

Service Manual

AVR200

Issue 1.0

DiVA AVR200 Surround Sound Receiver

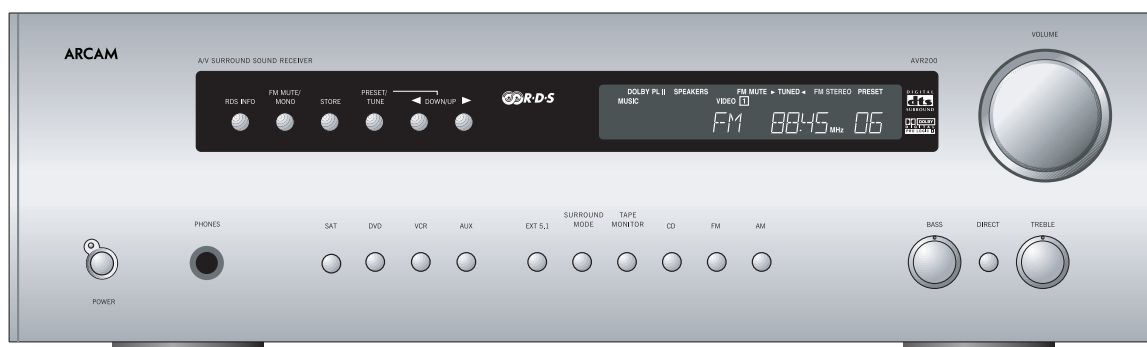


ARCAM

ARCAM

SERVICE MANUAL

AVR200 **SURROUND SOUND RECEIVER**



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SPECIFICATION

POWER AMPLIFIER AND PREAMPLIFIER SECTION

Rated distortion	(THD 20Hz-20 kHz FL/C/FR)	≤ 0.08%
	(THD 20Hz-20 kHz SL/SR)	≤ 0.3%
Input Sensitivity	(ref. 8 ohms, 1 kHz)	180+/-30 mV
S/N Ratio	(A-wtd, 1kHz, 1W, 8 ohm)	≥ -75 dB
	(A-wtd, 1kHz, 80W, 8 ohm)	≥ 92 dB
	FL/FR/C SL/SR	≥ -90 dB
Frequency Response	(20 Hz - 20 kHz)	0 ± 0.8 dB
Channel Balance	(1 dB to -40 dB, 1 kHz)	≤ 2 dB
	(-41 dB to -50 dB, 1 kHz)	≤ 3 dB
Audio muting at 1kHz		≥ 53 dB
Headphone O/P in 0.1%, 600 ohm load, CD in 500mV, 1 kHz		≥ 10V
Subwoofer out, 500mV in	(THD at 2V O/P, 100 Hz)	≥ 0.5%
	(S/N at 2V O/P, 100 Hz)	≥ 80 dB
Crosstalk	(2V input, 10W, 1 kHz)	> -68 dB
Continuous average power output (L/R/C RL/RR 8ohms)		80 W

Controls

Bass	(at 500mV in, 1W out, 100 Hz)	± 9 dB
Treble	(at 500mV in, 1W out, 10 kHz)	± 9 dB

SURROUND SECTION

Channel separation

I/p mode : L, R	: 1V in, 1 kHz, Ch R, L	≥ 45 dB
	: o/p at unexpected, 1 kHz, Ch C	≥ 35 dB
I/p mode : L= -R	: 1V in, 1 kHz, Ch R, L	≥ 28 dB
	: o/p at unexpected, 1 kHz, Ch C	≥ 30 dB
I/p mode : L= R	: 1V in, 1 kHz, Ch R, L	≥ 45 dB
	: o/p at unexpected, 1 kHz, Ch SL, SR	≥ 30 dB

Frequency Response

I/p mode : L, R	: 1V in, 1W, Ch R, L	40Hz	0 ± 1.5 dB
		20kHz	0 ± 0.8 dB
I/p mode : L= R	: 1V in, 1W, Ch C	300Hz	0 ± 0.8 dB
		20kHz	0 ± 0.8 dB
I/p mode : L= -R	: 1V in, 1W, Ch SL, SR	30Hz	0 ± 1.0 dB
		6.5kHz	-3 ± 1.0 dB

S/N Ratio (200mV in, 1, A-WTD w/ 1k termination)

I/p mode : L, R	: 1 kHz, Ch L, R	≥ 65 dB
I/p mode : L=R	: 1 kHz, Ch C	≥ 65 dB
I/p mode : L=-R	: 1 kHz, Ch SL, SR	≥ 65 dB
THD (2.2V in, 1W, w/ 80 kHz LPF, 1 kHz)		≤ 0.2%

AC-3/DTS SECTION

Frequency Response

FL, FR, C, SL, SR:	200Hz	0 ± 0.8 dB
	20kHz	0 ± 0.8 dB
Distortion 1W all channels		0.08%
S/N 1 W (CCIR/ARM, 200 Hz NOTCH & 400 Hz HPF)	≥ 85 dB	

PROLOGIC II AUDIO

Center Width Control (Use track 2 from PLII Audio Test CD ver1.0)

Step	L/R	C	Step	L/R	C
0	≤-31dB	0.0dB	5	-4.1dB	-6.6dB
1	-12dB	-0.6dB	6	-3.6dB	-9.0dB
2	-9.6dB	-1.1dB	7	-3.0dB	≤-31dB
3	-7.6dB	-1.8dB			
4	-4.8dB	-4.6dB			

Dimension Control (Use track 1 and 3 from PLII Audio Test CD ver1.0)

Step	C	SL	SR	Step	C	SL	SR
-3	≤-31dB	-7.8dB	≤-31dB	1	-20.4dB	≤-31dB	≤-31dB
-2	≤-31dB	-11.5dB	≤-31dB	2	-14.0dB	≤-31dB	≤-31dB
-1	≤-31dB	-19.5dB	≤-31dB	3	-11.5dB	≤-31dB	≤-31dB
0	≤-30dB	≤-31dB	≤-31dB				

AM TUNER SECTION

Input level is expressed as the reading in open-circuit of 75-ohm source impedance signal generator

Usable sensitivity (999/1000kHz)

≤ 30 dBμ

S/N Ratio (5mV in)

≥ 38 dB

THD (5mV in)

≤ 3%

IF Rejection (450 kHz)

≥ 36 dB

Image Rejection (F+2xIF)

≥ 28 dB

Selectivity

≥ 17 dB

Output

130+/- 20mV

Loop sensitivity (20dB S/N)

999/1000 kHz

≤ 66 dB

603/600 kHz

≤ 66 dB

1404/1400 kHz

≤ 66 dB

Frequency response (100 - 2.3 kHz, 5mV)

± 6 dB

FM TUNER SECTION

Input level is expressed as the reading in open-circuit of 75-ohm source impedance signal generator

Usable Sensitivity (98 MHz)

***C**

***AH**

Signal / Noise Ratio

Mono

≤ 15 dBμ

≤ 15 dBμ

(60 dBμ, IHF wtd)

Stereo

≥ 72 dB

≥ 72 dB

Frequency Response (20 Hz - 15 kHz, 60 dBμ)

≥ 66 dB

≥ 66 dB

Channel Separation (60 dBμ)

100 Hz

0 ± 1.5 dB

0 ± 1.5 dB

1 kHz

≥ 30 dB

≥ 30dB

10 kHz

≥ 38 dB

≥ 38 dB

≥ 30 dB

≥ 30 dB

Alternate Channel Selectivity

(40 dBμ, ±400 kHz)

≥ 60 dB

≥ 45 dB

Capture Ratio (40 dBμ)

≤ 3 dB

≤ 3 dB

AM Suppression

(60 dBμ, 100% Mod.FM, 30% Mod.AM)

≥ 48 dB

≥ 48 dB

Image Rejection (119.4 MHz)

≥ 85 dB

≥ 40 dB

I.F. Rejection (10.7 MHz)

≥ 78 dB

≥ 65 dB

Pilot Suppression (60 dBμ)

≥ 60 dB

≥ 60 dB

THD (60 dBμ, L=R 75 kHz for AH, 40 kHz Dev for C)

Mono

≤ 0.25%

≤ 0.25%

Stereo

≤ 0.35%

≤ 0.35%

Auto-Search Sensitivity

On

≥ 24 dBμ

≥ 24 dBμ

Off

≤ 15 dBμ

≤ 15 dBμ

RDS decode Sensitivity

≤ 26 dBμ

≤ 26 dBμ

PHYSICAL SPECIFICATIONS

Dimensions (Width x Height x Depth)

422 x 132 x 290mm

Net weight

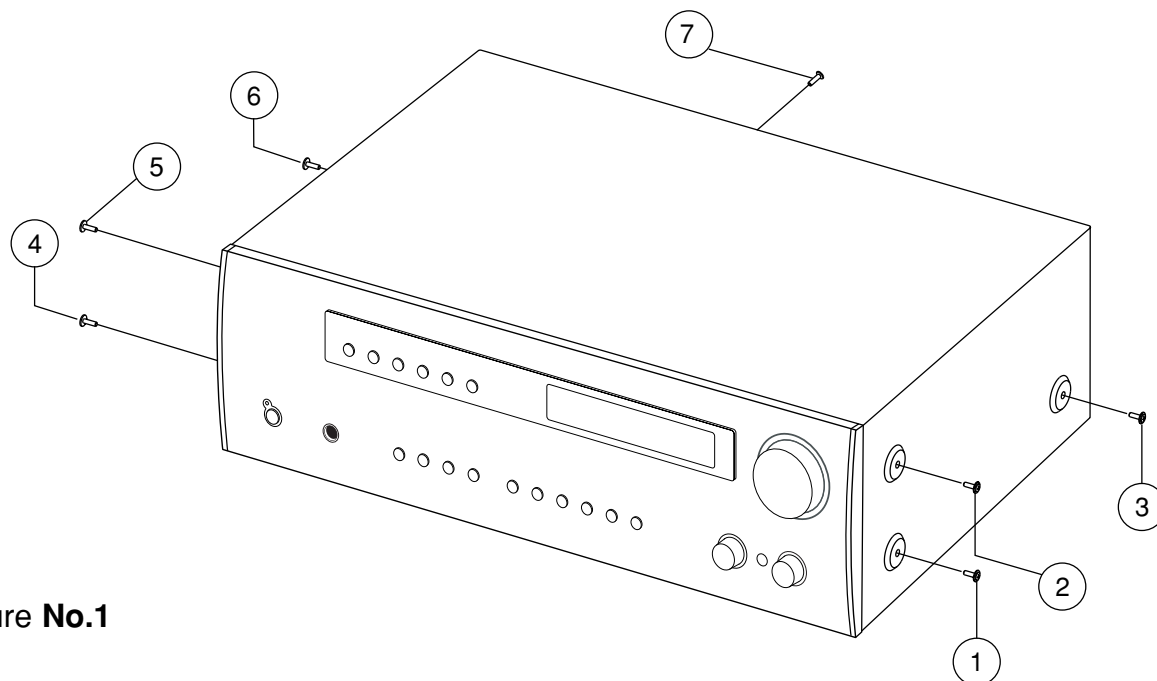
14kg (31 lbs)

Shipping weight

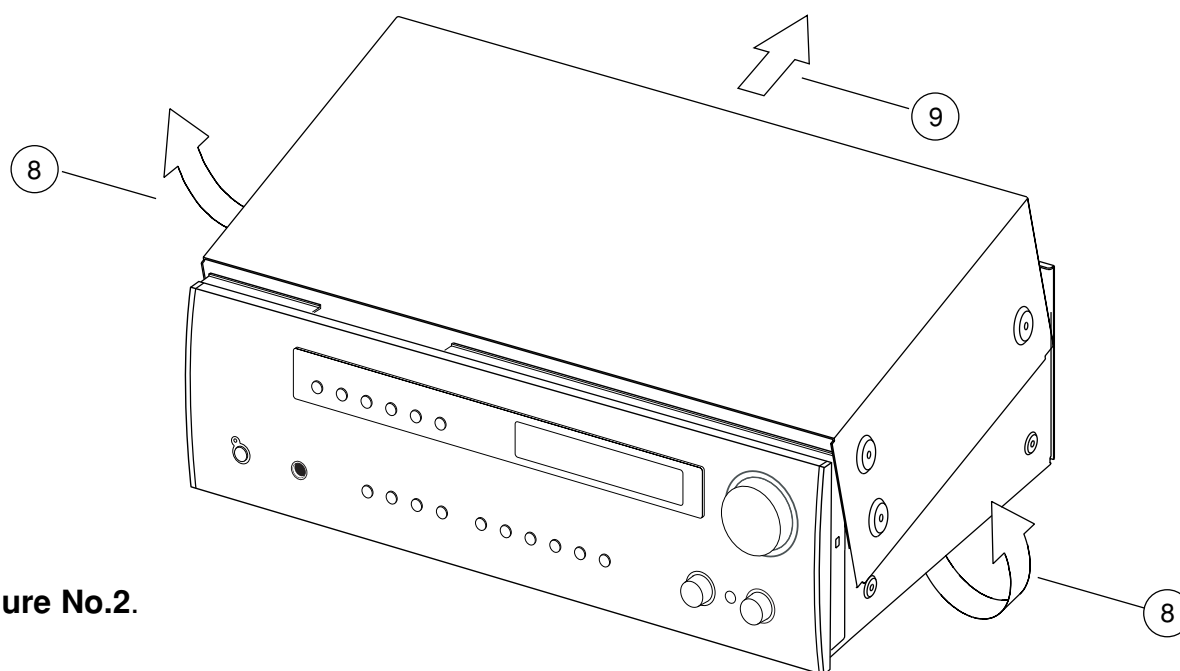
16.7kg (37 lbs)

DISASSEMBLY INSTRUCTIONS

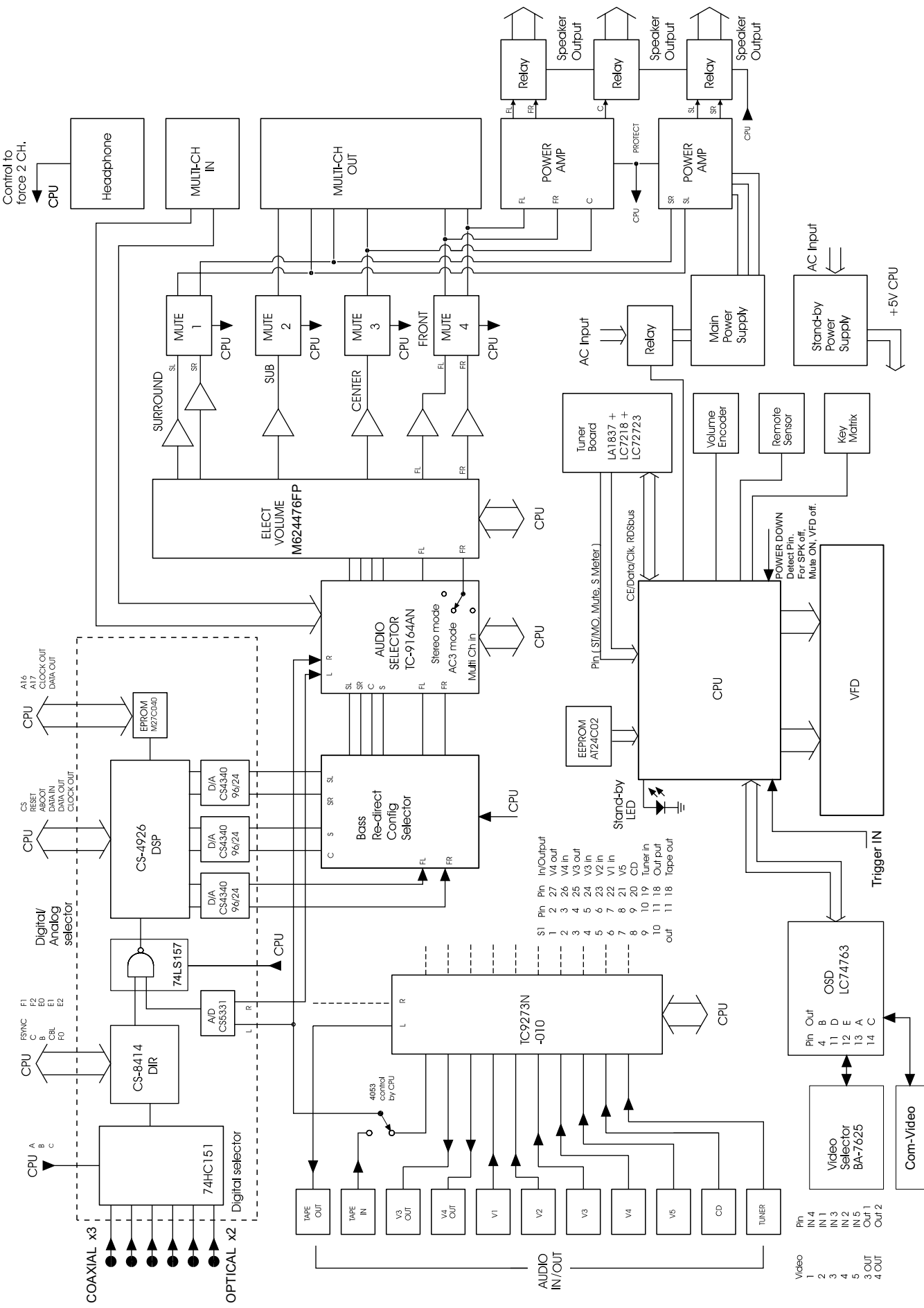
1. Remove machine screws M 4.0 x 6.0 (① to ⑥) from the side panels.
Remove tapping screw 3.0 x 8.5 (⑦) from the back panel.
Refer to **Figure No.1**.

**Figure No.1**

2. Pull both sides of the TOP COVER slightly outwards (⑧) and tilt approx. 35° and then remove in the direction as indicated by the arrow (⑨). Refer to **Figure No.2**.

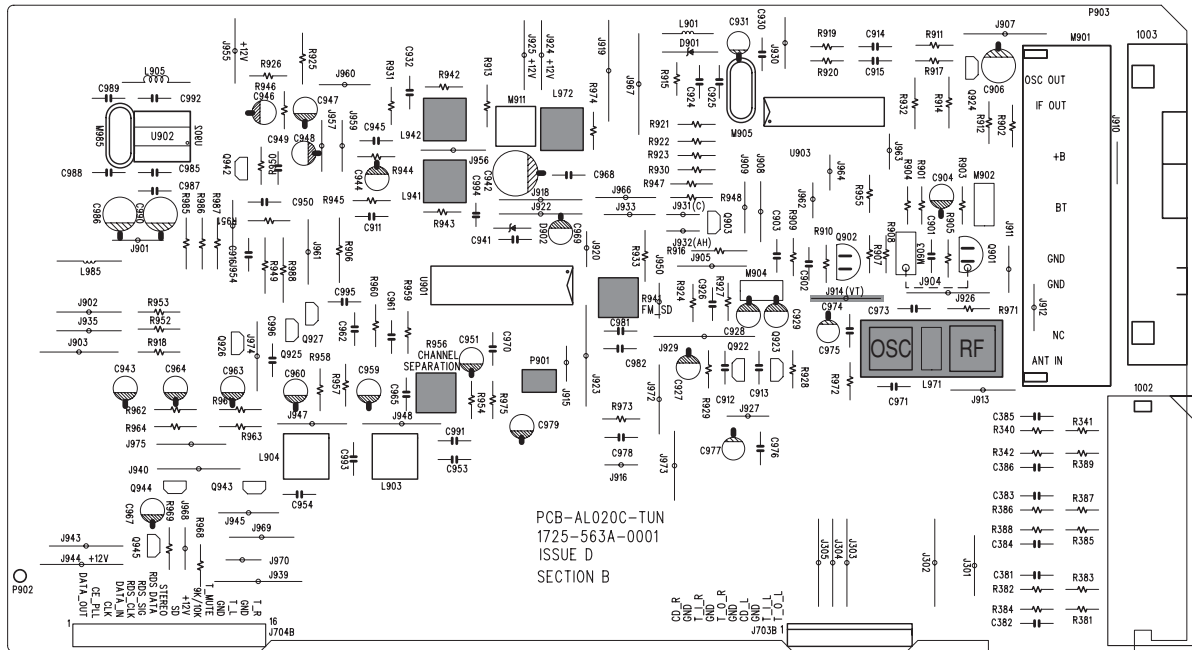
**Figure No.2.**

BLOCK DIAGRAM

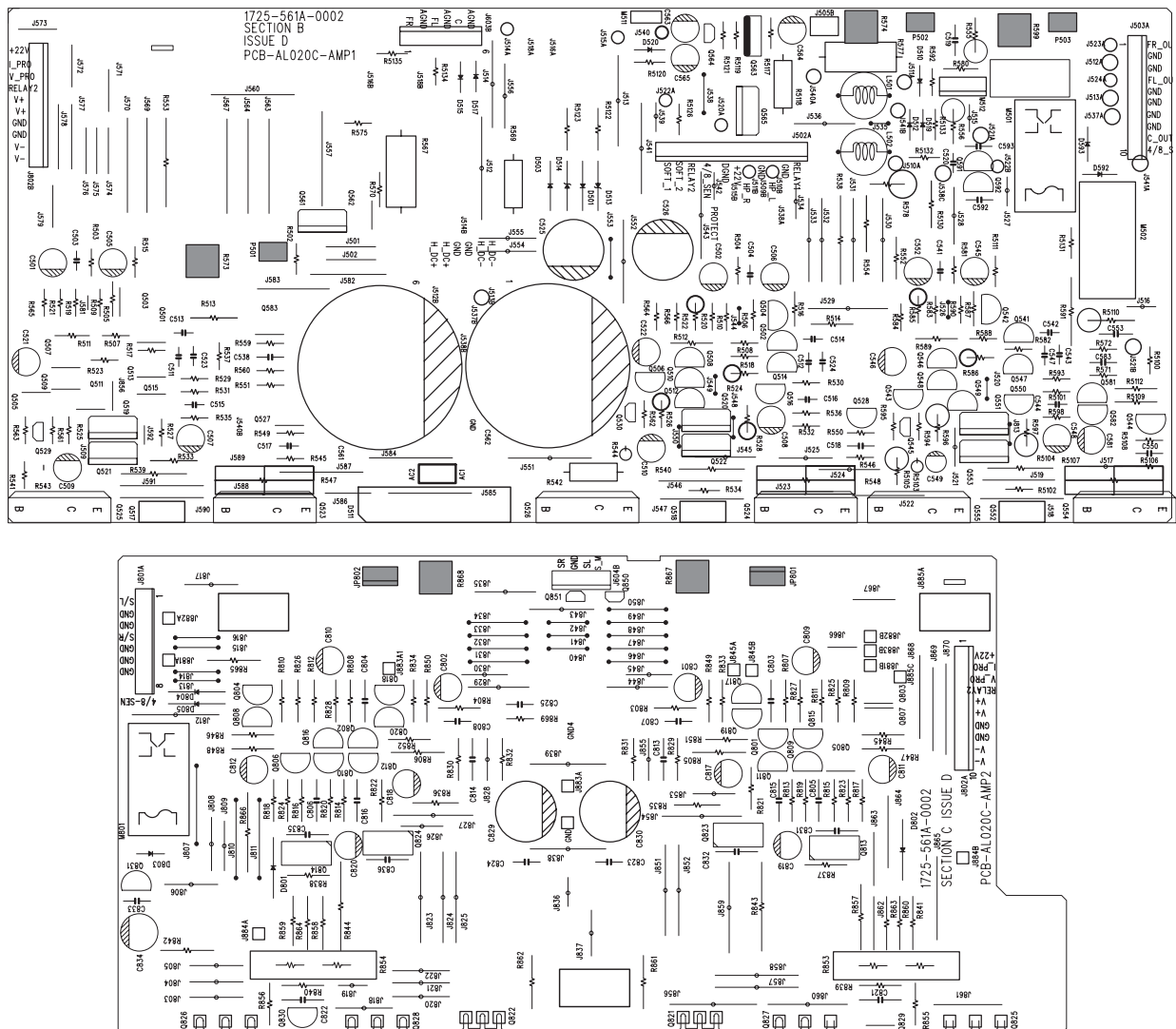


ADJUSTMENT POINTS DIAGRAM

1. TUNER



2. IDLE CURRENT - Front Amplifier & Surround Amplifier Board



INSTRUMENT SETUP

1. FM MEASUREMENT

Fig. 1

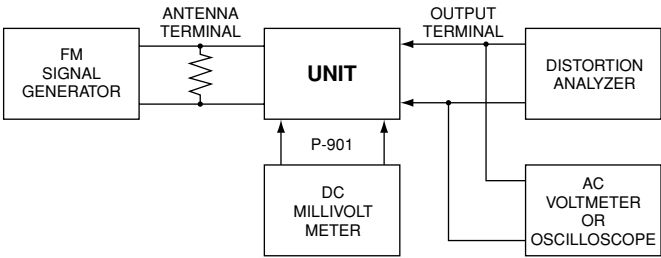
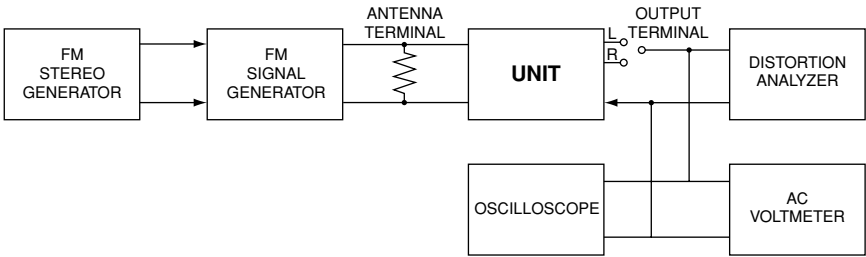
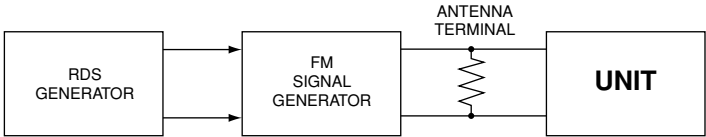


Fig. 2



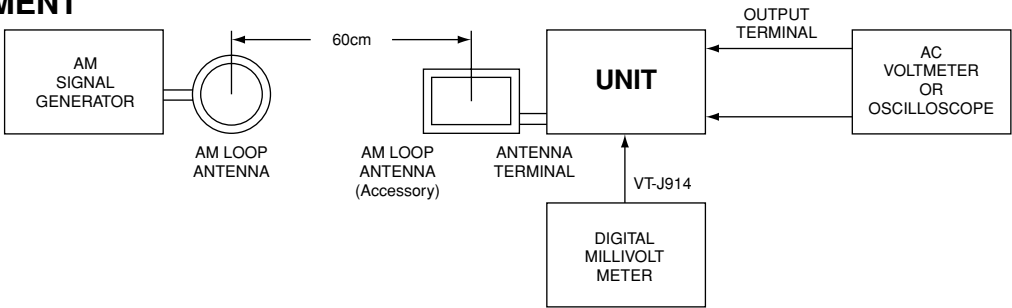
2. RDS MEASUREMENT

Fig. 3



3. AM MEASUREMENT

Fig. 4



ALIGNMENT PROCEDURES

AMPLIFIER SECTION

Idle Current

Step	Item	Connection	Adjustment	Adjust for
1	Front Left Channel	Voltmeter to P502 on Front Amp Board	R574	2mV±0.2mV
2	Front Right Channel	Voltmeter to P501 on Front Amp Board	R573	2mV±0.2mV
3	Center Channel	Voltmeter to P503 on Front Amp Board	R599	2mV±0.2mV
4	Rear Left Channel	Voltmeter to JP801 on Surround Amplifier Board (PCB N0901C-AMP2)	R867	2mV±0.2mV
5	Rear Right Channel	Voltmeter to JP802 on Surround Amplifier Board (PCB N091C-AMP2)	R868	2mV±0.2mV

FM/RDS SECTION

- FM mono: 1kHz, 75kHz devi., 60dB/μV
- FM stereo: 1kHz, 67.5kHz devi., 60dB/μV
- Pilot signal 19kHz 7.5kHz devi.

OUTPUTS

- Connect the non-inductive type resistor of 8 ohms to the all speaker terminals unless otherwise noted.

Item	Step	Connection of instrument	FM SG output	Stereo modulator output	Tuning frequency	Output indicator	Adjustment point	Adjust for	Remarks
FM IF/RF	1	Fig.1	99.0MHz 1kHz 75kHz devi. 65dBf (60dB)	—	99.0MHz	DC voltmeter	L941	0±100mV	FM MUTE/MODE switch: ON/AUTO Repeat the steps 1 to 3 until no further adjustment is necessary.
	2					AC voltmeter	IFT on the front end	Maximum	
	3					Distortion analyzer	L942	Minimum	
Stereo Distortion		Fig.2	99.0MHz Ext. mod. 65dBf (60dB)	Channel L or R 1kHz	99.0MHz	Distortion analyzer	IFT on the front end	Minimum	FM MUTE/MODE switch: ON/AUTO Don't turn more than +/-180°
Stereo Separation		Fig.2	99.0MHz Ext. mod. 65dBf (60dB)	Channel L or R 1kHz	99.0MHz	Oscilloscope	R956	Maximum separation	Repeat stereo distortion and stereo separation alignment until THD at minimum and separation at maximum.
Muting Level		Fig.1	99.0MHz 18dB	—	99.0MHz	Oscilloscope	R941	Signal output	
RDS		Fig.3	99.0MHz Ext. mod. 65dBf(60dB) RDS 2% MOD	—	99.0MHz	—	—	—	Decode the RDS-Program Station.

AM SECTION

AM Modulation: 400Hz, 30%

Step	AM SG output	Tuning frequency	Output indicator	Adjustment point	Adjust for
1	—	522kHz or 531kHz	Digital DC voltmeter	OSC coil on RF block L971	1.3±0.2V (522kHz) 1.35±0.2V (531kHz)
2	600kHz 400Hz 30% mod. 60dB/m	603kHz	AC voltmeter	RF coil on RF block L971	Maximum
3	600kHz 400Hz 30% mod. 60dB/m	999kHz	AC voltmeter	L972	Maximum

IMPORTANT NOTES

1. Show the software version

Press "DISPLAY", "5.1 INPUT" and "VIDEO 4".

2. Toggle between PAL and NTSC

Press "MEMORY" and "VIDEO 1".

3. Light up all the icon on the VFL.

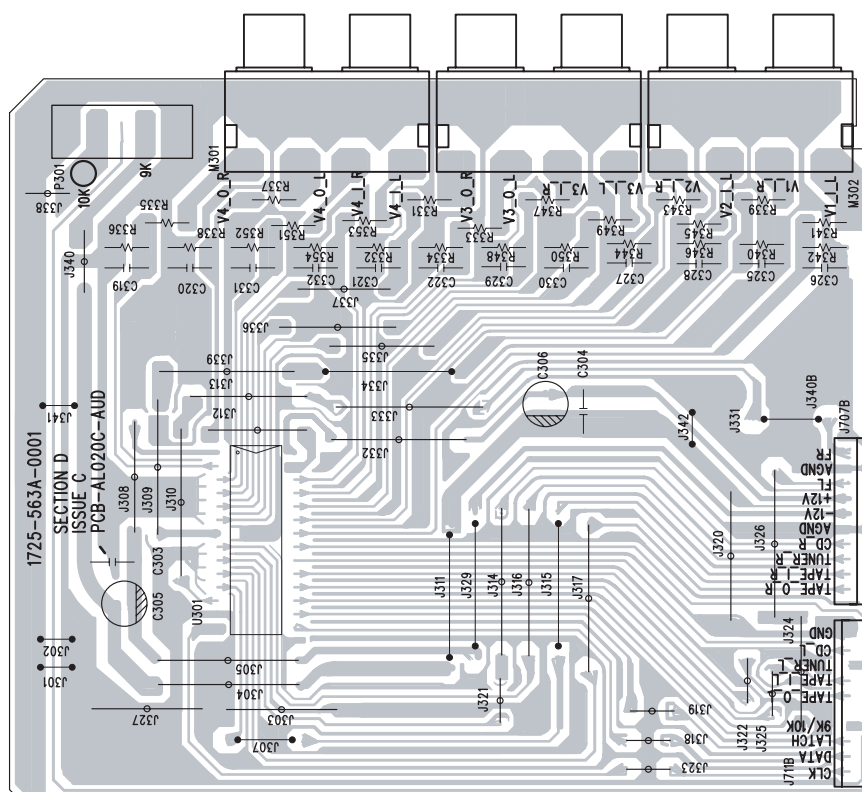
Press "DISPLAY", "5.1 INPUT" and "VIDEO 1".

4. Clear all tuner presets

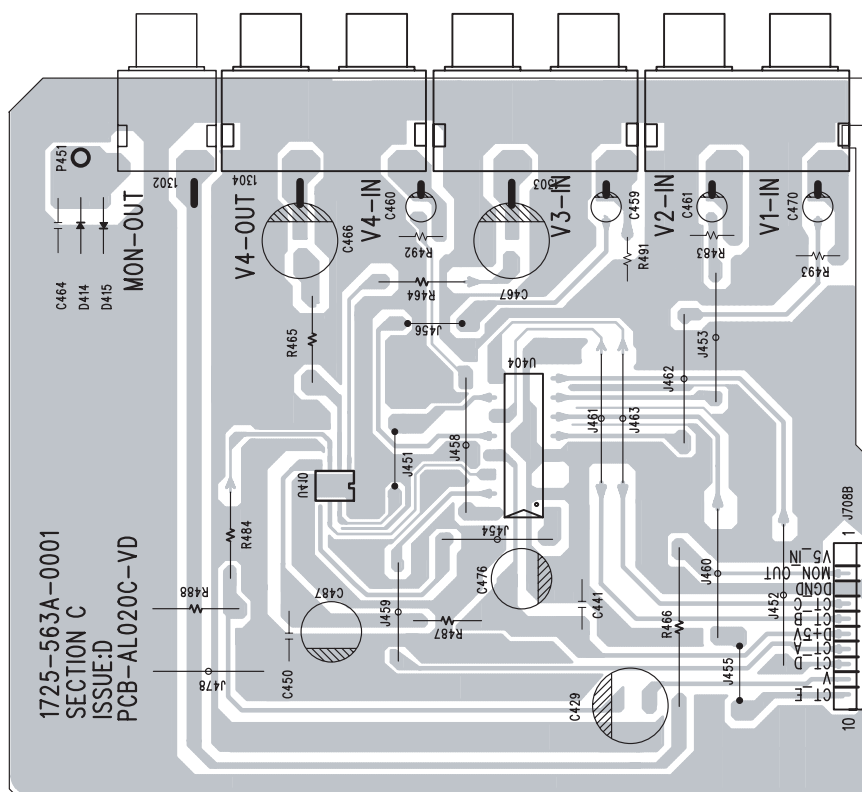
Press "5.1 INPUT" and "VIDEO 1".

PCB LAYOUT

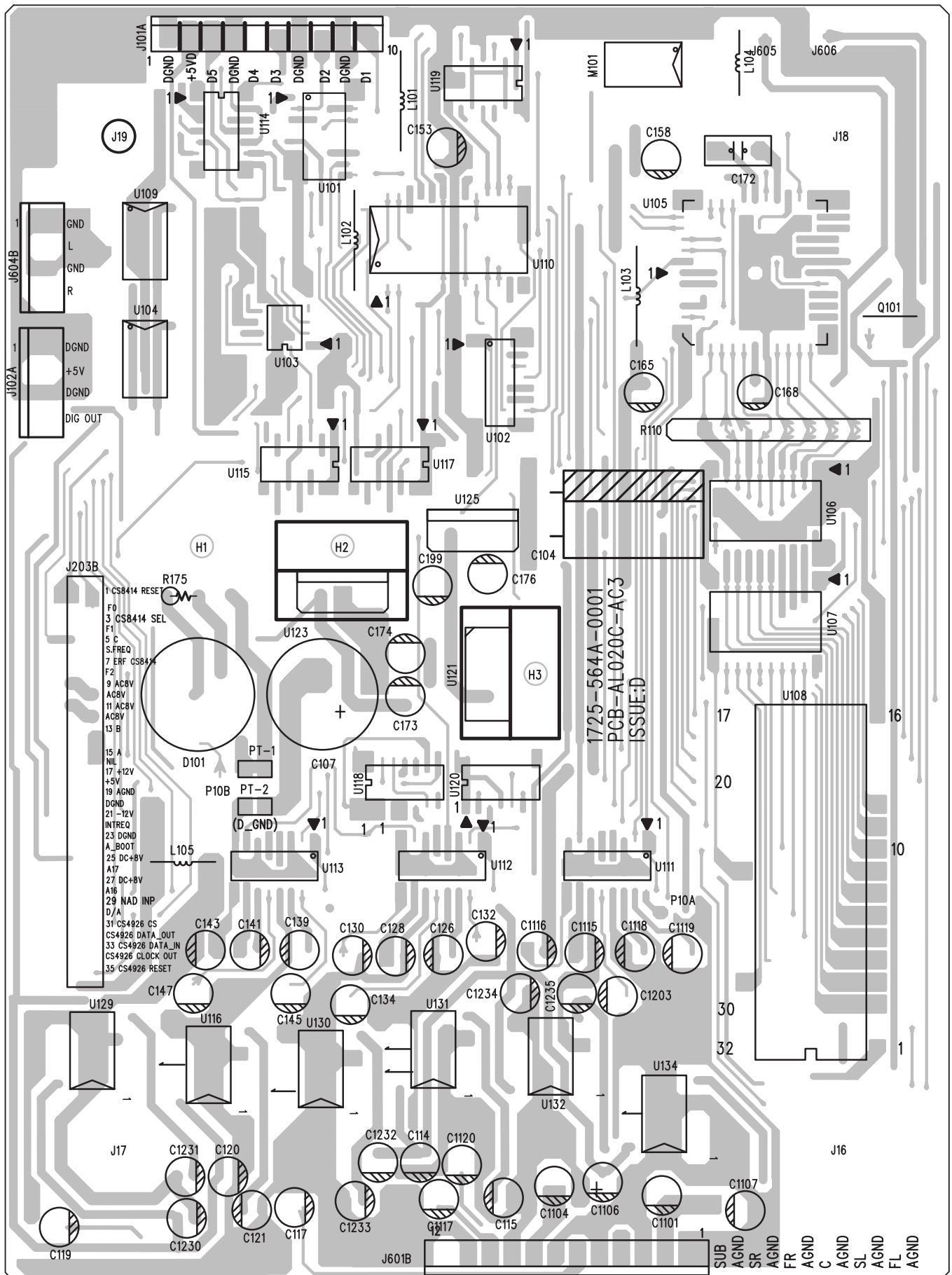
AUDIO BOARD



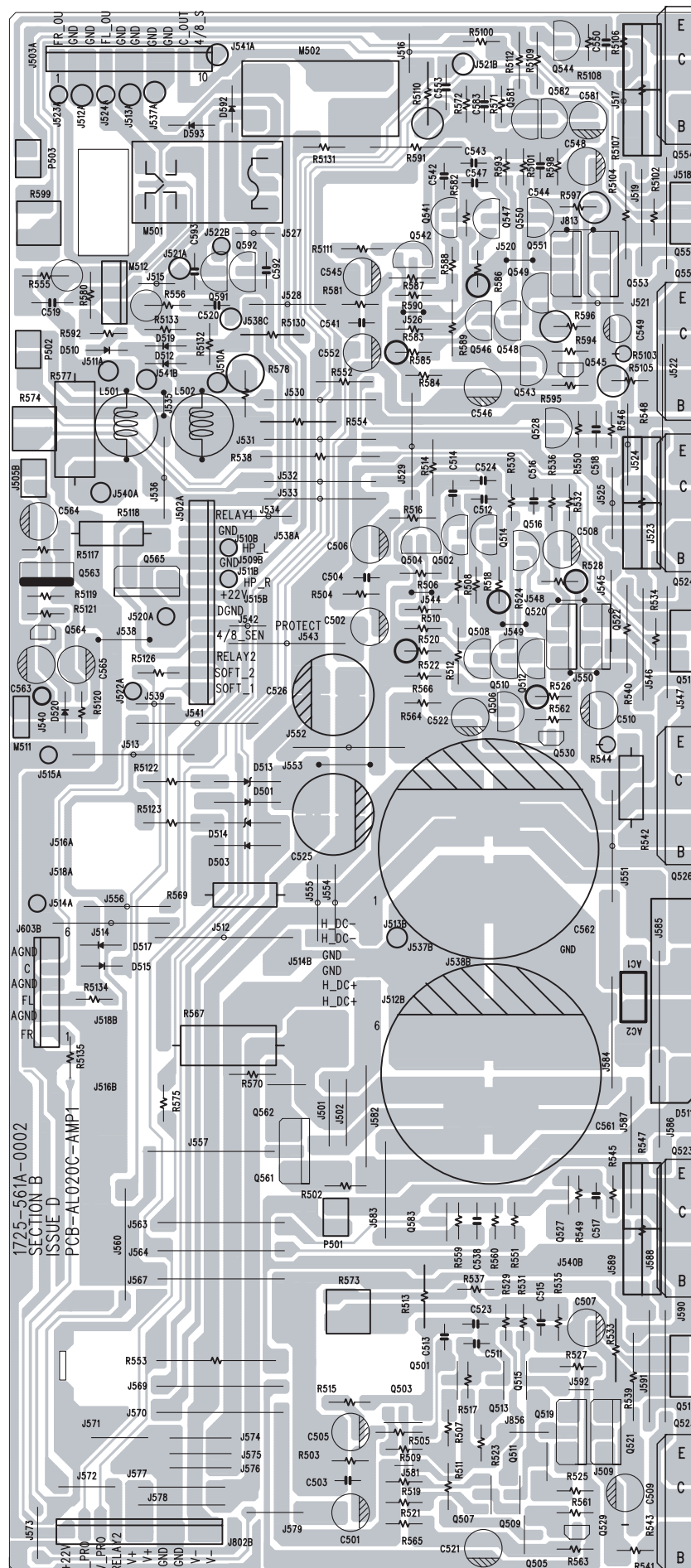
COMPONENT VIDEO BOARD



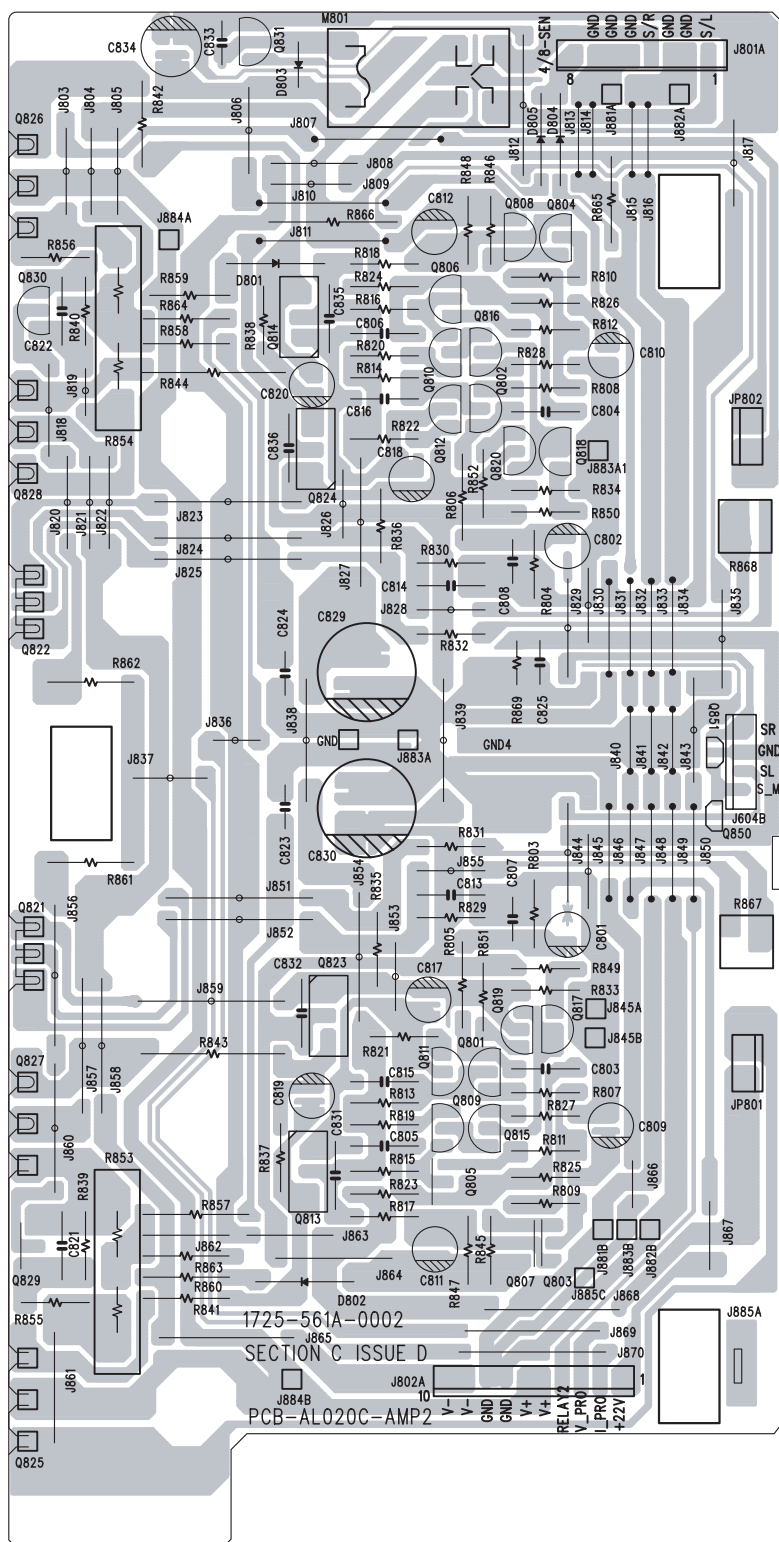
AC-3 BOARD - Component Side



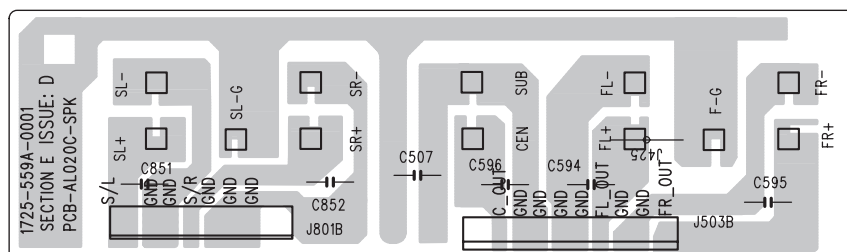
AMP1 BOARD



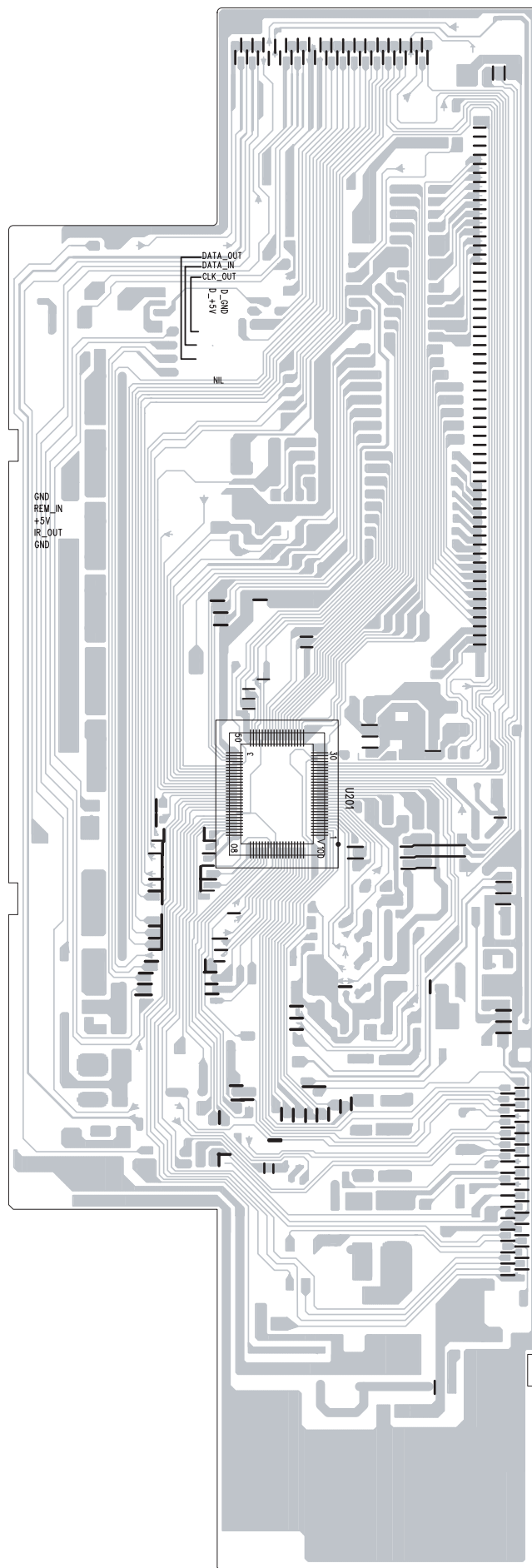
AMP2 BOARD



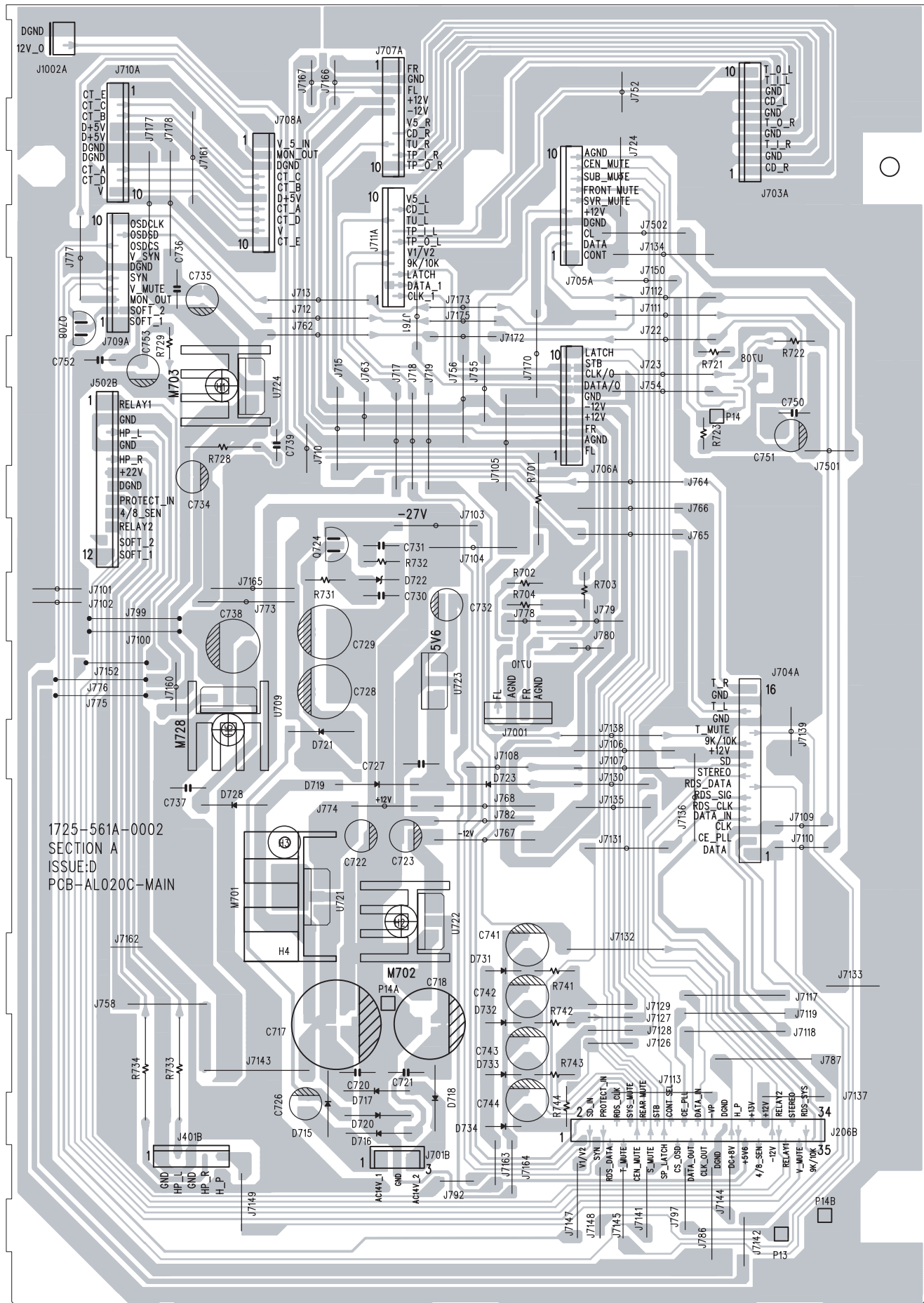
SPEAKER BOARD



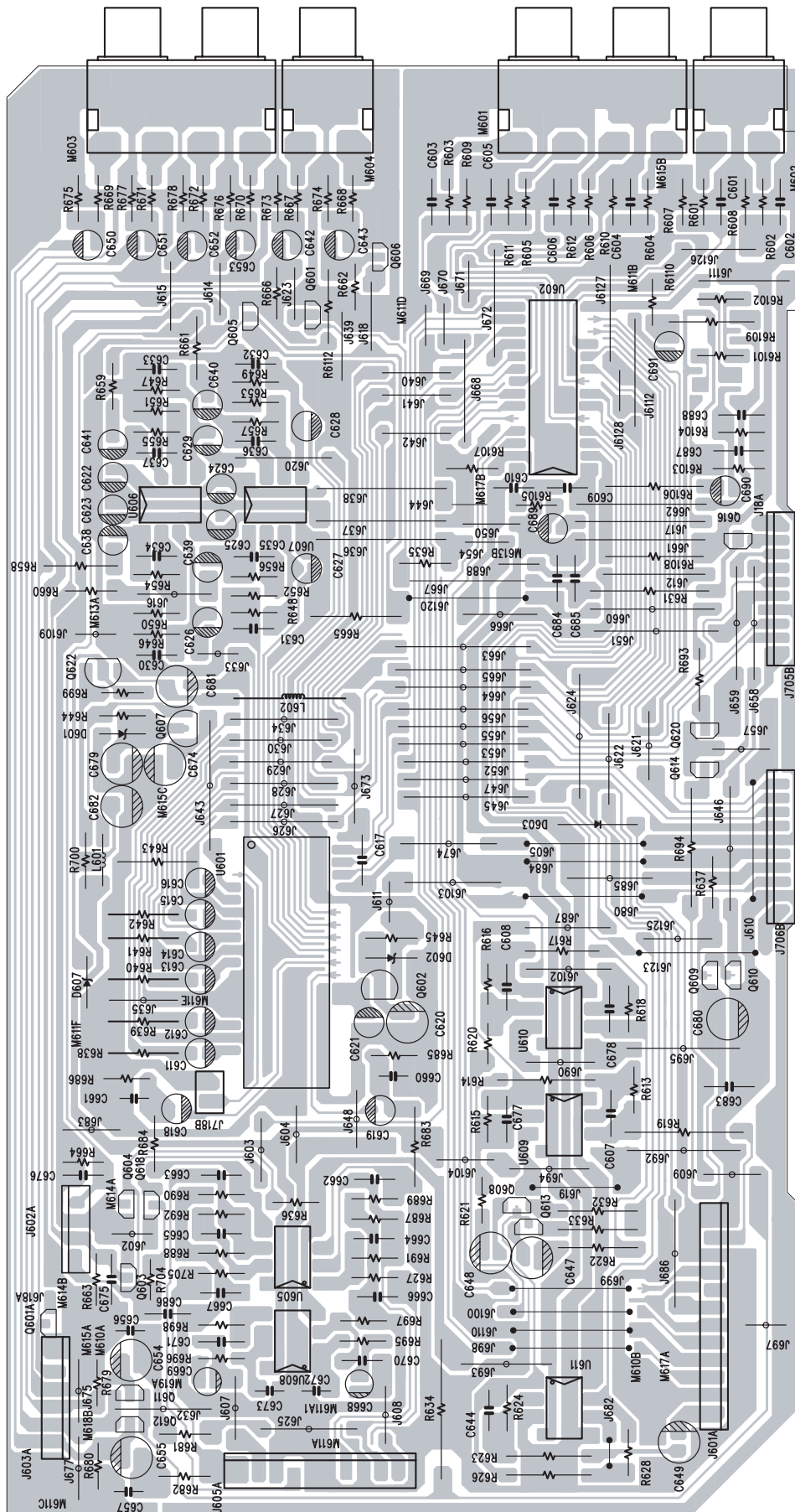
KEY BOARD - Solder Side



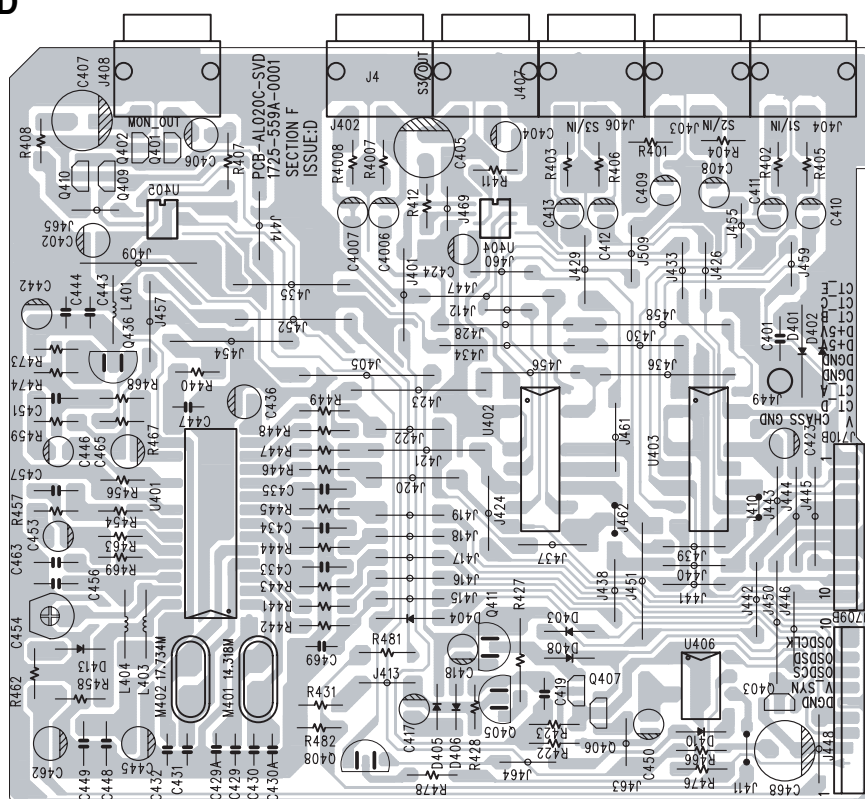
MAIN BOARD



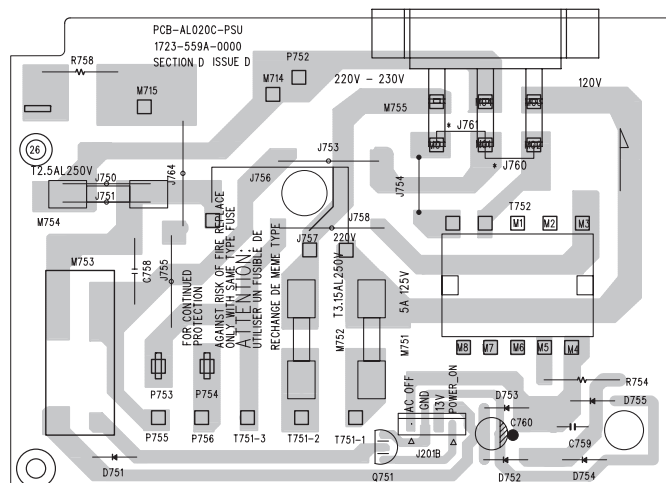
MULTI CHANNEL BOARD



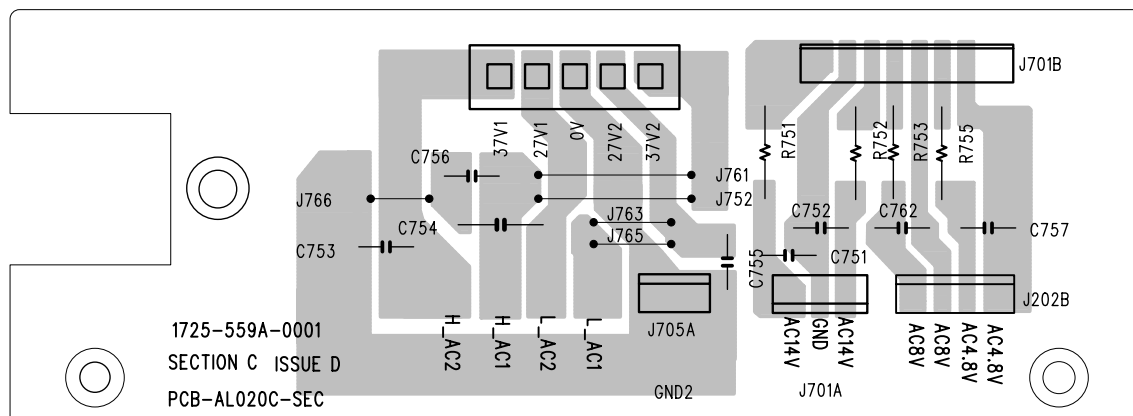
S-VIDEO BOARD



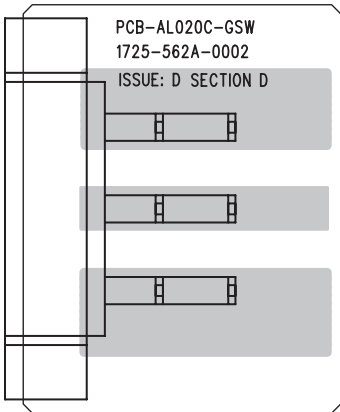
PSU BOARD



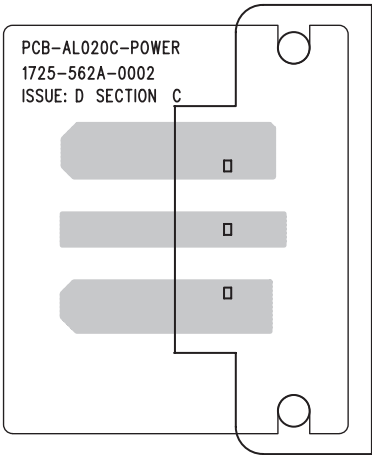
SECONDARY BOARD



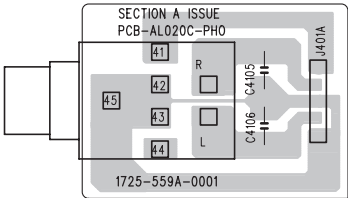
GSW BOARD



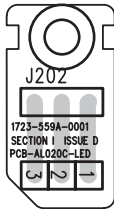
POWER BOARD



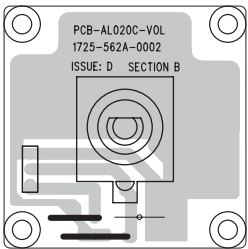
PHONE BOARD



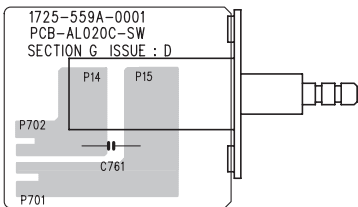
LED BOARD



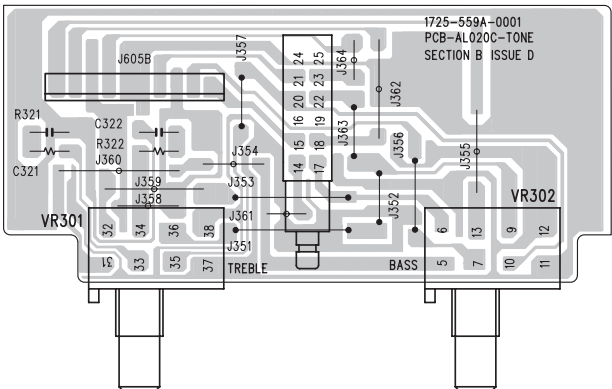
VOLUME BOARD



SWITCH BOARD

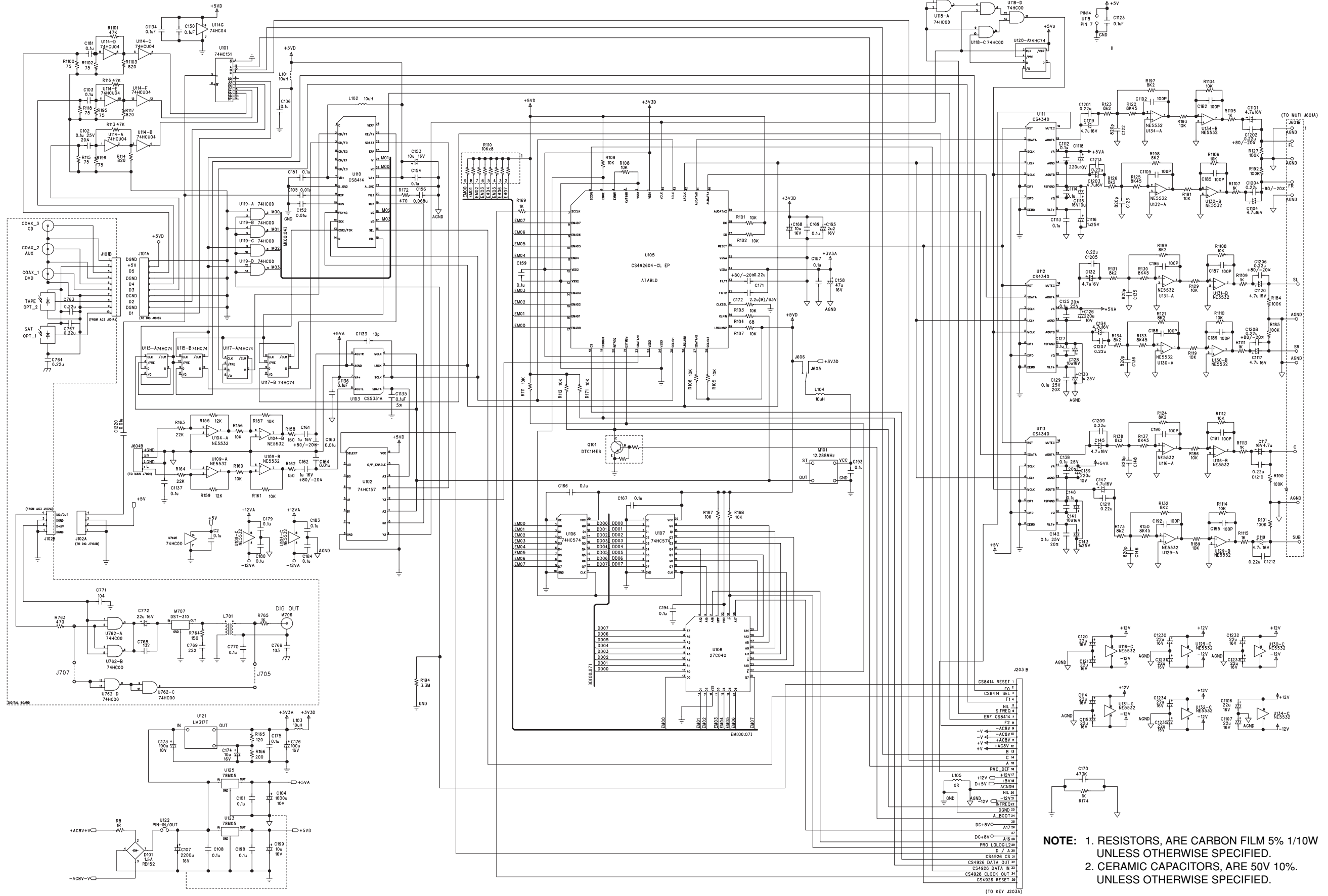


TONE BOARD



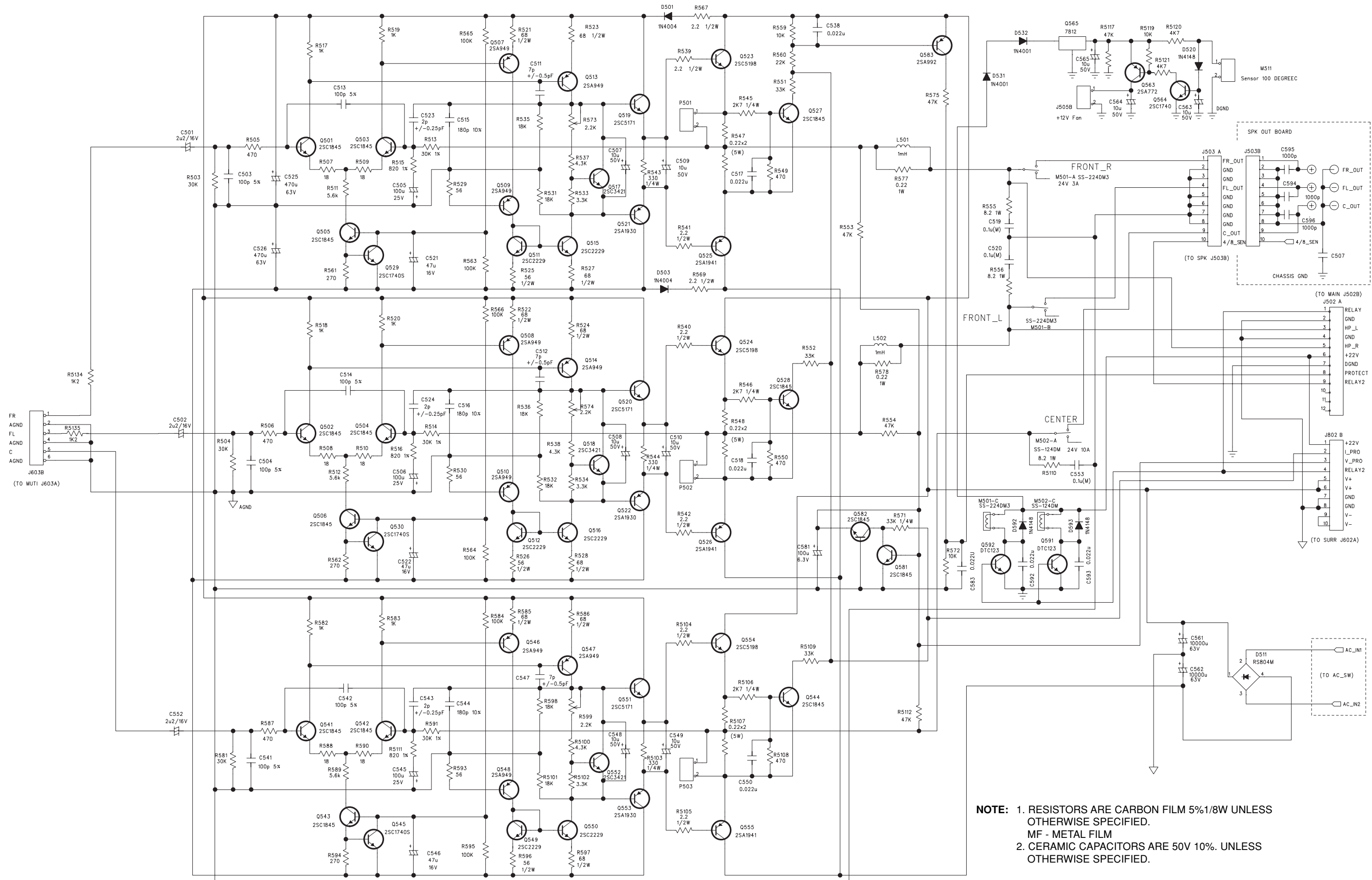
SCHEMATIC DIAGRAM

AC-3 / DTS



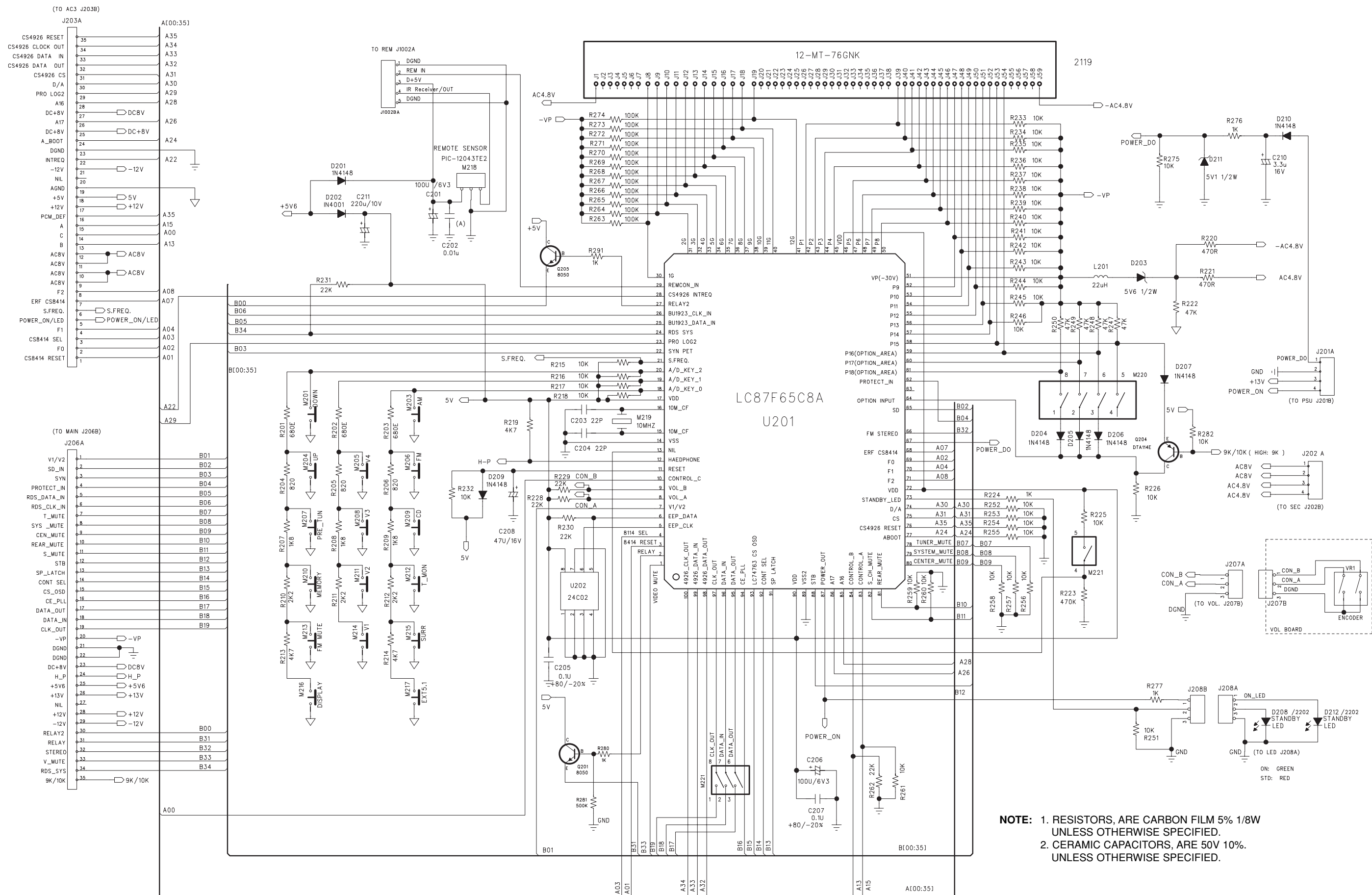
NOTE: 1. RESISTORS, ARE CARBON FILM 5% 1/10W
UNLESS OTHERWISE SPECIFIED.
2. CERAMIC CAPACITORS, ARE 50V 10%.
UNLESS OTHERWISE SPECIFIED.

AMP1



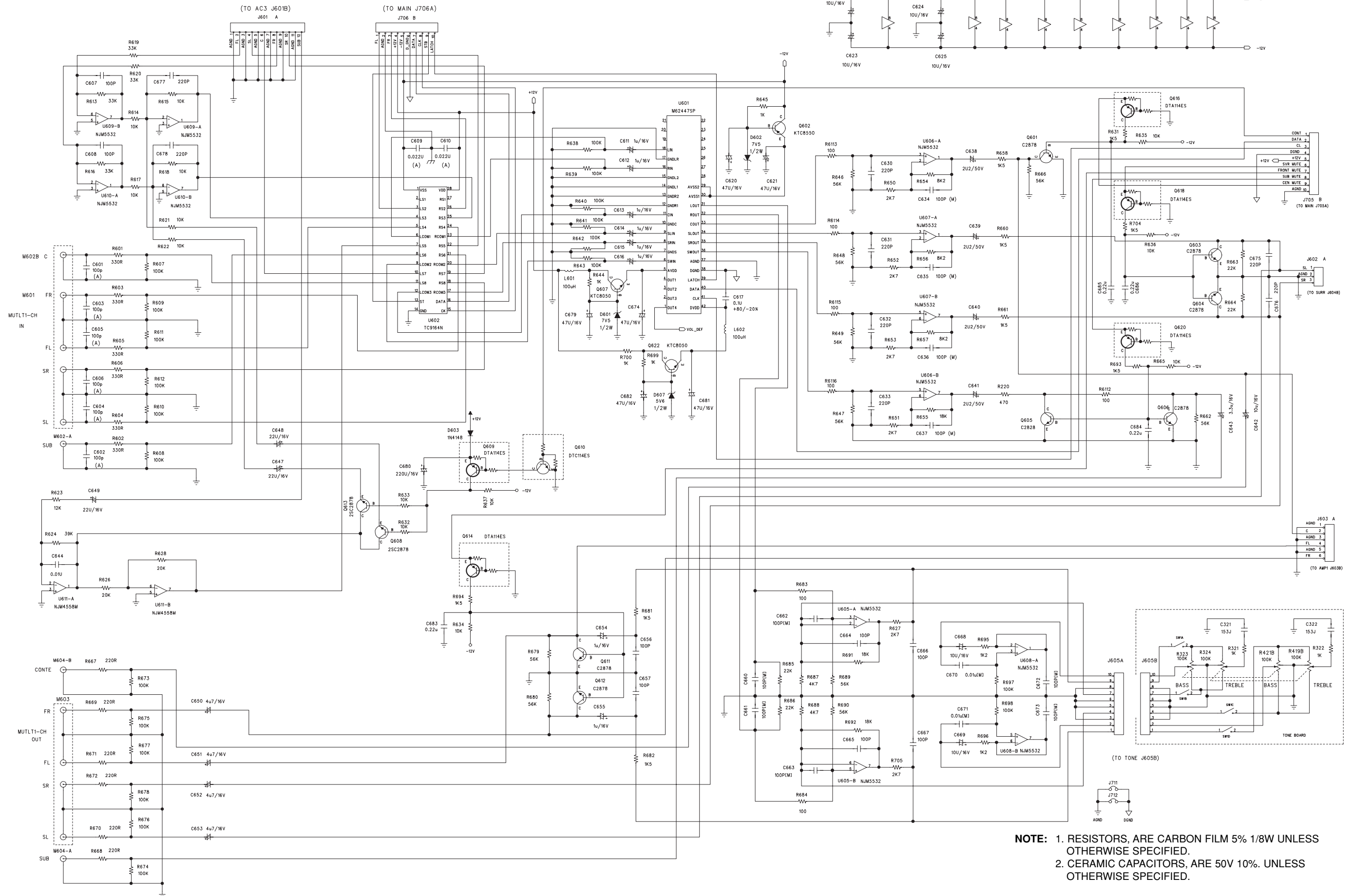
NOTE: 1. RESISTORS ARE CARBON FILM 5%1/8W UNLESS OTHERWISE SPECIFIED.
MF - METAL FILM
2. CERAMIC CAPACITORS ARE 50V 10%. UNLESS OTHERWISE SPECIFIED.

KEY

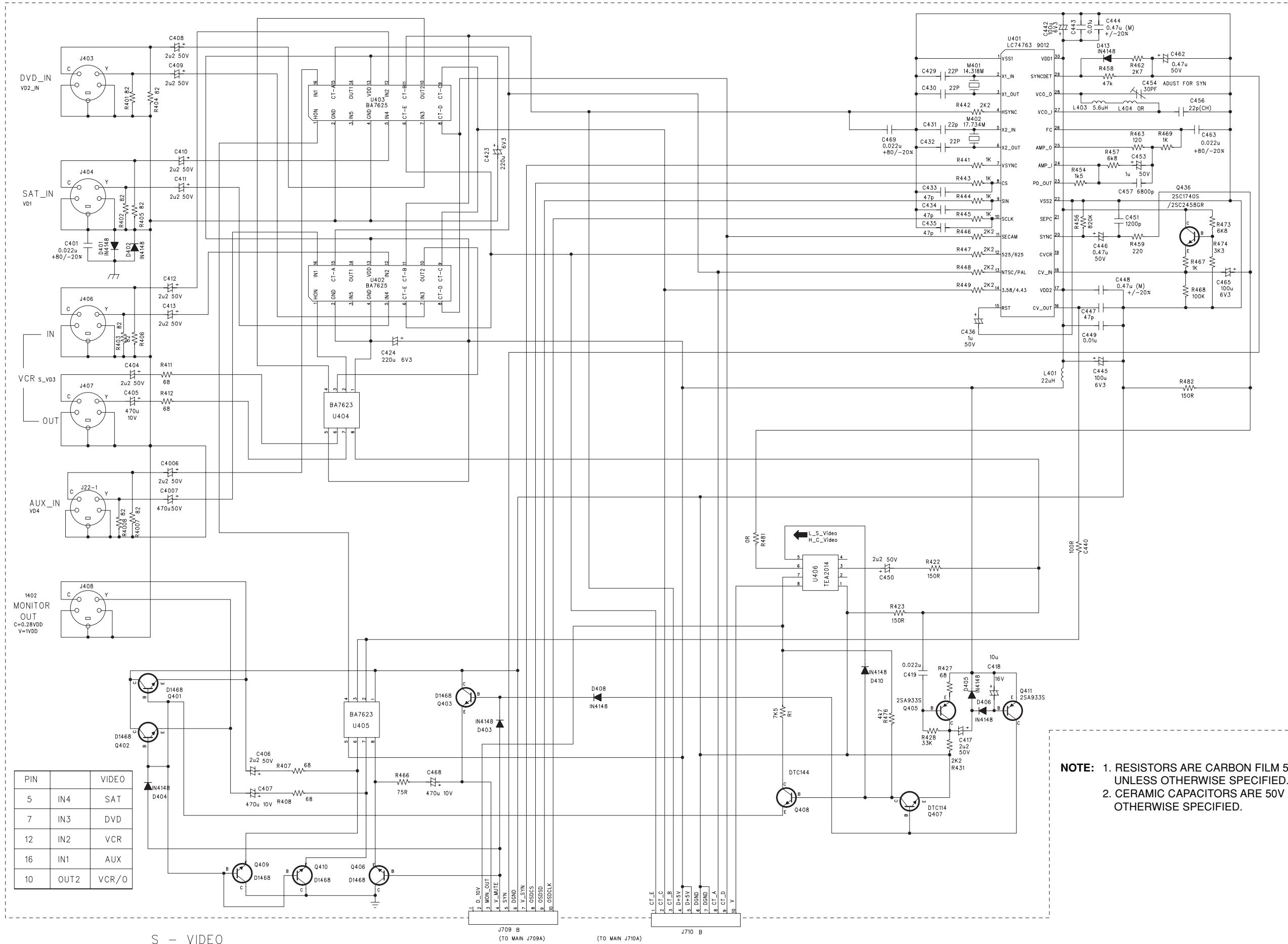


NOTE: 1. RESISTORS, ARE CARBON FILM 5% 1/8W
UNLESS OTHERWISE SPECIFIED.
2. CERAMIC CAPACITORS, ARE 50V 10%.
UNLESS OTHERWISE SPECIFIED.

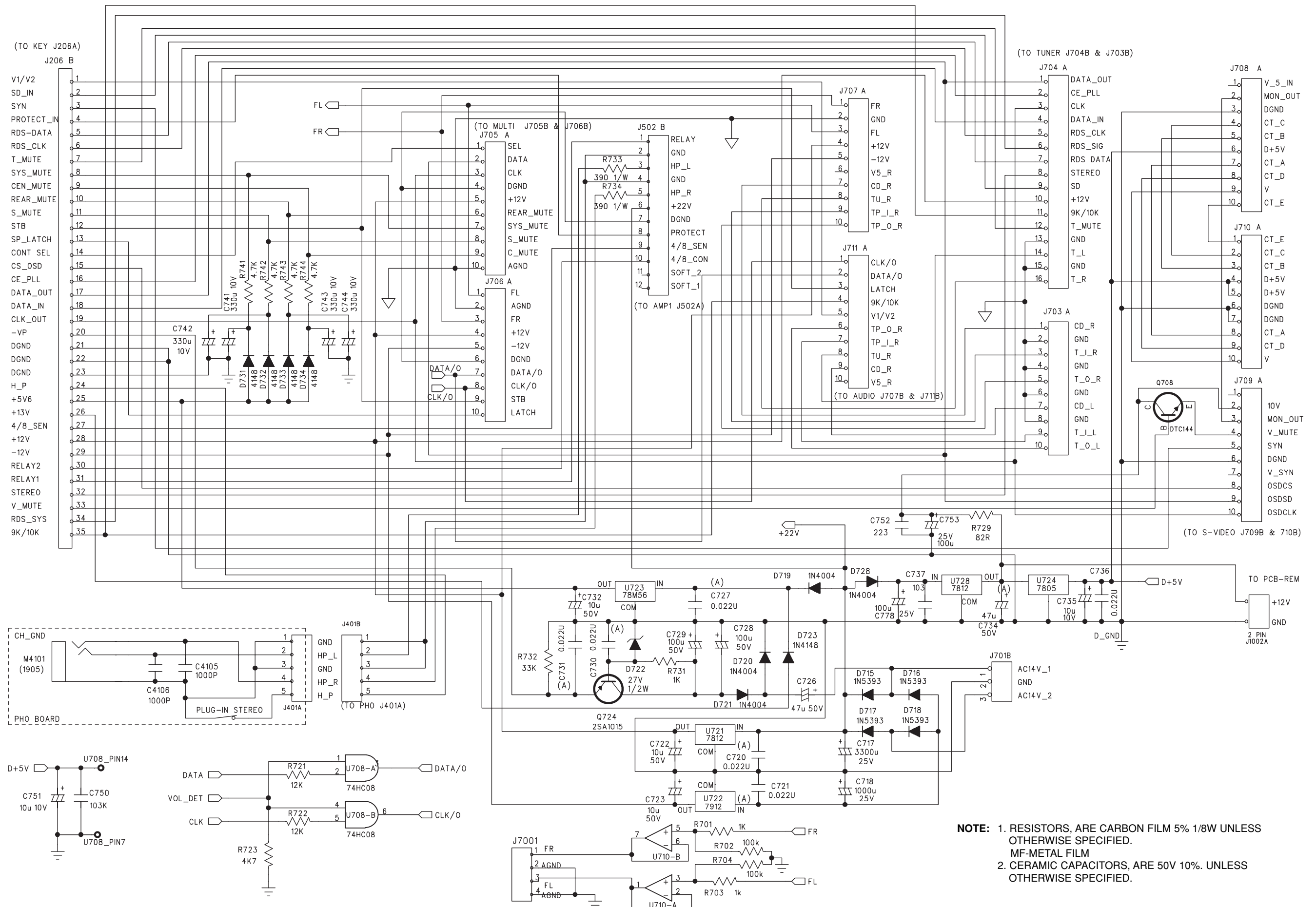
MULTI CHANNEL



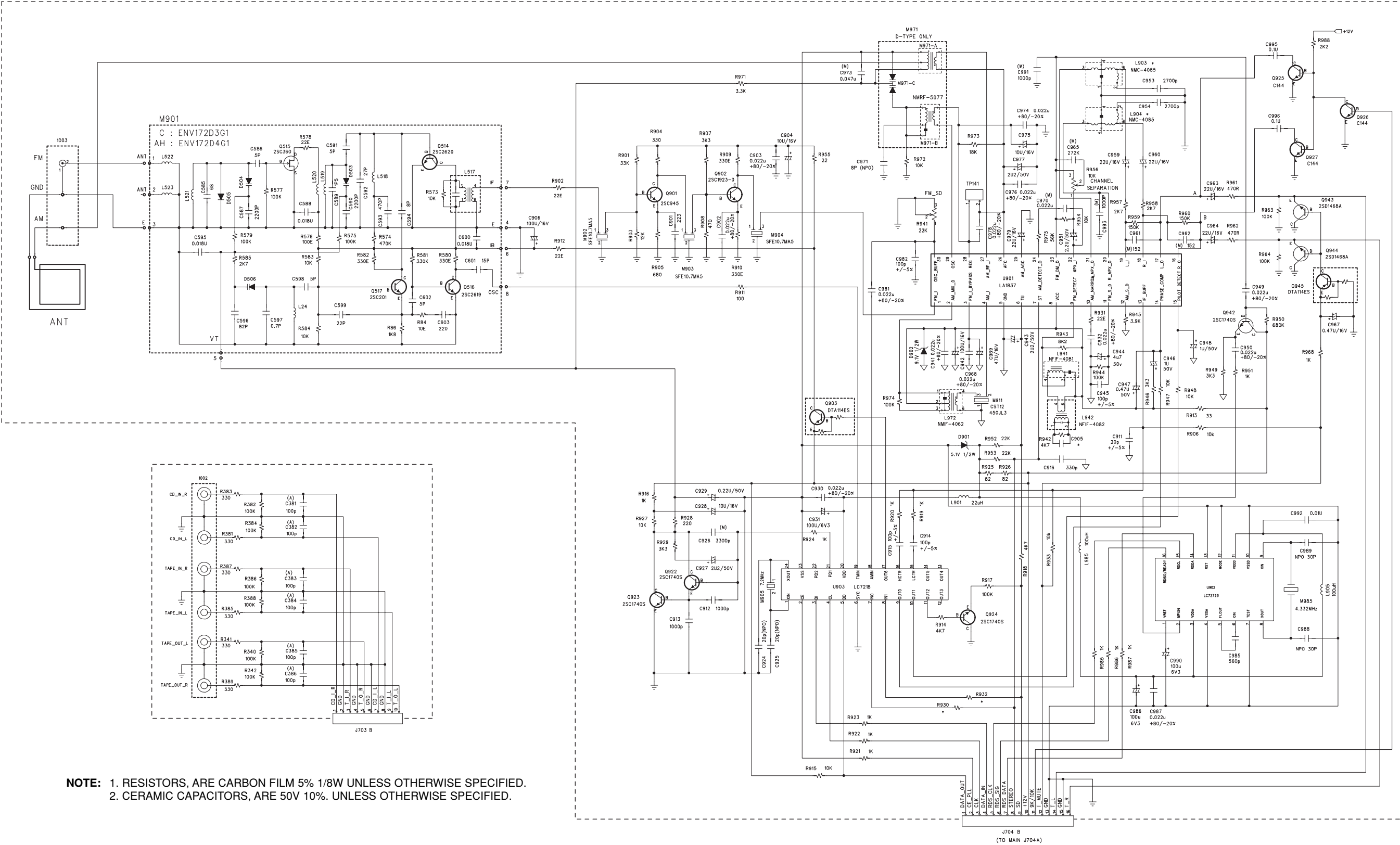
S-VIDEO



MAIN



TUNER

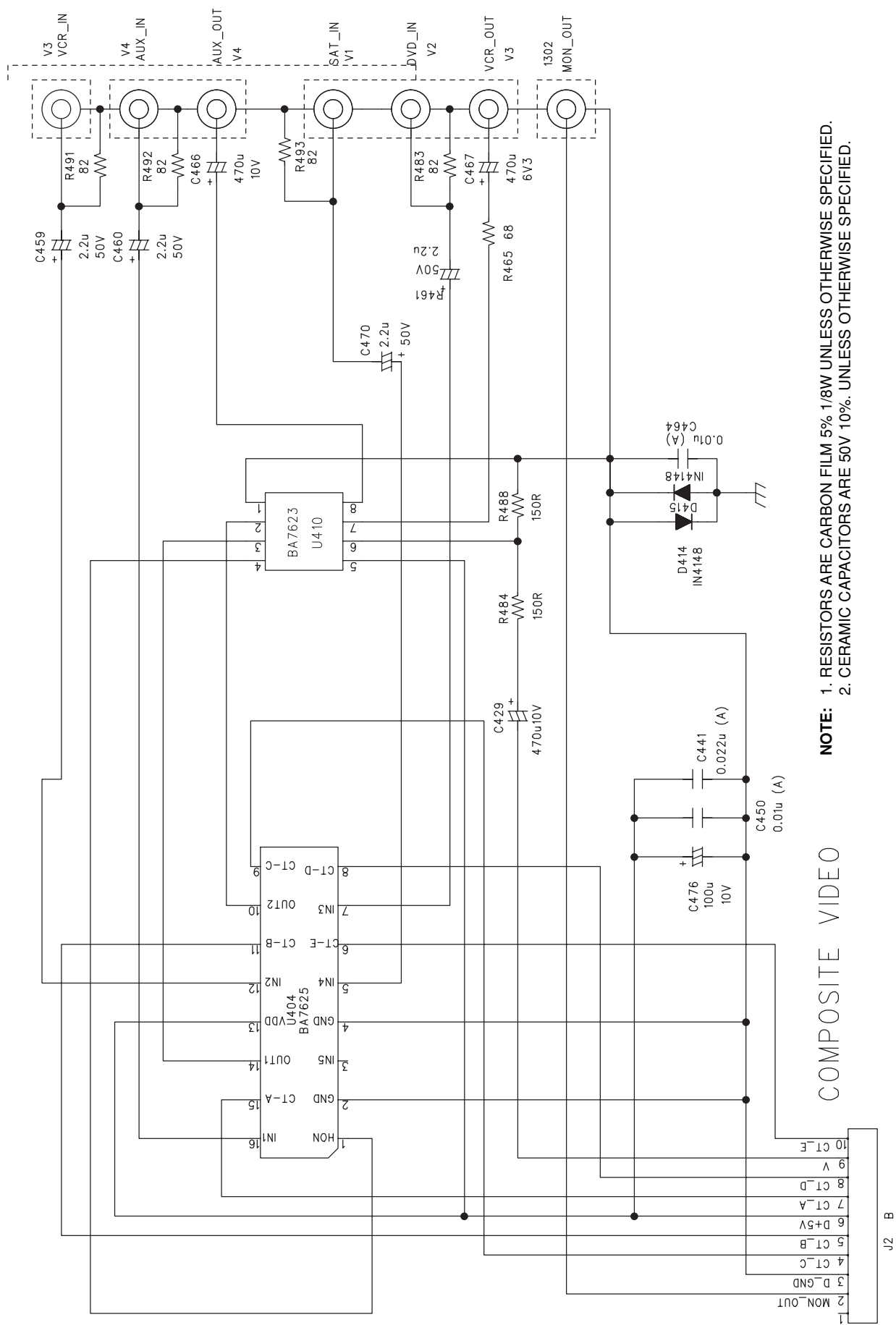


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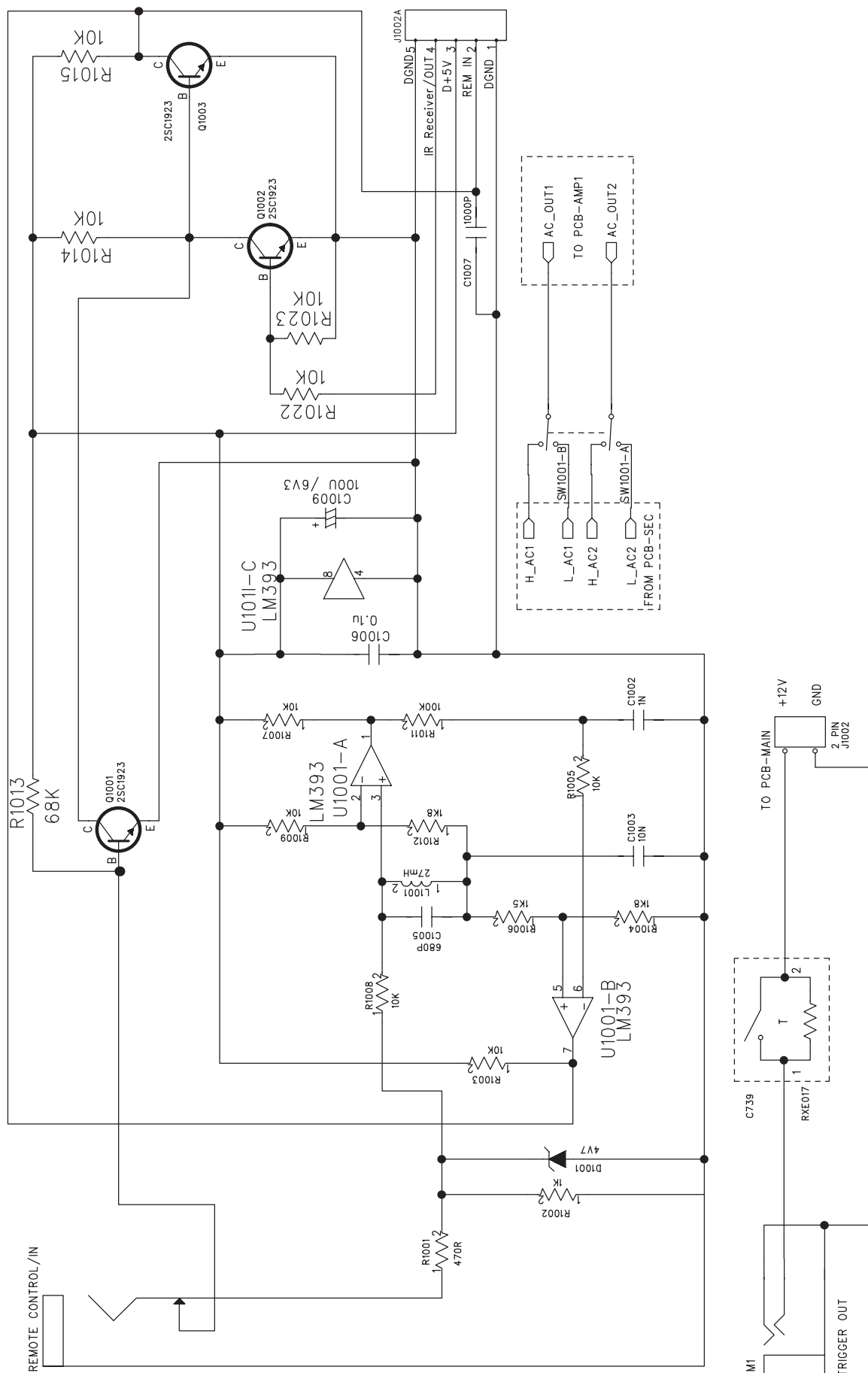
COMPONENT VIDEO



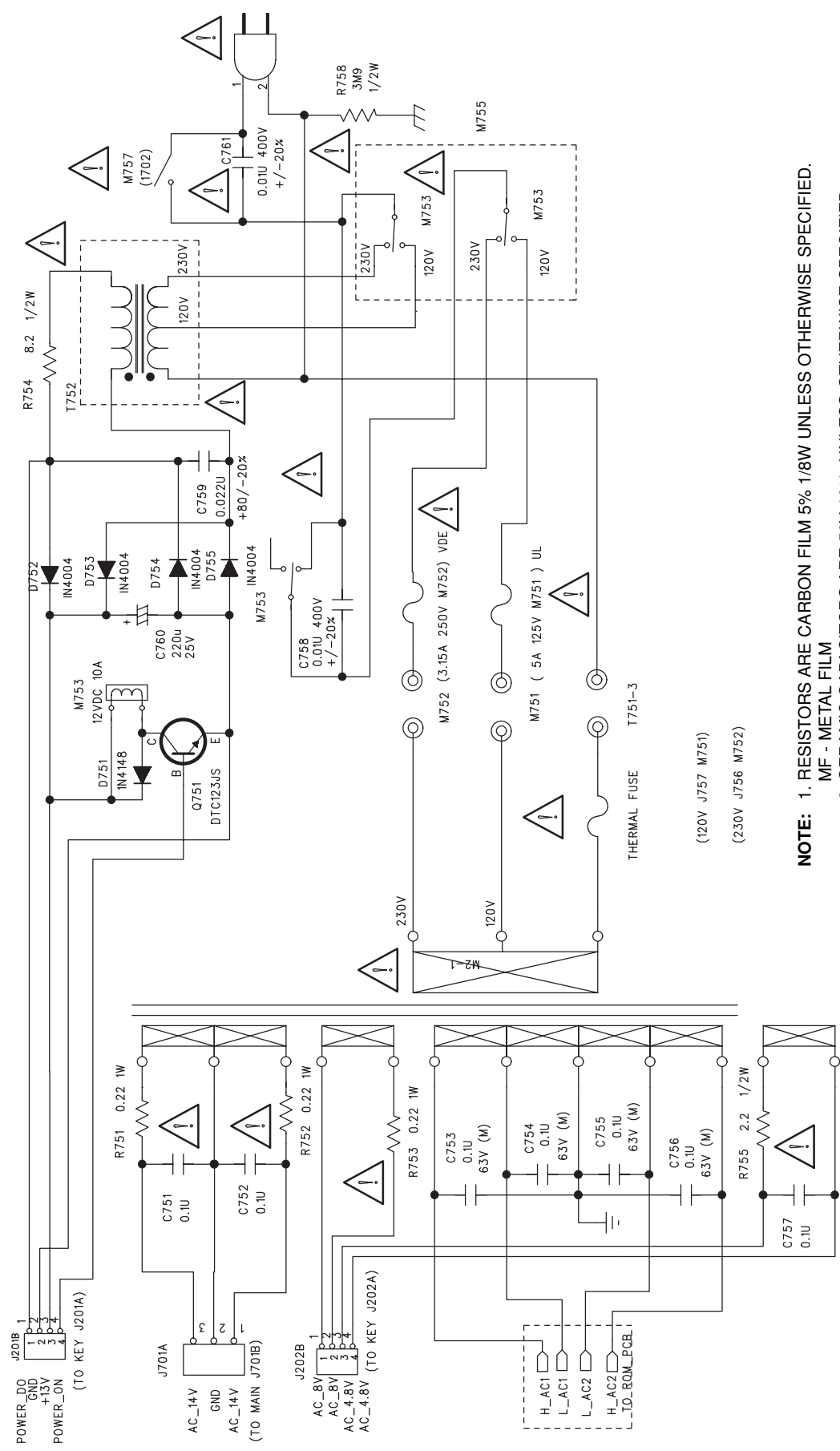
NOTE: 1. RESISTORS ARE CARBON FILM 5% 1/8W UNLESS OTHERWISE SPECIFIED.
2. CERAMIC CAPACITORS ARE 50V 10% UNLESS OTHERWISE SPECIFIED.

COMPOSITE VIDEO

REM



PSU

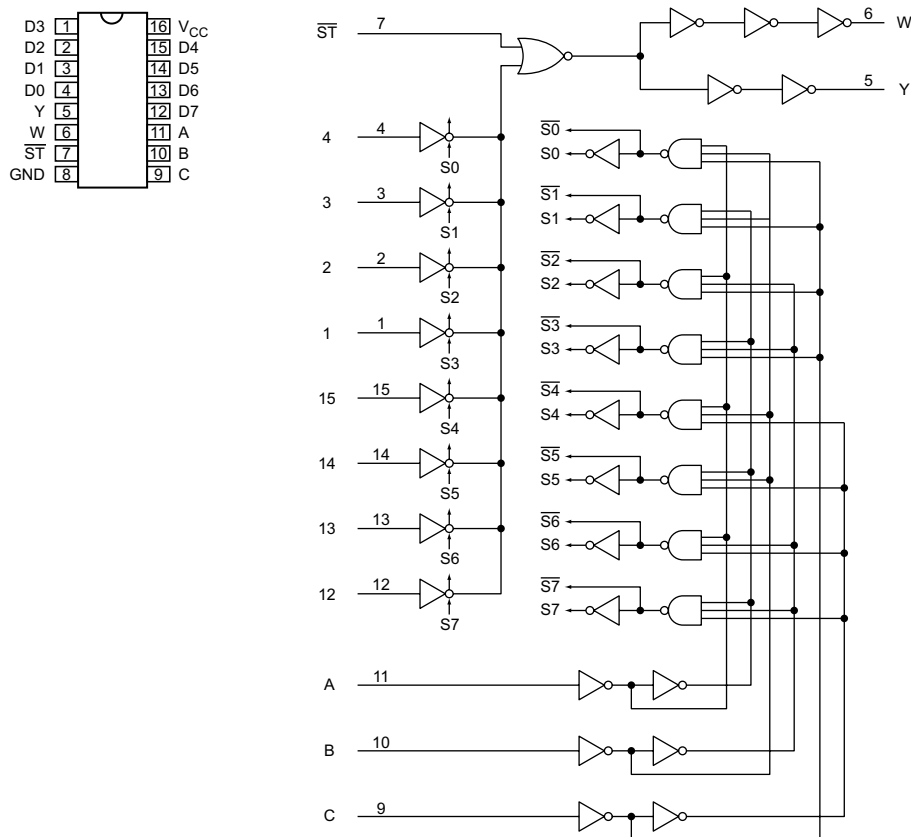


NOTE: 1. RESISTORS ARE CARBON FILM 5% 1/8W UNLESS OTHERWISE SPECIFIED.
MF - METAL FILM
2. CERAMIC CAPACITORS ARE 50V 10%. UNLESS OTHERWISE SPECIFIED.
3. COMPONENTS MARKED "Δ" ARE SAFETY CRITICAL PARTS.

IC BLOCK DIAGRAM

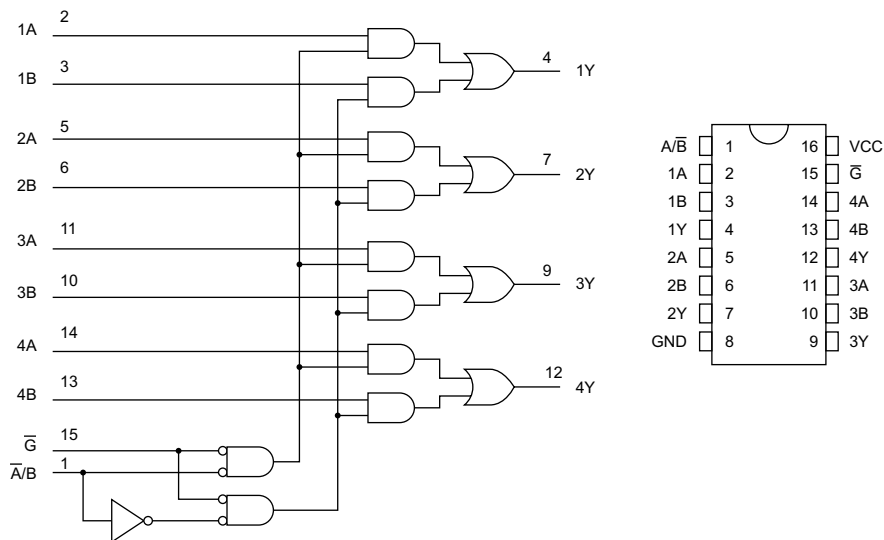
AC3 BOARD

U101: 74HC151



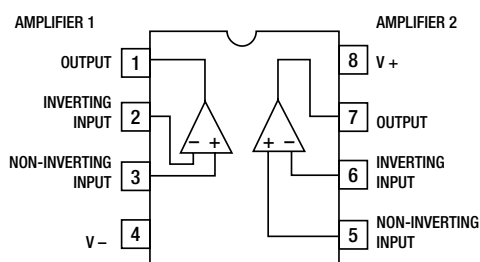
AC3 BOARD

U102: 74HC157

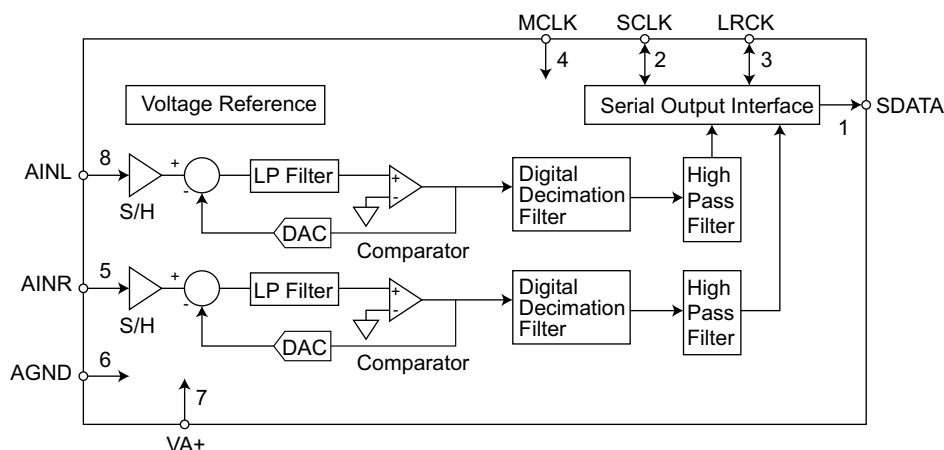


AC3 BOARD

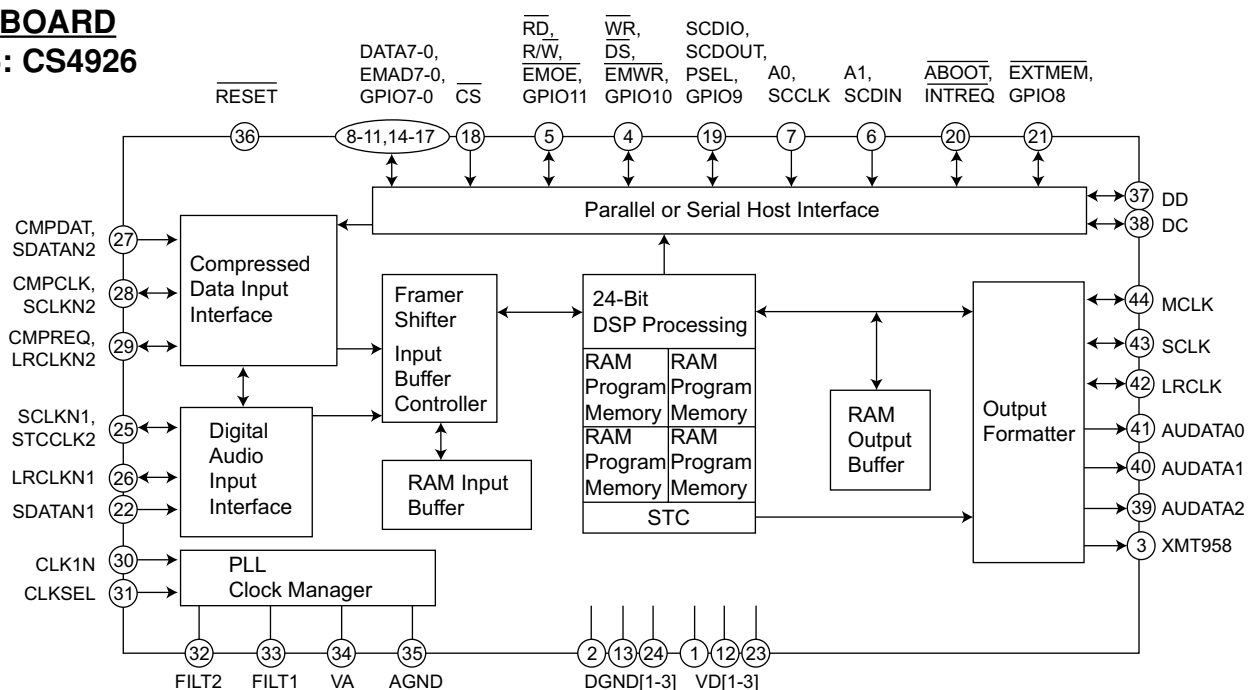
U104, U109, U116,
U129, U134: NE5532



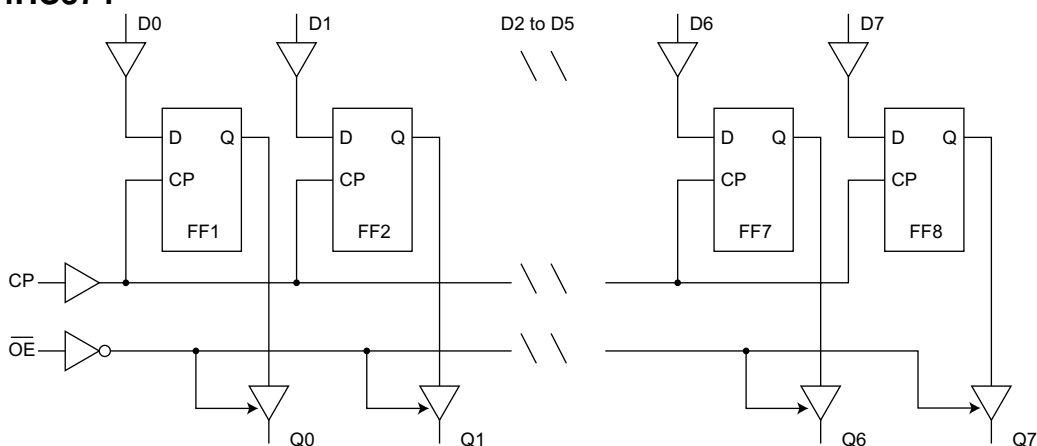
U103: CS5331A



U105: CS4926

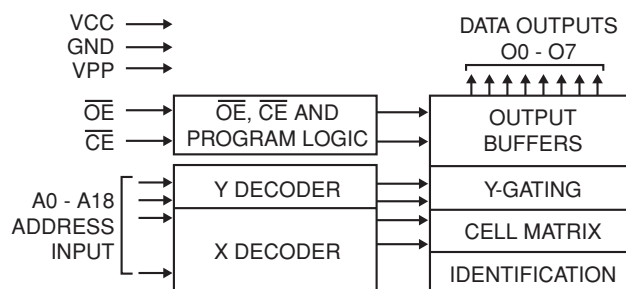


U106, U107: 74HC574



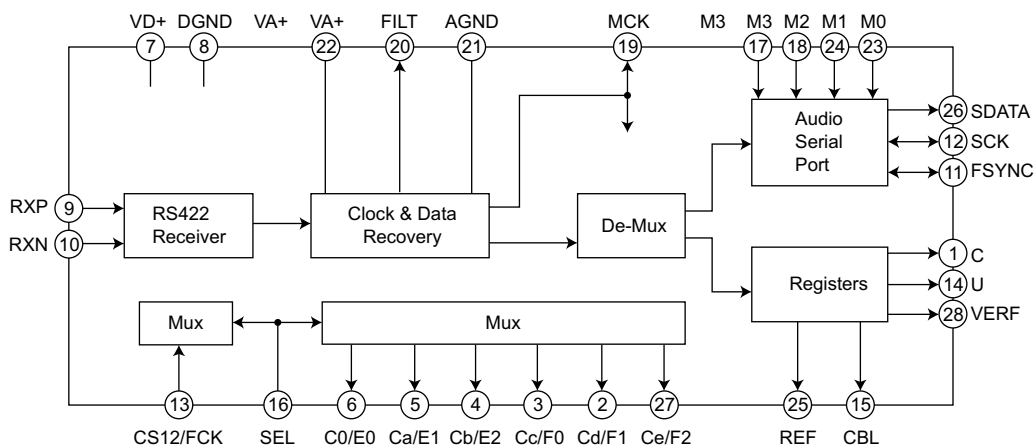
AC3 BOARD

U108: AT27C040



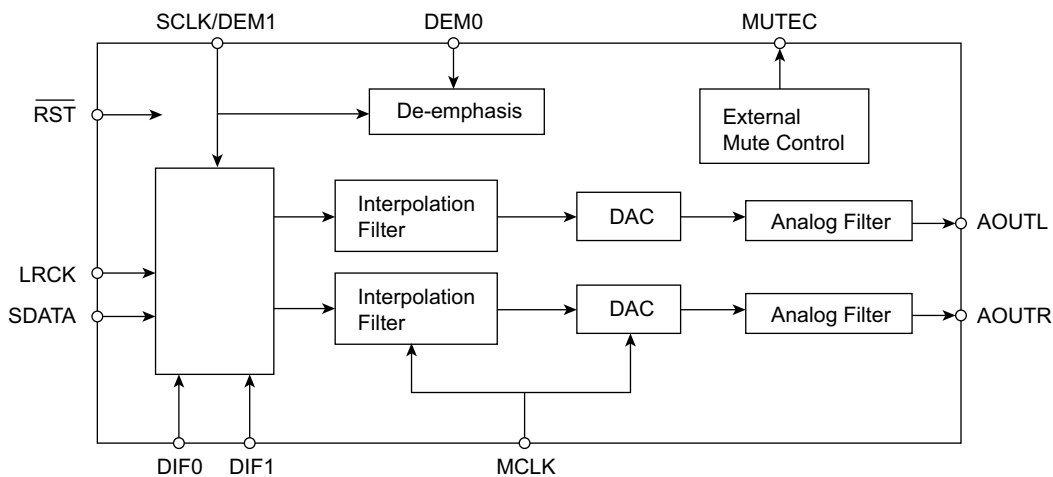
AC3 BOARD

U110: CS8414

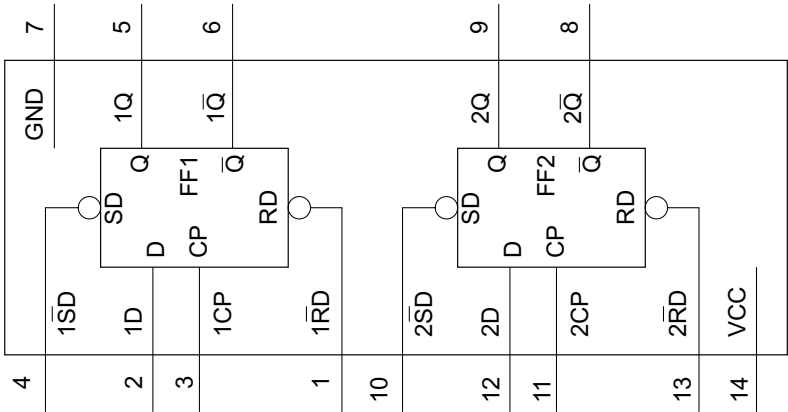


AC3 BOARD

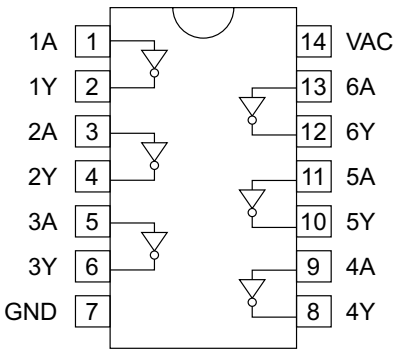
U111-U113: CS4340



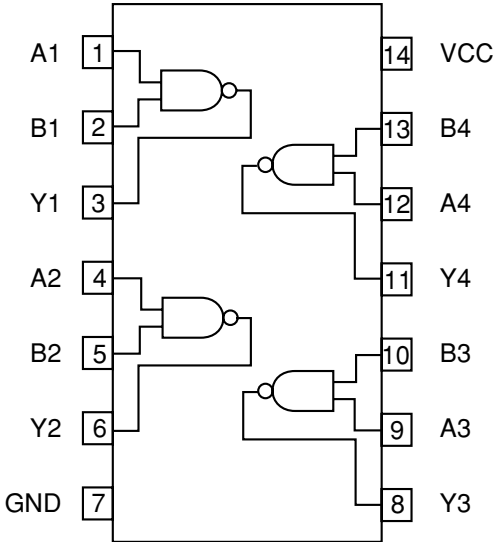
AC3 BOARD
U115, U117, U120: 74HC74



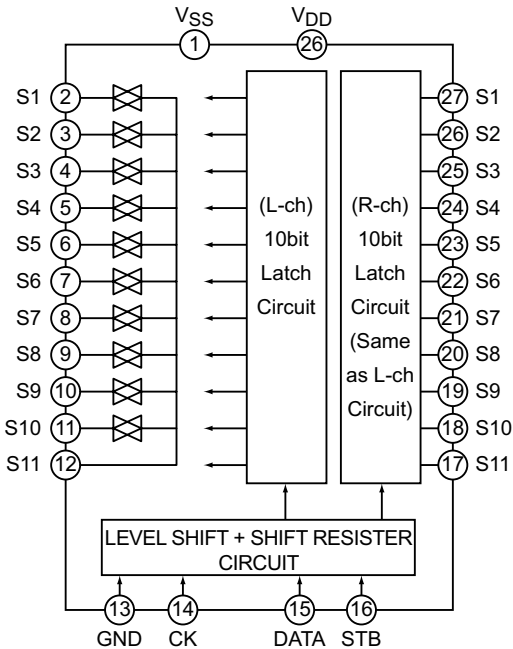
AC3 BOARD
U114: 74HCU04



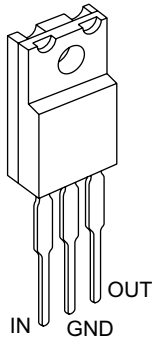
AC3 BOARD
U118, U119: 74HC00
DIGITAL BOARD
U762: 74HC00



AUDIO BOARD
U301: TC9273N

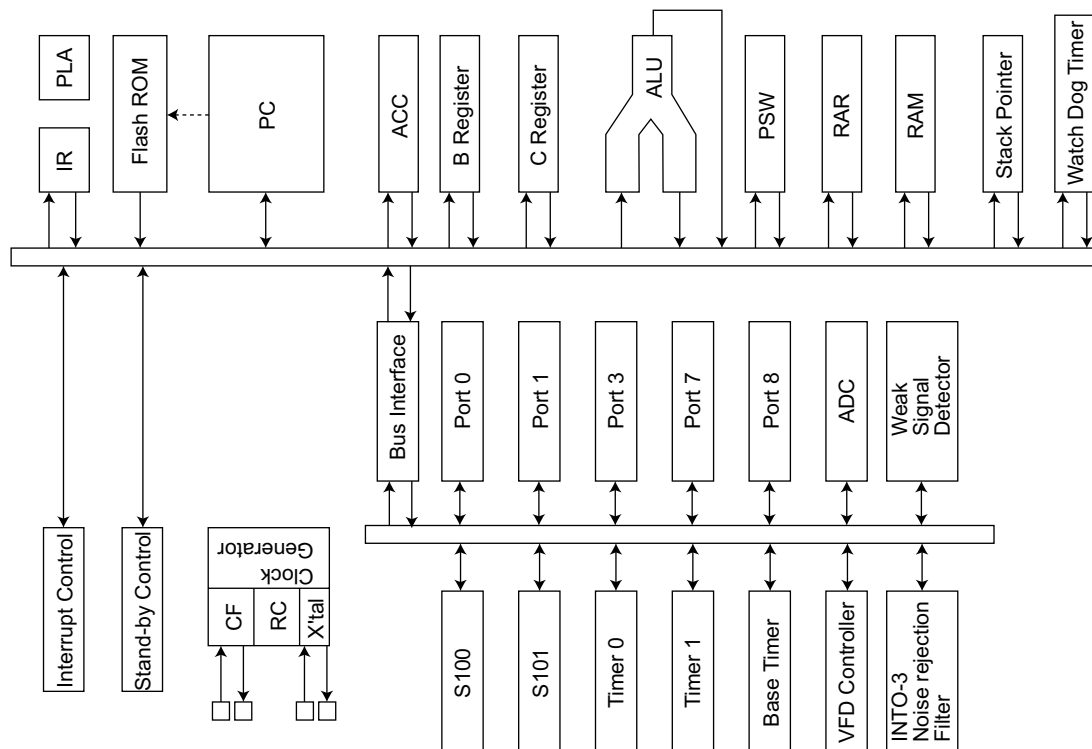


AC3 BOARD
U123, U125,
U130-U132: 7805
POWER AMP BOARD:
Q565C: 7812



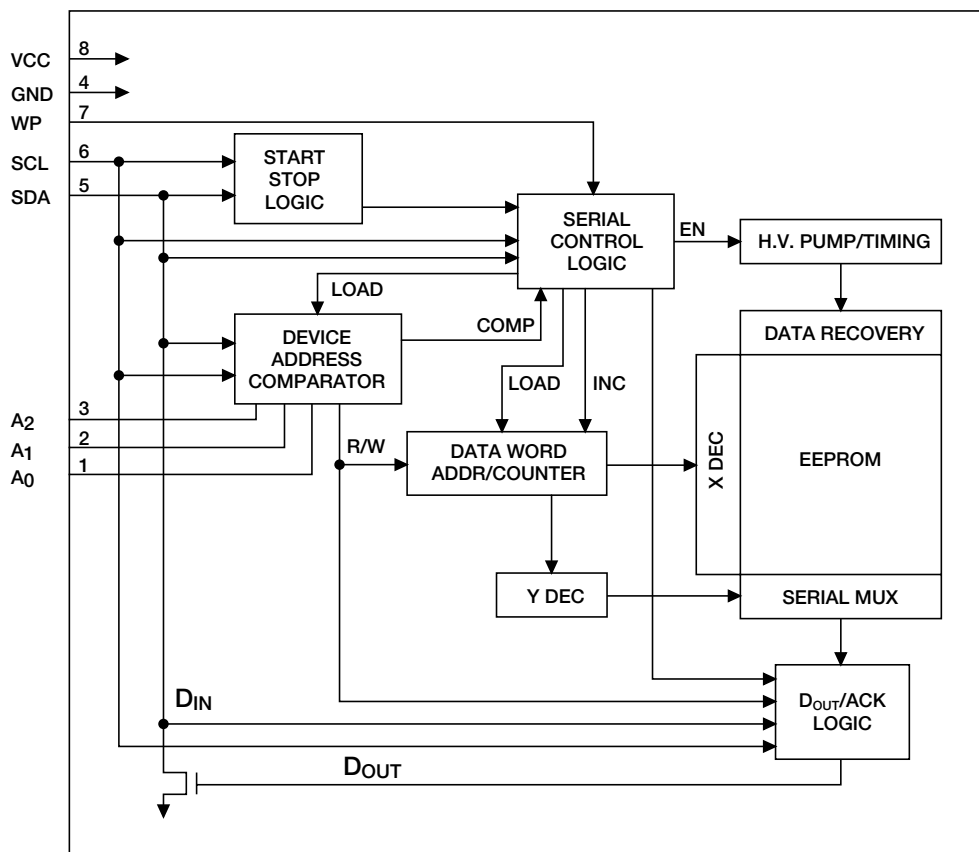
KEY BOARD

U201: LC87F65C8A



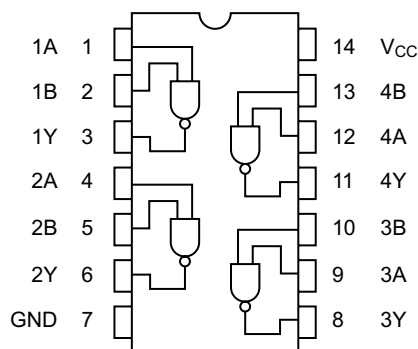
KEY BOARD

U202: 24C08



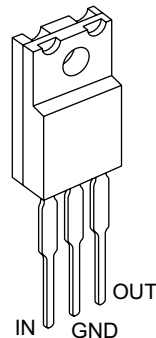
MAIN BOARD

U708: 74HC08



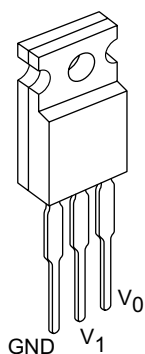
MAIN BOARD

U709, U721, U723, U724: 78XX



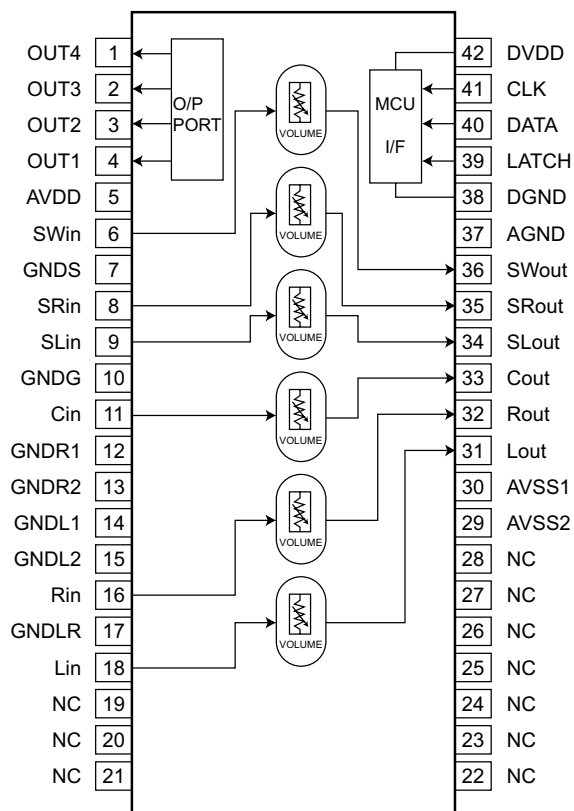
MAIN BOARD

U722: 79M12



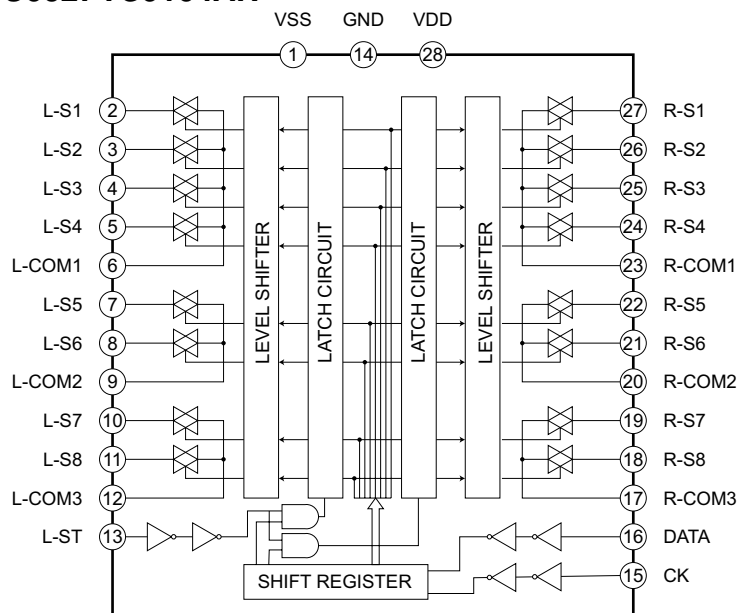
MULTI CHANNEL BOARD

U601: M62447SP



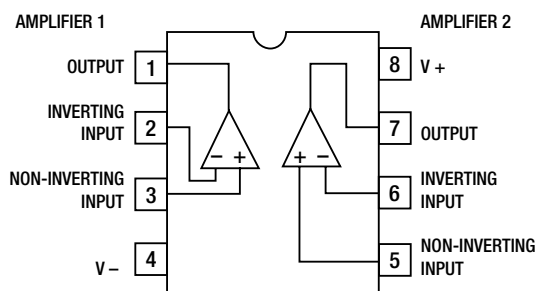
MULTI CHANNEL BOARD

U602: TC9164AN



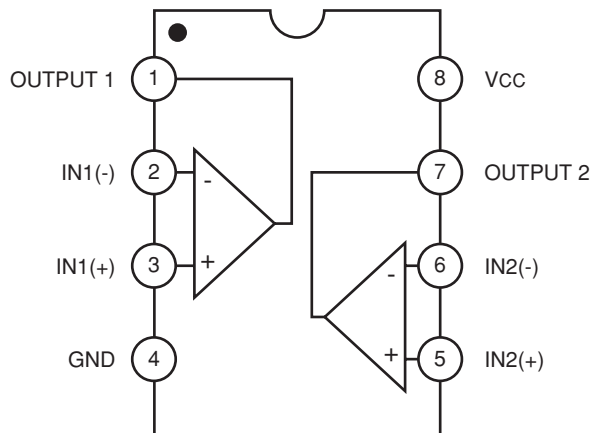
MULTI CHANNEL BOARD

U605-U611: NE5532



ROM BOARD

U1001: LM393D

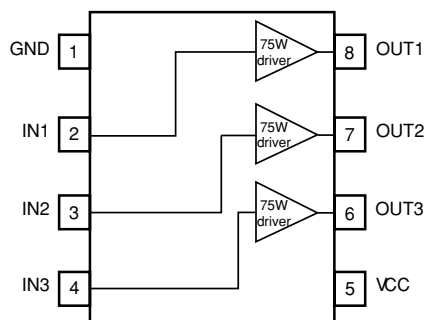


S-VIDEO BOARD

U401: BA7623

VIDEO BOARD

U410: BA7623

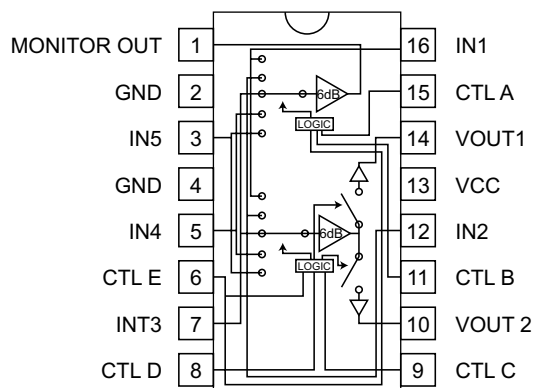


S-VIDEO BOARD

M402: BA7625

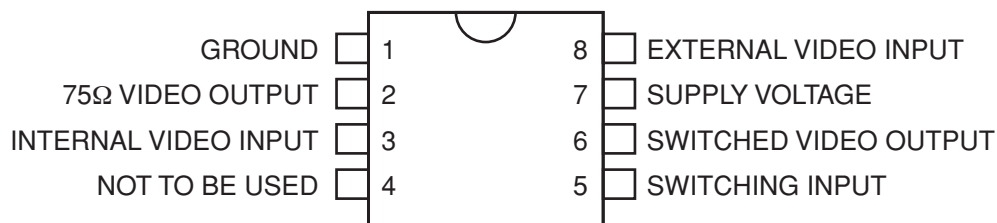
VIDEO BOARD

U404: BA7625



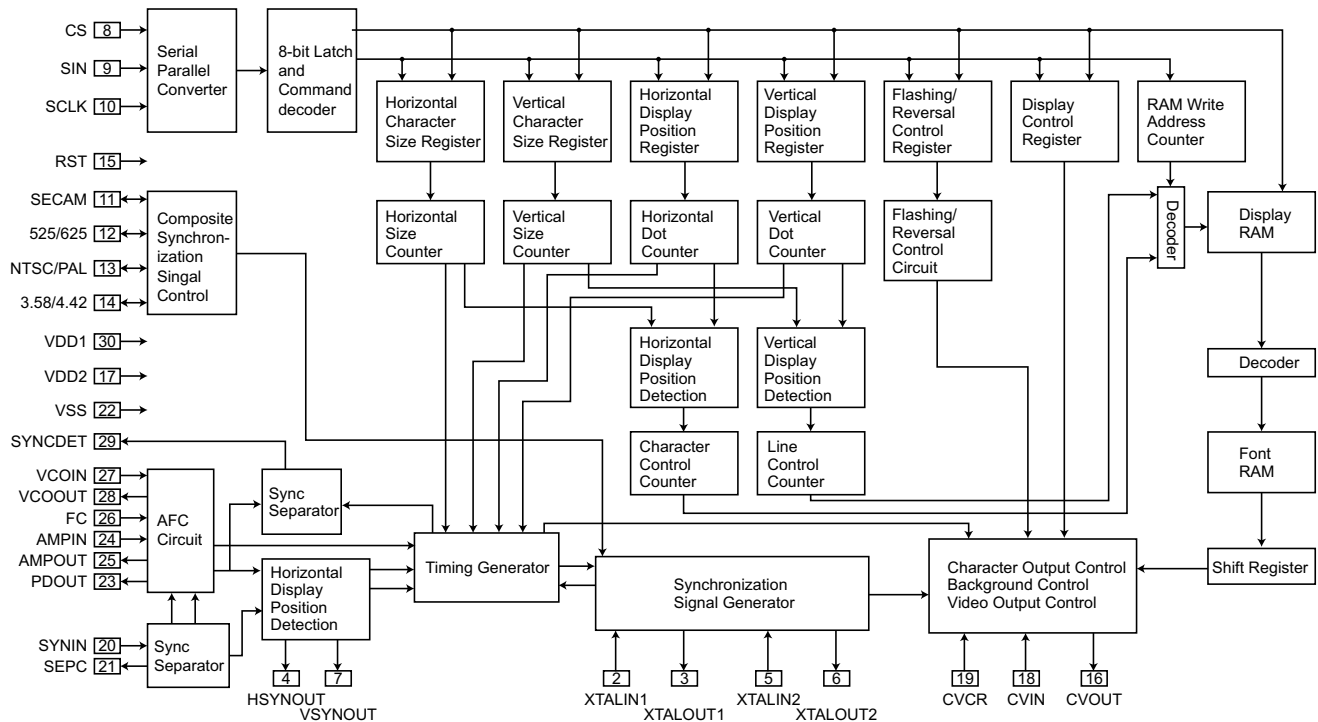
S-VIDEO BOARD

U404, U405: TEA2014A



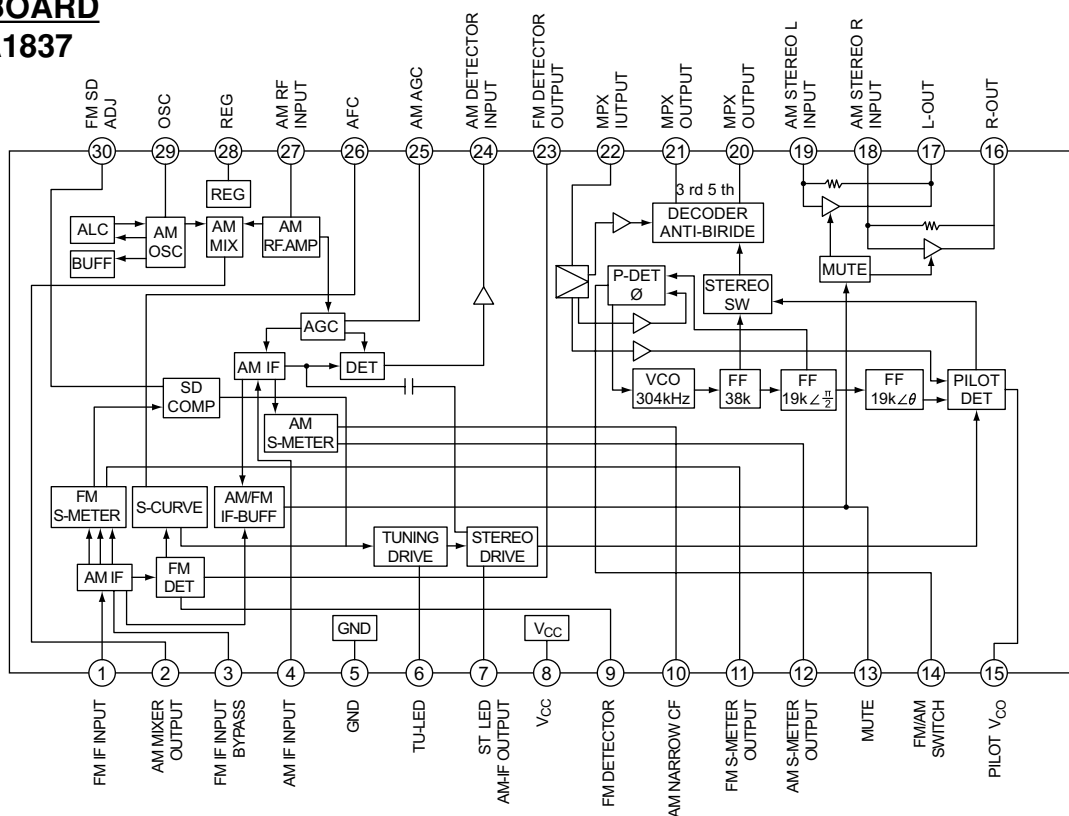
S-VIDEO BOARD

U402, U403: LC74763-9012



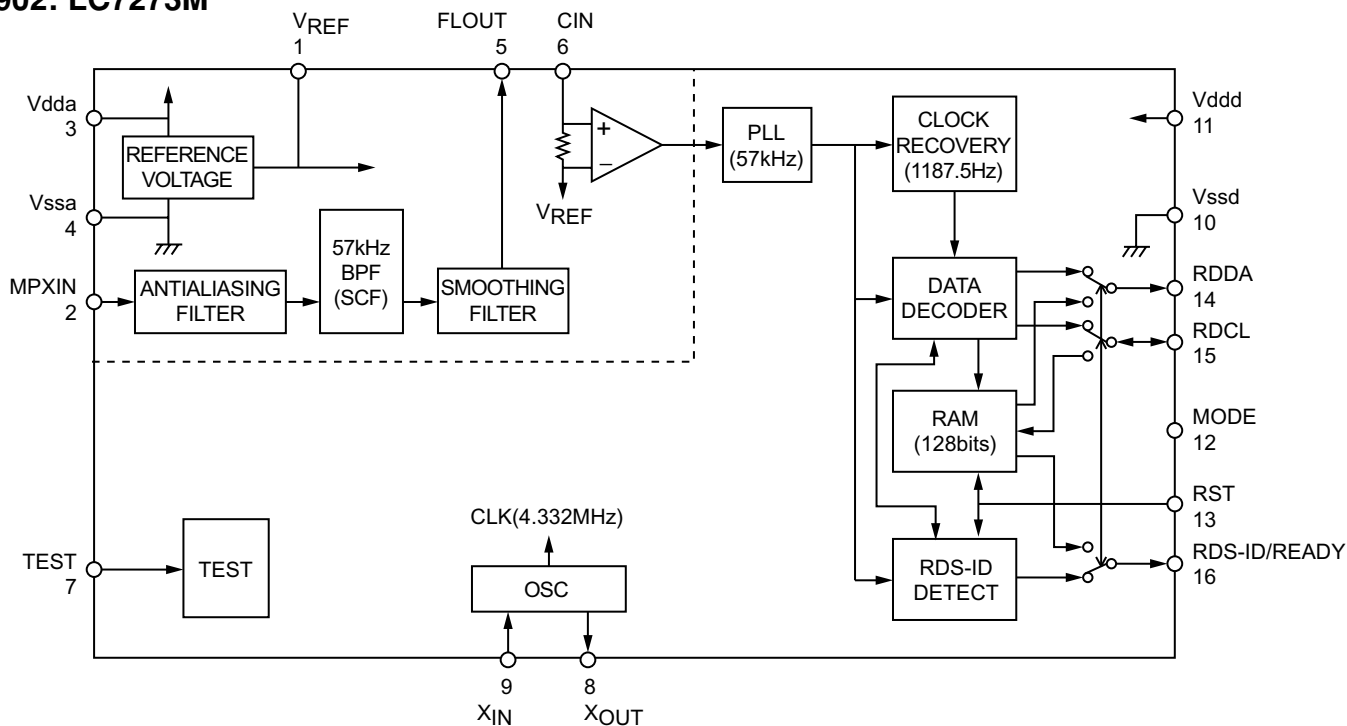
TUNER BOARD

U901: LA1837



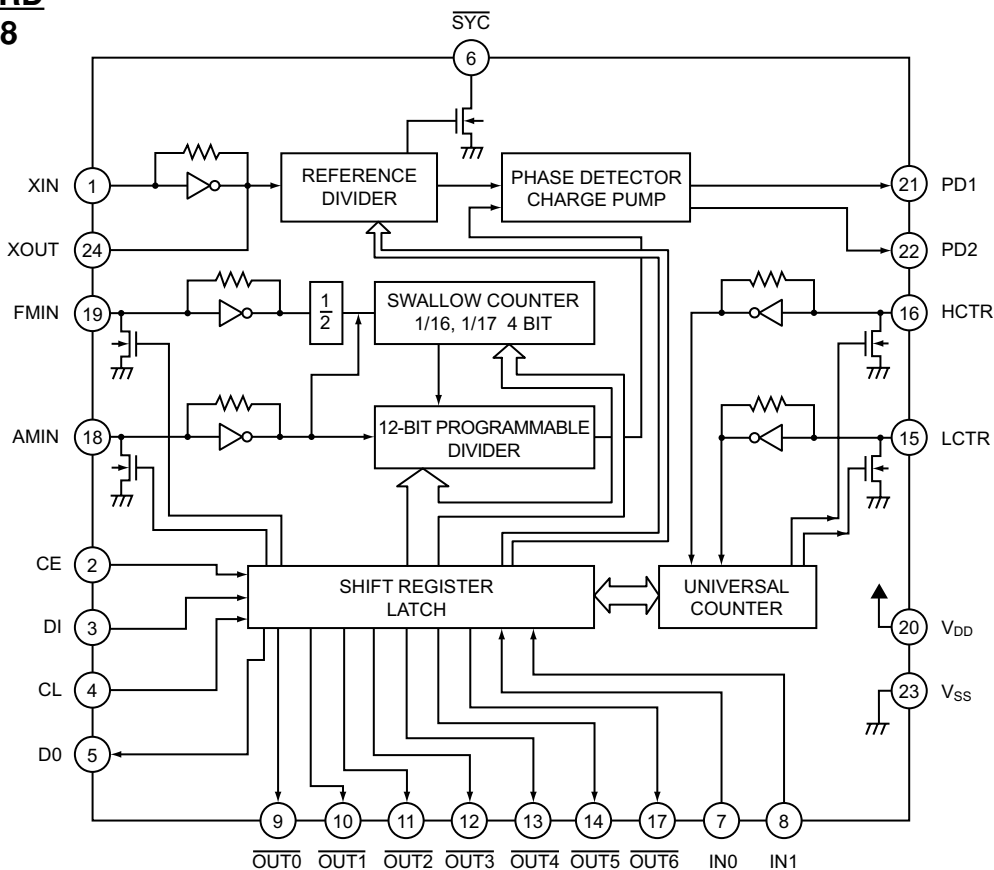
TUNER BOARD

U902: LC7273M



TUNER BOARD

U903: LC7218



ELECTRICAL PARTS LIST

Reference No.	Part No.	Description
AC3 BOARD	PCB-AL020C-AC3	AC3 ASSEMBLY
CAPACITORS		
C101,C103,C106,C108,C1112,	150F-104K-J-BD	CC 50V 0.1μF 10% 0805
C102,C125,C127,C129	150E-104M-J-BD	CC 25V 0.1F 20% 0805
C104	157C-108M-5-S5	CE 10V 1000μF 20% RL
C105,C1220,C152,C163,C164	150F-103K-J-BD	CC 50V 0.01μF 10% 0805
C107	157D-228M-5-W@T	CE 16V 2200μF 20% RL
C1101,C1104,C1117,C1119,C1120	150E-104M-J-BD	CC 25V 0.1F 20% 0805
C1102,C1105,C182,C185	150F-101J-J-BD	CC 50V 100pF 5% 0805 1.2
C1106,C1107,C114,C115	157D-226M-5-GM	CE 16V 22μF 20% RL 4X7
C1113,C1114,C1122,C1123,	150F-104K-J-BD	CC 50V 0.1μF 10% 0805
C1115,C128,C141,C153	157D-106M-5-GM	CE 16V 10μF 20% RL 4x7
C1116,C130,C143	157E-105M-5-EI	CE 25V 1μF 20% RL 3x5
C1118,C126,C139	157D-227M-5-KW	CE 16V 220μF 20% RL 6x12
C1131,C1132,C1134,C1136,C1137	150F-104K-J-BD	CC 50V 0.1μF 10% 0805
C1135	150F-100J-J-BD	CC 50V 10pF 5% 0805 1.2x
C117,C119,C1203,C132,C134	157D-475M-5-EI	CE 16V 4.7μF 20% RL 3X5
C120,C121,C1230-C1235	157D-226M-5-GM	CE 16V 22μF 20% RL 4X7
C1201,C1202,C1204-C1213,C171	15FF-224Z-J-BD	CC 50V 0.22μF +80/-20%
C122,C123,C135,C136,C146,C148	150F-821K-J-BD	CC 50V 820pF 10% 0805
C138,C140,C142,C181	150E-104M-J-BD	CC 25V 0.1F 20% 0805
C145,C147	157D-475M-5-EI	CE 16V 4.7μF 20% RL 3X5
C150,C151,C154,C157,C159	150F-104K-J-BD	CC 50V 0.1μF 10% 0805
C156	150F-683K-P-AC	CC 50V 0.068μF 10% 0603
C156	150F-683M-J-BD	CC 50V 0.068μF 20% 0805
C158	157D-476M-5-IU	CE 16V 47μF 20% RL 5x11
C161,C162	15FD-105Z-J-BD	CC 16V 1μF +80-20% 0805
C165	157D-225M-5-GM	CE 16V 2.2μF 20% RL 4X7
C166,C167,C169,C175,C179	150F-104K-J-BD	CC 50V 0.1μF 10% 0805
C168,C174,C199	157D-106M-5-GM	CE 16V 10μF 20% RL 4x7
C172	153F-225J-5-TOM	CM 50V 2.2μF RL 10X8
C173,C176	157C-107M-5-IU	CE 10V 100μF 20% RL 5x11
C180,C183,C184	150F-104K-J-BD	CC 50V 0.1μF 10% 0805
C187-C192,C195,C196	150F-101J-J-BD	CC 50V 100pF 5% 0805 1.2
C193,C194,C198	150F-104K-J-BD	CC 50V 0.1μF 10% 0805
DIODE		
D101	4840-0490-0	BRIDGE RECTIFIER RB152
HEAT SINKS		
H-U121	5400-0831-0	HEATSINK
H-U123	5400-9130-0	HEAT SINK FOR 7805 2438-
WAFERS		
J101A	2102-101S-004	WAFER 10P P2.5 ST.
J102A, J604B	2102-041S-004	4P ST.WAFER
J203B	2101-1581-0	FLEXIBLE CONN. 35P
J601B	2102-121S-004	12P ST.WAFER
COILS		
L101-L104	1801-100K-M	COIL 10μH 10% BL7.0
CRYSTAL		
M101	2300-3060-0	X'TAL 12.288MHZ +/-20PPM

Reference No.	Part No.	Description
	8910-0493-0	CRYSTAL IC KIT ASSY
TRANSISTOR		
Q101	485C-114E-5	TR DTC114ES
RESISTORS		
R101-R103,R105-R109	4720-103J-J	RMG 1/10W 10K 5% 0805
R104	4720-680J-J	RMG 1/10W 68R 5% 0805
R110	4707-103C-5-8	RCFA 1/2W 10K 2% RL 8 9P
R1101,R113,R116	4720-473J-J	RMG 1/10W 47K 5% 0805
R1104,R1106,R1108	4720-103J-J	RMG 1/10W 10K 5% 0805
R1105,R1107,R1109,R1111	4720-102J-J	RMG 1/10W 1K 5% 0805
R111,R1110,R1112,R1114	4720-103J-J	RMG 1/10W 10K 5% 0805
R1113,R1115,R135	4720-102J-J	RMG 1/10W 1K 5% 0805
R112,R119,R129,R156	4720-103J-J	RMG 1/10W 10K 5% 0805
R1121	4720-000J-J	RMG 1/10W 0R 5% 0805
R115,R118	4720-750J-J	RMG 1/10W 75R 5% 0805
R121-R126,R130-R134	4720-822J-J	RMG 1/10W 8.2K 5% 0805
R127,R184,R185,R190-R192	4720-104J-J	RMG 1/10W 100K 5% 0805
R136,R139,R169	4720-102J-J	RMG 1/10W 1K 5% 0805
R137,R138,R150,R173,R197-R199	4720-822J-J	RMG 1/10W 8.2K 5% 0805
R140	4720-101J-J	RMG 1/10W 100R 5% 0805
R155,R159	4720-153J-J	RMG 1/10W 15K 5% 0805
R157,R160,R161,R167,R168	4720-103J-J	RMG 1/10W 10K 5% 0805
R158,R162	4720-151J-J	RMG 1/10W 150R 5% 0805
R163,R164	4720-223J-J	RMG 1/10W 22K 5% 0805
R165	4720-121J-J	RMG 1/10W 120R 5% 0805
R166	4720-201J-J	RMG 1/10W 200R 5% 0805
R171,R181,R186,R189,R193	4720-103J-J	RMG 1/10W 10K 5% 0805
R172	4720-471J-J	RMG 1/10W 470R 5% 0805
R175	4715-010J-2	RMF 1/4W 1R 5% AT
R194	4720-335J-J	RMG 1/10W 3.3M 5% 0805
ICs		
S-U121	3100-3551-0	SI INSULATOR 12X18
U101	3131-7230-0	IC 74HC151 QUAD 4-PIN
U102	3131-3870-0	IC 74HC157 QUAD 2-INPUT
U103	3131-3700-0	IC CS5331A 18BIT A/D
U104,U109,U116,U129	3130-2430-0	IC-NE5532 OPER. AMP PHIL
U105	3131-3720-0	IC CS4926 DSP CRYSTAL
U106,U107	3130-8980-0	IC 74HC574 8X D-TYPE
U108	3131-7760-0	IC AT27C040 512KX8 OTP
U110	3130-8890-0	IC CS8414 DIR 96KHZ
U111-U113	3131-3710-0	IC CS4340 D/A CONVERTER
U114	3131-9100-0	IC 74HCU04 HEX INVERTERS
U115,U117,U120	3130-6590-0	IC 74HC74 DUAL D-TYPE
U118,U119	3131-9050-0	IC 74HC00 QUAD 2/P NAND
U121	3130-5610-0	IC LM317T+ADJ REGULATOR
U123,U125, U130-U132	3130-2020-2	IC 7805 REG 5V
U134	3130-2430-0	IC-NE5532 OPER. AMP PHIL
MISCELLANEOUS		
1003 *UK BLK / SILVER	2107-0681-0	ANT-TERMINAL (DIN-TYPE)
1003 *US BLK / SILVER	2107-0641-0	ANT-TERMINAL F-TYPE
2702	2954-3008-0000	TAPPING 3X8MM B-TITE
2703	4151-9931-0	INSULATION BUSHING

Reference No.	Part No.	Description
2704	2954-2606-0000	SCREWS BT 2.6X6
<u>POWER AMP BOARD</u>	PCB-AL020C-AMP1	POWER AMP L/R/C ASSEMBLY
<u>CAPACITORS</u>		
C501,C502,C552	157F-225M-5-IMN	CE 50V 2.2μF 20% RL 5x7
C503,C504,C513,C514,C541,C542	150F-101J-5-IF	CC 50V 100pF 5% RL 5x3.5
C505,C506,C545	157E-107M-5-IURY	CE 25V 100μF 20% RL5X11
C511,C512,C547	150F-070D-5-GG	CC 50V 7PF 0.5PF RL 4X4
C515,C516,C544	150F-181K-5-GG	CC 50V 180pF 10% RL 4x4
C517,C518,C538,C550,C583,C592,C593	150F-223Z-5-UG	CC 50V 0.022μF +80/-20%
C519,C520,C553	153F-104J-5-QUN	CM 50V 0.1μF RL (9X11)
C521,C522,C546	157D-476M-5-IU	CE 16V 47μF 20% RL 5x11
C523,C524,C543	15CH-020C-5-GG	CTC 0/60 2pF 0.25pF RL
C525,C526	157I-477M-5-X&	CE 63V 470μF 20% RL
C548,C549	157F-106M-5-IU	CE 50V 10μF 20% RL 5x11
C561,C562	8910-0078-0	CE 63V 10000μF 20% RL 35X
C563-C565,C507-C510	157F-106M-5-GM	CE 50V 10μF 20% RL 4X7
C581	157B-107M-5-KM	CE 6.3V 100μF 20% RL 6x7
<u>DIODES</u>		
D501,D503	4804-0040-1	DIODE IN4004 AL
D511	4840-7060-0	DIODE BRIDGE RS804M
D520,D592,D593	4804-1480-C	DIODE 1N4148 ATS
D531,D532	4804-0010-2	DIODE 1N4001 AT
<u>CONN ASSY</u>		
J502A	7712-1150-3004	CONN.ASSY 12P P2.5 L150
J503A	7710-1100-3004	CONN.ASSY 10P P2.5 L100
<u>WAFERS</u>		
J505B	2102-021S-004	2P ST.WAFER
J603B	2102-061S-004	6P ST. WAFER
J802B	2102-101S-004	WAFER 10P P2.5 ST.
P501-P503	2113-1160-0	WAFER 2P ST. P=2.5 NH
<u>SPRING COILS</u>		
L501,L502	1804-0540-0	SPRING COIL 1MH
<u>RELAYS</u>		
M501	4500-0910-0	RELAY 24VDC,125VA,3A
M502	4500-0900-0	RELAY 24VDC,250VAC,10A
<u>THERMISTOR</u>		
M511	8910-0489-0	THERMISTOR 100C
<u>TRANSISTORS</u>		
Q501-Q506,Q527,Q528	4860-0190-5	TR 2SC 1845 (F.E) RL
Q507-Q510,Q513-Q518	485A-949O-5	TR 2SA949-O HFE 70-140
Q511,Q512,Q515	485C-2229-5	TR 2SC2229-0 HFE 70-140
Q516,Q549,Q550	485C-2229-5	TR 2SC2229-0 HFE 70-140
Q517,Q518,Q552	4860-1220-5	TR 2SC3421 (0,Y) RL TSB
Q519,Q520,Q551	485C-5171-5	TR 2SC5171 HFE 100-320
Q521,Q522,Q553	485A-1930-5	TR 2SA1930 HFE 100-320
Q523,Q524,Q554	4860-5210-5	TR 2SC5198-0 HFE 80-160

Reference No.	Part No.	Description
Q525,Q526,Q555 Q529,Q530,Q545,Q564 Q541-Q544,Q581,Q582 Q563 Q583 Q591,Q592	4860-5220-5 4860-1590-5 4860-0190-5 485B-772P-5 4850-992F-5 485C-123J-5	TR 2SA1941-0 HFE 80-160 TR 2SC1740S TR 2SC 1845 (F.E) RL TR 2SB772P PNP POWER TR TR 2SA992 HFE 300-600 TR DTC123JSA ROHM
IC Q565	3130-2520-3	IC 7812 12V REGULATOR
HEATSINK Q565A	5400-1051-1	HEATSINK PLATE (312)
RESISTORS R507-R510,R588,R590 R5100,R537,R538 R5101,R531,R532,R535,R536,R598 R5102,R533,R534 R5103,R543,R544 R5104,R5105,R539-R542,R567,R659 R5106,R545,R546 R5107,R547,R548 R511,R512,R589 R5110,R555,R556 R5111,R515,R516 R5112,R5117,R553,R554,R575 R5119,R559,R572 R5120,R5121 R513,R591 R5134,R5135 R517-R520,R582,R583 R521-R524,R527,R528 R525,R526,R529 R529,R530,R593 R549,R550,R587 R560 R561,R562,R594 R563-R566,R584,R595 R571 R573,R574,R599 R577,R578 R585,R586,R597	4711-180A-2 4711-512A-2 4711-183A-2 4711-332A-2 4715-331A-2 4717-2R2J-2 4711-272A-2 474B-R22K-5-02 4711-562A-2 4718-8R2J-2-X 4715-681A-2 4711-473A-2 4711-103A-2 4711-472A-2 4715-273A-2 4711-122A-C 4711-102A-2 4717-680J-1 4717-560J-2 4711-560A-2 4711-471A-2 4711-223A-2 4711-271A-2 4711-104A-2 4715-333A-2 4756-2226-3-06 4718-R22J-2 4717-680J-1	RMF 1/8W 18R 1% AT RMF 1/8W 5.1K 1% AT RMF 1/8W 18K 1% AT RMF 1/8W 3.3K 1% AT RMF 1/4W 330R 1% AT RMF 1/2W 2.2R 5% AT RMF 1/8W 2.7K 1% AT RWR 5W 0.22R X2 10% RL RMF 1/8W 5.6K 1% AT RMF 1W 8.2R 5% AT RMF 1/4W 680R 1% AT RMF 1/8W 47K 1% AT RMF 1/8W 10K 1% AT RMF 1/8W 4.7K 1% AT RMF 1/4W 27K 1% AT RMF 1/8W 1.2K 1% ATS RMF 1/8W 1K 1% AT RMF 1/2W 68R 5% AL RMF 1/2W 56R 5% AT RMF 1/8W 56R 1% AT RMF 1/8W 470R 1% AT RMF 1/8W 22K 1% AT RMF 1/8W 270R 1% AT RMF 100K 1/8W 1% AT RMF 1/4W 33k 1% AT SVR 2.2K H3 7X7.6 R0615C RMF 1W 0.22R 5% AT RMF 1/2W 68R 5% AL
MISCELLANEOUS 2402,J520A AC-IN Q565B	4132-1061-0 7010-2357-0 2954-3008-0000	SOLDER TAG WIRE CON ASSY 2P L=330MM TAPPING 3X8MM B-TITE
POWER AMP SL/SR ASSEMBLY	PCB-AL020C-AMP2	POWER AMP SL/SR ASSEMBLY
CAPACITORS C805,C806 C815,C816 C803,C804 C813,C814	150F-020C-5-GG 150F-070D-5-GG 150F-101J-5-IF 150F-181K-5-GG	CC 50V 2pF 0.25pF RL 4x4 CC 50V 7PF 0.5PF RL 4X4 CC 50V 100pF 5% RL 5x3.5 CC 50V 180pF 10% RL 4x4

Reference No.	Part No.	Description
C821,C822,C833 C807,C808 C823,C824 C811,C812 C809,C810 C817-C820 C801,C802 C829,C830 C825 C831,C832,C835,C836	150F-223Z-5-UG 150F-471K-5-GG 153F-104J-5-QUN 157D-476M-5-IU 157E-107M-5-IURY 157F-106M-5-GM 157F-225M-5-IMN 157I-477M-5-X& 150F-102K-2-FC 150F-151K-2-FC	CC 50V 0.022μF +80/-20% CC 50V 470pF 10% RL 4x4 CM 50V 0.1μF RL (9X11) CE 16V 47μF 20% RL 5x11 CE 25V 100μF 20% RL5X11 CE 50V 10μF 20% RL 4x7 CE 50V 2.2μF 20% RL 5x7 CE 63V 470μF 20% RL CC 50V 1000pF 10% AT 3.5 CC 50V 150pF 10% AT 3.5x
DIODES D801,D802 D803-D805	4804-0040-1 4804-1480-C	DIODE IN4004 AL DIODE 1N4148 ATS
WAFERS J604B JP801,JP802 SCREW 2502,GND1	2102-041S-004 2113-1160-0 4131-7701-0 4132-1061-0	4P ST.WAFER WAFER 2P ST. P=2.5 NH ANTENNA WASHER SOLDER TAG
CONN ASSY J801A J802A	7708-1150-3004 7710-1200-3004	CONN.ASSY AWG24 8P P2.5 CONN ASSY 10P P2.5 L200
RELAY M801	4500-0910-0	RELAY 24VDC,125VA,3A
TRANSISTORS Q823,Q824 Q809-Q812,Q815,Q816 Q831 Q817-Q820 Q813,Q814 Q801-Q806,Q829,Q930 Q850,Q851 Q821,Q822 Q807,Q808 Q825,Q826 Q827,Q828	485A-1930-5 485A-949O-5 485C-123J-5 485C-2229-5 485C-5171-5 4860-0190-5 4860-0770-5 4860-1220-5 4860-1590-5 4860-5210-5 4860-5220-5	TR 2SA1930 HFE 100-320 TR 2SA949-O HFE 70-140 TR DTC123JSA ROHM TR 2SC2229-0 HFE 70-140 TR 2SC5171 HFE 100-320 TR 2SC 1845 (F.E) RL TR 2SC2878 (A,B) RL TR 2SC3421 (0,Y) RL TSB TR 2SC1740S TR 2SC5198-0 HFE 80-160 TR 2SA1941-0 HFE 80-160
RESISTORS R813-R816 R817,R818,R847,R848 R829,R830,R833,R834 R869 R865,R866 R845,R846 R803,R804,R823,R824 R835,R836 R861,R862 R805,R806,R839,R840 R863,R864 R831,R832 R827,R828 R809,R810	4711-102A-2 4711-104A-2 4711-183A-2 4711-221A-2 4711-223A-2 4711-271A-2 4711-273A-2 4711-332A-2 4711-333A-2 4711-471A-2 4711-473A-2 4711-512A-2 4711-560A-2 4711-562A-2	RMF 1/8W 1K 1% AT RMF 100K 1/8W 1% AT RMF 1/8W 18K 1% AT RMF 1/8W 220R 1% AT RMF 1/8W 22K 1% AT RMF 1/8W 270R 1% AT RMF 1/8W 27K 1% AT RMF 1/8W 3.3K 1% AT RMF 1/8W 33K 1% AT RMF 1/8W 470R 1% AT RMF 1/8W 47K 1% AT RMF 1/8W 5.1K 1% AT RMF 1/8W 56R 1% AT RMF 1/8W 5.6K 1% AT

Reference No.	Part No.	Description
R837,R838 R825,R826 R855,R856 R841-R844,R859,R860 R849,R850 R819-R822,R851,R852 R857,R858 R853,R854 R867,R868	4715-331A-2 4715-681A-2 4707-272J-2 4717-2R2J-2 4717-560J-2 4717-680J-1 4718-8R2J-2-X 474B-R22K-5-02 4756-2026-3-03	RMF 1/4W 330R 1% AT RMF 1/4W 680R 1% AT RCF 1/2W 2.7K 5% AT RMF 1/2W 2.2R 5% AT RMF 1/2W 56R 5% AT RMF 1/2W 68R 5% AL RMF 1W 8.2R 5% AT RWR 5W 0.22R X2 10% RL SVR 2K
<u>AUDIO BOARD</u>		
	PCB-AL020C-AUD	AUDIO ASSEMBLY
<i>SWITCH</i> 1204	5200-3171-0-01	DPDT SLIDE
<i>CAPACITORS</i> C319-C322,C325-C332 C303,C304 C305,C306	153F-101K-5-MKN 153F-103J-5-IM 157D-476M-5-IU	CM 100PF 50V RL (7X6) CM 50V 0.01μF 5% RL 5X7 CE 16V 47μF 20% RL 5x11
<i>WAFERS</i> J707B,J711B M301,M302	2101-1801-0 2113-1805-0	SOCKET (PCB/PCB) 10P 6P RCA JACK R/W GOLD
<i>RESISTORS</i> R332,R334,R336,R338,R340,R342, R344,R346,R348,R350,R352,R354 R339,R341,R343,R345,R347 R349,R351,R353 R331,R333,R335,R337	4711-105A-2 4711-222A-2 4711-331A-2	RMF 1/8W 1M 1% AT RMF 1/8W 2.2K 1% AT RMF 1/8W 330R 1% AT
<i>IC</i> U301	3130-8160-0	IC TC9273N ANALOG SWITCH
<u>DIGITAL BOARD</u>		
	PCB-AL020C-DIG	PCB ASSY DIGITAL AL020C
<i>CAPACITORS</i> C769 C763,C767 C772 C768 C766 C770,C771	150F-222K-5-LF 150F-223Z-5-UG 157D-226M-5-GM 150F-102K-2-FC 150F-103K-2-FC 150F-104K-2-FC	CC 50V 2200pF 10% RL 6.5 CC 50V 0.022μF +80/-20% CE 16V 22UF 20% RL 4X7 CC 50V 1000pF 10% AT 3.5 CC 50V 0.01μF 10% AT 3.5 CC 50V 0.1μF 10% AT
<i>WAFER / JACK</i> J102B J101B M706 M701	2102-041S-004 2102-101S-004 2113-1806-0 2113-1815-0	4P ST.WAFER WAFER 10P P2.5 ST. 1P RCA JACK BK GOLD 3P-H RCA JACK BLK GOLD
<i>COIL</i> L701	1802-0450-0	DIGITAL COIL

<u>Reference No.</u>	<u>Part No.</u>	<u>Description</u>
<i>FILTER</i> M707	2704-0060-0	EMC FILTER
<i>RESISTORS</i> R765 R764 R763	4711-102A-C 4711-151A-C 4711-471A-C	RMF 1/8W 1K 1% ATS RMF 1/8W 150R 1% ATS RMF 1/8W 470R 1% ATS
<i>ICs</i> U762 1001,1002	3131-9050-0 4811-F32R-3	IC 74HC00 QUAD 2I/P NAND LIGHT RX UNIT GPIF32R
<u>GSW BOARD</u>	PCB-AL020C-GSW	GSW ASSEMBLY
<i>MISCELLANEOUS</i> C-GND	4132-1061-0	SOLDER TAG
<i>SWITCH</i>	5200-3530-0	SWITCH,110-220V DPDT
<u>IEC BOARD</u>	PCB-AL020C-IEC	PCB ASSY IEC AL020C
<i>INLET</i> AC INLET	2113-1345-0	AC INLET (PCB MOUNT)
<u>KEY BOARD</u>	PCB-AL020C-KEY	KEYBOARD ASSEMBLY
<i>CAPACITORS</i> J202C C205,C207 C203,C204 C201,C206 C211 C210 C208 C202	150F-102K-2-FC 150F-104Z-5-IU 150F-220K-5-GG 157B-107M-5-KM 157C-107M-5-IU 157D-335M-5-IUK 157D-476M-5-IU 150F-103K-2-FC	CC 50V 1000pF 10% AT 3.5 CC 50V 0.1μF +80/-20% RL CC 50V 22pF 10% RL 4x4 CE 6.3V 100μF 20% RL 6x7 CE 10V 100μF 20% RL 5x11 CE 16V 3.3F 20% RL 5X11 CE 16V 47μF 20% RL 5x11 CC 50V 0.01μF 10% AT 3.5
<i>DIODES</i> D201,D202,D205-D207,D209,D210 D211 D203	4804-1480-C 4837-5B11-2 4837-5V61-2 4837-5B61-2	DIODE 1N4148 ATS DZ 1/2W 4.94~5.20V ROHM DZ 1/2W 5.6V ROHM AT DZ 1/2W 5.45-5.73 ROHM
<i>CONN ASSY</i> J207A J202A J201A	7703-1090-2004 7704-1200-2004 7704-1500-2004	CONN. ASSY 3P P2.5 L=90 CN ASSY 4P P=2.5 L=200 CN ASSY 4P P=2.5 L=500
<i>COIL</i> L201	1801-220K-M	COIL 22μH 10% AL BL7
<i>WAFERS</i> M221	2101-0661-0	SHUNT 2P P=2.54

Reference No.	Part No.	Description
M221 J203A,J206A J208C J1002A	2101-1368-0 2101-1581-0 2102-031S-004 2102-051S-004	REDEPTACLE 8PIN DUAL FLEXIBLE CONN. 35P 3 PIN ST. WAFER 5P ST.WAFER
CRYSTAL M219	2300-3150-0	CRYSTAL 10MHZ +/-30PPM
LED DISPLAY 2119	2460-1890-2	VFD 12-MT-84GNK FUTABA
MISCELLANEOUS		
M218 M218 2118	2601-3004-0801 2954-3008-0000 4132-1061-0 4152-5741-0	FIBRE WASHER TAPPING 3X8MM B-TITE SOLDER TAG HOLDER (FL)
TRANSISTORS M218 Q204 Q202 Q201,Q205	4814-3TE2-3 485A-114E-5 485C-144E-5 4860-0050-5	IR SENSOR PIC-12043TE2 TR DTA114ESA ROHM TR DTC144ES ROHM TR SS8050 C/D SAMSUNG RL
SWITCH	5200-3628-0-00	TACT SW SKHHBY 7MM HIGH
RESISTORS R281 R224,R225,R275,R277 R215-R218,R226,R232-R240 R241-R246,R251-R260 R261,R282,R276 R263-R270,R271-R274 R207-R209 R210-R212 R228-R231,R262 R220,R221 R213,R214,R219 R222,R247-R250 R223 R201-R203 R204-R206	4701-514J-C 4711-102A-2 4711-103A-2 4711-104A-2 4711-182A-2 4711-222A-2 4711-223A-2 4711-471A-2 4711-472A-2 4711-473A-2 4711-474A-2 4711-681A-C 4711-821A-2	RCF 1/8W 510K 5% ATS RMF 1/8W 1K 1% AT RMF 1/8W 10K 1% AT RMF 100K 1/8W 1% AT RMF 1/8W 1.8K 1% AT RMF 1/8W 2.2K 1% AT RMF 1/8W 22K 1% AT RMF 1/8W 470R 1% AT RMF 1/8W 4.7K 1% AT RMF 1/8W 47K 1% AT RMF 1/8W 470K 1% AT RMF 1/8W 680R 1% ATS RMF 1/8W 820R 1% AT
ICs U201 U202	3131-3810-0 3131-7250-0	IC LC87F65C8A 8-BIT MCU IC 24C08 8K EEPROM
LED BOARD	PCB-AL020C-LED	LED ASSEMBLY
LED	3700-3517-RG	LED RED/GREEN (L-469HGW)
CONN ASSY J202	7703-1090-2004	CONN. ASSY 3P P2.5 L=90

Reference No.	Part No.	Description
MAIN BOARD	PCB-AL020C-MAIN	PCB ASSY MAIN AL020C
CAPACITORS		
C717	157E-338M-5-5\$	CE 25V 3300F 20% RL
C718	157E-108M-5-X&	CE 25V 1000µF 20% RL
C720,C721,C727,C730,C731	150F-223K-2-FD	CC 50V 0.022µF 10% AT
C736,C737,C750,C752		
C722,C723,C732	157F-106M-5-GM	CE 50V 10µF 20% RL 4x7
C726,C734	157F-476M-5-LU	CE 50V 47µF 20% RL
C728,C738	157F-107M-5-OW	CE 50V 100µF 20% RL 8x12
C735,C751	157D-106M-5-GM	CE 16V 10µF 20% RL 4x7
C741-C744	157C-337M-5-OW	CE 10V 330µF 20% RL 8x12
C753	157F-106M-5-GM	CE 50V 10µF 20% RL 4x7
POLYSWITCH		
C739	5201-0000-0	RAYCHEM POLYSWITCH RXE01
DIODES		
D720,D721,D728	4804-0040-1	DIODE IN4004 AL
D719,D723,D731-D734	4804-1480-C	DIODE 1N4148 ATS
D715-D718	4805-3930-2	DIODE 1N5393 200V 1.5A
D722	4837-27V0-2	DZ 1/2W 27V(26.2-27.6)AT
WAFERS		
J206B	2101-1591-0	FLEXIBLE CONN. 35P P1.25
J703A,J705A-J711A	2101-1621-0	WAFER (PCB/PCB) 10P P2.0
J704A	2101-1641-0	WAFER (PCB/PCB) 16P P2.0
J1002A	2102-021S-004	2P ST.WAFER
J701B	2102-031S-004	3 PIN ST. WAFER
J7001	2102-041S-004	4P ST.WAFER
J401B	2102-051S-004	5P ST.WAFER
J502B	2102-121S-004	12P ST.WAFER
MISCELLANEOUS		
2305	2900-3008-3000	SCREW M3x8 PM BZ
	2954-2606-0000	SCREWS BT 2.6X6
U709B	2954-2606-0000	SCREWS BT 2.6X6
2302	2954-3008-0000	TAPPING 3X8MM B-TITE
U709A	2954-3008-0000	TAPPING 3X8MM B-TITE
2304	4132-1061-0	SOLDER TAG
M702,M703,M728	5400-0831-0	HEATSINK
M701	5400-1702-0	HEATSINK 23.5X17X50
TRANSISTOR		
Q724	4860-0660-5	TR 2SA1015 (G.R.) RL
RESISTORS		
R733,R734	4718-391J-2-X	RMF 1W 390R 5% AT
R731	4701-102J-C	RCF 1/8W 1K 5% ATS
R732	4701-333J-C	RCF 1/8W 33K 5% ATS
R741-R744	4701-472J-C	RCF 1/8W 4.7K 5% ATS
R721,R722	4711-123A-2	RMF 1/8W 12K 1% AT
R723	4711-472A-2	RMF 1/8W 4.7K 1% AT
R729	4711-820A-2	RMF 1/8W 82R 1% AT

Reference No.	Part No.	Description
ICs		
U708	3131-9110-0	IC 74HC08 AND GATES(SOP)
U709,U721	3130-2520-3	IC 7812 12V REGULATOR
U722	3130-3800-0	IC UPC79M12HF REGULATOR
U723	3130-8190-0	IC NJM78M56FA 5.6V
U724	3130-2020-2	IC 7805 REG 5V
MULTI BOARD		
	PCB-AL020C-MUTI	MULTI CH ASSEMBLY
CAPACITORS		
C656,C657,C664-C667	150F-101J-5-IF	CC 50V 100pF 5% RL 5x3.5
C644	150F-103K-5-II	CC 50V 0.01μF 10% RL 5x5
C617	150F-104Z-5-IU	CC 50V 0.1μF +80/-20% RL
C630-C633	150F-221K-5-GG	CC 50V 220pF 10% RL 4x4
C683-C686	150F-223Z-5-UG	CC 50V 0.022μF +80/-20%
C634-C637,C660-C663,C672,C673	153F-101K-5-MKN	CM 100PF 50V RL (7X6)
C670,C671	153F-103J-5-IM	CM 50V 0.01μF 5% RL 5X7
C622-C625,C642,C668,C669	157D-106M-5-GM	CE 16V 10μF 20% RL 4x7
C647-C649	157D-226M-5-II	CE 16V 22μF 20% RL 5x5
C680	157D-227M-5-KW	CE 16V 220μF 20% RL 6x12
C643	157D-335M-5-II	CE 16V 3.3μF 20% RL 5x5
C650-C653	157D-475M-5-EI	CE 16V 4.7μF 20% RL 3x5
C620,C621,C674,C679,C681,C682	157D-476M-5-IU	CE 16V 47μF 20% RL 5x11
C611-C616,C654,C655	157F-105M-5-IURY	CE 50V 1μF 20% RL5X11 YK
C638-C641	157F-225K-5-GM	CE 50V 2.2μF 10% RL 4X7
C601-C606	150F-101K-2-FC	CC 50V 100pF 10% AT 3.5x
C675,C676	150F-221K-2-FC	CC 50V 220pF 10% AT 3.5x
C609,C610	150F-223K-2-FD	CC 50V 0.022μF 10% AT
DIODES		
D603	4804-1480-2	DIODE 1N4148 AT
D607	4837-5V61-2	DZ 1/2W 5.6V ROHM AT
D601,D602	4837-7V51-2	DZ 1/2W 7.5V ROHM AT
WAFER / JACK		
J705B,J706B	2101-1801-0	SOCKET (PCB/PCB) 10P
J602A	2102-041S-004	4P ST.WAFER
J605A	2102-101S-004	WAFER 10P P2.5 ST.
J601A	2102-121S-004	12P ST.WAFER
J605A	1808-0130-0	FERRITE CODE D19XT10
1102,1105	2113-1808-0	4P RCA JACK R/W GOLD
1103,1106	2113-1809-0	2P RCA JACK BK/BK GOLD
CONN ASSY		
J603A	7706-1150-3004	CONN.ASSY 6P P2.5 L150
COILS		
L601,L602	1801-101K-M	COIL 100μH 10%
TRANSISTORS		
Q609,Q614,Q616,Q618,Q620,Q610	485A-114E-5	TR DTA114ESA ROHM
Q607,Q622	4860-0050-5	TR SS8050 C/D SAMSUNG RL
Q602	4860-0060-5	TR SS8550 C/D SAMSUNG RL
Q601A,Q605,Q606	4860-0770-5	TR 2SC2878 (A,B) RL
Q608,Q611,Q612,Q613		

Reference No.	Part No.	Description
RESISTORS		
R6112,R683,R684	4711-101A-2	RMF 1/8W 100R 1% AT
R644,R645,R660,R661	4711-102A-2	RMF 1/8W 1K 1% AT
R681,R682,R699,R700	4711-152A-2	RMF 1/8W 1.5K 1% AT
R614,R615,R617,R618	4711-103A-2	RMF 1/8W 10K 1% AT
R632-R637		
R654,R656,R657,R665	4711-822A-2	RMF 1/8W 8.2K 1% AT
R607-R612,R638-R643	4711-104A-2	RMF 100K 1/8W 1% AT
R673-R678,R697,R698		
R695,R696	4711-122A-2	RMF 1/8W 1.2K 1% AT
R623	4711-123A-2	RMF 1/8W 12K 1% AT
R631,R693,R694,R704	4711-152A-2	RMF 1/8W 1.5K 1% AT
R655	4711-183A-2	RMF 1/8W 18K 1% AT
R626,R628,R691,R692	4711-203A-2	RMF 1/8W 20K 1% AT
R667-R672	4711-221A-2	RMF 1/8W 220R 1% AT
R663-R686	4711-223A-2	RMF 1/8W 22K 1% AT
R627,R650-R653,R705	4711-272A-2	RMF 1/8W 2.7K 1% AT
R601-R606	4711-331A-C	RMF 1/8W 330R 1% ATS
R613,R616,R619,R620	4711-333A-2	RMF 1/8W 33K 1% AT
R658,R624	4711-392A-2	RMF 1/8W 3.9K 1% AT
R659	4711-471A-2	RMF 1/8W 470R 1% AT
R687,R688	4711-472A-2	RMF 1/8W 4.7K 1% AT
R646-R649,R662,R666	4711-563A-2	RMF 1/8W 56K 1% AT
R679,R680,R689,R690		
J6123,R680	4711-682A-2	RMF 1/8W 6.8K 1% AT
C618,C619,C626,C627-C629	4701-101J-2	RCF 1/8W 100R 5% AT
ICs		
U601	3130-8120-0	IC M62447SP ELECTRIC
U602	3130-3730-1	IC TC9164AN HV ANALOG SW
U605-U611	3130-2430-0	IC-NE5532 OPER. AMP PHIL
PHO BOARD		
	PCB-AL020C-PHO	PCB ASSY PHO AL020C
CAPACITORS		
C4105,C4106	153F-102J-5-IM	CM 50V 1000PF 5% RL 5x7
JACK		
	2113-1733-0	PHONE JACK 6312-03-070
CN ASSY		
J410A	7705-1330-2004	CN ASSY 5P P2.5 L=330
POWER SUPPLY BOARD		
	PCB-AL020C-PSU	PCB ASSY POWER SUPPLY
CAPACITORS		
C759	150F-223Z-5-UG	CC 50V 0.022μF +80/-20%
C760	157E-227M-5-PU	CE 25V 220μF 20% RL
C758	8910-0091-0	CC 400V 0.01μF +20% RL
DIODES		
D752-D755	4804-0040-1	DIODE IN4004 AL
D751	4804-1480-C	DIODE 1N4148 ATS

<u>Reference No.</u>	<u>Part No.</u>	<u>Description</u>
WAFER J201A	2102-041S-004	4P ST.WAFER
MISCELLANEOUS P753,P754 3001 M752 M756	4131-9321-0 4132-1011-0 4132-1011-0 4132-1061-0	TERMINAL WRAP FUSE HOLDER FUSE HOLDER SOLDER TAG
RELAY M753	4500-0890-0	RELAY 12VDC,250VAC,10A
FUSES M752 M751	5120-0024-0 5120-0200-0	3.15A TIME-LAG 5X20 FUSE T5A/125V 5X20MM
TRANSISTOR Q751	485C-123J-5	TR DTC123JSA ROHM
SWITCH	5200-3530-0	SWITCH,110-220V DPDT
RESISTORS R754 R758	4717-8R2J-2-F 4717-335J-2-S	RMF 1/2W 8.2R 5% AL RMF 1/2W 3.3M 5% AT UL
TRANSFORMER T752	1806-2501-0	EI-35 TRANSFORMER GTP750
<u>ROM ASSEMBLY</u>	PCB-AL020C-ROM	PCB ASSY ROM AL020C
CAPACITORS C1009 C1002 C1003 C1006 C1005	157C-107M-5-IM 150F-102K-2-FC 150F-103K-2-FC 150F-104K-2-FC 150F-681K-2-FC	CE 10V 100μF 20% RL 5X7 CC 50V 1000pF 10% AT 3.5 CC 50V 0.01μF 10% AT 3.5 CC 50V 0.1μF 10% AT CC 50V 680pF 10% AT 3.5x
DIODE D1001	4837-4B71-3	DZ 1/2W 4.7VB RLZ4.7B
WAFERS AC-O J1002A M101,M102	2101-1381-0 2102-051S-004 2113-1743-0	WAFER 2P P=3.96 ST 5P ST.WAFER MONO JACK HTJ-035-12E
CON ASSY J705B J100B	7010-2358-0 7702-1075-2004	WIRE CON ASSY 4P P=3.96 CONN.ASSY 2P P2.5 L=75
COIL L1001	1807-273J-PS	COIL 27MH 5% 8.3X9.7
SWITCH M103	5200-3530-0	SWITCH,110-220V DPDT

Reference No.	Part No.	Description
TRANSISTORS Q1001-Q1003	4851-9230-5	TR 2SC1923-0 HFE 70-140
RESISTORS R1002 R1003,R1014,R1015 R1022,R1023 R1005,R1007,R1009,R1011 R1006 R1004,R1012 R1013	4711-102A-C 4711-103A-C 4711-104A-C 4711-152A-2 4711-182A-2 4711-683A-2	RMF 1/8W 1K 1% ATS RMF 1/8W 10K 1% ATS RMF 1/8W 100K 1% ATS RMF 1/8W 1.5K 1% AT RMF 1/8W 1.8K 1% AT RMF 1/8W 68K 1% AT
IC U1001	3130-4990-0	IC LM393D DUAL VOLTAGE
SECONDARY BOARD	PCB-AL020C-SEC	SECONDARY ASSEMBLY
CAPACITORS C751,C752,C757,C762 C753-C756	150F-104K-5-II 153I-104J-5-NMN	CC 50V 0.1 μ F 10% RL 5x5 CM 63V 0.1 μ F RL (7.5X7)
WAFERS J705A J202B J701B	2101-1356-0 2101-9100-0 2102-041S-004 2102-071S-004	WAFER 5P P=3.96 ST. JM2422-4M WAFER 4P ST.WAFER WF T8 DE 7PIN COULOMB
CONN ASSY J701A	7703-1430-2004	CONN.ASSY 3P P2.5 L430
RESISTORS R755 R751-R753	4717-2R2J-2 4718-R22J-2	RMF 1/2W 2.2R 5% AT RMF 1W 0.22R 5% AT
SPEAKER BOARD	PCB-AL020C-SPK	SPEAKER ASSEMBLY
CAPACITORS C851,C852 C594-C956 C507	150F-331K-5-GE 153F-102J-5-IM 153F-104J-5-NSM	CC 50V 330pF 10% RL 4x3 CM 50V 1000PF 5% RL 5x7 CM 50V 0.01 μ F 5% RL
WAFERS J801B J503B	2102-081S-004 2102-101S-004 2113-1770-0 2113-1771-0	WAFER 8P P2.5 ST. WAFER 10P P2.5 ST. TERMINAL SPEAKER 4P TERMINAL SPEAKER 2P
S-VIDEO BOARD	PCB-AL020C-SVD	S-VIDEO ASSEMBLY
CAPACITORS C443,C449 C451 C401,C463,C469	150F-103K-5-II 150F-122K-5-IF 150F-223Z-5-UG	CC 50V 0.01 μ F 10% RL 5x5 CC 50V 1200pF 10% RL 5x3 CC 50V 0.022 μ F +80/-20%

Reference No.	Part No.	Description
C433-C435,C447	150F-470J-5-IF	CC 50V 47pF 5% RL 5x3.5
C444,C448	150F-474M-5-II	CC 50V 0.47μF 20% RL 5X5
C457	150F-682K-5-SF	CC 50V 6800pF 10% RL 10x
C419	153F-223J-5-LQ	CM 50V 0.022μF 5% RL
C454	1551-0210-0	TRIMCAP 5.2-30P
C442,C445,C465	157B-107M-5-KM	CE 6.3V 100μF 20% RL 6x7
C423,C424	157B-227M-5-KW	CE 6.3V 220μF 20% RL
C450	157C-227M-5-LUK	CE 10V 220μF 20% RL
C405,C407	157C-477M-5-OU	CE 10V 470μF 20% RL 8X11
C418	157D-106M-5-GM	CE 16V 10μF 20% RL 4x7
C468	157D-108M-5-S9	CE 16V 1000μF 20% RL
C440	157D-476M-5-IU	CE 16V 47μF 20% RL 5x11
C436,C453	157F-105M-5-GM	CE 50V 1μF 20% RL 4x7
C4006,C4007,C417	157F-225M-5-GM	CE 50V 2.2μF 20% RL 4x7
C404,C406,C408,C409-C413		
C446,C462	157F-474M-5-GM	CE 50V 0.47μF 20% RL 4x7
C429A,C430A	15CH-050D-5-GG	CTC 0/60 5pF 0.5pF RL
C456	15CH-220J-5-GG	CTC 0/60 22pF 5% RL 4X4
C429-C432	15CH-300J-5-IG	CTC 0/60 30pF 5% RL 5x4
DIODES		
D401-D406,D408,D410,D413,R456	4804-1480-C	DIODE 1N4148 ATS
SOCKETS		
J709B,J710B	2101-1801-0 2113-1183-0	SOCKET (PCB/PCB) 10P 1P DIN CONNECTOR HDC-050
COILS		
L401	1801-5R6K-M	COIL 5.6μH 10% BL=7
Q436	1801-220K-M	COIL 22μH 10% AL BL7
TERMINALS		
1402-1406,J402	2300-3020-0	X'TAL 14.318MHZ +20PPM
M401	2300-3030-0	X'TAL 17.734MHZ +20PPM
TRANSISTORS		
Q405,Q411	485C-144E-5	TR DTC144ES ROHM
Q401-Q403,Q407,Q408	4860-1590-5	TR 2SC1740S
U406	485A-933S-5	TR 2SA933S HFE 120-560
RESISTORS		
L403	4711-102A-2	RMF 1/8W 1K 1% AT
R441,R443,R444,R445		
R467,R469	4711-104A-2	RMF 100K 1/8W 1% AT
R468	4711-121A-2	RMF 1/8W 120R 1% AT
R463	4711-151A-C	RMF 1/8W 150R 1% ATS
R422,R423,R482	4711-152A-2	RMF 1/8W 1.5K 1% AT
R454	4711-221A-2	RMF 1/8W 220R 1% AT
R459	4711-222A-2	RMF 1/8W 2.2K 1% AT
R431,R442,R446-R449,R476	4711-272A-2	RMF 1/8W 2.7K 1% AT
R462	4711-332A-2	RMF 1/8W 3.3K 1% AT
R474,R428	4711-473A-2	RMF 1/8W 47K 1% AT
R458	4711-680A-2	RMF 1/8W 68R 1% AT
R407,R408,R411,R412,R427	4711-682A-2	RMF 1/8W 6.8K 1% AT
R457,R473	4711-750A-C	RMF 1/8W 75R 1% ATS
R466	4711-752A-2	RMF 1/8W 7.5K 1% AT

Reference No.	Part No.	Description
R478 R4007,R4008,R401-R406	4711-820A-2 4711-824A-2	RMF 1/8W 82R 1% AT RMF 1/8W 820K 1% AT
ICs		
U401	3131-7690-0	IC BA7623 VIDEO SOP8 ROH
U402,U403	3131-3750-0	IC LC74763-9012 OSD
U404,U405	3131-7700-0	IC TEA2014 VIDEO SW SGS
M402	3131-3730-0	IC BA7625 2X5CH
MAIN SW BOARD		
	PCB-AL020C-SW	PCB ASSY MAIN SW AL020C
POWER SWITCH		
1702 C761	5200-3665-0 8910-0091-0	POWER SWITCH TV5 CC 400V 0.01μF +-20% RL
TONE BOARD		
	PCB-AL020C-TONE	PCB ASSY TONE AL020C
CAPACITORS		
C321,C322	153F-153J-5-KP	CM 50V 0.015μF 5% RL
WAFERS		
J605B VR301,VR302	2102-101S-004 4750-5505-0	WAFER 10P P2.5 ST. VR 100WX2W/CC RK16312
SWITCH		
	5200-3629-0	4P2T PUSH SW PS-42E04
RESISTORS		
R321,R322	4711-102A-2	RMF 1/8W 1K 1% AT
TUNER BOARD		
	PCB-AL020C-TUN	PCB ASSY TUNER AL020C
TUNER		
M901	1300-0726-0	TUNER ENV172D3G1
CAPACITORS		
C914,C915,C945,C982	150F-101J-5-IF	CC 50V 100pF 5% RL 5x3.5
C912,C913	150F-102K-5-IF	CC 50V 1000pF 10% RL 5x3
C992	150F-103K-5-II	CC 50V 0.01μF 10% RL 5x5
C911	150F-200J-5-GG	CC 50V 20pF 5% RL 4x4
C901-C903,C987	150F-223Z-5-UG	CC 50V 0.022μF +80/-20%
C930,C932,C941,C949,C950		
C968,C974,C976,C978,C981		
C916	150F-331K-5-GE	CC 50V 330pF 10% RL 4x3
C985	150F-561K-5-GG	CC 50V 560pF 10% RL 4x4
C991	153F-102J-5-IM	CM 50V 1000PF 5% RL 5x7
C995,C996	153F-104J-5-PT	CM 50V 0.1μF 5% RL
C961,C962	153F-152J-5-JM	CM 50V 1500PF 5% RL
C970	153F-223J-5-LQ	CM 50V 0.022μF 5% RL
C953,C954,C965	153F-272J-5-JM	CM 50V 2700PF 5% RL
C926	153F-333J-5-NLM	CM 50V 0.033μF 5% RL 7.5
C973	153F-473J-5-NLM	CM 50V 0.047μF 5% RL 7.5

Reference No.	Part No.	Description
C931,C986,C990 C904,C928,C975 C906,C942 C959,C960,C963,C964,C979 C967 C969 C946,C948 C929 C927,C943,C951,C977 C947,C944 C971 C924,C925 C988,C989 C381-C386	157B-107M-5-KM 157D-106M-5-GM 157D-107M-5-IU 157D-226M-5-GM 157D-474M-5-II 157D-476M-5-IM 157F-105M-5-GM 157F-224M-5-GM 157F-225M-5-GM 157F-474M-5-GM 15CH-080D-5-GG 15CH-200J-5-GG 15CH-300J-5-IG 150F-101K-2-FC	CE 6.3V 100μF 20% RL 6x7 CE 16V 10μF 20% RL 4x7 CE 16V 100μF 20% RL 5x11 CE 16V 22μF 20% RL 4X7 CE 16V 0.47μF 20% RL 5x5 CE 16V 47μF 20% RL 5X7 CE 50V 1μF 20% RL 4x7 CE 50V 0.22μF 20% RL 4x7 CE 50V 2.2μF 20% RL 4x7 CE 50V 0.47μF 20% RL 4x7 CTC 0/60 8pF 0.5pF RL CTC 0/60 20pF 5% RL 4x4 CTC 0/60 30pF 5% RL 5x4 CC 50V 100pF 10% AT 3.5x
WAFERS / SOCKETS		
J704B J703B P901 1002	2101-1601-0 2101-1801-0 2113-1160-0 2113-1805-0	SOCKET (PCB/PCB) 16P SOCKET (PCB/PCB) 10P WAFER 2P ST. P=2.5 NH 6P RCA JACK R/W GOLD
COILS		
L901 L903,L904 L905,L985 L941 L942 L971 L972 R912	1801-220K-M 5600-3386-S 1801-101K-M 5600-3396-S 5600-3406-S 5600-3280-G 5600-3416-S 1801-101K-M	COIL 22μH 10% AL BL7 COIL MPX LPF NMC-4085 COIL 100μH 10% COIL FM DET-1 10.7MHZ COIL FM DET-2 10.7MHZ COIL MW RF BLOCK COIL AM IFT NMIF-4062 COIL 100μH 10%
RELAYS		
M905 M985	2300-0440-0 2300-1220-0	CRYSTAL 7.2MHZ 20PPM CRYSTAL 4.332MHZ
CERAMIC FILTERS		
M902-M904 M911	2701-0010-1 2701-0680-0	CF10.7 +-30 CF 450 +-1
TRANSISTORS		
Q902 Q903,Q945 Q925-Q927 Q901 Q922,Q923,Q942 Q943,Q944	4851-9230-5 485A-114E-5 485C-144E-5 485C-945P-5 4860-1590-5 4860-8120-0	TR 2SC1923-0 HFE 70-140 TR DTA114ESA ROHM TR DTC144ES ROHM TR 2SC945P HFE 200-400 TR 2SC1740S TR 2SD 1468 S
RESISTORS		
R911 R916,R986,R987 R919-R924,R951,R968,R985 R906,R915,R927,R933 R947,R948,R954,R972 R340,R342,R382,R384,R386 R388,R944,R963,R964,974 R903	4711-101A-2 4711-102A-2 4711-103A-2 4711-104A-2 4711-123A-2	RMF 1/8W 100R 1% AT RMF 1/8W 1K 1% AT RMF 1/8W 10K 1% AT RMF 100K 1/8W 1% AT RMF 1/8W 12K 1% AT

<u>Reference No.</u>	<u>Part No.</u>	<u>Description</u>
R959,R960	4711-154A-2	RMF 1/8W 150K 1% AT
R973	4711-183A-2	RMF 1/8W 18K 1% AT
R902,R931,R955	4711-220A-C	RMF 1/8W 22R 1% ATS
R928	4711-221A-2	RMF 1/8W 220R 1% AT
R988	4711-222A-2	RMF 1/8W 2.2K 1% AT
R952,R953	4711-223A-2	RMF 1/8W 22K 1% AT
R957,R958	4711-272A-2	RMF 1/8W 2.7K 1% AT
R913	4711-330A-2	RMF 1/8W 33R 1% AT
R341,R381,R383,R385,R387	4711-331A-C	RMF 1/8W 330R 1% ATS
R389,R904,R909,R910,		
R907,R929,R946,R949	4711-332A-2	RMF 1/8W 3.3K 1% AT
R901	4711-333A-2	RMF 1/8W 33K 1% AT
R945	4711-392A-2	RMF 1/8W 3.9K 1% AT
R908,R961,R962	4711-471A-2	RMF 1/8W 470R 1% AT
R918,R942	4711-472A-2	RMF 1/8W 4.7K 1% AT
R975	4711-563A-2	RMF 1/8W 56K 1% AT
R905	4711-681A-C	RMF 1/8W 680R 1% ATS
R950	4711-684A-2	RMF 1/8W 680K 1% AT
R925,R926	4711-820A-2	RMF 1/8W 82R 1% AT
R943	4711-822A-2	RMF 1/8W 8.2K 1% AT
D901	4837-4C20-2	DZ 1/2W 5.0-5.2V AT
D902	4837-7C20-2	DZ 1/2W 9.1-9.5V AT
<u>VOLUMES</u>		
R956	4756-1036-3-06	SVR 10K H3 7X7.6 RH0615C
R941	4756-2236-3-06	SVR 22K H3 7X7.6 RH0615C
<u>ICs</u>		
U901	3130-8180-0	IC LA1837 AM/FM IF
U902	3131-9040-0	IC LC72723M RDS
U903	3131-3760-0	IC LC7218 PLL FREQ
<u>VIDEO BOARD</u>		
	PCB-AL020C-VD	VIDEO ASSEMBLY
<u>CAPACITORS</u>		
C429,C466,C467,C476	157C-477M-5-OU	CE 10V 470μF 20% RL 8X11
C459-C461,C470	157F-225M-5-GM	CE 50V 2.2μF 20% RL 4x7
C441,C464	150F-103K-2-FC	CC 50V 0.01μF 10% AT 3.5
C450	150F-223K-2-FD	CC 50V 0.022μF 10% AT
<u>DIODES</u>		
D414,D415	4804-1480-C	DIODE 1N4148 ATS
<u>JACKS / SOCKETS</u>		
J708B	2101-1801-0	SOCKET (PCB/PCB) 10P
1302	2113-1810-0	1P RCA JACK YL GOLD
1303	2113-1811-0	4P RCA JACK YL GOLD
1304	2113-1812-0	2P RCA JACK YL GOLD
<u>RESISTORS</u>		
R484,R488	4711-151A-C	RMF 1/8W 150R 1% ATS
R464,R465	4711-680A-2	RMF 1/8W 68R 1% AT
R483,R491,R492,R493	4711-820A-2	RMF 1/8W 82R 1% AT

<u>Reference No.</u>	<u>Part No.</u>	<u>Description</u>
ICs U404 U410	3131-3730-0 3131-7690-0	IC BA7625 2X5CH IC BA7623 VIDEO SOP8 ROH
<u>VOLUME BOARD</u>	PCB-AL020C-VOL	VOLUME ASSEMBLY
<u>WAFER</u> J207B	2102-031S-004	3 PIN ST. WAFER
<u>VOLUME</u> M301	4750-6010-0	ROTART ENCODER

- NOTE:**
- The components identified by $\triangle$ mark are critical for risk of fire and electrical shock. Replace only with part number specified.
 - Capacitors : CP-Polystyrene, CM-Mylar, CE-Electrolytic, CC-Ceramic, CTC-NPO.
 - Resistors : RMF-Metal Film, RCF-Carbon Film, RWR-Wirewound Metal Oxide.

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