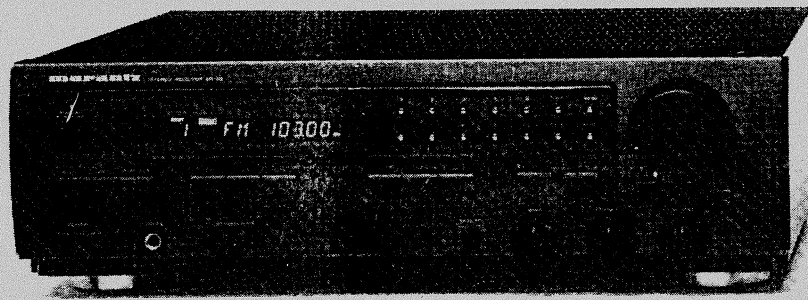


Service Manual

74 SR45/01B/02B/05B/UBL

Stereo Receiver



Model 74 SR45/02B

TABLE OF CONTENTS

SECTION	PAGE
1. BLOCK DIAGRAM AND COMPONENTS	1
2. SCHEMATIC DIAGRAMS, PCB'S AND COMPONENTS	3
3. WIRING DIAGRAM	41
4. EXPLODED VIEW AND PARTS LIST	44
5. ALIGNMENT PROCEDURES	47
6. ELECTRICAL PARTS LIST	51

Please use this service manual with referring to the user guide (D.F.U.) without fail.

marantz®

model SR-45

First issue : 1995

MARANTZ DESIGN AND SERVICE

Using superior design and selected high grade components, **MARANTZ** company has created the ultimate in stereo sound. Only original **MARANTZ** parts can insure that your **MARANTZ** product will continue to perform to the specifications for which it is famous.

Parts for your **MARANTZ** equipment are generally available to our National Marantz Subsidiary or Agent.

ORDERING PARTS:

Parts can be ordered either by mail or by Fax. In both cases, the correct part number has to be specified.

The following information must be supplied to eliminate delays in processing your order:

1. Complete address
2. Complete part numbers and quantities required
3. Description of parts
4. Model number for which part is required
5. Way of shipment
6. Signature: any order form or Fax. must be signed, otherwise such part order will be considered as null and void.

USA

MARANTZ AMERICA, INC.
440 MEDINAH ROAD
ROSELLE, ILLINOIS 60172-2330
USA
PHONE : 708-307-3100
FAX : 708-307-2687

CANADA

LENBROOK INDUSTRIES LIMITED
633 GRANITE COURT,
PICKERING, ONTARIO L1W 3K1
CANADA
PHONE : 416-831-6333
FAX : 416-831-6938

EUROPE

MARANTZ EUROPE B.V.
P.O. BOX 80002
BUILDING SFF2
5600 JB EINDHOVEN
THE NETHERLANDS
PHONE : +31-40-732241
FAX : +31-40-735578

PROFESSIONAL-USA

SUPERSCOPE TECHNOLOGIES, INC.
MARANTZ PROFESSIONAL PRODUCTS
1000 CORPORATE BLVD., SUITE D
AURORA, ILLINOIS 60504 USA
PHONE : 708-820-4800
FAX : 708-820-8103

PROFESSIONAL-CANADA

TC ELECTRONICS CANADA LTD
540 FIRING AVE.
BAIE D'URFÉ, QUEBEC H9X 3T2
CANADA
PHONE : 514-457-4044
FAX : 514-457-5524

TRADING

MARANTZ EUROPE B.V.
P.O. BOX 80002
BUILDING SFF2
5600 JB EINDHOVEN
THE NETHERLANDS
PHONE : +31-40-732241
FAX : +31-40-735578

AUSTRALIA

MARANTZ AUSTRALIA
3 Figtree Drive
Australia Centre
Homebush, NSW2140 AUSTRALIA
PHONE : +61 2 742.8311
FAX : +61 2 7643074

HONG-KONG

FORWARD INTERNATIONAL CORP. LTD.
15 TH FLOOR, REGENT CENTRE,
88 QUEEN'S ROAD, CENTRAL, H. K.
PHONE : +852 521-0883
FAX : +852 521-7835

THAILAND

MRZ STANDARD CO., LTD.
746-750 WANGBURAPA BANGKOK
10200 THAILAND
PHONE : +66 2222 9181
FAX : +66 2225 8871

TAIWAN

PAI-YUING CO., LTD.
6 TH FL NO. 148 SUNG KIANG RORD,
TAIPEI, 10429, TAIWAN R.O.C.
PHONE : +886 (2) 5221304-8
FAX : +886 (2) 5630415

MALAYSIA

WO KEE HONG ELECTRONICS SDN. BHD.
NO. 102 JALAN SS 21/35, DAMANSARA
UTAMA, 47400 PETALING JAYA
SELANGOR DARUL EHSAN,
MALAYSIA
PHONE : +60 3-7184666
FAX : +60 3-7173828

SINGAPORE

WO KEE HONG (SINGAPORE) PTE. LTD.
29, LENG KEE ROAD
SINGAPORE 0315,
PHONE : +65 475-4555
FAX : +65 475-8623

JAPAN—Technical

MARANTZ JAPN INC.
35-1, 7-chome, Sagamiono
Sagamihara-shi, Kanagawa
Japan
PHONE : +81 427 48 2181
FAX : +81 427 48 0889

日本マランツ株式会社

本社 〒228 神奈川県相模原市相模大野7丁目35番1号
営業本部 〒150 東京都渋谷区恵比寿南1丁目11番9号

SHOCK, FIRE HAZARD SERVICE TEST:

CAUTION: After servicing this appliance and prior to returning to customer, measure the resistance between either primary AC cord connector pins (with unit NOT connected to AC mains and its Power switch ON), and the face or Front Panel of product and controls and chassis bottom.

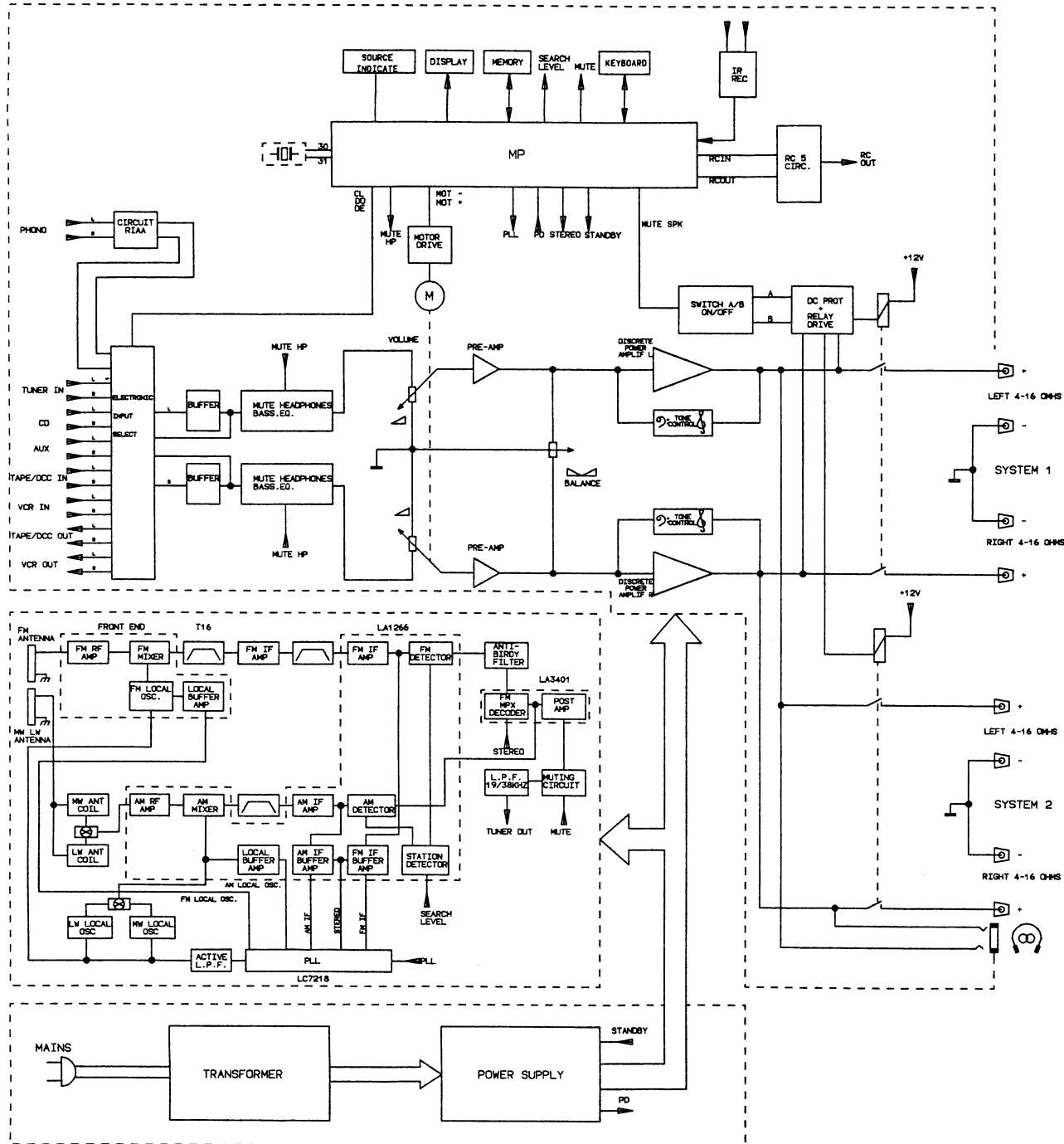
Any resistance measurement less than 1 Megohms should cause unit to be repaired or corrected before AC power is applied, and verified before it is return to the user/customer.

Ref. UL Standard NO.1492.

In case of difficulties, do not hesitate to contact the Technical Department at above mentioned address.

950501KI

1. BLOCK DIAGRAM



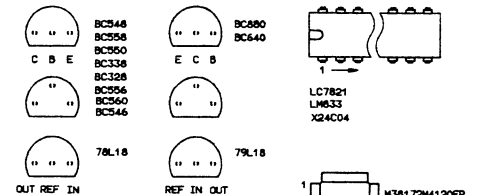
RESISTOR

- K5W 0204 DIN
- MSW 0204 DIN
- K5W 0207 DIN
- MSW 0207 DIN
- K5W 0309 DIN
- K5W 0411 DIN
- K5W 0617 DIN
- MSW 0309 DIN
- K5W 0414 DIN
- WIRE
- METAL OXIDE
- LOW NOISE
- LOW FLAMMABILITY
- NTC
- SAFETY RESISTOR

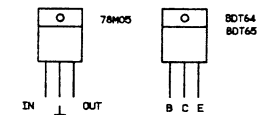
CAPACITOR

- ELECTROLYTIC
- TANTALUM ELECTROLYTIC
- FOIL
- CERAMIC
- MULTILAYER
- POLYPROPYLEN (KS-KP)

TOP VIEW



FRONT VIEW



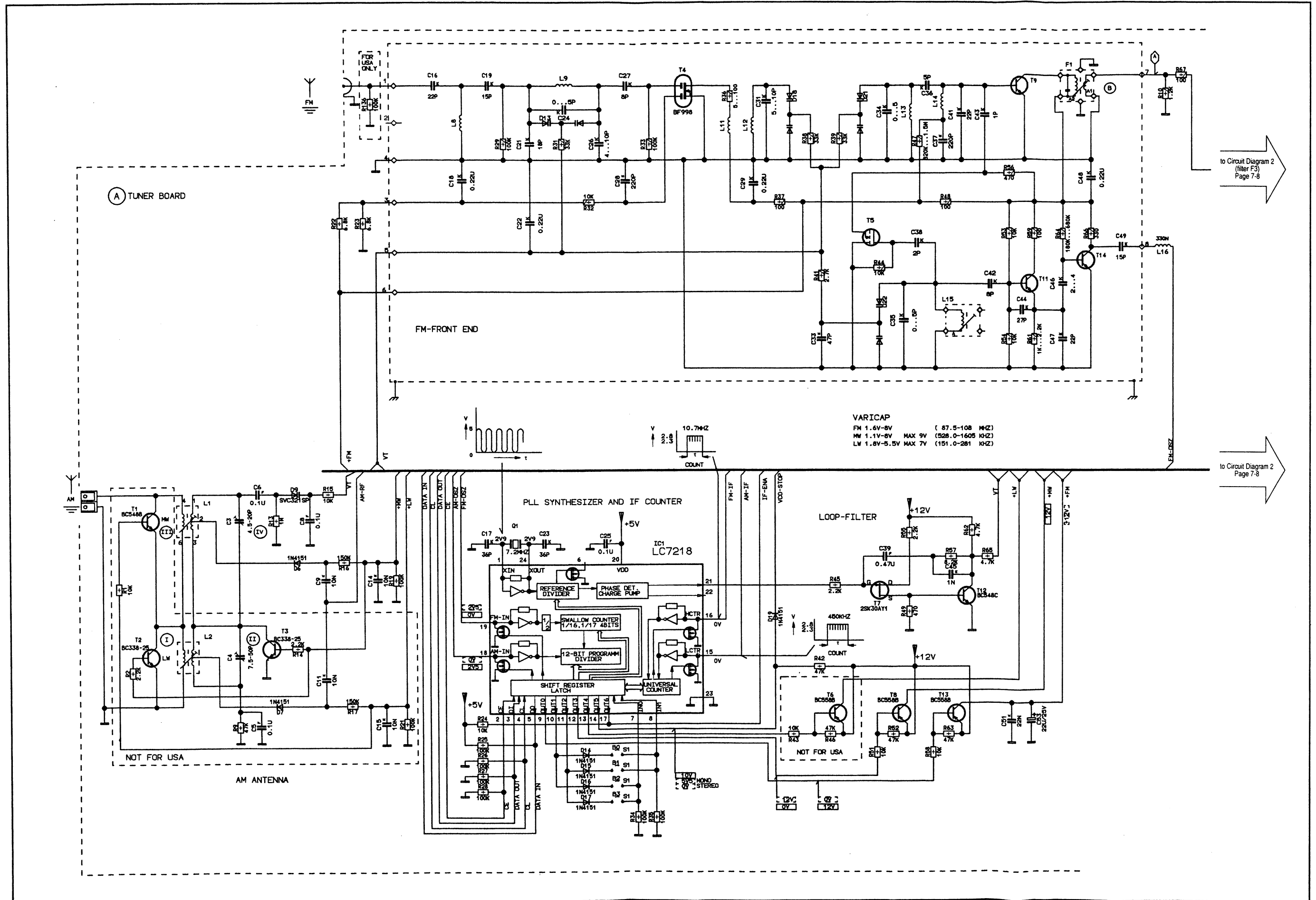
ATTENTION!
OBSERVE MDS COMPONENTS HANDLING
INSTRUCTIONS WHEN SERVICING!

ABSOLUTELY NECESSARY FOR THE SAFETY OF THE SET, THESE COMPONENTS
MEET THE SAFETY REQUIREMENTS ACCORDING TO VDE OR IEC, RESP.
AND MUST BE REPLACED BY PARTS OF SAME SPECIFICATION ONLY.

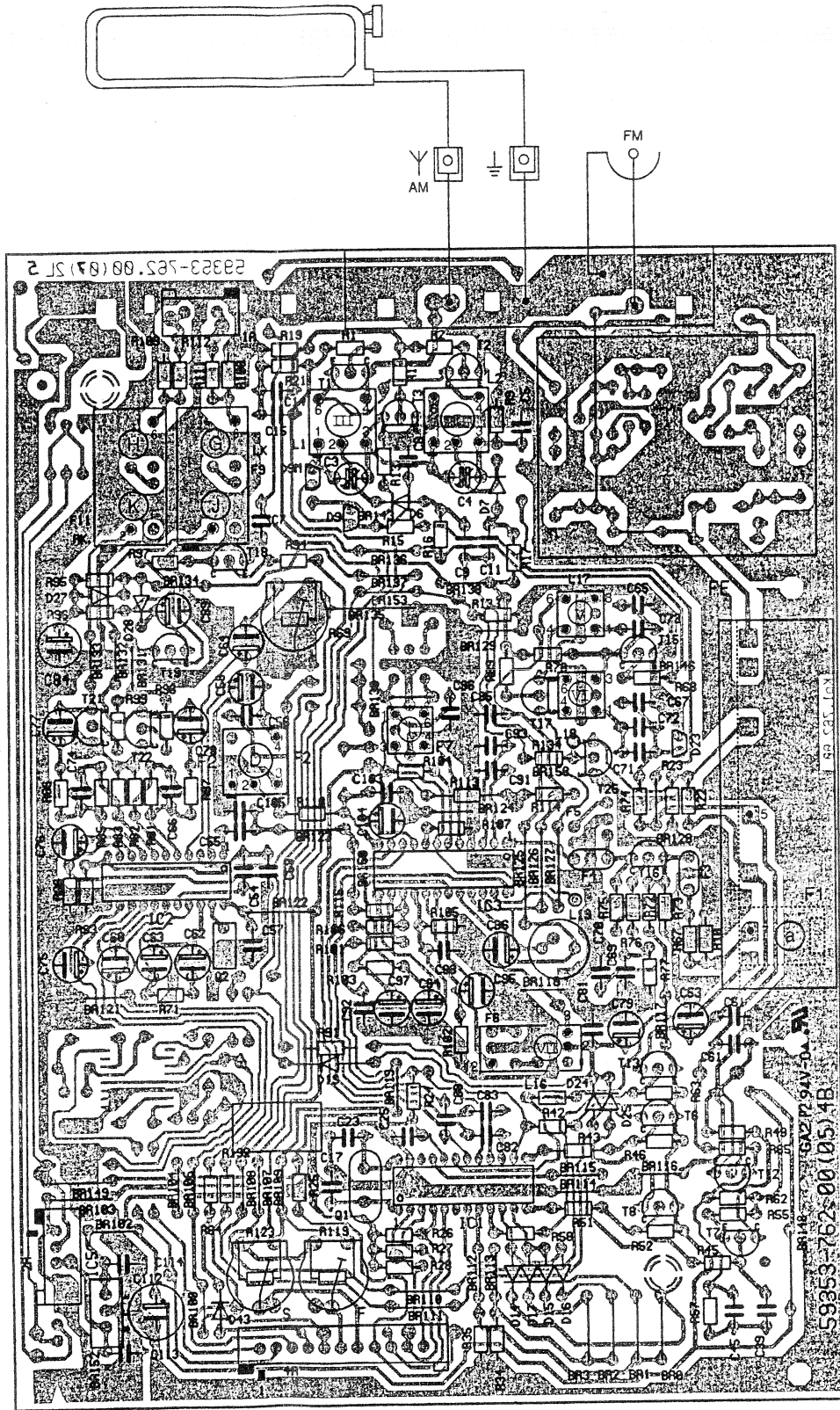
IF NOT OTHERWISE INDICATED ALL VOLTAGES ARE MEASURED
AGAINST CHASSIS WITH A VOLTMETER (RI=10MΩ).

2. SCHEMATIC DIAGRAM AND PCBS

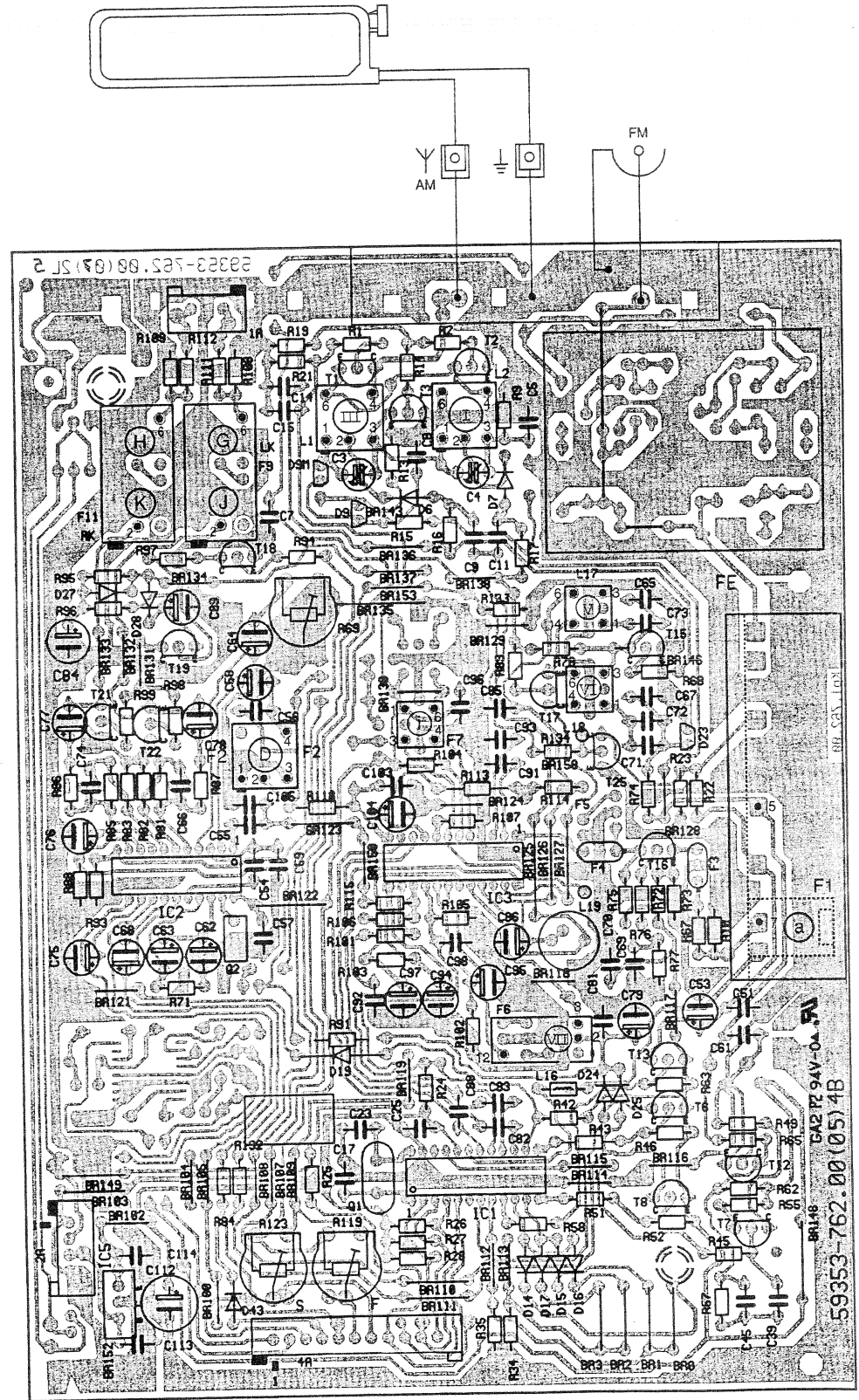
2.1 SCHEMATIC DIAGRAM TUNER BOARD - PART 1



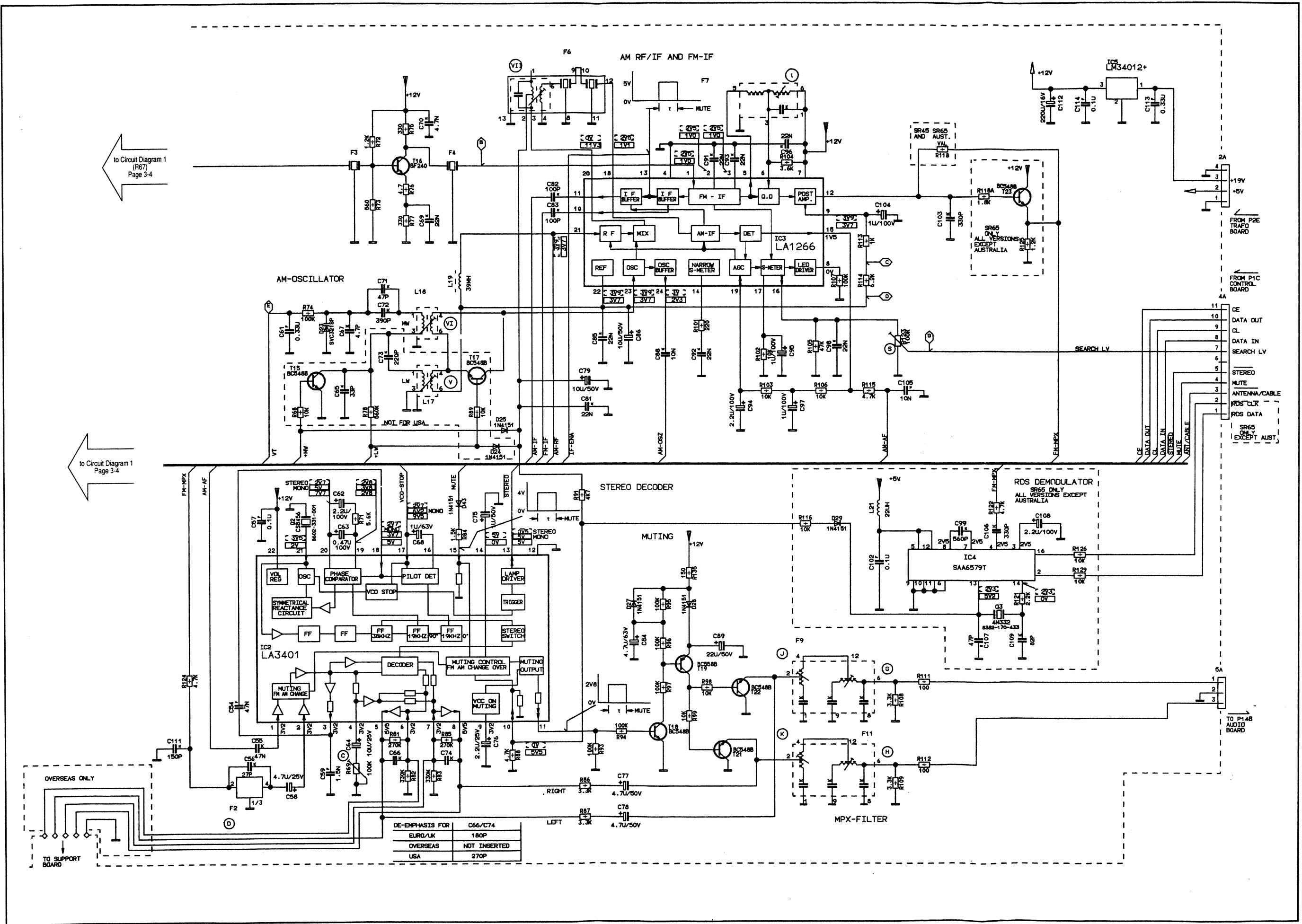
2.2 TUNER PCB
(component side)



2.2 TUNER PCB
(component side)

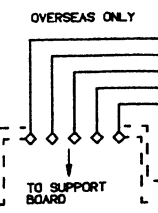


2.3 SCHEMATIC DIAGRAM TUNER BOARD - PART 2



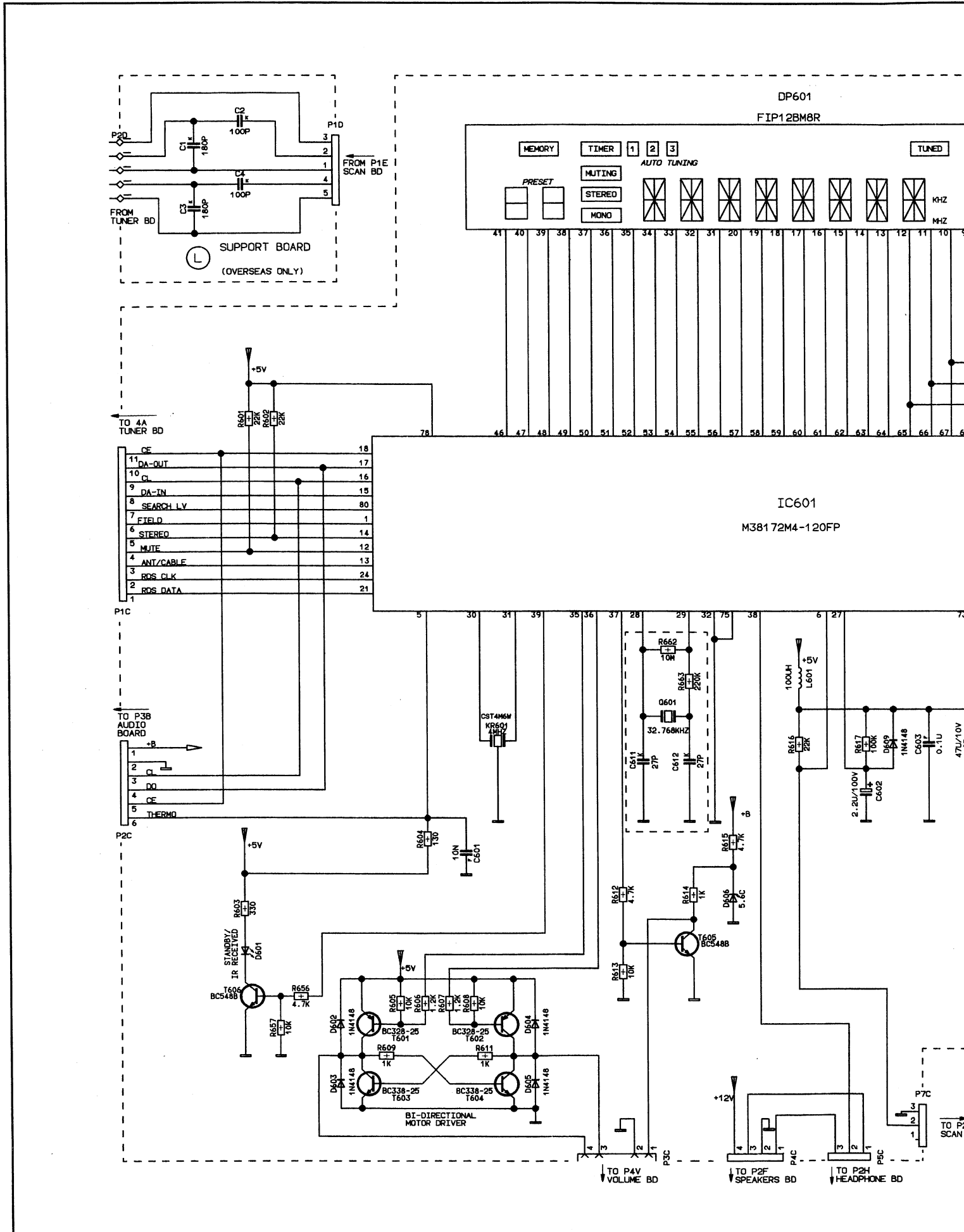
to Circuit Diagram 1 (R67) Page 3-4

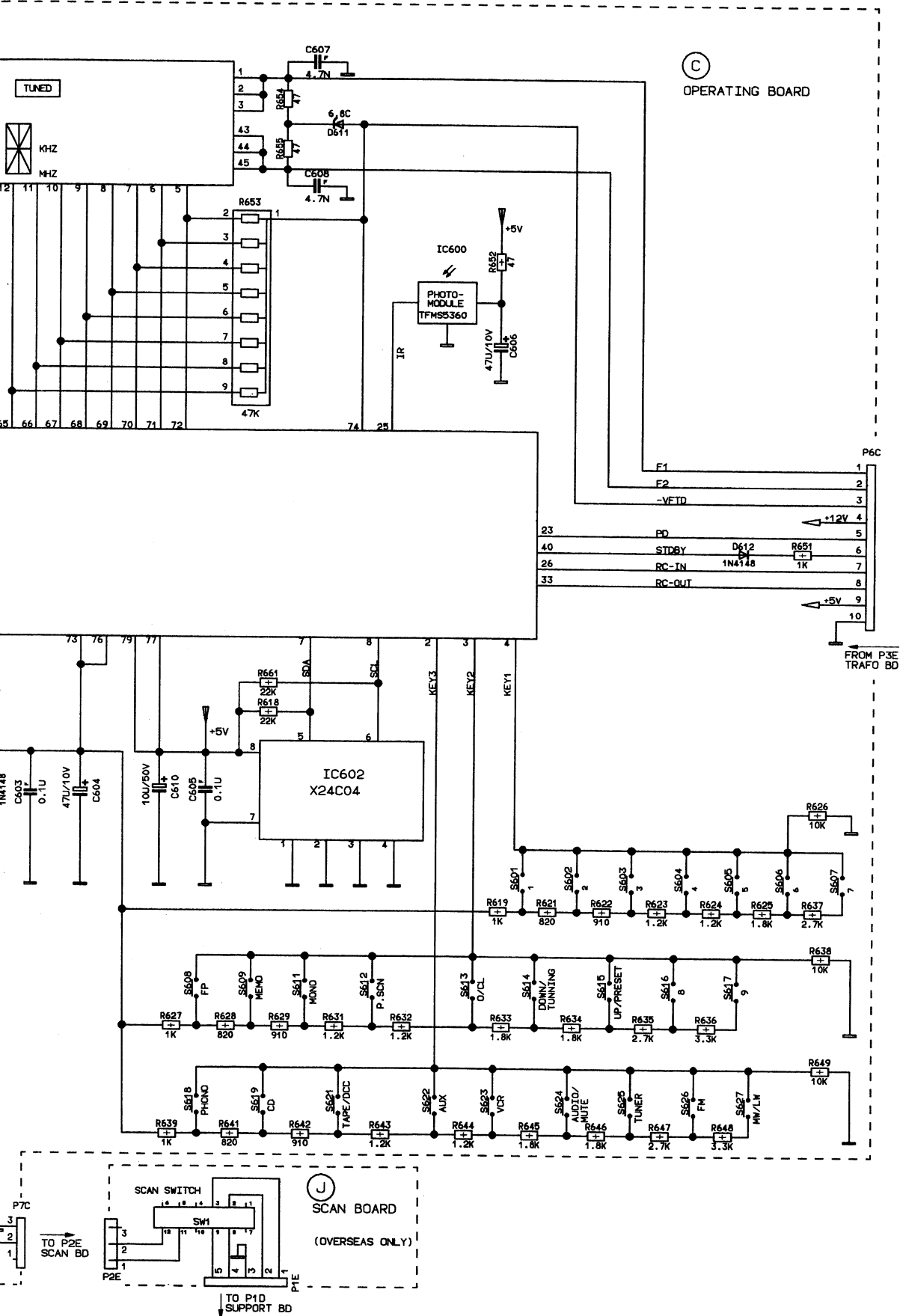
to Circuit Diagram 1 Page 3-4



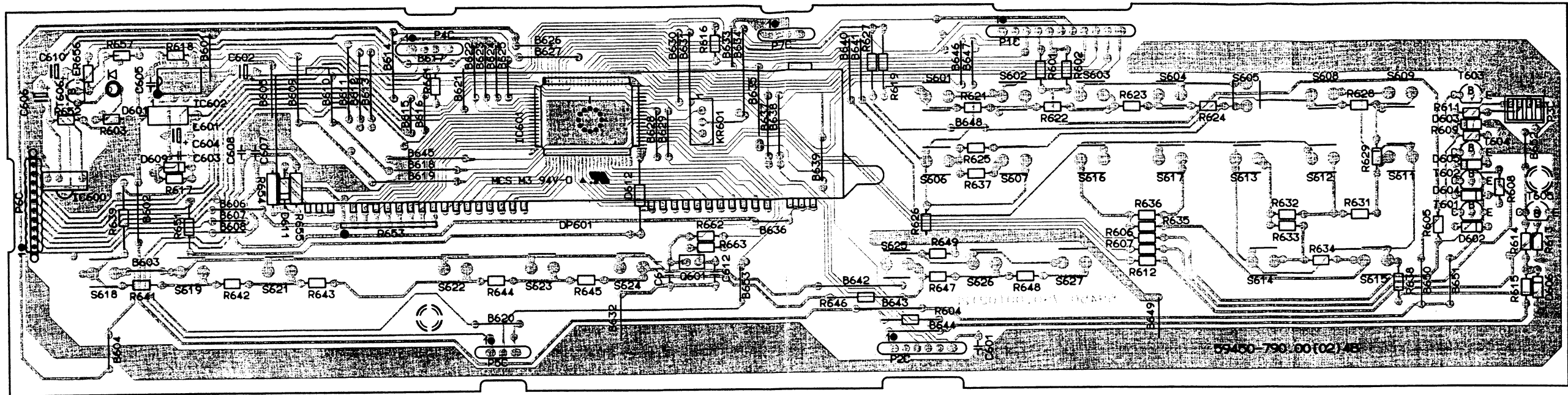
DE-EMPHASIS FOR	C66/C74
EURO/LK	180P
OVERSEAS	NOT INSERTED
USA	270P

2.4 SCHEMATIC DIAGRAM: OPERATING BOARD, SUPPORT BOARD, SCAN BOARD

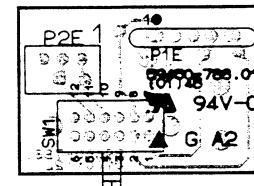




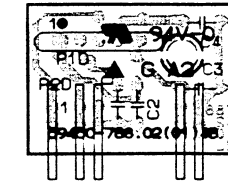
2.5.1 CONTROL PCB
(component side)



2.5.2 SCAN PCB
(component side)

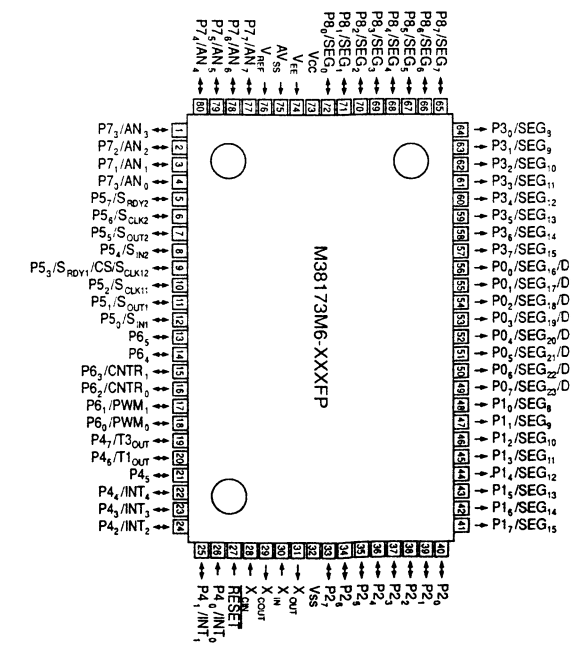
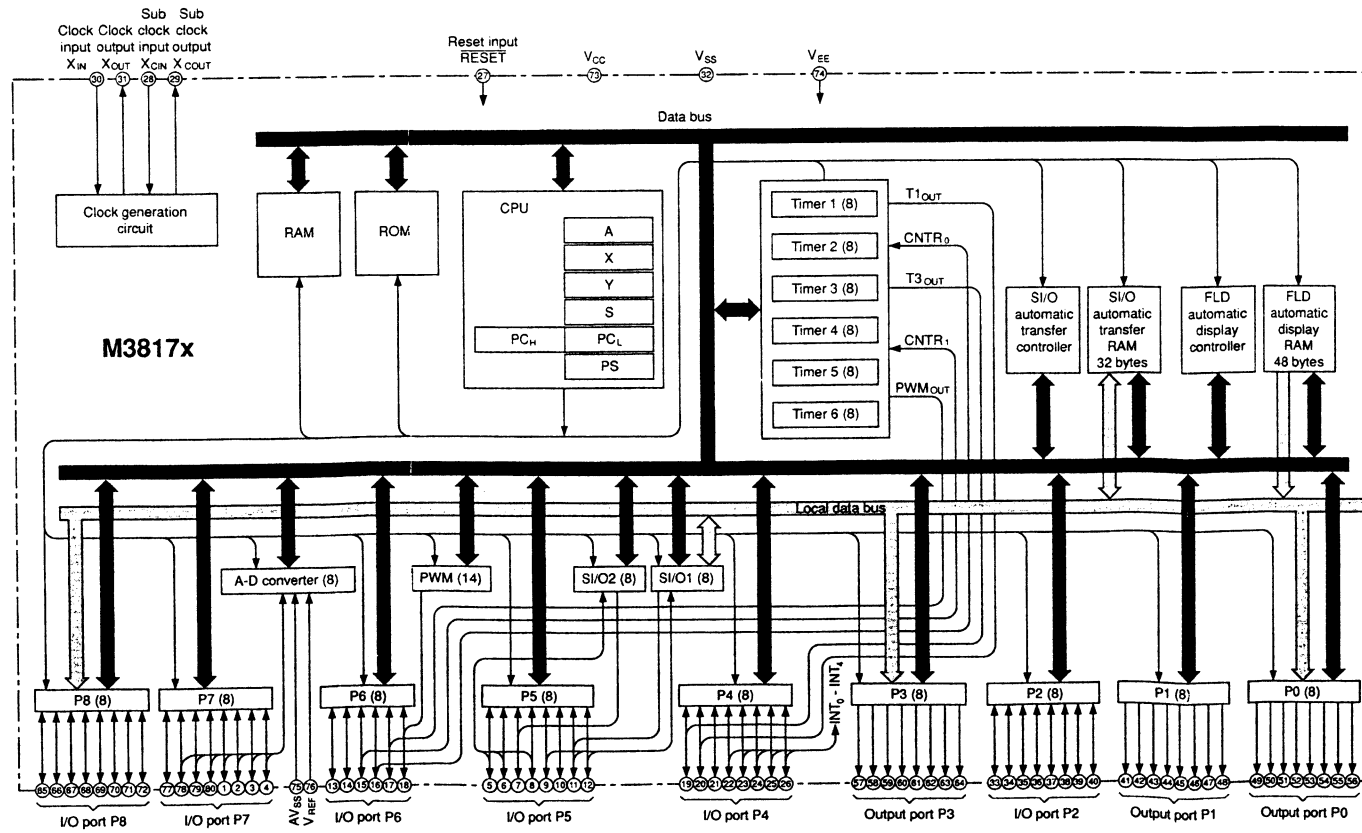


2.5.3 SUPPORT PCB
(component side)

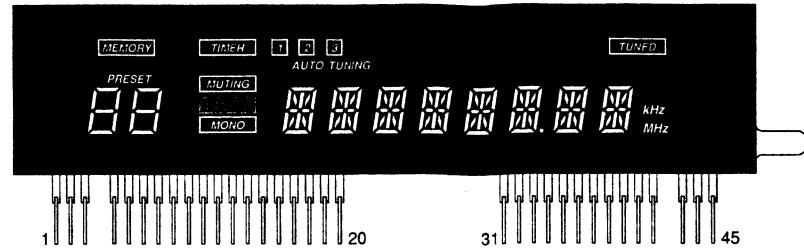


PIN DESCRIPTION M3817x

Pin	Name	Function	Alternate Function	
73, 32	V _{CC} , V _{SS}	Power supply	Power supply inputs 4.0 to 5.5V to V _{CC} and 0V to V _{SS} .	
74	V _{EE}	Pull-down power input	Applies voltage supplied to pull-down resistors of ports P0, P1, P2 and P3.	
76	V _{REF}	Analog reference voltage	Reference voltage input pin for A-D converter.	
75	AV _{SS}	Analog power voltage	GND input pin for A-D converter. Keep at the same potential as V _{SS} .	
27	RESET	Reset input	To reset the microcomputer, this pin should be kept at an "L" level for more than 2μs under high-speed operating conditions. In low-speed operation start mode, internal reset is not released until the X _{CIN} - X _{COU} T clock has had time to stabilize.	
30	X _{IN}	Clock input	Input and output signals for the internal clock generation circuit. It consist of internal feedback amplifier. Connect a ceramic resonator or quartz crystal between the X _{IN} and X _{COU} T pins to set the oscillation frequency. If an external clock is used, connect the clock source to the X _{IN} pin and leave the X _{COU} T pin open. This clock is used as system clock.	
31	X _{COU} T	Clock output		
28	X _{CIN}	Sub clock input	Input and output signals for the internal sub clock generation circuit. It consist of internal amplifier without feedback. Connect a ceramic resonator or quartz crystal and external feedback resistor between the X _{CIN} and X _{COU} T pins. If an external clock is used, connect the clock source to the X _{CIN} pin and leave the X _{COU} T pin open. This clock can also be used as the system clock.	
29	X _{COU} T	Sub clock output		
56 - 49	P0 ₇ /SEG ₆ /DIG ₀ , P0 ₆ /SEG ₅ /DIG ₁ , P0 ₅ /SEG ₄ /DIG ₂ , P0 ₄ /SEG ₃ /DIG ₃ , P0 ₃ /SEG ₂ /DIG ₄ , P0 ₂ /SEG ₁ /DIG ₅ , P0 ₁ /SEG ₀ /DIG ₆	Output port P0	An 8-bit output port. The output structure is high-breakdown-voltage P-channel open drain with internal pull-down resistors connected between the output and the V _{EE} pin. Are "L" at reset.	FLD automatic display pins
48 - 41	P1 ₇ /DIG ₆ - P1 ₁ /DIG ₁₅	Output port P1	An 8-bit output port with the same function as port P0.	FLD automatic display pins
40 - 33	P2 ₀ - P2 ₇	I/O port P2	An 8-bit CMOS I/O port. An I/O direction register allows each pin to be individually programmed as either input or output. At reset this port is set to input mode. The input levels are TTL compatible.	
64 - 57	P3 ₇ /SEG ₆ - P3 ₁ /SEG ₁₅	Output port P3	An 8-bit output port with the same function as port P0.	FLD automatic display pins
26	P4 ₀ /INT ₀	Input port P4 ₀	A 1-bit CMOS input pin.	External interrupt input pin
25 - 22	P4 ₇ /INT ₁ - P4 ₁ /INT ₄	I/O port P4	A 7-bit CMOS I/O port with the same function as port P2, with CMOS compatible input levels.	External interrupt input pins
21	P4 ₅			
20, 19	P4 ₆ /T1 _{OUT} , P4 ₇ /T3 _{OUT}			Timer output pins
12 - 9	P5 ₇ /S _{IN1} , P5 ₆ /S _{OUT1} , P5 ₅ /S _{CLK1} , P5 ₄ /S _{RDY1} , P5 ₃ /S _{RDY1} , P5 ₂ /S _{CLK2} , P5 ₁ /S _{RDY2}	I/O port P5	An 8-bit I/O port with the same function as port P2. The output structure of this port is N-channel open drain, and the input levels are CMOS compatible. Keep the input voltage of this port between 0V and V _{CC} .	Serial I/O1 I/O pins
8 - 5	P5 ₇ /S _{IN2} , P5 ₆ /S _{OUT2} , P5 ₅ /S _{CLK2} , P5 ₄ /S _{RDY2} , P5 ₃ /S _{RDY2}			Serial I/O2 I/O pins
18	P6 ₀ /PWM ₀	I/O port P6	A 6-bit CMOS I/O port with the same function as port P2, with CMOS compatible input levels.	14-bit PWM output pin
17	P6 ₇ /PWM ₁			8-bit PWM output pin
16, 15	P6 ₂ /CNTR ₀ , P6 ₁ /CNTR ₁			Event counter input pins
14, 13	P6 ₄ , P6 ₅			
4 - 1, 80 - 77	P7 ₇ /AN ₀ - P7 ₁ /AN ₇	I/O port P7	An 8-bit CMOS I/O port with the same function as port P2, with CMOS compatible input levels.	A-D converter input pins
72 - 65	P8 ₇ /SEG ₀ - P8 ₁ /SEG ₇	I/O port P8	An 8-bit I/O port with the same function as port P2. The output structure of this port is P-channel open drain, and the input levels are CMOS compatible. Please note that this port does not have internal pull-down resistors.	FLD automatic display pins



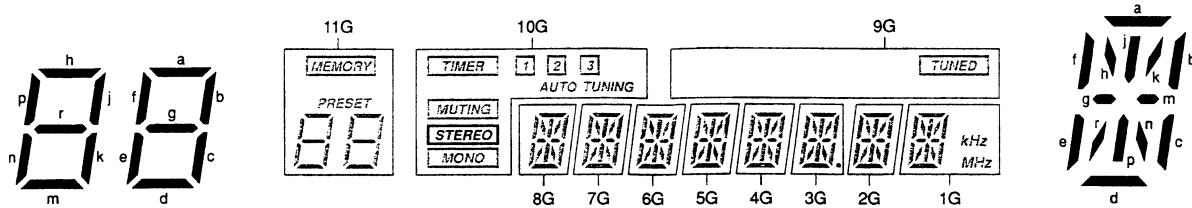
2.6 DISPLAY



PIN CONNECTION

TERMINAL NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45											
ELECTRODE	F	F	F	N	P	P	P	P	P	P	P	P	P	P	P	P	N	N	N	N	N	N	N	N	N	N	N	N	N	1	1	10	9	8	7	6	5	4	3	2	1	N	F	F	F	F
	F	F	F	NP	P	P	P	P	P	P	P	P	P	P	P	P	N	N	N	N	N	N	N	N	N	N	N	N	G	G	G	G	G	G	G	G	G	G	P	P	P	P	P	P	P	P

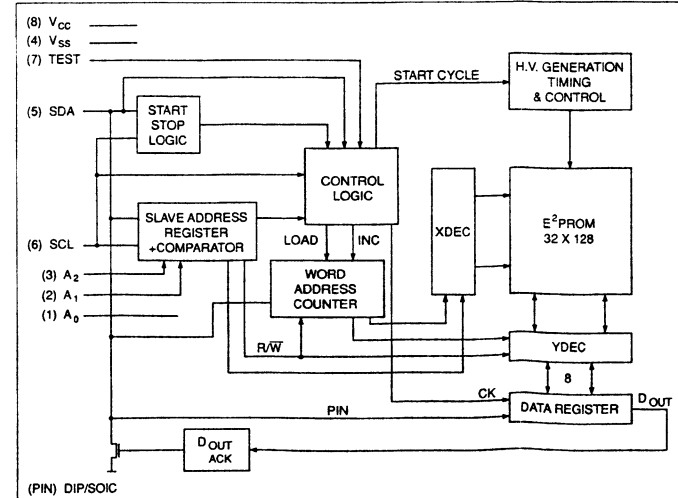
F --- Filament NP --- No Pin P --- Anode G --- Grid



ANODE CONNECTION

	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
Pa	1	3	-	2	2	2	2	2	2	2	2
Pb	2	2	-	1	1	1	1	1	1	1	1
Pf	3	-	-	1	1	1	1	1	1	1	1
Pg	TIMER	-	-	2	2	2	2	2	2	2	2
Pe	MUTING	-	-	1	1	1	1	1	1	1	1
Pc	STEREO	-	-	2	2	2	2	2	2	2	2
Pd	MONO	-	-	1	1	1	1	1	1	1	1
Ph	TUNING	-	-	2	2	2	2	2	2	2	2
Pj	AUTO	-	-	1	1	1	1	1	1	1	1
Pk	-	-	-	2	2	2	2	2	2	2	2
Pm	-	-	-	1	1	1	1	1	1	1	1
Pn	-	-	-	2	2	2	2	2	2	2	2
Pp	-	-	-	1	1	1	1	1	1	1	1
Pr	-	-	-	2	2	2	2	2	2	2	2
P S15	PRESET	-	TUNED	-	-	-	-	-	-	-	MHZ
P S16	MEMORY	-	-	-	-	-	-	-	-	-	KHZ

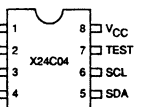
FUNCTIONAL DIAGRAM



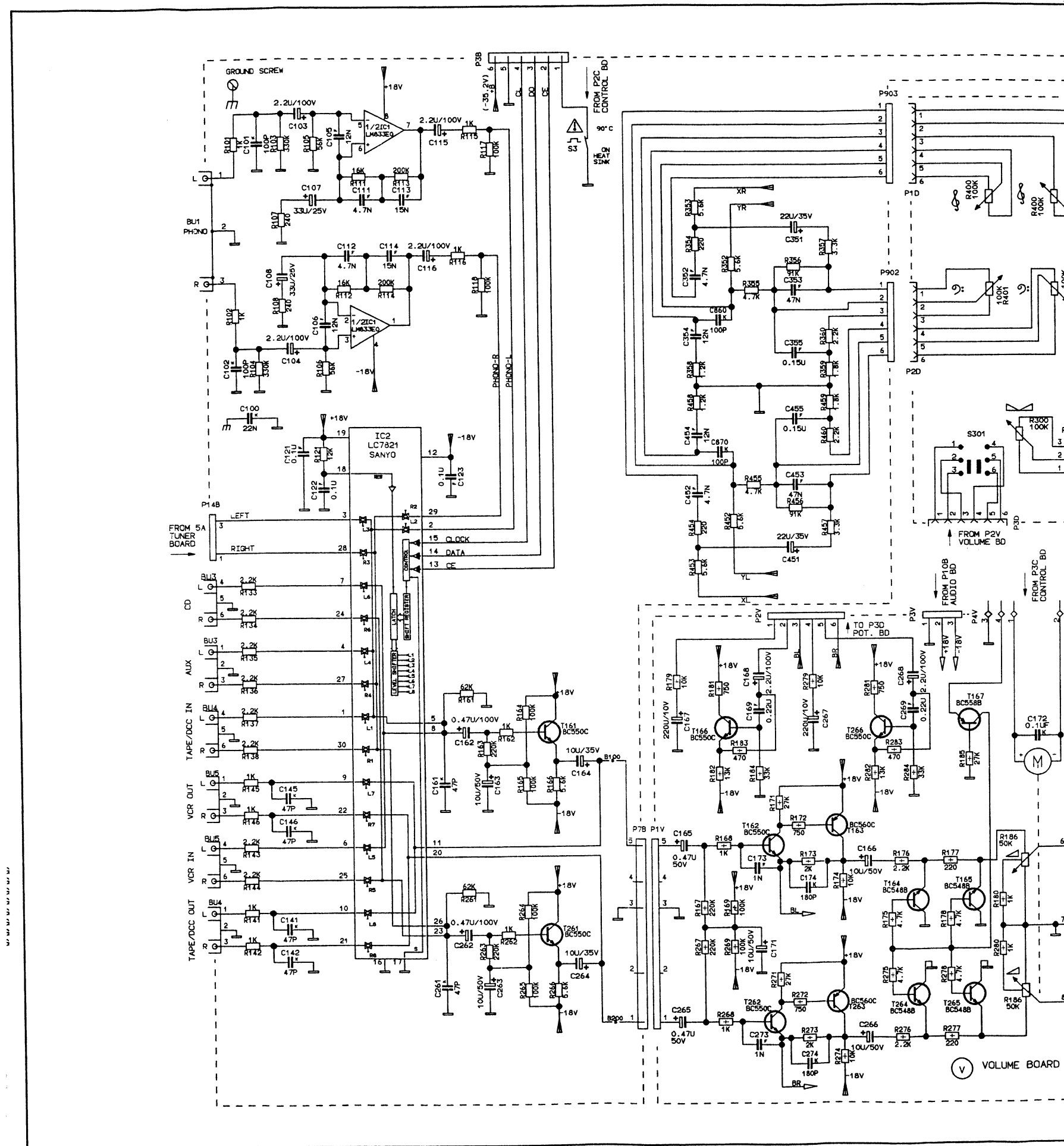
PIN NAMES

- A₀ - A₂ Address Inputs
- SDA Serial Data
- SCL Serial Clock
- TEST Hold at VSS
- VSS Ground
- VCC Supply Voltage
- NC No Connect

DIP/SOIC

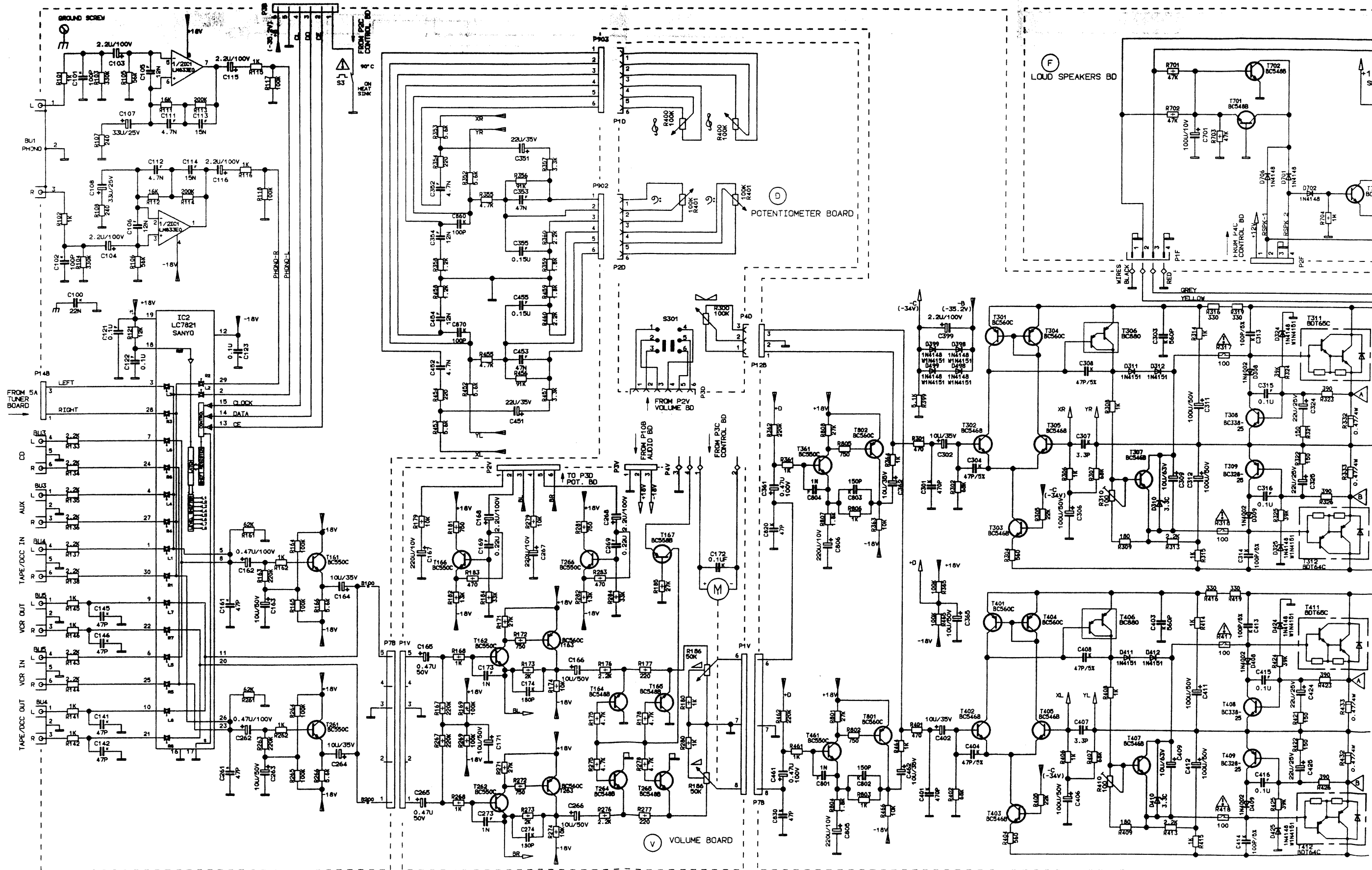


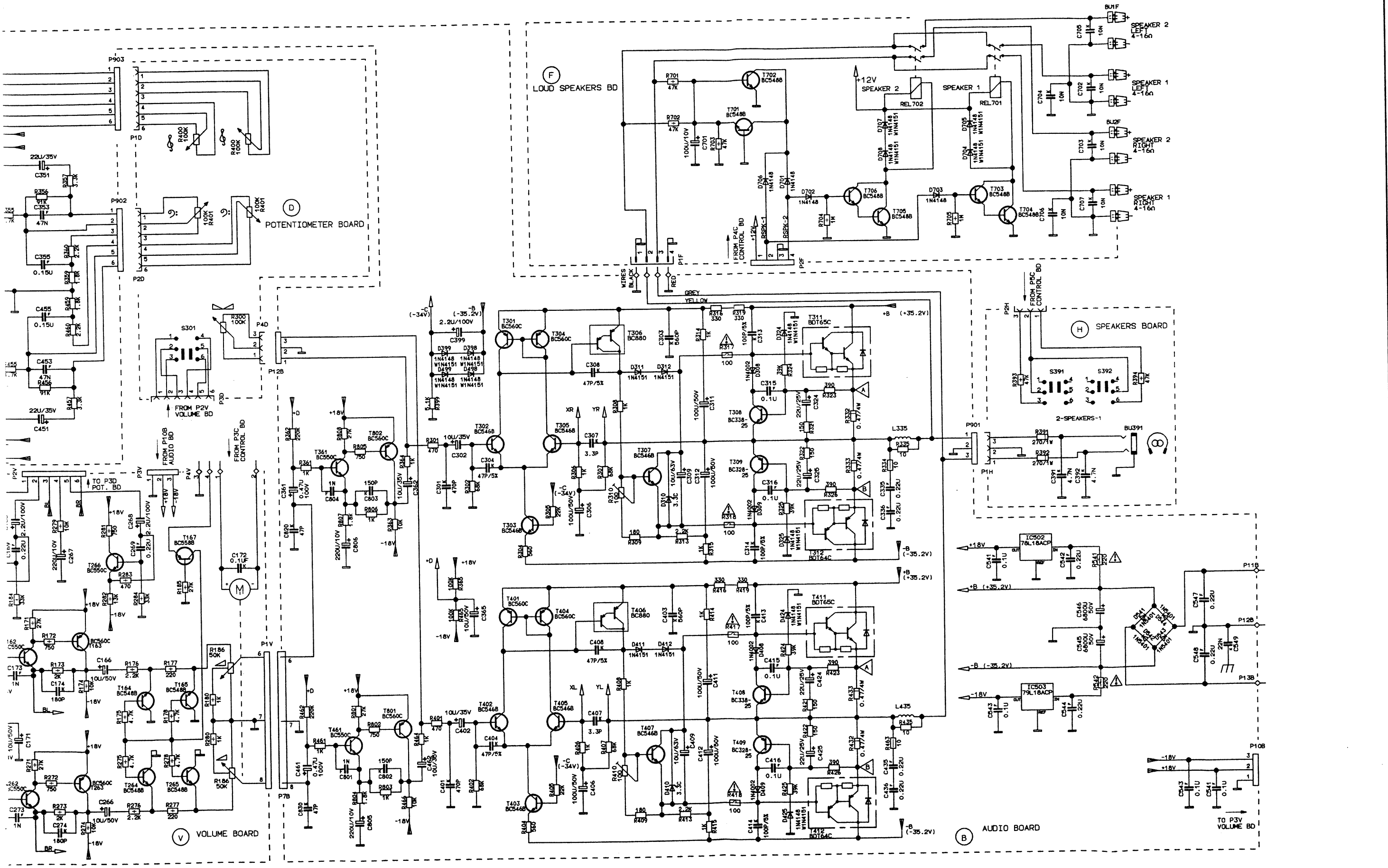
2.7 SCHEMATIC DIAGRAM (VERSIONS /02B/05B): AUDIO BOARD, VOLUME BOARD, POTENTIOMETER BOARD, LOUD SPEAKERS BOARD, SPEAKERS BOARD



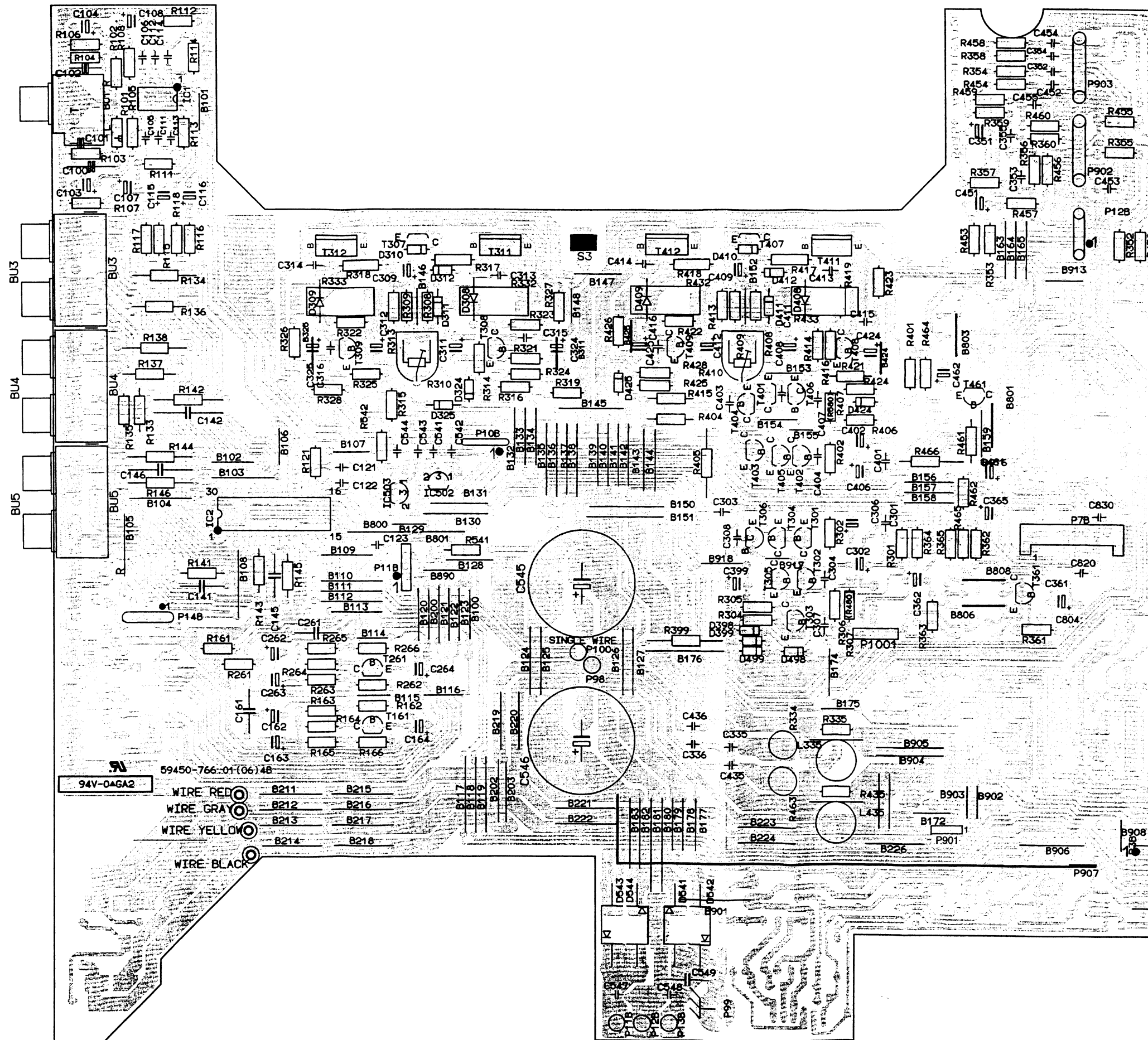
P₃/SEG₁
 P₃/SEG₂
 P₃/SEG₃
 P₃/SEG₄
 P₃/SEG₅
 P₃/SEG₆
 P₃/SEG₇
 P₃/SEG₈
 P₀/SEG₁/DIG₀
 P₀/SEG₁/DIG₁
 P₀/SEG₁/DIG₂
 P₀/SEG₁/DIG₃
 P₀/SEG₁/DIG₄
 P₀/SEG₁/DIG₅
 P₀/SEG₁/DIG₆
 P₀/SEG₁/DIG₇
 P₁/SEG₉
 P₁/SEG₁₀
 P₁/SEG₁₁
 P₁/SEG₁₂
 P₁/SEG₁₃
 P₁/SEG₁₄
 P₁/SEG₁₅

2.7 SCHEMATIC DIAGRAM (VERSIONS /02B/05B): AUDIO BOARD, VOLUME BOARD, POTENTIOMETER BOARD, LOUD SPEAKERS BOARD, SPEAKERS BOARD

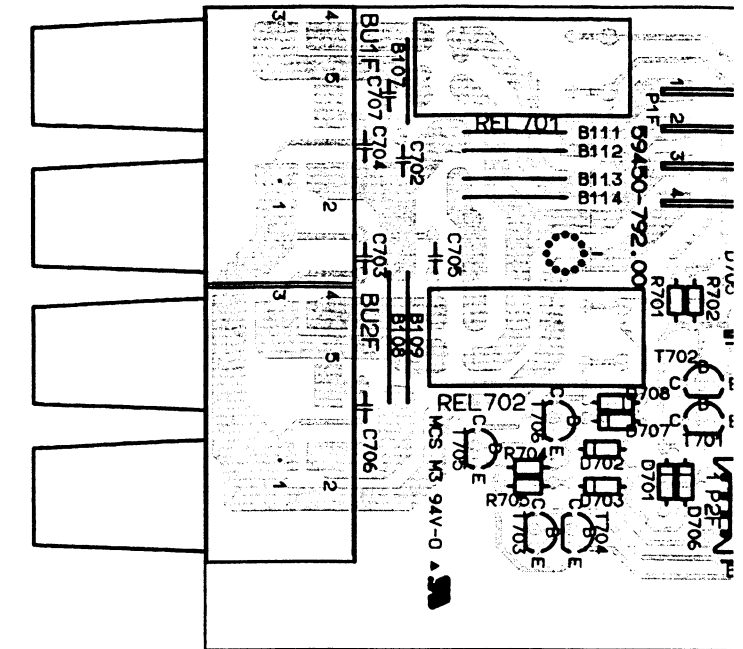




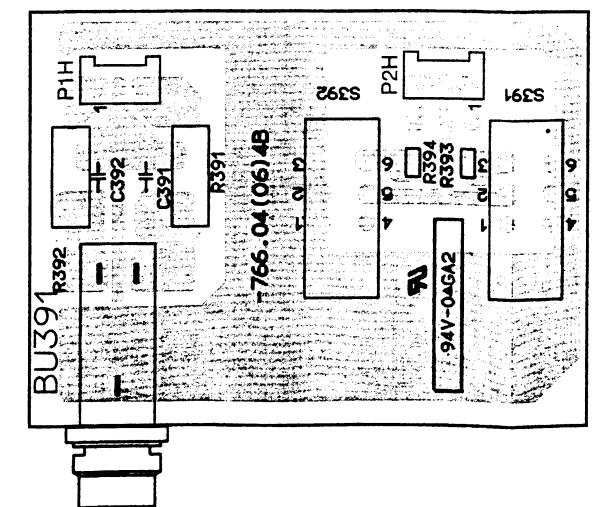
2.8.1 AUDIO PCB
(component side)

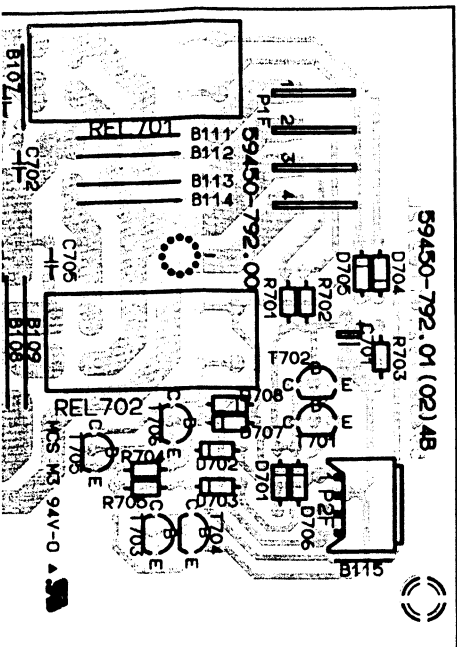


2.8.2 LOUD SPEAKERS PCB
(component side)

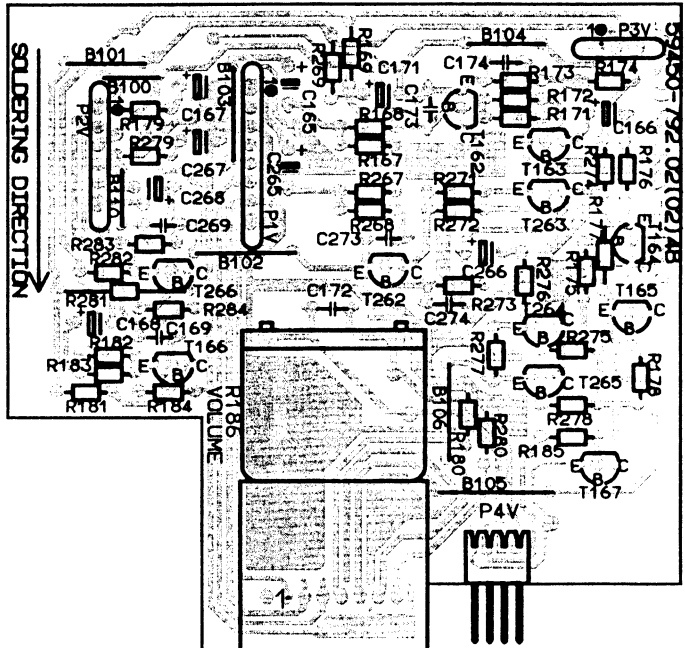


2.8.4 SPEAKERS PCB
(component side)

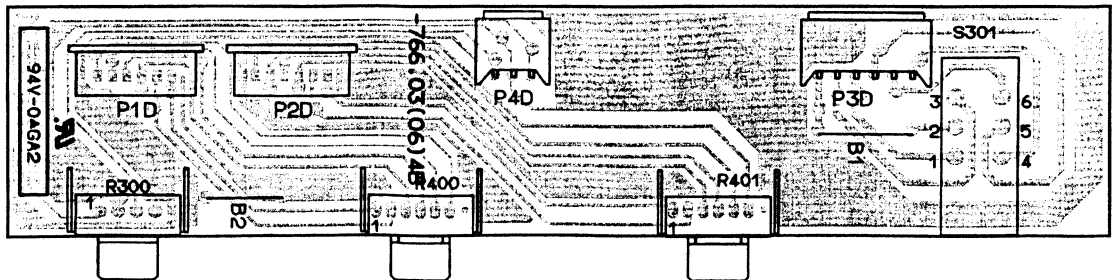
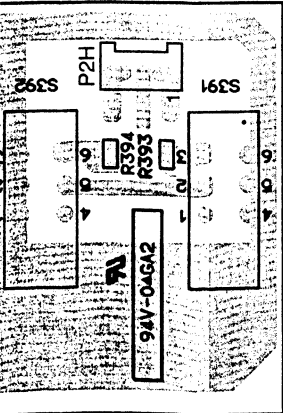




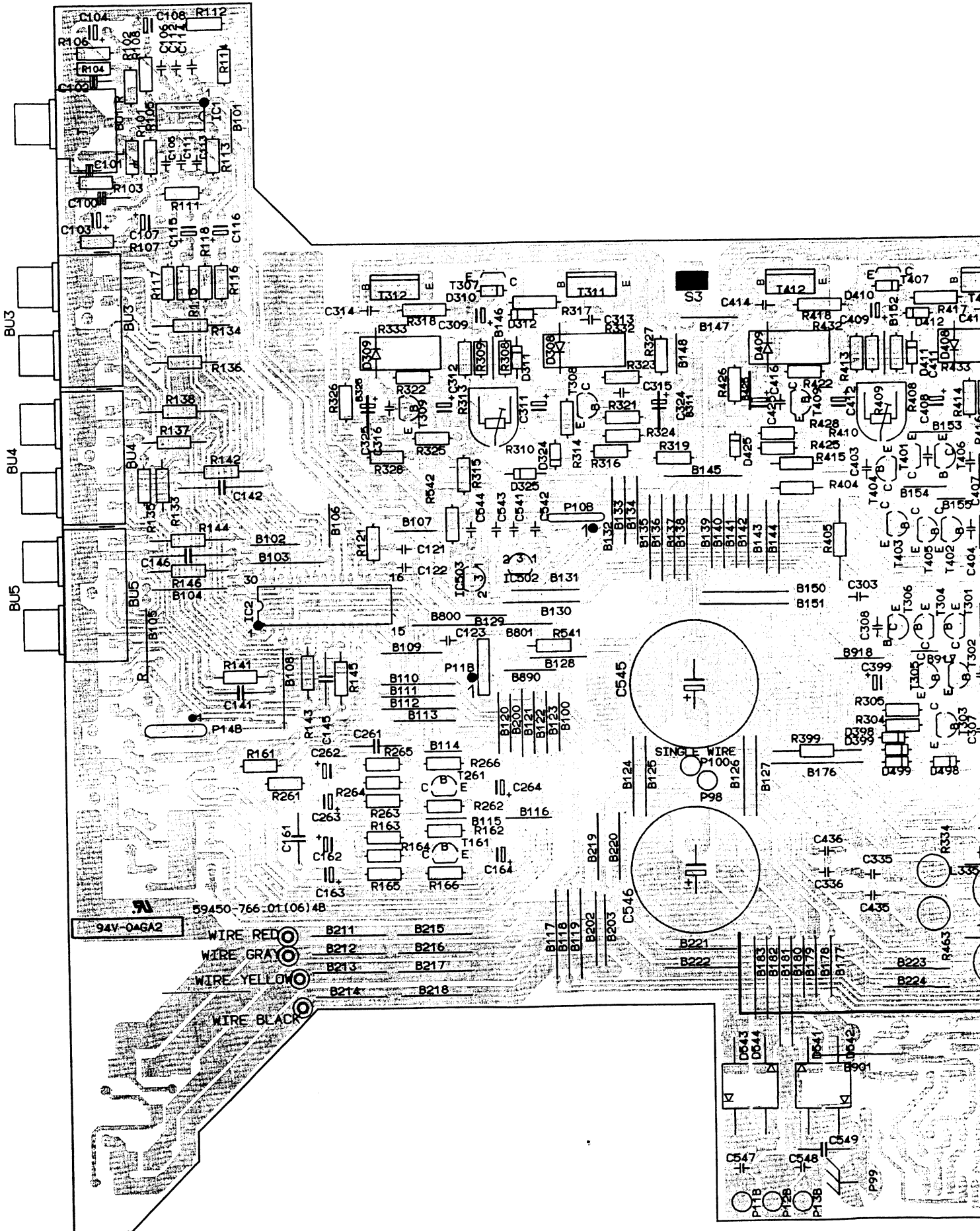
2.8.3 VOLUME PCB
(component side)



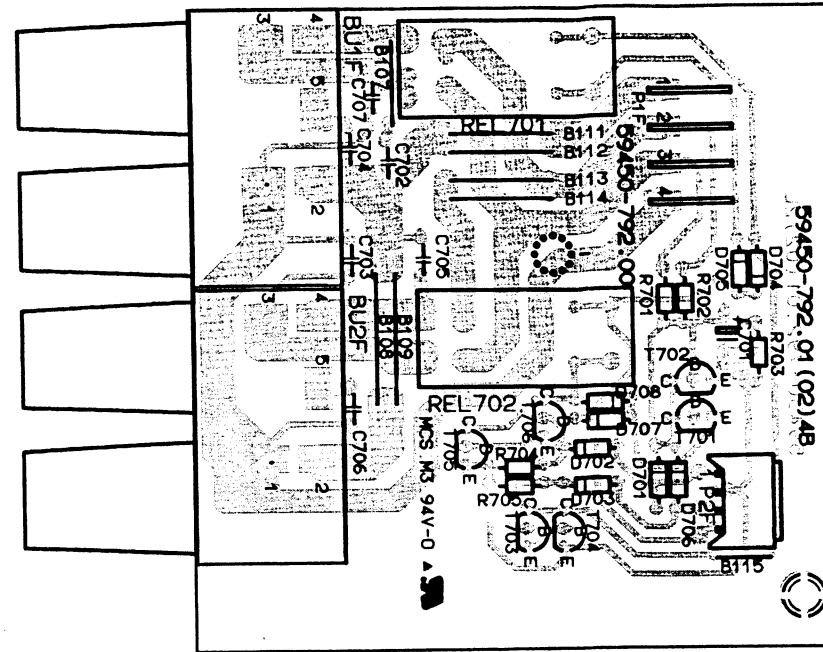
2.8.5 POTENTIOMETER PCB
(component side)



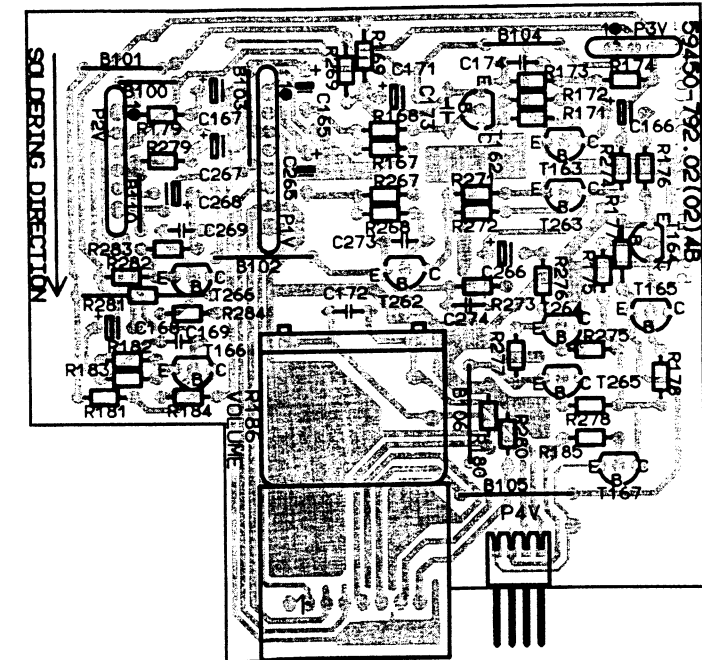
2.8.1 AUDIO PCB
component side)



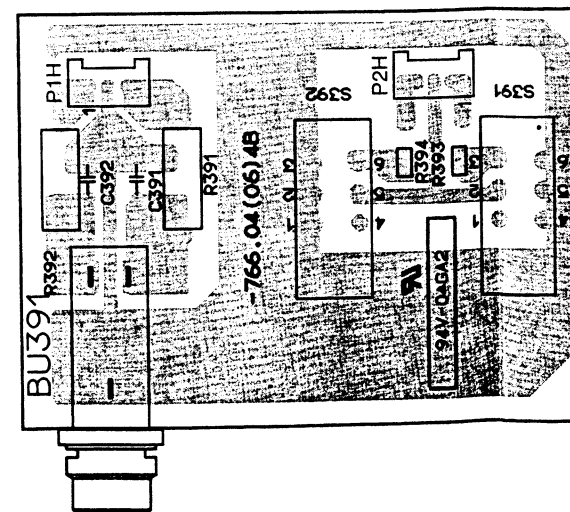
2.8.2 LOUD SPEAKERS PCB
(component side)



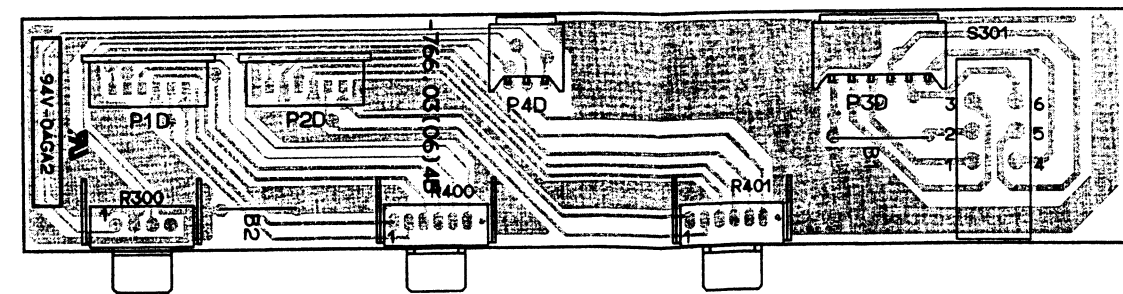
2.8.3 VOLUME PCB
(component side)



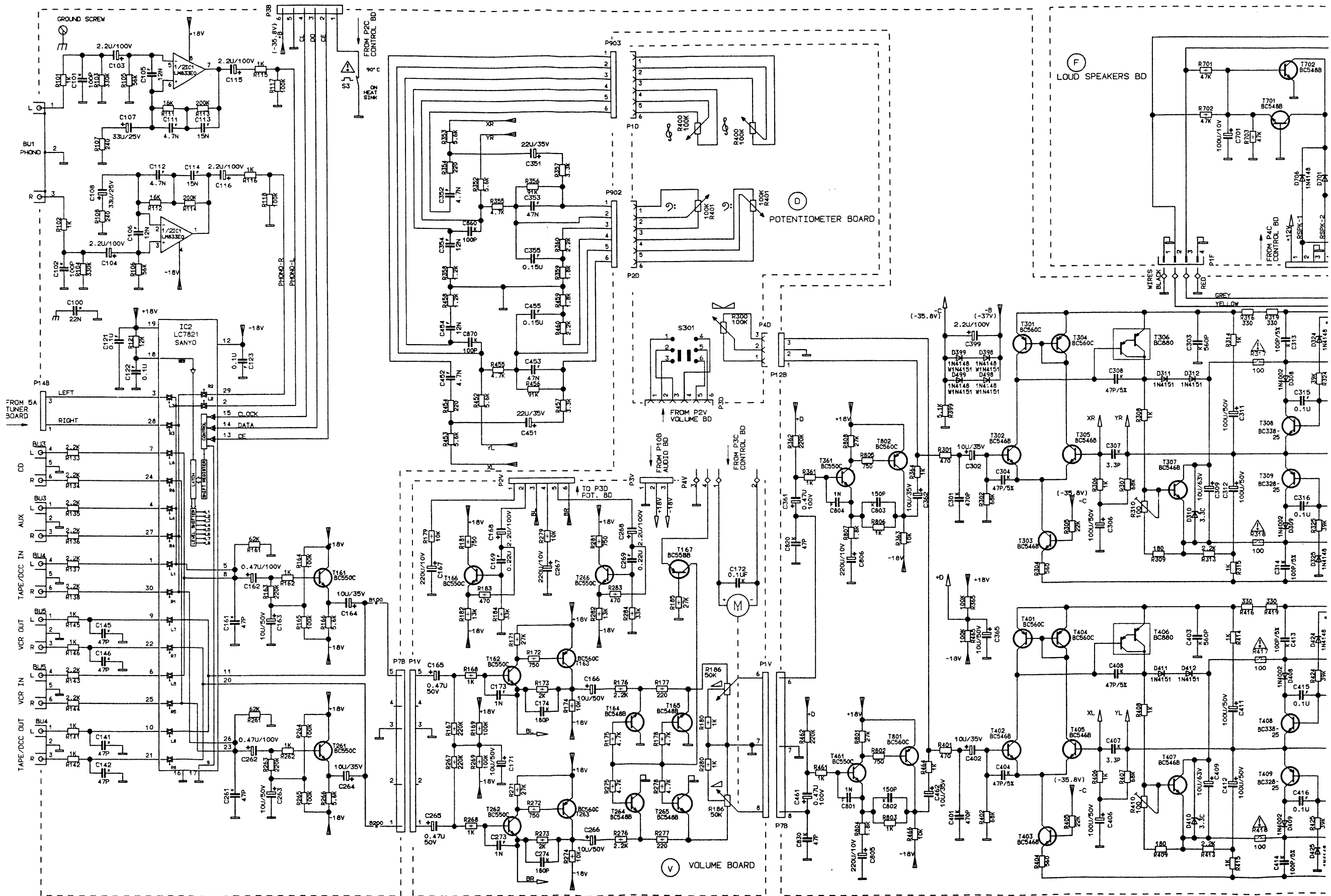
2.8.4 SPEAKERS PCB
(component side)

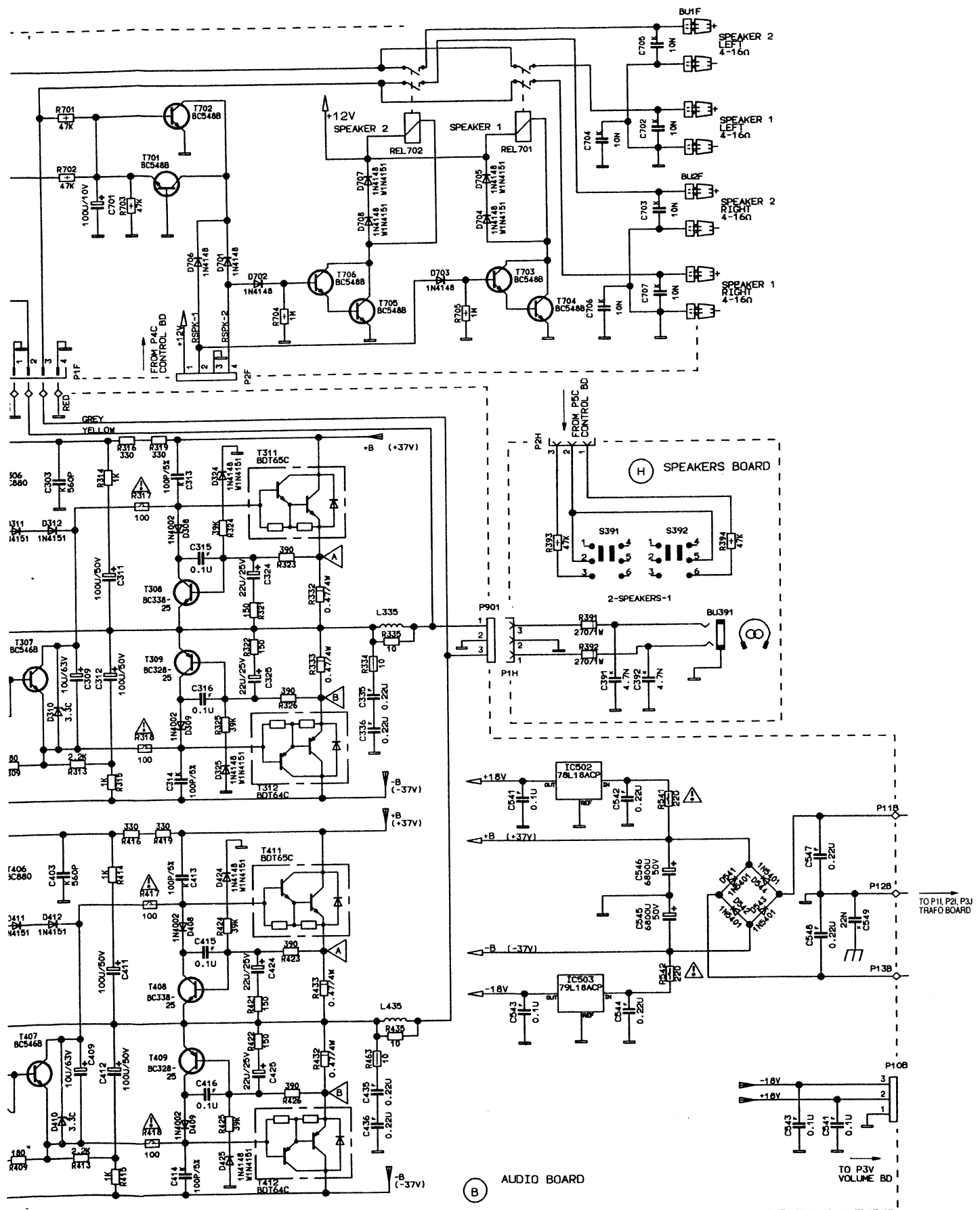


2.8.5 POTENTIOMETER PCB
(component side)

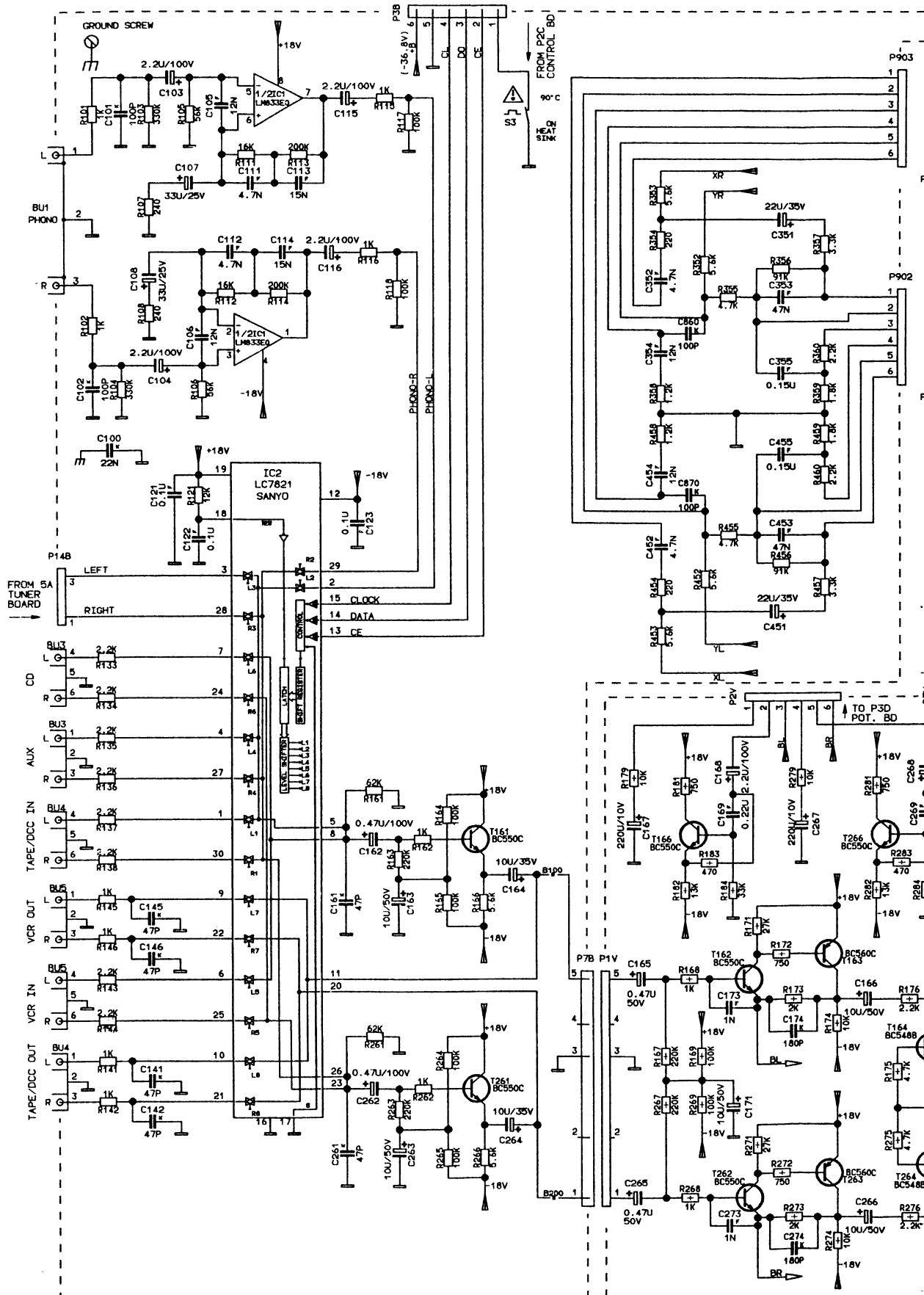


2.9 SCHEMATIC DIAGRAM (VERSION /01B): AUDIO BOARD, VOLUME BOARD, POTENTIOMETER BOARD, LOUD SPEAKERS BOARD, SPEAKERS BOARD

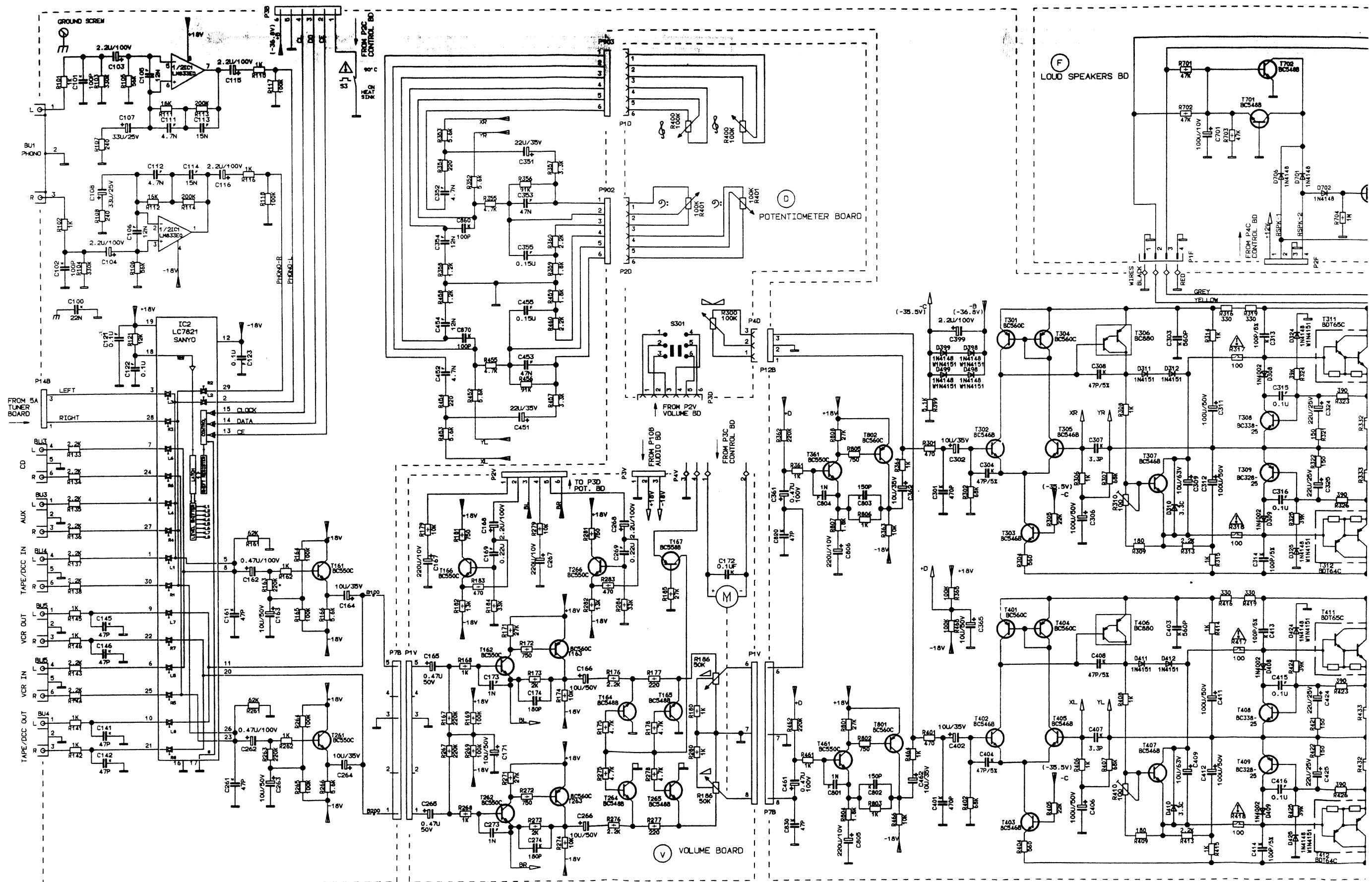


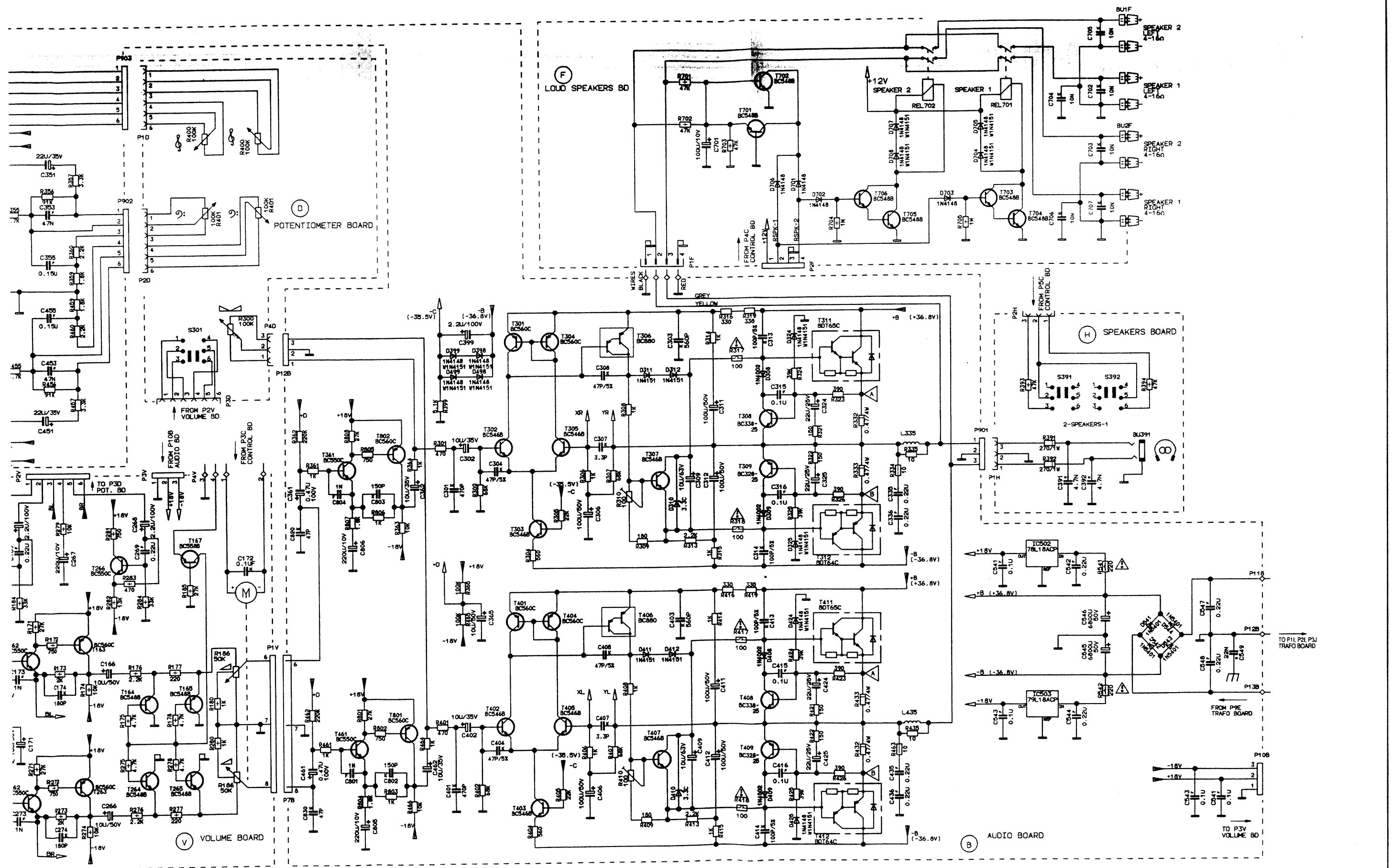


2.10 SCHEMATIC DIAGRAM (VERSION /UBL): AUDIO BOARD, VOLUME BOARD, POTENTIOMETER BOARD, LOUD SPEAKERS BOARD, SPEAKERS BOARD

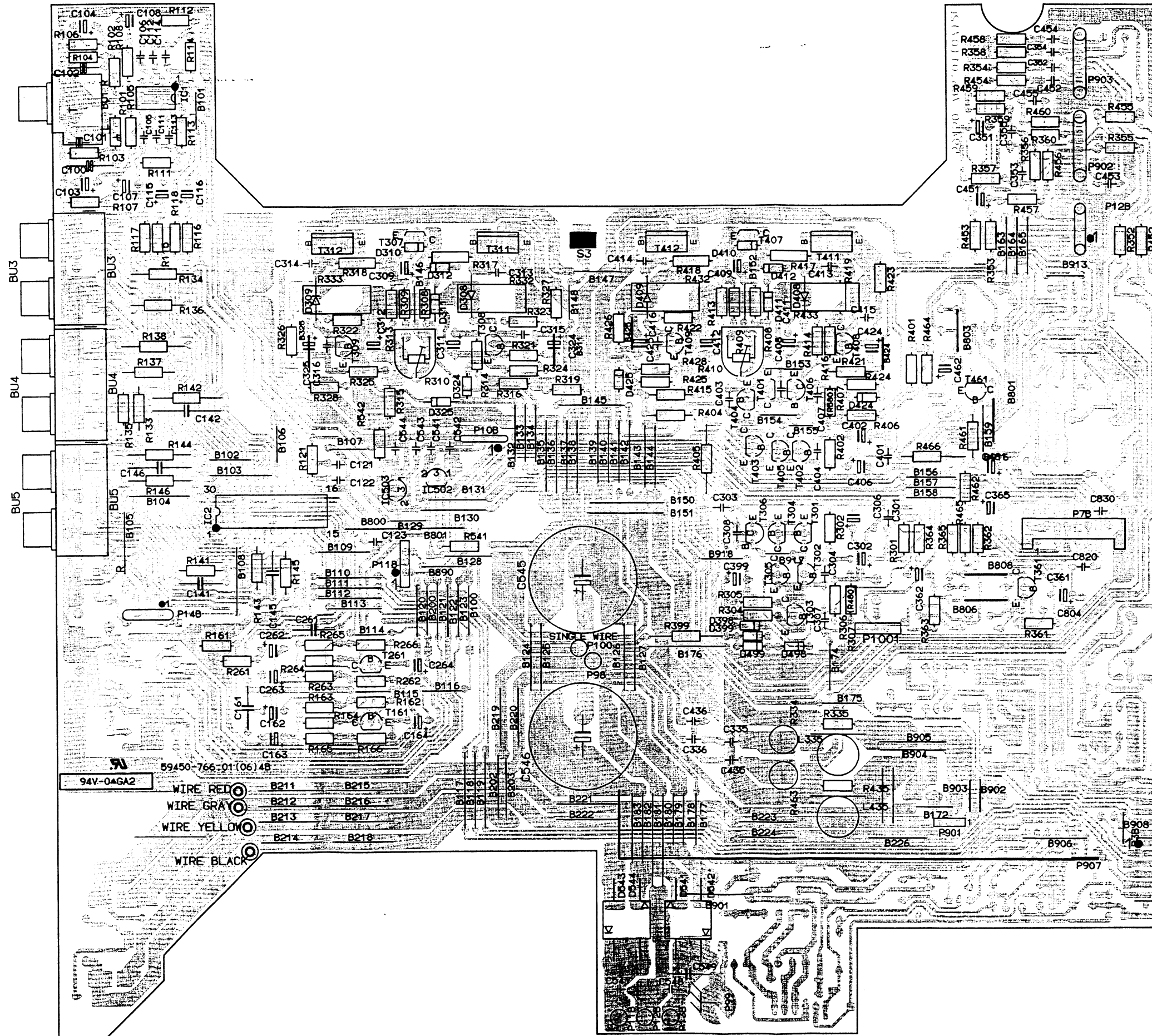


2.10 SCHEMATIC DIAGRAM (VERSION /UBL): AUDIO BOARD, VOLUME BOARD, POTENTIOMETER BOARD, LOUD SPEAKERS BOARD, SPEAKERS BOARD

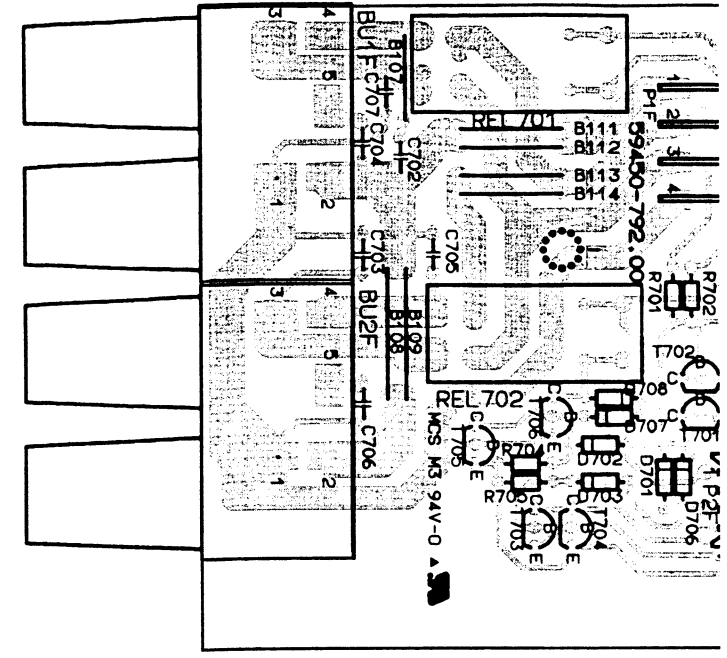




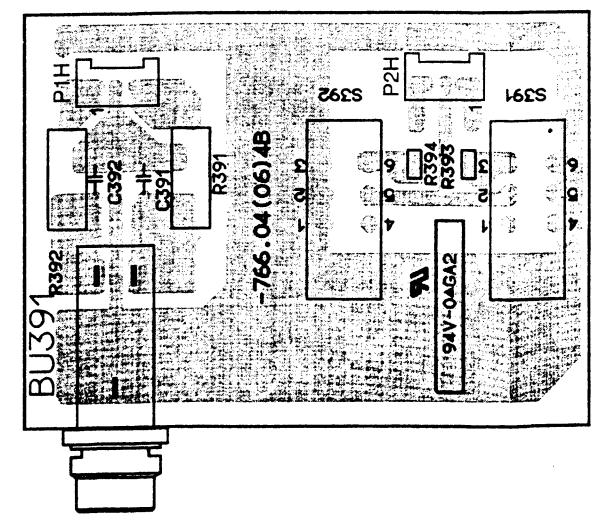
2.8.1 AUDIO PCB
(component side)

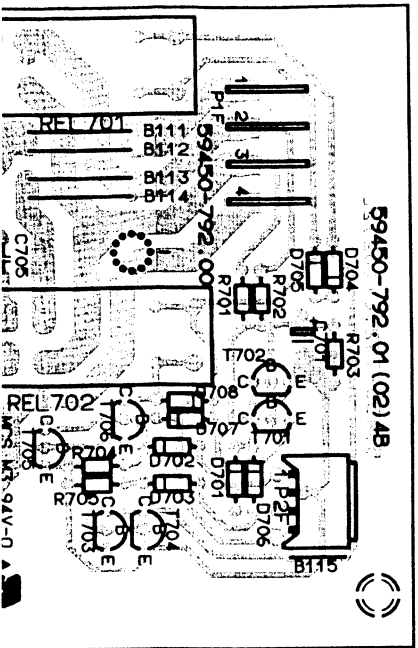


2.8.2 LOUD SPEAKERS PCB
(component side)

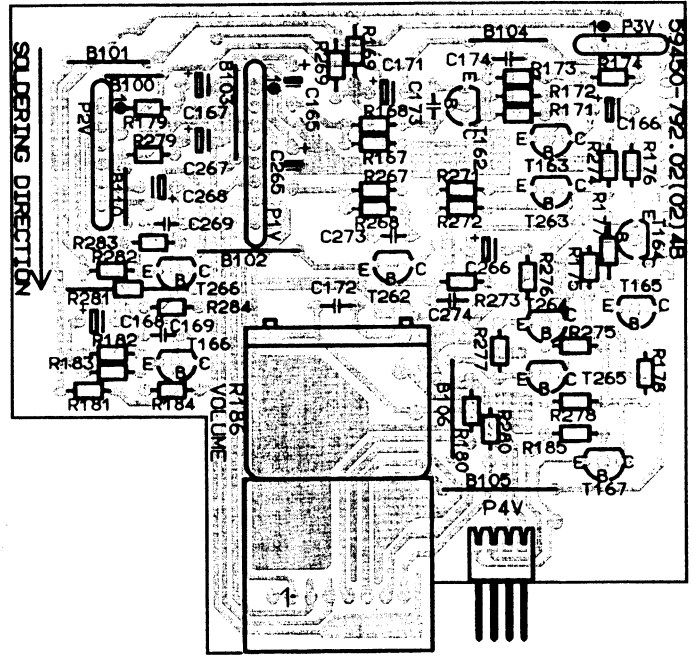


2.8.4 SPEAKERS PCB
(component side)

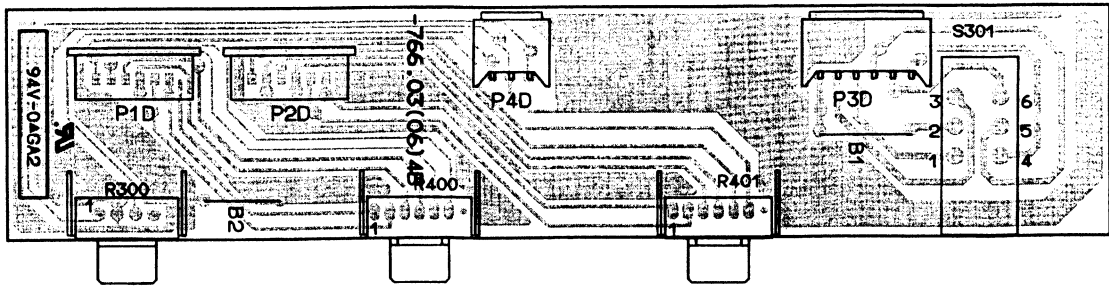
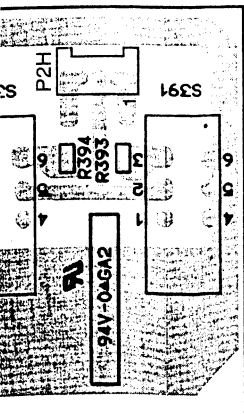




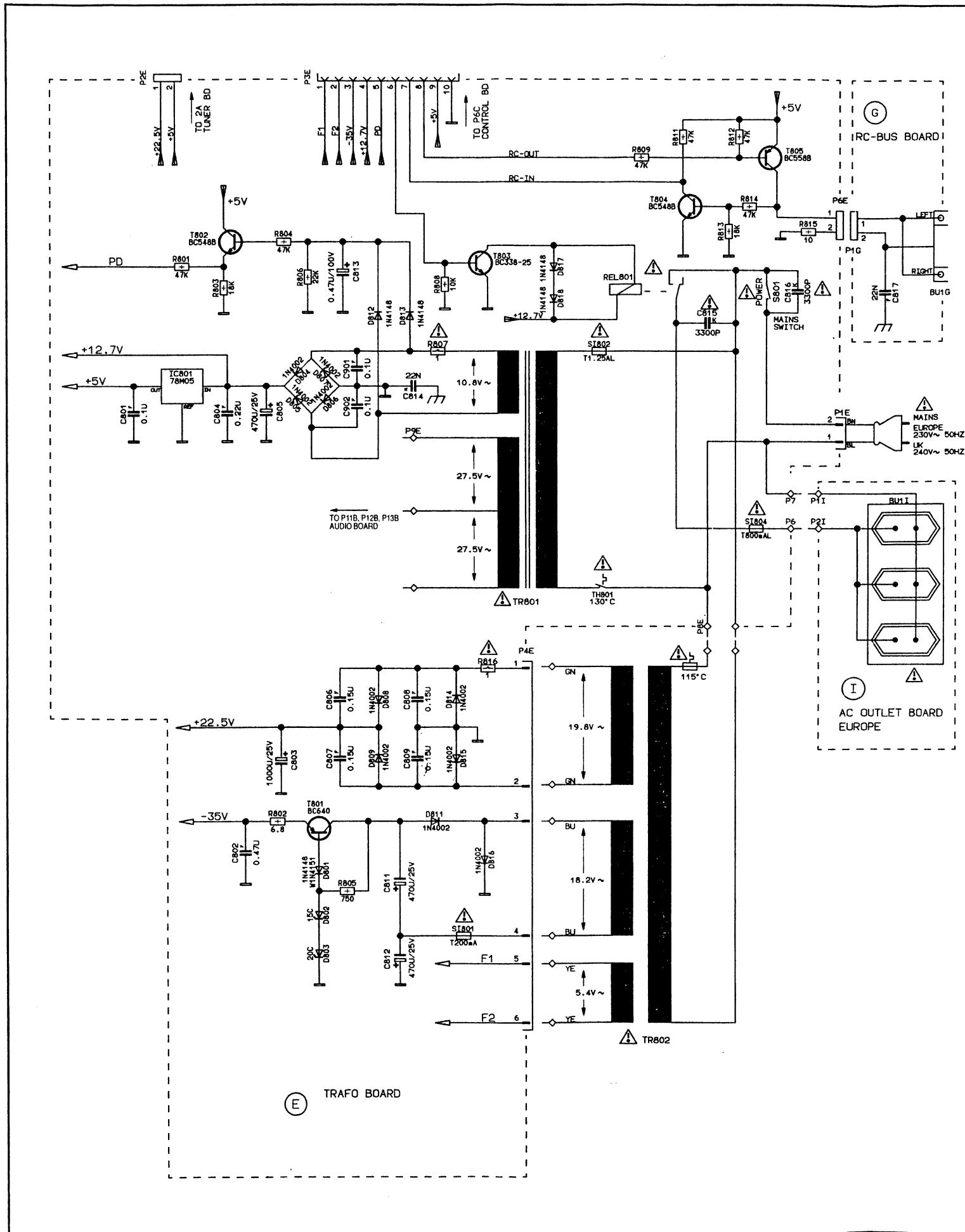
2.8.3 VOLUME PCB
(component side)

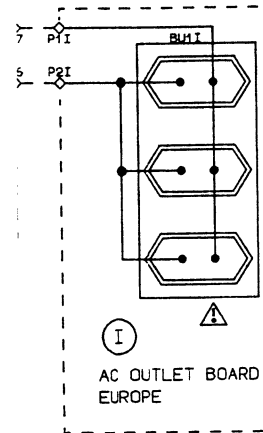
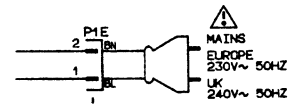
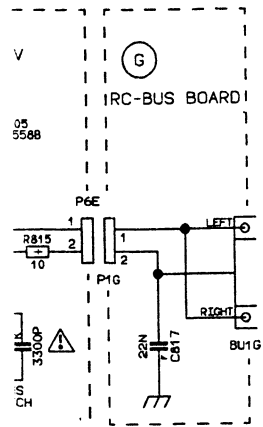


2.8.5 POTENTIOMETER PCB
(component side)

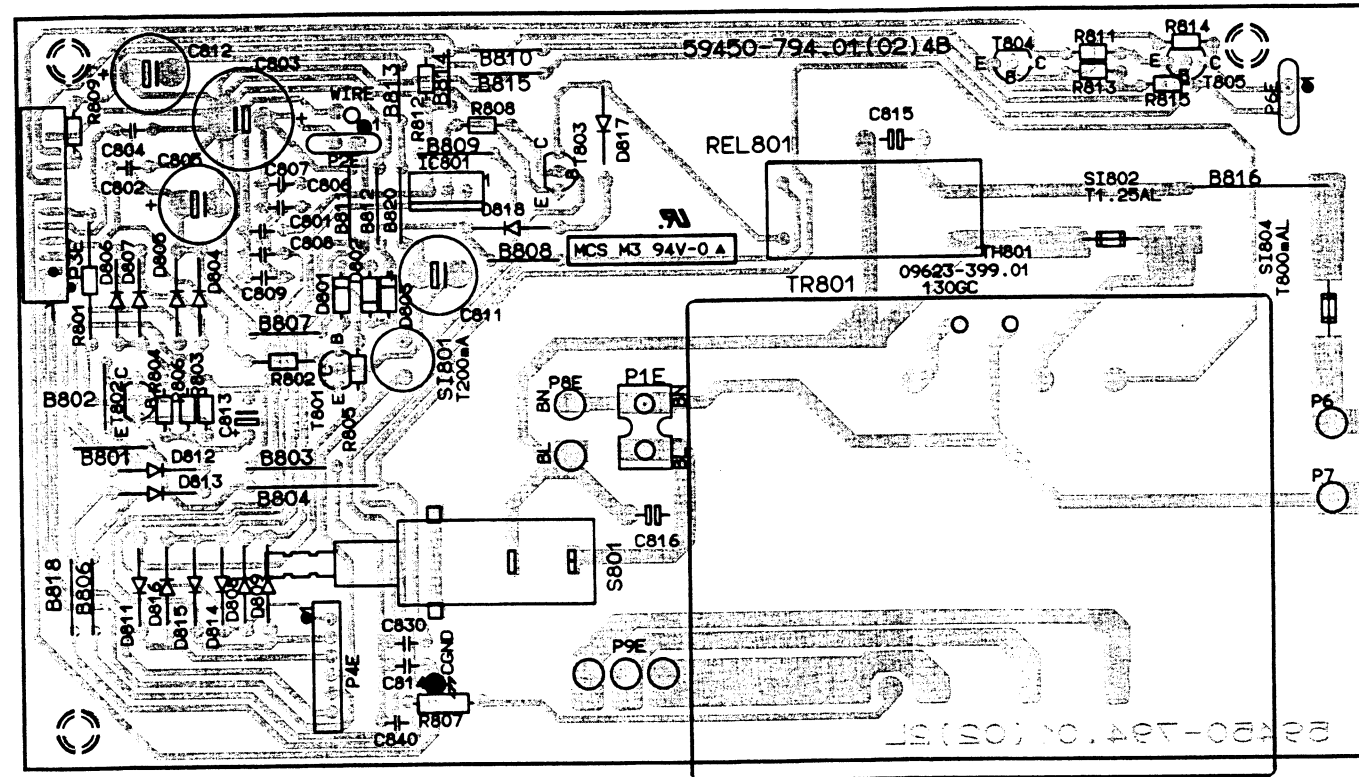


2.11 SCHEMATIC DIAGRAM (VERSIONS /02B/05B): TRAF0 BOARD, RC-BUS BOARD, AC OUTLET BOARD

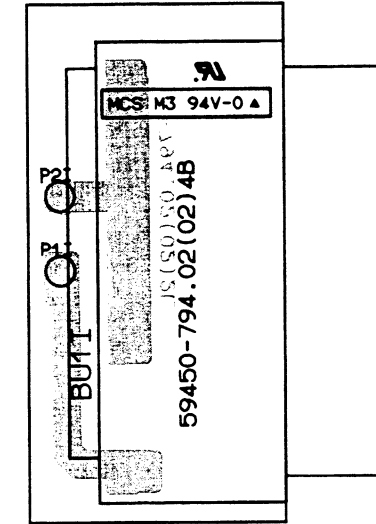




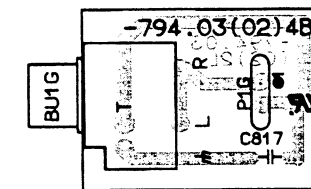
2.12.1 TRAF0 PCB (VERSIONS /02B/05B)
(component side)



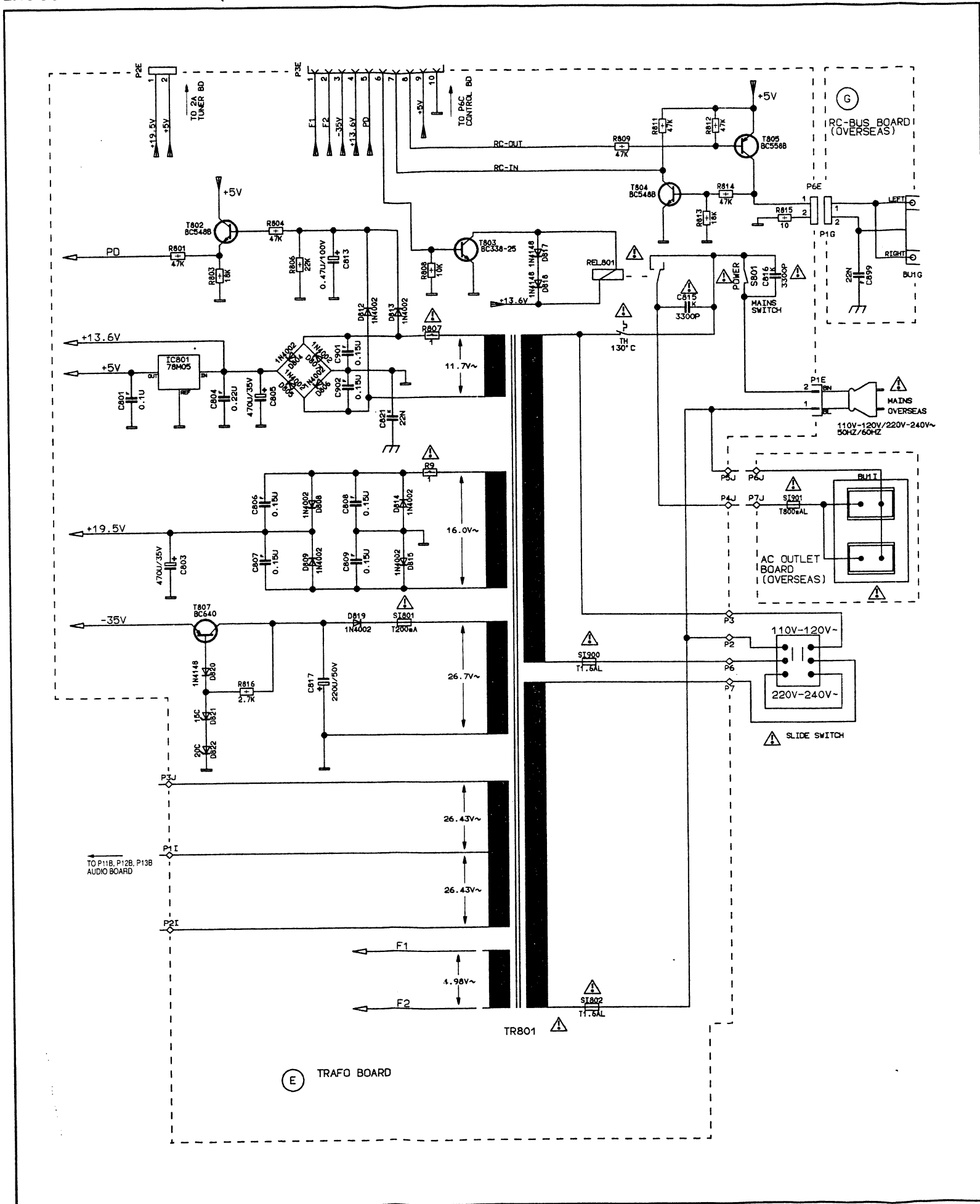
2.12.2 AC OUTLET PCB (VERSION /02B)
(component side)



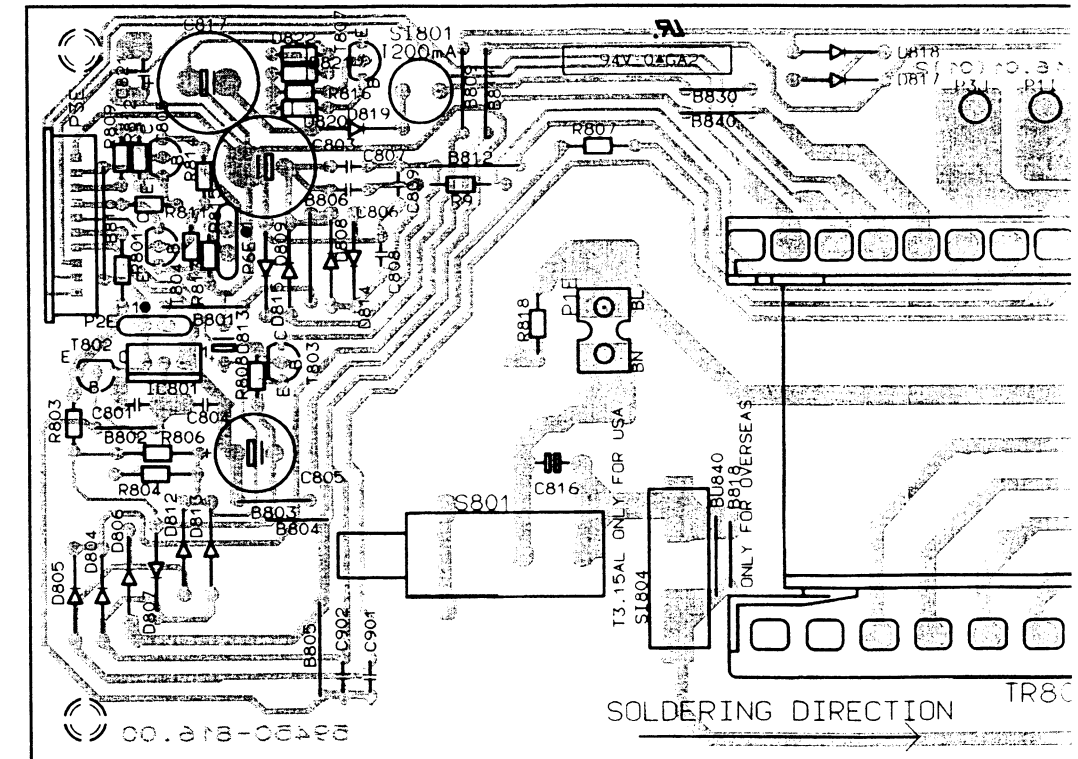
2.12.3 RC-BUS PCB (VERSIONS /02B/05B)
(component side)



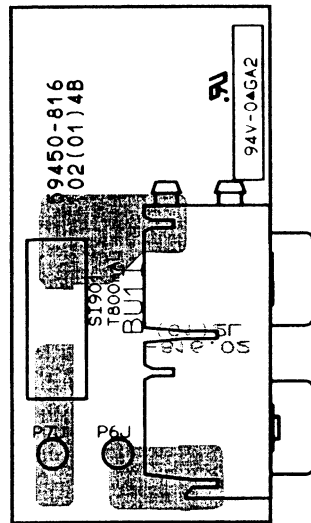
2.13 SCHEMATIC DIAGRAM (VERSION /01B): TRAF0 BOARD, RC-BUS BOARD, AC OUTLET BOARD



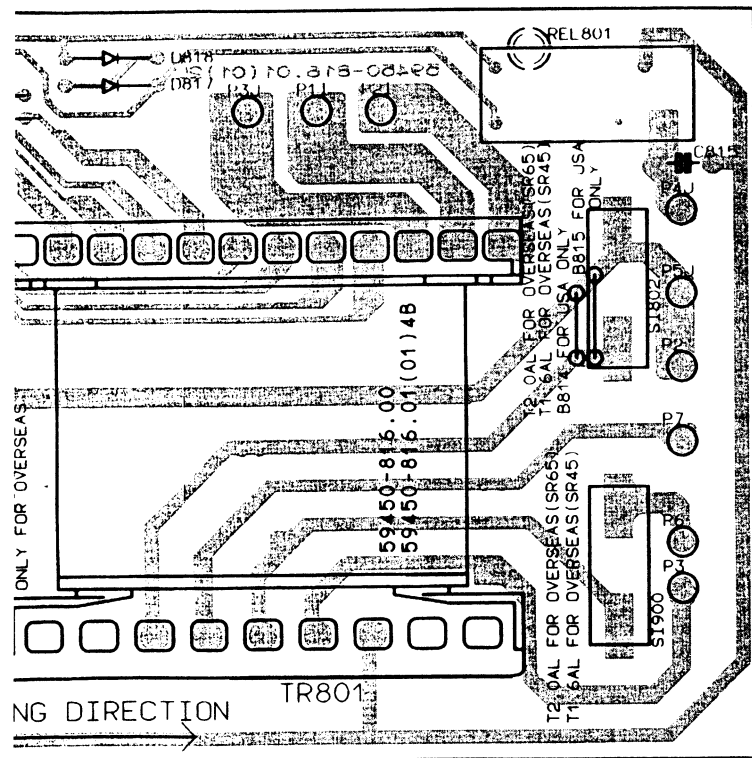
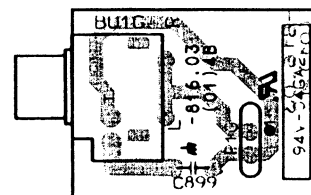
2.14.1 TRAF0 PCB (VERSIONS /01B/UBL) (component side)



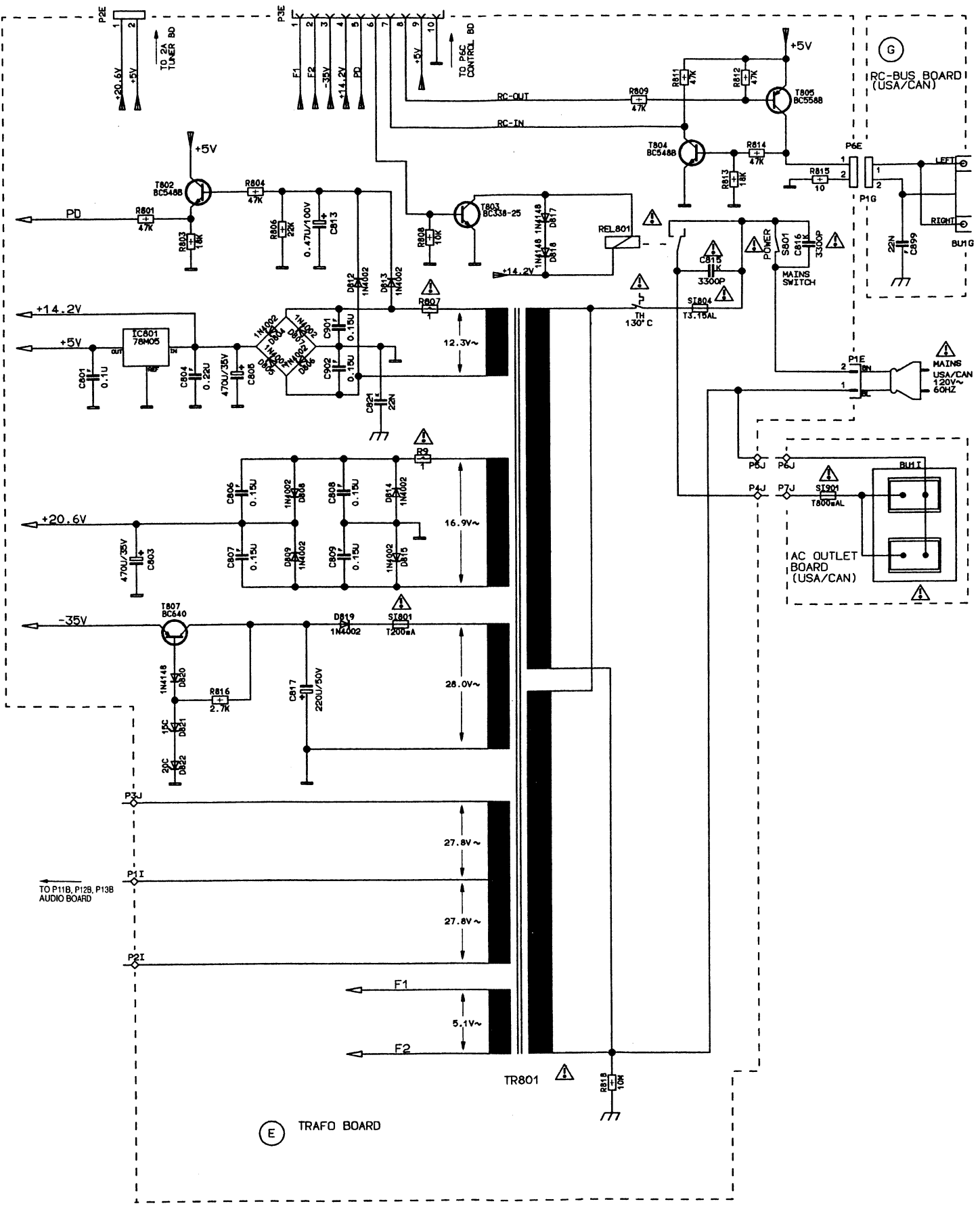
2.14.2 AC OUTLET PCB (VERSIONS /01B/UBL)
(component side)



2.14.3 RC-BUS PCB (VERSIONS /01B/UBL)
(component side)



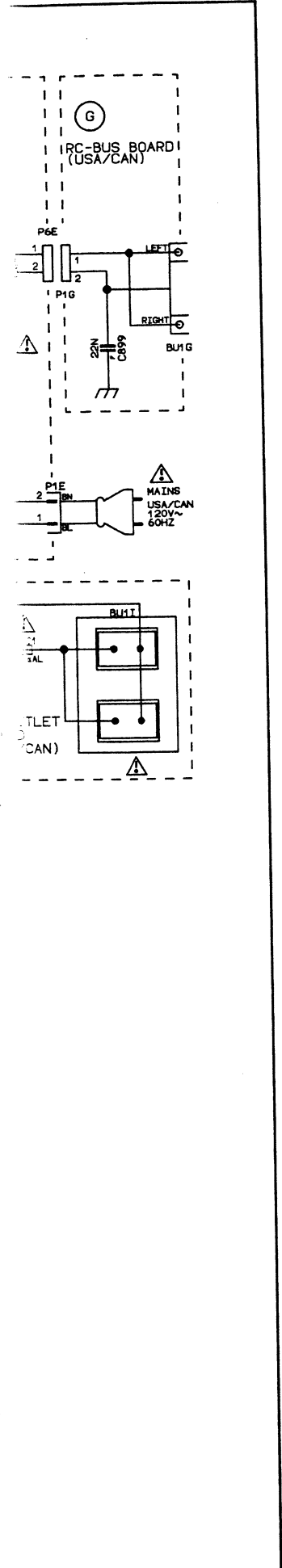
2.15 SCHEMATIC DIAGRAM (VERSION /UBL): TRAF0 BOARD, RC-BUS BOARD, AC OUTLET BOARD



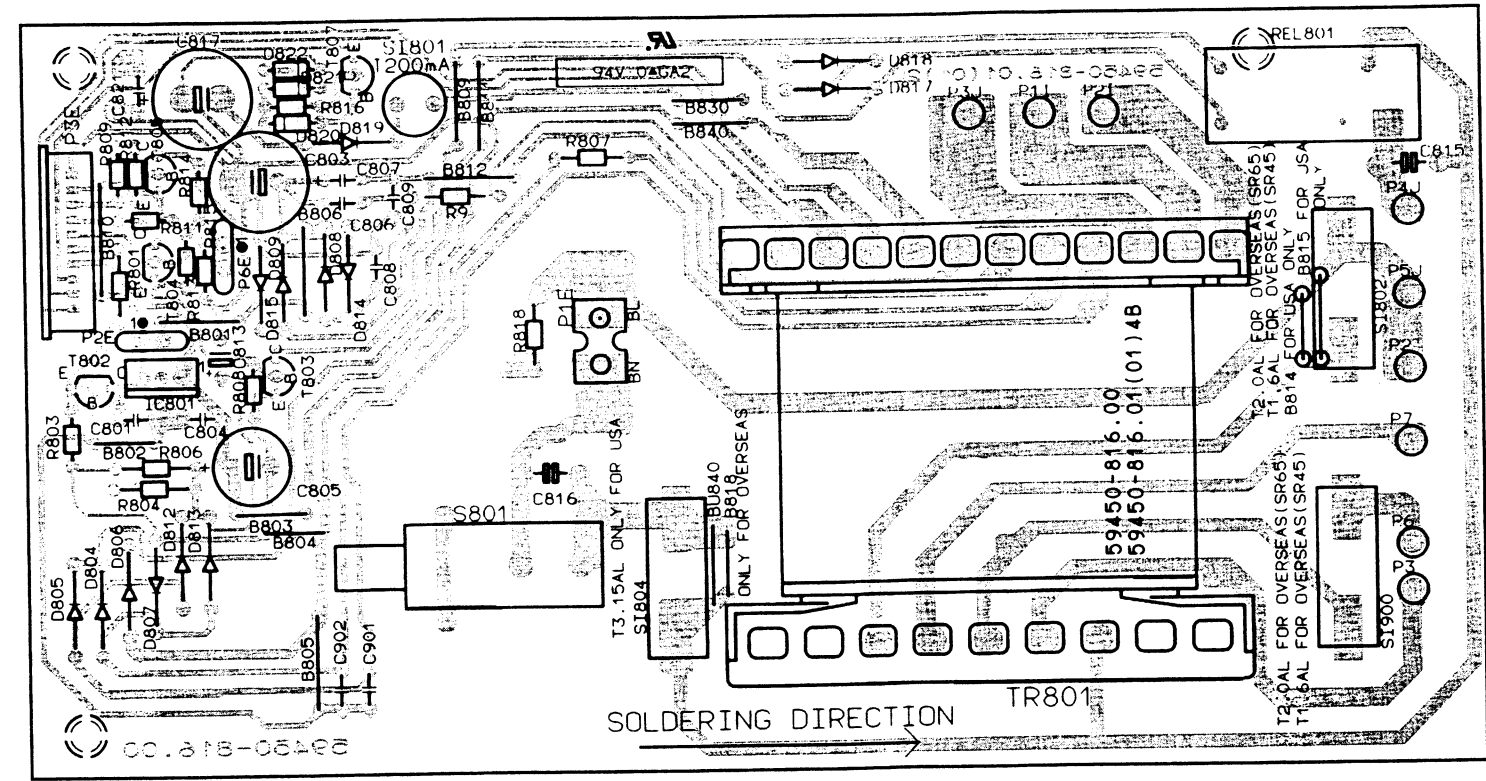
(E) TRAF0 BOARD

(G) RC-BUS BOARD (USA/CAN)

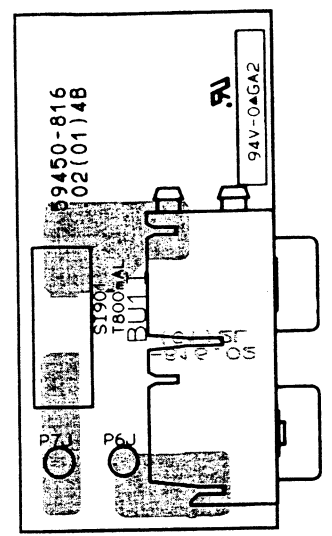
AC OUTLET BOARD (USA/CAN)



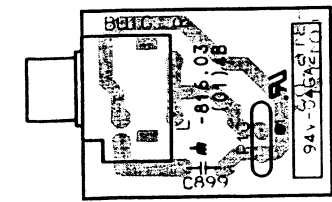
2.14.1 TRAF0 PCB (VERSIONS /01B/UBL)
(component side)



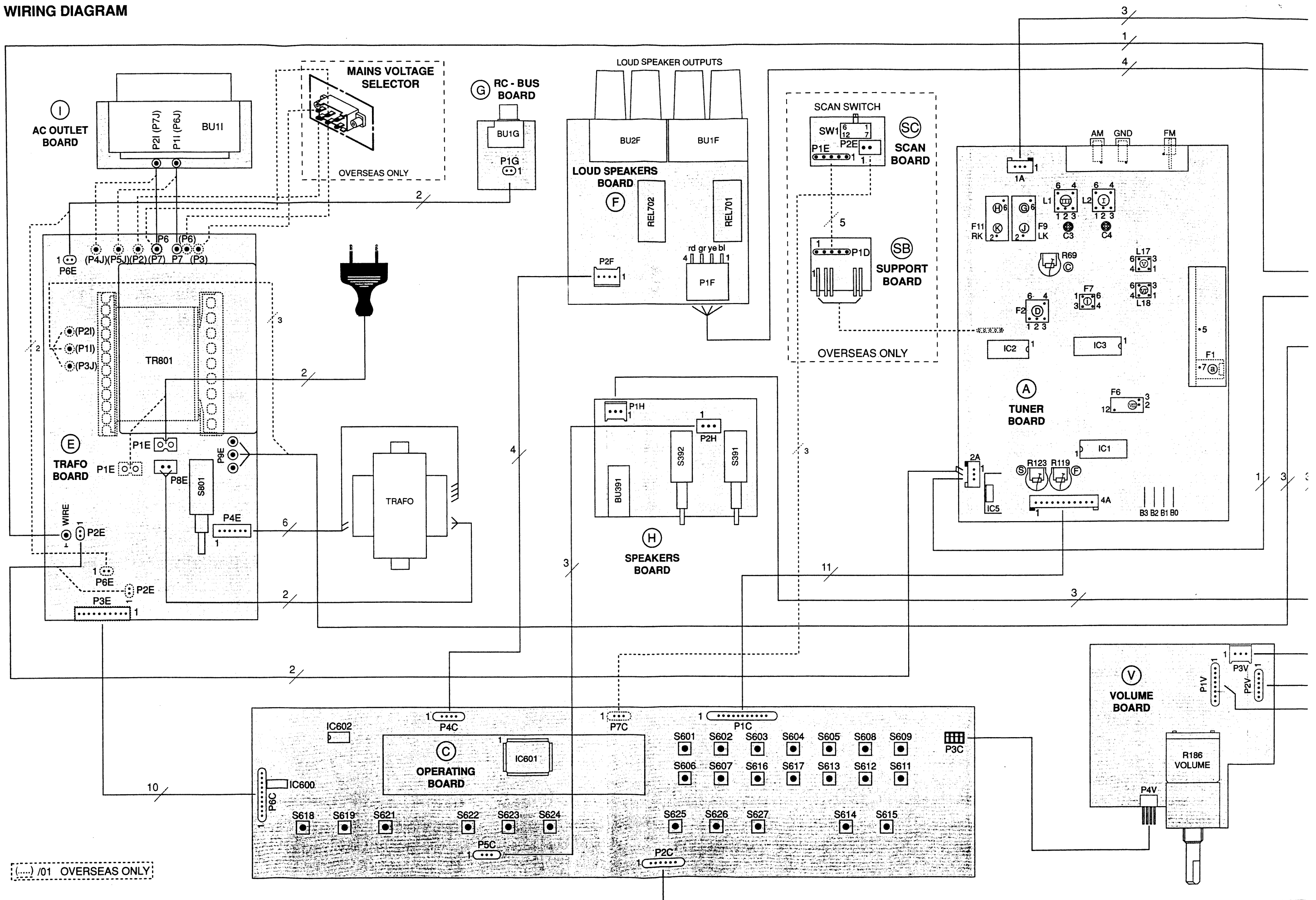
2.14.2 AC OUTLET PCB (VERSIONS /01B/UBL)
(component side)

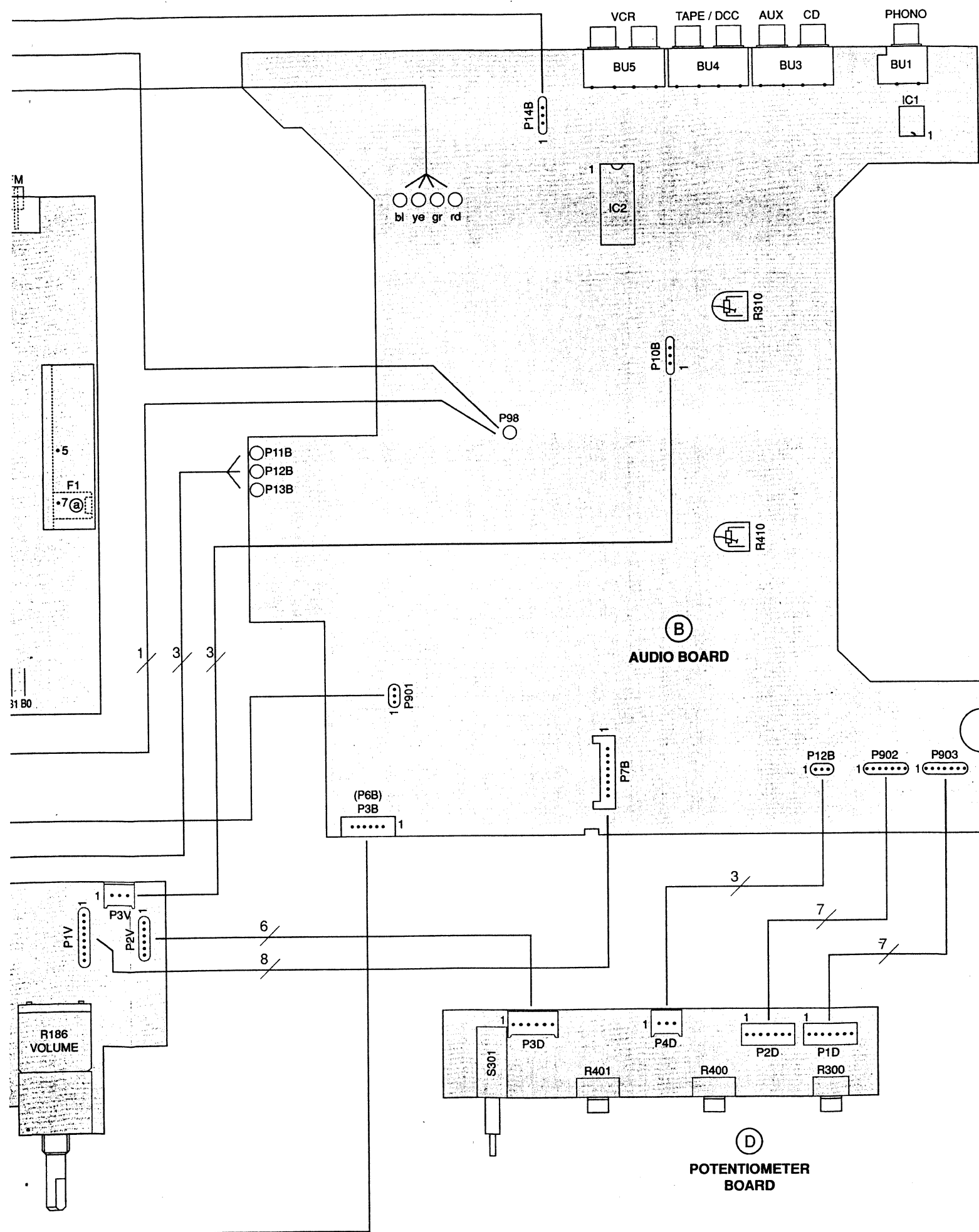


2.14.3 RC-BUS PCB (VERSIONS /01B/UBL)
(component side)



3. WIRING DIAGRAM

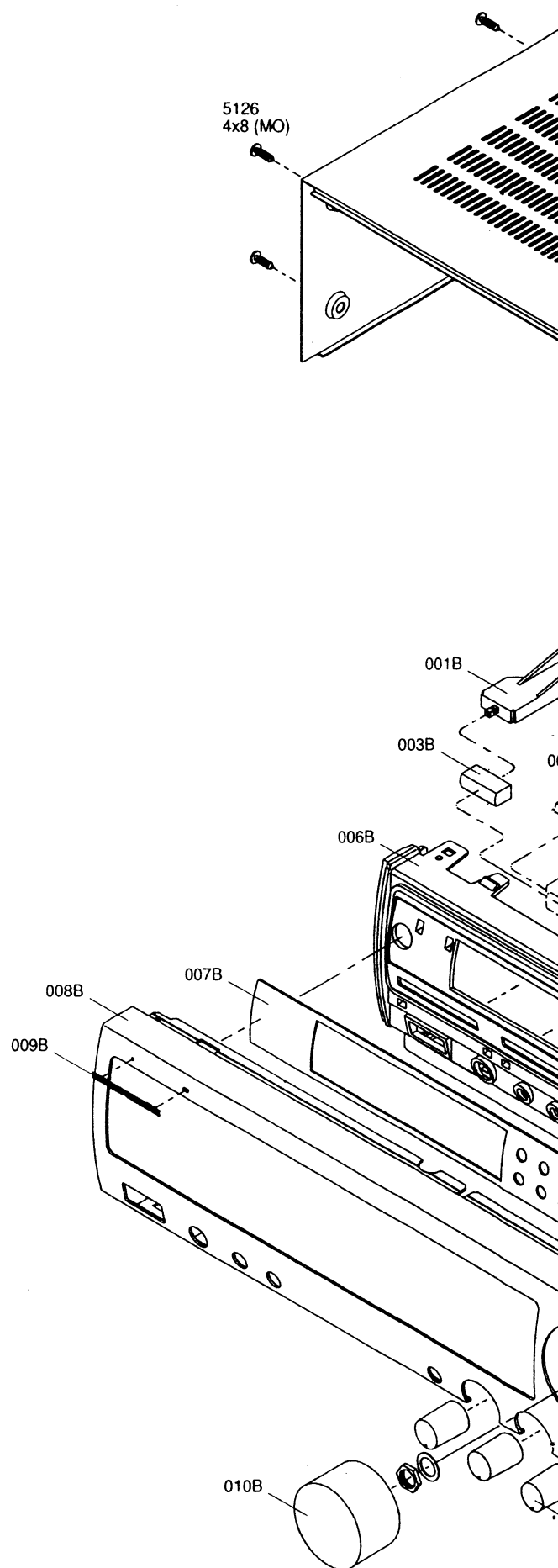


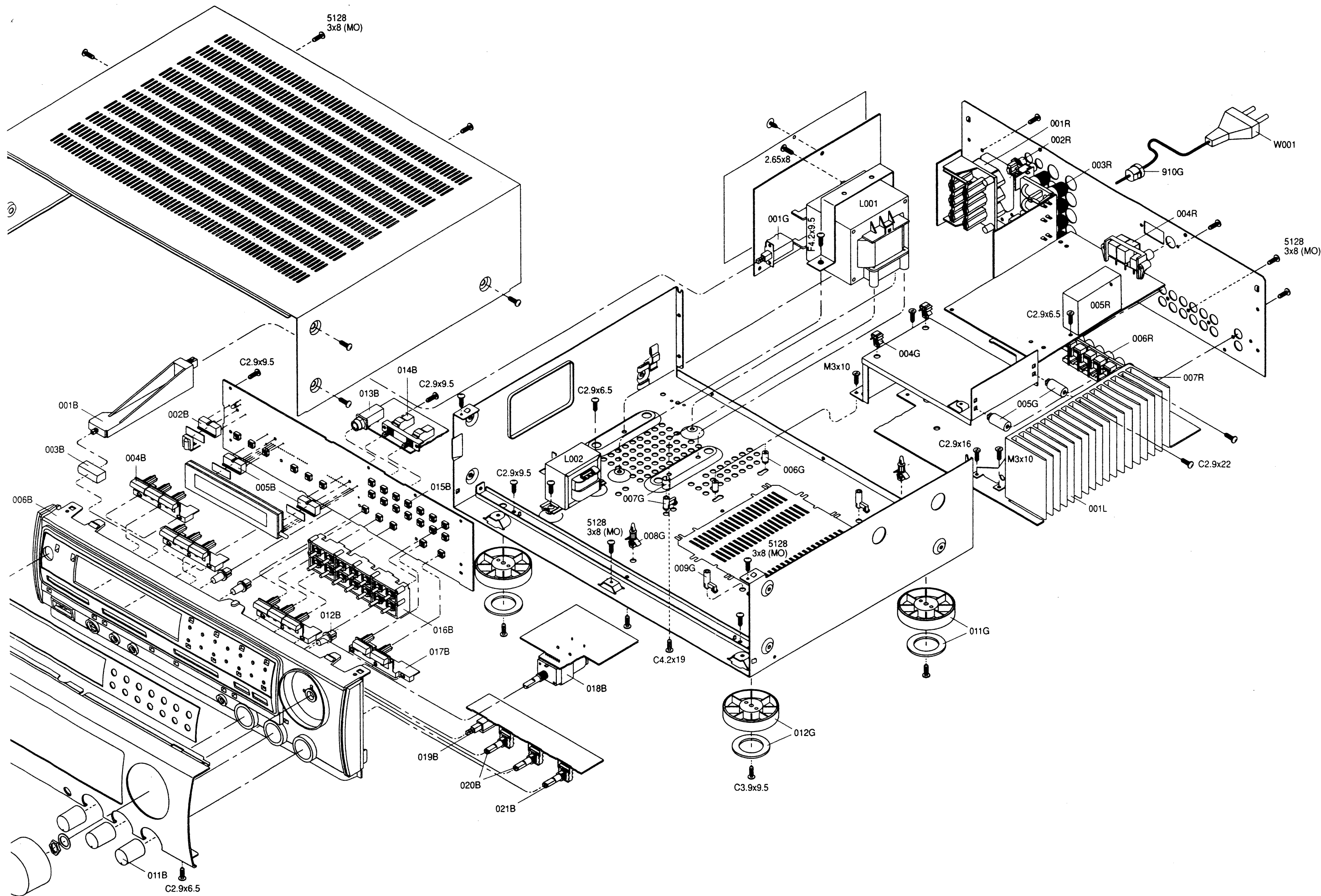


4. EXPLODED VIEW AND PARTS LIST

(VERS.:VERSION, U:U.S.A., F:JAPAN, K:FAR EAST, **:EUROPE)

POS. NO	VERS. COLOR	PART NO. (PH)	DESCRIPTION	PART NO. (MZ)
001B		482240421349	POWER LINK	QP40421349
003B		482241063889	POWER SWITCH KNOB	QP41063889
004B		482241063893	FUNCTION BUTTON	QP41063893
006B		482242651847	FRONT PANEL MOLD	QP42651847
007B		482245062514	WINDOW	QP45062514
008B		482242651846	FRONT PANEL ALUMI.	QP42651846
009B		482245911172	MARANTZ BADGE	185J251010
010B		482241341923	VOLUME KNOB	QP41341923
011B		482241331868	TONE/BALANCE KNOB	QP41331868
012B		482241063895	BASS-EQ BUTTON	QP41063895
013B		482226731463	HEAD PHONE JACK	QP26731463
015B		482241062446	TACT SWITCH	QP41062446
016B		482241063892	14 KEY BUTTON	QP41063892
017B		482241063894	TUNE KEY	QP41063894
▲ 001G	02B/05B	482227613636	MAINS SWITCH	QP27613636
011G		482246242048	FOOT (REAR)	183J057110
012G		482246242045	FOOT (FRONT)	183J057010
▲ 001R	02B	482226741233	MAINS OUTLET	QP26741233
002R		482226531305	RCA PIN JACK (RC-5)	QP26531305
003R		482229061254	SPEAKER TERMINAL	QP29061254
004R		482226710296	ANTENNA TERMINAL	QP26710296
005R		482221010531	TUNER PACK	QP21010531
006R		482226741153	RCA PIN JACK (4)	QP26741153
007R		482226731834	RCA PIN JACK (2)	QP26731834
001T	01B/02B/05B	482273622519	USER MANUAL	QP73622519
001T	U		USER MANUAL	QP73622544
BU1I	01B	482226731962	MAINS SOCKET	QP26731962
▲ L001	01B	482214621835	MAINS TRANSFORMER	QP14621835
▲ L001	U		MAINS TRANSFORMER	QP14621842
▲ L001	02B/05B	482214621834	MAINS TRANSFORMER	QP14621834
▲ L002	01B	482214621836	MAINS TRANS. (SUB)	QP14621836
▲ L002	U		MAINS TRANS. (SUB)	QP14621844
▲ L002	02B	482214621843	MAINS TRANS. (SUB)	QP14621843
▲ L002	05B	482214621849	MAINS TRANS. (SUB)	QP14621849
SW1	01B	482227613635	SCAN SWITCH	QP27613635
SWM1	01B	482227721807	SLIDE SWITCH	QP27721807
▲ W001	01B	482232111135	MAINS CORD	QP32111135
▲ W001	U		MAINS CORD	QP32111068
▲ W001	02B/05B	482232122917	MAINS CORD	QP32122917
Z001		482221810595	REMOTE COMMANDER	QP21810595





5. ALIGNMENT PROCEDURES

5.1 FM Alignment Procedures

(Function switch at "FM" position)

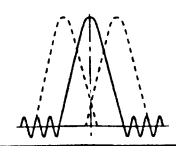
Note: The frontend is a completely preadjusted module. Only the IF-filter must be adjusted to the IF amplifier.

The values of the tuning voltages are:

87.5MHz = typ. 1.6V min 1.3V

108MHz = typ. 8.0V max 9V

• FM IF Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Adjust
1	Connect an FM sweep generator to FM aerial socket. $U_{RF} = \text{approx. } 100\mu\text{V} / 75\Omega$	98MHz	Connect an oscilloscope to measuring point (B)	With IF filter F1 (a) adjust for maximum level and symmetrical position. 

• FM Demodulator Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Adjust
1	Connect an FM generator to FM aerial socket. $U_{RF} = 1\text{mV} / 75\Omega$ $\Delta f = \pm 40\text{kHz}$	98MHz	Connect a distortion analyzer to measuring point (R) and (L)	With filter F7 (i) adjust for minimum distortion. (typ. $\leq 0.2\%$)

• FM Field Strength IND - Search Stop Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Adjust
1	Connect an FM generator to FM aerial socket. $U_{RF} = 1\text{mV} / 75\Omega$	98MHz	DC-VM to measuring point (F)	With R119 (F) set to 1.5V +0.05V.
2	Connect an FM generator to FM aerial socket. $U_{RF} = 15\mu\text{V} / 75\Omega$	98MHz	DC-VM to measuring point (G)	With R123 (S) set to 0.7V +0.05V.

• Multiplex Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Adjust
1	Connect a stereo encoder to FM aerial socket.	106MHz $L_{\text{mod.}} = 1\text{kHz}$	Connect AC-VM to measuring point (R)	With R69 (C) adjust for maximum and symmetrical crosstalk attenuation.
2		106MHz $R_{\text{mod.}} = 1\text{kHz}$	Connect AC-VM to measuring point (L)	
3	Connect an FM generator to FM aerial socket.	98MHz $f_{\text{mod.}} = 38\text{kHz}$	Connect AC-VM to measuring point (R) and (L)	With F9 (J), F11 (K) adjust for minimum level.
4		98MHz $f_{\text{mod.}} = 19\text{kHz}$		With F9 (G), F11 (H) adjust for minimum level.

• Adjacent Channel Filter Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Adjust
1	Connect an AF generator to the input of F2 (Pin 2). $U_{AF} = \text{approx. } 100\text{mV}$	114 kHz	Connect AC-VM to the output of F2 (Pin 4).	With F2 (D) adjust for minimum level.

5.2 AM Alignment Procedures

(Function switch at "AM" position)

• MW/LW Oscillator Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Adjust
1		531kHz (MW)	Connect DC-VM to measuring point (E)	With L18 (VI) set the tuning voltage to 1.1V.
2		153kHz (LW)		With L17 (V) set the tuning voltage to 1.8V.

• MW RF IF Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Adjust
1	Feed in an AM generator signal via a frame aerial. $m = 30\%$, $f_{\text{mod.}} = 1\text{kHz}$	1449kHz	Connect AC-VM to measuring point (R) and (L)	With C3 (IV) and the IF Filter F6 (VII) set U_{AF} to maximum level.
2		558kHz		With L1 (III) set U_{AF} to maximum level.
3	Repeat the adjustment of C3 and L1 until sensitivity is maximized, end with C3.			

• LW RF IF Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Adjust
1	Feed in an AM generator signal via a frame aerial. $m = 30\%$, $f_{\text{mod.}} = 1\text{kHz}$	261kHz	Connect AC-VM to measuring point (R) and (L)	With C4 (II) set U_{AF} to maximum level.
2		162kHz		With L2 (I) set U_{AF} to maximum level.
3	Repeat steps 1 and 2 until sensitivity is maximized, end with C4.			

5.3 Amplifier Alignment Procedures

• Quiescent Current Alignment

Step	Signal Source Connection	Volume	Indicator Connection	Adjust
1	No input signal. Turn on the set for at least 2 minutes.	min.	Connect DC-VM to measuring point left channel (A) ↔ (B)	With R310 set the voltage to 10mV $\pm 0.5\text{mV}$.
2			Connect DC-VM to measuring point right channel (A) ↔ (B)	With R410 set the voltage to 10mV $\pm 0.5\text{mV}$.

• FM IF offset

The ceramic resonators have different intermediate frequencies as a result of tolerances. Dependent on the IF, a jumper has to be closed or a jumper has to be opened. B0 - B3 (see table).

The resonators have been provided with a colour code.

When replacing one of the ceramic resonators, take care that the colours codes of all resonators are the same.

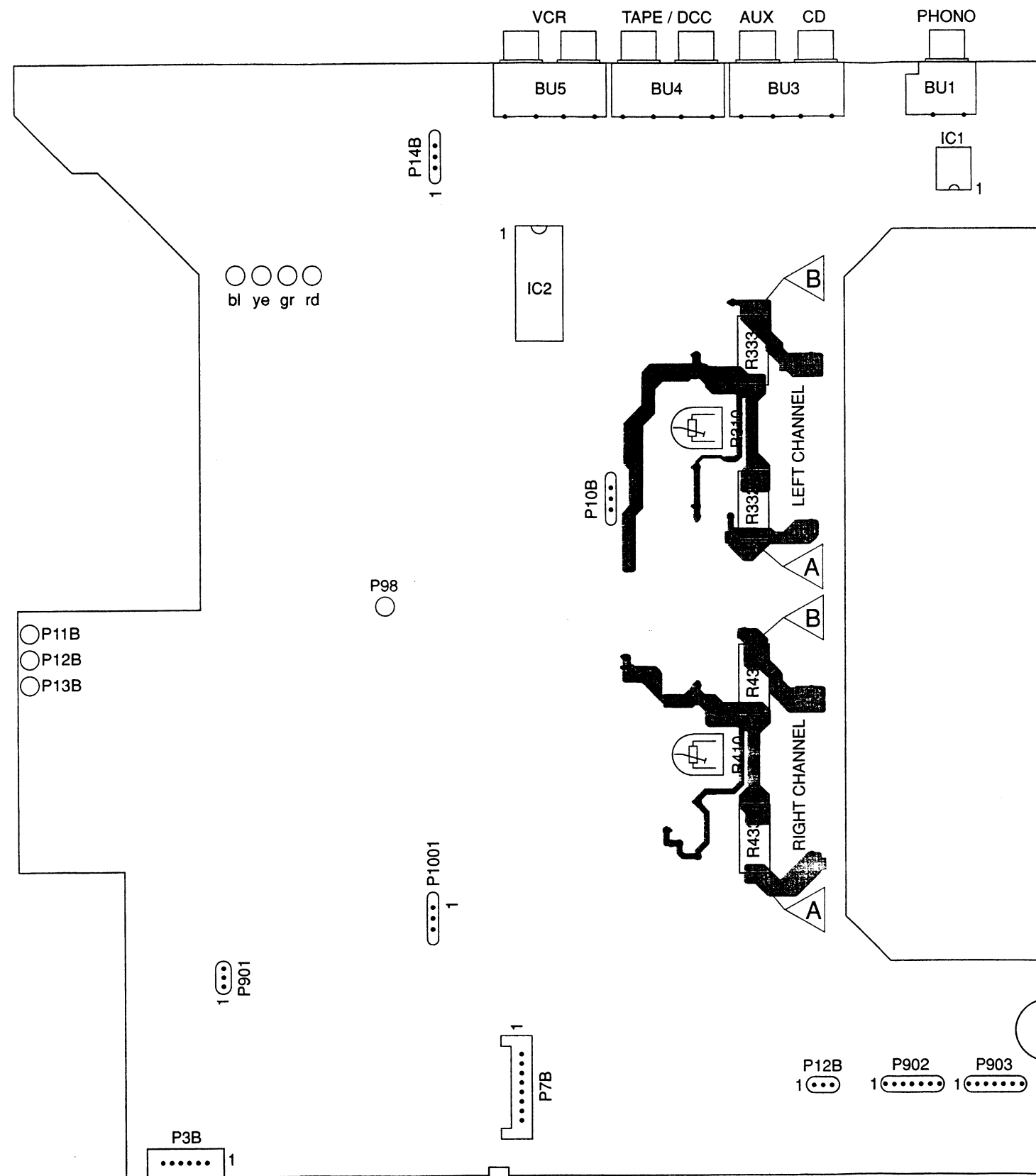
 Measuring points

 Trimming point

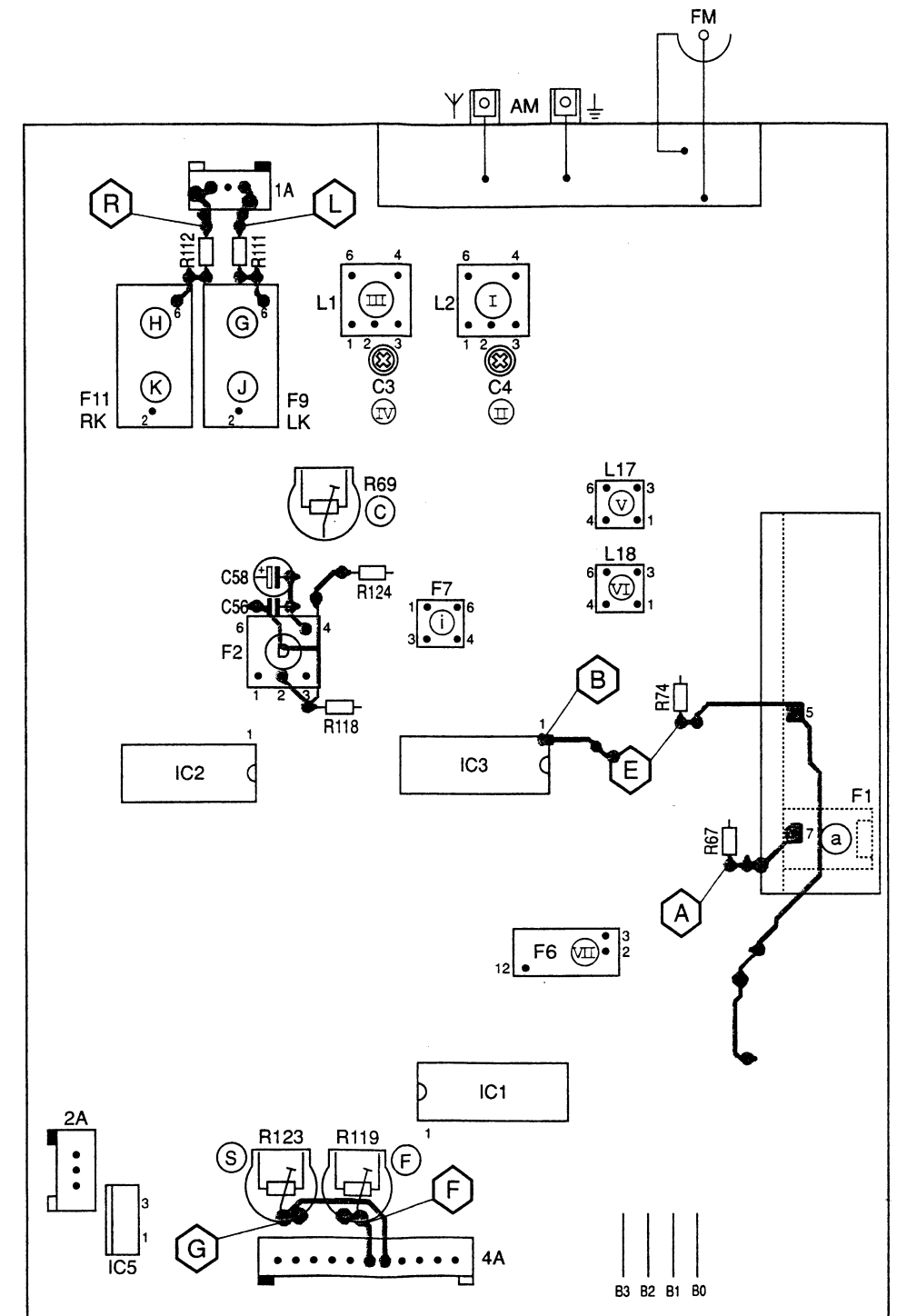
IF (MHz)	Jumper				Filter color
	B 3	B 2	B 1	B 0	
10.6500	0	1	0	0	Black
10.6750	0	1	1	0	Blue
10.7000	1	0	0	0	Red
10.7250	1	0	1	0	Orange
10.7500	1	1	0	0	White

0 = jumper open 1 = jumper closed

5.4 Amplifier Alignment Points



5.5 Tuner Alignment Points



6. ELECTRICAL PARTS LIST

(VERS.:VERSION, U:U.S.A., F:JAPAN, K:FAR EAST, **:EUROPE)

POS. NO	VERS.C OLR	PART NO. (PH)	DESCRIPTION	PART NO. (MZ)	POS. NO	VERS.C OLR	PART NO. (PH)	DESCRIPTION	PART NO. (MZ)
CAPACITORS									
C3		482212560222	TRIM.CAP. 4.5-20pF	QP12560222	D804		532213030684	DIODE 1N4002 -GA	QQ13030684
C4		482212560223	TRIM.CAP. 7.5-45pF	QP12560223	D809				
C545		482212442455	ELE.CAP. 6800µF 50V	QP12442455	D811	02B/05B	532213030684	DIODE 1N4002 -GA	QQ13030684
C546		482212442455	ELE.CAP. 6800µF 50V	QP12442455	D812		482213030621	DIODE 1N4148WW.	QP13030621
C702	02B	482212613722	CER.CAP. 0.01µF 10%	QP12613722			482213030621	DIODE 1N4148WW.	QP13030621
C803		482212440214	ELE.CAP.CB1000µF 25V	QP12440214	D813				
C815	01B/02B/ U	482212611805	CER.CAP.A 3300pF 20%	QP12611805	D814		532213030684	DIODE 1N4002 -GA	QQ13030684
C816		482212611805	CER.CAP.A 3300pF 20%	QP12611805	D816				
					D817	01B/02B/ U	482213030621	DIODE 1N4148WW.	QP13030621
SEMICONDUCTORS									
D6		532213034052	DIODE 1N4151	QQ13034052	D818	01B/02B/ U	482213030621	DIODE 1N4148WW.	QP13030621
D7		532213034052	DIODE 1N4151	QQ13034052	D819	01B/ U	532213030684	DIODE 1N4002 -GA	QQ13030684
D9		482213082789	DIODE SVC321SP	QP13082789	D820	01B/ U	482213030621	DIODE 1N4148WW.	QP13030621
D14					D821	01B/ U	482213083968	Z-DIODE 15V C 0.5W	QP13083968
I					D822	01B/ U	482213083968	Z-DIODE 15V C 0.5W	QP13083968
D17									
D19		532213034052	DIODE 1N4151	QQ13034052	IC1		482220983163	IC LM833N	QP20983163
D23		482213082789	DIODE SVC321SP	QP13082789	IC2		482220972748	IC LC7821	QP20972748
D24		532213034052	DIODE 1N4151	QQ13034052	IC3		482220971785	IC LA1266	QP20971785
D25		532213034052	DIODE 1N4151	QQ13034052	IC5		482220933347	IC LM340AT-12NSC	QP20933347
D27		532213034052	DIODE 1N4151	QQ13034052	IC01		482220930178	IC LC7218	QP20930178
D28		532213034052	DIODE 1N4151	QQ13034052	IC02		482220973434	IC LA3401	QP20973434
D43		532213034052	DIODE 1N4151	QQ13034052	IC502	01B/05B/ U	482220990579	IC MC78L18ACP	QP20990579
D308		532213030684	DIODE 1N4002 -GA	QQ13030684					
D309		532213030684	DIODE 1N4002 -GA	QQ13030684	IC503	01B/05B/ U	482220990581	IC MC79L18ACP	QP20990581
D310		482213081781	Z-DIODE 3.3V B 0.5W	QP13081781					
D311		532213034052	DIODE 1N4151	QQ13034052	IC600		482221230842	IR-SENSOR TFM5360	QP21230842
D312		532213034052	DIODE 1N4151	QQ13034052	IC601		482220990583	IC M38172-M4-XXX	QP20990583
D324		482213030621	DIODE 1N4148WW.	QP13030621	IC602		482220990584	IC X24C04	QP20990584
D325		482213030621	DIODE 1N4148WW.	QP13030621	IC801		482220980891	IC MC78M05CT	QP20980891
D398		482213030621	DIODE 1N4148WW.	QP13030621					
D399		482213030621	DIODE 1N4148WW.	QP13030621	T1		482213040937	TRANS. BC548B	QP13040937
D408		532213030684	DIODE 1N4002 -GA	QQ13030684	T2		532213044779	TRANS. BC338-25	QQ13044779
D409		532213030684	DIODE 1N4002 -GA	QQ13030684	T3		532213044779	TRANS. BC338-25	QQ13044779
D410		482213081781	Z-DIODE 3.3V B 0.5W	QP13081781	T6		482213044197	TRANS. BC558B	QP13044197
D411		532213034052	DIODE 1N4151	QQ13034052	T7		482213042121	TRANS. FET F2072SK30A-TM-Y1	QP13042121
D412		532213034052	DIODE 1N4151	QQ13034052	T8		482213044197	TRANS. BC558B	QP13044197
D424		482213030621	DIODE 1N4148WW.	QP13030621	T12		482213044196	TRANS. BC548C	QP13044196
D425		482213030621	DIODE 1N4148WW.	QP13030621	T13		482213044197	TRANS. BC558B	QP13044197
D498		482213030621	DIODE 1N4148WW.	QP13030621	T15		482213040937	TRANS. BC548B	QP13040937
D499		482213030621	DIODE 1N4148WW.	QP13030621	T16		482213040902	TRANS. BF240	QP13040902
D541					T17		482213040937	TRANS. BC548B	QP13040937
D544		532213034939	DIODE 1N5401	QQ13034939	T18		482213040937	TRANS. BC548B	QP13040937
D601		482213082743	LED TLHR 4400 TFK	QP13082743	T19		482213044197	TRANS. BC558B	QP13044197
D602					T21		482213040937	TRANS. BC548B	QP13040937
D605		482213030621	DIODE 1N4148WW.	QP13030621	T22		482213040937	TRANS. BC548B	QP13040937
D606		482213034173	Z-DIODE 5.6V C 0.5W	QP13034173	T25		482213040937	TRANS. BC548B	QP13040937
D609		482213030621	DIODE 1N4148WW.	QP13030621	T161		482213041096	TRANS. BC550C	QP13041096
D611		482213080515	Z-DIODE 5.1V C 0.5W	QP13080515	T162		482213041096	TRANS. BC550C	QP13041096
D612		482213030621	DIODE 1N4148WW.	QP13030621	T163		482213061755	TRANS. BC560C	QP13061755
D701					T164		482213040937	TRANS. BC548B	QP13040937
I					T165		482213040937	TRANS. BC548B	QP13040937
D708		482213030621	DIODE 1N4148WW.	QP13030621	T166		482213041096	TRANS. BC550C	QP13041096
D801	02B/05B	482213030621	DIODE 1N4148WW.	QP13030621	T167		482213044197	TRANS. BC558B	QP13044197
D802	02B/05B	482213083968	Z-DIODE 15V C 0.5W	QP13083968	T261		482213041096	TRANS. BC550C	QP13041096
D803	02B/05B	482213083968	Z-DIODE 15V C 0.5W	QP13083968	T262		482213041096	TRANS. BC550C	QP13041096

(VERS.:VERSION, U:U.S.A., F:JAPAN, K:FAR EAST, **:EUROPE)

POS. NO	VERS.C OLR	PART NO. (PH)	DESCRIPTION	PART NO. (MZ)	POS. NO	VERS.C OLR	PART NO. (PH)	DESCRIPTION	PART NO. (MZ)
T265		482213040937	TRANS. BC548B	QP13040937	▲ R417		482211141024	RES. B 100Ω 5%	QP11141024
T266		482213041096	TRANS. BC550C	QP13041096	▲ R418		482211141024	RES. B 100Ω 5%	QP11141024
T301		482213061755	TRANS. BC560C	QP13061755	▲ R423	02B/05B/ U	482211711898	RES. A 390Ω 5%	QP11711898
T302		482213044461	TRANS. BC546B	QP13044461	▲ R426	02B/05B/ U	482211711898	RES. A 390Ω 5%	QP11711898
T303		482213044461	TRANS. BC546B	QP13044461					
T304		482213061755	TRANS. BC560C	QP13061755	▲ R541	U		RES. B 220Ω 5%	QP05210221
T305		482213044461	TRANS. BC546B	QP13044461	▲ R541	02B/05B	482211711898	RES. A 390Ω 5%	QP11711898
T306		482213063852	TRANS. BC880	QP13063852	▲ R542	02B/05B	482211711898	RES. B 220Ω 5%	QP05210221
T307		482213044461	TRANS. BC546B	QP13044461	▲ R542	02B/05B	482211711898	RES. A 390Ω 5%	QP11711898
T308		532213044779	TRANS. BC338-25	QQ13044779	R653		482211192219	RES.NET. 8X47K Ω	QP11192219
T309		482213040988	TRANS. BC328-25PHI	QP13040988	▲ R807		482211170183	RES. B 1Ω 5%	QP11170183
T311		482213062269	TRANS. BDT65C	QP13062269					
T312		532213061575	TRANS. BDT64C	QQ13061575					
T361		482213041096	TRANS. BC550C	QP13041096	MISCELLANEOUS				
T401		482213061755	TRANS. BC560C	QP13061755	DP601		482213091507	FL-DISPLAY	QP13091507
T402		482213044461	TRANS. BC546B	QP13044461	F2		482221451727	ANTI BIRDIE FILTER	QP21451727
T403		482213044461	TRANS. BC546B	QP13044461	F3		482215762739	COIL CER. FILTER 70	QP15762739
T404		482213061755	TRANS. BC560C	QP13061755	F4		482215762739	COIL CER. FILTER 70	QP15762739
T405		482213044461	TRANS. BC546B	QP13044461	F6		482224271509	IF COIL SER. FILTER SFL450J3	QP24271509
T406		482213063852	TRANS. BC880	QP13063852	F7		482215611092	FM-DEM. COIL	QP15611092
T407		482213044461	TRANS. BC546B	QP13044461	F9		482215611104	COIL MPX FILTER LPF-V20	QP15611104
T408		532213044779	TRANS. BC338-25	QQ13044779	F11		482215611104	COIL MPX FILTER LPF-V20	QP15611104
T409		482213040988	TRANS. BC328-25PHI	QP13040988	KR601	02B/05B	482224271559	CRYSTAL 32.768 KHz	QP24271559
T411		482213062269	TRANS. BDT65C	QP13062269					
T412		532213061575	TRANS. BDT64C	QQ13061575	L0		482215760207	HF-CHOKO COIL	QP15760207
T461		482213041096	TRANS. BC550C	QP13041096	L1		482215611094	MW DETECTOR COIL	QP15611094
T601		482213040988	TRANS. BC328-25PHI	QP13040988	L2		482215611095	LW DETECTOR COIL	QP15611095
T602		482213040988	TRANS. BC328-25PHI	QP13040988	L16		482215770423	CHOKO COIL AX 0.33µH	QP15770423
T603		532213044779	TRANS. BC338-25	QQ13044779	L17		482215611091	LW-OSC COIL	QP15611091
T604		532213044779	TRANS. BC338-25	QQ13044779	L18		482215611089	MW-OSC COIL	QP15611089
T605		482213044461	TRANS. BC546B	QP13044461	L19		482215753632	CHOKO COIL 39mH 5%	QP15753632
T606		482213044461	TRANS. BC546B	QP13044461	L601		482215771739	CHO.COIL433003038991	QP15771739
T701					Q1		482224272294	X'TAL 7.2 MHz	QP24272294
I					Q2		482224272295	X'TAL RESONATOR CSB456F11	QP24272295
T706		482213040937	TRANS. BC548B	QP13040937	Q601	01B/ U	482224271559	X'TAL 32.768 KHz	QP24271559
T801	02B/05B	482214881194	TRANS. BC640	QP14881194	Q601	02B/05B	482224272527	X'TAL RESONATOR CST4.0MGW	QP24272527
T802		482213040937	TRANS. BC548B	QP13040937	▲ REL701		482228060592	RELAY V23037A0002A10	QP28060592
T803	01B/02B/ U	532213044779	TRANS. BC338-25	QQ13044779	▲ REL702		482228060592	RELAY V23037A0002A10	QP28060592
T804		482213040937	TRANS. BC548B	QP13040937	▲ RL801	01B/02B/ U	482228050076	RELAY G2R117PVUSSV	QP28050076
T805		482213044197	TRANS. BC558B	QP13044197					
T807	01B/ U	482214881194	TRANS. BC640	QP14881194					

SPECIFICATION

FM TUNER SECTION

Frequency range	87.5 ~ 108 MHz
Sensitivity	
DIN mono (s/n 26 dB 75 Ohms)	0.9 μ V
DIN stereo (s/n 46 dB 75 Ohms)	25 μ V
Selectivity adjacent channel 98 MHz	65 dB
Tuner output (1 kHz 75 kHz deviation)	1200 mV
Signal to noise ratio	
S/N DIN weighted mono	80 dB
S/N DIN weighted stereo	73 dB
Total harmonic distortion mono	0.1 %
Total harmonic distortion stereo	0.2 %
Accuracy of frequency response across 30 Hz~15 kHz bandwidth	+0.5 / -1.5 dB

MW TUNER SECTION

Frequency range	/01 version: 520 ~ 1710 kHz
	531 ~ 1602 kHz
	/02 and /05 version: 531 ~ 1602 kHz
Sensitivity (s/n 20 dB 30% mod. 999 kHz)	400 μ V/m
Selectivity 999 kHz	35 dB
Signal to noise ratio at 999 kHz	54 dB

LW TUNER SECTION

Frequency range	153 ~ 281 kHz
Sensitivity (s/n 20 dB 30% mod. 207 kHz)	800 μ V/m
Signal to noise ratio at 207 kHz	52 dB

AMPLIFIER SECTION

Power output	DIN 4 Ω	53 W
	DIN 8 Ω	42 W
	RMS 8 Ω	40 W
Dynamic power 8 Ω / 4 Ω		64 / 100 W
T.H.D. at 8 Ω rated RMS output		0.01 %
Damping factor		70
Input sensitivity	: PHONO	2.5 mV / 47 k Ω
	: CD / AUX / TAPE / DCC / VCR	185 mV / 47 k Ω
S/N	: PHONO	78 dB
	: CD / AUX / TAPE / DCC / VCR	95 dB

POWER REQUIREMENTS

/ 02 version	230 V AC, 50 / 60 Hz
/ 05, / 07 version	240 V AC, 50 / 60 Hz
/ 01 version (4 voltages)	110 / 120 / 220 / 240 V AC, 50 / 60 Hz

DIMENSIONS

Width	420 mm
Height	132 mm
Depth	334 mm

WEIGHT	7.5 kg
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