

PROJECTION TELEVISION

AP-93 CHASSIS



1999-2000
MODEL RELEASE

<u>MODEL</u>	<u>CHASSIS</u>
50CX29B	AP-90
60CX29B	AP-90
50GX49B	AP-92
50UX57B	AP-83R
60UX57B	AP-83R
53SBX59B	AP-93
61SBX59B	AP-93
DIGITAL	
61HDX98B	DP-85
60SDX88B	DP-86
53SDX89B	DP-86
52LDX99B	DL-1
36SDX88B	MM-1
27MM30V	PA-2

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GENERAL INFORMATION

SECTION 1

PTV MODEL TO CHASSIS CROSS REFERENCE CHART

ModelNo	Chassis
43FDX01B	DP05
43GX01B	AP02
46EX2B/K	AP22
46EX3B/BS	AP32
46EX4K/KS	AP32
46GX01B	AP92R
46UX10BA	AP13
46UX10BF	AP23
46UX11KA	AP13
46UX11KF	AP23
46UX12B	AP33
46UX13K	AP33
46UX16B	AP43
46UX17K	AP43
46UX20B	AP53
46UX20BA	AP53P
46UX21K	AP53
46UX21KA	AP53P
46UX24B	AP63
46UX25K	AP63
46UX50B	AP73
46UX51K	AP73
46UX7B/K	AP13
50CX01B	AP90R
50CX29B	AP90
50ES1B/K	AP31
50EX01B	AP91R
50EX10B	AP32
50EX11BV	AP32
50EX12B	AP32F
50EX12BA	AP32V
50EX12BX	AP52
50EX13K	AP32F
50EX13KA	AP32V
50EX13KX	AP52
50EX14BV	AP52
50EX16B	AP52
50EX20B	AP52
50EX2K	AP22
50EX39B	AP91
50EX6K	AP32
50EX8K	AP32
50FX18B	AP62
50FX19K	AP62
50FX30B	AP62
50FX48B	AP62P
50FX49B	AP92
50GX10B	AP92R
50GX20B	AP92R
50GX49B	AP92
50SBX70B	AP74
50SBX78B	AP84
50SX5P	AP33B

ModelNo	Chassis
50SX6P	AP43B
50UX10B	AP23
50UX11K	AP23
50UX14B	AP33
50UX15K	AP33
50UX18B	AP43
50UX19K	AP43
50UX22B	AP53
50UX22BA	AP53P
50UX23K	AP53
50UX23KA	AP53P
50UX26B	AP63
50UX27K	AP63
50UX52B	AP73
50UX53K	AP73
50UX57B	AP83R
50UX58B	AP83
50UX58K	AP83
50UX59B	AP93
50UX7B/K/W	AP13
50UX8D/W	AP13
52LDX99B	DL1
53FDX01B	DP05
53SBX01B	AP93R
53SBX59B	AP93
53SDX01B	DP06
53SDX88BA	DP86V
53SDX89B	DP86
53SWX01W	DP07
55EX15K	AP52
55EX1K	AP12
55EX7K	AP32
55EX9K	AP32
55FX20B	AP62
55FX48B	AP82
55FX49B	AP92
55UX58B	AP83P
55UX58BA	AP83
55UX59B	AP93
60CX01B	AP90R
60CX29B	AP90
60EX01B	AP91R
60EX28B	AP52P
60EX38B	AP52P
60EX39B	AP91
60FX32B	AP62
60GX49B	AP92
60SBX72B	AP74
60SBX78B	AP84
60SDX88B	DP86
60SDX88BA	DP86V
60SX10B	AP53D
60SX10BA	AP53DP

ModelNo	Chassis
60SX11K	AP53D
60SX11KA	AP53DP
60SX12B	AP63B
60SX13K	AP63B
60SX1K	AP14
60SX2K	AP24
60SX3B	AP34
60SX4K	AP34
60SX8B	AP43B
60SX9K	AP43B
60UX54B	AP73
60UX55K	AP73
60UX57B	AP83R
60UX58B	AP83
60UX58K	AP83
60UX59B	AP93
61DMX01W	NEW
61HDX01W	DP85
61HDX98B	DP85
61SBX01B	AP93R
61SBX59B	AP93
61SDX01B	DP06
61SWX01W	DP07
70SBX74B	AP74
CT4271	VP6
CT4275	VP6X2
CT4520K	VP7X2
CT4521K	VP7X2
CT4525	VP2
CT4531	VP2
CT4532	VP2
CT4533K	VP9X1
CT4534	VP3
CT4535K	VP9X1
CT4536	VP3
CT4546	VP3
CT4555	VP3
CT4580K	VP7X2
CT5033K	VP9X1
CT5071	VP6
CT5072	VP6
CT5075	VP6X2
CT5080	VP7X2
CT5081K	VP7X2
CT5522K	VP7X2
CT5533K	VP9X1
CT5582K	VP7X2
CU4600K	VP8X2
CU4601K	VP8X2
CU5000K	VP8X2
CU5001B	VP8X2
CU5002K	VP8X2
CU5003D	VP8X2

PTV CHASSIS TO MODEL CROSS REFERENCE CHART

Chassis	ModelNo
AP02	43GX01B
AP12	55EX1K
AP13	46UX10BA
AP13	46UX11KA
AP13	46UX7B/K
AP13	50UX7B/K/W
AP13	50UX8D/W
AP14	60SX1K
AP22	46EX2B/K
AP22	50EX2K
AP23	46UX10BF
AP23	46UX11KF
AP23	50UX10B
AP23	50UX11K
AP24	60SX2K
AP31	50ES1B/K
AP32	46EX3B/BS
AP32	46EX4K/KS
AP32	50EX10B
AP32	50EX11BV
AP32	50EX6K
AP32	50EX8K
AP32	55EX7K
AP32	55EX9K
AP32F	50EX12B
AP32F	50EX13K
AP32V	50EX12BA
AP32V	50EX13KA
AP33	46UX12B
AP33	46UX13K
AP33	50UX14B
AP33	50UX15K
AP33B	50SX5P
AP34	60SX3B
AP34	60SX4K
AP43	46UX16B
AP43	46UX17K
AP43	50UX18B
AP43	50UX19K
AP43B	50SX6P
AP43B	60SX8B
AP43B	60SX9K
AP52	50EX12BX
AP52	50EX13KX
AP52	50EX14BV
AP52	50EX16B
AP52	50EX20B
AP52	55EX15K
AP52P	60EX28B
AP52P	60EX38B
AP53	46UX20B
AP53	46UX21K
AP53	50UX22B

Chassis	ModelNo
AP53	50UX23K
AP53D	60SX10B
AP53D	60SX11K
AP53DP	60SX10BA
AP53DP	60SX11KA
AP53P	46UX20BA
AP53P	46UX21KA
AP53P	50UX22BA
AP53P	50UX23KA
AP62	50FX18B
AP62	50FX19K
AP62	50FX30B
AP62	55FX20B
AP62	60FX32B
AP62P	50FX48B
AP63	46UX24B
AP63	46UX25K
AP63	50UX26B
AP63	50UX27K
AP63B	60SX12B
AP63B	60SX13K
AP73	46UX50B
AP73	46UX51K
AP73	50UX52B
AP73	50UX53K
AP73	60UX54B
AP73	60UX55K
AP74	50SBX70B
AP74	60SBX72B
AP74	70SBX74B
AP82	55FX48B
AP83	50UX58B
AP83	50UX58K
AP83	55UX58BA
AP83	60UX58B
AP83	60UX58K
AP83P	55UX58B
AP83R	50UX57B
AP83R	60UX57B
AP84	50SBX78B
AP84	60SBX78B
AP90	50CX29B
AP90	60CX29B
AP90R	50CX01B
AP90R	60CX01B
AP91	50EX39B
AP91	60EX39B
AP91R	50EX01B
AP91R	60EX01B
AP92	50FX49B
AP92	50GX49B
AP92	55FX49B
AP92	60GX49B

Chassis	ModelNo
AP92R	46GX01B
AP92R	50GX10B
AP92R	50GX20B
AP93	50UX59B
AP93	53SBX59B
AP93	55UX59B
AP93	60UX59B
AP93	61SBX59B
AP93R	53SBX01B
AP93R	61SBX01B
DL1	52LDX99B
DP05	43FDX01B
DP05	53FDX01B
DP06	53SDX01B
DP06	61SDX01B
DP07	53SWX01W
DP07	61SWX01W
DP85	61HDX01W
DP85	61HDX98B
DP86	53SDX89B
DP86	60SDX88B
DP86V	53SDX88BA
DP86V	60SDX88BA
NEW	61DMX01W
VP2	CT4525
VP2	CT4531
VP2	CT4532
VP3	CT4534
VP3	CT4536
VP3	CT4546
VP3	CT4555
VP6	CT4271
VP6	CT5071
VP6	CT5072
VP6X2	CT4275
VP6X2	CT5075
VP7X2	CT4520K
VP7X2	CT4521K
VP7X2	CT4580K
VP7X2	CT5080
VP7X2	CT5081K
VP7X2	CT5522K
VP7X2	CT5582K
VP8X2	CU4600K
VP8X2	CU4601K
VP8X2	CU5000K
VP8X2	CU5001B
VP8X2	CU5002K
VP8X2	CU5003D
VP9X1	CT4533K
VP9X1	CT4535K
VP9X1	CT5033K
VP9X1	CT5533K

CTV MODEL TO CHASSIS CROSS REFERENCE CHART

ModelNo	Chassis
13SA10B	OEM
13VR12B	OEM
19VR13B	OEM
20CX20B	PANA
20MA1B	FH92XS-1
20SA2B	M2XU
20SA3B	M3L
20SA4B	M2XU
20SA5B	M3XU
27AX0B	M1LXU
27AX1B	M1LXU
27AX2B	M1LXU
27AX3B	M1CLXU
27AX4B	M1CLXU
27AX5BX	M1CLXU
27CX01B	SHARP
27CX0B	M1CLXU
27CX15B	M3LXU
27CX1B	M3LXU
27CX21B	M3LXU2
27CX22B	Zenith GX
27CX25B	M3LXU
27CX28B	NA6L Pan
27CX29B	OEM
27CX31B	Zenith GX
27CX3B	A3LXU
27CX4B	A3LXU
27CX5B	M3LXU
27CX6B	M3LXU
27CX75B	M3LXU2
27CX7B	M3LXU2
27DX5B	A1LXU
27FX48B	NA6D Pan
27FX90BC	A2LXU
27GX01B	PANA
27MM20B	PA-1
27MMV30B	PA-2
27UX01B	PANA
27UX5B	A3LXU
31CX4B	A3LXU
31CX5B	A3LXU2 1995
31CX5B	A3LXU2 1996
31CX6B	A3LXU2
31DX10B	M1LXU1
31DX11B	M1CLXU
31DX20B	M1LXU1
31DX21B	M1CLXU
31DX22B	M1CLXU
31GX31B	M1CLXU
31KX1B	G9LXU1M
31KX2B	G9LXU1M
31KX39K	M1CLXU
31KX3K	G9LXU1M

ModelNo	Chassis
31KX41K	M1CLXU
31KX6B	G9LXU1M
31KX7B	G9LXU1M
31KX9K	G9LXU1M
31UX5B	A3LXU
32CX10B	A3LXU2
32CX11B	A3LXU3
32CX12B	A3LXU4
32CX32B	A3LXU3
32CX33B	A3LXU3
32CX38B	A3LXU3
32CX39B	M9LXU
32CX39B	M9LXU
32CX7B	A3LXU2
32FX41B-501	M7LXU
32FX48B	M7LXU2
32FX49B	M9LXU
32GX01B	M10
32TX78B	A3LXU3
32TX79K	A3LXU3
32UX01B	M10
32UX51B	M7LXU
32UX58B	M7LXU2
32UX59B	M9LXU
32UX8B	A4LXU
35CX30B	A3LXU3
35CX45B	A3LXU4
35TX10B	A3LXU
35TX20B	A3LXU2
35TX30B	A2LXU
35TX50B	A2LXU
35TX59K	A2LXU
35TX69K	A2LXU
35TX79K	A4LXU
35TX88B	A3LXU3
35TX89K	A3LXU3
35UX60B	A2LXU
35UX70B	A4LXU
35UX70B	A4LXUP
35UX80B	A4LXUP
35UX85B	A6LXU
36CX35B	M7LXU
36FX38B	M7LXU2
36FX42B-501	M7LXU
36FX48B	M7LXU2
36FX49B	M9LXU
36GX01B	M10
36MMV60B	MM1
36MMV70B	MM1
36SDX01B	MM-1T
36SDX01BR	MM-1R
36SDX88B	MM1
36SX72B	M8LXU

ModelNo	Chassis
36SX78B	M8LXU
36TX53K	M7LXU
36UX01B	M10
36UX52B	M7LXU
36UX58B	M7LXU2
36UX59B	M9LXU
CT1386W/B	G7
CT2075W	G7NU
CT2076W/B	G7NU
CT2077W/B	G7XU
CT2079B	G7XU
CT3170	G7LXU
CT3175	G7LXU
CT3190B/K	G9LXU
CT3196B/K	G9LXU
CT3198K	G9LXU
CT7872B/K	G9LXU
CT7880	G7NU
CT7881B/K	G9LXU
CT7882B/K	G9LXU
CT7883B	A1LXU
CT7892B/K	G9LXU
CT7893B	A1LXU
CT7894B	A1LXU
CT7896B	G9LXU
CT7897B	G9LXU
CT7898B	G9LXU
CT7899K	G9LXU

CTV CHASSIS TO MODEL CROSS REFERENCE CHART

Chassis	ModelNo
A1LXU	CT7893B
A1LXU	CT7883B
A1LXU	27DX5B
A1LXU	CT7894B
A2LXU	35TX50B
A2LXU	35UX60B
A2LXU	35TX59K
A2LXU	35TX30B
A2LXU	27FX90BC
A2LXU	35TX69K
A3LXU	27CX3B
A3LXU	35TX10B
A3LXU	27UX5B
A3LXU	27CX4B
A3LXU	31CX4B
A3LXU	31UX5B
A3LXU2	32CX10B
A3LXU2	31CX6B
A3LXU2	35TX20B
A3LXU2	32CX7B
A3LXU2 1995	31CX5B
A3LXU2 1996	31CX5B
A3LXU3	32TX78B
A3LXU3	35TX89K
A3LXU3	35TX88B
A3LXU3	32TX79K
A3LXU3	32CX38B
A3LXU3	32CX33B
A3LXU3	32CX32B
A3LXU3	32CX11B
A3LXU3	35CX30B
A3LXU4	35CX45B
A3LXU4	32CX12B
A4LXU	32UX8B
A4LXU	35TX79K
A4LXU	35UX70B
A4LXUP	35UX80B
A4LXUP	35UX70B
A6LXU	35UX85B
FH92XS-1	20MA1B
G7	CT1386W/B
G7LXU	CT3170
G7LXU	CT3175
G7NU	CT2075W
G7NU	CT2076W/B
G7NU	CT7880
G7XU	CT2079B
G7XU	CT2077W/B
G9LXU	CT3190B/K
G9LXU	CT7872B/K
G9LXU	CT7898B
G9LXU	CT7897B
G9LXU	CT7899K

Chassis	ModelNo
G9LXU	CT3198K
G9LXU	CT7896B
G9LXU	CT7892B/K
G9LXU	CT3196B/K
G9LXU	CT7881B/K
G9LXU	CT7882B/K
G9LXU1M	31KX3K
G9LXU1M	31KX1B
G9LXU1M	31KX2B
G9LXU1M	31KX6B
G9LXU1M	31KX7B
G9LXU1M	31KX9K
M10	36UX01B
M10	32GX01B
M10	36GX01B
M10	32UX01B
M1CLXU	31DX22B
M1CLXU	27CX0B
M1CLXU	31DX21B
M1CLXU	27AX4B
M1CLXU	31KX39K
M1CLXU	27AX5BX
M1CLXU	27AX3B
M1CLXU	31DX11B
M1CLXU	31GX31B
M1CLXU	31KX41K
M1LXU	27AX0B
M1LXU	27AX1B
M1LXU	27AX2B
M1LXU1	31DX20B
M1LXU1	31DX10B
M2XU	20SA2B
M2XU	20SA4B
M3L	20SA3B
M3LXU	27CX5B
M3LXU	27CX25B
M3LXU	27CX1B
M3LXU	27CX15B
M3LXU	27CX6B
M3LXU2	27CX75B
M3LXU2	27CX21B
M3LXU2	27CX7B
M3XU	20SA5B
M7LXU	36UX52B
M7LXU	32UX51B
M7LXU	32FX41B-501
M7LXU	36TX53K
M7LXU	36FX42B-501
M7LXU	36CX35B
M7LXU2	32UX58B
M7LXU2	36UX58B
M7LXU2	36FX48B
M7LXU2	32FX48B

Chassis	ModelNo
M7LXU2	36FX38B
M8LXU	36SX72B
M8LXU	36SX78B
M9LXU	36FX49B
M9LXU	36UX59B
M9LXU	32CX39B
M9LXU	32UX59B
M9LXU	32FX49B
M9LXU	32CX39B
MM1	36MMV70B
MM1	36MMV60B
MM1	36SDX88B
MM-1R	36SDX01BR
MM-1T	36SDX01B
NA6D Pan	27FX48B
NA6L Pan	27CX28B
OEM	13SA10B
OEM	19VR13B
OEM	13VR12B
OEM	27CX29B
PA-1	27MM20B
PA-2	27MMV30B
PANA	27UX01B
PANA	27GX01B
PANA	20CX20B
SHARP	27CX01B
Zenith GX	27CX22B
Zenith GX	27CX31B

61SBX59B and the 53SBX59B Chassis AP-93

Description	Part Number	Description	Part Number
MAIN CHASSIS	UE05433	POWER / DEFLECTION PWB	JT09173
SIGNAL PWB	JT09163	• BRIDGE RECTIFIER	D901 (2338313)
• MICROPROCESSOR	I001 (CP06614U)	• VERTICAL OUTPUT (LA7838)	I601 (2003541)
• MEMORY (Service Adjustments)	I004 (CP05272U)	• SIDE PIN CUSHION (Comparator)	I602 (CP06351U)
• RESET IC for Microprocessor	I007 (2000541)	• SWITCHING REGULATOR (Driver IC)	I901 (CZ00451)
• MICROPROCESSOR for OSD	I102 (CP05243U)	• SHUT DOWN (Photo Coupler)	I902 (2000465)
• RESET IC for OSD Microprocessor	I103 (2000541)	• 120V REGULATOR (Photo Coupler)	I903 (2000465)
• 5 Volt REGULATOR (Prescaler)	I106 (CP05571)	• 120V REGULATOR	I905 (2381349)
• AUDIO OUTPUT IC (TA8200AH)	I401 (2004751)	• +12 REGULATOR	I908 (CP05573)
• 5 Volt REGULATOR for Microprocessor	Q026 (2312171)	• -12 REGULATOR (M12V)	I909 (1360891)
• X100 (32kHz VCO Crystal)	X100 (BP00771)	• A12V REGULATOR	I910 (CP03912F)
PinP TUNER	U102 (2429691)	• TV9V REGULATOR	I912 (CP03923F)
PinP UNIT KC-021	U002 (HP00202)	• TV5V REGULATOR	I913 (CP03922F)
3D/YC COMB FILTER PWB U301	(HP00703)	• +5V REGULATOR Dig. Conv.	IK01 (CP05571)
TERMINAL PWB	JT09473	• +5V REGULATOR Dig. Conv. SRAM	IK03 (CP05571)
• A/V SELECT IC	IY01 (2020452)	• CONVERGENCE OUTPUT (RH, GH & GV)	IK04 (CZ00431)
• +9V REGULATOR	IY02 (2003423)	• CONVERGENCE OUTPUT (RV, BH & BV)	IK05 (CZ00431)
SURROUND PWB	JT09222	• HORIZONTAL DRIVE TRANSFORMER	T701 (2260291U)
• FRONT GRAPHIC EQUALIZATION	IG01 (CP02771U)	• FLYBACK TRANSFORMER (High Voltage)	T702 (BW00632)
• CENTER GRAPHIC EQUALIZATION	IG10 (CP02771U)	• HIGH VOLTAGE DRIVER (2SC3116 S/T)	Q701 (2326216)
• DOLBY PRO LOGIC DECODER	IS01 (CP00801U)	• HORIZONTAL OUTPUT (2SC2514F)	Q777 (CF01541F)
• DOLBY PASSIVE DECODER	IS03 (CP00791U)	• 120V B+ CURRENT SENSING (2SA821S)	Q903 (CF02281R)
• FRONT/PinP AUDIO CONTROL	IS05 (2020001)	• SHUT DOWN SCR (03P2M TA)	Q914 (2323782R)
• REAR/CENTER AUDIO CONTROL	IS10 (2020001)	• HORIZONTAL Vcc ON/OFF SW (2SC458)	Q916 (2320591M)
• REAR AUDIO OUTPUT IC	IS11 (2004751)	• 220V (Screen Voltage) PROTECTOR	E701 (AZ00107M)
• PERFECT VOLUME	IS12 (CP02601)	• RAW 150V PROTECTOR	E991 (AZ00109M)
SIGNAL SUB PWB Part of Signal PWB	JT09163	• B+ 120V (Main B+) PROTECTOR	E994 (AZ00104M)
• RAINFOREST IC (TA1222BN)	I501 (CP03552U)	• +27V PROTECTOR	E995 (AZ00109M)
• COMPONENT SELECTOR IC	I503 (CK08951R)	• -23V PROTECTOR	E996 (AZ00109M)
• X502 (32fH VCO Crystal)	X502 (2168771)	• Audio +32V PROTECTOR	E997 (AZ00109M)
• X501 (Crystal)	X501 (2791501)	• Audio +22V PROTECTOR	E998 (AZ00109M)
		• +31V PROTECTOR	E999 (AZ00109M)
		DIGITAL Convergence Unit (UKDG)	CS00351

61SBX59B and the 53SBX59B Chassis AP-93

Description	Part Number	Description	Part Number
• INFRARED RECEIVER	HM01 (CZ00523)		
<u>VELOCITY MODULATION PWB</u>			
<u>Comes with CRT PWB's</u>		<u>JT09192</u>	
<u>CRT PWB</u>			
<u>Includes the Velocity Modulation PWB</u>		<u>JT09192</u>	
• RED DRIVER	Q861 (2312372F)		
• GREEN DRIVER	Q831 (2312372F)		
• BLUE DRIVER	Q801 (2312372F)		
<u>CRT Sockets</u>			
• RED CRT SOCKET	E861 (EY00941)		
• GREEN CRT SOCKET	E831 (EY00941)		
• BLUE CRT SOCKET	E801 (EY00941)		
<u>REMOTE CONTROL CLU-615MP</u>		<u>HL00715</u>	
Additional Parts Information			

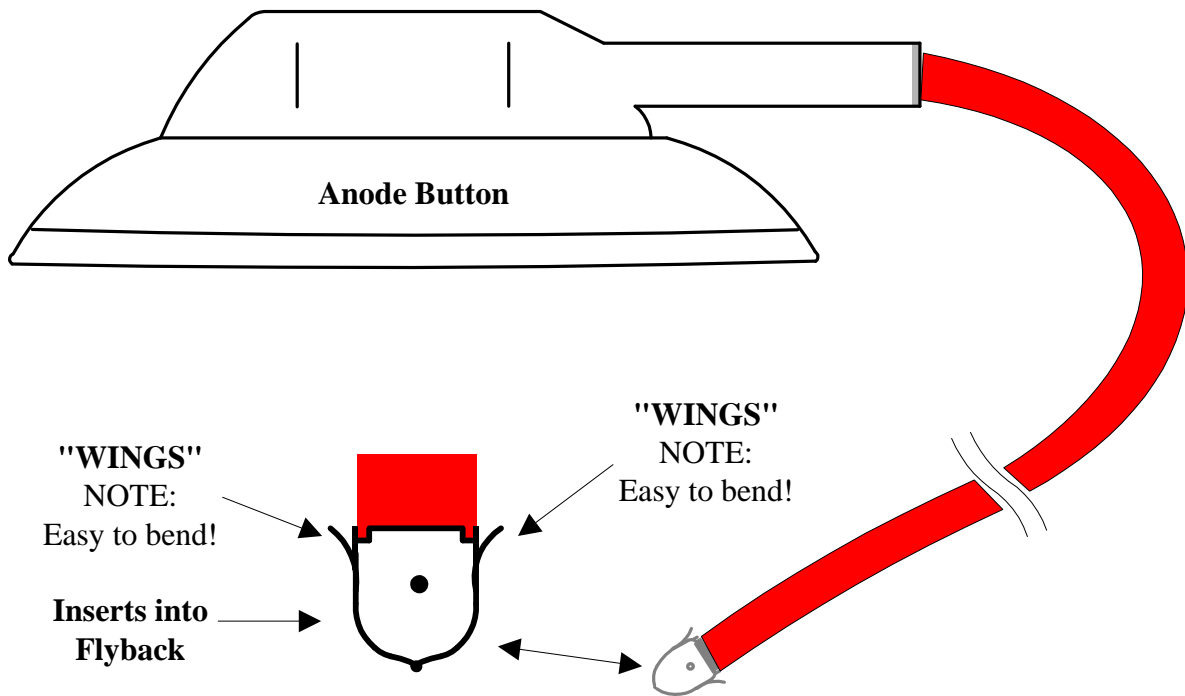
SCREEN ASSY. 61 Inch	KR01161
SCREEN ASSY. 53 Inch	KR01162
BLUE CRT ASSY.	UE04333
GREEN CRT ASSY	UE04332
RED CRT ASSY	UE04331
MIRROR FRONT SURFACE 61"	KS00163
MIRROR FRONT SURFACE 53"	KS02021
FOCUS PACK TYPE MHF116	AZ00005
SPEAKER GRILL 61 Inch	PH06891
SPEAKER GRILL 53 Inch	PH06771
ANTENNA SWITCH	HPO00341
Ultra Shield Only 61 Inch	KR01292
Ultra Shield Only 53 Inch	KR01291

AP-93 ANODE LEAD CHANGES

To remove anode lead from "Flyback Transformer",
Press down slightly and twist either clockwise or counter clockwise.
Then lift, if there is resistance, repeat twisting until a release is felt.

WARNING:

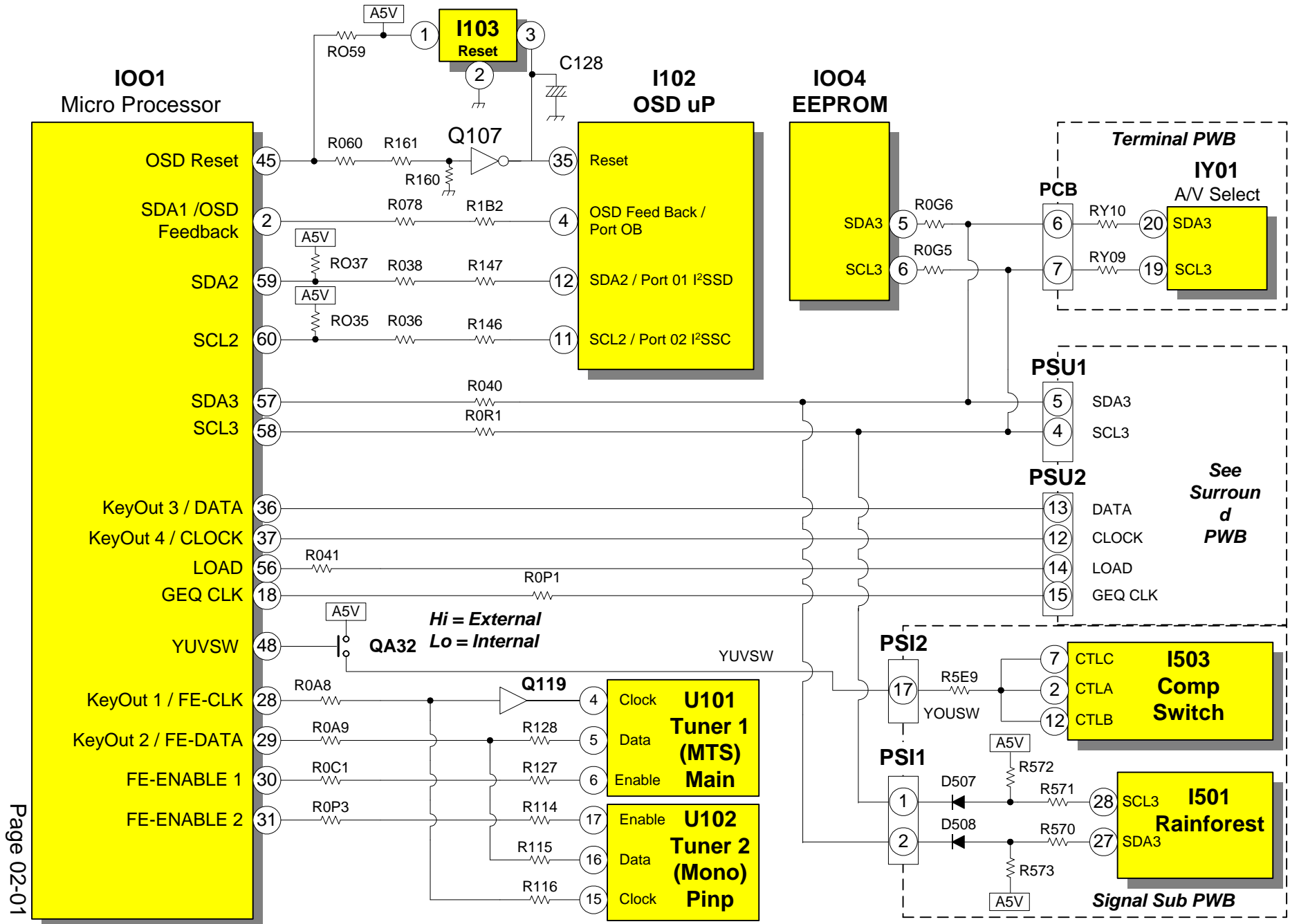
DO NOT FORCE OUT, DAMAGE TO WINGS WILL OCCUR !



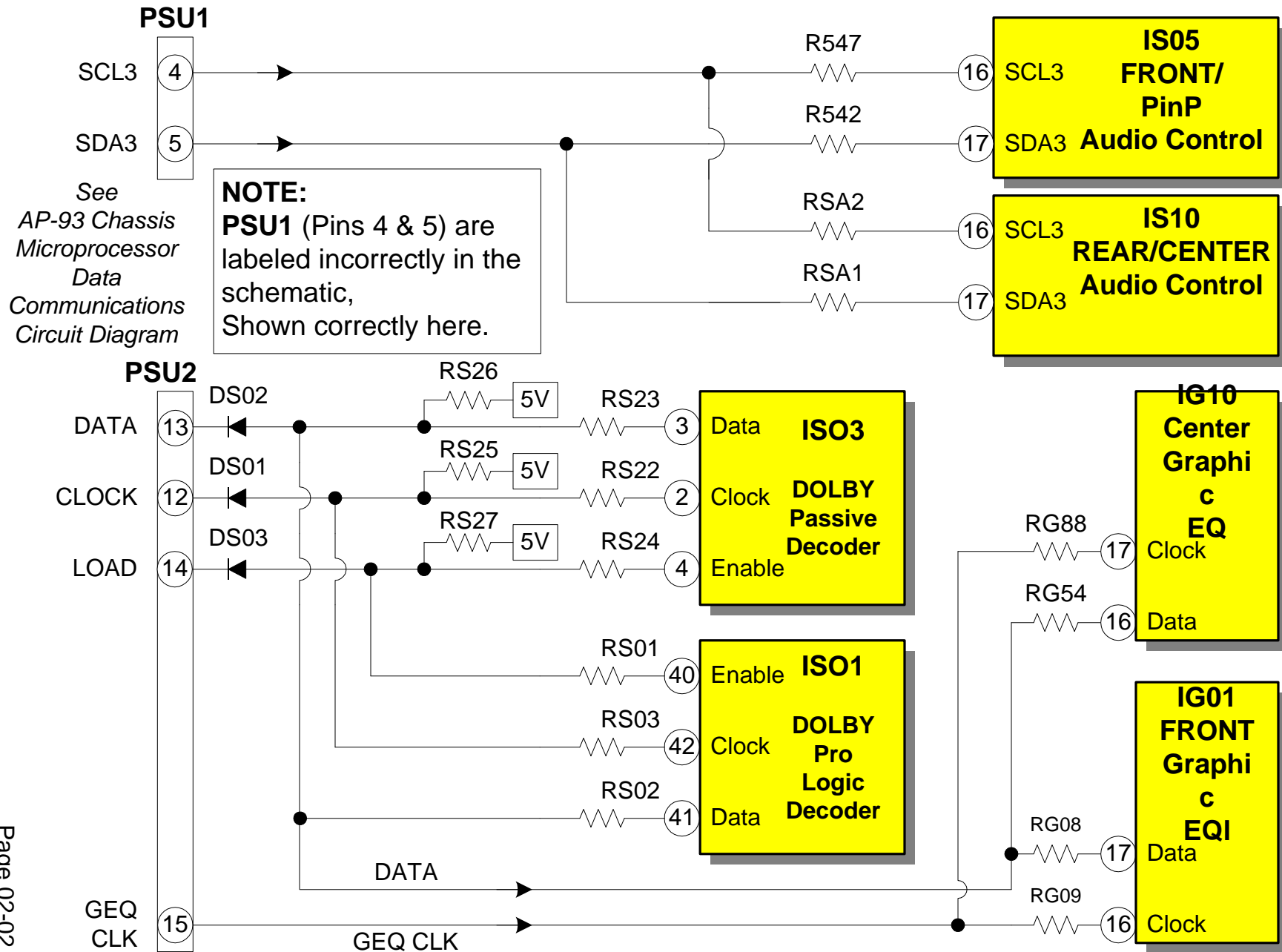
MICROPROCESSOR INFORMATION

SECTION 2

AP-93 CHASSIS MICROPROCESSOR DATA COMMUNICATIONS CIRCUIT DIAGRAM

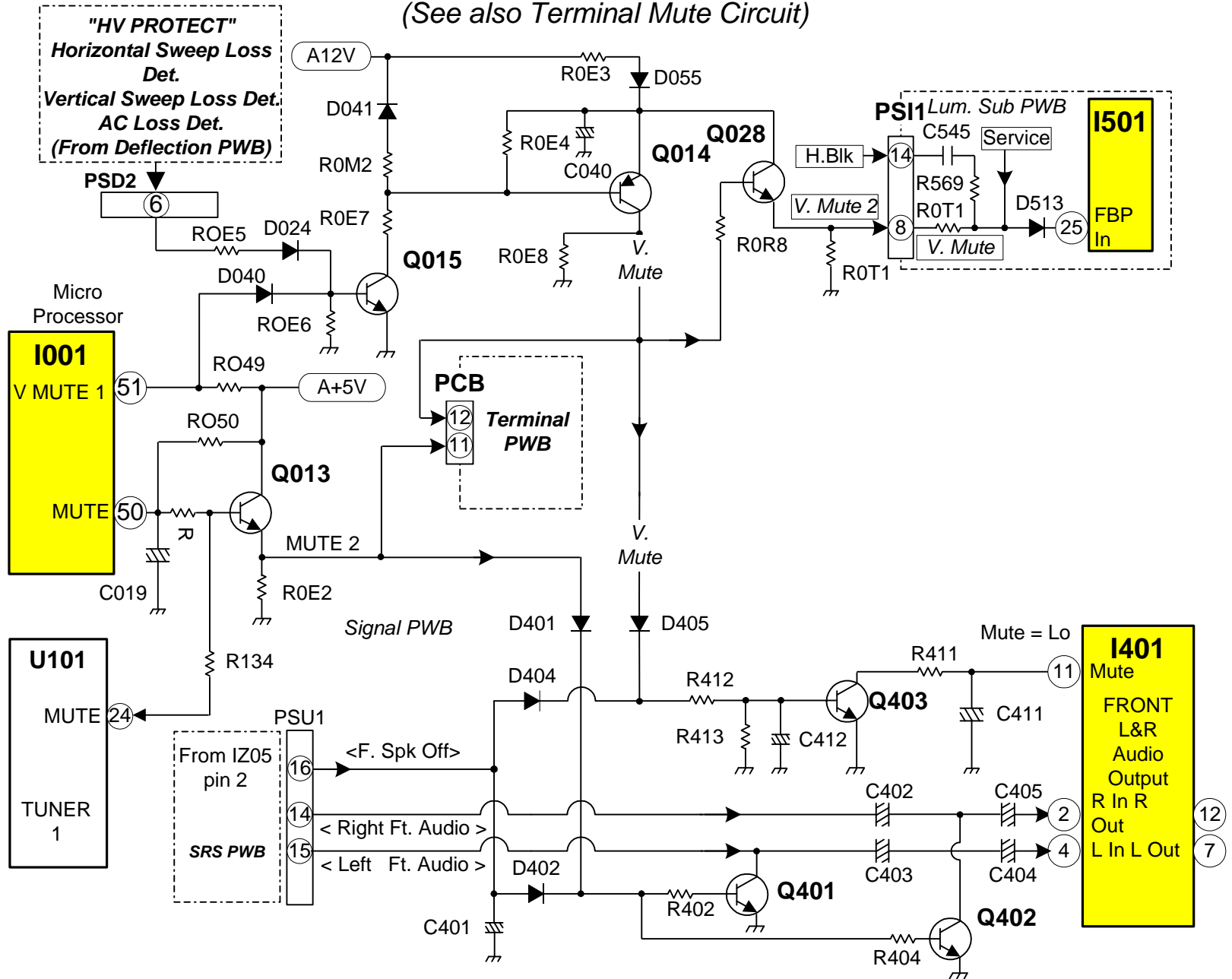


AP-93 SERIES CHASSIS MICROPROCESSOR DATA COMMUNICATIONS (SURROUND PWB)



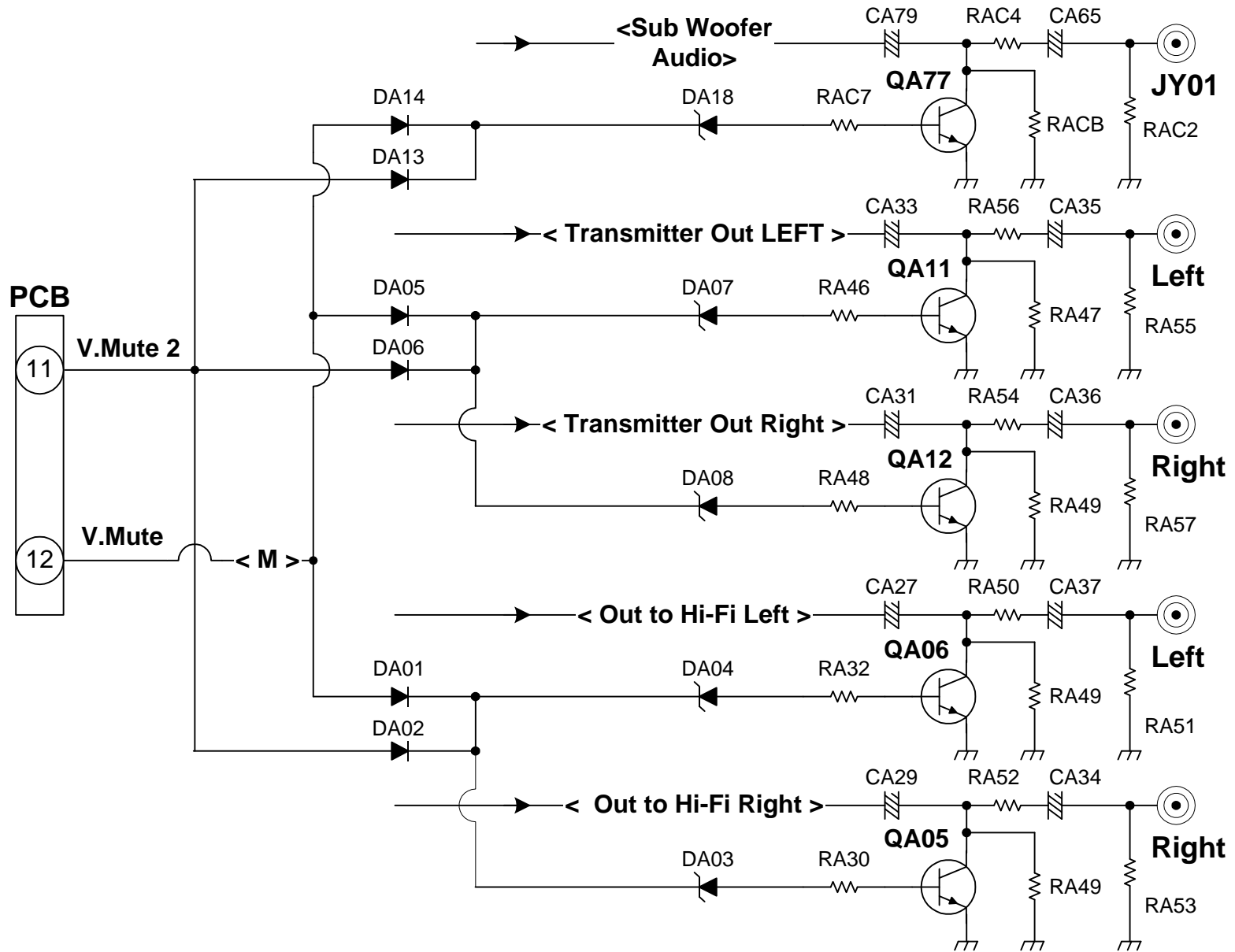
AP-93 Series Chassis AUDIO and VIDEO MUTE Circuit

(See also Terminal Mute Circuit)

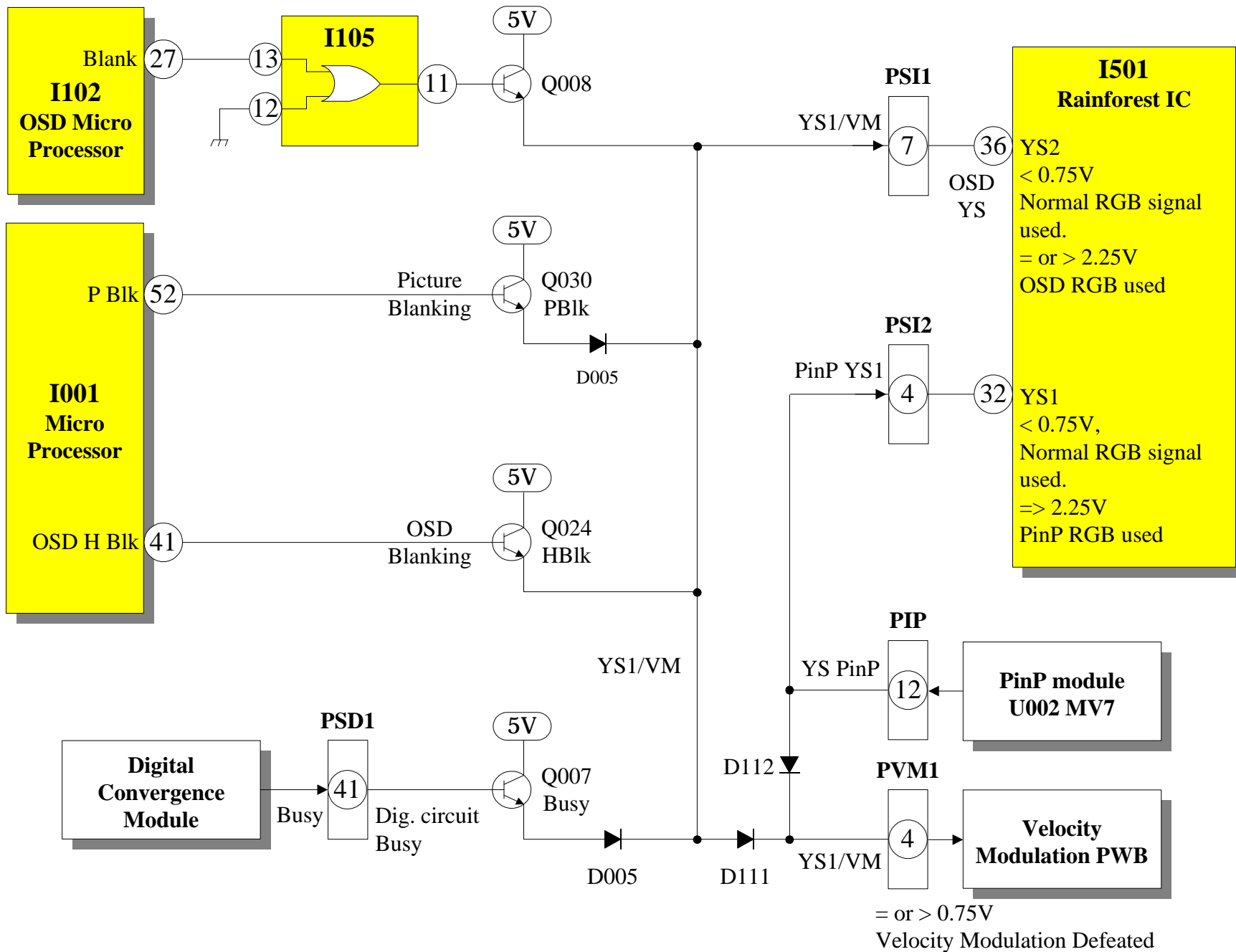


AP-93 SERIES CHASSIS MUTE CIRCUIT (TERMINAL PWB)

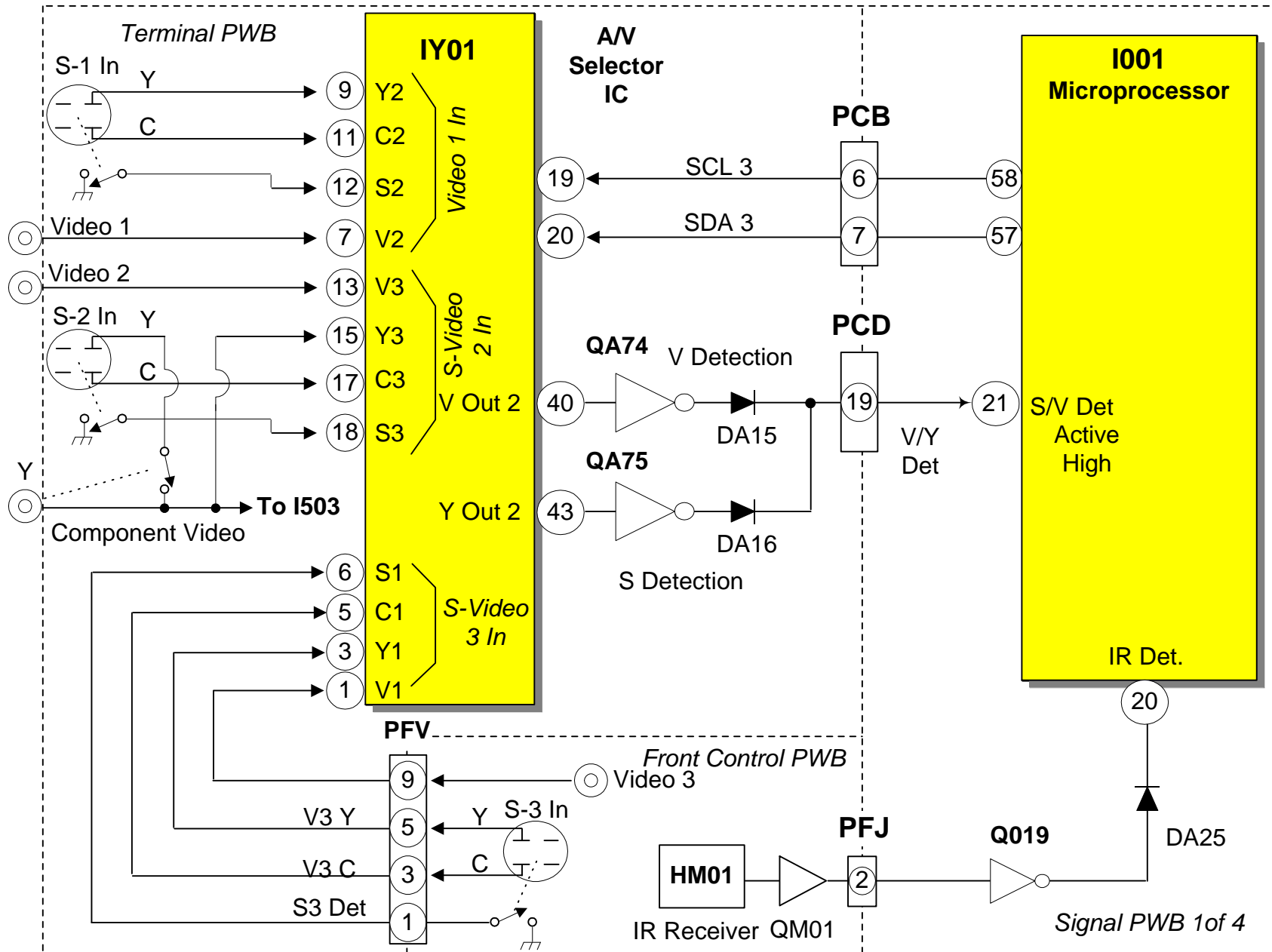
Also see AP-93 Series Chassis Audio & Video Mute Circuit



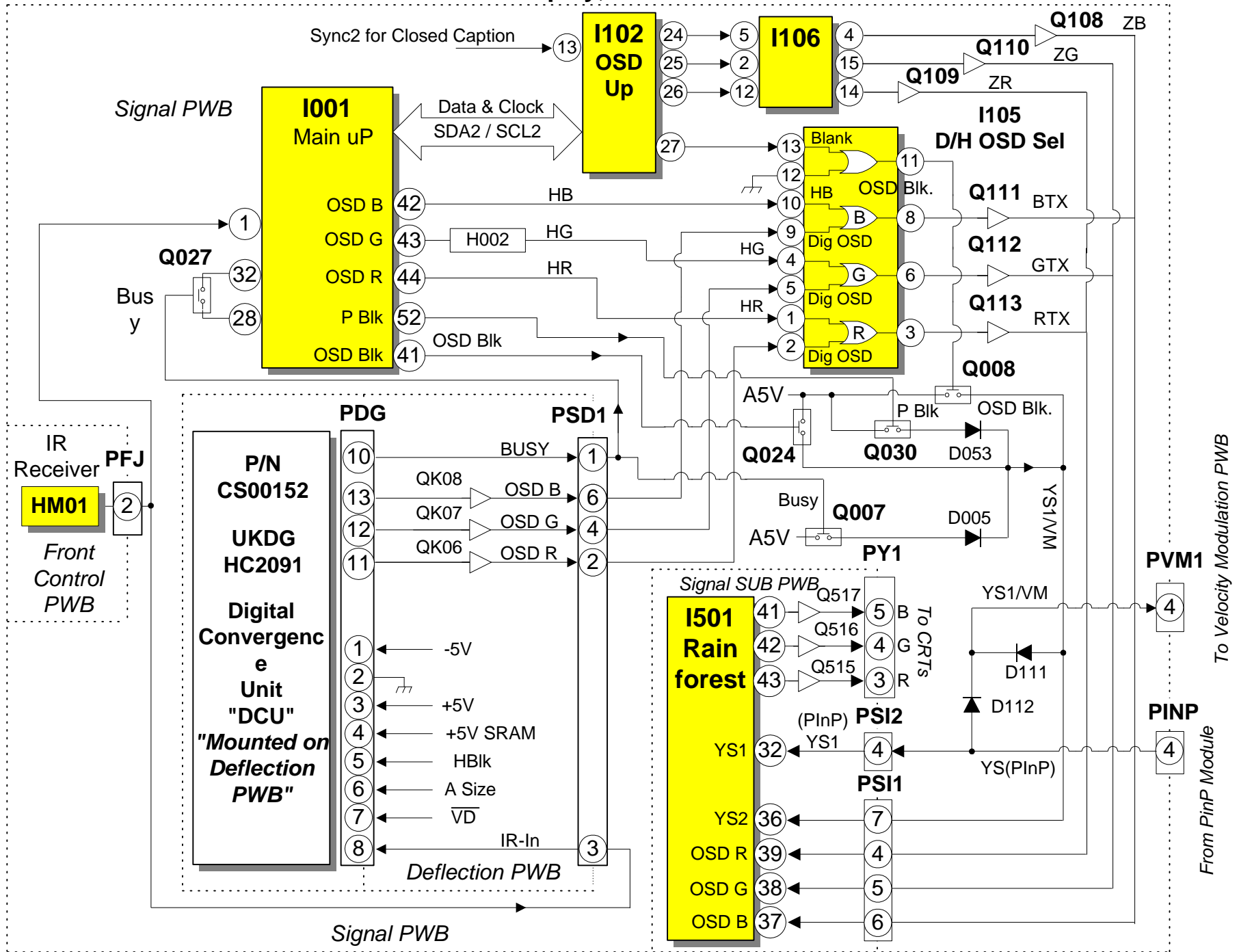
AP-93 PICTURE BLANKING AND VELOCITY MODULATION MUTE CIRCUIT



AP-93 AUTO LINK DETECTION CIRUCIT



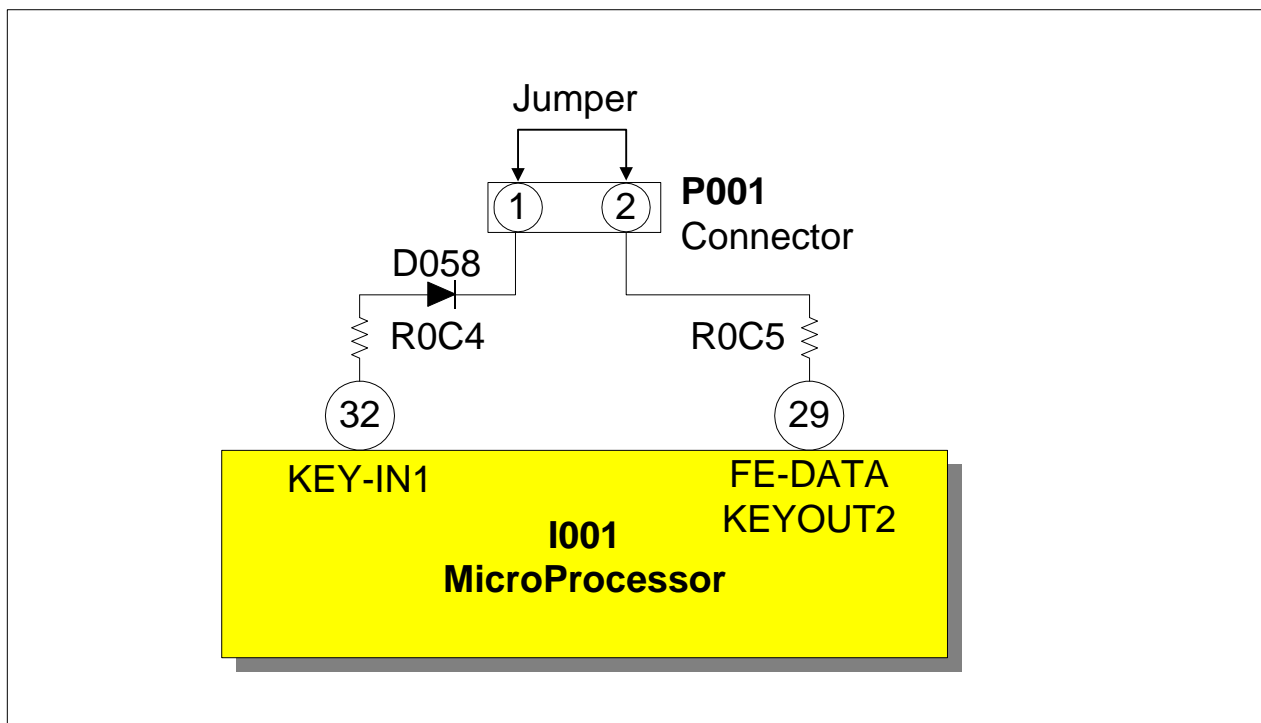
AP-93 CHASSIS "On Screen Display, OSD" SIGNAL CIRCUIT DIAGRAM



AP-93 MEMORY INITIALIZATION PROCEDURE (EEPROM RESET)

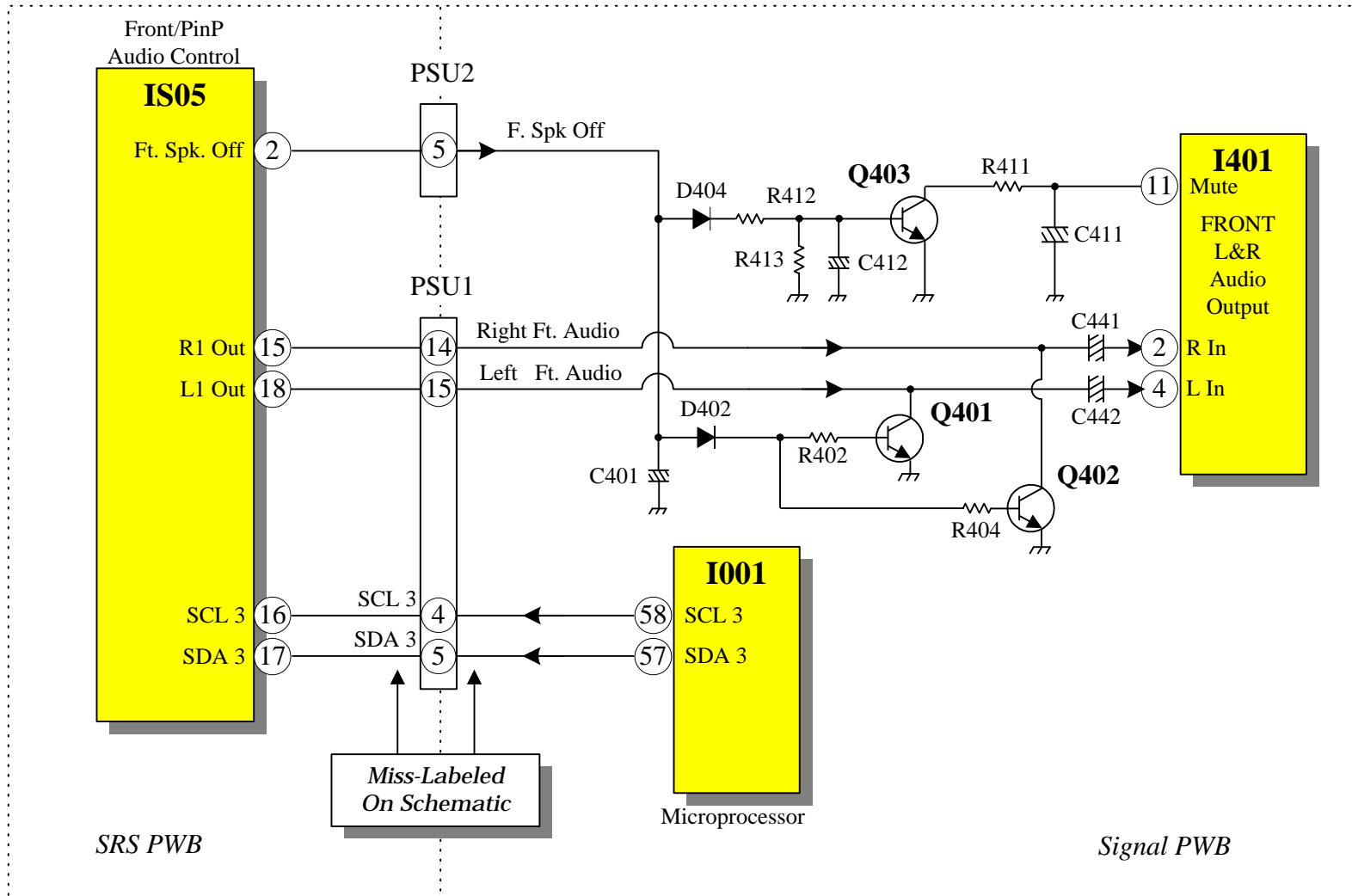
- 1.) Disconnect Power to Television.
- 2.) Remove the Back Cover.
- 3.) Remove the two screws holding the Main chassis to the Cabinet if necessary.
- 4.) Disconnect wiring harness clips to free up the chassis if necessary.
- 5.) Reconnect Power to the Television and turn the set **ON**.
- 6.) Locate **P001** and add a jumper between pins 1 and 2 of the **P001** connector as shown below.
- 7.) Hold jumper in place for 5 seconds. (A beep should be heard).
- 8.) Remove the jumper.
- 9.) Confirm EEPROM reset, Input source is now set to Air and not to Cable 1 or 2. No Child Lock, and only channels 2 through 13 are in memory.
- 10.) Reassemble Chassis and reinstall PTV back. Set is now ready to operate.

NOTE: All customers' Auto Programming and Set-Ups are returned to factory settings.



AP-93 Series Chassis Front Speaker Off Circuit

(See also Main and Terminal Mute Circuit)



POWER SUPPLY INFORMATION

SECTION 3

POWER SUPPLY ON AND OFF (STAND-BY) OPERATION EXPLANATION

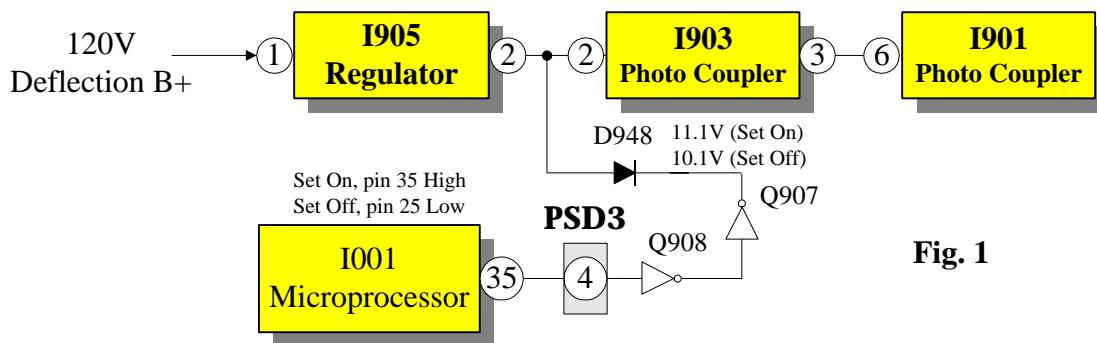
The power supply in the AP-93 chassis works very similar to the previous models, with only a few exceptions. This power supply runs all the time when the AC is applied. The use of the power supply creating the A12V supply eliminates the need for a Stand-By transformer. The following explanation will describe the Turning ON and OFF of the projection television.

The Microprocessor generates the ON-OFF control signal as before, with the exception that there is no Relay Driver. The schematic shows a relay driver **Q003**, however it is in parentheses. This means that the component doesn't exist in the set.

This On/Off control will perform the following :

- Turns on the regulation control signal
- Turns on the A5V and A9V regulator
- Turns on the Shut Down "Power Shorted" detection circuit
- Turns on the Horizontal Vcc supply to the Rainforest IC, I501

The Microprocessor outputs the On/Off control from **Pin 35**, to the **PSD3** connector **Pin 4**. (See *Figure 1*) The active state is On = High and Off = Low. The high for Power On is then routed to **Q908** and **Q907**. **Q908** is turned On, removing the base bias for **Q907**. **Q907** turns off and removes **D948** from the circuit of **Pin 2** of **I905** which is the regulation error voltage feedback line for the regulator IC, **I901**.



The purpose of **D948** during Stand-By, is to create a false feedback that artificially compensates for the reduction in output voltage when the power supply switches to a lower frequency. However, due to another factor, this doesn't cause the power supply frequency to rise to maximum which will be described next.

HORIZONTAL B+ DEFEAT CIRCUIT: (See *Figure 2*)

When the power supply goes into Stand-By mode, the Horizontal Drive signal for deflection is shut off. This is accomplished by **Q916** and **Q917**. The Low out produced from the Power On/Off **pin 35** of the Microprocessor is detected by the base of **Q916**. This allows the collector voltage to go high. This action turns off **Q917** which removes the B+ from its collector. The Collector of **Q917** is connected to the Deflection B+ **pin 22** of the Rainforest IC, **I501** via **pin 3** of the **PSD2** connector and **Pin 13** of the **PSI1** connector. This action stop **I501** from producing a horizontal deflection drive signal.

(Continued on page 2)

POWER SUPPLY ON AND OFF (STAND-BY) OPERATION EXPLANATION

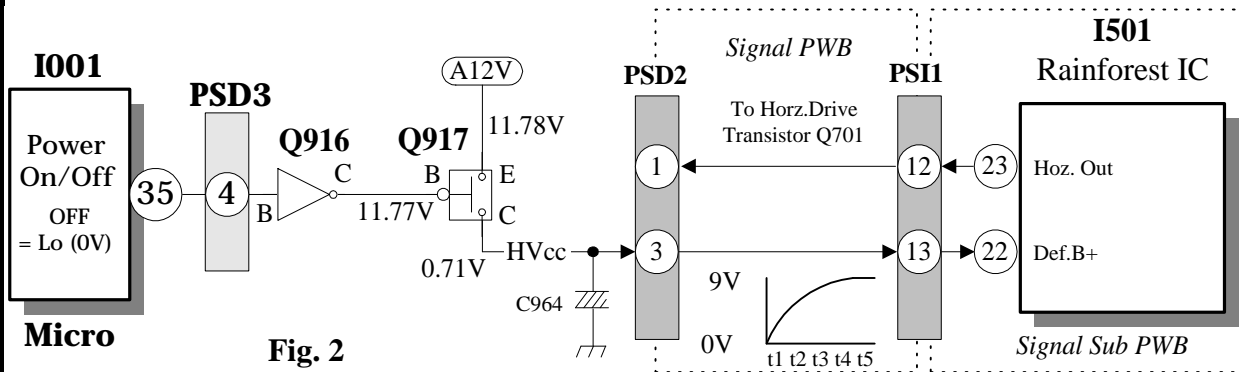


Fig. 2

POWER SUPPLY OPERATIONAL FREQUENCY DURING STAND-BY:

(See Figure 3)

When the Horizontal deflection is defeated, the power supply no longer has a deflection load. This low current demand is detected by the three resistors connected to the source of the internal Switch MOS FET inside I901 via pin 2. Pin 4 of I901 is the over current detection pin, however it is also the current demand sensing pin. When the current demand is low due to horizontal defeat, pin 4 will be less than 1.4V and the internal frequency will switch to 20Khz. This is caused by the Quasi Resonant circuit operation which is covered in a Hi-Lite article.

This reduction of power supply frequency will move the frequency below the Bell of the power supply transformer and all secondary voltages will reduce to approximately 1/2 of their normal voltage.

Due to the fact that the power supply is still operating at 1/2 voltage output, the Green LEDs used for visual trouble sensing will reduce in intensity, however they will remain lit. With the exception of the TV9V and TV5V regulator. Which are turned off in Stand By.

(Continued on page 3)

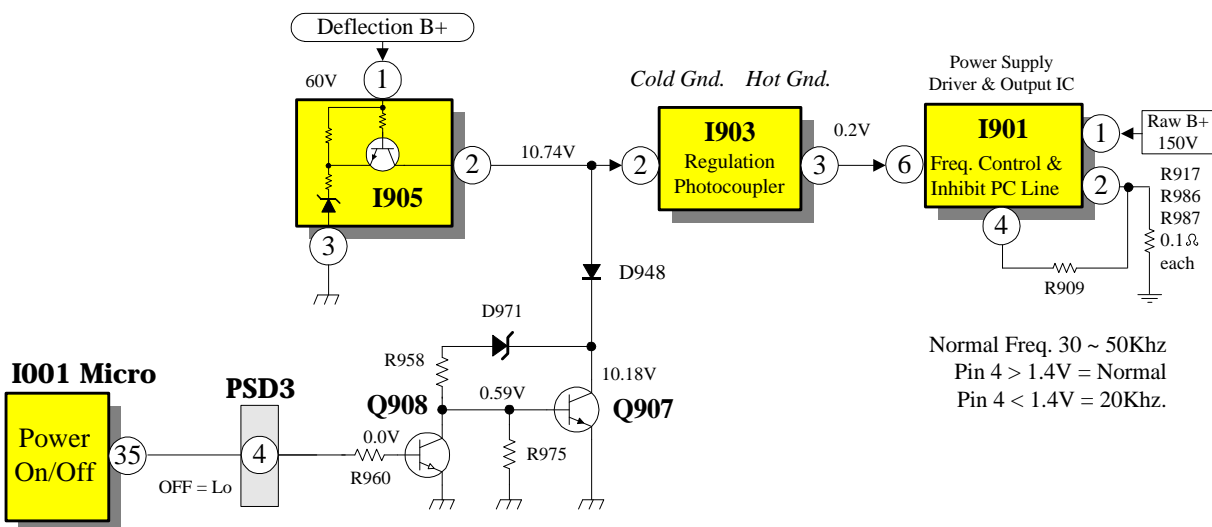


Fig. 3

Normal Freq. 30 ~ 50Khz
 Pin 4 > 1.4V = Normal
 Pin 4 < 1.4V = 20Khz.

POWER SUPPLY ON AND OFF (STAND-BY) OPERATION EXPLANATION

TV9V AND TV5V REGULATOR OPERATION IN STAND-BY:

(See Figure 4)

Both of these ICs as well as the A12V regulator are DC to DC converters just like last year. This is because of the wide range of input voltages from Stand-By to Normal operation of the Power Supply.

The TV9V regulator (I912) and the TV5V regulator (I913) are shut off during Stand-By mode. This is accomplished by Q906 and Q905. When the low for the power On/Off pin 35 of the Microprocessor is detected by Q906, it's collector will go high. This action will turn ON Q905 and its collector will go low. This will pull pin 5 of I912 and I913 low, turning off the two DC to DC converters.

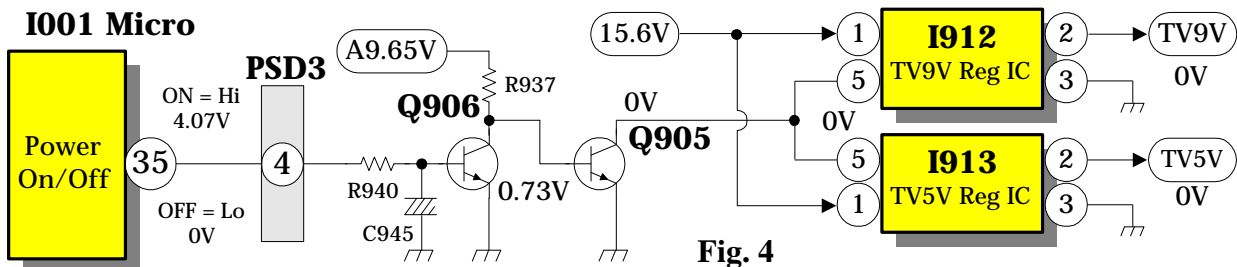


Fig. 4

SOME SHUT-DOWN DETECTION CIRCUITS SHUT OFF DURING STAND-BY:

(See Figure 5)

During Stand-By, all of the secondary voltages are reduced to approximately 50% of their normal voltage. This could cause a potential problem with the Short Detection circuits for shutdown. To avoid accidental shut down, Q906 also controls the activity of Q905. During Stand-By, Q906 is turned off. This allows the Base of Q905 to be pulled up which turns on Q905 and its collector voltage is low. Q918 is also turned off because its base voltage is pulled low through D975. This prevents any pull-up voltage from appearing on the emitter of Q913. The base of Q913 is connected to 6 Low Detection inputs, (See AP-93 Power Supply Shut Down Circuit). When the power supply operates at 50%, the Short Detection circuit could activate. By turning off Q913, no accidental shut down operation can occur. For added protection, Q912 also prevents any Shut-Down voltage from reaching the Gate of Q914, which is the Shut-Down SCR latch.

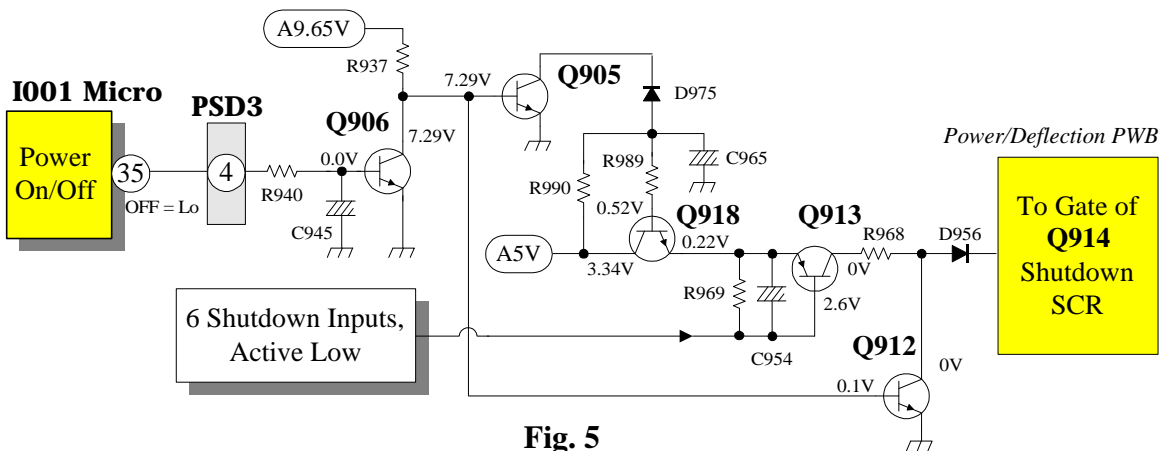
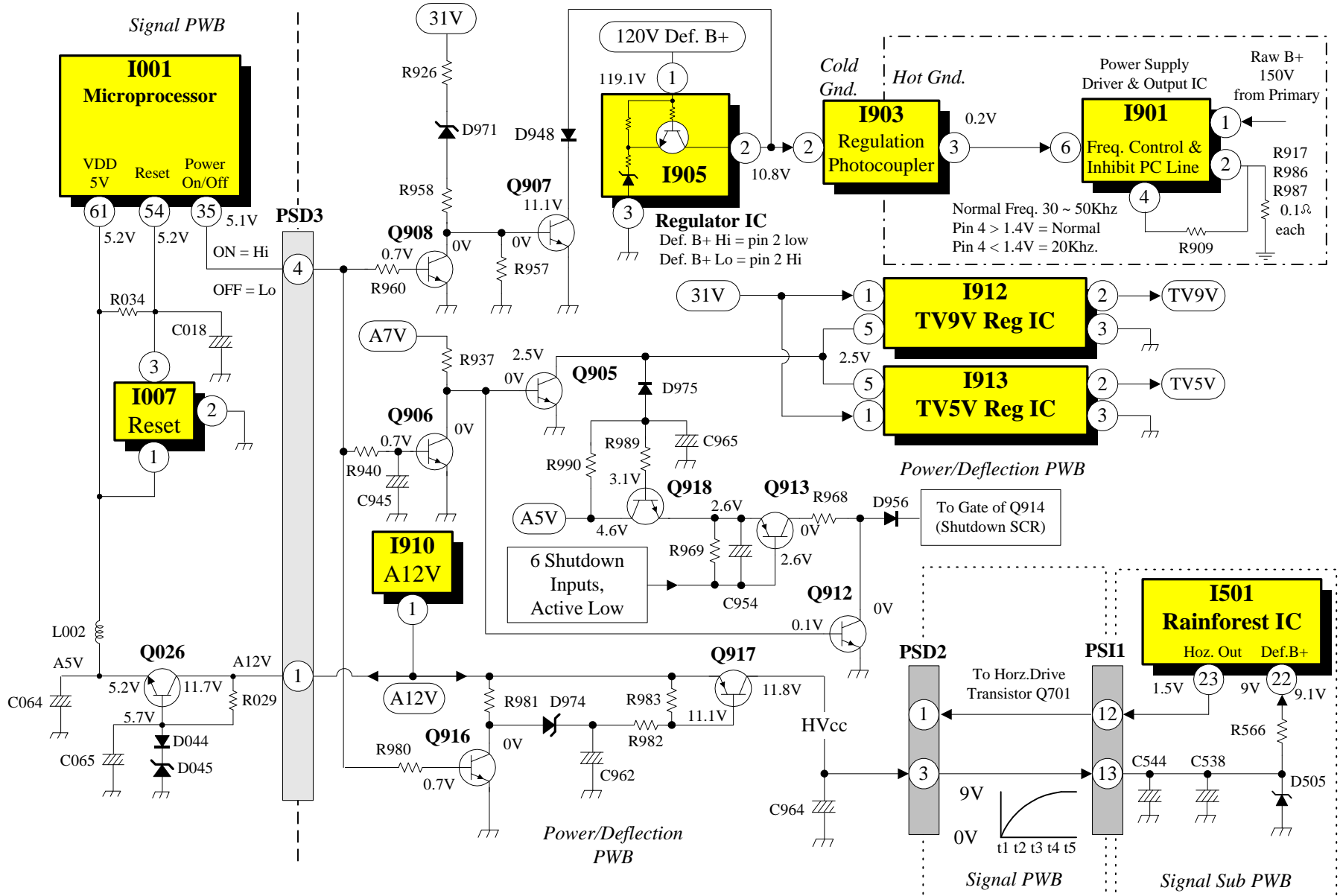
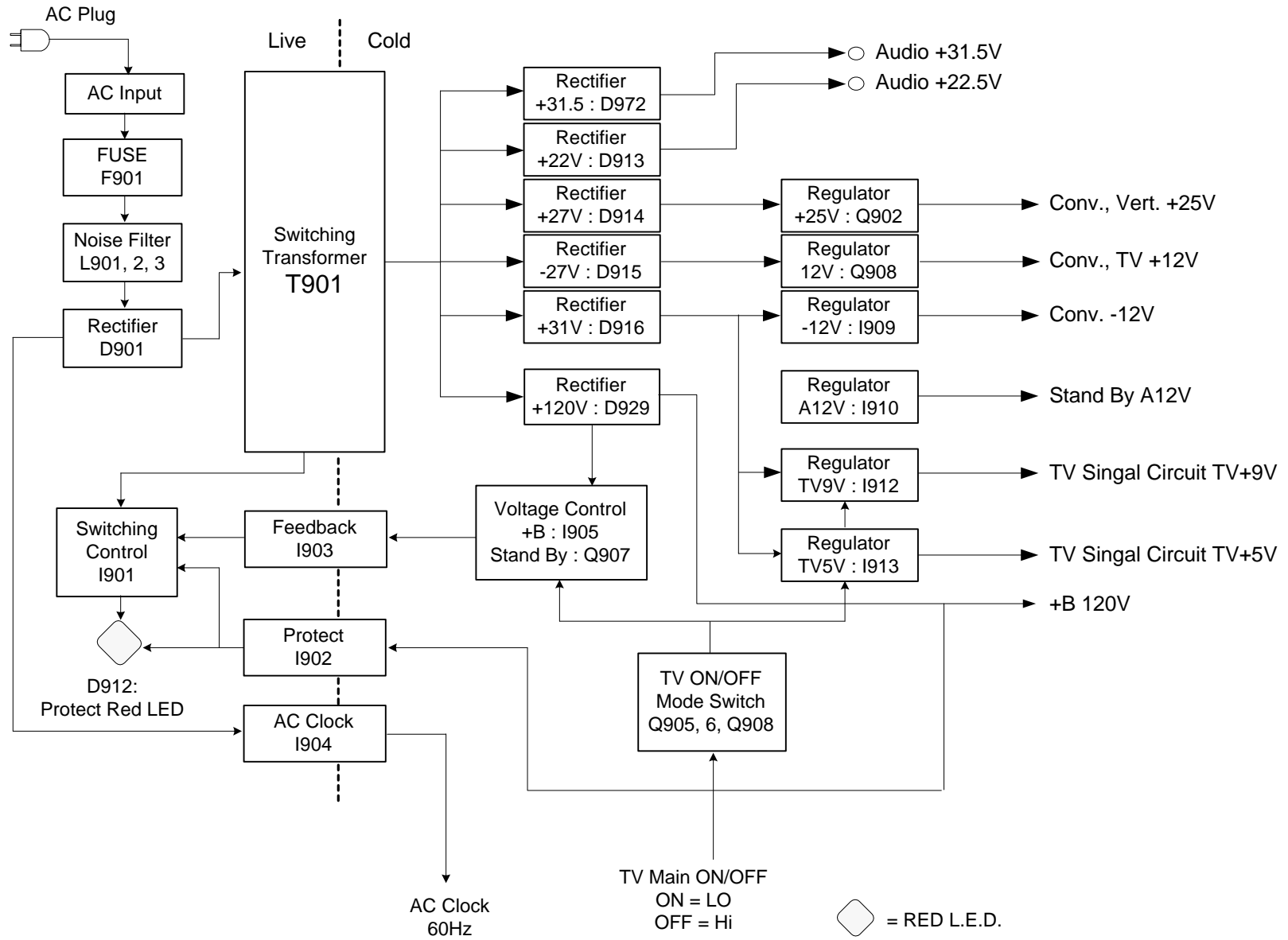


Fig. 5

AP-93 SERIES "POWER ON & OFF" DIAGRAM

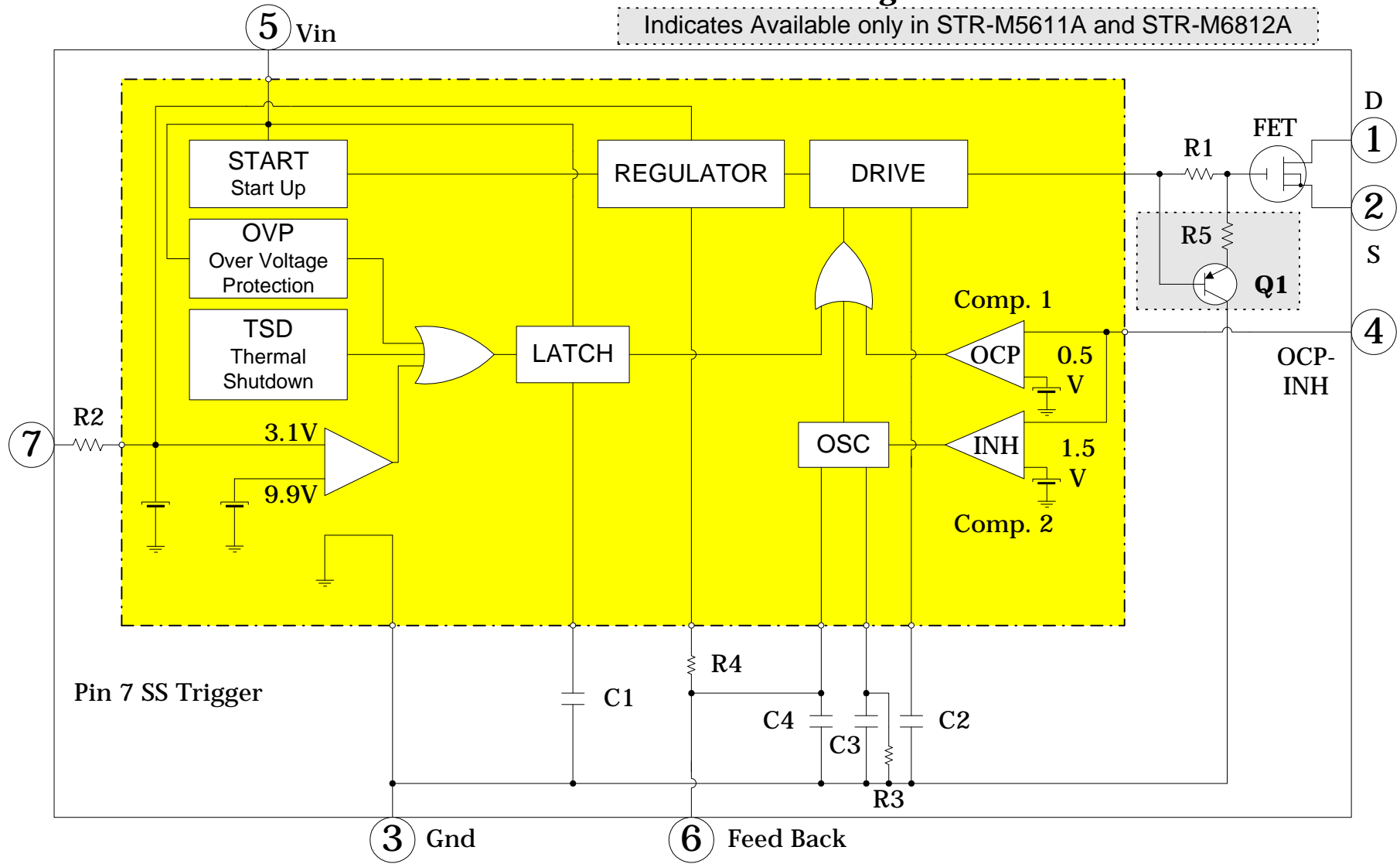


AP93 POWER SUPPLY DISTRIBUTION DIAGRAM



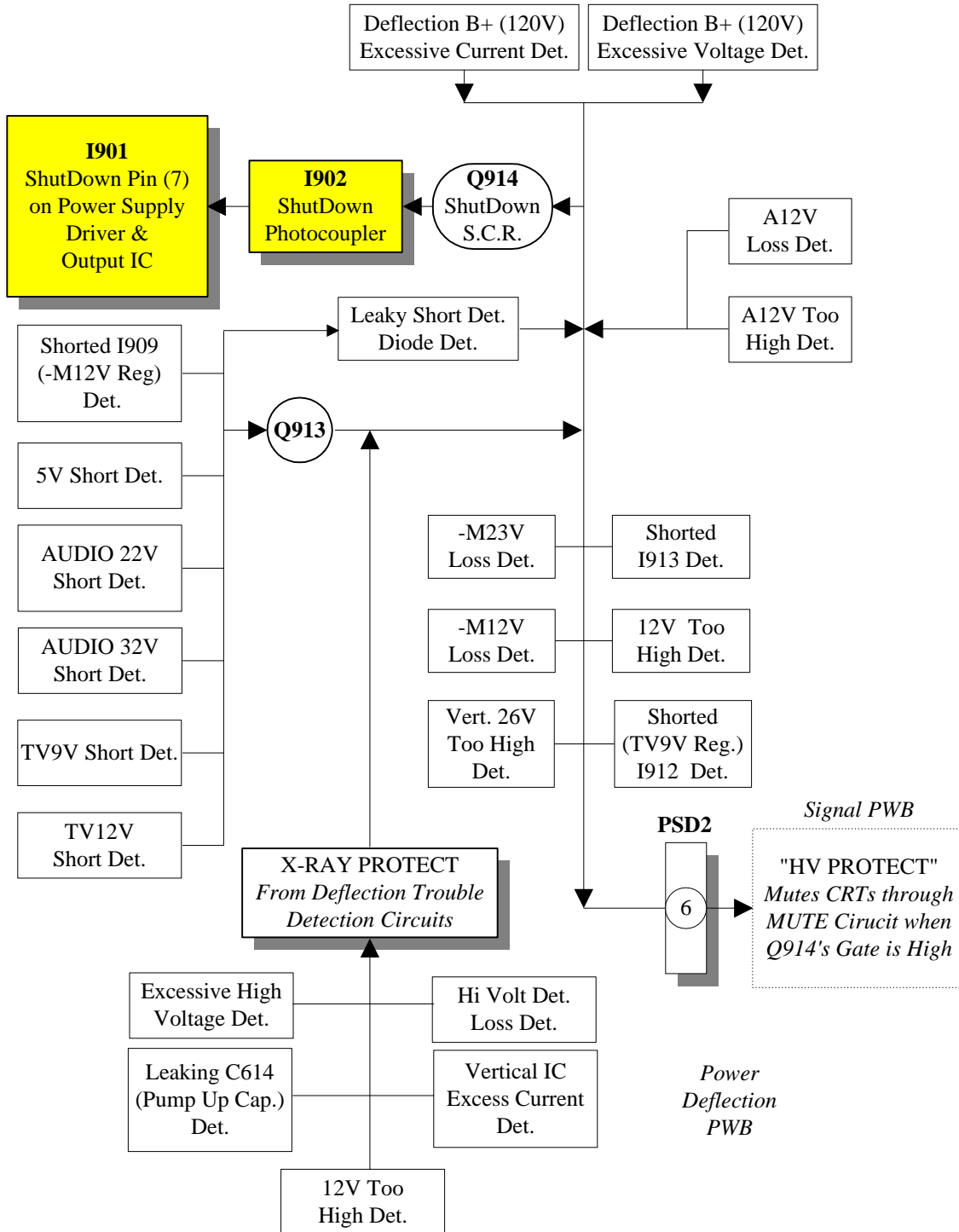
AP-93 (I901) POWER SUPPLY DRIVER IC STR-M6811A Internal Block Diagram

Indicates Available only in STR-M5611A and STR-M6812A

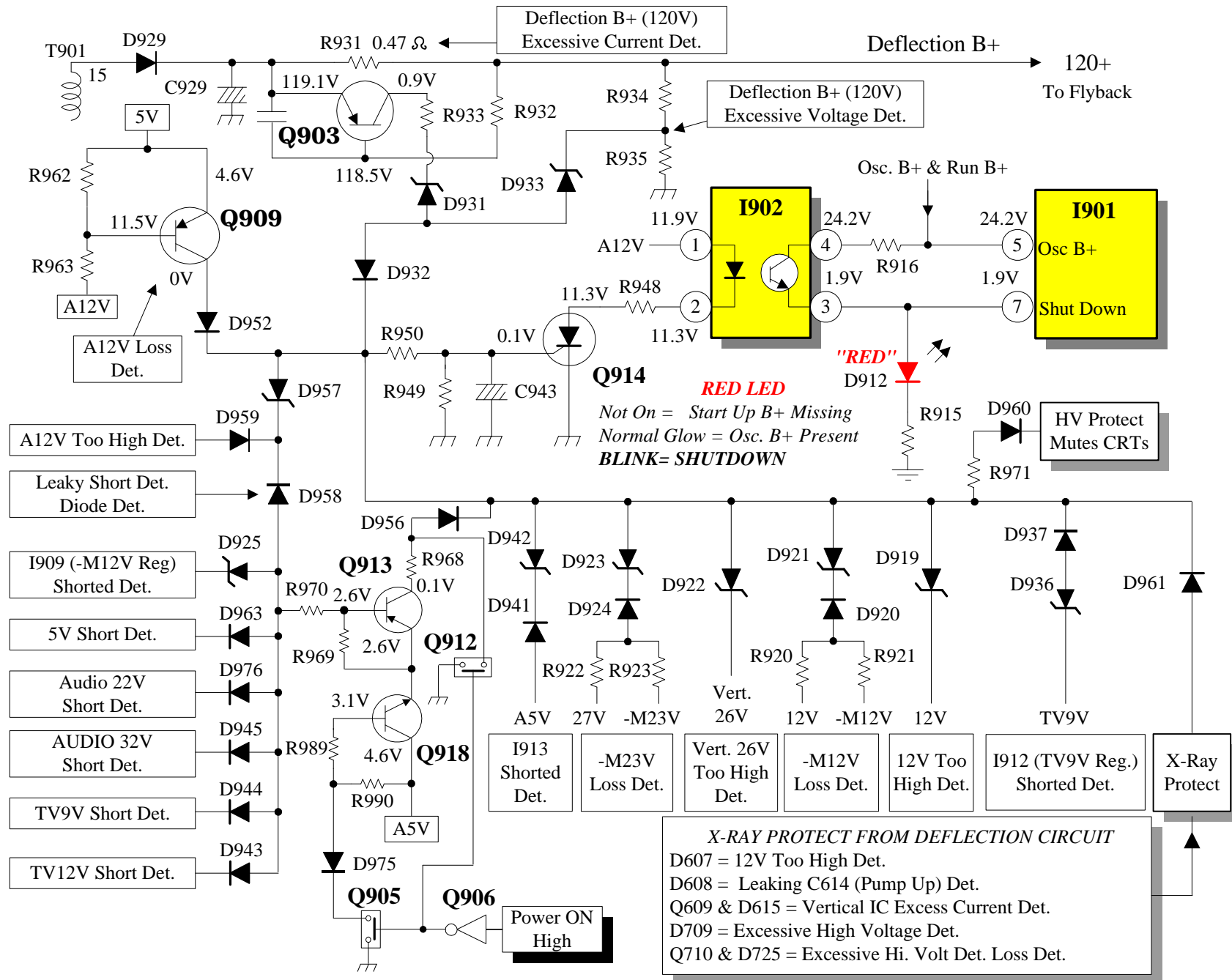


AP-93 POWER SUPPLY SHUTDOWN BLOCK DIAGRAM

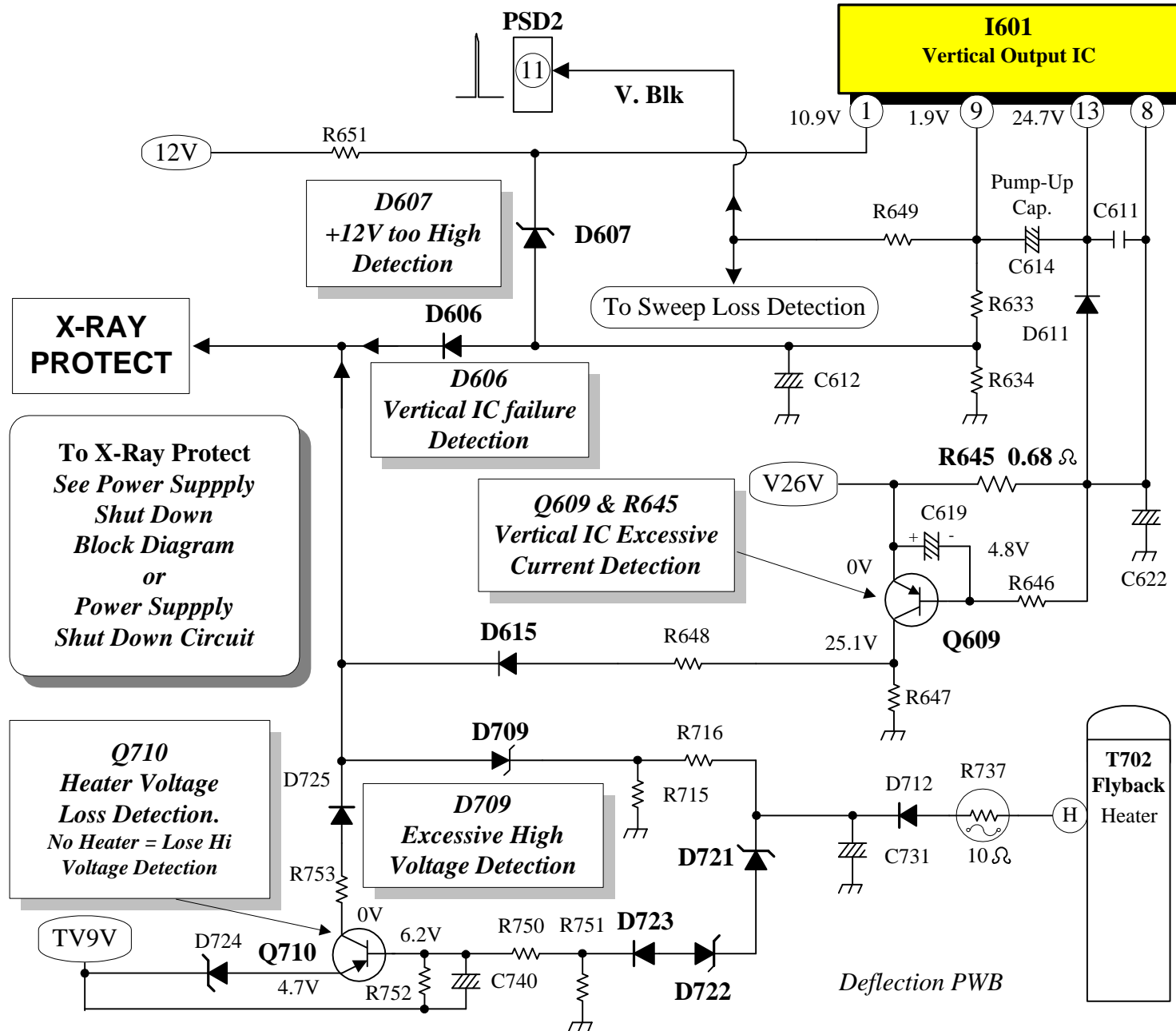
22 SHUT DOWN INPUTS



AP-93 POWER SUPPLY SHUTDOWN CIRCUIT



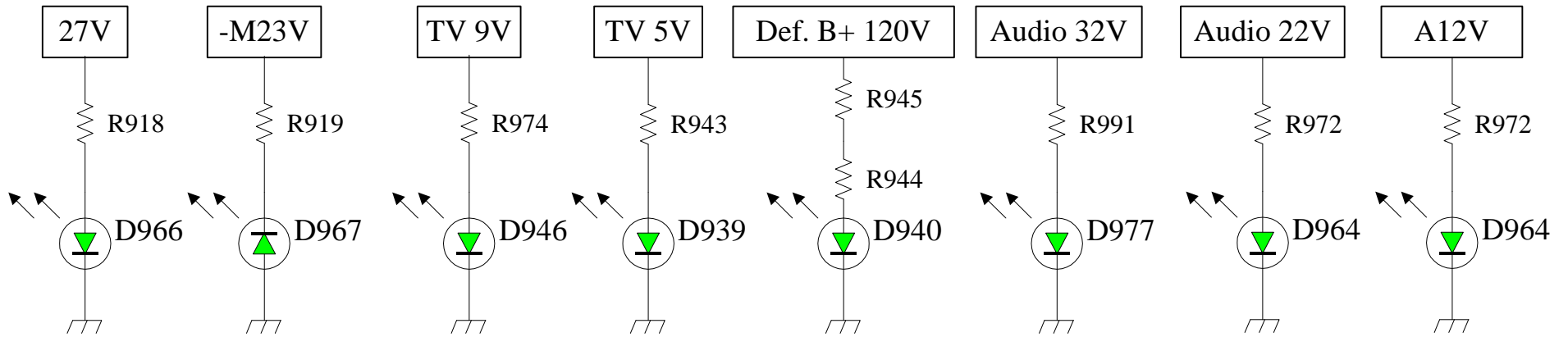
AP-93 SERIES "X-RAY PROTECT" BLOCK DIAGRAM



AP-93 CHASSIS L.E.D. (VISUAL TROUBLE DETECTION) DIODES

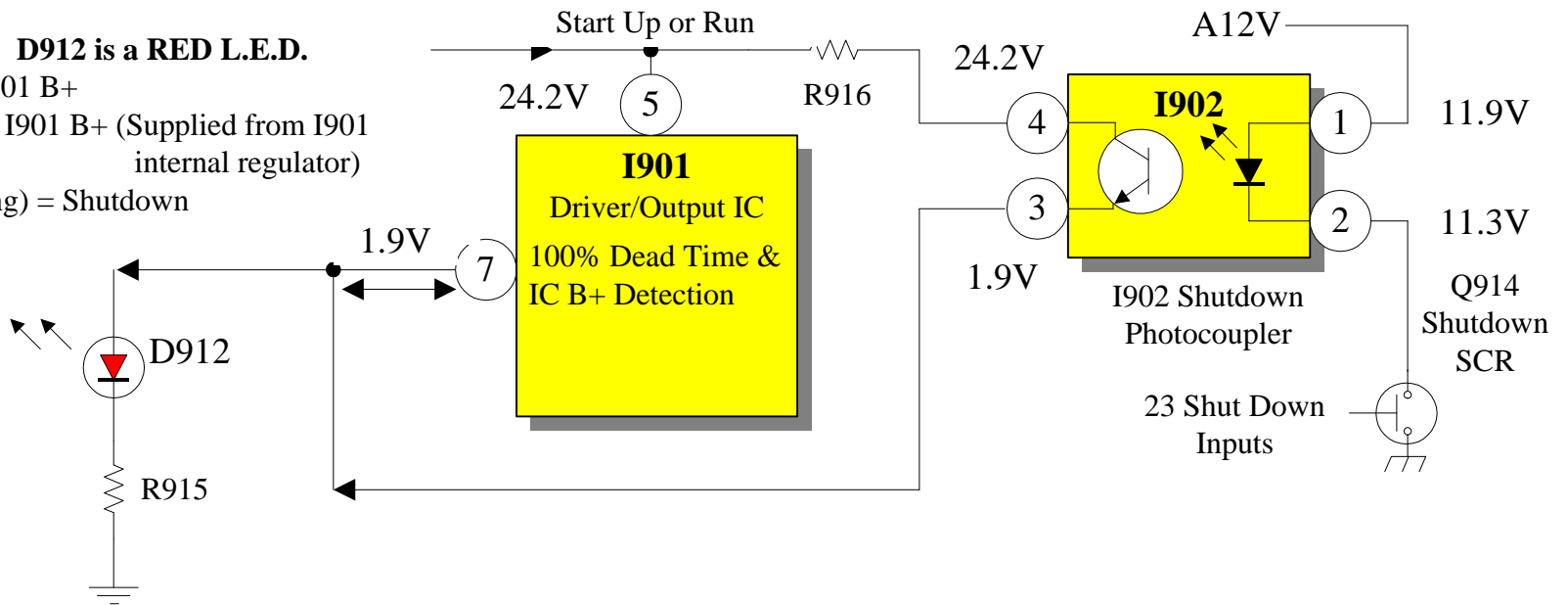
8 GREEN L.E.D.s and 1 RED L.E.D.

(9 Total L.E.D.s for visual trouble sensing observation)



8 GREEN L.E.D.s

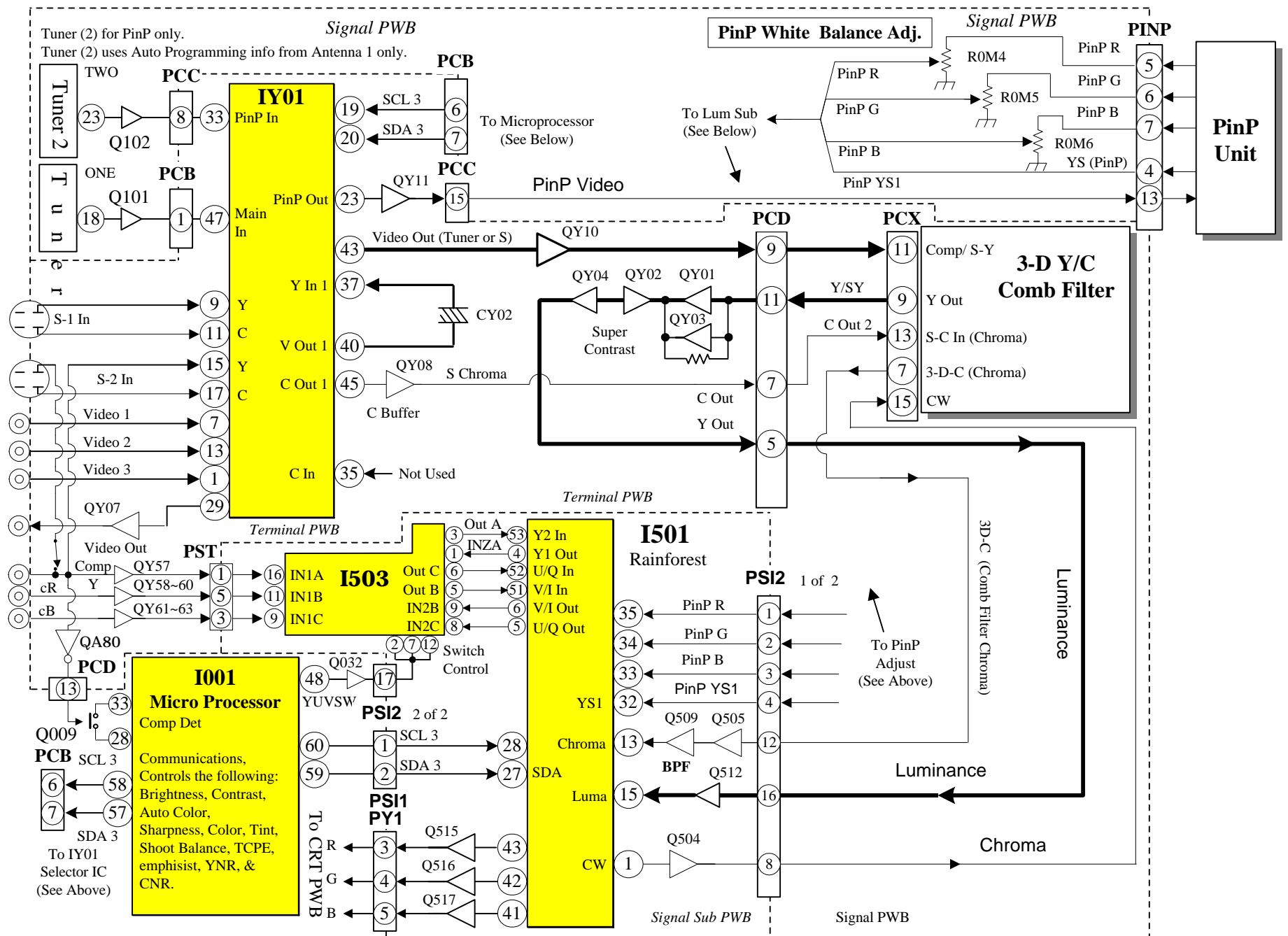
D912 is a RED L.E.D.
 Off = No I901 B+
 On (Mid) = I901 B+ (Supplied from I901 internal regulator)
 On (Blinking) = Shutdown



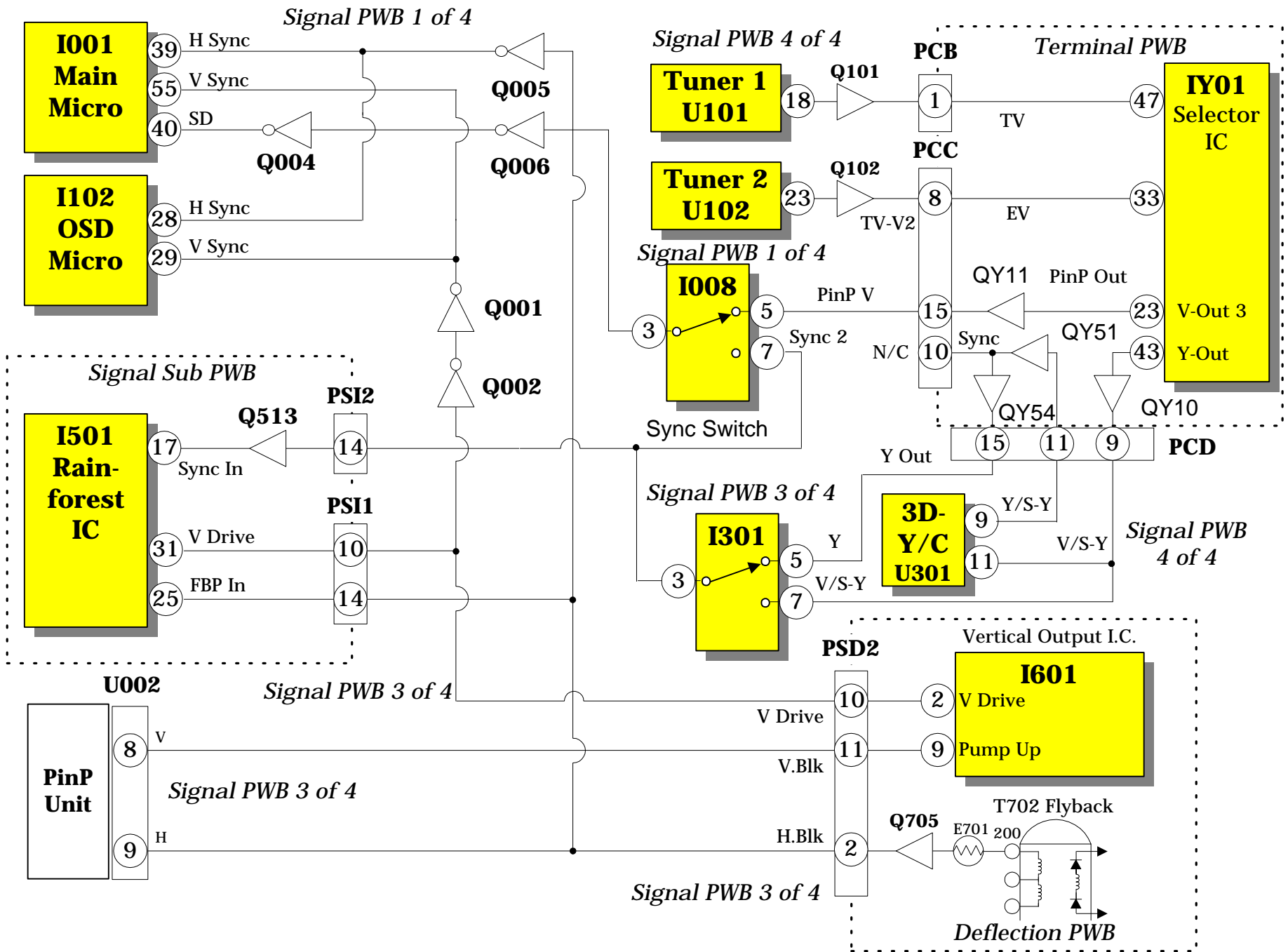
VIDEO INFORMATION

SECTION 4

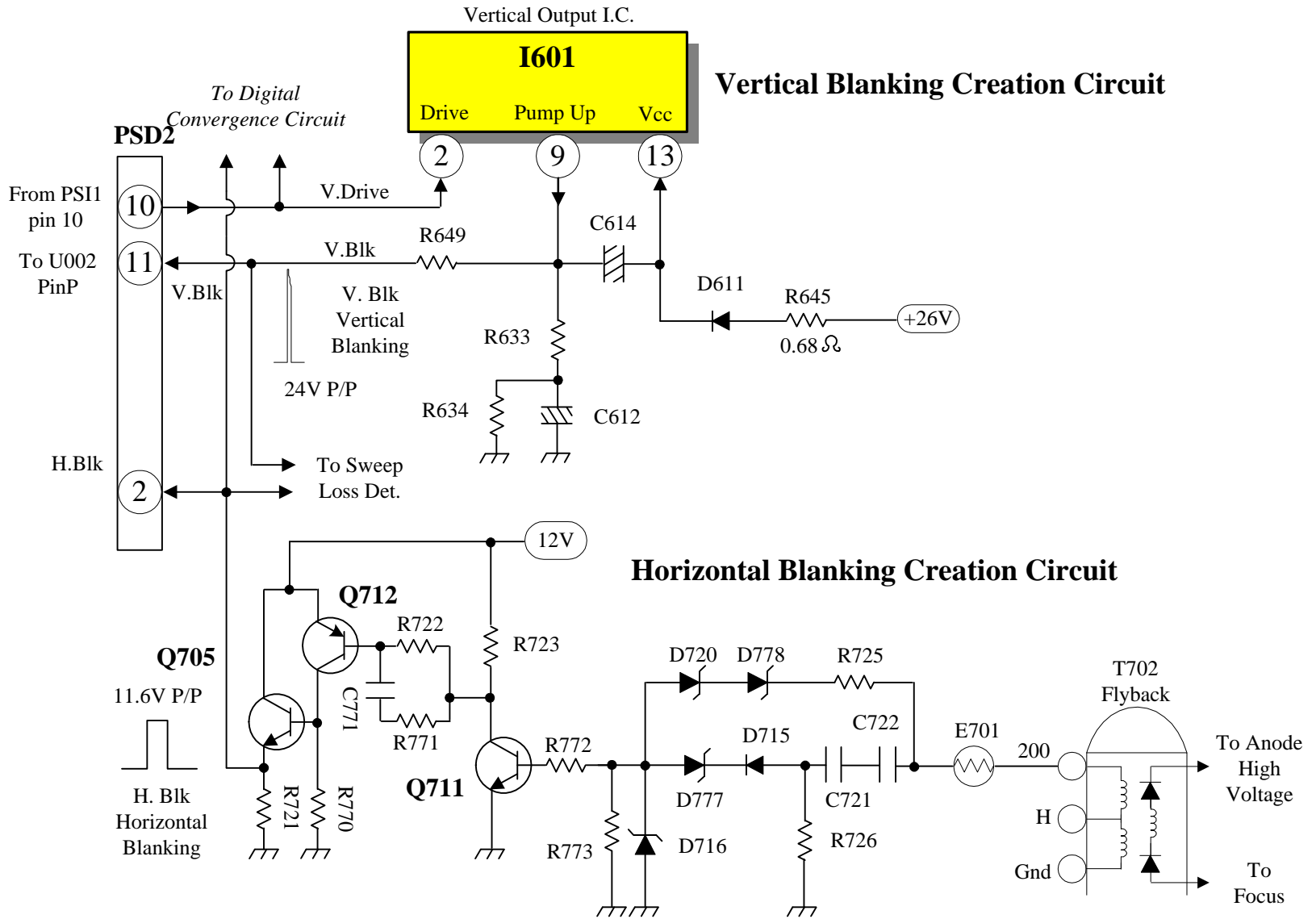
AP-93 CHASSIS VIDEO BLOCK DIAGRAM



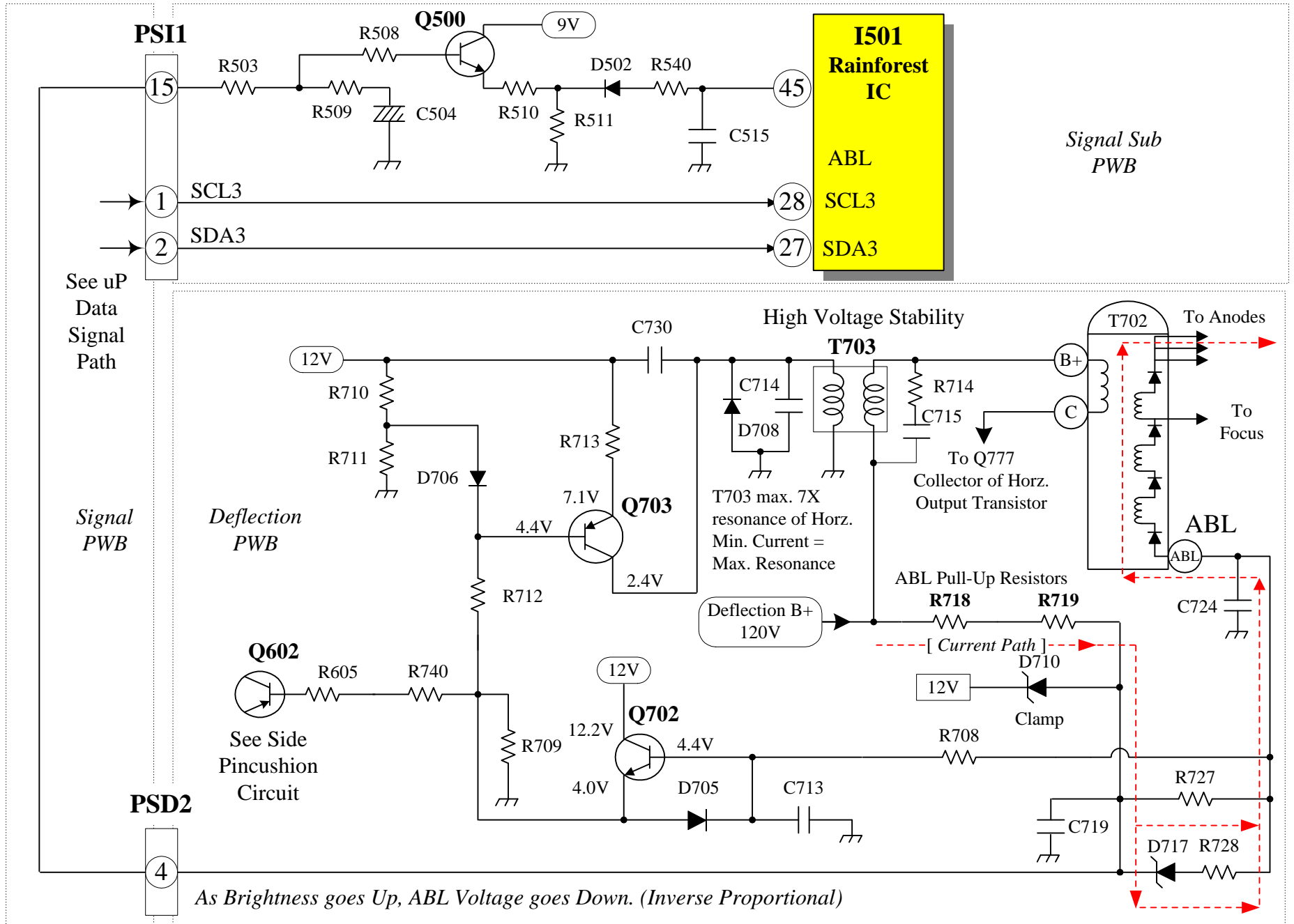
AP-93 SYNC CIRCUIT



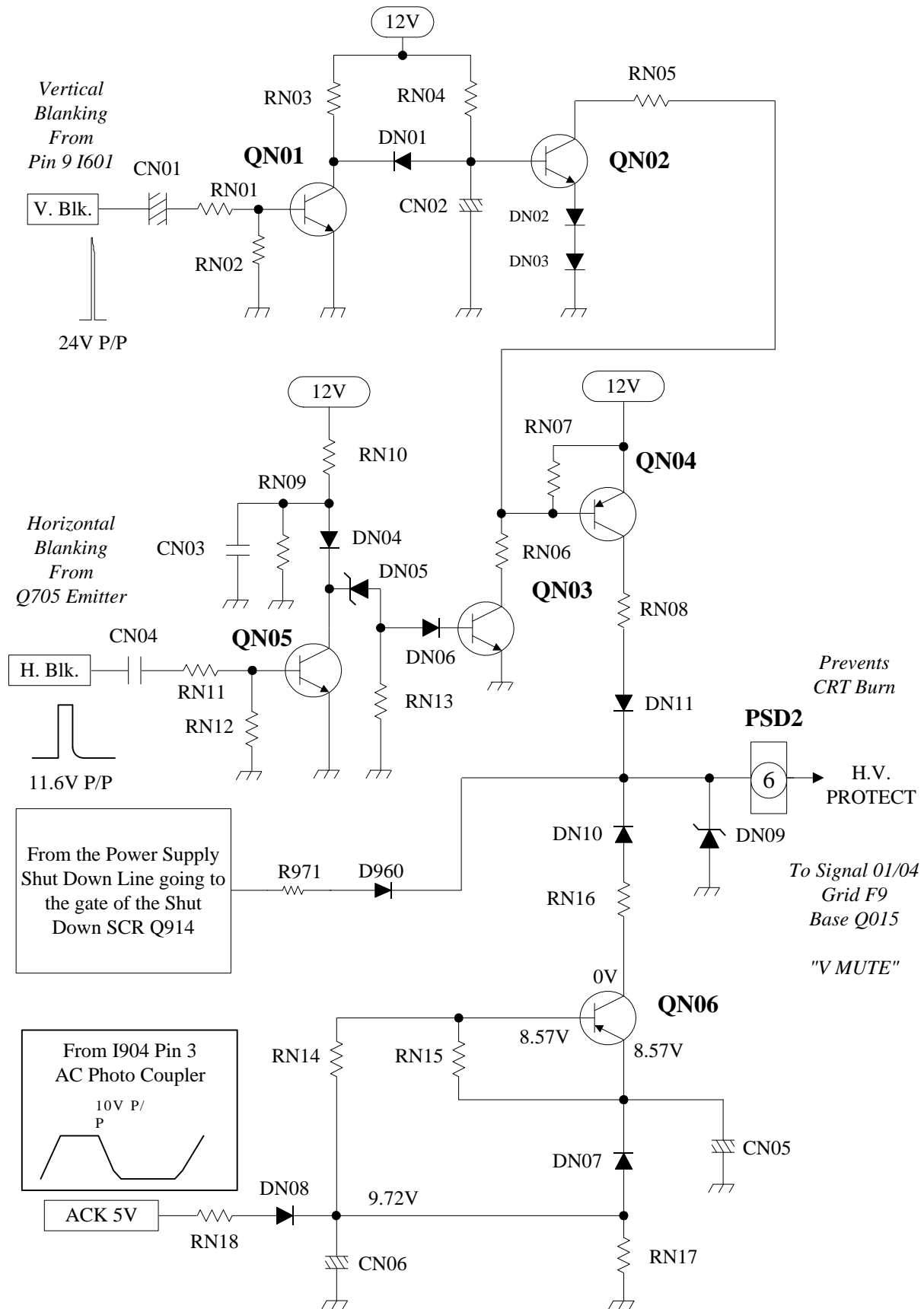
AP-93 HORIZONTAL & VERTICAL BLANKING CIRCUIT



AP-93 CHASSIS A.B.L. CIRCUIT DIAGRAM



AP-93 HORIZONTAL & VERTICAL SWEEP LOSS DETECTION CIRCUIT

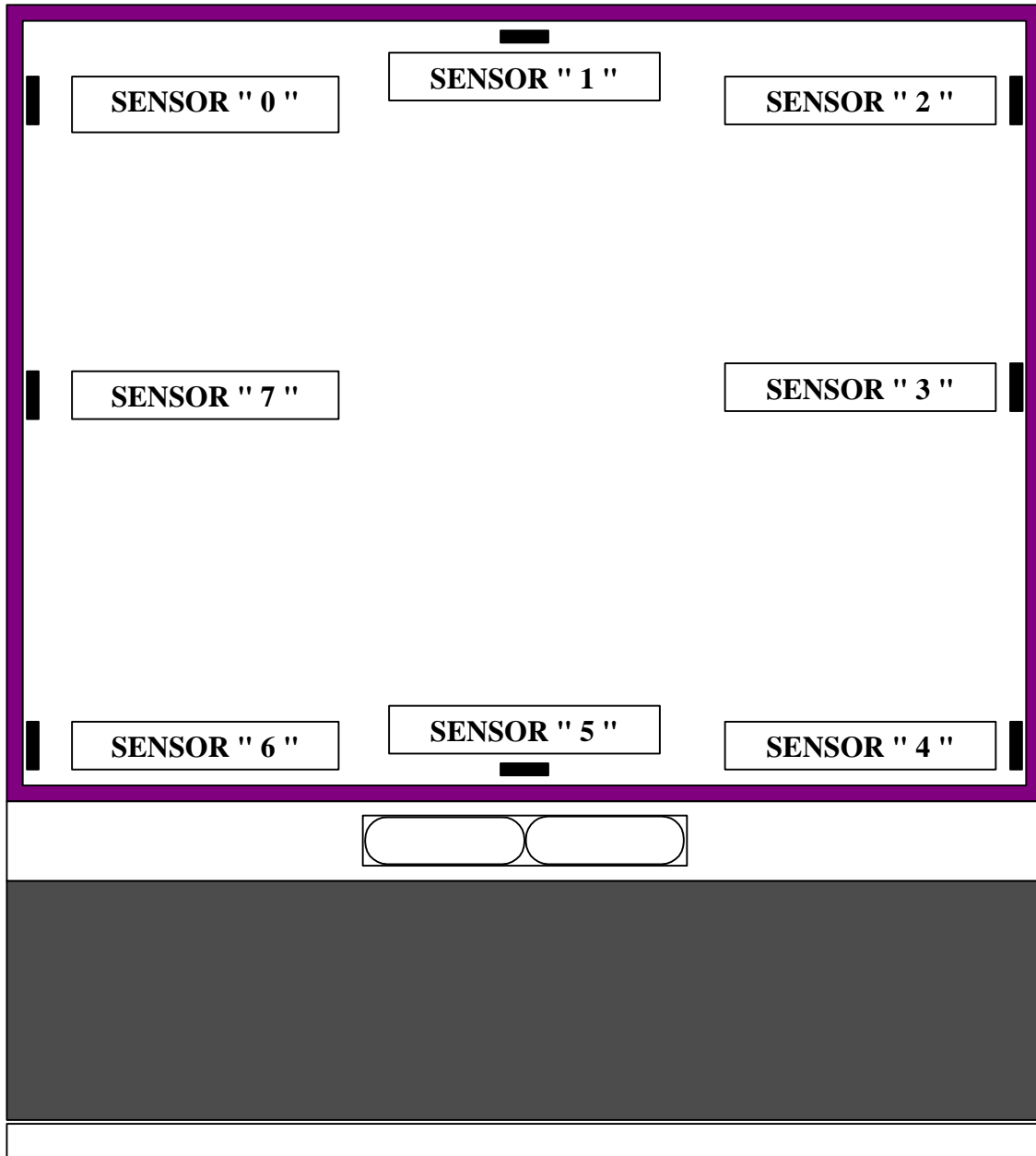


DIGITAL
CONVERGENCE
INFORMATION

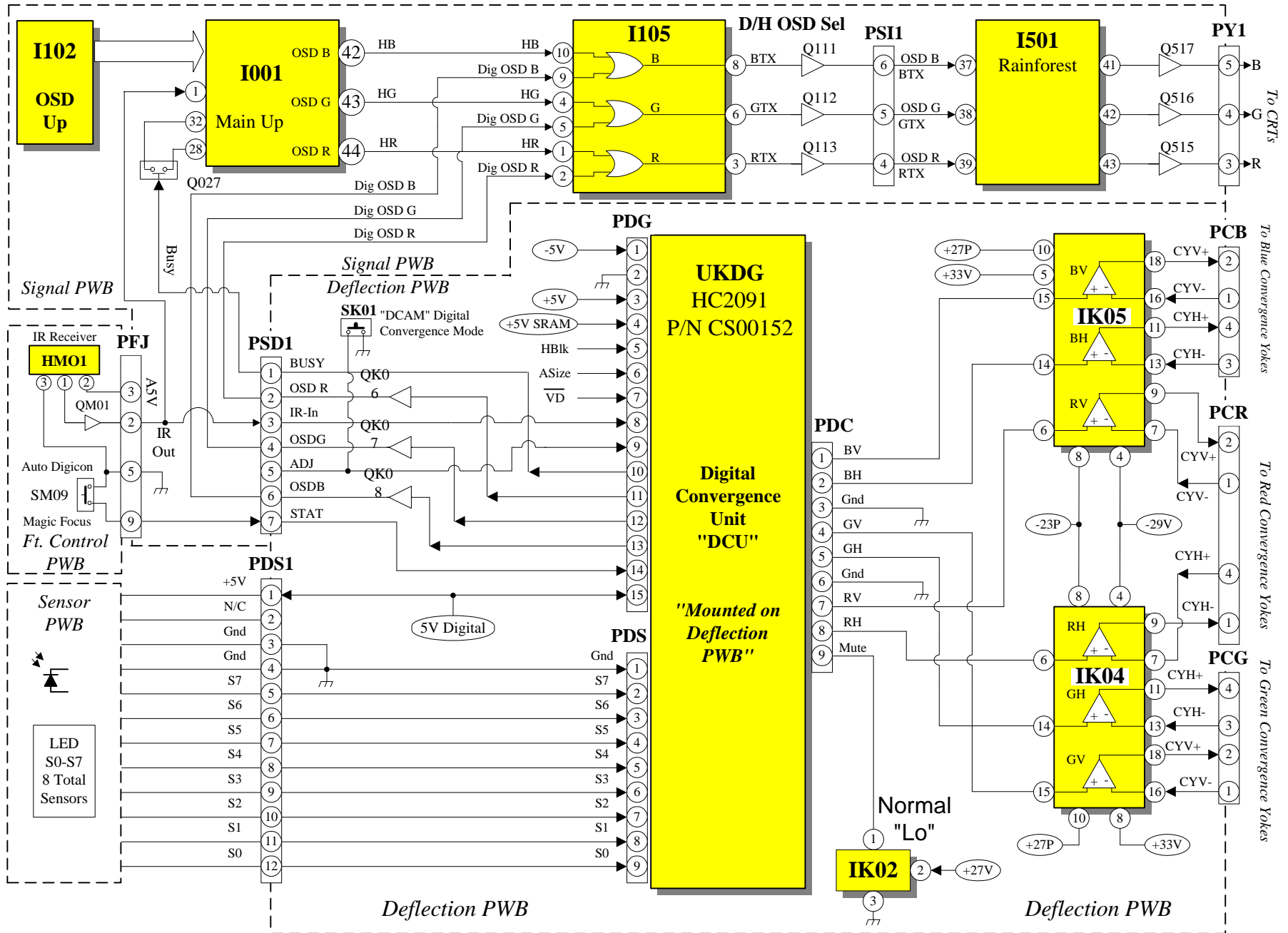
SECTION 5

**AP-93 DIGITAL CONVERGENCE
"MAGIC FOCUS" SENSOR LOCATION**

FRONT VIEW



AP-93 CHASSIS "DIGITAL CONVERGENCE" INTERCONNECTION CIRCUIT DIAGRAM



AP-93 SERIES CHASSIS "CLU-615MP" REMOTE CONTROL

REMOTE PERSONALITY WHILE IN THE DIGITAL CONVERGENCE ADJUSTMENT MODE "D.C.A.M."

*** To Clear R.A.M. data.**

Turn set OFF.
Press and hold the Service Button,
(D.C.A.M.) on deflection P.W.B..
Turn set ON.

"SWAP" = "ROM READ"
Reads old R.O.M. data.
(Last data stored in R.O.M.
(Press 2 times)

"PIP CH" = "INITIALIZE"
Perform after STORE &
before EXIT
[MOVE + PIP CH]

*** "HELP" = "PHASE"**
(Aligns Cursor to Grid)

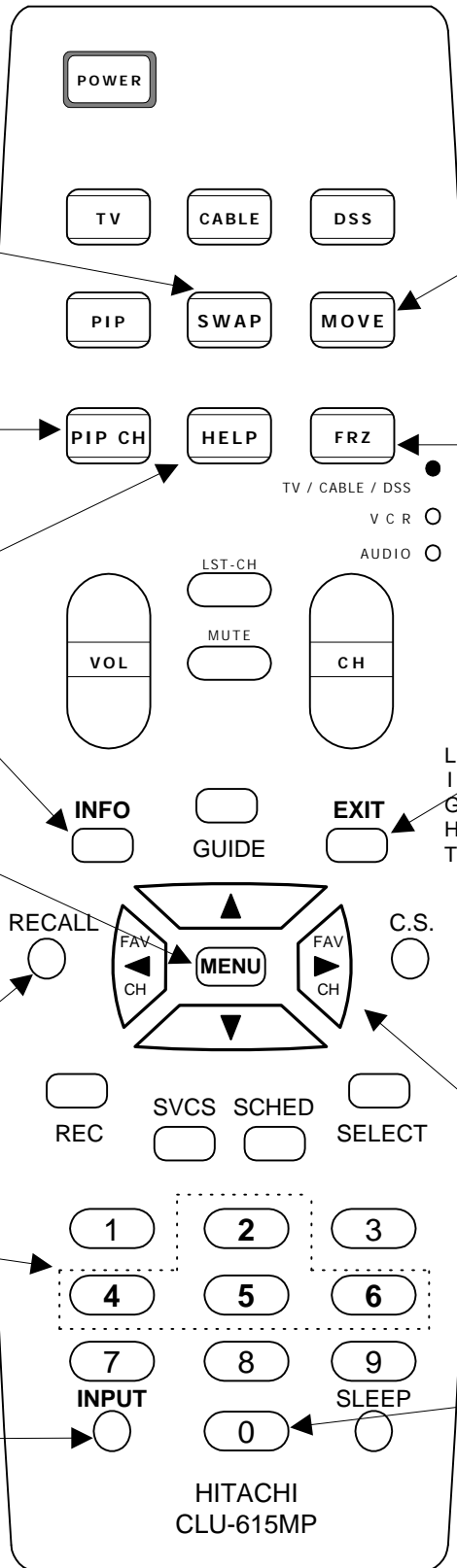
"INFO" = "INTERPOLATE"
(Calculates mid-points)

"MENU" = "REMOVE COLOR"
Removes color not being
adjusted.
(Will NOT remove GREEN)

"RECALL" = "GREEN adjust"
Digital Cursor Blinks GREEN
* 3x3 adjustment mode
(Press 5 times), can only be
entered when R.A.M. is cleared.

"MOVES DIGITAL CURSOR"
Moves Adjustment Point
(2) Up, (4) Left,
(5) Down, (6) Right

"INPUT" = "BLUE adjust"
Digital Cursor Blinks BLUE
13 x 9 adjustment mode
(Press 5 times)



"MOVE" = "ROM WRITE" (STORE)
Stores data into R.O.M..
(Press 2 times)

*** "FRZ" = "RASTER POSITION"**
Aligns selected color's digital
raster (Digital Centering).
Only perform after mechanical
Centering is complete.

"EXIT" = "ENTER & EXIT"
Enter or Exit the D.C.A.M.
Must initially enter D.C.A.M. with
Service Button on chassis.
(Press 5X)
Toggles between External Video
and Internally generated Cross
hatch. After exiting the DCAM,
set can change channels or
external video source.

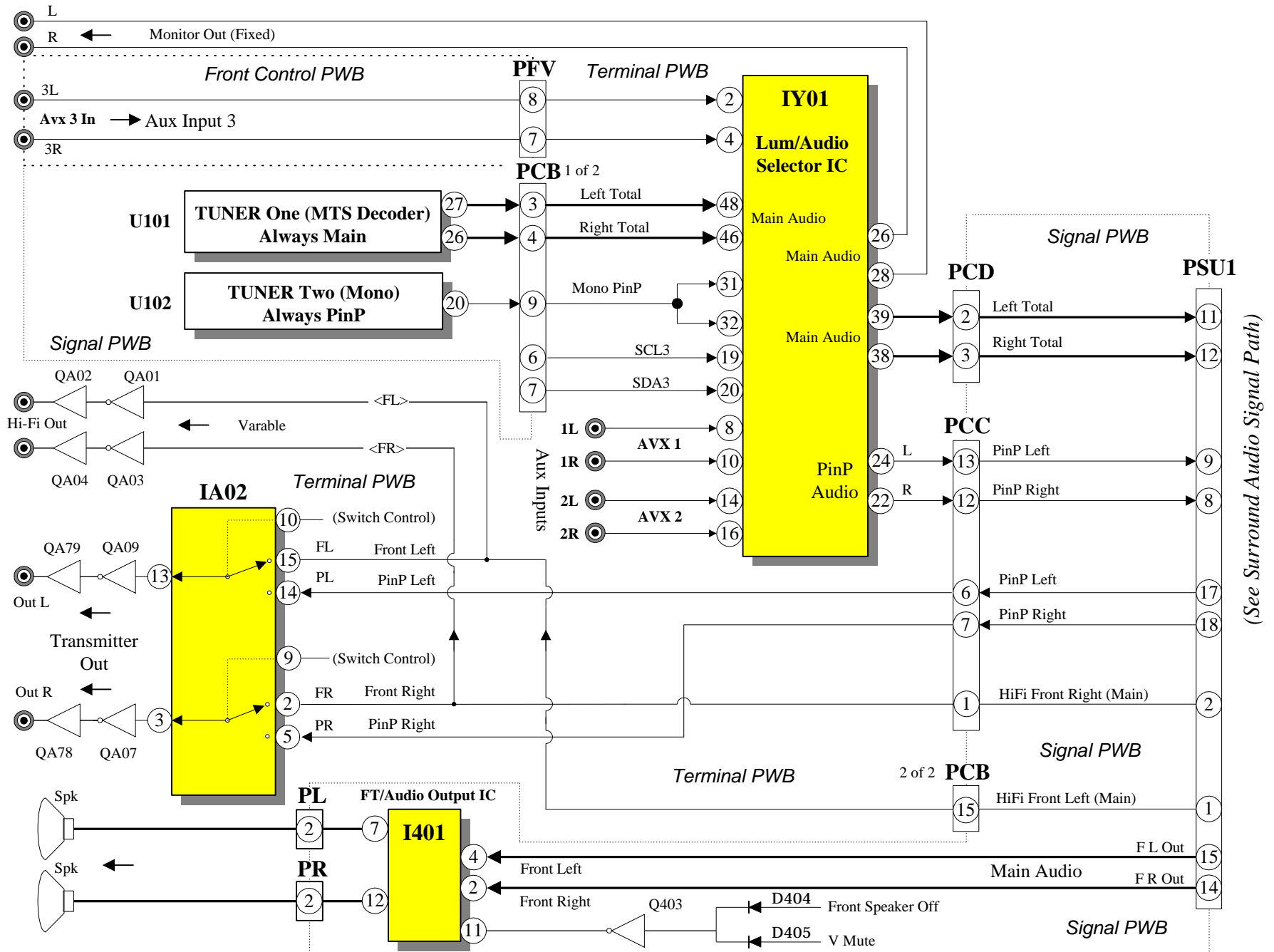
"CURSOR" = "CURSOR (adjust)"
Adjust the selected color at
the current stopping position.
▲ Up
▼ Down
◀ Left
▶ Right

"0" = "RED adjust"
Digital Cursor Blinks RED
7x5 adjustment mode
(Press 5 times)

AUDIO
INFORMATION

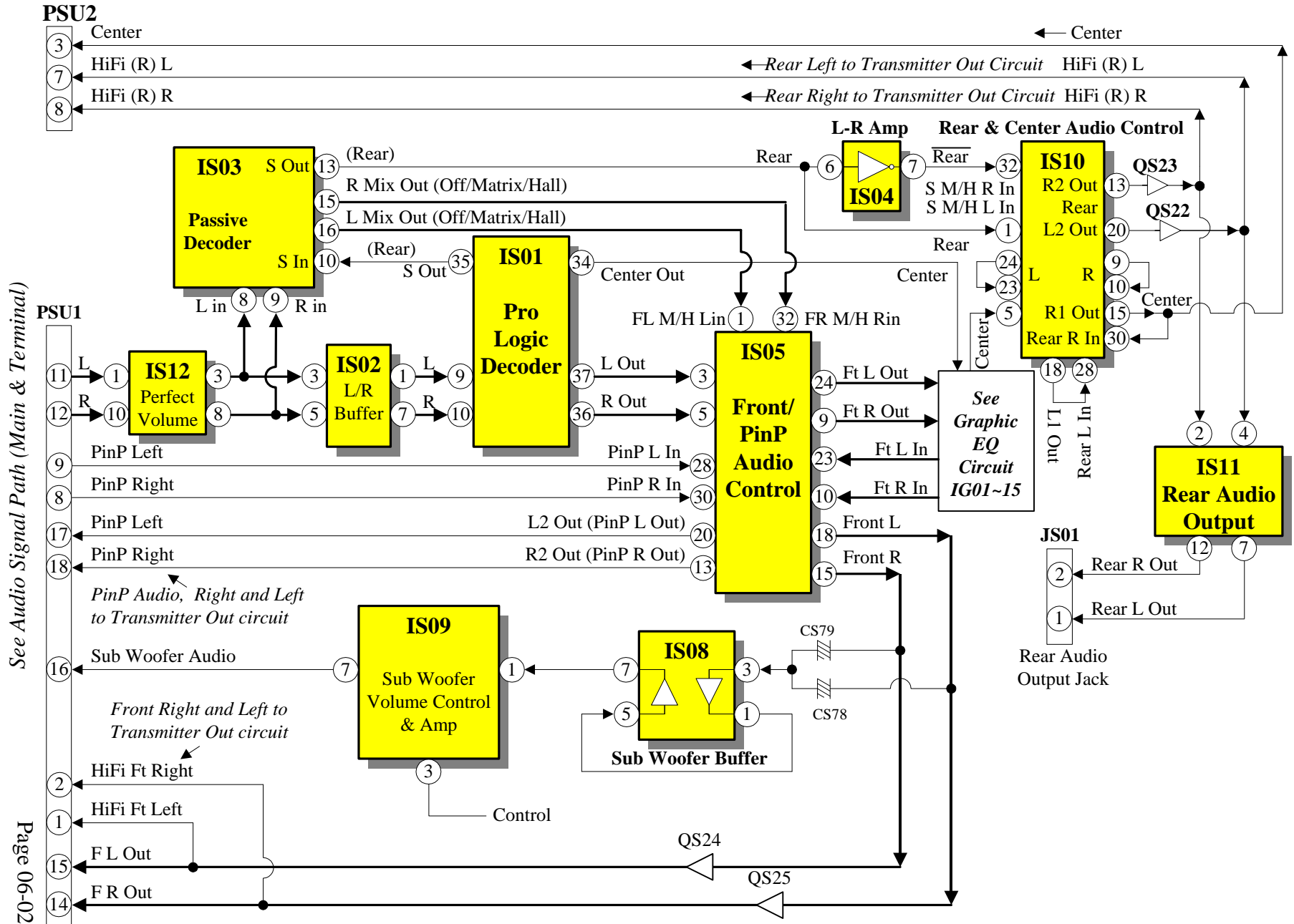
SECTION 6

AP-93 SERIES CHASSIS AUDIO SIGNAL PATH (Main & Terminal)



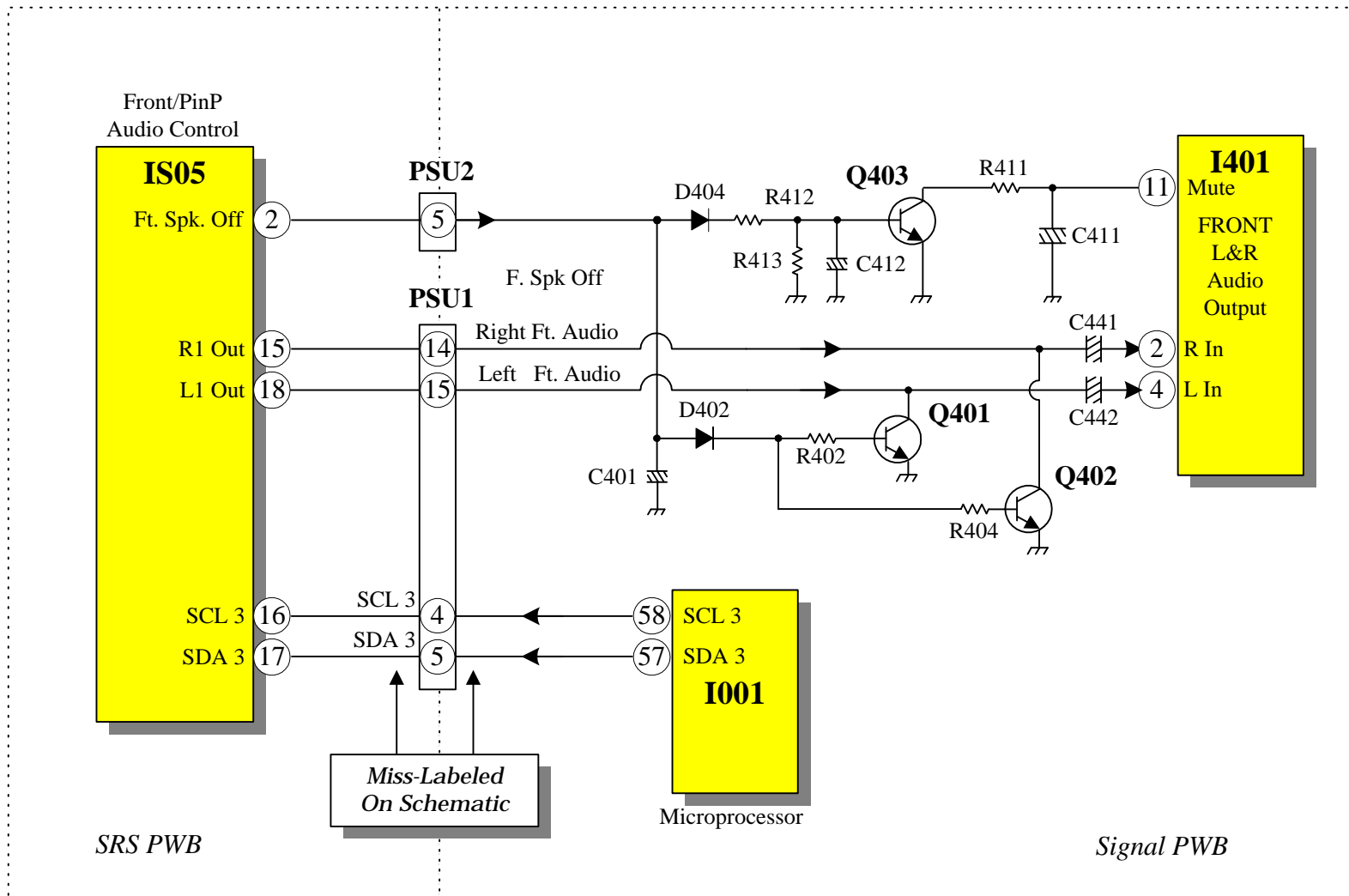
(See Surround Audio Signal Path)

AP-93 SERIES CHASSIS SURROUND AUDIO SIGNAL PATH



AP-93 Series Chassis Front Speaker Off Circuit

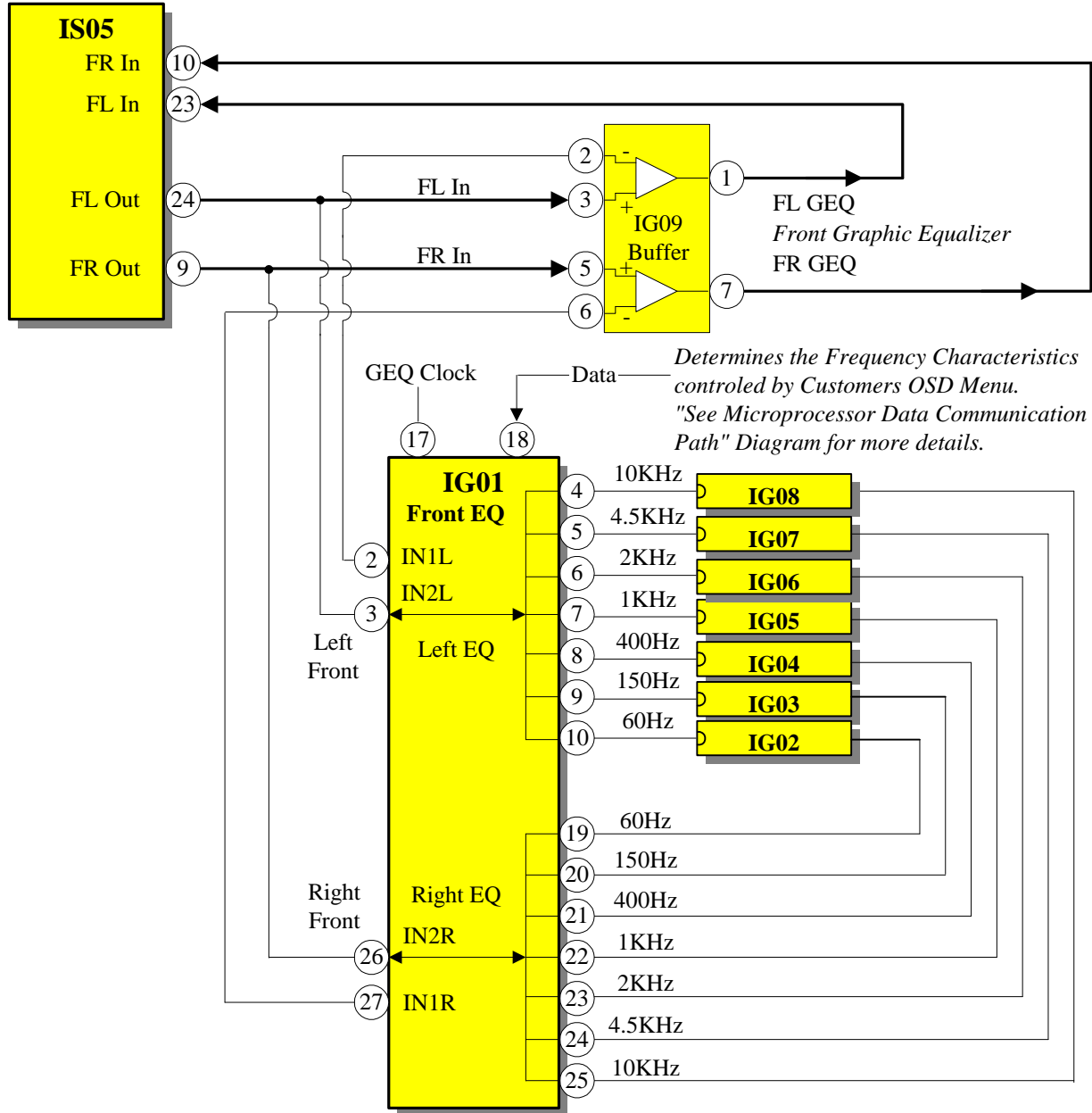
(See also Main and Terminal Mute Circuit)



AP-93 FRONT AUDIO RIGHT & LEFT GRAPHIC EQUALIZER CIRCUIT

For continuation of Front Left and Right Audio signal flow, see AP-93 Series Chassis Surround Audio Signal Path Diagram (Surround and Main/Terminal)

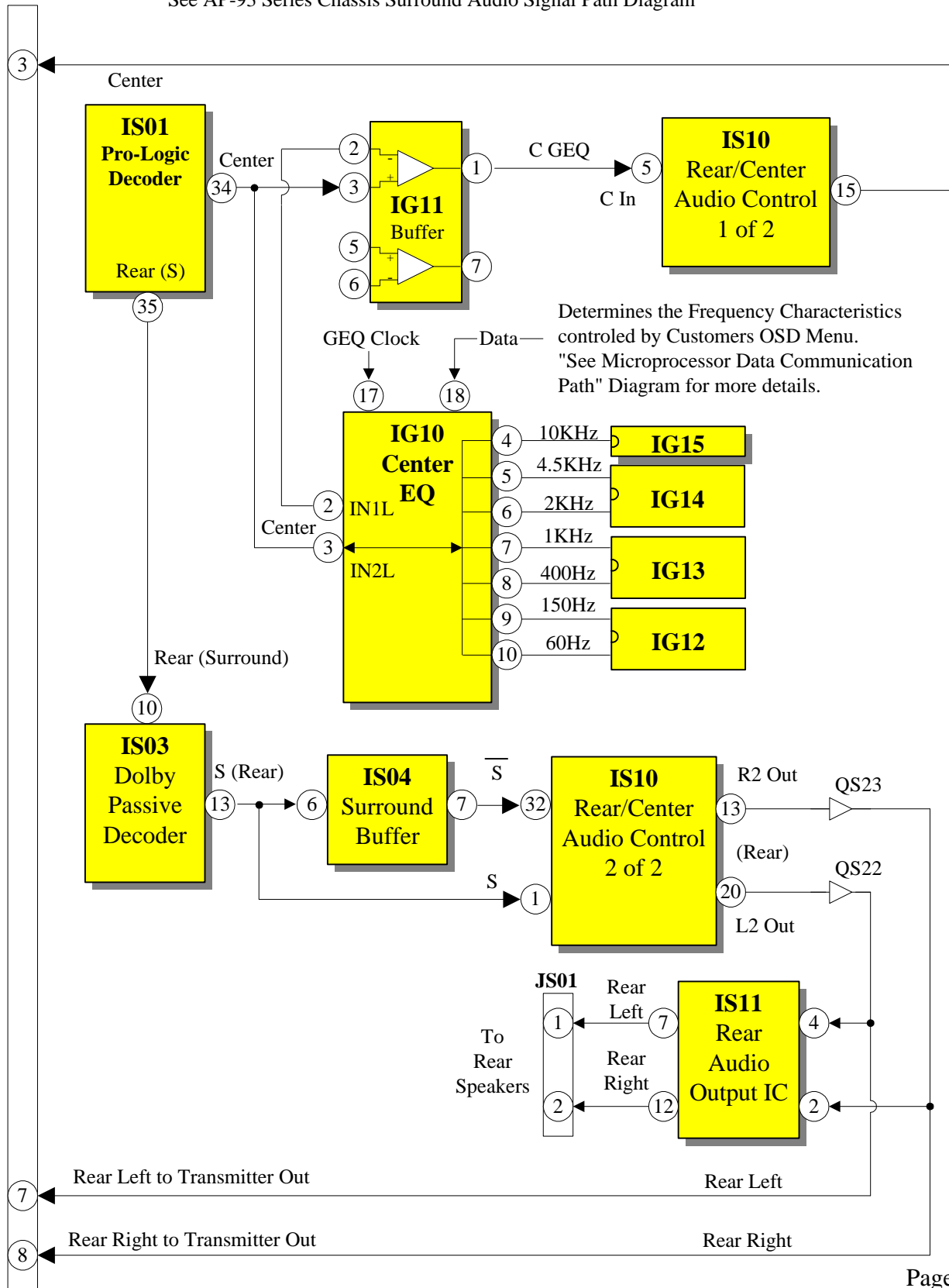
FRONT & PinP
AUDIO CONTROL IC



AP-93 SERIES CHASSIS CENTER GRAPHIC EQUALIZER CIRCUIT AND REAR (SURROUND) AUDIO OUTPUT CIRCUIT

PSU2

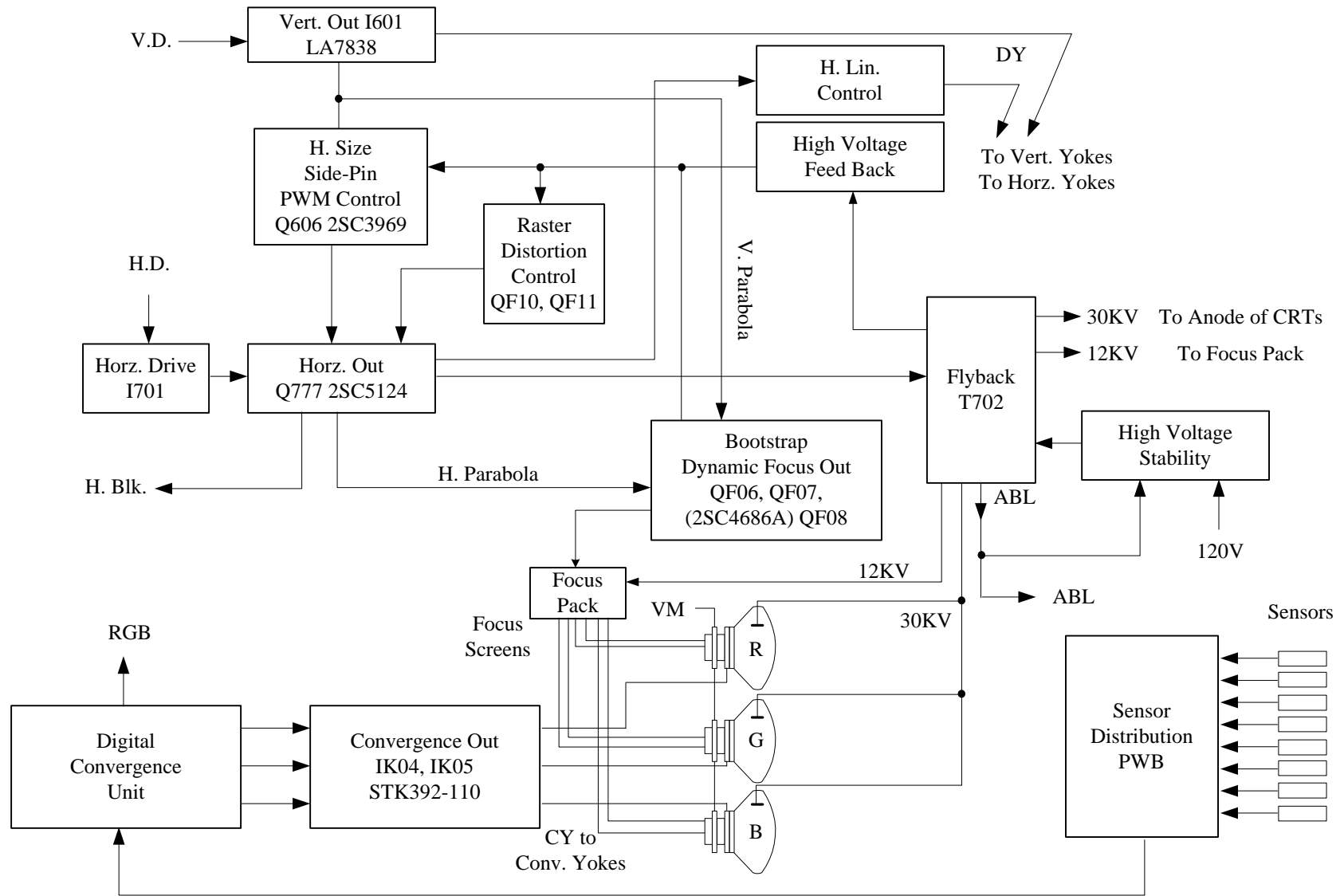
For continuation of Center Channel Audio signal flow,
See AP-93 Series Chassis Surround Audio Signal Path Diagram



DEFLECTION
CIRCUIT
INFORMATION

SECTION 7

AP93 DEFLECTION BLOCK DIAGRAM



AP-93 SIDE PINCUSHION CIRCUIT DIAGRAM

