

# SERVICE MANUAL

MODEL NAME : MIS – 4201



Designed by	Checked by	Approved by

## \* Revision History

[illegible]

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# 1. For Safe Service

## 1-1. SAFETY PRECAUTIONS

MIS-4201 is a display device to be divided into a Panel part , a Drive part and a mechanical part. The Panel part consists of Electrodes, Phosphor, various dielectrics and gas, the Drive part includes electronic circuitry and Board and The mechanical part includes mask assembly, back cover and other parts.

When using / handling this monitor, Please pay attention to the below warning and cautions. Indicates a hazard that may lead to death or injury if the warning is ignored and the product is handled incorrectly.

Indicates a hazard that can lead to injury or damage to property if the caution is ignored and the product is handled incorrectly.

## 1-2. WARNING

- 1) Do not supply a voltage higher than that specified to this product.  
This may damage the product and may cause fire.
- 2) Do not use this product in locations where the humidity is extremely high, where it may be splashed with water, or where flammable materials surround it.  
Do not install or use the product in a location that does not satisfy the specified environmental conditions. This may damage the product and may cause a fire.
- 3) If a foreign substance (such as water, metal, or liquid) gets inside the product, immediately turn off the power. Continuing to use the product, it may cause fire or electric shock.
- 4) If the product emits smoke, and abnormal smell, or makes an abnormal sound, immediately turn off the power. Continuing to use the product, it may cause fire or electric shock.
- 5) Do not disconnect or connect the connector while power to the product is on.  
It takes some time for the voltage to drop to a sufficiently low level after the power has been turned off. Confirm that the voltage has dropped to a safe level before disconnecting or connecting the connector.
- 6) Do not pull out or insert the power cable from/to an outlet with wet hands.  
It may cause electric shock.
- 7) Do not damage or modify the power cable. It may cause fire or electric shock.
- 8) If the power cable is damaged, or if the connector is loose, do not use the product: otherwise, this can lead to fire or electric shock.
- 9) If the power connector or the connector of the power cable becomes dirty or dusty, wipe it with a dry cloth. Otherwise, this can lead to fire.
- 10) MIS-4201 set uses a high voltage (Max.450V DC). Keep the cautions concerning electric shock and do not touch the Device circuitry when handling the PDP Unit. And because the capacitor of the Device circuitry may remain charged at the moment of Power OFF, standing by for 1 minute is required in order to touch the Device circuitry

- 11) In order to protect static electricity due to C-MOS circuitry of the Drive part, wear a wrist band to protect static electricity when handling.
- 12) When cleaning the Panel, wipe it with a soft cloth moistened with water or neutral detergent, be careful not to touch the connector part of the Panel. And don't use chemical materials like thinner or benzene.
- 13) If this product is used as a display board to display a static image, "image sticking" occurs. This means that the luminance of areas of the display that remain lit for a long time drops compared with luminance of areas that are lit for a shorter time, causing uneven luminance across the display.  
The degree to which this occurs is in proportion to the luminance at which the display is used. To prevent this phenomenon, therefore, avoid static images as much as possible and design your system so that it is used at a low luminance, by reducing signal level difference between bright area and less bright area through signal processing.
- 14) Because PDP Module(set) emits heat from the Glass Panel part and the Drive circuitry, the environmental temperature must not be over 40° C. the temperature of the Glass Panel part is especially high owing to heat from internal Drive circuitry. And because the PDP Module(set) is driven by high voltage, it must avoid conductive materials.
- 15) When inserting components or circuit board in order to repair, be sure to fix a lead line to the connector before soldering.
- 16) When inserting high-power resistor(metal-oxide film resistor or metal film resistor) in order to repair, insert it as 10mm away as from a board.
- 17) During repairs, high voltage or high temperature components must be put away from a lead line
- 18) This is a Cold Chassis but you had better use a cold transformer for safety during repairs. When repairing electricity source part, you must use the cold transformer.
- 19) Do not place an object on the glass surface of the display. The glass may be broken or be scratched.
- 20) This product may be damaged if it is subject to excessive stresses (such as excessive voltage, current, or temperature).  
The absolute maximum ratings specify the limits of these stresses.
- 21) The recommended operating conditions are conditions in which the normal operation of this product is guaranteed. All the rated values of the electrical specifications are guaranteed within these conditions.  
Always use the product within the range of the recommended operating conditions. Otherwise, the reliability of the product may be degraded
- 22) This product has a glass display surface. Design your system so that excessive shock and load are not applied to the glass. Exercise care that the vent at the corner of the glass panel is not damaged.  
If the glass panel or vent is damaged, the product is inoperable.

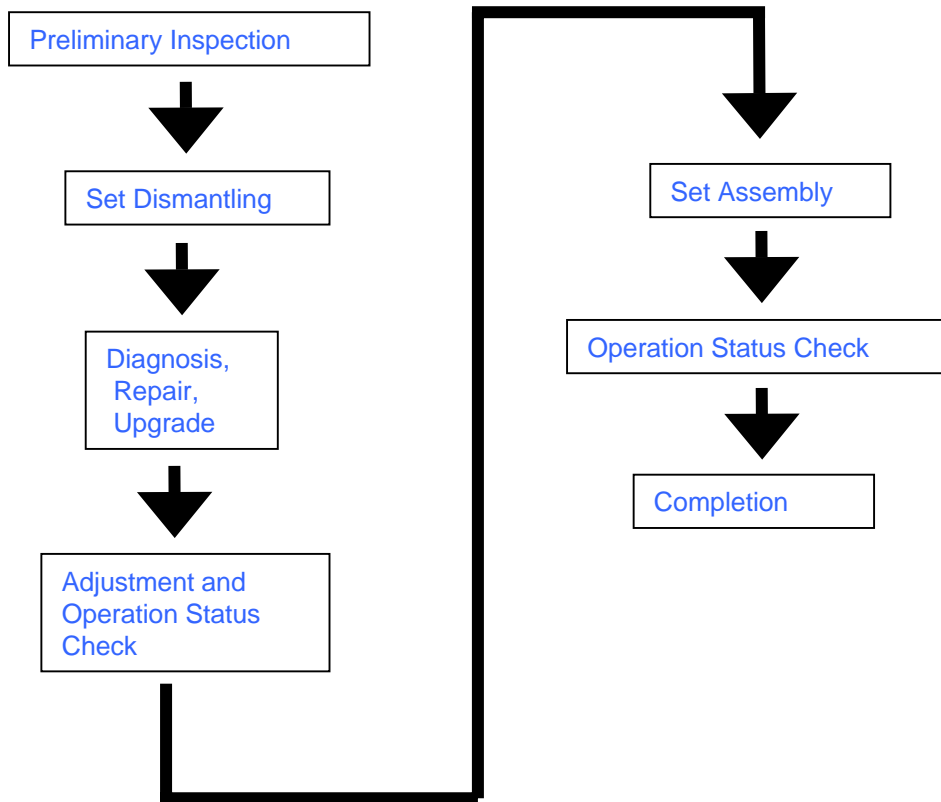
- 23) Do not cover or wrap the product with a cloth or other covering while power is supplied to the product.
- 24) Before turning on the power to the product, check the wiring of the product and confirm that the supply voltage is within the rated voltage range. If the wiring is wrong or if a voltage outside the rated range is applied, the product may malfunction or be damaged.
- 25) Do not store this product in a location where temperature and humidity are high. This may cause the product to malfunction. Because this product uses a discharge phenomenon, it may take time to light (Operation may be delayed) when the product is used after it has been stored for a long time. In this case, it is recommended to light all cells for about 2 hours (aging).
- 26) This product is made from various materials such as glass, metal, and plastic. When discarding it, be sure to contact a professional waste disposal operator.
- 27) If faults occur due to arbitrary modification or disassembly, Orion PDP Co., Ltd. is not responsible for function, quality or other items.
- 28) Use of the product with a combination of parameters, conditions, or logic not specified in the specifications of this product is not guaranteed. If intending to use the product in such a way, be sure to consult Orion PDP Co., Ltd. in advance.
- 29) Within the warranty period, general faults that occur due to defects in components such as ICs will be rectified by Orion PDP Co Ltd. However, IMAGE STICKING due to misapplying the above (12) provision is not included in the warranty. Repairs due to the other faults may be charged depending on responsibility for the faults.

## 2. Tools and Measuring

- 1) Portable Oscilloscope
- 2) Digital Multi-Meter (DMM)
- 3) (+) type adjustment bar
- 4) (+) type screw driver and tip
- 5) Hexagonal screw driver

## 3. Service Procedure

MIS-4201 service is carried out in the following order.  
For service procedures and methods of each part,  
refer to the corresponding section in this manual.



## 4. Product Specification

### 4-1. General Specification

FEATURE	SPECIFICATION	REMARK
POWER INPUT	AC 100V ~ 240V , 50/60 Hz	
POWER CONSUMPTION	400W [MAX]	FULL WHITE 100% LEVEL
DIMENSIONS	925mm[W]×523mm[H]×76.5mm[D]	
WEIGHT	27Kg	MONITOR BODY ONLY
SCREEN SIZE	921mm[H]×518mm[V]	DIAGONAL IS 42 INCH
ASPECT RATIO	16 : 9	
RESOLUTION	853[H]×480[V]	WIDE VGA[1pixel=3 RGB cells]
PIXEL PITCH	1.08 mm × 1.08 mm	
COLOR ARRANGEMENT	RGB VERTICAL STRIPE TYPE	
NUMBER OF GRADATION	256 STEPS FOR VIDEO,RGB	
PEAK BRIGHTNESS	Min. ≥ 200 cd/m <sup>2</sup>	1 % WINDOWS
CONTRAST RATIO	Min. ≥ 400 : 1	DRCR
SEAM	≤ 6mm	Monitor to Monitor
VIEWING ANGLE	160 deg.	
CONTROL TIME INTERVAL	≥ 10 SECOND	MSCS CONTROL
FRONT FILTER	LOW REFLECTION COATING FILM	



## 4-2. Input & Output Terminal

PORT NAME	PORT SPEC.	INPUT PORT		OUTPUT PORT		REMARK
		PORT TYPE	Q'ty	PORT TYPE	Q'ty	
COMPOSITE [VIDEO]	NTSC/PAL/SECAM	BNC 1 PIN	1	BNC 1 PIN	1	
S-VIDEO	NTSC/PAL/SECAM	DIN 4 PIN	1	DIN 4 PIN	1	
COMPONENT [DVD/DTV]	Y,Pb/Cb,Pr/Cr * DVD : 480i,576i * DTV : 480P,576P 720P[50/60Hz] 1080i[50/60Hz]	BNC 3 PIN	1	BNC 3 PIN	1	
PC	ANALOG RGB *VGA *SVGA *XGA *UXGA[1600*1200,60Hz]	D-SUB 15 PIN	1	D-SUB 15 PIN	1	
DVI	DIGITAL RGB [TMDS] *VGA *SVGA *XGA *UXGA[1600*1200,60Hz]	DVI-D 24 PIN	1	DVI-D 24 PIN	1	* OPTION HDCP
REMOTE CONTROL	RS-232C *FEMALE : INPUT *MALE : OUTPUT	D-SUB 9 PIN	1	D-SUB 9 PIN	1	STRAIGHT TYPE [NOT TWIST]

### 4-3. Input Signal Specification

No	Item		Min	Type	Max	Unit	Remark
1	Component (DVD / D-TV)	Component Input Terminal	Component Input Y, Pb, Pr (Green, Blue, Red)				
		Y Input Level	0.6	0.8	0.8	Vpp	
		Sync Level	0.24	0.3	0.36	Vpp	
		Pb Input Level			± 350	mV	
		Pr Input Level			± 350	mV	
2	DVI	DVI Input Terminal	DVI-D Terminal Digital R,G,B(TMDS)				
			Vcc(Termination Supply Vol.) =3.3V, ±5% Termination Resistance : 50Ohms, ± 10%				
3	PC (ANALOG RGB)	RGB Input Level	0.5	0.7	1.0	Vpp	
		Sync Separate	2.5		5.0	Vdc	
		Sync Composite	2.5		5.0	Vdc	
		Sync On Green	0.2	0.3	0.4	Vpp	Negative Sync
4	Composite Video	Video Input Terminal	BNC Jack				
		Video Input Level	0.85	1.0	1.15	Vpp	
		Video Sync Input	0.25	0.30	0.35	Vpp	
		Video burst Input	0.25	0.30	0.35	Vpp	
5	S-Video	S-Video Input Terminal	4 PIN DIN Jack				
		NTSC	Y=1Vp-p/75ohm, C=0.286Vp-p/75ohm				
		PAL	Y=1Vp-p/75ohm, C=0.299Vp-p/75ohm				

## 5. Board Description

### 5-1. I/P PCB

For input signal, S-video signal to separately enter luminance and color signals, Y/C composite video signal, DVD signal, DTV signal and the graphic signals of analog RGB and digital RGB can be used. In case of graphic signals, both analog and digital versions use AD9887 ADC. Each of 3CH even/ odd signals are converted into 8bit signals and entered to scaler. Similarly, DTV signals are also entered to scaler through the same route. Video signals are converted to the digital format of BT601 through the video processor of VPC3230D. Among input signals, CVBS (only NTSC) is entered to VPC3230D as Y/C is separated through 3D-comb filter. VPC3230D converts the format of input signals into 16-bit BT601, thus enters them to the deinterlacer of MDIN-150. MDIN-150 converts interface signal into progressive to send signal output to scaler. The output signal format is BT601, that is, Y:U:V 4:2:2 16bit. Scaler receives the input of MDIN-150 from control of CPU[RDC R2021] and graphic signal from AD9887, thus administers scaling to the resolution of multi-panel [853\*480] and produces signal output in LVDS format.



## 5-2. DIGITAL PCB

DIGITAL PCB receives the following signals and data from IP Board.

### \*LVDS FORMAT

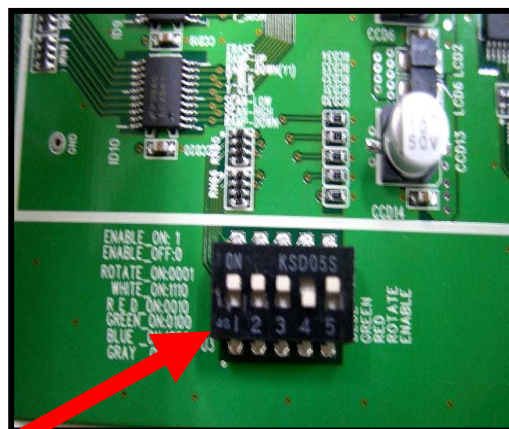
- R, G, B data
- DCLK
- Enable
- H Sync.
- V Sync.
- etc.

The data of R, G, B received from IP PCB is processed and adjusted to be displayed in PDP through CON PCB and COF (Data drive circuit. )

DIGITAL PCB also has APL(Automatic Power Limit) circuit which controls the power consumption and the heat in the PDP.

The data of H Sync, V Sync and DCLK is converted to X, Y & Z Timing pulse data for PDP.

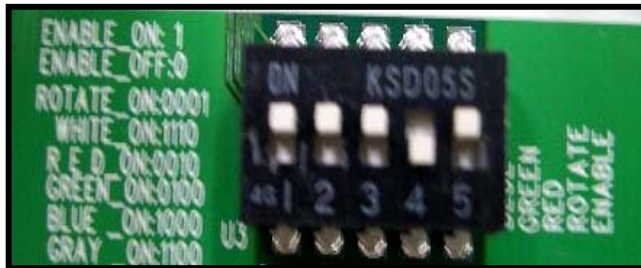
It is also working to reduce the Dynamic false contour and to maximize the 256 Gray level.



Test Pattern Switch for Module Inspection  
[High : ON]

## 5-2-1. How to use Inner Pattern Switch on DIGITAL PCB

ON 1



As an example,  
white pattern

0 [Inner Pattern Switch on DIGITAL PCB

※ SET NO : 1 2 3 4  
 - WHITE : 1 1 1 0  
 - RED : 0 0 1 0  
 - GREEN : 0 1 0 0  
 - BLUE : 1 0 0 0  
 - GRAY : 1 1 0 0  
 - ROTATE : 0 0 0 1

WHITE



RED



YELLOW



GREEN



CYAN



BLUE



MAGENTA

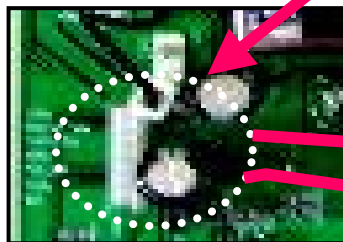
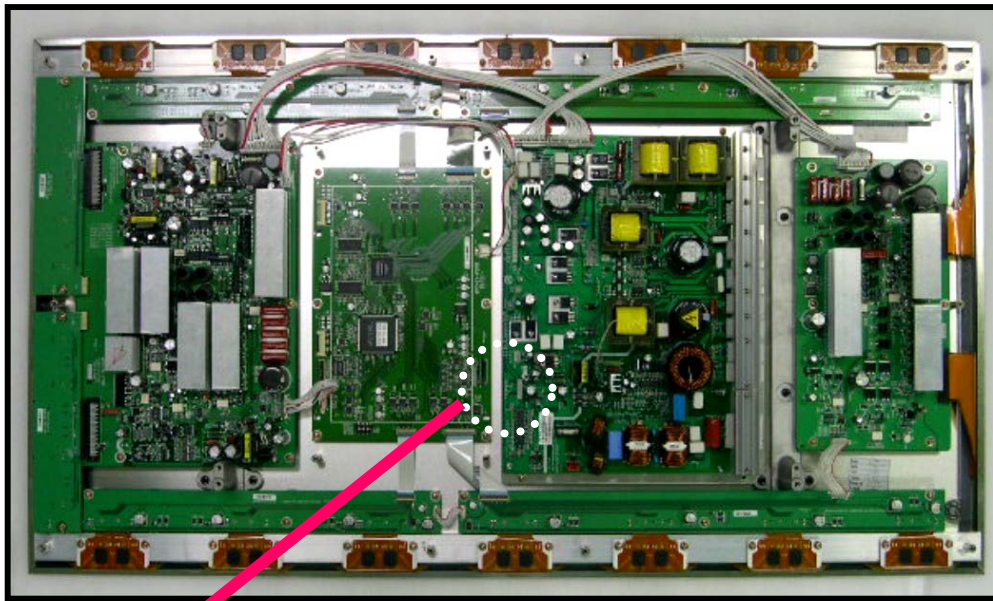
5 : Enable ON - 1  
 Enable OFF - 0

\*If you want to use this inner pattern switch on DIGITAL PCB, the switch of CN801 on POWER PCB should be set as shown next page.

If the switch [CN801] on POWER PCB is connected, you can turn the power on & off



## 5-2-2. How to use switch on POWER PCB



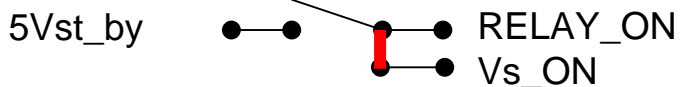
[PLANK TYPE]

**CN801**

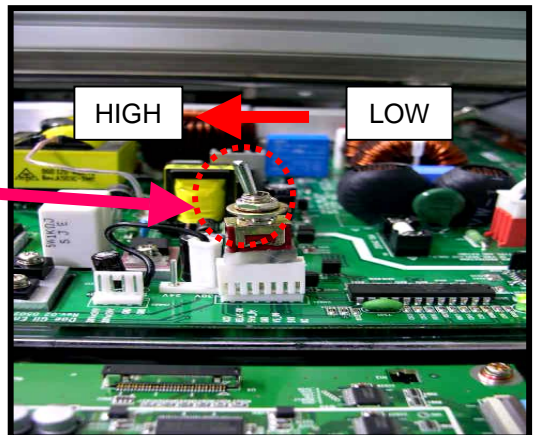


- 1:ACD
- 2:RELAY\_ON
- 3:5Vst\_by
- 4:GND
- 5:Vs\_ON
- 6:5VD
- 7:NC

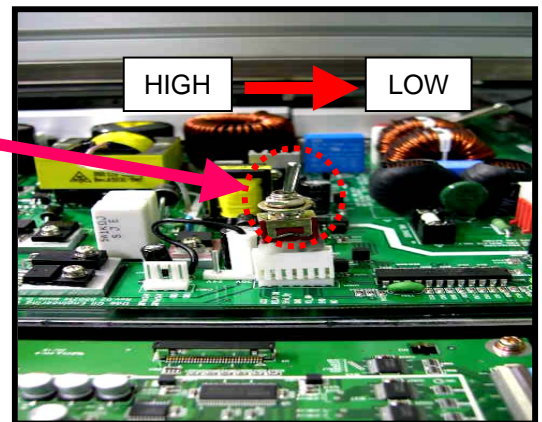
1 2 3 4 5 6 7



SWITCH DIAGRAM



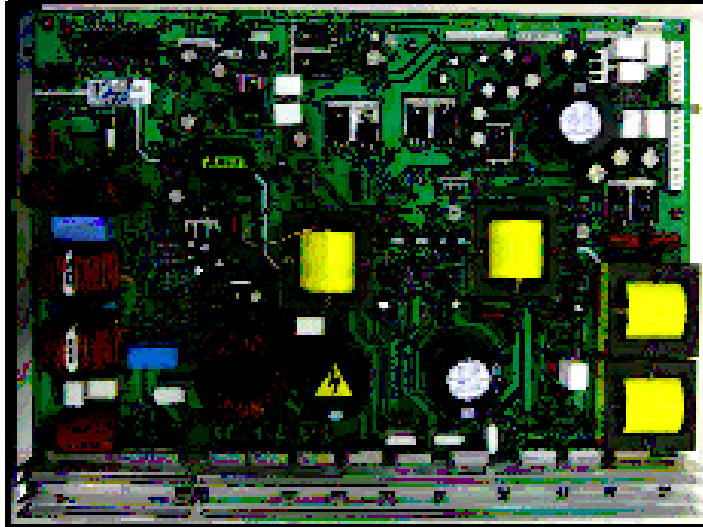
[Turn Off]



[Turn On]

### 5-3. POWR PCB

POWER PCB is to receive the AC power outside and to send the power each PCB in MIS-4201. AC 100 ~ 240 V  $\pm$  10% & 50/60 Hz  $\pm$  1 Hz is available.



### 5-4. SUS X PCB

SUS X PCB consists of the following.

- SUSTAIN : It includes the circuits of Energy recovery and discharge.
- V\_SHELF power REGULATOR : It works for adjusting and keeping the Voltage in the panel.
- 15V REGULATOR : It is changing from the 5V received from POWER PCB to the 15V and supplying it to Drive IC and SUS Y PCB.



## 5-5. SUS Y PCB

SUS Y PCB consists of the following.

- SUSTAIN
- Y-SHELF
- SCAN
- SCAN REGULATOR
- RAMP-DOWN
- Y-ERASE
- RAMP-UP REGULATOR
- 15V REGULATOR

SUSTAIN includes the circuits of Energy recovery and discharge.

The others work for adjusting and keeping the voltage sending to Panel.



## 5-6. SCAN HIGH / LOW PCB

The SCAN HIGH and LOW PCB consist of 4 PDP Scan Driver IC.

Driver IC controls 65 of high current and high voltage of output by using the 65 bit cascable 8MHz shift register. Additionally, 64 or 65 bit of output may be used depending on input values into the SEL port. Driver IC is supplied with the 150V power output and the 5V logic power separately. Command inputs are compatible with CMOS.





## 5-7. CON HIGH LEFT & RIGHT / CON LOW LEFT & RIGHT PCB

The CON HIGH LEFT & RIGHT / CON LOW LEFT & RIGHT PCB are connecting the data signal from SUS Y PCB with Z(data) Driver IC which is attached to the Panel.

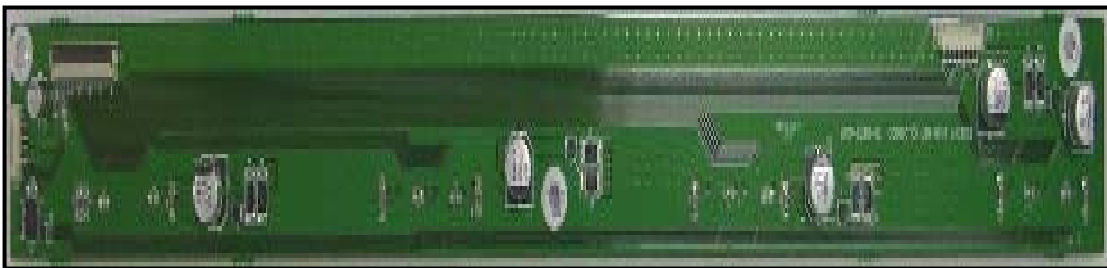
The CON HIGH LEFT & RIGHT / CON LOW LEFT & RIGHT PCB are connected to totally 7 COF(Chip On Film).

COF consists of the DATA Driver IC.

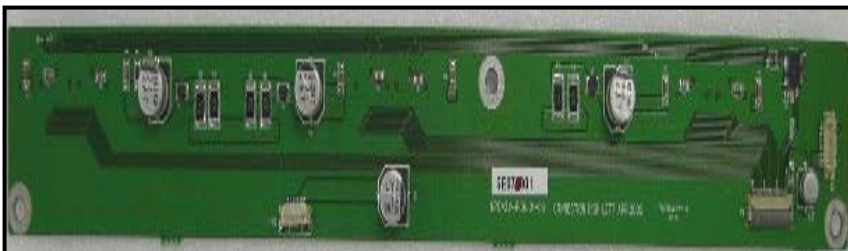
Those 7 COF having 2559 lines are connected with Panel.



CON LOW LEFT(LL) PCB



CON LOW RIGHT(LR) PCB

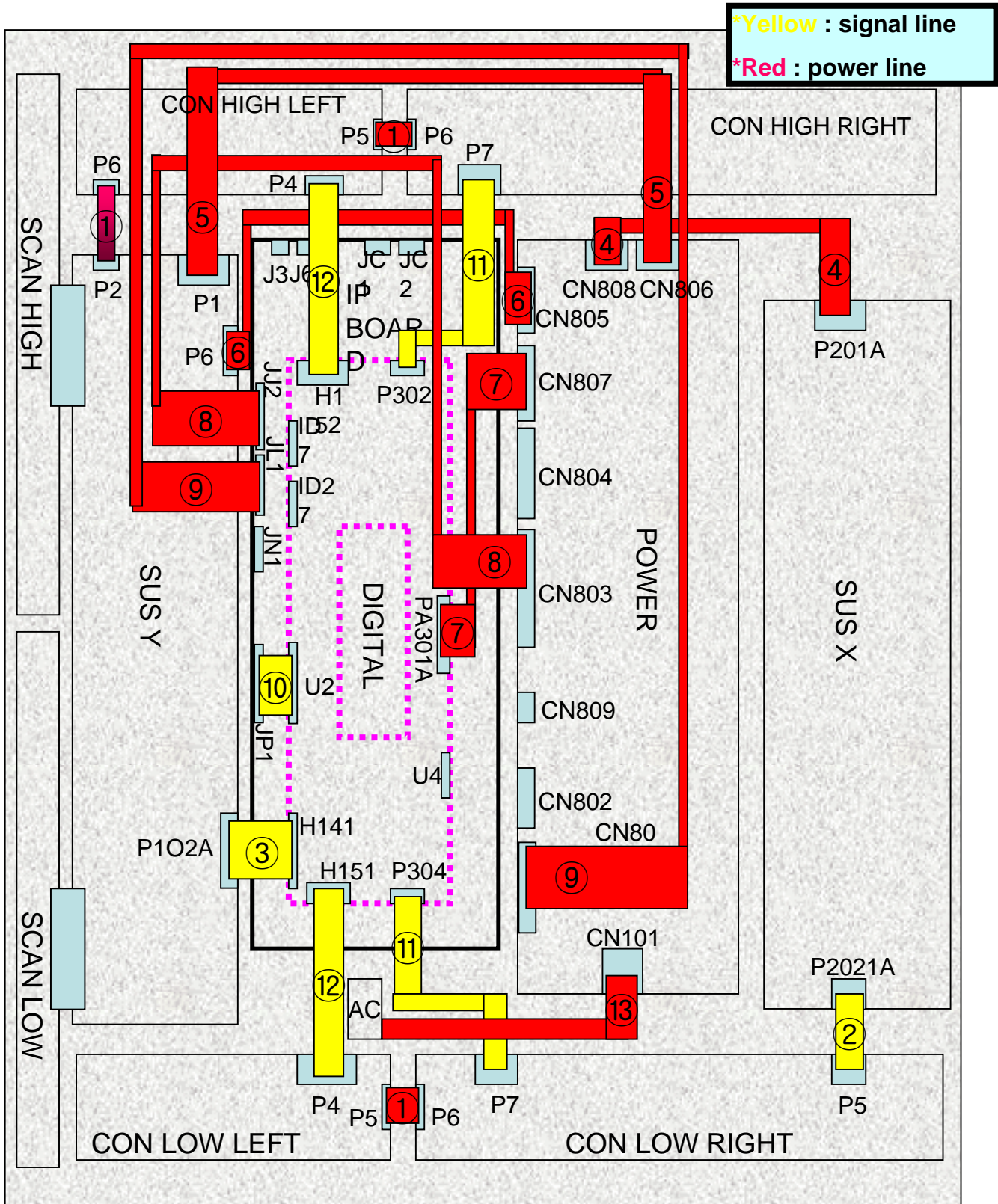


CON HIGH LEFT(HL) PCB



CON HIGH RIGHT(HR) PCB

## 6. Wiring Diagram [Signal Line & Power Line]

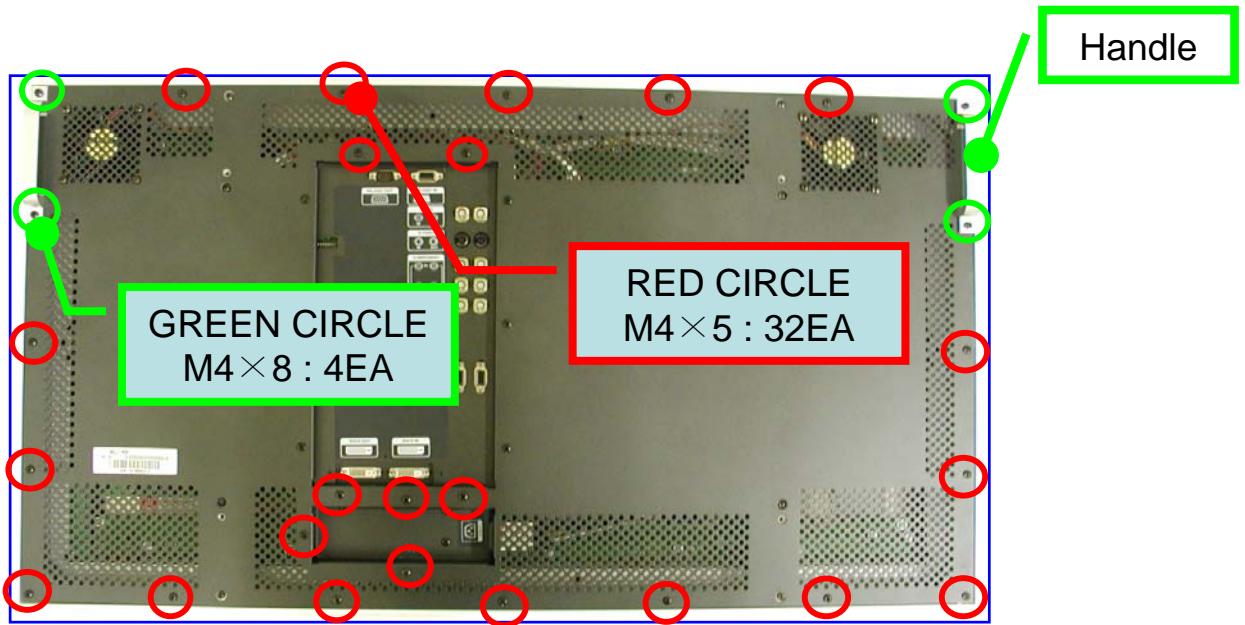


## \*A]The specification of connection

No.	MATERIAL NUMBER	MATERIAL NAME	SPECIFICATION	Q' TY	UNIT	REMARK
①	M7506149	CONNECTOR CABLE 6P	12505HS- 06+12505TS+ULW=50	3	EA	CON~ CON,Y
②	M7506150	CONNECTOR CABLE 12P	12505HS- 12+12505TS+ULW=90	1	EA	X~CON
③	M7506151	CONNECTOR CABLE 15P	12505HS- 15+12505TS+ULW=90	1	EA	Y~DIG.
④	M7506148	CONNECTOR CABLE 8P	YH396-08V+YT396J+ULW=400	1	EA	X_SUS
⑤	M7506146	CONNECTOR CABLE 10P	YH396-10V+YT396J+ULW=400	1	EA	Y_SUS
⑥	M7506147	CONNECTOR CABLE 4P	YH396-04V+YT396J+ULW=300	1	EA	Y_5V
⑦	M7506155	CONNECTOR CABLE 4P	171822-08+170262-1=100	1	EA	DIG._5V
⑧	M7506143	CONNECTOR CABLE 10P	SMH250-10+LH01-250-12=460	1	EA	AV-POW
⑨	M7506154	CONNECTOR CABLE 6P	SMH250-06+LH01-250-07=590	1	EA	AV-POW
⑩	M7506145	CONNECTOR CABLE 31P	GT121-31S-CD+GT121-C- 15000=120	1	EA	AV-DIG
⑪	M7519752	FFC	50P 100L 0.5pt SINGLE SIDE	2	EA	
⑫	M7519753	FFC	30P 80L 0.5pt SINGLE SIDE	2	EA	
⑬	M7519247	NOISE FILTER	02P-210M(TDK)-INLET(D)	1	EA	

# 7.Dismantling Procedure

## 7-1. Dismantling of Back Cover



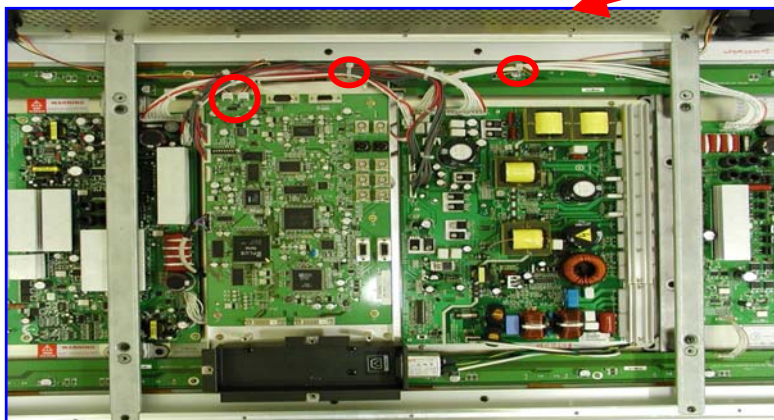
### 1) Materials Used

M7543053 SCREW MACHINE M4×8 BIND MFZN 4EA

M7543073 SCREW MACHINE M4×5 BIND MFZN 23EA

### 2) Dismantling Procedure

- ① Remove 4 screws to fasten handle.
- ② Remove edge screws first, then continue on to remove other screws.



- ③ Lift up back cover as shown in the picture to the left. Then, remove J3 and J6 connectors.
- ④ After removing the cable tie, remove fan cable.



## 7-2. Dismantling of I/P Plate Assembly

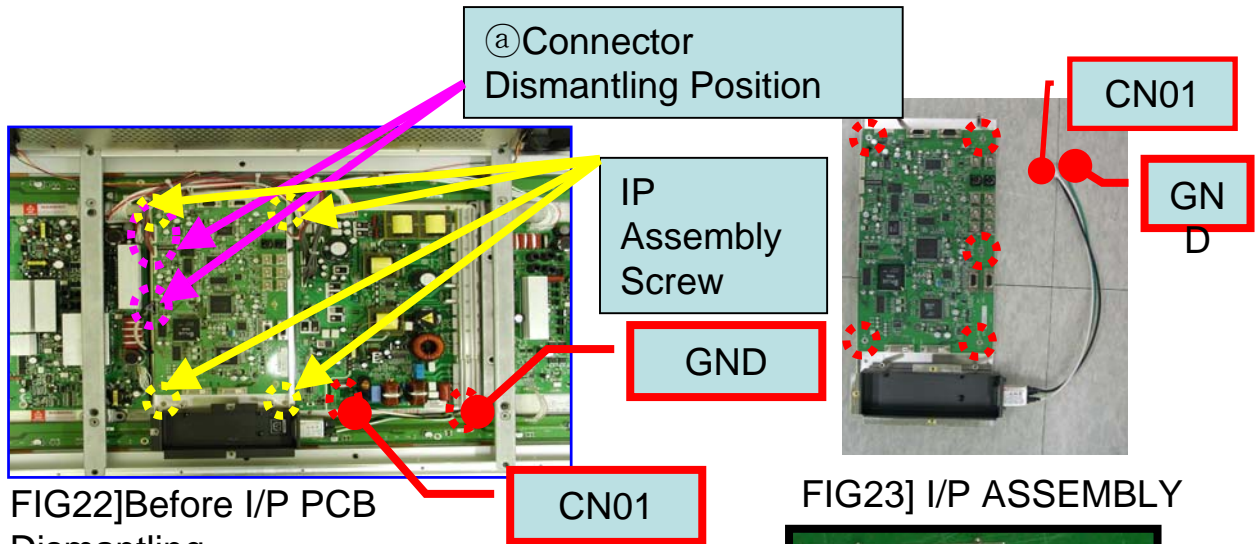


FIG23] I/P ASSEMBLY

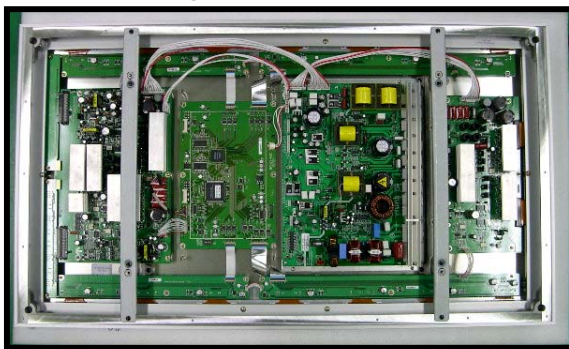
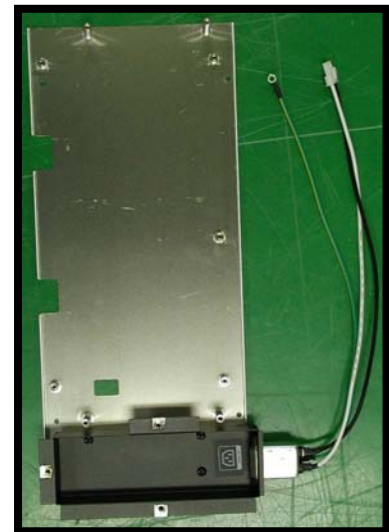


FIG24] After I/P PCB Dismantling

FIG24] I/P Plate+Noise



### 1) Materials Used

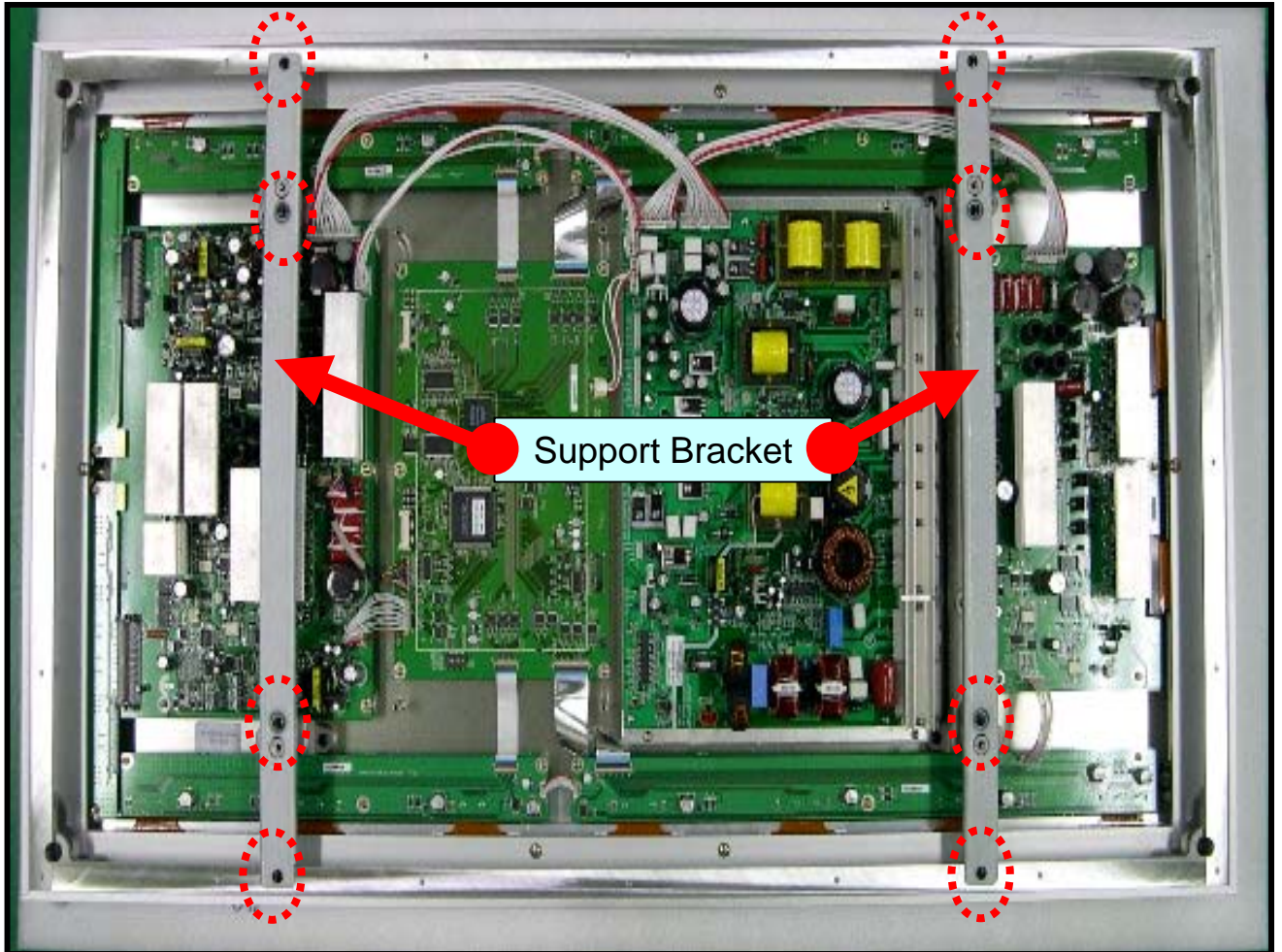
M7543061 SCREW MACHINE PSW M3×8 MFZN 9 EA

### 2) Dismantling Procedure

- ① Dismantle connector in magenta circle of ① in Fig. 22].
- ② Remove 4 screws in yellow circle of ② in Fig. 22].
- ③ Dismantle CN01 connector of ③ in Fig. 22].
- ④ Remove 2 screws of GND of ④ in Fig. 22].
- ⑤ Remove I/P PCB from the dismantled IP assembly[Fig. 23].  
Remove 5 screws in red circle.
- ⑥ Dismantled up to the status indicated in Fig. 24].

### Filter Ass'y

### 7-3. Dismantling of Support Bracket



#### 1) Materials Used

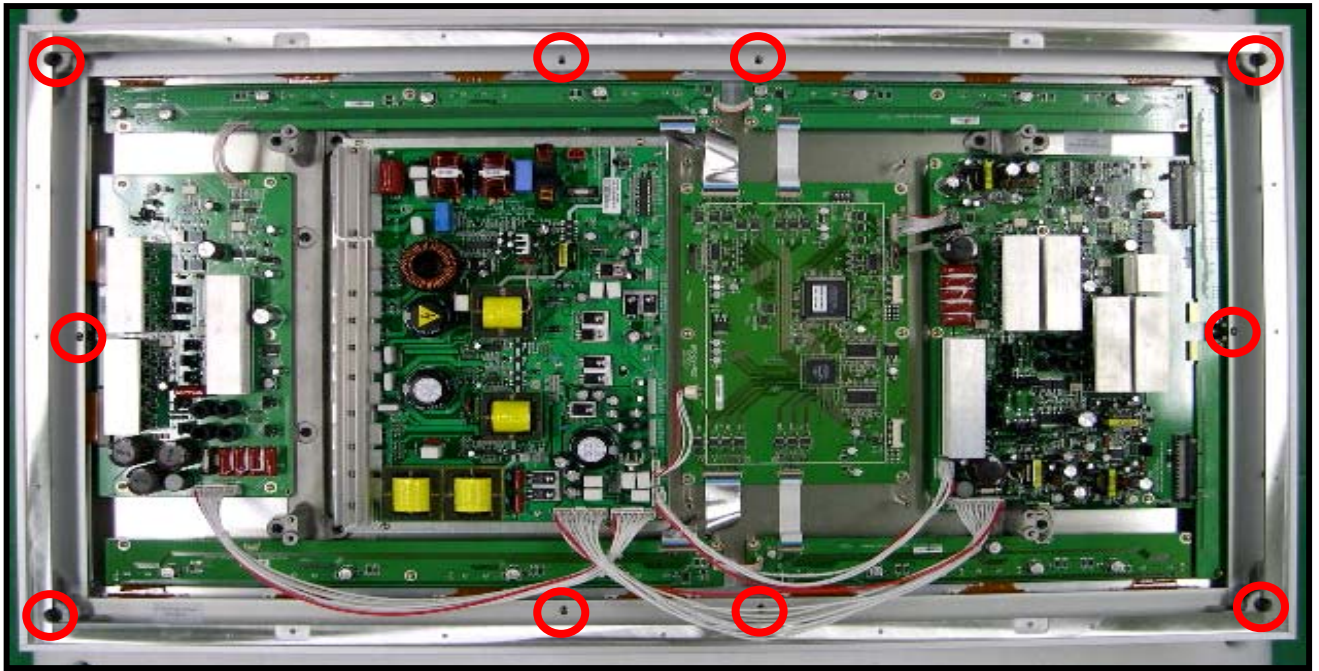
M7543053 SCREW MACHINE BIND M4×8 MFZN(BLACK) 8 EA

#### 2) Dismantling Procedure

- ① Remove 4 fixing screws on the right.
- ② Remove 4 fixing screws on the left.



## 7-4. Dismantling of Master Frame

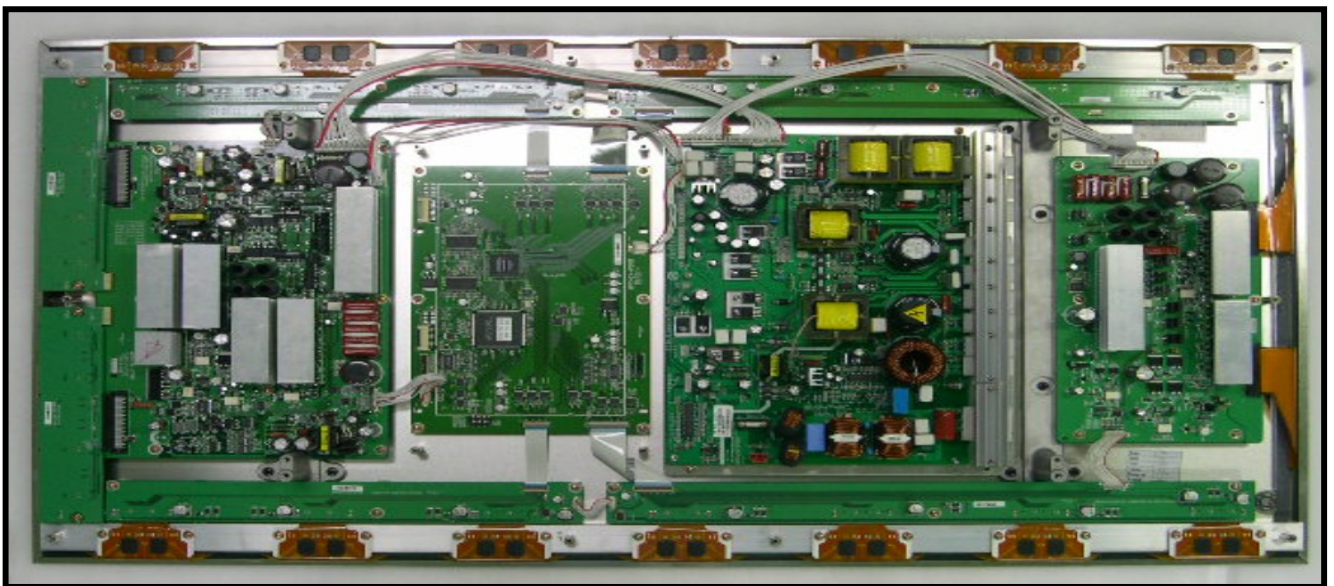


### 1) Materials Used:

M7543053 SCREW MACHINE BIND M4×8 MFZN(BLACK) 10 EA

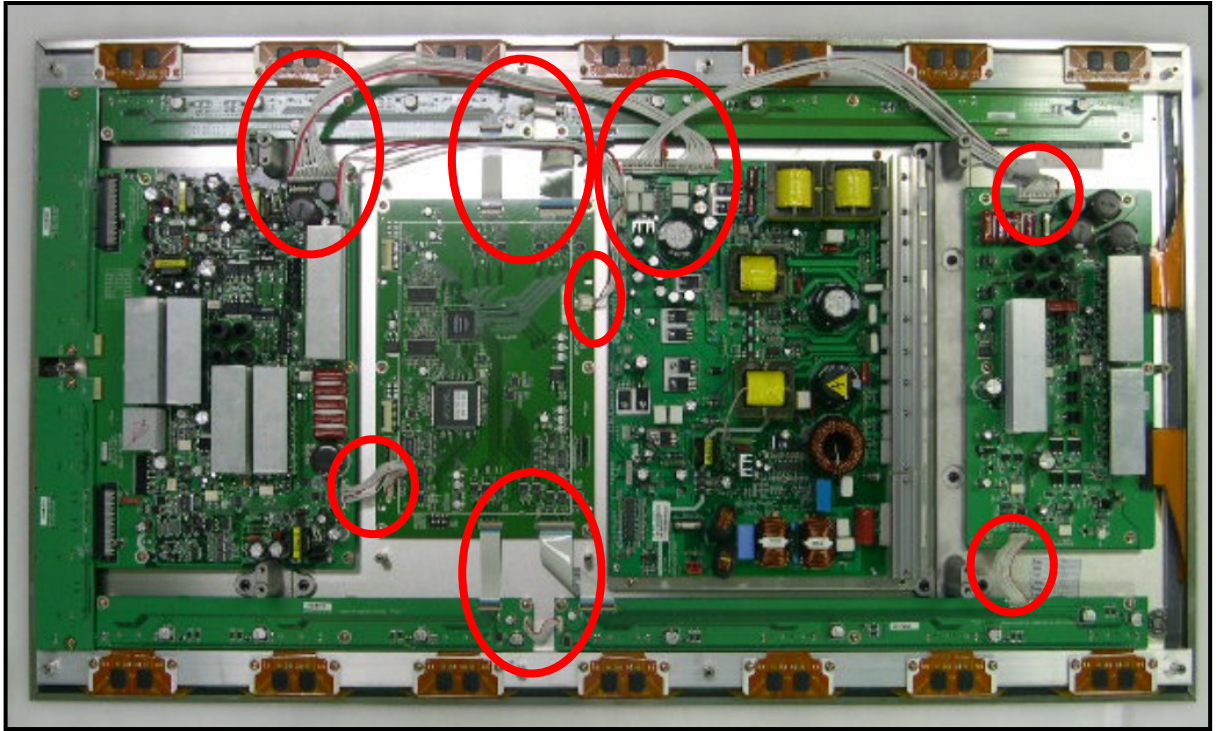
### 2) Dismantling Procedure (Refer to the above picture indicating the screws to be removed.)

There is no particular order of dismantling. However, make sure to remove all 10 screws. The below picture indicates the pure module status after dismantling master frame.





## 7-5. Dismantling of Wires

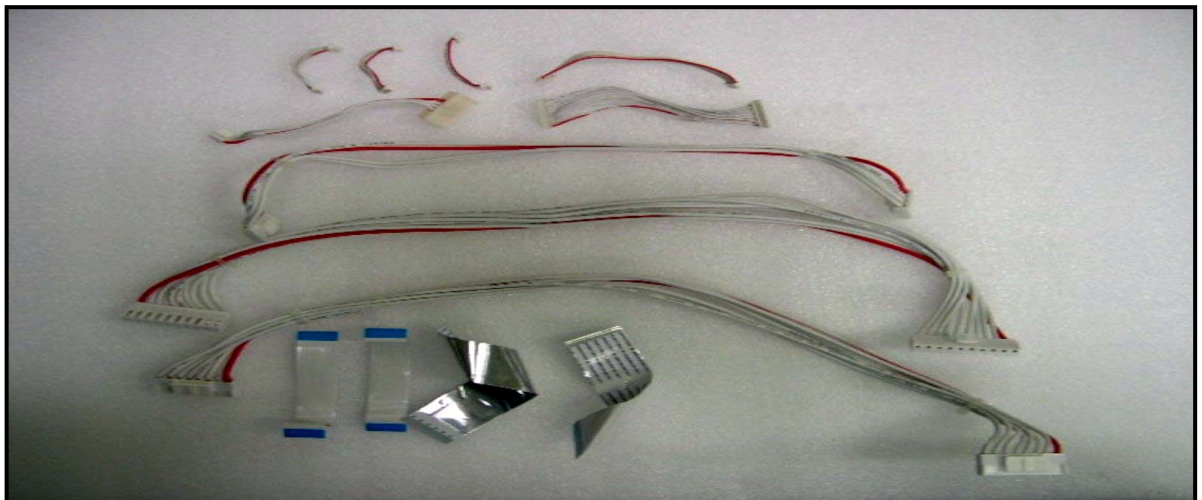


### 1) Dismantling Procedure:

When dismantling wires, make sure to dismantle all of the 13 varieties without any specific order.

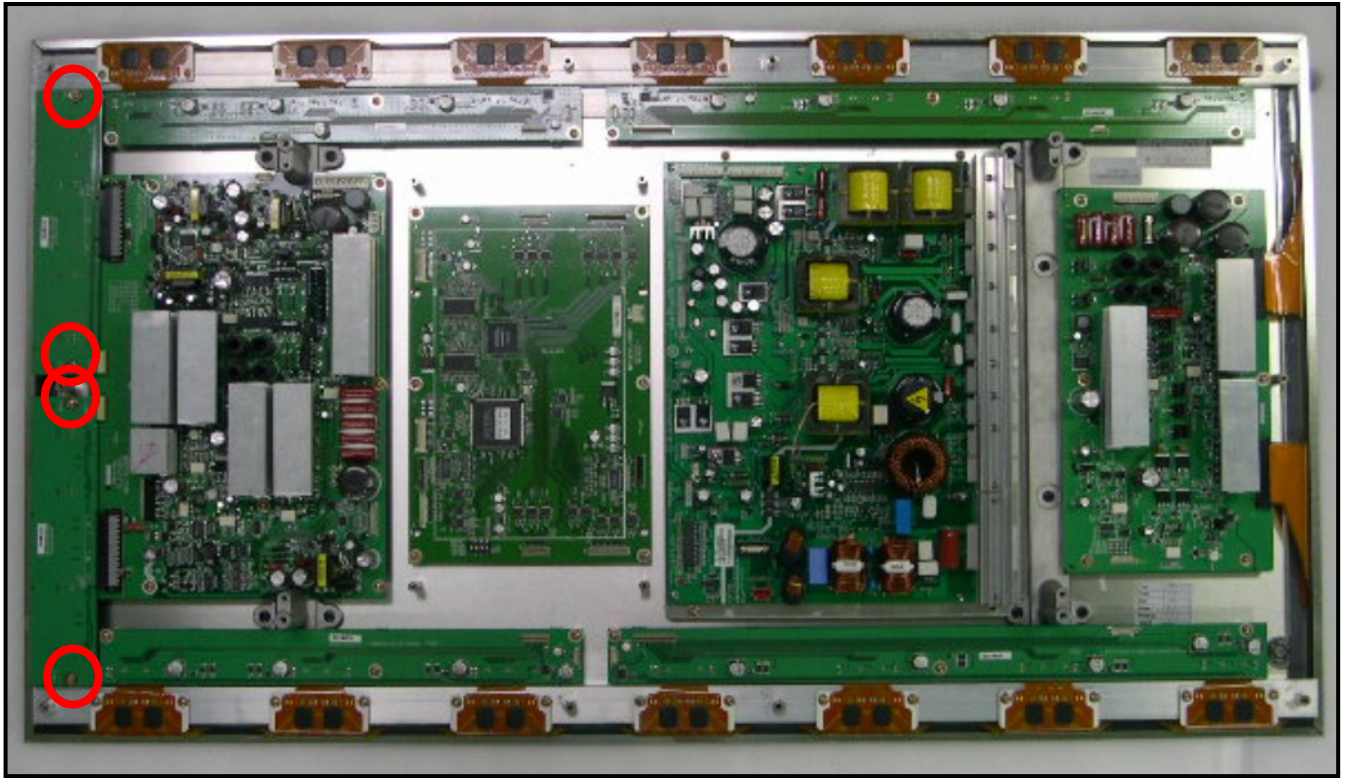
During assembly, take caution not to cause damage to connectors. Refer to 6. Wiring Diagram (Signal & Power line) for wire connection.

### 2) The below picture shows wires dismantled from the above picture.





## 7-6. Dismantling of SCAN PCB

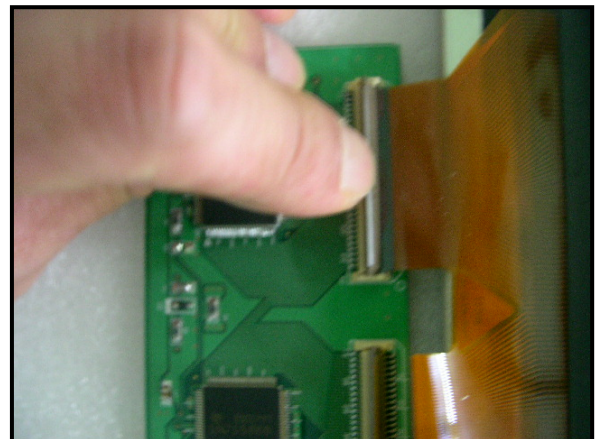


### 1) Materials Used:

M7543061 SCREW MACHINE PSW M3×8 MFZN 4 EA

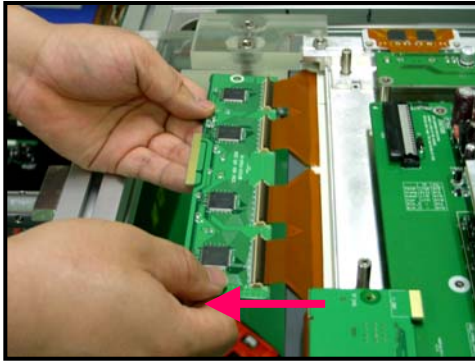
### 2) Dismantling Procedure (Refer to above picture for screws to be removed.)

Remove all 4 screws without any specific order. The picture below shows the process of FPC dismantling after removing screws.

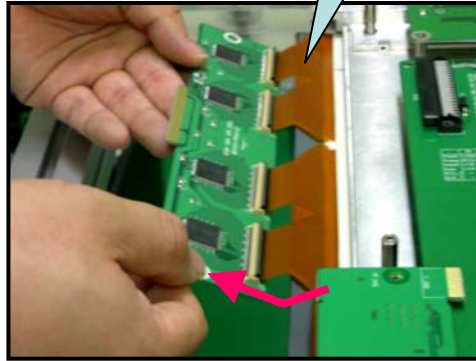


## 7-6-1. Tips for disassembling

### 1) SCAN LOW & HIGH PCB

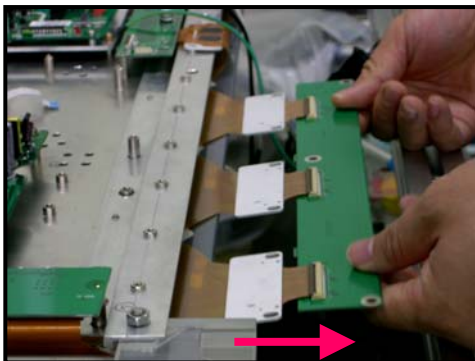


Picture 1. Not recommended

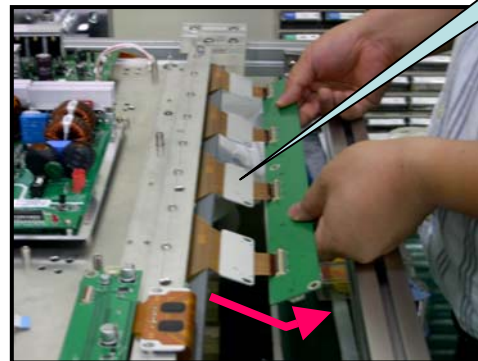


Picture 2. Recommended

### 2) CON LOW/LEFT & RIGHT PCB



Picture 1. Not recommended



Picture 2. Recommended

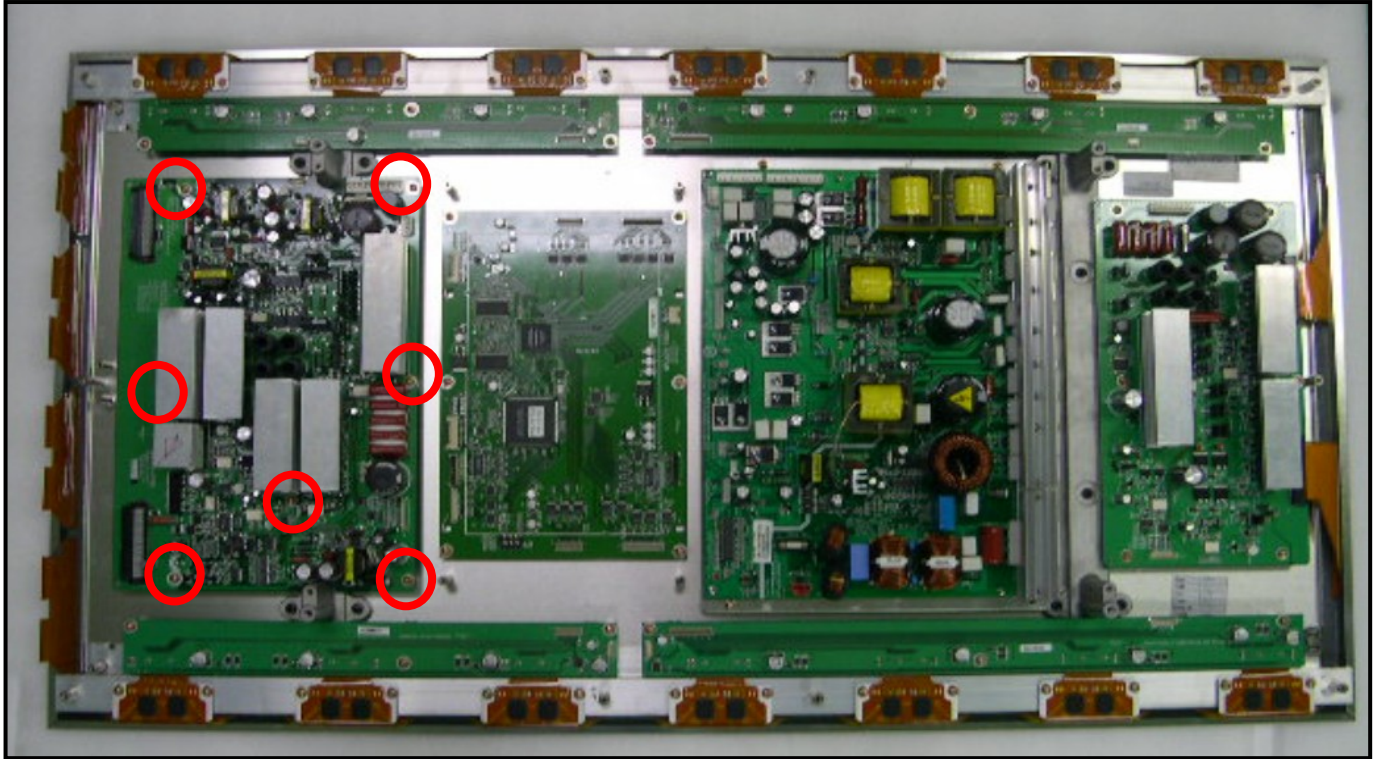
<Attention> As Picture 1, it is not recommended taking out FPC and COF from PCB Connector horizontally. As Picture 2, hold Scan PCB Connector as pictured and pull down the PCB and take out FPC and COF.

### 3) CON\_HIGH/LEFT & RIGHT PCB

: The same is recommended as CON LOW/LEFT & RIGHT PCB



## 7-7. Dismantling of SUS Y PCB



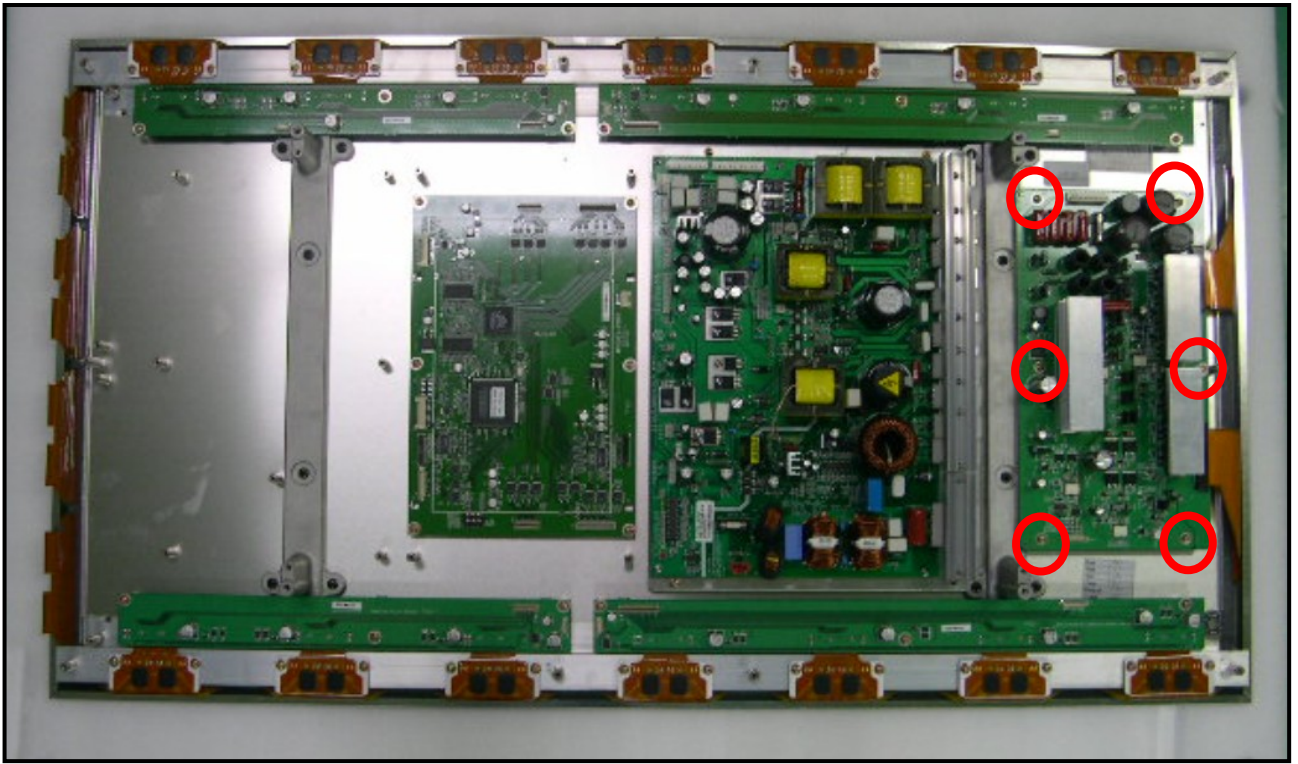
### 1) Materials Used:

M7543051 SCREW MACHINE PSW M3×8 MFZN 7EA

### 2) Dismantling Procedure(Refer to above picture for screws to be removed.)

Remove all 7 screws without any specific order.

## 7-8. Dismantling of SUS X PCB



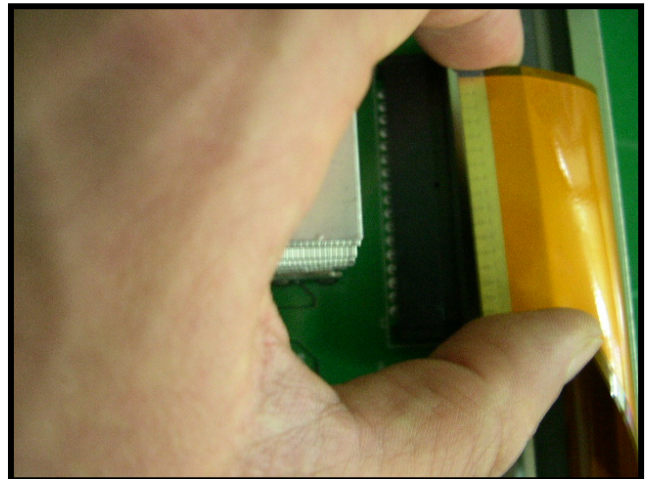
### 1) Materials Used:

M7543061 SCREW MACHINE PSW M3×8 MFZN 6EA

### 2) Dismantling Procedure (Refer to above picture for screws to be removed.)

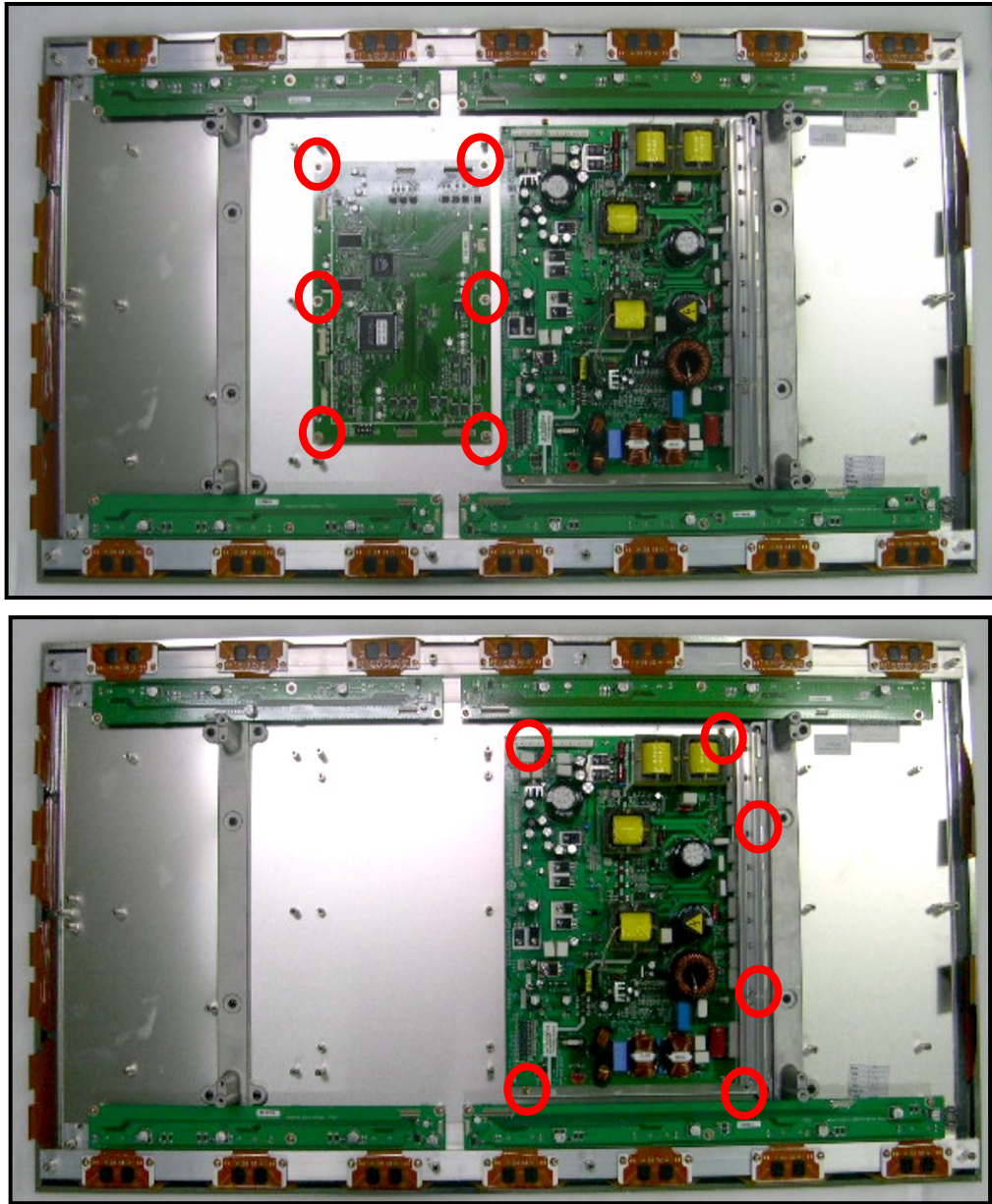
Remove all 6 screws without any specific order.

The below picture shows the process of FPC dismantling after removing screws.





## 7-9. Dismantling of DIGITAL / POWER PCB



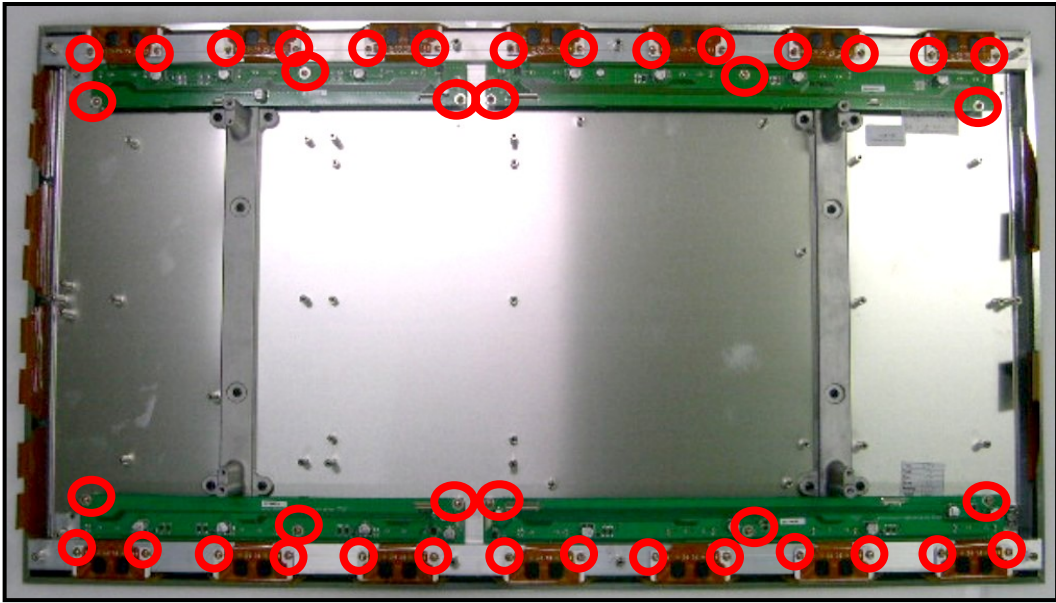
### 1) Materials Used:

M7543061 SCREW MACHINE PSW M3×8 MFZN 12EA

### 2) Dismantling Procedure (Refer to above picture for screws to be removed.)

Remove all 12 screws without any specific order.

## 7-10. Dismantling of CON PCB



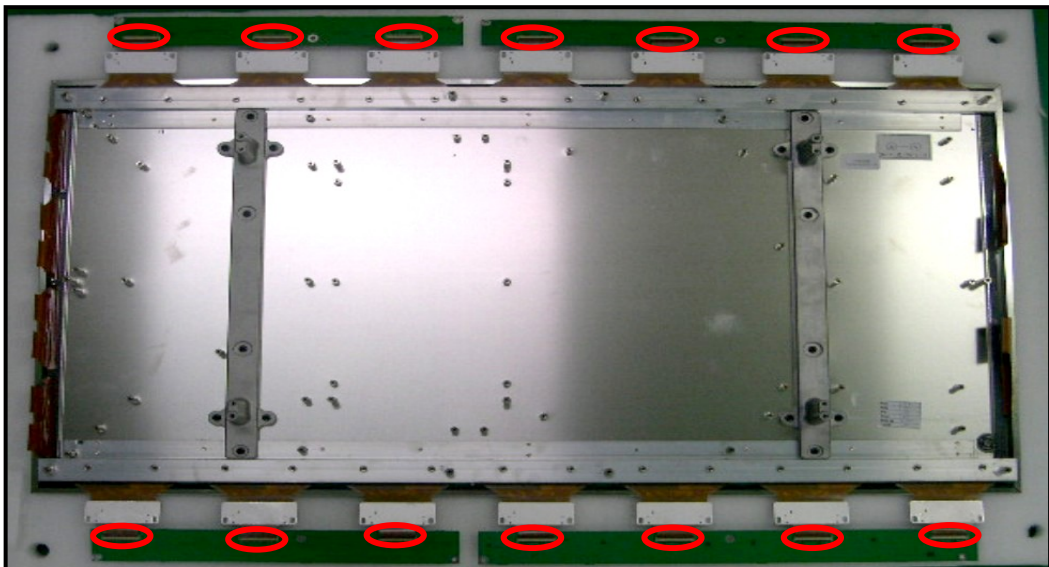
### 1) Materials Used:

M7543061 SCREW MACHINE PSW M3×8 MFZN 20EA

### 2) Dismantling Procedure (Refer to above picture for screws to be removed.)

Remove all 12 screws without any specific order.

The below picture shows the process of COF dismantling. The process is the same as of SUS Y PCB FPC dismantling.



## 8. Adjustment Method

### 8-1. Voltage Adjustment

#### 1) Measurement instruments

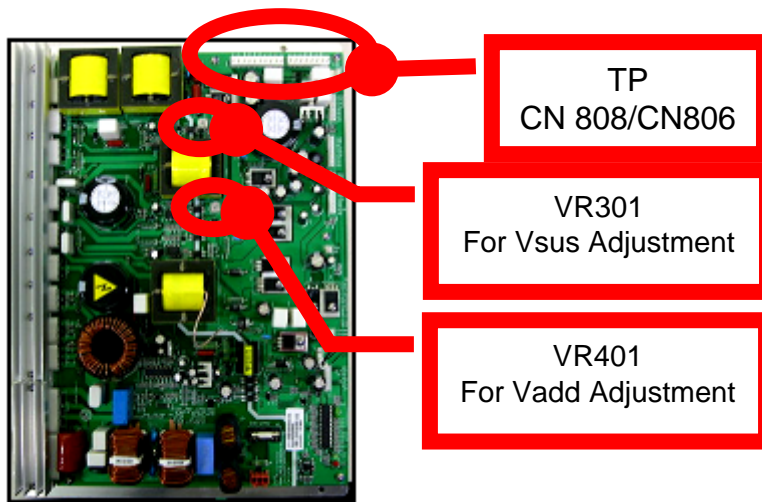
- ① Multi test signal such as BSG-360A and BSG-265L or equivalent
- ② Color Analyzer such as CA-100 or equivalent
- ③ Millimeter (acceptable tolerance is 0.5%)
- ④ Computer: The following is recommended.

SXGA(Resolution: 1024 \* 768,60Hz) True color 16 Bit

#### 2) Power Board Adjustment

##### 1) Factors for adjustment

VR :Variable Resistor  
TP : Test Point



Vsus	190
Vadd	75
Vyer	190
Vscan	87
Ramp up	235
Vxshelf	190

Fig1]The voltage label  
On the back plate

##### 2) Voltage adjustment

- Turn on the SET by MSCS Control.
- Select the Input of Your Using Signal
- Set the voltage as written on the back-plate, refer to Fig1].

	Min	Type	Max	Preset	TP
Vsus	180V	190V	195V	190V	CN808 #1 PIN
Vadd	65V	70V	75V	70V	CN806 #1 PIN



### 3. Y Board Adjustment

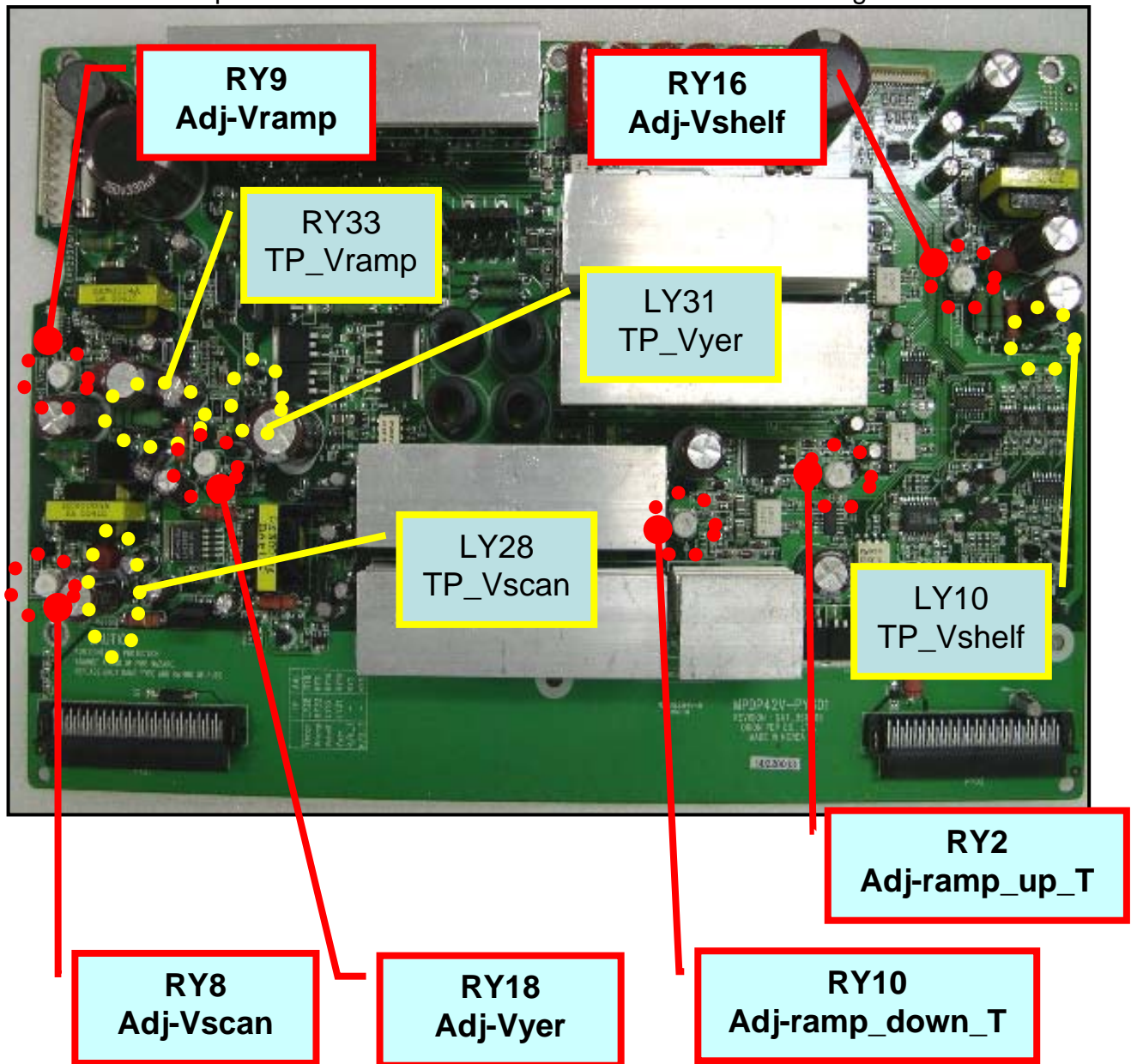
#### 1) Factors of Adjustment

$\Delta$  Ramp-Down : To be indicated as  $\Delta$  Ramp-Dn

#### 2) Voltage adjustment

After Power board voltage adjustment, Y Board voltage is to be adjusted. Adjust the voltage as written on the back plate refer to fig1].

Ramp Up & Ramp Down should not be adjusted because it is possible with Oscilloscope .But You Set a Center of Each VR's Variable Range.

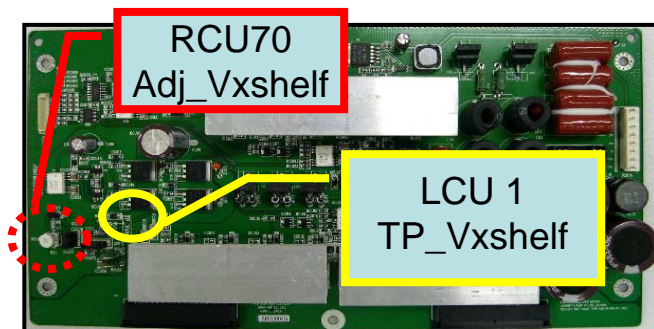




	V <sub>yer</sub>	V <sub>y_shelf</sub>	V <sub>y_scan</sub>	V <sub>ramp_up</sub>	Δ Ramp-Up	Δ Ramp-Dn
Min	170V	115V ~ 120V Fixed Voltage	80V	210V	40usec	110usec
Type	175V		85V	215V	70usec	145usec
Max	180V		90V	230V	80usec	230usec
Preset	175V		85V	215V	CENTER	CENTER
VR	RY18		RY8	RY9	RY2	RY10
TP	LY31		LY28	RY33	-	-

#### 4. X Board adjustment

##### 1) Factors of adjustment.



##### 2) Voltage adjustment

After Y board voltage adjustment, X Board voltage is to be adjusted. Adjust the voltage as written on the back plate's label

## 8-2. White Balance Adjustment

### 1. Preparation

- 1) Connect all signal lines and power cables required for set adjustment.
- 2) Set and check the set ID.
- 3) Run MSCS.EXE program to prepare for adjustment on the basis of details specified in operation manual.
  - A] Setting and Connection of Com Port
  - B] Setting Multi Screen for the Installed Set
  - C] Setting Select Input
- 4) Check all M-PDP columns in PDP Control and click 'power on' button to turn on multi screen.
  - \* Set values in overall mode as of the set values indicated in Appendix 1].
- 5) Signal Device and Measuring Instruments Used
  - A] Luminance and Chromaticity Meter
    - CA-100 or other devices of equivalent or higher capacities
  - B] Signal Device [All Input Display]
    - BSG-360A or other devices of equivalent or higher capacities
  - C] Digital Voltage Meter [DVM,A-level Device]
- 6) Prior to adjusting white balance, let multi screen age for 20minutes or more in full white 70% level.
- 7) Change to individual mode to administer adjustment.
  - \*Take caution to prevent image retention caused by long-term fixed pattern during adjustment.
  - [Refrain from using of the same pattern for 2 minutes or longer.]

## 2. White Balance Adjustment

### 1) Adjustment Procedure [as of Input Mode]

\*DVI ⇒ PC ⇒ DTV-YUV ⇒ DVD ⇒ VIDEO ⇒ S-VIDEO ⇒ END

### 2) Adjustment of DVI Mode

A] Authorization Pattern: Vertical 8 gray pattern in Fig. 3]

B] Timing: 1024 × 768 ,60Hz

### C] Adjustment Procedure

- ① Attach measuring probe of luminance meter in position 2) of Fig. 3]. Refer to Fig. 3].
- ② In MSCS, Click "Picture Control" of "Control" menu bar in order to run "Picture Control" window
- ③ Input the password [ password : jglee ] .  
Then will be displayed the below picture (Fig. 2).  
if the values of active window are '0', click the PDP SET Image to load the saved values.

\*Set values as indicated in Appendix 1].

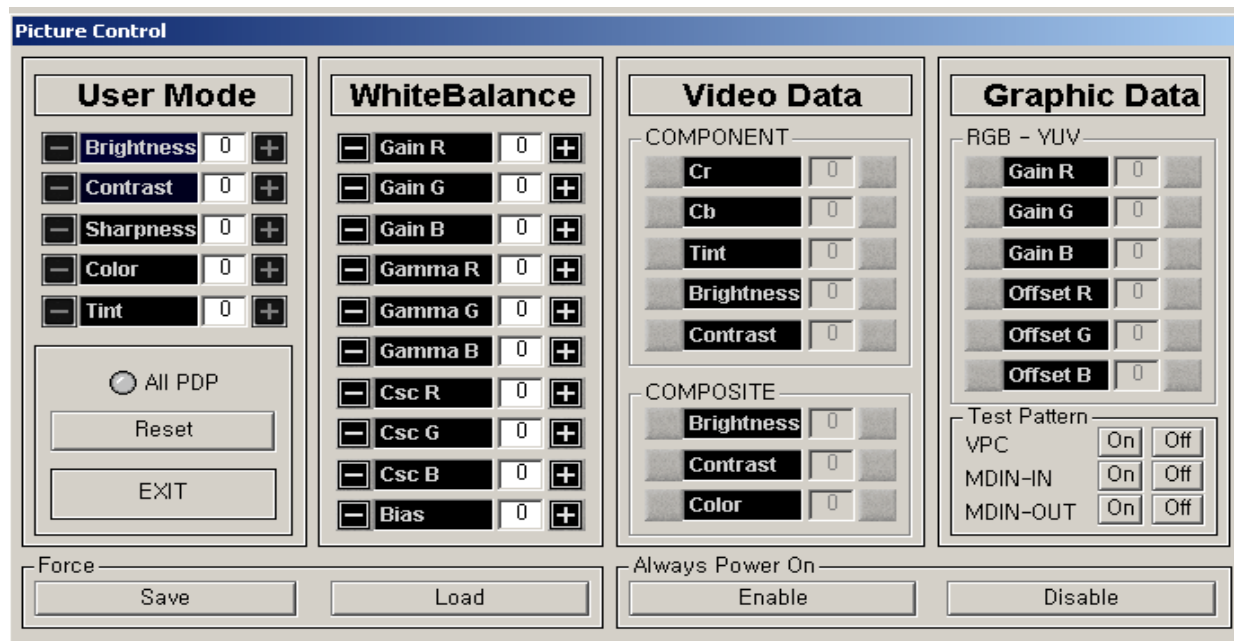


Fig 2] White Balance Adjustment Screen

- ④ Adjust gain values (R.G.B.) in white balance of Fig 2] to adjust color coordinates and luminance.

\*Color Coordinates :

x :  $0.285 \pm 0.001$ , y :  $0.300 \pm 0.001$ , Y :  $98 \text{ cd/m}^2 \pm 1 \text{ cd/m}^2$

A] Set B as 100 and adjust G to adjust luminance. Then, adjust R to adjust coordinates.

B] In case the conditions of luminance are satisfied, but coordinates are not suitable, adjust R and G after adjusting B.

C] When adjustment is not satisfactory, reduce luminance by  $3 \text{ cd/m}^2$  and administer adjustment as in clause 1] and 2].

⇒ Luminance is classified into 3 levels: 98,95,92  $\text{cd/m}^2$

D] When adjustment is completed, click 'exit' button in Fig. 2].

### 3) Adjustment of PC Mode

A] Authorization Pattern: Cross match

B] Timing:  $1024 \times 768$ , 60Hz

#### C] Adjustment Procedure

- ① Click 'auto tracking' button. (all M-PDPs must be checked.)
- ② Authorize vertical 8 gray pattern as in Fig. 3].
- ③ In MSCS, Click "Picture Control" of "Control" menu bar in order to run "Picture Control" window
- ④ Input the password [ password : jglee ]. Then will be displayed the below picture (Fig. 2). if the values of active window are '0', click the PDP SET Image to load the saved values.
- ⑤ Administer setting so the values are as indicated in Appendix 1]. Then, administer adjustment.
- ⑥ Attach probe of luminance meter in position A) of Fig. 3] to adjust graphic data values of Fig. 4] so that W/B coordinates can be adjusted as of A) in the following page.
- ⑦ Attach probe of luminance meter in position B) of Fig. 3] and administer adjustment as of B) in the following page.
- ⑧ After completing adjustment, attach probe in position A) of Fig. 3] again to check coordinates. If the coordinates do not correspond, repeat the above processes of 6) and 7).
- ⑨ After authorizing pattern as indicated in Fig. 1], check if conditions of luminance and coordinates are satisfied.  
x :  $0.285 \pm 0.005$ , y :  $0.300 \pm 0.005$ , Y :  $140 \text{ cd/m}^2$  or more
- ⑩ When adjustment is completed, click 'exit' button in Fig. 2].

A)

\*Adjustment Values

x :  $0.285 \pm 0.001$ y :  $0.300 \pm 0.001$ Y :  $15 \text{ cd/m}^2 \pm 1 \text{ cd/m}^2$ 

B)

\*Adjustment Values

x :  $0.285 \pm 0.001$ y :  $0.300 \pm 0.001$ Y :  $98 \text{ cd/m}^2 \pm 1 \text{ cd/m}^2$ 

Adjust DVI with luminance.

Fig. 6] Low Gradation  
Adjustment CoordinatesFig. 7] High Gradation  
Adjustment Coordinates

[Caution] Adjust No. 1 with offset R/G/B.

Adjust No. 2 with gain R/G/B.

Readjustment required if differences are found between  
No. 1 and 2 after adjustment

Fig. 3] Vertical 8 Gray Pattern

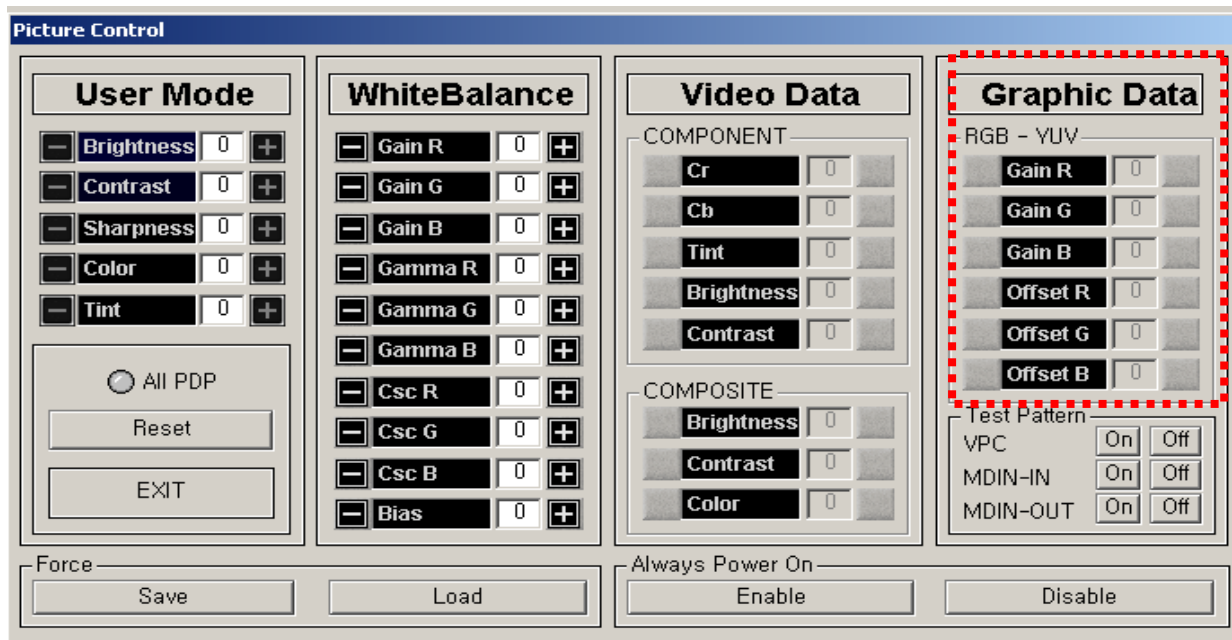


Fig. 4] PC/DTV-YUV Adjustment Screen

#### 4) Adjustment of DTV-YUV Mode

A] Authorization Pattern: Fig. 3] Vertical 8 Gray Pattern

B] Timing: PAL region  $\Rightarrow$  576P

NTSC region  $\Rightarrow$  720P[60Hz]

#### C] Adjustment Procedure

- ① In MSCS, Click “Picture Control” of “Control” menu bar in order to run “Picture Control” window
- ② Input the password [ password : jglee ]. Then will be displayed the below picture (Fig. 2). if the values of active window are ‘0’, click the PDP SET Image to load the saved values.
- ③ Set values as indicated in Appendix 1] and administer adjustment.
- ④ Attach probe of luminance meter in position 1) of Fig. 3).  
Then, use offset R/G/B to administer adjustment so that to achieve the status as indicated in Fig. 6].
- ⑤ Attach probe of luminance meter in position 2) of Fig 3].  
Then, use gain R/G/B to administer adjustment so that to achieve the statue as indicated in Fig. 7].
- ⑥ Attach probe of luminance meter in position 2) of Fig 3] to adjust gain G so that the luminance requirements of Fig. 7] are satisfied. Then, adjust gain R&B to adjust coordinated.
- ⑦ After authorizing pattern as in Fig 1], check if the conditions of luminance and coordinates are satisfied.  
x :  $0.285 \pm 0.005$   
y :  $0.300 \pm 0.005$   
Y : 140 cd/m<sup>2</sup> or more
- ⑧ When adjustment is completed, click ‘exit’ button in Fig. 2).

## 5) Adjustment of DVD Mode

A] Authorization Pattern: Authorizing Fig.1] Full White Pattern/ Vertical 8 Gray

B] Timing: PAL region  $\Rightarrow$  576i  
NTSC region  $\Rightarrow$  480i

C] Set values as indicated in Appendix 1].

D] Check for abnormalities in screen when changing mode. Also, set probe as indicated in Fig. 1] and check if the following conditions are satisfied.

x :  $0.285 \pm 0.005$

y :  $0.295 \pm 0.005$

Y : 140 cd/m<sup>2</sup> or more

## 6) Adjustment of Video Mode

A] Authorization Pattern: Authorizing Fig. 1] Full White Pattern/ Vertical 8 Gray

B] Timing: PAL region  $\Rightarrow$  PAL-B  
NTSC region  $\Rightarrow$  NTSC

Set values as indicated in Appendix 1].

When changing mode. Also, set probe as

When changing mode. Also, set probe as

Set probe as

Indicated in Fig. 1] and check if the following condition are satisfied.

If the following condition are satisfied.

If the following condition are satisfied.

ed.

## 7) Adjustment of S-Video Mode

A] Authorization Pattern: Authorizing Fig. 1] Full White Pattern/ Vertical 8 Gray  
Full White Pattern/ Vertical 8 Gray

Timing : PAL region  $\Rightarrow$  PAL-B

SECAM region  $\Rightarrow$  SECAM

When changing mode. Also, set probe as

When changing mode. Also, set probe as

Set probe as

Indicated in Fig. 1] and check if the following conditions are satisfied.

If the following conditions are satisfied.

If the following conditions are satisfied.

# Appendix1]"White Balance" Default Values

\*White Balance Default Values per Initial Input Mode [DVI,PC,DTV]

ITEM	DEFAULT[DVI]	ITEM	DEFAULT[PC]	DEFAULT[DTV]
Gain R	49	Gain R	63	79
Gain G	83	Gain G	67	69
Gain B	100	Gain B	59	77
Gamma R	50	Offset R	61	90
Gamma G	50	Offset G	68	77
Gamma B	50	Offset B	63	91
CSC R	98	*RED letters changed when adjusting white balance *Black letters fixed		
CSC G	98			
CSC B	98			
Bias	50			

\*User Mode Set Values[Only brightness differing per graphic/ video mode]

ITEM	BRIGHTNESS	CONTRAST	SHARPNESS	COLOR	TINT
Value	15[20:DVD.VIDEO,SVIDEO]	20	15	15	15

\*Video Data[Component: Fixed]

ITEM	Cr	Cb	TINT	BRIGHTNESS	CONTRAST
Value	40	40	20	200	30

\*Video Data[Composite: Fixed]

ITEM	BRIGHTNESS	CONTRAST	COLOR
Value	145	45	125



# 9.How To Upgrade

## 9-1.PC System Requirements

Use the following PC-system to run the Flash Loader efficiently

- Standard PC.
- operating system : Windows 9x, Windows ME, Windows 2000, Windows NT or Windows XP
- Serial port.

## 9-2. Program Down\_Load

1.Connect the serial port of the PC to the RS-232C port of MPDP.

2.Invoke the Flash Loader, click **Star** and select **Programs / Oplus/ FLASH** Loader. And Then The Flash Loader main window is displayed such as FIG1]

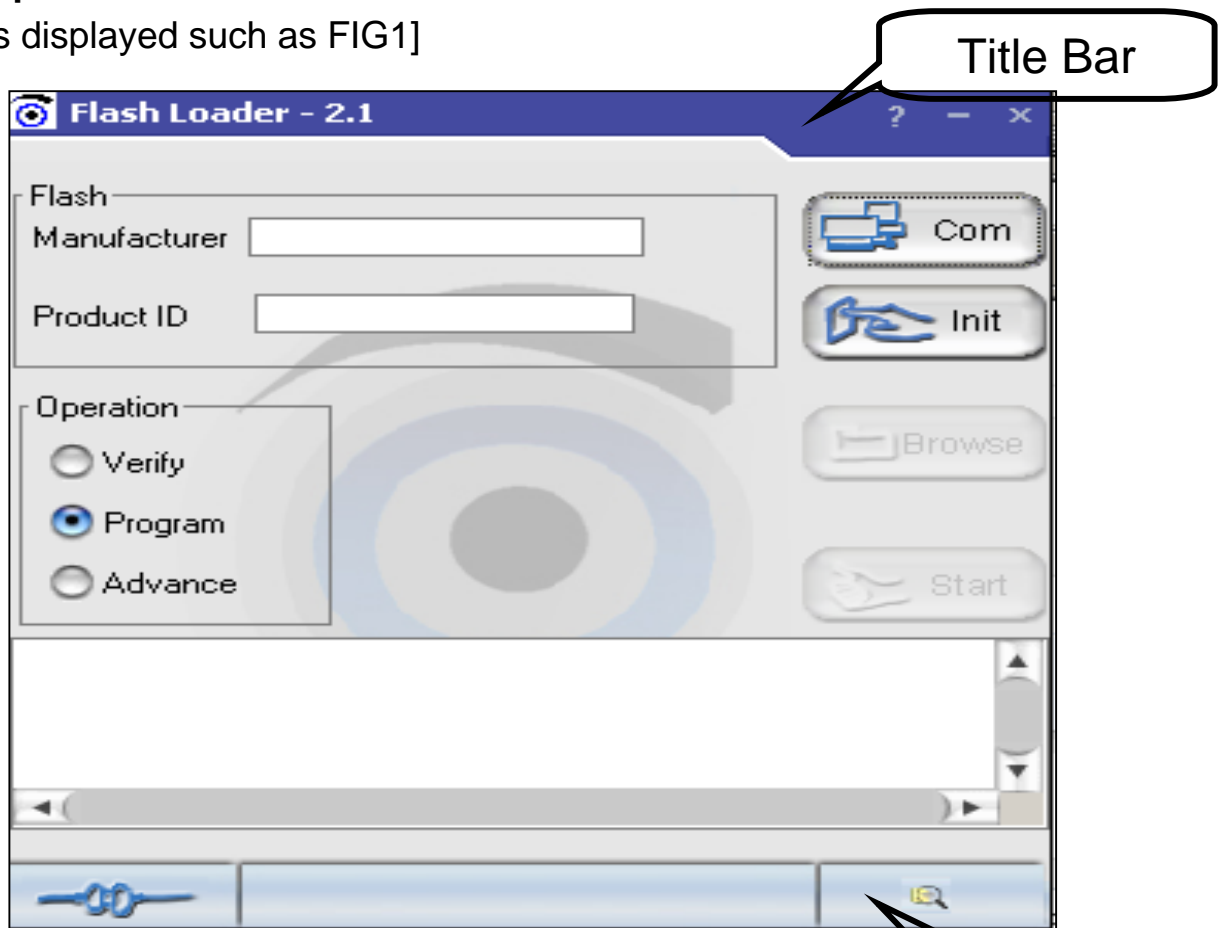


Fig 1) Flash Loader Main Window (No Communication)

Status Bar  
ORION PDP CO.,LTD

\*Explain to buttons on the FIG1]

1) Title Bar Commands

The title bar command icons are used to invoke on-line help (?), minimize the dialog box (-) or to close the Flash Loader application (x)

2) Status Bar Information

The status bar provide important information about the status of the Flash Loader as described below.



The Connected icon is shown when the Flash Loader has allocated the Com port " of the PC during search for a target, programming or verification of the Flash. When the Flash Loader has finished the search for a target, programming or verification it will release the Com port and display the Disconnected icon.



The Search Target icon is shown when the Flash Loader is trying to start the communication with the MPDP.

The icon will vanish after the communication has been successfully established.

3. Click the "COM" button to configure and initiate the serial communication between the PC and MPDP.

The COM Settings dialog box is displayed.  
Select the "COM Port" on the PC that is connected to the MPDP and  
choose the "Baud Rate" 115200."

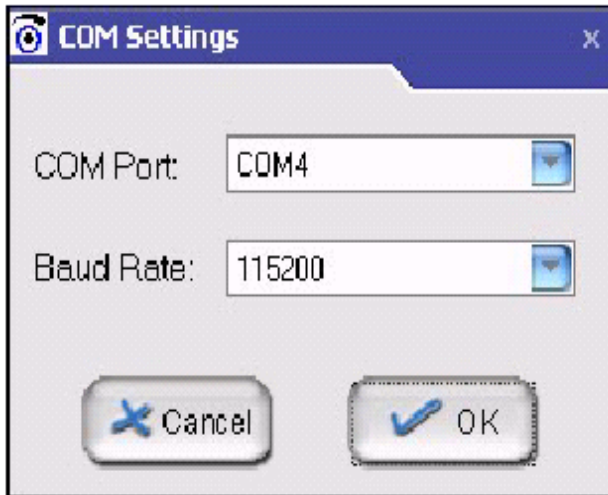


Fig 2) COM Port Setting

Click the "OK" button to close the dialog box and to return to the Flash Loader main window. It will now display the current information about the Flash.

**\*Note:** If the selected Com port is already allocated by some other application (e.g. HyperTerminal) the error message will be displayed such as FIG3].

You should close the application that has allocated the port

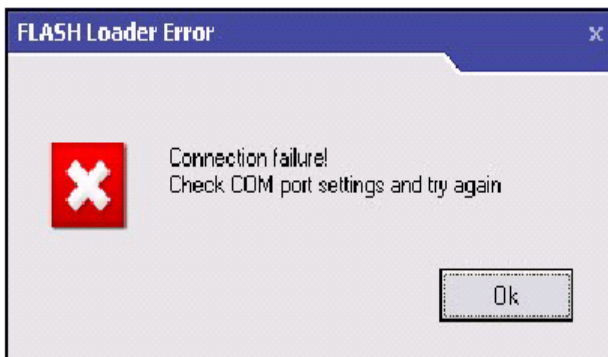


Fig 3) Error Message

4. Connect the POWER Cord to invoke the Boot Loader.

**\*Note:** The Boot Loader will during 2 seconds check if the Flash Loader is running. If this is the case, the Boot Loader will initiate the communication with the Flash Loader.

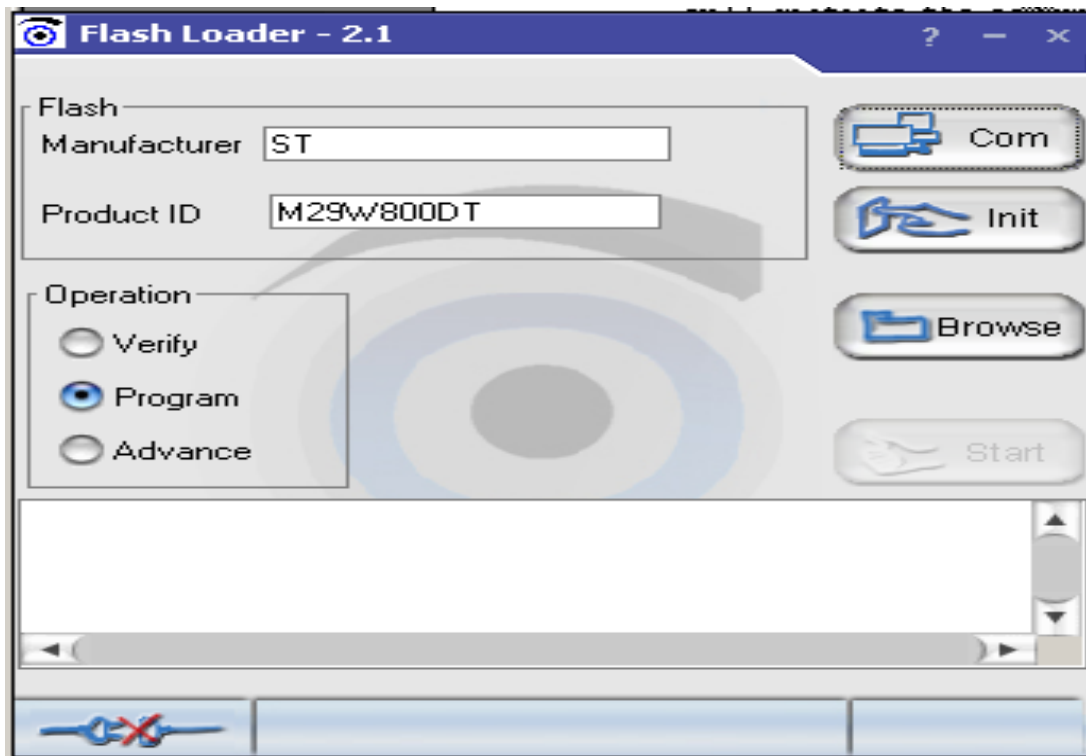


Fig 4) Flash Loader Main Window

Click the "Init" button to initiate the communication with the board.

**\*Explain to character on Fig 4)**

1) Flash Manufacturer

The manufacturer of the Flash.

2) Flash Product ID

The product Id of the Flash.

5. Click the “Browse” button to select the files to program
  6. Click the “Start” button to start the selected action program.
- The status bar at the bottom of the dialog box will show the programming.  
A message will show the result of the programming.
- Tip:** The Start button will change function to Stop during the action.

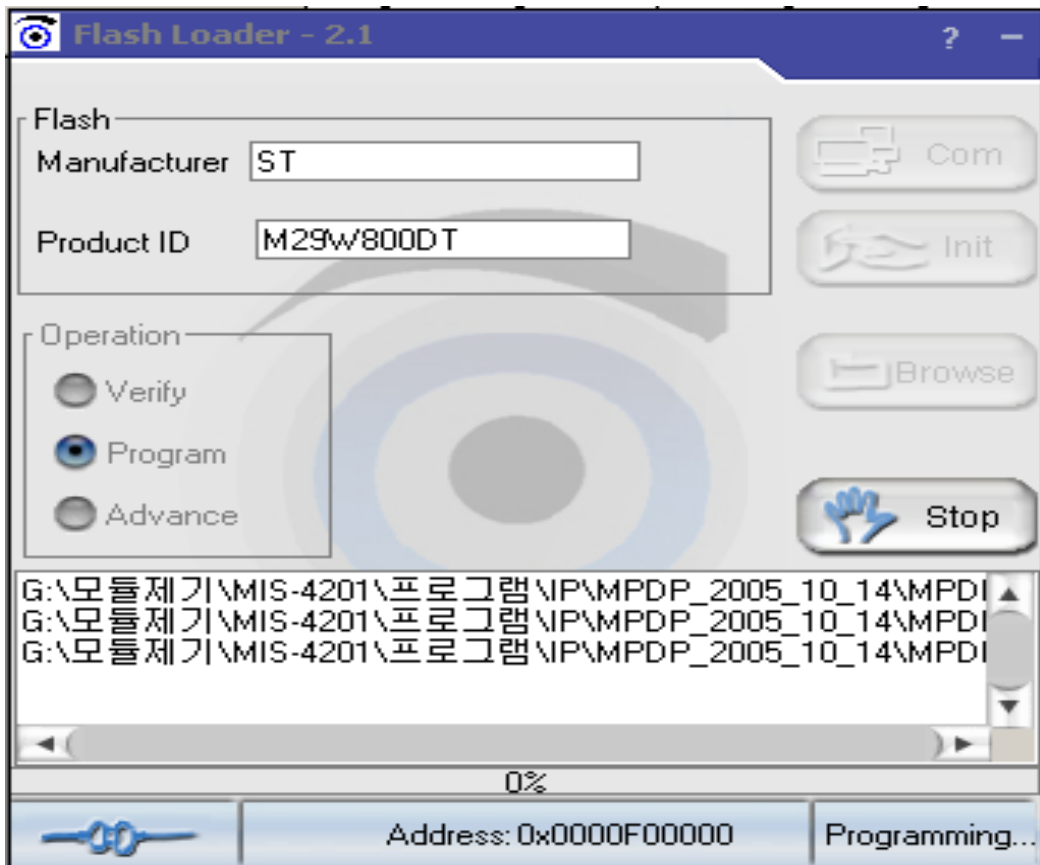


Fig 5) Flash Loader Main Window (Programming)

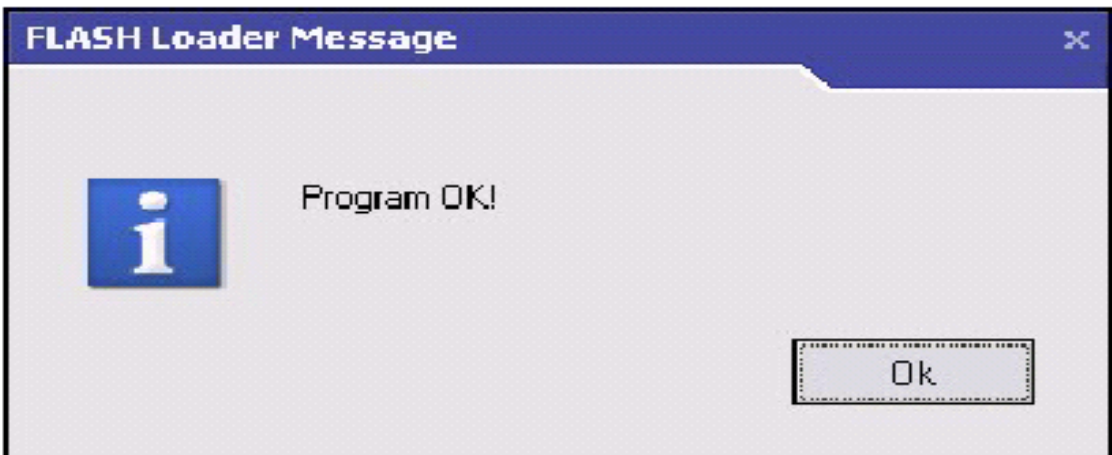
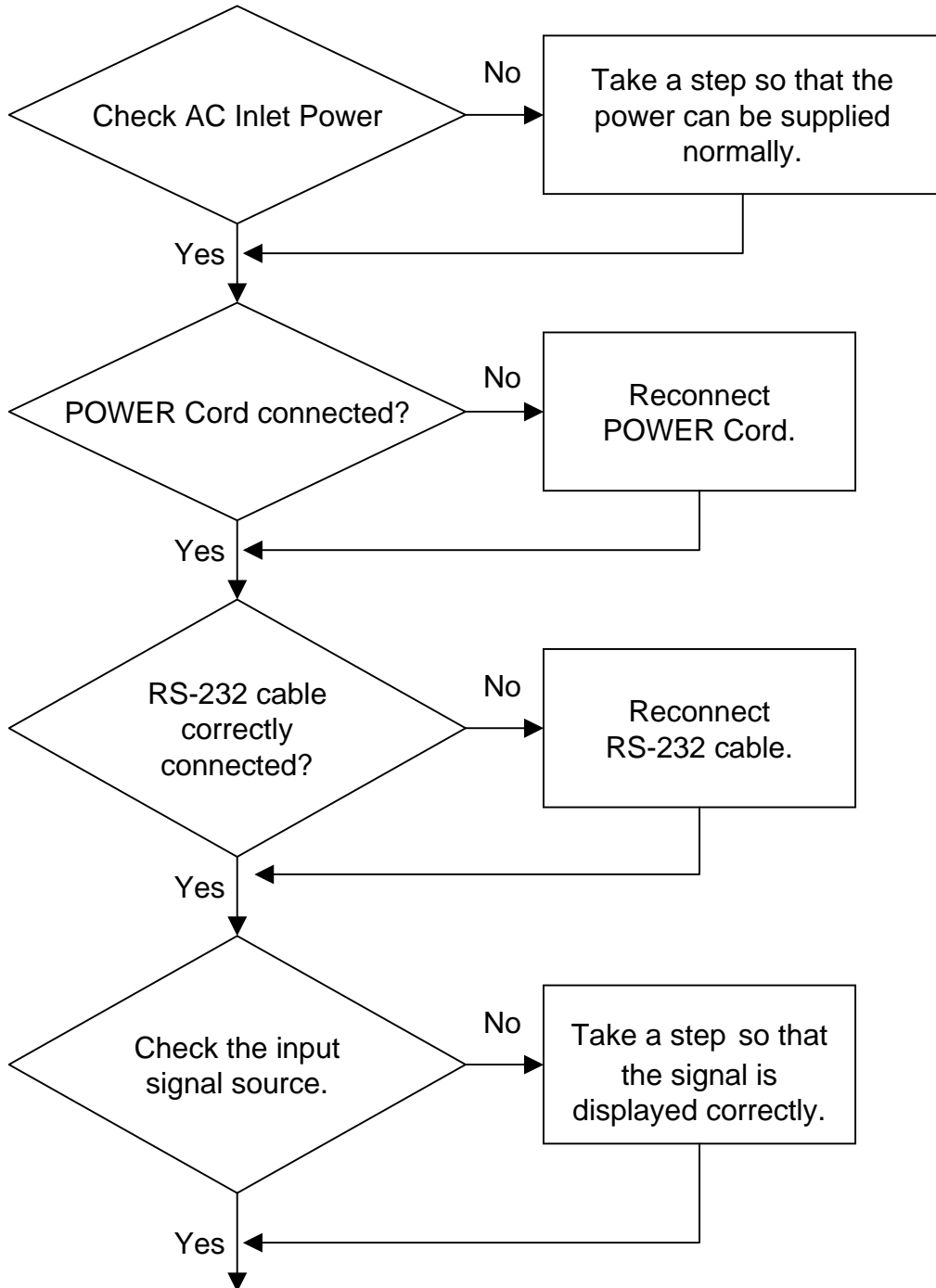


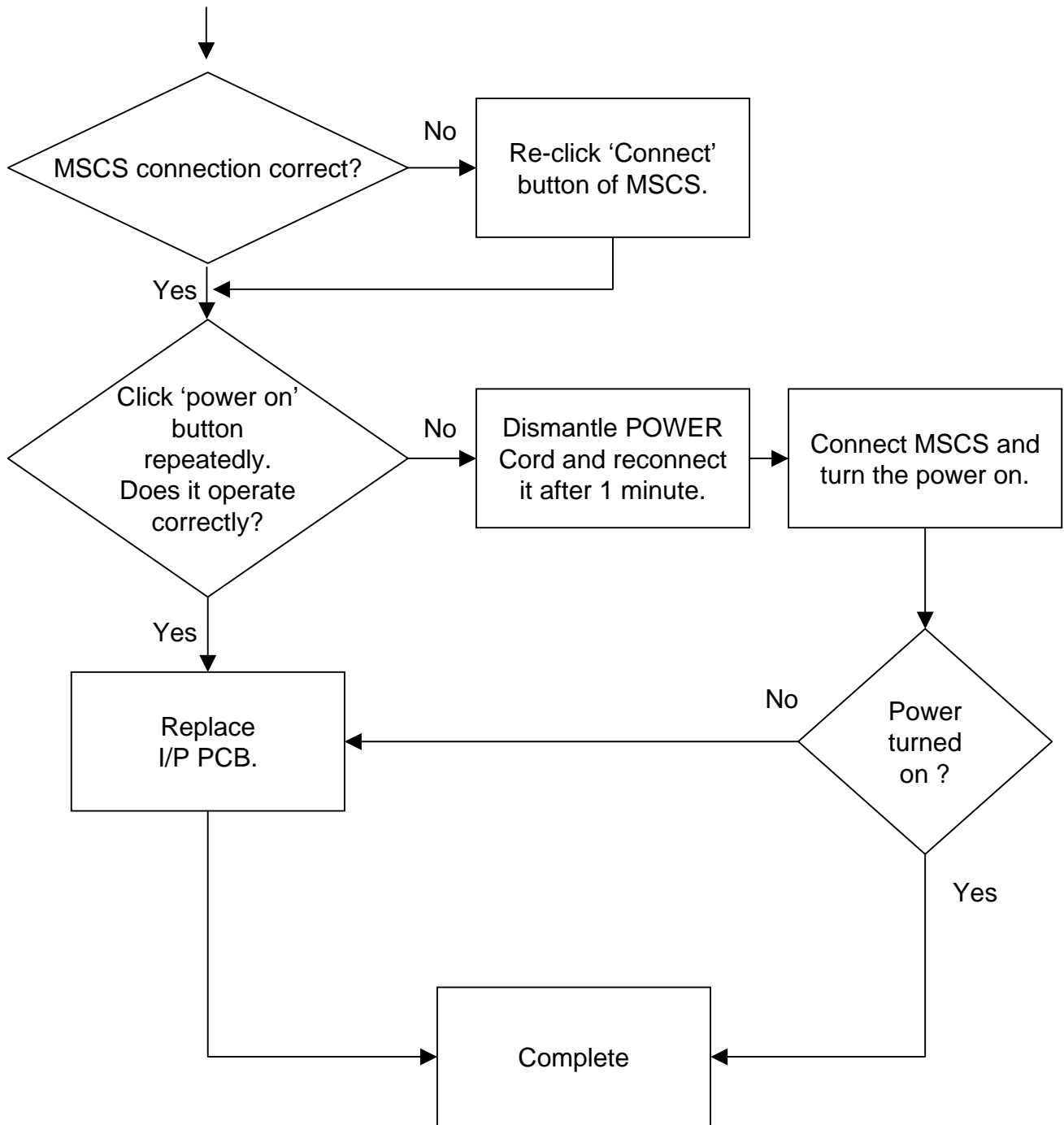
Fig 6) Flash Loader Message Program OK

7. Click the "OK" Button
8. Disconnect the POWER Cord.

# 10. Trouble Shooting (Measures per Symptom)

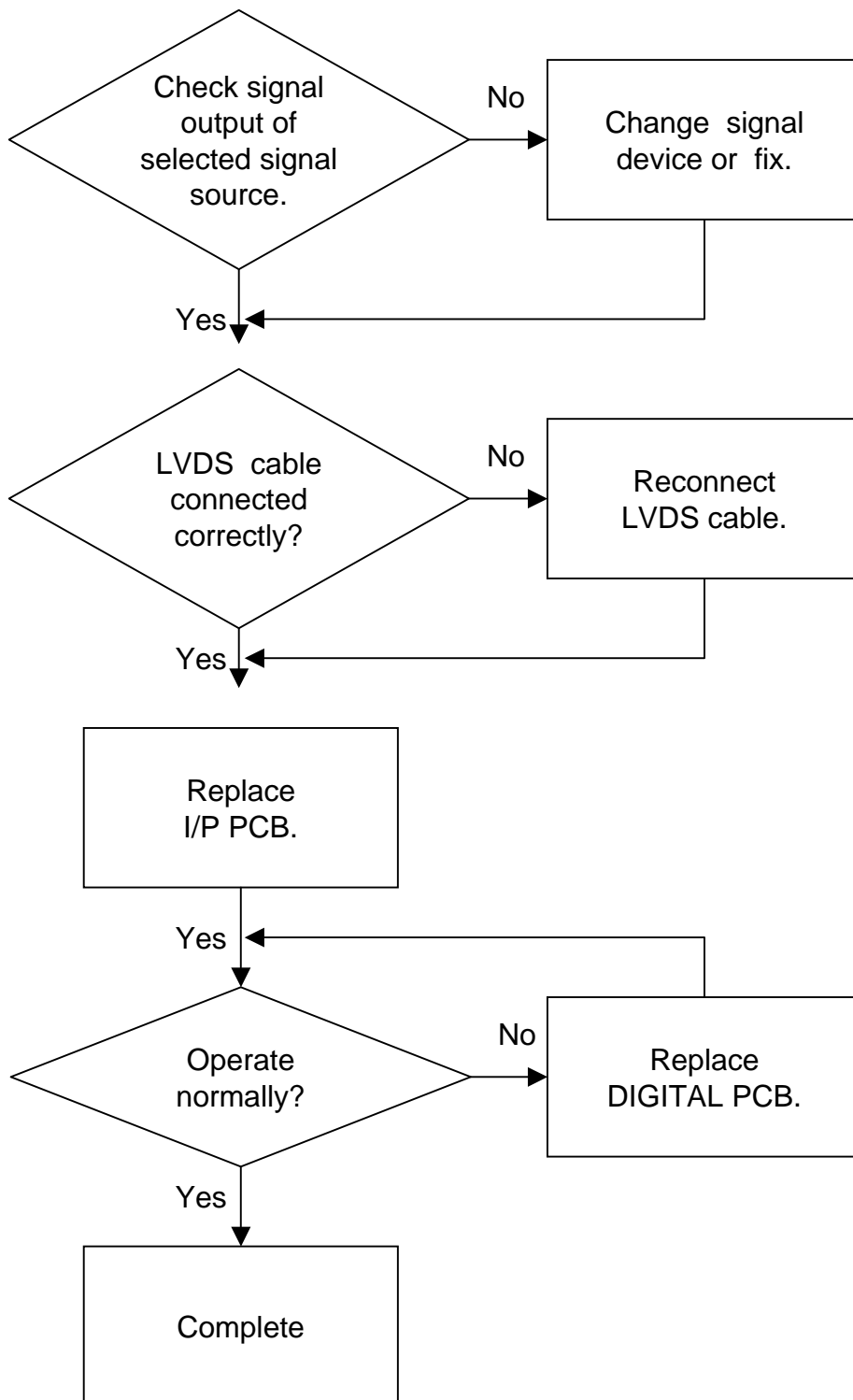
## 10-1. Power Not Turned On



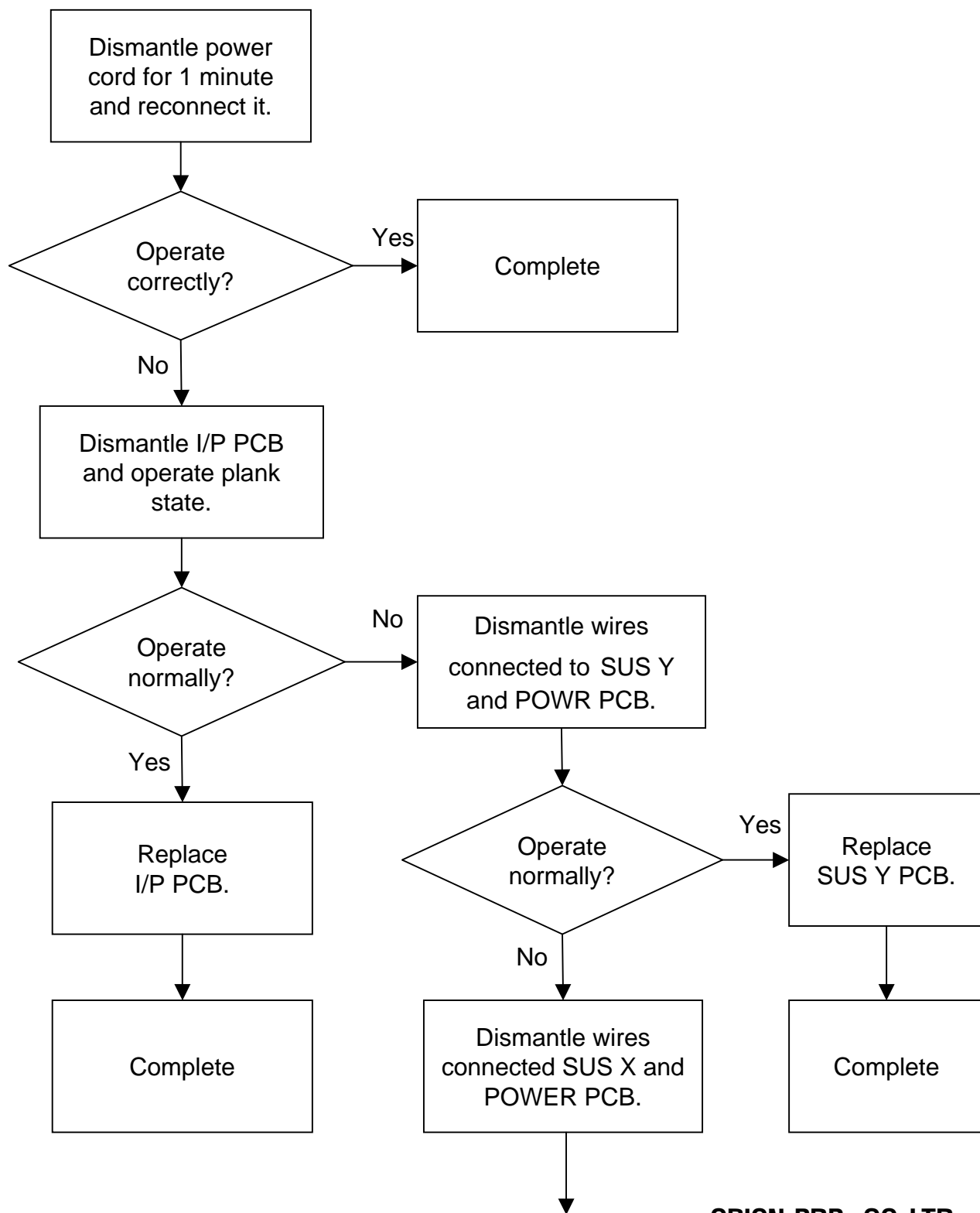


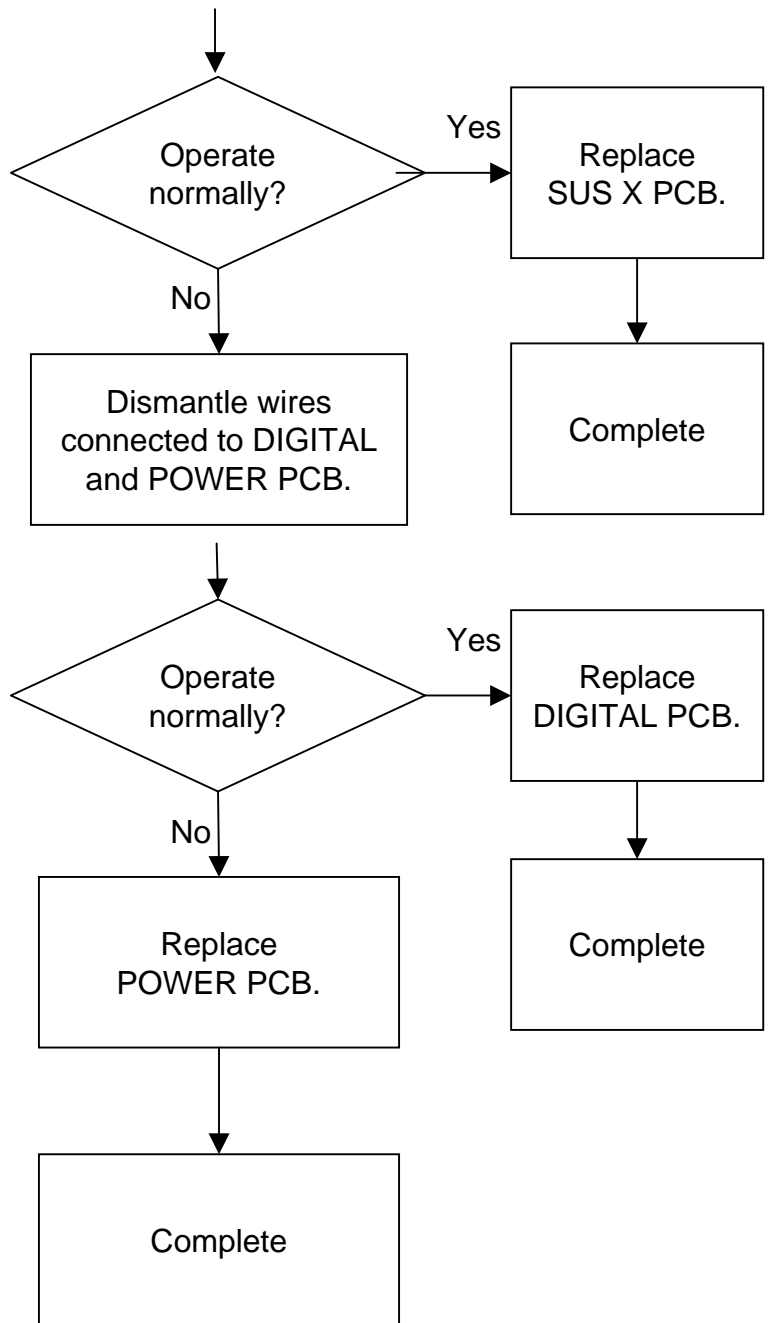


## 10-2. Power turned On But color Defected or the set is not worked.

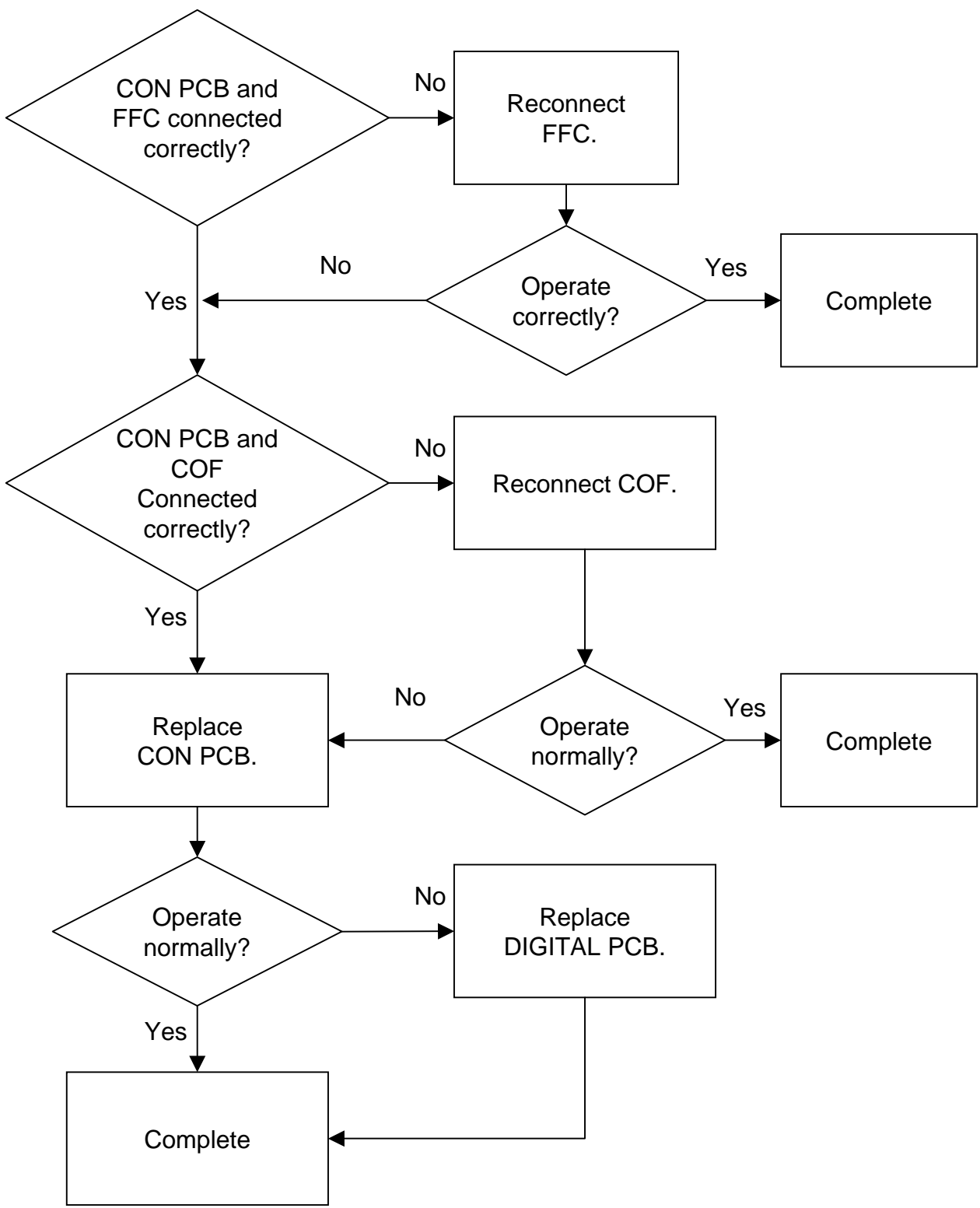


### 10-3. Power Turned Off After Few Seconds of Being Turned On



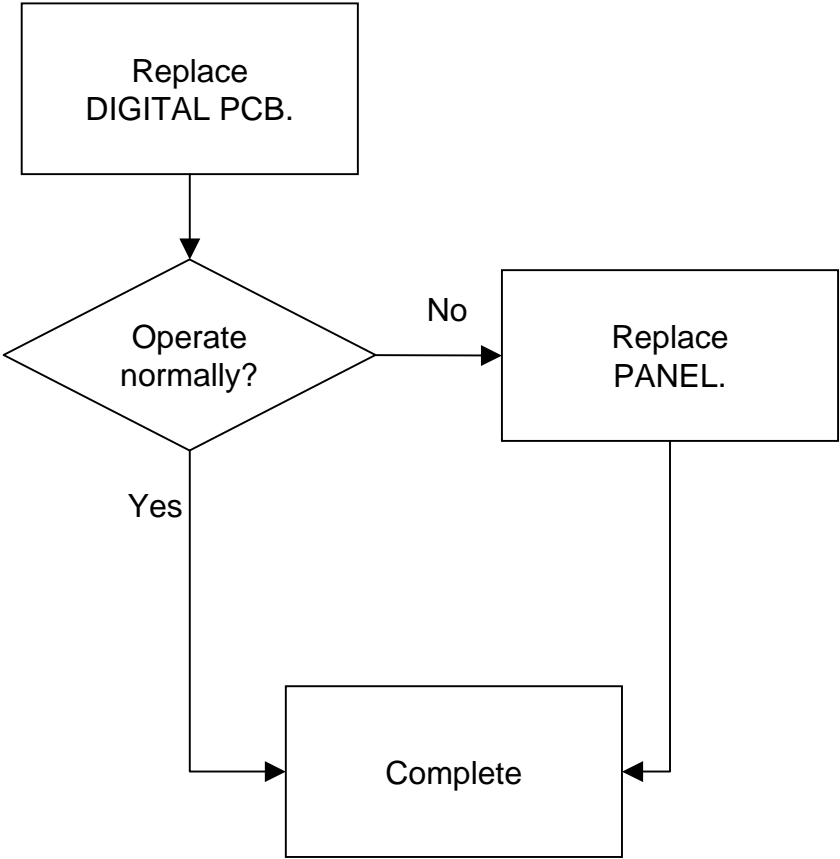


10-4. Vertical Blankness on Screen (Block Type)

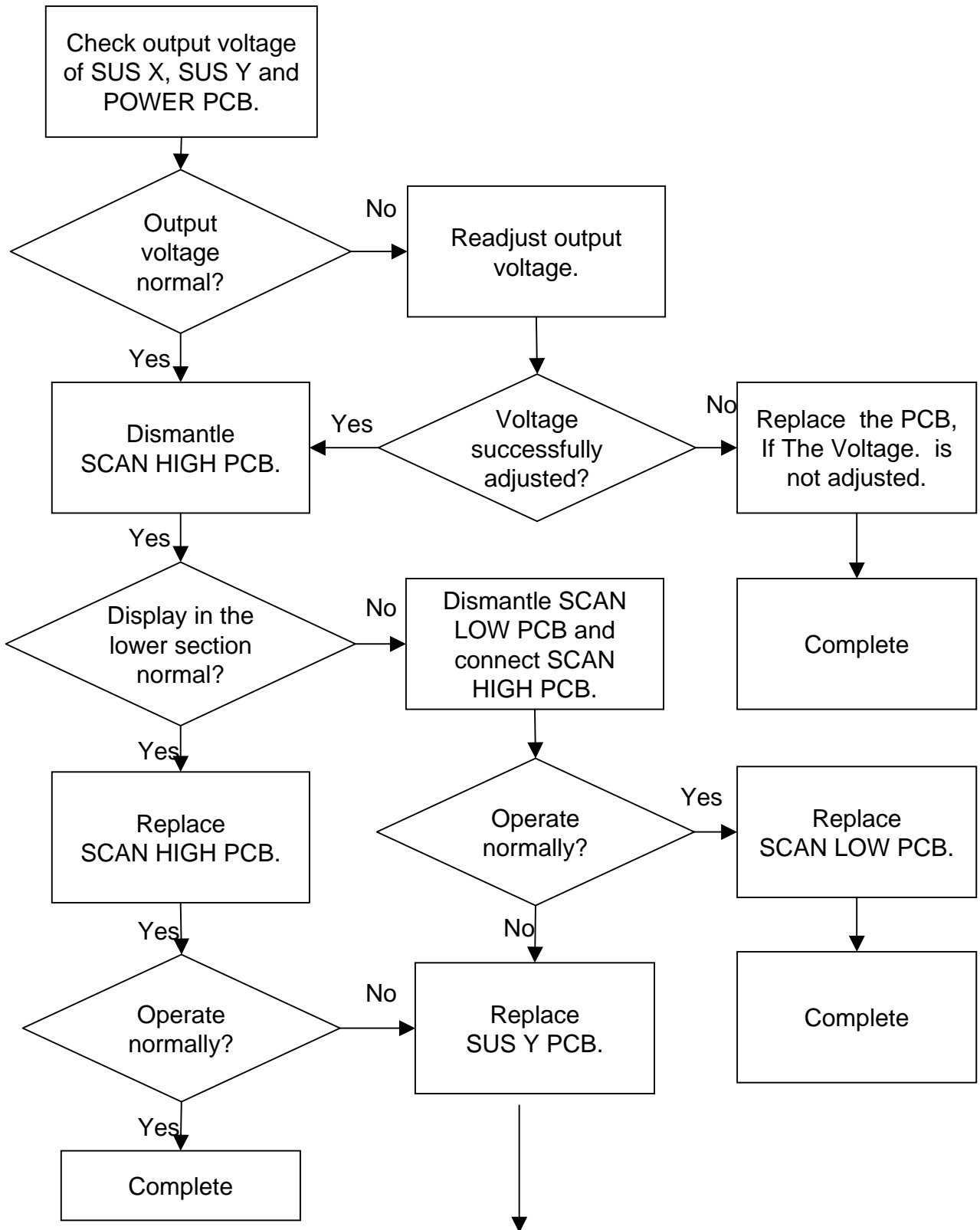


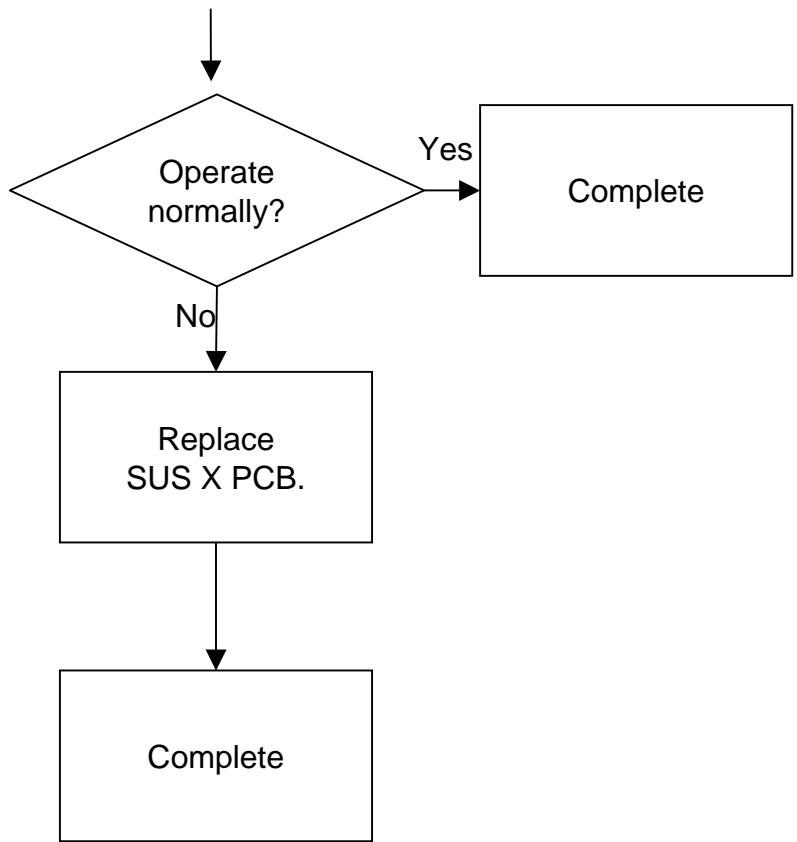


10-5. Vertical Blankness on Screen (Irregular Lines Missing)

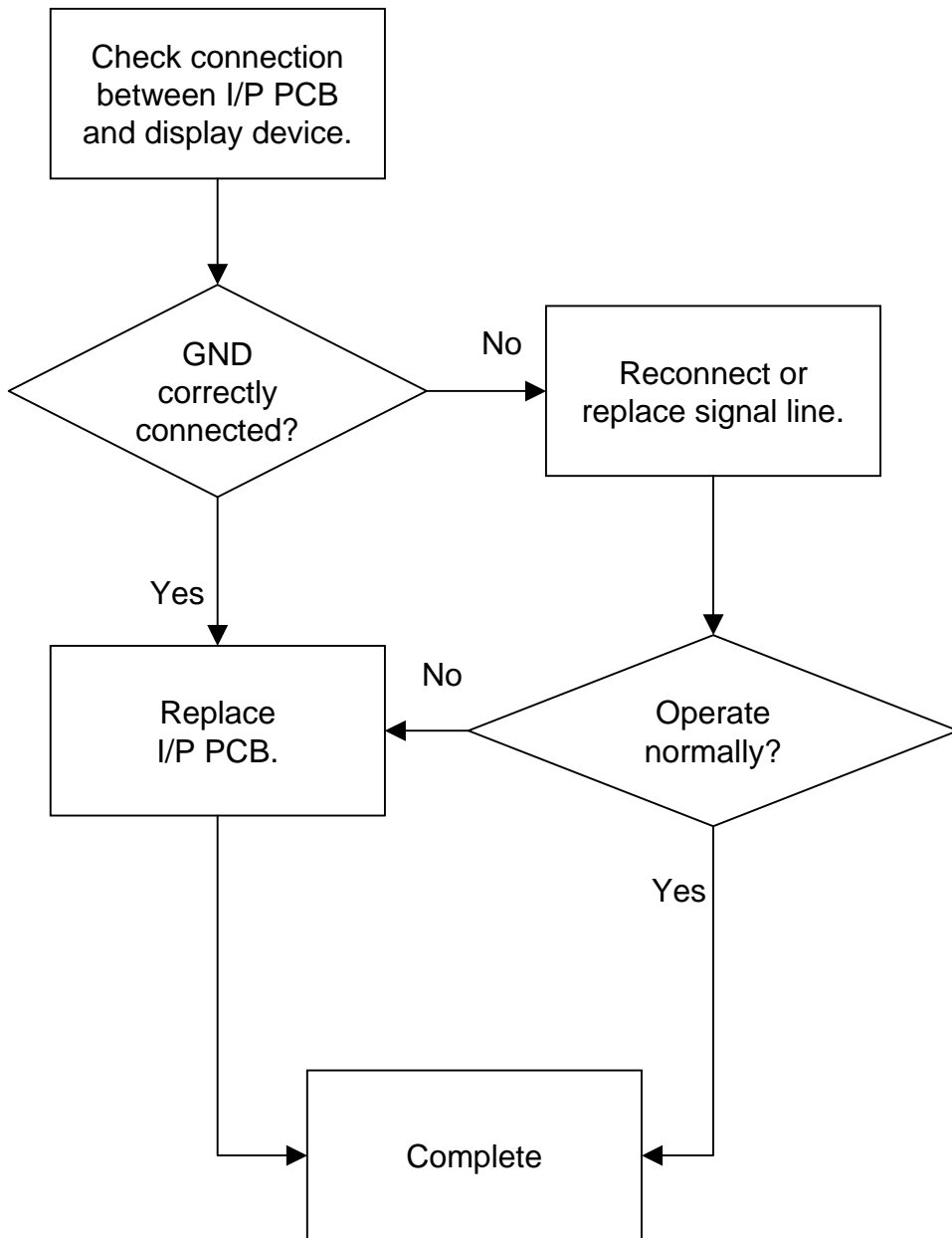


## 10-6. Dark Screen or Flickering

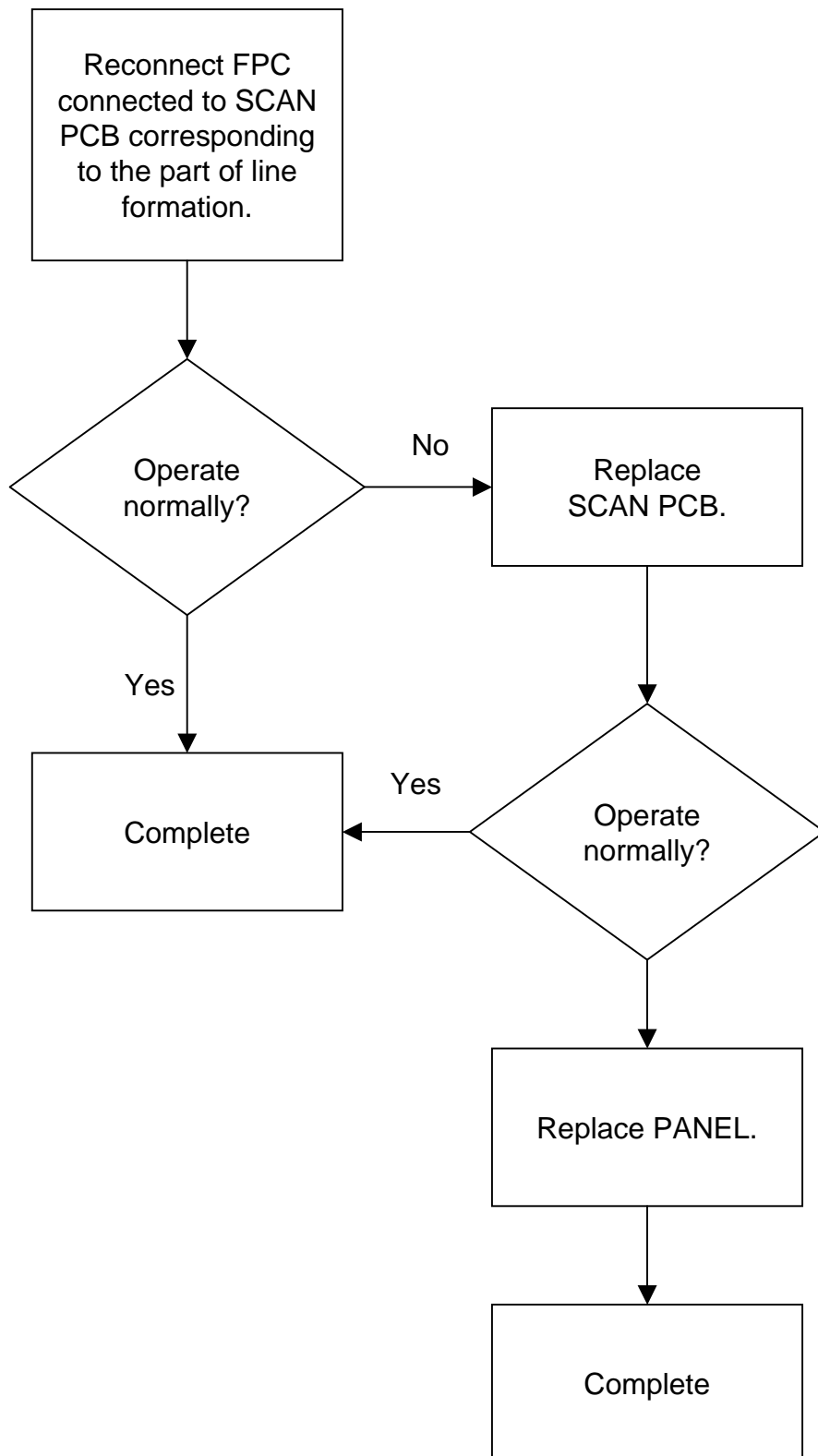




## 10-7. Horizontal Noise Formed on Screen



## 10-8. Black or White Horizontal Lines Formed on Screen





# 11. Part Replacement and Related Details

※ When repairing set, make sure to locate set on a smooth and thick material placed on flat surface.

## 11-1. Replacement of I/P PCB

1. Save the white balance value of the defected IP PCB.
2. Dismantle back cover.
3. Dismantle 3 wires connected.
4. Replace defected I/P PCB.
5. Set white balance with the existing value by through control program.
6. Adjust PC and DTV-YUV mode in accordance with the white balance adjustment method in Chapter 5.
7. When adjustment is completed, compare set with other sets so that the colors can be adjusted to be similar to the colors of other sets.

## 11-2. Replacement of SUS Y PCB

1. Dismantle back cover.
2. In order to conveniently dismantle SUS Y PCB, loosen bolts fastening SCAN PCB so that the depth of fastening is about half the original.
3. Dismantle 3 wires connected.
4. Replace defected SUS Y PCB.
5. Set Vyer, Vscan and Vramp-up by referring to the adjustment voltages of voltage label attached to back plate.

## 11-3. Replacement of SUS X PCB

1. Dismantle back cover.
2. Dismantle FPC connected to SUS X PCB.
3. Dismantle 2 wires connected.
4. Replace defected SUS X PCB.
5. Set Vx-shelf as the adjustment voltage of voltage label attached to back plate.

## 11-4. Replacement of Power Board

1. Dismantle back cover.
2. Dismantle 7 wires connected.
3. Replace defected POWER PCB.
4. Set  $V_{sys}$  and  $V_{add}$  by referring to the adjustment voltages of voltage label attached to back plate.

## 11-5. Replacement of DIGITAL PCB

1. Dismantle back cover.
2. Dismantle I/P PCB and I/P plate.
3. Dismantle 1 wire and 4 FFCs connected.
4. Replace defected DIGITAL PCB.

## 11-6. Replacement of SCAN PCB

1. Dismantle back cover.
2. Dismantle master frame.  
※ In order to prevent damages on COF in the course of dismantling, make sure dismantling should be done by a team two persons.
3. Replace defected SCAN PCB.

## 11-7. Replacement of CON PCB

1. Dismantle back cover.
2. Dismantle master frame.  
※ In order to prevent damages on COF in the course of dismantling, make sure dismantling should be done by a team two persons.
3. Replace defected CON PCB.

## 12.Spare Parts List

No	Material Number	Material Name	Material Specification	Q'ty	Unit	Remark
1	P70100A00C	CARTON BOX	MPDP	1	set	BOX Ass'y
2	P70300A003	PACKING PAD	MPDP-EPP	1	set	EPP PAD Ass'y
3	G7740145	ASSEMBLED MOD	WSBAMIS4201	1	EA	PLANK
4	G7714004	B/P ASSEMBLED PNL	MSPA4201	1	EA	BACK+PANEL
5	G7814020	MASTER FRAME ASS'Y	MPDP-01	1	EA	
6	M7570556	GUIDE PIN	PM42M-GUI00-00	4	EA	
7	M7570549	SUPPORT BRACKET	PM42V-SUB00-00	2	EA	
8	G7814021	COVER BACK ASS'Y	MPDP(3P)	1	EA	ATTACHED FAN
9	M7570586	COVER BACK	PM42M-CBA000-00	1	EA	Back Cover
10	M7543066	SCREW TAPTITE	TT2 PAN 5*12 MFZN(BLACK)	8	EA	FOR FAN ASSEMBLY
11	M7543070	SCREW MACHINE	BIND M4*5 MFZN(BLACK)	32	EA	COVER BACK+ I/P COVER+ NOISEFILTER COVER
12	M7543053	SCREW MACHINE	M4×8 BIND MFZN(BLACK)	22	EA	SUPPORT BRACKET+ HANDLE+ MASTER FRAMR ASS'Y
13	M7572082	DC-FAN	AD0812DB-A72GL-550	1	EA	
14	M7572083	DC-FAN	AD0812DB-A72GL-250	1	EA	
15	M7570557	HANDLE	PM42M-HAN00-00	2	EA	
16	M7572950	BACK LABEL (CHINA)	MPDP-4201-01	1	EA	CHINA CCC LABEL
17	M7572931	BACK LABEL(EU)	MPDP-4201-00	1	EA	Others Country

No	Material Number	Material Name	Material Specification	Q'ty	Unit	Remark
18	M7572932	AV BACK LABEL	MPDP-4201-POWER		EA	
19	M7570587	NOISE FILTER COVER	PM42M-NFC00-00		EA	
20	M7519247	NOISE FILTER	02P-210M(TDK)-INLET(D)		EA	
21	M7543069	SCREW MACHINE	BIND M3*8 PW MFZN(BLACK)		EA	
22	M7543061	SCREW MACHINE	PSW M3*8 MFZN	74	EA	Board ASS'Y +BACK- PLATE
23	G7800004	SCAN-H ASS'Y	MPA42V-PSH01	1	EA	
24	G7802003	SCAN-L ASS'Y	MPA42V-PSL01	1	EA	
25	G7806005	CONN-HR-ASS'Y	MPA42V-PCHR01	1	EA	
26	G7804005	CONN-HL-ASS'Y	MPA42V-PCHL01	1	EA	
27	G7806006	CONN-LR-ASS'Y	MPA42V-PCLR01	1	EA	
28	G7804006	CONN-LL-ASS'Y	MPA42V-PCLL01	1	EA	
29	G7808004	SUS-X-ASS'Y	MPA42V-PXS01	1	EA	
30	G7810002	SUS-Y-ASS'Y	MPA42V-PYS01	1	EA	
31	G7812005	DIGITAL ASS'Y	MPA42V-PDI01	1	EA	
32	M7512011	POWER	DGO-120S1	1	EA	
33	G7840000	IP ASS'Y	MIS4201-IP-00	1	EA	
34	M7570552	I/P COVER	PM42M-IPC00-00	1	EA	
35	M7570551	I/P PLATE	PM42M-IPP00-00	1	EA	
36	M7506149	CONNECTOR CABLE 6P	12505HS- 06+12505TS+ULW=50	3	EA	CON~C ON,Y

No	Material Number	Material Name	Material Specification	Q' ty	Un it	Remark
37	M7506150	CONNECTOR CABLE 12P	12505HS-12+12505TS+ULW=90	1	EA	X~CON
38	M7506151	CONNECTOR CABLE 15P	12505HS-15+12505TS+ULW=90	1	EA	Y~DIG.
39	M7506148	CONNECTOR CABLE 8P	YH396-08V+YT396J+ULW=400	1	EA	X_SUS
40	M7506146	CONNECTOR CABLE 10P	YH396-10V+YT396J+ULW=400	1	EA	Y_SUS
41	M7506147	CONNECTOR CABLE 4P	YH396-04V+YT396J+ULW=300	1	EA	Y_5V
42	M7506155	CONNECTOR CABLE 4P	171822-08+170262-1=100	1	EA	DIG._5V
43	M7506143	CONNECTOR CABLE 10P	SMH250-10+LH01-250-12=460	1	EA	AV-POW
44	M7506154	CONNECTOR CABLE 6P	SMH250-06+LH01-250-07=590	1	EA	AV-POW
45	M7506145	CONNECTOR CABLE 31P	GT121-31S-CD+GT121-C-15000=120	1	EA	AV-DIG
46	M7519752	FFC	50P 100L 0.5pt SINGLE SIDE	2	EA	
47	M7519753	FFC	30P 80L 0.5pt SINGLE SIDE	2	EA	



## 13.Option List[Cables]

No	Material Number	Material Name	Material specification	Q'ty	Unit	Remark
1	M7565704	PC CABLE	D-SUB 15M/M 1M 7.5	1	EA	
2	M7565706	DVI-D CABLE	SY-150M 1M	1	EA	
3	M7565708	VIDEO CABLE	BNC 1P 1M	1	EA	
4	M7565710	DVD CABLE	BNC 3P 1M	1	EA	
5	M7565751	RS-232C CABLE	D-SUB 9M/F 1M	1	EA	
6	M7565712	S-VIDEO CABLE	MINI DIN 4P 1M	1	EA	
7	M7565705	PC CABLE	D-SUB 15M/M 5M 7.5	1	EA	
8	M7565707	DVI-D CABLE	SY-150M 5M	1	EA	
9	M7565709	VIDEO CABLE	BNC 1P 5M	1	EA	
10	M7565711	DVD CABLE	BNC 3P 5M	1	EA	
11	M7565752	RS-232C CABLE	D-SUB 9M/F 5M	1	EA	
12	M7565713	S-VIDEO CABLE	MINI DIN 4P 5M	1	EA	

# 14.Exploded View For MIS-4201

