MITAC

M1420/M1420A
Service Manual

AM-4020

SAME AS GALAXY

765

SERVICEMAN WARNING X-RAY PRECAUTION

This product includes critical mechanical and electrical parts which are essential for X-radiation safety. For continued safety replace critical components indicated in the service manual only with exact replacement parts given in the parts list. Operating high voltage for this product is 24KV at minimum brightness. Refer to service manual for measurement procedures and proper service adjustments.

Use high impedance meter to measure 2ND anode voltage. Connect HV probe (lead) to 2ND anode: connect (-) to picture tube dag grounding device. Arcing 2ND anode lead to chassis or tuner may damage transistors. When discharging picture tube or 2ND anode lead, arc to picture tube mounting wire or picture tube dag only. HV supply failures can increase X-radiation. Service HV supply with set inoperative or limit operating time to minimum.

WARNING

Picture tube in this receiver employs integral implosion protection. Replace with tube of the same type number for continued safety. High-vacuum picture tube is dangerous to handle. Only qualified personnel should service.

TABLE OF CONTENTS

1. INTRODUCTION

This monitor has been manufactured with only the highest quality components, under the highest standards of quality control. Please read this manual thoroughly-including all safety precautions.

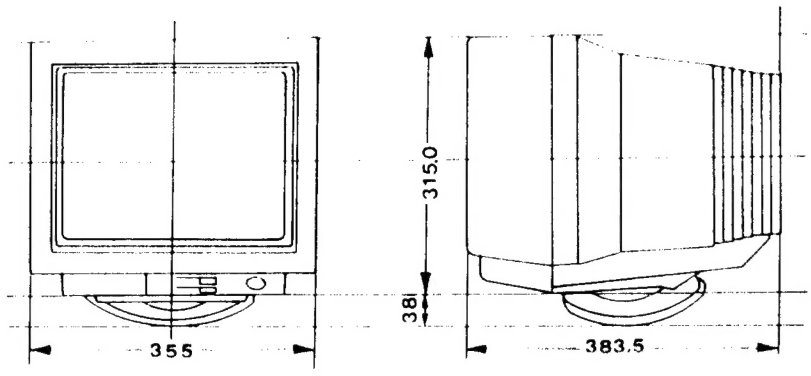
2. FEATURES

- 0.28mm dot-pitch tinted non-glare high resolution 14" CRT
- high reliability, high performance and five modes, multidisplay, high resolution color monitor
- built-in switching regulator power circuit, can be used with 110V AC, 60Hz / 220V AC, 50Hz

3. SPECIFICATIONS

PICTURE TUBE	14" Color, 90 degree deflection Non-glare, tinted screen Phosphor P22, 0.28mm dot pitch
DISPLAY AREA	240mm (H) x 180mm (V)
COMPATIBILITY	Super VGA, VGA, 8514/A, Apple MAC II
RESOLUTION	Super VGA: 800 pixels (H) x 600 lines (V) VGA: 640 x 480 / 640 x 400 / 640 x 350 8514/A: 1024 x 768 (interlaced) Apple MAC II: 640 x 480
SYNCHRONIZATION (SCAN FREQUENCY)	Horizontal: 31.468 kHz and 35.52 kHz Vertical: 55 ~ 86Hz
VIDEO-BANDWIDTH	45 MHz
INPUT SIGNAL	Video: RGB analog Sync: TTL separate, composite
INPUT CONNECTOR	1.2m (4 ft.) signal cable with 15-pin, D-shell male connector Optional 15-pin adapter for Apple MAC II
POWER REQUIREMENTS	110V AC, 60Hz / 220V AC, 50Hz 75 Watts maximum consumption

WEIGHT 14kg (30.8 lbs) gross



4. ENVIRONMENTAL REQUIREMENTS

Temperature

- ENCLOSED CABINET: $15^{o}C \sim 40^{o}$ (operating)
  $-20^{o}C \sim 60^{o}C$ (storage)

Humidity

- OPERATING: 10 ~ 80%, non-condensing
- STORAGE: 10 ~ 90%, non-condensing

Altitude

- OPERATING: up to 10,000 ft.
- STORAGE: up to 30,000 ft.

5. SAFETY PRECAUTIONS

Do not plug in the monitor unless the red voltage switch on the back of the monitor is set to the same voltage as that of the power outlet you plan to use. If you are not sure whether the switch is properly set, consult your dealer.

- Do not attempt to modify the monitor's three-prong power plug in any way.
- Do not push objects of any kind through openings in the monitor.
- Unplug the monitor immediately and have it checked by qualified service personnel if:
  - Liquid has been spilled into the monitor, or if it has been exposed to excessive moisture.
  - The unit has been dropped or damaged.
  - Fuses blow repeatedly.
  - The power cord is frayed or otherwise damaged.
- When replacement parts are required, be sure the service technician uses components specified by the manufacturer. Unauthorized substitutions may result in fire, electrical shock or other hazards.

6. INPUT SIGNAL TIMING

	350 line mode 1	400 line mode 2	480 line mode 3	600 line mode 4	768 line mode 5
H FREQUENCY (KHz)	31.47	31.47	31.47	35.2	35.52
H TOTAL TIME (μs)	31.778	31.778	31.778	28.4	28.15
HPW (μs)	3.83	3.83	3.83	2.84	3.9195
HFP (μs)	0.636	0.636	0.636	0.59	0.17816
HBP (μs)	1.907	1.907	1.907	2.27	1.2471
H DISPLAY (μs)	26.058	26.058	26.058	22.7	22.8045
H PIXELS	640	720	640	800	1024
V FREQUENCY (Hz)	70	70	60	56	86.962
V TOTAL TIME (ms)	14.268	14.268	16.65	17.84	11.499
VPW (ms)	0.064	0.064	0.064	0.057	0.113
VFP (ms)	1.176	0.381	0.286	0.043	0.0141
VBP (ms)	1.906	1.111	1.048	0.74	0.577
V DISPLAY (ms)	11.122	12.711	15.253	17.0	10.8096
NO. OF LINES	350	400	480	600	768
VIDEO DOT CLOCK (MHz)	25.17	28.32	25.17	35.2	44.9

*H: horizontal
*V: vertical

Control Mode Polarity

MODE:	1	2	3	4	5
H SYNC:	+	–	–	–	+
V SYNC:	–	+	–	–	+

7. THEORY OF OPERATION

Switch Mode Power Supply

U901 SG3842 is a current mode control IC. To avoid the screen being interfered, its circuit applies SYNC trigger.

Pin 6 is the output signal. Pin 6 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 D920, D921, D922 and D923, to obtain output voltage by way of the π filter circuit.

Pin 3 offers over voltage protection, which detects the source current of Q901 via R911. When the output is over the limit, the voltage will be cut to zero volts. The 18V input will be regulated to 12V output via regulator U108.

TH901 is a positive temperature coefficient resistance. It performs degaussing function when the power is on.

See figure SD6400120100002-1 of 3(p.37).

Input Circuit

From the SYNC signal of U101 74LS86, we know the shaping and polarity status. We also get positive H-SYNC output from pin 8, and positive V-SYNC output from pin 6.

In order to make sure that the H-SYNC output and V-SYNC output have the same pulse width, we use R109, C111, R110 and C112 to get V-SYNC output from pin 13 and H-SYNC output from pin 5 of U102 74LS123.

See figure SD6400120010002 - 2 of 3 (p. 37).

Mode Detector

U103 LM567 is a low power tone decoder. The cut-in point of frequency is determined by VR112 and C116. When the output of pin 8 is 12V, the frequency is 31KHz; When the output is zero volt, the frequency is 35KHz.

See figure SD6400120010002 - 2 of 3 (p. 37).

H-deflection Circuit

U106 HA11235 is adopted to be the deflection IC. Pin 16 of U106 is a H-SYNC input.

H-DRIVE pulse is the output at pin 10.

Auto H-HOLD is completed by the current source controller CKT which is composed of U104, Q303, Q301, Q304, and U102.

Pin 9 is an X-ray protection, the reference signal of pin 9 is provided by fly back transformer pin 6.

H-PHASE is controlled by pin 13. Its reference signal also comes from fly back transformer pin 6.

Q403 is a H-OUTPUT transistor. Q403 produces high voltage output at fly back transformer pin 10 by way of the ON/OFF control Q305, T401.

See figure SD6400120100002 - 2 of 3, 3 of 3 (p. 37).

V-deflection Circuit

U106 HA11235 is also a vertical process IC, its pin 7 is a SYNC input point.

V-SIZE is controlled by the current which passes through pin 4.

V-HOLD is controlled by VR207, R216, and C209. The vertical sawtooth wave comes out from pin2, is amplified by Q204, Q205, Q206, Q208, and is applied to the vertical defection yoke.

See figure SD6400120100002 - 2 of 3, 3 of 3 (p. 37).

Video Amplifier

U701 LM1203 is adopted to be a pre-amplifier.

R, G and B are separately send into pin 4, pin 6 and pin 9, while the clamp pulse is the input at pin 14.

Pin 15, pin 19, and pin 24 control the black level.

Pin 18, pin 22, and pin 27 control the white balance.

VR702, VR722, and VR742 control the dark balance.

R, G, and B are the output of pin 16, pin 20 and pin 25 individually.

Q741, Q742, Q721, Q722, Q701, and Q702 make up the cascode circuit, and amplify R, G, and B indivisually.

Q744, Q743, Q724, Q723, Q704 and Q703 make up single end push pull circuit to promote band width.

See figure SD6400120100001 (p. 37).

8. CONTROLS AND ADJUSTMENTS

Turn VR702, VR722, VR742 clockwise to the end and the other variable resistors to the mid-position. Warm up for at least thirty minutes.

1. B^+ ADJUSTMENT:

a. Apply 31.5 KHz cross hatch pattern.

b. Adjust VR901 to obtain 90V DC at D502 cathode end.

2. CUT-OFF (G1) VOLTAGE ADJUSTMENT:

a. Adjust the BRIGHTNESS controller to the right end.

b. Adjust VR501 (SUB-BRIGHTNESS) to obtain -20 volts at G1 point.

3. H FREE RUNNING:

a. Make one end of R304 termination short.

b. Apply 35KHz full white pattern.

c. Adjust VR301 (H-HOLD) to obtain the best H FREE RUNNING.

4. H-CENTER ADJUSTMENT:

a. Apply 31.5 KHz cross hatch pattern.

b. Adjust G2 screen variable resistor to make raster visible.

c. Adjust VR503 (H-CENTER) to put the raster on the center of the screen.

5. H-PHASE ADJUSTMENT:

a. Apply 31.5KHz cross hatch pattern.

b. Adjust VR303 (H-PHASE) until the the image is on the center of the raster.

6. H-WIDTH ADJUSTMENT:

a. Apply 31.5KHz cross hatch pattern.

b. Adjust L402 to obtain 240mm horizontal width.

7. V-CENTER ADJUSTMENT:

a. Apply 31.5KHz cross hatch pattern.

b. Adjust VR206 (V-CENTER) to place the image on the center of the screen.

8. V-LINEARITY ADJUSTMENT:

a. Apply 31.5KHz cross hatch pattern.

b. Adjust VR204 (V-LIN) to meet the linearity specifications.

9. V-SIZE ADJUSTMENT:

a. Apply VGA cross hatch pattern in 480 mode, then adjust VR201 to get 180mm vertical size.

b. Apply VGA cross hatch pattern in 400 mode, then adjust VR203 to get 180mm vertical size.

c. Apply VGA cross hatch pattern in 350 mode, then adjust VR202 to get 180mm vertical size.

10. PIN-CUSHION ADJUSTMENT:

a. Apply 31.5KHz cross hatch patten.

b. Adjust VR401 (PIN-GAIN) and VR402 (PIN-PHASE) to meet the pincushion's specifications.

11. HV PROTECTION ADJUSTMENT:

a. Apply 31.5KHz cross hatch patten.

b. Adjust VR502 (X-RAY) to obtain 3.7V DC at D302 Cathode end.

12. BLACK LEVEL ADJUSTMENT:

a. Apply raster pattern only.

b. Adjust the BRIGHTNESS controller to the right end and the CONTRAST controller to the left end.

c. Adjust G2 variable resistor to obtain 0.8~1.2FL on the screen.

d. Keep the original raster colors and adjust VR702, VR722, VR742 to obtain 0.240±0.02/0.250±0.02 X/Y coordinates.

13. WHITE BALANCE:

a. Apply 31.5KHz full white pattern.

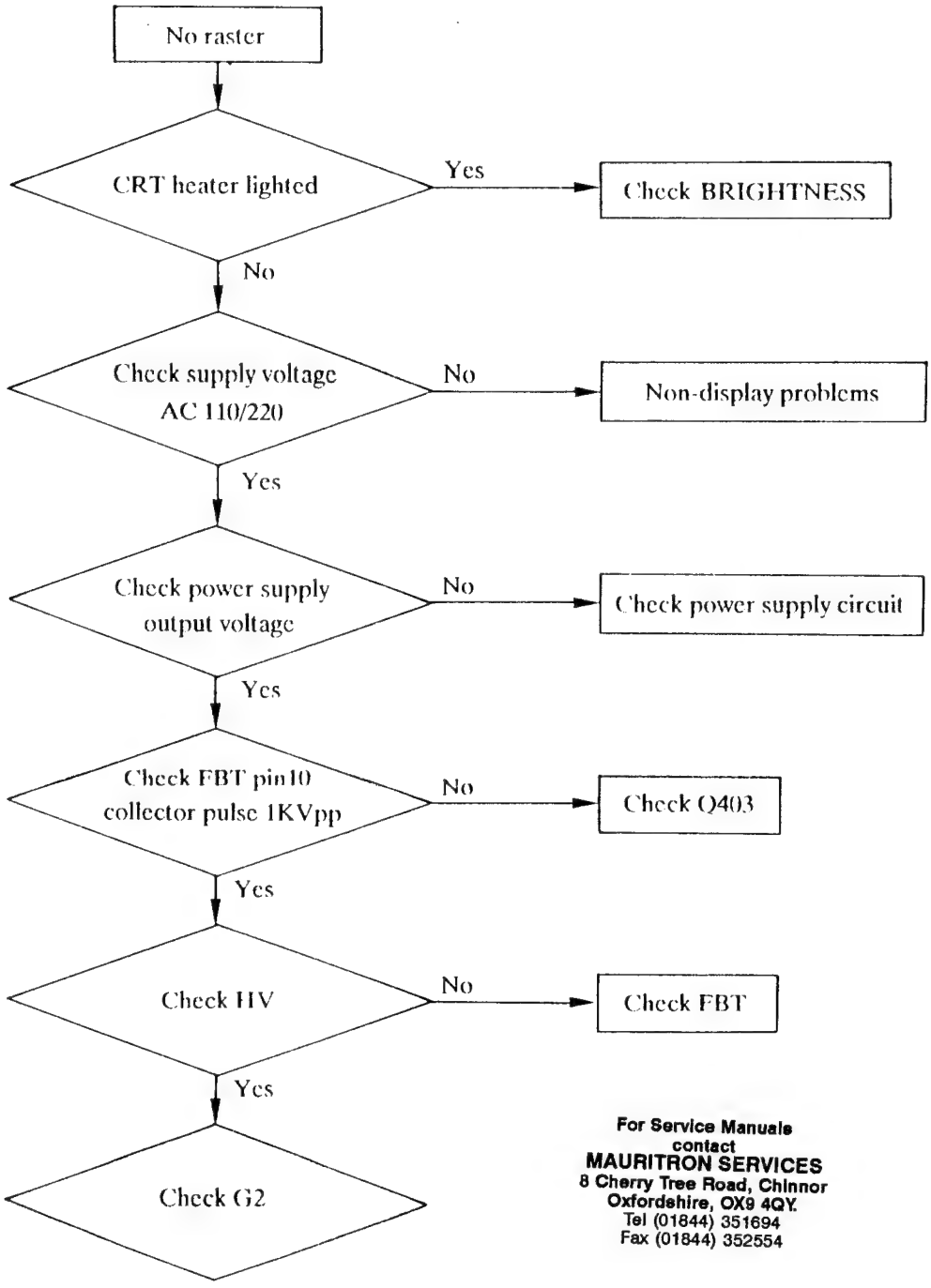
b. Adjust the BRIGHTNESS controller to the mid-position and the CONTRAST controller to the right end.

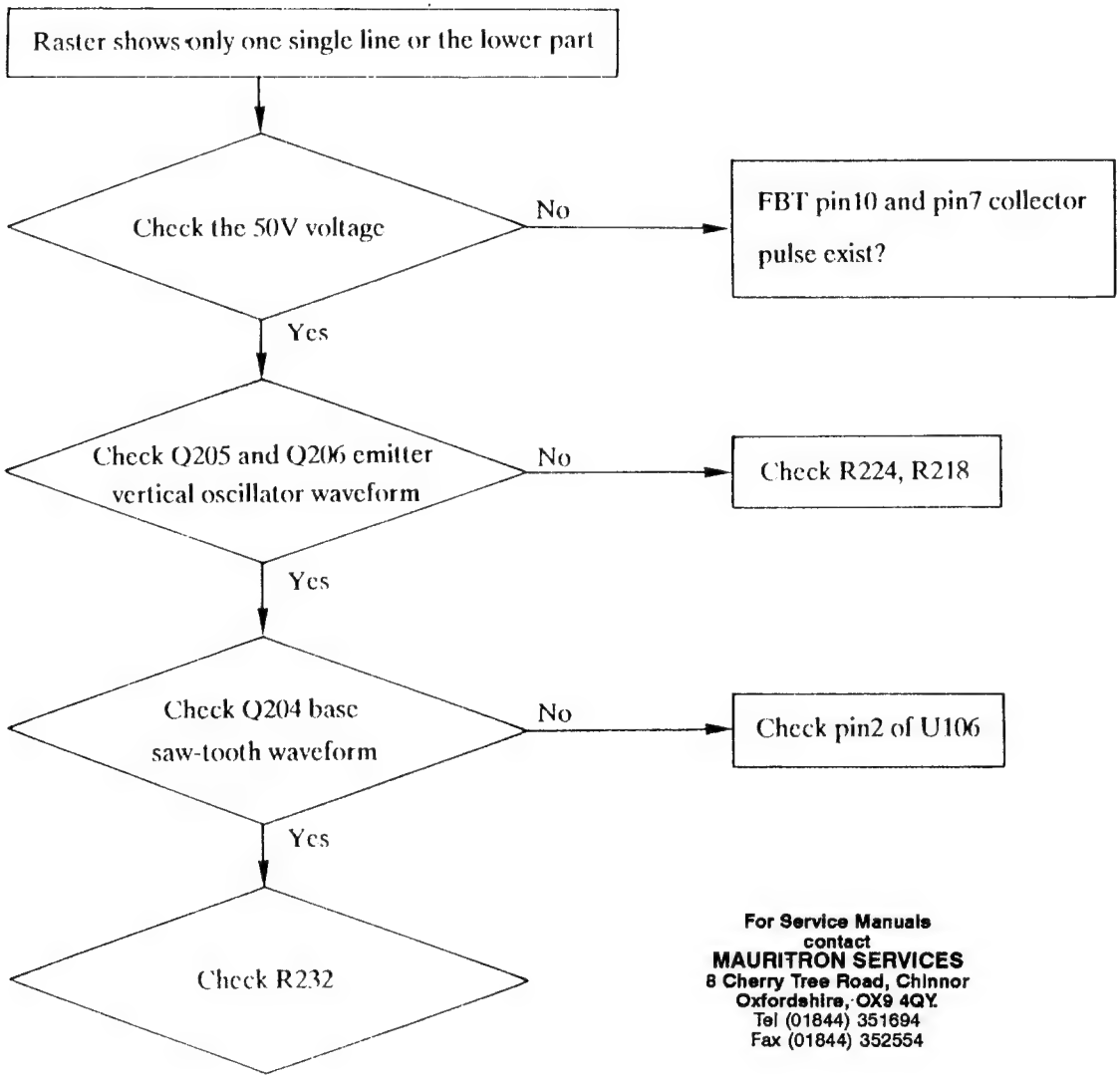
c. Adjust VR701, VR721 to obtain 0.281/0.311 X/Y coordinates.

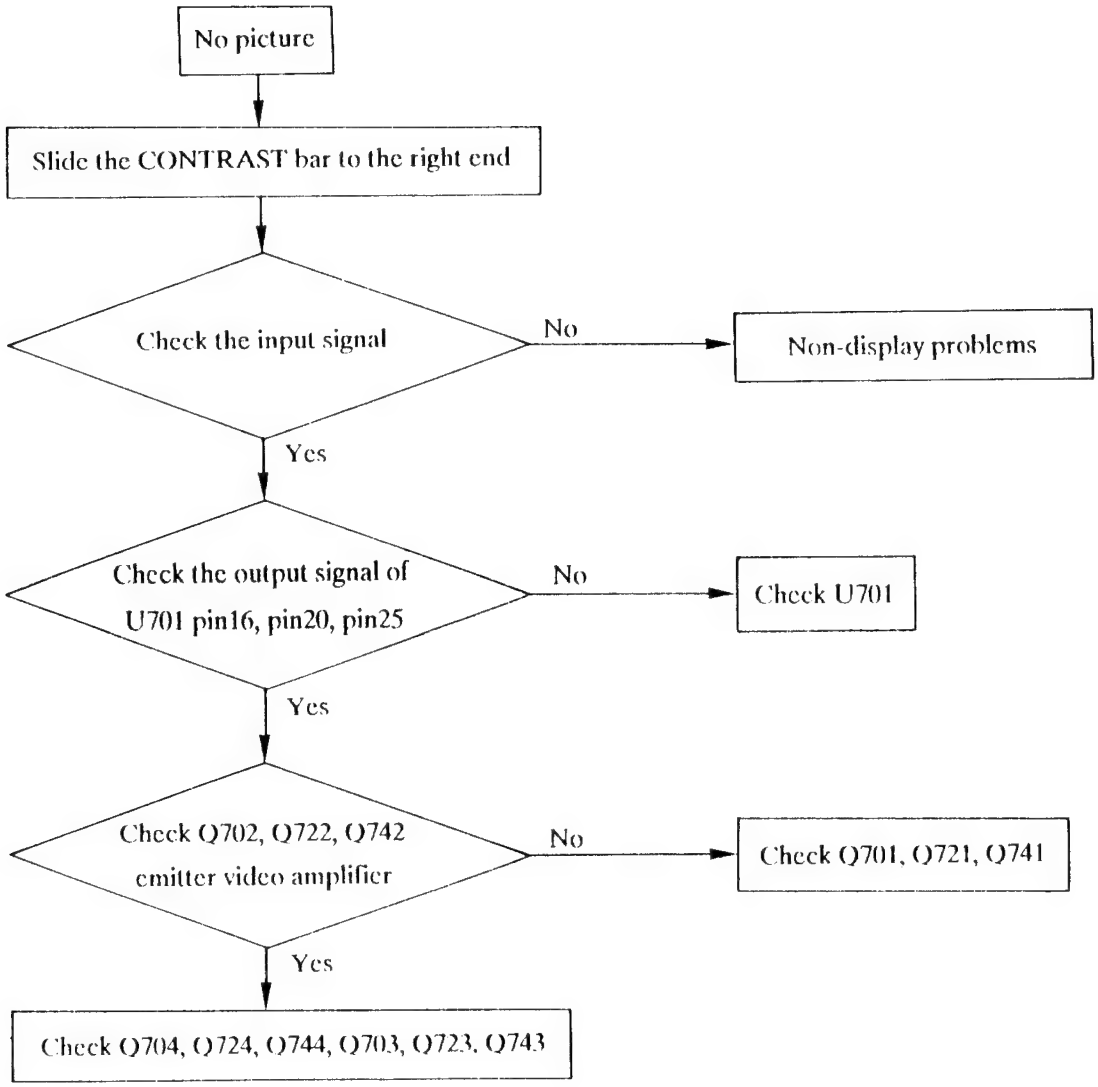
d. Adjust the CONTRAST controller to get Y = 3.5FL.

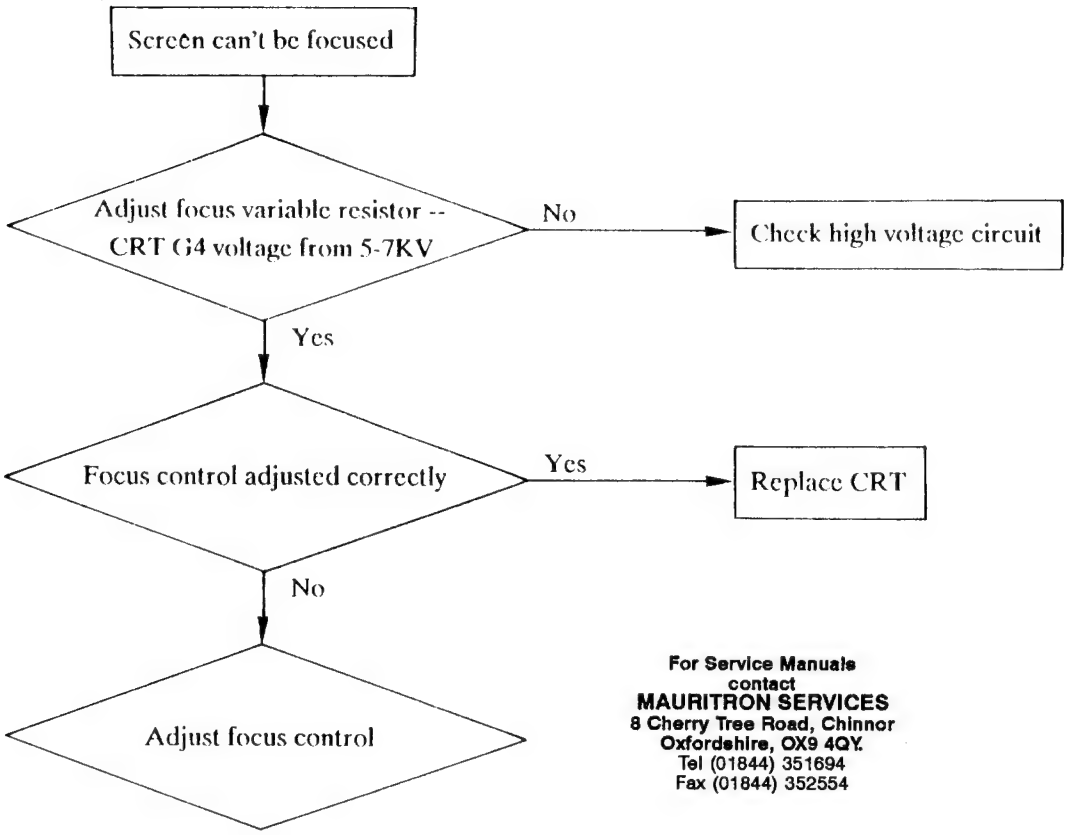
e. Adjust VR702, VR742 to get 0.281/0.311 X/Y coordinates.

9. TROUBLESHOOTING

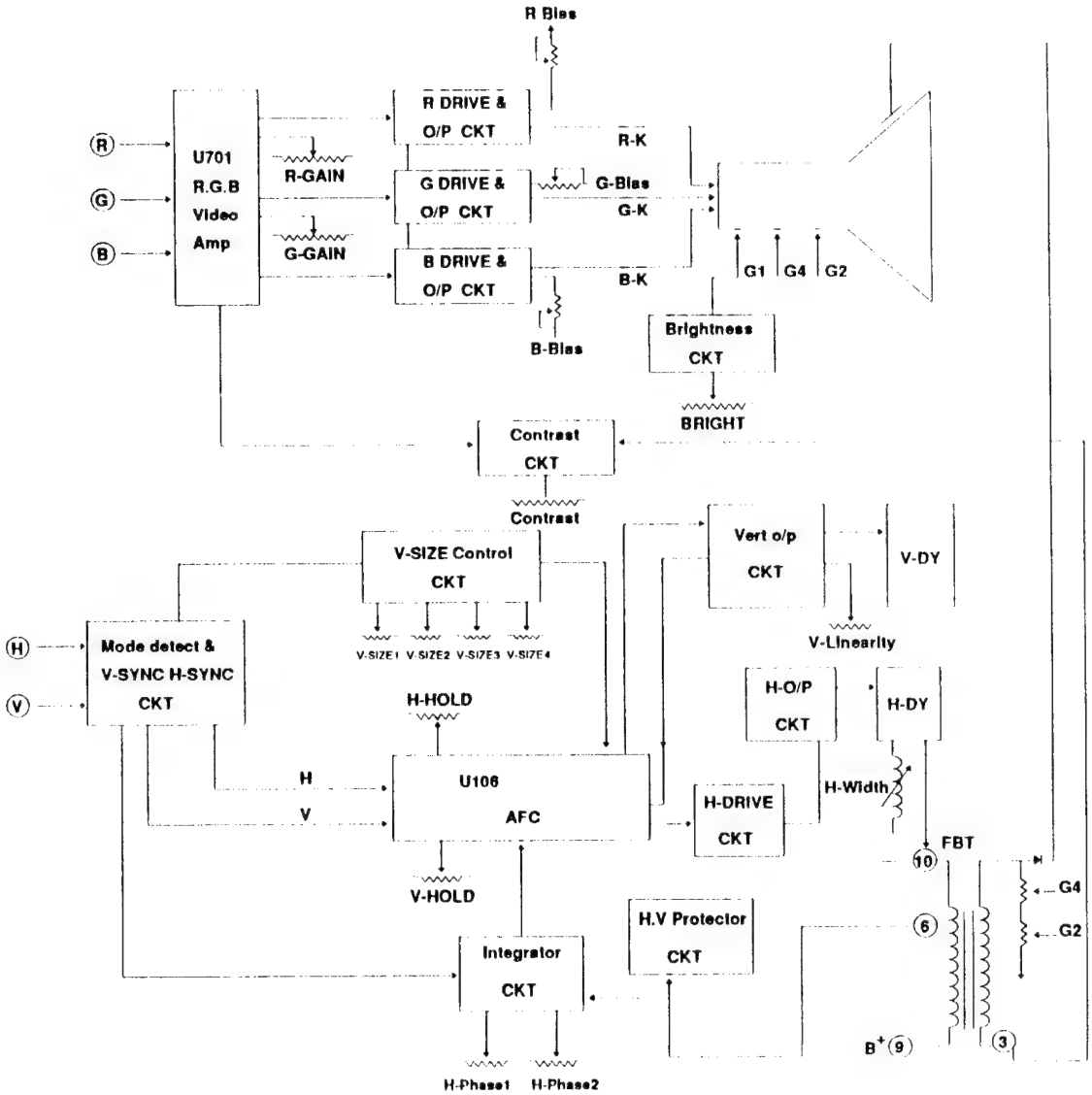








10. BLOCK DIAGRAMS



11. PARTS LIST

CRT BOARD

	Name	Description	Part Number
	PCB	PW-M1420 CRT BD COMM	630012010001
⚠	CRT	14", CLR, M34KBV80X11	643500010001
⚠	CRT	14", CLR, M34KDD50XE02J	643500010007
⚠	CRT	14", CLR, M34JUQ23XX229(S)	643500010003
	CRT	14", CLR, M34JUQ23XX229(M3)(S)	643500010004
	CRT SOCKET	9P, CLR/VGA	633100050001
	HEATSINK	CRT BOARD, M1420 COMM	634312000003
	INSULATOR	TO220, M1420 COMM	634612000002
	HEAT SINK OIL	AK-100	600100000001

RES

Location	Description	Part Number
R744	130, 5%, 1/4W, CF, AX	631100210131
R702, 722, 742, 703, 723,743	10K, 5%, 1/4W, CF, AX	631100210103
R763, R764	1.5K, 5%, 1/4W, CF, AX	631100210152
R761, 762	22, 5%, 1/4W, CF, AX	631100210220
R715, 735, 755	220, 5%, 1/4W, CF, AX	631100210221
R765	4.3K, 5%, 1/4W, CF, AX	631100210432
R705, 725, 745	390, 5%, 1/4W, CF, AX	631100210391
R713	39K, 5%, 1/4W, MF, AX	631100210393
R714	5.6K, 5%, 1/4W, CF, AX	631100210562
R711, 731, 751	75K, 5%, 1/4W, CF, AX	631100210753
R701, 721, 741	75, 5%, 1/4W, CF, AX	631100210750
R706, 707, 726, 727, 746, 747	82, 5%, 1/4W, CF, AX	631100210820
R712, 732, 752	100, 5%, 1/2W, CF, AX	631100220101
R708, 728, 748	15K, 5%, 1/2W, CF, AX	631100220153
R766	2K, 5%, 1/2W, CF, AX	631100220202
R767	22K, 5%, 1/2W, CF, AX	631100220223
R709, 710, 729, 730, 749, 750	470, 5%, 3W, MOF, AX, MINI	631101070471
R704, 724	33, 5%, 1/4W, CF, AX	631100210330
R700, 720, 740	1M, 5%, 1/4W, CF, AX	631100211105

WARNING:

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

VR

Location	Description	Part Number
VR702, 722, 742	20K, 20%, 3W, B, V, 6MM	631120060203
VR701, 721	100, 30%, 3W, B, V, 6MM	631120061101

CAP

Location	Description	Part Number
C705, 725, 745	68.OP, 5%, 50V, CD, NPO	631200013680
C704, 724, 744, 703, 723, 743, 772	.1U, 205, 50V, MLC, RA, 25U	631200095104
C768	100U, 20%, 16V, ALU, 85'C	631202535107
C763, 771	470U, 20%, 16V, ALU, 85'C	631202535477
C701, 721, 741, 760	10.OU, 20%, 50V, ALU, 85'C	631202565106
C706, 726, 746	1.0U, 20%, 160V, ALU, 85'C	631202605105
C707, 727, 747, 761	10.OU, 20%, 160V, ALU, 85'C	631202605106
C702, 722, 742, 764, 765, 766, 767, 708	.01U, +80-20%, 50V, HI-K, 25V	631204017103
C769, 770	.01U, +80-20%, 1KV, HI-K, 25U	631204157103

COIL

Location	Description	Part Number
L701, 721, 741	PEAKING, 3.3UH, 10%	631300010001
L761	CHOKE, 125UH, 10%	631300020002

DIODE

Location	Description	Part Number
D701, 721, 741	1N4148	632001014148

TRANS

Location	Description	Part Number
Q705, 725, 745	2SD669AC, NPN	632031010669
Q701, 721, 741	2SC945Q, NPN	632031010945
Q703, 723, 743	2SB1109C, PNP	632031011109
Q704, 724, 744	2SD1609C, NPN	632031011609
Q702, 722, 742	2SC3955, NPN	632031013955

IC

Location	Description	Part Number
U701	LM1203, VIDED PROCESSOR	632200211203

CON

Location	Description	Part Number
J703	HDR, MA, 2P*1, ST, TIN, 7.5MM	633100110002
J704	HDR, SHROUDED, MA, 3P*1, ST, TIN	633100110203
J701	HDR, SHROUDED, MA, 6P*1, ST, TIN	633100110206
J702	HDR, SHROUDED, MA, 7P*1, ST, TIN	633100110207

JUMPER WIRE

Location	Description	Part Number
JP101, 108	D.6, 5MM, TIN	633200050001
JP201 TO JP217	D.6, 10MM, TIN	633200050002

SPARK GAP

Location	Description	Part Number
SP704	300V, 30%	633500110002
SP701, 702, 703	200V, 20%	633500110003
SP701, 702, 703	200V, 20%, NE	633500110004
SP704	300V, 20%, NE	633500110003
SP701, 702, 703, 704	.75P, 1KV	633500110006

MAIN BOARD

RES

Location	Description	Part Number
R110	22.1K, 1%, 1/4W, MF, AX	631100012212
R323	46.4K, 1%, 1/4W, MF, AX	631100014642
R317	7.68K, 1%, 1/4W, MF, AX	631100017681
R216	8.66K, 1%, 1/4W, MF, AX	631100018661
R222,R230,231	10, 5%, 1/4W, CF, AX	631100210100
R510	100, 5%, 1/4W, CF, AX	631100210101
R225,111,107,106,307,308,352,301,304,305, 327,204,206,208,214,202,201,521,102,519, 907,911,922	1.0K, 5%, 1/4W, CF, AX	631100210102
R227,228,229,114,115,318,520,502,503, 512,508,913	10K, 5%, 1/4W, CF, AX	631100210103
R523	100K, 5%, 1/4W, CF, AX	631100210104
R213,518,511	1.2K, 5%, 1/4W, CF, AX	631100210122
R310,315,209	1.5K, 5%, 1/4W, CF, AX	631100210152
R404	180, 5%, 1/4W, CF, AX	631100210181
R321	18K, 5%, 1/4W, CF, AX	631100210183
R113,506,505	2.0K, 5%, 1/4W, CF, AX	631100210202
R408,912	20K, 5%, 1/4W, CF, AX	631100210203
R909	20K, 5%, 1/4W, CF, AX	631100210203
R331	200K, 5%, 1/4W, CF, AX	631100210204
R908,915	22, 5%, 1/4W, CF, AX	631100210220
R221	220, 5%, 1/4W, CF, AX	631100210221
R210	22K, 5%, 1/4W, CF, AX	631100210223
R105, 215	300, 5%, 1/4W, CF, AX	631100210301
R910	3.0K, 5%, 1/4W, CF, AX	631100210302
R302,324	33, 5%, 1/4W, CF, AX	631100210330
R108,513	330, 5%, 1/4W, CF, AX	631100210331
R218,320,401, 217	3.3K, 5%, 1/4W, CF, AX	631100210332
R403	4.3K, 5%, 1/4W, CF, AX	631100210432
R326	470, 5%, 1/4W, CF, AX	631100210471
R313,312,309,306,322,325,212,104,103	4.7K, 5%, 1/4W, CF, AX	631100210472
*R601	470K, 5%, 1/4W, CF, AX	631100210474
R205 , R116	510, 5%, 1/4W, CF, AX	631100210511
R303,203,353	5.1K, 5%, 1/4W, CF, AX	631100210512
R112	2.8K, 1%, 1/4W, MF, AX	631100012801

* means for 1420A only.

Location	Description	Part Number
R109,316,314	51K, 5%, 1/4W, CF, AX	631100210513
R406	56, 5%, 1/4W, CF, AX	631100210560
R405,509	560, 5%, 1/4W, CF, AX	631100210561
R211	5.6K, 5%, 1/4W, CF, AX	631100210562
R914	68, 5%, 1/4W, CF, AX	631100210680
R402	75K, 5%, 1/4W, CF, AX	631100210753
R522	8.2K, 5%, 1/4W, CF, AX	631100210822
R504,920,921	10, 5%, 1/2W, CF, AX	631100220100
R901	1M, 5%, 1/2W, CF, AX	631100220105
R101,224	150, 5%, 1/2W, CF, AX	631100220151
R507	180K, 5%, 1/2W, CF, AX	631100220184
R923	.2, 5%, 1/2W, CF, AX	631100220208
R219	220, 5%, 1/2W, CF, AX	631100220221
R515,516	2.2, 5%, 1/2W, CF, AX	631100220229
R514	120K, 5%, 1/2W, CF, AX	631100220124
R328	1K, 5%, 1/2W, CF, AX	631100220102
R207	47, 5%, 1/2W, CF, AX	631100220470
R220	1.8, 5%, 1W, MOF, AX, MINI	631101050189
R226	2.0, 5%, 1W, MOF, AX, MINI	631101050209
R223	.33, 5%, 1W, MOF, AX, MINI	631101050338
R902,903	47K, 5%, 2W, MOF, AX, MINI	631101060473
R906	.50, 5%, 2W, MOF, AX, MINI	631101060508
R905	390, 5%, 3W, MOF, AX, MINI	631101070391
R904	22K, 5%, 5W, MOF, AX, MINI	631101080223
R501	10K, 5%, 2W, MOF, F, MINI	631101140103
R517	20, 5%, 2W, MOF, F, MINI	631101140200
R329	150, 5%, 3W, MOF, AX, MINI	631101070151
R409	680, 5%, 2W, MOF, F, MINI	631101140681
R319	8.25K, 1%, 1/4W, MF, AX	631100018251
R330	6.19K, 1%, 1/4W, MF, AX	631100016191

VR

Location	Description	Part Number
VR303,206,205	10K, 20%, .05W, B, V, 12MM, W/SHAFT	631120052103
VR202,402	1K, 20%, 1/2W, B, V, 8MM	631120050102
VR401	10K, 20%, 1/2W, B, V, 8MM	631120050103
VR204,301	2K, 20%, 1/2W, B, V, 8MM	631120050202
VR503	60, 20%, 2W, B, H, 8MM	631120120600
VR901	1K, 20%, 1/2W, B, H, 8MM	631120100102
VR502	10K, 20%, 1/2W, B, H, 8MM	631120100103
VR501	100K, 20%, .3W, B, H, 6MM	631120100104

NTCR

Location	Description	Part Number
TH902	50HM, 15%, DISK, 08SPOOSL	631120510509
TH901	200HM, 270V	631120550201

CAP

	Location	Description	Part Number
	C212,217,910	100P, 5%, 50V, CD, NPO	631200013101
	C210	150P, 5%, 50V, CD, NPO	631200013151
	C211	270P, 5%, 50V, CD, NPO	631200013271
	C206	10U, 5%, 16V, TT, F	631201123106
	C330	2.2U, 10%, 25V, TT, F	631201143225
	C209	1U, 10%, 35V, TT, F	631201154105
	C106,219,220,406,214,109 , 314, 316	.01U, 20%, 50V, SEMI, YSV	631201555103
	C908,107,302,313,501,340	.1U, 205, 50V, MLC, RA, ZSU	631201555104
	*C602, 603	.1U, 205, 50V, MLC, RA, ZSU	631201555104
⚠	C411	2700P, 5%, 2KV, MPP	631201853272
⚠	C410	2200P, 5%, 2KV, MPP	631201853222
⚠	C408	.22U, 55, 250V, PP	631202013224
⚠	C409	.33U, 5%, 250V, PP	631202013334
	C309	2200P, 5%, 100V, PP, F	631202073222
	C116	.01U, 1%, 63V, MEF, BOX	631202091103
	C100, 103, 111,304	1000P, 5%, 63V, MEF	631202093102
	C113,300, 311,308	.01U, 50V, 5%, MEF, RA, ST	631202093103
	C319,221,913, 321	.1U, 50V, 5%, MEF, RA, ST	631202093104
	C507	.22U, 5%, 63V, MEF	631202103224
	C511	.039U, 5%, 63V, MEF	631202103393
	C305	4700P, 50V, 5%, MEF, RA, ST	631202093472
	C510	.22, 5%, 250V, MEF, AX, TUBE	631202203224
	C912	8200P, 5%, 50V, PE	631202213822
	C310	1500P, 2%, 50V, PE, RA, F	631202242152
	C208,303,105	100U, 20%, 16V, ALU, 85'C	631202535107
	C213	2200U, 20%, 16V, ALU, 85'C	631202535228
	C404,101	47.0U, 20%, 16V, ALU, 85'C	631202535476
⚠	*C930,931,108,104,301,405	470U, 20%, 16V, ALU, 85'C	631202535477
	C907	100U, 20%, 25V, ALU, 85'C	631202545017
	C218	1000U, 20%, 25V, ALU, 85'C	631202545108
	C506	22.0U, 20%, 25V, ALU, 85'C	631202545226
	C403	33.0U, 20%, 25V, ALU, 85'C	631202545336
	C412, 315	47OU, 20%, 25V, ALU, 85'C	631202545477
	C928,929	1000U, 20%, 35V, ALU, 85'C	631202555108
	C112	1000P, 2%, 50V, MEF, RA, F	631202202102
	C312	6800P, 50V, 5%, MEF, RA, ST	631202093682

* means for 1420A only.

Location	Description	Part Number
C204,307,130,114	1.0U, 20% 50V. ALU, 85'C	631202565105
C932,318,320,207,317,102 , 115	10.0U, 20%, 50V, ALU, 85'C	631202565106
*C601	10.0U, 20%, 50V, ALU, 85'C	631202565106
C202	2.2U, 20%, 50V, ALU, 85'C	631202565225
C402	4.7U, 20%, 50V, ALU, 85'C	631202565475
C508	47.0U, 20%, 50V, ALU, 85'C	631202565476
C216,205	1.0U, 20%, 100V, ALU, 85'C	631202595105
C401	10.0U, 20%, 100V, ALU, 85'C	631202595106
C509	100U, 20%, 100V, ALU, 85'C	631202595107
C924,925,926,927,503	100U, 20%, 160V, ALU, 85'C	631202605107
C505	10.0U, 20%, 250V, ALU, 85'C	631202625106
C903,904	220U, 20%, 200V, ALU, 105'C,F	631202910227
C201	10U, 20%, 50V, BP ALU, 85'C	631203165106
C909	.01U, +80-20%, 50V, HI-K, 25V	631204017103
C905	.047U, +80-20%, 1KV, HI-K, 25V	631204067473
C203	.01U, 20%, 100V, HI-K, 25U	631204115103
C920,921,922,923	1000P, 20% 1KV, HI-K, 25U	631204155102
C110	1000P, 10%, 50V, HI-K, Y5P	631204374102
C215	470P, 10%, 50V, HI-K, Y5P	631204374471
C911	560P, 20%, 50V, HI-K, Y5P	631204375561
C504,502	.01U 10%, 500V,HI-K, Y5P	631204414103
C407	1000P, 10%, 1KV, HI-K, Y5P	631204424102
C906	270P, 20%, 1KV, HI-K, Y5P	631204425271
C901,902	.22U, 20%, 250VAC, X-CAP	631209015224
C914	4700P, 20%, 250VAC, 25U, SFTY, Y-CAP	631209215472

COIL

Location	Description	Part Number
L501	CHOKE, 1mH, 10%, TR8534	631300020001
L920,921,922	CHOKE, 100UH, 10%	631300020003
L401	LINEARITY, TR8541	631300030001
L402	WIDTH, 14", M1420A	631300040001

FBT

Location	Description	Part Number
⚠ T403	31.46/35.52KHZ	631360010005

XSFORMER

Location	Description	Part Number
T401	HOR DRIVE, EE19, TR8537	631360030001
T402	SIDE PINCUSHION	631360050001
T902	PWR, EE42/15, TR8536	631360070001
T901	LINE FILTER, EE25.4, TR8528	631360110002

* means for 1420A only.

DIODE

	Location	Description	Part Number
	D204	G2B, VRRM100V	632001010002
	D901,902,903,904	20D10, VRRM1000V	632001010020
	D922,923	BYM26B, VRRM400V	632001010026
	D920,921	BYM26C, VRRM600V	632001010027
	D906,512,511	UF4002, VRRM100V	632001014002
	D508,509,501,502,503	UF4003, VRRM200V	632001014003
	D505,510	UF4004,VRRM400V	632001014004
	D905	UF4006	632001014006
	D908,909,504,506,513,201,202,301,514	1N4148	632001014148
	D101, 302	HZC2, ZENER, 5V, 5%	632002010005
	D302	HZC2, ZENER, 5V, 5%	632002010005
	D907,507	BZX79C15,ZENER	632002010079
	D924	BZX79B7V5, ZENER, 2%	632002010080
	D401	UF4002	632001014002

TRANS

	Location	Description	Part Number
	Q305	BD139, NPN, 5A, 8W	632031010139
	Q402	BD140, PNP, 1.5A, 8W	632031010140
	Q208	BD649,PNP	632031010649
	Q206	BD241B, NPN, 5A, 40W	632031010241
	Q205	BD242B, PNP, 5A, 40W	632031010242
	Q502	BF423, PNP, 830MW	632031010423
	Q303,203,102	2SA733Q, PNP	632031010733
	Q103,201,101,209,210,Q301,304,302, 401,207,Q202,204,506,507,501	SC945Q, NPN	632031010945
	Q403	BUH515D	632031010515
⚠	Q503	2SD1138C, NPN	632031011138
	Q504,505	2SC2910, NPN	632031012910
⚠	Q901	BUZ80A, FET	632031020080
	Q901	BUK456-800A, FET, TO-220, N	632032010456
	Q902	BT151-500R	632033110151

IC

Location	Description	Part Number
U101	74LS86A, QUAD 2I/P OR GATES	632100090086
U102	74LS123	632100090123
U104	LM358, DUAL OP/AMP	632200010358
U107	LM393, COMPARTOR	632200010393
U103	LM567C,OP, TONE DECODER	632200010567
U108	MC78M12BC, VOLTAGE REGULATOR, 12V	632200110078
U109	MC78L15AC, VOLTAGE REGULATOR, 15V	632200110079
U601	LM1881, VIDEO SYNC SEPARATOR	632200211881
U106	HA11235, SYN. SIGNAL PROCESS SYS	632200310001
U901	3842, CURRENT-MODE PWM CTLR	632200313842
U105	4066BC, QUAD BILATERAL SW	632200314066

CON

Location	Description	Part Number
J902	HDR, MA, 2Px1, ST, TIN, 7.5MM	633100110002
J401	HDR, MA, 6Px1, ST, TIN	633100110006
J102	HDR, SHROUDED, MA, 2Px1. ST, TIN	633100110202
J501	HDR, SHROUDED, MA, 3Px1. ST, TIN	633100110203
J010	HDR, SHROUDED, MA, 4Px1, ST, TIN	633100110204
J601	HDR, SHROUDED, MA, 7Px1, ST, TIN	633100110207
J901	WFR, MA, 3Px1, ST	633100110303

WIRE

Location	Description	Part number
BB' TO B'B CC TO C'C	1007, #24, YEL, 110MM, 7/7	633200012401
DD' TO D'D FF' TO F'F	1007, #24, BLU, 200MM, 7/7	633200012402
AA' TO A'A	1007, #24, RED, 300MM, 7/7	633200012403

JUMPER WIRE

Location	Description	Part Number
*JP102 TO JP107	D.6, 5MM. TIN	633200050001
*JP218 TO JP264	D.6, 10MM. TIN	633200050002
JP301 TO JP305	D.6, 15MM, TIN	633200050003
*JP306	D.6, 15MM, TIN	633200050003

* means for 1420A only.

FUSE

	Location	Description	Part Number
⚠	F901	250V/3A, SLO, UL/CSA	633500010001
		5x20MM, FC-04-01	633500020001

WIRE ASSY

Location	Description	Part Number
TO CRT PCB J701	7P, 1007, #24, 160MM	642200010104
LK TO LK	2W, 1007, #24, RED/BED/BLD, 170MM	642200010201
*	2W, 1007, #24. BWN/GRN, 35CM	642200010202
SW 110V TO 220V	2W, 1015, #22, BLK/WHT, 270MM	642200010252
	RECT, GRN, 2x5, .1	633400010001
FOR LED	2P, 1007, #24, RED/BLK, 270MM	642200010101
	D2 .36MM, L14.2MM, H10.25MM	633100990001
	AK-100	600100000001
	SC121	600100000002
	SOLDER MASK, D12MM	225000000107
	BLANK, PAPER, 38x5, MPC2000	242660110409

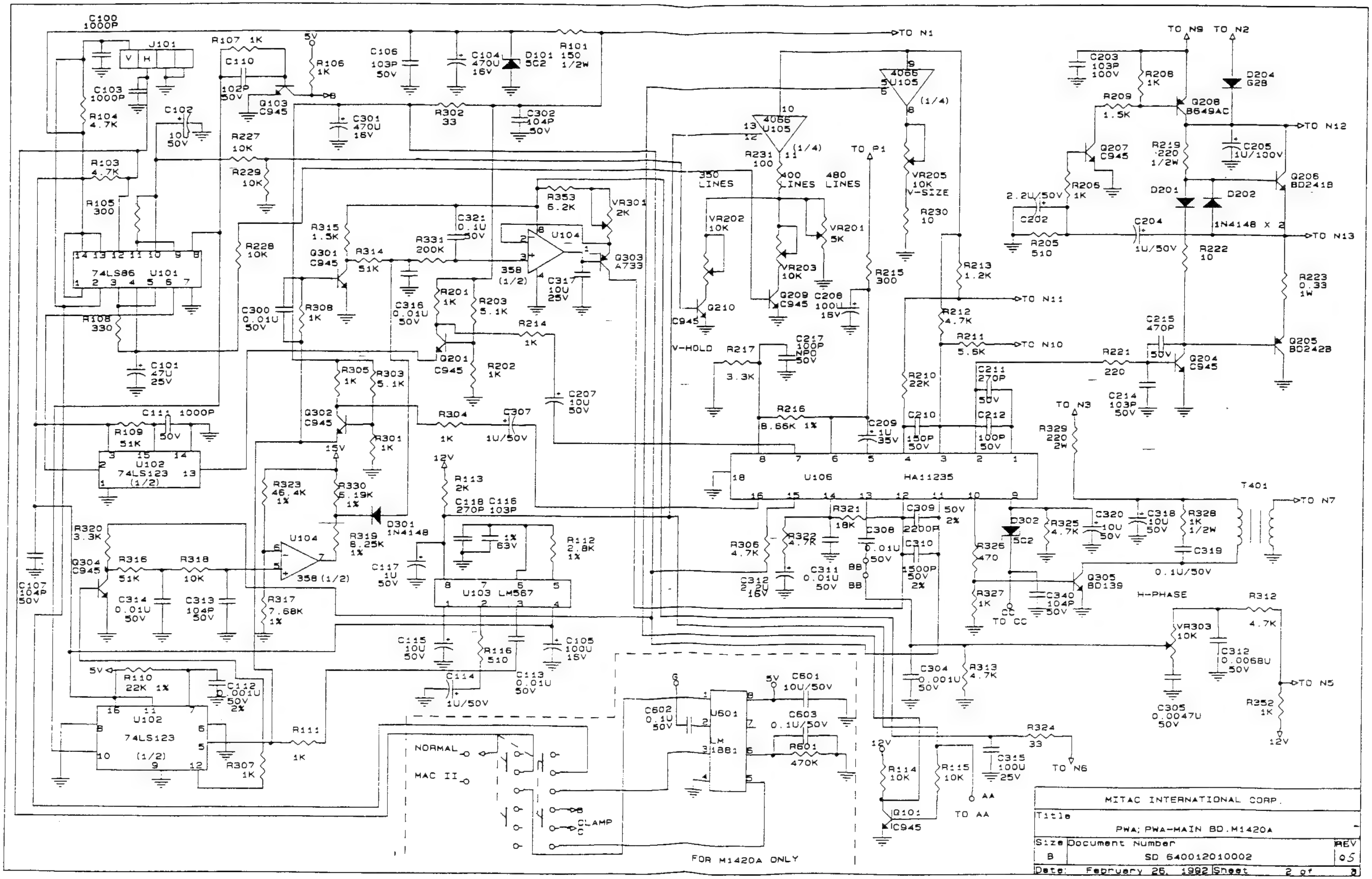
Name	Description	Part Number
CLIP	TRANSISTER, M1420 COMM	634112000001
HEATSINK	HORIZONTAL OUTPUT M1420 COMM	634212000004
HEATSINK	POWER, M1420 COMM	634312000001
HEATSINK	VIDEO, M1420 COMM	634312000002
HEATSINK	VERTICAL, CAL, M1420 COMM	634312000004
INSULATOR	WASHER, M1420 COMM	634612000001
INSULATOR	TO220, M1420 COMM	634612000002
LED	RECT, GRN, 2*5, .1	633400010001
PIN HOLDER	D2.36MM, L14.2MM, H10.25MM	633100990001
HEATSINK OIL	AK-100	600100000001
TAPE	SOLDER MASK, D12MM	225000000107
SONY BOND	SC121	600100000002
LABEL	BLANK, PAPER, 38*5, MPC2000	242660110409

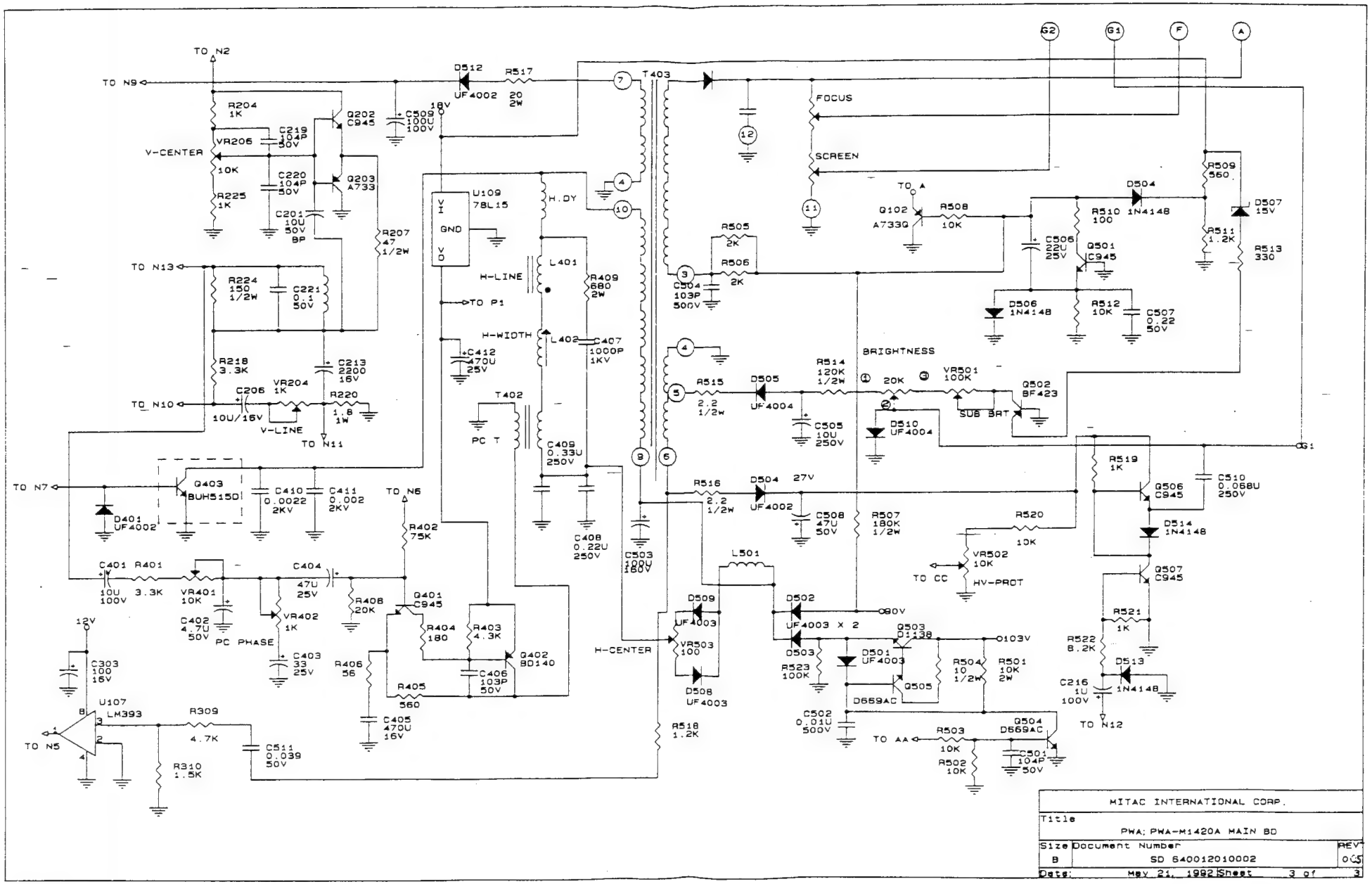
* means for 1420A only.

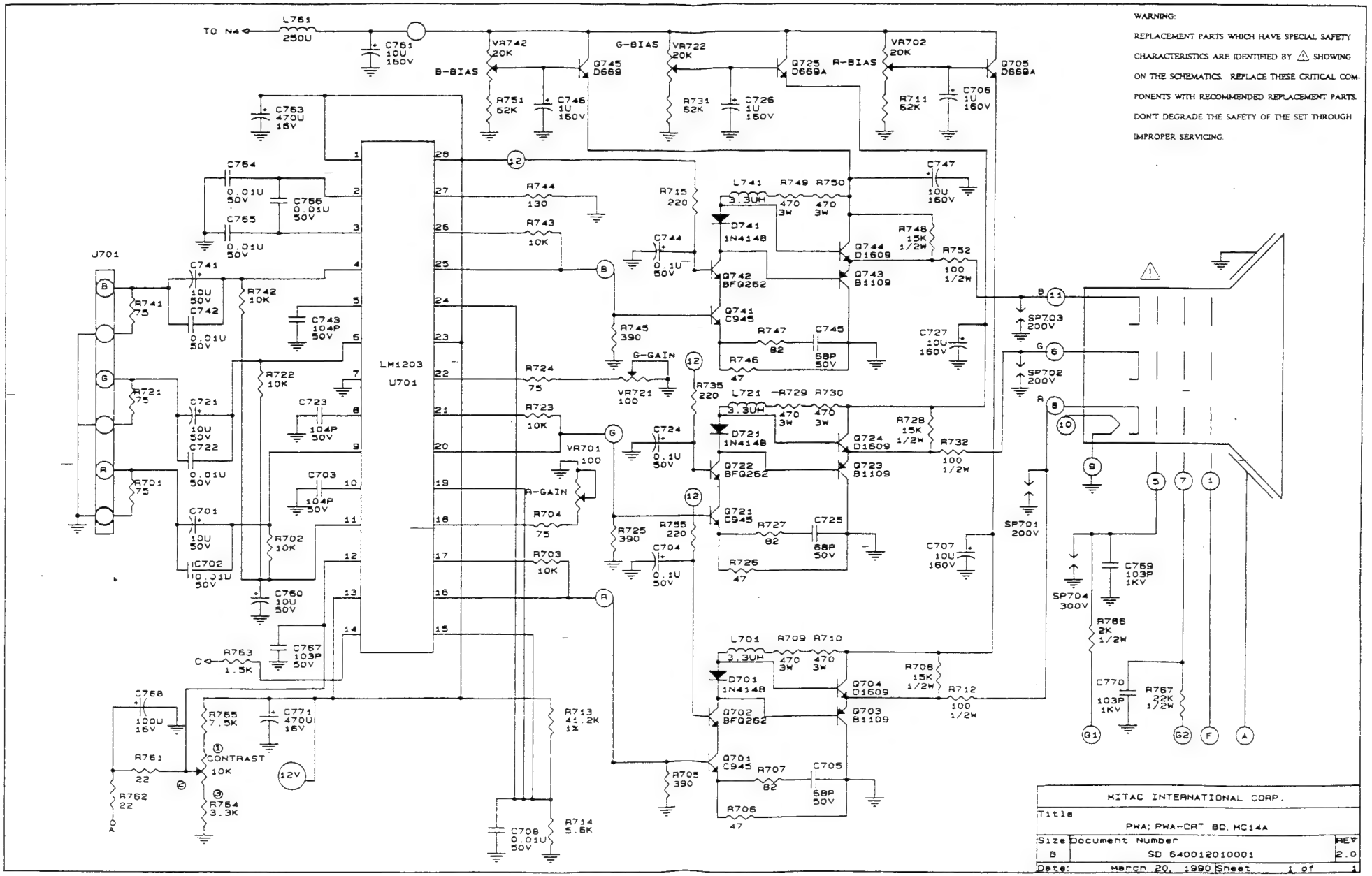
12. SERVICE DIAGRAMS

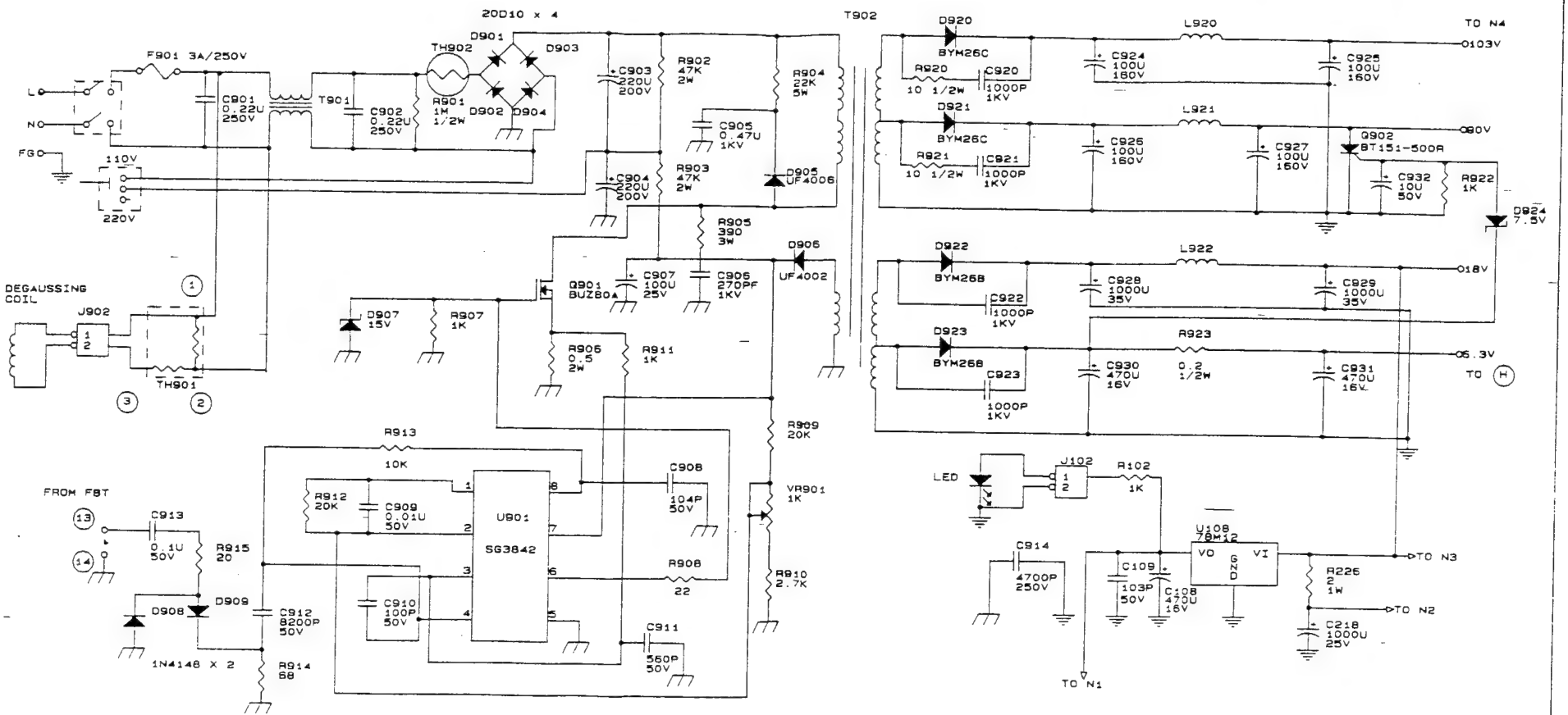
The following pages contain service diagrams for 1420/1420A.

Drawing No.	Description	Rev	Pages
SD 640012010002	PWA-MAIN BD. MC14A	5.0	3 sheets
SD 640012010001	PWA-CRT BD. MC14A	2.0	1 sheet
AD 643012010001	CHASSIS ASSY	R00	1 sheet
AD 645012010001	MONITOR ASSY	R00	1 sheet
630012010002	PWA-V/MAIN BD.	R05	1 sheet
630012010001	PWA-V/CRT BD.	R03	1 sheet


MITAC INTERNATIONAL CORP.
Title
PWA; PWA-MAIN BD.M1420A
Size B
Document Number SD 640012010002
REV 05
Date: February 25, 1992
Sheet 2 of 3
U106 HA11235
U101 74LS86
U102 74LS123 (1/2)
U103 LM567
U104 358 (1/2)
U105 4066 (1/4)
U601 LM1881
FOR M1420A ONLY
NORMAL
MAC II
CLAMP
V-HOLD
V-SIZE
H-PHASE
350 LINES
400 LINES
480 LINES
TO N1
TO N2
TO N3
TO N5
TO N6
TO N7
TO N9
TO N10
TO N11
TO N12
TO N13
TO P1
TO AA
TO CC
T401
J101


TO N2
TO N9
D512
UF4002
R517
20
2W
T403
18V
C509
1000U
100V
R204
1K
Q202
C945
VR206
C219
104P
50V
V-CENTER
10K
R225
1K
C220
104P
50V
Q203
A733
C201
10U
50V
BP
R207
47
1/2W
U109
78L15
VI
GND
VO
H.DY
L401
H-LINE
R409
680
2W
TO P1
H-WIDTH
L402
C407
1000P
1KV
C412
470U
25V
T402
PC T
C409
0.33U
250V
C408
0.22U
250V
C503
100U
160V
TO N13
R224
150
1/2W
C221
0.1
50V
R218
3.3K
C213
2200
16V
TO N10
C206
10U/16V
VR204
1K
V-LINE
R220
1.8
1W
TO N11
TO N7
Q403
BUH5150
D401
UF4002
C410
0.0022
2KV
C411
0.002
2KV
TO N6
R402
75K
C401
10U
100V
R401
3.3K
VR401
10K
C404
47U
25V
C402
4.7U
50V
PC PHASE
VR402
1K
C403
33
25V
R408
20K
Q401
C945
R404
180
R403
4.3K
Q402
B0140
R406
56
R405
560
C405
470U
16V
C406
103P
50V
12V
C303
100
16V
U107
LM393
TO N5
R309
4.7K
R310
1.5K
C511
0.039
50V
H-CENTER
D509
UF4003
VR503
100
D508
UF4003
R518
1.2K
L501
D502
UF4003 X 2
80V
D503
R523
100K
D501
UF4003
Q503
D1138
103V
Q505
D669AC
R504
10
1/2W
R501
10K
2W
C502
0.01U
500V
TO AA
R503
10K
R502
10K
Q504
D669AC
C501
104P
50V
G2
G1
F
A
FOCUS
SCREEN
TO A
Q102
A733Q
R508
10K
D504
1N4148
R509
560
D507
15V
R510
100
R511
1.2K
R513
330
C506
22U
25V
Q501
C945
R505
2K
R506
2K
C504
103P
500V
D506
1N4148
R512
10K
C507
0.22
50V
BRIGHTNESS
R514
120K
1/2W
20K
VR501
100K
SUB BRT
Q502
BF423
R515
2.2
1/2W
D505
UF4004
C505
10U
250V
D510
UF4004
R516
2.2
1/2W
D504
27V
UF4002
C508
47U
50V
R507
180K
1/2W
R520
10K
VR502
10K
HV-PROT
TO CC
R519
1K
Q506
C945
C510
0.068U
250V
D514
1N4148
Q507
C945
R521
1K
R522
8.2K
D513
1N4148
C216
1U
100V
TO N12
MITAC INTERNATIONAL CORP.
Title
PWA: PWA-M1420A MAIN BD
Size
B
Document Number
SD 640012010002
REV
0C5
Date:
May 21, 1992
Sheet
3 of
3

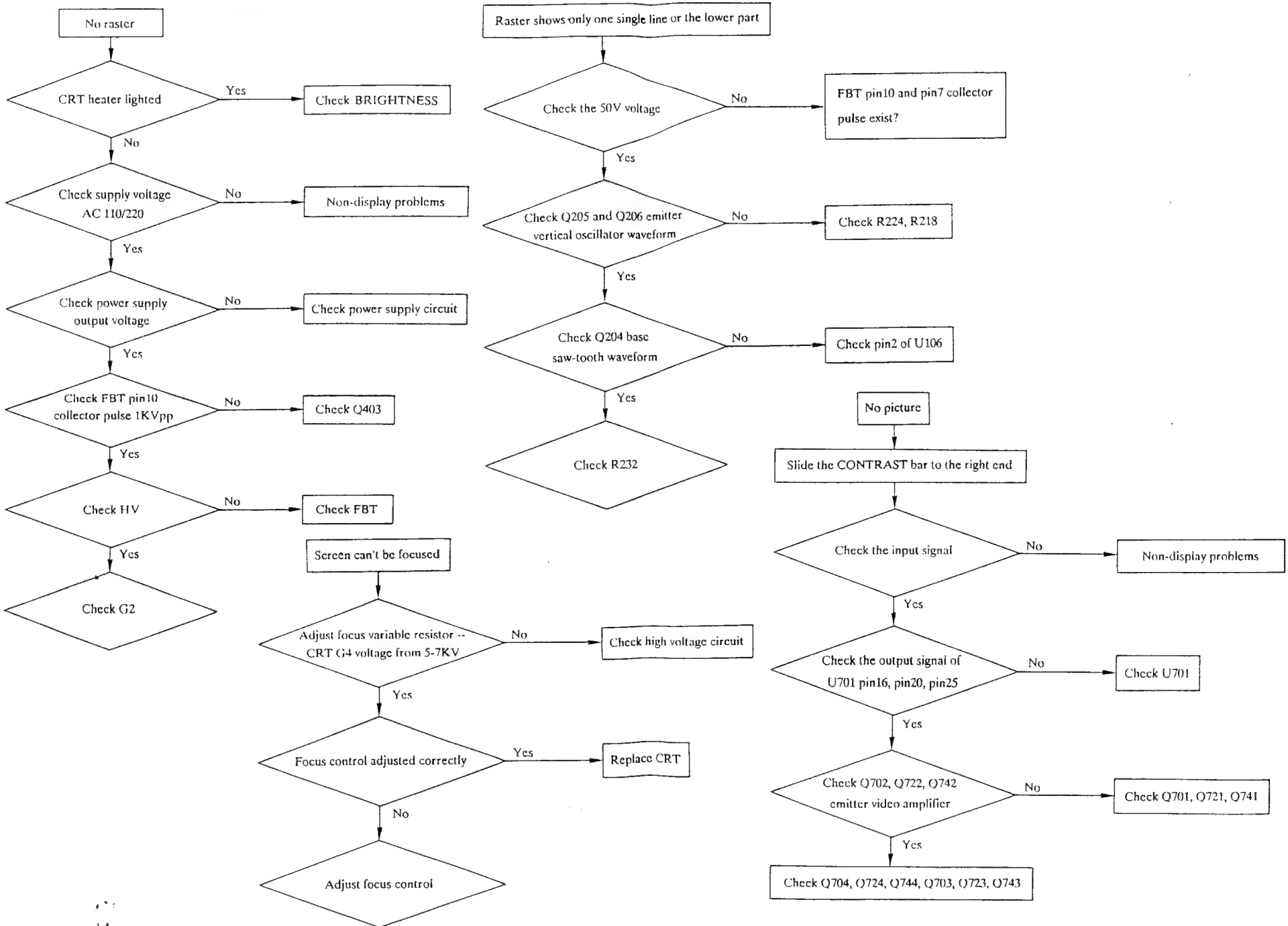

WARNING:
REPLACEMENT PARTS WHICH HAVE SPECIAL SAFETY CHARACTERISTICS ARE IDENTIFIED BY ⚠ SHOWING ON THE SCHEMATICS. REPLACE THESE CRITICAL COMPONENTS WITH RECOMMENDED REPLACEMENT PARTS. DON'T DEGRADE THE SAFETY OF THE SET THROUGH IMPROPER SERVICING.
MITAC INTERNATIONAL CORP.
Title
PWA; PWA-CRT BD, MC14A
Size B
Document Number SD 640012010001
REV 2.0
Date: March 20, 1990 Sheet 1 of 1
LM1203
U701
J701
TO N4
B-BIAS
G-BIAS
R-BIAS
CONTRAST
G-GAIN
B-GAIN
R-GAIN
SP701 200V
SP702 200V
SP703 200V
SP704 300V
12V



For Service Manuals
contact
MAURITRON SERVICES
8 Cherry Tree Road, Chinnor
Oxfordshire, OX9 4QY.
Tel (01844) 351694
Fax (01844) 352554

MITAC INTERNATIONAL CORP.		
Title: PWA: PWA-MAIN BD. M1420A		
Size: B	Document Number: 6400120100002	REV: 05
Date: May 7, 1992	Sheet 1 of 3	

TROUBLESHOOTING



CONTROLS AND ADJUSTMENTS

Turn VR702, VR722, VR742 clockwise to the end and the other variable resistors to the mid-position. Warm up for at least thirty minutes.

1. B^+ ADJUSTMENT:

a. Apply 31.5 KHz cross hatch pattern.

b. Adjust VR901 to obtain 90V DC at D502 cathode end.

2. CUT-OFF (G1) VOLTAGE ADJUSTMENT:

a. Adjust the BRIGHTNESS controller to the right end.

b. Adjust VR501 (SUB-BRIGHTNESS) to obtain -20 volts at G1 point.

3. H FREE RUNNING:

a. Make one end of R304 termination short.

b. Apply 35KHz full white pattern.

c. Adjust VR301 (H-HOLD) to obtain the best H FREE RUNNING.

4. H-CENTER ADJUSTMENT:

a. Apply 31.5 KHz cross hatch pattern.

b. Adjust G2 screen variable resistor to make raster visible.

c. Adjust VR503 (H-CENTER) to put the raster on the center of the screen.

5. H-PHASE ADJUSTMENT:

a. Apply 31.5KHz cross hatch pattern.

b. Adjust VR303 (H-PHASE) until the the image is on the center of the raster.

6. H-WIDTH ADJUSTMENT:

a. Apply 31.5KHz cross hatch pattern.

b. Adjust L402 to obtain 240mm horizontal width.

7. V-CENTER ADJUSTMENT:

a. Apply 31.5KHz cross hatch pattern.

b. Adjust VR206 (V-CENTER) to place the image on the center of the screen.

8. V-LINEARITY ADJUSTMENT:

a. Apply 31.5KHz cross hatch pattern.

b. Adjust VR204 (V-LIN) to meet the linearity specifications.

9. V-SIZE ADJUSTMENT:

a. Apply VGA cross hatch pattern in 480 mode, then adjust VR201 to get 180mm vertical size.

b. Apply VGA cross hatch pattern in 400 mode, then adjust VR203 to get 180mm vertical size.

c. Apply VGA cross hatch pattern in 350 mode, then adjust VR202 to get 180mm vertical size.

10. PIN-CUSHION ADJUSTMENT:

a. Apply 31.5KHz cross hatch patten.

b. Adjust VR401 (PIN-GAIN) and VR402 (PIN-PHASE) to meet the pincushion's specifications.

11. HV PROTECTION ADJUSTMENT:

a. Apply 31.5KHz cross hatch patten.

b. Adjust VR502 (X-RAY) to obtain 3.7V DC at D302 Cathode end.

12. BLACK LEVEL ADJUSTMENT:

a. Apply raster pattern only.

b. Adjust the BRIGHTNESS controller to the right end and the CONTRAST controller to the left end.

c. Adjust G2 variable resistor to obtain 0.8~1.2FL on the screen.

d. Keep the original raster colors and adjust VR702, VR722, VR742 to obtain 0.240±0.02/0.250±0.02 X/Y coordinates.

13. WHITE BALANCE:

a. Apply 31.5KHz full white pattern.

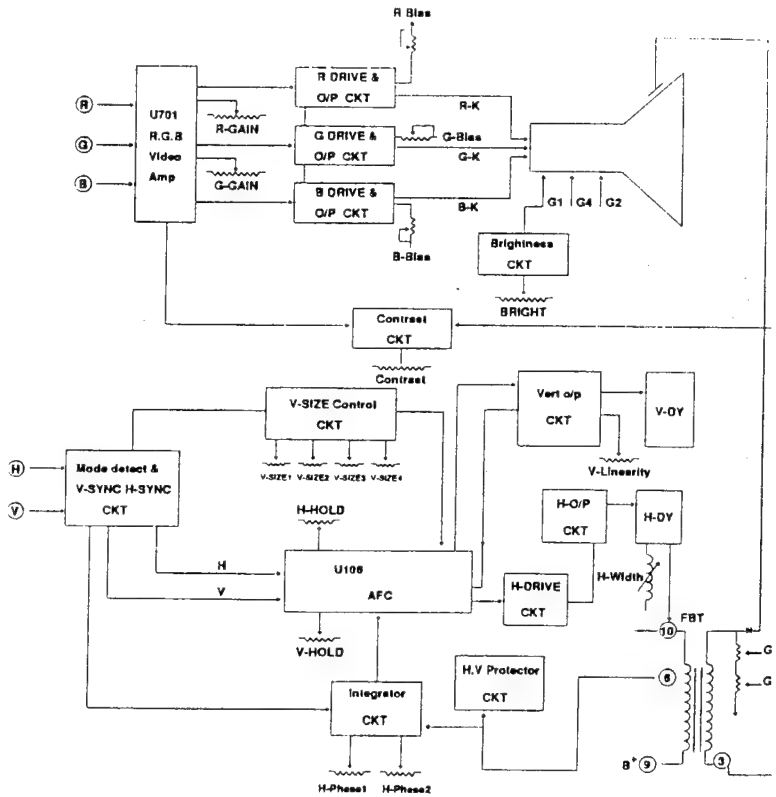
b. Adjust the BRIGHTNESS controller to the mid-position and the CONTRAST controller to the right end.

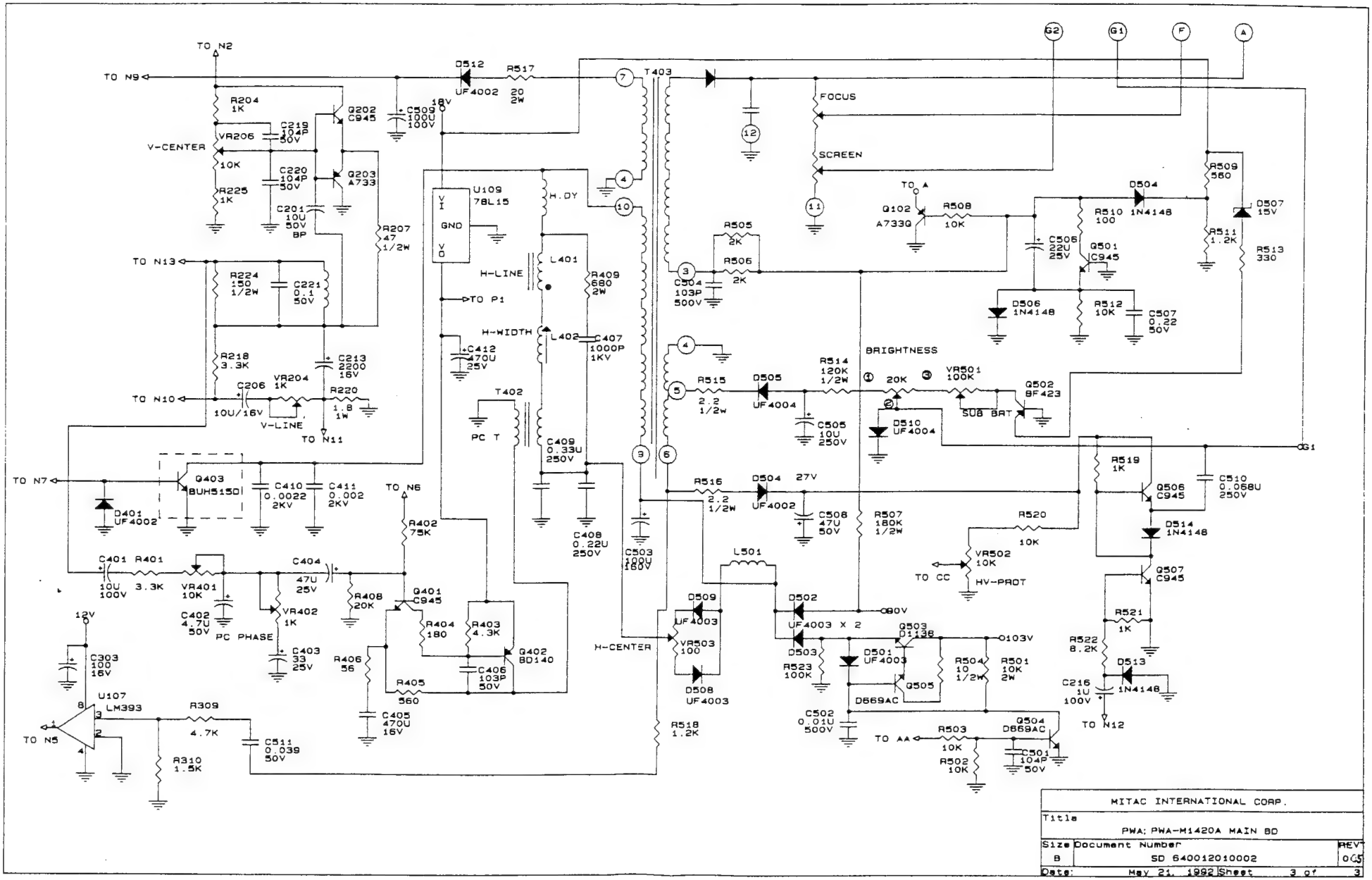
c. Adjust VR701, VR721 to obtain 0.281/0.311 X/Y coordinates.

d. Adjust the CONTRAST controller to get Y = 3.5FL.

e. Adjust VR702, VR742 to get 0.281/0.311 X/Y coordinates.

BLOCK DIAGRAMS





MITAC INTERNATIONAL CORP.		
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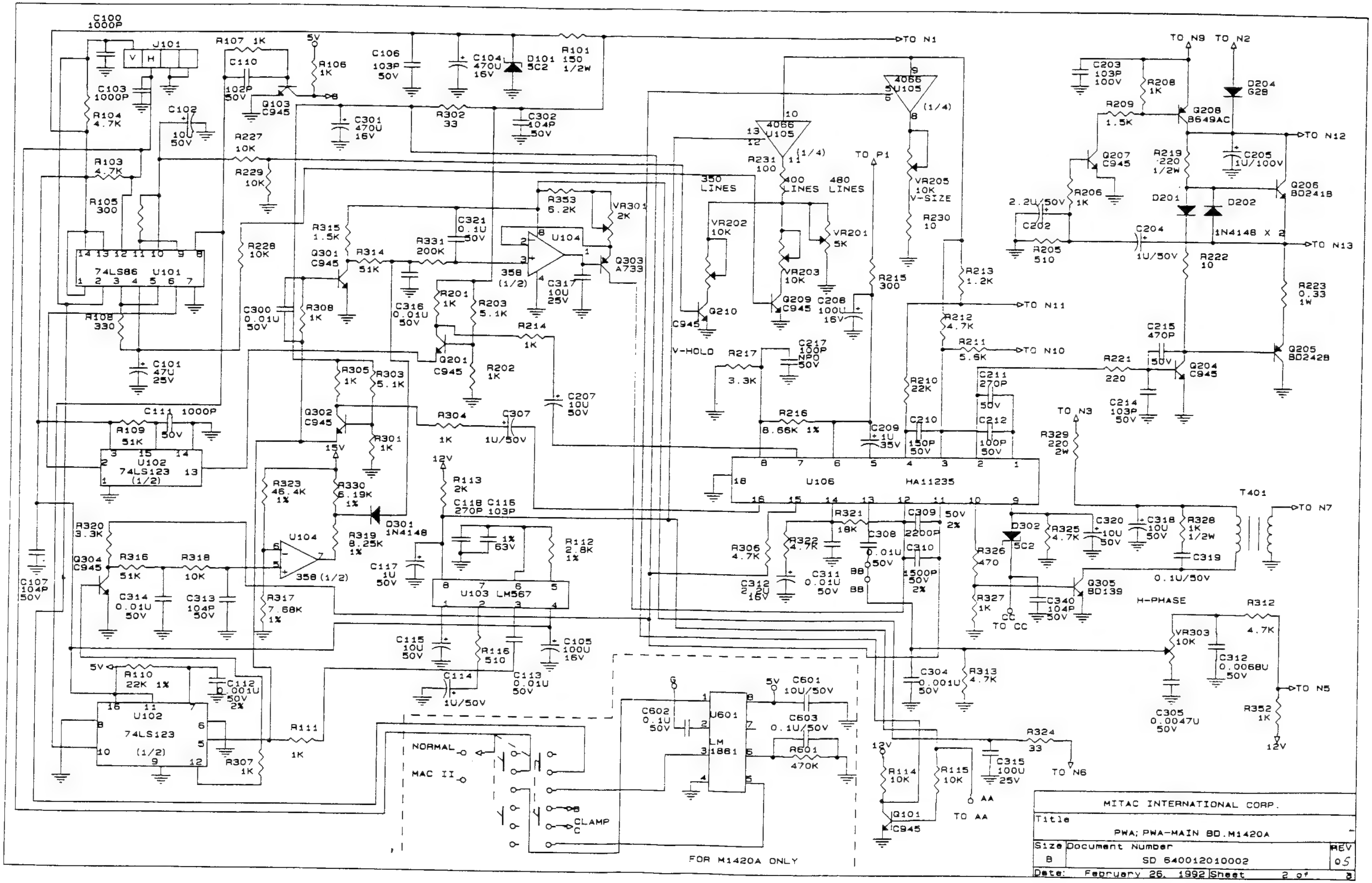
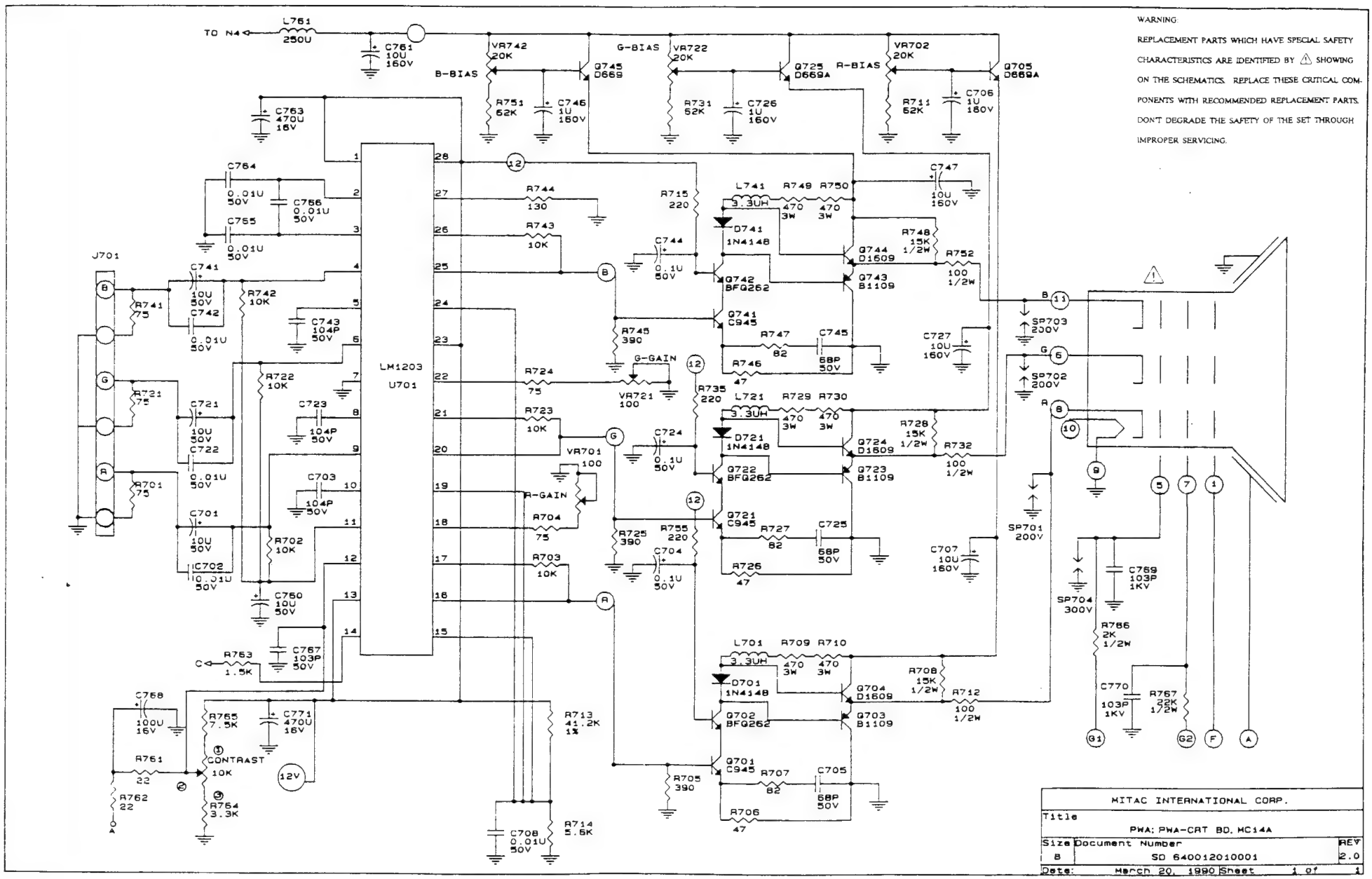
Size: B	Document Number: SD 640012010002	REV: 05
Date: May 21, 1992	Sheet 3 of 3	



MITAC INTERNATIONAL CORP.

Title	PWA; PWA-MAIN BD.M1420A	
Size B	Document Number SD 640012010002	REV 05
Date: February 26, 1992	Sheet 2 of 3	


WARNING:
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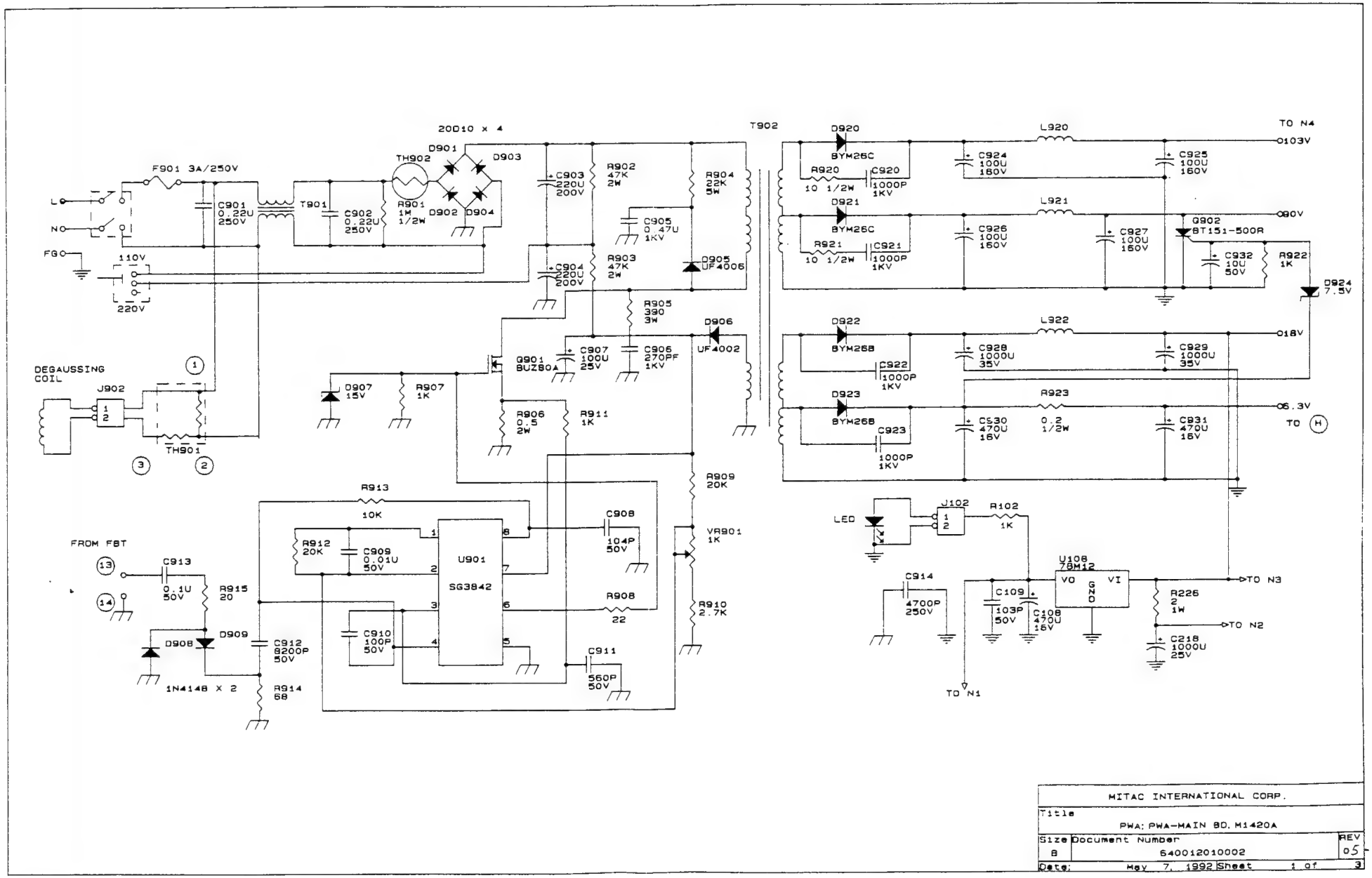
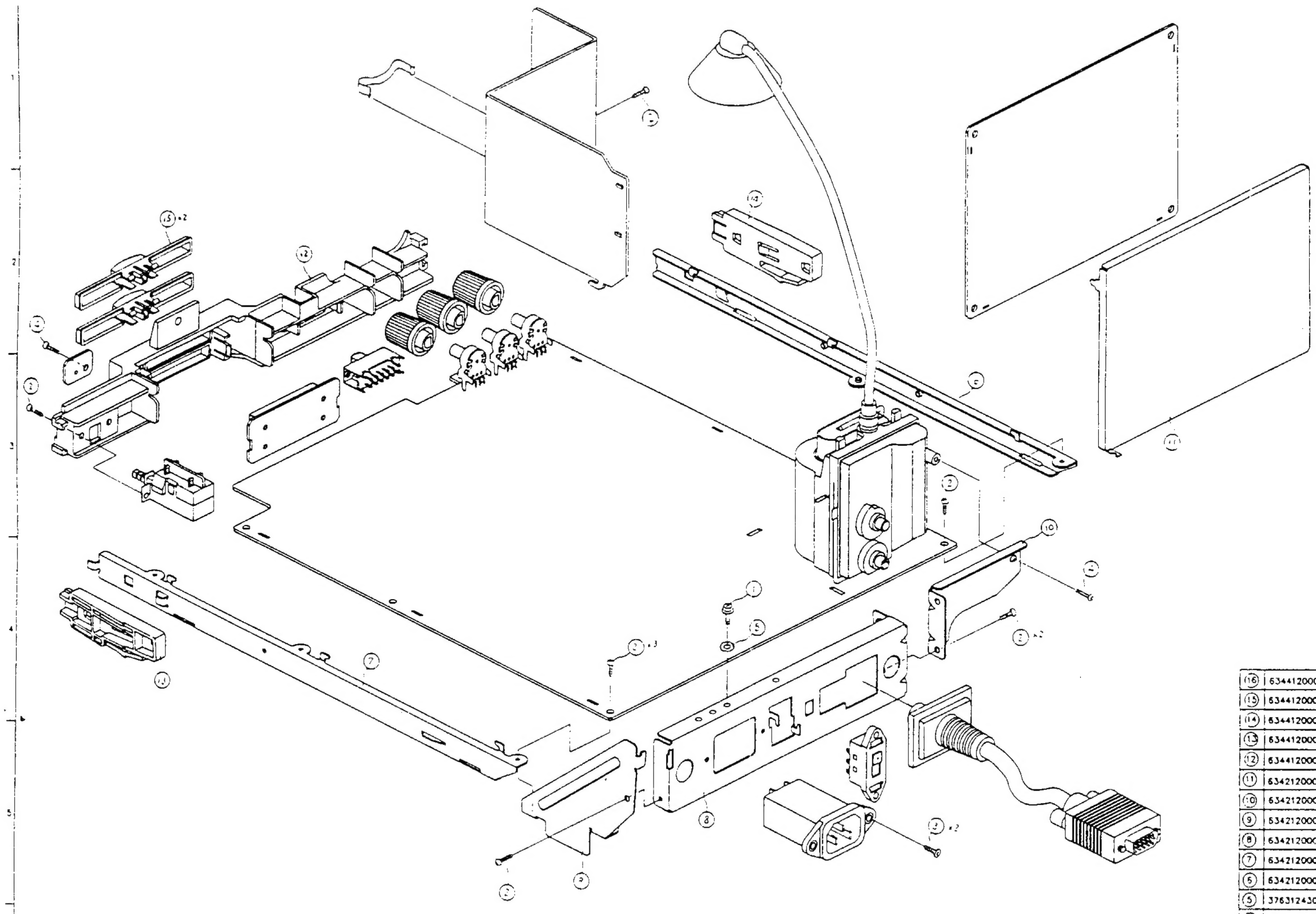
TO N4
L761 250U
C761 10U 160V
B-BIAS
VR742 20K
Q745 D669
G-BIAS
VR722 20K
Q725 D669A
R-BIAS
VR702 20K
Q705 D669A
R751 62K
C746 1U 160V
R731 62K
C726 1U 160V
R711 62K
C706 1U 160V
C763 470U 16V
J701
LM1203 U701
C764 0.01U 50V
C766 0.01U 50V
C765 0.01U 50V
C741 10U 50V
C742 0.01U 50V
R741 75
R742 10K
C743 104P 50V
R744 130
R743 10K
R745 390
R724 75
G-GAIN
VR721 100
R723 10K
VR701 100
R-GAIN
R704 75
R703 10K
R722 10K
C723 104P 50V
C721 10U 50V
C722 0.01U 50V
R721 75
C703 104P 50V
C701 10U 50V
C702 0.01U 50V
R701 75
R702 10K
C760 10U 50V
C767 103P 50V
R763 1.5K
C768 100U 16V
R765 7.5K
C771 470U 16V
R761 22
CONTRAST 10K
12V
R762 22
R764 3.3K
R713 41.2K 1%
C708 0.01U 50V
R714 5.6K
R715 220
C744 0.1U 50V
L741 3.3UH
R749 470 3W
R750 470 3W
D741 1N4148
Q744 D1609
Q742 BFQ262
Q743 B1109
Q741 C945
R747 82
C745 68P 50V
R746 47
R748 15K 1/2W
R752 100 1/2W
C747 10U 160V
C727 10U 160V
R735 220
C724 0.1U 50V
L721 3.3UH
R729 470 3W
R730 470 3W
D721 1N4148
Q724 D1609
Q722 BFQ262
Q723 B1109
R728 15K 1/2W
R732 100 1/2W
R725 390
R755 220
C704 0.1U 50V
Q721 C945
R727 82
C725 68P 50V
R726 47
C707 10U 160V
L701 3.3UH
R709 470 3W
R710 470 3W
D701 1N4148
Q704 D1609
Q702 BFQ262
Q703 B1109
R708 15K 1/2W
R712 100 1/2W
R705 390
Q701 C945
R707 82
C705 68P 50V
R706 47
SP703 200V
SP702 200V
SP701 200V
SP704 300V
C769 103P 1KV
R766 2K 1/2W
C770 103P 1KV
R767 22K 1/2W
MITAC INTERNATIONAL CORP.
Title
PWA: PWA-CRT BD. MC14A
Size B
Document Number SD 640012010001
REV 2.0
Date: March 20, 1990 Sheet 1 of 1



MITAC INTERNATIONAL CORP.		
Title: PWA: PWA-MAIN BD. M1420A		
Size: B	Document Number: 640012010002	REV: 05
Date: May 7, 1992	Sheet 1 of 3	

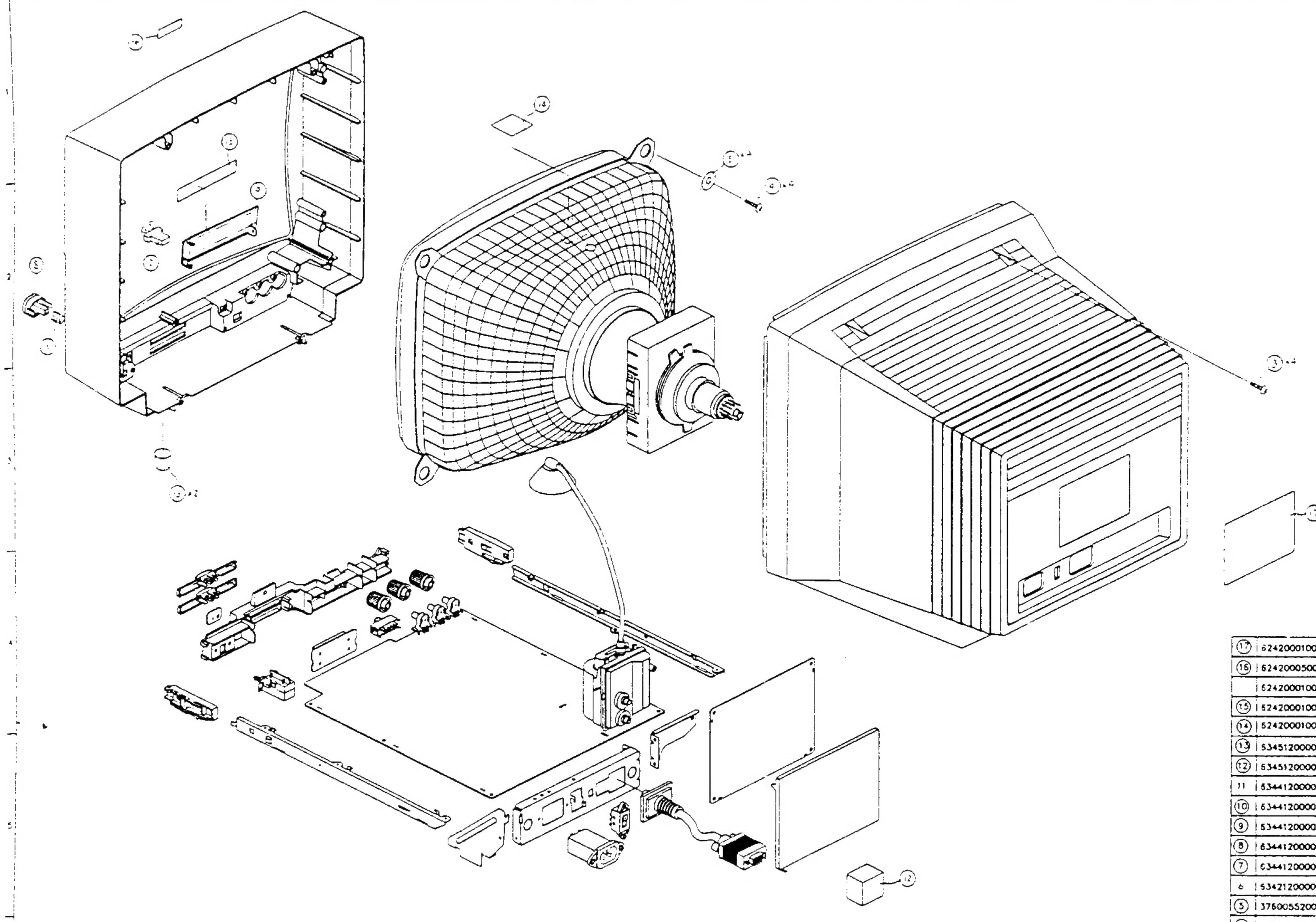


ITEM	P/N	DESCRIPTION	QTY	UNIT	REMARKS
16	634412000015	WHEEL-THUMB	3	EA	
15	634412000013	KNOB-SLIDE	2	EA	
14	634412000011	RUNNER-LEFT	1	EA	
13	634412000010	RUNNER-RIGHT	1	EA	
12	634412000009	BRACKET-MAIN BOARD	1	EA	
11	634212000008	SHIELD-CRT BD.	1	EA	
10	634212000007	BRACKET-FBT MTG.	1	EA	
9	634212000006	BRACKET-ARM	1	EA	
8	634212000003	PANEL-REAR	1	EA	
7	634212000002	BRACKET-PCB MTG. RIGHT	1	EA	
6	634212000001	BRACKET-PCB MTG. LEFT	1	EA	
5	376312430953	LOCK WASHER OUTER M4 T0.5	1	EA	
4	374201130088	PH SELF-TAP M3 L8 RND DBL SPL	2	EA	
3	371614300606	PH SCREW M3 L6 FLAT	2	EA	
2	371212300831	PHILLIPS SCREW SET M3 L8	7	ST	
1	370124008003	SCREW M4 L8 PH HEX FLANGE HD	2	EA	

DRAWING NAME: CHASSIS ASSY

MATERIAL NO.: AD643 0123 10001

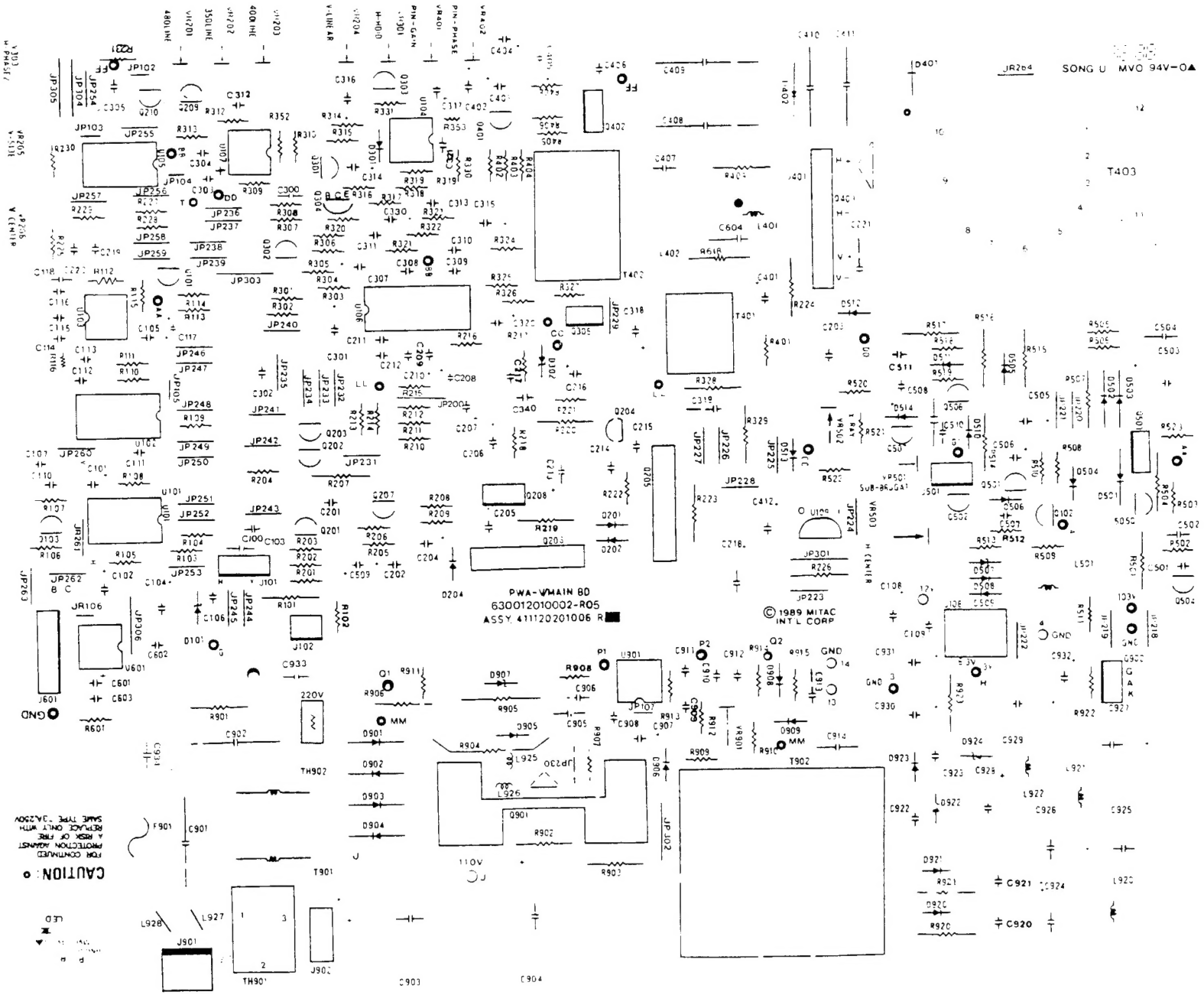
International Corp.



ITEM	P/N	DESCRIPTION	QTY	UNIT	REMARKS
17	624200010002	LABEL-BACKCOVER MC14V	1	PC	
16	624200050001	OVERLAY-LOGO	1	PC	
	624200010005	LABEL-AUX CTR'L MC14V		PC	
15	624200010004	LABEL-AUX CTR'L MC14A	1	PC	
14	624200010003	LABEL-WARNING	1	PC	
13	534512000002	RUBBER PAD	2	EA	
12	534512000001	SPONGE-CRT BOARD	1	EA	
11	634412000019	CAP-BEZEL	1	EA	
10	634412000014	BUTTON-POWER ON/OFF	1	EA	
9	534412000012	DOOR-AUX CTR'L	1	EA	
8	634412000008	BEZEL 14" PX1005	1	EA	
7	634412000004	BACKCOVER 14" PX1005	1	EA	
6	534212000009	BAR-LINK	1	EA	
5	376005520017	WASHER-FLAT 05.5/20T1.5 ZNW	4	EA	
4	373231252203	T-SCREW M5S L20 RND(+) 2 ZNW	4	EA	
3	373231242161	T-SCREW M4S L16 RND(+) 2 ZNW	5	EA	
2	371212300831	DOOR LOCK TIFCO-1061	1	EA	
1	342630601201	SPRING-SWITCH	1	EA	

DRAWING NAME: MONITOR ASSY

International Corp.


SONG U MVO 94V-0▲
T403
PWA-VMAIN 8D
630012010002-R05
ASSY 411120201006 R
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CAUTION :
FOR CONTINUED PROTECTION AGAINST A RISK OF FIRE REPLACE ONLY WITH SAME TYPE 3A,250V

PWA-V/CRT BD.
630012010001-R03
ASSY. 411120202005 R
© 1989 MITAC
ILT'L.CORP
G-GAIN
R-GAIN
G-BIAS
R-BIAS
B-BIAS
VR721
VR701
VR702
VR722
VR742
R714
R713
R706
R707
R709
R710
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R G2 G G1 G2
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SONG U MVO 94V-0