

Trouble Repair

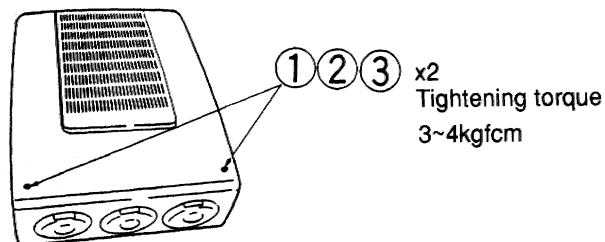
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DISASSEMBLY

METHOD OF REMOVING EACH PANEL

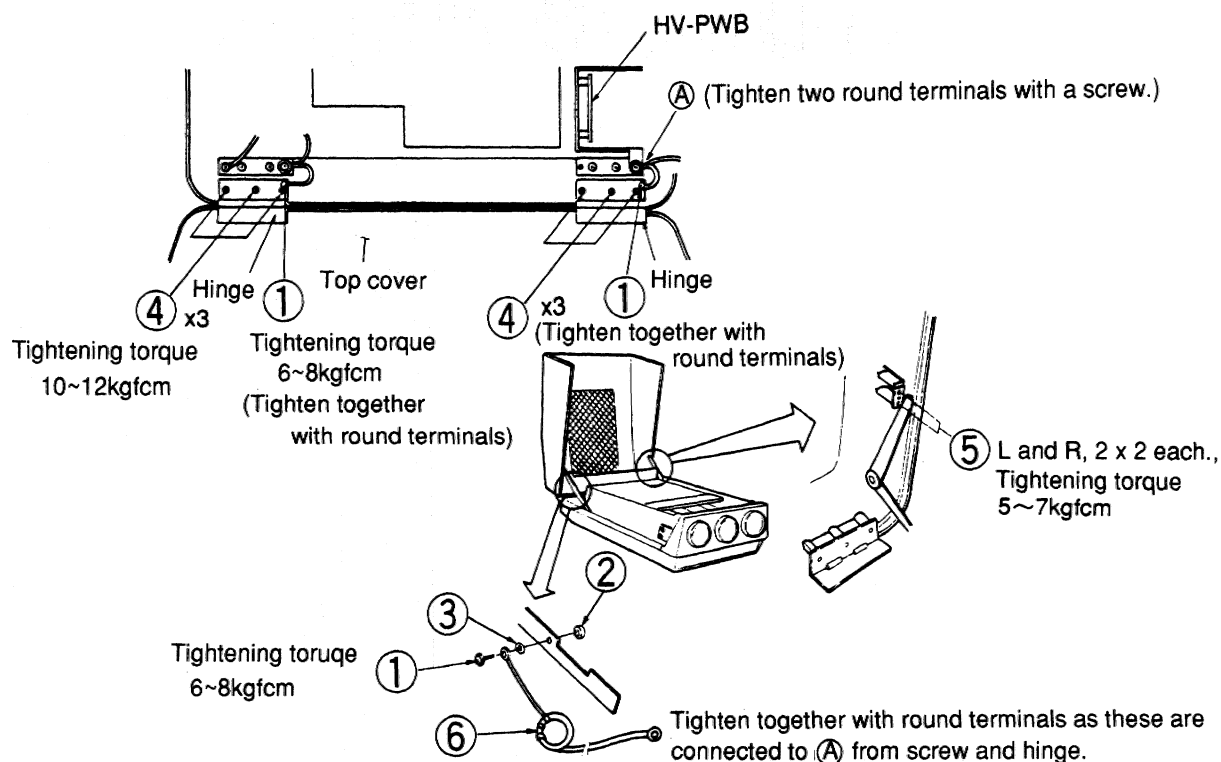
(1) Loosen screw ① and open the top cover. (FIG. 1)



No.	Part Name	Designation	Q'ty
1	SCREW, COFBMS*4*20*2PF	091084074	2
2	WASHER, SPECIAL	012850771	2
3	CLIP	012850751	2

FIG. 1

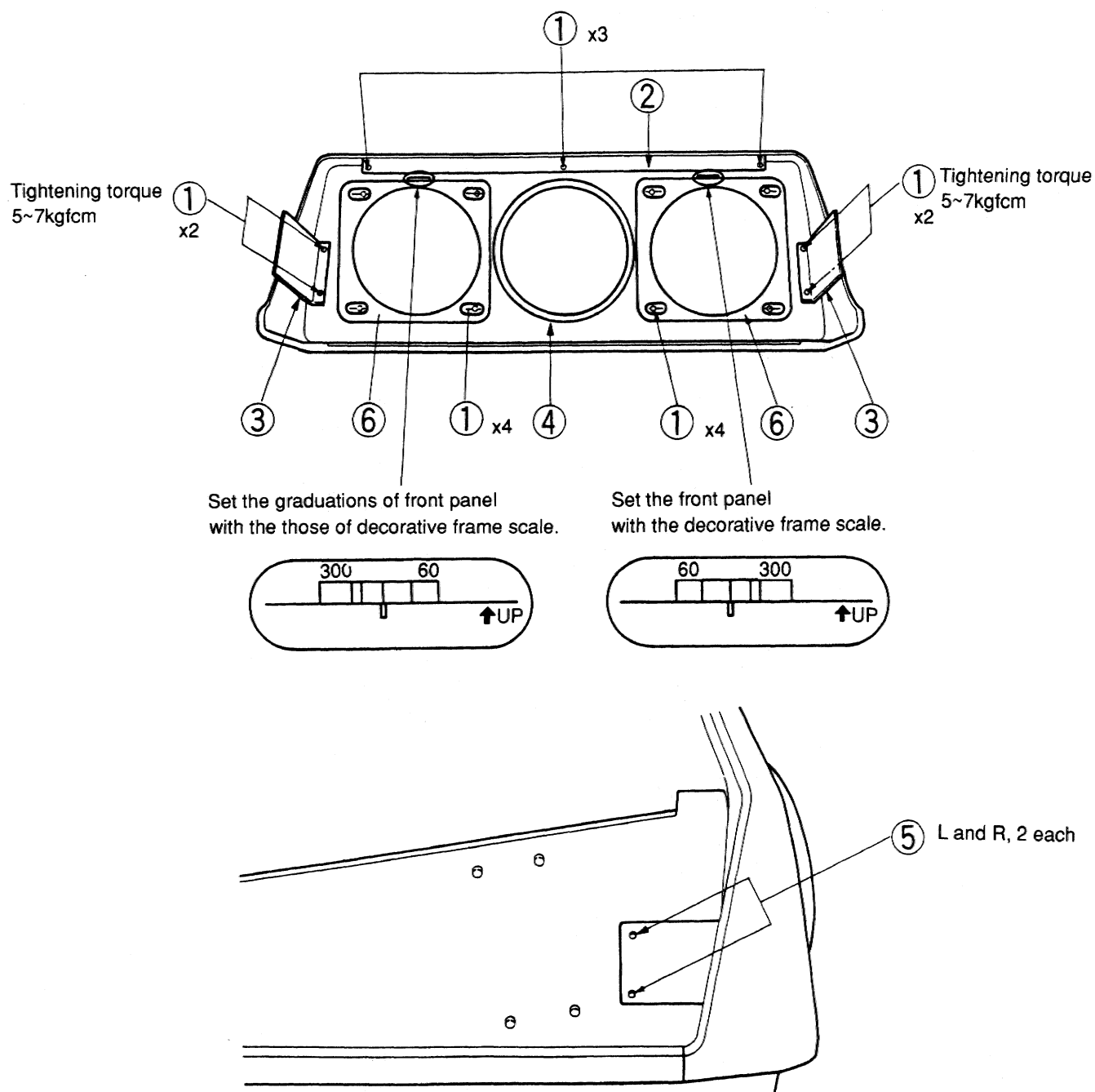
(2) Remove screws ①, ④, and ⑤ and take the top cover out. (Fig. 2)



No.	Part Name	Designation	Q'ty
1	Screw (PLCPIMS*3*8*15BF)	0910E3051	3
2	Screw (AHEXIN*3*15CF)	091430302	1
3	Screw (ESTWA*3*15CF)	091580302	1
4	Screw (#2CFTS*4*14*15BF)	091304041	6
5	Screw (P-#2CBRITS*3*12*15BF)	091NG3071	4
6	Ferrite core (toroidal 25 x 15 x 12)	61605019	1

FIG. 2

(3) Remove screw ⑤ and take the front panel out. (FIG. 3)

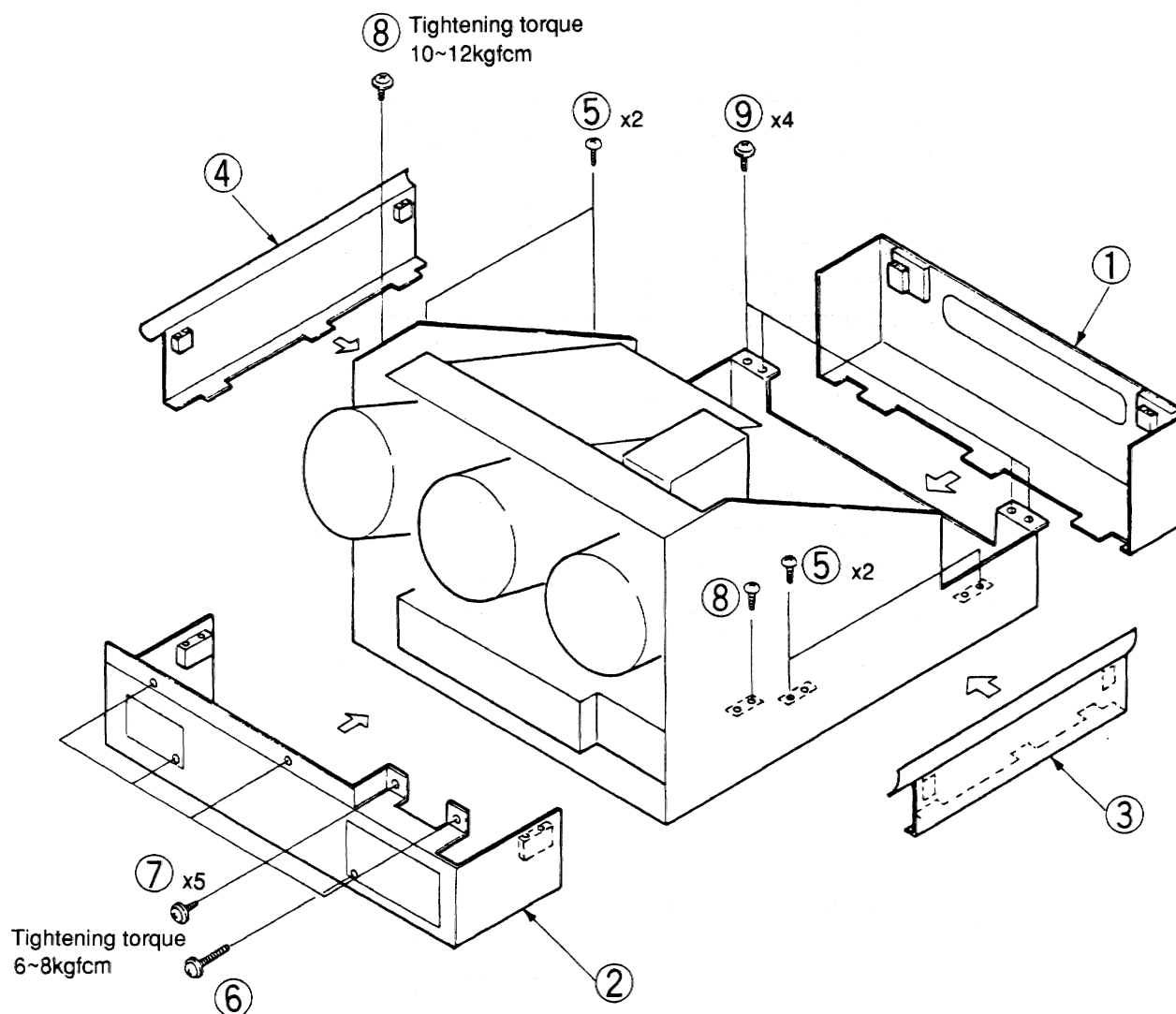


No.	Part Name	Designation	Q'ty
1	Screw (P-#2CBRITS*3*12*15BF)	091NG3071	15
2	Reinforcing fitting metal	12506641	1
3	Fitting metal	12506761	2
4	Front panel	012300751	1
5	Screw (P-#2CBRITS*3*8*15BF)	091NG3051	4
6	Decorative frame, R.	012401951	2

FIG. 3

DISASSEMBLY

- (4) Remove screw ⑤ and take the Side panel, Left ④ and Side panel, Right ③ out. (FIG. 4)
- (5) Remove screws ⑥ and ⑦ and ⑧ take the terminal panel out. (FIG. 4)
- (6) Remove screw ⑨ and take the rear panel ① out. (FIG. 4)

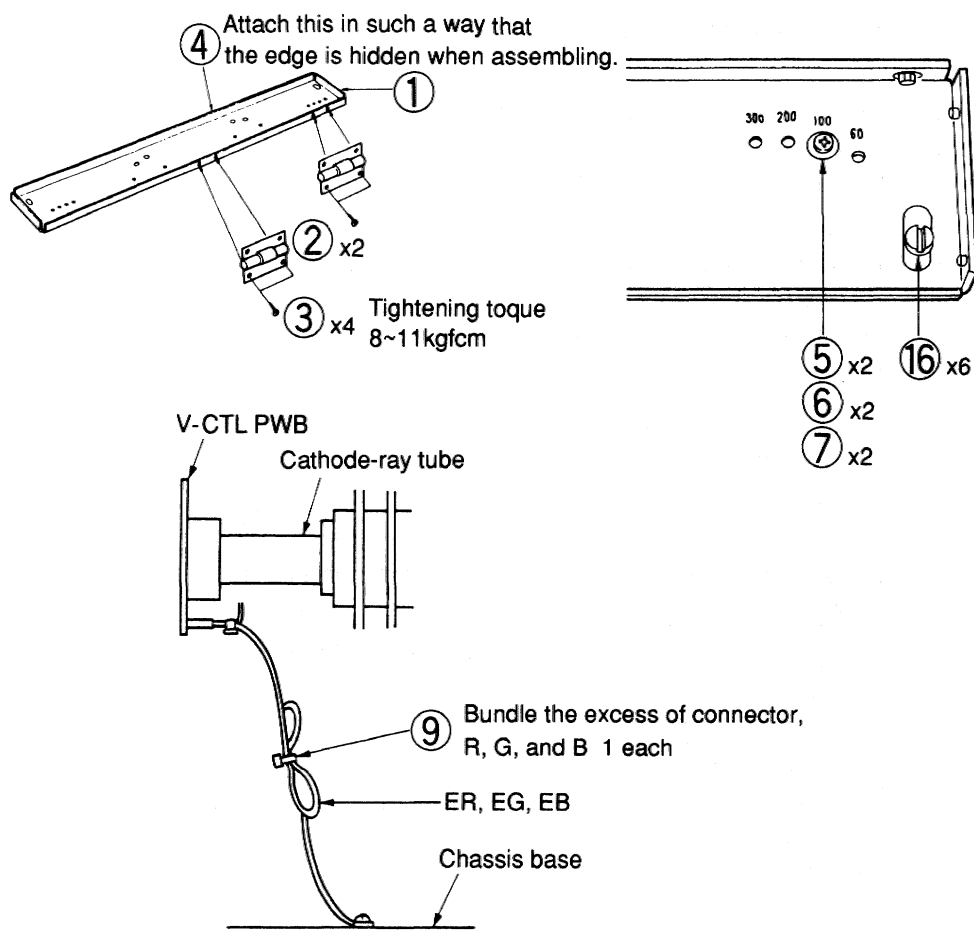


No.	Part Name	Designation	Q'ty
1	Rear panel ass'y	012301601	1
2	Terminal panel ass'y	012301541	1
3	Side panel R ass'y	012301561	1
4	Side panel L ass'y	012301581	1
5	Screw (#2CBRTS*4*20*15BF)	091664071	4
6	Screw (PL-CPIMS*3*25*15KF)	0910E3133	1
7	Screw (PL-CPIMS*3*8*15KF)	0910E3053	5
8	Screw (#2CBRTS*4*20*15BF)	091664071	2
9	Screw (#2CBRTS*4*20*15BF)	091664071	4

FIG. 4

(ii) \mathbf{D} is a 2×2 matrix, symmetric and positive definite, and \mathbf{D}^{-1} is described and illustrated in (1) and (2) above.

DISASSEMBLY

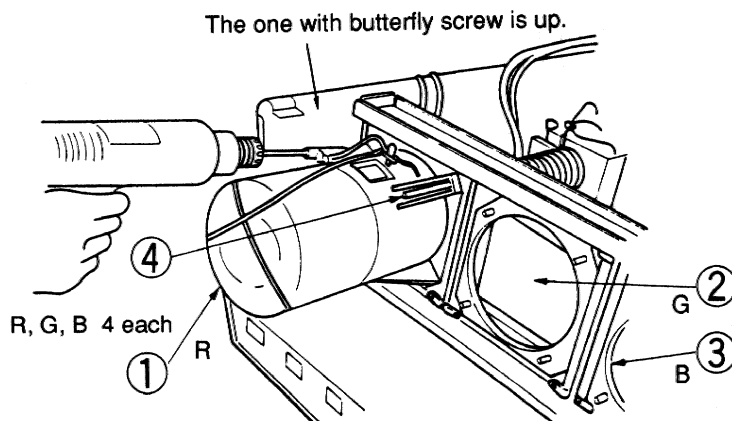


No.	Part Name	Designation	Q'ty
1	CRT metal fitting T	12511342	1
2	Hinge (TH-TM-122)	12281691	2
3	Screw (P-#20CBRITS*3*8*15BF)	091NG3051	4
4	Filament Tape 15X30MM	92203161	1
5	Screw (PL-CPIMS*4*10*15BF)	0910E4021	2
6	Screw (PL-CPIMS*4*10*15BF)	0910E4021	2
7	Screw (PL-CPIMS*4*10*15BF)	0910E4021	2
8	Screw (PL-CPIMS*4*10*15BF)	0910E4021	4
9	Bundling band (L=85)	24281271	3
10	Shield plate (DIG)	24H20241	1
11	Shield plate (DEF)	24H20231	1
12	Cord clamber (D20)	24281351	1
13	Screw (P-#2CBRITS*3*8*15BF)	091NG3051	4
14	Screw (P-#2CBRITS*3*8*15BF)	091NG3051	3
15	Screw (P-#2CBRITS*3*8*15BF)	091NG3051	3
16	Special screw (CRT)	012850452	6
17	Screw (P-#2CBRITS*3*8*15BF)	091NG3051	3

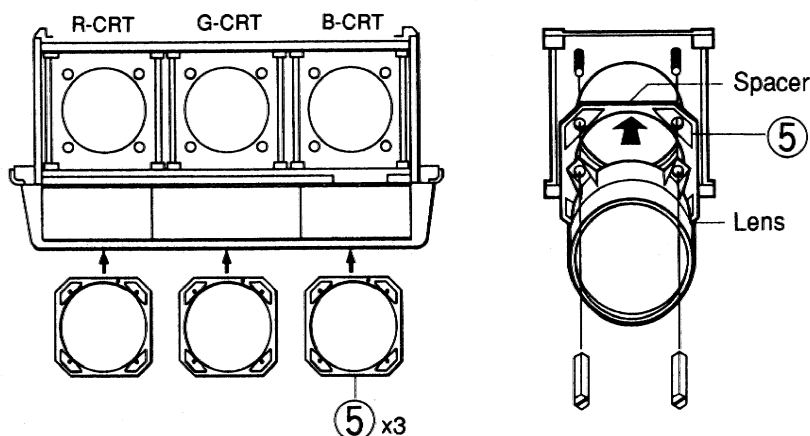
FIG. 1

METHOD REMOVING LENS

Remove screw ④ and take the lens out.



When assembling, wipe the dirt from the lens surface using compressed air prior to mounting.



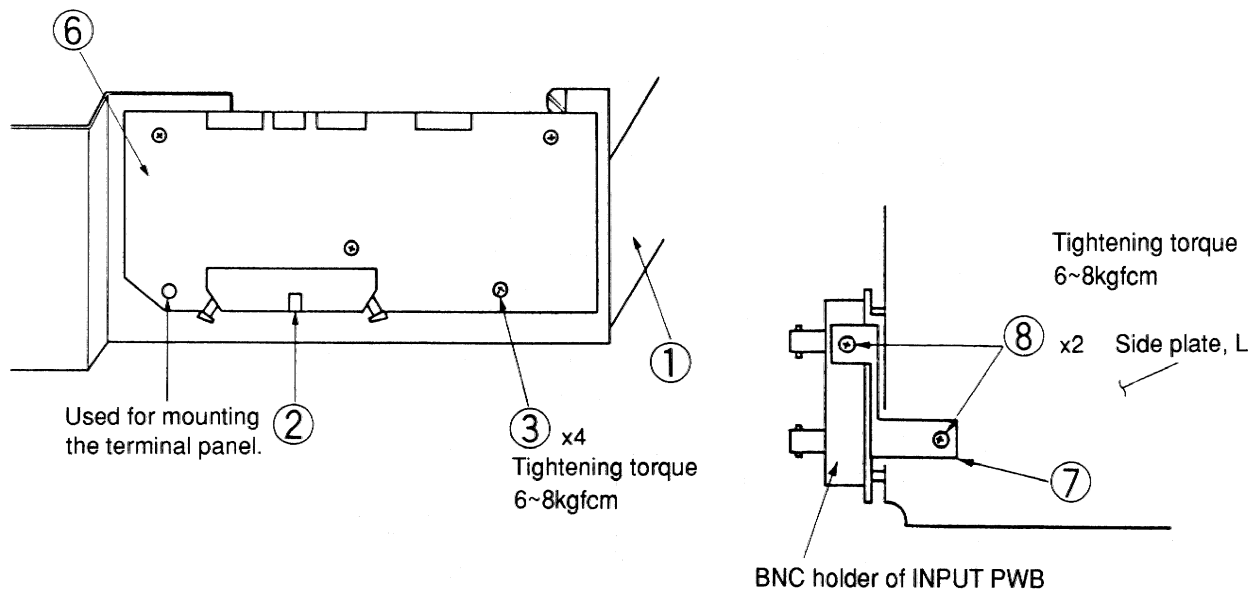
No.	Part Name	Designation	Q'ty
1	Lens (HD-6CM)	074922024	1
2	Lens (HD-6CM, R-ECP)	074922039	1
3	Lens (HD-6CM, R-ECP)	074922038	1
4	Special nut (LNS)	012850941	12
5	Spacer A	12401971	
5	Spacer B	12401981	
5	Spacer C	12401991	
5	Spacer D	12402001	
5	Spacer E	12402011	
5	Spacer F	12402021	
5	Spacer G	12402211	
5	Spacer H	12402221	
5	Spacer I	12402231	

Note: No. 5 spacer mounting varies depending upon the screen size and the angle of projection. For information on mounting, refer to Installation (on page 2-15)

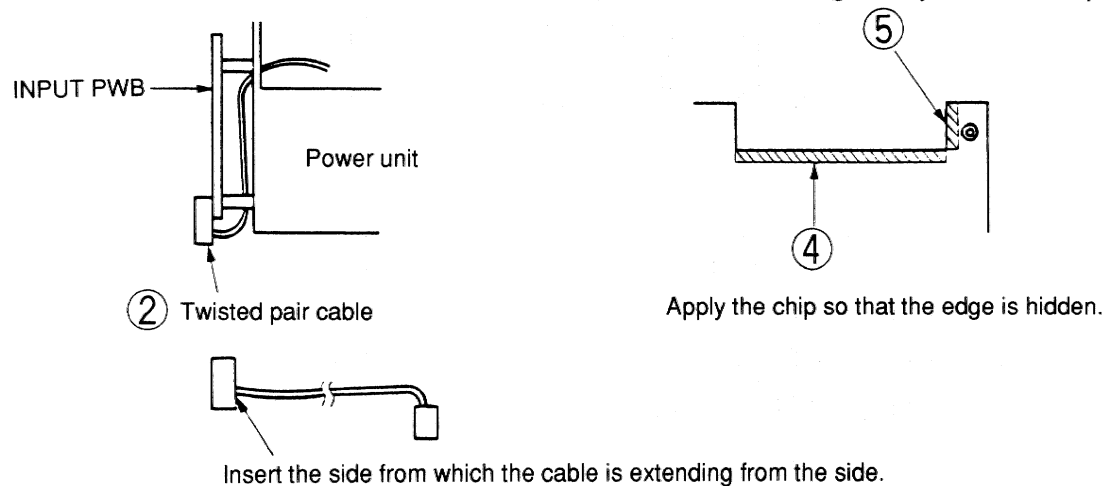
DISASSEMBLY

METHOD OF REMOVING THE INPUT PWB

- (1) Remove each panel as described and illustrated in (1) and (5) above.
- (2) Remove the twisted pair cable ②. (FIG. 1)
- (3) Remove screw ⑧ and take the shield plate ⑦ out. (FIG. 1)
- (4) Remove screw ③ and take the INPUT PWB ⑥ out. (FIG. 1)



When assembling, make the wiring as shown.
Note: Care should be taken to ensure that the twisted pair cable is not caught in by the terminal panel.

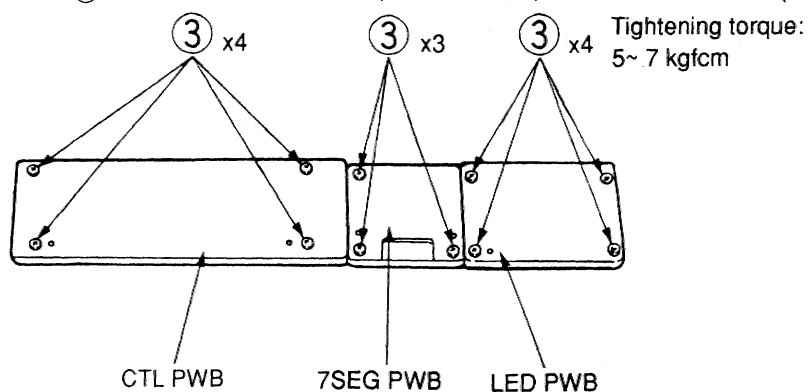


No.	Part Name	Designation	Q'ty
1	Power supply UNIT	079642141	1
2	Twisted pair cable 34PX810MM	73495184	1
3	Screw (PL-CPIMS*3*8*15BF)	0910E3051	4
4	Nichiban cloth tape 25X95mm	92203179	1
5	Nichiban cloth tape 25X25mm	92203179	1
6	INPUT PWB ASSY	0931E7N01	1
7	Shield plate (BNC)	24H20101	1
8	Screw (PL-CPIMS*3*8*15BF)	0910E3051	2

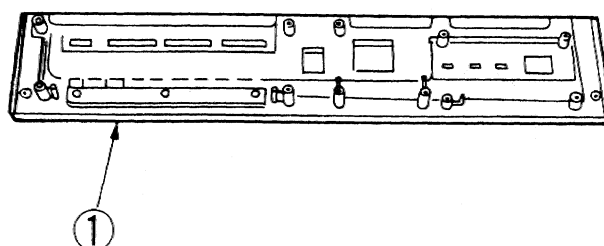
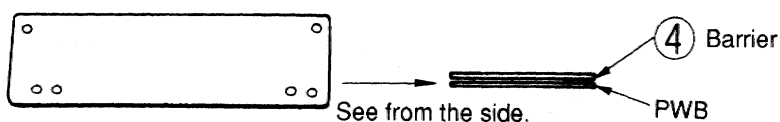
FIG. 1

METHOD OF REMOVING THE CL7 PWB

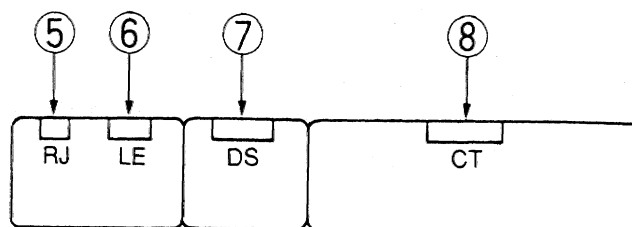
- (1) Remove each panel as described and illustrated in (1) and (6).
- (2) Remove screw ③ and take the CTL PWB, 7SEG PWB, and LED PWB out. (FIG. 1)



Note: When assembling, peel the sheet of the 7SEG section and then proceed.



Connector position



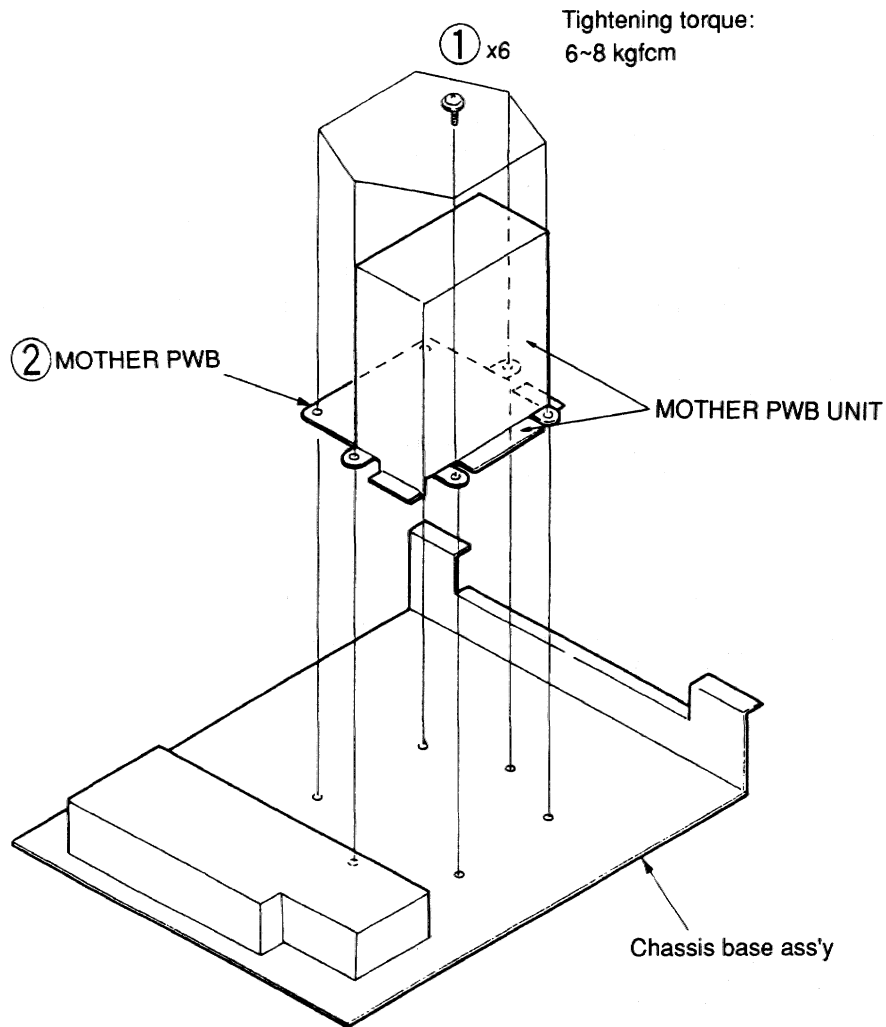
No.	Part Name	Designation	Q'ty
1	Control panel ass'y	012404601	1
2	Fitting metal (control)	12506781	1
3	Screw (P-#2CBRITS * 3 * 12 * 15BF)	091NG3071	13
4	Barrier (control panel)	24J09821	1
5	CN3P (RJ) 1375, 2468-26	73B355RJ	1
6	CN5P (LE) 650W, 1007-26	73B5B088	1
7	CN9P (DS) 725W, 1007-26	73B9B017	1
8	CN10P (CT) 825W, 1007-26	73B0B019	1

FIG. 1

DISASSEMBLY

METHOD OF REMOVING THE MOTHER PWB

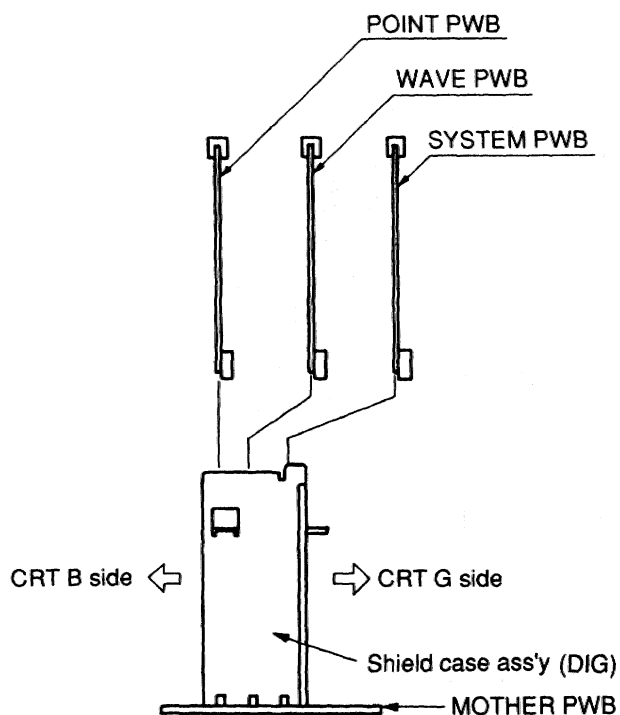
- (1) Remove each panel as described and illustrated in (1) and (3) above.
- (2) Remove the CRT G as described and illustrated in (1) and (4) of the Method of Removing the CRT above.
- (3) Remove the screw ① and take the MOTHER PWB UNIT out.



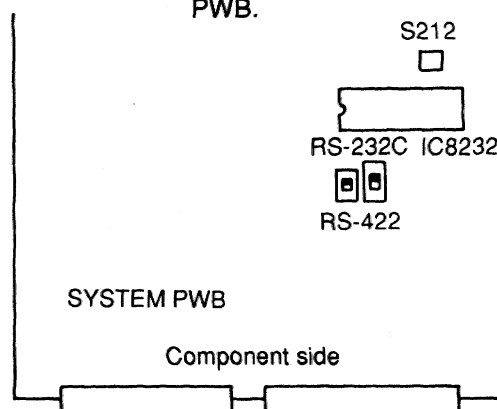
No.	Part Name	Designation	Q'ty
1	Screw (PL-CPIMS*3*8*15BF)	0910E3051	6
2	MOTHER PWB ASSY	0931E7R01	1



FIG. 1

(4) Remove the POINT PWB, WAVE PWB, and SYSTEM PWB.



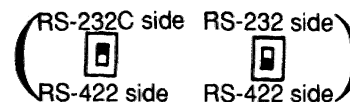
Note: Check the switches shown below before inserting the SYSTEM PWB into the MOTHER PWB.



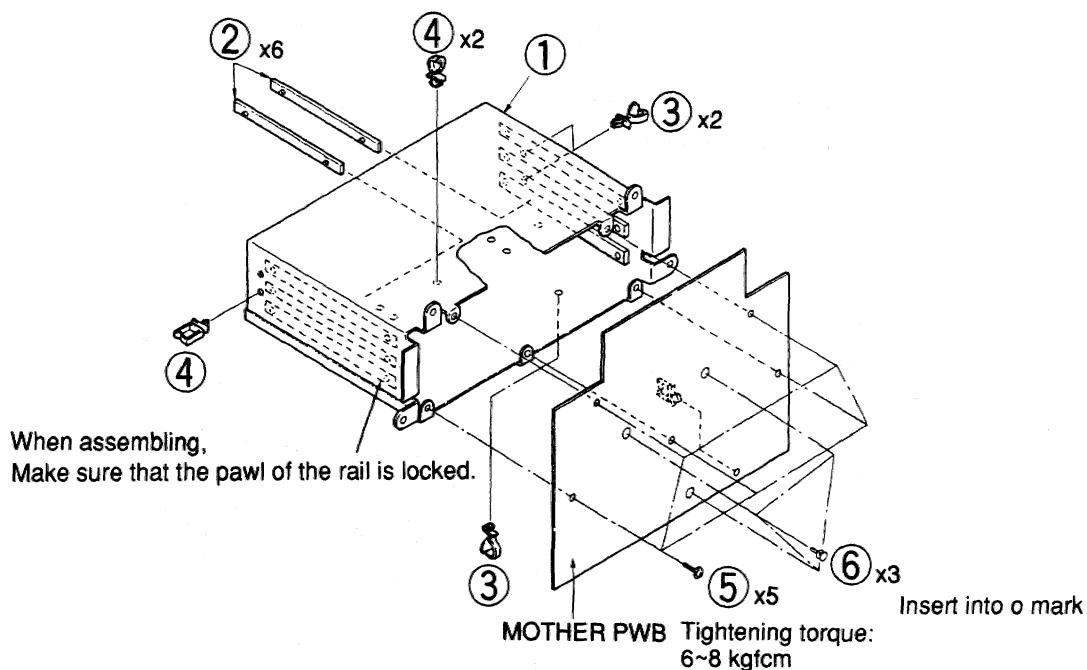
S212 :  

S221 : RS-232C side

S222 : RS-232C side



(5) Remove screw ⑤ and take the MOTHER PWB out.

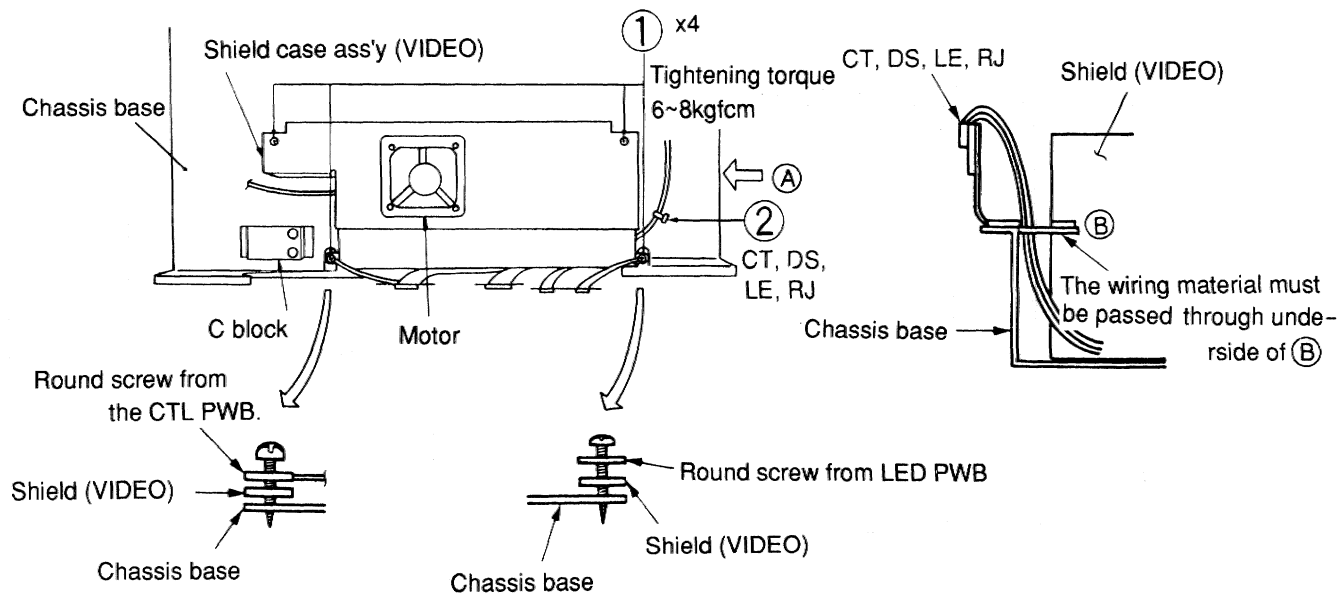


No.	Part Name	Designation	Q'ty
1	Shield case ass'y (DIG)	12511401	1
2	Rail (180S)	25281751	6
3	Lead clamber (H-19.5)	25283111	5
4	Lead clamber	12281301	2
5	Screw (P-#2CBRITS*3*8*15BF)	091NG3051	5
6	Card spacer (H8)	25281271	3

DISASSEMBLY

METHOD OF REMOVING THE VIDEO MOTHER PWB

- (1) Remove screw ① and take the shield case ass'y out. (FIG. 1)



No.	Part Name	Designation	Q'ty
1	Screw (PL-CPIMS*3*8*15BF)	0910E3051	4
2	Bundling band (L=85)	24281271	1

FIG. 1

- (2) Remove connectors R, G, and B from the GAIN CTL PWB. (FIG. 2)
- (3) Remove the connectors R, G, and B from the edge saddle.

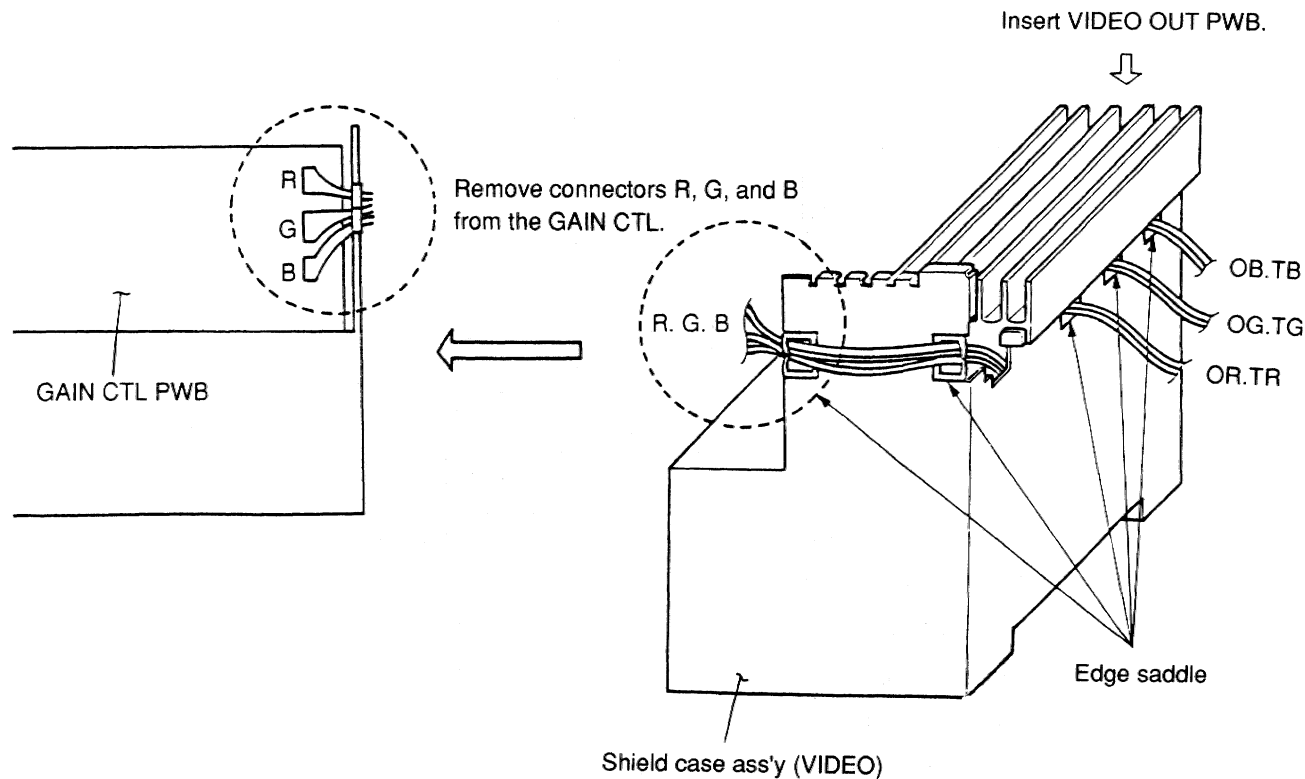
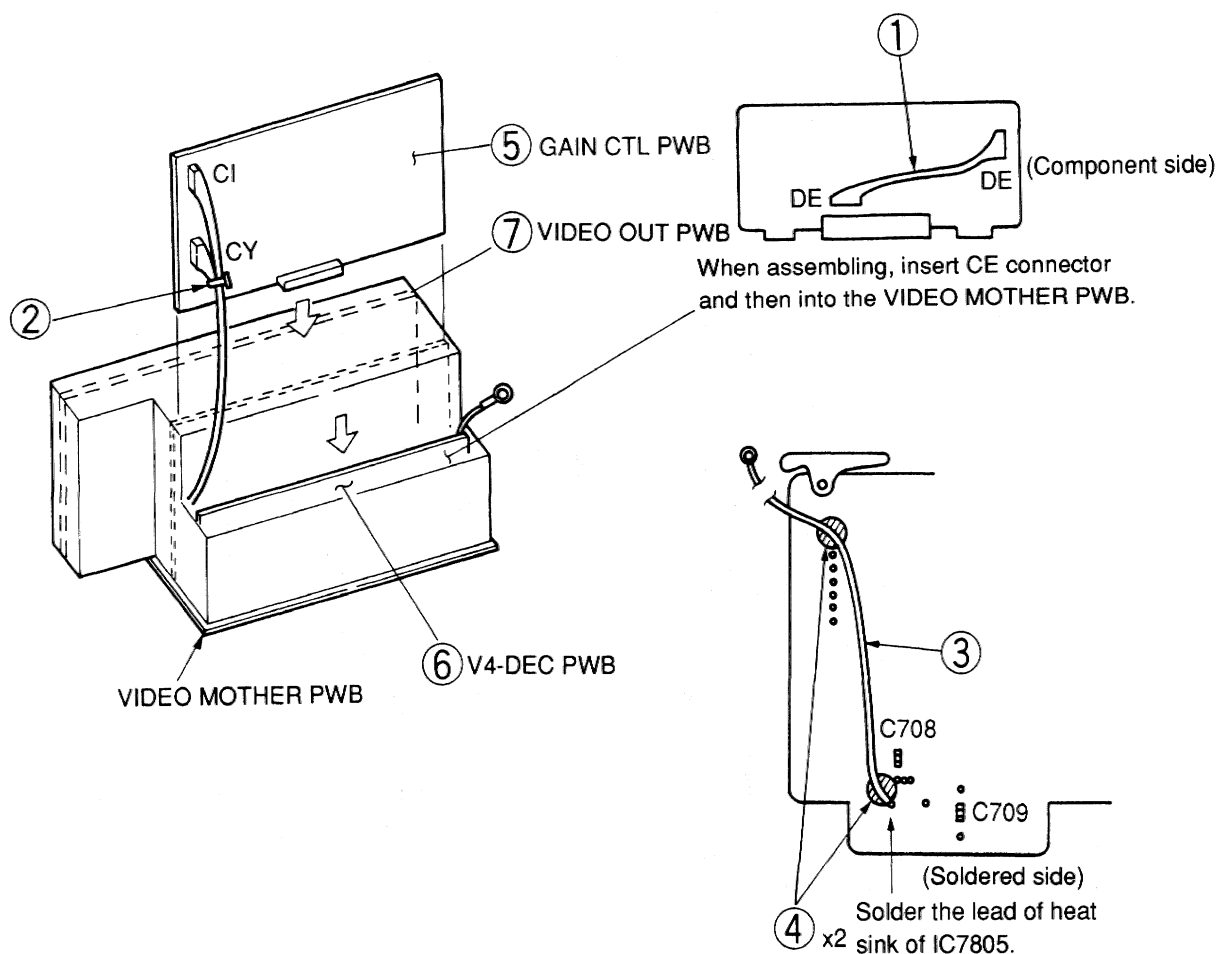


FIG. 2

- (4) Remove the GAIN CTL PWB, V4-DEC PWB, and VIDEO OUT PWB.

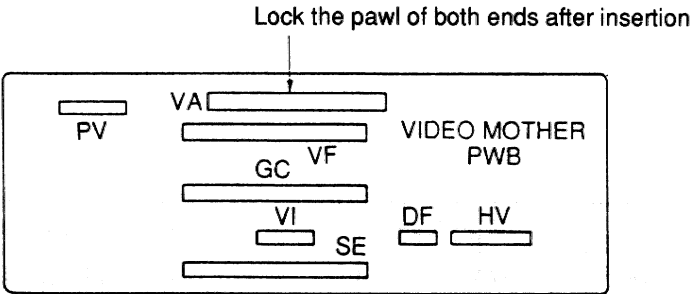
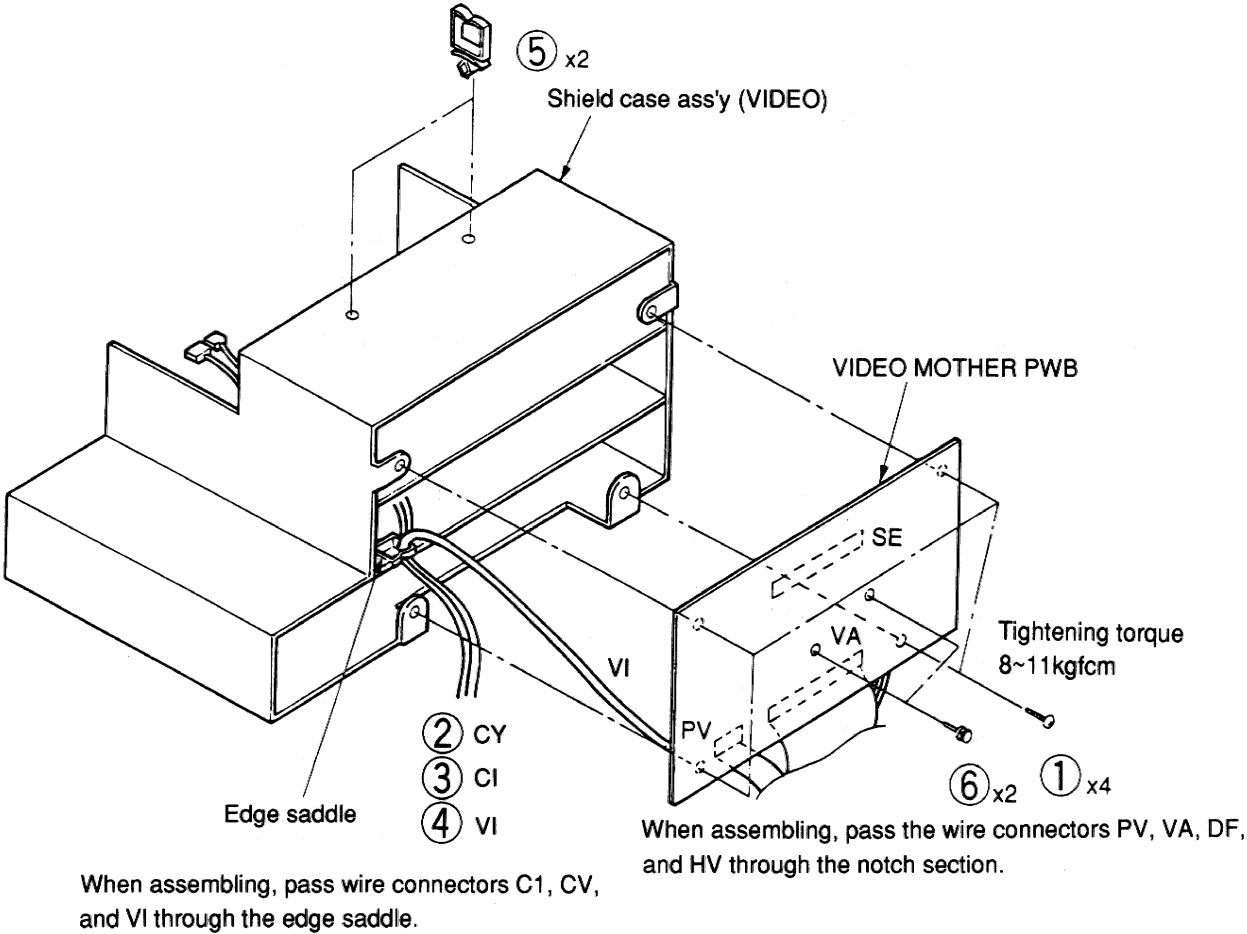


No.	Part Name	Designation	Q'ty
1	CN6P (DE) 175W, 1365-30	73B6B092	1
2	Bundling band (L=85)	24281271	1
3	CN round screw250S, 1015-22	73300064	1
4	Hot melt 3M 3748TC (500G)	92201148	
5	GAIN CTL PWB ASSY	0931E7G01	1
6	V4-DEC PWB ASSY	0931C5D01	1
7	VIDEO OUT PWB ASSY	0931E7S01	1

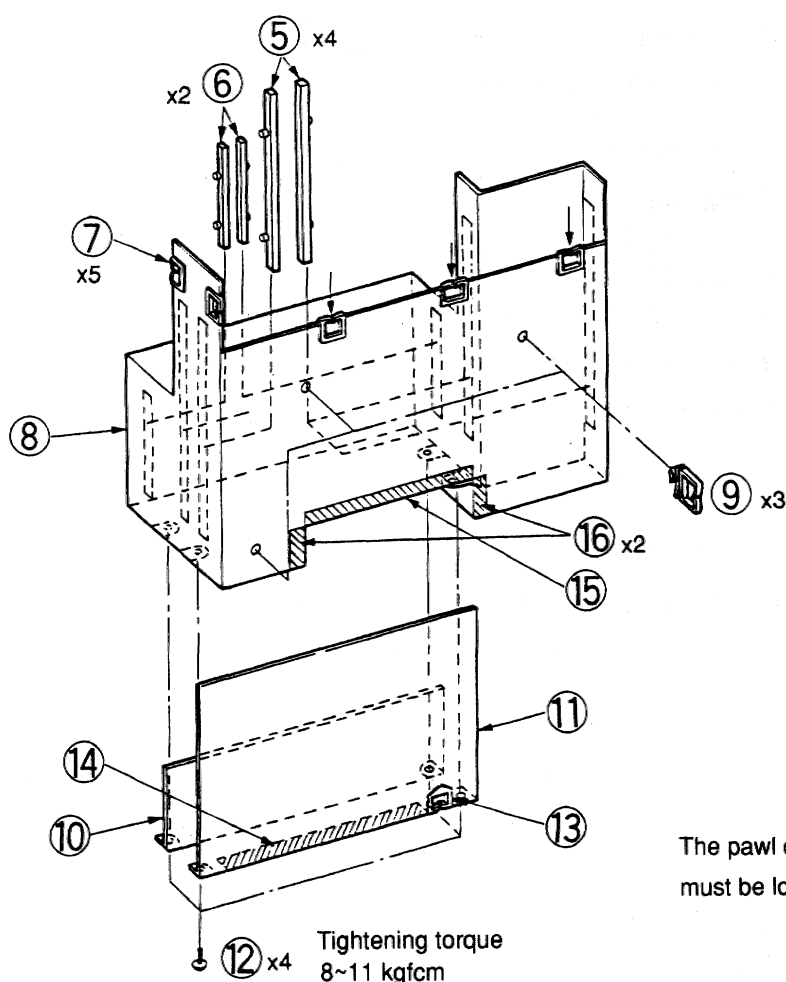
FIG. 3

DISASSEMBLY

(6) Remove screw ① and take the VIDEO MOTHER PWB out. (FIG. 4)



No.	Part Name	Designation	Q'ty
1	Screw (P-#2CBRITS*3*8*15BF)	091NG3051	4
2	CN5P (CY) 1250W, MIX	73B5B090	1
3	CN6P (CI) 1300W, 1365-30	73B6B096	1
4	CN7P (VL) 1150W, MIX	73B7B016	1
5	Lead clamber	12281301	2
6	Card spacer (H8)	025281271	2



No.	Part Name	Designation	Q'ty
1	CN11P(PV) 325W, 1007-24	73BAB015	1
2	Flat ribbon cable 64PX300MN	73495195	1
3	CN4P (DF) 600W, 1007-26	73B4B148	1
4	CN9P (HV) 1100W, 1007-24	73B9B018	1
5	Rail (180S)	25281751	4
6	Rail (80S)	16290111	2
7	Edge saddle	15290081	5
8	Shield case ass'y (VIDEO)	12511442	1
9	Lead clasper	12281301	3
10	Shield plate B	12511741	1
11	Shield plate A	12511731	1
12	Screw (P-#2CBRITS*3*8*15BF)	091NG3051	4
13	Edge saddle	25282461	1
14	Nichiban cloth tape 25X140mm	92203179	1
15	Nichiban cloth tape 25X140mm	92203179	1
16	Nichiban cloth tape 25X40mm	92203179	2
17	CN7P (VI) 1150W, MIX	73B7B016	1

FIG. 5

DISASSEMBLY

METHOD OF REMOVING C-DRIVE PWB AND F-DRIVE PWB

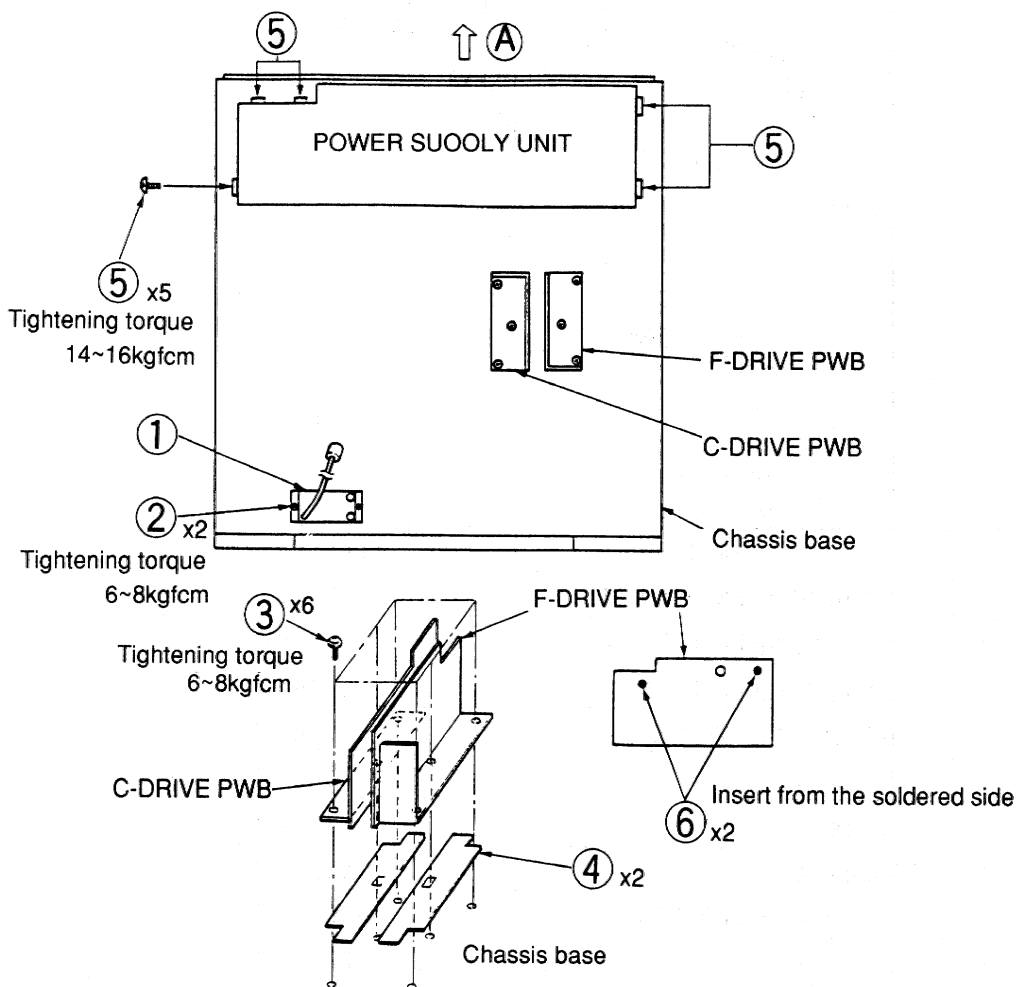
- (1) Remove each panel as described and illustrated in ① above. (FIG. 1)
- (2) Remove the CRT R (G) as described and illustrated in (3) above. (FIG. 1)
- (3) Remove screw ③ and take the C-DRIVE PWB and F-DRIVE PWB out. (FIG. 1)

METHOD OF REMOVING THE POWER UNIT

- (1) Remove each panel as described and illustrated in (4) and (5) above. (FIG. 1)
- (2) Remove the INPUT PWB in the method described and illustrated in (1)~(4).
- (3) Remove screw (5) and pull the POWER SUPPLY UNIT in the direction of an arrow ①. (FIG. 1)

METHOD OF REMOVING THE HIGH-VOLTAGE C BLOCK

Remove screw ② and take the high-tension C block out. (FIG. 1)

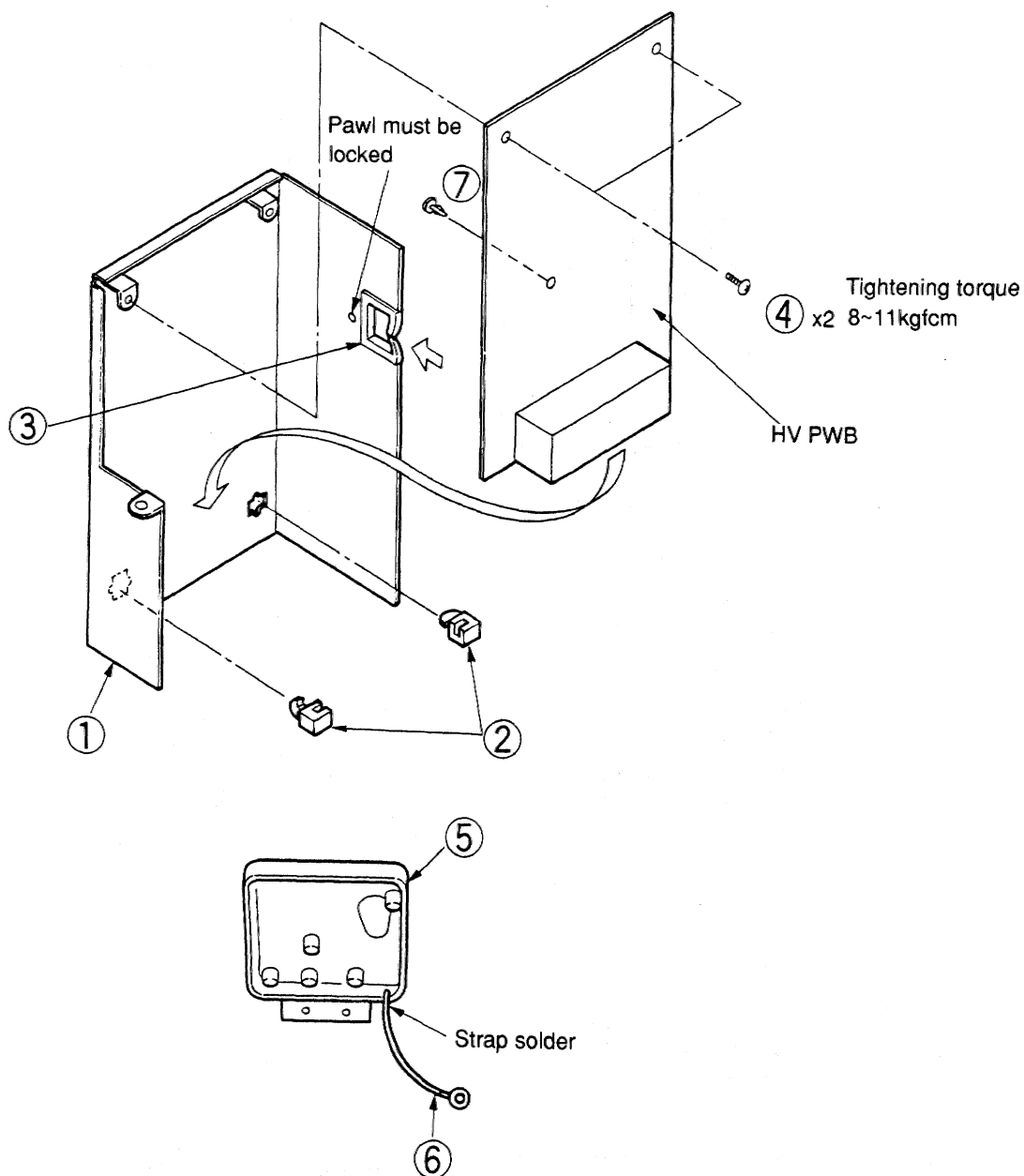


No.	Part Name	Designation	Q'ty
1	High-voltage C block MSC42-28D	039510037	1
2	Screw (P-#2CBRITS *3*12*15BF)	091NG3071	2
3	Screw (PL-CPIMS *3*8*15BF)	0910E3051	6
4	Heat dissipating sheet (CF-DRIVE)	74905018	2
5	Screw (PL-CPIMS *4*10*15BF)	0910E4021	5
6	Card spacer (H8)	25281271	2

FIG. 1

METHOD OF REMOVING THE HV PWB

- (1) Remove each panel as described and illustrated in (1) and (4).
(But only the side panel L should be removed in (4).)
- (2) Remove screw ④ and take the HV PWB out.



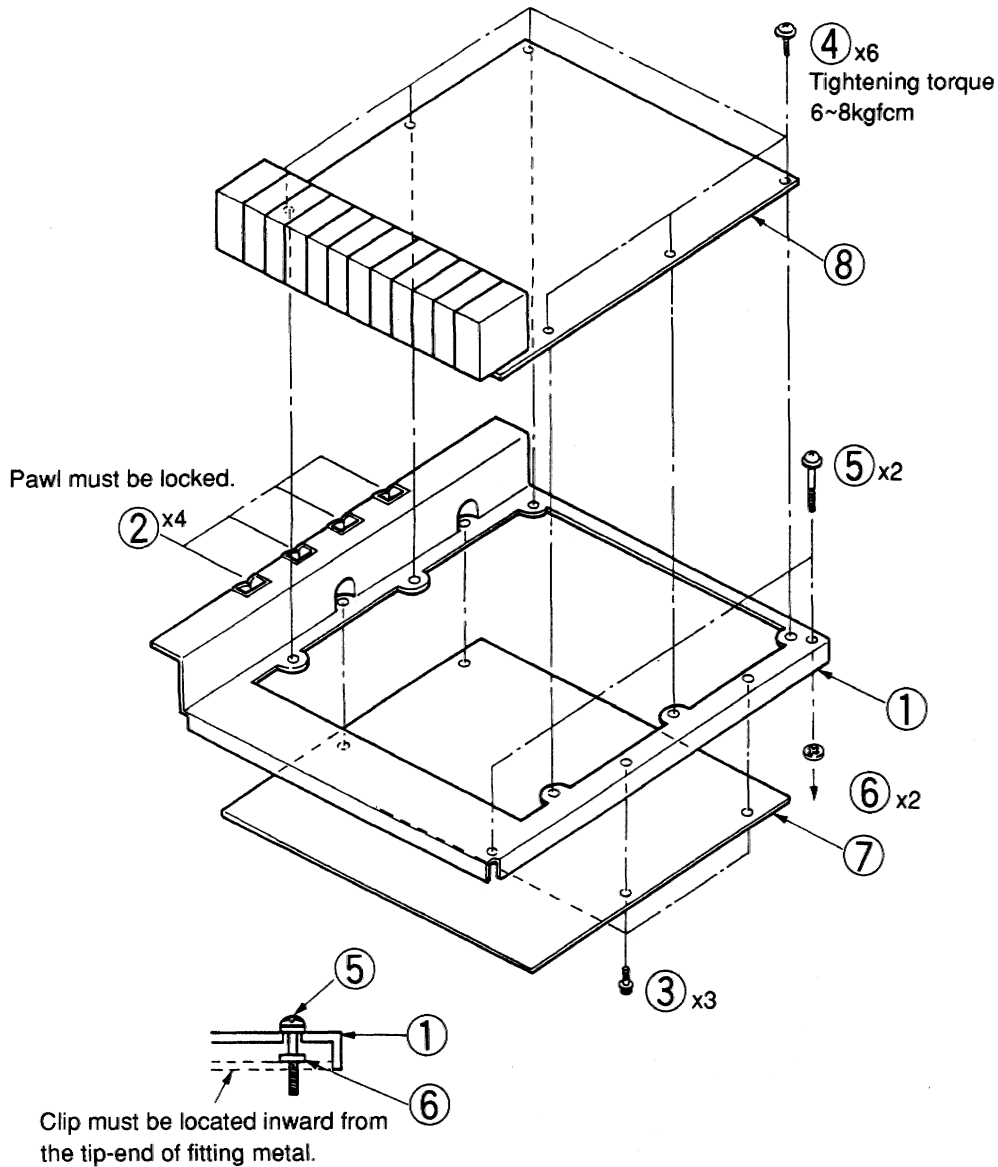
No.	Part Name	Designation	Q'ty
1	Metal fitting (HV)	12511391	1
2	PWB holder B	24408381	2
3	Edge saddle	25282461	1
4	Screw (P-#2CBRITS*3*8*15BF)	091NG3051	2
5	Screen control unit	039603308	1
6	CN round screw 100S, 1015-22	73300058	1
7	Card spacer (H8)	025281271	1

FIG. 1

DISASSEMBLY

METHOD OF REMOVING THE DEF PWB

- (1) Remove each panel as described and illustrated in (1).
- (2) Remove screw ④ and take the DEF PWB out.

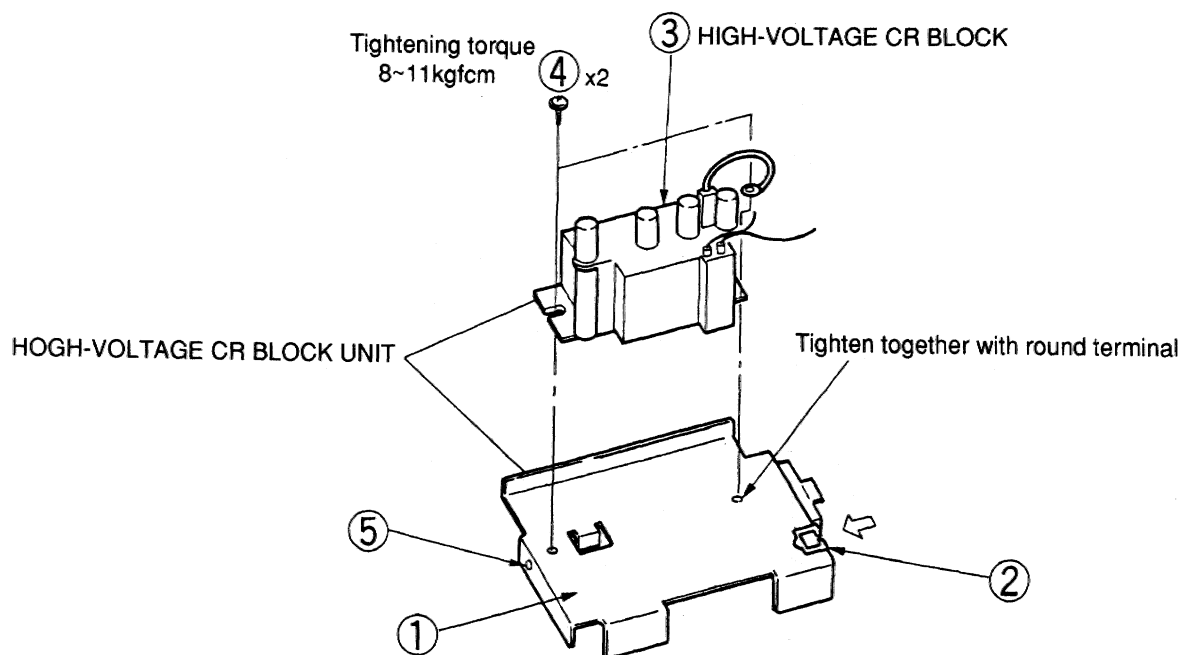


No.	Part Name	Designation	Q'ty
1	Fitting metal (DEF)	12511362	1
2	Edge saddle	15290081	4
3	Push rivet (D3, T1-2)	12281621	4
4	Screw (P-#2CBRITS*3*8*15BF)	091NG3051	6
5	Screw (PL-CPIMS*3*8*15BF)	0910E3101	2
6	Clip (M3)	12850781	2
7	Barrier (DEF)	24J09652	1
8	DEF PWB ASSY	0931E7E01	1

FIG. 1

METHOD OF REMOVING THE CR HIGH-VOLTAGE BLOCK

- (1) Remove each panel as described and illustrated in (1).
- (2) Remove screw ⑤ and take the HV CR BLOCK UNIT out.
- (3) Remove screw ④ and take the HIGH-VOLTAGE CR BLOCK.

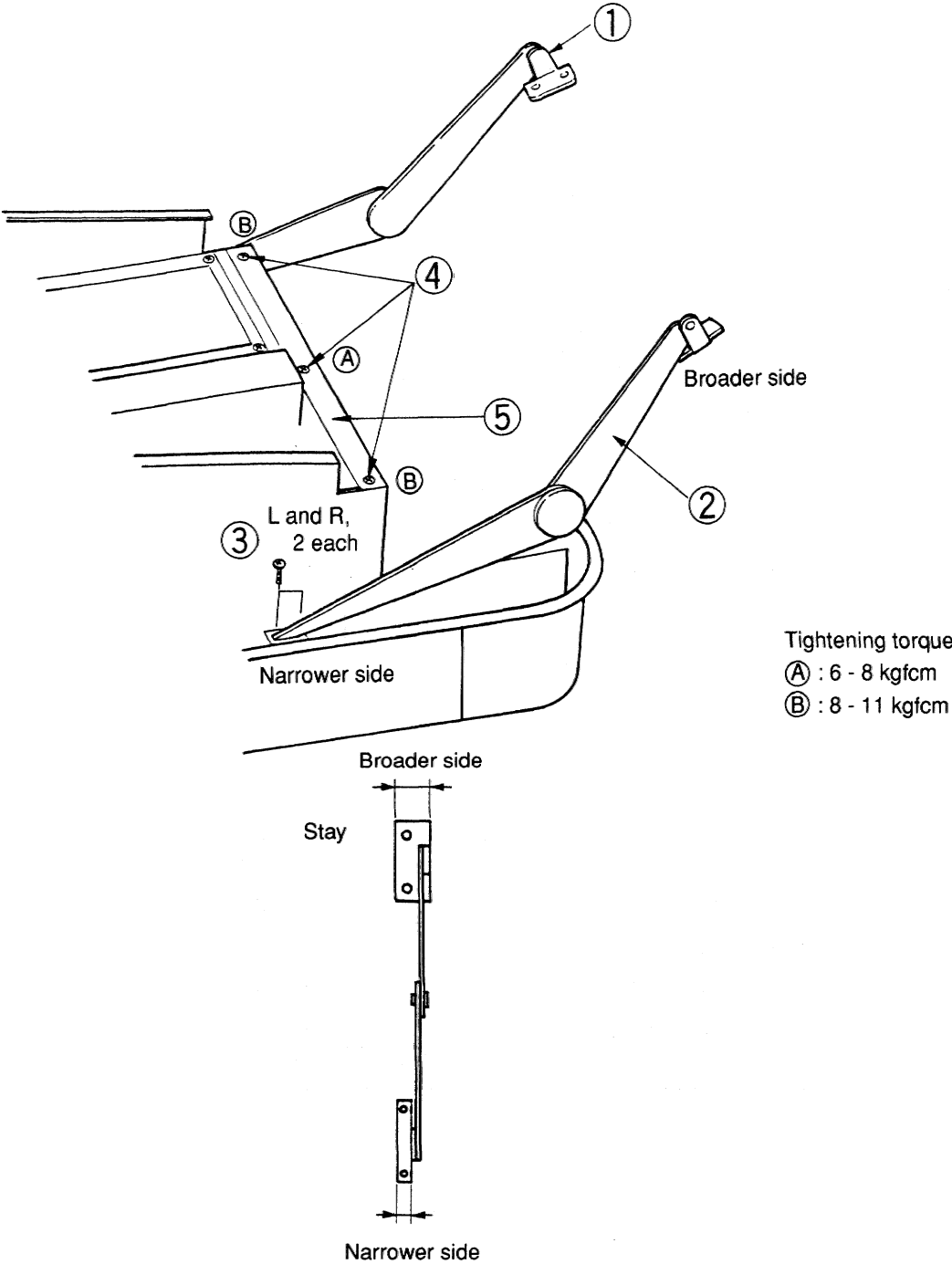


No.	Part Name	Designation	Q'ty
1	Fitting metal (CRB)	24H20131	1
2	Edge saddle	25282131	1
3	HIGH VOLTAGE CR block	039510024	1
4	Screw (P-#2CBRITS*3*12*15BF)	091NG3071	2
5	Screw (P-#2CBRITS*3*12*15BF)	091NG3071	1

DISASSEMBLY

METHOD OF REMOVING THE STAY

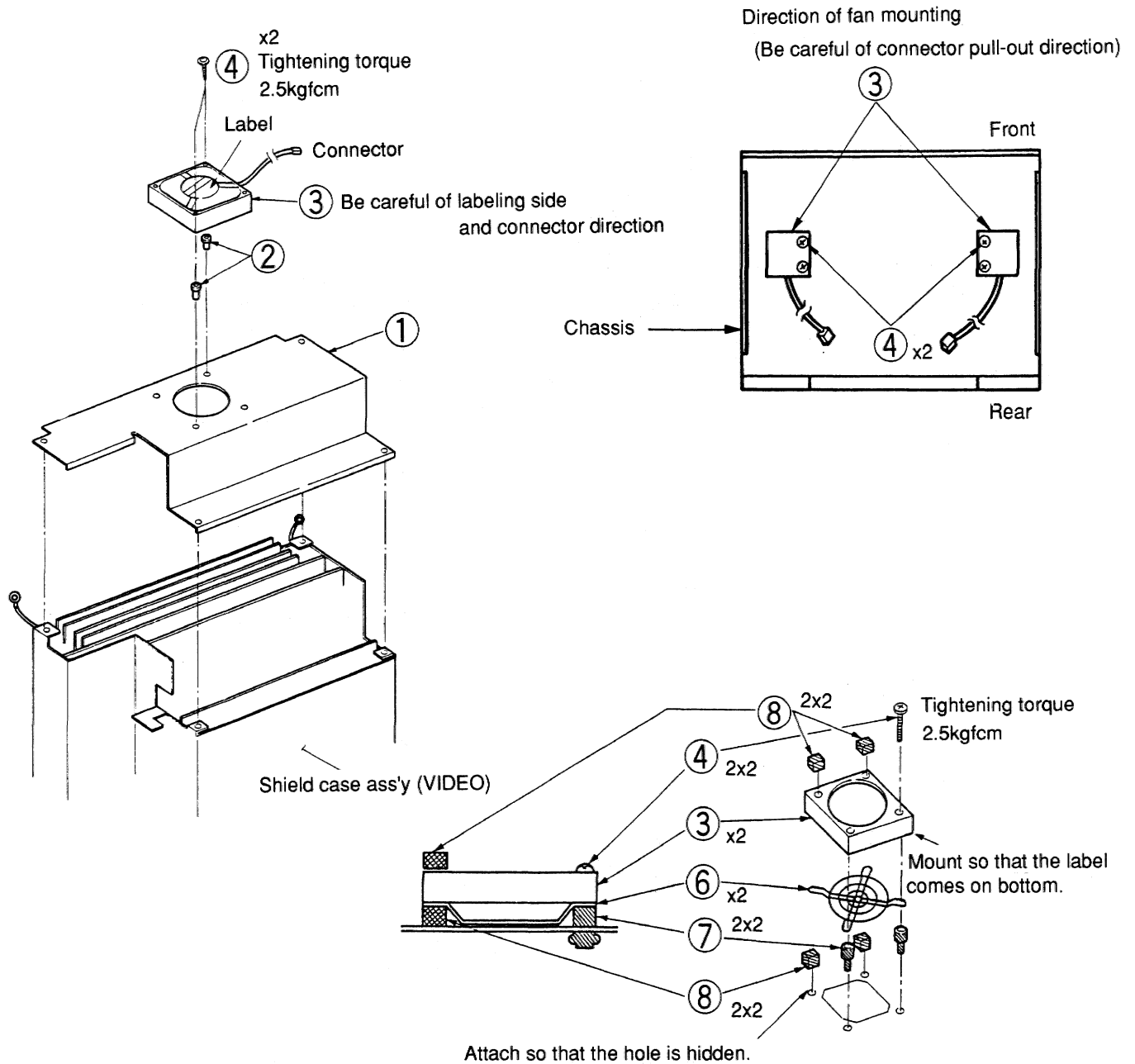
- (1) Remove each panel as described and illustrated in (1).
- (2) Remove screw ③ and take the stays L and R out.



No.	Part Name	Designation	Q'ty
1	Stay R	012281341	1
2	Stay L	012281081	1
3	Screw (PL-CPIMS*3*8*15BF)	0910E3051	4
4	Screw (P-#2CBRITS*3*12*15BF)	091NG3071	3
5	Reinforced fitting metal (SET)	12511481	1

METHOD OF REMOVING THE FAN

- (1) Remove each panel as described and illustrated in (1).
- (2) Remove screw ④ and take the fan out.

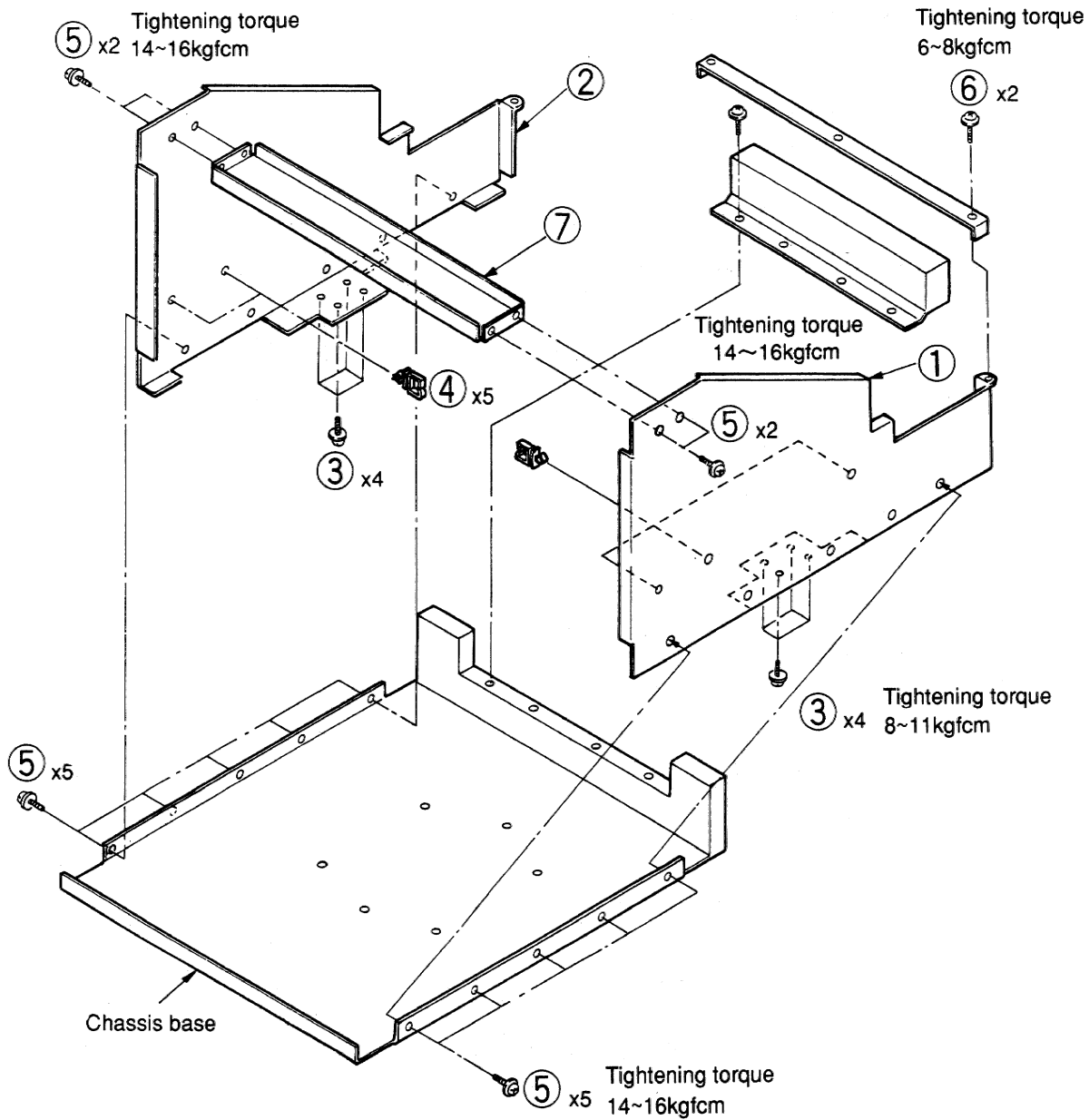


Attach so that the hole is hidden.

No.	Part Name	Designation	Q'ty
1	Shield case (cover, VIDEO)	12511472	1
2	Special nut (M4)	012850981	2
3	DC fan (109P0912M4D03)	031700939	3
4	Screw (CPIMS*3*40*15BF)	091013181	2
5	Screw (CPIMS*3*40*15BF)	091013181	4
6	Fan guard	12281851	2
7	Special nut (M4)	012850981	4
8	Rubber sheet (fan)	24J09661	8

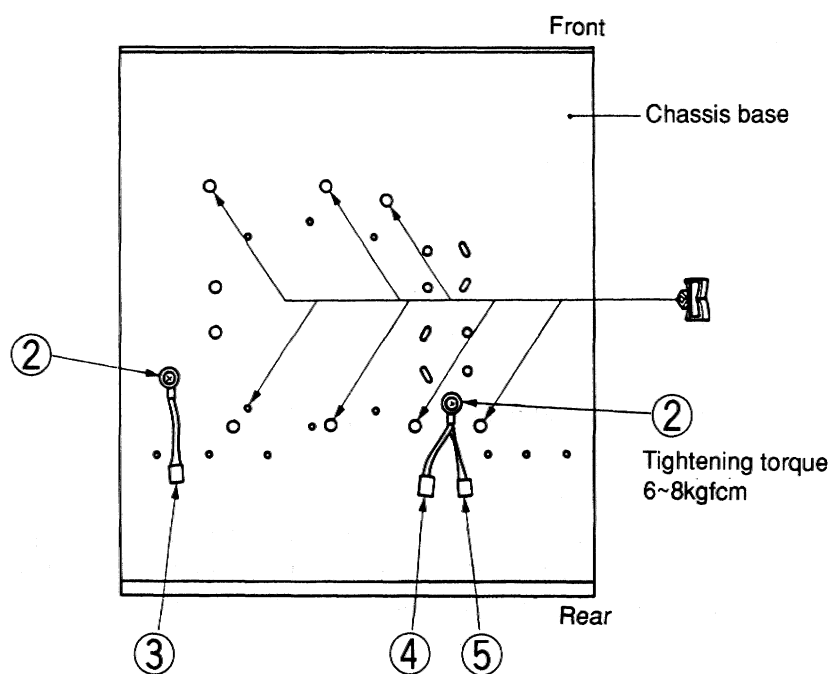
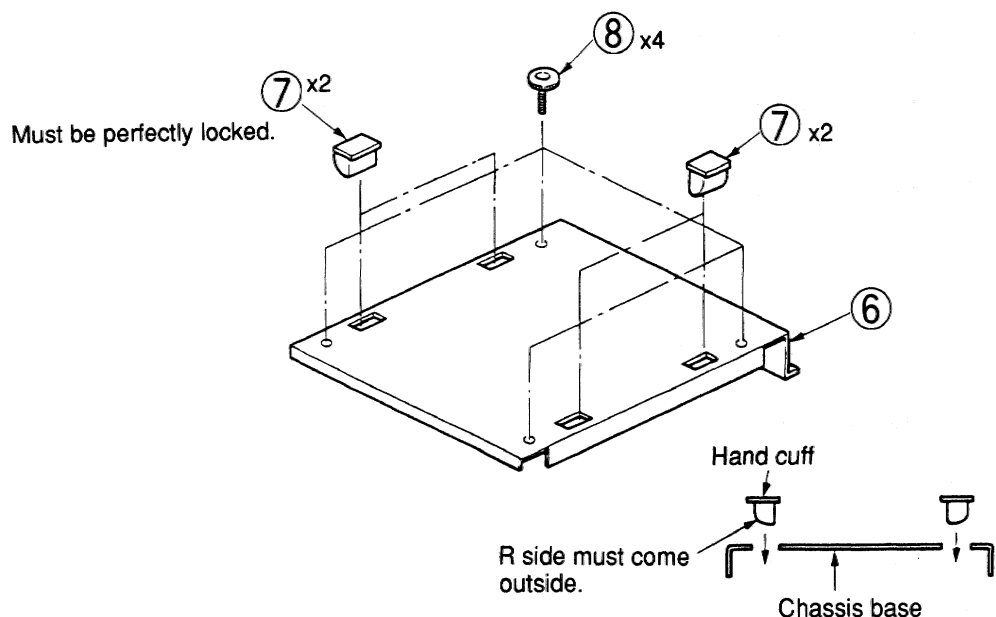
DISASSEMBLY

METHOD OF REMOVING THE CHASSIS



※ When assembling, tighten the screw (3) and then mount the side plate on the chassis base.

No.	Part Name	Designation	Q'ty
1	Side plate R	12511332	1
2	Side plate L	12511322	1
3	Screw (PL-CPIMS #6*20*3kF)	0910E6016	8
4	Lead clasper C	24282511	5
5	Screw (PL-CPIMS #4*10*15BF)	0910E4021	14
6	Screw (PL-CPIMS #3*8*15BF)	0910E3051	2
7	CRT fitting metal T	12511342	1



No.	Part Name	Designation	Q'ty
1	Lead clasper C	24282511	7
2	Screw (PL-CPIMS*3*8*15BF)	0910E3051	2
3	ON octal round terminal 350W, 1015-22	73399744	1
4	ON octal round terminal 425W, 1015-22	73399743	1
5	ON octal round terminal 600W, 1015-22	73399742	1
6	Chassis base ass'y	12511303	1
7	Hand cuff (T3, M-002)	12401441	4
8	Foot ass'y	012402171	4

ADJUSTMENT CONTENTS

I. SCOPE

Stand alone, 100" screen, NTSC/Video, RGB source, etc.

II. SERVICE (FIELD TECHNICIAN) ADJUSTMENTS

1. High Voltage Unit

NOTE: Performed Only when High voltage UNIT is replaced.

High-Voltage Adjustment

High-Voltage protect Adjustment

2. DEF PWB

NOTE: Performed when DEF PWB is replaced.

DEF PWB

H. OSC FREQ CHECK (Fine Adjustment)

H. Phase (1)

H. WID, V HGT, H&V LIN

H. Phase (2)

H. Phase, V POS, H WID V HGT Check

3. White Balance Procedure

NOTE: Perform when V4-DEC PWB, VIDEO OUT PWB, GAIN CTL PWB, or CRT is replaced.

Adjustment VRs Initial Settings

White Balance Preadjustment

White Balance Adjustment

4. Centering Magnets

Refer to Setup Guide Section Centering Magnet Adjustment Pages 3-23.

5. Focus Adjustment

Lens (Optical)

Electric (CRT)

C.P.C Magnets—C.P.C Magnet Adjustment Pages 3-24.

6. Convergence Adjustments

Refer to Setup Guide Section Convergence Adjustment Pages 3-29.

7. Switcher Connection

Signal Entry—Refer to Setup Guide Section Signal Entry Pages 3-6.

Size and Centering—Refer to Setup Guide Section Centering Magnet Adjustment Pages 3-23.

Convergence Check—Refer to Setup Guide Section Setting for Using Point Convergence Pages 3-58.

Focus Check—Refer to Setup Guide section Focus Adjustment Pages 3-20.

III. SERVICE (BENCH) ADJUSTMENTS

NOTE: These adjustments are performed when components have been replaced. Presetting these four PWBs will allow the Field Service Technician to "plug and play" at the customer's location saving time and expense in the process.

1. V4-DEC PWB (PWC-3683)5-41

2. SYSTEM PWB (PWC-3717)5-46

3. WAVE PWB (PWC-3719)5-50

4. POINT PWB (PWC-3718)5-52

5. TIMING DIAGRAMS5-55

6. PWB ADJUSTMENT POINT DIAGRAMS5-58

SERVICE (FIELD TECHNICIAN) ADJUSTMENTS

The Adjustment Procedures outlined on the following pages covers both the PG-6000/6000G/9000/9000G projectors.

1. Supply Voltage : AC 120V, 60Hz (PG-6000/9000)
2. Burn In. AC220~240V, 50Hz (PG6000G/9000G)
Allow the projector to warm up for a minimum of 20 minutes before performing any adjustment procedures.
3. Input Signals
 - (1) Video Inputs
Video signal : 1.0 Vp-p, 75Ω, positive
S-video signal : Y: 1.0 Vp-p, 75Ω, positive
C: 0.28 Vp-p, 75Ω burst level
 - (2) RGB Input
Video signal : 0.7 Vp-p, 75Ω, positive
Sync signal : 1.0 Vp-p, 75Ω, positive/negative
Sync On Green video signal : 0.7 Vp-p, 75Ω positive
Sync On Green sync signal : 0.3 Vp-p, 75Ω
Deflection frequency : H: 15-61kHz PG-6000/6000G
: H: 15-90kHz PG-9000/9000G
: V: 38-150Hz PG6000/6000G/9000/9000G
4. Screen
Be sure to use a 100" flat screen.
5. The projector is adjusted in Stand Alone configuration.
6. The Intelligent Switcher System ISS-6010/6010G should be properly adjusted in advance.
7. For detailed information about the operating method and installation location of the control section and remote control, refer to the relevant Instruction Manual.
8. Unless otherwise specified, the digital control picture shall be adjusted in a normalized state (brightness, color, and sharpness shall be 50%, and the tint shall be 0%, and the contrast shall be 75%).
9. With regard to the adjustment of the video signal input, the video mode shall be in the fixed MANUAL mode when using signals without the burst signal, namely, the monoscope signal, cross signal, crosshatch signal, dot signal, etc.

II. SERVICE (FIELD TECHNICIAN) ADJUSTMENTS

1. High-Voltage Adjustment

NOTE: Performed only when High voltage unit replaced.

High-Voltage Adjustment

① HV ADJ

- (1) Connect a high voltmeter to the HV CR block. Switch power on and apply an all-white NTSC signal input.
- (2) Adjust the high voltage to 32.0 ± 0.1 kV using VR5501 HV ADJ.
- (3) Inject silicon rubber into VR5501 to seal it. Measure the voltage mentioned in step (2) above, and check that it is 32.0 ± 0.1 kV.

② FREQ ADJ

- (1) Connect a digital voltmeter to the limiter current check terminal (HV CURR), and adjust CONTRAST, SCREEN UNIT VR until the voltage is 0.9 ± 0.1 V.
- (2) Connect a digital voltmeter to the following.
 - + side: HV PWB +15V line
 - side: TP5505 CTL terminal
- (3) Adjust the voltage to $*3.5 \pm 0.1$ V using VR5504 FREQ ADJ.
- (4) After that turn the VIDEO OUT PWB
 - VR3001 (R WHT REF)
 - VR3201 (G WHT REF)
 - VR3401 (B WHT REF)to the MIN position (fully counterclockwise).

High-Voltage Protect Adjustment

① HV Protect (2)

- (1) Connect a digital voltmeter to the following:
 - + end: TP5501 REF terminal
 - end: TP5503 HV protector (2) terminal
- (2) Supply an NTSC all white signal and set the brightness and contrast of remote control to the MAX position.
- (3) Adjust VR5503 HV PROTECT (2) to 0.15 ± 0.01 V.
- (4) Inject silicon rubber into VR5503 to seal it. Measure the voltage at HV PROTECT (2) above, and make sure that it is 0.15 ± 0.01 V.

② HV Protect (1)

- (1) Connect a digital voltmeter to the following:
 - + end: TP5501 REF terminal
 - end: TP5502 HV protect (1) terminal
- (2) Adjust VR5502 HV PROTECT (1) to 0.15 ± 0.01 V.
- (3) Inject silicon rubber into VR5502 to seal it. Measure the voltage at HV PROTECT (1) above, and make sure that it is 0.15 ± 0.01 V.

SERVICE (FIELD TECHNICIAN) ADJUSTMENTS

2. DEF PWB

DEF PWB

NOTE: Performed when DEF PWB is replaced.

1) Control VRs and Switch Settings

1)-1 Turn VR5004 fully counterclockwise, and set all other vcontrol VRs to their mechanical center.

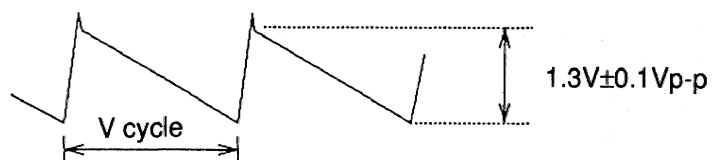
1)-2 Set S5002 to the ADJ position.

Also set S4201 to OFF position.

2) Vertical Height and Vertical Hold Adjustments

2)-1 Connect the vertical deflection yoke to connectors VR, VG and VB.

2)-2 Connect an oscilloscope to TP4003 and make adjustment so that the vertical sawtooth wave at VR4002 V-HEIGHT becomes 1.3 ± 0.1 Vp-p (The peak edge should be ignored in this case).



2)-3 The vertical sync is supplied from the HV connector.

HV PIN ③ : Vertical sync signal (See the figure shown below.)

HV PIN ⑨ : GND

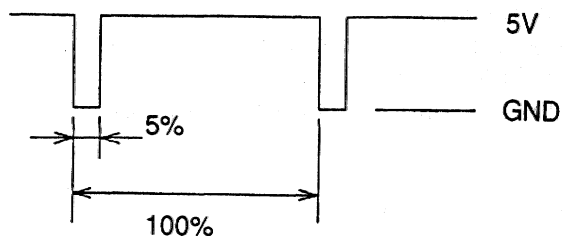


Fig. 2)-4

SERVICE (FIELD TECHNICIAN) ADJUSTMENTS

- 2)-4 Check to be sure that the sawtooth wave of TP4003 locks to the vertical sync signal when the 38 Hz or 150 Hz vertical sync signal is supplied.
- 2)-5 Pull the VG connector out and check to be sure that D4010 lights and that LP pin ① voltage is greater than 10Vdc.
- 2)-6 Make sure that the waveform of HV pin ② and that of DP pin ③ appear as shown in Fig. 2)-7.
- 2)-7 The waveform shown in Fig. 2)-7 moves back and forth with respect to the vertical sync signal when the voltage at DP pin ⑪ changes from 0-12V. (The trigger is vertical sync signal.)

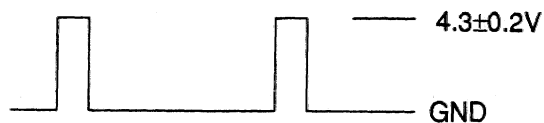


Fig. 2)-6

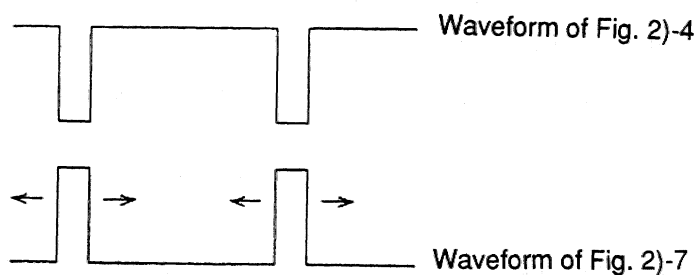


Fig. 2)-7

SERVICE (FIELD TECHNICIAN) ADJUSTMENTS

3) Horizontal Oscillation Adjustment

3)-1 The HV connector supplies the Horizontal sync signal.

HV pin ① Horizontal sync signal

HV pin ⑨ GND

Waveform is the same Fig. 2)-4

3)-2 Adjust VR5001 F/V CTL1 to 3.00 ± 0.02 V at TP5003 when the horizontal sync signal frequency is 30 kHz.

3)-3 Connect a frequency counter or oscilloscope to TP5005, and adjust VR5006 H.OSC(1) to 15.0 ± 0.2 kHz when the horizontal sync signal frequency is 15 kHz; VR5003 FV CTL(2) to 25.0 ± 0.2 kHz when the horizontal sync signal frequency is 25 kHz; VR5007 H.OSC(2) to 55.1 ± 0.2 kHz when the horizontal sync signal frequency is 55 kHz.

3)-4 Apply horizontal frequency signals of 15 kHz, 25 kHz, 55kHz, 61kHz and 90kHz and check to be sure that free run is within ± 200 Hz at the frequency below the frequency of 30kHz and within ± 300 Hz at the frequency below 30kHz.

3)-5 Set S5002 to the NORM position.

4) Horizontal Amplitude Adjustment

4)-1 Connect a horizontal deflection yoke to the HR, HG, and HB connectors.

4)-2 Adjust VR5005 H-WIDTH to $*1.8 \pm 0.1$ V at voltage of PA pin ②.

4)-3 Adjust VR5301 F/V so that the voltage becomes 3.00 ± 0.02 V at TP5303 when the horizontal sync signal frequency is 30kHz.

Note: Be sure to make adjustment after checking to be sure that the horizontal sync frequency at TP5305 is 30.00 ± 0.01 kHz.

4)-4 Check to be sure that when the power at pin ① of PA is removed, D5023 lights and that pin ① of LP becomes in excess of 10V.

4)-5 When the HG connector is removed and the power of 4)-2 is connected to pin ① of PA, check to make sure that D5023 remains lit.

4)-6 Remove the power at pin ① of PA once again and connect the HG connector for connection off and that pin ① of LP drops below 1V.

5) VR5002 H-POSITION Adjustment

5)-1 Make sure that pin ② of HV and pin ① of DP show the waveform of Fig. 2)-7.

5)-2 Check to be sure that VR5002 is set in the mechanical center.

5)-3 Make sure that the waveform of Fig. 2)-7 moves back and forth with respect to the horizontal sync signal when the voltage at pin ⑧ of DP is changed from 0 to 12V.

6) Horizontal Deflection Output Transistor Protective Circuit Adjustment

Connect a digital voltmeter to TP5007 (+ terminal) and TP5006 (- terminal), apply a 15-kHz signal input, and adjust VR5004 H-OUT PROTECTOR to 2.0 ± 0.1 V.

H. OSC FREQ CHECK (Fine Adjustment)

- 1) Horizontal Oscillation Frequency Check (Fine adjustment)
 - 1)-1 Set S5002 to the ADJ position.
 - 1)-2 Connect a frequency counter to TP5005.
 - 1)-3 Input signal 7 in RGB mode, and check with VR5006 H. OSC (1) that it is 15.0 ± 0.2 kHz.
 - 1)-4 Input signal 8, and check with VR5003 F/V CTL (2) that it is 25.0 ± 0.2 kHz.
 - 1)-5 Input signal 11, and check with VR5007 H. OSC (2) that it is 55.1 ± 0.2 kHz.
 - 1)-6 Disconnect the frequency counter, and set S5002 back to the NORM position.

H. Phase (1)

- 1) Horizontal Phase Adjustment 1 (Vertical phase added from MP)
 - 1)-1 Input NTSC split screen pattern in video mode. Display and use the projector generated coarse cross hatch pattern to make these adjustments.
 - 1)-2 Set CONTRAST to the MIN position.
 - 1)-3 Turn the G screen VR clockwise until the back raster appears.
 - 1)-4 Increase CONTRAST to output the monoscope pattern.
 - 1)-5 Adjust G-FOCUS of VR4202 on the DEF PWB.
 - 1)-6 Adjust VR5002 on the DEF PWB until the cross hatch pattern is centered within the raster. (The H-Position of remote controller is in the normalized state.)
 - 1)-7 Adjust G-centering MG against the screen center.
(Coarse adjustment)
Carefully note the horizontal line of crosshatch, etc. (in tilt direction) and turn the deflection yoke when any tilt is found.)
 - 1)-8 Switch to RGB and receive signal 15 VGA480 crosshatch and adjust H-LINEAR and V-LINEAR.
 - 1)-9 Adjust H-POSITION and V-POSITION so that the cross hatch comes to the center of the raster.

H. WID, V HGT, H&V LIN

- 1) Horizontal width, Vertical Height, Horizontal and Vertical Linearity Adjustments
 - 1)-1 Input NTSC split screen pattern in video mode. Display and use the projector generated coarse cross hatch pattern to make these adjustments.
 - 1)-2 Adjust H-LINEAR and V-LINEAR to make the horizontal and vertical linearities uniform.
 - 1)-3 With H-AMPLITUDE set to the MAX position, adjust VR5005 H-WIDTH on the DEF PWB to 10% overscan.
 - 1)-4 Switch to RGB and receive signal 15 VGA480 character H.
 - 1)-5 Adjust H-Amplitude and V-Amplitude so that 5% underscan is observed on the screen.
After that, check to be sure that Linear, Position (both H and V) with respect to the raster and make necessary fine adjustment, when and if necessary.
Note: Adjustment of amplitude, phase, and linearity should be done by G signal tube.

H. Phase (2)

- 1) Adjustment of Amplitude, Phase, and Electrical Focus (VIDEO)
 - 1)-1 Receive a 525 monoscope signal with the VIDEO.
 - 1)-2 Adjust H-Position and V-Position so that the cross hatch pattern is centered within the raster.
 - 1)-3 Adjust H-Amplitude so that 5% overscan is observed on the screen. Also adjust V-Amplitude in such a way that V-Amplitude is balanced.
 - 1)-4 Check the H-Linearity and V-Linearity and make fine adjustment.
 - 1)-5 Adjust the center focus and the edge focus. But the R center focus must be set with special attention to the worst focus at four corners of the screen. (Make sure that G and B are in center.)
 - 1)-6 Receive the 625 cross hatch pattern and similar make adjustment.
 - 1)-7 After adjustment, turn S4201 on.
(To obtain satisfactory white uniformity, When adjusting the B-Center Focus from the remote controller, be sure to turn S4201 off in advance.)

SERVICE (FIELD TECHNICIAN) ADJUSTMENTS

H. Phase, V POS, H WID, V HGT Check

Checking Horizontal Phase, Vertical Position, Horizontal Amplitude, and Vertical Amplitude

1) Horizontal Phase, Vertical Position

Check that the center of each signal meets the center of the screen.

2) Horizontal Amplitude, Vertical Amplitude

- 2)-1 Receive the 525 cross hatch pattern and check to be sure that the horizontal amplitude is 5% overscanned and that the vertical amplitude is balanced.
- 2)-2 Receive the 625 cross hatch pattern and check to be sure that the horizontal amplitude is 5% overscanned and that the vertical amplitude is balanced.
- 2)-3 Receive signal 15 VGA480 H character, and check that horizontal and vertical amplitude show 5% underscan.

3. White Balance Procedure

Perform when V-DEC PWB, Video Out PWB, GAIN CTL PWB or CRT is replaced.

Adjustment VRs Initial Settings

- GAIN CTL PWB

WHT P. LEVEL	(VR7001)	Mechanical center
BKG LEVEL	(VR7005)	
R WHT P.	(VR7006)	
G WHT P.	(VR7007)	
B WHT P.	(VR7008)	
SUB CONT	(VR7009)	

- VIDEO OUT PWB

R WHT REF	(VR3001)	Mechanical center
R BLK REF	(VR3002)	MIN (fully counterclockwise)
R SUB BRT	(VR3003)	Mechanical center
R DRV RET	(VR3005)	
R WHT 2	(VR3007)	
R BLK 2	(VR3008)	
R BLK SIG	(VR3009)	
R OS	(VR3010)	
G WHT REF	(VR3201)	Mechanical center
G BLK REF	(VR3202)	MIN (fully counterclockwise)
G SUB BRT	(VR3203)	Mechanical center
G DRV RET	(VR3205)	
G WHT 2	(VR3207)	
G BLK 2	(VR3208)	
G BLK SIG	(VR3209)	
B WHT REF	(VR3401)	Mechanical center
B BLK REF	(VR3402)	MIN (fully counterclockwise)
B SUB BRT	(VR3403)	Mechanical center
B DRV RET	(VR3405)	
B WHT 2	(VR3407)	
B BLK 2	(VR3408)	
B BLK SIG	(VR3409)	
B OS	(VR3410)	

S3601 (AKB TEST/NORM) TEST position

SERVICE (FIELD TECHNICIAN) ADJUSTMENTS

- Each R, G, B Screen VR Minimum (Fully Counterclockwise)
MIN (fully counterclockwise) for both R, G, B
- DEF PWB

R FOCUS	(VR4201)] Mechanical center
G FOCUS	(VR4202)	
B FOCUS	(VR4203)	

S4201 (DEFOCUS) OFF

- Normal control mode
- On-screen manual mode (AKB ON)
- Projector Stand Alone mode
- Main power ON standby mode
- Video switching during power ON

Remote Controller

Unless otherwise specified, set the BRIGHT, COLOR, and SHARPNESS controls to the center (50%) position, the TINT control to the 0% position, and the CONTRAST control to the 100% position in pre-adjustments, and store these settings in the memory.

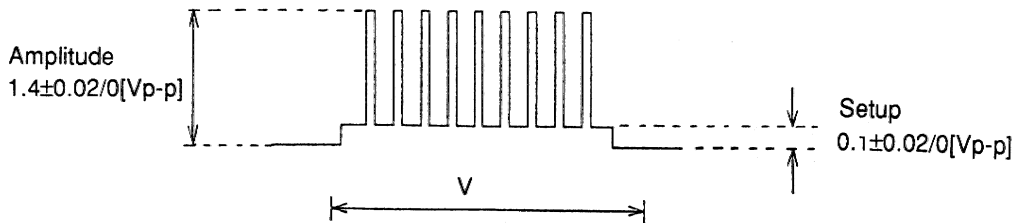
After the pre-adjustments, set CONTRAST to 75% and store this setting in the memory.

SERVICE (FIELD TECHNICIAN) ADJUSTMENTS

White Balance Preadjustment

* The trigger of oscilloscope can be made easier to see by bringing an other probe into contact with DEF PWB TP4001(VD).

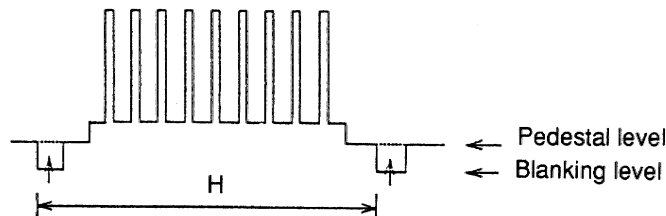
- ① Apply an NTSC cross hatch signal input. Set CONTRAST to MAX on the remote controller, and store it in the memory. Set the VIDEO mode to NTSC 3.58.
- ② Check the emitter of Q715 on the V4-DEC PWB that the waveform is as shown in the figure below. (Use an extension PWB for the V4 DEC PWB.)



If any deviation is found, adjust VR702 for amplitude and VR812 for setup on the V4-DEC PWB.

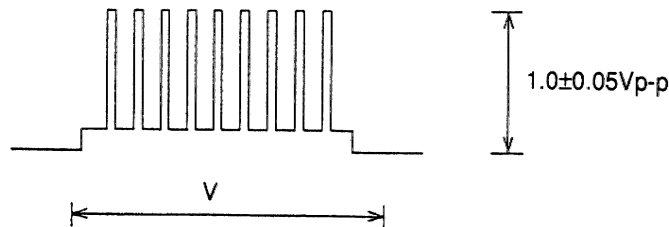
- ③ Check TP7006 (G-channel OUT) on the GAIN CTL PWB, and adjust as follows:
 - (1) Adjust VR7001 (BKG LEVEL) until the blanking level is the same as the pedestal level (± 0.05 V).

(Trigger: H period)

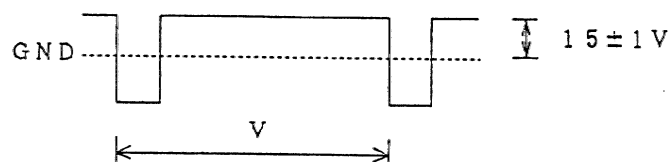


- (2) Adjust VR7009 (SUB CONT) until the cross hatch signal is 1.0 ± 0.05 Vp-p.

(Trigger: V period)



- ④ Check TP7721 (G1) (G: TP7722; B: TP7723) on the R CRT PWB, and adjust VR3002 (R BLK REF) (G: VR3202; B: VR3402) on the video OUT PWB. (See the figure below.)



Similarly adjust the G and B channels.

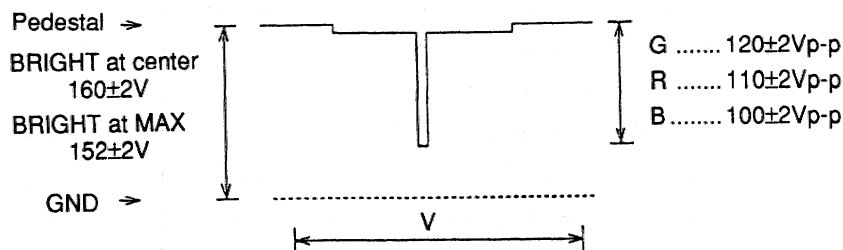
- ⑤ Check TP7711 (cathode) (G: TP7712; G: TP7713) on the R CRT PWB, and adjust as follows:
- (1) Adjust the pedestal to 160 ± 2.0 V using VR3003 (R SUB BRT) (G: VR3203; B: VR3403) on the VIDEO OUT PWB.
 - (2) Adjust the cross hatch signal amplitude to 120 ± 2 Vp-p using VR3001 (R WHT REF) (G: VR3201; B: VR3401).
 - (3) With the brightness raised to the maximum on the remote controller, adjust the pedestal to 152 ± 2 V using VR3005 (R DRV RET) (G: VR3205; B: VR3405).

Similarly adjust the G and B channels.

Adjust the cross hatch signal amplitude for the R and B channels as follows:

R channel 110 ± 2 Vp-p (VR3001)

B channel 100 ± 2 Vp-p (VR3401)



* Adjust the brightness to normal.

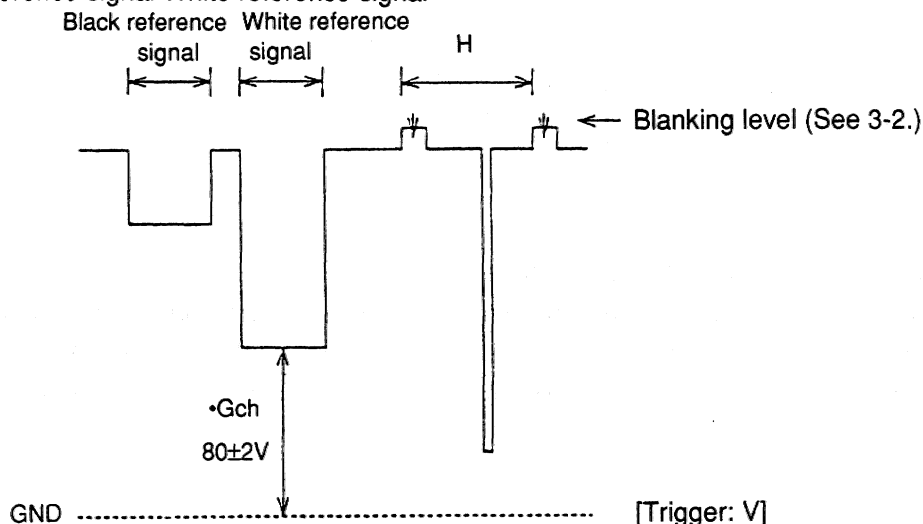
- ⑥ Check TP7712 (cathode) on the G CRT PWB, and adjust as follows:
- (1) Adjust the white reference signal level to 80 ± 2 V using VR7005 (WHT P LEVEL) on the GAIN CTL PWB.
 - (2) Adjust the blanking level to be the same as the pedestal level using VR7001 (BKG LEVEL). (See 3-2.)
 - (3) With the brightness raised from the center position to the maximum on the remote controller, adjust VR7007 (G WHT P) on the gain CTL PWB so that the white reference signal peak will stay still against GND.

"If the white reference signal peak moves in the direction opposite to the pedestal, turn VR7007 counter-clockwise. If it moves in the same direction as the pedestal, turn VR7007 clockwise."

If the white reference signal peak is not 80 ± 2 V, return to step (1).

- (4) With the brightness raised from the center position to the maximum, watch the cathode and adjust VR7006 (R WHT P) for the R channel and VR7008 (B WHT P) for the B channel on the gain CTL PWB so that the white reference signal level remains constant. (It is not necessary to adjust the white reference signal amplitude for the R and B channels.)

Black reference signal White reference signal



- ⑦ Normalize the brightness and contrast BRIGHT at the center position and CONTRAST at 75%) with the remote controller, and store the settings in the memory.

SERVICE (FIELD TECHNICIAN) ADJUSTMENTS

White Balance Adjustment

1) Setting

- ① Supply a NTSC split field gray scale pattern.
- ② Set the VIDEO OUT PWB S3601 to the TEST position.
- ③ Set the CONTRAST to the MAX position and store the new setting.
- ④ Set the VIDEO mode to NTSC 3.58.
- ⑤ Turn AKB ON on the Source Information screen.
- ⑥ Check to be sure that color temperature is 6500 k (initial value) on the Source Information screen.
- ⑦ Cool the radiator of the VIDEO OUT PWB by means of a fan.

2) Put the cap on R-CRT and B-CRT and adjust the G-CRT screen VR so that there is clear distinction between 10% and 5% and that the screen will appear similarly dark at 5% and 0% with special attention to the upper grayscale in the center of the G-CRT monoscope.

3) ① Remove the cap of the R-CRT and B-CRT and reduce the contrast using the remote controller then adjust the R-CRT and B-CRT so that the white balance becomes quite satisfactory with special attention paid to the grayscale in the center of the NTSC split field gray scale pattern.

(Because the G-CRT is standard, do not move the G-CRT screen VR.)

Note: Take a balance at two points below on the grayscale in the center of the NTSC split field gray scale pattern:

(A) When contrast is 5% Outermost side (bright)

(B) When contrast is 75% Innermost side (dark)

For practical reason, preference must be given to (B).

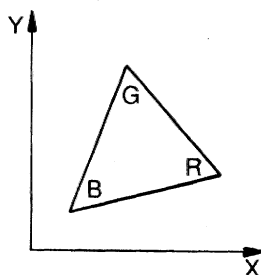
② Set the contrast to the MAX position, measure the color temperature, and adjust the R WHT REF (VR3001) and B WHT REF (VR3401) as follows until the following values are obtained.

$$X = 0.335 \pm 0.01$$

$$Y = 0.325 \pm 0.01$$

Note: When R is increased, the value of X increases.

Also, when B is increased, the values of both X and Y are decreased.



③ Repeat steps ① and ② and take the contrast tracking.

After that, supply a crosshatch signal at the maximum contrast and keep the amplitude of each cathode on record. Check to be sure that each amplitude value does not exceed 125Vp-p. If the amplitude exceed the said value, reduce the cathode amplitude of the G-CRT slightly using VR3201 and take step 3). (Refer to 10.)

- 4) Receive the NTSC cross hatch pattern and check the onscreen white balance on the Source Information screen, etc. If the white balance does not track properly, adjust the following.

R OS (VR3010)

B OS (VR3410)

on the VIDEO OUT PWB.

(Hereafter, the adjustment of the afore-mentioned VRs must not be made.)

- 5) Observe the cathode on the each CRT PWB of R, G, and B and adjust the following VRs on the VIDEO OUT PWB as indicated below:

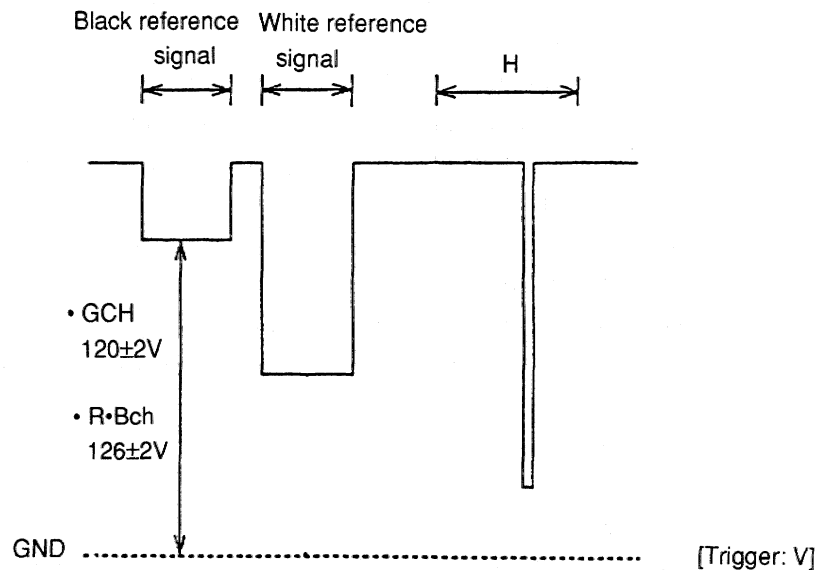
G ch $120 \pm 2V$

R, B ch $126 \pm 2V$

VRs used: R BLK SIG (VR3009)

G BLK SIG (VR3209)

B BLK SIG (VR3409)



- 6) Set the VIDEO OUT PWB S3601 to the NORM position and supply NTSC cross hatch pattern.
- 7) Observe G1 each CRT PWB of R, G, and B using a digital voltmeter and adjust each VR indicated below until the voltage is $14 \pm 1V$.

R BLK 2 (VR3008)

G BLK 2 (VR3208)

B BLK 2 (VR3408)

Note: Because G1 tends to be varied depending upon the brightness (APL) of the screen, make necessary adjustment after stabilizing (after about two minutes) it with the NTSC cross hatch pattern.

- 8) Supply an NTSC crosshatch signal, observe the cathode on the CRT PWB, and adjust the amplitude to just the same as that rescored in step 3)-③ using the belowmensioned VRs on the VIDEO OUT PWB: (Make the waveform of the NORM side cathode exactly the same as that on the TEST side cathode.)

R WHT 2 (VR3007)

G WHT 2 (VR3207)

B WHT 2 (VR3407)

SERVICE (FIELD TECHNICIAN) ADJUSTMENTS

- 9) Supply a NTSC split field color bars, set the contrast to a maximum, and stabilize it properly. After that, check the voltage of G1 and make necessary readjustment. (Refer to step 7.)
- 10) Measure the color temperature at the portion (white portion) from where the peak voltage is appearing at a point near the center of the monoscope screen and check to be sure that the following adjustment is made:

$$X = 0.335 \pm 0.01$$

$$Y = 0.325 \pm 0.01$$

Note: If the standard values are slightly exceeded, fine adjustment may be made using as follows.

R WHT 2 (VR3007)

B WHT 2 (VR3407)

However, if the said values are adjusted too much, the cutoff white balance may be lost.

If each voltage waveform of cathode G1 on the NORM position of S3601 is made the same as that on the TEST position, the value may well come within the standard value. Therefore, check to be sure in advance that the TEST-NORM are exactly the same by using the VR.

After that, supply a crosshatch signal, observe the cathode of each CRT, and check to be sure that the amplitude should not exceed 125Vp-p.

If the amplitude is 125Vp-p or more, adjust it to 125Vp-p using VR3007, VR3207, and VR3407.

After that, measure the color temperature, adjust the cathode amplitude of G-CRT if the value has exceeded the standard (± 0.01), and cause the value of Y to reduce somewhat to meet the standard, and then make adjustment of step 9) once again.

Note: Because the cathode amplitude of G-CRT adversely affect the peak luminance to a considerable extent, the amplitude should be reduced to a minimum.

- 11) Turn the AKB OFF on the monoscope screen and store the new setting.
- 12) Measure the color temperature with the brightness set to the MAX position and MIN position and adjust runout with respect to the center using as follows.

R DRV RET (VR3005)

G DRV RET (VR3205)

B DRV RET (VR3405)

(When VR is set in the MAX position, turn VR clockwise to increase; turn it counterclockwise to decrease.

When the VR is set in the MIN position, the reverse of the foregoing applies.)

Care should be taken to set with R and B as much as possible.

- 13) Set the BRIGHT VR to the center and the CONTRAST VR to 75% and store it (for normalization).

Also, set the VIDEO mode to the AUTO position.

- 14) Supply the following signal and turn AKB off from on on the information screen and store it.

- NTSC 4.43

- PAL

- SECAM

- VGA480

4. Centering Magnets Adjustments

Refer to Setup Guide Section Centering Magnet Adjustment Pages 3-23.

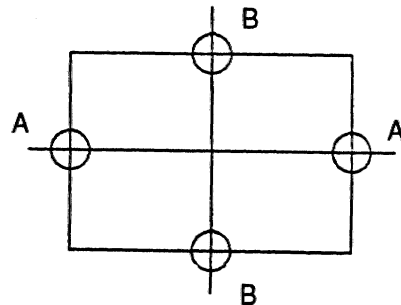
5. Focus Adjustment

Lens (Optical)

- (1) Receive signal 15 VGA480 H character in RGB mode.
- (2) Display only the G-CRT.
- (3) Watch the center part, and adjust the G-CRT lens focus knob.
- (4) Watch the peripheral part, and adjust the G-CRT lens peripheral focus knob.
- (5) After that, turn the center focus knob once again and make readjustment so that the balance between the center focus and the peripheral focus becomes the best.
- (6) Make a similar adjustment for the R and B CRTs.

Electric (CRT)

- (1) Receive NTSC split screen pattern in video mode.
- (2) Check that G-CENTER FOCUS on the remote controller is at 50%, and adjust VR4202 on the DEF PWB, watching the center.
- (3) Watch part A, and adjust G-H-EDGE FOCUS.
- (4) Watch part B, and adjust G-V-EDGE FOCUS, and store the setting.



- (5) If the center focus is adversely affected, repeat steps (3) to (5).
- (6) Adjust the CPC Mg 4 poles finely (with the H character and the just focus state and make the entire focus equal)
- (7) Repeat steps 2) through 6) if necessary and adjust the focus to the optimum state.
- (8) Just as in the case of step 3) for R and B, adjust VR4201 and VR4203.

Note1: With regard to R, adjust VR4201 so that the center-peripheral focus is well balanced. (Only in case of VGA480).

Note2: At the time of B adjustment, make sure that the DEF PWB FOCUS SW S4201 is placed in the OFF state.

C.P.C Magnets

Refer to Setup Guide Section C.P.C Magnet Adjustment Pages 3-24.

SERVICE (FIELD TECHNICIAN) ADJUSTMENTS

6. Convergence Adjustment

Refer to Setup Guide Section Convergence Adjustment Pages 3-29.

7. ISS Switcher Connection

Signal Entry

Refer to Setup Guide Section Signal Entry Pages 3-6.

Size and Centering

Refer to Setup Guide Section Centering Magnet Adjustment Pages 3-23.

Convergence Check

Refer to Setup Guide Section Setting for Using Point Convergence Pages 3-58.

Focus Check

Refer to Setup Guide Section Focus Adjustment Pages 3-20.

III. SERVICE (BENCH) ADJUSTMENTS

1. V4-DEC PWB (PWC-3683)

Items

- ① Preparations
- ② Blanking Position Adjustment (VR705)
- ③ Contrast Level Adjustment (VR702, VR703)
- ④ PAL Comb Filter Adjustment (VR701, T701)
- ⑤ PAL Chroma Adjustment (T752, VR811) (1H DLY Adjustment)
- ⑥ SECAM Chroma Adjustment (T801, T802, T803, T804, VR813)
 - (1) Bell filter adjustment (T801)
 - (2) SECAM ID adjustment (T802)
 - (3) R-Y, B-Y demodulation adjustment (T803, T804, VR813)
- ⑦ Tint Adjustment (VR814)

① Preparations

- Input signals

- (1) Video signal:

NTSC 3.58	color bars
NTSC 4.43	color bars
PAL	color bars
SECAM	color bars

Note: Unless otherwise specified, NTSC 3.58 color bars will be used as video signal.

- (2) S-video signal: NTSC 3.58 color bars

- Preparations

- (1) Terminate the quad decoder output at 75 ohms. (Connect it to a monitor.)
- (2) Turn all the variable resistors (VRs) to the mechanical center position.

SERVICE (BENCH) ADJUSTMENTS

Table 3-1-1

MODE	07A	07B	06A
PAL	LOW	H1	HI
NTSC 4.43	LOW	LOW	HI
NTSC 3.58	LOW	LOW	LOW
SECAM	LOW	HI	LOW
AUTO	HI	LOW	LOW

Note: HI means +5 V and low 0 V.

- ② Blanking Position Adjustment (VR705)
Setup level adjustment (VR812)
- (1) Disconnect external signals.
 - (2) Connect a probe to the emitter of Q715.
 - (3) Turn VR812 fully counterclockwise to increase the brightness all the way.
 - (4) Adjust VR705 until the green waveform is $8+0/-1$ [usec] as shown in Figure 3-2-1.
 - (5) Also adjust VR812 until the setup level is $0.1+0.02/-0$ [Vp-p] as shown in Figure 3-2-1.

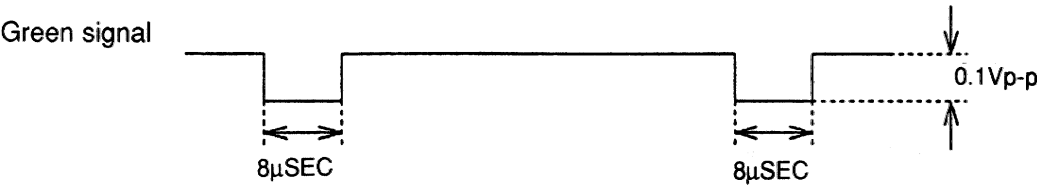


Figure 3-2-1 Green Signal Blanking Waveform

③ Contrast Level Adjustment (VR702, VR703)

- (1) Input an NTSC color bars signal.
- (2) Turn VR703 fully counterclockwise.
- (3) Adjust VR702 until the emitter output of Q715 is $1.4 \pm 0.1/0$ [Vp-p] as shown in Figure 3-1-1.

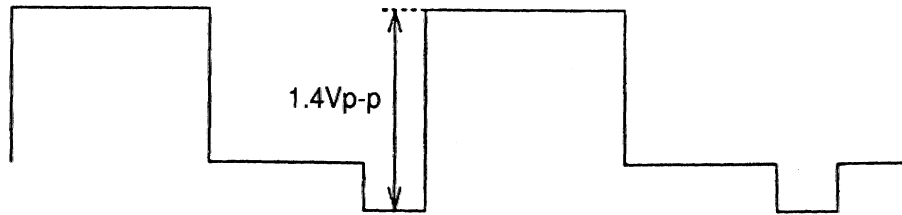


Figure 3-1-1 Green Signal Level

④ PAL Comb Filter Adjustment (VR701, T701)

- (1) Set the quad decoder to manual PAL mode, and input a PAL color bar signal.
- (2) Connect an oscilloscope to pin 7 of IC709, and adjust T701 and VR701 until the color signal component (4.43 MHz) is minimum while watching the waveform.

⑤ PAL Chroma Adjustment (T752, VR811) (1H DLY adjustment)

- (1) Turn the color VR to the maximum position, and receive the DEM signal.
- (2) Connect an oscilloscope to TP803 via the pad shown in Figure 3-5-1.
- (3) Turn T752 to adjust the first wave of each line to the same height. (Figure 3-5-2 (a))
- (4) Turn VR811 to adjust the third wave of each line to the same height. (DELAY) (Figure 3-5-2 (b))
- (5) Lower the brightness of the monitor connected, and check that there is no blind. If there is, repeat the adjustment steps of (2) to (4).

Note: If the adjustment has been properly made, the lower four windows of the test signals will be grey and the upper four windows color when the DEM signal is received from the PM5519.

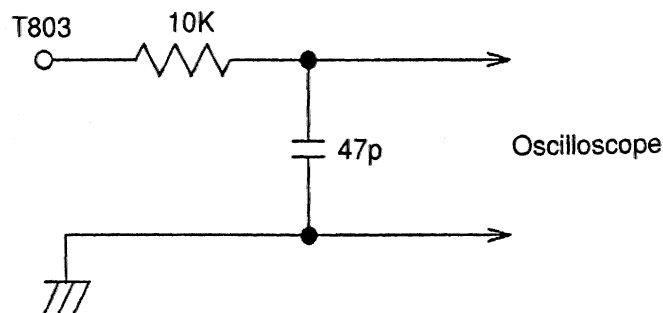


Figure 3-5-1 Pad

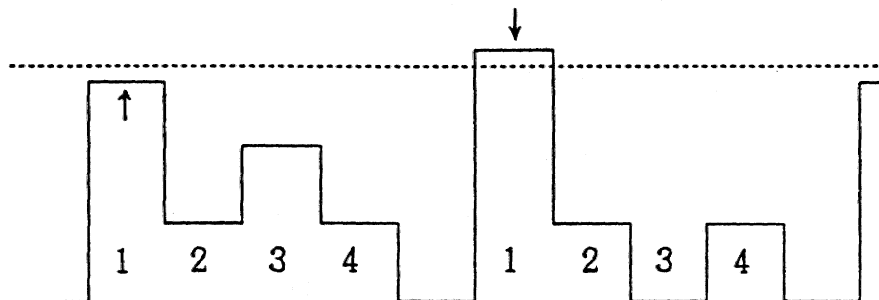


Figure 3-5-2 (a) Before Adjustment

SERVICE (BENCH) ADJUSTMENTS

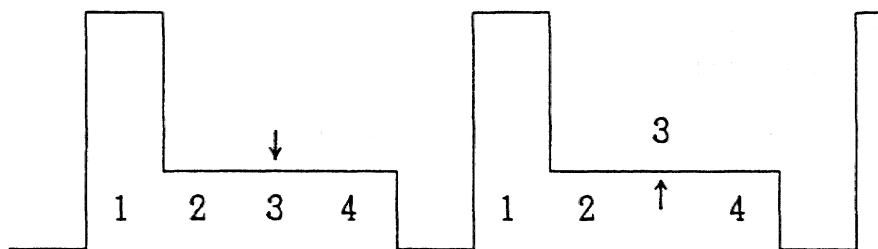


Figure 3-5-2 (b) After Adjustment

⑥ SECAM Chroma Adjustment (T801, T802, T803, T804, VR813)

(1) Bell filter adjustment (T801)

1)-1 Set the quad decoder system to the manual SECAM mode.

1)-2 Input a SECAM test signal (color bars).

1)-3 Connect an oscilloscope to TP801 (pin 18 of IC701), and adjust T801 until the levels are the same every 1H.

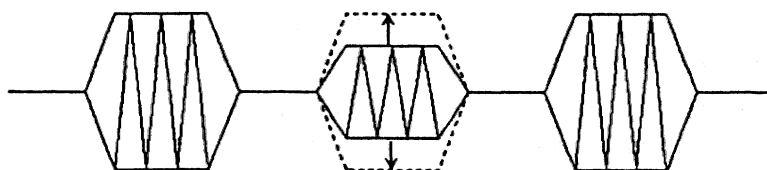


Figure 3-6-1 SECAM Chroma Signal

(2) SECAM ID adjustment (T802)

2)-1 Connect a "DMM" and an oscilloscope to the SECAM IDENT output terminal (T802).

2)-2 Adjust T802 until the DC+AC components of the wave form reach the maximum (about 8.5 [V_{DC}]).
The test screen appears tinted.

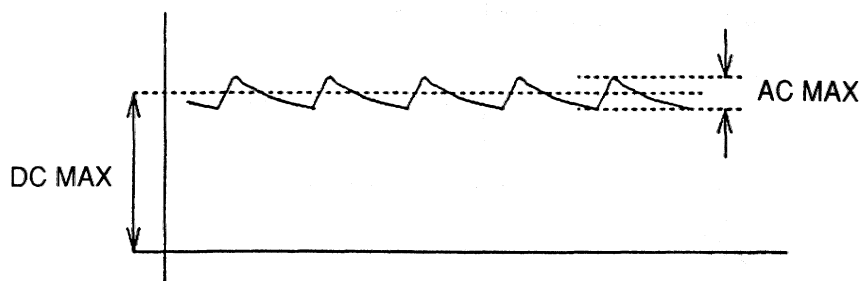


Figure 3-6-2 SECAM IDENT Waveform

(3) R-Y, B-Y demodulation adjustment (T803, T804, VR813)

3)-1 Receive a SECAM color bar signal.

3)-2 Turn COLOR to the maximum position.

3)-3 Connect an oscilloscope to TP803.

3)-4 Adjust T803 to adjust the white level as indicated by the dotted lines in Figure 3-6-3 (a).

3)-5 Connect an oscilloscope to TP804.

3)-6 Adjust T804 to adjust the white level as indicated by the dotted lines in Figure 3-6-3 (b).

3)-7 Receive a SECAM slide signal, and adjust VR813 so that the background color will be the same as the color of the PAL slide signal. If necessary, adjust T803 and T804.

Note: Steps 3)-1 to 3)-6 constitute the primary adjustment, and step 3)-7 is the final adjustment.

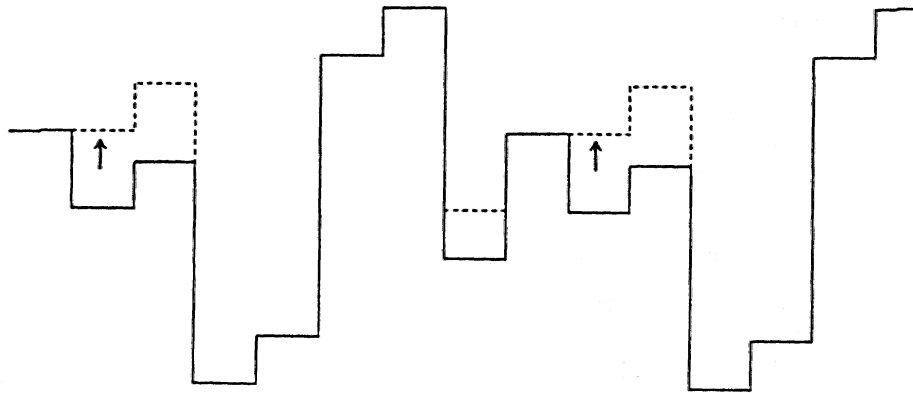


Figure 3-6-3 (a) R-Y Signal

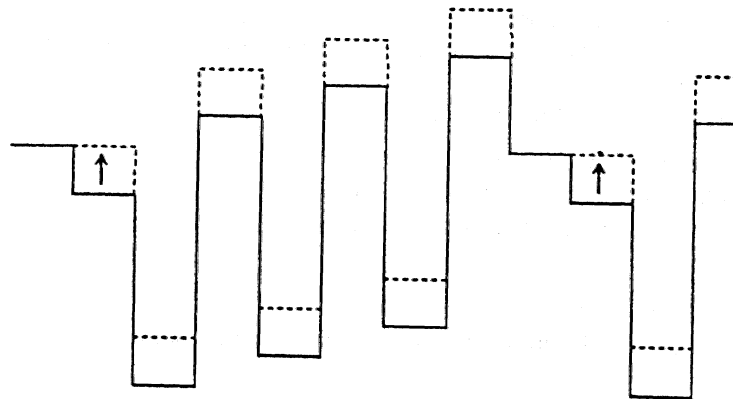


Figure 3-6-3 (b) B-Y Signal

⑦ Tint Adjustment (VR814)

- (1) Select the Video Input PWB (SW-S1) to the manual NTSC mode.
- (2) Input the NTSC 3.58 color bar signal.
- (3) Adjust VR814 to $6.0 \pm 0.1 V_{DC}$ at test point.

Connector EH pin 5 set your scope probe to X1 (75 Ω) to perform this adjustment.

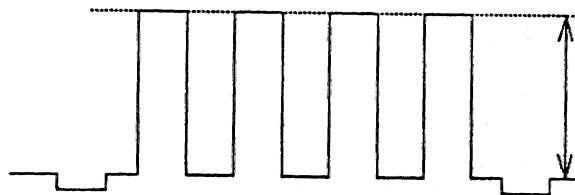


Figure 3-7-1 B Signal

SERVICE (BENCH) ADJUSTMENTS

2. SYSTEM PWB (PWC-3717)

① Switch Settings

- (1) Set S8212 to the OFF position.
- (2) Set S8221 to the RS-232C position.
- (3) Set S8222 to the RS-422 position.

② Initializing EROM

- (1) Apply the following voltages to the connectors specified.

Connector SV-30, 31-A, B, C	+5±0.2 V
Connector SV-29-B, C	+5±0.2 V
Connector SV-32-A, B, C	GND
Connector SV-25-B, C	+15±0.2 V
Connector SV-27-B, C	-15±0.2 V
Connector SV-26-B, C	GND

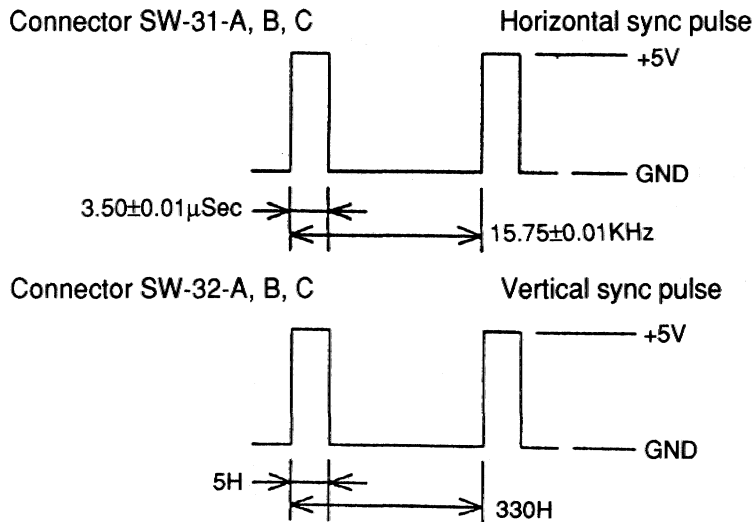
- (2) Switch power on, and check that "EE" appears on the 7-segment LED.
("EE" appears only when power is switched on for the first time, not in subsequent switching operations. Thus, this step may be omitted.)
- (3) Check that the LED displays "00" in about 7 seconds.

③ Calendar/Timer Oscillation Frequency Adjustment

- (1) Connect a frequency counter via a resistor of 10 k Ω in series to the X8211 terminal (IC8222 pin ⑱).
- (2) Adjust trimmer capacitor C8212 until the oscillation frequency is 32.768 kHz±1.0 Hz.

④ PLL Adjustment

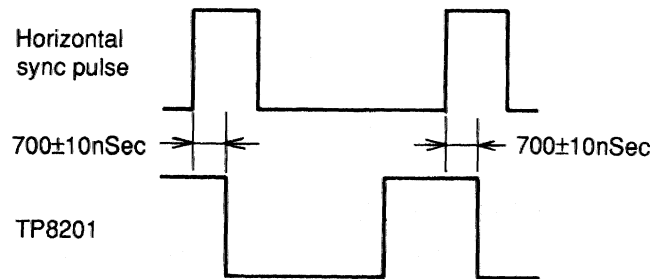
- (1) Connect a voltmeter to pin ② of IC8245.
- (2) Input the special 15.75kHz signal to the front control panel's RGB connectors.



- (3) Turn VR8201 to counterclockwise fully.
- (4) Connect an oscilloscope to TP8201, and adjust L8201 to align TP8201's waveform to the horizontal input sync pulse.
- (5) Adjust L8201 so that the display of the 7-segment LED becomes 80.

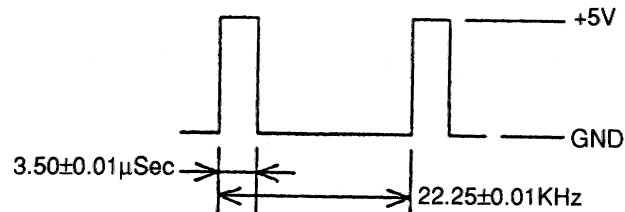
SERVICE (BENCH) ADJUSTMENTS

- (6) Adjust VR8201 in such a way that the phase of the waveform of TP8201 is delayed to the extent of 700 ± 10 nsec. with respect to the input horizontal sync pulse.

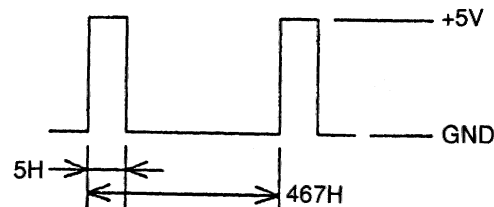


- (7) Adjust L8301 finely so that the display of the 7-segment LED becomes 80.
 (8) Check to be sure that the voltage at pin ② of IC8245 is $2.5 \pm 0.2 \text{ V}$.
 (9) Change the input signal to the following signal and it to each section.

Connector SW-31-A. B. C Horizontal sync pulse (22.25kHz)



Connector SW-32-A. B. C Vertical sync pulse (60Hz)



- (10) Just as in the case of step 4), make coarse adjustment of L8202 so that the horizontal sync pulse fed can be synchronized with the waveform of TP8201.
 (11) Adjust L8202 finely so that the display of the 7-segment LED becomes 80.
 (12) Check to be sure that the voltage at pin ② of IC8245 is $2.5 \pm 0.2 \text{ V}$.

SERVICE (BENCH) ADJUSTMENTS

⑤ On-screen Output Check

(1) Connect the following output signals to the jig display.

Connector SV-9-C	R on-screen output
Connector SV-10-C	G on-screen output
Connector SV-11-C	B on-screen output
Connector SV-12-C	Test pattern output
Connector SV-13-C	Blanking pattern output

(2) Input the following sync signals to the connectors specified.

Connector SW-31-A, B, C	Horizontal sync pulse (15.75 kHz)
Connector SW-32-A, B, C	Vertical sync pulse (60 Hz)

(3) Check the characters and test pattern shown on the jig display are normal.

⑥ Memory Check

(1) Start the memory check program.

(2) Verify error free operation.

⑦ RS-232C Input/Output Serial Port Check

(1) Connect the RS-232C input/output of a jig personal computer to the following connectors.

Connector SW-14-B	RS-232C CTS input
Connector SW-15-B	RS-232C RXD input
Connector SW-16-B	RS-232C RTS output
Connector SW-17-B	RS-232C TXD output

(2) Start the serial port check program.

(3) Verify error free operation.

⑧ RS-422 Input/Output Serial Port Check (1)

(1) Set S8221 to the RS-422/485 position.

(2) Set S8222 to the RS-422 position.

(3) Connect the RS-422 input/output of a jig personal computer to the following connectors.

Connector SW-15-B	RS-422 RXD (negative) input
Connector SW-15-C	RS-422 RXD (positive) input
Connector SW-17-B	RS-422 TXD (negative) output
Connector SW-17-C	RS-422 TXD (positive) output

(4) Start the serial port check program.

(5) Verify error operation.

⑨ RS-422 Input/Output Serial Port Check (2)

- (1) Connect the RS-422 input/output of a jig personal computer to the following connectors.

Connector SW-10-B	RS-422 RXD (negative) input
Connector SW-10-C	RS-422 RXD (positive) input
Connector SW-8-B	RS-422 TXD (negative) output
Connector SW-8-C	RS-422 TXD (positive) output

- (2) Start the serial port check program.

- (3) Verify proper operation.

⑩ TTL Level Input/Output Serial Port Check

- (1) Connect the TTL serial port input/output of a jig personal computer to the following connectors.

Connector SW-28-A	TTL RXD input
Connector SW-28-B	TTL TXD output

- (2) Start the serial port check program.

- (3) Verify proper operation.

⑪ Parallel port Input/Output Check

- (1) Connect the parallel port and output of the personal computer for jigs to each connector.

- (2) Start the parallel port check program.

- (3) Check that the parallel port check results shown on the jig display screen are free of errors.

⑫ Remote Controller Input Check

- (1) Input remote controller signals to the following connectors.

Connector SW-2-B
Connector SW-2-C

- (2) Start the remote controller check program.

- (3) Check that the remote controller reception check results shown on the jig display are free of errors.

SERVICE (BENCH) ADJUSTMENTS

3. WAVE PWB (PWC-3719)

Apply input signals of a horizontal frequency of 15.75 kHz and vertical frequency of 60 Hz.

- ① WAVE Waveform Amplitude Adjustment (Use a digital voltmeter for measurement.)
 - Horizontal direction: Adjust VR8401 until the output of pin ②⑤ of IC8401 is $0.75 \pm 0.01 V_{DC}$.
 - Vertical direction: Adjust VR8402 until the output of pin ②⑦ of IC8401 is $0.75 \pm 0.01 V_{DC}$.
- ② Sine Wave Adjustment

Sine wave adjustment is the same in horizontal and vertical directions. The following adjustment steps refer mainly to adjustment in horizontal directions except for those in brackets [] which apply to adjustment in vertical directions. (Use an oscilloscope for measurement.)

 - (1) Adjust VR8403 [VR8404] until the parabola waveform (DC range) at pin ① [pin ⑧] of IC8421 appears as shown in Figure 1.
 - (2) Adjust VR8407 [VR8408] until the waveform (AC range) at pin ⑭ [pin ⑧] of IC8424 appears as shown in Figure 3.
 - (3) Adjust VR8403 [VR8404] so that the part marked ☆ of the waveform shown in Figure 3 will be horizontal to the abscissa. (At this time, the waveform will be as shown in Figure 4-1 [Figure 4-2]).
 - (4) Adjust VR8407 [VR8408] so that the waveform shown in Figure 4-1 [Figure 4-2] will be vertically symmetric in the DC range.
- ③ Static Convergence Adjustment (Use an oscilloscope for measurement.)

Normalize the static convergence data, and adjust VR8411 until the output at pin ⑧ of IC8447 is $0 \pm 0.3 V_{DC}$.

Figure 1



Figure 2

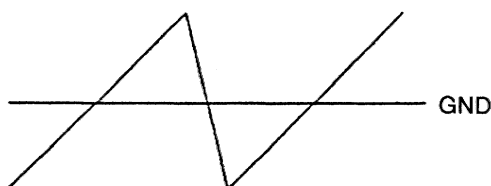


Figure 3

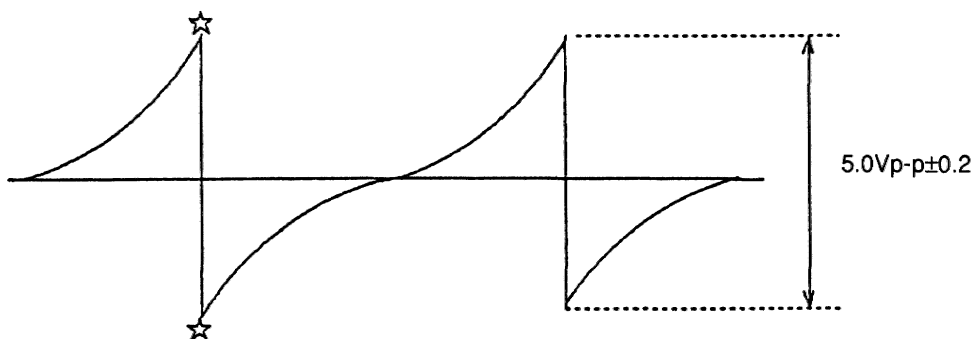


Figure 4-1

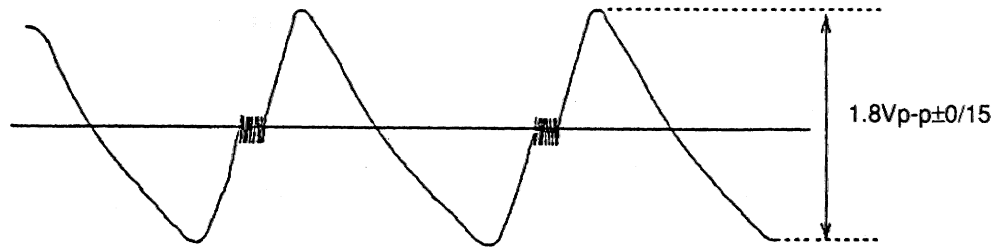
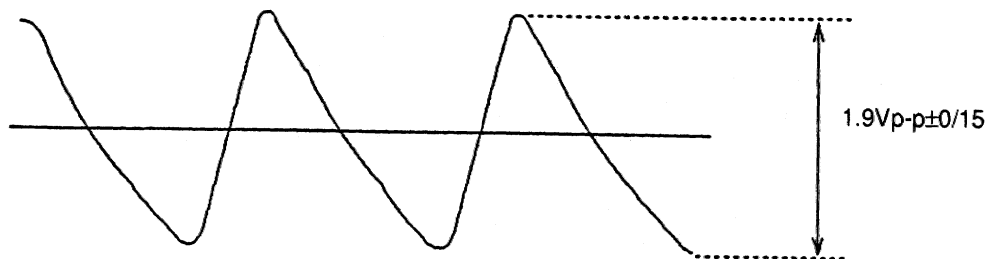


Figure 4-2

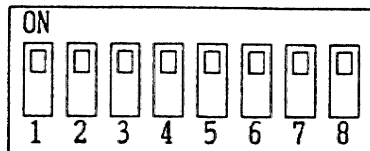


SERVICE (BENCH) ADJUSTMENTS

4. POINT PWB (PWC-3718)

① DIP Switch Setting

Set the DIP switch S8701 as shown in the figure below (after adjusting the PWB).



(DIP switch setting after PWB adjustment)

② Connections

Apply source voltages and signals and connect devices to the terminals of connector PO as specified below.

49A, 48A, 47A, 45A	:+5 V \pm 0.5/-0 V (1.3 A)
49B, 48B, 47B, 45B	:+5 V \pm 0.5/-0 V (1.3A)
42A, 44B	:+15 V \pm 1.0 V (100 mA)
46A, 46B, 50A, 50B	:Digital GND
43A, 43B	:Analog GND
14A	:Horizontal sync signal input, TTL level, positive (15 kHz/90 kHz)
16A, 16B	:Vertical sync signal input, TTL level, positive (150 Hz/38 Hz)
13A	:Clock input of 128 times locked to horizontal sync signal, TTL level
17A	:Serial communication data input, TTL level Connect after level conversion to personal computer 232C port transmission terminal
18A	:Serial communication data output, TTL level Connect after level conversion to personal computer 232C port receiving terminal
21A	:R-H point converter waveform output. Connect oscilloscope.
22A	:R-V point converter waveform output. Connect oscilloscope.
23A	:G-H point converter waveform output. Connect oscilloscope.
24A	:G-V point converter waveform output. Connect oscilloscope.
25A	:B-H point converter waveform output. Connect oscilloscope.
26A	:B-V point converter waveform output. Connect oscilloscope.

③ Adjustment

(1) VR8762 adjustment

While watching TP8820 with an oscilloscope (1 V/div), adjust VR8762 until the voltage on it is 4.0 ± 0.1 V.

(2) VR8763 adjustment

While watching 21A (R-H point converter output) at the connector PO with an oscilloscope (1 V/div), adjust VR8763 until the voltage on it is 0 ± 0.1 V.

④ Continuity

Set the personal computer to terminal mode, and check the following.

(1) Serial communication port check

Supply a check command of the check program existing in the PWB and make a serial port check. As the results are shown on the display of the personal computer, check to be sure that nothing is in trouble.

(2) Memory check

Check each of the following memories for write/read using the check program provided inside the PWB, and display the check results on the display screen of the personal computer via the serial communication port. Make sure that all the memories are free of errors.

- SRAM 32K bytes (IC8705)
- EEPROM 32K/128K bytes (IC8706)
- OUTRAM 128K bytes x 3 (R, G, B) (IC8760, 8761, 8762, 8763, 8790, 8791, 8792, 8793, 8820, 8821, 8822, 8823)

(3) Output check

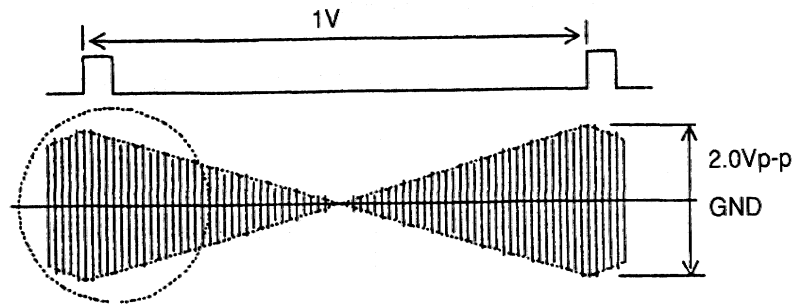
(a) 90 kHz - 38 Hz

Apply the following signals to 14A, 16A, and 13A of the connector PO.

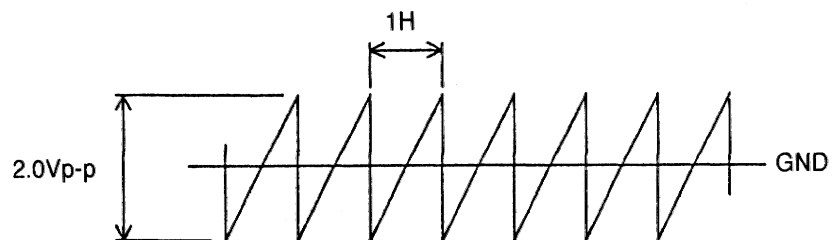
- 14A: Horizontal sync signal, 90 kHz, TTL level, positive
- 16A: Vertical sync signal, 38 Hz, TTL level, positive
- 13A: Clock of 128 times locked to horizontal sync signal, TTL level

Check that the waveform is as shown in the figure below at each horizontal output terminal, using an oscilloscope. At this time, trigger the oscilloscope with a vertical sync signal.

- PO-21A (R-H)
- PO-23A (G-H)
- PO-25A (B-H)

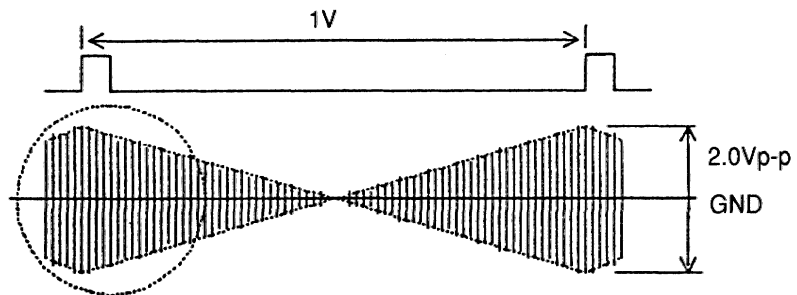


Extend the time base of the oscilloscope and observe the part shown cycled in the figure below, and check that a sawtooth wave of horizontal period is output as shown in the figure.

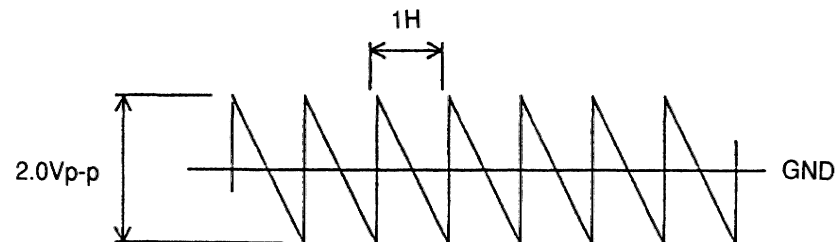


Similarly, check with the oscilloscope the waveform each vertical output terminal that it is as shown in the figure.

- PO-22A (R-V)
- PO-24A (G-V)
- PO-26A (B-V)



Extend the time base of the oscilloscope and observe the part shown cycled in the figure below, and check that a sawtooth wave of horizontal period is output as shown in the figure. Also check the phase of the sawtooth wave that it is inverted from that of the horizontal output terminal.



(b) 15 kHz - 150 Hz

Apply the following signals to 14A, 16A, and 13A of the connector PO.

14A: Horizontal sync signal, 15 kHz, TTL level, positive

16A: Vertical sync signal, 150 Hz, TTL level, positive

13A: Clock of 128 times locked to horizontal sync signal, TTL level

Check each of the horizontal and vertical output waveforms similar to (a) above.

But check to be sure that the phase of horizontal sync sawtooth wave between the horizontal output and the vertical output is inverted with each other.

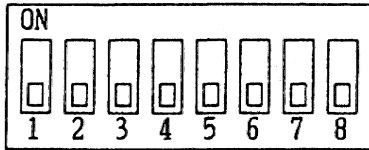
SERVICE (BENCH) ADJUSTMENTS

(4) Reset terminal check

Set IIA of the connector PO to "L" level (connecting it to GND), and check that the output waveforms specified in ④-(3) disappear (the output falls to 0 V).

(5) DIP Switch Setting

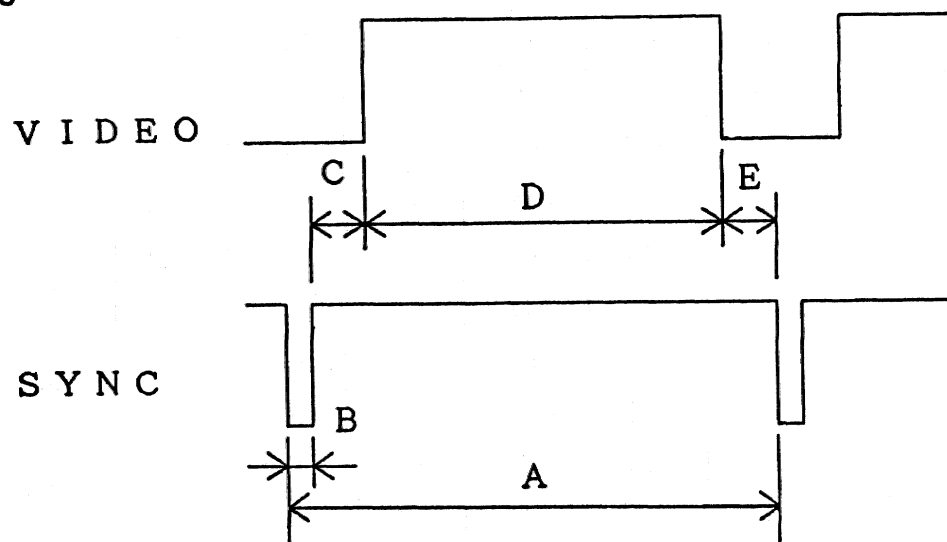
Set the DIP switch S8701 as shown in the figure below (original setting before shipment).



(Original setting before shipment)

(6) The setting should be made to the state shown in step 5) when assembling the set of DIP switch S8701.

TIMING DIAGRAMS



		A	B	C	D	E	
Signal 1	Hus	63	4.2	7.2	45	6.6	(CGA)
	Vms	16.4	0.075	1.525	12.6	2.2	
Signal 2	Hus	45.5	4.9	1.6	39	0	(EGA)
	Vms	16.68	0.6	0.08	16	0	
Signal 3	Hus	31.8	3.8	1.6	26.1	0.3	(VGA350)
	Vms	14.3	0.06	1.72	11.53	0.99	
Signal 4	Hus	31.8	3.8	1.6	26.1	0.3	(VGA400)
	Vms	14.3	0.06	0.89	13.19	0.16	
Signal 5	Hus	31.78	2.76	1.6	26.29	1.13	(IDTV)
	Vms	16.67	0.64	0.77	15.14	0.12	
Signal 6	Hus	28.57	2.12	3.17	21.16	2.12	(MAC2)
	Vms	15.00	0.09	1.11	13.71	0.09	
Signal 7	Hus	66.7	9.1	5.7	51.7	0.2	15K/60Hz
	Vms	16.7	0.07	3.33	10.95	2.35	
Signal 8	Hus	40.0	5.5	3.4	31.0	0.1	25K/60Hz
	Vms	16.7	0.07	3.33	10.95	2.35	
Signal 9	Hus	28.6	3.9	2.4	22.2	0.1	35K/60Hz
	Vms	16.7	0.07	3.33	10.95	2.35	
Signal 10	Hus	22.2	3.0	1.9	17.2	0.1	45K/60Hz
	Vms	16.7	0.07	3.33	10.95	2.35	
Signal 11	Hus	18.2	2.5	1.6	14.1	0	55K/60Hz
	Vms	16.7	0.07	3.33	10.95	2.35	

TIMING DIAGRAMS

		A	B	C	D	E	
Signal 12	Hus	66.7	9.1	5.7	51.7	0.2	15K/38Hz
	Vms	26.3	0.11	5.2	17.2	3.8	
Signal 13	Hus	66.7	9.1	5.7	51.7	0.2	15K/70Hz
	Vms	14.3	0.06	2.9	9.4	1.9	
Signal 14	Hus	66.7	9.1	5.7	51.7	0.2	35K/60Hz
	Vms	10.0	0.05	2.0	6.6	1.3	
Signal 15	Hus	31.8	3.8	1.6	26.1	0.3	15K/100Hz
	Vms	16.7	0.06	0.79	15.79	0.06	
Signal 16	Hus	15.62	1.76	2.04	11.80		64K/60Hz
	Vms	16.67	0.23	0.34	16.0		
Signal 17	Hus	13.34	0.83	1.93	10.25	0.33	75K/60Hz
	Vms	16.57	0.05	0.5	15.93	0.09	
Signal 18	Hus	11.11	1.0	1.4	8.31	0.4	90K/Hz
	Vms	16.57	0.05	0.5	15.93	0.09	
Signal 19	Hus	16.18	1.38	2.10	12.39	0.31	CAD CAM (SUN-WS)
	Vms	15.16	0.06	0.50	14.57	0.03	
Signal 20	Hus	12.799	1.422	1.422	9.481	0.474	HP-WS
	Vms	13.887	0.038	0.704	13.107	0.038	
Signal 21	Hus	12.771	1.067	1.896	9.481	0.327	SPEA1280
	Vms	13.519	0.038	0.496	12.985	0	
Signal 22	Hus	14.64	1.30	1.32	11.56	0.46	QUADRA
	Vms	13.342	0.044	0.574	12.68	0.044	
Signal 23	Hus	66.7	9.1	5.7	51.7	0.2	15K/150Hz
	Vms	6.67	9.94	9.4	6.18	0.05	
Signal 24	Hus	11.11	1.0	1.4	8.31	0.4	90K/150Hz
	Vms	6.67	0.04	0.4	6.18	0.05	
Signal 25	Hus	20.880	2.400	1.280	16.000	1.120	VESA800
	Vms	13.887	0.124	0.479	12.510	0.722	
Signal 26	Hus	20.677	2.092	2.462	15.754	0.369	VESA1024
	Vms	16.667	0.124	0.600	15.880	0.062	
Signal 27	Hus	40.28	3.04	3.80	30.4	3.04	PC-9801
	Vms	17.72	0.32	1.01	16.11	0.28	

		A	B	C	D	E	
Signal 28	Hus	30.45	1.46	2.92	24.29	1.78	N5200/07
	Vms	12.50	0.15	0.43	11.88	0.046	
Signal 29	Hus	19.99	1.43	2.14	14.28	2.14	PC-H98
	Vms	16.65	0.20	0.56	15.59	0.30	
Signal 30	Hus	15.49	1.79	1.49	11.91	0.3	EWS4800
	Vms	16.69	0.06	0.67	15.85	0.11	

(Caution) When signal 3, 4, 15 input the switcher, sync's polarity must change under Table.

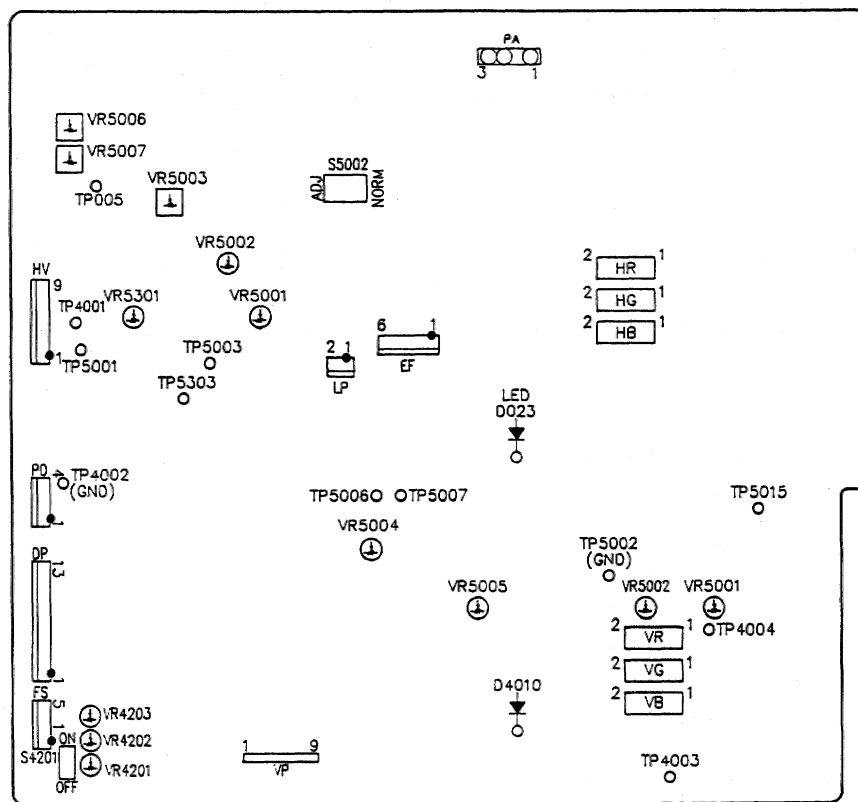
	Sync's Polarity	
	H	V
VGA 350	P	N
VGA 400	N	P
VGA480	N	N

TTL Level

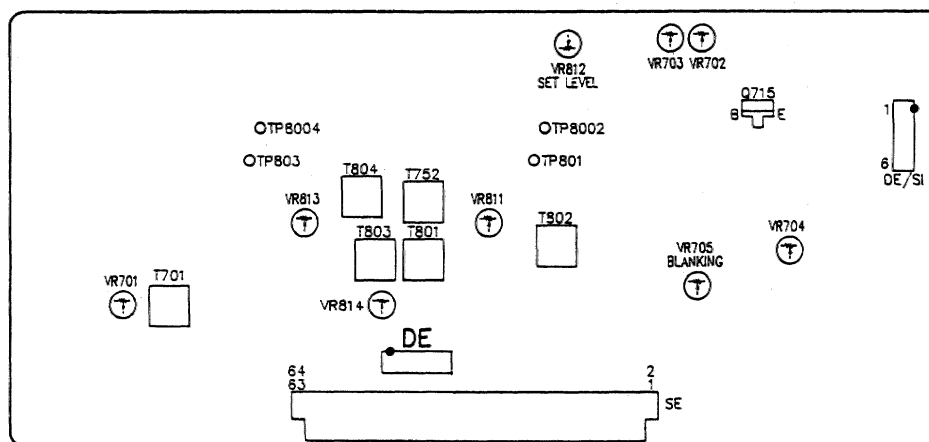
P: Positive

N: Negative

1. *Journal of the American Medical Association*, 1997; 277: 1033-1038.

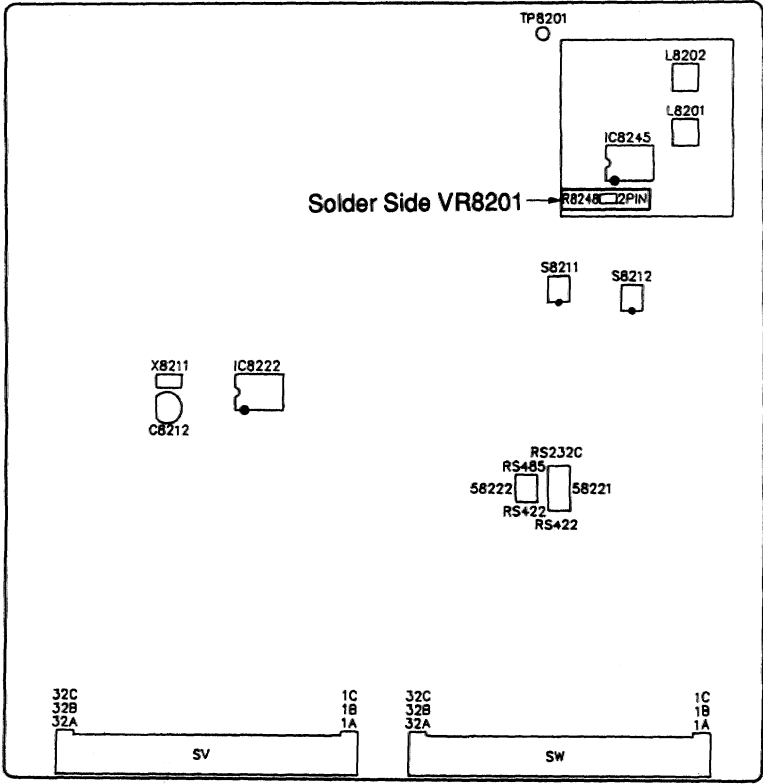


DEF PWB (PWC-379A)

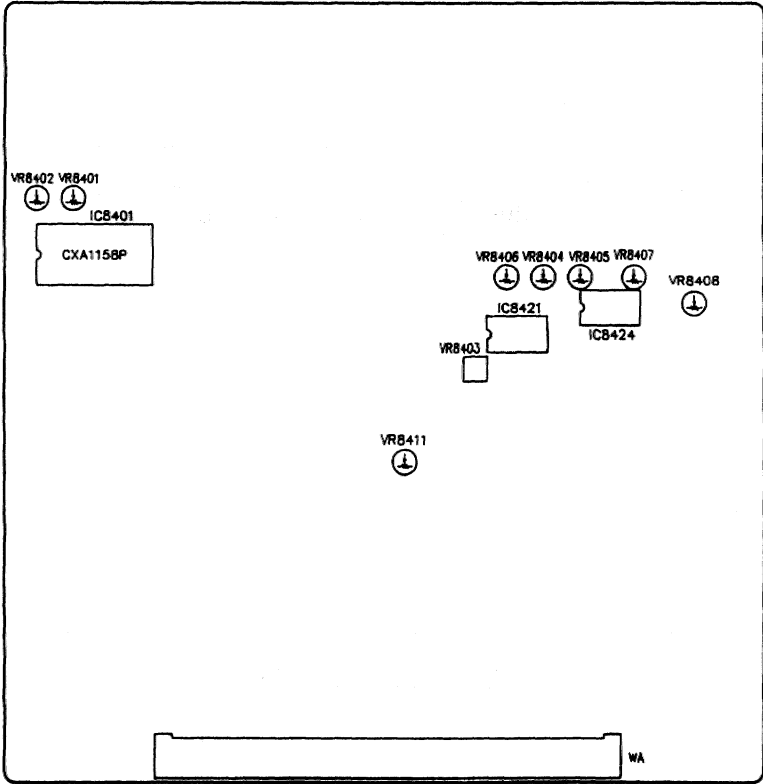


V4-DEC PWB (PWC-3683)

PWB ADJUSTIING POINT DIAGRAM

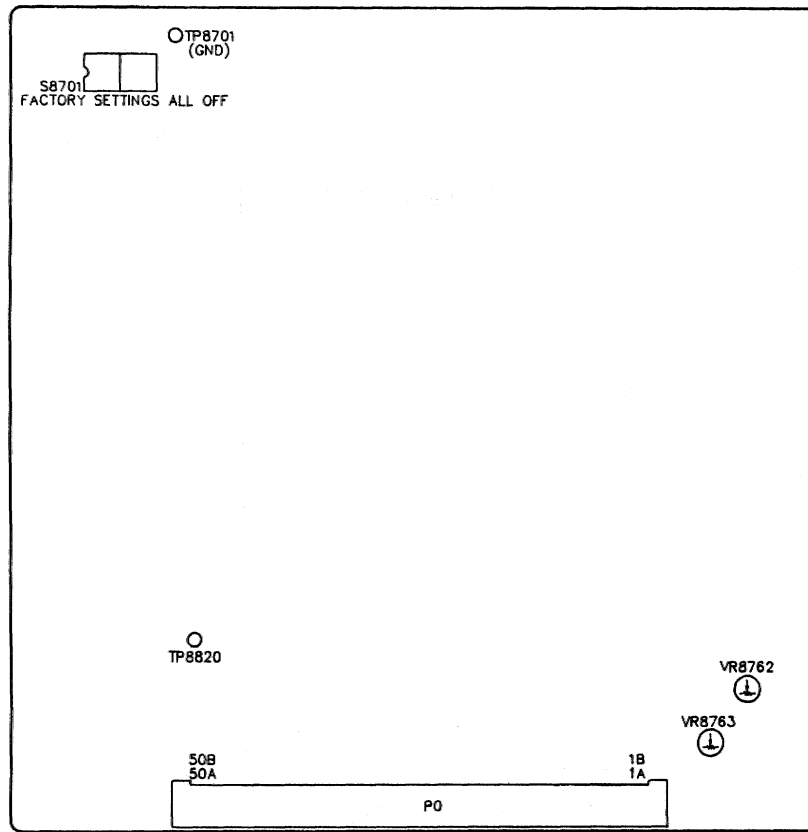


SYSTEM PWB (PWC-3717)

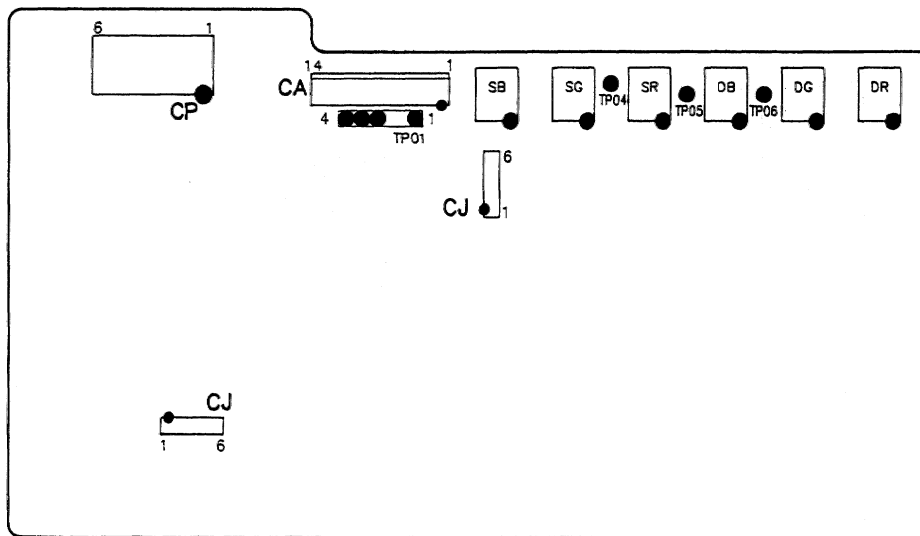


WAVE PWB (PWC-3719)

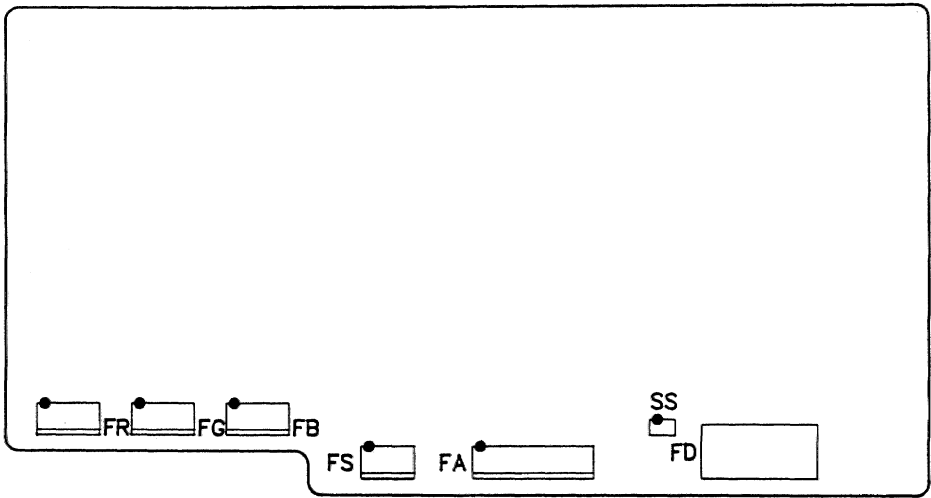
PWB ADJUSTIING POINT DIAGRAM



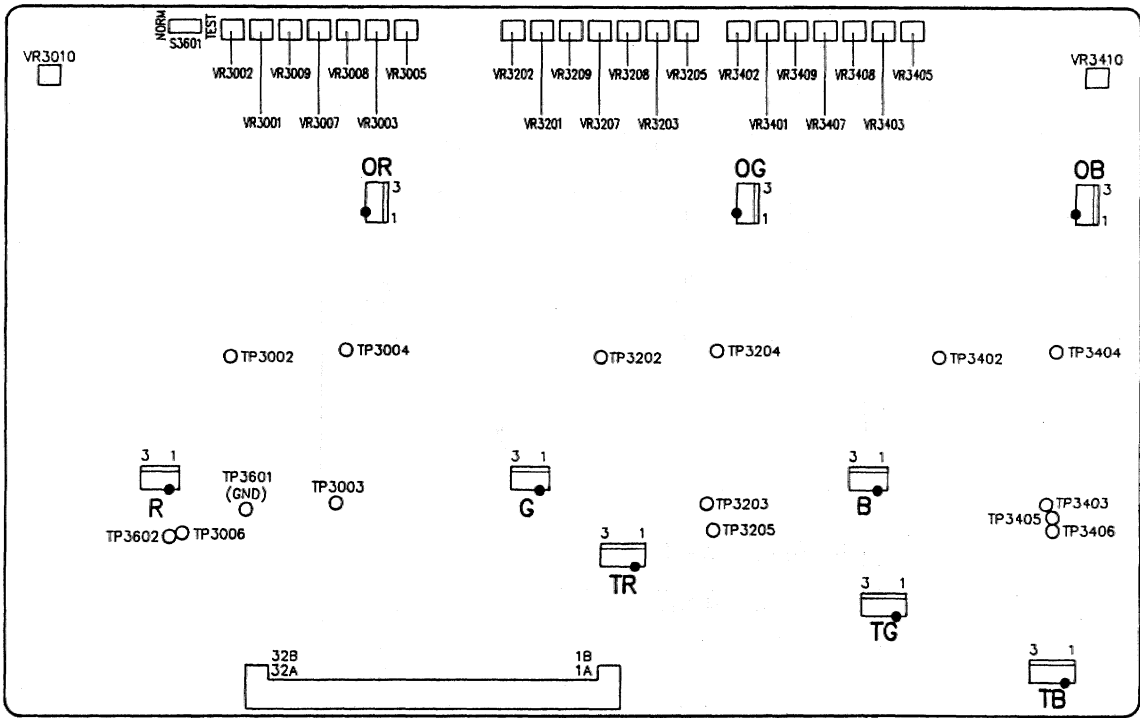
POINT PWB (PWC-3718)



C-DRIVE PWB (PWC-3712B)

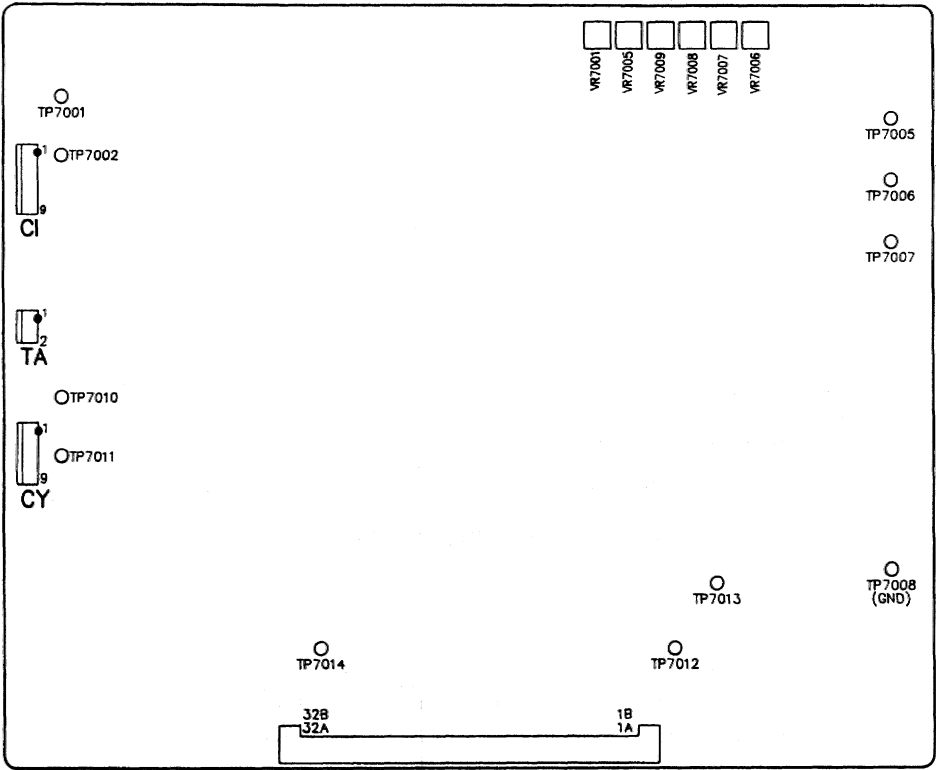


F-DRIVE PWB (PWC-3712A)

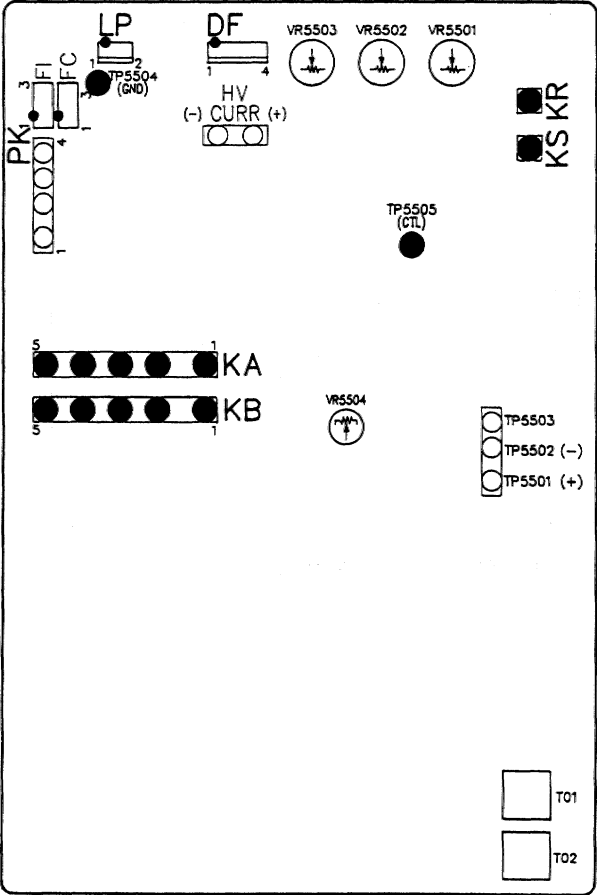


VIDEO OUT PWB (PWC-3716)

PWB ADJUSTIING POINT DIAGRAM

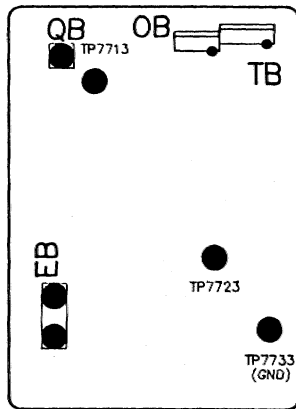


GAIN CTL PWB (PWC-3715)

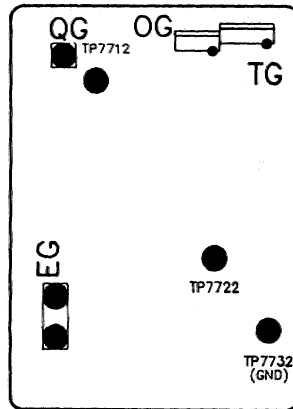


HV PWB (PWC-3714)

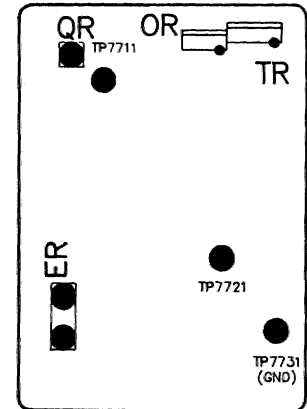
PWB ADJUSTING POINT DIAGRAM



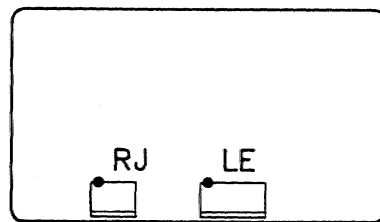
R-CRT PWB (PWC-3711F)



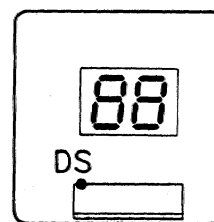
G-CRT PWB (PWC-3711E)



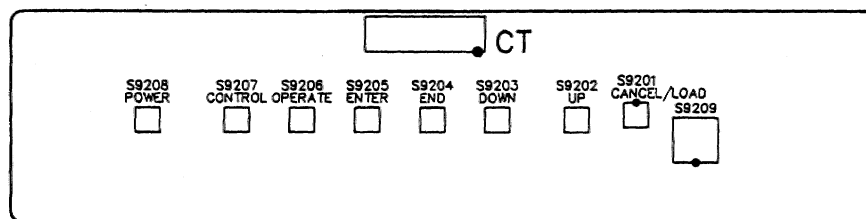
R-CRT PWB (PWC-3711D)



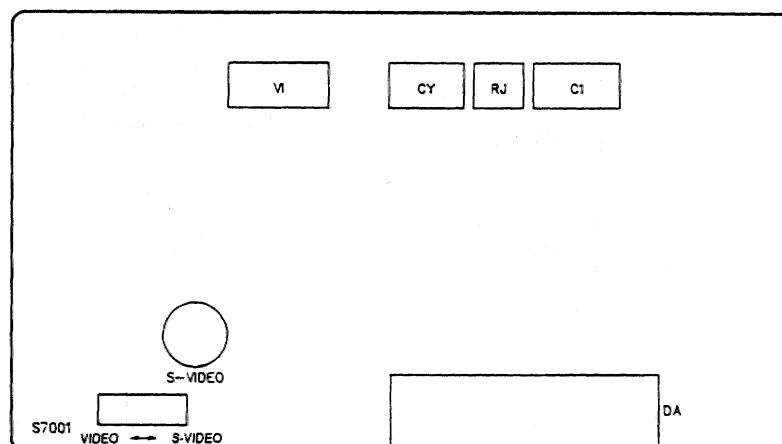
LED PWB (PWC-3711B)



7SEG PWB (PWC-3711C)



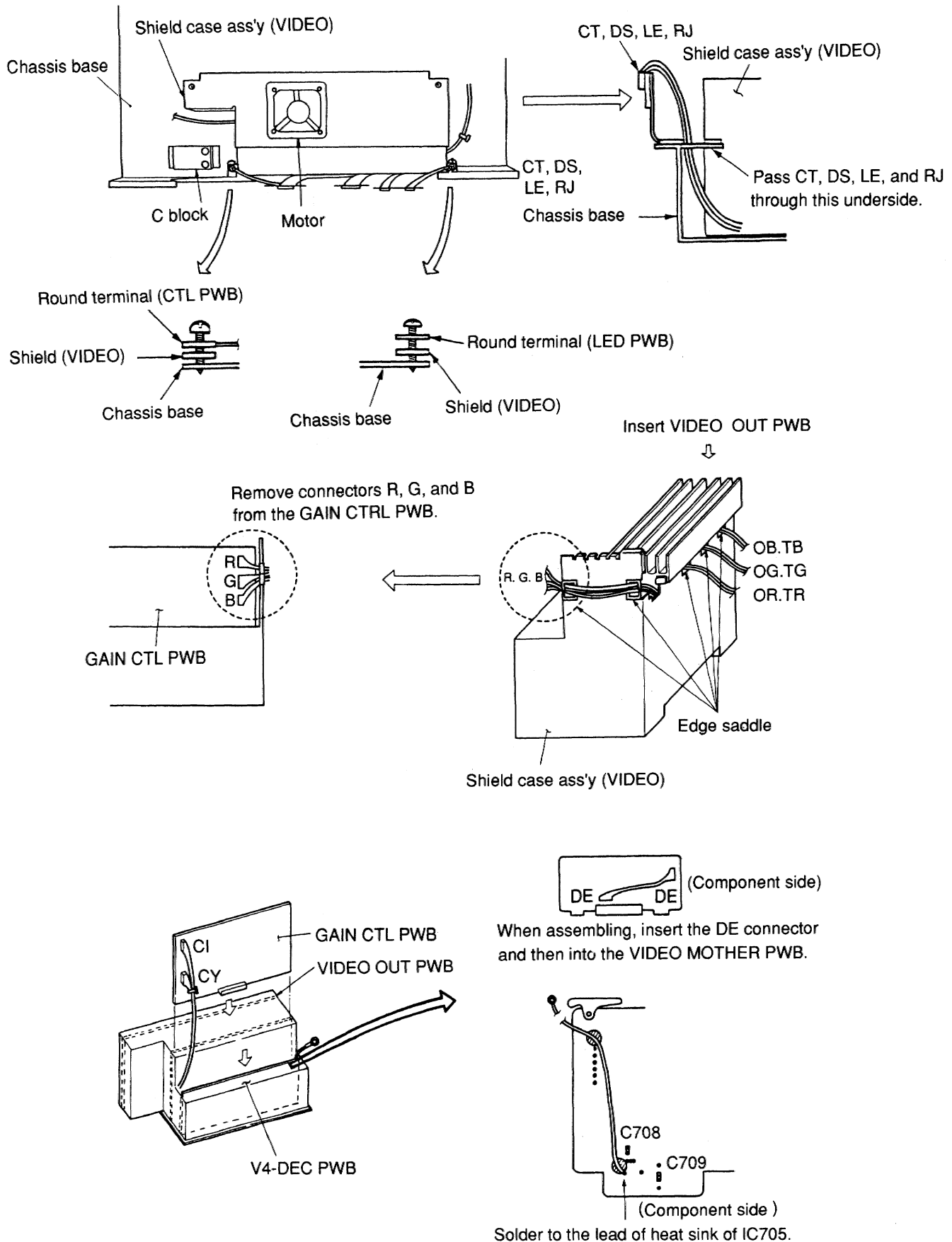
CTL PWB (PWC-3711A)

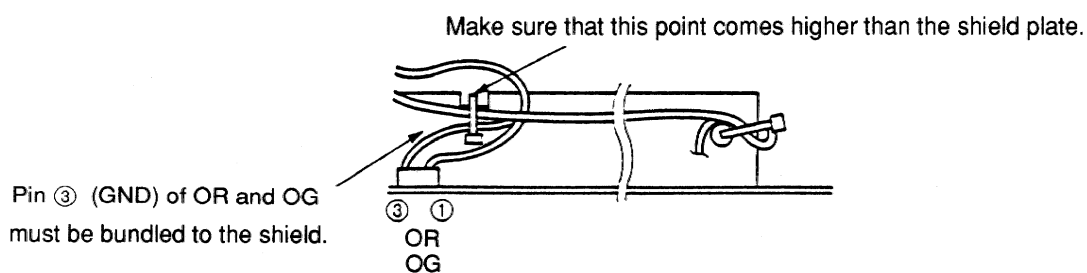
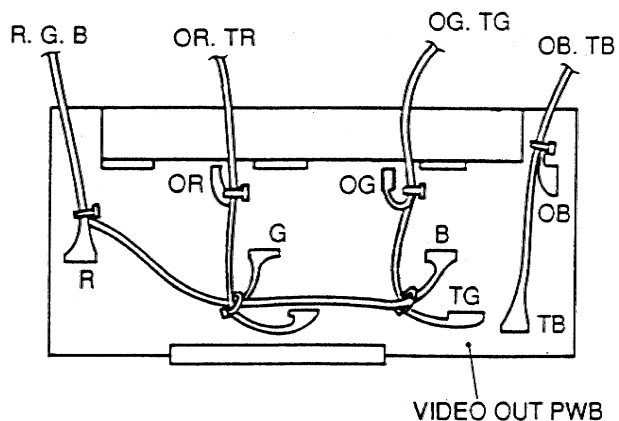
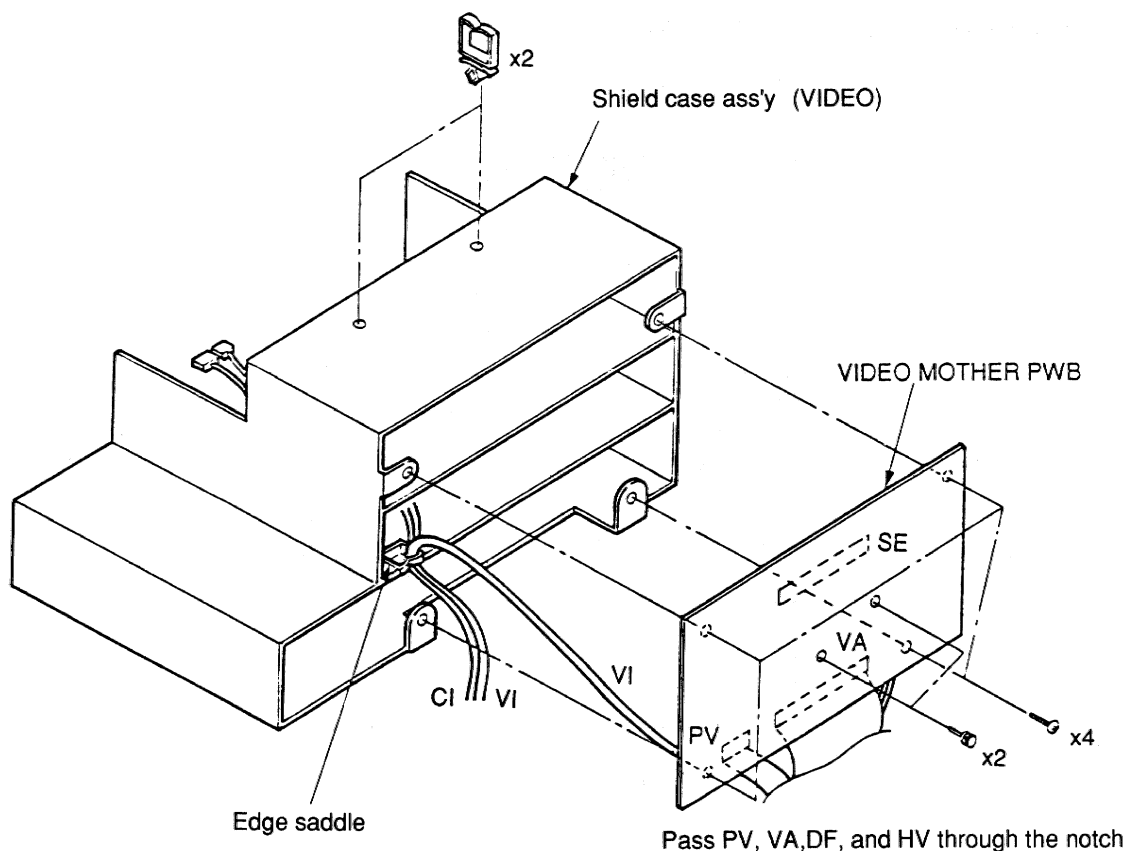


INPUT PWB (PWC-3713)

WIRING METHOD

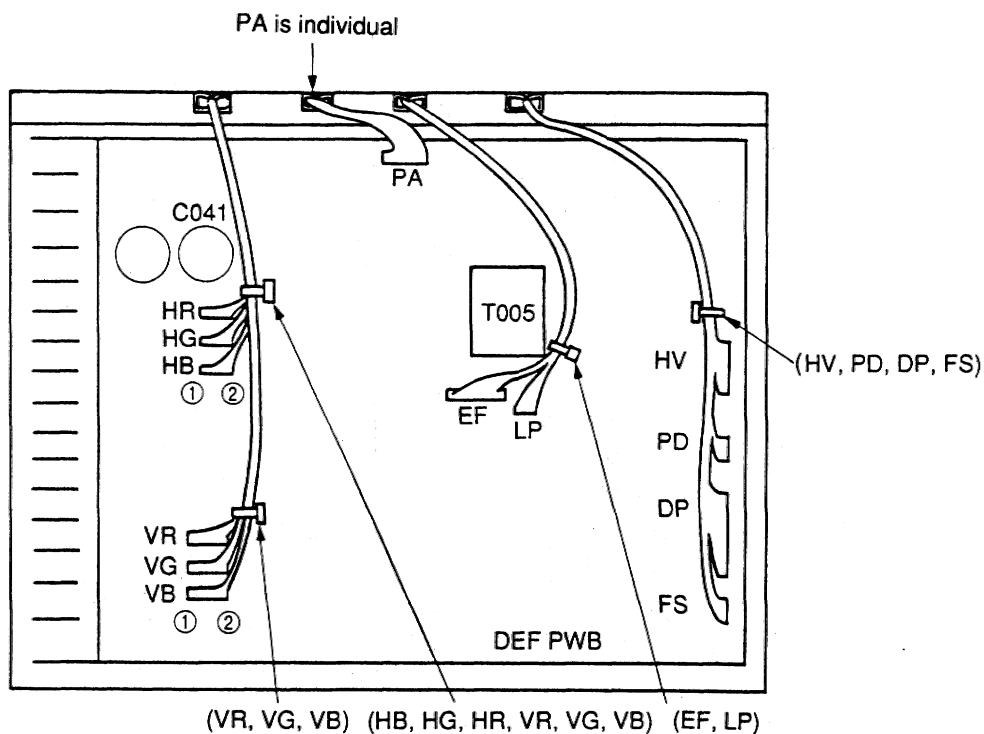
METHOD OF WIRING THE VIDEO MOTHER PWB UNIT





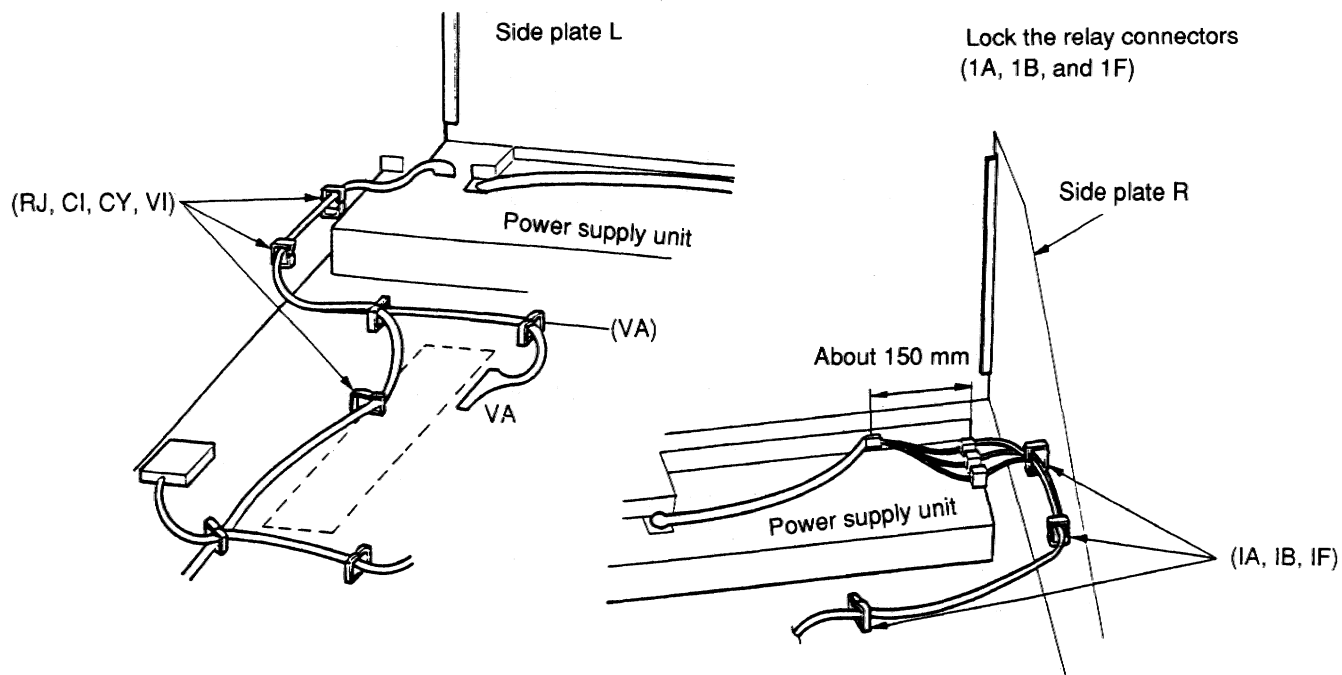
WIRING METHOD

METHOD OF WIRING THE DEF PWB UNIT

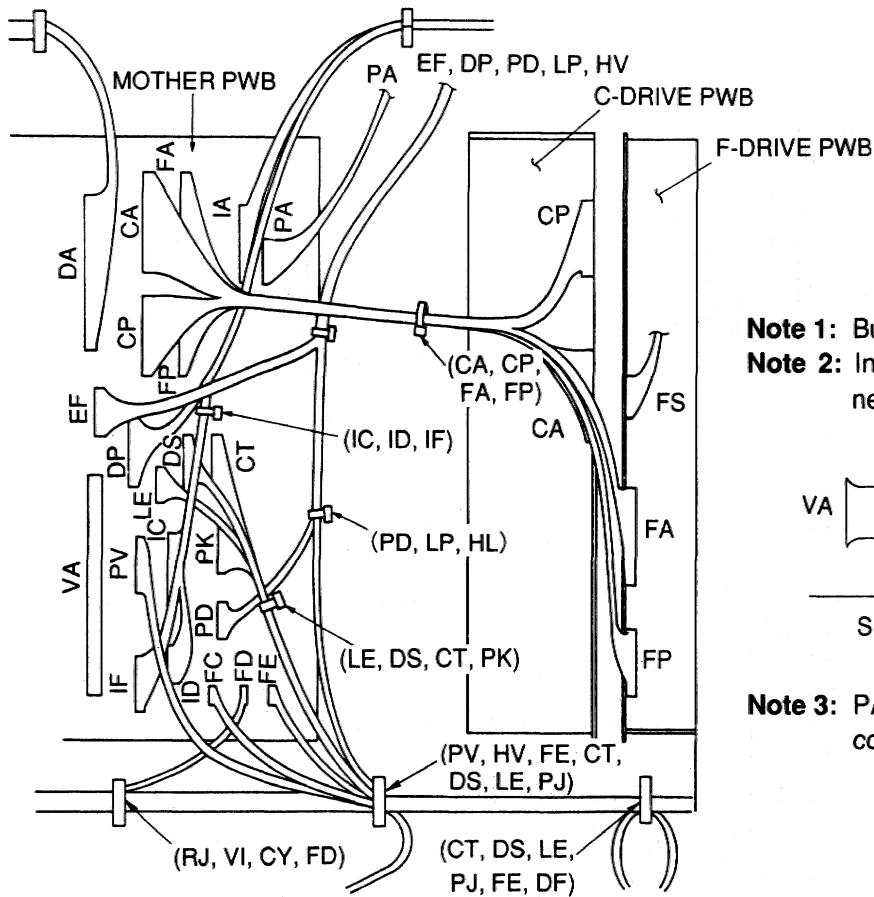


HR, HG, HB		VR, VG, VB	
Pin ①	Pin ②	Pin ①	Pin ②
Blue	Red	Yellow	Brown

METHOD OF WIRING THE POWER SUPPLY UNIT

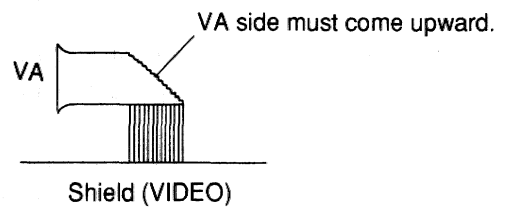


METHOD OF WIRING THE MOTHER PWB UNIT

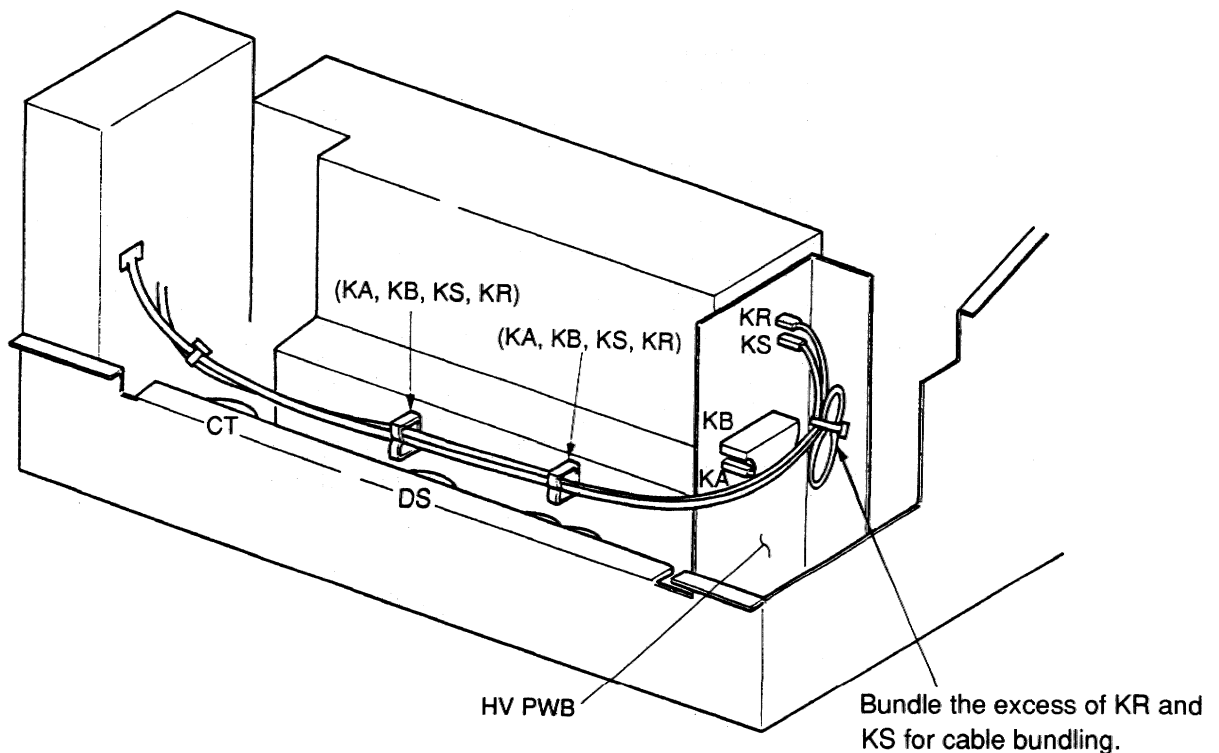


Note 1: Bundle in order of ①~⑤.

Note 2: Insert VA after bundling and make necessary wiring.

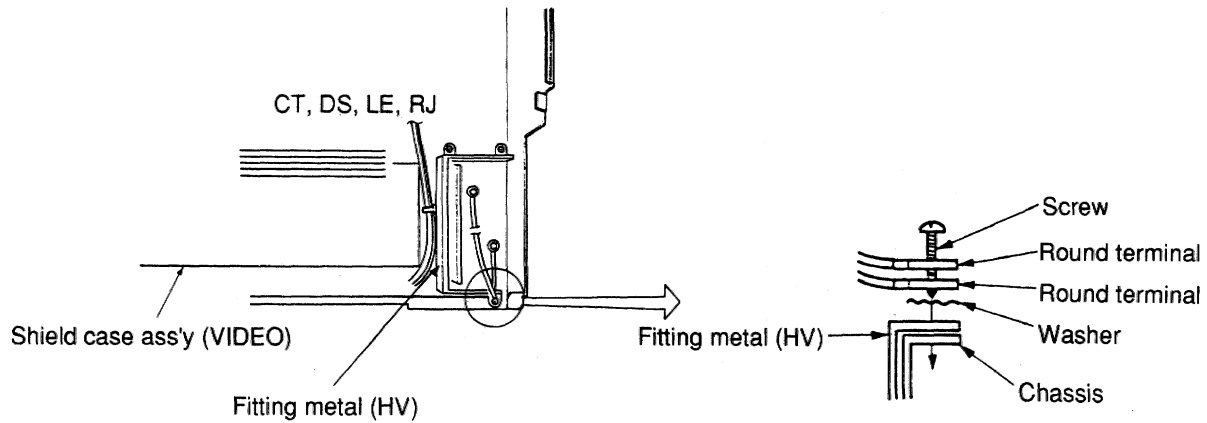


Note 3: PA must not bundle with other wire connectors.

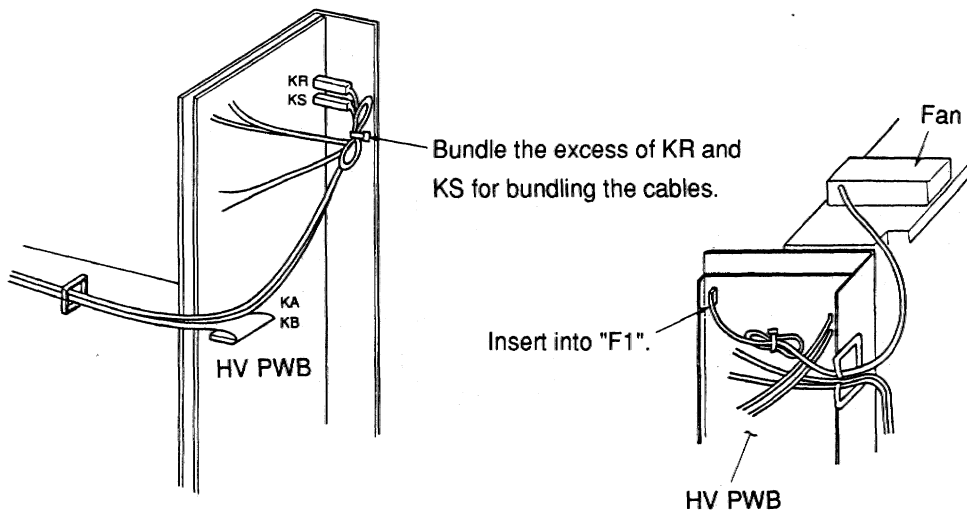
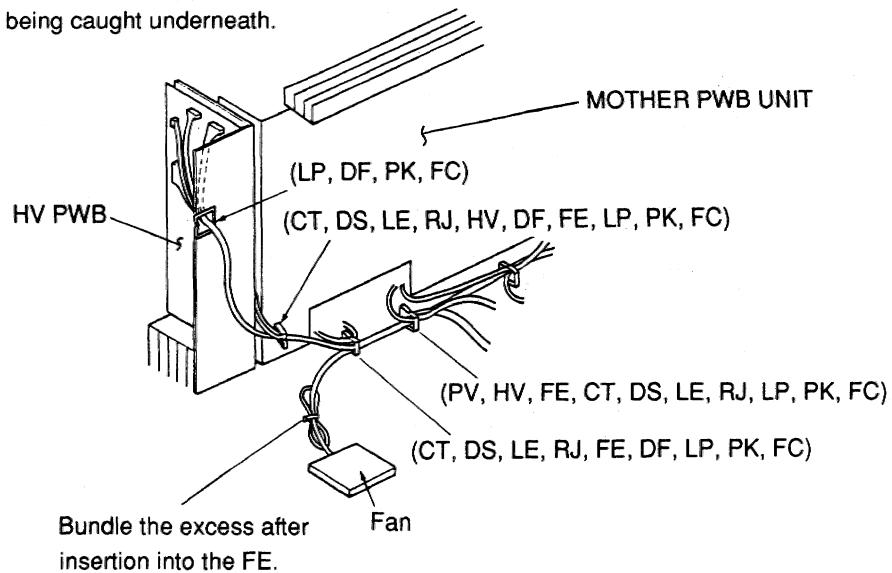


WIRING METHOD

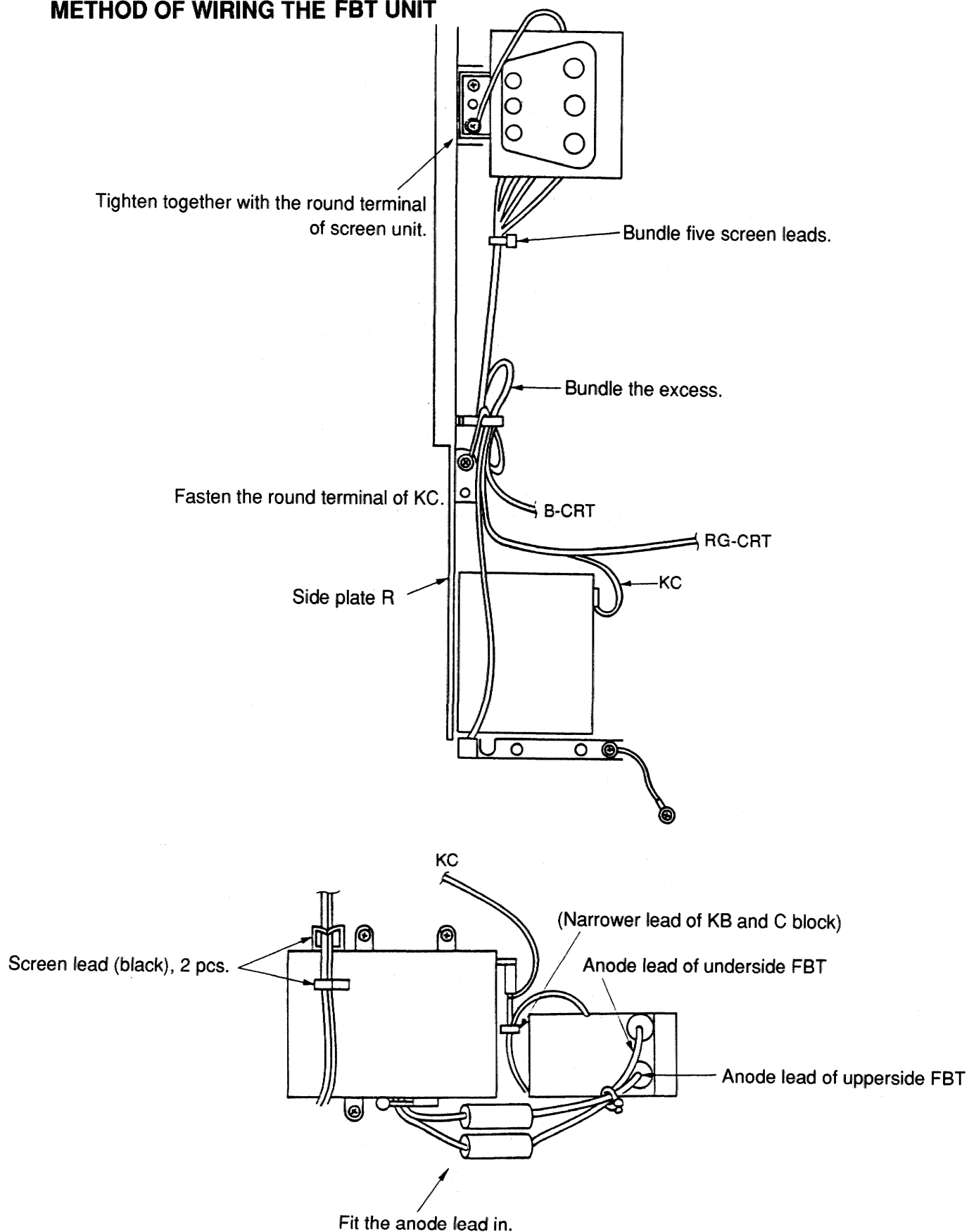
METHOD OF WIRING THE HV PWB UNIT



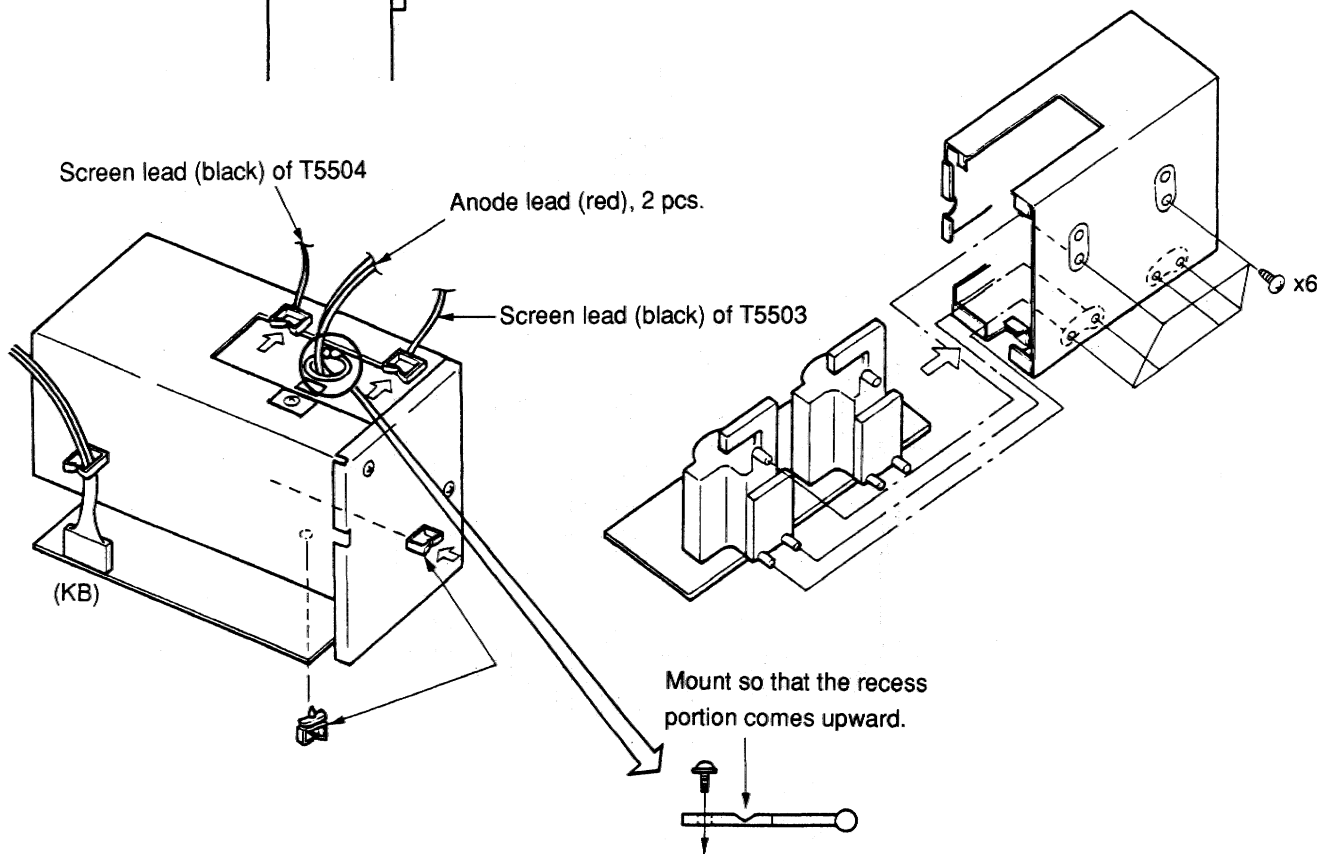
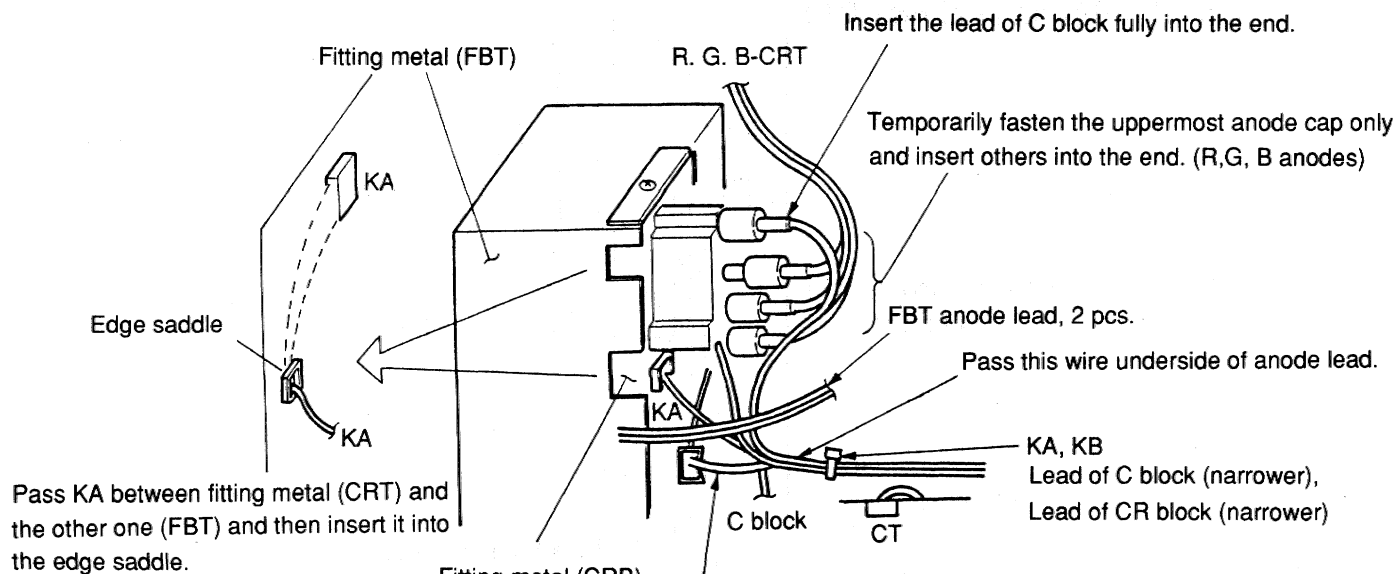
※ When mounting, care should be taken to avoid CT, Ds, LE, and RJ connectors being caught underneath.



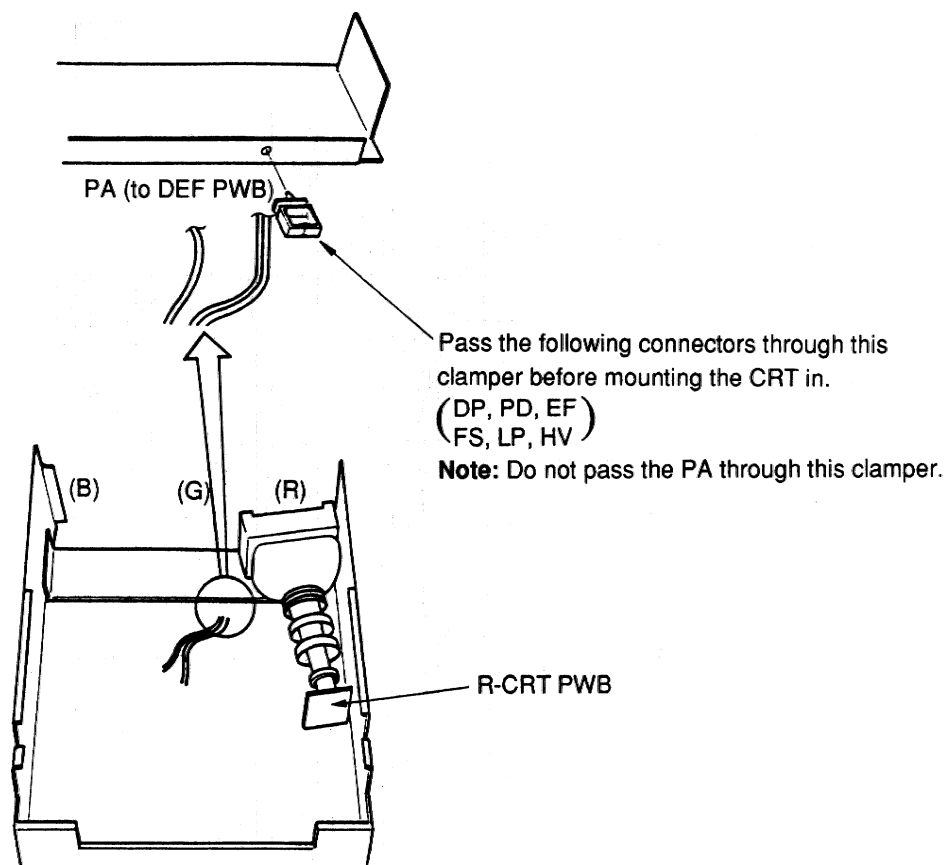
METHOD OF WIRING THE FBT UNIT



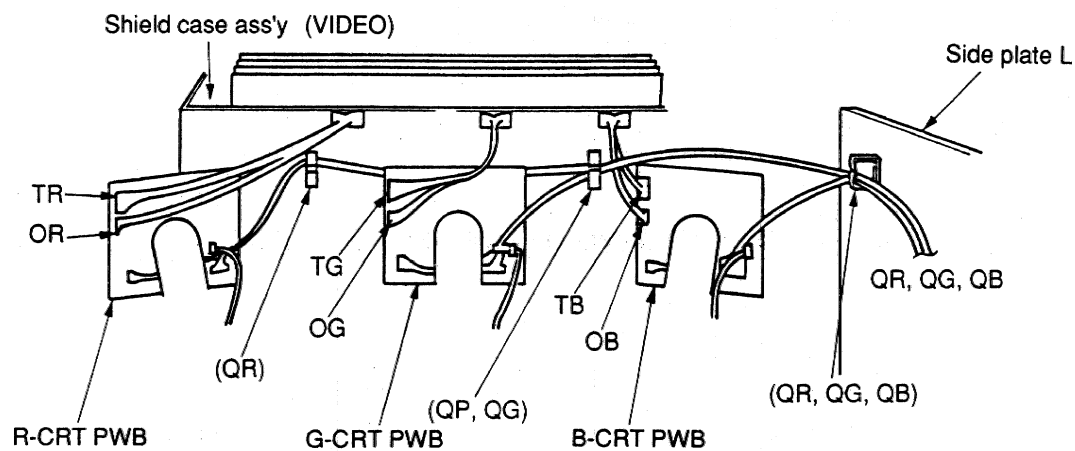
WIRING METHOD



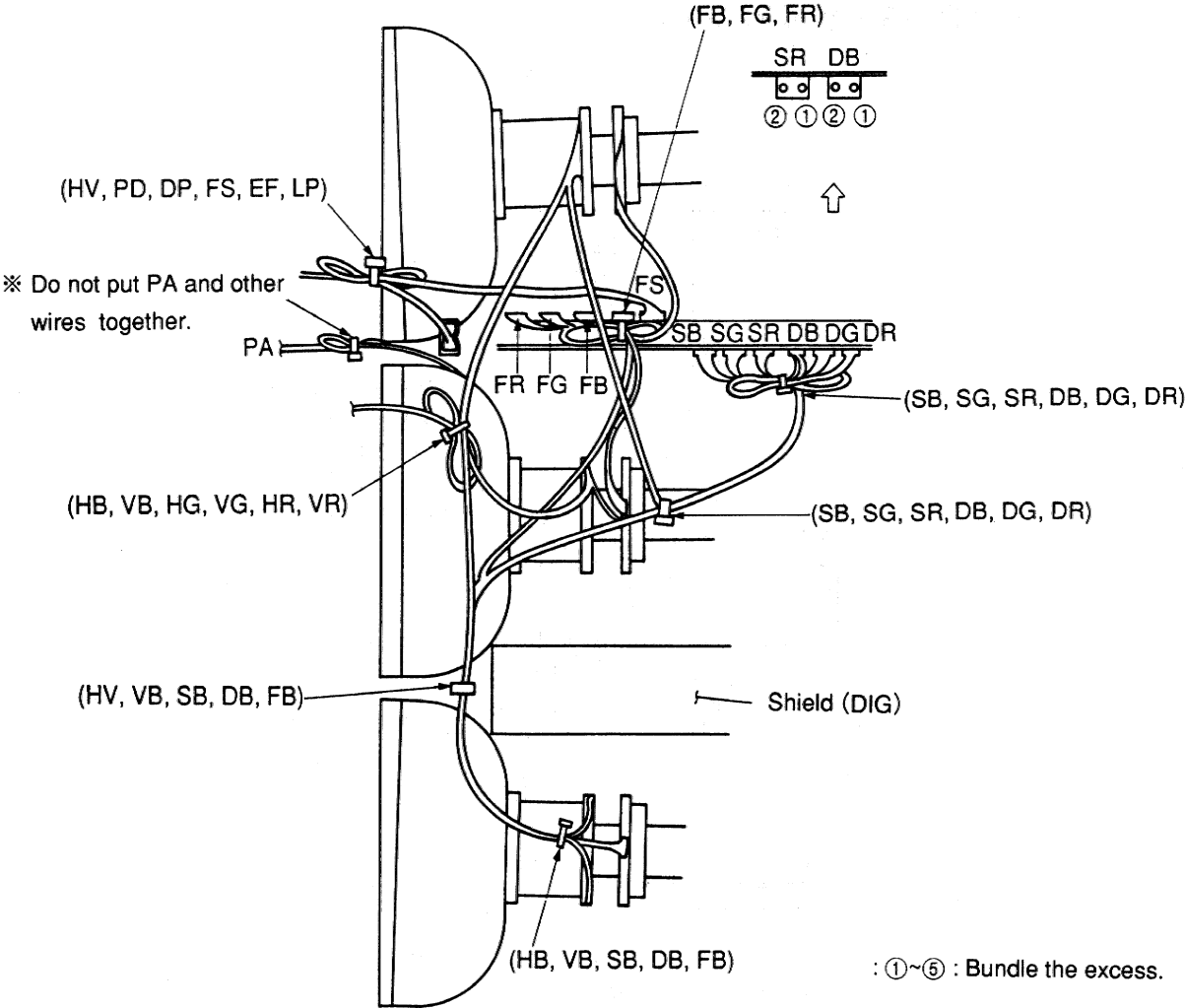
METHOD OF WIRING THE CRT UNIT



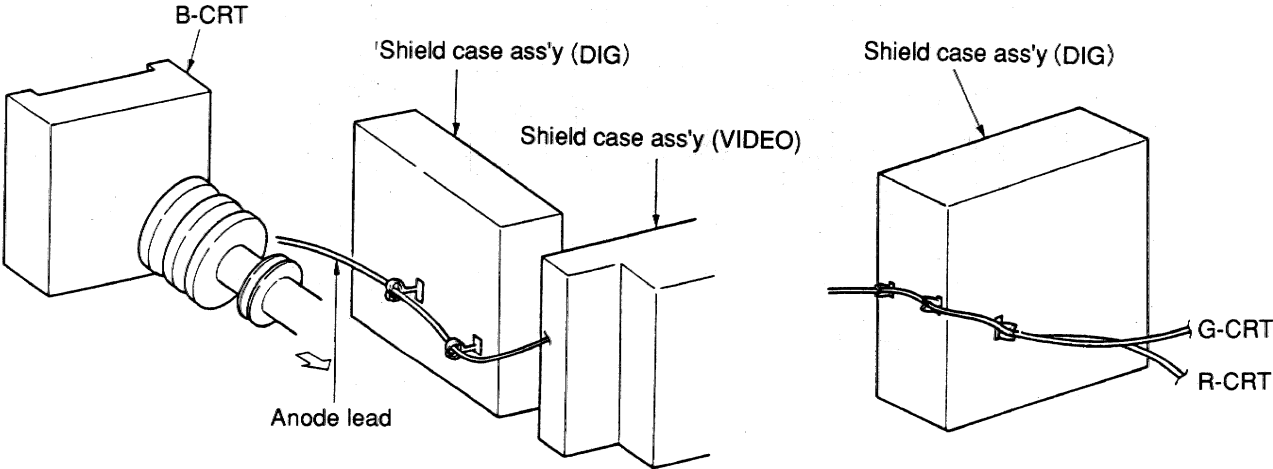
Mount the CRT in the order of B → R → G, making sure that the anode cap comes to the lower side after wiring the anode lead.

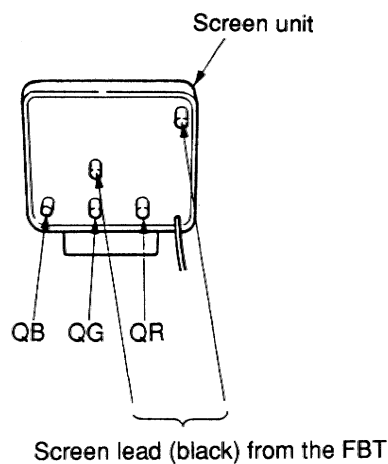
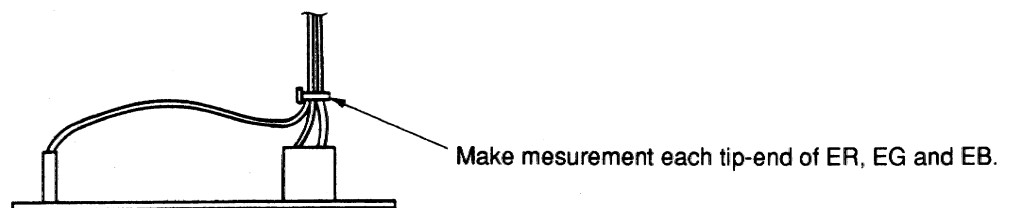
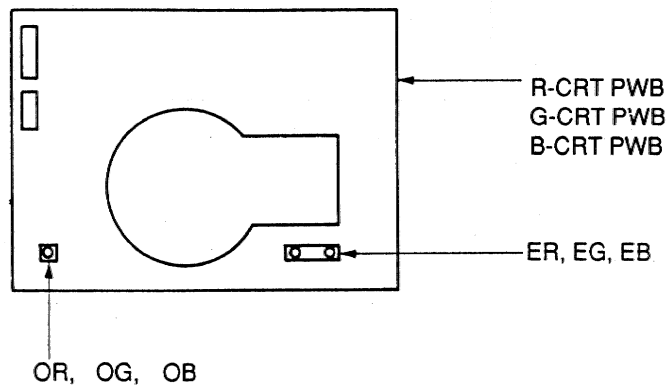
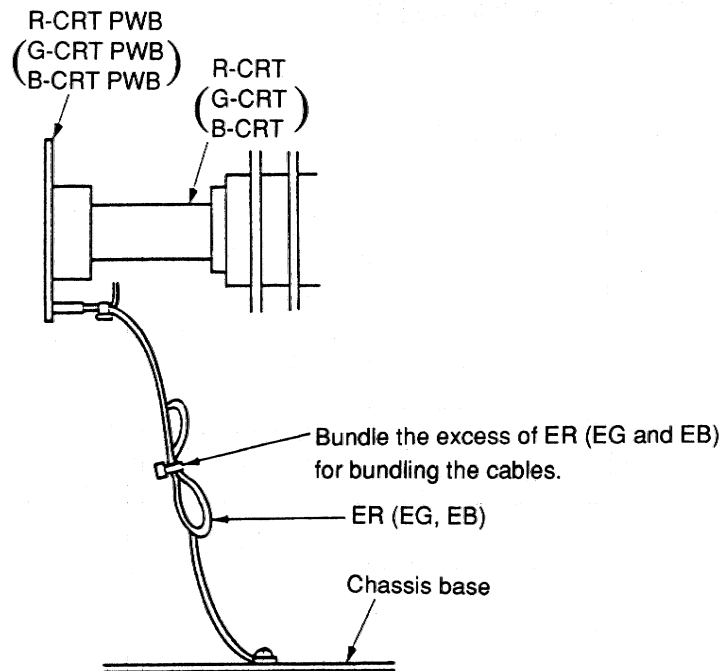


WIRING METHOD



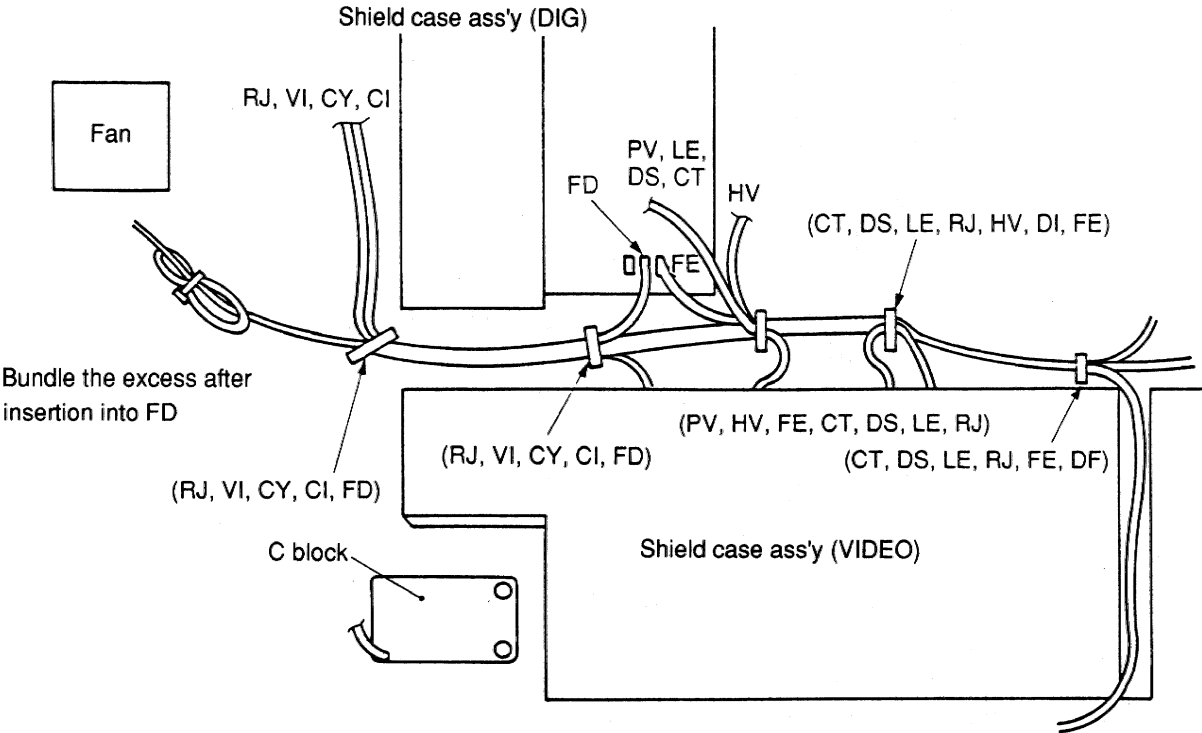
DB, DG, DR		SR, SG, SB	
Pin 1	Pin 2	Pin 1	Pin 2
Blue	Red	Yellow	Brown





WIRING METHOD

METHOD OF WIRING THE TOTAL ASSEMBLY



Detail Diagram

