



Trouble Diagnosis



CONTENTS

Troubleshooting Chart	4-2
Error Message Function	4-15

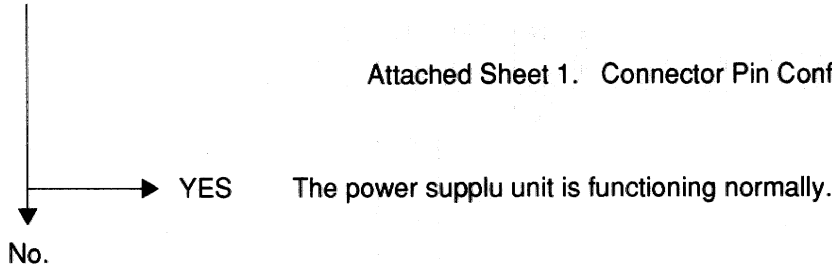
TROUBLESHOOTING CHART

1. No Power /Power Supply Problems

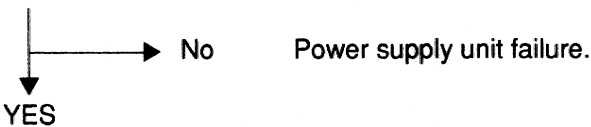
When a projector does not function properly it is one of two failures: Power supply or some other component failure. The following flow chart will help you to determine which component (sub assembly) has failed. This chart lists Test points and Reference Voltages to assist you in your troubleshooting efforts.

IA ①	About 35 V	(H DEF)	When a video signal is supplied.
IA ②	About 7 V	(FOCUS)	
IA ③	About -7 V	(FOCUS)	
IB ①	About 180 V	(VIDEO OUT)	
IB ③	About 110 V	(HV)	
IB ④	About 60 V	(V DEF)	
IB ⑤	About 35 V	(CONV. etc)	
IB ⑥	About 15 V		
IB ⑦	About -15 V		
IB ⑧	About -35 V	(CONV. etc)	
IB ⑪	About 6.3 V	(CRT HEATER)	
IB ⑬	About 5 V	(DIGITAL)	
IB ⑭	About 5 V	(STAND BY)	

Attached Sheet 1. Connector Pin Configuration



Remove 1A, 1B, 1F connectors and check to be sure that the specified voltage is output to the 1A and 1B connectors of the power unit when 1F (2) and (3) are shorted. (But be sure to connect a 3.6Kohm/10W resistor between 1B (1) and (2) for preventing the operation of the overvoltage protector. Also, be sure to apply 1.5 V DC voltage between 1A (4) (+) and 1A (5) (GND) when checking the voltage of 1A (1), (2), and (3).



Remove connectors HV PWB LP, KA, and KB for CRT protection and properly connect 1A, 1B, and 1F connectors. (Connectors LP, KA, and KB should be Checked while they are removed. All other connectore should be attached if no other problems are detected while taking these measurements.)

NOTE: On the following pages these corrections need to be made:	
Current listing	Correction
Output alarm from wave PWB	WAVE PWB failure
DRIVE PWB in trouble	DRIVE PWB failure
F DRIVE PWB in trouble	F DRIVE PWB failure
DEF PWB horizontal	Horizontal (DEF PWB) circuit failure
DEF PWB Vertical	Vertical (DEF PWB) circuit failure
GAIN CTL PWB in trouble	GAIN CTL PWB failure
VIDEO OUT PWB in trouble	VIDEO OUT PWB failure
POINT PWB in trouble	POINT PWB failure
SYSTEM PWB in trouble	SYSTEM PWB failure

There are more of these corrections. I hope that ypu will delete in trouble and replace it with failure.

Check if the STAND BY LED (rear panel) lights when the main power is switched ON.

↓
 → NO Check item 2.

YES

Remove the C DRIVE PWB CA connector and check if the specified voltage is output to 1A and 1B connectors.

↓
 → YES Output alarm from the WAVE PWB.

NO

Remove the C. DRIVE PWB CP connector and check if the the specified voltage is output to the 1A and 1B connectors when the power is turned ON.

↓
 → YES Drive PWB in trouble

NO

Remove the F DRIVE PWB FA connector and check if the specified voltage is output to the 1A and 1B connectors when the power is turned ON.

↓
 → YES Output alarm from the Wave PWB

NO

Remove the F DRIVE PWB FP connector and check if the specified voltage is output to the 1A and 1B connectors when the power is turned ON.

↓
 → YES F DRIVE PWB in trouble

NO

Remove the HV PWB PK connector and check if the specified voltage is output to 1A and 1B connector when the power is turned ON.

↓
 → YES F DRIVE PWB in trouble

NO

Remove the DEF PWB PA connector and check if the specified voltage is output to the 1A and 1B connectors when the power is turned ON.

↓
 → YES DEF PWB horizontal deflection system in trouble

NO

Remove the DEF PWB PD connector and check if the specified voltage is output to the 1B connector when the power is turned ON.

↓
 → YES DEF PWB vertical deflection system or control system in trouble

TROUBLESHOOTING CHART

NO

Remove the GAIN CTL PWB and check if the specified voltage is output to the 1A and 1B connectors when the power is turned ON.



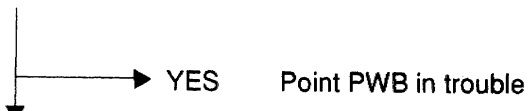
NO

Remove the VIDEO OUT PWB and check if the specified voltage is output to the 1A and 1B connectors when the power is turned ON.



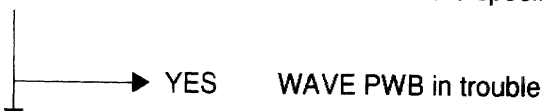
NO

Remove the POINT PWB and check if the specified voltage is output to the 1A and 1B connectors when the power is turned ON.



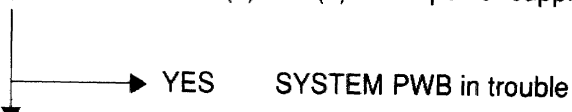
NO

Remove the WAVE PWB and check if the specified voltage is output to the 1A and 1B connectors.



NO

Remove the SYSTEM PWB and check if the specified voltage is output to the 1A and 1B connectors when the output connectors IF (2) and (3) of the power supply unit are shorted.

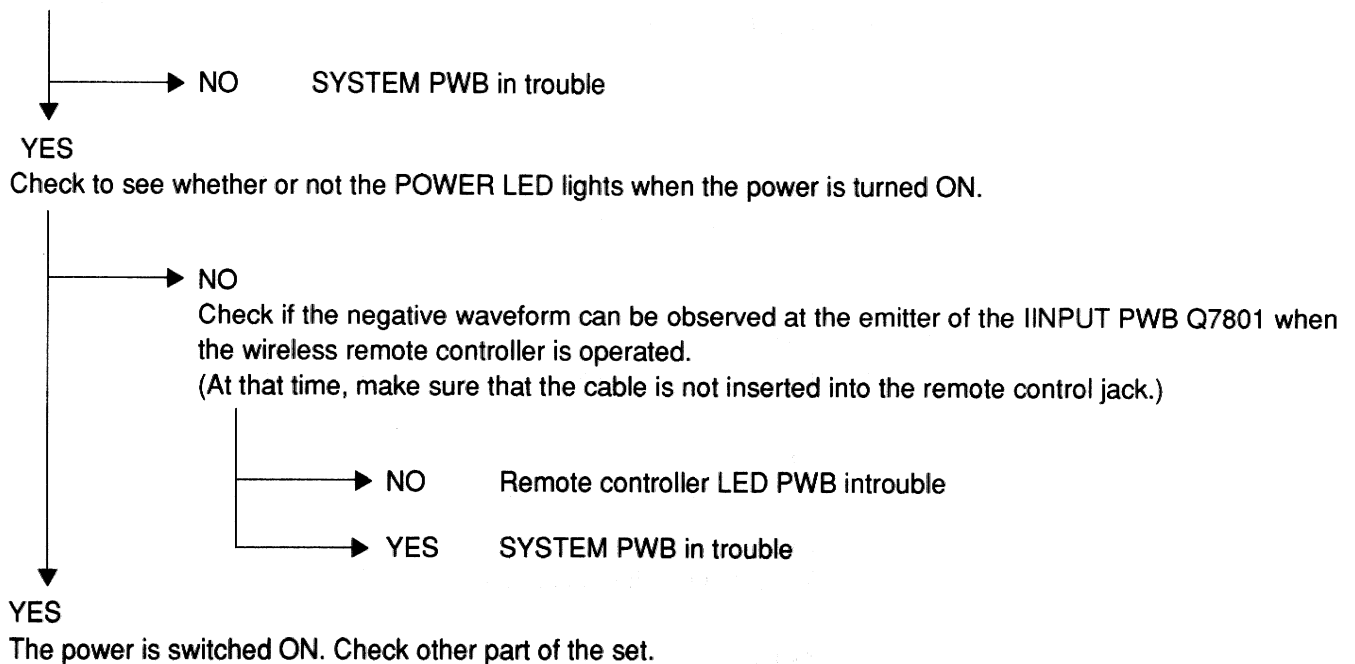


NO

Check to ensure that the power line is not shorted by the connection cable, or the like of the MOTHER PWB.

2. Projector Does Not Power UP

Check to see if the STAND BY LED is lit in the STAND BY mode.



3. Projector Stays Locked in STAND BY mode

Care should be taken as JP is put in the STAND BY state after turning the power ON for protection of the circuit.

- 1) When the Fan is Stopped (When any one of the three fans is stopped).

NOTE: Either is only used when offering two options.

There is a one minute reset cycle time between the STAND BY and POWER ON MODES when rear control panel LEDs display EO. Therefore, replace the defective fan.

- 2) C DRIVE PWB failure places the projector into the STAND BY mode with the rear control panel LEDs displaying F8.

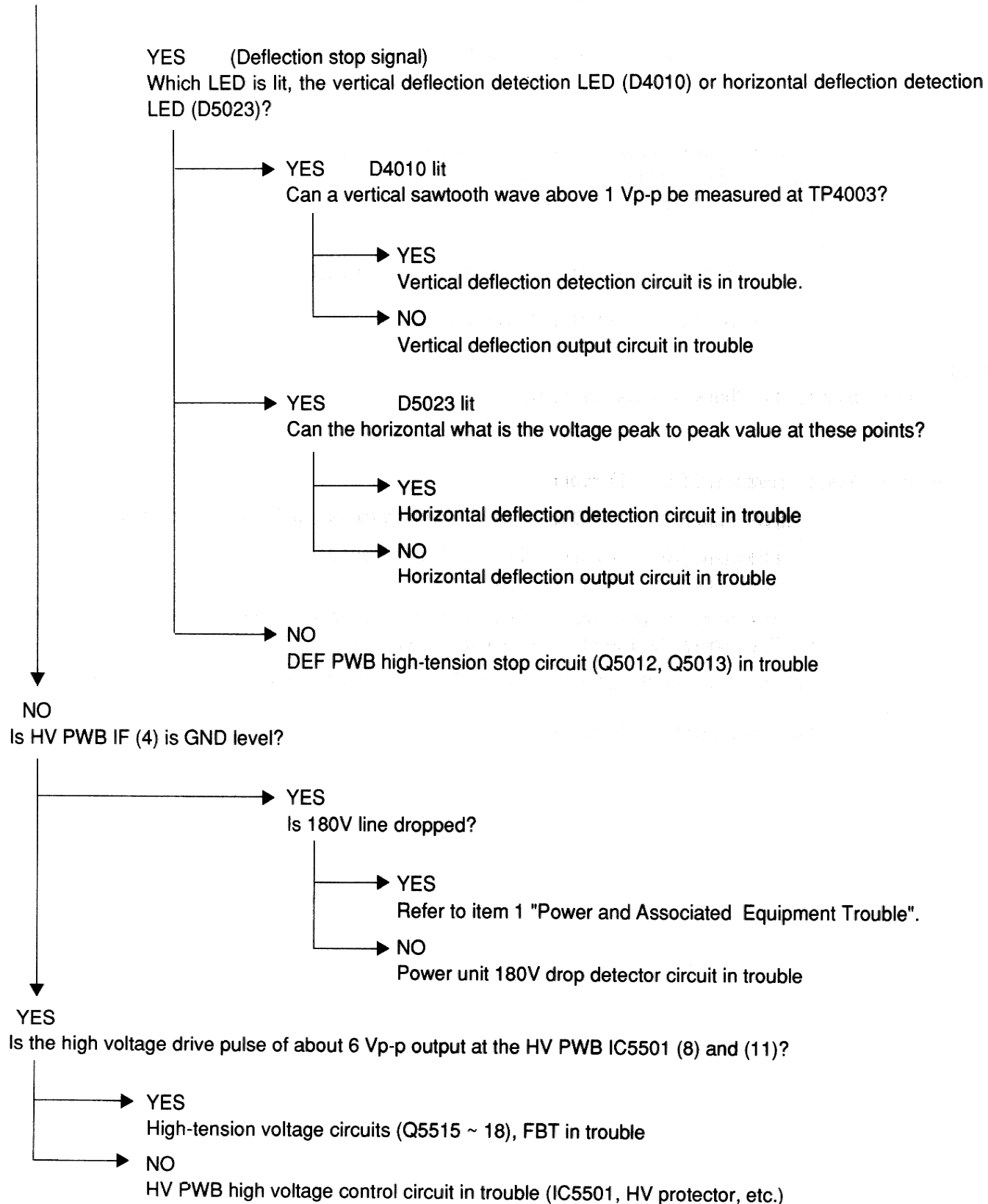
The set is placed in the STAND BY state with F8 displayed on the 7-segment LED at the rear panel.

TROUBLESHOOTING CHART

4. No High Voltage

This projector was designed with several CRT protect circuits. Therefore, use caution when testing these protect circuits for failures that the HV PWB High Voltage Over Voltage circuit is not activated.

Is HV PWB LP (1) GND Level?



5. HV Operation But No Video

Is the video image output to either R, G, or B CRT?

NO

Does the picture Mute Function Operate Properly?

YES

Clear the picture mute.

NO

Is no signal input selected?

YES

Select the correct input.

NO

Is the GAIN CTL PWB IC7001 (3) voltage more than 5V ?

NO

Is the base voltage of the GAIN CTL PWB Q7036 more than 5 V?

NO

VIDEO OUT PWB, single tube ABL circuit in trouble.

YES

Is the base voltage of the GAIN CTL PWB Q7035 more than 5V?

NO

HV PWB ABL circuit in trouble

YES

Is the voltage at pin 12 of the GAIN CTL PWB IC7017 about 0 V?

YES

Is the contrast set to the MIN position?

YES

Set the contrast to the proper level.

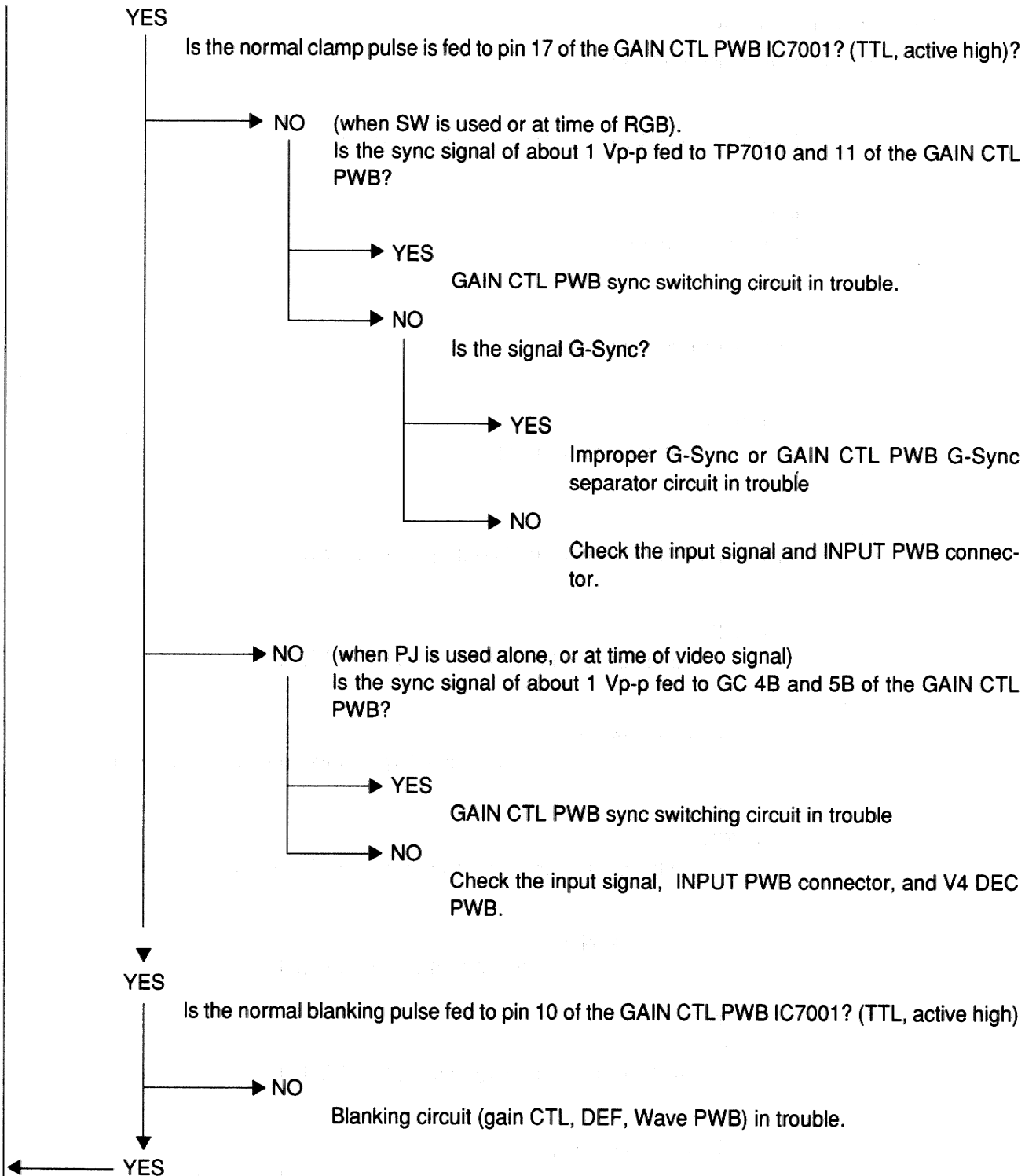
NO

WAVE PWB or SYSTEM PWB in trouble

NO

GAIN CTL PWB limiter in trouble.

TROUBLESHOOTING CHART



YES

Is the video signal of about 0.4Vp-p fed to pins 4, 6, and 8 of the GAIN CTL PWB IC7001?

NO

(At time of SW use or at time of RGB)

Is the video signal of about 0.7Vp-p fed to the GAIN CTL PWB TP7001, TP7002, and TP7003?

YES

GAIN CTL PWB video switching circuit in trouble.

NO

Check the input and INPUT PWB connector.

NO

(At time of PJ use alone, and at time of video)

Is the video signal of about 0.7Vp-p fed to the GAIN CTL PWB GC 1B, 2B, and 3B?

YES

GAIN CTL PWB video switching circuit in trouble

NO

Check the input signal, INPUT PWB connector, and V4 DEC PWB.

YES

Is the video signal of about 1Vp-p output to the GAIN CTL PWB TP7005, TP7006, and TP7007?

NO

GAIN CTL PWB pre-drive circuit in trouble

YES

Are the video signal of about 110Vp-p, about 120Vp-p, and about 100Vp-p output to pin 1 of the VIDEO OUT PWB OR, pin 1 of the VIDEO OUT PWB OG, and pin 1 of the VIDEO OUT PWB OB?

NO

VIDEO OUT PWB in trouble

YES

Check to be sure that the following video signals are output to the respective CRT PWBs:

About 110Vp-p to the R CRT PWB TP7711.

About 120Vp-p to the G CRT PWB TP7712.

About 100Vp-p to the CRT PWB TP7713.

YES

The CRT not output a signal, or G2 connector in trouble

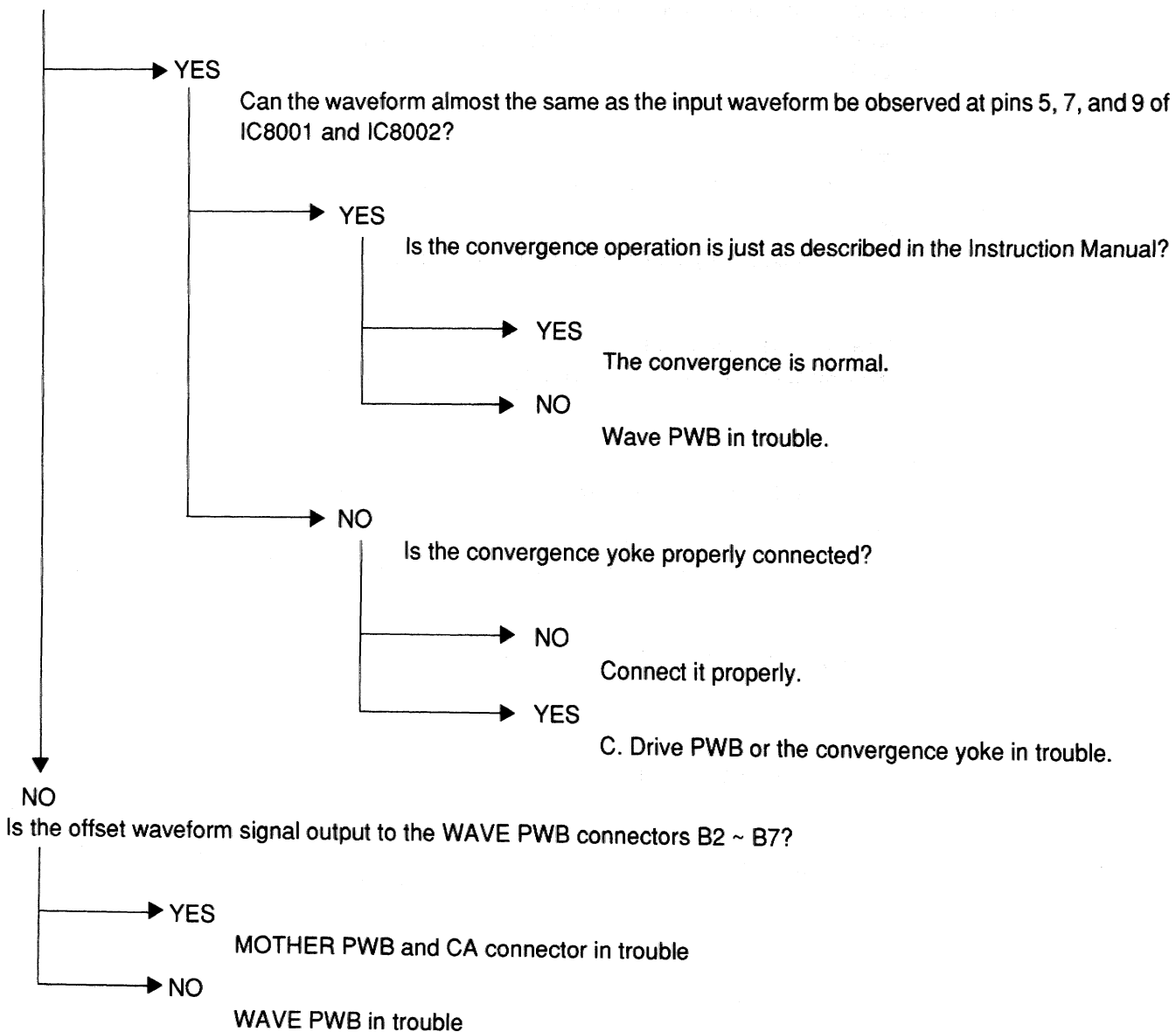
NO

The CRT PWB not output a signal, or OR, OG, or OB connector in trouble

TROUBLESHOOTING CHART

6. Convergence Failure

Is the offset wave signal of about 1 to 5 Vp-p is fed to input waveform test points TP8001 ~ TP8006 of the C DRIVE PWB.

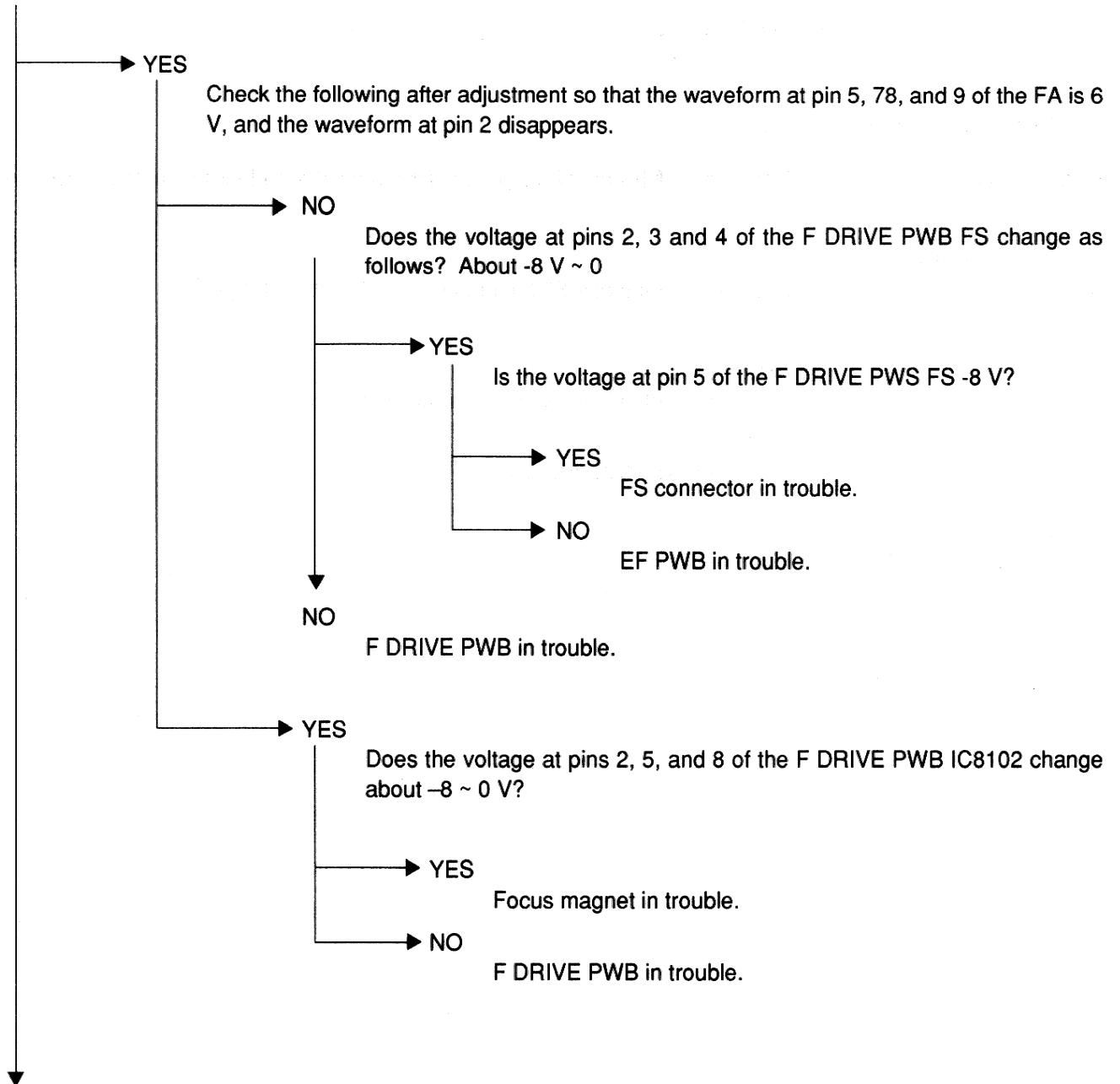


7. Electric Focus Failure

Is the static focus not proper? Or, the vertical dynamic focus improper?
Or else, the horizontal dynamic focus improper? ---- can be localized.

7-1 Static Focus Failure

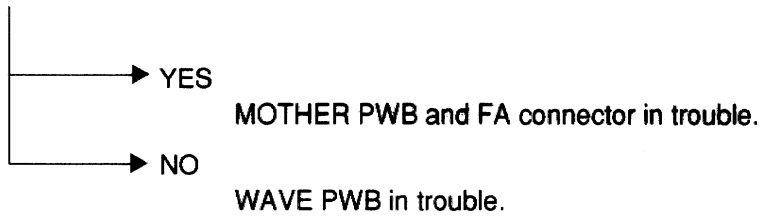
Does the voltage at pins 5, 7 and 9 of the DRIVE PWB FA change to about 0 ~ 2 V when adjusting the static focus from the minimum to the maximum, from the remote controller?



TROUBLESHOOTING CHART

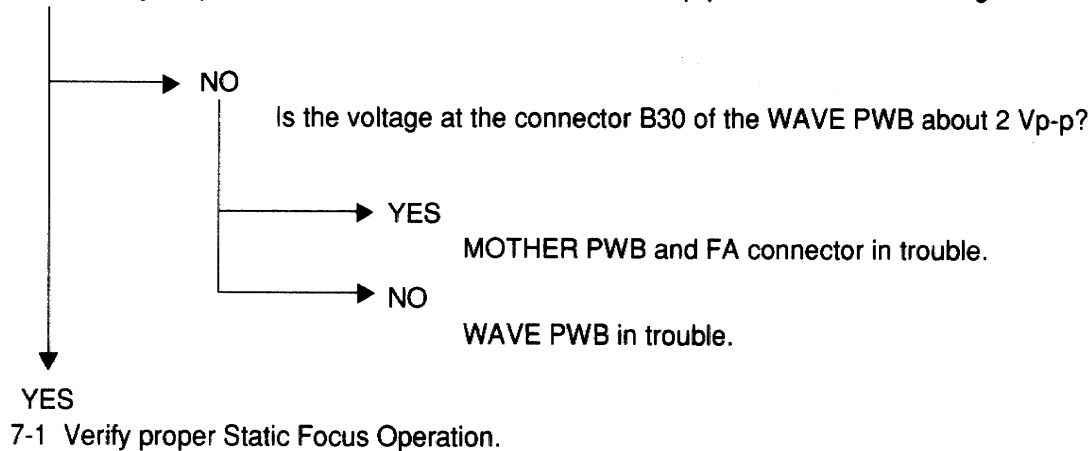
NO

Do change the voltage at connector B26, 27, or 29 of the Wave PWB change to about 0 ~ 12 V when adjusting the static focus from the minimum to the maximum?



7-2 Vertical Dynamic Focus Failure

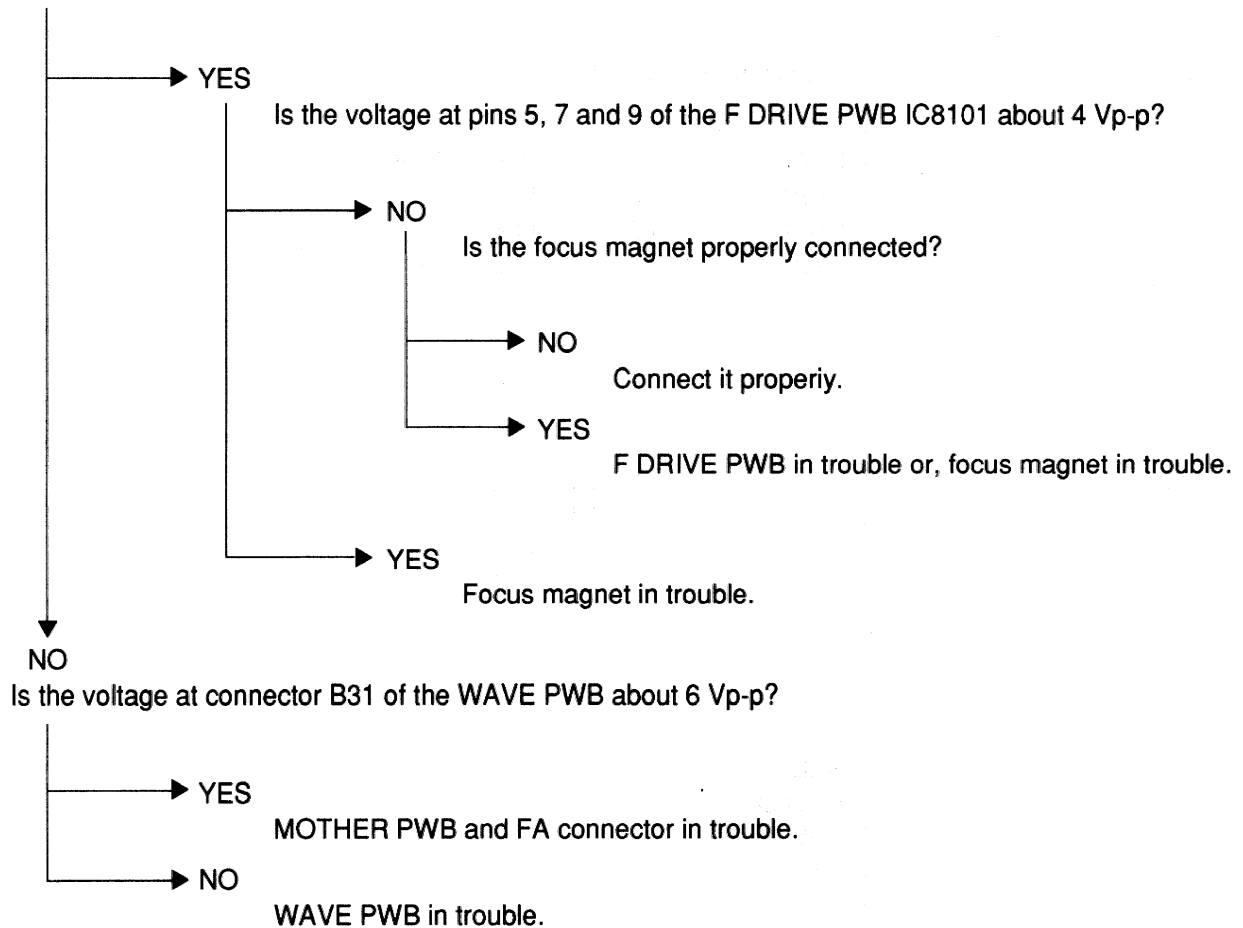
Is the voltage at pin 3 of the F DRIVE PWB FA is about 2 Vp-p? when the vertical edge focus is set to the maximum.



7-3 Horizontal Dynamic Focus Failure

When the balance between the left and the right is poor, adjust the tilt phase.

Is the voltage at pin 5 of the F DRIVE PWB FA about 6 Vp-p when the horizontal edge focus is maximum?

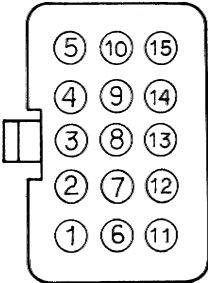


TROUBLESHOOTING CHART

[Attached Sheet 1]

PS Unit
Specifications of Connector Pin

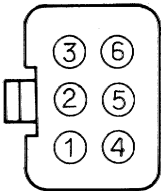
(1) "IB"



Connector Pin Specifications

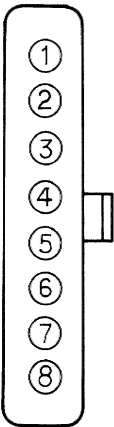
⑤ 35V	⑩ GND	⑮ GND
④ 60V	⑨ GND	⑭ 5.0V (STAND-BY)
③ 110V	⑧ -35V	⑬ 5.0V
② GND	⑦ -15V	⑫ GND
① 180V	⑥ 15V	⑪ 6.3V

(2) "IA"



③ -F/V	⑥ N. C
② F/V	⑤ GND
① +B. H. DEF	④ +B. CTL

(3) "IF"



① MUTE
② POWER
③ GND
④ 5V
⑤ DATA
⑥ CLK
⑦ STB
⑧ GND

ERRO MESSAGE FUNCTION

ERROR CODE EXPLANATION

This projection systems have the capability of displaying an error message when either of the following occur: projector operation failure or improper connection.

Code messages are displayed on the 2 seven segment displays located on the rear control panel.

Code list and explanations can be found on the attached sheets.

1. 7--Segment Display Error Code List

1. Communication Errors

- (1) "F3"
Point PWB communications error.
- (2) "F7"
Point PWB does not respond.
- (3) "F1"
Switcher communications error.
- (5) "F5"
Switcher does not respond.
- (6) "F4"
System program has crashed.
- (7) "F8"
Convergence adjustment has stopped. →
 - Is the PP pulse normal.
 - CF drive overvoltage.
- (8) "F0"
Fan stoppage.

2. Power Supply Failure

- (1) "A1" ~ "AF"
Refer to " 2. Power Unit Failure Diagnosis" for further details.
NOTE: I am renaming the error code explanation headings on the next two pages.

3. DEF PWB Failure

- (1) "B1" ~ "BF"
Refer to "3. DEF PWB Failure Diagnosis" for further details.

4. Gain CTL/Video OUT PWB Failure

- (1) "41" ~ "7F"
Refer to "5. Gain CTL/Video OUT PWB Failure Diagnosis for further details.

5. HV PWB Failure

- (1) "D0"
HV OFF with the protector operated. →
 - The PS unit 180 V dropped.
 - DEF deflection stopped.
 - Video OUT output abnormal.
 - HV overcurrent.
 - HV overvoltage.
- (2) "D1"
HV OFF without the protector operated. →
 - Cause: HV PWB in trouble.

ERROR MESSAGE FUNCTION

2. Power Unit Failure Diagnosis

Display	POWER	Symptom	Next Step
A1	NG	5V fuse blown.	
A2	?	180V power cut off.	
A3	?	180V power cut off.	
A4	***	***	
A5	?	110V power cut off. (5V fuse blown)	
A6	***	***	
A7	?	180V power cut off. 110V power cut off.	
A8	?	F/V power cut off.	
A9	?	F/V power cut off.	
AA	?	F/V power cut off. 180V power cut off.	
AB	?	F/V power cut off. 180V power cut off, and 5V fuse blown	
AC	***	***	
AD	?	F/V power cut off. 110V power cut off	
AE	***	***	
AF	NG	All power cut off or power OFF.	

Note: ? : This mode is not currently used.

*** : Unused mode. Possible detection section failure.

3. DEF PWB Failure Diagnosis

Display	DEF	Symptom	Next Step
B1	OK	H sync input alarm	TO STEP 01
B2	OK	V sync input alarm	TO STEP 01
B3	OK	HV sync alarm	TO STEP 01
B4	NG	H deflection stopped	TO STEP 02
B5	NG	H deflection stopped and H sync input alarm	TO STEP 02
B6	NG	H deflection stopped and V sync input alarm	TO STEP 02
B7	NG	H deflection stopped and HV sync input alarm	TO STEP 02
B8	NG	V deflection stopped	TO STEP 03
B9	NG	V deflection stopped and H sync input alarm	TO STEP 03
BA	NG	V deflection stopped and V sync input alarm	TO STEP 03
BB	NG	V deflection stopped and HV sync input alarm	TO STEP 03
BC	NG	HV deflection stopped	TO STEP 01, 02, 03
BD	NG	HV deflection stopped and H sync alarm	TO STEP 01, 02, 03
BE	NG	HV deflection stopped and V sync alarm	TO STEP 01, 02, 03
BF	NG	HV deflection stopped and HV sync alarm	TO STEP 01, 02, 03

* Step 01 : Check GAIN CTL PWB for valid input signal.

* Step 02 : H deflection yoke connector check and F/V power check.

* Step 03 : Deflection yoke connector check and DEF output check.

4. GAIN CTL/VIDEO PWB Failure Diagnosis

NOTE: This listing containing variations of the following explanation which is confusing. For example OUT (B) Not output is easier to understand when written: No (B) OUTPUT'. Therefore the following corrections should be made for this page and the next:

Current listing	Correction
OUT (B) Not output	No (B) Video Output
OUT (G) Not output	No (G) Video Output
OUT (R) Not output	No (R) Video Output
OUT (R, G, B) Not output	No (R, G, B) Video Output
GAIN (R, G, B) Not output	No (R, G, B) Video Gain Output

Display	Gain/OUT	Symptom	Next Step
41	NG	OUT (B) Not output.	TO STEP 01
42	NG	OUT (G) Not output.	TO STEP 01
43	NG	OUT (G, B) Not output	TO STEP 01
44	NG	OUT (R) Not output	TO STEP 01
45	NG	OUT (R, B) Not output	TO STEP 01
46	NG	OUT (R, G) Not output	TO STEP 01
47	NG	OUT (R, G, B) Not output	TO STEP 01
48	***	***	
49	NG	GAIN (B) Not output	TO STEP 02
4A	***	***	
4B	NG	GAIN (B), OUT (G) Not output	TO STEP 03
4C	***	***	
4D	NG	GAIN (B), OUT (R) Not output	TO STEP 03
4E	***	***	
4F	NG	GAIN (B), OUT (R, G) Not output	TO STEP 03
50	***	***	
51	***	***	
52	NG	GAIN (G) Not output	TO STEP 02
53	NG	GAIN (G), OUT (B) Not output	TO STEP 03
54	***	***	
55	***	***	
56	NG	GAIN (G), OUT (R) Not output	TO STEP 03
57	NG	GAIN (G), OUT (R, B) Not output	TO STEP 03
58	***	***	
59	***	***	
5A	***	***	
5B	NG	GAIN (G, B) Not output	TO STEP 02
5C	***	***	
5D	***	***	
5E	***	***	
5F	NG	GAIN (G, B), OUT (R) Not output	TO STEP 03

ERROE MESSAGE FUNCTION

Display	Gain/OUT	Symptom	Next Step
60	***	***	
61	***	***	
62	***	***	
63	***	***	
64	NG	GAIN (R) Not output	TO STEP 02
65	NG	GAIN (R), OUT (B) Not output	TO STEP 03
66	NG	GAIN (R), OUT (G) Not output	TO STEP 03
67	NG	GAIN (R), OUT (G, B) Output	TO STEP 03
68	***	***	
69	***	***	
6A	***	***	
6B	***	***	
6C	***	***	
6D	NG	GAIN (R, B) Not output	TO STEP 02
6E	***	***	
6F	NG	GAIN (R, B), OUT (G) Not output	TO STEP 03
71	***	***	
72	***	***	
73	***	***	
74	***	***	
75	***	***	
76	NG	GAIN (R, G) Not output	TO STEP 02
77	NG	GAIN (R, G), OUT (B) Not output	TO STEP 03
78	***	***	
79	***	***	
7A	***	***	
7B	***	***	
7C	***	***	
7D	***	***	
7E	***	***	
7F	NG	GAIN (R, G, B) Not output	TO STEP 04

Note: *** Unused mode. Possible detection section failure.

* Step 01: Check if the CRT is cut off.

If it is replace the CRT PWB.

* Step 02: 1) Verify valid input signal.

(If this problem occurs in video but not RGB mode, then the V4-DEC PWB is faulty.)

Note: An all white raster must be input to run this check.

2) If nothing unusual is found, replace the GAIN CTL PWB Check performance one more time.

* Step 03: If error persists after performing step 02; Go back to step 01.

* Step 04: 1) First, check the power supply unit. (180 V, 15 V)

2) When the power supply unit is normal, perform Step 02.