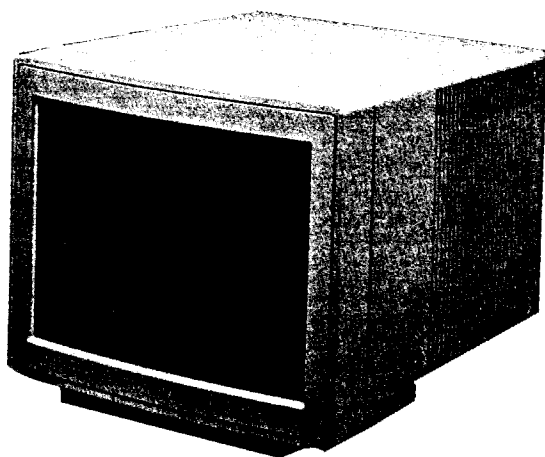


SONY

TRINITRON® Graphic Display Monitor

GDM-1601/1602



REVISED
SERVICE MANUAL

LIST OF DIFFERENT POINTS (GDM-1601/1602)

This service manual has been prepared for GDM-1601.

Redraw the CIRCUIT DIAGRAM of SECTION 5, EXPLODED VIEWS of SECTION 6, and ELECTRICAL PARTS LIST of SECTION 7 in accordance with the list of different points when using this manual for GDM-1602.

Change the H period in the waveform diagram in the CIRCUIT DIAGRAM of SECTION 5 from 15.5 to 21 μ sec and the voltage from +B145 to 120 V.

	GDM-1601		GDM-1602	
L Board	Part No.	Description	Part No.	Description
C41	A-1235-013-A	L BOARD COMPLETE	A-1235-011-A	L BOARD COMPLETE
	1-136-091-00	FILM 0.0068MF 3% 2KV	1-136-139-00	FILM 0.012MF 3% 2KV

POWER BLOCK ASSY	Part No.	A-1477-875-A	Part No.	A-1477-873-A
G Board IC51	1-235-843-11	POWER MODULE (DM-28)	1-235-844-11	POWER MODULE (DM-32)

	GDM-1601				GDM-1602			
D Board	Part No.	Description			Part No.	Description		
	A-1345-676-A	D BOARD COMPLETE			A-1345-722-A	D BOARD COMPLETE		
C110	1-130-475-00	MYLAR	0.0022MF	5% 50V	1-130-481-00	MYLAR	0.0068MF	5% 50V
C211	1-102-961-00	CERAMIC	27PF	5% 50V	1-102-953-00	CERAMIC	18PF	5% 50V
C219	1-136-121-00	FILM	0.27MF	5% 400V	1-136-133-00	FILM	0.43MF	5% 400V
C220	1-136-103-00	FILM	0.1MF	5% 200V	1-136-060-00	FILM	0.047MF	5% 400V
C224	1-130-908-00	FILM	0.0039MF	3% 1.6KV	1-136-178-00	FILM	0.0047MF	3% 1.6KV
C310	1-136-070-00	FILM	0.005MF	3% 2KV	1-136-098-00	FILM	0.0073MF	3% 2KV
D202	8-719-909-83	DIODE	1SS83					
R137	1-249-405-11	CARBON	100	5% 1/6W	1-247-811-00	CARBON	150	5% 1/6W
R240	1-215-451-00	METAL	18K	1% 1/6W	1-215-461-00	METAL	47K	1% 1/6W
R246	1-215-459-00	METAL	39K	1% 1/6W	1-215-451-00	METAL	18K	1% 1/6W
R253	1-249-435-11	CARBON	33K	5% 1/6W	1-249-433-11	CARBON	22K	5% 1/6W
R257	1-214-913-00	METAL	100K	1% 1/2W	1-214-907-00	METAL	56K	1% 1/2W
R268	1-215-459-00	METAL	39K	1% 1/6W	1-215-487-00	METAL	560K	1% 1/6W
R272	1-215-415-00	METAL	560	1% 1/6W	1-215-447-00	METAL	12K	1% 1/6W
R273					1-215-415-00	METAL	560	1% 1/6W
R274					1-214-767-00	METAL	39K	1% 1/4W
R301	1-215-919-11	METAL OXIDE	2.2K	5% 3W F	1-215-918-00	METAL OXIDE	1.5K	5% 3W F
R302	1-216-438-11	METAL OXIDE	8.2K	5% 1W F	1-215-874-11	METAL OXIDE	6.8K	5% 1W F
R303	1-215-874-11	METAL OXIDE	6.8K	5% 1W F	1-215-873-00	METAL OXIDE	4.7K	5% 1W F
R304	1-215-874-11	METAL OXIDE	6.8K	5% 1W F	1-215-873-00	METAL OXIDE	4.7K	5% 1W F
R328	1-216-367-00	METAL OXIDE	0.68	5% 2W F	1-216-371-11	METAL OXIDE	1.5	5% 2W F
R335	1-215-446-00	METAL	11K	1% 1/6W	1-215-447-00	METAL	12K	1% 1/6W
RV205	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		1-224-252-XX	RES, ADJ, METAL GLAZE	10K	
JS1		W				N		
JS2		W				N		
DD Board								
D5	8-719-109-97	DIODE	RD6.8ESB2		8-719-109-89	DIODE	RD5.6ESB2	
DE Board								
C4	1-130-475-00	MYLAR	0.0022MF	5% 50V	1-130-483-00	MYLAR	0.01MF	5% 50V

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6.	EXPLODED VIEWS
7.	ELECTRICAL PARTS LIST

SECTION 1

GENERAL

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1-1. FEATURES

Sony GDM-1601 is a highly integrated color display monitor which is designed for displaying high resolution graphics.

- The GDM-1601 high resolution graphic display monitor employs the Super Fine-pitch TRINITRON® picture tube.
- Resolution is extremely high with 1280 (horizontal) × 1024 (vertical) picture elements per frame, thus a high-density color display can be obtained.
- A silica coating on the screen provides a glare-free display.
- Cylindrical screen reduces distortion as viewed from the sides, sharpens the picture corners, and diminishes reflections.
- The display unit can be turned over 360 degrees to the right or left, and can be tilted 15 degrees up or 5 degrees down if SU-536 Display Stand is attached.
- Since the 60 Hz non-interlace method is employed, display of little flicker can be obtained.

1-2. SPECIFICATIONS

System Raster scanning method (non-interlace)
R/G/B input, full color system
Sync on green (internal sync), or separated/composite sync input (Automatically selected)

Picture tube Super fine-pitch Trinitron color tube
0.26mm phosphor pitch with aperture grill
16 inches measured diagonally
90-degree deflection
Anti-reflective coating (silica coating)

Visual picture size Approx. 295(h) × 236(w) mm (11⁷/₈ × 9³/₈ inches)
1280(H) × 1024(V) viewable pixels

Horizontal deflection frequency (fh)
63.34 kHz

Vertical deflection frequency (fv)
59.98 Hz

Video amplifier
frequency band width
60 Hz-100 MHz ± 3 dB (TYP)

Signal In case of composite signal
R/B video signal input:
Video level—0.714 V p-p, positive
G video signal input:
1.0 V p-p, composite,
Video level—0.714 V p-p, positive
Sync level—0.286 V p-p, negative
In case of separate sync
R/G/B video signal input:
0.714 V p-p, positive
EXTERNAL SYNC input:
1.0—4.0 V p-p, negative

Connector type
BNC type 75 ohm input impedance

Power requirements
100-120V±10%
220-240V±10%
50/60 Hz ±3 Hz

AC input current
100-120V: 2.4A max.
220-240V: 1.4A max.

Environmental conditions
Operating temperature : 10° - 40°C
Operating humidity : 10 - 80%, condensation
Storage temperature : 0° - 60°
Storage humidity : 5 - 90%, condensation

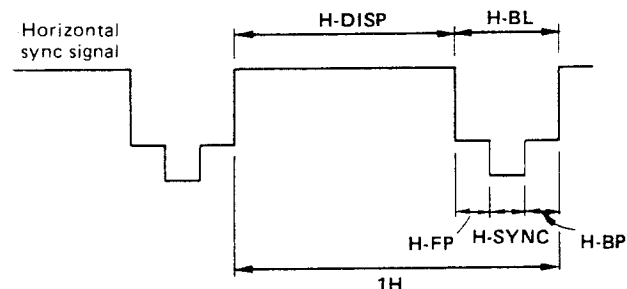
Dimensions
Approx. 406 × 380 × 450 mm (w/h/d)
(15.98 × 14.96 × 17.72 inches)
Approx. 406 × 406 × 450 mm (w/h/d)
SU-536 Display Stand
(15.98 × 15.98 × 17.72 inches)

Weight Approx. 26.5 kg (58 lbs)
Approx. 29 kg (64 lbs) with SU-536 Display Stand (optional)

Signal timing

Dot clock 9.24ns(108.18MHz)

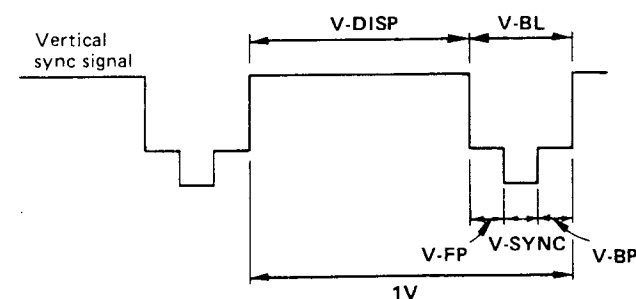
Horizontal



$f_H = 63.34 \text{ kHz}$

H-DISP:	Horizontal-display Period active	11.832μs	(1280 dot)
H-FP:	Horizontal-frontporch	0.407μs	(44 dot)
H-SYNC:	Horizontal-sync	1.701μs	(184 dot)
H-BP:	Horizontal-backporch	1.849μs	(200 dot)
H-BL:	Horizontal-blanking	3.956μs	(428 dot)
1H:	1 Horizontal total Period	15.788μs	(1708 dot)

Vertical



$f_V = 59.98 \text{ Hz}$

V-DISP:	Vertical-display Period active time	16.162ms	(1024 line)
V-FP:	Vertical-frontporch	47.35μs	(3 line)
V-SYNC:	Vertical-sync	47.35μs	(3 line)
V-BP:	Vertical-backporch	410.4μs	(26 line)
V-BL:	Vertical-blanking	0.505ms	(32 line)
1V:	1 Vertical-total Period	16.667ms	(1056 line)

1-3. FEATURES

Sony GDM-1602 is a highly integrated color display monitor which is designed for displaying high resolution graphics.

- The GDM-1602 high resolution graphic display monitor employs the Super Fine-pitch TRINITRON[®] picture tube.
- Resolution is extremely high with 1024 (horizontal) × 768 (vertical) picture elements per frame, thus a high-density color display can be obtained.
- A silica coating on the screen provides a glare-free display.
- Cylindrical screen reduces distortion as viewed from the sides, sharpens the picture corners, and diminishes reflections.
- The display unit can be turned over 360 degrees to the right or left, and can be tilted 15 degrees up or 5 degrees down if SU-536 Display Stand is attached.
- Since the 60 Hz non-interlace method is employed, display of little flicker can be obtained.

1-4. SPECIFICATIONS

System Raster scanning method (non-interlace)
R/G/B input, full color system
Sync on green (internal sync), or separated/composite sync input (Automatically selected)

Picture tube Super fine-pitch Trinitron color tube
0.26mm phosphor pitch with aperture grill
16 inches measured diagonally
90-degree deflection
Anti-reflective coating (silica coating)

Visual picture size
Approx. 295(h) × 221(w) mm (11³/₈ × 8³/₄ inches)
1024(H) × 768(V) viewable pixels

Horizontal deflection frequency (fh)
48.78 kHz

Vertical deflection frequency (fv)
60.0 Hz

Video amplifier
frequency band width
60 Hz-100 MHz ± 3 dB (TYP)

Signal In case of composite signal
R/B video signal input:
Video level—0.714 V p-p, positive
G video signal input:
1.0 V p-p, composite,
Video level—0.714 V p-p, positive
Sync level—0.286 V p-p, negative
In case of separate sync
R/G/B video signal input:
0.714 V p-p, positive
EXTERNAL SYNC input:
1.0—4.0 V p-p, negative

Connector type
BNC type 75 ohm input impedance

Power requirements
100-120V ± 10%
220-240V ± 10%
50/60 Hz ± 3 Hz

AC input current

100-120V: 2.3A max.
220-240V: 1.3A max.

Environmental conditions

Operating temperature: 10° - 40°C
Operating humidity: 10 - 80%, condensation
Storage temperature: 0° - 60°
Storage humidity: 5 - 90%, condensation

Dimensions

Approx. 406 × 380 × 450 mm (w/h/d)
(15.98 × 14.96 × 17.72 inches)
Approx. 406 × 406 × 450 mm (w/h/d) with
SU-536 Display Stand
(15.98 × 15.98 × 17.72 inches)

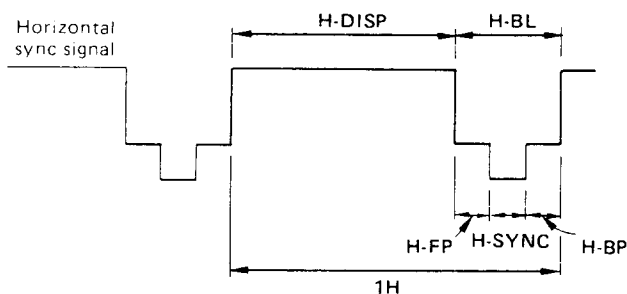
Weight

Approx. 26.5 kg (58 lbs)
Approx. 29 kg (64 lbs) with SU-536 Display
Stand (optional)

Signal timing

Dot clock 15.625ns (64 MHz)

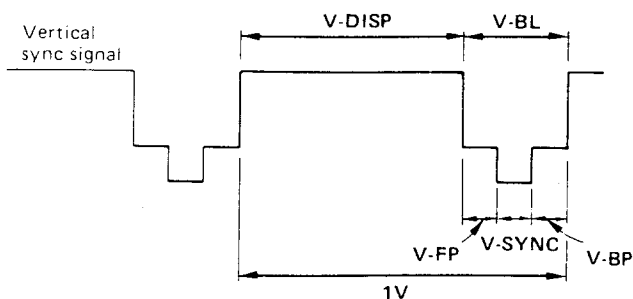
Horizontal



fh=48.78kHz

H-DISP:	Horizontal-display Period active	16.0μs	(1024 dot)
H-FP:	Horizontal-frontporch	1.0μs	(64 dot)
H-SYNC:	Horizontal-sync	1.5μs	(96 dot)
H-BP:	Horizontal-backporch	2.0μs	(128 dot)
H-BL:	Horizontal-blanking	4.5μs	(288 dot)
1H:	1 Horizontal total Period	20.5μs	(1312 dot)

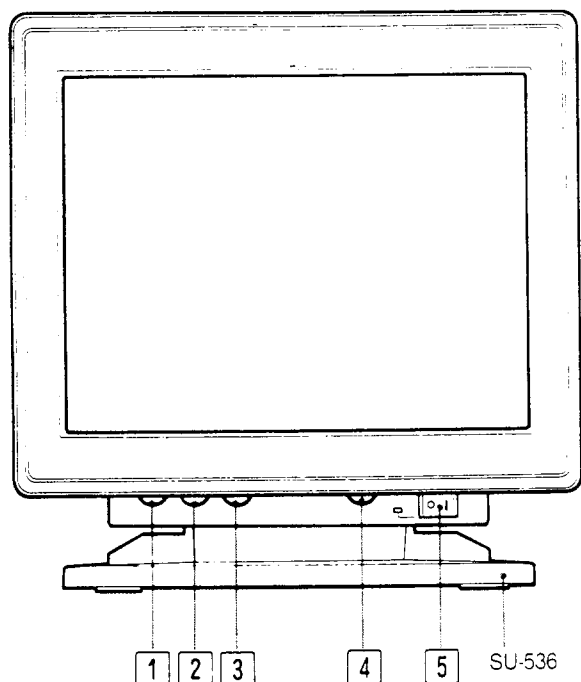
Vertical



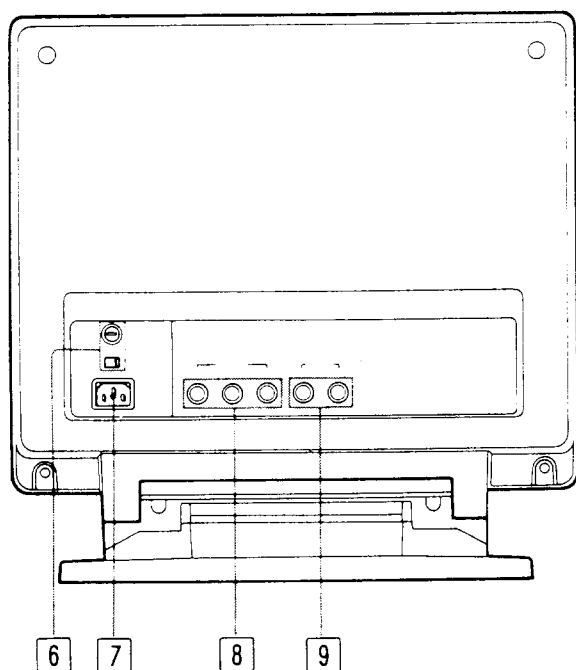
fv=60.0Hz

V-DISP:	Vertical-display Period active	15.744ms	(768 line)
V-FP:	Vertical-frontporch	61.5μs	(3 line)
V-SYNC:	Vertical-sync	61.5μs	(3 line)
V-BP:	Vertical-backporch	799.5μs	(39 line)
V-BL:	Vertical-blanking	922.5μs	(45 line)
1V:	1 Vertical-total Period	16.667ms	(813 line)

1-5. LOCATION AND FUNCTION OF CONTROLS



- 1 V STAT (vertical static convergence) control**
Adjusts the red and the blue horizontal lines so that they converge with the green horizontal line.
- 2 H STAT (horizontal static convergence) control**
Adjusts the red and the blue vertical lines so that they converge with the green vertical line.
- 3 V CENT (vertical centering) control**
Centers the picture in the vertical direction.
- 4 Contrast control (●)**
Adjusts the picture contrast.
- 5 Power switch and indicator**
- 6 Voltage selector (under the cover) and fuse**
Use the monitor with the appropriate selector setting and fuse.
The voltage selector is set to the 100 - 120 V position and a 4-ampere 125 V fuse is attached at the factory. When using the monitor in any other voltage area, the selector must be reset and the supplied T3,15-ampere 250 V fuse must be used. Refer this service to qualified personnel.



- 7 AC IN connector**
- 8 VIDEO IN connectors (BNC)**
Accept RGB video signals (0.714 Vp-p, positive).
When no external sync signal is applied, an internal sync signal (0.286 Vp-p, negative) must be added to the G signal.
- 9 SYNC IN (external sync input) connectors (BNC, 75 ohms)**
Accept external sync signals (1 — 4 Vp-p, negative).
HD: for horizontal drive pulse or composite sync.
VD: for vertical drive pulse
When an external sync signal is applied, the monitor is automatically switched from the internal sync mode to the external sync mode.

SECTION 2

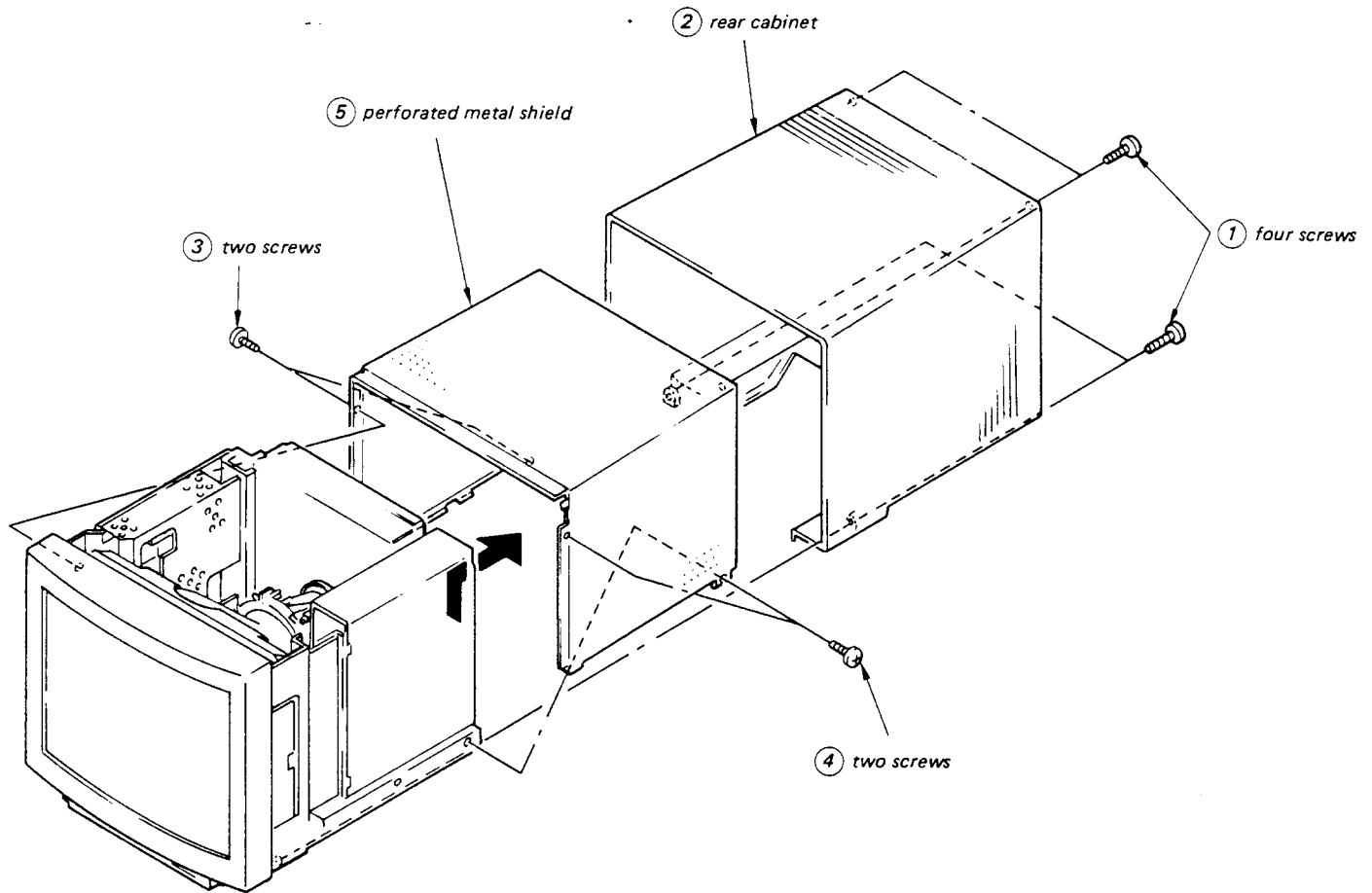
DISASSEMBLY AND REPLACEMENT

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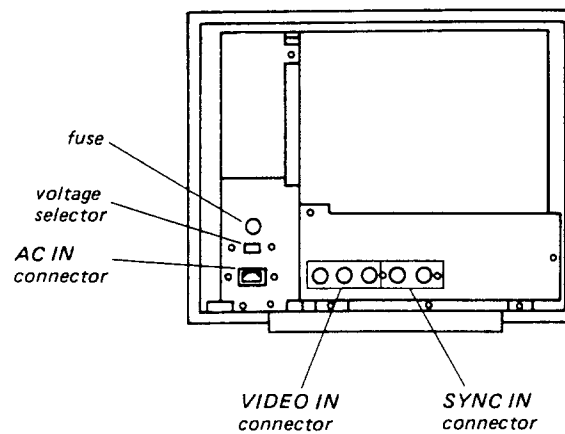
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SECTION 2 DISASSEMBLY

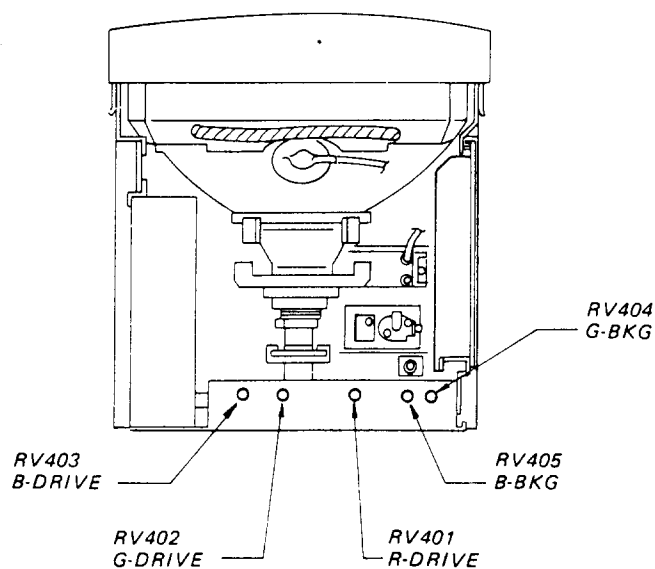
2-1. REAR CABINET REMOVAL



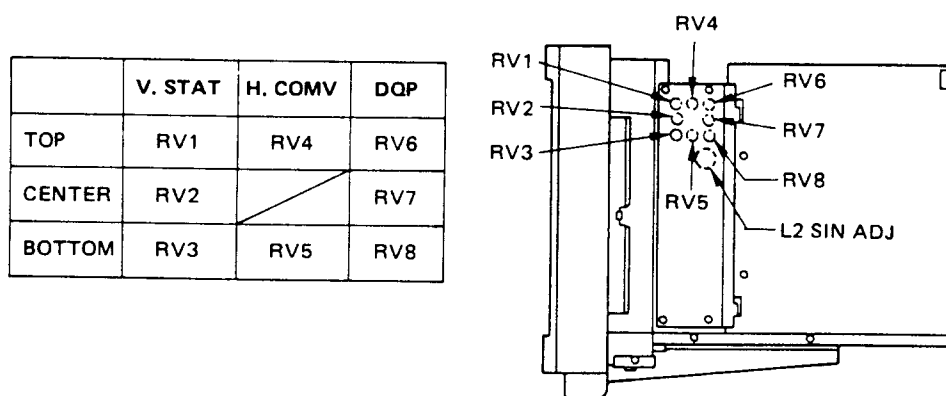
2-2. LOCATION OF REAR PANEL



2-3. LOCATION OF ADJUSTMENT FOR A BOARD

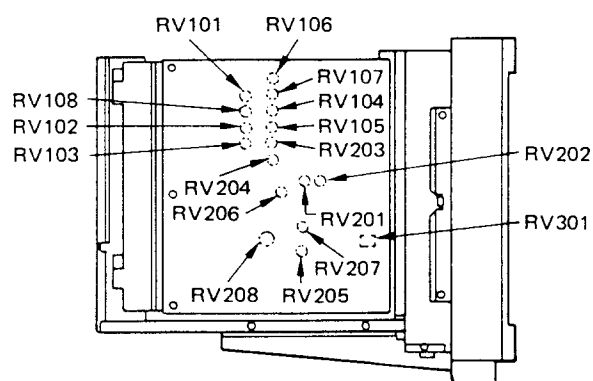


2-4. LOCATION OF ADJUSTMENT FOR L BOARD

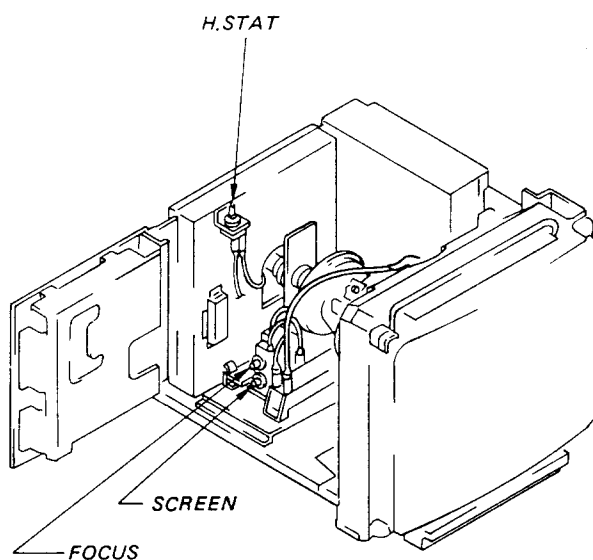


2-5. LOCATION OF ADJUSTMENT FOR D BOARD

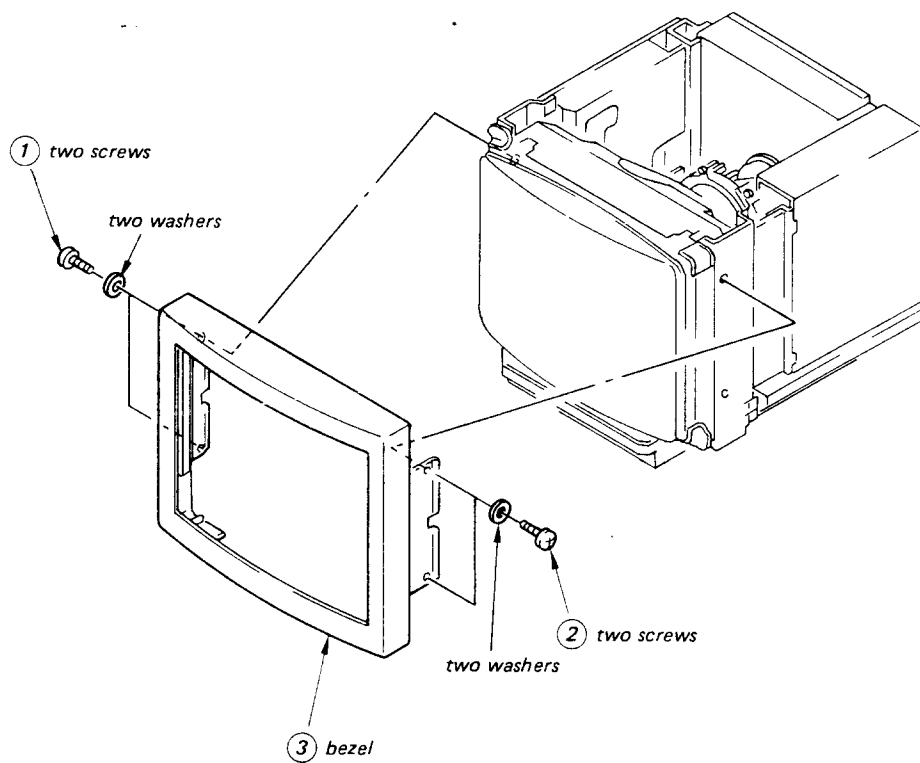
RV101	V.SIZE
RV102	V.LINEARITY
RV103	V.LINEARITY BALANCE
RV104	BOT AMP
RV105	BOT PHASE
RV106	TOP AMP
RV107	TOP PHASE
RV108	V.CENTER
RV201	KEY
RV202	KEY BALANCE
RV203	PIN AMP
RV204	H.SIZE
RV205	H.PHASE
RV206	SIDE PIN BALANCE
RV207	H-FREQUENCY
RV208	H-CENTER
RV301	HV ADJ



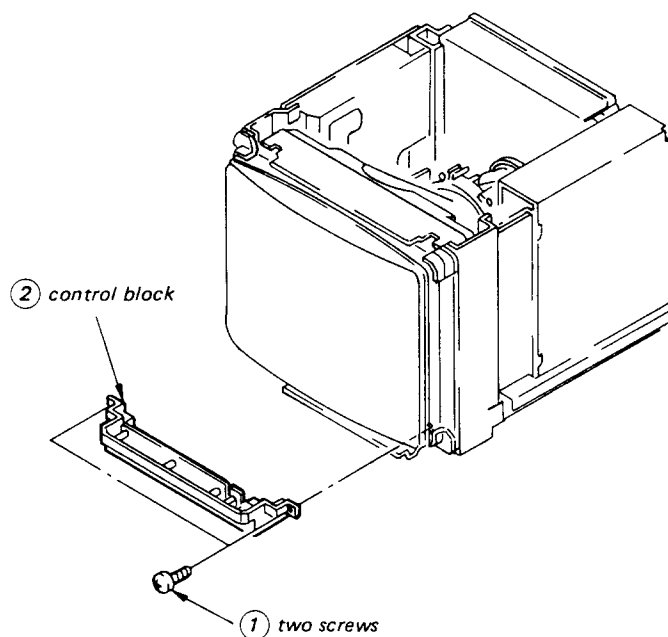
2-6. LOCATION OF ADJUSTMENT FOR FOCUS, SCREEN AND H. STAT



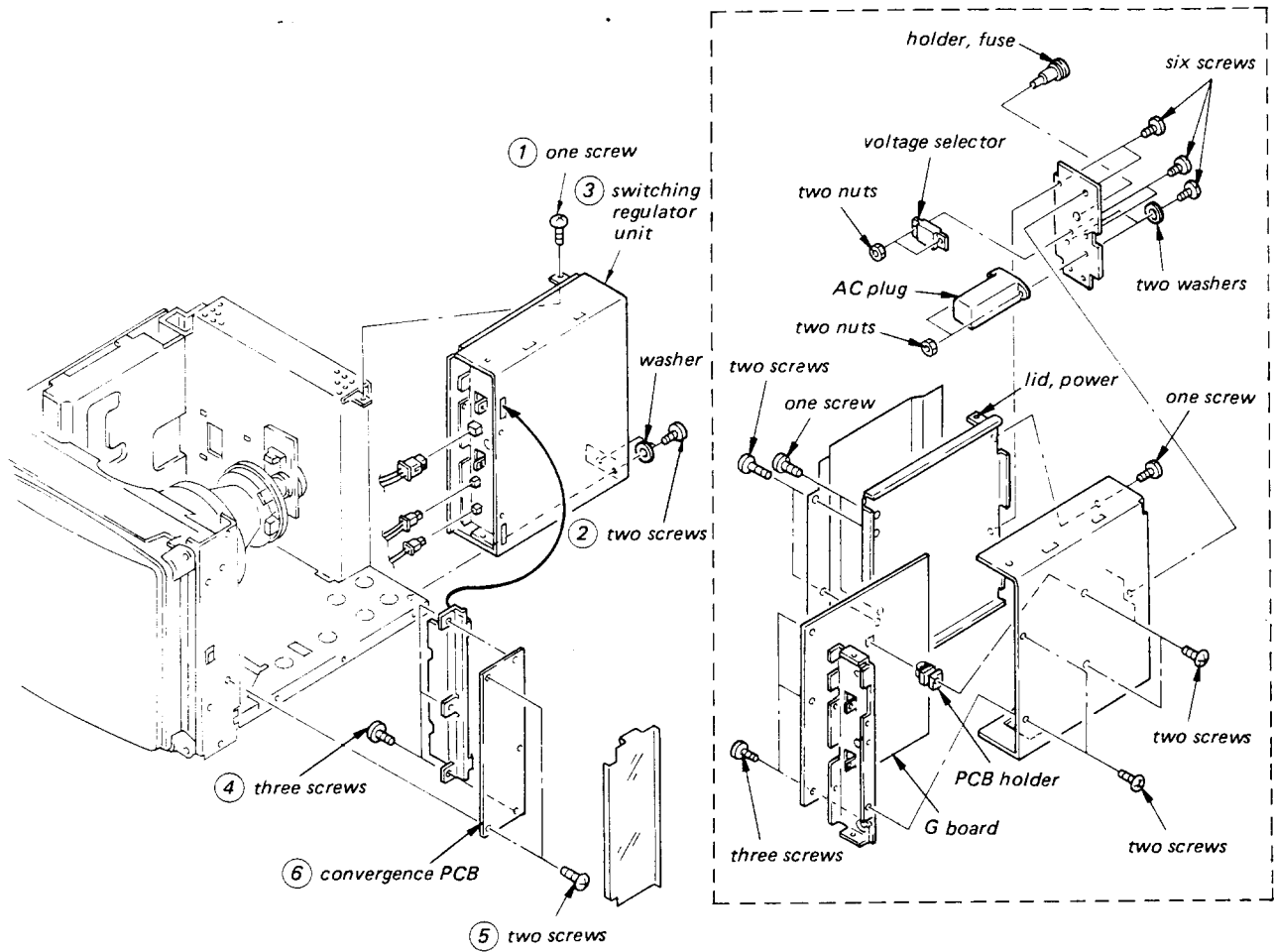
2-7. BEZEL REMOVAL



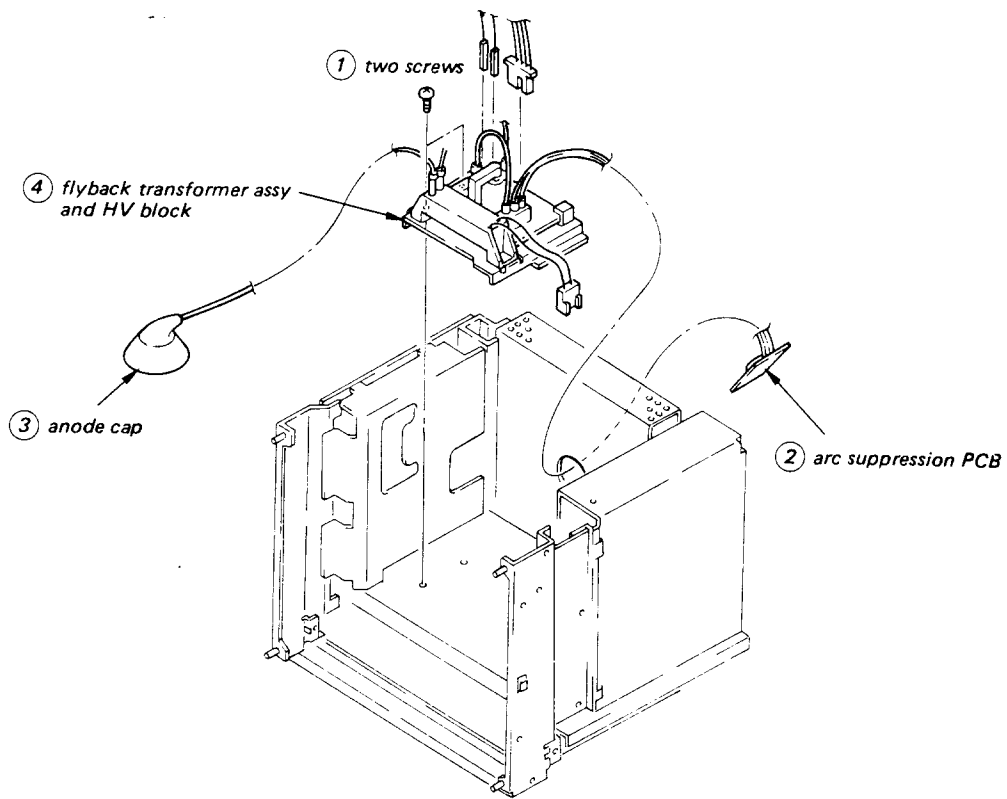
2-8. CONTROL BLOCK REMOVAL



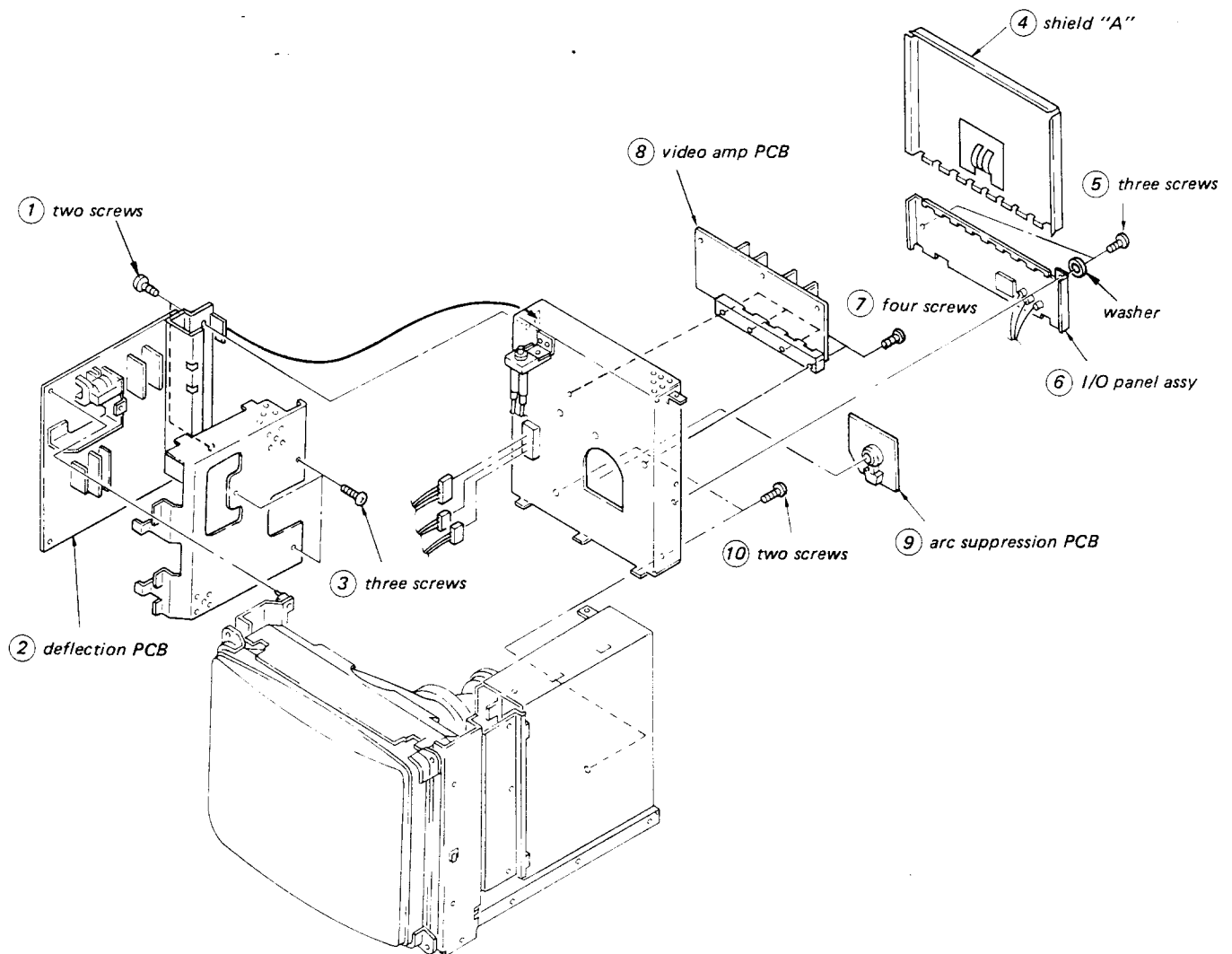
2-9. SWITCHING REGULATOR UNIT AND CONVERGENCE PCB REMOVAL



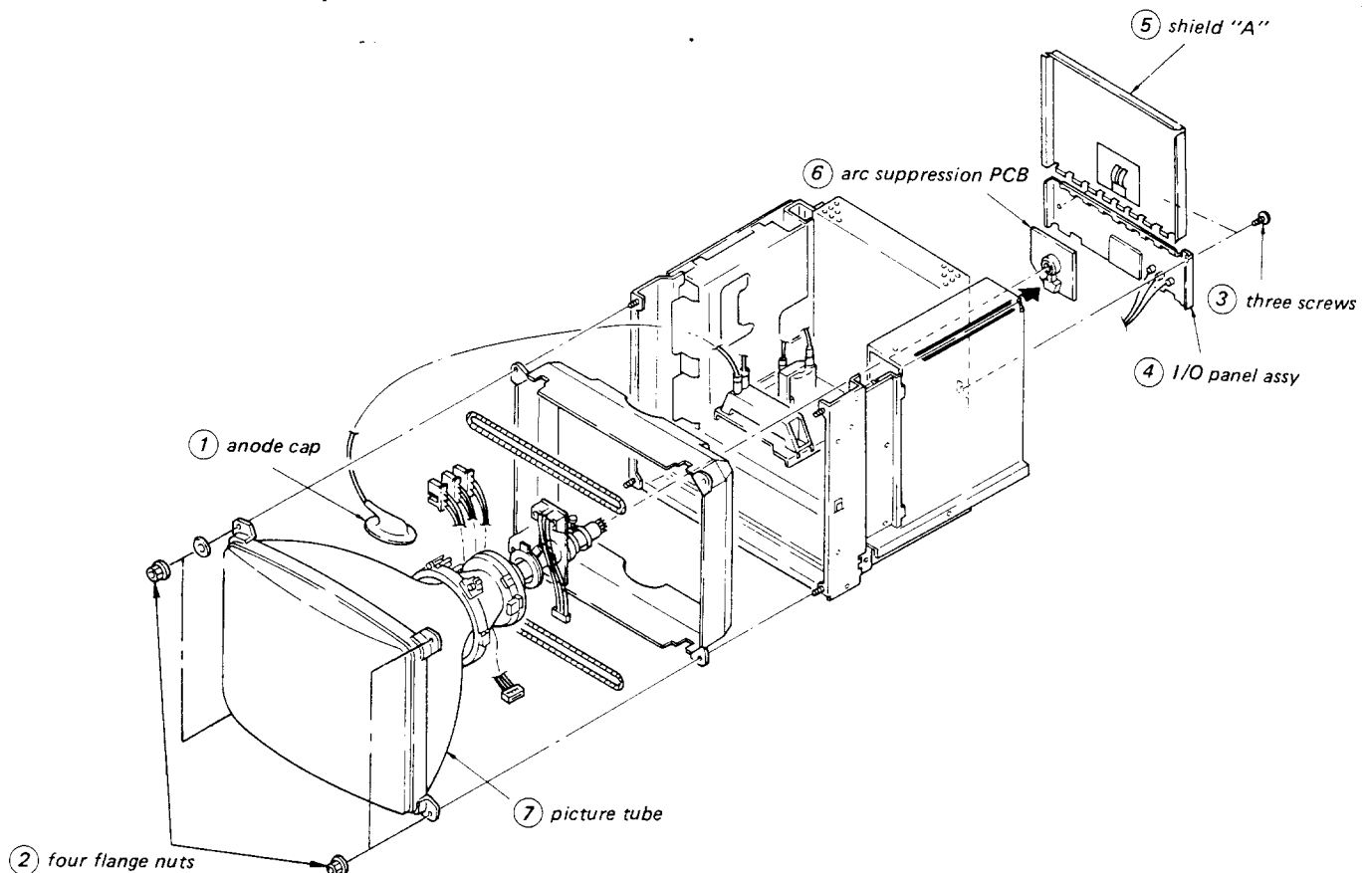
2-10. FLYBACK TRANSFORMER ASSY AND HV BLOCK REMOVAL



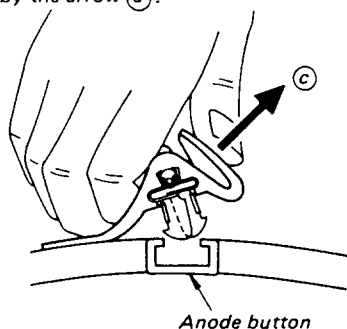
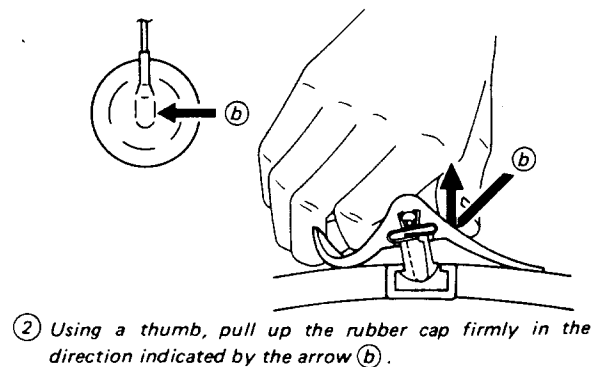
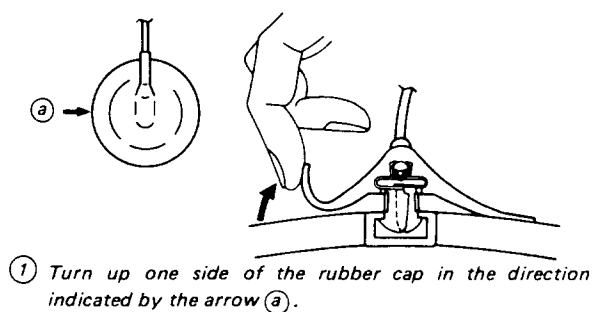
2-11. DEFLECTION PCB, VIDEO AMP PCB AND ARC SUPPRESSION PCB REMOVAL



2-12. PICTURE TUBE REMOVAL



• ANODE CAP REMOVAL



SECTION 3

CIRCUIT DESCRIPTIONS

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3-1. A BOARD

3-1-1. Composition

The A board consists of three channels of video signal amplifiers that include a contrast control circuit, pedestal clamp circuit, output amplifier (main), and blanking circuit. In addition, a sync signal separator and various control pulse generators are also located on the A board. Each of the three AA boards, mounted on the A board, consists of a contrast amplifier and clamp circuit. The AB board, also mounted on the A board, includes a sync signal separator and control pulse generators.

3-1-2. Contrast Amplifier (AA Board)

The contrast control amplifier utilizes a differential amplifier for current balance control and a feedback circuit to obtain wide frequency response and good tracking between channels. In this circuit, the amplifier gain can be continuously changed by DC adjustment for contrast control. This is achieved with the following signal process. A reference pulse is inserted on the back porch of the input signal (output of buffer Q1).

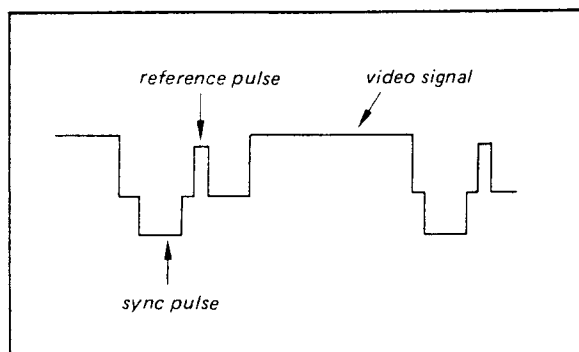


Fig. 3-1 Reference Pulse

The signal is then input to the contrast amplifier consisting of Q2 thru Q7. The gain is determined in the differential amplifier, Q3 and Q4, by altering the balance of the collector currents. Q8 thru Q13 are preamplifiers. The amplified signal is then buffered by Q14 and input to a sampling circuit for feedback. Q15 samples the magnitude of the reference pulses and charges C10. Meanwhile, a DC voltage, determined by the contrast control VR (H board) via RV401 (R-DRV), is input at pin ⑤ of IC1 (2/2). IC1 (2/2) outputs a DC voltage to the base of Q6 so that the sampled voltage at pin ⑥ is compared with that at pin ⑤. By feeding back the output of IC1 (2/2) to the contrast amplifier, the reference pulse level becomes equal to the potential difference between the two inputs of IC1 (2/2). Contrast can be changed by RV4 on the H board, as explained.

3-1-3. Pedestal Clamp (AA Board)

This circuit performs pedestal clamping for DC restoration of the input signal since the input stage of the video amplifier is AC coupled. Altering the DC bias at the collector of Q4 restores the DC component of the input signal and stabilizes the pedestal level (black) of the signal at the CRT cathode. Q5 acts as a DC power supply to regulate a bias voltage to Q4. The emitter voltage of Q5 is controlled by the output from IC1 (1/2), which is a high gain DC amplifier. A reference voltage (DC) is provided at pin ③ of IC1, and a feedback voltage subtracted by Q17 from the final video stage is at pin ②. Q17 samples and holds the detected voltage at R111 activating the gate by a background pulse. IC1 (1/2) compares the two input voltages and the output, thru Q5, controls the DC level of the collector of Q4 so as to equalize the input voltages.

3-1-4. Sync Separator and Pulse Generator (AB Board)

The sync separator, consisting of Q1 thru Q3, distinguishes the sync portion of the composite video signal and separates the sync pulses into horizontal sync (HD) and vertical sync (VD). When external sync signals are input to the monitor, the two sync signals are directly input to pins ② (X2) and ④ (X1) of IC1, the data selector. IC1 detects external sync pulses and automatically selects data lines X2 and X1. If no external sync pulses are detected, data lines Y2 and Y1, internal sync, are selected. HD and VD pulses are then sent to the D board via the B board.

Meanwhile, the pulses output from pin ⑬ of IC1 trigger IC2 (1/2), a monostable multivibrator. A background pulse is generated, synchronized with HD, and is output thru Q6 and Q7. At the same time, IC2 (2/2) is triggered by the background pulse and generates the contrast control pulse.

3-1-5. Video Output Amplifier

The video signals from the AA board preamplifier are input to the base of Q101. The video output stage is composed of a cascade amplifier consisting of Q101 and Q102 and has a gain of 20 dB. The frequency response of ± 3 dB from 60 Hz to 100 MHz is optimized with parallel peaking (L101), series peaking (L102), and emitter peaking (Q101), which compensate for the high frequency response.

3-1-6. Blanking Amplifier

Blanking signals are input from the D board, via the B board, to the base of Q403 to switch it on. Q404 is switched off when Q403 is-on, and a blanking pulse of approximately 60 Vp-p appears at the emitter of Q404. The blanking pulses are then clamped at specific DC levels and supplied to each of the three G1 grids of the CRT via the C board. Two individual clamping levels can be varied by RV404 (G-BKG) and RV405 (B-BKG), with respect to the Red channel, for background level adjustment.

3-2. B BOARD

The B board is an interface card for signals between the A board and the D, H, and power supply boards. All signal I/O, as well as DC power I/O, contain filters to suppress RFI.

Q1 acts as a fade control for the picture when the monitor is powered up. When power is applied, Q1 is turned on and clamps the contrast control voltage to a minimum. C2 is gradually charged up and Q1 is switched off, returning the contrast control voltage to the normal level.

3-3. C BOARD

The C board relays the bias voltages and video signals to the CRT electrodes. Spark gaps and neon lamps are mounted on the board to return the CRT discharge (flash-over) current to chassis ground.

3-4. D BOARD (Deflection and HV Regulation)

3-4-1. DA Board

The DA board performs the horizontal oscillator, horizontal phase locked loop, vertical oscillator, and vertical synchronization functions. These functions are processed and controlled by IC1.

The horizontal and vertical sync (HD, VD) signals from the A board, positive true, are input to pins ① and ①9 of IC1. The H sync signal is then delayed in phase by a PHASE SHIFTER and is input to an AFC circuit. Meanwhile, the horizontal retrace pulse, thru a voltage divider (C225, C226), is fed back to pin ④ and triggers a SAW TOOTH GENERATOR. The delayed H sync signal and the sawtooth wave are compared in the AFC circuit. The output from the AFC circuit synchronizes the horizontal scanning with the HD signal. RV205 (H-PHASE) controls the delay time of the PHASE SHIFTER and adjusts the horizontal position of the display image. Horizontal deflection is driven by the output at pin ⑫.

The vertical oscillator is triggered by the VD sync signal and locked at a frequency of 60 Hz. IC1 outputs two vertical rate pulses, a V drive pulse from pin ①6 and a V blanking pulse from pin ①5.

3-4-2. DB Board

The DB board generates waveforms, including a sawtooth wave, for S-correction of vertical deflection.

IC1 (1/2), configured as a Miller integrator, generates a vertical period sawtooth wave. Transistor Q1 and capacitor C2 control the rise and fall times of the sawtooth wave. The bias current of the ramp generator is supplied from IC2 (2/2) to pin ② of IC1 (1/2) and the peaks of the waveform are determined by diodes D1 and D5. The resulting zero-crossing sawtooth wave is input to the vertical deflection circuit via RV101 (V-SIZE) and also input to another Miller integrator, IC2 (1/2), generates a vertical period parabolic wave. IC1 (2/2) integrates the output from IC2 (1/2) and generates an S-correction wave (similar to a sine wave) at pin ⑦. This output is amplitude adjusted by RV102 (V-LIN) and is input to the vertical deflection circuit for linearity correction. RV103 (V-LINE BALANCE) adds a DC component to the V sawtooth wave at IC2 (1/2) to allow adjustment of the balance of vertical linearity at the top and bottom of the display. Additionally, the V-sawtooth and V-sine waves are supplied to other correction circuits on the D board.

3-4-3. DC Board

The DC board receives the horizontal retrace pulse from T203 (HOT) and the V-sawtooth from the DB board and generates a complex "butterfly" waveform. The sawtooth is input to D1, D2, and D3, split into positive and negative half waves, and the amplitudes are varied by RV104, RV105, RV106, and RV107. IC1 (1/2) sums the amplitude adjusted sawtooth waves to modulate the horizontal ramp signals for top and bottom pincushion correction. IC1 (2/2) performs a similar function for phase control by altering the starting point of the horizontal ramp signals. Meanwhile, the H retrace pulse is inverted by Q1 and triggers a phase control shifter composed of Q3 and Q4 after passing thru Q2. The magnitude of the pulse phase shift is varied by the output voltage from pin ⑦ of IC1 (2/2) and allows individual phase adjustments for both top and bottom pincushion distortion correction. The output voltage from pin ① of IC1 (1/2) is input to Miller integrator IC2 (2/2) with reset switch Q5 activated by the collector of Q4. Accordingly, a horizontal sawtooth signal, synchronized by Q4, is generated and is amplitude modulated by the sawtooth wave output from IC1 (1/2). This signal is inverted by IC2 (1/2) and is input to Q103.

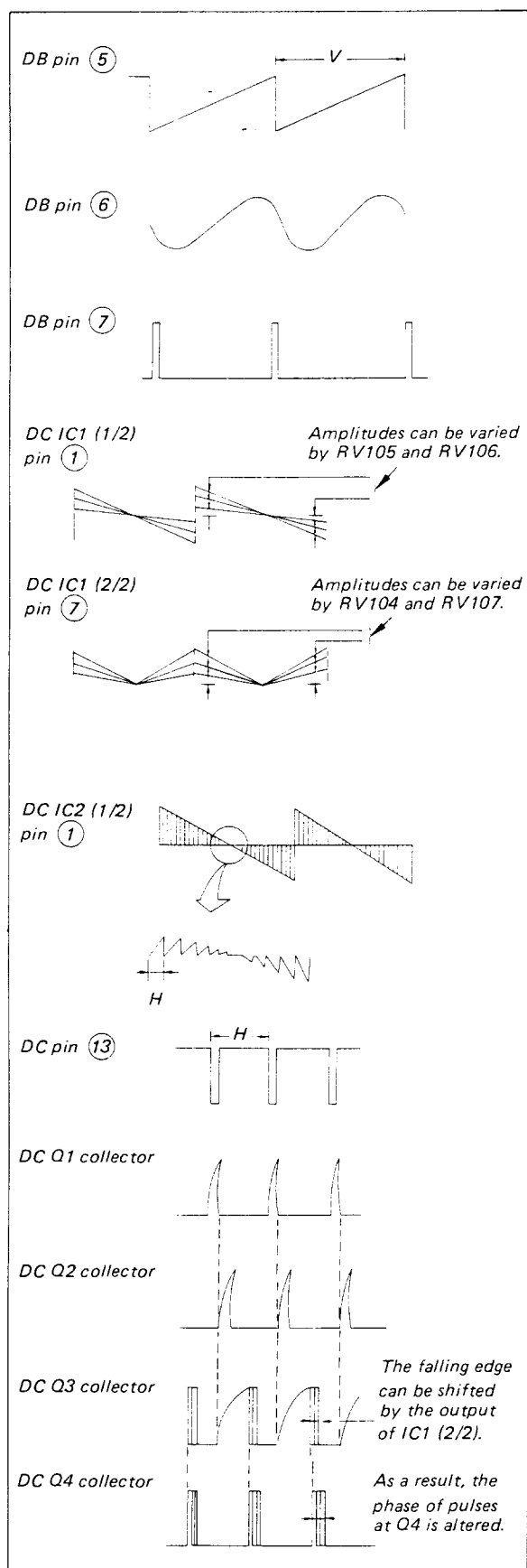


Fig. 3-2 Waveforms on "DB" and "DC" Boards

3-4-4. Horizontal Deflection Output Circuit

The horizontal predriver circuit of Q214 and T202 boosts the horizontal oscillator output from the DA board to switch output transistor Q215 on and off. The horizontal deflection yoke, resonance capacitor C224, and damper diode D210 are connected to the collector of Q215, and +B voltage is supplied to horizontal output transformer T203. The secondary windings of the HOT, via D213 and D214, produce DC voltages for Q216 and Q217 for control of raster centering. D211, D212, C227, and C228 are configured as a boot-strap circuit with the primary winding to increase the voltage at the collector of Q215 for horizontal size selection. (WIDE or NARROW can be selected by a jumper wire.)

The horizontal deflection yoke current flows thru "S" correction capacitor C219 and horizontal linearity coil (HLC) L203. Transistor Q210 provides DC power to the output circuit, thru Q211 and Q212, that is modulated with the vertical period parabolic wave to correct side pincushion distortion. Q210 is driven by IC201 (2/2) and the output at the collector of Q212 is fed back to IC201 (2/2) for regulation. At IC201 (2/2), the amplitude adjusted V parabolic wave is fed to the positive input and the regulated V sawtooth wave with specific DC bias is fed to the negative input. RV203 (PIN-AMP) adjusts the amplitude of the parabolic wave from IC201 (1/2) for side pincushion correction, and RV202 (KEY) varies the amplitude and polarity of the sawtooth wave output from Q201 to correct keystone distortion. DC bias for IC201 (2/2) is varied by RV204 (H SIZE) and changes the DC level at the emitter of Q212 for horizontal picture size adjustment.

Two vertical period waveforms, the parabolic wave from Q207 and the sawtooth wave from Q201 are input to the DA board at pin 15 and modulate the AFC voltage to allow adjustment of side pincushion distortion balance, SIDE PIN BAL RV206, and keystone distortion balance, KEY BAL RV201.

3-4-5. Vertical Deflection Output

The vertical deflection sawtooth wave and top/bottom pincushion correction signals are input to differential amplifier Q103 and Q102 to drive Q105. The output of Q105 is amplified by the SEPP complimentary pair amplifier, Q106 – Q107, and drives the vertical deflection yoke. T101 (VPT) amplifies the horizontal rate top/bottom pincushion correction signals and modulates the deflection current thru its secondary winding. The voltage across R128 resulting from detecting the deflection yoke current is fed back to the differential amplifier input via R130 and C110.

The vertical drive pulses from the DA board switch on Q104 during the duration of the vertical blanking time. Q104 then supplies +B voltage to the vertical output circuit to generate a high peak voltage flyback pulse in the deflection yoke. Consequently, the vertical retrace time is minimized and is shorter than the vertical blanking time.

3-4-6. Blanking Pulse Generator

The vertical blanking pulse output from the DA board is input to the emitter of Q203 and pulse width adjusted by Q204.

The horizontal parabolic voltage wave appearing at C219 is input to Q209 thru a voltage divider consisting of R240, C211, R257, and C217. D205 and D206 clamp the parabolic wave, and Q209 controls the input voltage to produce a horizontal rate pulse at the collector with appropriate width.

The horizontal rate pulse and the vertical rate pulses are summed at the bases of Q205 and Q206 and output to the B board.

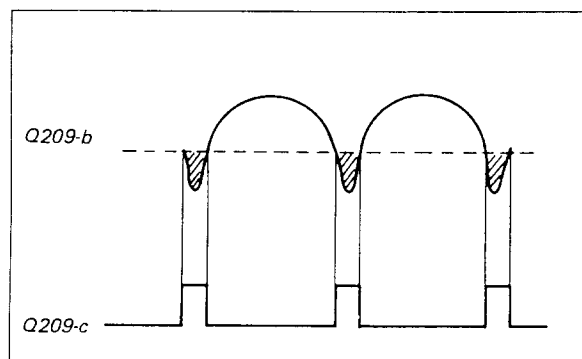


Fig. 3-3 Blanking Pulse

3-4-7. HV Regulator

Horizontal drive pulses from the collector of Q214 are input to Q302 and amplified by Q302 and Q303 to drive output transistor Q304 thru T301 (HDT). The flyback transformer (FBT) resonance capacitor C310 and regulation coil (HRC) L301 are connected to the collector of Q304, and +B voltage is supplied to the line output transformer (LOT) T303.

The FBT is a multisingular type, and its secondary winding incorporates six rectifier diodes. The second stage generates focus voltage (G4) and screen voltage (G2). The high-voltage output of the FBT is supplied to the CRT anode thru HV block and is also divided in the ratio of 1/3000 by a pair of high-voltage resistor. This divided voltage is supplied to the DD and DE boards.

IC1 (2/2) on the DE board receives this HV feedback voltage and compares it to a reference voltage of 9.00 V dc. The resulting differential voltage is amplified and input to IC2 (1/2) on the DD board.

The output pulse from Q214 is delayed in phase by Q310 and Q311 and drives the base of Q1 on the DD board. Q1 charges and discharges C4 to generate a sawtooth wave that is input to IC2 (1/2). A square wave is generated by comparing the horizontal rate sawtooth wave and the amplified idfferential error voltage. This square wave is pulse width modulated with respect to the error voltage and switches the regulator output transistor Q306 after amplification by Q305 and T302. The flyback pulse peak voltage is controlled by altering the duration of the on time of Q306 and regulates the HV voltage.

In addition to the HV output, T303 (LOT) also generates ± 24 V dc for the vertical deflection output circuit, -95 V dc for G1 bias, and 6.3 V dc for the cathode heaters.

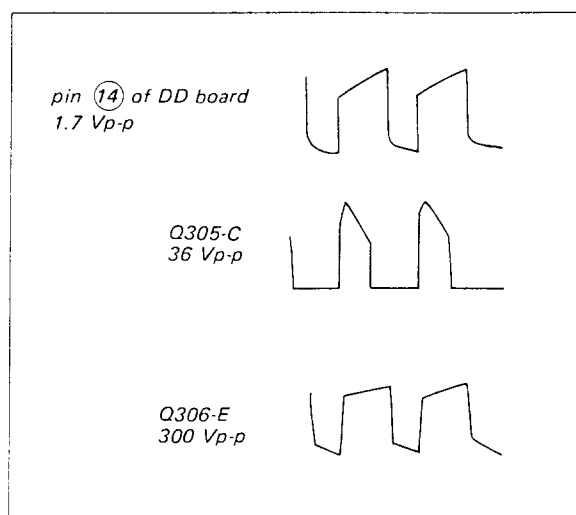


Fig. 3-4

3-4-8. HV Hold-Down Circuit

Feedback voltage, normally 9.00 V, from the HV block is input to the positive input of comparator IC1 (1/2) on the DD board. It is compared with a reference voltage (VHV) selected by R305, R345, and R314 of 9.60 ± 0.10 V. Normally, the output of IC1 (1/2) is low. When the voltage at the positive input exceeds VHV, the output voltage at pin ① goes high and switches on Q309 thru hold-circuit IC1 (1/2) on the DE board. The collector of Q309 is connected to the collector of Q302 to disable the HV drive pulse when Q309 switches on, holding down the high voltage. The high voltage value when hold down initiates can be calculated as follows:

$$\begin{aligned} \text{HP (PRT)} &= 9.60 (\pm 0.10) \times 3000 (+1/-3\%) \\ &= 28.80 \begin{smallmatrix} +0.59 \\ -1.15 \end{smallmatrix} \text{ kV} \end{aligned}$$

3-4-9. Beam Protector

If the CRT anode current increases beyond a predetermined value, the beam protector circuits inhibits high voltage operation. This monitor incorporates two individual beam protectors to provide double over current protection.

Anode current is supplied by the secondary of the FBT and flows thru series resistors R307 – R310. Voltage on pin ⑤ of connector D-6 decreases as the high voltage current increases. Since the bleed current flowing to high-voltage feedback resistors and focus resistors is constant, any change in anode current is proportional to the voltage drop across sense resistors R307 – R310. When anode current exceeds a threshold value, the voltage at the positive input of IC2 (2/2) on the DD board drops below that of the negative input (VHV), and the output changes from a “high” to a “low” state. IC2 (2/2) is configured as a comparator with hysteresis and the output is held “low”. As a result, high-voltage predriver Q302 is inhibited and prevents excessive current flow to the CRT.

IC1 (2/2) on the DD board comprises the second beam protector and functions in a similar manner to IC2 (2/2). The current threshold of beam protector #2 is set at a higher value than the threshold of beam protector #1.

3-4-10. Scan Failure Protection

Scan detection circuits are utilized to inhibit HV generation and protect the CRT phosphor upon loss of horizontal or vertical deflection.

The collector voltage for Q302 (HV predriver) is obtained by rectifying the retrace pulse from the HOT. Upon loss of horizontal deflection, no voltage is supplied to the collector of Q302 and HV is inhibited.

Vertical deflection flyback pulses are rectified by D106 and charge capacitor C327 to turn Q308 “on”. However, when vertical deflection fails, Q308 is switched “off” and Q307 is switched “on”. The collector of Q302 is held low by Q307, inhibiting HV operation.

3-5. G BOARD (Power Supply)

3-5-1. AC Line Filter

The AC line filter consists of an input filter, and transformers T1 and T2, and capacitors C1, C28, C30, and C31 which are mounted on the G board.

3-5-2. AC Voltage Selector

AC input voltage is selected by switch S902 on the connector panel. When set for AC100 to 120 V, the voltage rectifier circuit is configured as a voltage doubler. When set for AC220 to 240 V, the voltage rectifier circuit is configured as a full-wave rectifier.

3-5-3. Degauss

The degauss coil is mounted on the metal CRT shield to automatically demagnetize the CRT. The mechanical relay RY52 and one of the two posistors THP1 and THP2 provide an attenuating AC current to the degauss coil L901. Transistor Q56 controls RY52 and a time constant circuit, R65 and C88, allows a degaussing duration time of approximately five seconds at each turn on cycle. Until RY52 is selected on, AC current thru the posistor causes its resistance to increase and the current is gradually attenuated.

3-5-4. OVP Circuit

The over voltage protection (OVP) circuit is designed into the AC primary line circuit. The circuit operates, for example, when applying an AC input voltage of 220 V to the monitor with the AC voltage selector switch set to 100 – 120 V. When the switch is set to this position, a series circuit consisting of neon lamp NL1 and resistor R4 is connected across the AC primary lines (from Live to Neutral). The neon lamp fires at a voltage of 230 ± 34 V and results in a blown fuse F901. The maximum AC voltage which triggers this protection circuit is set at 164 ± 24 V, with the voltage selection switch set to 100 – 120 V AC.

3-5-5. DC Power Supply (Regulator)

DC supply voltages (+145 V <GDM-1602: 120 V>, +60 V, +15 and –15 V) are generated by a Y-Z type switching mode regulator. Two regulators are utilized, one for the +B voltage and one for +B2, +15, and –15 voltages. This description is for the +B regulator.

IC51 compares a feedback voltage from the +B line to

an internally generated reference voltage to determine the current flow to the control winding of transformer T4 (PRT-1). T4 is a cross transformer with the mutual inductance between the primary and secondary windings controlled by the current through a perpendicular winding. Consequently, the frequency and voltage of a resonant circuit, C15 and T5, is varied. The output from the secondary of T5 is rectified and filtered to provide +145 V DC (GDM-1602: 120 V DC). +B over voltage is detected by IC51 and opens the AC primary input lines via relay RY51. The low voltage circuit (IC52) operates in a similar manner.

3-6. H BOARD

The following operator control VRs are mounted on the H board:

- V CENT (RV1) raster vertical position adjustment
- H STAT (RV2) horizontal static convergence adjustment
- V STAT (RV3) vertical static convergence adjustment
- CONT (RV4) display contrast (intensity)

3-7. J BOARD

An LED indicator showing that the power supply "on" is mounted on the J board.

3-8. L BOARD

3-8-1. Composition

The L board consists of a semi-dynamic convergence compensation circuit and a quadrapole coil drive circuit for dynamic focus compensation (beam spot shaping).

3-8-2. Modulated Waveform Generator

Four types of modulated vertical rate parabolic waveforms are generated for convergence and dynamic focus controls.

Inverter IC1 (1/2) receives the vertical rate parabolic wave from the D board and generates an inverted parabolic wave to be used at RV2 and RV7. A clamp circuit composed of Q1 and Q2 also receives the parabolic wave from the D board and clamps the middle portion of the wave to ground potential. This clamped wave is input to IC4 at pin (4) and an inverted clamped wave from IC1 (2/2) is input to IC4 at pin (5).

Transistor Q3 receives HD pulses from the D board and generates a vertical period ramp signal across C4, that is input to zero-crossing comparator IC2 (1/2). A 50% duty cycle square wave is output from IC2 (1/2) and drives switcher IC4.

As a result IC4 outputs the following four waveforms:

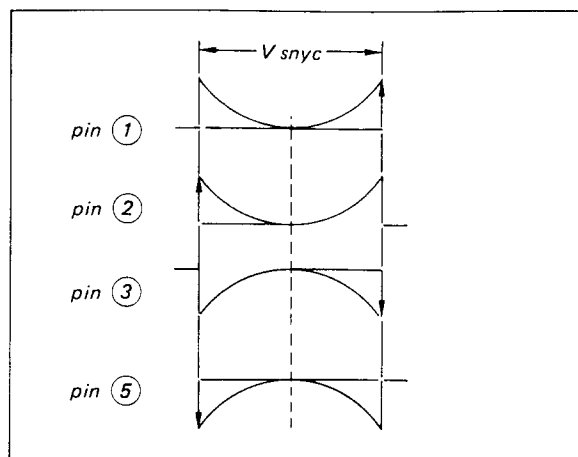


Fig. 3-5 Waveforms of IC4

3-8-3. Horizontal Convergence

This circuit is designed to allow adjustment for both horizontal static and "Y bow" misconvergence.

The waveforms from IC4 are amplitude adjusted by RV4 and RV5 and combined at the negative input of IC3 (2/2) with a DC bias (H STAT) supplied from the H board. High voltage amplifier Q7, driven by IC3 (2/2), controls the convergence plate voltage thru the IBR (Inner Bleeder Resistor) in the CRT and allows adjustment of the red and the electron beams.

3-8-4. Vertical Convergence

This circuit is designed to allow adjustment of both vertical static and "V TILT" misconvergence.

The output waveforms from IC4 are amplitude adjusted by RV1 and RV3 and mixed with the parabolic waveform from RV2. IC2 (2/2) sums these waveforms along with a DC bias (V STAT) and drives the neck twist coil (NTC) thru buffer amp Q4 and Q5.

3-8-5. Dynamic Quadrapole (DQP) Drive

This monitor utilizes a Convergence Free Deflection (CFD) yoke to minimize misconvergence with a non-uniform magnetic field. However, this magnetic field tends to distort the beam spot shape in relation to location on the CRT. A DQP magnet is placed on the CRT neck at the focus electrode of the electron gun to compensate for beam spot distortion and to achieve uniform focus on the entire display.

IC3 (1/2) sums vertical period parabolic wave signals from RV6, RV7, and RV8 and supplies vertical period drive current to the DQP thru Q6 and L3 (RF choke). Horizontal flyback pulses from the D board are input to C40 and activate a resonant circuit consisting of L1, C40, and C41. As a result, sine wave current synchronized with the horizontal scanning rate is generated and, thru adjustable inductor L2, is superimposed with the vertical period current to improve focus at the sides of the display.

SECTION 4

ADJUSTMENT

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1. PICTURE PROJECTION TEST

1-1. Picture Projection

- 1) Connect power from an isolated-type variac after checking that the power switch of the set is turned off.
- 2) Adjust the AC input to the rated voltage.
- 3) Supply signals to the set.
- 4) Adjust SCREEN VR so that the raster brightness is at an appropriate level.
- 5) Check that the picture is not rolling.
- 6) Rotate RV207 (H FREQ) on the D board to lock the picture, if there is slipping.

1-2. Checking the Operation of Individual Sections

- 1) Check that the POWER lamp (green) lights when the POWER switch on the set is turned on.
- 2) Apply input signals.
- 3) Rotate the following VR's and check that the circuits are functioning.
 - (1) CONT (contrast) VR
 - (2) V. CENT VR
 - (3) V. STAT VR
 - (4) H. STAT VR
 - (5) SCREEN VR
 - (6) FOCUS VR
 - (7) R DRV, G DRV, B DRV VR's (on the A board)
 - (8) G BKG, B BKG VR's (on the A board)
- 4) Checking Direction of Rotation of Contrast VR. Check that the contrast increases when the contrast VR is rotated clockwise and that it decreases when rotated counterclockwise.
After checking, rotate the contrast VR clockwise fully and make the contrast maximum.
- 5) Checking R, G, and B connection.
Alternately switch on and off the R, G, and B switches on the signal generator and check for correspondence between the three colors R, G, and B.

1-3. Checking Voltage of Individual Sections

Checking that the following voltages are present on each board.

- 1) +B Voltage $145 \pm \frac{1}{2}$ V (GDM-1602: $120 \pm \frac{1}{2}$ V) (D-1 pin 1 - pin 3 GND)
- 2) +12 V output 12.0 ± 0.3 V (D-1 pin ④ - pin ⑤ GND)
- 3) -12 V output -12.0 ± 0.6 V (D-1 pin ⑥ - pin ⑤ GND)
- 4) The voltage between TP304 on the D board and GND is 9.00 ± 0.05 V.
Readjust by rotating RV301 if the standard is not met.
- 5) +B₂ Voltage 59.0 ± 3 V (D-1 pin ② - GND)

2. ADJUSTMENT

2-1. White Balance Coarse Adjustment

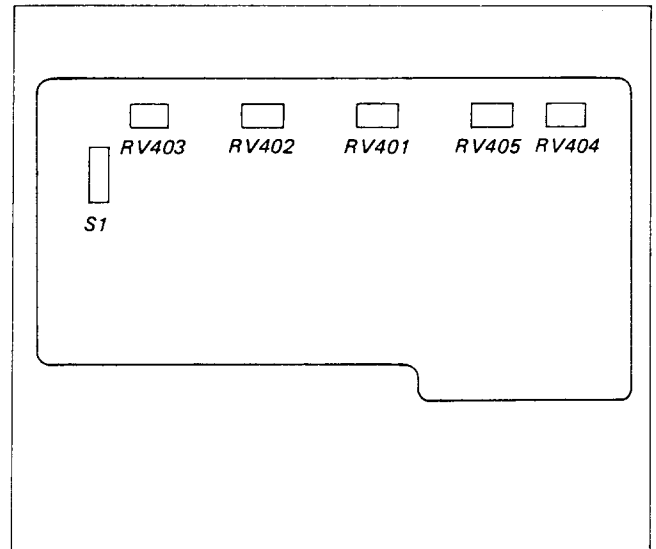


Fig. 2-1-1 A board

- 1) Adjustment of video signal voltage
 - (1) Input the full white signal
Set to the following points:
 - (2) A board

RV404 (G-BKG)	.....	Min
RV405 (B-BKG)	.....	Min
RV401 (R-DRV)	.....	Min
RV402 (G-DRV)	.....	Min
RV403 (B-DRV)	.....	Min
Front Panel CONT VR	.....	Max
 - (3) Connect the oscilloscope probe to TP2 (KR) on the C board.
 - (4) Vary RV401 on the A board and adjust the video level to 40 Vp-p. (See Fig. 2-1-2.)
 - (5) Connect the oscilloscope probe to TP1 (GIR) on the C board.

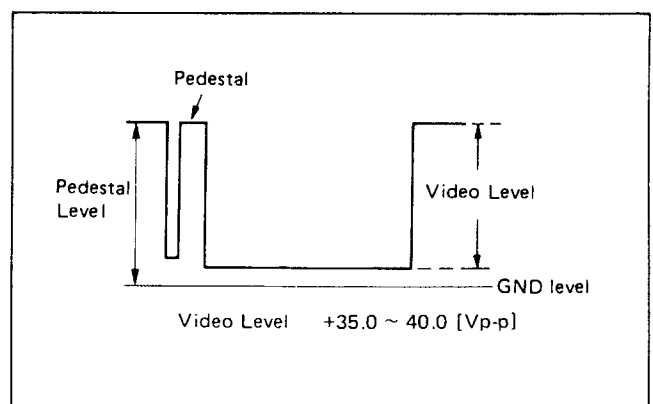


Fig. 2-1-2

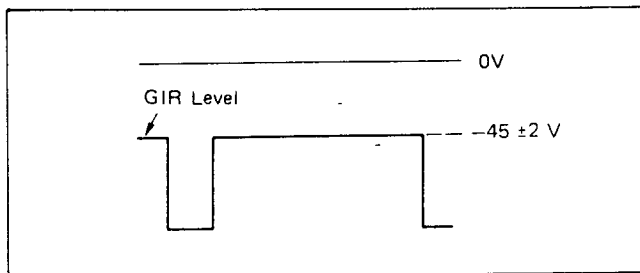


Fig. 2-1-3

2) Coarse adjustment

- (1) Set the CONT VR to minimum.
- (2) Adjust the SCREEN (G2) VR so that the background of the screen disappears.
- (3) Adjust the RV404 (G-BKG) and RV405 (B-BKG) for dark level white balance.
- (4) Set the CONT VR to maximum.
- (5) Adjust the RV402 (G-DRV) and RV403 (B-DRV) for the high-light white balance.
- (6) Repeat from (1) to (5) until getting the good white balance. (This adjustment need not be precise.)

2-2. Beam Landing Coarse Adjustment

If you use the CRT of FRU provided by SONY, you need not do adjustments described below.

- 1) Input a full white signal (or equivalent signal).
- 2) Rotate the CONT VR fully clockwise.
- 3) Project only green (switch off SG R and B channel outputs).
- 4) Adjust SCREEN (G2) VR to obtain appropriate brightness.
- 5) Move the DY backward and make a coarse adjustment with the purity magnet so that the green raster is at the screen center. (see Fig. 2-2-1)
- 6) Move the DY forward and adjust so that the entire screen turns green.
- 7) Adjust the DY tilt.
- 8) Lightly fix the DY with the DY fixing bracket.

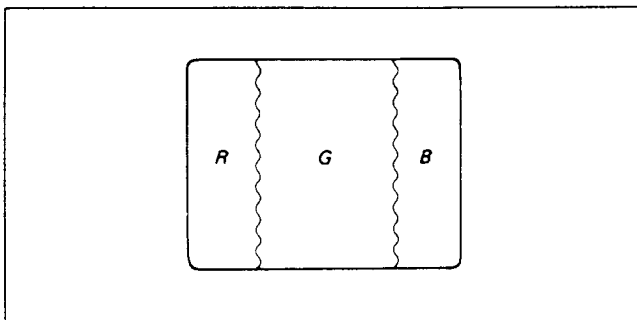


Fig. 2-2-1

2-3. Focus Adjustment

If you use the CRT of FRU provided by SONY, you need not do adjustments described in the item 6), 7), 8).

- 1) Receive a white hatch signal.
- 2) Draw DQP/NTC connector.
- 3) Adjust the focus operating RV902 (FOCUS VR).
- 4) Switch off the SG green switch.
- 5) Adjust the H convergence of red and blue in the picture center by H START VR.
- 6) Impress 500 mADC to the DQP terminal of NTC from the outside.
- 7) Switch on and off the external power supply switch to move the NTC longitudinally. Fix the NTC with screws in a place where the convergence does not slip.
- 8) Disconnect the connector from the external power supply and connect the connector DQP/NTC.
- 9) Connect oscilloscope intersecting point of L2 and C41 (L board) and adjust L2 so that SIN wave to maximum.
- 10) Switch on a green signal and adjust the focus operating RV6, 7, and 8 on the L board.

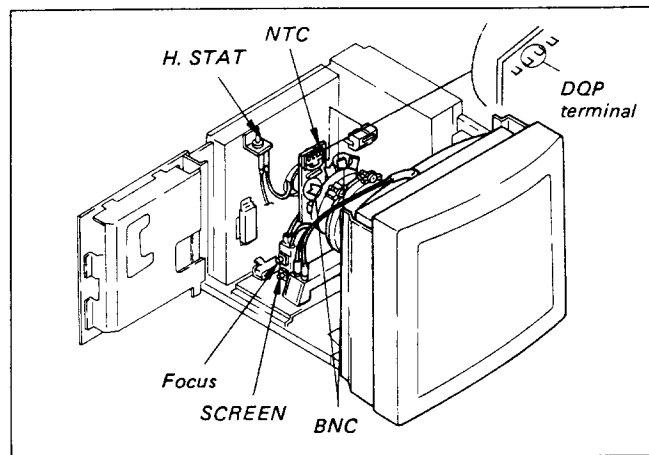


Fig. 2-3-1

2-4. Convergence Coarse Adjustment

If you use the CRT of FRU provided by SONY, you need not do adjustments described in the item 2), 5), 6).

- 1) Receive a white hatch signal.
- 2) Operate the BMC magnet and adjust the BMC in horizontal and vertical directions of the picture.
- 3) Operate the H STAT VR and adjust the convergence in the picture center.
- 4) Operate V CONV (RV1, 2, and 3) on the L board and adjust the V convergence.

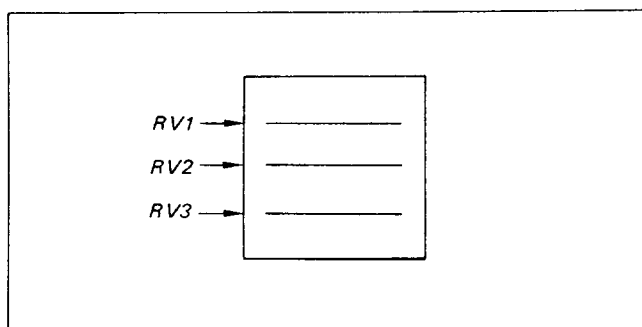


Fig. 2-4-1

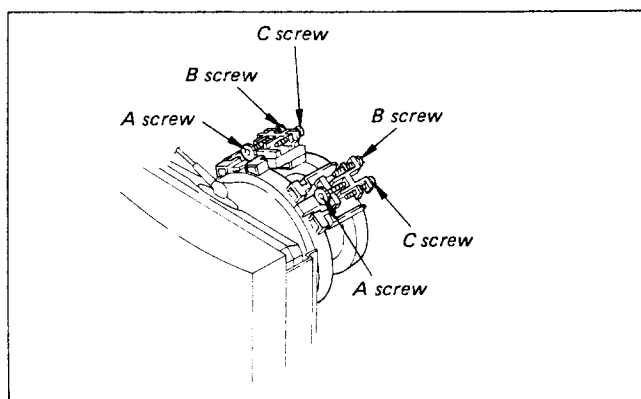


Fig. 2-4-2

- 5) Adjust XBV and XCV by the reactor on the right side seen from the CRT.
- 6) Adjust H AMP and H TILT by the reactor on the left side seen from the CRT.

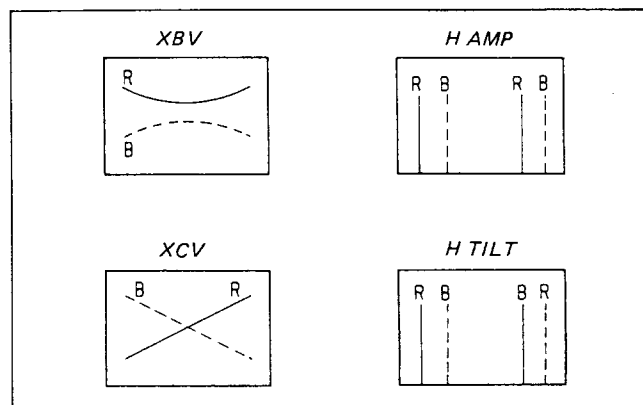


Fig. 2-4-3

2-5. Beam Landing Adjustment

If you use the CRT of FRU provided by SONY, you need not do adjustments described below.

- 1) Put the monitor in the Helmholtz room. ($B_H = 0$, $B_V = -0.35$ gauss)
- 2) Input a full white signal (or equivalent signal), and turn the Blue and Red channel off.
- 3) Set the CONT VR to maximum.
- 4) Degauss the screen by the hand degauss coil.
- 5) After more than 30 minutes aging, attach the landing checker and adjust the DY position, the purity control, the DY tilt and the landing of 4 corners. The landing deviation have to be less than $\pm 10\mu m$ of 4 corners.
- 6) Attach magnets on the panel side if necessary as shown in Fig. 2-5-1. (Do not exceed one magnet at each corner.)

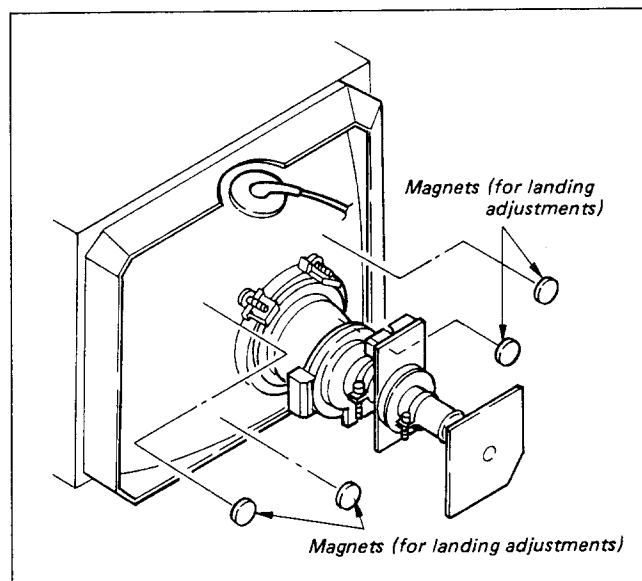


Fig. 2-5-1

- 7) Tighten the DY screw.

Final check

After the adjustments have been completed, face the set in all direction, (North, South, East and West) and check whether there is no uneven color in any direction. This test have to be done with full flat field of RGB each color. Check that the picture is not tilted.

2-6. Convergence Adjustment

If you use the CRT of FRU provided by SONY, you adjust described in the item 5), 6).

- 1) Receive a white hatch signal.
- 2) Check the BNC.
- 3) Deflect the DY while achieving a balance of the entire picture.
- 4) Fix the DY with three DY spacers.

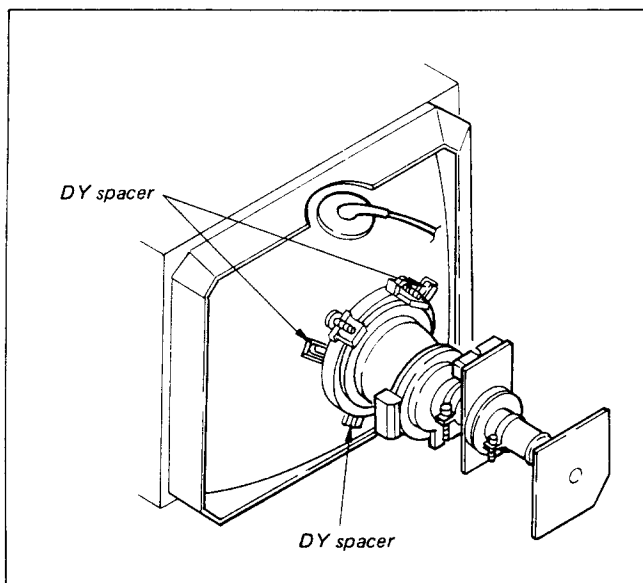


Fig. 2-6-1

- 5) Operate the H STAT VR and adjust the convergence in a horizontal direction in the picture center.
- 6) Adjust the convergence in a vertical direction operating the V STAT VR (RV1, 2, and 3) on the L board.
- 7) Adjust the V convergence on the X axis by the reactor on the right side seen from the CRT.
(See Fig. 2-6-2, 2-6-3)

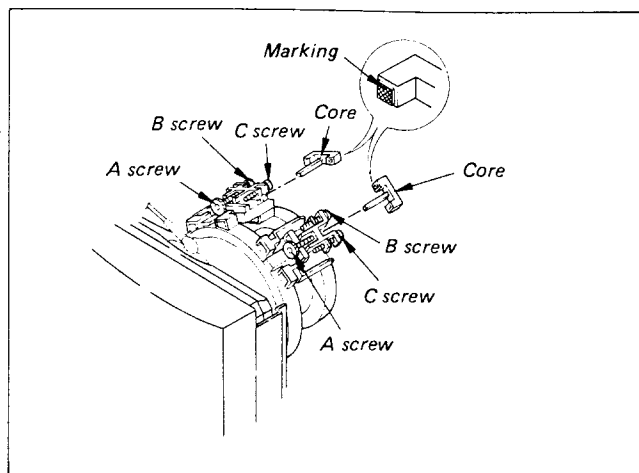
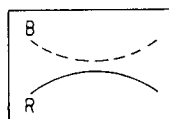


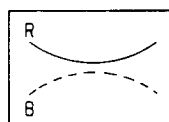
Fig. 2-6-2

(a) XBV positive balance correction



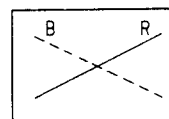
Set the N pole (white paint mark) on the core on the Screw B side and rotate the Screw A.

(b) XBV negative balance correction



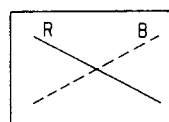
Set the N pole (white paint mark) on the core on the Screw C side and rotate the Screw A.

(c) XCV positive balance correction



Rotate the Screw B so that the coil can move forward.

(d) XCV negative balance correction



Rotate the Screw C so that the coil can move forward.

Fig. 2-6-3

- 8) Adjust the H convergence on the Y axis operating the H CONV VR (RV4 and 5) on the L board.

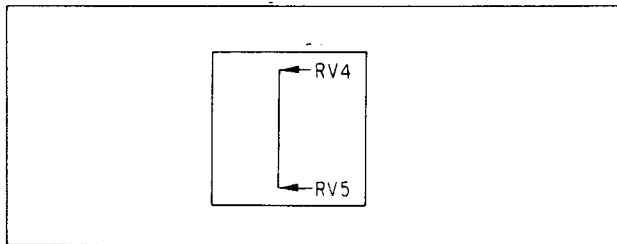


Fig. 2-6-4

- 9) Adjust the H convergence by the reactor on the left side seen from the CRT.

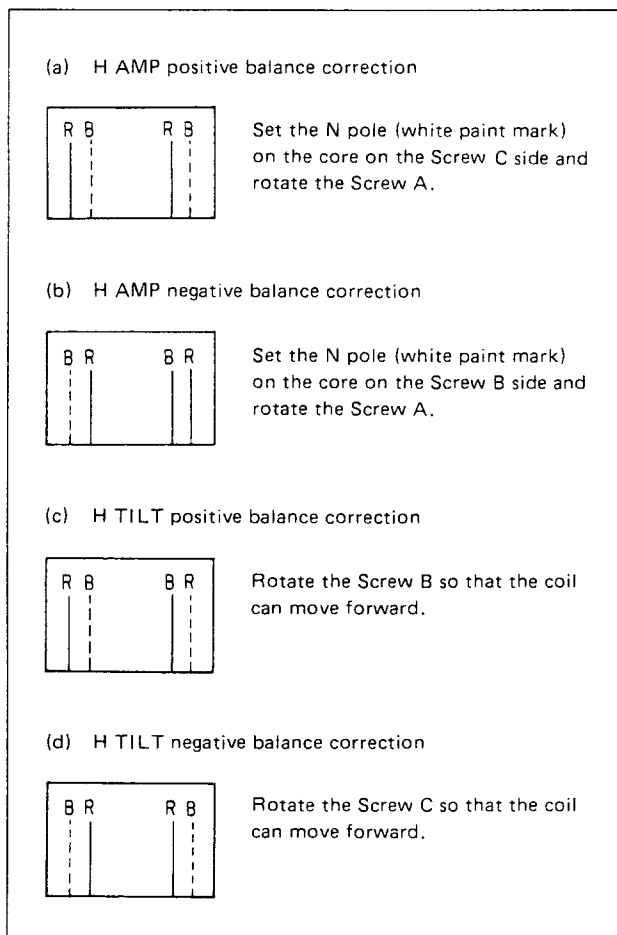


Fig. 2-6-5

2-7. Checking Synchronization

(Black hatch signal is preferred for adjusting the following items.)

Check that synchronization is normal under the conditions described below.

- 1) When the monitor POWER switch is turned on and off.
- 2) When the SG G-video switch is turned on and off (including SYNC).

2-8. Adjustment of Top and Bottom Pincushion Distortion

Input the Green Cross-hatch signal.

- 1) The picture should appear as shown in Fig. 2-8-2 when the boards have been adjusted. If not, adjust to obtain a picture as shown in Fig. 2-8-2 with the RV106 and RV104.

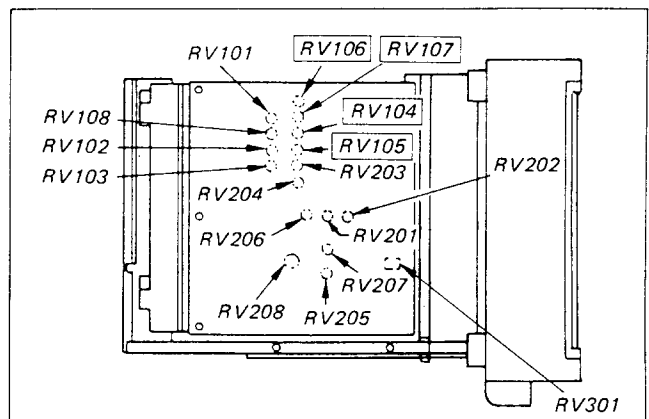


Fig. 2-8-1 Location of RV104, 105, 106, 107

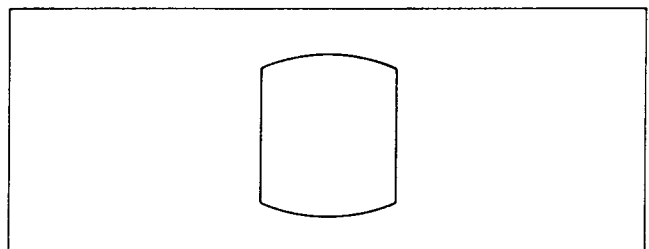


Fig. 2-8-2

- 2) Maintain this condition and move the correction crests to the center as shown in the following with the TOP PHASE VR (RV107) and BOTTOM PHASE VR (RV105).

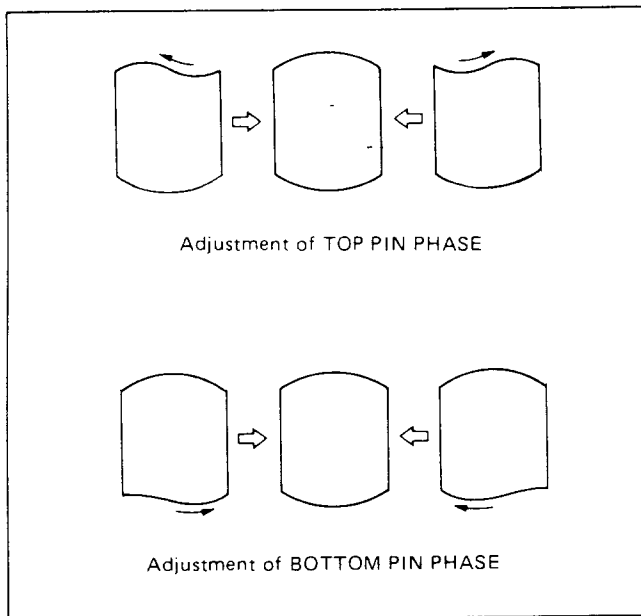


Fig. 2-8-3

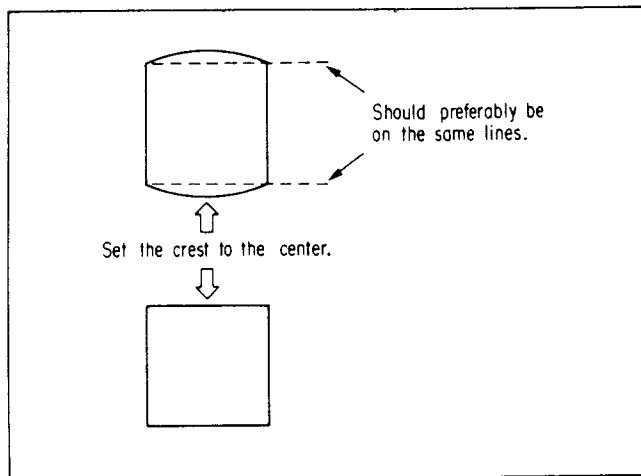


Fig. 2-8-4

- 3) Adjust the lateral line horizontally with **TOP AMP** RV106 and **BOT AMP** RV104 as shown in Fig. 2-8-5.

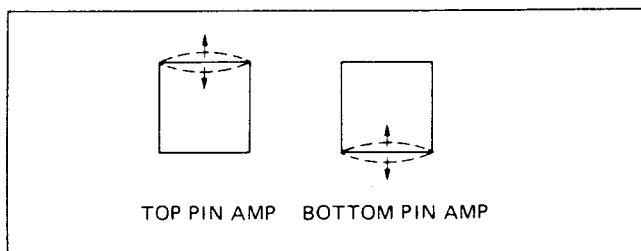


Fig. 2-8-5

2-9. Vertical and Horizontal, Position and Size Adjustment

Turn the **V-CENT** VR on the front panel control to its center click.

- 1) Face the monitor in North or South direction. Adjust the picture to the center in the vertical direction by turning **V-CENT** VR (RV108). After the adjustment have been completed, face the set in East or West direction. Be sure to degauss when the direction is changed.

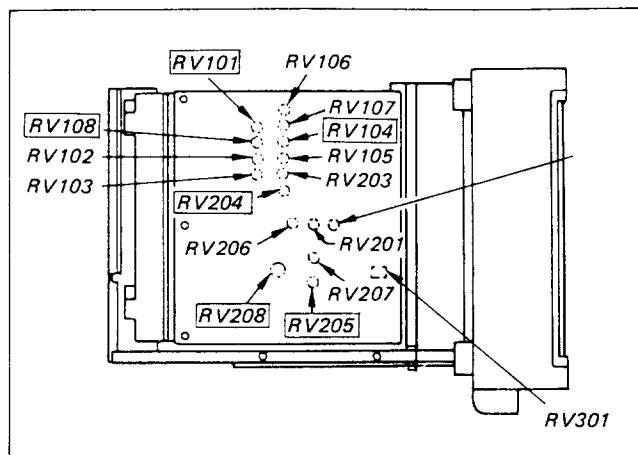


Fig. 2-9-1 Location of RV101, 108, 204, 205, 208

- 2) Set the vertical size of the screen center to 9.3" (236 mm) <GDM-1602: 8.7" (221 mm)> $\pm 1\%$ with **V SIZE** VR (RV101).
- 3) Set the A board S1 on "TEST" side, to produce raster. And adjust **H. CENT** VR (RV208) so that the raster comes to the center of the CRT.
- 4) Set the horizontal size of the screen center to 11.6" (295 mm) $\pm 1\%$ by adjusting **H. SIZE** VR (RV204).
- 5) Set the picture to the raster center by adjusting **H. PHASE** (RV205).

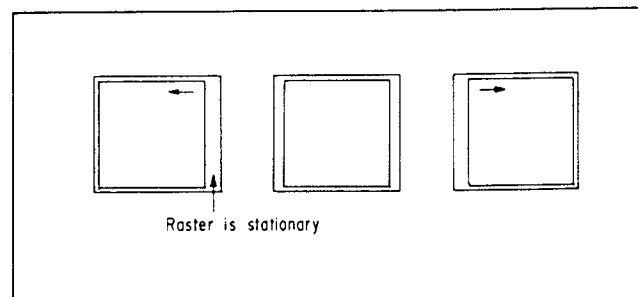


Fig. 2-9-2 Movement of H. Phase

*NOTICE

The adjustment of section 2-9 have to be repeated after the adjustment of the section 2-10 and 2-11 have been completed.

After V&H adjustment, the raster has to be set as shown below.

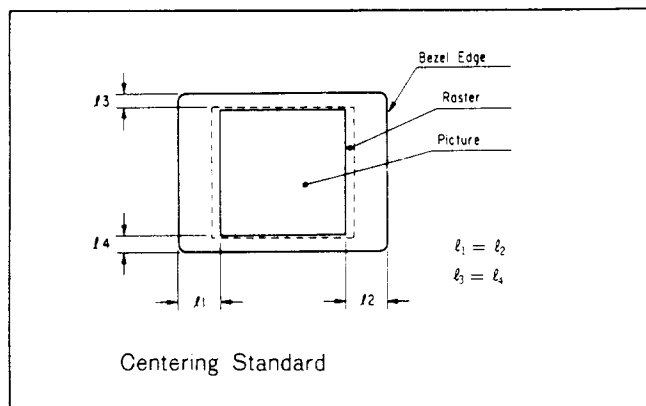


Fig. 2-9-3

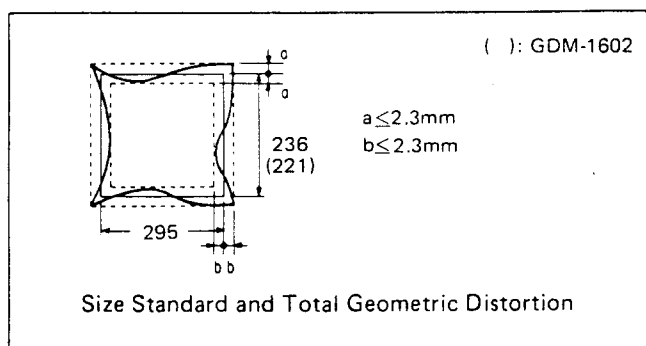


Fig. 2-9-4

2-10. Horizontal Pincushion Distortion Adjustment

- 1) Rotate **PIN AMP** RV203 so that both right and left sides of the picture become linear.

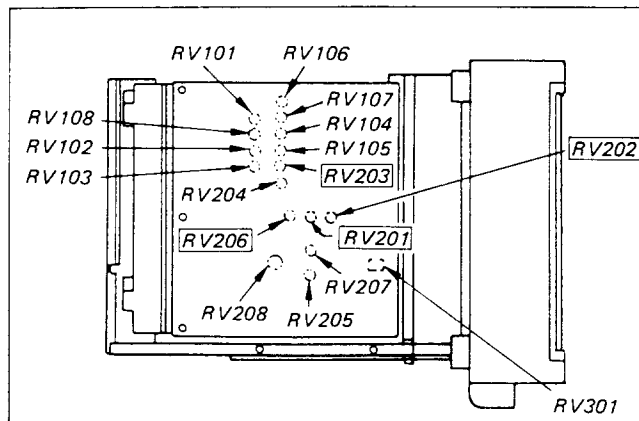


Fig. 2-10-1 Location of RV201, 202, 203, 206

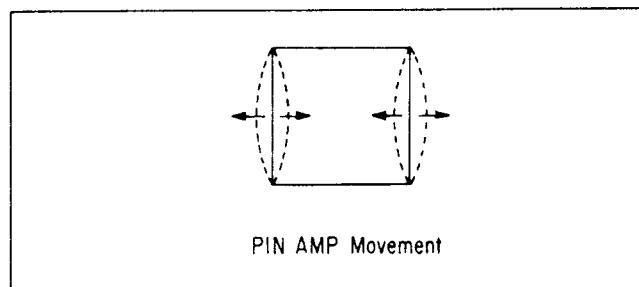


Fig. 2-10-2

- 2) Adjust with **KEY** RV201, **KEY BAL** RV202 so that the widths of the top and bottom sections of the picture become equal.

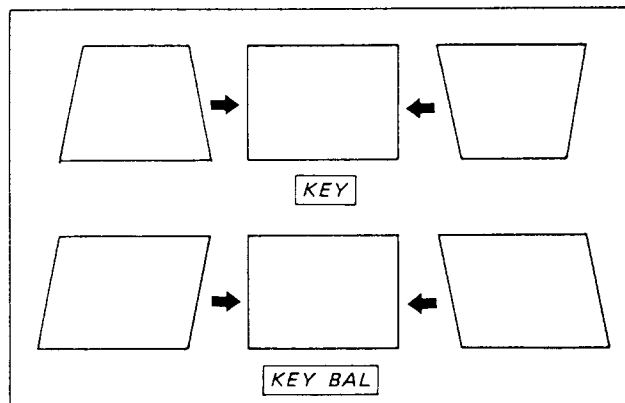


Fig. 2-10-3 Movement of KEY, KEY BAL

- 3) Again watch the right and left pincushion distortion. When one side is over corrected or under corrected after the other side has been made linear with **PIN AMP** RV203, rotate **SIDE PIN BAL** RV206 to adjust the pincushion distortion on both sides equally, then again adjust to make linear with **PIN AMP** RV203.

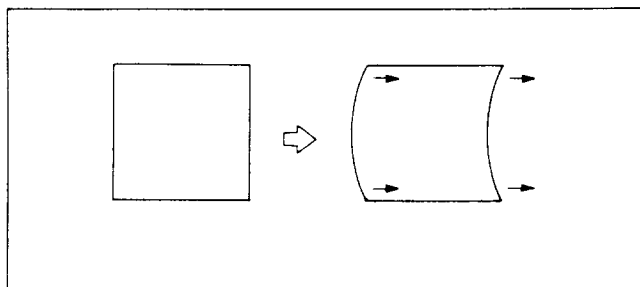


Fig. 2-10-4 PIN BAL Movement

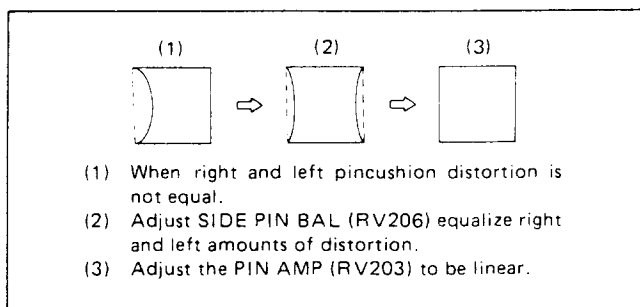


Fig. 2-10-5

2-11. Vertical Linearity Adjustment

- 1) Rotate **V-LIN BAL** RV103 to equalize height of the frames in the upper and lower sections and in symmetrical positions.
- 2) Adjust to equalize the frame dimensions in the upper and lower sections and in center of the picture with **V-LIN** RV102.
- 3) Repeat Steps 1) and 2) above if necessary.

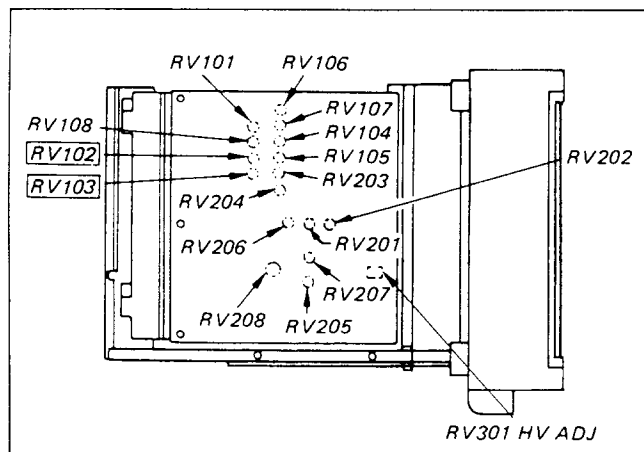


Fig. 2-11-1 Location of RV102, 103

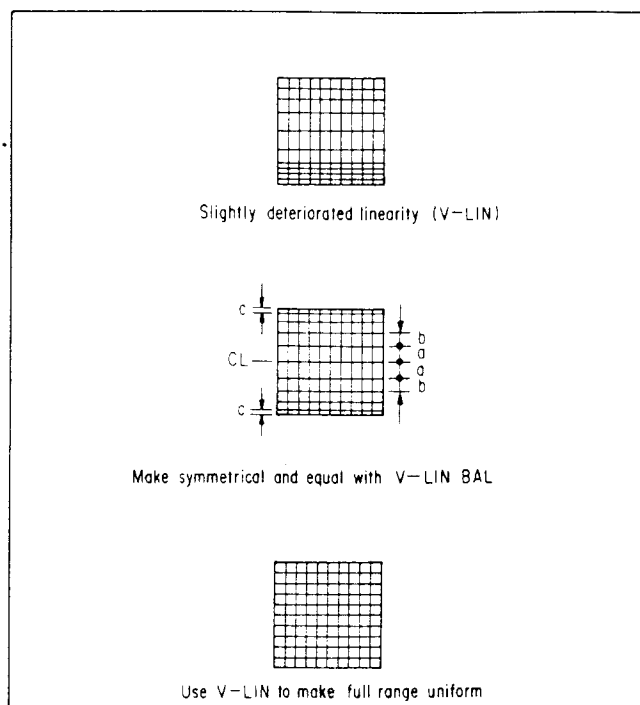


Fig. 2-11-2

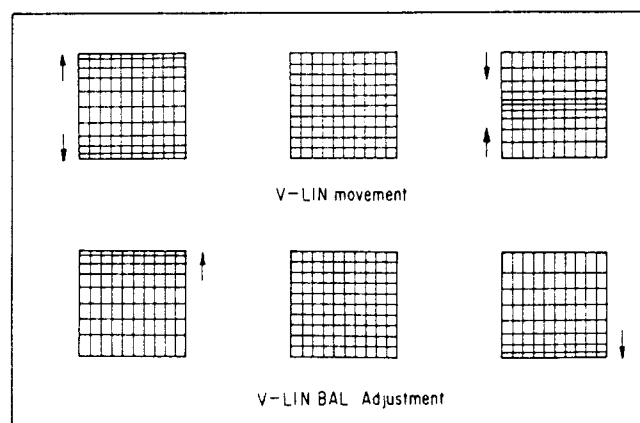


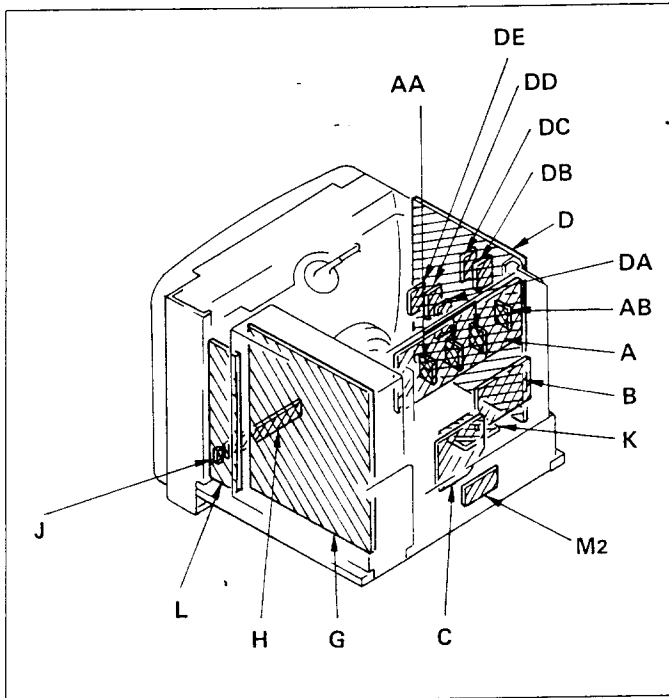
Fig. 2-11-3

Note: V-LIN BAL does not move when turning V-LIN VR to a minimum. (the center shrinks most)

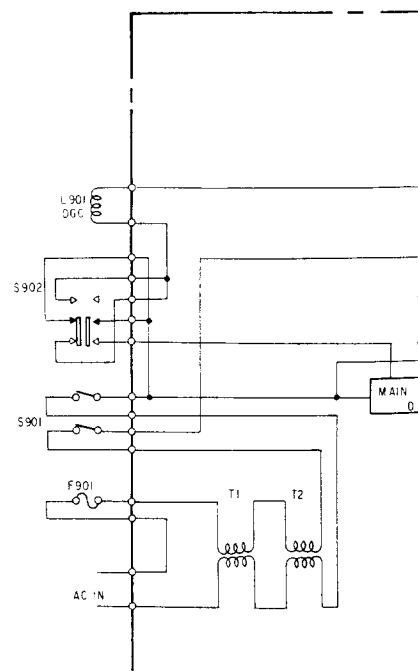
2-12. Total Geometric Distortion Check

- 1) Attach the linearity gauge. (EIA ball-chart) Input the green cross-hatch signal.
- 2) Check all cross points on the picture whether those are in the $\pm 1\%$ deviation circles.
- 3) If there are any excess points out of circles, the monitor should be adjusted again.

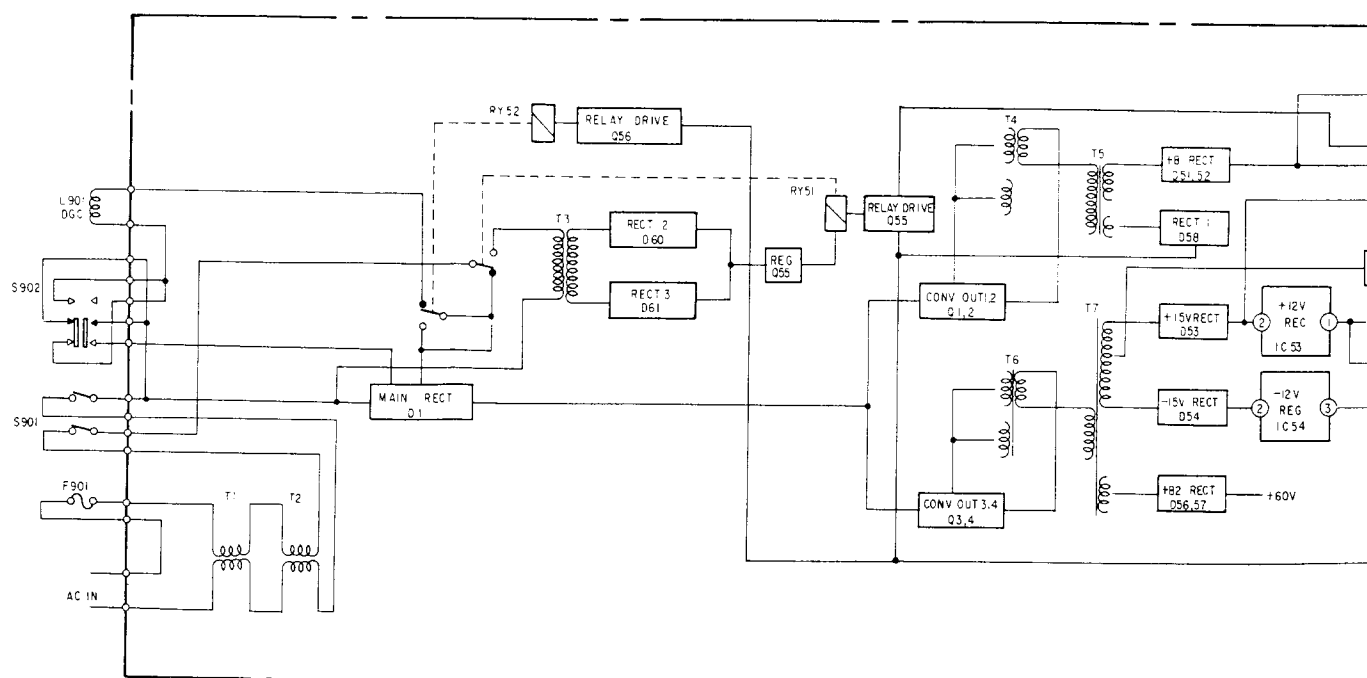
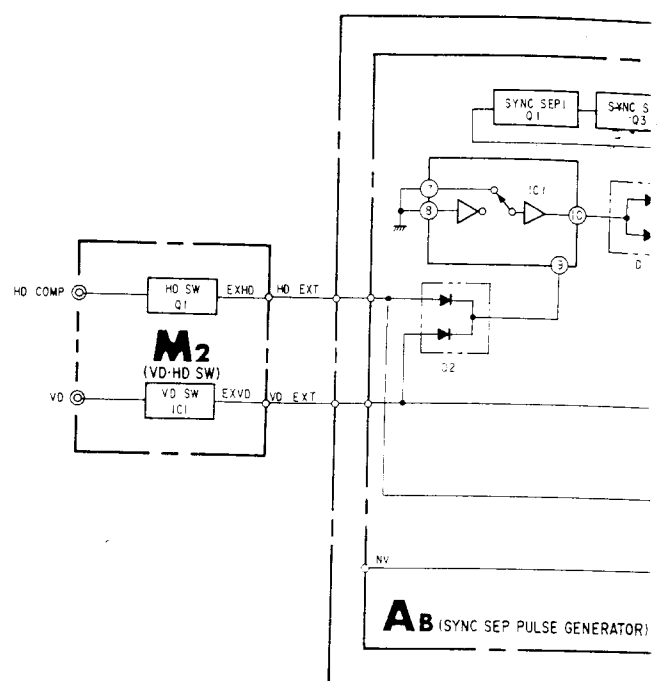
5-1. CIRCUIT BOARDS LOCATION

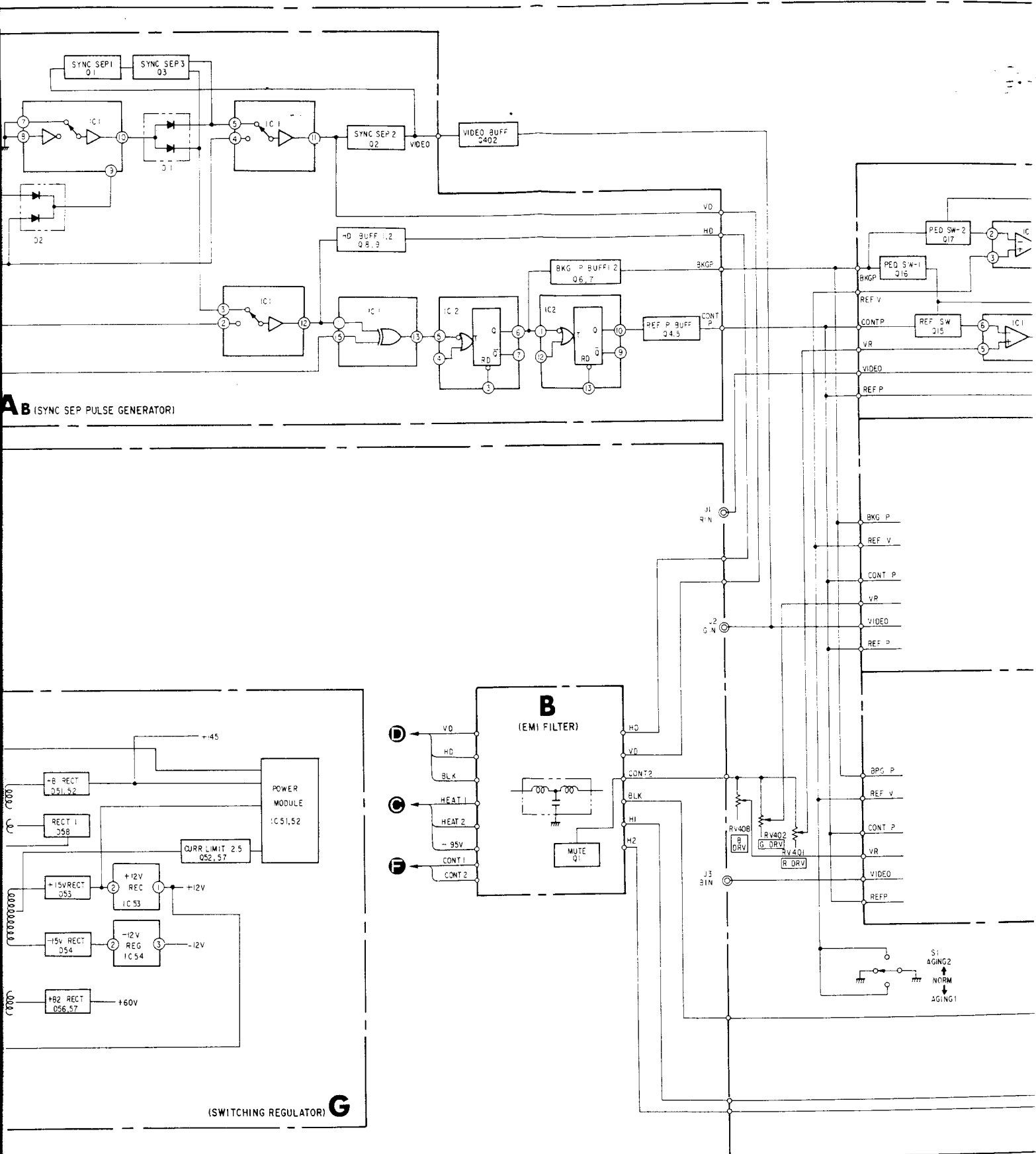


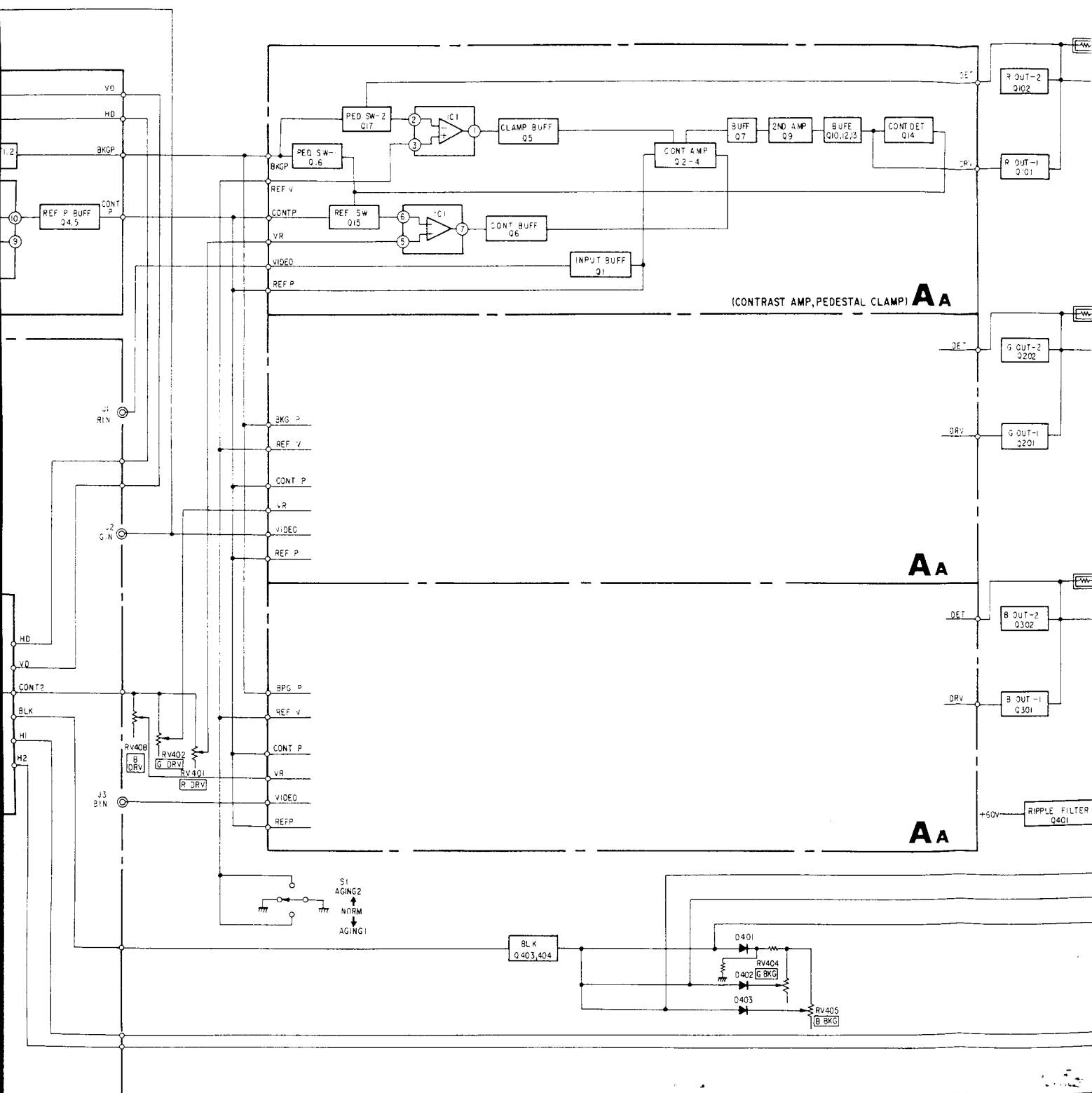
5-2. BLOCK DIAGRAMS

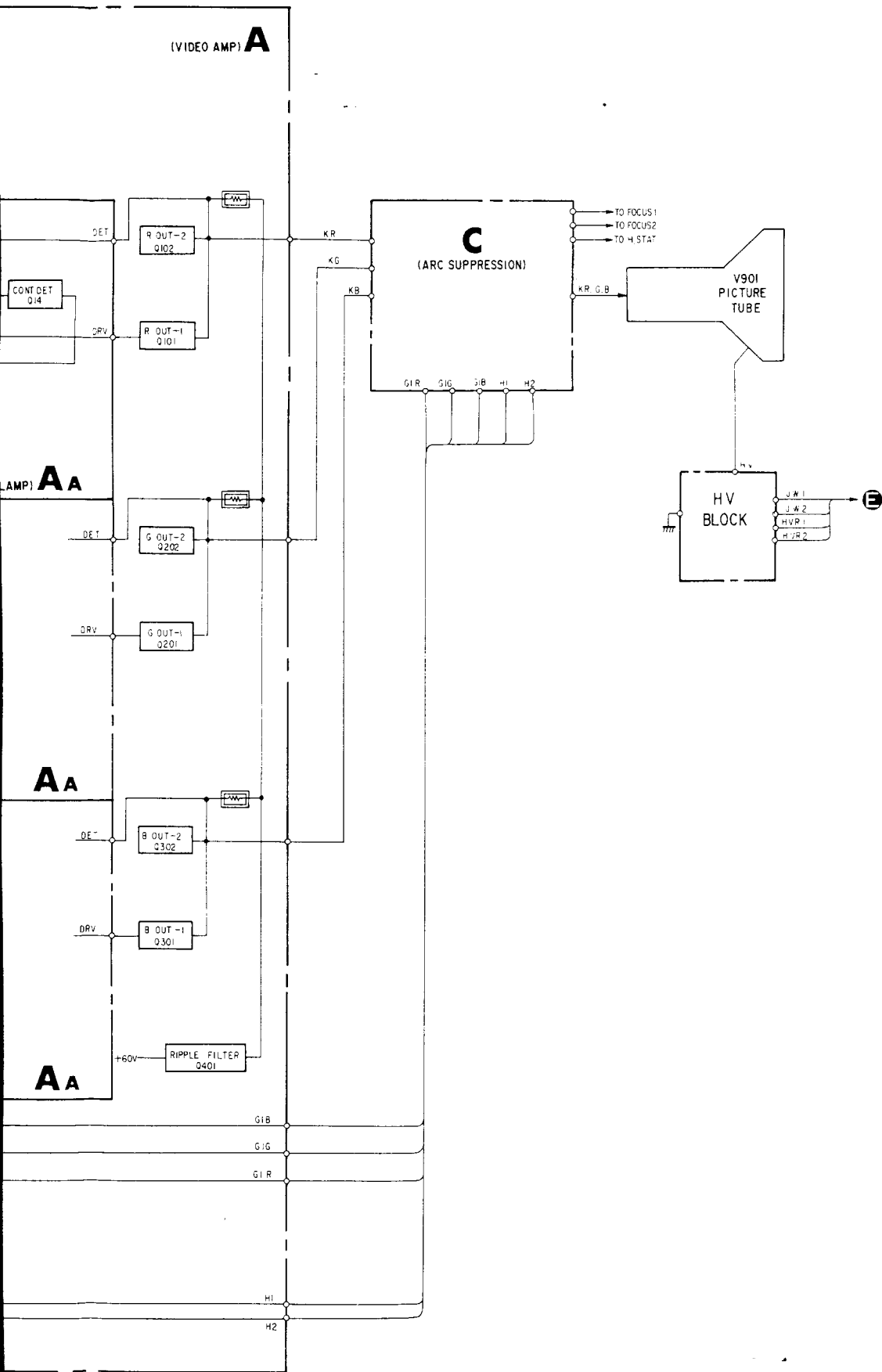


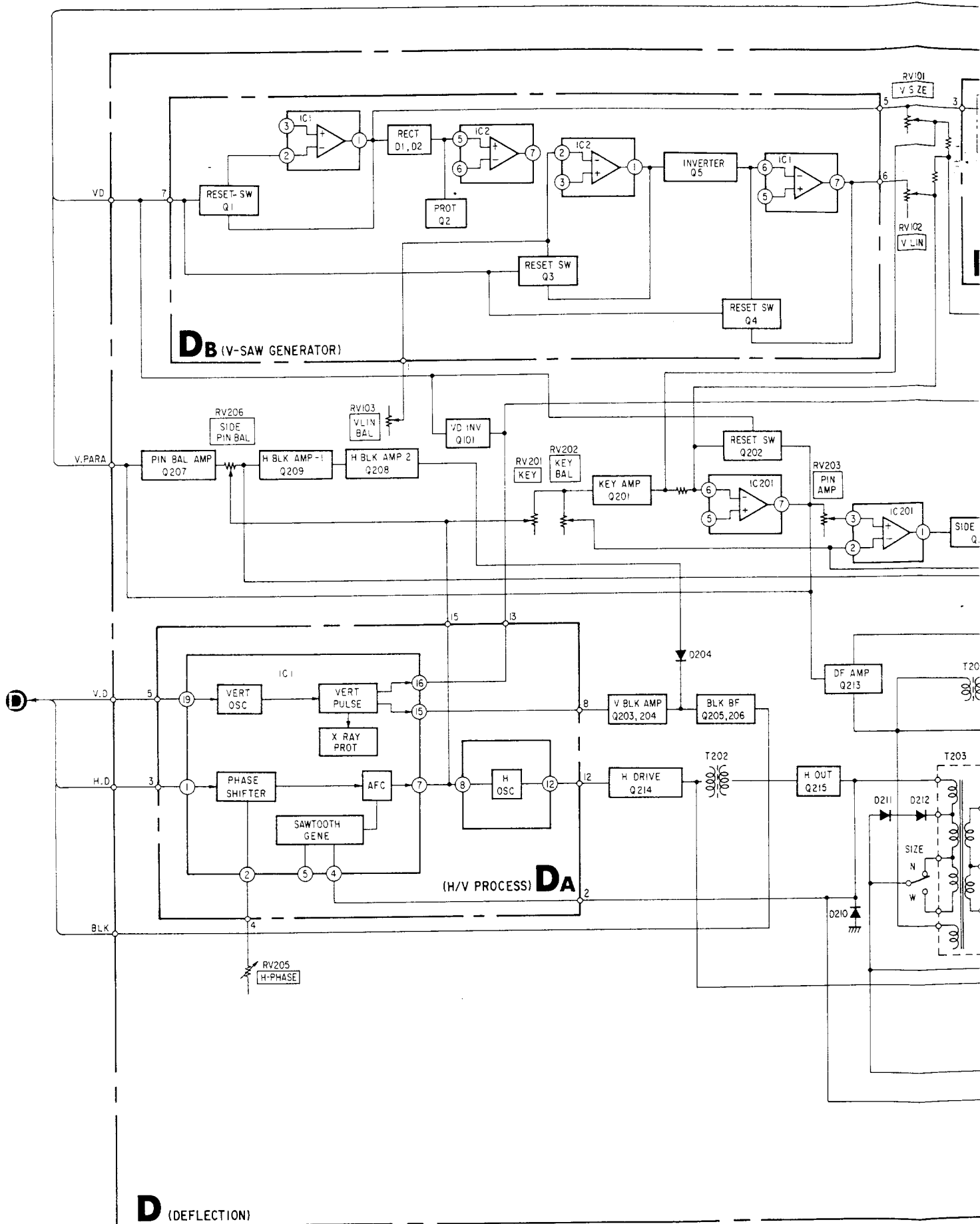
5-2. BLOCK DIAGRAMS

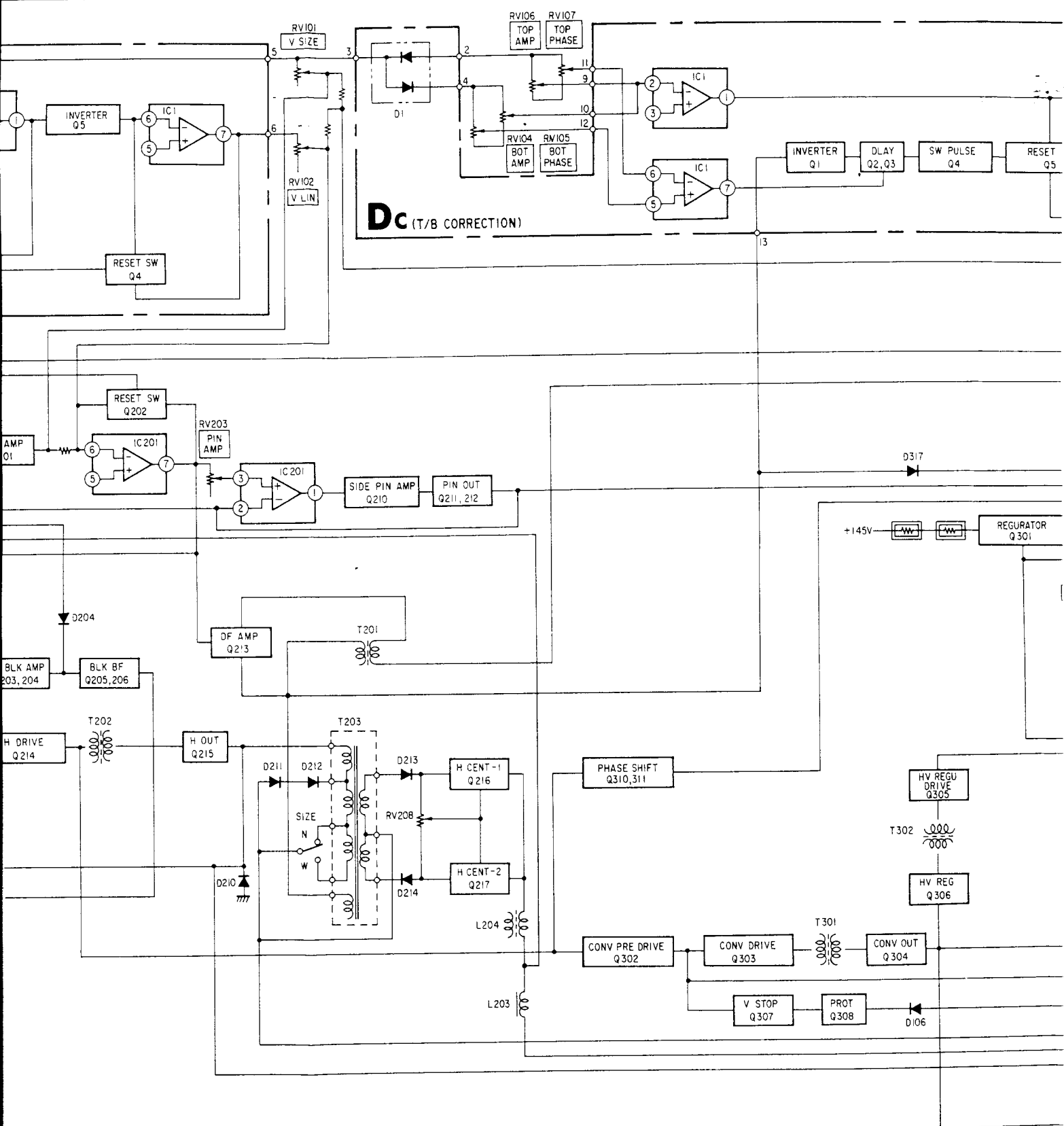


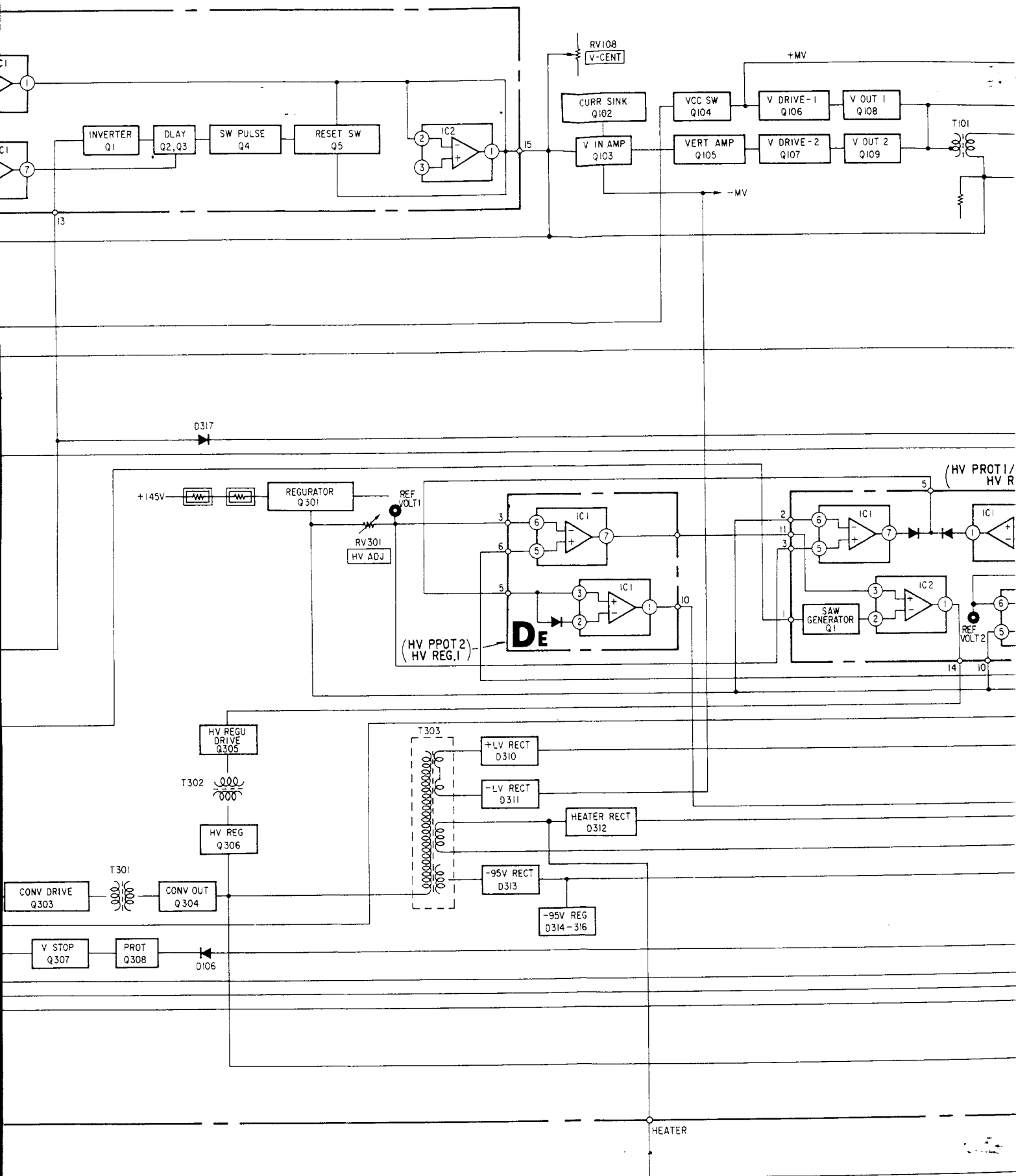


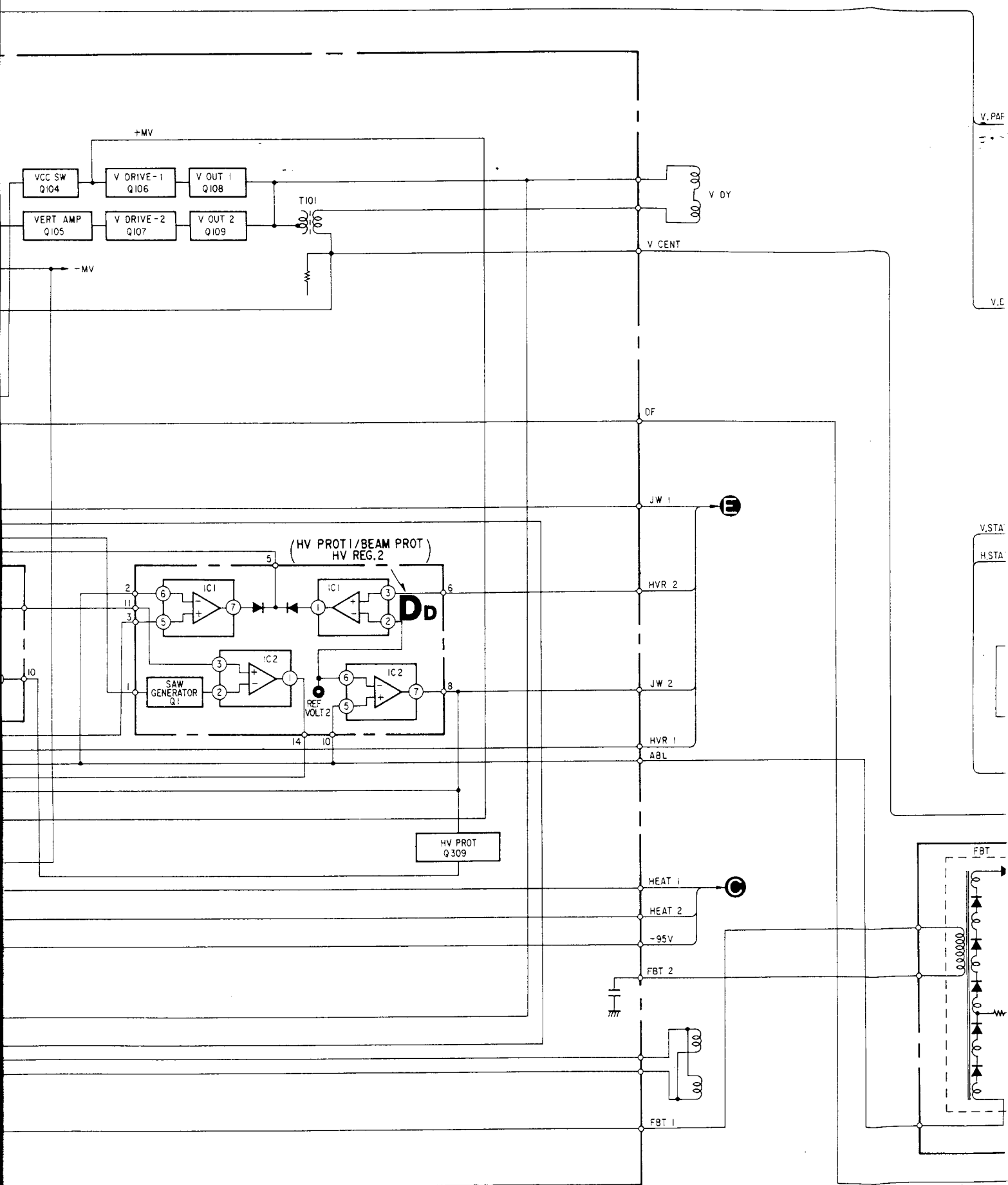












2-13. White Balance Adjustment

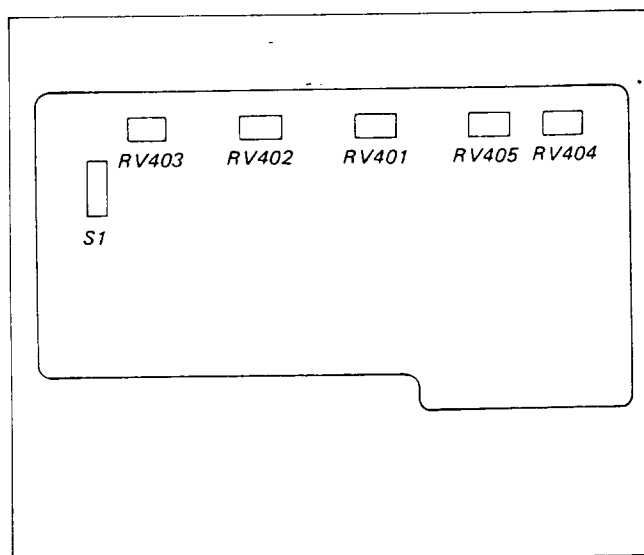


Fig. 2-13-1 A board (view from rear)

Conditions: 1. Age the set longer than 30min.
2. Face east or west.
3. After convergence, landing and white balance rough adjustment have been done.
4. Use the Minolta TV color analyzer II, calibrated by Sony spectrometer.

- (1) Set the sensor of TV color analyzer to the screen center.
- (2) Input gray scale signal with 5% set up.
- (3) Set Cont.VR to maximum.
- (4) Gradually change the G2 (SCREEN) VR and stop at the point where the pedestal level is just extinguished (check that set up level lights faintly).
- (5) Set Cont.VR to minimum.
- (6) Input full white signals and adjust the G.BKG (RV404) and B.BKG (RV405) for dark level white balance.
- (7) Return Cont.VR to its previous maximum condition.
- (8) Adjust the G.DRV (RV402) and B.DRV (RV403) for the high light white balance.
- (9) Change signals to gray scale then check the pedestal level is disappeared and set up level is appeared.
- (10) Repeat item (4) through (9) to get good white balance both high light and dark level.

* note

The color temperature is set to 9300 degrees K +8 MPCD as represented by X and Y CIE coordinates of $X = 0.283 \pm 0.03$, $Y = 0.298 \pm 0.03$.

3. SAFETY RELATED ADJUSTMENTS

The following adjustments and operational checks must be made to ensure safety from X ray emission from the set when D Board or H.V Assembly or Power Block are changed or repaired.

1) Checking Test Point Voltage

Check the voltages on the test points (TP301, 302 and 304) whether or not they meet the standard values if the parts marked \blacktriangle are changed. Change the parts marked \blackboxtimes if the standard is not met.

Changed Parts (\blacktriangle)	Check Point	Adjust Part (\blackboxtimes)
D302	TP301 = DC 32.00 $\begin{smallmatrix} +0.50 \\ -1.00 \end{smallmatrix}$ V	D302
D301, R305, R314, R345	TP302 = DC 9.60 ± 0.10 V	R345
D302, RV301, R311, R312, R313	When RV301 is turned and TP304'S voltage value becomes maximum, the value must be less than 9.45V	R312

* Conditions. Input voltage: 100 to 120 VAC.
+B voltage: 146.0 VDC
(GDM-1602: 121.0 VDC)
Input signal: White dot
(white on black)
CONT: Where a dot can be seen vaguely.

2) Replacing Power Block Assy and Checking After Part Replacement

Check that the +B MAX voltage value is within the standard and that OVP circuit operation is normal if the power block assy or a part in the power block assy (G board) is replaced.

(1) Checking +B max voltage

Condition. Input voltage: 130 VAC
Input signal: White hatch on black
CONT: Minimum

The voltage on pin ① of connector D-1 should be below 146.0 VDC (GDM-1602: 121.0 VDC).

(2) Checking OVP circuit operation

Check that the OVP circuit operates and taht pictures disappear if 161.50 VDC (GDM-1602: 134.00 VDC) is applied to the +B line from the outside.

3) Checking After Replacing D Board for FBT in HV Block

Check that pin ⑤ of connector D-3 on D board has a voltage of $+15.0 \pm 4.0$ V if the D board for the FBT in the HV block is replaced.

- 4) Check that the HV HOLD DOWN circuit operates normally if the following parts are replaced:

(Marked *)

DD board or a part on it.

DE board or a part on it.

D board or Q309 on it.

Checking Method

Apply 9.7 VDC or less between pin ⑤ of connector D-3 on D board and the ground from the outside and check that the HOLD DOWN circuit operates and the raster disappears.

- 5) Check that the beam protector (1) operates normally if the following parts are replaced:

(Marked *)

DD board or a part on it.

D board or R332 on it.

Checking Method

(Adjust the voltage on TP304 to 9.00 ± 0.05 VDC by rotating RV301 before checking.)

- 1 The raster should show if between pin ⑩ on the DE board and ground is shorted and power is turned on.

- 2 When a variable resistor of over $12 \text{ k}\Omega$ is connected in series with an ammeter between TP303 and ground and the resistance value is gradually reduced from its maximum value, the protector circuit shall function and the rasters disappear when the current value drops below 1.13 mA.

- 3 Removal a short clip between pin ⑩ on the DE board and ground.

- 6) Check that the beam protector (2) operates normally if the following parts are replaced:

(Marked *)

DD board or a parts on it.

DE board or a parts on it.

D board or Q309 on it.

Checking Method

- 1 The raster should show if between TP306 and ground is shorted and power is turned on.

- 2 When a variable resistor of over $12 \text{ k}\Omega$ is connected in series with an ammeter between TP303 and ground and the resistance value is gradually reduced from its maximum value, the protector circuit shall function and the rasters disappear when the current value drops below 1.16 mA.

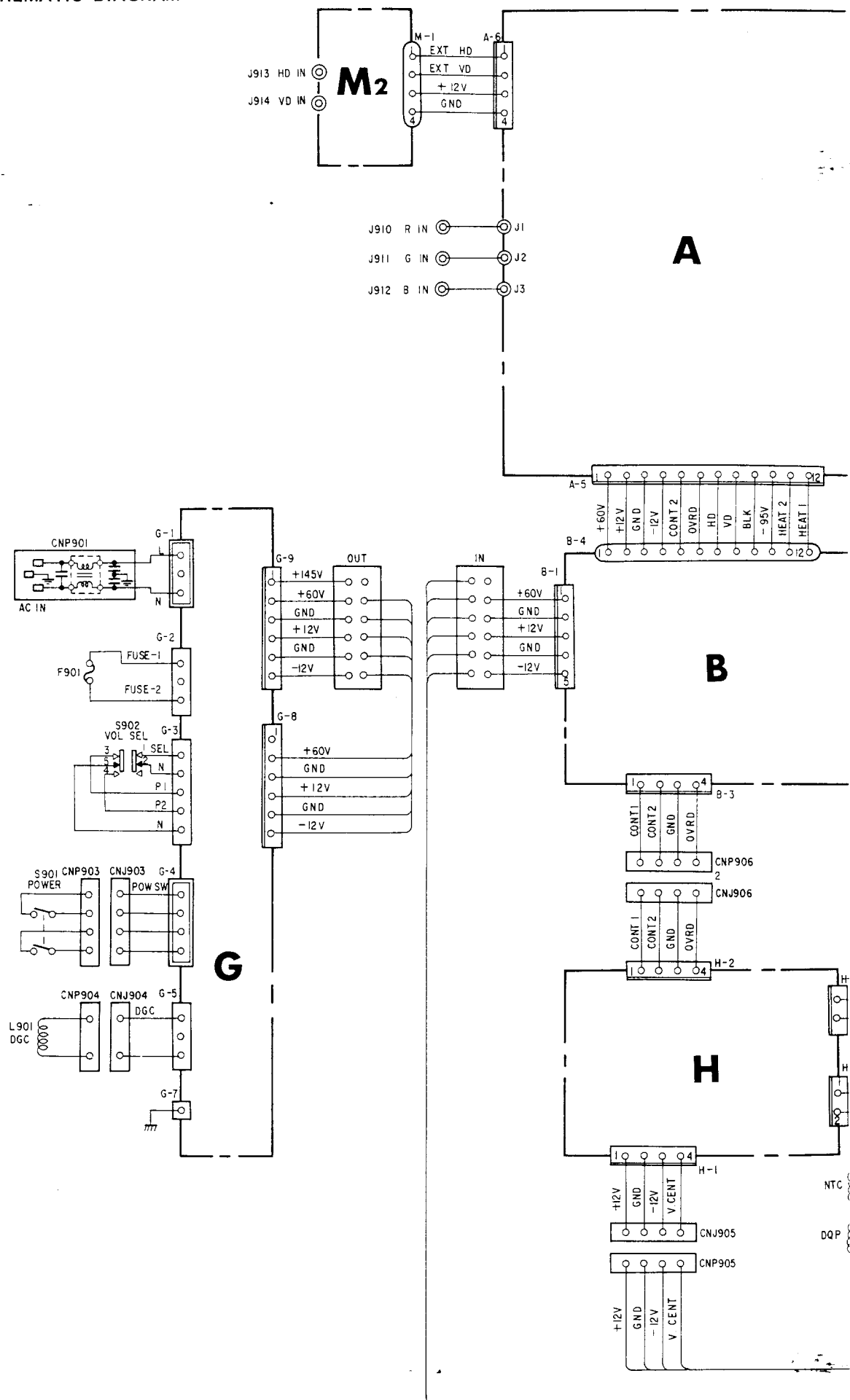
- 3 Removal a short clip between TP306 and ground.

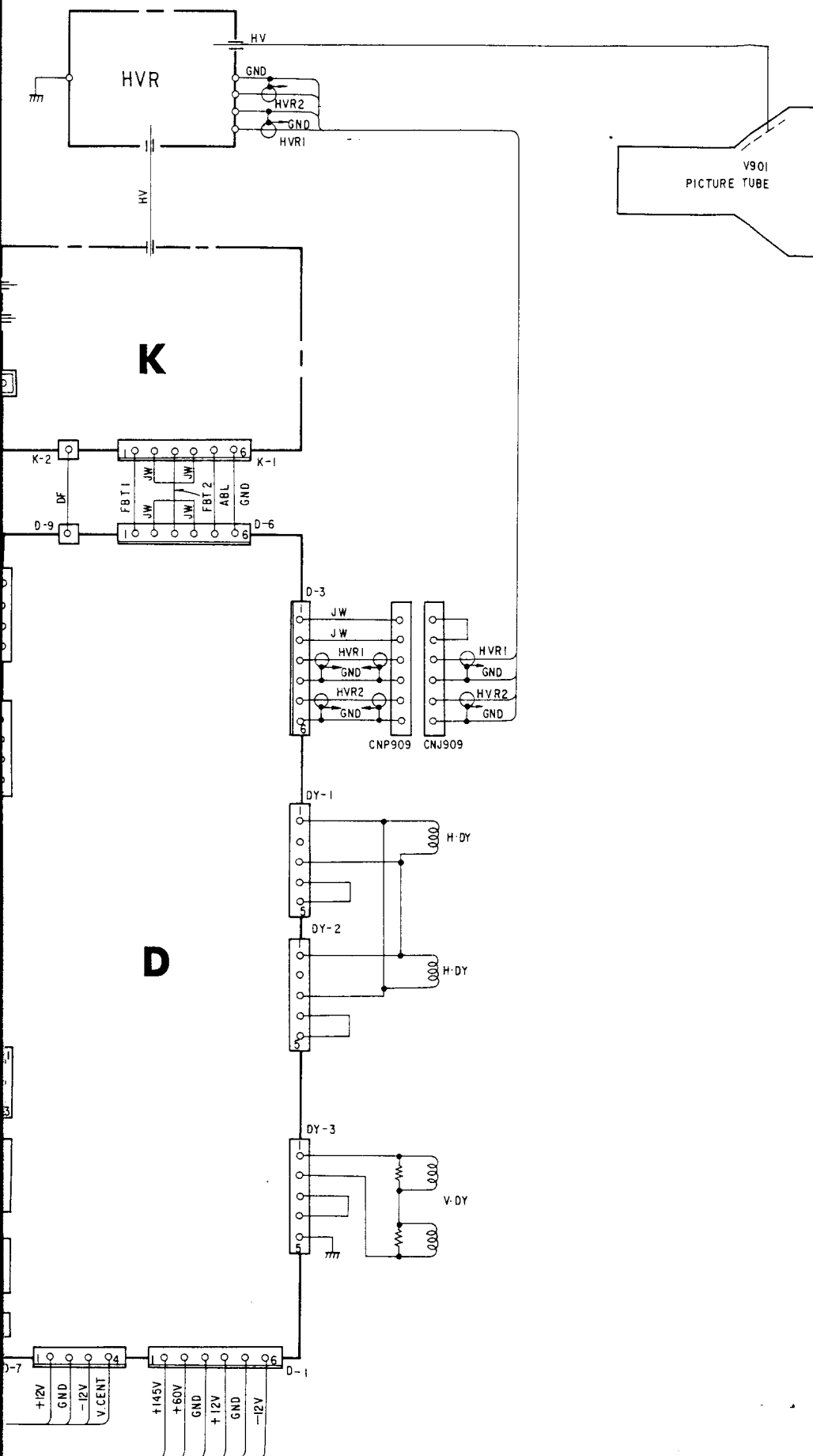
SECTION 5 DIAGRAM

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	A, AA, AB, B, C, G, M and M2 Boards. . .	5-24
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
5-3. FLAME SCHEMATIC DIAGRAM









5-4. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS 1




- Note:
- All capacitors are in μF unless otherwise noted. pF : μF 50WV or less are not indicated except for electrolytics and tantalums.
 - Resistors on LA, LB, AA, AB and DC boards are $\frac{1}{10}\text{W}$ and those on all other boards are $\frac{1}{6}\text{W}$ unless otherwise noted.
 - k: 1000 Ω , M: 1000 k Ω
 - Δ : internal component.
 -  : nonflammable resistor.
 - All variable and adjustable resistors have characteristic curve B, unless otherwise noted.


The components identified by  in this parts list have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.


When replacing components identified by  , make the necessary adjustments indicated. If results do not meet the specified value, change the component identified by  and repeat the adjustment until the specified value is achieved. (Refer to D302, R312 and R345 adjustments and * mark on page 4-9 of Section 4.)

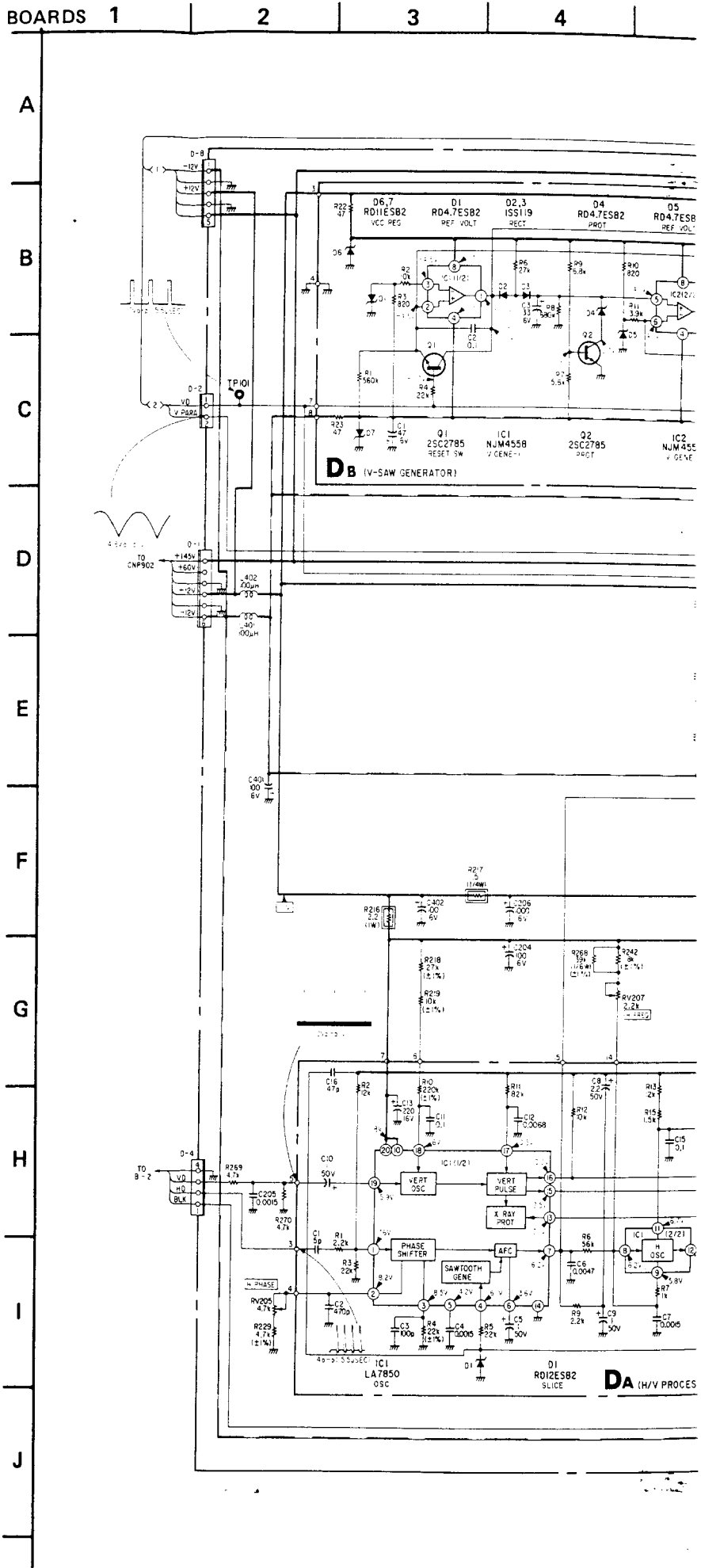
When replacing the part in below table, be sure to perform the related adjustment.

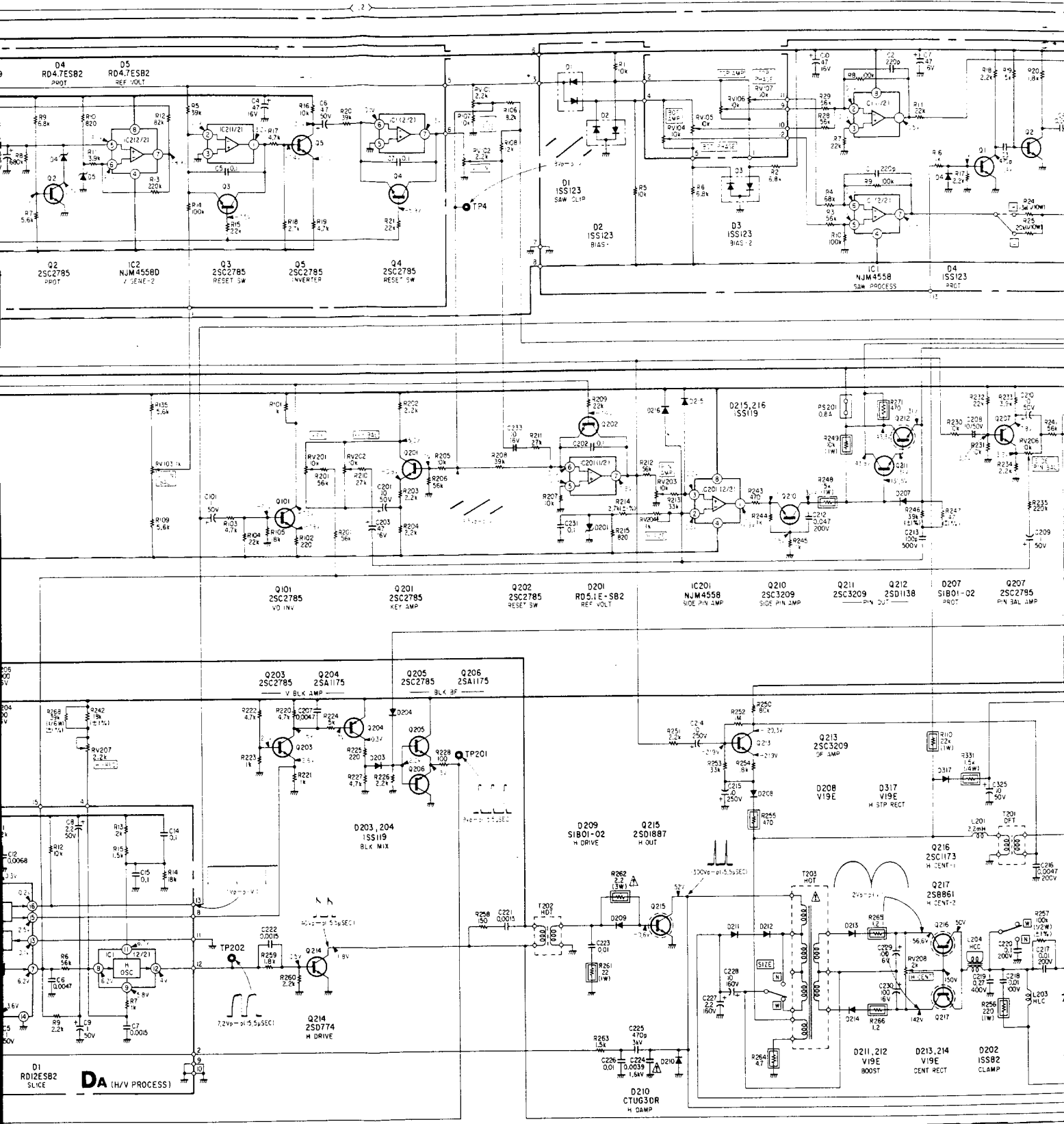
Part replaced ()	Adjustment ()
D302	D302
RV301, R311, R312, R313, D302	R312
D301, R305, R314, R345	R345

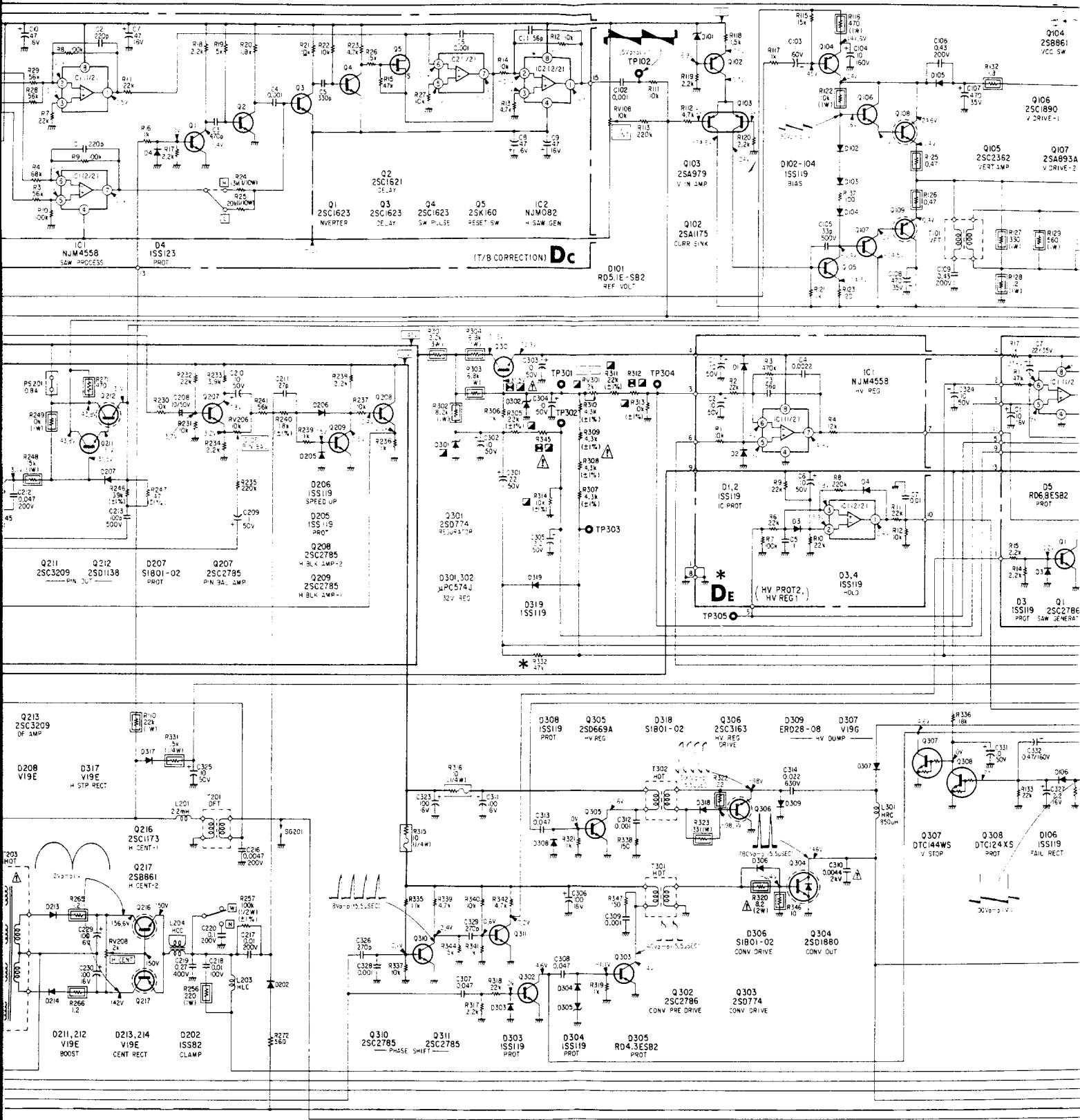
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a 10M Ω digital multimeter.
-  : adjustment for repair.
- Voltage variations may be noted due to normal production tolerances.
-  : B+ bus.
-  : B- bus.
- Circled numbers are waveform references.
- Readings are taken with 16 gray scale signal input.

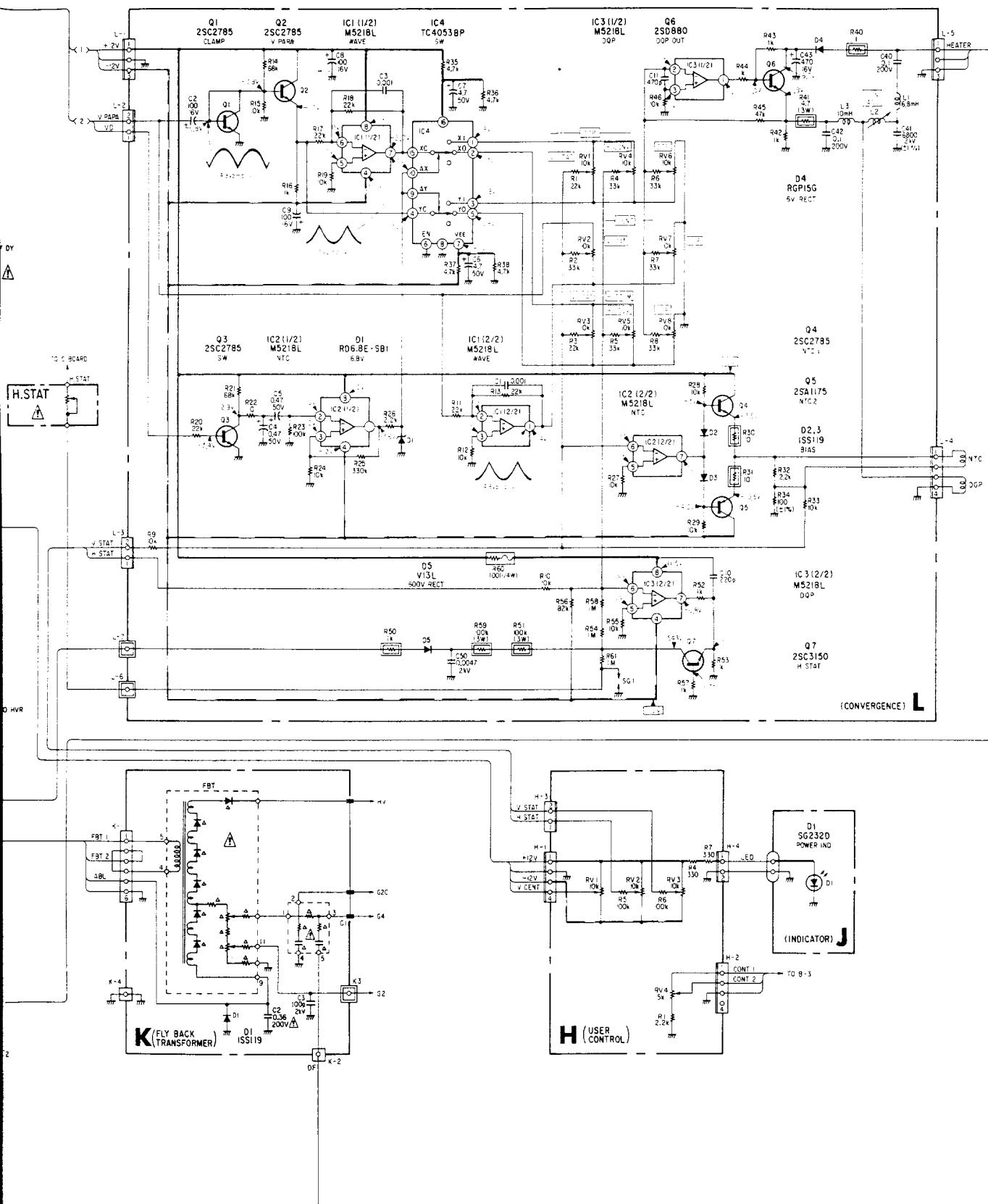
Note: The components identified by shading and mark  are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un tramé et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

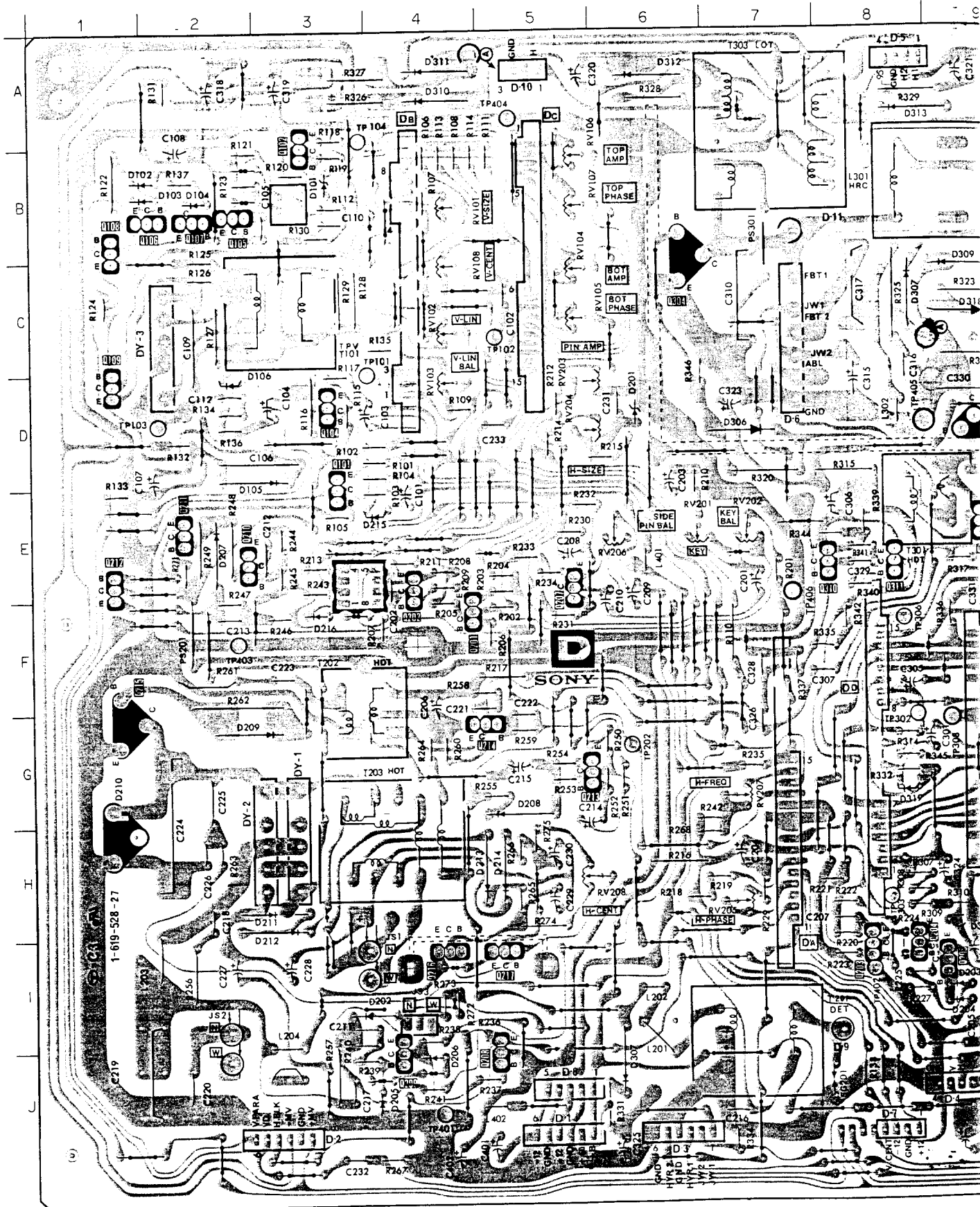








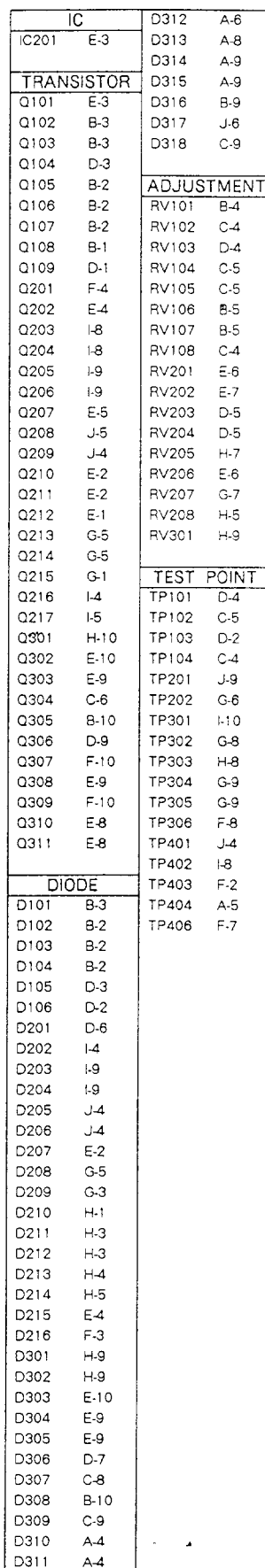
— D Board —



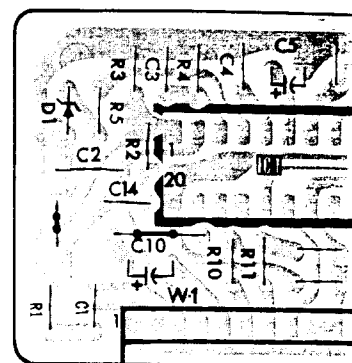
[DEFRECTION]

[H/V PROCESS]

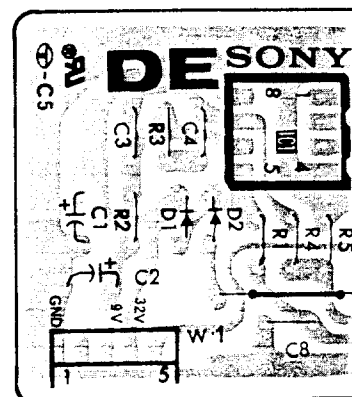
[USER CONTROL]



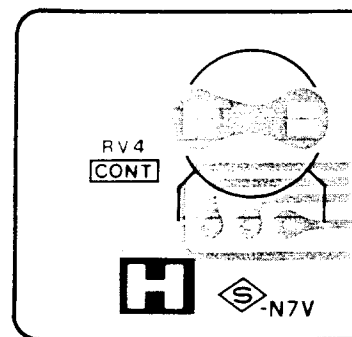
– DA Board –



— DE Board —



— H Board —



DB

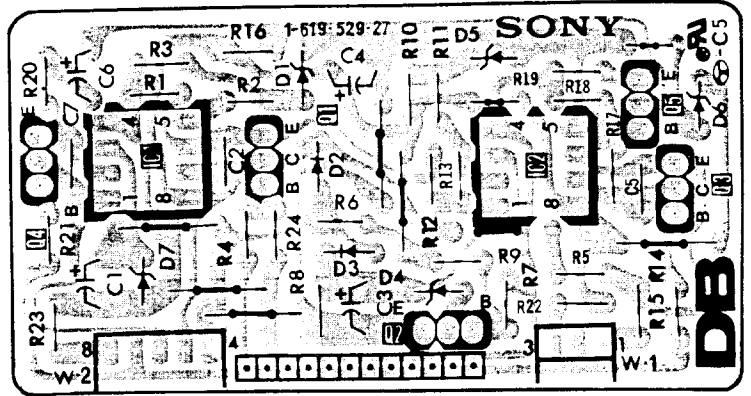
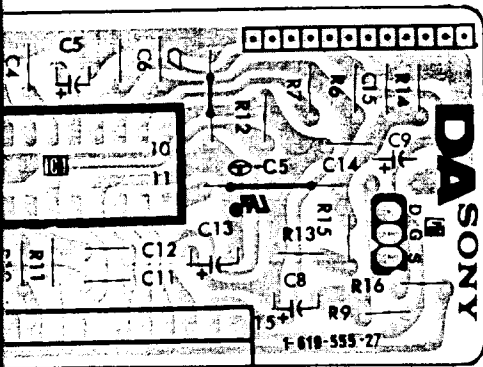
[V-SAW GENERATOR]

Dc

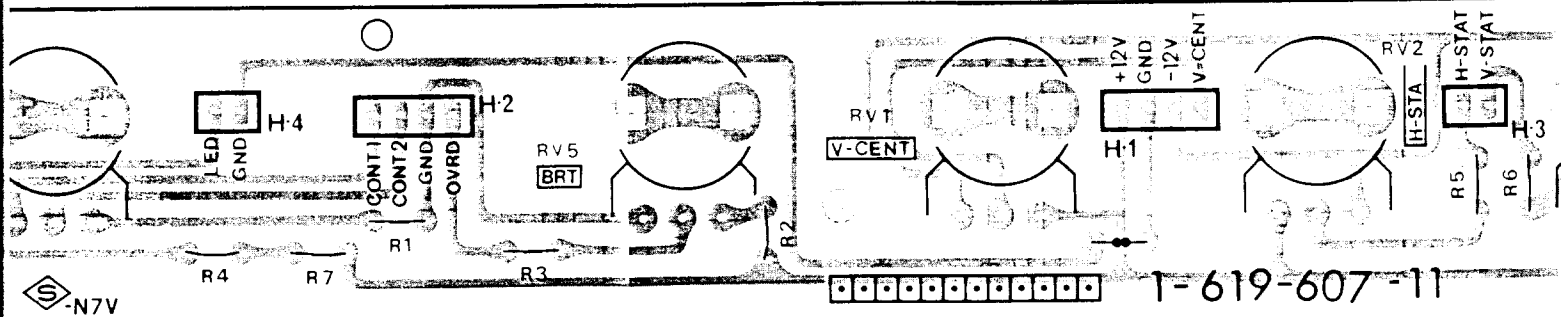
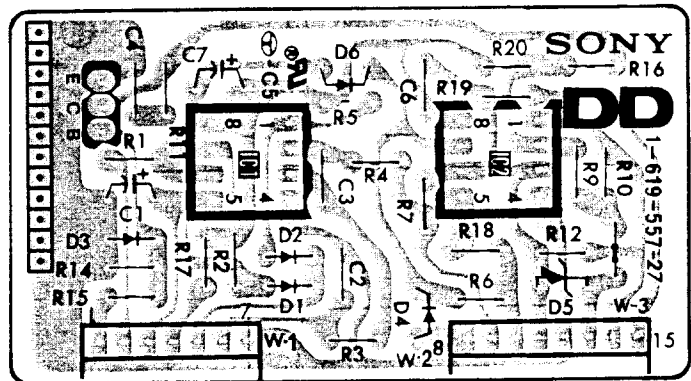
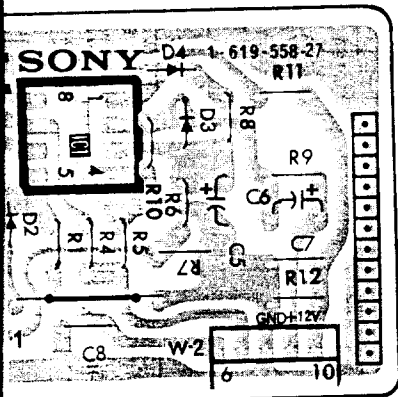
[T/B CORRECTION]

DD[HV PROT
HV REG 2]

— DB Board —



— DD Board —



```
[HV PROT 1/BEAM PROT]
[HV REG 2]
```

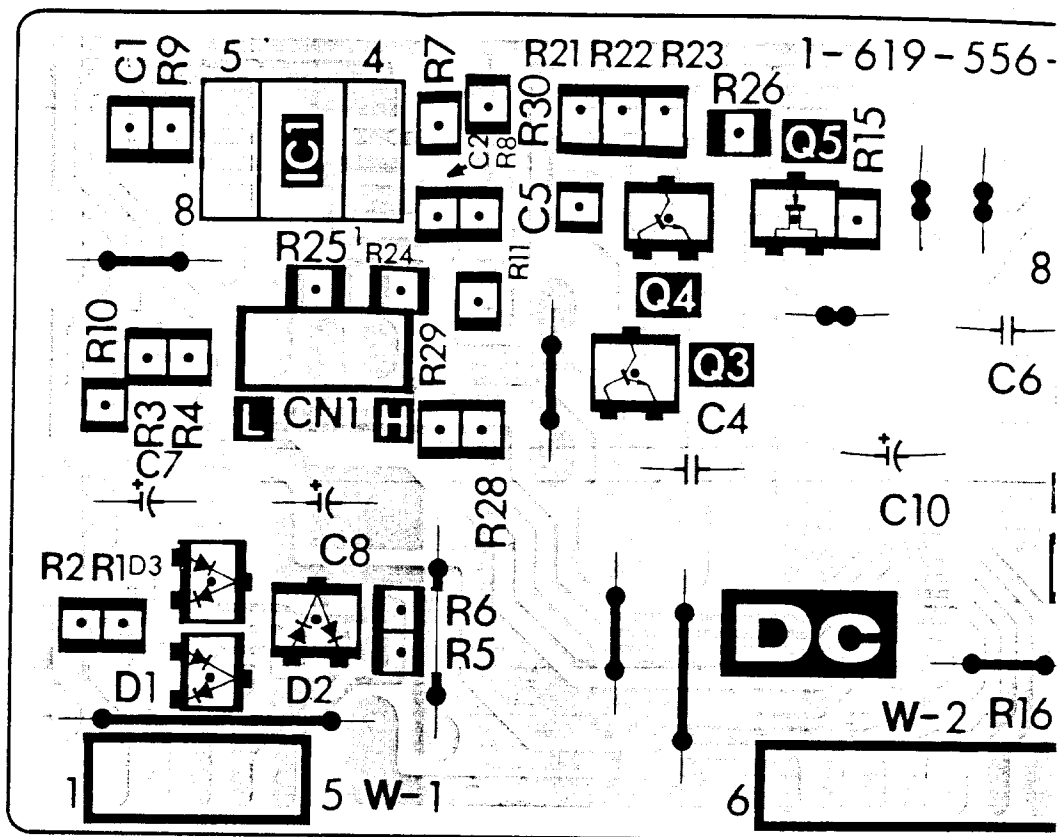
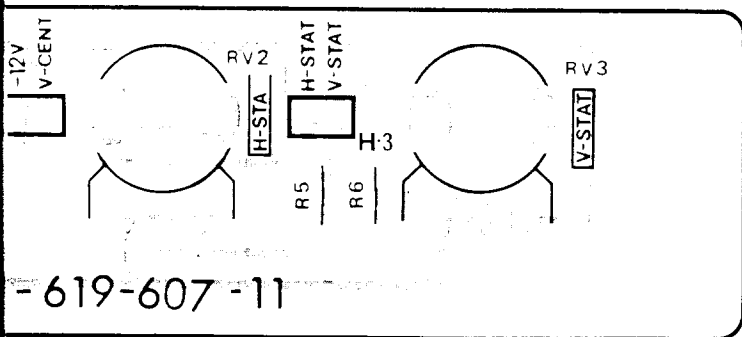
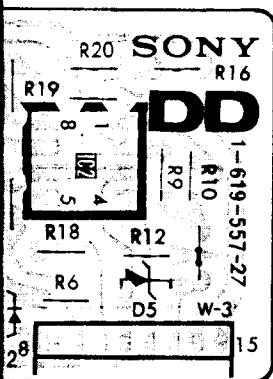
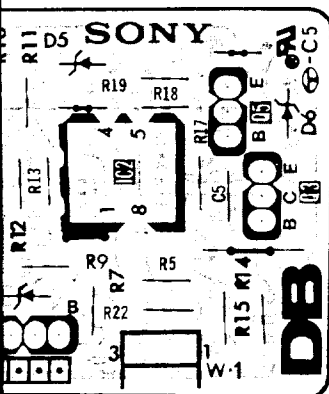
```
[HV PROT 2]
[HV REG 1]
```

[FLY BACK TRANSFORMER]

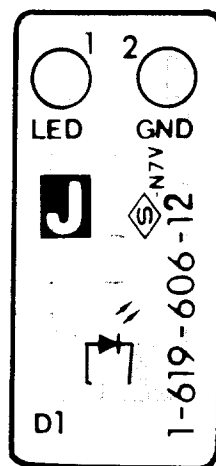
J

[CORRECTION]

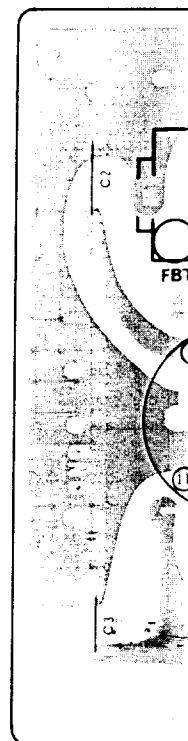
— DC Board —



— J Board —



— K Board —

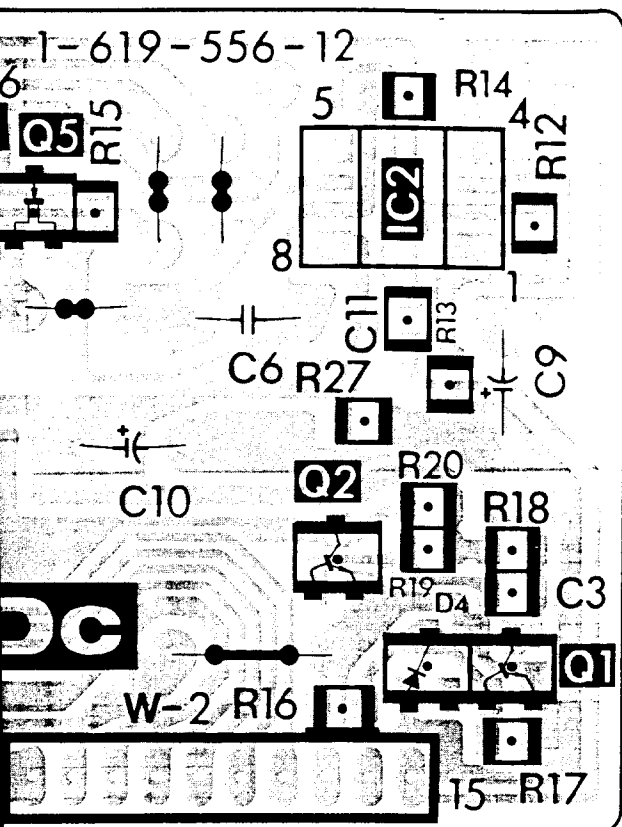


[INDICATOR]

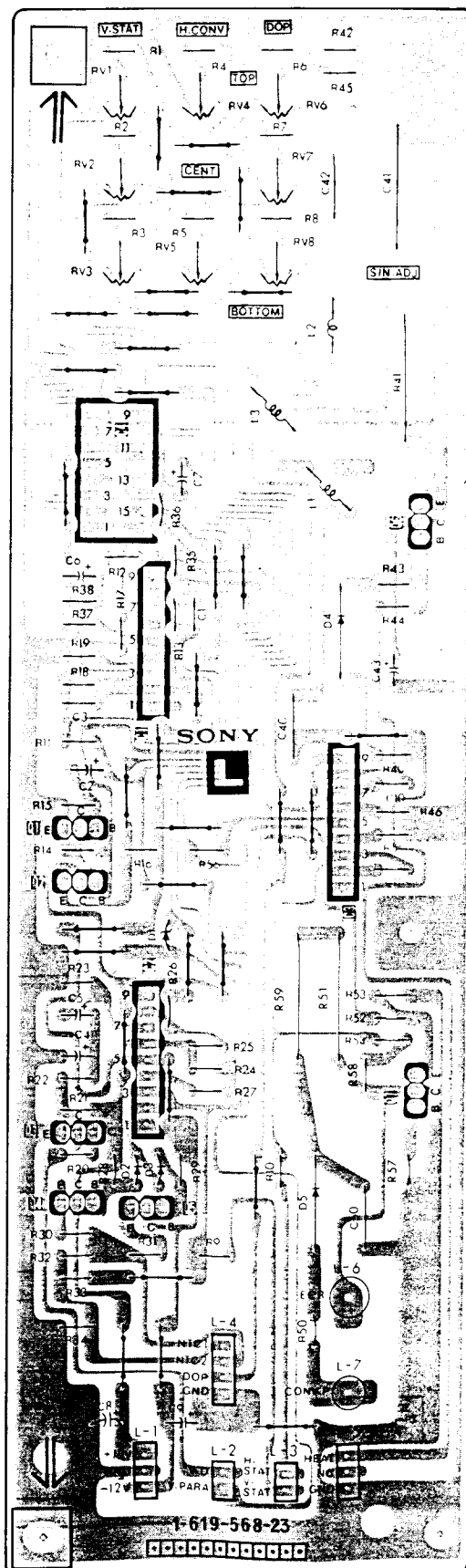
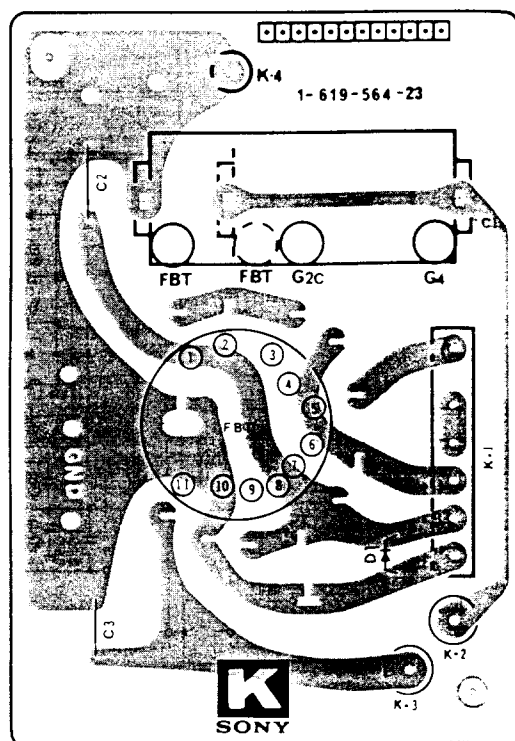
[CONVERGENCE]

Caution: In case of use 8 pin IC in IC1, 2 and 3, use the pin number 2 – 9.

– L Board –

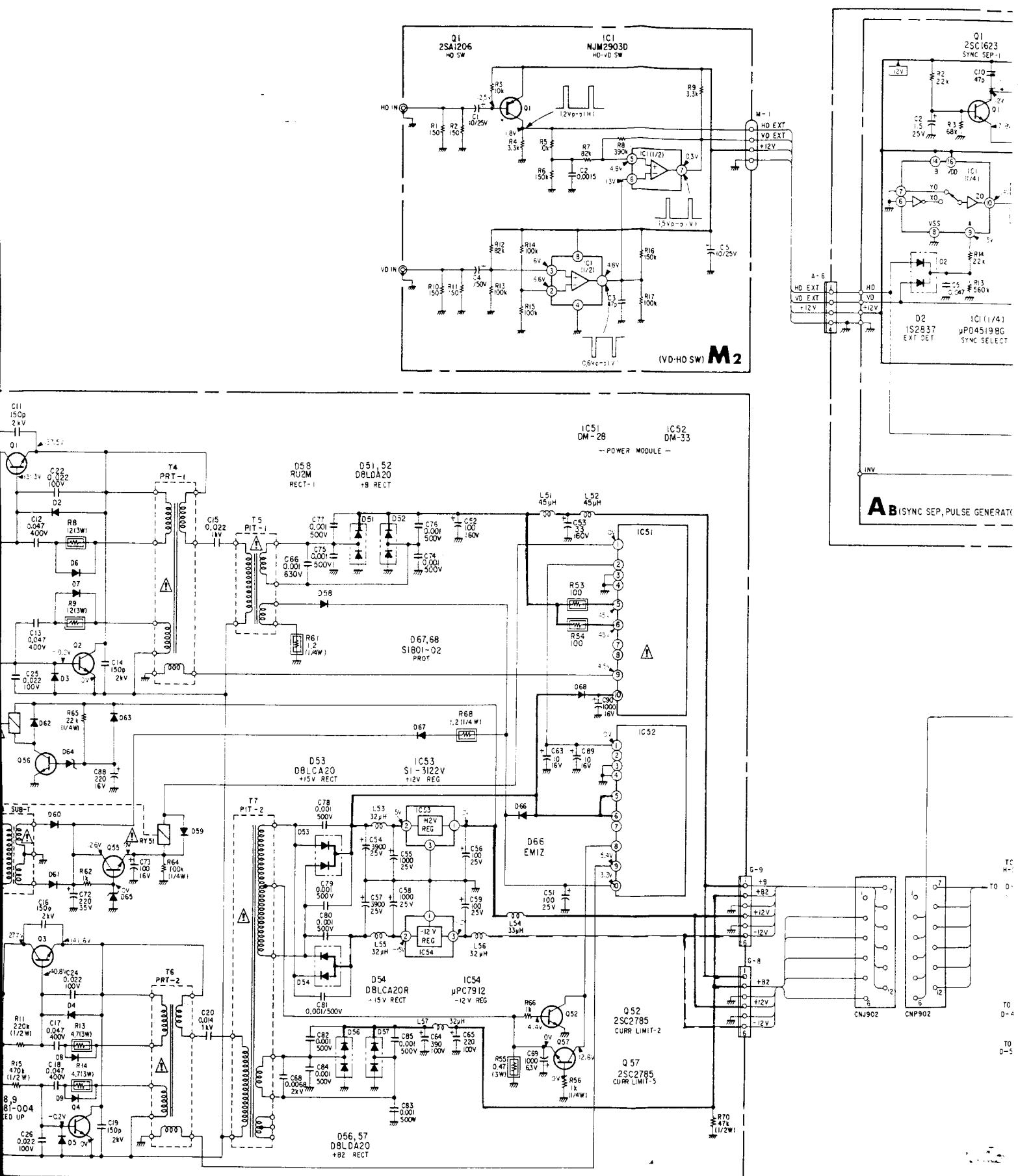


— K Board —

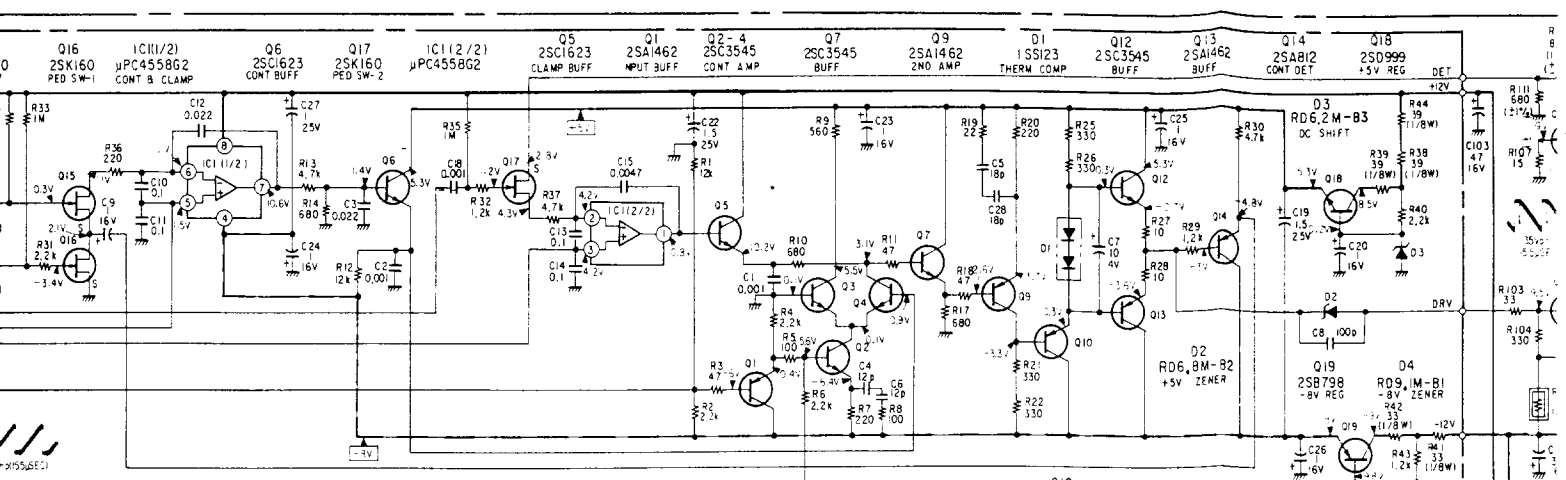


1

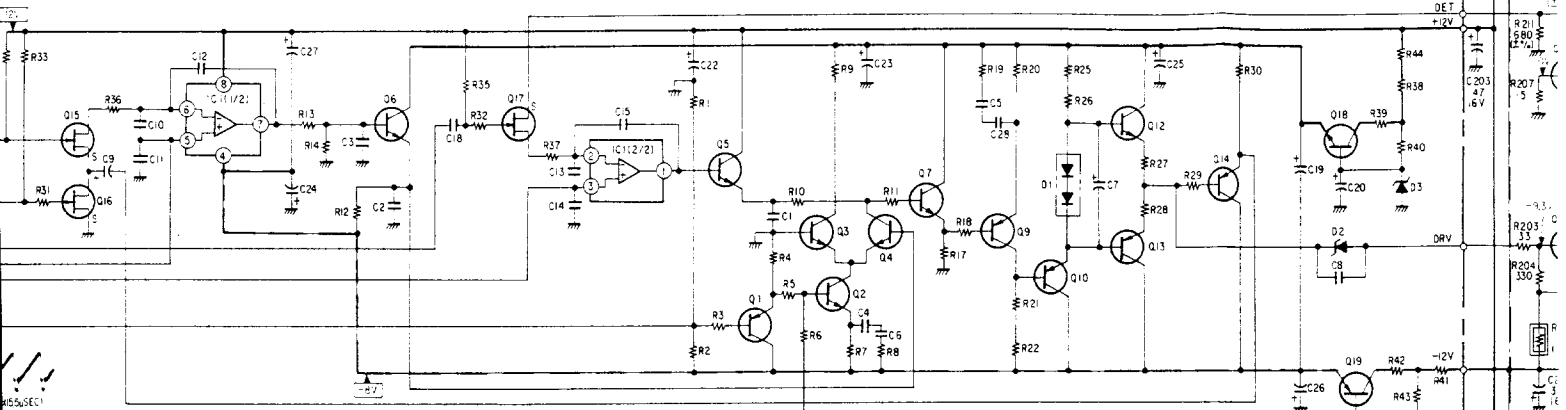




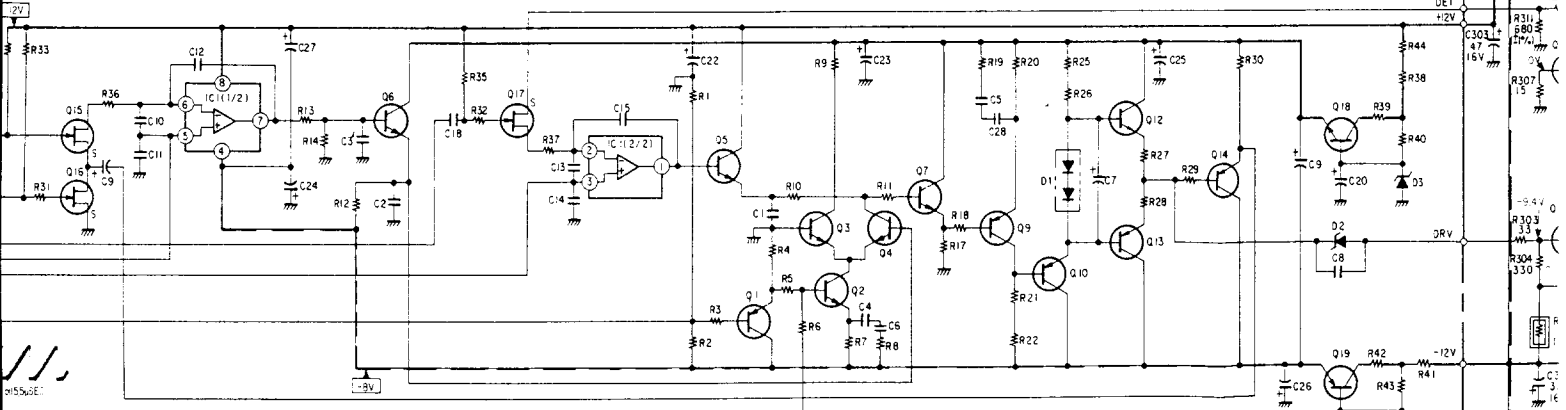




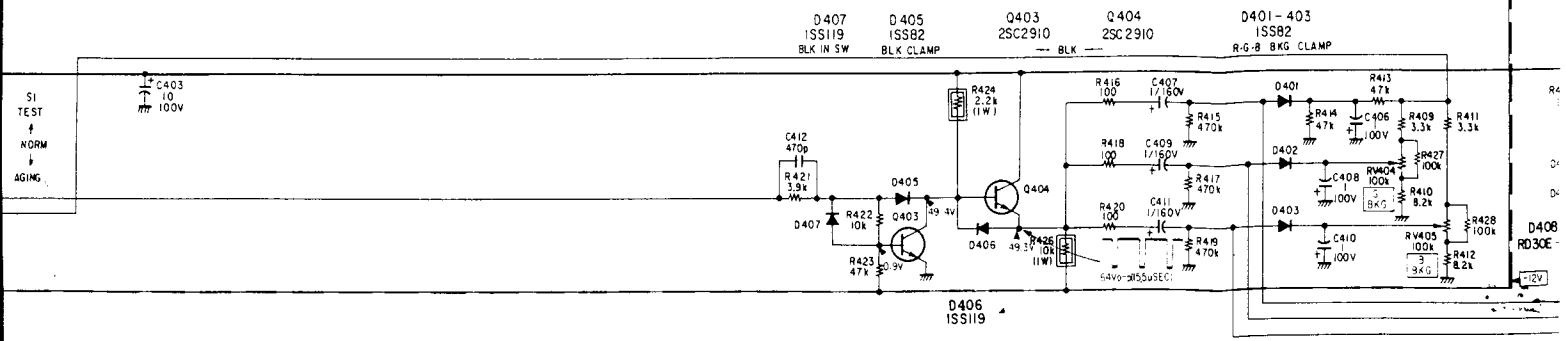
A (CONTRAST AMP, PEDESTAL CLAMP)

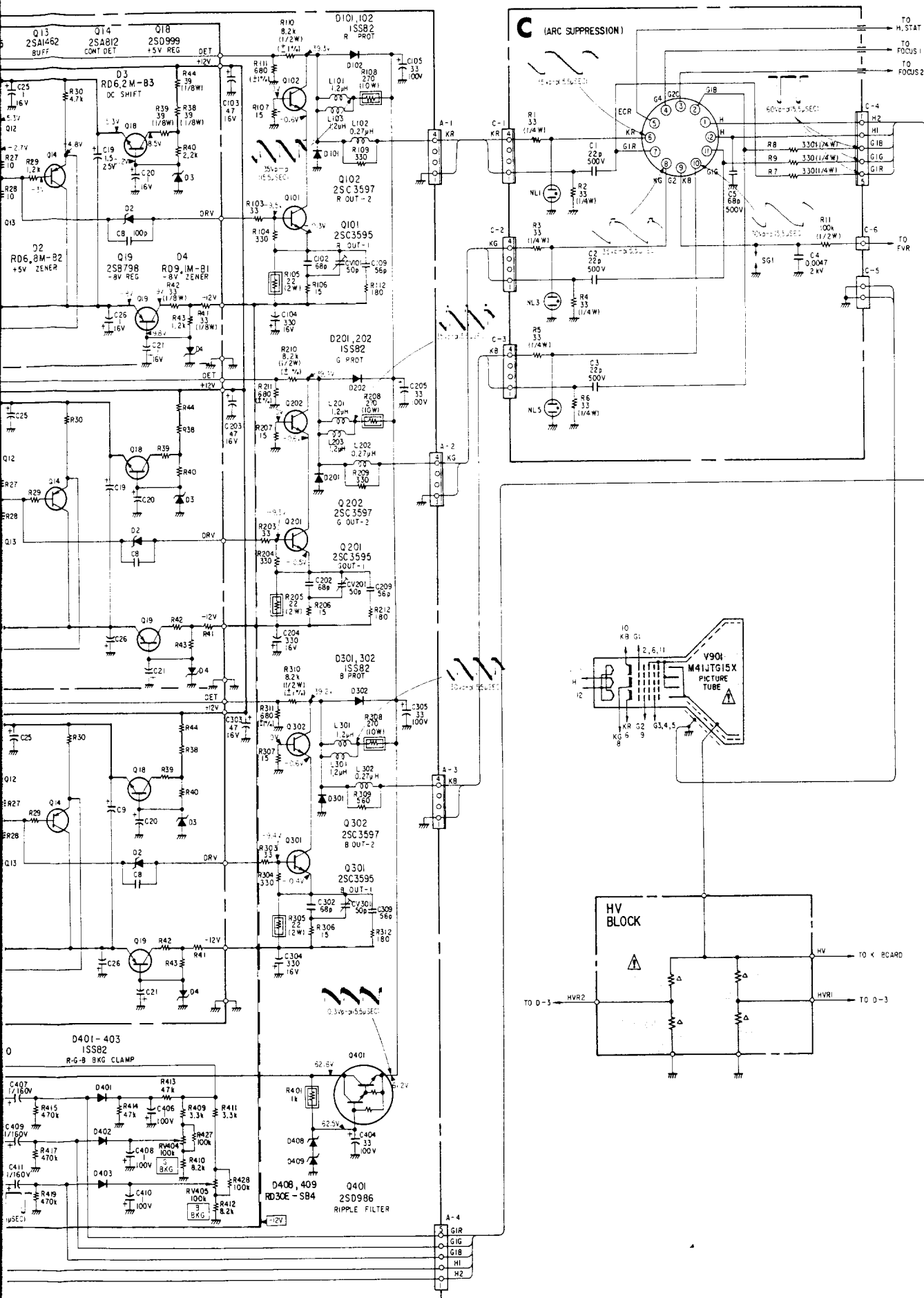


(CONTRAST AMP, PEDESTAL CLAMP)



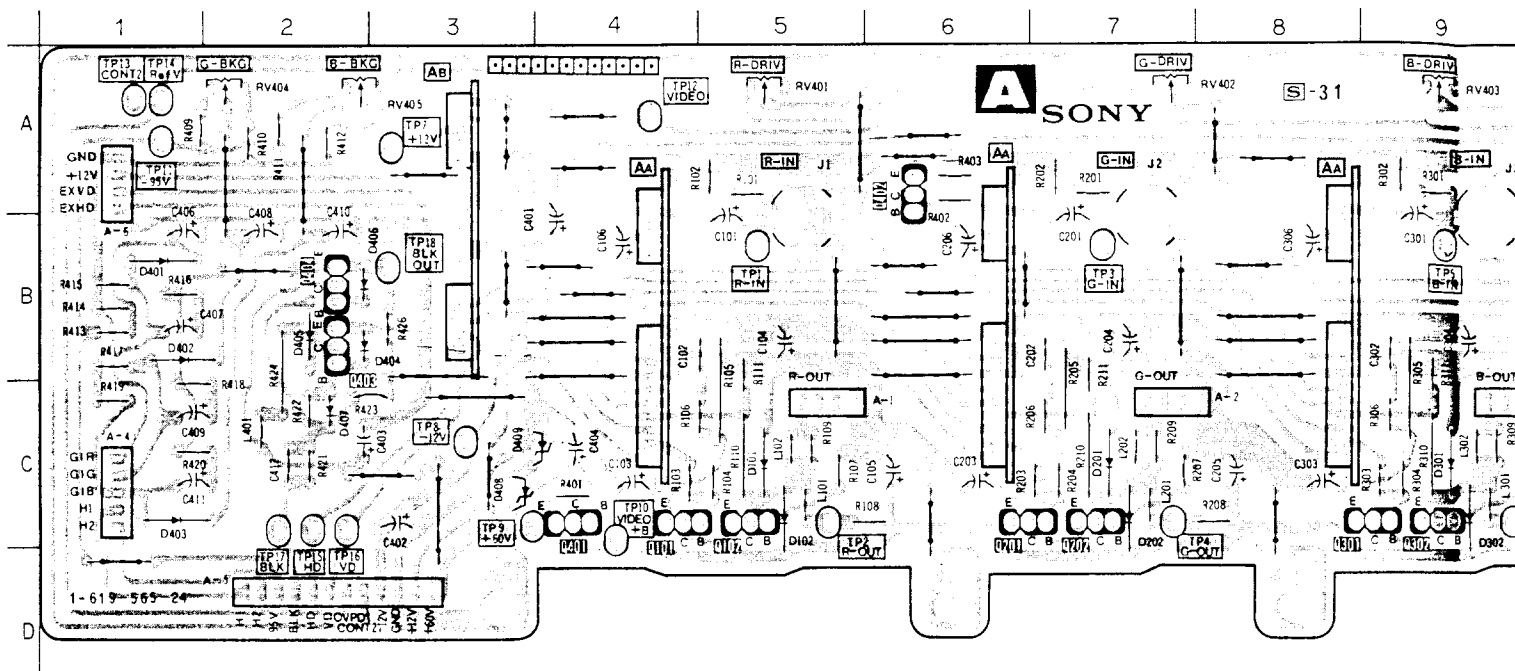
CONTRAST AMP, PEDESTAL CLAMP)



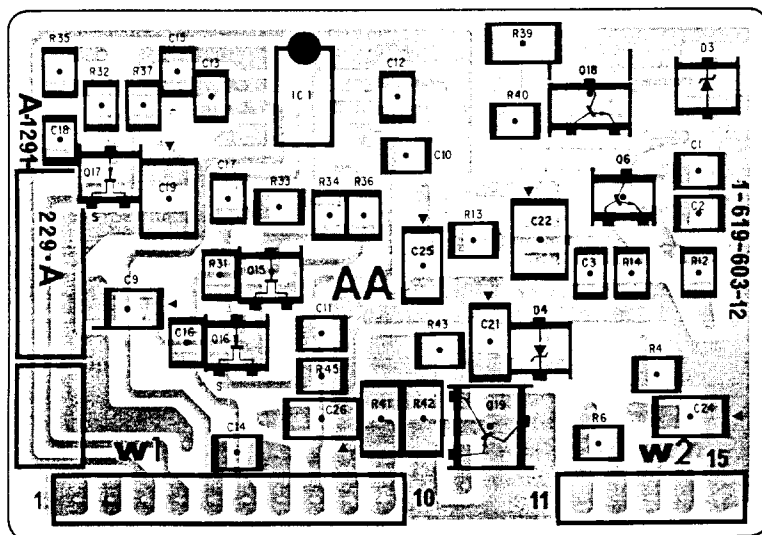


— A Board —

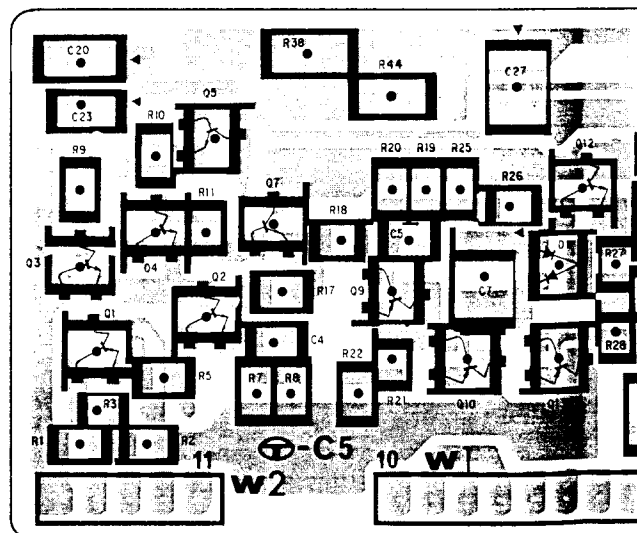
TRANSISTOR	Q402 A-6	D202 C-7	D407 C-2	RV404 A-2	TP10 C-4
Q101 C-4	Q403 B-2	D301 C-9	D408 C-3	RV405 A-2	TP11 A-1
Q102 C-5	Q404 B-2	D302 C-9	D409 C-3	TEST POINT	TP13 A-1
Q101 C-6		D401 B-1			TP14 A-1
Q202 C-7	DIODE	D402 B-1	ADJUSTMENT	TP2 C-5	TP15 C-2
Q301 C-8	D101 C-5	D403 C-1	RV401 A-5	TP4 C-7	TP16 C-2
Q302 C-9	D102 C-5	D405 B-2	RV402 A-7	TP6 C-9	TP17 C-2
Q401 C-4	D201 C-7	D406 B-2	RV403 A-9	TP9 C-3	TP18 B-3



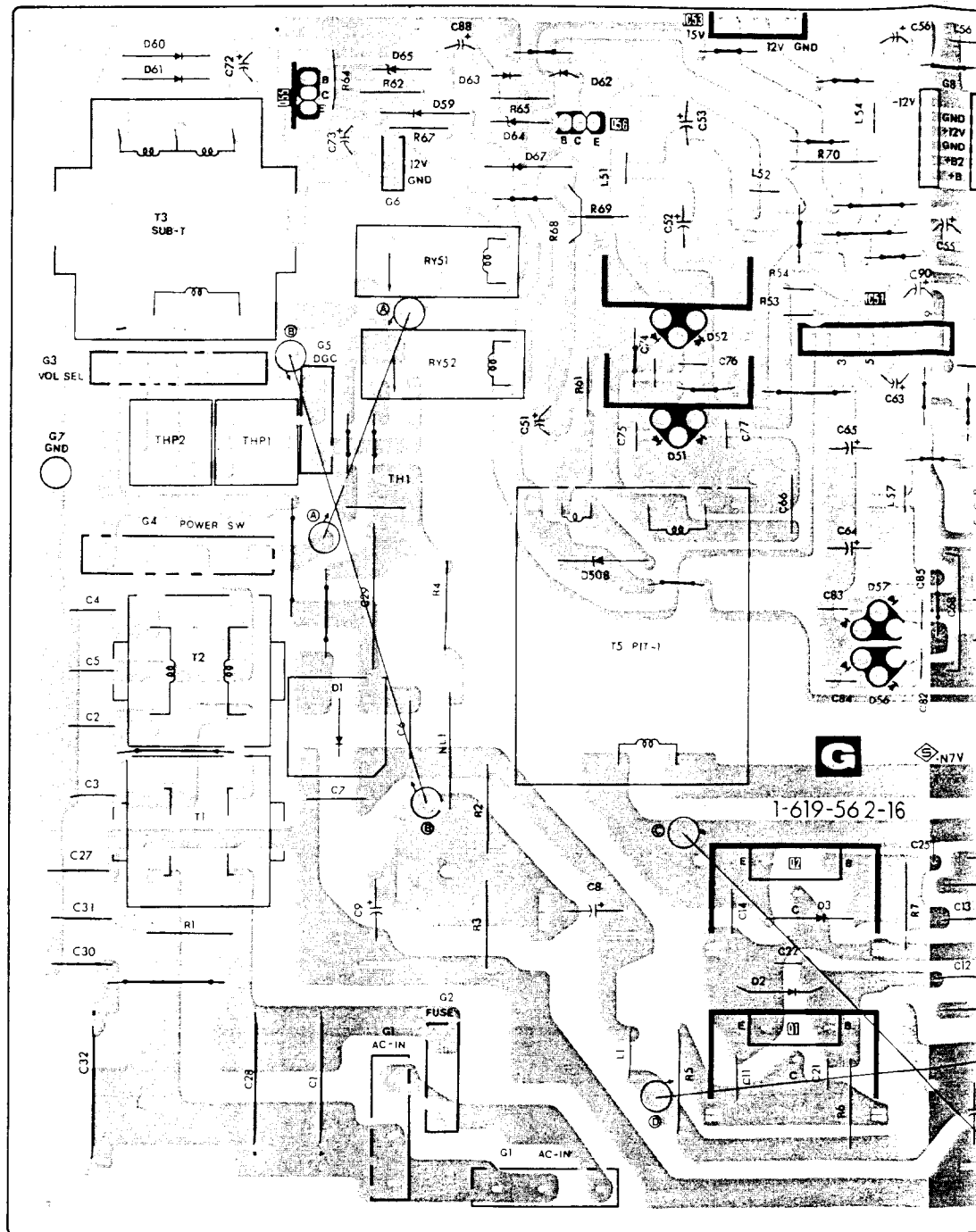
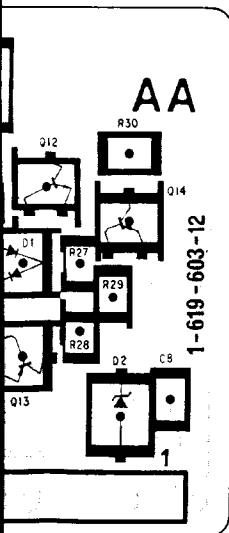
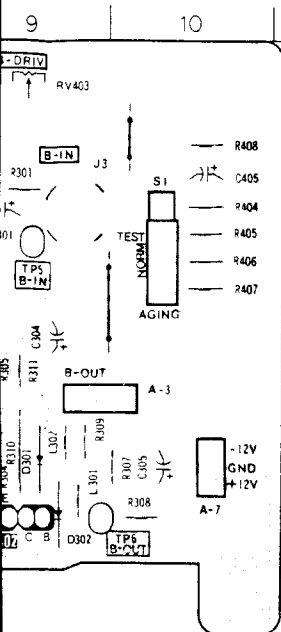
– AA Board – (Component Side)



– AA Board – (Conductor Side)



— G Board —



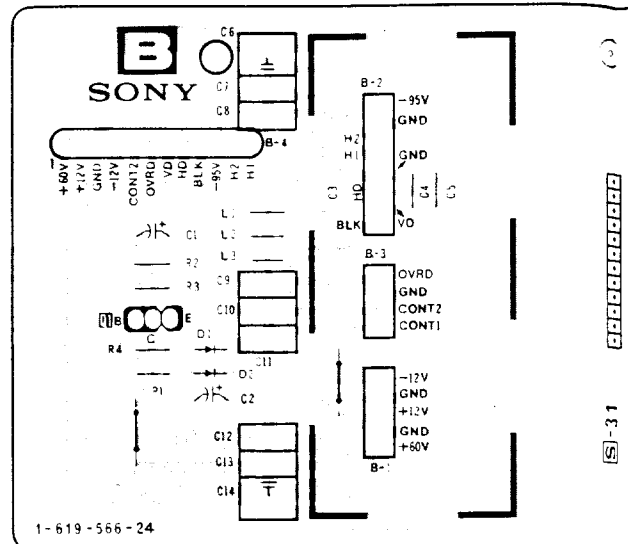
AB[SYNC SEP,
PULSE GENERATOR]**G**

[SWITCHING REGULATOR]

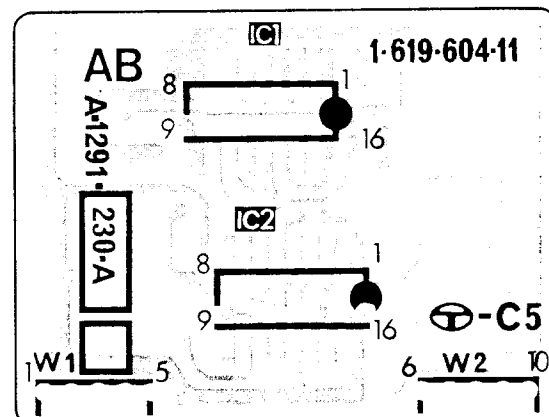
B

[EMI FILTER]

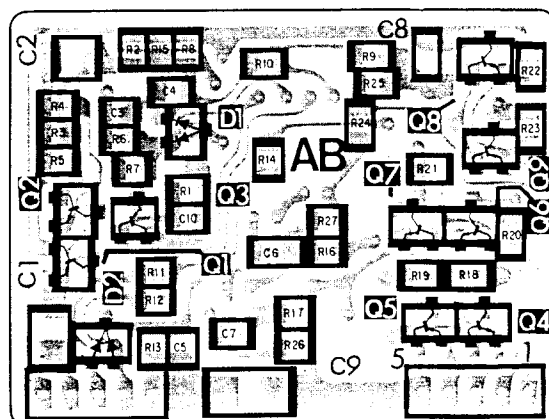
— B Board —



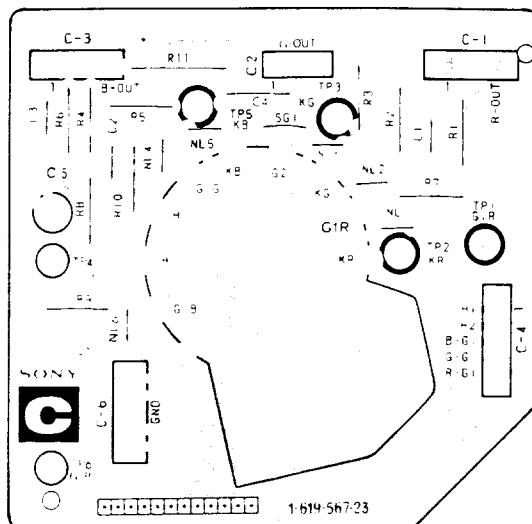
— AB Board — (Component Side)



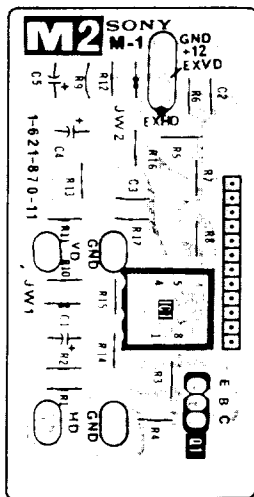
— AB Board — (Conductor Side)



— C Board —



— M2 Board —

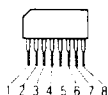


5-5. SEMICONDUCTORS

BA4558
NJM2903D
NJM4558D
 μ PC4558C



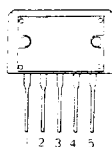
M5218L



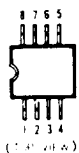
NJM4558S



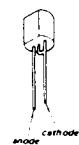
STR9005



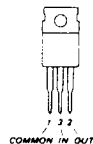
μ PC4082G2
 μ PC4558G2



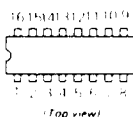
μ PC574J



μ PC7912H



TC4053BP
 μ PD4519BG
 μ PD4528BG



2SA1048
2SA1115
2SC2458
2SC2603
DTC144WS



2SA1175
2SC2785
2SC2786-M



2SA1206-K1
2SC2901



2SA812
2SA1462
2SA1621
2SC1623
2SC2712Y
2SC2812L5
2SK160-K5



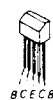
2SA893A
2SC2910



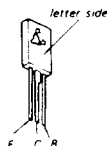
2SA933S
2SC1740
2SC1890A
2SC2362



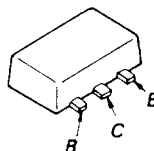
2SA979



2SB649
2SC3595
2SC3597
2SD986



2SB798
2SD1664
2SD999



2SB861
2SC1173
2SC3150
2SC3163
2SD1137
2SD1138
2SD880



2SC3164



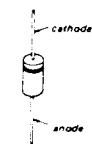
2SC3209
2SD774



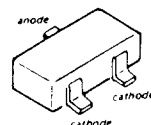
2SD1880
2SD1887



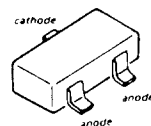
10E2
1SS82
ERD28-08S
RD13E-L1
RD6.8E-L1
RGP15G



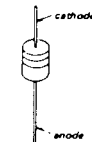
1S2835



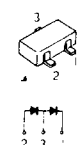
1S2837



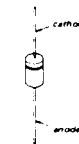
1SS119
1SS133
1SS148
RD11ES-B2
RD12ES-B2
RD4.3ES-B2
RD4.7ES-B2
RD5.1ES-B2
RD9.1ES-B2



1SS123



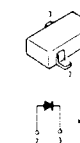
ERD31-02
RM2CS
RU-2M
SIB01-02



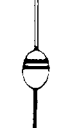
RB406NH



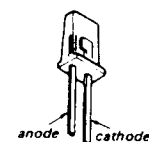
RD6.2M-B1
RD6.8M-B2
RD9.1M-B2



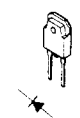
V19E
V19G



SG232D
SR632D



CTUG3DR



SECTION 6

EXPLODED VIEWS


TABLE OF CONTENTS


<u>Section</u>	<u>Title</u>	<u>Page</u>
6-1.	Bezel, Cabinet	6-1
6-2.	Chassis	6-2
6-3.	Picture Tube	6-3
6-4.	Kit	6-4
6-5.	Packing Assy	6-5

NOTE:

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.

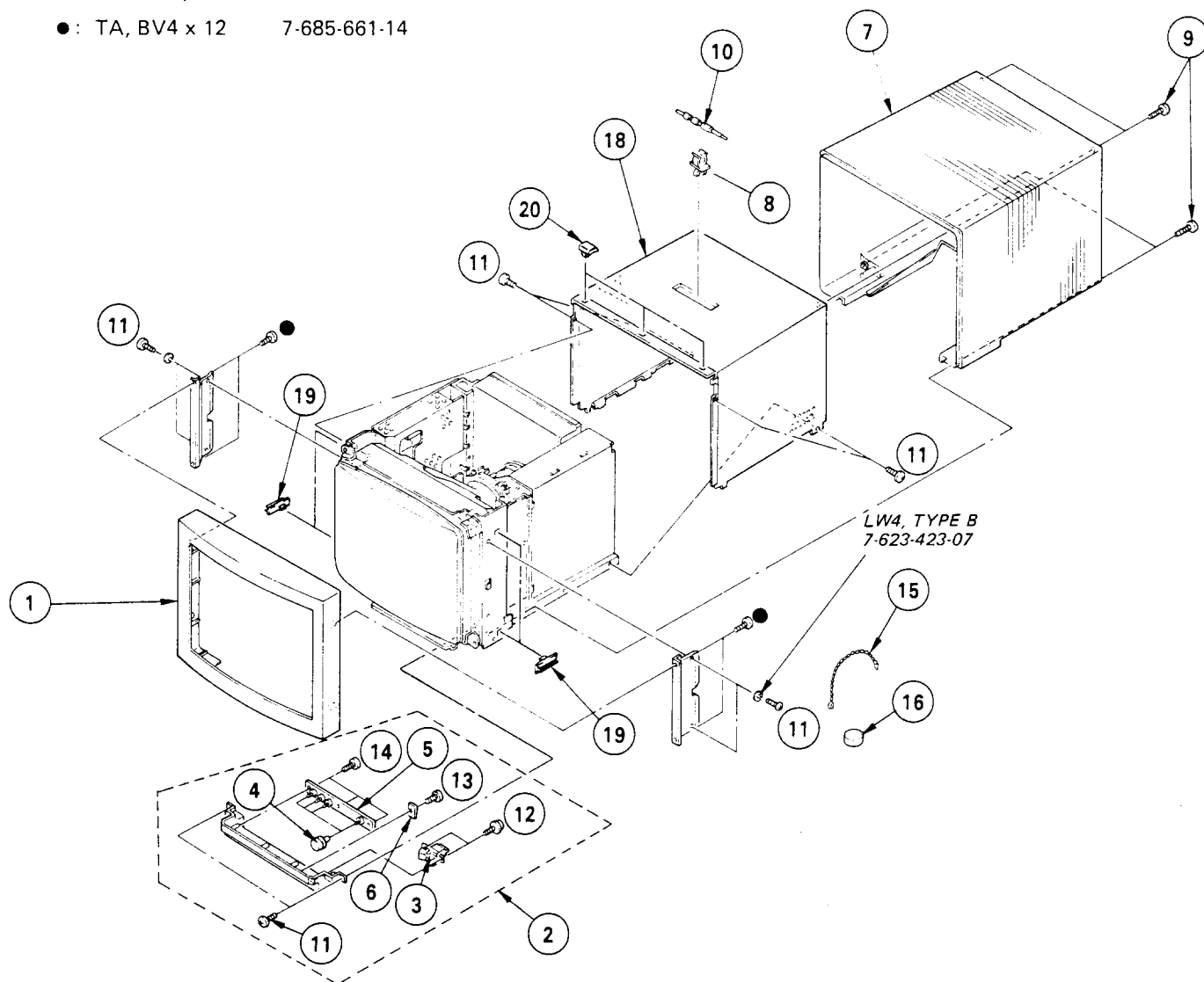
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.


The components identified by shading and mark  are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

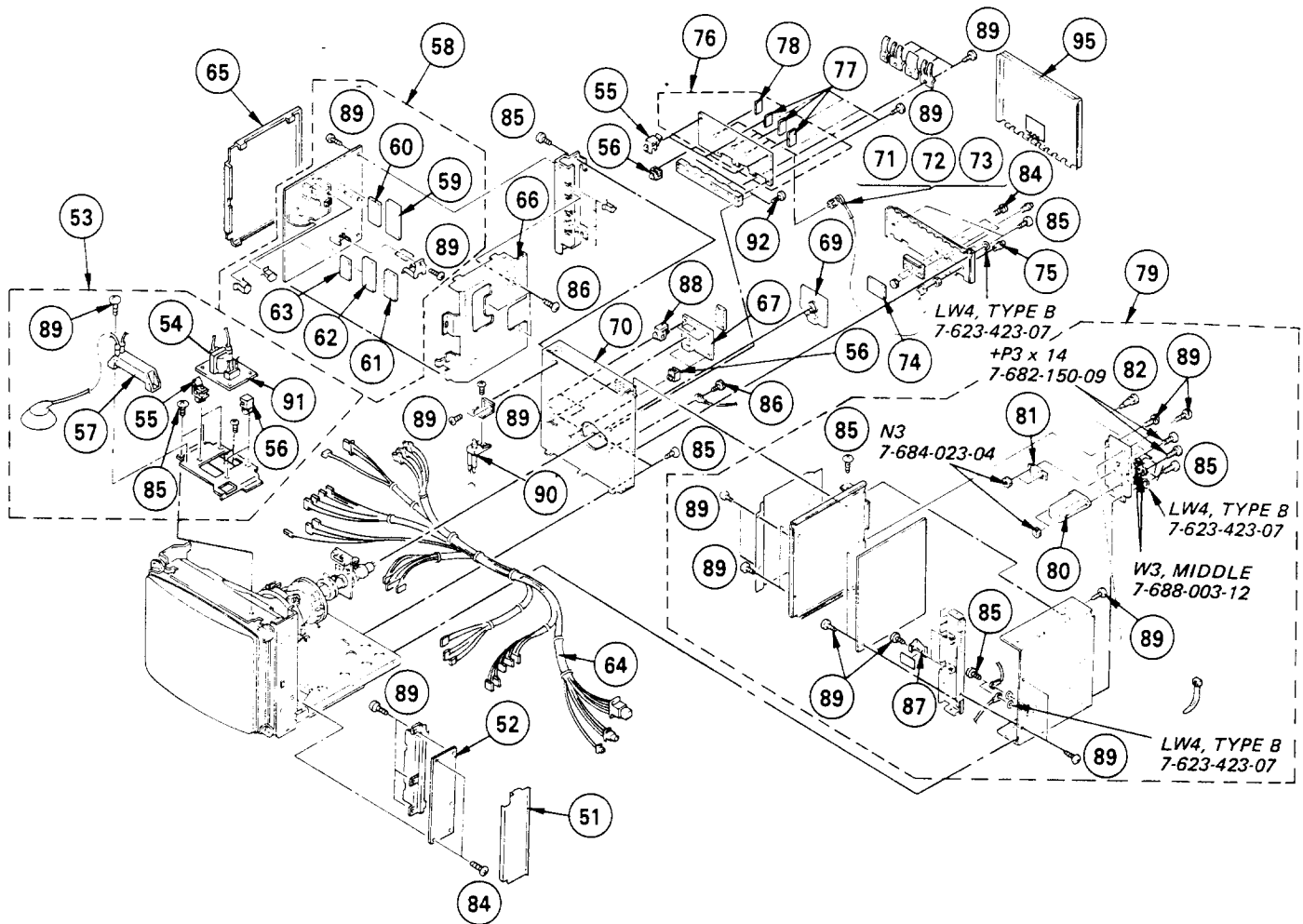
6-1. BEZEL, CABINET

●: TA, BV4 x 12 7-685-661-14



No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
1	X-4381-916-1	BEZEL ASSY		10	4-382-826-01	SCREW DRIVER, ADJUSTMENT	
2	★A-1477-357-A	CONTROL BLOCK ASSY	2-6	11	4-381-962-11	SCREW (M4X8), TAPPING, (+-) (BV)	
3	 A-1-570-779-11	SWITCH, SEESAW (AC POWER)		12	3-701-833-01	HEAD WASHER, TAPPING SCREW	
4	4-381-915-01	KNOB		13	4-381-964-01	SCREW (3X8), TAPPING, (+-) (BV)	
5	*1-619-607-11	H BOARD		14	4-381-964-11	SCREW (3X12), TAPPING, (+-) (BV)	
6	*1-619-606-11	J BOARD		15	4-308-870-00	CLIP, LEAD WIRE	
7	*4-381-947-11	CABINET		16	1-452-032-00	MAGNET, DISK: 10MM Ø	
8	*4-322-922-00	HOLDER, COIL, DEGAUSSER		18	*4-384-359-01	PERFORATED METAL SHIELD	
9	4-381-963-01	SCREW (M5X16), (+-) (B)		19	*3-680-613-11	SUPPORT, PC BOARD	
				20	*4-026-507-00	SPACER	

6-2. CHASSIS

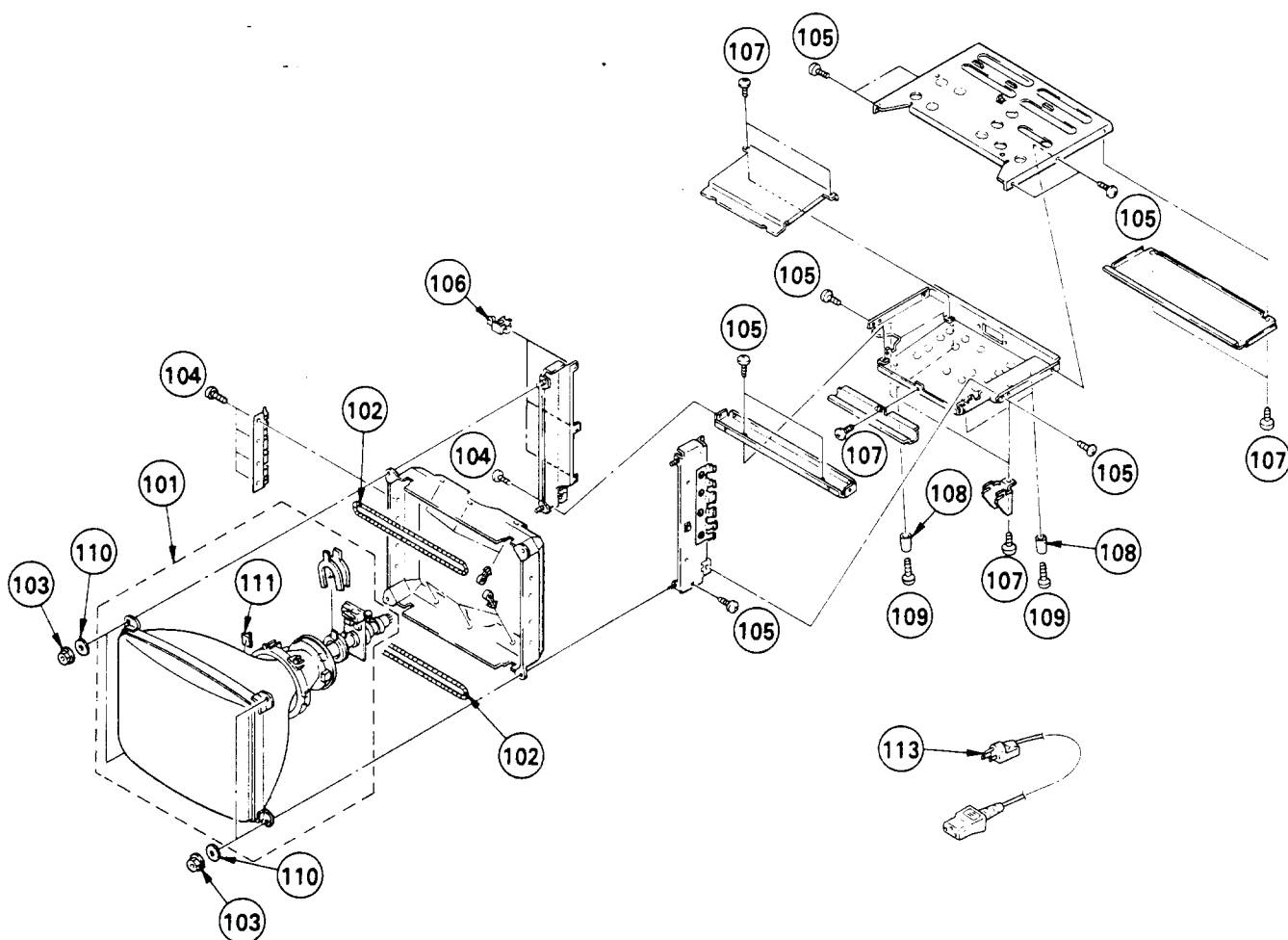


No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
51	*4-381-966-01	COVER (L), PC BOARD		71	*1-557-152-21	CABLE, PIN (GREEN CABLE)	
52	*A-1235-013-A	L BOARD, COMPLETE (GDM-1601 ONLY)		72	*1-557-152-51	CABLE, PIN (RED CABLE)	
	*A-1235-011-A	L BOARD, COMPLETE (GDM-1602 ONLY)		73	*1-557-152-71	CABLE, PIN (BLUE CABLE)	
53	▲*A-1465-154-A	HV BLOCK COMPLETE ASSY	54-57, 89, 85	74	*A-1301-758-A	M2 BOARD, COMPLETE	
54	▲*1-439-393-21	TRANSFORMER ASSY, FLYBACK		75	1-562-576-11	ADAPTER, CONVERSION BNC PIN	
55	*3-703-141-00	HOLDER, PCB		76	*A-1296-180-A	A BOARD, COMPLETE	77, 78
56	*3-701-903-00	HOLDER, PC BOARD		77	*A-1291-229-A	AA BOARD, COMPLETE	
57	▲*1-230-127-21	RESISTOR ASSY, HIGH-VOLTAGE		78	*A-1291-230-A	AB BOARD, COMPLETE	
58	*A-1345-676-A	D BOARD, COMPLETE (GDM-1601 ONLY)	59-63	79	▲*A-1477-875-A	POWER BLOCK ASSY (GDM-1601 ONLY)	80-82, 86, 87, 89
	*A-1345-722-A	D BOARD, COMPLETE (GDM-1602 ONLY)	59-63		▲*A-1477-873-A	POWER BLOCK ASSY (GDM-1602 ONLY)	80-82, 86, 87, 89
59	*1-619-529-21	DB BOARD		80	▲*1-526-945-11	INLET, AC 3P	
60	*A-1340-848-A	DC BOARD, COMPLETE		81	▲*1-554-913-11	SWITCH, SLIDE (VOLTAGE CHANGE)	
61	*1-619-555-21	DA BOARD		82	1-533-191-11	HOLDER, FUSE	
62	*1-619-557-21	DD BOARD		85	4-381-961-01	SCREW (M4X8), TAPPING, (+-) (BV)	
63	*1-619-558-21	DE BOARD		86	4-381-964-01	SCREW (3X8), TAPPING, (+-) (BV)	
64	*1-937-755-11	HARNESS (MAIN (D))		87	*4-313-732-00	CLIP, HINGE, CIRCUIT BOARD	
65	*4-381-975-01	COVER (D), PC BOARD		88	*4-321-929-00	HOLDER, PC BOARD	
66	*4-381-997-01	COVER (D), PC BOARD		89	4-381-960-11	SCREW (M3X8), TAPPING, (+-) (BV)	
67	*A-1130-505-A	B BOARD, COMPLETE		90	▲*1-237-344-11	RESISTOR ASSY, HIGH-VOLTAGE	
68	*A-1499-604-A	SAFETY COVERS, PLASTIC METAL FOR PCBs (51, 65, 95)		91	*1-619-564-21	K BOARD	
69	*A-1330-733-A	C BOARD, COMPLETE		92	4-381-961-11	SCREW (M4X16), TAPPING (+-) (BV)	
70	*4-381-929-01	COVER, ABC SHIELD			A-1499-495-A	COAX CABLE, VIDEO INTERCONNECT (71, 72, 73)	
					A-1499-498-A	PCB PLASTIC PARTS (55, 56, 88)	

The components identified by shading and mark ▲ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ▲ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

6-3. PICTURE TUBE

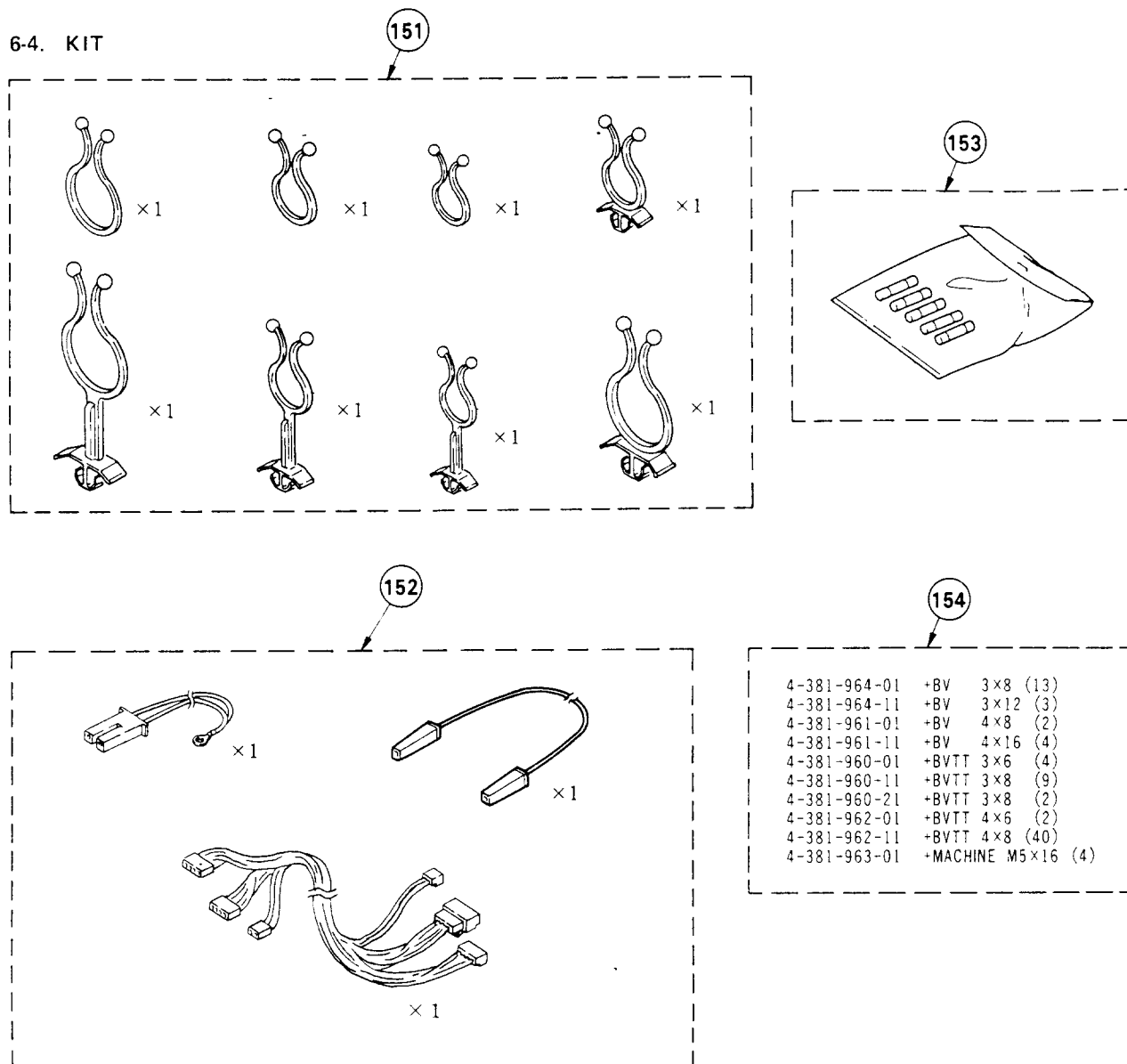


No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
101	▲8-738-551-92	PICTURE TUBE ASSEMBLY (M41JTG15X)		106	*3-703-141-00	HOLDER, PCB	
102	▲1-426-285-11	COIL, DEMAGNETIZATION		107	4-381-960-11	SCREW (M3X8), TAPPING, (+-) (BV)	
103	4-306-034-00	FLUNGE NUT, (8) 5MM		108	3-642-656-01	FOOT	
104	4-381-964-01	SCREW (3X8), TAPPING, (+-) (BV)		109	4-381-962-21	SCREW (M4X20), TAPPING, (+-) (BV)	
105	4-381-962-11	SCREW (M4X8), TAPPING, (+-) (BV)		110	4-363-206-01	WASHER, CRT POSITION	
				111	4-309-369-02	SPACER, DY	
				112	A-1499-304-A	CRT HARDWARE (103, 110, 111)	
				113	▲1-534-827-14	CORD, POWER 10R, 120V-7A (J/US/CNO)	

Les composants identifiés par une trame et une marque ▲ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

The components identified by shading and mark ▲ are critical for safety. Replace only with part number specified.

6-4. KIT

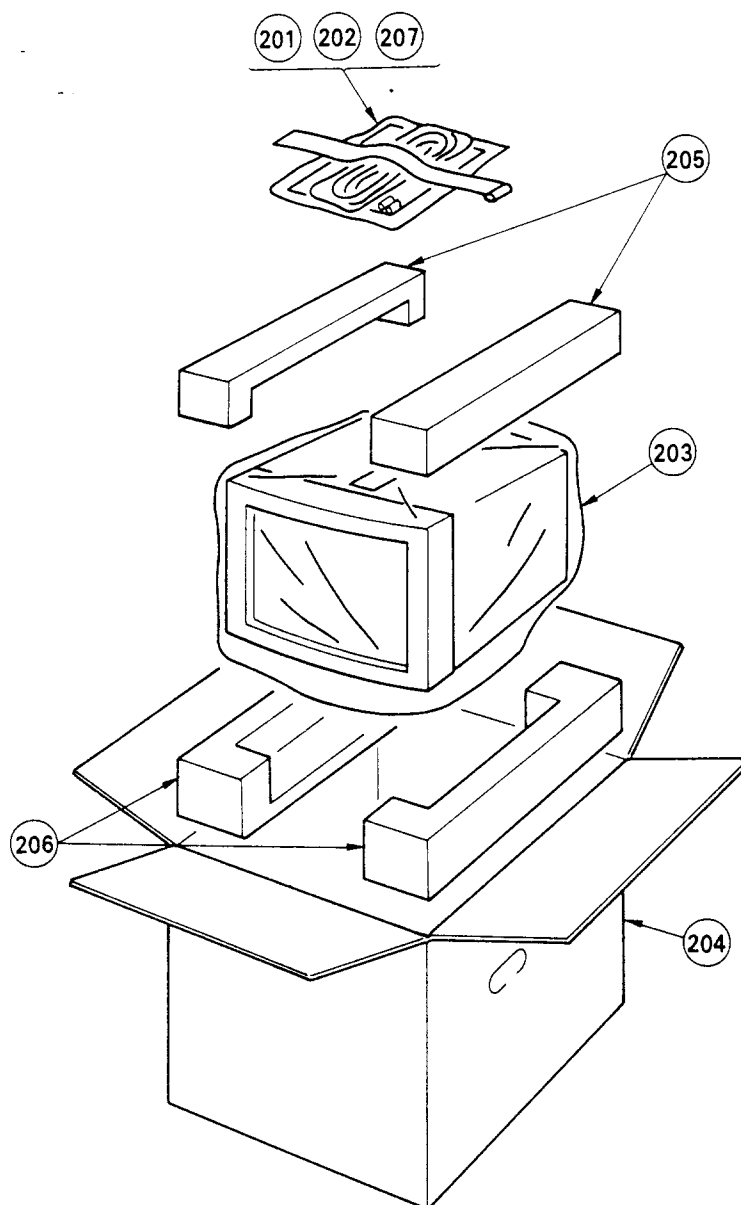


No.	Part No.	Description	Remark
151	*A-1499-499-A	CABLE CLAMPS	
152	*A-1499-505-A	CABLE ASSEMBLY	
153	△*A-1499-501-A	FUSES FOR J/US/CND A 4AMP ×5	
	△1-532-746-11	FUSES, GLASS TUBE 4A/125V (J/US/CND)	
	△*A-1499-502-A	FUSES FOR EUROPE A T3.15AMP ×5	
	△1-532-237-11	FUSES, TIME LAG 3.15A/250V (EUROPE)	
154	*A-1499-500-A	MISC SCREWS	

Les composants identifiés par une trame et une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

The components identified by shading and mark △ are critical for safety. Replace only with part number specified.

6-5. PACKING ASSY



No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
201	4-482-319-01	MANUAL, INSTRUCTION		203	*4-309-537-00	BAG, PROTECTION	
202	Δ.1-534-827-14	CORD 10ft 120V-7A (J/US/CND)		204	*4-382-898-01	INDIVIDUAL CARTON (GDM-1601 ONLY)	
					*4-382-898-01	INDIVIDUAL CARTON (GDM-1602 ONLY)	
				205	4-382-862-01	CUSHION (UPPER)	
				206	4-382-863-01	CUSHION (LOWER)	
				207	Δ.1-532-746-11	FUSES, GLASS TUBE 4A/125V (J/US/CND)	
					Δ.1-532-237-11	FUSES, TIME LAG 3.15A/250V (EUROPE)	

The components identified by shading and mark Δ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

SECTION 7

ELECTRICAL PARTS LIST

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NOTE:

The components identified by shading and mark Δ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une trame et une marque Δ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

• Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

• All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS

- All resistors are in ohms
- F : nonflammable

When indicating parts by reference number, please include the board name.

CAPACITORS

COILS

MF : μ F, PF : μ F • MMH : mH, UH : μ H

- The components identified by \square in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
	A-1130-505-A	B BOARD, COMPLETE *****		*A-1235-013-A	L BOARD, COMPLETE (GDM-1601 ONLY) *****		
		<u>CONNECTOR</u>		*A-1235-011-A	L BOARD, COMPLETE (GDM-1602 ONLY) *****		
B1	*1-566-057-11	PIN, CONNECTOR 5P		*4-381-906-01	SPRING (F)		
B2	*1-566-060-11	PIN, CONNECTOR 8P		*4-381-907-01	INSULATOR (A)		
B3	*1-566-056-11	PIN, CONNECTOR 4P			<u>CAPACITOR</u>		
		<u>CAPACITOR</u>		C1	1-102-074-00	CERAMIC 0.001MF 10% 50V	
C1	1-123-818-00	ELECT 22MF 20% 25V		C2	1-126-101-11	ELECT 100MF 20% 16V	
C2	1-123-818-00	ELECT 22MF 20% 25V		C3	1-102-074-00	CERAMIC 0.001MF 10% 50V	
C3	1-162-282-31	CERAMIC 100PF 10% 50V		C4	1-124-902-00	ELECT 0.47MF 20% 50V	
C4	1-162-282-31	CERAMIC 100PF 10% 50V		C5	1-124-902-00	ELECT 0.47MF 20% 50V	
C5	1-162-282-31	CERAMIC 100PF 10% 50V		C6	1-124-927-11	ELECT 4.7MF 20% 50V	
		<u>FILTER</u>		C7	1-124-927-11	ELECT 4.7MF 20% 50V	
C6	1-421-752-11	FILTER, NOISE		C8	1-126-101-11	ELECT 100MF 20% 16V	
C7	1-235-906-11	FILTER, LOW PASS		C9	1-126-101-11	ELECT 100MF 20% 16V	
C8	1-235-906-11	FILTER, LOW PASS		C10	1-162-286-31	CERAMIC 220PF 10% 50V	
C9	1-235-906-11	FILTER, LOW PASS		C11	1-162-290-31	CERAMIC 470PF 10% 50V	
C10	1-235-906-11	FILTER, LOW PASS		C40	1-129-769-00	FILM 0.1MF 10% 200V	
C11	1-235-906-11	FILTER, LOW PASS		C41	1-136-091-00	FILM 0.0068MF 3% 2KV	
C12	1-235-906-11	FILTER, LOW PASS		C42	1-129-769-00	FILM 0.1MF 10% 200V	
C13	1-235-906-11	FILTER, LOW PASS		C43	1-126-103-11	ELECT 470MF 20% 16V	
C14	1-421-752-11	FILTER, NOISE		C50	1-162-114-00	CERAMIC 0.0047MF 2KV	
		<u>DIODE</u>			<u>DIODE</u>		
D1	8-719-911-19	DIODE 1SS119		D1	8-719-109-96	DIODE RD6.8ES-81	
D2	8-719-911-19	DIODE 1SS119		D2	8-719-911-19	DIODE 1SS119	
		<u>IC LINK</u>		D3	8-719-911-19	DIODE 1SS119	
JW3	1-532-838-21	LINK, IC		D4	8-719-921-53	DIODE RGP15G	
		<u>COIL</u>		D5	8-719-901-17	DIODE V11L	
L1	1-410-315-21	INDUCTOR 0.68UH			<u>IC</u>		
L2	1-410-315-21	INDUCTOR 0.68UH		IC1	8-759-600-02	IC M5218L	
L3	1-410-315-21	INDUCTOR 0.68UH		IC2	8-759-600-02	IC M5218L	
		<u>TRANSISTOR</u>		IC3	8-759-600-02	IC M5218L	
Q1	8-729-178-54	TRANSISTOR 2SC2785		IC4	8-759-140-53	IC UPD4053BC	
		<u>RESISTOR</u>			<u>COIL</u>		
R1	1-249-426-11	CARBON 5.6K 5% 1/4W		L1	1-459-074-00	COIL, DUST CORE 6.8MMH(HCC)	
R2	1-249-426-11	CARBON 5.6K 5% 1/4W		L2	1-459-338-00	COIL, VAR, FERRITE (PAC)	
R3	1-249-430-11	CARBON 12K 5% 1/4W		L3	1-459-111-00	COIL, DRAM CORE (CDI)	
R4	1-249-430-11	CARBON 12K 5% 1/4W			<u>CONNECTOR</u>		
				L1	*1-566-055-11	PIN, CONNECTOR 3P	
				L2	*1-566-054-11	PIN, CONNECTOR 2P	
				L3	*1-566-054-11	PIN, CONNECTOR 2P	
				L4	*1-566-056-11	PIN, CONNECTOR 4P	
				L5	*1-566-055-11	PIN, CONNECTOR 3P	

A

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Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
C403	1-123-640-00	ELECT 10MF	20% 100V		*4-381-994-01	SHEET, BN; Q301	
C404	1-126-106-51	ELECT 33MF	20% 100V	Q302	8-729-802-57	TRANSISTOR 2SC3597	
C405	1-124-791-11	ELECT 1MF	20% 50V	Q401	8-729-112-68	TRANSISTOR 2SD986	
C406	1-124-791-11	ELECT 1MF	20% 100V		*4-381-901-01	SPRING (A); Q401	
C407	1-124-798-11	ELECT 1MF	20% 160V	Q402	8-729-117-54	TRANSISTOR 2SA1175	
C408	1-124-791-11	ELECT 1MF	20% 100V	Q403	8-729-891-02	TRANSISTOR 2SC2910	
C409	1-124-798-11	ELECT 1MF	20% 160V	Q404	8-729-891-02	TRANSISTOR 2SC2910	
C410	1-124-791-11	ELECT 1MF	20% 100V				
C411	1-124-798-11	ELECT 1MF	20% 160V				
C412	1-162-290-31	CERAMIC 470PF	10% 50V				
C413	1-123-875-11	ELECT 10MF	20% 50V				
		TRIMMER					
CV101	1-141-269-00	CAP, TRIMMER					
CV201	1-141-269-00	CAP, TRIMMER					
CV301	1-141-269-00	CAP, TRIMMER					
		DIODE					
D101	8-719-901-83	DIODE 1SS83		R101	1-215-387-00	METAL 39 1% 1/6W	
D102	8-719-901-83	DIODE 1SS83		R102	1-215-387-00	METAL 39 1% 1/6W	
D201	8-719-901-83	DIODE 1SS83		R103	1-249-399-11	CARBON 33 5% 1/4W	
D202	8-719-901-83	DIODE 1SS83		R104	1-249-411-11	CARBON 330 5% 1/4W	
D301	8-719-901-83	DIODE 1SS83		R105	1-215-882-00	METAL OXIDE 22 5% 2W F	
D302	8-719-901-83	DIODE 1SS83		R106	1-249-395-11	CARBON 15 5% 1/4W	
D401	8-719-901-83	DIODE 1SS83		R107	1-249-395-11	CARBON 15 5% 1/4W	
D402	8-719-901-83	DIODE 1SS83		R108	1-216-736-11	METAL 270 1% 10W	
D403	8-719-901-83	DIODE 1SS83		R109	1-249-411-11	CARBON 330 5% 1/4W	
D405	8-719-901-83	DIODE 1SS83		R110	1-214-886-00	METAL 8.2K 1% 1/2W	
D406	8-719-911-19	DIODE 1SS119		R111	1-215-417-00	METAL 680 1% 1/6W	
D407	8-719-911-19	DIODE 1SS119		R112	1-249-408-11	CARBON 180 5% 1/4W	
D408	8-719-110-72	DIODE RD30ES-B2		R201	1-215-387-00	METAL 39 1% 1/6W	
D409	8-719-110-72	DIODE RD30ES-B2		R202	1-215-387-00	METAL 39 1% 1/6W	
		JACK		R203	1-249-399-11	CARBON 33 5% 1/4W	
J1	1-526-575-00	SOCKET, PLUG 1P		R204	1-249-411-11	CARBON 330 5% 1/4W	
J2	1-526-575-00	SOCKET, PLUG 1P		R205	1-215-882-00	METAL OXIDE 22 5% 2W F	
J3	1-526-575-00	SOCKET, PLUG 1P		R206	1-249-395-11	CARBON 15 5% 1/4W	
		COIL		R207	1-249-395-11	CARBON 15 5% 1/4W	
L101	1-410-498-11	INDUCTOR 1.2UH		R208	1-216-736-11	METAL 270 1% 10W	
L102	1-410-357-11	INDUCTOR 0.27UH		R209	1-249-411-11	CARBON 330 5% 1/4W	
L103	1-410-498-11	INDUCTOR 1.2UH		R210	1-214-886-00	METAL 8.2K 1% 1/2W	
L201	1-410-498-11	INDUCTOR 1.2UH		R211	1-215-417-00	METAL 680 1% 1/6W	
L202	1-410-357-11	INDUCTOR 0.27UH		R212	1-249-408-11	CARBON 180 5% 1/4W	
L203	1-410-498-11	INDUCTOR 1.2UH		R301	1-215-387-00	METAL 39 1% 1/6W	
L301	1-410-498-11	INDUCTOR 1.2UH		R302	1-215-387-00	METAL 39 1% 1/6W	
L302	1-410-357-11	INDUCTOR 0.27UH		R303	1-249-399-11	CARBON 33 5% 1/4W	
L303	1-410-498-11	INDUCTOR 1.2UH		R304	1-249-411-11	CARBON 330 5% 1/4W	
		TRANSISTOR		R305	1-215-882-00	METAL OXIDE 22 5% 2W F	
Q101	8-729-802-37	TRANSISTOR 2SC3595		R306	1-249-395-11	CARBON 15 5% 1/4W	
	*4-381-902-01	SPRING (B); Q101		R307	1-249-395-11	CARBON 15 5% 1/4W	
	*4-381-994-01	SHEET, BN; Q101		R308	1-216-736-11	METAL 270 1% 10W	
Q102	8-729-802-57	TRANSISTOR 2SC3597		R309	1-249-414-11	CARBON 560 5% 1/4W	
Q201	8-729-802-37	TRANSISTOR 2SC3595		R310	1-214-886-00	METAL 8.2K 1% 1/2W	
	*4-381-902-01	SPRING (B); Q201		R311	1-215-417-00	METAL 680 1% 1/6W	
	*4-381-994-01	SHEET, BN; Q201		R312	1-249-408-11	CARBON 180 5% 1/4W	
Q202	8-729-802-57	TRANSISTOR 2SC3597		R401	1-249-417-11	CARBON 1K 5% 1/4W F	
Q301	8-729-802-37	TRANSISTOR 2SC3595		R402	1-249-421-11	CARBON 2.2K 5% 1/4W	
	*4-381-902-01	SPRING (B); Q301		R403	1-249-421-11	CARBON 2.2K 5% 1/4W	
				R404	1-215-453-00	METAL 22K 1% 1/6W	
				R405	1-249-427-11	CARBON 6.8K 5% 1/4W	
				R406	1-215-446-00	METAL 11K 1% 1/6W	
				R407	1-249-433-11	CARBON 22K 5% 1/4W	
				R408	1-249-419-11	CARBON 1.5K 5% 1/4W	
				R409	1-249-423-11	CARBON 3.3K 5% 1/4W	
				R410	1-249-428-11	CARBON 8.2K 5% 1/4W	
				R411	1-249-423-11	CARBON 3.3K 5% 1/4W	
				R412	1-249-428-11	CARBON 8.2K 5% 1/4W	
				R413	1-249-437-11	CARBON 47K 5% 1/4W	
				R414	1-249-437-11	CARBON 47K 5% 1/4W	
				R415	1-247-895-00	CARBON 470K 5% 1/4W	
				R416	1-249-405-11	CARBON 100 5% 1/4W	
				R417	1-247-895-00	CARBON 470K 5% 1/4W	
				R418	1-249-405-11	CARBON 100 5% 1/4W	
				R419	1-247-895-00	CARBON 470K 5% 1/4W	

A A

7-4

The components identified by shading and mark Δ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une trame et une marque Δ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Aa

AB

M2

G

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
R43	1-216-051-00	METAL GLAZE 1.2K 5% 1/10W		R16	1-216-067-00	METAL GLAZE 5.6K 5% 1/10W	
R44	1-216-164-00	METAL GLAZE 39 5% 1/8W		R17	1-216-067-00	METAL GLAZE 5.6K 5% 1/10W	
R45	1-216-295-00	METAL GLAZE 0 5% 1/10W		R18	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
*****				R19	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
*A-1291-230-A AB BOARD, COMPLETE				R20	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
*****				R21	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
CAPACITOR				R22	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
C1	1-216-296-00	METAL GLAZE 0 5% 1/8W		R23	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
C2	1-135-084-21	TANTAL. CHIP 1.5MF 10% 25V		R24	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
C3	1-163-145-00	CERAMIC CHIP 0.0015MF 5% 50V		R26	1-216-093-00	METAL GLAZE 68K 5% 1/10W	
C4	1-163-809-11	CERAMIC CHIP 0.047MF 10% 25V		R27	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
C5	1-163-809-11	CERAMIC CHIP 0.047MF 10% 25V		*****			
C6	1-163-109-00	CERAMIC CHIP 47PF 5% 50V		*A-1301-758-A M2 BOARD, COMPLETE			
C7	1-163-109-00	CERAMIC CHIP 47PF 5% 50V		*****			
C8	1-135-084-21	TANTAL. CHIP 1.5MF 10% 25V		1-563-559-11 RECEPTACLE, BNC			
C9	1-135-084-21	TANTAL. CHIP 1.5MF 10% 25V		CAPACITOR			
C10	1-163-109-00	CERAMIC CHIP 47PF 5% 50V		C1	1-124-247-00	ELECT 10MF 20% 25V	
CONNECTOR				C2	1-130-473-00	MYLAR 0.0015MF 5% 50V	
CN1	*1-506-602-11	PLUG, L TYPE (2.0MM PITCH) 5P		C3	1-162-215-31	CERAMIC 47PF 5% 50V	
CN2	*1-506-602-11	PLUG, L TYPE (2.0MM PITCH) 5P		C4	1-124-499-11	ELECT 1MF 20% 50V	
DIODE				C5	1-124-247-00	ELECT 10MF 20% 25V	
D1	8-719-100-03	DIODE 1S2835		IC			
D2	8-719-100-05	DIODE 1S2837		IC1	8-759-729-03	IC NJM2903D	
IC				TRANSISTOR			
IC1	8-759-109-19	IC UPD45198G		Q1	8-729-103-19	TRANSISTOR 2SA1206-K1	
IC2	8-759-106-39	IC UPD45288G		RESISTOR			
TRANSISTOR				R1	1-249-407-11	CARBON 150 5% 1/4W	
Q1	8-729-100-66	TRANSISTOR 2SC1623		R2	1-249-407-11	CARBON 150 5% 1/4W	
Q2	8-729-100-66	TRANSISTOR 2SC1623		R3	1-249-429-11	CARBON 10K 5% 1/4W	
Q3	8-729-112-65	TRANSISTOR 2SA1462		R4	1-249-423-11	CARBON 3.3K 5% 1/4W	
Q4	8-729-100-66	TRANSISTOR 2SC1623		R5	1-249-429-11	CARBON 10K 5% 1/4W	
Q5	8-729-100-76	TRANSISTOR 2SA812		R6	1-247-883-00	CARBON 150K 5% 1/4W	
Q6	8-729-100-66	TRANSISTOR 2SC1623		R7	1-249-440-11	CARBON 82K 5% 1/4W	
Q7	8-729-100-76	TRANSISTOR 2SA812		R8	1-215-483-00	CARBON 390K 5% 1/4W	
Q8	8-729-100-66	TRANSISTOR 2SC1623		R9	1-249-423-11	CARBON 3.3K 5% 1/4W	
Q9	8-729-100-76	TRANSISTOR 2SA812		R10	1-249-407-11	CARBON 150 5% 1/4W	
RESISTOR				R11	1-249-407-11	CARBON 150 5% 1/4W	
R1	1-216-043-00	METAL GLAZE 560 5% 1/10W		R12	1-249-440-11	CARBON 82K 5% 1/4W	
R2	1-216-081-00	METAL GLAZE 22K 5% 1/10W		R13	1-249-441-11	CARBON 100K 5% 1/4W	
R3	1-216-093-00	METAL GLAZE 68K 5% 1/10W		R14	1-249-441-11	CARBON 100K 5% 1/4W	
R4	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W		R15	1-249-441-11	CARBON 100K 5% 1/4W	
R5	1-216-081-00	METAL GLAZE 22K 5% 1/10W		R16	1-247-883-00	CARBON 150K 5% 1/4W	
R6	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W		R17	1-249-441-11	CARBON 100K 5% 1/4W	
R7	1-216-081-00	METAL GLAZE 22K 5% 1/10W		*****			
R8	1-216-115-00	METAL GLAZE 560K 5% 1/10W		Δ *A-1477-875-A POWER BLOCK ASSY (INCLUDING G BOARD)			
R9	1-216-111-00	METAL GLAZE 390K 5% 1/10W		***** (GDM-1601 ONLY)			
R10	1-216-081-00	METAL GLAZE 22K 5% 1/10W		Δ *A-1477-873-A POWER BLOCK ASSY (INCLUDING G BOARD)			
R11	1-216-081-00	METAL GLAZE 22K 5% 1/10W		***** (GDM-1602 ONLY)			
R12	1-216-081-00	METAL GLAZE 22K 5% 1/10W		*4-381-905-01 SPRING (D)			
R13	1-216-115-00	METAL GLAZE 560K 5% 1/10W		*4-381-907-01 INSULATOR (A)			
R14	1-216-081-00	METAL GLAZE 22K 5% 1/10W		*4-381-908-01 INSULATOR (B)			
R15	1-216-081-00	METAL GLAZE 22K 5% 1/10W					

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Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
<u>CAPACITOR</u>							
C1	Δ 1-136-360-11	FILM 0.22MF	20% 250V	D4	8-719-302-11	DIODE RM2CSS	
C6	1-162-599-12	CERAMIC 0.0047MF	20% 400V	D5	8-719-302-11	DIODE RM2CSS	
C7	1-162-599-12	CERAMIC 0.0047MF	20% 400V	D6	8-719-982-04	DIODE ER881-004	
C8	1-125-441-21	ELECT(BLOCK) 820MF	20% 200V	D7	8-719-982-04	DIODE ER881-004	
C9	1-125-441-21	ELECT(BLOCK) 820MF	20% 200V	D8	8-719-982-04	DIODE ER881-004	
C10	1-125-440-11	ELECT(BLOCK) 220MF	20% 400V	D9	8-719-982-04	DIODE ER881-004	
C11	1-162-129-00	CERAMIC 150PF	10% 2KV	D51	8-719-500-43	DIODE D8LDA20	
C12	1-136-060-00	FILM 0.047MF	5% 400V	*4-373-947-01 HEAT SINK (GA); D51			
C13	1-136-060-00	FILM 0.047MF	5% 400V	D52	8-719-500-43	DIODE D8LDA20	
C14	1-162-129-00	CERAMIC 150PF	10% 2KV	*4-373-947-01 HEAT SINK (GA); D52			
C15	1-130-661-00	FILM 0.022MF	3% 600V	D53	8-719-500-41	DIODE D8LCA20	
C16	1-162-129-00	CERAMIC 150PF	10% 2KV	*4-373-947-01 HEAT SINK (GA); D53			
C17	1-136-060-00	FILM 0.047MF	5% 400V	D54	8-719-500-42	DIODE D8LCA20R	
C18	1-136-060-00	FILM 0.047MF	5% 400V	*4-373-947-01 HEAT SINK (GA); D54			
C19	1-162-129-00	CERAMIC 150PF	10% 2KV	D56	8-719-500-43	DIODE D8LDA20	
C20	1-136-240-11	FILM 0.014MF	5% 1KV	D57	8-719-500-43	DIODE D8LDA20	
C22	1-106-375-12	MYLAR 0.022MF	10% 100V	D58	8-719-302-00	DIODE RU-2M	
C24	1-106-375-12	MYLAR 0.022MF	10% 100V	D59	8-719-200-02	DIODE 10E2	
C25	1-106-375-12	MYLAR 0.022MF	10% 100V	D60	8-719-302-00	DIODE RU-2M	
C26	1-106-375-12	MYLAR 0.022MF	10% 100V	D61	8-719-302-00	DIODE RU-2M	
C27	Δ 1-161-953-51	CERAMIC 0.0047MF	20% 400V	D62	8-719-911-19	DIODE 1SS119	
C28	Δ 1-136-360-11	FILM 0.22MF	20% 250V	D63	8-719-911-19	DIODE 1SS119	
C30	Δ 1-161-953-51	CERAMIC 0.0047MF	20% 400V	D64	8-719-101-64	DIODE RD6.8E-L2	
C31	Δ 1-161-953-51	CERAMIC 0.0047MF	20% 400V	D65	8-719-101-86	DIODE RD13E-L2	
C51	1-124-478-11	ELECT 100MF	20% 25V	D66	8-719-200-02	DIODE 10E2	
C52	1-124-347-00	ELECT 100MF	20% 160V	D67	8-719-200-02	DIODE 10E2	
C53	1-123-024-00	ELECT 33MF	160V	D68	8-719-200-02	DIODE 10E2	
C54	1-124-441-11	ELECT 3900MF	20% 25V	<u>CONNECTOR</u>			
C55	1-124-557-11	ELECT 1000MF	20% 25V	G1	*1-506-348-XX	3P PLUG (L)	
C56	1-124-478-11	ELECT 100MF	20% 25V	G2	*1-508-765-00	3P PLUG (M)	
C57	1-124-441-11	ELECT 3900MF	20% 25V	G3	*1-508-767-00	5P PLUG	
C58	1-124-557-11	ELECT 1000MF	20% 25V	G4	*1-506-348-XX	4P PLUG	
C59	1-124-478-11	ELECT 100MF	20% 25V	G5	*1-508-765-00	3P PLUG (M)	
C63	1-124-039-51	ELECT 10MF	20% 16V	G7	*1-508-784-00	1P PLUG	
C64	1-124-603-11	ELECT 390MF	20% 100V	G8	*1-566-058-11	PIN, CONNECTOR 6P	
C65	1-124-933-11	ELECT 220MF	20% 100V	G9	*1-566-058-11	PIN, CONNECTOR 6P	
C66	1-129-702-00	FILM 0.001MF	10% 630V	<u>MODULE</u>			
C68	1-136-091-00	FILM 0.0068MF	3% 2KV	IC51	Δ 1-235-843-11	POWER MODULE (DM-28)	
C69	1-124-471-00	ELECT 1000MF	20% 6.3V	IC52	1-235-842-11	POWER MODULE (DM-33)	
C72	1-124-484-11	ELECT 220MF	20% 35V	<u>IC</u>			
C73	1-126-101-11	ELECT 100MF	20% 16V	IC53	8-749-931-22	IC SI-3122V	
C74	1-102-038-00	CERAMIC 0.001MF	500V	IC54	8-759-179-12	IC UPC7912H	
C75	1-102-038-00	CERAMIC 0.001MF	500V	<u>COIL</u>			
C76	1-102-038-00	CERAMIC 0.001MF	500V	L1	1-459-215-00	CORE COIL	
C77	1-102-038-00	CERAMIC 0.001MF	500V	L51	1-459-155-00	COIL (WITH CORE) 45UH	
C78	1-102-038-00	CERAMIC 0.001MF	500V	L52	1-459-155-00	COIL (WITH CORE) 45UH	
C79	1-102-038-00	CERAMIC 0.001MF	500V	L53	1-459-406-00	COIL (WITH CORE)	
C80	1-102-038-00	CERAMIC 0.001MF	500V	L54	1-459-406-00	COIL (WITH CORE)	
C81	1-102-038-00	CERAMIC 0.001MF	500V	L55	1-459-406-00	COIL (WITH CORE)	
C82	1-102-038-00	CERAMIC 0.001MF	500V	L56	1-459-406-00	COIL (WITH CORE)	
C83	1-102-038-00	CERAMIC 0.001MF	500V	L57	1-459-406-00	COIL (WITH CORE)	
C84	1-102-038-00	CERAMIC 0.001MF	500V	<u>NEON LAMP</u>			
C85	1-102-038-00	CERAMIC 0.001MF	500V	NL1	1-519-403-11	GAS DISCHARGE TUBE (SMALL TYPE)	
C88	1-124-120-11	ELECT 220MF	20% 16V				
C89	1-124-039-51	ELECT 10MF	20% 16V				
C90	1-124-360-00	ELECT 1000MF	20% 16V				
<u>DIODE</u>							
D1	8-719-503-06	DIODE S3WB60Z					
D2	8-719-302-11	DIODE RM2CSS					
D3	8-719-302-11	DIODE RM2CSS					


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Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
<u>TRANSISTOR</u>				<u>C BOARD, COMPLETE</u> *****			
Q1	8-729-904-97	TRANSISTOR 2SC3164B		1-526-866-11	SOCKET, CRT		
Q2	8-729-904-02	TRANSISTOR 2SC3164		1-556-880-51	LEAD ASSY, HIGH-VOLTAGE		
Q3	8-729-904-97	TRANSISTOR 2SC3164B		<u>CAPACITOR</u>			
Q4	8-729-904-02	TRANSISTOR 2SC3164		C1	1-161-959-00	CERAMIC 22PF	10% 500V
Q52	8-729-178-54	TRANSISTOR 2SC2785		C2	1-161-959-00	CERAMIC 22PF	10% 500V
Q55	8-729-313-82	TRANSISTOR 2SD1138		C3	1-161-959-00	CERAMIC 22PF	10% 500V
	*4-347-706-00	HEAT SINK (TR); Q55		C4	1-162-114-00	CERAMIC 0.0047MF	2KV
Q56	8-729-178-54	TRANSISTOR 2SC2785		C5	1-102-989-00	CERAMIC 68PF	5% 500V
Q57	8-729-178-54	TRANSISTOR 2SC2785		<u>CONNECTOR</u>			
<u>RESISTOR</u>				C6	1-560-435-00	HORIZONTAL PIN ASSY 2P	
R1	Δ 1-202-845-51	SOLID 390K 10% 1/2W		<u>NEON LAMP</u>			
R2	1-215-904-11	METAL OXIDE 100K 5% 2W F		NL1	1-519-276-00	LAMP, NEON	
R3	1-215-904-11	METAL OXIDE 100K 5% 2W F		NL2	1-519-368-21	LAMP, NEON	
R4	1-217-290-11	WIREWOUND 2.2 10% 5W F		NL3	1-519-276-00	LAMP, NEON	
R5	1-207-451-00	WIREWOUND 0.1 10% 1/2W		NL4	1-519-368-21	LAMP, NEON	
R6	1-202-842-11	SOLID 220K 10% 1/2W		NL5	1-519-276-00	LAMP, NEON	
R7	1-202-846-00	SOLID 470K 10% 1/2W		NL6	1-519-368-21	LAMP, NEON	
R8	1-216-469-11	METAL OXIDE 12 5% 3W F		<u>RESISTOR</u>			
R9	1-216-469-11	METAL OXIDE 12 5% 3W F		R1	1-202-337-37	SOLID 33 10% 1/4W	
R10	1-207-451-00	WIREWOUND 0.1 10% 1/2W		R2	1-202-337-37	SOLID 33 10% 1/4W	
R11	1-202-842-11	SOLID 220K 10% 1/2W		R3	1-202-337-37	SOLID 33 10% 1/4W	
R13	1-216-397-11	METAL OXIDE 4.7 5% 3W F		R4	1-202-337-37	SOLID 33 10% 1/4W	
R14	1-216-397-11	METAL OXIDE 4.7 5% 3W F		R5	1-202-337-37	SOLID 33 10% 1/4W	
R15	1-202-846-00	SOLID 470K 10% 1/2W		R6	1-202-337-37	SOLID 33 10% 1/4W	
R53	1-249-405-11	CARBON 100 5% 1/4W F		R7	1-202-371-37	SOLID 330 10% 1/4W	
R54	1-249-405-11	CARBON 100 5% 1/4W F		R8	1-202-371-37	SOLID 330 10% 1/4W	
R55	1-217-245-11	WIREWOUND 0.47 10% 3W F		R9	1-202-371-37	SOLID 330 10% 1/4W	
R56	1-247-713-11	CARBON 1K 5% 1/4W		R11	1-202-838-00	SOLID 100K 10% 1/2W	
R61	1-249-448-11	CARBON 1.2 5% 1/4W F		<u>SPARK GAP</u>			
R62	1-247-713-11	CARBON 1K 5% 1/4W		SG1	1-519-063-XX	DISCHARGING GAP	
R64	1-249-469-11	CARBON 100K 5% 1/4W		*****			
R65	1-249-462-11	CARBON 22K 5% 1/4W		*A-1345-676-A	D BOARD, COMPLETE (GDM-1601 ONLY)		
R66	1-247-713-11	CARBON 1K 5% 1/4W			*****		
R68	1-249-448-11	CARBON 1.2 5% 1/4W F		*A-1345-722-A	D BOARD, COMPLETE (GDM-1602 ONLY)		
R70	1-244-913-51	CARBON 47K 5% 1/2W			*****		
<u>RELAY</u>				*1-508-784-00	1P PLUG		
RY51	Δ 1-515-559-11	RELAY, POWER		*1-561-724-00	SOCKET, CONNECTOR 2P		
RY52	Δ 1-515-559-11	RELAY, POWER		*4-381-995-01	SPRING (E)		
<u>TRANSFORMER</u>				<u>CAPACITOR</u>			
T1	Δ 1-421-662-11	LFT		C101	1-124-791-11	ELECT 1MF	20% 50V
T2	Δ 1-421-662-11	LFT		C102	1-130-471-00	MYLAR 0.001MF	5% 50V
T3	Δ 1-447-981-12	TRANSFORMER, POWER		C103	1-124-798-11	ELECT 1MF	20% 160V
T4	Δ 1-421-890-11	P.R.T		C104	1-124-046-00	ELECT 10MF	160V
T5	Δ 1-421-892-12	PIT		C105	1-102-233-00	CERAMIC 33PF	10% 500V
T6	Δ 1-421-890-11	P.R.T		C106	1-136-108-00	FILM 0.43MF	5% 200V
T7	Δ 1-421-893-12	PIT		C107	1-126-104-11	ELECT 470MF	20% 35V
<u>THERMISTOR</u>				C108	1-126-104-11	ELECT 470MF	20% 35V
TH1	Δ 1-800-416-11	THERMISTOR		C109	1-136-108-00	FILM 0.43MF	5% 200V
THP1	Δ 1-800-686-32	THERMISTOR (POSITIVE)		C110	1-130-475-00	MYLAR 0.0022MF	5% 50V
THP2	Δ 1-806-387-11	THERMISTOR (POSITIVE)					

The components identified by  in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.


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
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Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
C112	1-124-284-00	ELECT	10MF 20% 16V	C402	1-126-101-11	ELECT 100MF 20% 16V	
C201	1-123-875-11	ELECT	10MF 20% 50V				
C202	1-136-165-00	FILM	0.1MF 5% 50V				
C203	1-124-477-11	ELECT	47MF 20% 16V				
C204	1-126-101-11	ELECT	100MF 20% 16V				
						CONNECTOR	
C205	1-130-473-00	MYLAR	0.0015MF 5% 50V	D1	*1-566-058-11	PIN, CONNECTOR 6P	
C206	1-124-360-00	ELECT	1000MF 20% 16V	D2	*1-566-054-11	PIN, CONNECTOR 2P	
C207	1-130-479-00	MYLAR	0.0047MF 5% 50V	D3	*1-566-058-11	PIN, CONNECTOR 6P	
C208	1-124-284-00	ELECT	10MF 20% 16V	D4	*1-566-056-11	PIN, CONNECTOR 4P	
C209	1-124-499-11	ELECT	1MF 20% 50V	D5	*1-566-056-11	PIN, CONNECTOR 4P	
C210	1-123-875-11	ELECT	10MF 20% 50V	D7	*1-566-056-11	PIN, CONNECTOR 4P	
C211	1-102-961-00	CERAMIC	27PF 5% 50V	D8	*1-566-055-11	PIN, CONNECTOR 3P	
C212	1-106-383-00	MYLAR	0.047MF 10% 200V	D9	*1-508-784-00	1P PLUG	
C213	1-101-810-00	CERAMIC	100PF 5% 500V	D10	*1-566-055-11	PIN, CONNECTOR 3P	
C214	1-123-947-00	ELECT	10MF 20% 250V	D11	*1-508-784-00	1P PLUG	
C215	1-123-947-00	ELECT	10MF 20% 250V	DY1	*1-508-767-00	5P PLUG	
C216	1-106-359-00	MYLAR	0.0047MF 10% 200V	DY2	*1-508-767-00	5P PLUG	
C217	1-106-367-00	MYLAR	0.01MF 10% 200V	DY3	*1-508-767-00	5P PLUG	
C218	1-106-367-00	MYLAR	0.01MF 10% 100V	JS1	*1-556-106-00	CONNECTOR, MINIATURE 1P	
C219	1-136-121-00	FILM	0.27MF 5% 400V	JS2	*1-556-106-00	CONNECTOR, MINIATURE 1P	
C220	1-136-103-00	FILM	0.1MF 5% 200V			DIODE	
C221	1-130-473-00	MYLAR	0.0015MF 5% 50V	D101	8-719-109-85	DIODE RD5.1ES-82	
C222	1-130-473-00	MYLAR	0.0015MF 5% 50V	D102	8-719-911-19	DIODE 1SS119	
C223	1-136-153-00	FILM	0.01MF 5% 50V	D103	8-719-911-19	DIODE 1SS119	
C224 	1-130-908-11	FILM	0.0039MF 3% 1.6KV	D104	8-719-911-19	DIODE 1SS119	
				D105	8-719-200-02	DIODE 10E2	
C225	1-161-753-00	CERAMIC	470PF 10% 3KV				
C226	1-106-367-00	MYLAR	0.01MF 10% 100V	D106	8-719-911-19	DIODE 1SS119	
C227	1-123-267-00	ELECT	2.2MF 20% 160V	D201	8-719-109-81	DIODE RD4.7ES-82	
C228	1-124-046-00	ELECT	10MF 160V	D202	8-719-901-83	DIODE 1SS83	
C229	1-126-101-11	ELECT	100MF 20% 16V	D203	8-719-911-19	DIODE 1SS119	
				D204	8-719-911-19	DIODE 1SS119	
C230	1-126-101-11	ELECT	100MF 20% 16V				
C231	1-136-165-00	FILM	0.1MF 5% 50V	D205	8-719-911-19	DIODE 1SS119	
C233	1-124-284-00	ELECT	10MF 20% 16V	D206	8-719-911-19	DIODE 1SS119	
C301	1-124-908-11	ELECT	22MF 20% 50V	D207	8-719-200-02	DIODE 10E2	
C302	1-123-875-11	ELECT	10MF 20% 50V	D208	8-719-918-84	DIODE V19EF1	
				D209	8-719-200-02	DIODE 10E2	
C303	1-123-875-11	ELECT	10MF 20% 50V				
C304	1-123-875-11	ELECT	10MF 20% 50V	D210	8-719-302-83	DIODE CTU-G3DR	
C305	1-124-925-11	ELECT	2.2MF 20% 50V		*4-381-904-01	SPRING (C); D210	
C306	1-126-101-11	ELECT	100MF 20% 16V		*4-381-908-01	INSULATOR (B); D210	
C307	1-136-161-00	FILM	0.047MF 5% 50V	D211	8-719-918-84	DIODE V19EF1	
				D212	8-719-918-84	DIODE V19EF1	
C308	1-136-161-00	FILM	0.047MF 5% 50V				
C309	1-130-471-00	MYLAR	0.001MF 5% 50V	D213	8-719-918-84	DIODE V19EF1	
C310 	1-136-069-11	FILM	0.0044MF 3% 2KV	D214	8-719-918-84	DIODE V19EF1	
C311	1-126-101-11	ELECT	100MF 20% 16V	D215	8-719-911-19	DIODE 1SS119	
C312	1-130-475-00	MYLAR	0.0022MF 5% 50V	D216	8-719-911-19	DIODE 1SS119	
				D301	8-759-157-40	IC UPC574J	
C313	1-136-161-00	FILM	0.047MF 5% 50V				
C314	1-129-718-00	FILM	0.022MF 10% 630V	 D302 		IC	
C315	1-123-024-00	ELECT	33MF 160V	D303	8-719-911-19	DIODE 1SS119	
C316	1-106-367-00	MYLAR	0.01MF 10% 100V	D304	8-719-911-19	DIODE 1SS119	
C317	1-136-115-00	FILM	0.56MF 5% 200V	D305	8-719-109-75	DIODE RD4.3ES-82	
				D306	8-719-200-02	DIODE 10E2	
C318	1-126-105-11	ELECT	1000MF 20% 35V				
C319	1-126-105-11	ELECT	1000MF 20% 35V	D307	8-719-918-79	DIODE V19GF2	
C320	1-126-103-11	ELECT	470MF 20% 16V	D308	8-719-911-19	DIODE 1SS119	
C321	1-124-046-00	ELECT	10MF 20% 160V	D309	8-719-928-08	DIODE ERD28-08S	
C322	1-124-798-11	ELECT	1MF 20% 160V	D310	8-719-933-13	DIODE ERC35-02	
				D311	8-719-933-13	DIODE ERC35-02	
C323	1-126-101-11	ELECT	100MF 20% 16V				
C324	1-123-875-11	ELECT	10MF 20% 50V	D312	8-719-921-53	DIODE RGP15G	
C325	1-123-875-11	ELECT	10MF 20% 50V	D313	8-719-921-53	DIODE RGP15G	
C326	1-102-980-00	CERAMIC	270PF 5% 50V	D314	8-759-157-40	IC UPC574J	
C327	1-124-925-11	ELECT	2.2MF 20% 50V	D315	8-759-157-40	IC UPC574J	
				D316	8-759-157-40	IC UPC574J	
C328	1-130-471-00	MYLAR	0.001MF 5% 50V				
C329	1-102-980-00	CERAMIC	270PF 5% 50V	D317	8-719-918-84	DIODE V19EF1	
C331	1-123-875-11	ELECT	10MF 20% 50V	D318	8-719-200-02	DIODE 10E2	
C332	1-123-928-00	ELECT	0.47MF 20% 160V	D319	8-719-911-19	DIODE 1SS119	
C401	1-126-101-11	ELECT	100MF 20% 16V				













Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
<u>IC</u>				<u>RESISTOR</u>			
IC201	8-759-145-58	IC UPC4558C		Q307	8-729-900-85	TRANSISTOR DTC144WS	
<u>COIL</u>				Q308	8-729-900-83	TRANSISTOR DTC124XS	
L201	1-459-454-00	COIL, FERRITE CHOKE		Q309	8-729-900-85	TRANSISTOR DTC144WS	
L202	1-410-678-31	INDUCTOR 220UH		Q310	8-729-178-54	TRANSISTOR 2SC2785	
L203	1-459-689-12	COIL, HORIZONTAL LINEARITY		Q311	8-729-178-54	TRANSISTOR 2SC2785	
L204	1-424-017-11	HCL		<u>RESISTOR</u>			
L301	1-459-677-11	COIL, CHOKE (U-18 TYPE) 850UH		R101	1-249-417-11	CARBON 1K 5% 1/4W	
L302	1-421-329-00	COIL, CHOKE		R102	1-249-411-11	CARBON 330 5% 1/4W	
L401	1-421-421-00	COIL, CHOKE 100UH		R103	1-249-425-11	CARBON 4.7K 5% 1/4W	
L402	1-421-421-00	COIL, CHOKE 100UH		R104	1-249-433-11	CARBON 22K 5% 1/4W	
<u>IC LINK</u>				R105	1-249-432-11	CARBON 18K 5% 1/4W	
PS201	1-532-838-21	LINK, IC		R106	1-249-428-11	CARBON 8.2K 5% 1/4W	
PS301	1-532-839-11	LINK, IC		R107	1-249-429-11	CARBON 10K 5% 1/4W	
<u>TRANSISTOR</u>				R108	1-249-430-11	CARBON 12K 5% 1/4W	
Q101	8-729-178-54	TRANSISTOR 2SC2785		R109	1-249-426-11	CARBON 5.6K 5% 1/4W	
Q102	8-729-117-54	TRANSISTOR 2SA1175		R110	1-215-877-11	METAL OXIDE 22K 5% 1W F	
Q103	8-729-697-92	TRANSISTOR 2SA979		R111	1-249-429-11	CARBON 10K 5% 1/4W	
Q104	8-729-336-11	TRANSISTOR 2SB861-02		R112	1-249-425-11	CARBON 4.7K 5% 1/4W	
Q105	8-729-800-32	TRANSISTOR 2SC2362K		R113	1-247-887-00	CARBON 220K 5% 1/4W	
Q106	8-729-309-08	TRANSISTOR 2SC1890A		R114	1-215-491-00	CARBON 820K 5% 1/4W	
Q107	8-729-309-36	TRANSISTOR 2SA893A		R115	1-249-431-11	CARBON 15K 5% 1/4W	
Q108	8-729-300-70	TRANSISTOR 2SD1137		R116	1-215-867-00	METAL OXIDE 470 5% 1W F	
*4-381-904-01	SPRING (C); Q108			R117	1-249-417-11	CARBON 1K 5% 1/4W	
*4-381-907-01	INSULATOR (A); Q108			R118	1-249-419-11	CARBON 1.5K 5% 1/4W	
Q109	8-729-805-98	TRANSISTOR 2SB1037		R119	1-249-421-11	CARBON 2.2K 5% 1/4W	
*4-381-904-01	SPRING (C); Q109			R120	1-249-421-11	CARBON 2.2K 5% 1/4W	
*4-381-907-01	INSULATOR (A); Q109			R121	1-249-417-11	CARBON 1K 5% 1/4W	
Q201	8-729-178-54	TRANSISTOR 2SC2785		R122	1-215-875-11	METAL OXIDE 10K 5% 1W F	
Q202	8-729-178-54	TRANSISTOR 2SC2785		R123	1-249-406-11	CARBON 120 5% 1/4W	
Q203	8-729-178-54	TRANSISTOR 2SC2785		R125	1-249-377-11	CARBON 0.47 5% 1/4W F	
Q204	8-729-117-54	TRANSISTOR 2SA1175		R126	1-249-377-11	CARBON 0.47 5% 1/4W F	
Q205	8-729-178-54	TRANSISTOR 2SC2785		R127	1-215-866-11	METAL OXIDE 330 5% 1W F	
Q206	8-729-117-54	TRANSISTOR 2SA1175		R128	1-216-350-11	METAL OXIDE 1.2 5% 1W F	
Q207	8-729-178-54	TRANSISTOR 2SC2785		R129	1-216-431-11	METAL OXIDE 560 5% 1W F	
Q208	8-729-178-54	TRANSISTOR 2SC2785		R130	1-215-429-00	METAL 2.2K 1% 1/6W	
Q209	8-729-178-54	TRANSISTOR 2SC2785		R131	1-249-384-11	CARBON 1.8 5% 1/4W F	
Q210	8-729-103-08	TRANSISTOR 2SC3209		R132	1-249-384-11	CARBON 1.8 5% 1/4W F	
Q211	8-729-103-08	TRANSISTOR 2SC3209		R133	1-249-433-11	CARBON 22K 5% 1/4W	
Q212	8-729-313-82	TRANSISTOR 2SD1138		R134	1-249-424-11	CARBON 3.9K 5% 1/4W	
*4-381-904-01	SPRING (C); Q212			R135	1-249-426-11	CARBON 5.6K 5% 1/4W	
*4-381-907-01	INSULATOR (A); Q212			R136	1-249-417-11	CARBON 1K 5% 1/4W	
Q213	8-729-103-08	TRANSISTOR 2SC3209		R137	1-249-405-11	CARBON 100 5% 1/4W	
Q214	8-729-177-43	TRANSISTOR 2SD774		R138	1-247-725-11	CARBON 10K 5% 1/4W	
Q215	8-729-805-07	TRANSISTOR 2SD1887-CA		R201	1-249-438-11	CARBON 56K 5% 1/4W	
*4-381-904-01	SPRING (C); Q215			R202	1-249-421-11	CARBON 2.2K 5% 1/4W	
Q216	8-729-804-17	TRANSISTOR 2SD1666-R		R203	1-249-421-11	CARBON 2.2K 5% 1/4W	
Q217	8-729-804-67	TRANSISTOR 2SB1133-R		R204	1-249-421-11	CARBON 2.2K 5% 1/4W	
Q301	8-729-177-43	TRANSISTOR 2SD774		R205	1-249-429-11	CARBON 10K 5% 1/4W	
Q302	8-729-178-61	TRANSISTOR 2SC2786		R206	1-249-438-11	CARBON 56K 5% 1/4W	
Q303	8-729-177-43	TRANSISTOR 2SD774		R207	1-249-429-11	CARBON 10K 5% 1/4W	
Q304	8-729-805-97	TRANSISTOR 2SD1880		R208	1-249-436-11	CARBON 39K 5% 1/4W	
*4-381-904-01	SPRING (C); Q304			R209	1-249-433-11	CARBON 22K 5% 1/4W	
Q305	8-729-306-92	TRANSISTOR 2SD669A		R210	1-249-434-11	CARBON 27K 5% 1/4W	
Q306	8-729-902-00	TRANSISTOR 2SC3163		R211	1-249-434-11	CARBON 27K 5% 1/4W	
*4-381-904-01	SPRING (C); Q306			R212	1-249-438-11	CARBON 56K 5% 1/4W	
*4-381-907-01	INSULATOR (A); Q306			R213	1-249-435-11	CARBON 33K 5% 1/4W	
				R214	1-215-431-00	METAL 2.7K 1% 1/6W	
				R215	1-249-416-11	CARBON 820 5% 1/4W	
				R216	1-216-353-00	METAL OXIDE 2.2 5% 1W F	
				R217	1-249-449-11	CARBON 1.5 5% 1/4W F	
				R218	1-215-455-00	METAL 27K 1% 1/6W	
				R219	1-215-445-00	METAL 10K 1% 1/6W	
				R220	1-249-425-11	CARBON 4.7K 5% 1/4W	

• The components identified by  in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

Les composants identifiés par une trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifique.

The components identified by shading and mark  are critical for safety. Replace only with part number specified.

D

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
R221	1-249-417-11	CARBON 1K 5% 1/4W		R313	1-215-445-00	METAL 10K 1% 1/6W	
R222	1-249-425-11	CARBON 4.7K 5% 1/4W		R314	1-215-445-00	METAL 10K 1% 1/6W	
R223	1-249-417-11	CARBON 1K 5% 1/4W		R315	1-212-857-00	FUSIBLE 10 5% 1/4W F	
R224	1-249-431-11	CARBON 15K 5% 1/4W		R316	1-212-857-00	FUSIBLE 10 5% 1/4W F	
R225	1-249-409-11	CARBON 220 5% 1/4W		R317	1-249-421-11	CARBON 2.2K 5% 1/4W	
R226	1-249-421-11	CARBON 2.2K 5% 1/4W		R318	1-249-433-11	CARBON 22K 5% 1/4W	
R227	1-249-425-11	CARBON 4.7K 5% 1/4W		R319	1-249-417-11	CARBON 1K 5% 1/4W	
R228	1-249-405-11	CARBON 100 5% 1/4W		R320 	1-216-380-51	METAL OXIDE 8.2 5% 2W F	
R229	1-215-437-00	METAL 4.7K 1% 1/6W		R321	1-249-417-11	CARBON 1K 5% 1/4W	
R230	1-249-429-11	CARBON 10K 5% 1/4W		R322	1-249-397-11	CARBON 22 5% 1/4W F	
R231	1-249-429-11	CARBON 10K 5% 1/4W		R323	1-215-860-11	METAL OXIDE 33 5% 1W F	
R232	1-249-433-11	CARBON 22K 5% 1/4W		R325	1-216-469-11	METAL OXIDE 12 5% 3W F	
R233	1-249-424-11	CARBON 3.9K 5% 1/4W		R326	1-216-353-00	METAL OXIDE 2.2 5% 1W F	
R234	1-249-421-11	CARBON 2.2K 5% 1/4W		R327	1-216-353-00	METAL OXIDE 2.2 5% 1W F	
R235	1-247-887-00	CARBON 220K 5% 1/4W		R328	1-216-367-11	METAL OXIDE 0.68 5% 2W F	
R236	1-249-417-11	CARBON 1K 5% 1/4W		R329	1-212-936-00	FUSIBLE 1.2 5% 1/2W F	
R237	1-249-429-11	CARBON 10K 5% 1/4W		R330	1-215-873-00	METAL OXIDE 4.7K 5% 1W F	
R238	1-249-421-11	CARBON 2.2K 5% 1/4W		R331	1-247-715-11	CARBON 1.5K 5% 1/4W F	
R239	1-249-417-11	CARBON 1K 5% 1/4W		R332	1-249-437-11	CARBON 47K 5% 1/4W	
R240	1-215-451-00	METAL 18K 1% 1/6W		R333	1-215-870-11	METAL OXIDE 1.5K 5% 1W F	
R241	1-249-438-11	CARBON 56K 5% 1/4W		R334	1-249-429-11	CARBON 10K 5% 1/4W	
R242	1-215-451-00	METAL 18K 1% 1/6W		R335	1-215-446-00	METAL 11K 1% 1/6W	
R243	1-249-413-11	CARBON 470 5% 1/4W		R336	1-249-432-11	CARBON 18K 5% 1/4W	
R244	1-249-417-11	CARBON 1K 5% 1/4W		R337	1-249-429-11	CARBON 10K 5% 1/4W	
R245	1-249-417-11	CARBON 1K 5% 1/4W		R338	1-249-407-11	CARBON 150 5% 1/4W	
R246	1-215-459-00	METAL 39K 1% 1/6W		R339	1-249-425-11	CARBON 4.7K 5% 1/4W	
R247	1-215-461-00	METAL 47K 1% 1/6W		R340	1-249-429-11	CARBON 10K 5% 1/4W	
R248	1-215-876-00	METAL OXIDE 15K 5% 1W F		R341	1-249-417-11	CARBON 1K 5% 1/4W	
R249	1-215-875-11	METAL OXIDE 10K 5% 1W F		R342	1-249-425-11	CARBON 4.7K 5% 1/4W	
R250	1-247-885-00	CARBON 180K 5% 1/4W		R344	1-249-431-11	CARBON 15K 5% 1/4W	
R251	1-249-421-11	CARBON 2.2K 5% 1/4W		 R345 		METAL 1/6W	
R252	1-247-903-00	CARBON 1M 5% 1/4W		R346	1-249-393-11	CARBON 10 5% 1/4W F	
R253	1-249-435-11	CARBON 33K 5% 1/4W		R347	1-249-407-11	CARBON 150 5% 1/4W	
R254	1-249-420-11	CARBON 1.8K 5% 1/4W		VARIABLE RESISTOR			
R255	1-249-413-11	CARBON 470 5% 1/4W F		RV101	1-224-250-XX	RES, ADJ, METAL GLAZE 2.2K	
R256	1-215-865-11	METAL OXIDE 220 5% 1W F		RV102	1-228-991-00	RES, ADJ, CARBON 2.2K	
R257	1-214-913-00	METAL 100K 1% 1/2W		RV103	1-230-627-11	RES, ADJ, CARBON 1K	
R258	1-249-407-11	CARBON 150 5% 1/4W		RV104	1-230-630-11	RES, ADJ, CARBON 10K	
R259	1-249-420-11	CARBON 1.8K 5% 1/4W		RV105	1-230-630-11	RES, ADJ, CARBON 10K	
R260	1-249-421-11	CARBON 2.2K 5% 1/4W		RV106	1-230-630-11	RES, ADJ, CARBON 10K	
R261	1-215-859-00	METAL OXIDE 22 5% 1W F		RV107	1-230-630-11	RES, ADJ, CARBON 10K	
R262 	1-216-393-51	METAL OXIDE 2.2 5% 3W F		RV108	1-230-630-11	RES, ADJ, CARBON 10K	
R263	1-249-419-11	CARBON 1.5K 5% 1/4W		RV201	1-230-630-11	RES, ADJ, CARBON 10K	
R264	1-249-389-11	CARBON 4.7 5% 1/4W F		RV202	1-230-630-11	RES, ADJ, CARBON 10K	
R265	1-249-382-11	CARBON 1.2 5% 1/4W F		RV203	1-230-630-11	RES, ADJ, CARBON 10K	
R266	1-249-382-11	CARBON 1.2 5% 1/4W F		RV204	1-224-249-XX	RES, ADJ, METAL GLAZE 1K	
R268	1-215-459-00	METAL 39K 1% 1/6W		RV205	1-224-251-XX	RES, ADJ, METAL GLAZE 4.7K	
R269	1-249-425-11	CARBON 4.7K 5% 1/4W		RV206	1-230-630-11	RES, ADJ, CARBON 10K	
R270	1-249-425-11	CARBON 4.7K 5% 1/4W		RV207	1-224-250-XX	RES, ADJ, METAL GLAZE 2.2K	
R271	1-249-413-11	CARBON 470 5% 1/4W F		RV208	1-237-346-11	RES, ADJ, CERAMIC CARBON 2K	
R272	1-215-415-00	METAL 560 1% 1/6W		RV301	1-230-841-11	RES, ADJ, METAL FILM 2K	
R274	1-247-706-11	CARBON 330 5% 1/4W		SPARK GAP			
R275	1-249-411-11	CARBON 330 5% 1/4W		SG201	1-519-063-XX	DISCHARGING GAP	
R301	1-215-919-11	METAL OXIDE 2.2K 5% 3W F		TRANSFORMER			
R302	1-216-438-11	METAL OXIDE 8.2K 5% 1W F		T101	1-421-602-11	TRANSFORMER, FERRITE (VPCT)	
R303	1-215-874-11	METAL OXIDE 6.8K 5% 1W F		T201	1-421-607-00	TRANSFORMER, FERRITE (DFT)	
R304	1-215-874-11	METAL OXIDE 6.8K 5% 1W F		T202	1-421-608-00	TRANSFORMER, FERRITE (CDT)	
R305	1-215-453-00	METAL 22K 1% 1/6W		T203 	1-439-349-11	TRANSFORMER, FERRITE (HOT)	
R306	1-249-417-11	CARBON 1K 5% 1/4W		T301	1-421-608-00	TRANSFORMER, FERRITE (CDT)	
R307 	1-215-436-31	METAL 4.3K 1% 1/6W					
R308 	1-215-436-31	METAL 4.3K 1% 1/6W					
R309 	1-215-436-31	METAL 4.3K 1% 1/6W					
R310 	1-215-436-31	METAL 4.3K 1% 1/6W					
R311 	1-215-453-31	METAL 22K 1% 1/6W					
 R312 		METAL 1/6W					

The components identified by shading and mark Δ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une trame et une marque Δ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

D

DA

DB

DC

Ref.No.	Part No.	Description	Remark
T302	1-421-608-00	TRANSFORMER, FERRITE (COT)	
T303	Δ 1-439-392-11	LOT	

Ref.No.	Part No.	Description	Remark
C4	1-124-236-00	ELECT 47MF	20% 16V
C5	1-136-165-00	FILM 0.1MF	5% 50V
C6	1-124-259-00	ELECT 4.7MF	20% 50V
C7	1-136-165-00	FILM 0.1MF	5% 50V

*1-619 555-21 DA BOARD

CAPACITOR

C1	1-102-942-00	CERAMIC	5PF	1PF	50V
C2	1-107-234-00	MICA	470PF	5%	50V
C3	1-102-973-00	CERAMIC	100PF	5%	50V
C4	1-130-473-00	MYLAR	0.0015MF	5%	50V
C5	1-123-611-00	ELECT	1MF	20%	50V
C6	1-130-479-00	MYLAR	0.0047MF	5%	50V
C7	1-136-570-11	FILM	0.0015MF	2%	50V
C8	1-124-257-00	ELECT	2.2MF	20%	50V
C9	1-123-611-00	ELECT	1MF	20%	50V
C10	1-123-611-00	ELECT	1MF	20%	50V
C11	1-136-165-00	FILM	0.1MF	5%	50V
C12	1-130-481-00	MYLAR	0.0068MF	5%	50V
C13	1-124-120-11	ELECT	220MF	20%	16V
C14	1-136-165-00	FILM	0.1MF	5%	50V
C15	1-136-165-00	FILM	0.1MF	5%	50V
C16	1-101-880-00	CERAMIC	47PF	5%	50V

DIODE

D1 8-719-110-31 DIODE RD12ES-B2

IC

IC1 8-759-802-70 IC LA7850

RESISTOR

R1	1-249-421-11	CARBON	2.2K	5%	1/4W
R2	1-249-430-11	CARBON	12K	5%	1/4W
R3	1-249-433-11	CARBON	22K	5%	1/4W
R4	1-215-453-00	METAL	22K	1%	1/6W
R5	1-249-433-11	CARBON	22K	5%	1/4W
R6	1-249-438-11	CARBON	56K	5%	1/4W
R7	1-249-417-11	CARBON	1K	5%	1/4W
R9	1-249-421-11	CARBON	2.2K	5%	1/4W
R10	1-215-477-00	METAL	220K	1%	1/6W
R11	1-249-440-11	CARBON	82K	5%	1/4W
R12	1-249-429-11	CARBON	10K	5%	1/4W
R13	1-249-430-11	CARBON	12K	5%	1/4W
R14	1-249-432-11	CARBON	18K	5%	1/4W
R15	1-249-419-11	CARBON	1.5K	5%	1/4W

CONNECTOR

W1 *1-564-350-00 PLUG (L TYPE) 15P

*1-619-529-21 DB BOARD

CAPACITOR

C1	1-124-236-00	ELECT	47MF	20%	16V
C2	1-136-165-00	FILM	0.1MF	5%	50V
C3	1-123-820-00	ELECT	33MF	20%	16V

DIODE

D1	8-719-109-81	DIODE RD4.7ES-B2
D2	8-719-911-19	DIODE 1SS119
D3	8-719-911-19	DIODE 1SS119
D4	8-719-109-81	DIODE RD4.7ES-B2
D5	8-719-109-81	DIODE RD4.7ES-B2
D6	8-719-110-22	DIODE RD11ES-B2
D7	8-719-110-22	DIODE RD11ES-B2

IC

IC1	8-759-145-58	IC UPC4558C
IC2	8-759-145-58	IC UPC4558C

TRANSISTOR

Q1	8-729-178-54	TRANSISTOR 2SC2785
Q2	8-729-178-54	TRANSISTOR 2SC2785
Q3	8-729-178-54	TRANSISTOR 2SC2785
Q4	8-729-178-54	TRANSISTOR 2SC2785
Q5	8-729-178-54	TRANSISTOR 2SC2785

RESISTOR

R1	1-215-487-00	CARBON	560K	5%	1/4W
R2	1-249-429-11	CARBON	10K	5%	1/4W
R3	1-249-416-11	CARBON	820	5%	1/4W
R4	1-249-433-11	CARBON	22K	5%	1/4W
R5	1-249-436-11	CARBON	39K	5%	1/4W
R6	1-249-434-11	CARBON	27K	5%	1/4W
R7	1-249-426-11	CARBON	5.6K	5%	1/4W
R8	1-215-489-00	CARBON	680K	5%	1/4W
R9	1-249-427-11	CARBON	6.8K	5%	1/4W
R10	1-249-416-11	CARBON	820	5%	1/4W
R11	1-249-424-11	CARBON	3.9K	5%	1/4W
R12	1-249-440-11	CARBON	82K	5%	1/4W
R13	1-247-887-00	CARBON	220K	5%	1/4W
R14	1-249-441-11	CARBON	100K	5%	1/4W
R15	1-249-433-11	CARBON	22K	5%	1/4W
R16	1-249-429-11	CARBON	10K	5%	1/4W
R17	1-249-425-11	CARBON	4.7K	5%	1/4W
R18	1-249-422-11	CARBON	2.7K	5%	1/4W
R19	1-249-425-11	CARBON	4.7K	5%	1/4W
R20	1-249-436-11	CARBON	39K	5%	1/4W
R21	1-249-433-11	CARBON	22K	5%	1/4W
R22	1-249-401-11	CARBON	47	5%	1/4W
R23	1-249-401-11	CARBON	47	5%	1/4W
R24	1-249-433-11	CARBON	22K	5%	1/4W

CONNECTOR

W1	*1-564-347-00	PLUG (L TYPE) 3P
W2	*1-564-348-00	PLUG (L TYPE) 5P

*A-1340-848-A DC BOARD, COMPLETE

*1-564-431-11 POST, CONNECTOR 3P

Dc

Dd

Ref.No.	Part No.	Description	Remark
<u>CAPACITOR</u>			
C1	1-163-125-00	CERAMIC CHIP 220PF	5% 50V
C2	1-163-125-00	CERAMIC CHIP 220PF	5% 50V
C3	1-163-133-00	CERAMIC CHIP 470PF	5% 50V
C4	1-106-343-00	MYLAR 0.001MF	5% 50V
C5	1-163-129-00	CERAMIC CHIP 330PF	5% 50V
C6	1-106-343-00	MYLAR 0.001MF	5% 50V
C7	1-124-236-00	ELECT 47MF	20% 16V
C8	1-124-236-00	ELECT 47MF	20% 16V
C9	1-124-236-00	ELECT 47MF	20% 16V
C10	1-124-236-00	ELECT 47MF	20% 16V
C11	1-163-111-00	CERAMIC CHIP 56PF	5% 50V
<u>DIODE</u>			
D1	8-719-101-23	DIODE 1SS123	
D2	8-719-101-23	DIODE 1SS123	
D3	8-719-101-23	DIODE 1SS123	
D4	8-719-101-23	DIODE 1SS123	
<u>IC</u>			
IC1	8-759-100-96	IC UPC4558G2	
IC2	8-759-103-09	IC UPC4082G2	
<u>TRANSISTOR</u>			
Q1	8-729-100-66	TRANSISTOR 2SC1623	
Q2	8-729-162-13	TRANSISTOR 2SC1621	
Q3	8-729-100-66	TRANSISTOR 2SC1623	
Q4	8-729-100-66	TRANSISTOR 2SC1623	
Q5	8-729-116-04	TRANSISTOR 2SK160-K4	
<u>RESISTOR</u>			
R1	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R2	1-216-069-00	METAL GLAZE 6.8K 5%	1/10W
R3	1-216-091-00	METAL GLAZE 56K 5%	1/10W
R4	1-216-093-00	METAL GLAZE 68K 5%	1/10W
R5	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R6	1-216-069-00	METAL GLAZE 6.8K 5%	1/10W
R7	1-216-081-00	METAL GLAZE 22K 5%	1/10W
R8	1-216-097-00	METAL GLAZE 100K 5%	1/10W
R9	1-216-097-00	METAL GLAZE 100K 5%	1/10W
R10	1-216-097-00	METAL GLAZE 100K 5%	1/10W
R11	1-216-081-00	METAL GLAZE 22K 5%	1/10W
R13	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W
R14	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R15	1-216-089-00	METAL GLAZE 47K 5%	1/10W
R16	1-216-049-00	METAL GLAZE 1K 5%	1/10W
R17	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W
R18	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W
R19	1-216-077-00	METAL GLAZE 15K 5%	1/10W
R20	1-216-055-00	METAL GLAZE 1.8K 5%	1/10W
R21	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R22	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R23	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W
R24	1-216-678-11	METAL CHIP 13K 0.50%	1/10W
R25	1-216-682-11	METAL CHIP 20K 0.50%	1/10W
R26	1-216-077-00	METAL GLAZE 15K 5%	1/10W
R27	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R28	1-216-091-00	METAL GLAZE 56K 5%	1/10W
R29	1-216-091-00	METAL GLAZE 56K 5%	1/10W

Ref.No.	Part No.	Description	Remark
<u>CONNECTOR</u>			
W1	*1-506-602-11	PLUG, L TYPE (2.0MM PITCH) 5P	
W2	*1-506-603-11	PLUG, L TYPE (2.0MM PITCH) 10P	

	*1-619-557-21	DD BOARD	*****
<u>CAPACITOR</u>			
C1	1-124-462-00	ELECT 10MF	20% 16V
C2	1-136-171-00	FILM 0.33MF	5% 50V
C3	1-102-824-00	CERAMIC 470PF	5% 50V
C4	1-130-471-00	MYLAR 0.001MF	10% 50V
C6	1-130-471-00	MYLAR 0.001MF	10% 50V
C7	1-123-817-11	ELECT 22MF	20% 35V
<u>DIODE</u>			
D1	8-719-911-19	DIODE 1SS119	
D2	8-719-911-19	DIODE 1SS119	
D3	8-719-911-19	DIODE 1SS119	
D4	8-719-911-19	DIODE 1SS119	
D5	8-719-109-97	DIODE RD6.8ES-82	
D6	8-719-911-19	DIODE 1SS119	
<u>IC</u>			
IC1	8-759-729-03	IC NJM2903D	
IC2	8-759-729-03	IC NJM2903D	
<u>TRANSISTOR</u>			
Q1	8-729-178-61	TRANSISTOR 2SC2786	
<u>RESISTOR</u>			
R1	1-249-437-11	CARBON 47K 5%	1/4W
R2	1-249-432-11	CARBON 18K 5%	1/4W
R3	1-247-887-00	CARBON 220K 5%	1/4W
R4	1-247-887-00	CARBON 220K 5%	1/4W
R5	1-249-432-11	CARBON 18K 5%	1/4W
R6	1-249-417-11	CARBON 1K 5%	1/4W
R7	1-247-895-00	CARBON 470K 5%	1/4W
R9	1-249-429-11	CARBON 10K 5%	1/4W
R10	1-249-425-11	CARBON 4.7K 5%	1/4W
R11	1-249-405-11	CARBON 100 5%	1/4W
R12	1-247-887-00	CARBON 220K 5%	1/4W
R14	1-249-421-11	CARBON 2.2K 5%	1/4W
R15	1-249-421-11	CARBON 2.2K 5%	1/4W
R16	1-249-417-11	CARBON 1K 5%	1/4W
R17	1-249-417-11	CARBON 1K 5%	1/4W
R18	1-249-441-11	CARBON 100K 5%	1/4W
R19	1-249-441-11	CARBON 100K 5%	1/4W
<u>CONNECTOR</u>			
W1	*1-564-349-00	PLUG (L TYPE) 7P	
W2	*1-564-347-00	PLUG (L TYPE) 3P	
W3	*1-564-348-00	PLUG (L TYPE) 5P	

The components identified by shading and mark **Δ** are critical for safety.
Replace only with part number specified.

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Ne les remplacer que par une pièce portant le numéro spécifié.

DE

K

J

H

Ref.No.	Part No.	Description	Remark
	*1-619-558-21	DE BOARD *****	
	*1-564-348-00	PLUG (L TYPE) 5P	
<u>CAPACITOR</u>			
C1	1-124-261-00	ELECT 10MF 20% 50V	
C2	1-124-261-00	ELECT 10MF 20% 50V	
C3	1-101-884-00	CERAMIC 56PF 5% 50V	
C4	1-130-475-00	MYLAR 0.0022MF 5% 50V	
C5	1-124-499-11	ELECT 1MF 20% 50V	
C6	1-124-261-00	ELECT 10MF 20% 50V	
C7	1-130-483-00	MYLAR 0.01MF 5% 50V	
<u>DIODE</u>			
D1	8-719-911-19	DIODE 1SS119	
D2	8-719-911-19	DIODE 1SS119	
D3	8-719-911-19	DIODE 1SS119	
D4	8-719-911-19	DIODE 1SS119	
<u>IC</u>			
IC1	8-759-145-58	IC UPC4558C	
<u>RESISTOR</u>			
R1	1-249-429-11	CARBON 10K 5% 1/4W	
R2	1-249-433-11	CARBON 22K 5% 1/4W	
R3	1-247-895-00	CARBON 470K 5% 1/4W	
R4	1-249-430-11	CARBON 12K 5% 1/4W	
R6	1-249-433-11	CARBON 22K 5% 1/4W	
R7	1-249-441-11	CARBON 100K 5% 1/4W	
R8	1-247-887-00	CARBON 220K 5% 1/4W	
R9	1-249-433-11	CARBON 22K 5% 1/4W	
R10	1-249-433-11	CARBON 22K 5% 1/4W	
R11	1-249-433-11	CARBON 22K 5% 1/4W	
R12	1-249-429-11	CARBON 10K 5% 1/4W	


	*1-619-564-21	K BOARD *****	
<u>CAPACITOR</u>			
C1	Δ 1-453-104-11	CR PACK, HIGH-VOLTAGE	
C2	Δ 1-136-106-11	FILM 0.36MF 5% 200V	
C3	Δ 1-162-558-51	CERAMIC 100PF 10% 2KV	
<u>DIODE</u>			
D1	8-719-911-19	DIODE 1SS119	
<u>CONNECTOR</u>			
K1	1-508-768-00	6P PLUG	
K2	*1-508-784-00	1P PLUG	
K4	*1-508-784-00	1P PLUG	


Ref.No.	Part No.	Description	Remark
	*1-619-606-11	J BOARD *****	
<u>DIODE</u>			
D1	8-719-102-34	DIODE SG232D	

	*1-619-607-11	H BOARD *****	
<u>CONNECTOR</u>			
H1	*1-566-043-11	PIN, CONNECTOR 4P	
H2	*1-566-043-11	PIN, CONNECTOR 4P	
H3	*1-566-041-11	PIN, CONNECTOR 2P	
H4	*1-566-041-11	PIN, CONNECTOR 2P	
<u>RESISTOR</u>			
R1	1-249-421-11	CARBON 2.2K 5% 1/4W	
R4	1-249-411-11	CARBON 330 5% 1/4W	
R5	1-249-441-11	CARBON 100K 5% 1/4W	
R6	1-249-441-11	CARBON 100K 5% 1/4W	
R7	1-249-411-11	CARBON 330 5% 1/4W	
<u>VARIABLE RESISTOR</u>			
RV1	1-228-595-00	RES, VAR, CARBON 10K	
RV2	1-228-595-00	RES, VAR, CARBON 10K	
RV3	1-228-595-00	RES, VAR, CARBON 10K	
RV4	1-228-596-00	RES, VAR, CARBON 5K	




<u>MISCELLANEOUS</u>			

	Δ 1-230-127-21	RESISTOR ASSY, HIGH-VOLTAGE	
	Δ 1-237-344-11	RESISTOR ASSY, HIGH-VOLTAGE	
	Δ 1-439-393-21	TRANSFORMER ASSY, FLYBACK	
	1-452-032-00	MAGNET, DISK; 10MM ϕ	
	1-533-191-11	HOLDER, FUSE	
	*1-557-152-21	CABLE, PIN (GREEN CABLE)	
	*1-557-152-51	CABLE, PIN (RED CABLE)	
	*1-557-152-71	CABLE, PIN (BLUE CABLE)	
	1-562-576-11	ADAPTER, CONVERSION BNC PIN	
	*1-937-755-11	HARNESS (MAIN (D))	
CNP901	Δ 1-526-945-11	INLET, AC 3P	
F901	Δ 1-532-237-11	FUSE, TIME-LAG 3.15A/250V (EUROPE ONLY)	
	Δ 1-532-746-11	FUSE, GLASS TUBE 4A/125V (J,US,CND ONLY)	
L901	Δ 1-426-285-11	COIL, DEMAGNETIZATION	
S901	Δ 1-570-779-11	SWITCH, SEESAW (AC POWER)	
S902	Δ 1-554-913-11	SWITCH, SLIDE (VOLTAGE CHANGE)	
V901	Δ 8-738-551-92	PICTURE TUBE ASSEMBLY (A41JTG15X)	

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specified.

ACCESSORIES AND PACKING MATERIALS

<u>Part No.</u>	<u>Description</u>	<u>Remark</u>
*A-1499-505-A	CABLE ASSY (GDM-1602 ONLY)	
*A-1499-507-A	PACKAGE ASSY, SAFETY (GDM-1602 ONLY)	
*A-1499-604-A	SAFETY COVER ASSY	
*A-1499-628-A	PACKAGE ASSY, SAFETY (GDM-1601 ONLY)	
 1-532-237-11	FUSE, TIME-LAG 3.15A/250V (EUROPE ONLY)	
 1-532-746-11	FUSE, GLASS TUBE 4A/125V (J,US,CND ONLY)	
 1-534-827-14	CORD, POWER 10ft 7A/120V (J,US,CND ONLY)	
*4-309-537-00	BAG, PROTECTION	
*4-382-841-01	INDIVIDUAL CARTON (GDM-1601 ONLY)	
*4-382-862-01	CUSHION (UPPER) (ASSY)	
*4-382-863-01	CUSHION (LOWER) (ASSY)	
*4-382-898-01	INDIVIDUAL CARTON (GDM-1602 ONLY)	
4-482-319-01	MANUAL, INSTRUCTION	