

FE-2 SELF DIAGNOSTIC SOFTWARE

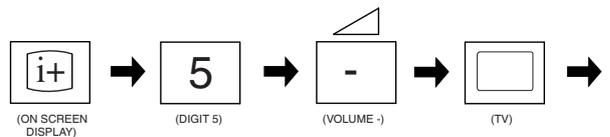
The identification of errors within the FE-2 chassis is triggered in one of two ways :- 1: Busy or 2: Device failure to respond to IIC. In the event of one of these situations arising the software will first try to release the bus if busy (Failure to do so will report with a continuous flashing LED) and then communicate with each device in turn to establish if a device is faulty. If a device is found to be faulty the relevant device number will be displayed through the LED (Series of flashes which must be counted) See table 1., non fatal errors are reported using this method. Each time the software detects an error it is stored within the NVM. See Table 2.

Table 1

Error Message	LED Code
No error	00
Reserved	01
OCP (Over Current Protection)	02
Not Used	03
No Vertical Sync	04
IKR Error at power on	05
IIC bus clock and/or data lines low at power on	06
NVM no IIC bus acknowledge at power on	07
Not Used	08
Tuner no acknowledge at power on	09
Sound Processor Error	10
Jungle controller 8 volts error	11

How to enter into Table 2

1. Turn on the main power switch of the TV set and enter into the 'Standby Mode'.
2. Press the following sequence of buttons on the Remote Commander.



3. The following table will be displayed indicating the error count.

Flash Timing Example : e.g. error number 3

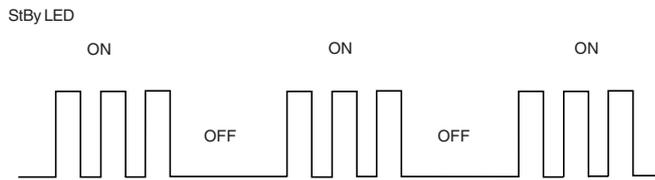


Table 2

ERROR MENU			
E02:	OCP	(0, 255)	0
E03:	OVP N/A	(0, 255)	0
E04:	VSYNC	(0, 255)	0
E05:	IKR	(0, 255)	0
E06:	IIC	(0, 255)	0
E07:	NVM	(0, 255)	0
E08:	JUNGLE	(0, 255)	0
E09:	TUNER	(0, 255)	0
E10:	SOUNDP	(0, 255)	0
E11:	8V	(0, 255)	0
E12:	EMMA	(0, 255)	0
E13:	PORT EX	(0, 255)	0
E14:	RTC	(0, 255)	0
WORKING TIME			
HOURS			1
MINUTES			22

Note: To clear the error count data press '80' on the Remote commander.

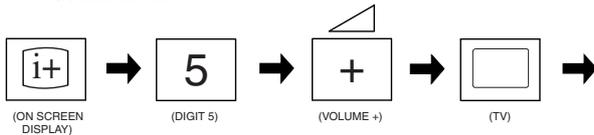
SECTION 4 CIRCUIT ADJUSTMENTS

4-1. Electrical Adjustments

Service adjustments to this model can be performed using the supplied remote Commander RM-947.

How to enter into the Service Mode

1. Turn on the main power switch and enter into the stand-by mode.
2. Press the following sequence of buttons on the Remote Commander.



'TT—' will appear in the upper right corner of the screen. Other status information will also be displayed.

3. Press 'MENU' on the remote commander to obtain the following menu on the screen.

Geometry
Service
Design
Status
Sound
IF Adjust
Error menu
FE-2 Stereo v4.46
Factory data FFh FFh
MSP Device : MSP3411G

4. Move to the corresponding adjustment item using the up or down arrow buttons on the Remote Commander.
5. Press the right arrow button to enter into the required menu item.
6. Press the 'Menu' button on the Remote Commander to quit the Service Mode when all adjustments have been completed.

Note :

- After carrying out the service adjustments, to prevent the customer accessing the 'Service Menu' switch the TV set OFF and then ON.

ERROR MENU			
E02	OCP	(0, 255)	0
E03	OVP N/A	(0, 255)	0
E04	VSYNC	(0, 255)	0
E05	IKR	(0, 255)	0
E06	IIC	(0, 255)	0
E07	NVM	(0, 255)	0
E08	JUNGLE	(0, 255)	0
E09	TUNER	(0, 255)	0
E10	SOUNDP	(0, 255)	0
E11	8V	(0, 255)	0
WORKING TIME			
HOURS			7
MINUTES			22

SERVICE

Offset-R	(0, 63)	Adj
Offset-G	(0, 63)	Adj
R-Drive	(0, 63)	31
G-Drive	(0, 63)	Adj
B-Drive	(0, 63)	Adj
Peak-Freq	(0, 3)	0
Luma-Delay	(0, 15)	8
SC0	(0, 3)	3
White-Peak	(0, 15)	15
Subcont	(0, 15)	8
Subright	(0, 63)	30
Subcol	(0, 63)	Adj
Subsharp	(0, 63)	25
Cutoff Br.	(0, 63)	31
Br OSD	(0, 15)	10
Br TXT	(0, 15)	7

GEOMETRY

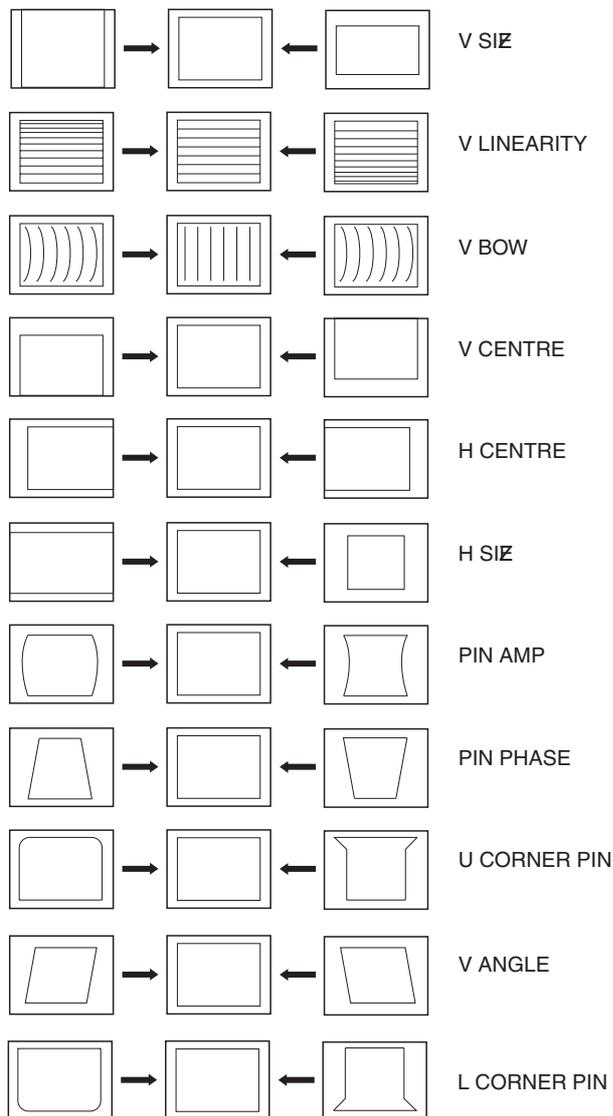
V-Linearity	(0, 63)	Adj
V-Scroll	(0, 63)	32
Left-HBik	(0, 15)	10
Right-HBik	(0, 15)	7
V-Angle	(0, 63)	Adj
V-Bow	(0, 63)	Adj
H-Centre	(0, 63)	Adj
H-Size	(0, 63)	Adj
Pin-Amp	(0, 63)	Adj
U-Corner-Pin	(0, 63)	Adj
L-Corner-Pin	(0, 63)	Adj
Pin Phase	(0, 63)	Adj
V-Slope	(0, 63)	40
V-Size	(0, 63)	Adj
S-Correction	(0, 63)	Adj
V-Centre	(0, 63)	Adj
V-Zoom	(0, 63)	27
Magenta	(0, 63)	31

IF ADJUST

AGC Adjust	(-16, +15)	+0
Automute		1
Audio Gain		0
L Gating		0

Deflection System Adjustment

1. Set the TV set or operation in Service Mode [See Page 21] and enter into the 'Geometry' service menu.
2. Select and adjust each item in order to obtain the optimum image.



GEOMETRY

V-Linearity	(0, 63)	Adj
V-Scroll	(0, 63)	32
Left-HBlk	(0, 15)	10
Right-HBlk	(0, 15)	7
V-Angle	(0, 63)	Adj
V-Bow	(0, 63)	Adj
H-Centre	(0, 63)	Adj
H-Size	(0, 63)	Adj
Pin-Amp	(0, 63)	Adj
U-Corner-Pin	(0, 63)	Adj
L-Corner-Pin	(0, 63)	Adj
Pin Phase	(0, 63)	Adj
V-Slope	(0, 63)	40
V-Size	(0, 63)	Adj
S-Correction	(0, 63)	Adj
V-Centre	(0, 63)	Adj
V-Zoom	(0, 63)	27
Magenta	(0, 63)	31

Sub Brightness Adjustment

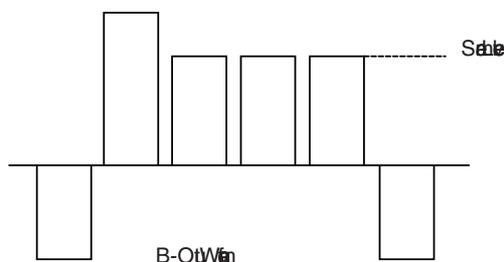
1. Input a Monoscope pattern.
2. Set the TV set or operation in Service Mode. [See Page 21].
3. Select 'Service' from the on screen menu display and press 'Right Arrow'.
4. The 'Service' menu will appear on the screen. [See Page 21].
5. Adjust the 'Sub-Brightness' data so that there is barely a difference between the 0 IRE and 10 IRE signal levels.

Sub Contrast Adjustment

1. Input a video signal that contains a small 100% white area on a black background.
2. Connect an digital voltmeter to Pin 10 of J701 [C Board].
3. Set the TV set or operation in Service Mode. [See Page 21].
4. Select 'Service' from the on screen menu display and press 'Right Arrow'.
5. The 'Service' menu will appear on the screen.[See Page 21]
6. Adjust the Sub-Contrast to obtain a voltage of 105 +/- 5V.

Sub Colour Adjustment

1. Receive a PAL colour bar signal.
2. Connect an oscilloscope to Pin 5 of CN003 [A Board].
3. Set the TV set for operation in Service Mode. [See Page 21].
4. Select 'Service' from the on screen menu display and press 'Right Arrow'.
5. The 'Service' menu will appear on the screen.[See Page 21]
6. Adjust the 'Sub Colour' so that the Cyan, Magenta and Blue colour bars are of equal levels as indicated below.

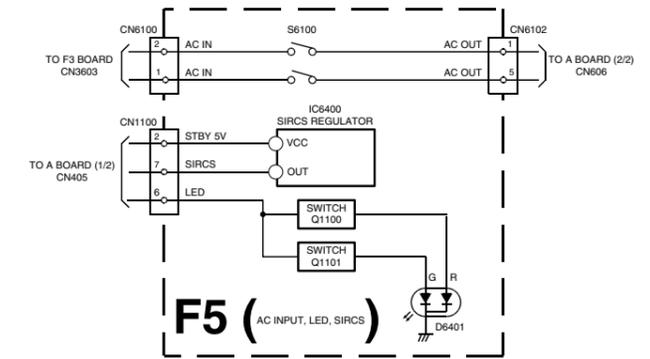
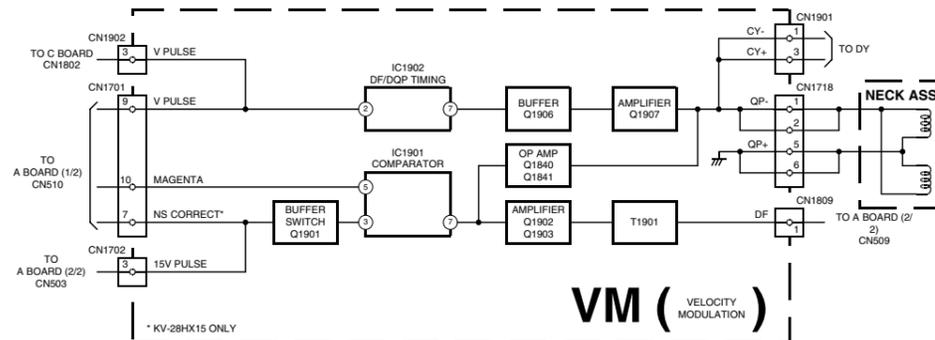
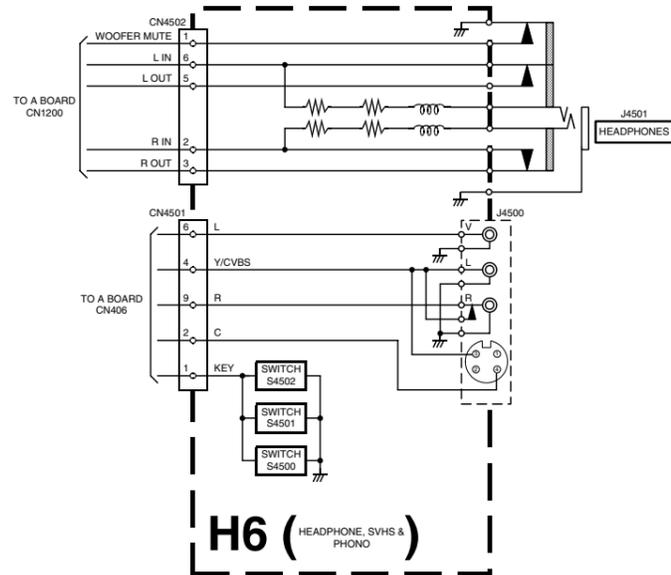
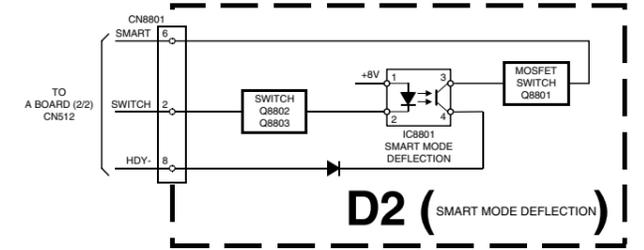
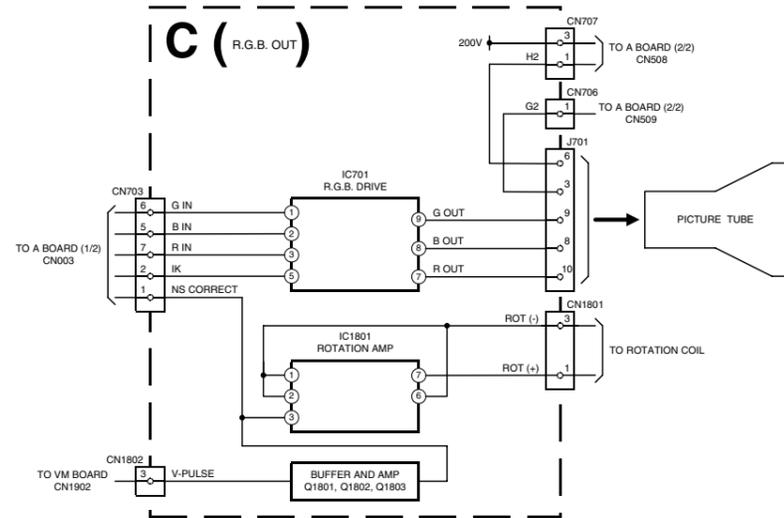
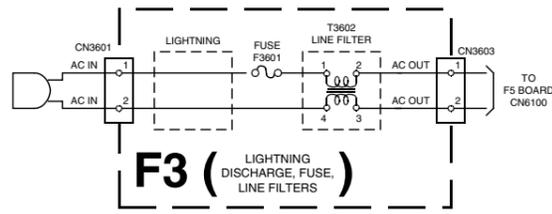


4-2. TEST MODE 2:

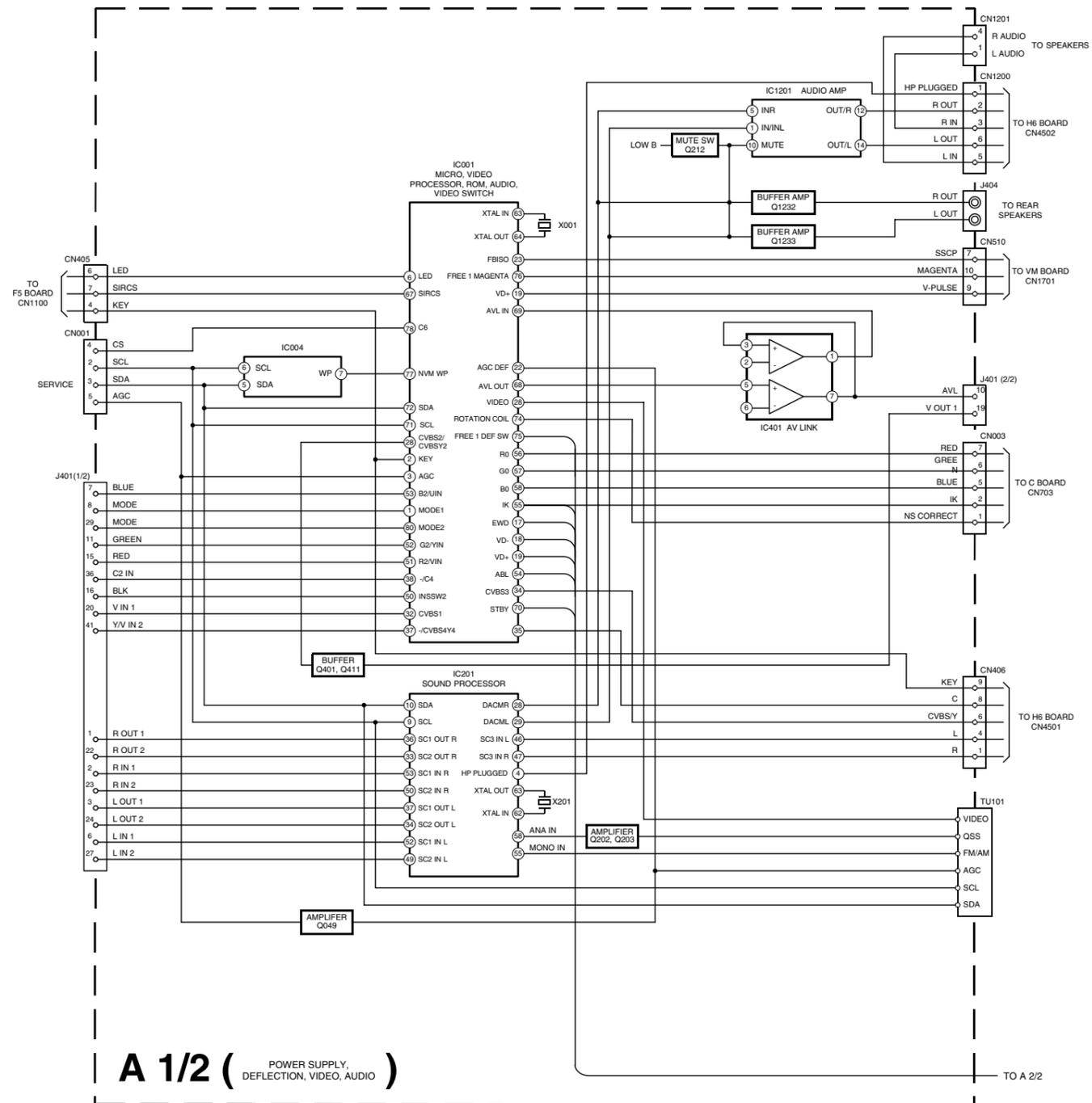
Test Mode 2 is available by programming the TV set for operation in Service Mode [As shown on Page 21], OSD 'TT' appears. The functions described below are available by selecting the two numbers. To release the 'Test mode 2', press 00, 10, 20 ... twice or switch the TV set into Stand-by mode. In 'TT Menu' mode, it is possible to remove the Menu from the screen by pressing the Speaker OFF button once. Pressing the Speaker OFF button a second time will cause the Menu to reappear. The function is kept even when the menu is not displayed on screen.

00	'TT' mode off
01	Picture maximum
02	Picture minimum
03	Set speaker/headphone Volume to 35%
04	Set speaker/headphone Volume to 50%
05	Set speaker/headphone Volume to 65%
06	Set speaker/headphone Volume to 80%
07	Ageing mode
08	Shipping Condition
11	Sub picture adjustment
12	Sub colour adjustment
13	Sub Brightness adjustment
14	Text H Position adjustment
15	Rotation Coil Test
16	Picture level 50%
19	Factory Mode Enable/Disable
21	Destination ADEKR
22	Destination BL
23	Destination ADEKR
24	Destination U
25	Destination ADEKR
26	Destination BL
27	Destination ADEKR
28	Destination ADEKR
31	Auto Shutoff Enable/Disable
36	Velocity Modulation (VM) OFF/ON test
41	Re-initialise NVM
43	Select Dual A sound
44	Select Dual B sound
45	Select Mono sound
46	Select Stereo sound
48	Set NVM as non virgin
49	Set NVM as virgin
53	FM Overmodulation Enable/Disable
55	Tuner selection (SONY/ALPS)
59	Select Model 3 Scarts + PIP or 2 Scarts
68	Enable/Disable X26 countermeasure (N problem)
73	Enable Zweiton D/K2 system (6.5/6.74)
74	Enable Zweiton D/K3 system (6.5/5.74)
78	Balance full right
79	Balance full left
87	Local keys test
99	Display Error and Working Time menu

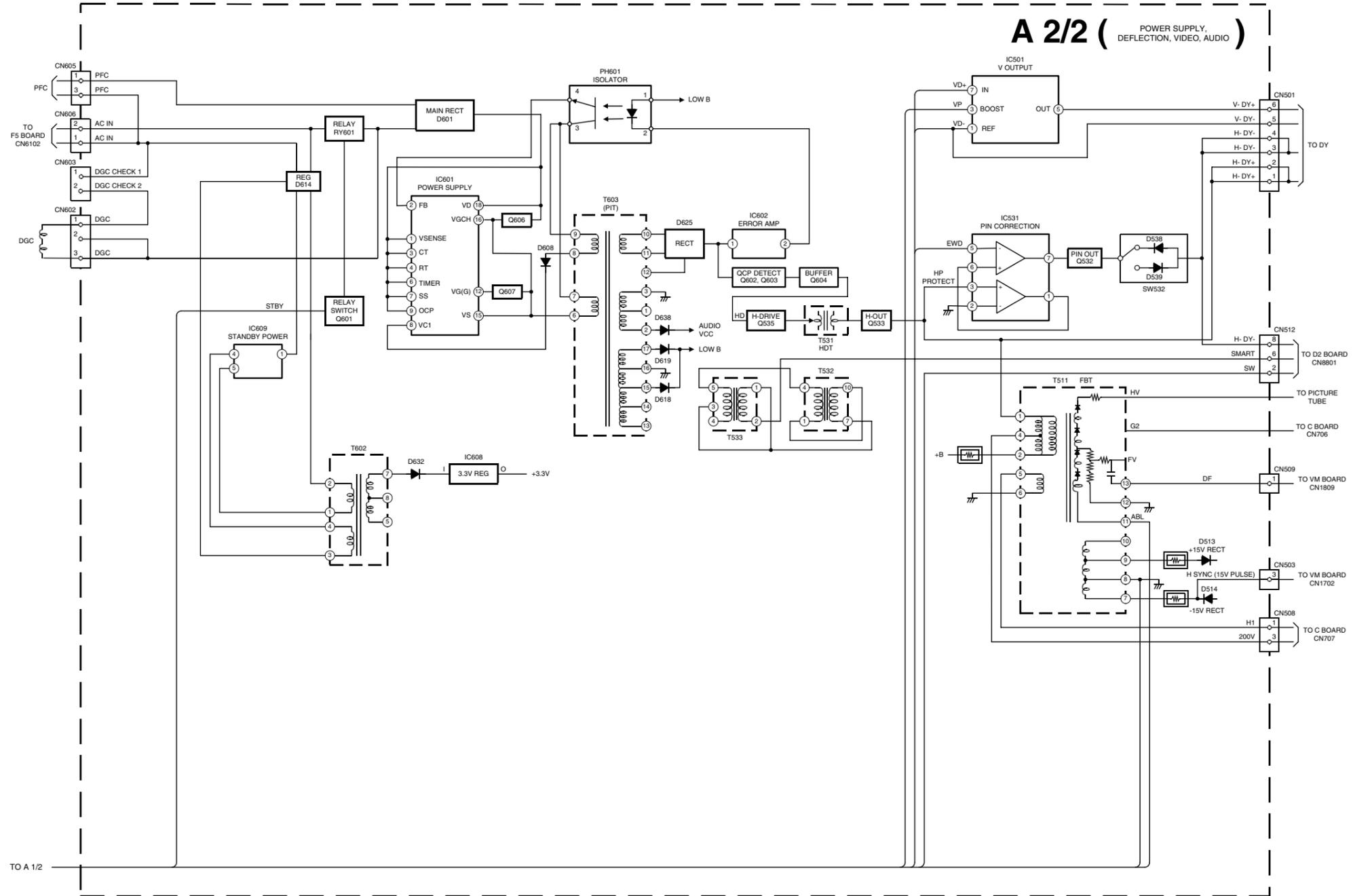
5-1. BLOCK DIAGRAMS (1)



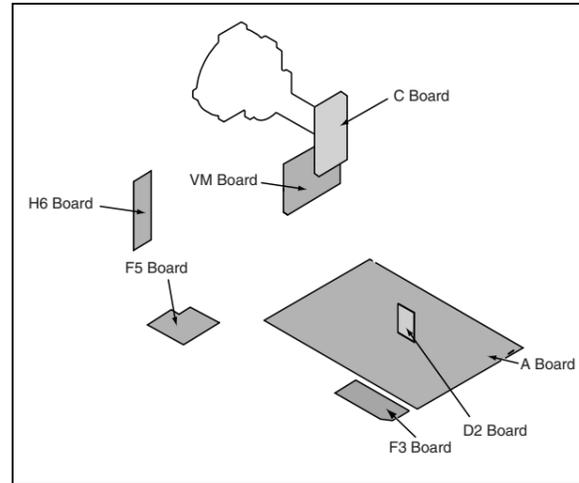
5-1. BLOCK DIAGRAMS (2)



5-1. BLOCK DIAGRAMS (3)



5-2. CIRCUIT BOARD LOCATION



5-3. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

Note :

- All capacitors are in μF unless otherwise noted.
- pF : μF 50WV or less are not indicated except for electrolytic types.
- Indication of resistance, which does not have one for rating electrical power, is as follows.

Pitch : 5mm
Electrical power rating : 1/4W

- Chip resistors are 1/10W
- All resistors are in ohms.
k = 1000 ohms, M = 1000,000 ohms
- : nonflammable resistor.
- : fusible resistor.
- : internal component.
- : panel designation or adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- All voltages are in Volts.
- Readings are taken with a 10Mohm digital multimeter.
- Readings are taken with a color bar input signal.
- Voltage variations may be noted due to normal production tolerances.
- : B + bus.
- : B - bus.
- : RF signal path.
- : earth - ground.
- : earth - chassis.

Reference Information

RESISTOR	RN	:	METAL FILM
	RC	:	SOLID
	FPRD	:	NON FLAMMABLE CARBON
	FUSE	:	NON FLAMMABLE FUSIBLE
	RS	:	NON FLAMMABLE METAL OXIDE
	RB	:	NON FLAMMABLE CEMENT
	RW	:	NON FLAMMABLE WIREWOUND
		:	ADJUSTMENT RESISTOR
COIL	LF-8L	:	MICRO INDUCTOR
CAPACITOR	TA	:	TANTALUM
	PS	:	STYROL
	PP	:	POLYPROPYLENE
	PT	:	MYLAR
	MPS	:	METALIZED POLYESTER
	MPP	:	METALIZED POLYPROPYLENE
	ALB	:	BIPOLAR
	ALT	:	HIGH TEMPERATURE
	ALR	:	HIGH RIPPLE

Note : The components identified by shading and marked Δ are critical for safety. Replace only with the part numbers specified in the parts list.

Note : Les composants identifiés par une trame et par une marque Δ sont d'une importance critique pour la sécurité. Ne les remplacer que par des pièces de numéro spécifié.

~ A Board IC Voltage Table~

Ref No	Pin No	Voltage (V)	Ref No	Pin No	Voltage (V)
IC001	1	0	IC001	67	4.8
	2	3.2		68	0.4
	3	2.9		69	0
	5	0		70	0
	6	2.0		71	0
	8	2.3		72	0
	9	8.0		73	7.1
	10	5.0		74	5.0
	12	0		75	8.1
	13	0		76	-3.5
	14	4.0		77	0
	16	1.4		78	3.2
	17	1.5		79	3.2
	18	0		80	0
	19	0		1	0.3
	20	3.8		3	-12.6
	21	3.8		5	0.2
	22	5.0		6	13.9
26	0	7	0.3		
28	3.5	1	1.4		
29	3.6	2	2.3		
30	1.9	3	1.8		
31	0.3	5	2.4		
32	3.6	6	1.6		
34	1.9	7	6.4		
35	1.4	1	-80.4		
36	3.9	2	-80.5		
38	1.8	3	-80.2		
40	3.3	4	-80.2		
42	3.3	5	-81.5		
43	1.4	6	-81.6		
45	0	7	-77.8		
46	0	9	-81.8		
47	3.6	10	-76		
48	2.8	11	-81.9		
49	2.3	12	-79.4		
50	0.2	14	16.5		
51	2.5	15	11		
52	2.5	16	14.4		
53	2.5	18	86.4		
54	2.1	1	11		
55	5.2	3	4.9		
56	3.0	5	0		
57	3.1	6	0		
58	3.1	7	11.3		
59	3.2	9	0.3		
62	0	10	0		
63	0	12	0		
64	0	14	11.35		
65	0				

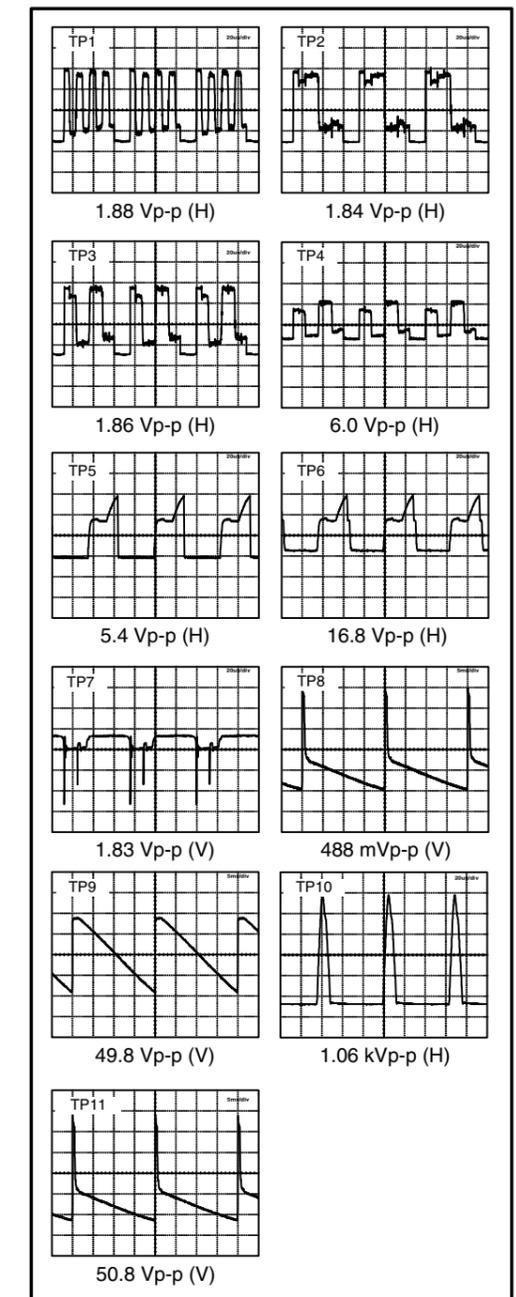
~ A Board Semiconductor Voltage Table ~

Ref	(e)	(b)	(c)	Ref	(e)	(b)	(c)
Q013	0	0.7	0	Q604	0	0	2.5
Q016	0	0	3.3	Q608	0	0	5.6
Q212	0	0.7	0	Q609	5.6	5.6	0
Q401	4.8	4.2	1.8				
Q411	1.1	1.7	4.2	Ref	(s)	(g)	(d)
Q601	5.6	4.8	5.3	Q606	10.9	14.5	86.7
Q602	14.2	5.1	8	Q607	-82.4	-79.9	10.9
Q603	8	8	0	Q535	0	2.5	95.2

~ A Board Difference Table 1~

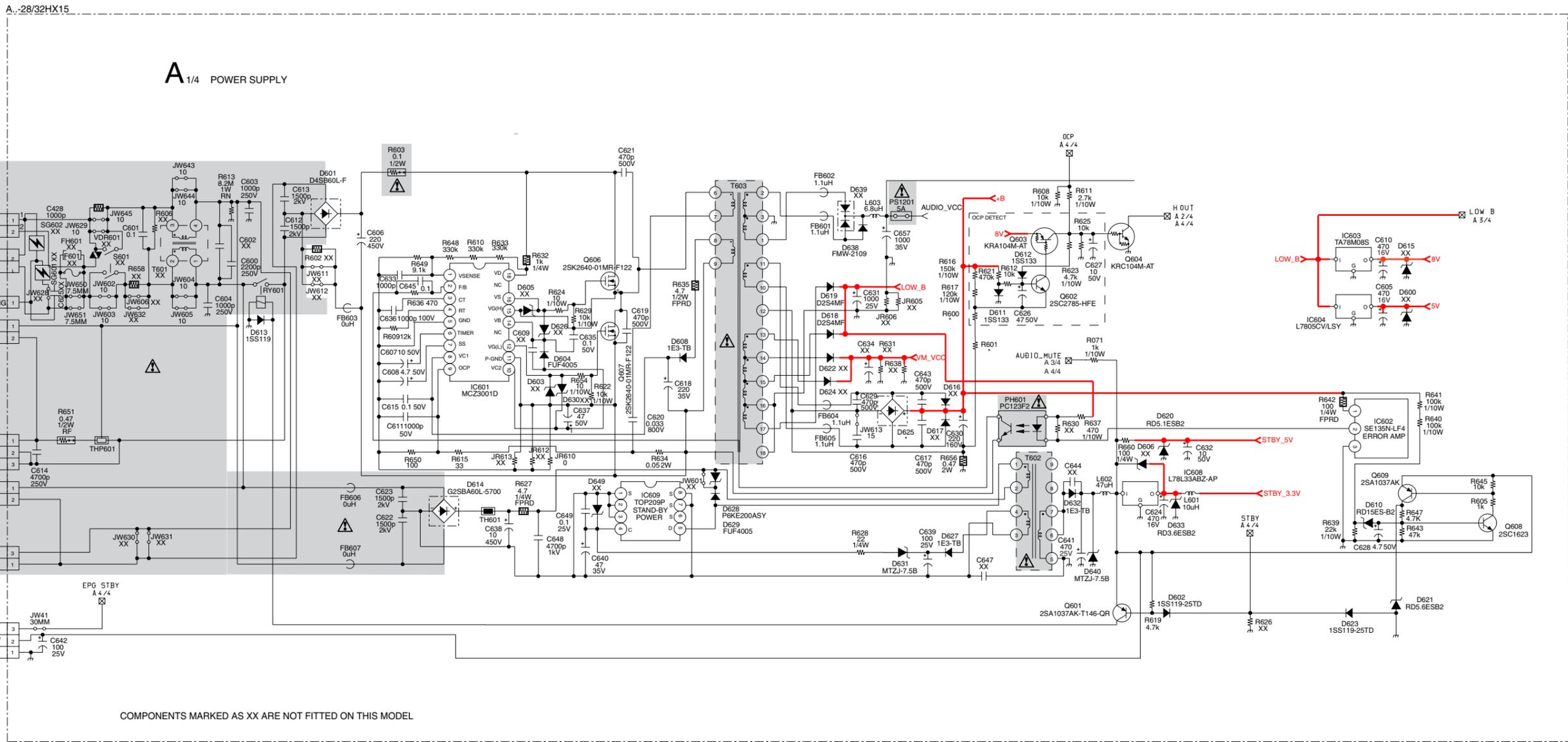
Ref	KV-28HX15	KV-32HX15
C508	0.047UF 50V	NOT FITTED
C542	0.001UF 10% 2KV	680PF 10% 2KV
C555	17000PF 3% 1.2KV	18000PF 3% 1.2KV
C570	2.2UF 20% 50V	NOT FITTED
C582	150PF 5% 50V	47PF 5% 50V
CLP000-1	NOT FITTED	PIN (45) WIRE
CN503	NOT FITTED	PLUG 3P
D535	EU-2	GP08D
D538	EU-2	GP08D
D625	FBIU4D7M1-B-4	D4SBL20UF1
L405	NOT FITTED	LEAD, JUMPER 5MM
L406	NOT FITTED	LEAD, JUMPER 5MM
L504	NOT FITTED	LEAD, JUMPER 5MM
Q570	2SC2412K-T-146-R	NOT FITTED
JR101	NOT FITTED	SHORT CHIP 0
R022	47K 5% 1/10W	39K 0.5% 1/10W
R034	1M 5% 1/10W	2.2M 5% 1/10W
R053	15K 5% 1/10W	82K 5% 1/10W
R455	SHORT CHIP 0	4.7UH
R505	6.8K 0.5% 1/10W	8.2K 0.5% 1/10W
R508	8.2K 0.5% 1/10W	10K 0.5% 1/10W
R513	220K 5% 1/10W	1M 5% 1/10W
R516	56K 1% 1/2W	47K 1% 1/2W
R517	18K 1% 1/4W	27K 1% 1/4W
R518	2.7K 5% 1/10W	6.8K 5% 1/10W
R521	220K 5% 1/10W	1M 5% 1/10W
R532	8.2K 5% 1/10W	4.7K 5% 1/10W
R534	100K 5% 1/10W	1M 5% 1/10W
R535	560K 5% 1/10W	390K 5% 1/10W
R538	100 5% 3W	200 5% 3W
R539	NOT FITTED	LEAD, JUMPER 17.5MM
R541	SHORT CHIP 0	NOT FITTED
R542	1M 5% 1/10W	NOT FITTED
R547	NOT FITTED	LEAD, JUMPER 7.5MM
R548	3.3 5% 1/4W	NOT FITTED
R549	NOT FITTED	LEAD, JUMPER 7.5MM
R561	680K 5% 1/10W	NOT FITTED
R562	39K 0.5% 1/10W	NOT FITTED
R569	10K 5% 1/10W	NOT FITTED
R570	1K 5% 1/10W	NOT FITTED
R571	270 5% 1/10W	NOT FITTED
R572	390 5% 1/10W	NOT FITTED
R600	390 0.5% 1/10W	120 0.5% 1/10W
R601	470 0.5% 1/10W	680 0.5% 1/10W
R1239	NOT FITTED	220 5% 3W

~ A Board Waveforms ~

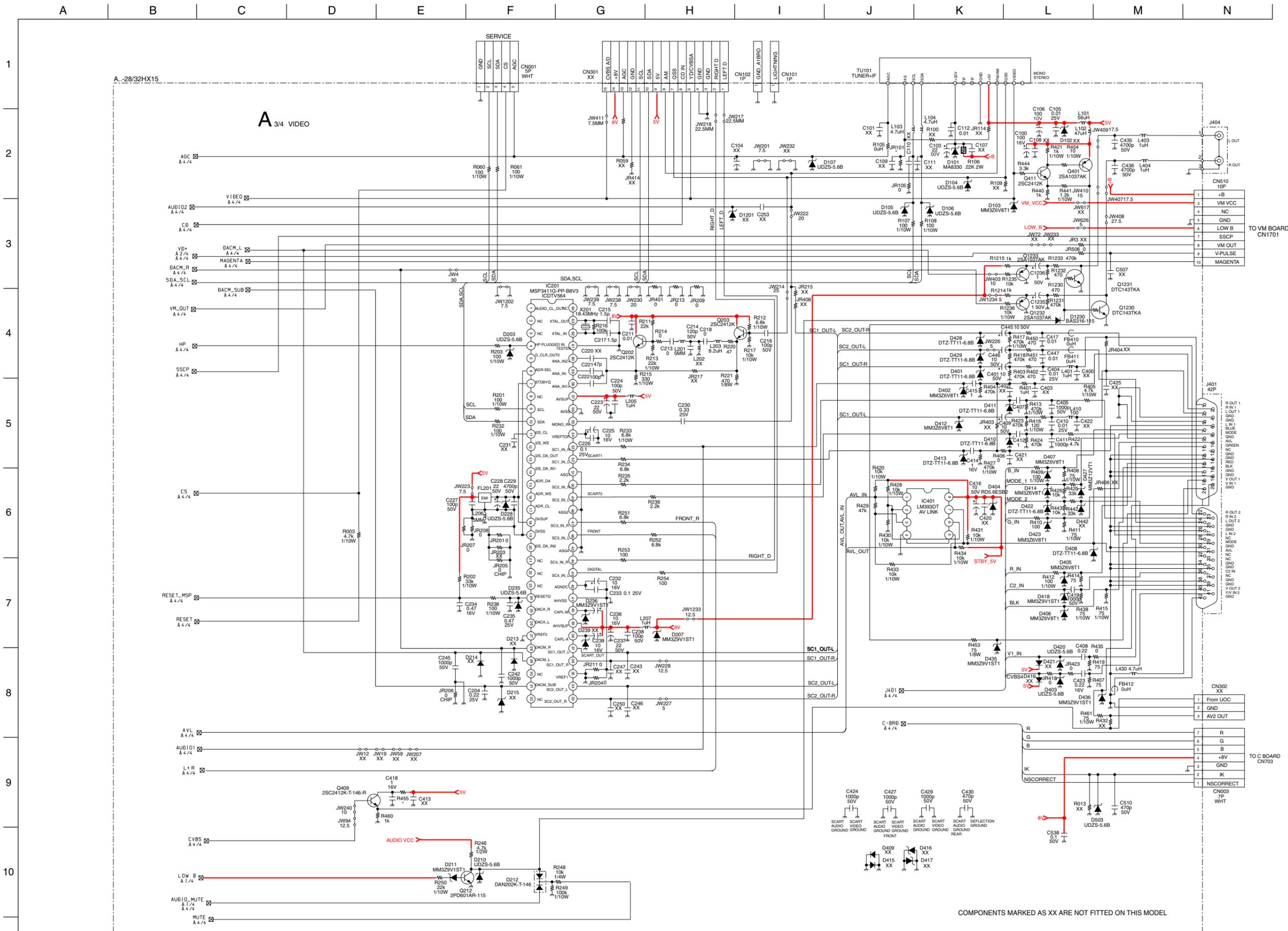


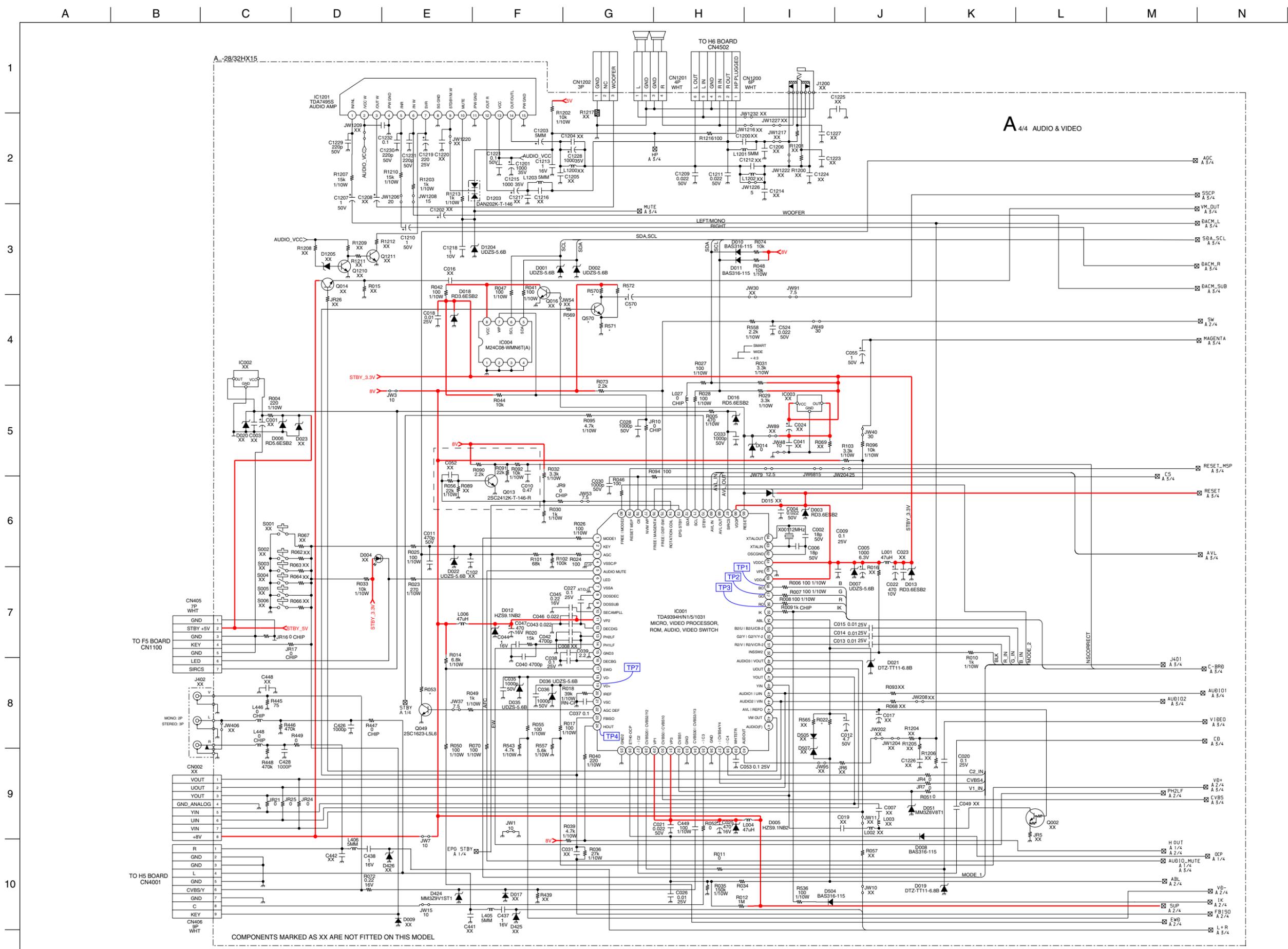
~ A Board Difference Table 2~

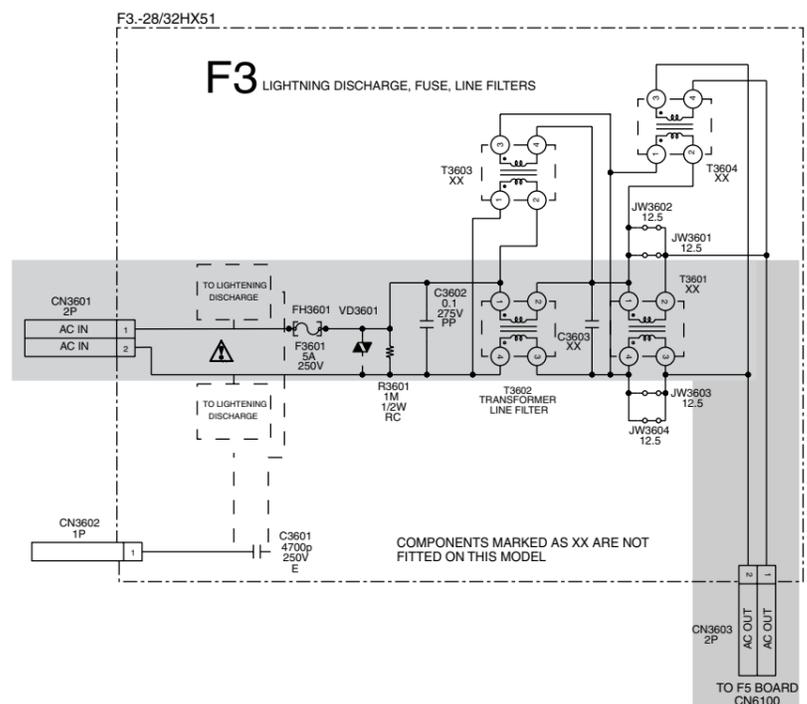
Ref	KV-28HX15B	KV-28HX15E	KV-28HX15U
TU101	1-693-555-14 FRONTEND (TUNER+IF)	1-693-556-14 FRONTEND (TUNER+IF)	1-693-557-14 FRONTEND (TUNER+IF)



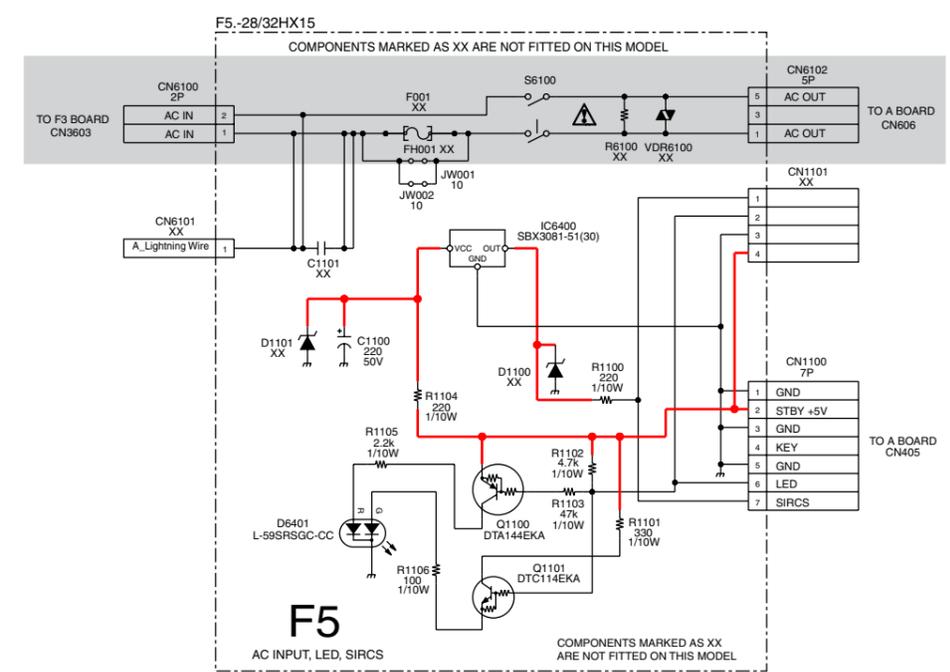
COMPONENTS MARKED AS XX ARE NOT FITTED ON THIS MODEL



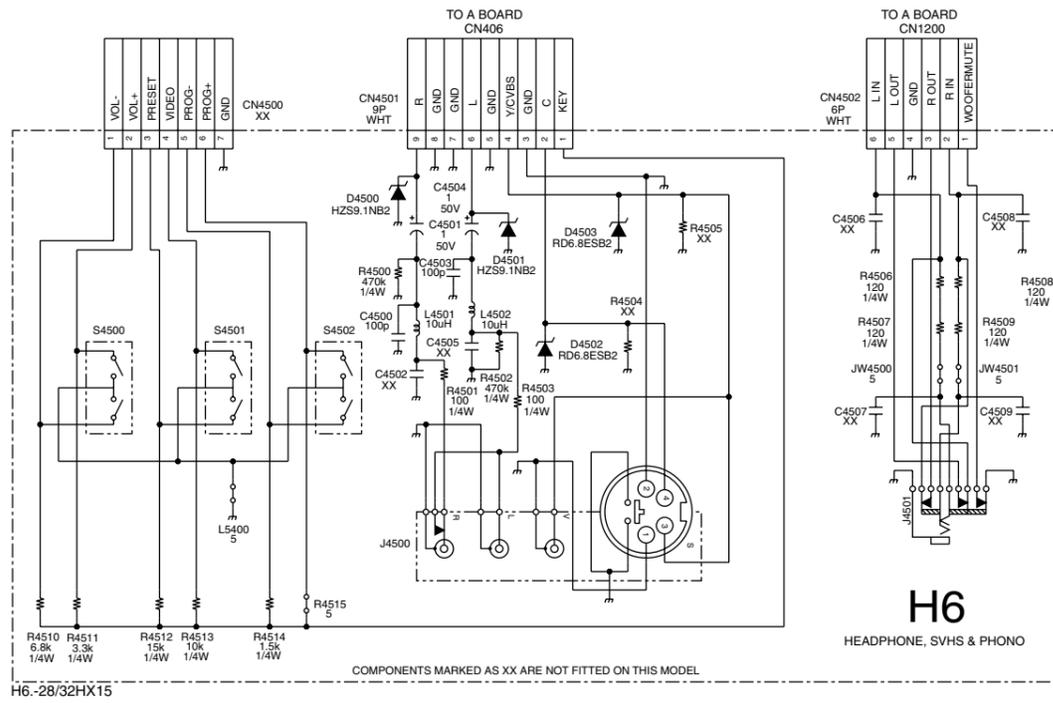




~ F3 Board Schematic Diagram [Lightning Discharge, Fuse, Line Filters] ~



~ F5 Board Schematic Diagram [AC Input, LED, SIRCS] ~



~ H6 Board Schematic Diagram [Headphone, SVHS & Phono] ~

~ C Board Semiconductor Voltages ~

Ref	Anode	Cathode	Ref	Anode	Cathode	Ref	Anode	Cathode
D701	0.7	0	D706	131.8	199.4	D710	0	2.6
D702	154.4	199.4	D707	136.7	199.4	D1801	0	8.0
D703	0	0	D708	0	3.1	D1802	0	3.8
D705	0	0.7	D709	0	3.0	D1803	0	4.2

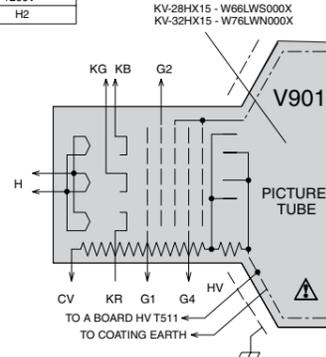
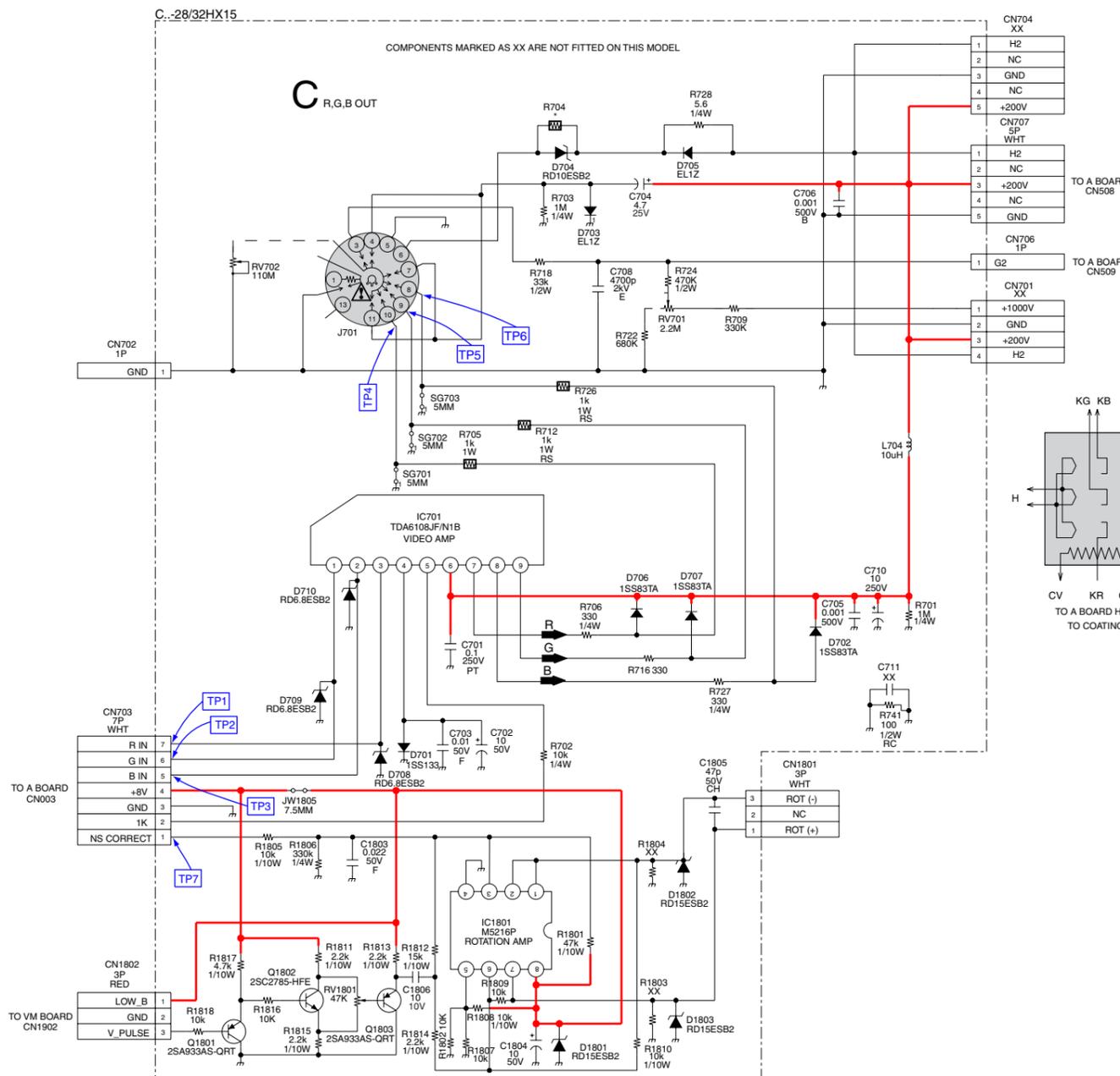
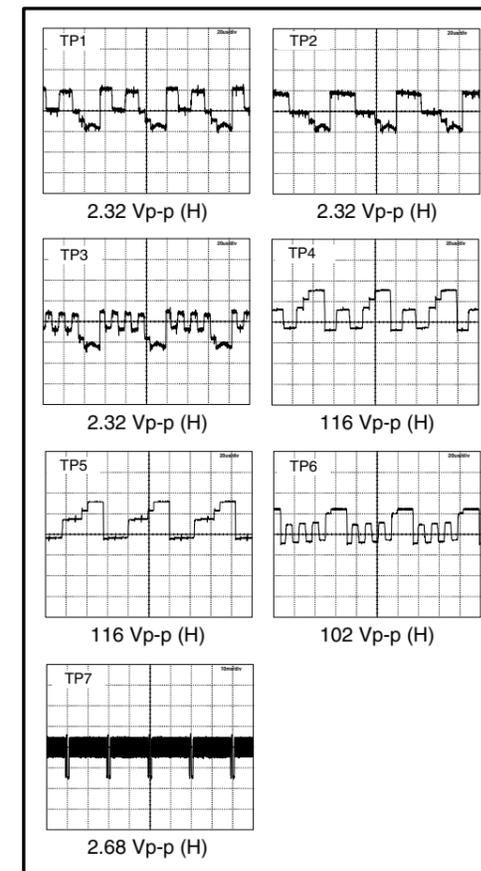
~ C Board Difference Table ~

Ref	KV-28HX15	KV-32HX15
R704	0.22 5% 2W	LEAD, JUMPER 15MM

~ C Board IC Voltages ~

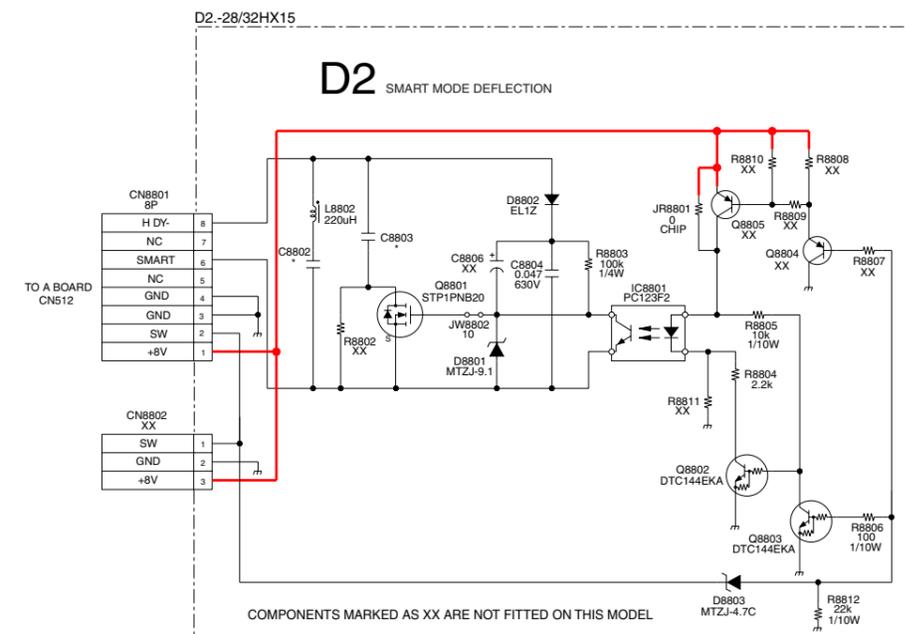
Ref No	Pin No	Voltage (V)	Ref No	Pin No	Voltage (V)
IC701	1	3.0	IC1801	1	3.8
	2	2.6		2	3.8
	3	3.1		3	3.8
	4	0.7		4	0
	5	6.3		5	4.0
	6	199		6	4.0
	7	133.5		7	4.2
	8	154.4		8	8.0
	9	136.2			

~ C Board Waveforms ~



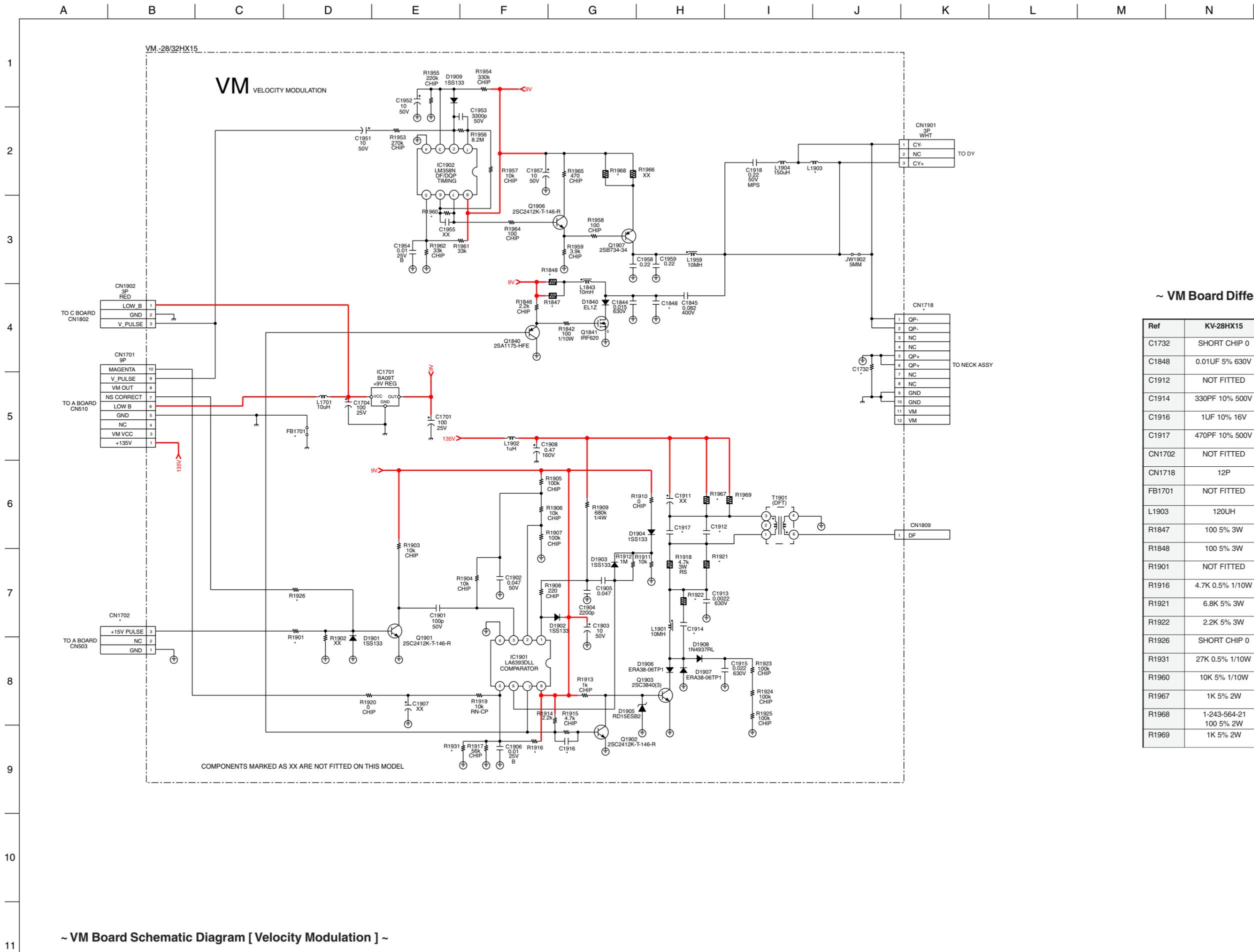
~ D2 Board Difference Table ~

Ref	KV-28HX15	KV-32HX15
C8802	0.12UF 5% 250V	0.1UF 5% 400V
C8803	0.033UF 5% 250V	30000PF 3% 1.2KV



~ C Board Schematic Diagram [R-G-B Out] ~

~ D2 Board Schematic Diagram [Smart Mode Deflection] ~



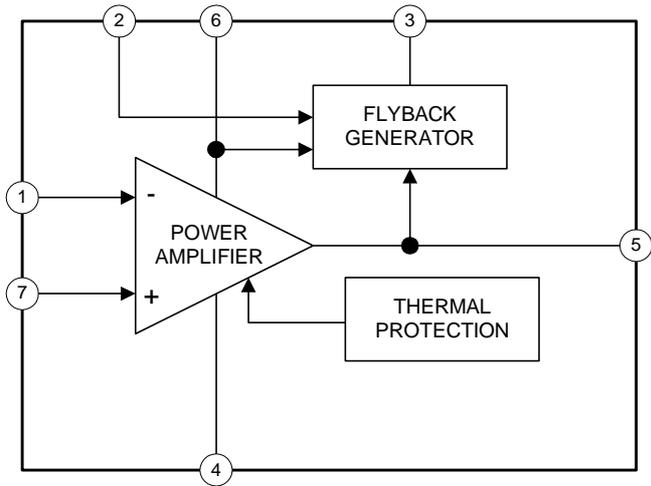
~ VM Board Difference Table ~

Ref	KV-28HX15	KV-32HX15
C1732	SHORT CHIP 0	0.01UF 10% 25V
C1848	0.01UF 5% 630V	0.0047UF 5% 630V
C1912	NOT FITTED	100PF 10% 500V
C1914	330PF 10% 500V	220PF 10% 500V
C1916	1UF 10% 16V	470PF 10% 50V
C1917	470PF 10% 500V	330PF 10% 500V
CN1702	NOT FITTED	3P
CN1718	12P	8P
FB1701	NOT FITTED	LEAD, JUMPER 5MM
L1903	120UH	47UH
R1847	100 5% 3W	56 5% 3W
R1848	100 5% 3W	56 5% 3W
R1901	NOT FITTED	47K 5% 1/10W
R1916	4.7K 0.5% 1/10W	3.9K 0.5% 1/10W
R1921	6.8K 5% 3W	4.7K 5% 3W
R1922	2.2K 5% 3W	1.5K 5% 3W
R1926	SHORT CHIP 0	NOT FITTED
R1931	27K 0.5% 1/10W	18K 0.5% 1/10W
R1960	10K 5% 1/10W	6.8K 0.5% 1/10W
R1967	1K 5% 2W	820 5% 2W
R1968	1-243-564-21 100 5% 2W	1-215-886-11 100 5% 2W
R1969	1K 5% 2W	820 5% 2W

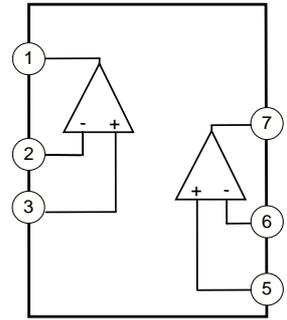
~ VM Board Schematic Diagram [Velocity Modulation] ~

5-5. IC BLOCK DIAGRAMS

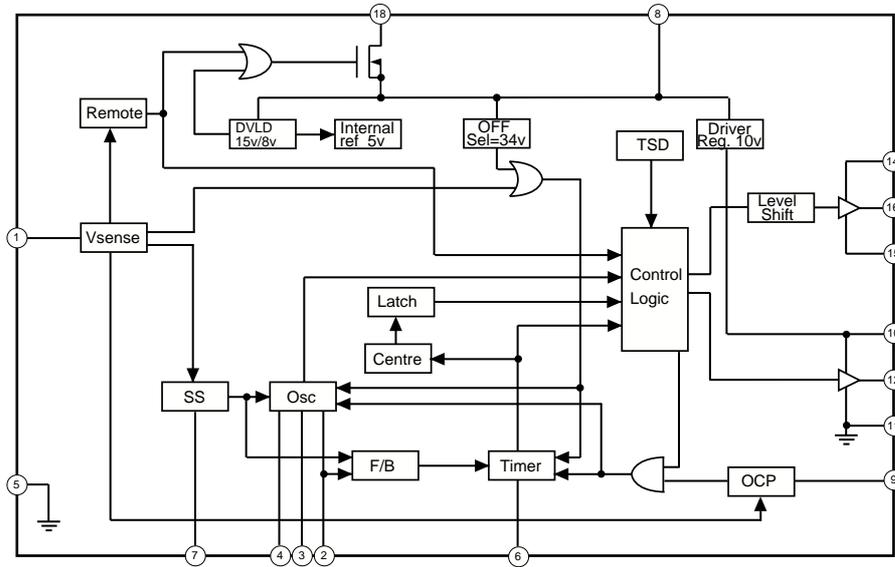
A BOARD IC501 STV9379A



A BOARD IC401/IC531 LM393DT



A BOARD IC601 MCZ3001D



A BOARD IC1201 TDA7495S

