

MITSUBISHI DIGITAL ELECTRONICS

V19 / V21

PWB Level
Troubleshooting Guide

V19 / V21

PWB Level Troubleshooting Guide

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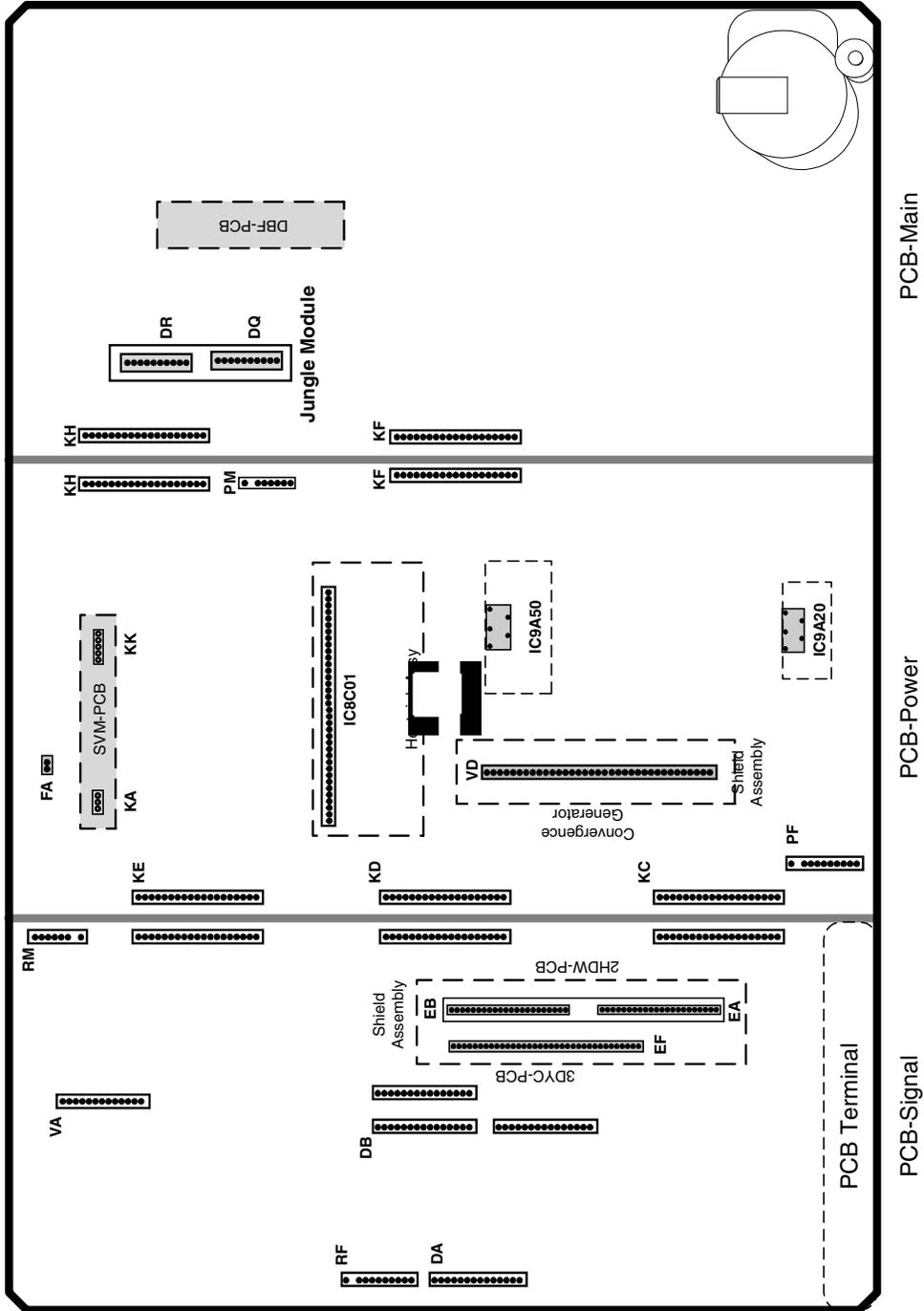
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Introduction

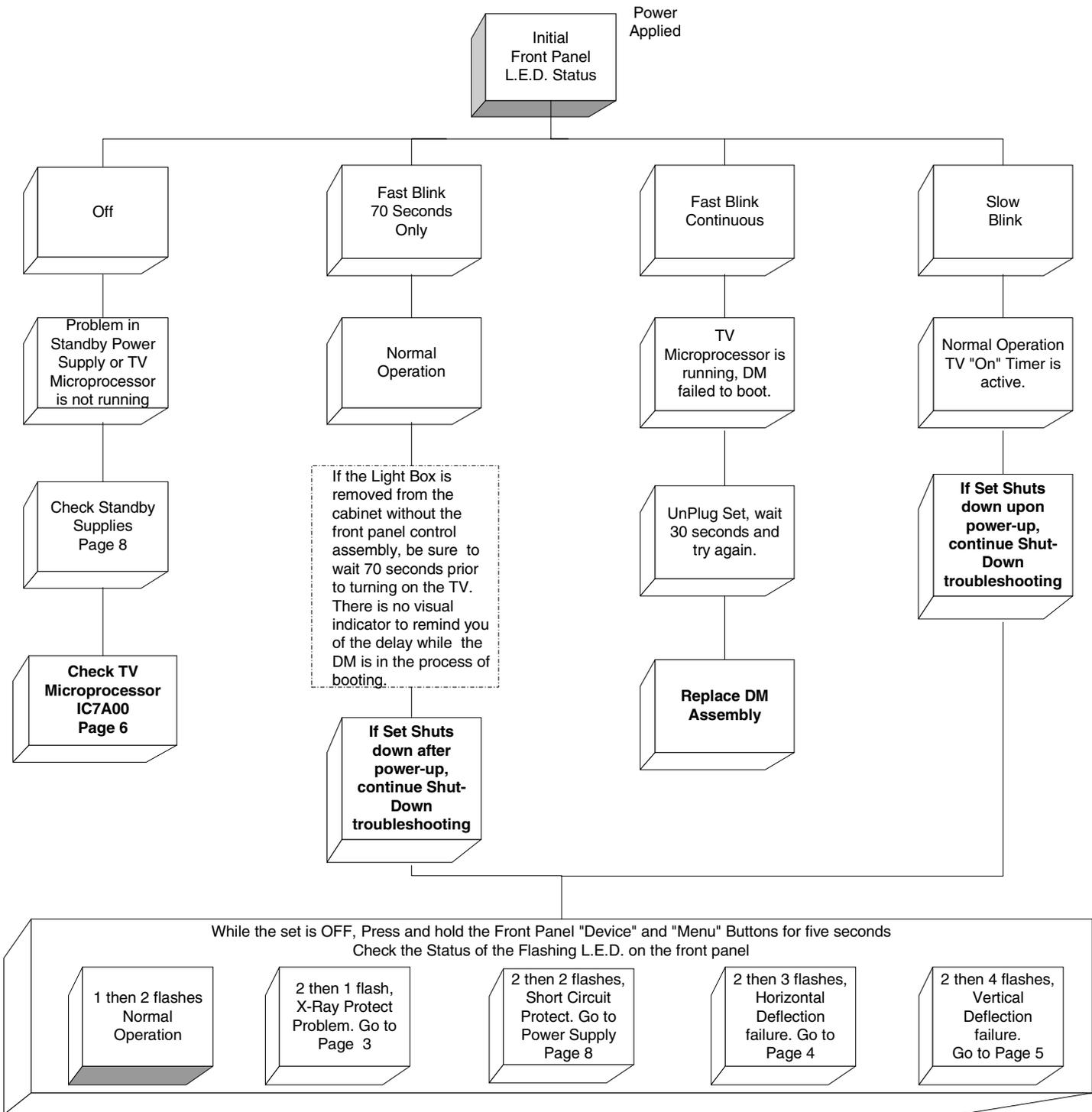
The purpose of this V19 / V21 PWB Level Troubleshooting Guide is to assist the servicer to quickly identify common chassis test points, and to facilitate efficient servicing procedures in the field or service shop / depot. It is intended for use in tandem with the Service manual as an aid to troubleshooting a set. Included are many major DC voltage measurements and AC waveforms pertinent to proper operations of the chassis. In addition, troubleshooting procedures are provided for some common service issues a Technician may encounter.

This guide is not intended to be used as a resource for technical training, circuit analysis, or adjustment procedures. Refer to the V19 / V21 Technical Training guide and/or the Service manual which includes all schematics, parts lists, and adjustment procedures for these purposes.

Printed Circuit Board Diagram



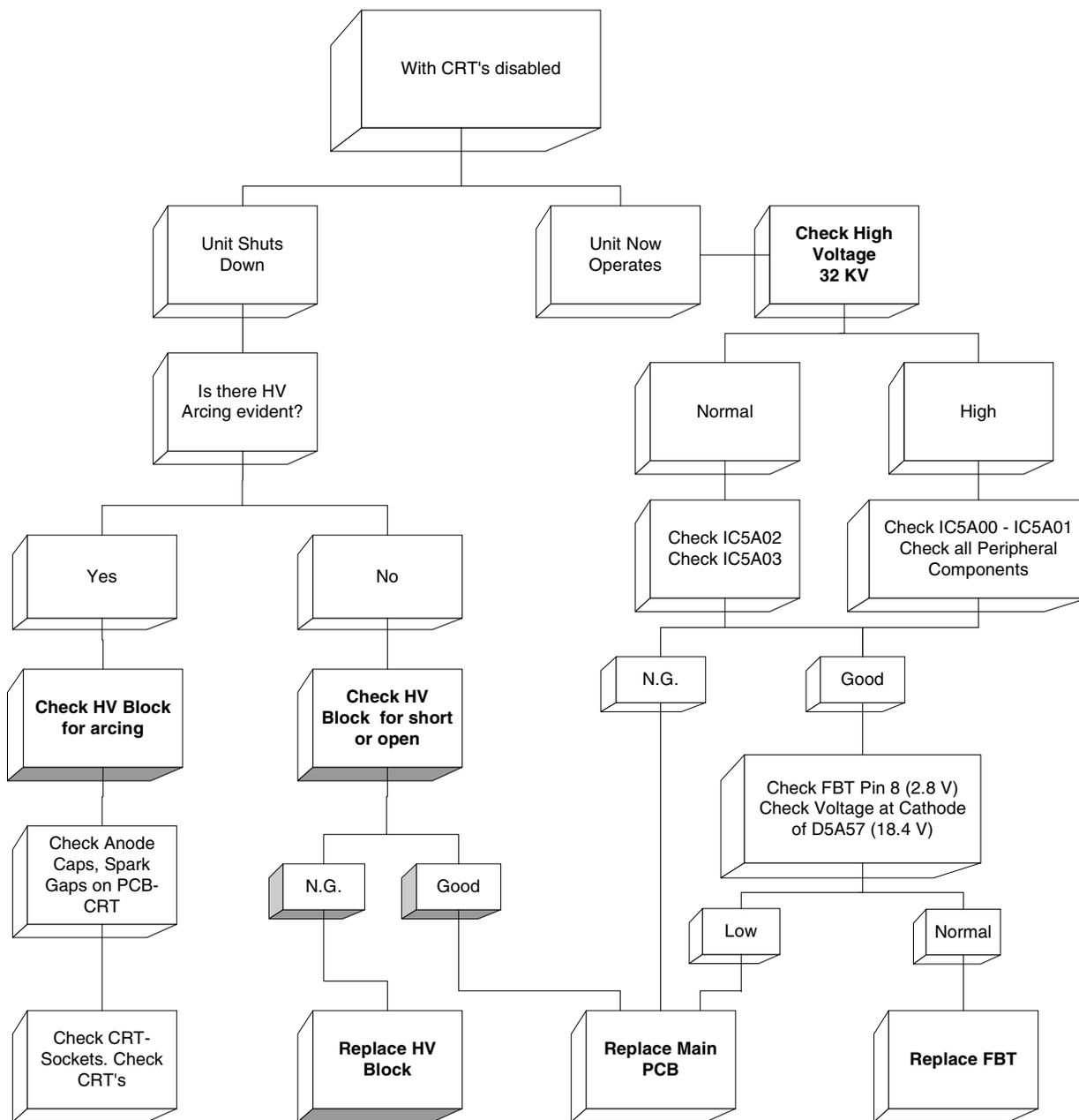
Troubleshooting Shut-Down Problems



**Troubleshooting Shut-Down Problems
X-Ray Protect**

Caution !

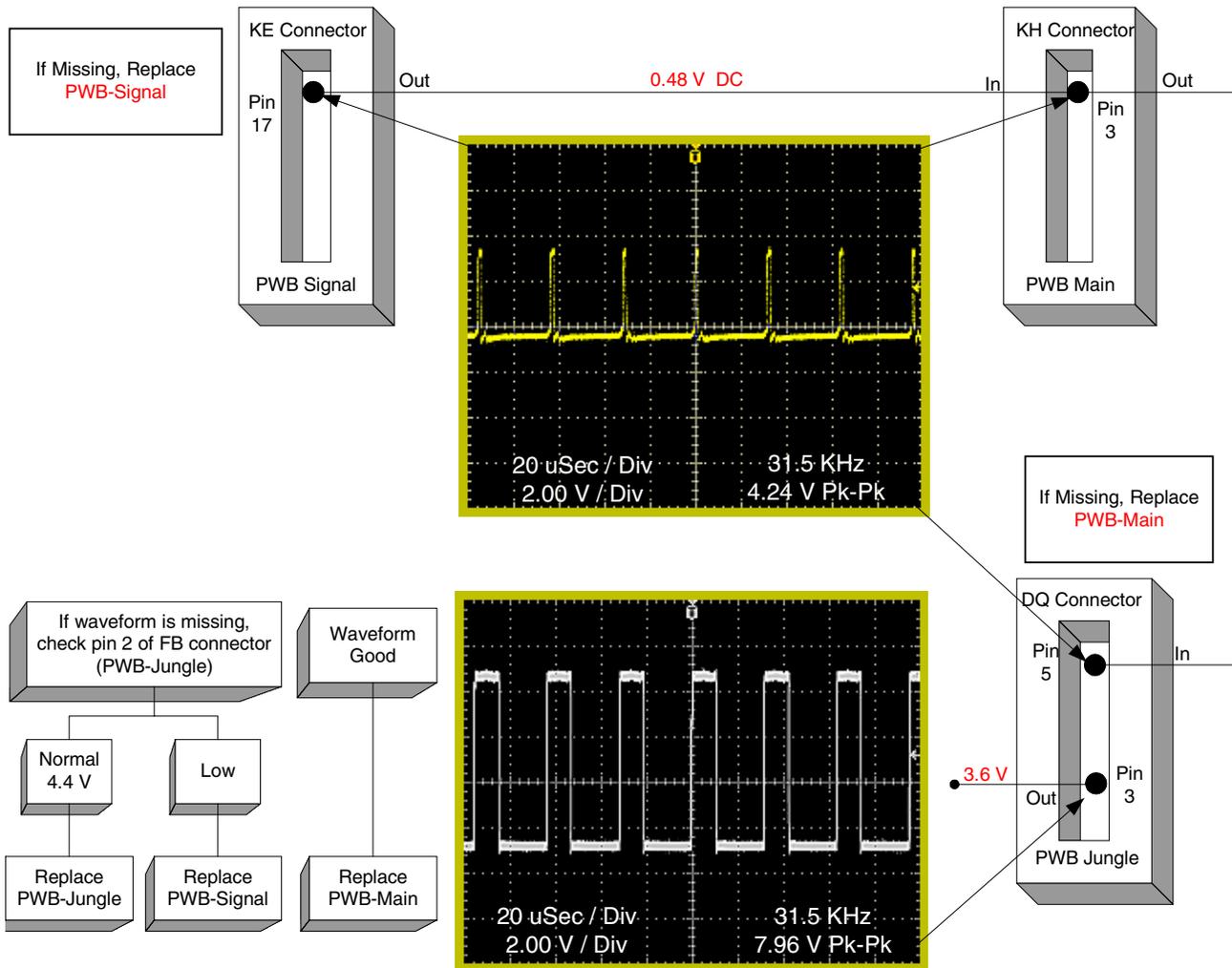
Prior to the diagnostics of these issues, it is imperative that you disable the CRT's to prevent phosphor damage. Do so by removing Connector SP, which removes filament voltage, or removing each CRT-PCB.



**Troubleshooting Shut-Down Problems
Horizontal Deflection Failure**

Caution !

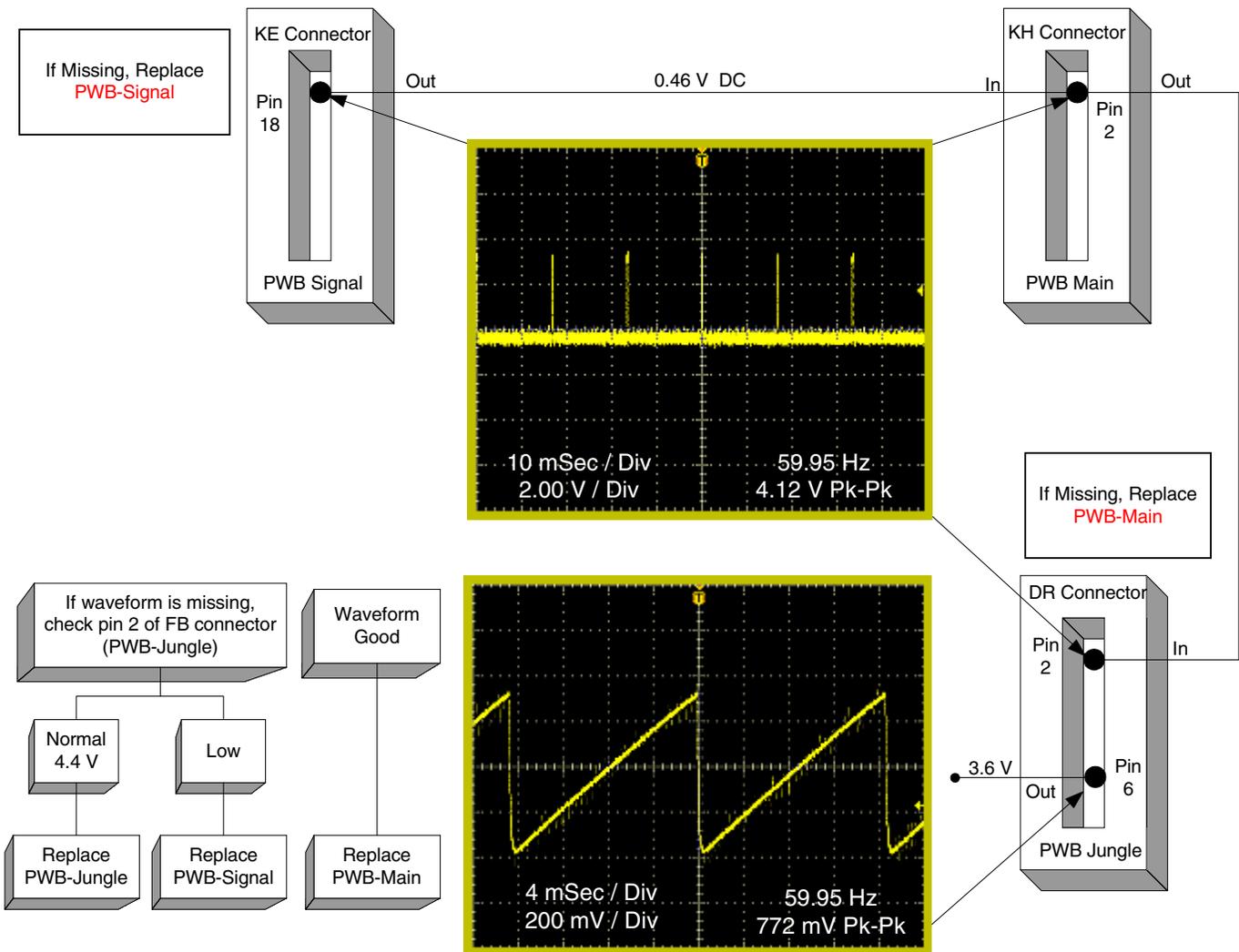
Prior to the diagnostics of these issues, it is imperative that you disable the CRT's to prevent phosphor damage. Do so by removing Connector SP, which removes filament voltage. Also remove D5A13 on the Main PCB to disable the deflection shut-down circuitry

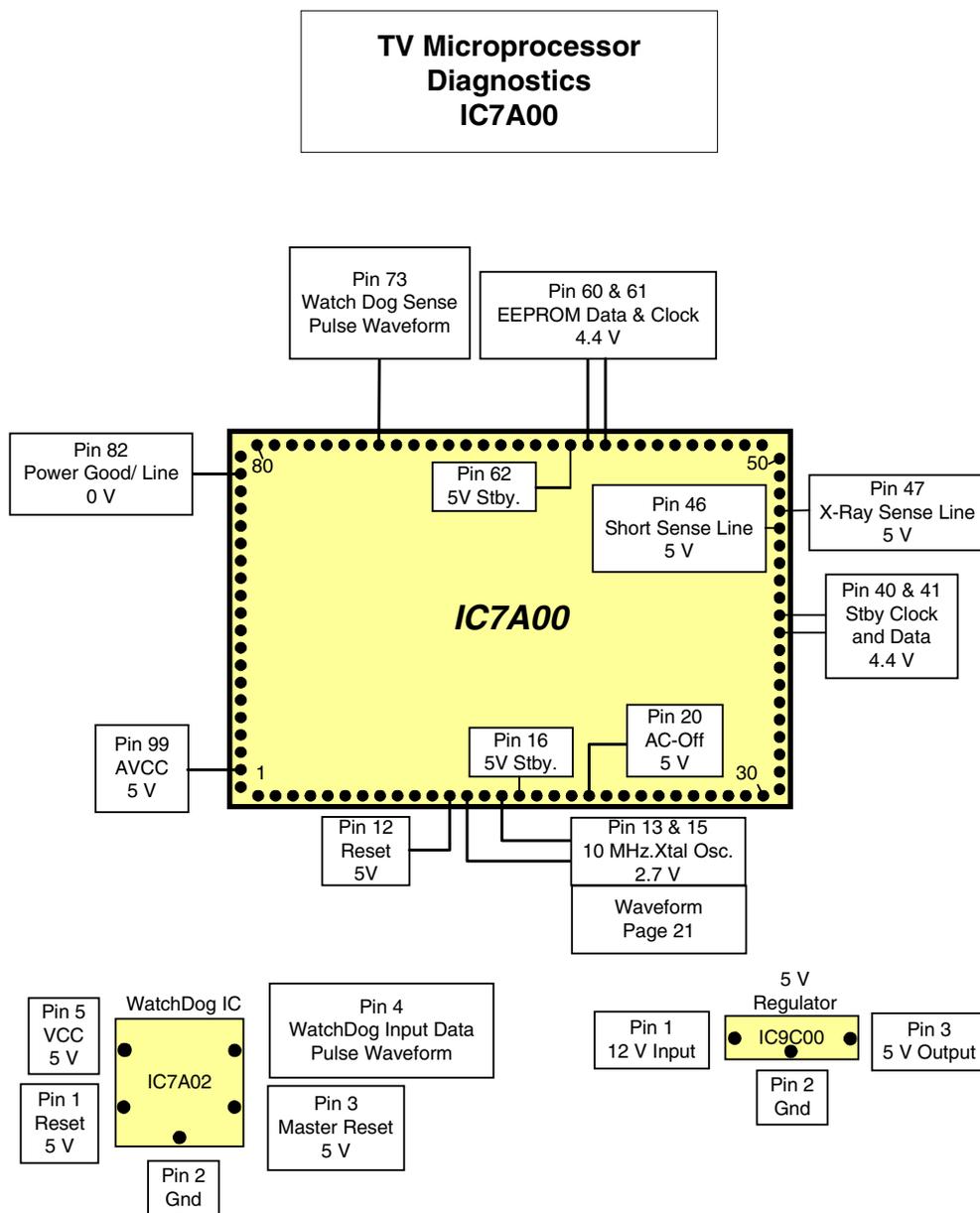


**Troubleshooting Shut-Down Problems
Vertical Deflection Failure**

Caution !

Prior to the diagnostics of these issues, it is imperative that you disable the CRT's to prevent phosphor damage. Do so by removing Connector SP, which removes filament voltage. Also remove D5A13 on the Main PCB to disable the deflection shut-down circuitry





Check the following for a No Start Condition

- 1) Check 5V Supplies to IC on Pins 16, 62, and 99.
All 5V Supplies are sourced from IC9C00, Pin 3
- 2) Check Reset Pin 12
- 3) Check for Oscillator operation on Pins 13 and 15
- 4) Check AC-Off on pin 20, should be High.
- 5) Check Power Good line Pin 82. Should be Low.
- 6) Check clock and data signals, Pins 40, 41, 60, and 61.
- 7) Check for presence of WatchDog pulse on Pin73

Check the following for a Shut-down Condition

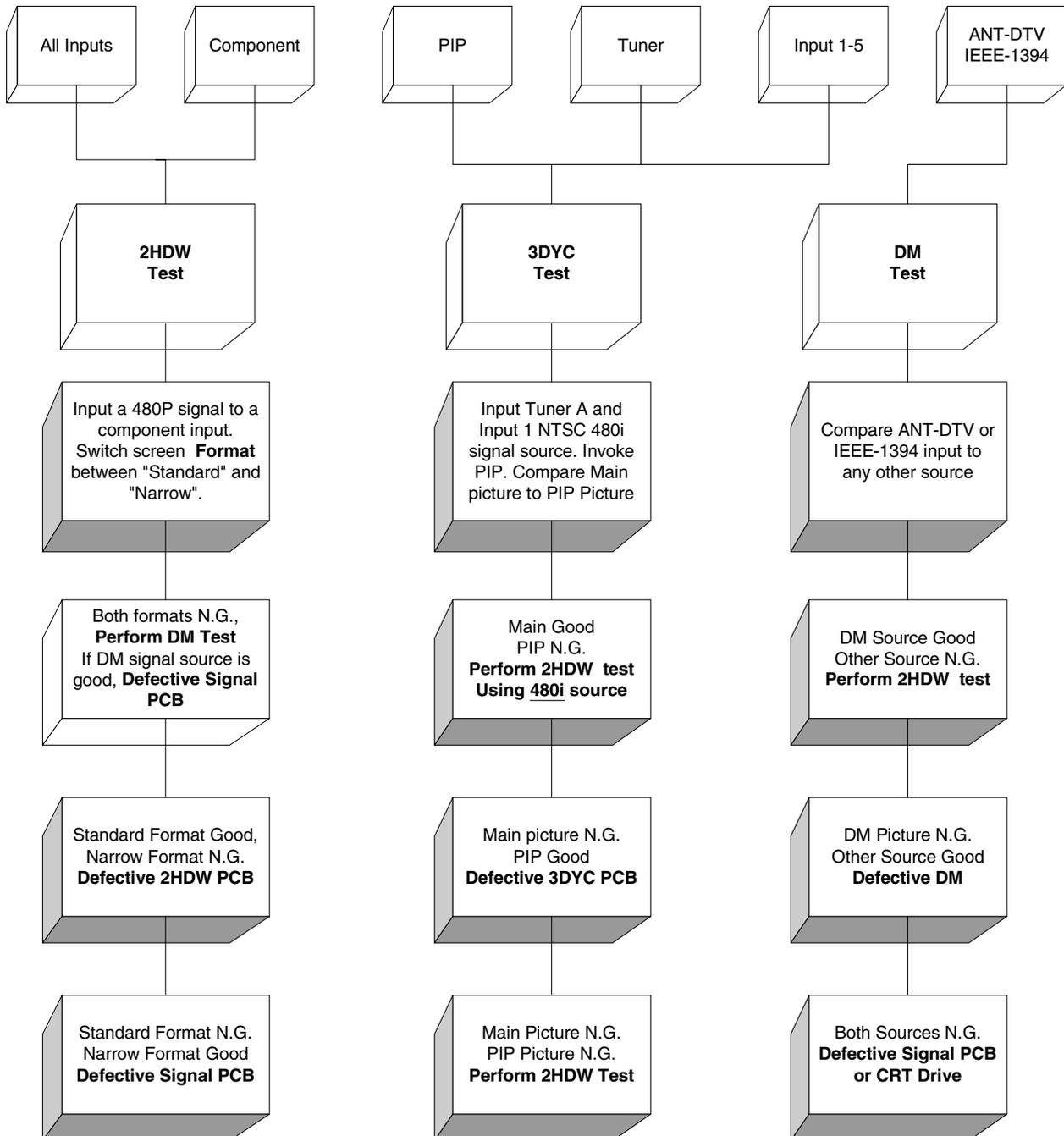
- 1) Check Pin 47, X-Ray Sense line.
This monitors high voltage and Arc-Protection on the Main PWB. If there is a defect here, go to deflection troubleshooting procedures.
- 2) Check Pin 46, Short-Sense line.
This monitors the +/- 24 supplies from the main power supply, in addition to a 12 V standby supply. If there is a defect here, go to the power supply troubleshooting procedures.

Verify DC Voltages and Waveforms prior to PCB replacement

Defect in Color or Video

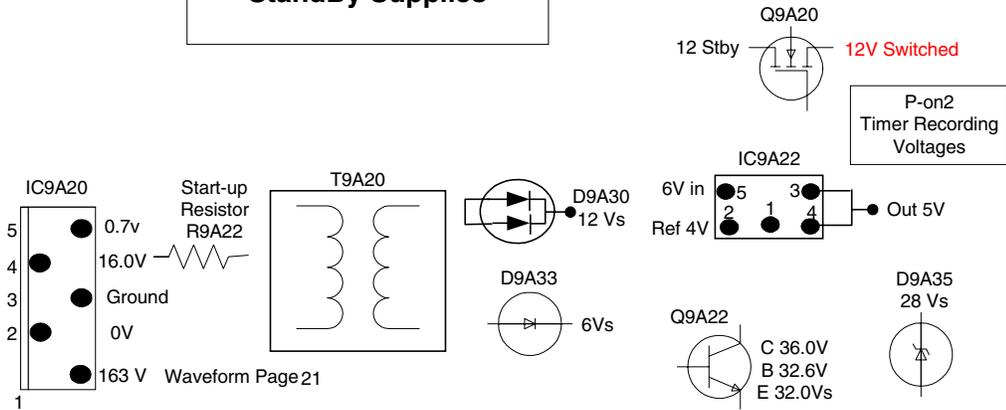
PCB 2HDW Page 4
PCB 3DYC Page 3

Which Video Source Input Shows a defect?

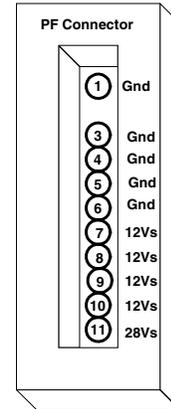
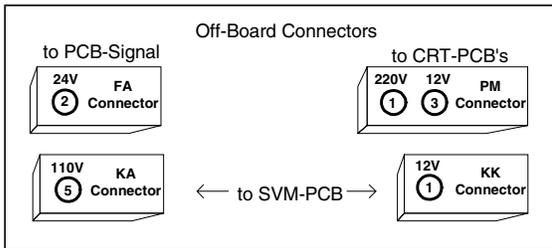
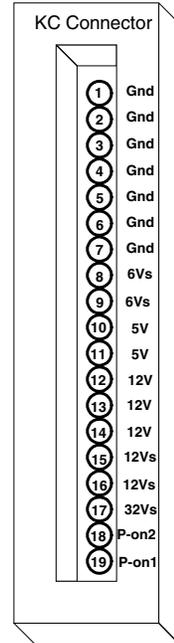


Power Supply Quick Reference

StandBy Supplies



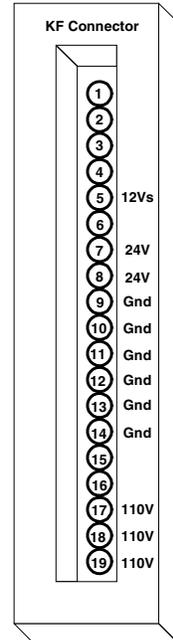
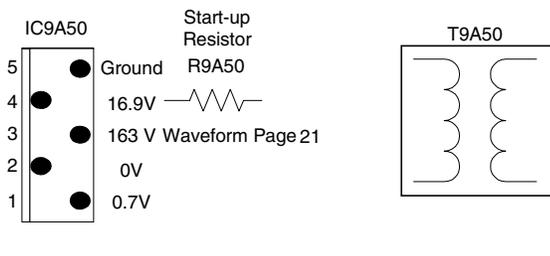
Power-Pcb ↔ Signal-PCB



Note; 12 V Switched, +/- 24 V Supplies are monitored by the "Short Sense" line to the TV Microprocessor pin 46

Power-PCB ↔ DM

Switched Supplies

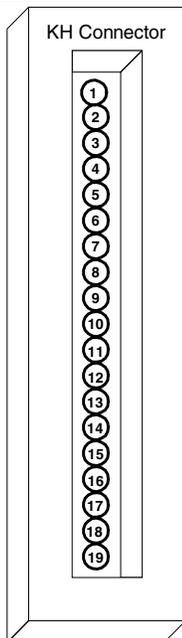


Power-PCB ↔ Main-PCB

Refer to Page 1, Printed Circuit Board Diagram, for component and connector locations

**Main-PCB
Jungle-PCB
Quick Reference**

Power-PCB ↔ Main-PCB

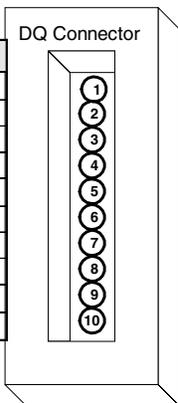


ID	In/Out	DC	Waveform
Gnd	-	-	-
VD	Out	.46	Page 14
HD	Out	.48	Page 14
FP	In	0	-
Gnd	-	-	-
VTIM	Out	.26	Page 14
SCP	Out	.95	Page 14
ACL	Out	2.8	-
N/C	-	-	-
VBlank	Out	0	-
X-Ray	In	5.0	-
N/C	-	-	-
N/C	-	-	-
SCL-Stby	I/O	4.5	Data
H-Pulse	Out	.51	Page 14
Gnd5	-	-	-
V-Pulse	Out	.26	Page 14
SDA-Stby	I/O	4.5	Data
HV-Adj	Out	2.0	-

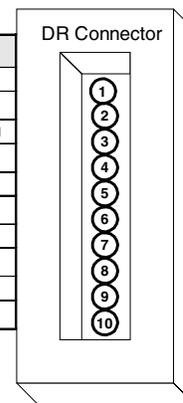
Jungle-PCB ↔ Main-PCB

Jungle-PCB ↔ Main-PCB

Waveform	DC	In/Out	ID
-	-	-	H-Gnd
Page 14	4.0	Out	Side_Pin
Page 15	3.6	Out	H_Drive
Page 15	.57	In	H_Pulse
Page 15	.47	In	HD
-	9.0	Out	FH_Status
-	5.13	Out	F33k
-	-	-	N/C
-	9.0	In	9Vsb
-	9.0	In	9Vsb



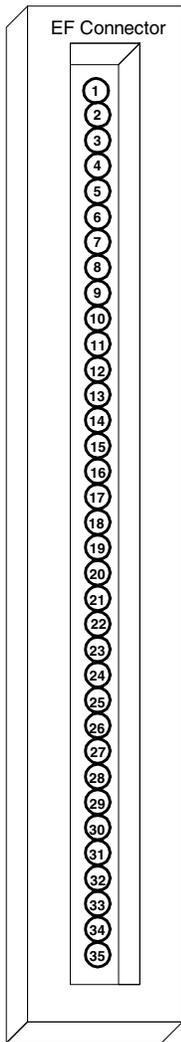
Waveform	DC	In/Out	ID
Page 14	.95	In	SCP-2H
Page 14	.45	In	VD
Page 14	.26	In	V_Timing
Page 14	0	Out	V_Saw
-	-	-	V-Gnd
Page 14	3.4	Out	VDRV-
N/A	N/A	N/A	VDRV+
-	12.0	In	12Vsb
Data	4.4	I/O	SDA5
Data	4.4	I/O	SCL5



Refer to Page 1, Printed Circuit Board Diagram, for component and connector locations

**3DYC-PCB
CRT Drive
Quick Reference**

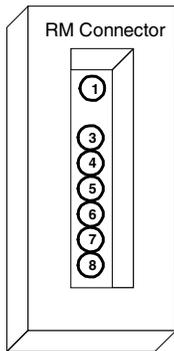
Signal-PCB ↔ 3DYC-PCB



ID	In/Out	DC	Waveform
Gnd	-	-	-
3D_Hsync	In	.58	Page 15
Gnd	-	-	-
3D_Vsync	In	.15	Page 15
M_Frun	-	-	-
3D_Csync	In	4.7	Page 15
NT_Sw	In	-	-
3D_Pb	Out	3.0	Page 15
Gnd	-	-	-
3D_Pr	Out	3.0	Page 15
Gnd	-	-	-
3D-Y	Out	2.8	Page 15
Gnd	-	-	-
SDA-3D	I/O	4.4	Data
SCL-3D	I/O	4.4	Data
9V-1	In	9.0	-
9V-1	In	9.0	-
Kil	In	0	-
3DRst	In	5.0	-
5V	In	5.0	-
5V	In	5.0	-
Gnd	-	-	-
Gnd	-	-	-
VY_3DYC	In	3.76	Page 15
Gnd	-	-	-
C_3DYC	In	2.62	Page 15
Gnd	-	-	-
Gnd	-	-	-
Gnd	-	-	-
Y-Mon	Out	2.62	Page 15
Gnd	-	-	-
C-M on	Out	2.6	Page 16
Gnd	-	-	-
Gnd	-	-	-
Gnd	-	-	-

CRT-PCB's ↔ Signal-PCB

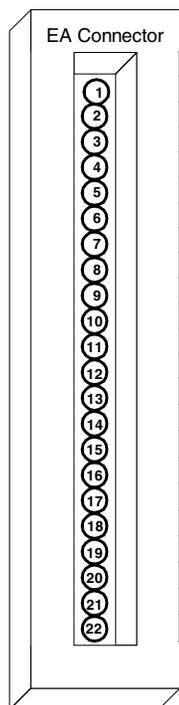
**CRT Drive
Signal-PCB**



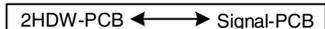
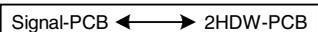
ID	In/Out	DC	Waveform
R_Out	Out	2.9	Page 16
-	-	-	-
Gnd	-	-	-
G_Out	Out	3.13	Page 16
Gnd	-	-	-
B_Out	Out	2.9	Page 16
Gnd	-	-	-
Ik	In	2.0	Page 16

Refer to Page 1, Printed Circuit Board Diagram, for component and connector locations

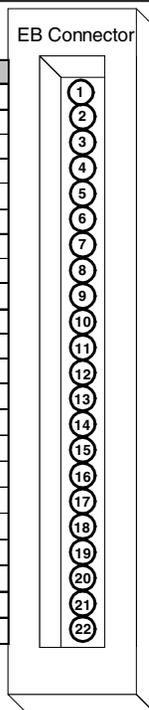
**2HDW (Line Doubler) PCB
Quick Reference**



ID	In/Out	DC	Waveform
PIP-Y	In	3.0	Page 16
Gnd	-	-	-
PIP-PB	In	2.85	Page 16
Gnd	-	-	-
PIP-PR	In	2.83	Page 16
PIP-H	In	.58	Page 16
Gnd	-	-	-
PIP-V	In	.16	Page 16
3.3V	In	3.3	-
3.3V	In	3.3	-
Gnd	-	-	-
Gnd	-	-	-
9V-2	In	9.0	-
Gnd	-	-	-
AMDP-Y-In	In	2.36	Page 16
Gnd	-	-	-
AMDP-PB-In	In	2.2	Page 16
Gnd	-	-	-
AMD-PR-In	In	2.2	Page 17
Main-H	In	.58	Page 17
Gnd	-	-	-
Main-V	In	.15	Page 17



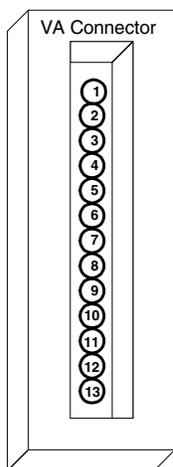
Waveform	DC	In/Out	ID
Page 17	2.25	Out	Y-AMDP
	-	-	Gnd
Page 17	2.65	Out	PB-AMDP
	-	-	Gnd
Page 17	2.65	Out	PR-AMDP
Page 17	4.5	Out	H-AMDP
Page 17	4.8	Out	V-AMDP
	-	-	Gnd
	-	Out	YS-AMDP
	-	-	Gnd
	-	Out	FP
	-	-	N/C
	-	In	5V-A
	-	In	5V
	-	-	Gnd
Data	3.8	I/O	SDA-AMDP
Data	3.8	I/O	SCL-AMDP
	-	-	Gnd
Data	.18	I/O	CS-AMDP
Data	5.0	I/O	Clk
Data	3.18	In	D_In
Data	5.0	Out	D_Out



Refer to Page 1, Printed Circuit Board Diagram, for component and connector locations

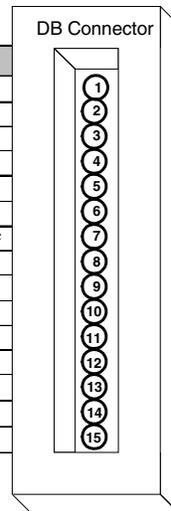
Digital Module
Quick Reference

Signal-PCB ↔ DM Assembly



ID	In/Out	DC	Waveform
DM-G	Out	2.4	Page 17
Gnd	-	-	-
DM-B	Out	2.4	Page 17
Gnd	-	-	-
DM-R	Out	2.4	Page 17
Gnd	-	-	-
DM-H	Out	3.11	Page 17
DM-V	Out	3.22	Page 18
Gnd	-	-	-
DSP-H	In	.44	Page 18
DSP-V	In	0	Page 18
Gnd	-	-	-
Masking	Out	0	High = OSD on

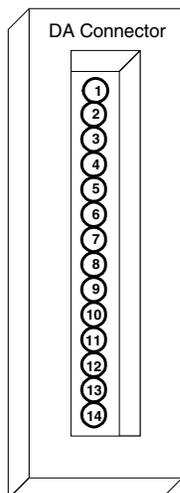
DM Assembly ↔ Signal-PCB



Waveform	DC	In/Out	ID
Page 18	.9	In	Main -Y
-	-	-	Gnd
Page 18	2.2	In	Main-CB
-	-	-	Gnd
Page 18	2.2	In	Main-CR
-	-	-	Gnd
Page 18	4.7	In	Main_Sync
-	-	-	N/C
-	-	-	Gnd
-	5.0	Out	TV_Reset
-	-	-	Gnd
Page* 18	.9*	Out	Y-DM
-	-	-	Gnd
Page* 18	.9*	Out	C-DM
-	-	-	Gnd

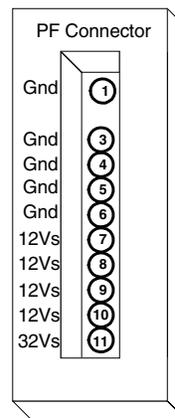
* Available in HDTV or OSD Modes Only

Signal-PCB ↔ DM Assembly



ID	In/Out	DC	Waveform
L-DM	Out		HD Audio
Gnd	-	-	-
R-DM	Out		HD Audio
Gnd	-	-	-
DM_Reset	In	0V	-
Powergood	Out	0V	
TV-DM_RTS	I/O		Data
TV-DM_CTS	I/O		Data
DM_Rxd	I/O		Data
Gnd	-	-	-
TV-DM_Txd	I/O		Data
DMDetect	Out	0V	
IR_In_Busy	Out		Data
IR_Out_ENA	In		Data

DM Assembly ↔ Power-PCB

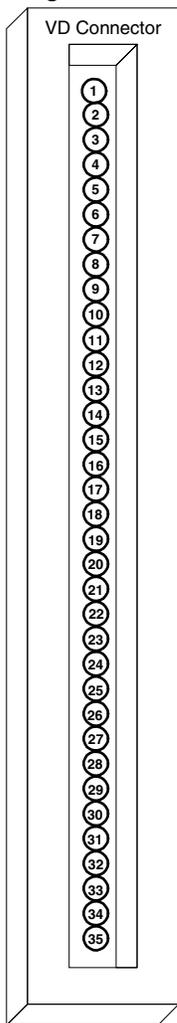


Voltages and Waveforms taken in 480i mode except where indicated

Refer to Page 1, Printed Circuit Board Diagram, for component and connector locations

**Convergence
Quick Reference**

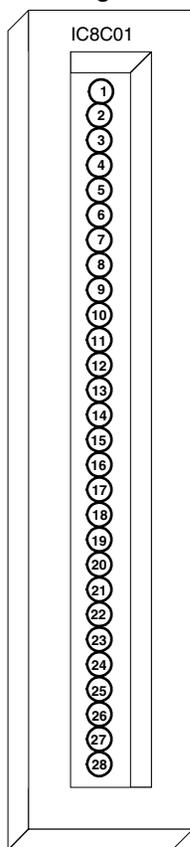
Convergence Generator



ID	In / Out	DC	Waveform
C_E2Reset	In	5.0	-
N/C	-	-	-
12V	In	12.0	-
C_Mute	In	5.0	-
C_Reset	In	5.0	-
C_Busy	I/O	4.5	-
C_Ack	I/O	4.8	-
C_Sda	I/O	4.2	Data
C_Scl	I/O	4.2	Data
HPulse	In	.56	Page 18
HV-Adj	In	1.8	-
N/C	-	-	-
VPulse	In	.25	Page 18
Gnd	-	-	-
Gnd	-	-	-
N/C	-	-	-
C_OSDr	Out	0	-
C_OSDg	Out	0	-
C_OSDb	Out	0	-
N/C	-	-	-
C_Blck	Out	-	-
5V	In	5.0	-
N/C	-	-	-
Gnd	-	-	-
Gnd	-	-	-
Gnd	-	-	-
9V	In	9.0V	-
DF	Out	-1.7	Page 18
-9V	In	-9.0	-
BV	Out	.12	Page 19
GV	Out	0	Page 19
RV	Out	0	Page 19
BH	Out	.5	Page 19
GH	Out	.14	Page 19
RH	Out	.15	Page 19

Power-PCB ←→ Convergence Generator

Convergence IC



ID	In / Out	DC	Waveform
BH	In	.257	Page 19
-BH	Yoke Return	.257	Page 19
+BH	Out	.45	Page 19
+GH	Out	.20	Page 19
-GH	Yoke Return	0	Page 19
GH	In	0	Page 19
RH	In	.28	Page 20
_RH	Yoke Return	.28	Page 20
+RH	Out	0	Page 20
-VCC	In	-24	-
N/C	-	-	-
VCC	In	24	-
Pre+VCC	In	24	-
Gnd	-	-	-
Pre-VCC	In	-24	-
-VCC2	In	-24	-
Gnd	-	-	-
Vcc2	In	24	-
Mute	In	5.0	-
+RV	Out	0	Page 20
-RV	Yoke Return	0	Page 20
RV	In	0	Page 20
GV	In	0	Page 20
-GV	Yoke Return	.1	Page 20
+GV	Out	0	Page 20
+BV	Out	.1	Page 21
-BV	Yoke Return	.2	Page 21
BV	In	.2	Page 21

Power-PCB ←→ IC8C01

Partial Glossary

ID	Definition
C_E2Reset	Reset Pulse from EEPROM
C_Ack	Convergence Acknowledge
C_SDA	Convergence Serial Data
C_SCL	Convergence Serial Clock
HPulse	Horizontal Pulse
VPulse	Vertical Pulse
C_OSD	Convergence On Screen Display
DF	Dynamic Beam Forming Pulse

Refer to Page 1, Printed Circuit Board Diagram, for component and connector locations

