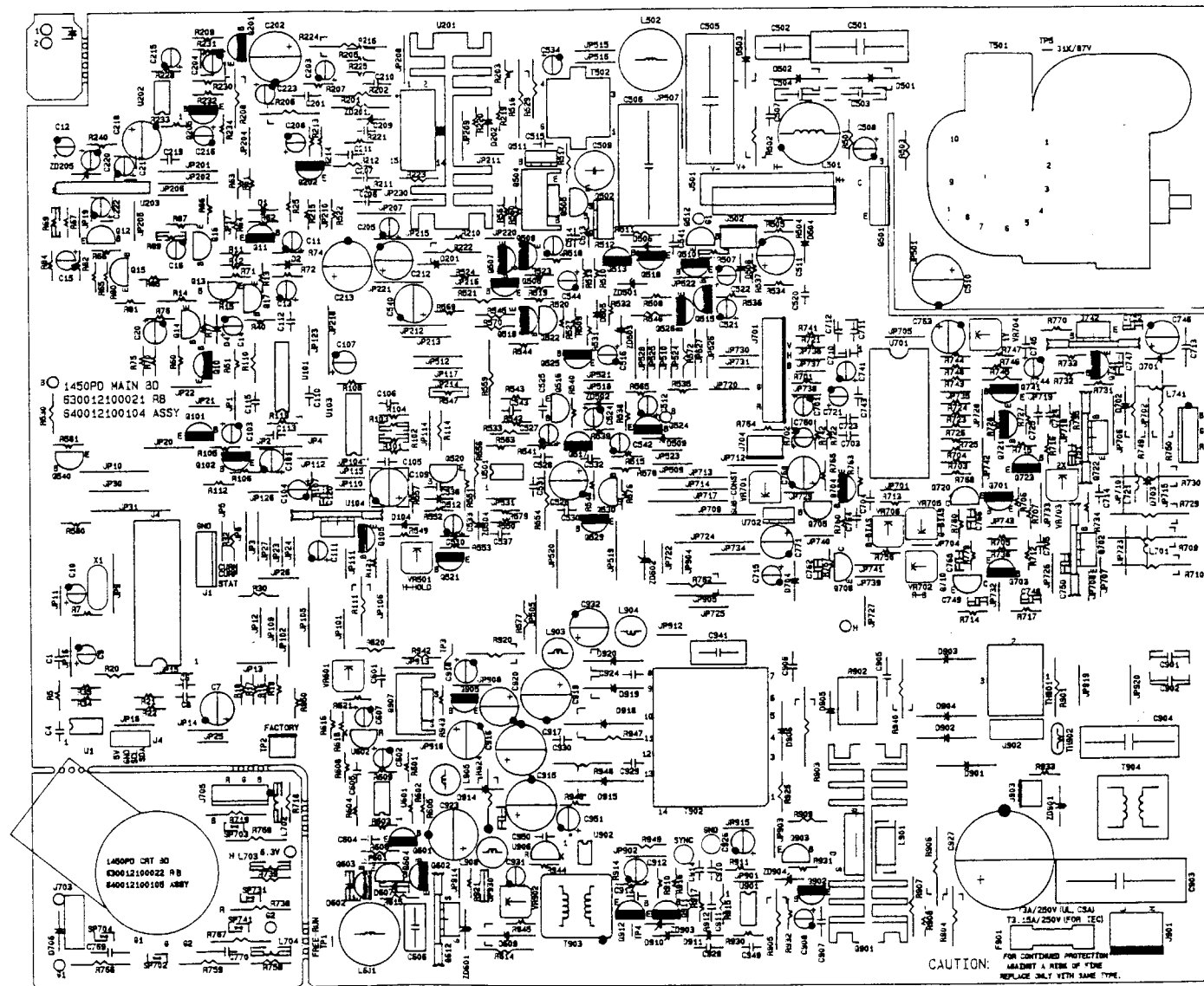
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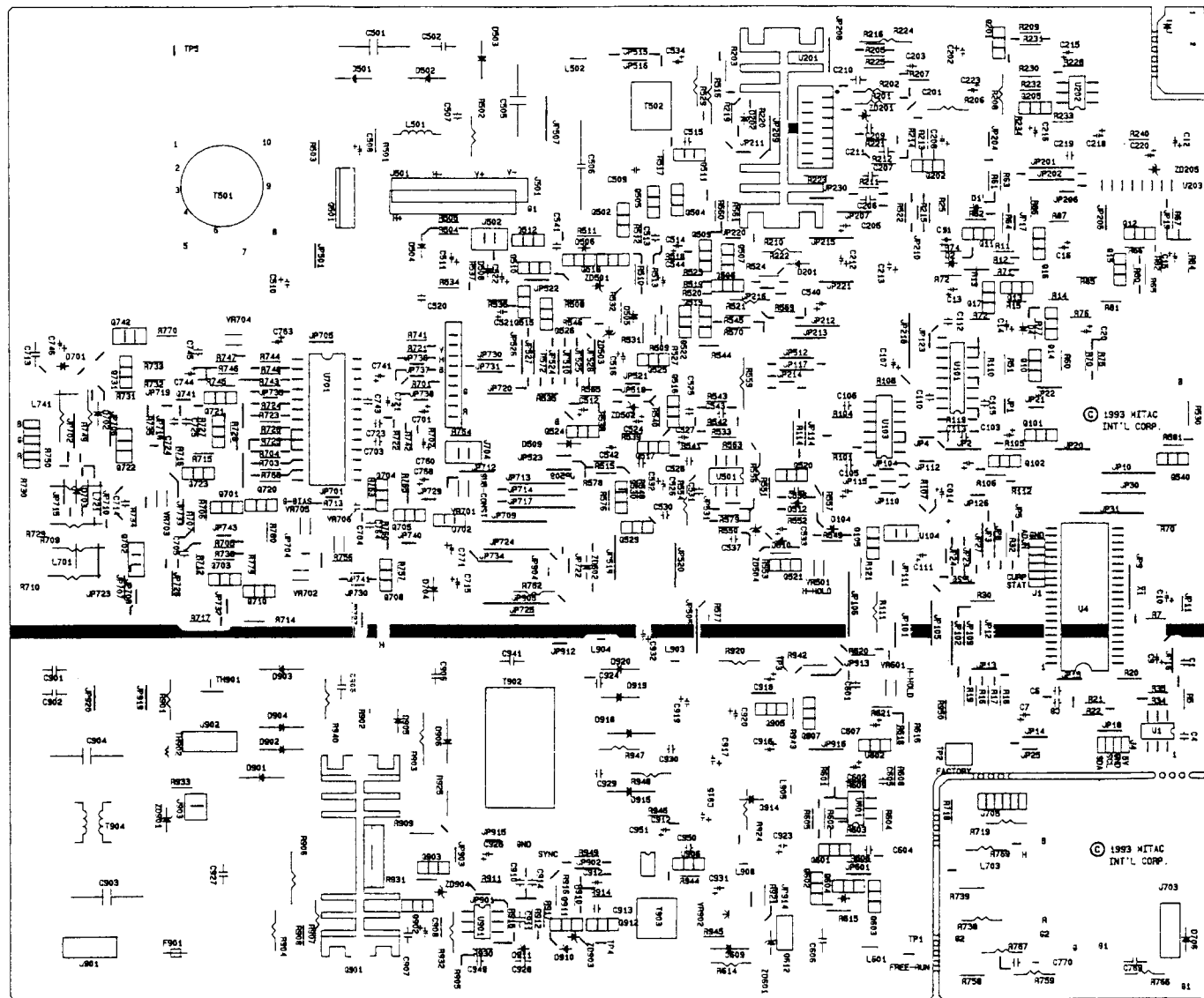
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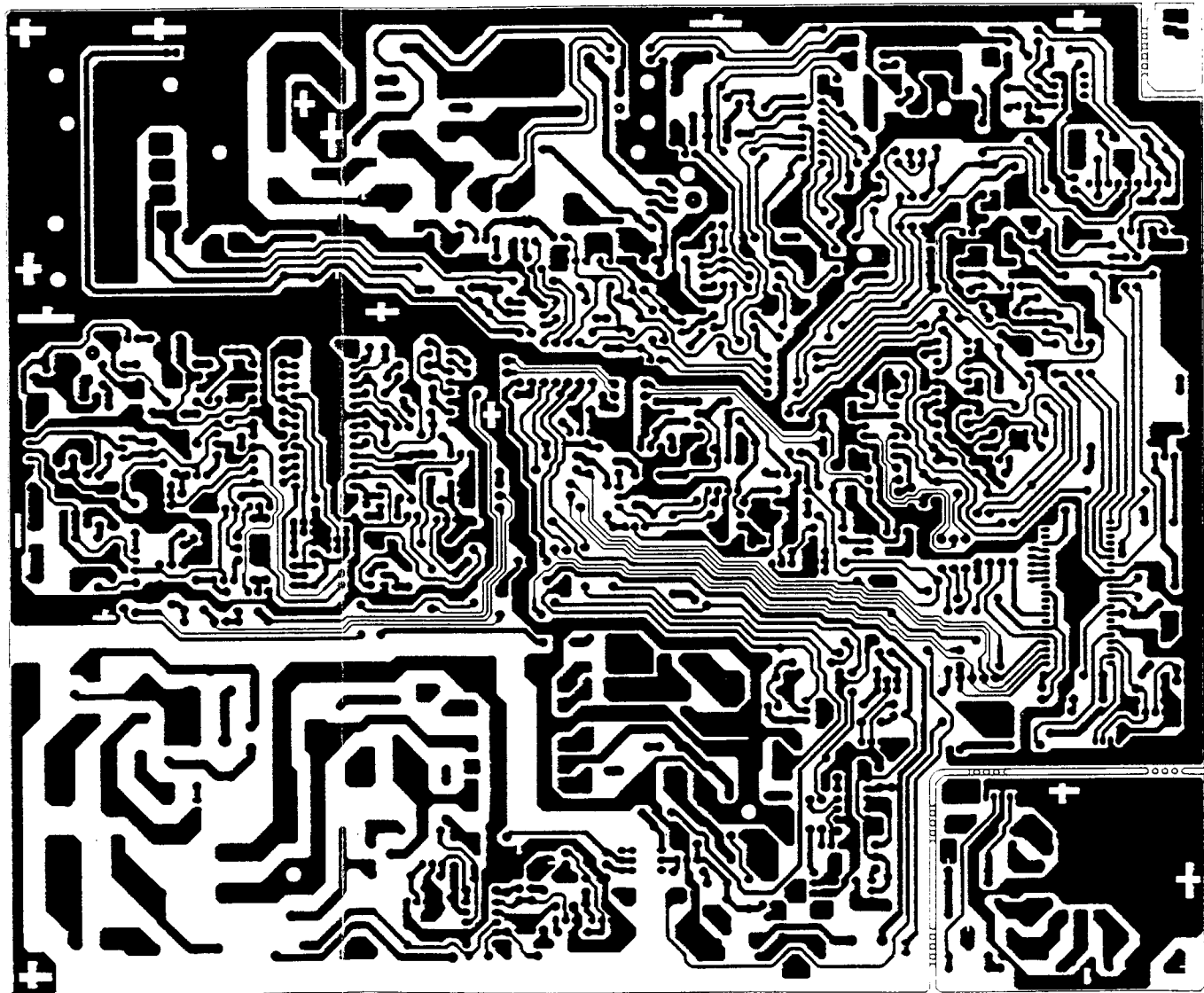




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