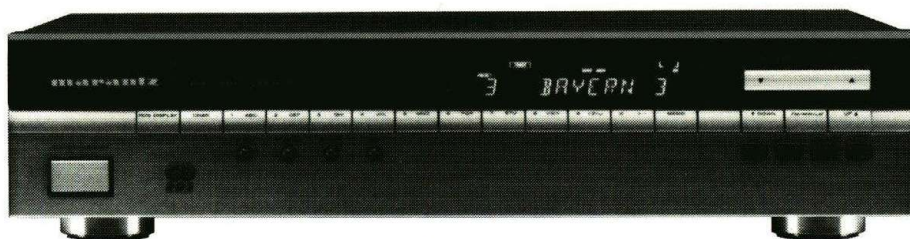


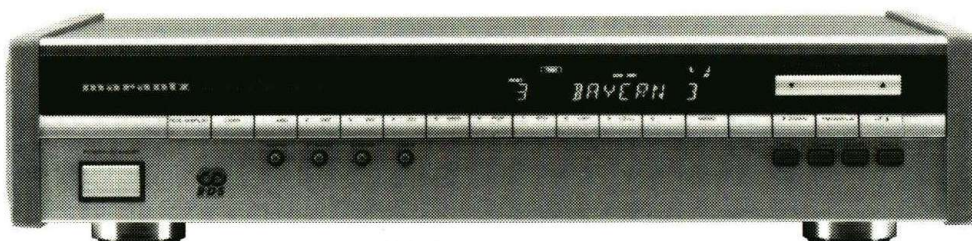
Service Manual

74 ST72/62B/62G

Synthesized stereo tuner



Model 74 ST72/62B



Model 74 ST72/62G

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marantz®

model ST-72L

First issue : 1992

4822 725 50984

PCS 66 319

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 telex. In both cases, 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 telex must be signed otherwise such part order will be considered as null and void.

PARTS ORDERING

Parts may be ordered or advice can be given at the following addresses:

AUSTRIA MARANTZ Hietzinger Kai 137a 1130 Wien	FRANCE MARANTZ FRANCE 4 Rue Bernard Palissy 92600 Asnières France Telex: 611651	GREAT BRITAIN MARANTZ HiFi U.K. Ltd. Kingsbridge House Padbury oaks 575-583 Bath Road Long ford Middlesex UB7 OEH Faxnr.: 0753 680 428	ITALY MARANTZ ITALIANA S.P.A. Via Chiese, 74 20126 Milano Italy	SWITZERLAND MARANTZ Technischer Service Duenstraße 3 3186 Dürdingen Switzerland
BELGIUM MARANTZ EUROPE B.V. Div. Benelux P.O. Box 218 Building HCM9 5600 MD Eindhoven The Netherlands Fax. 11 01 11	GERMANY MARANTZ GERMANY GmbH Alexanderstraße 1 2000 Hamburg Germany	GREECE SHERTON ELECTRONICS S.A. P.O.Box 21025 Hippocratus Street 188 Athens 11471 Greece Telex: 216.795	SAUDI ARABIA AL ALAMIAH ELECTRONICS P.O.Box 5954 University Street Riyadh 11432 Saudi Arabia Telex: 401530	TURKEY DOGRUOL Ltd. I.M.C. 6 Blok N°6310 Unkapani Istanbul Turkey Telex: 22085
CHILE MARANTZ DIVISION OF PHILIPS S.A. AV. Santa Maria, 0760 Casilla 2687 Santiago Telex: 240.239	THE NETHERLANDS MARANTZ EUROPE B.V. Div. Benelux P.O. Box 218 Building HCM9 5600 MD Eindhoven The Netherlands Fax. 040 - 75 52 66	JAPAN MARANTZ JAPAN, Inc. 35-1, 7-chome, Sagamiono Sagamihara-shi, Kanagawa Japan	SOUTH AFRICA MARANTZ DIVISION OF PHILIPS S.A. Main Road Martindale P.O.Box 58088 Newville 21114 South Africa	MALTA CACHIA & GALEA Republic Street, 68D Valetta Telex: 1682
DENMARK MARANTZ Horsvinget 5 2630 Tastrup	SWEDEN MARANTZ Box 1324 171 25 Solna	KUWAIT AL ALAMIAHA ELECTRONICS Ussama Building Fahd al Saleem Street P.O.Box 23781 Safat-Kuwait Telex: 22694	SPAIN Euroservice S.A. Bernardo obrégón, 26 28012 Madrid Faxnr.: 3412 306 198	PORTUGAL MARANTZ Divisao Philips S.A. service Oturela-carnaxide 2795 LinDA-A-VELHA Telex: 43906
NORWAY MARANTZ Postboks 7034 Assiden 3007 Drammen	FINLAND MARANTZ Kuortanegatan 1 00520 Helsingfors 52			

All of the above locations are fully equipped to take care of your total service needs. Because various countries have differing configuration requirements, it is necessary that you contact the service facility in your particular country. In the event that there is no service location listed for your country, please, contact the nearest facility for the necessary assistance.

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

MARANTZ INTERNATIONAL
Vestdijk 9
5600 MD Eindhoven
The Netherlands
Phone: +31/40.758290
Telefax: +31/40.75.82.99
Telex: 35000 PHTC NL routing IND NLMTFAT

Specification

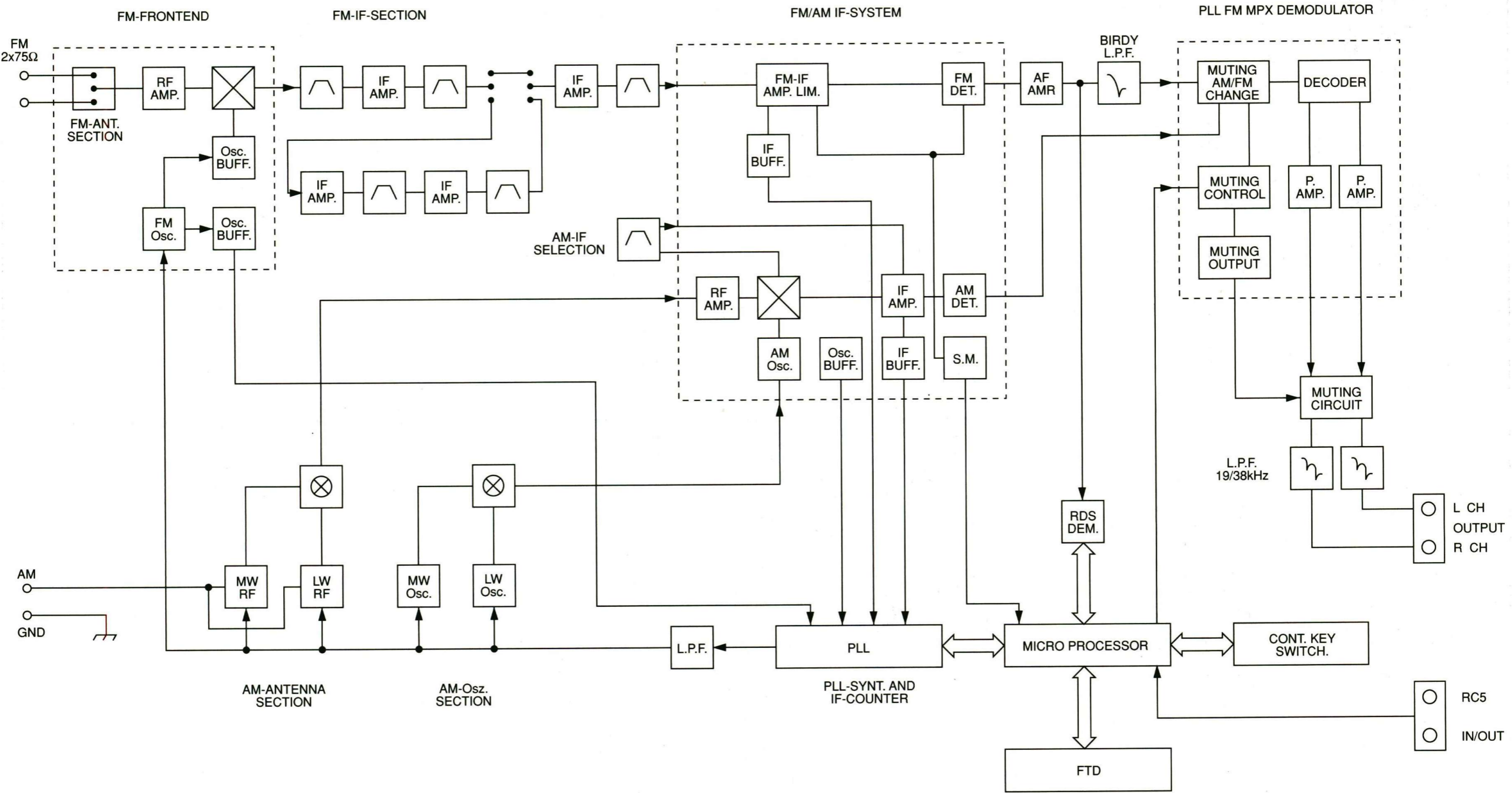
General		
Mains voltage	:	220 V-240 V ~
Mains frequency	:	50-60 Hz
Dimensoins	Width	: 420 mm /62B, 454 mm /62G
	Height	: 100 mm /62B, 102 mm /62G
Tuner: FM section		
Tuning range	:	87.5 MHz to 108 MHz
Aerial inputs	:	75 Ω coaxial LOCAL/DX
Frequency response	:	30-12500 Hz +0.5 dB -2 dB
Sensitivity	mono	: 1.2 μV 26 dB S/N at 98 MHz, 75 Ω
	stereo	: 50 μV 50 dB S/N Δf=75 kHz
	width / narrow	: > 56 dB / > 76 dB
Selectivity		
Suppression	IF - AM	: 100 dB - 50 dB
	pilot tone	
	19 kHz / 38 kHz	: > 55 dB / > 60 dB
	image	
	frequency	: 80 dB (at 98 MHz)
Channel separation (1 kHz)	:	40 dB
Distortion T.H.D	mono	
	width / narrow	: 0.1% / 0.25%
	stereo	
	width / narrow	: 0.3% / 0.7%
Signal/noise	mono	: 84 dB IEC bewertet
ratio	stereo	: 77 dB IEC bewertet
Output		: 295 mV at Δf = 22.5kHz
Tuner: AM section		
Wave ranges	MW	: 528 kHz - 1605 kHz
	LW	: 150 kHz - 283 kHz
Sensitivity	MW (1 MHz)	: 2.3 mV/m 26 dB S/N (Loop-Ant.)
	LW (261 kHz)	: 5.8 mV/m
Selectivity		: 26 dB for 9 kHz off resonance
Suppression	IF	: 47 dB
Output		: 350 mV
Tuner: Digital section		
Tuning steps	FM / MW / LW	: 50 kHz / 25 kHz / 9kHz / 1 kHz (Auto / Man.)
Presets	FM / MW / LW	: : 59 / 59 / 59 random / sequentill

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 return to user/customer. Ref. UL Standard NO. 1270. Para 74. 3. D (Mandatory Test after servicing Electrical Appliances, effective 7-1-83).

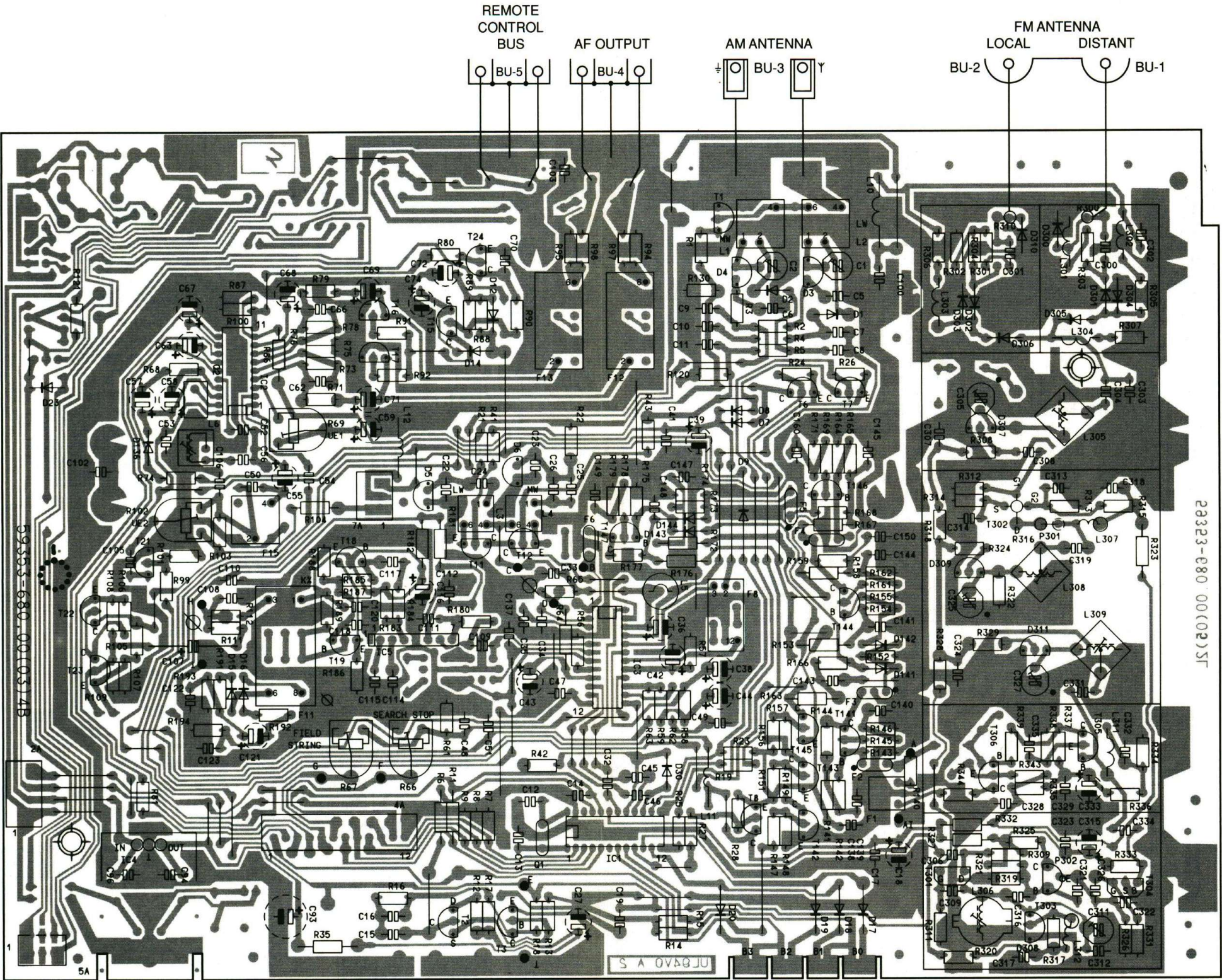
1. BLOCK DIAGRAM



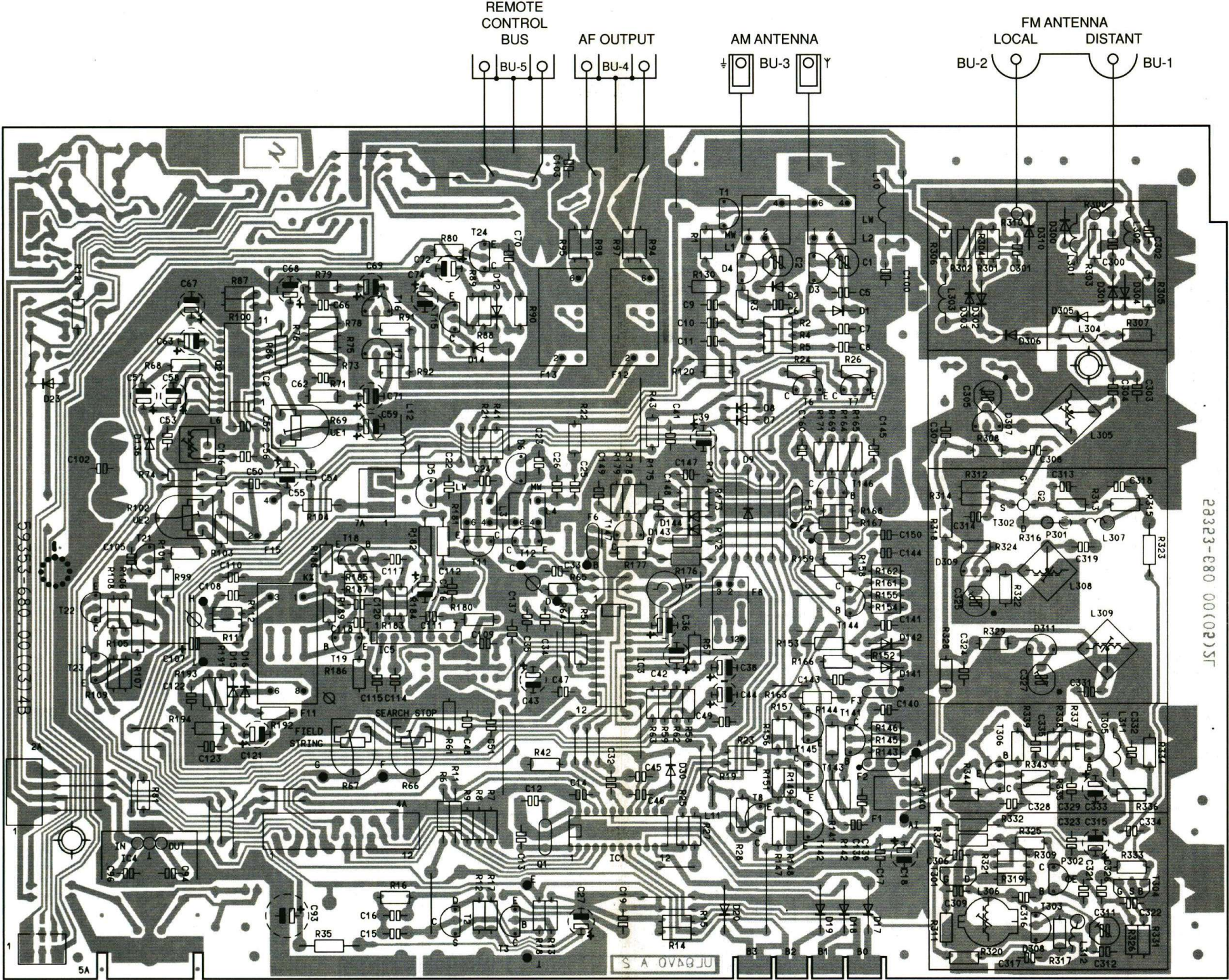
PCS 66 322

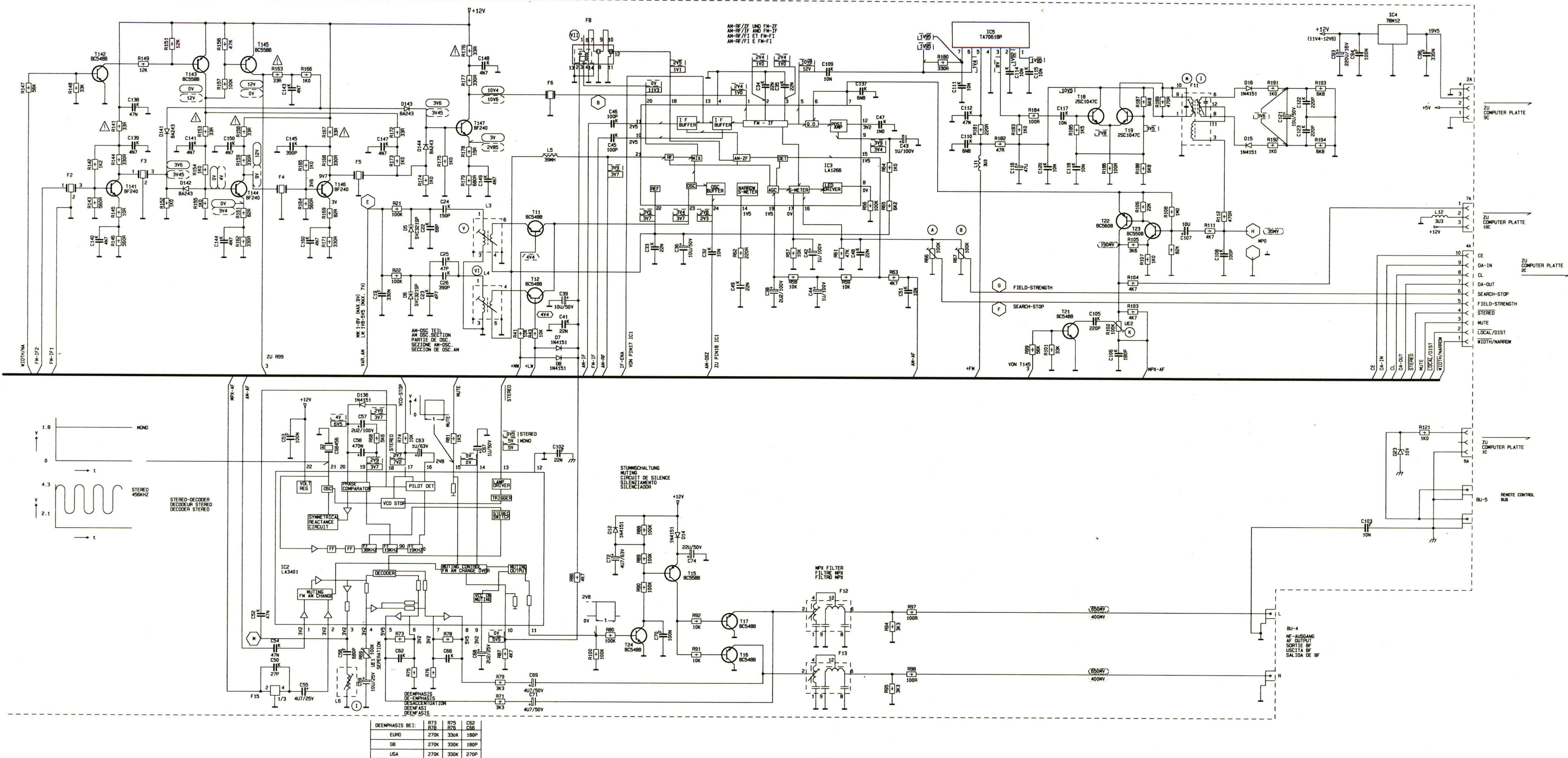


CHASSIS PCB
(component side)



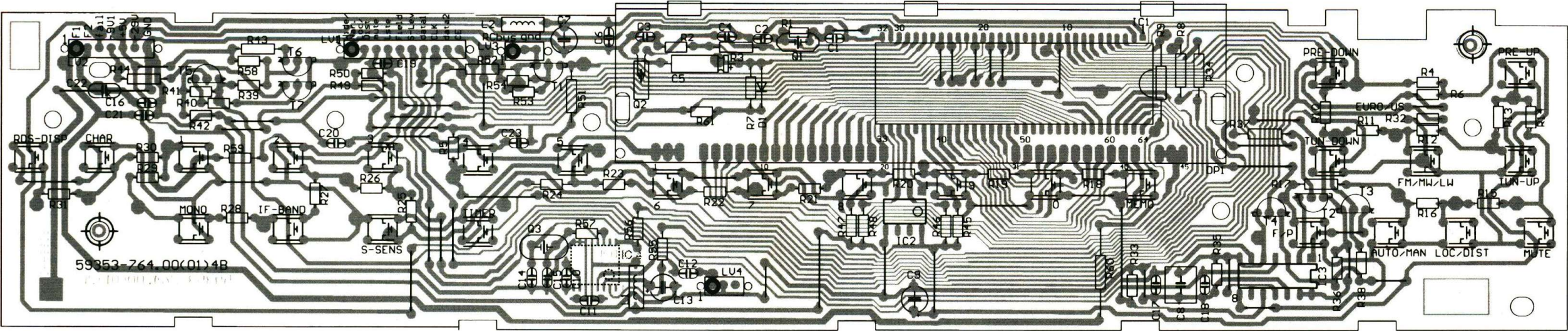
CHASSIS PCB
(component side)



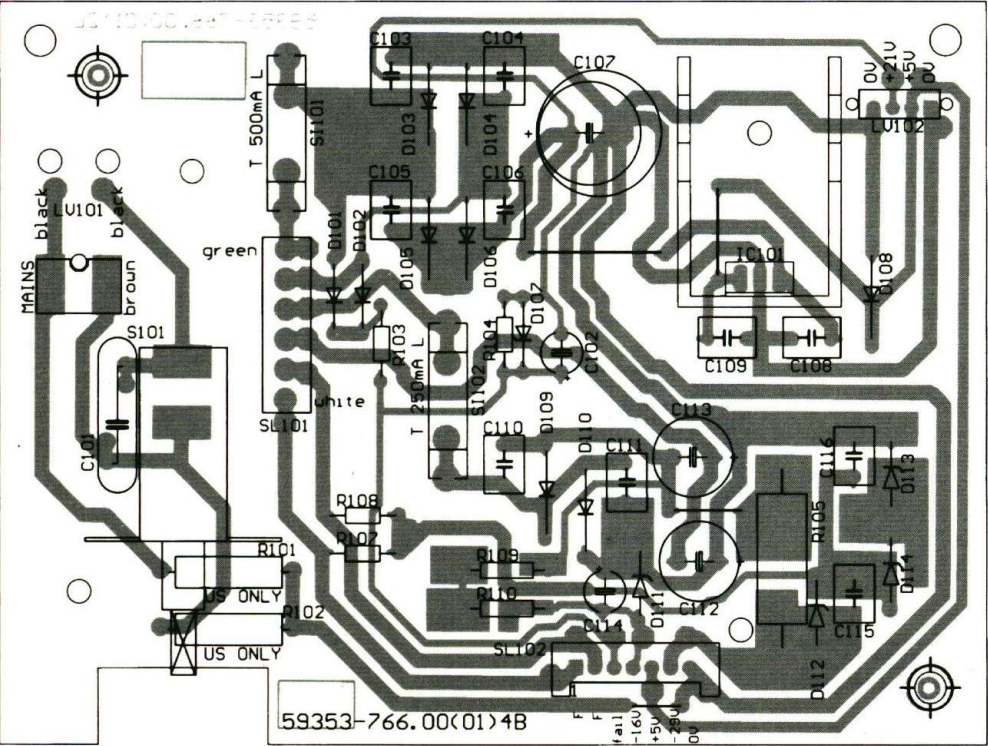


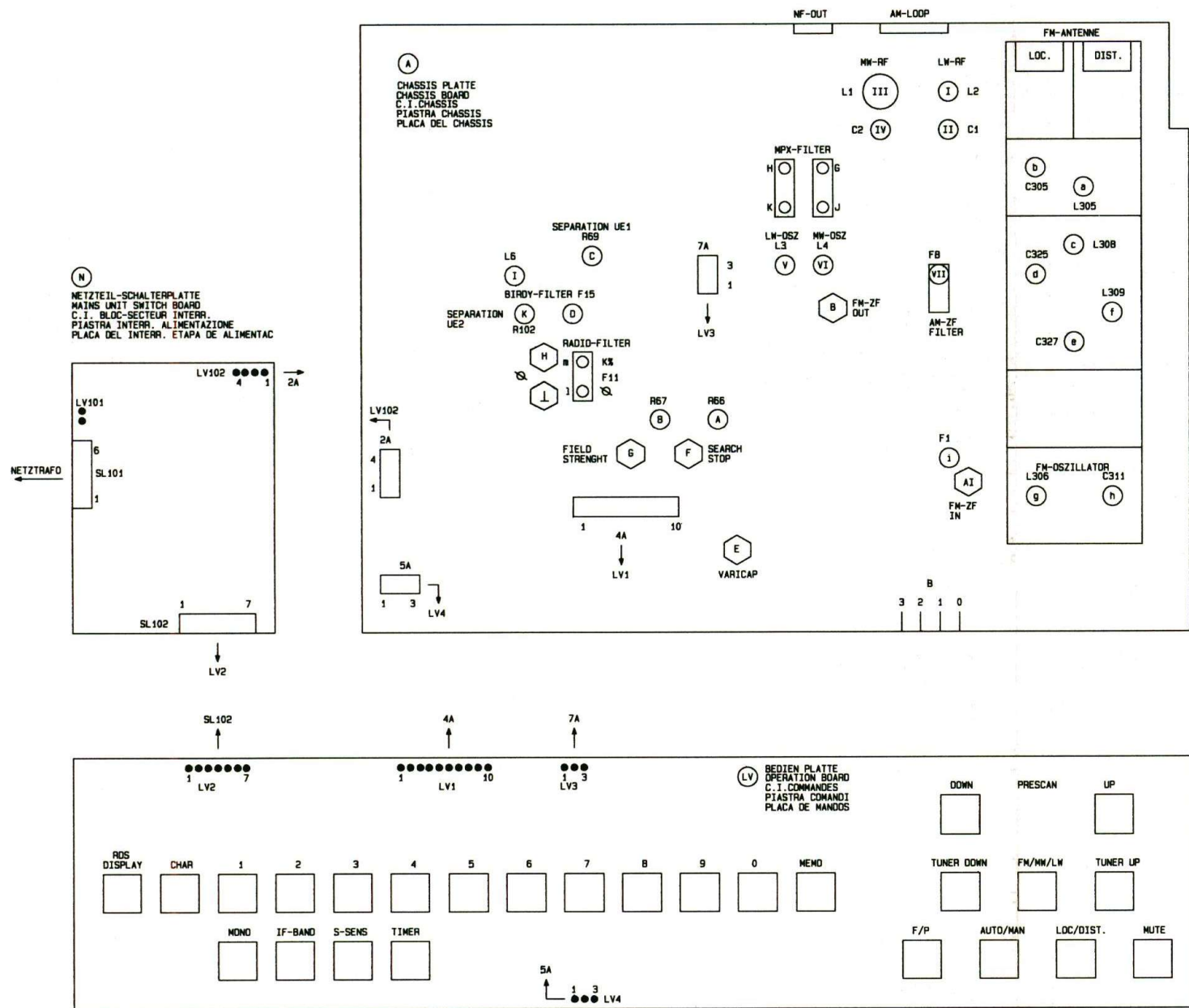


CONTROL PCB
(component side)



MAINS UNIT SWITCH PCB
(component side)





KONDENSATOR/CAPACITOR
CONDENSATEUR/CONDENSATORE/CONDENSADOR

- ELKO
ELECTROLYTIC
ELECTROLYTIQUE
ELETROLITICO
ELECTROLITICO
- TANTAL
TANTALUM ELEC.
ELEC. AU TANTALE
ELET. AL TANTALICO
ELEC. DE TANTALO
- FOLIE
FOLIE
A FEUILLE
A FOGLIA
DELAMINA
- K
KERAMIK
CERAMIC
CERAMIQUE
A CERAMICA
CERAMICO
- G
GLIMMER
MICA
AU MICA
A MICA
DE MICA
- V
VIELSCHICHT
MULTILAYER
A COUCHES MULTIPLES
A PIU STRATI
MULTICAPA
- P
POLYPROPYLEN
DE POLIPROPILENO
(KS-KP)
- BIPOLAR

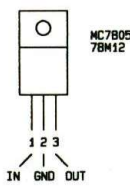
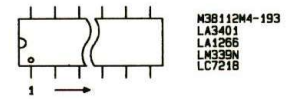
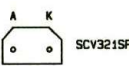
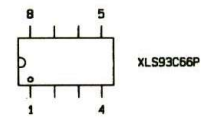
AENDERUNGEN VORBEHALTEN

SUBJECT TO ALTERATION
SOUS RESERVE DE MODIFIC
CON RISERVA DI MODIFICA
RES. EL DERECHO DE MODIFIC.

WIDERSTAND/RESISTOR
RESISTANCE/RESISTENCIA

- KSW 0204 DIN
- MSW 0204 DIN
- KSW 0207 DIN
- MSW 0207 DIN
- KSW 0411 DIN
- KSW 0517 DIN
- MSW 0309 DIN
- NTC
- DRAHT
WIRE
BOBINEE
A FILO
- METALLOXYDSCHICHT
METAL OXIDE
A OXYDE METALLIQUE
AD OSSIDO METALICO
- RAUSCHARM
LOW NOISE
A SOUFFLE REDUIT
A BASSO RUMORE
- SCHMER ENTFLAMMBAR
LOW FLAMMABILITY
PEU INFLAMMABLE
A BASSA INFLAMMABILITA
- SICHERUNGSWIDERSTAND
SAFETY RESISTOR
FUSIBLE
DI SICUREZZA

VON OBEN GESEHEN
TOP VIEW
VUE DE HAUT
VISTA DA SOPRA
VISTO DESDE ARRIBA



ACHTUNG !
VORSCHRIFTEN BEIM UMGANG MIT
MOS BAUTEILEN BEACHTEN.
ATTENTION !
OBSERVE MOS COMPONENTS HANDLING
INSTRUCTIONS WHEN SERVICING.
ATTENTION !
LORS LA MANIPULATION DES
CIRCUITS MOS, RESPECTER LES
PRESCRIPTIONS MOS.
ATTENZIONE !
OSSERVARE LE RELATIVE
PRESCRIZIONI DURANTE I LAVORI CON
COMPONENTI MOS.
ATENCION !
RESPECTAR EL TRATAMIENTO DE
COMPONENTS MOS.

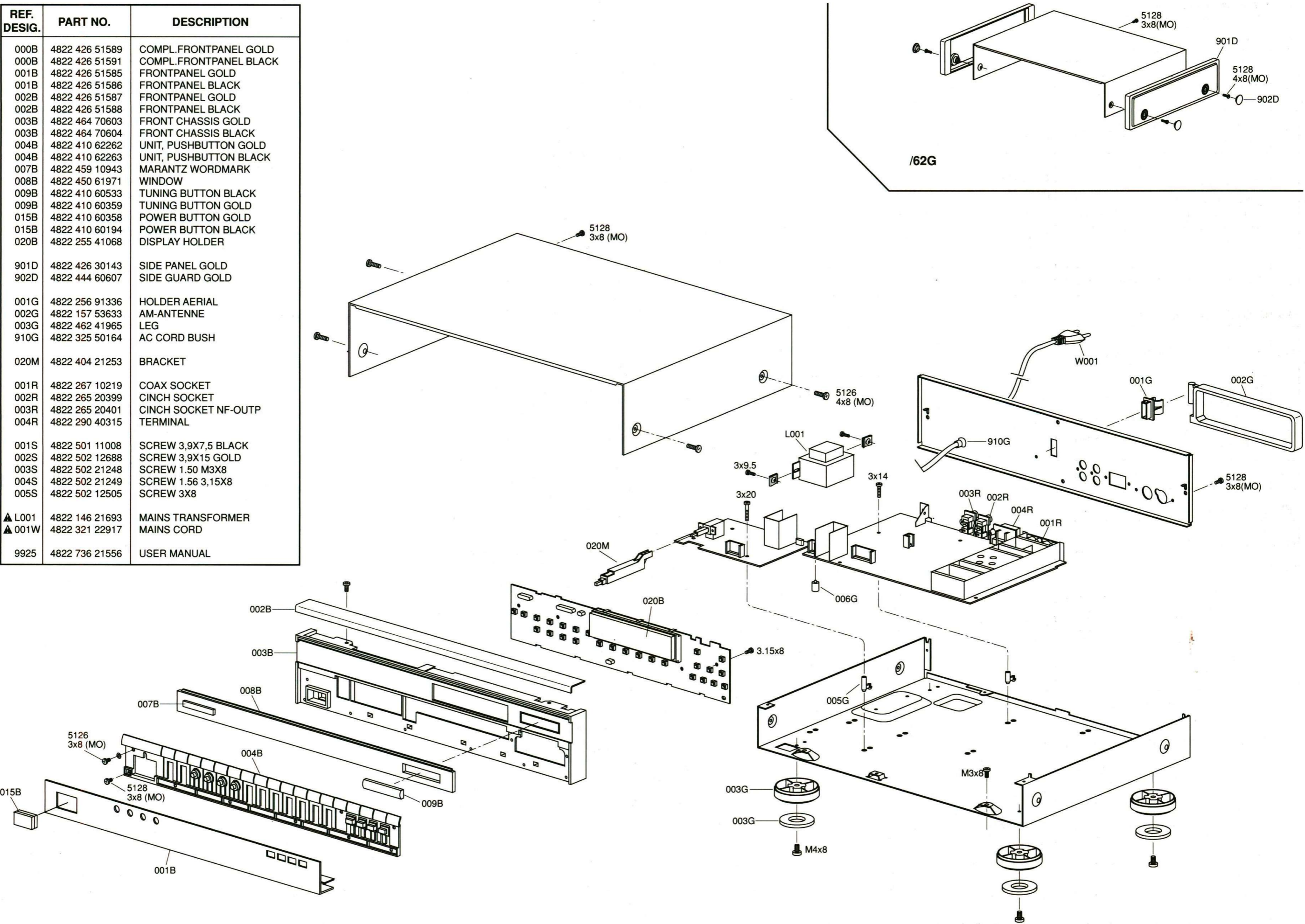
- AM
- FM
- MW
- LW
- FM-STEREO

SPANNUNGEN MIT VOLTMETR (RI=10 MOHM), FALLS NICHT
ANDERS ANGEZEIGT, GEGEN MASSE GEMESSEN.
MESSWERTE GELTEN BEI 220V~ NETZSPANNUNG.
IF NOT OTHERWISE INDICATED ALL VOLTAGES ARE MEASURED
AGAINST CHASSIS WITH A VOLTMETR (RI=10 MOHM).
THE VALUES ARE VALID FOR 220V AC MAINS VOLTAGES.
SAUF INDICATION CONTRAIRE, LES TENSIONS SONT MEASUREES
PAR RAPPORT AU CHASSIS AVEC UN VOLTMETR (RI=10 MOHM).
LES VALEURS SONT VALIDES POUR UNE TENSION SECTEUR
DE 220V CA.
TENSIONI MISURATE CON VOLTMETRO (RI=10 MOHM), SALVE
ALTRE INDICAZIONI, RIFERITE A MASSA I VALORI DI MISURA
VALGONO CON TENSIONE DI RETE DI 220V.
LAS TENSIONES, SIEMPRE QUE NO SE INDICUE OTRA COSA,
SE MIDEN CON RESPECTO A MASA CON VOLTMETRO (RI=10 MOHM).
LOS VALORES DE MEDIDA SON VALIDOS CON 220V DE TENSION DE RED.

FUER DIE GERAETESICHERHEIT ABSOLUT ERFORDERLICH UND ENTSPRECHEND
DEN RICHTLINIEN DES VDE BZW. IEC IM ERSATZFALL QUERFEN NUR
BAUTEILE MIT GLEICHER SPEZIFIKATION VERWENDET WERDEN.
ABSOLUTELY NECESSARY FOR THE SAFETY OF THE SET, THESE COMPONENTS
MEET THE SAFETY REQUIREMENT ACCORDING TO VDE OR IEC.
MUST BE REPLACED BY PARTS OF SAME SPECIFICATION ONLY.
ABSOLUTEMENT NECESSAIRE POUR LA SECURITE DE L'APPAREIL
ET CONFORME AUX REGULATIONS VDE ET IEC, EN CAS DE REMPLACEMENT
N'UTILISER QUE DES COMPOSANTS AVEC LES MEMES SPECIFICATIONS.
NECESSARI PER LA SICUREZZA DELL'APPARECCHIO E SONO CONFORMI
ALLE NORME DI SICUREZZA VDE E IEC. IN CASO DI SOSTITUZIONE
IMPIEGARE QUINDI SOLTANTO PEZZI IN RICAMBO ORIGINALI.
ABSOLUTAMENTE NECESARIO PARA LA SEGURIDA DEL APARATO Y DE ACUERDO
CON LAS NORMAS DE SEGURIDAD VDE O IEC, EN CASO DE SUSTITUCION
SOLO DEBEN EMPLEARSE COMPONENTS CON LA MISMA ESPECIFICACION.

3. EXPLODED VIEW AND PARTS LIST

REF. DESIG.	PART NO.	DESCRIPTION
000B	4822 426 51589	COMPL.FRONTPANEL GOLD
000B	4822 426 51591	COMPL.FRONTPANEL BLACK
001B	4822 426 51585	FRONTPANEL GOLD
001B	4822 426 51586	FRONTPANEL BLACK
002B	4822 426 51587	FRONTPANEL GOLD
002B	4822 426 51588	FRONTPANEL BLACK
003B	4822 464 70603	FRONT CHASSIS GOLD
003B	4822 464 70604	FRONT CHASSIS BLACK
004B	4822 410 62262	UNIT, PUSHBUTTON GOLD
004B	4822 410 62263	UNIT, PUSHBUTTON BLACK
007B	4822 459 10943	MARANTZ WORDMARK
008B	4822 450 61971	WINDOW
009B	4822 410 60533	TUNING BUTTON BLACK
009B	4822 410 60359	TUNING BUTTON GOLD
015B	4822 410 60358	POWER BUTTON GOLD
015B	4822 410 60194	POWER BUTTON BLACK
020B	4822 255 41068	DISPLAY HOLDER
901D	4822 426 30143	SIDE PANEL GOLD
902D	4822 444 60607	SIDE GUARD GOLD
001G	4822 256 91336	HOLDER AERIAL
002G	4822 157 53633	AM-ANTENNE
003G	4822 462 41965	LEG
910G	4822 325 50164	AC CORD BUSH
020M	4822 404 21253	BRACKET
001R	4822 267 10219	COAX SOCKET
002R	4822 265 20399	CINCH SOCKET
003R	4822 265 20401	CINCH SOCKET NF-OUTP
004R	4822 290 40315	TERMINAL
001S	4822 501 11008	SCREW 3,9X7,5 BLACK
002S	4822 502 12688	SCREW 3,9X15 GOLD
003S	4822 502 21248	SCREW 1.50 M3X8
004S	4822 502 21249	SCREW 1.56 3,15X8
005S	4822 502 12505	SCREW 3X8
▲ L001	4822 146 21693	MAINS TRANSFORMER
▲ 001W	4822 321 22917	MAINS CORD
9925	4822 736 21556	USER MANUAL






4. TUNER ALIGNMENT PROCEDURES

4-1. FM Alignment Procedures
(Function switch at "FM" position)

• FM IF Alignment
IF BAND switch at "WIDE" position

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Adjust
1	Connect an FM generator to test point (A) .	10.7 MHz	Connect an oscilloscope to test point (B)	With IF filter F1 (i) adjust for maximum level and symmetrical position.
2	Connect an FM generator to FM aerial socket "Distant." $U_{RF} = 1\text{mV} / 75\Omega$ $\Delta f \pm 40\text{kHz}$	108.0 MHz	Connect AC VTVM to test point (H)	With F11 (l) adjust for $0\text{V} \pm 8\text{mV}$.
3			Connect a Distortion Analyzer to AF output	With F11 (m) adjust for minimum distortion.
4	Repeat steps 2 and 3 until sensitivity is maximized.			

• FM RF (Oscillator) Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Adjust
1	Connect an FM generator to FM aerial socket "Distant." $U_{RF} = 1\text{mV} / 75\Omega$ $\Delta f \pm 40\text{kHz}$	108.0 MHz	DC VTVM to test point 	With C 311  set the tuning voltage to 8.5V.
2		87.5 MHz		With L 306  set the tuning voltage to 2.5V.
3	Repeat steps 1 and 2 until sensitivity is maximized.			

• FM RF Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Adjust
1	Connect an FM generator to the FM aerial socket "Distant.". Adjust U_{RF} so that it is below the limiting threshold. 1kHz modulated.	106.0 MHz	Connect AC VTVM to AF output.	With C 305 (b) , C 325 (d) and C 327 (e) set U_{AF} to maximum level.
2		88.0 MHz		With L 305 (a) , L 308 (c) and L 309 (f) set U_{AF} to maximum level.
3	Repeat steps 1 and 2 until sensitivity is maximized.			

• 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 "Distant." $U_{RF} = 1\text{mV}$	98.0 MHz	DC VTVM to test point (G) .	With R 67 (B) set the field strength output to $1.55\text{V} + 0.05\text{V}$.
2	Connect an FM generator to FM aerial socket "Distant." $U_{RF} = 15\mu\text{V}$	98.0 MHz	DC VTVM to test point (F) .	With R 66 (A) set the field strength output to $0.7\text{V} + 0.05\text{V}$.

• Multiplex Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Adjust
1	Connect an FM generator to FM aerial socket "Distant." Set IF BAND to "narrow".	106.0 MHz L mod. 1kHz	Connect AC VTVM to AF-output "R"	With R 69 (C) adjust for maximum and symmetrical crosstalk attenuation.
2		106.0 MHz R mod. 1kHz	Connect AC VTVM to AF-output "L"	
3	Connect an FM generator to FM aerial socket "Distant." Set IF BAND to "wide".	106.0 MHz L mod. 1kHz	Connect AC VTVM to AF-output "R"	With R 102 (K) adjust for maximum and symmetrical crosstalk attenuation.
4		106.0 MHz R mod. 1kHz	Connect AC VTVM to AF-output "L"	
5	Connect an AF generator to test point (H) . U_{AF} approx. 100mV	19 kHz	Connect AC VTVM to AF-output	With F12 (E) , F13 (F) adjust for minimum level.
6		38 kHz		With F12 (G) , F13 (H) adjust for minimum level.

• 57 kHz Wave Trap Alignment
IF BAND switch at "WIDE" position




Step	Signal Source Connection	Signal Frequency	Indicator Connection	Adjust
1	Connect an AF generator to test point (H) . U_{AF} approx. 50mV	57 kHz	Connect AC VTVM to test point (M) .	With L6 (l) adjust for minimum level.

• Adjacent Channel Filter Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Adjust
1	Connect an AF generator to test point (H) . U_{AF} approx. 100mV	114 kHz	Connect AC VTVM to test point (M) .	With F15 (D) adjust for minimum level.

4-2. AM/LW Alignment Procedures
(Function switch at "AM" position)

• AM/LW RF (Oscillator) Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Adjust
1	Feed in an AM generator signal via a frame aerial. m = 30%, 1kHz mod.	531 kHz (AM)	Connect DC VTVM to test point 	With L4  set the tuning voltage to 1.1V.
2		153 kHz (LW)		With L3  set the tuning voltage to 1.8V.
3	Repeat steps 1 and 2 until sensitivity is maximized.			

• AM 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%, 1 kHz mod.	1449 kHz	Connect AC VTVM to AF output	With C2 (IV) , F8 (VII) set U_{AF} to maximum level.
2		558 kHz		With L1 (III) set U_{AF} to maximum level.
3	Repeat steps 1 and 2 until sensitivity is maximized.			

• LW RF IF Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Adjust
1	Feed in an AF generator signal via a frame aerial. m = 30%, 1kHz mod.	261 kHz	Connect AC VTVM to AF output	With C1 ② set U_{AF} to maximum level.
2		162 kHz		With L2 ① set U_{AF} to maximum level.
3	Repeat steps 1 and 2 until sensitivity is maximized.			

4-3. Alignment Points and Test Points

• FM IF offset

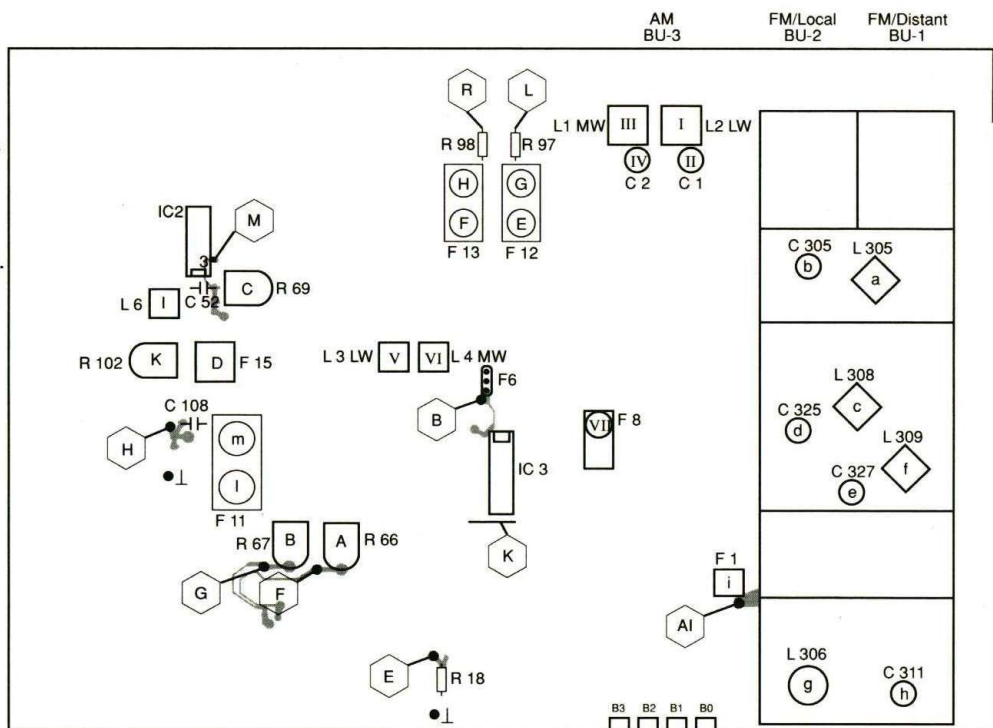
The ceramic resonators have different intermediate frequencies as a result of tolerances. Dependent on the IF, a jumper has to be closed or a jumper has to be opened. B0 - B3 (see table). The resonators have been provided with a colour code.

IF (MHz)	Jumper				Filter color
	B3	B2	B1	B0	
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

Measuring point

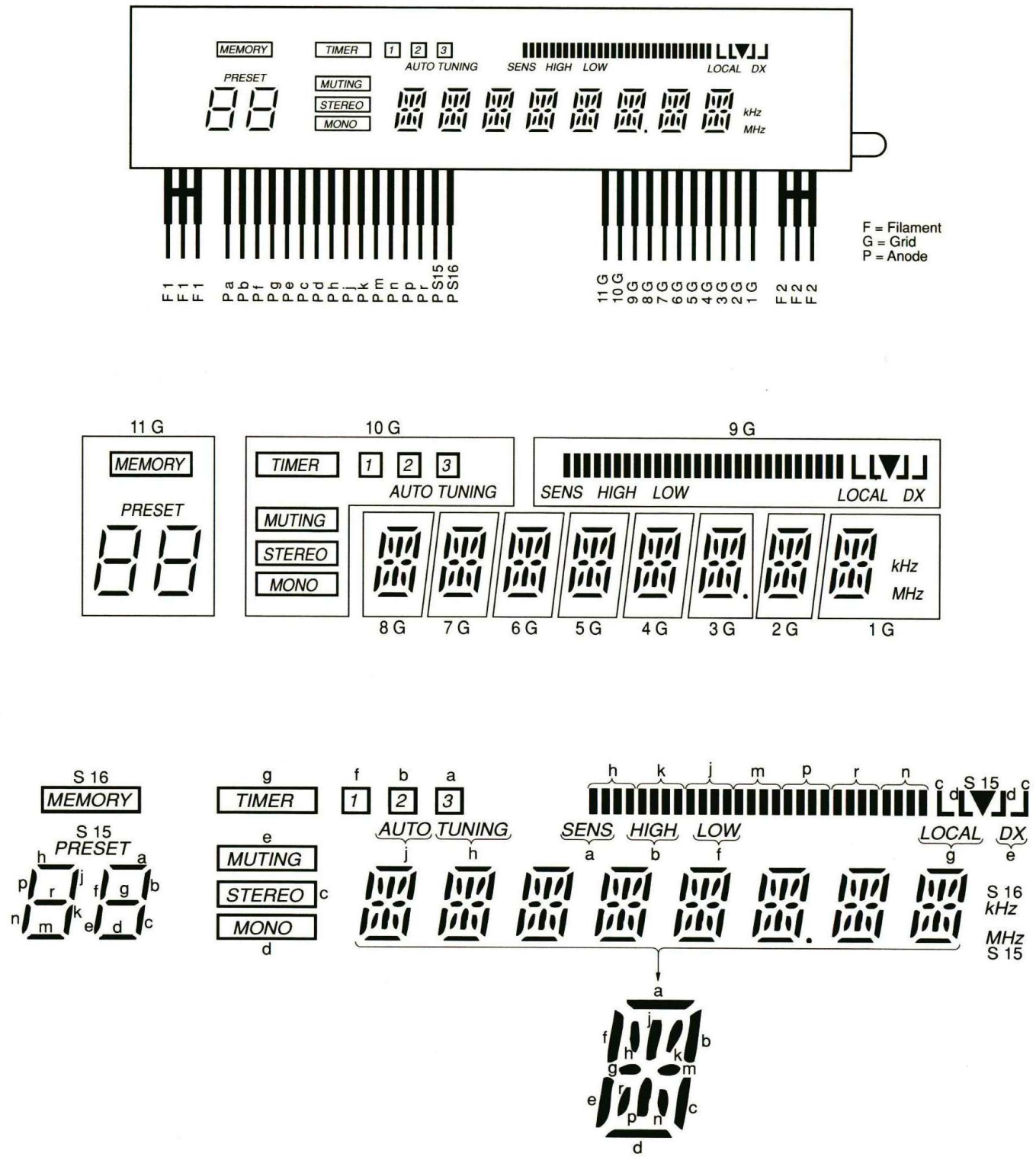
Trimming point



5. TEST MODE

To enter the display test mode in ST-72L press the keys LOCAL and TIMER simultaneously with POWER_ON.
The test mode lights up sequentially each segment of the display and, during this time, all other microcontroller ports are in high impedance state.
The display test sequence finishes with all the segments ON for about 1 second and starts again. To leave the test mode turn power off.

6. DISPLAY



7. ELECTRICAL PARTS LIST

ASSIGNMENT OF COMMON PARTS CODES.

RESISTOR
R***: (1) GD05 --- 140, Carbon film fixed resistor, ±5%, 1/4W
R***: (2) GD05 --- 160, Carbon film fixed resistor, ±5%, 1/6W
① — Resistance value

Examples
① Resistance value
0.1Ω...001 10Ω...100 1kΩ...102 100kΩ...104
0.5Ω...005 18Ω...180 2.7kΩ...272 680kΩ...684
1Ω...010 100Ω...101 10kΩ...103 1MΩ...105
6.8Ω...068 390Ω...391 22kΩ...223 4.7MΩ...475

(Note) Please distinguish 1/4W from 1/6W by the shape of parts used actually.

C***: CERAMIC CAP.
(1) DD1 --- 370, Ceramic condenser
Disc type
Temp. coeff. P350 ~ N1000, 50V
①②
Capacity value
Tolerance

Examples
① Tolerance (Capacity deviation)
±0.25pF...0
±0.5pF...1
±5%...5
* Tolerance of COMMON PARTS handled here are as follows:
0.5pF ~ 5pF...±0.25pF
6pF ~ 10pF...±0.5pF
12pF ~ 560pF...±5%
② Capacity value
0.5pF...005 3pF...030 100pF...101
1pF...010 10pF...100 220pF...221
1.5pF...015 47pF...470 560pF...561

C***: CERAMIC CAP.
(1) DK16 --- 300, High dielectric constant ceramic condenser
Disc type
Temp. chara. 2B4, 50V
①
Capacity value

Example
② Capacity value
100pF...101 1000pF...102 10000pF...103
470pF...471 2200pF...222

C***: ELECTROLY CAP. (⚡), FILM CAP. (⚡)
(1) EA --- 10, Electrolytic condenser
One-way lead type, Tolerance ±20%
①②
Dielectric strength
Capacity value

Examples
① Capacity value
0.1μF...104 4.7μF...475 100μF...107
0.33μF...334 10μF...106 330μF...337
1μF...105 22μF...226 1100μF...108
2200μF...228
② Working voltage
6.3V...006 25V...025
10V...010 35V...035
16V...016 50V...050

(2) DF15 --- 350, Plastic film condenser
One-way type, Mylar ±5% 50V
①
Capacity value

Examples
① Capacity value
0.001μF (1000pF)...102 0.1μF...104
0.0018μF...182 0.56μF...564
0.01μF...103 1μF...105
0.015μF...153

REF. DESIG.	PART NO.	DESCRIPTION
		CHASSIS CIRCUIT BOARD, MAINS UNIT SWITCH CIRCUIT BOARD:
		CAPACITORS
C1	4822 125 50332	TR15 7,5/50PF VCT56
C2	4822 125 50329	TR13 4,5/20PF VCT56
▲C101	4822 126 11805	SI-KERKO. 3300PF 20%
C107	4822 124 80339	ELCO CB 1000UF 35V
C305	4822 125 50329	TR13 4,5/20PF VCT56
C311	4822 125 50386	TR12 3/10PF VCT56
C325	4822 125 50329	TR13 4,5/20PF VCT56
C327	4822 125 50329	TR13 4,5/20PF VCT56
		RESISTORS
▲R35	4822 116 53666	KSW SI A 47 OHM 5%
R66	4822 100 20694	ESTR.SK10-A 100 KOHM
R67	4822 100 20694	ESTR.SK10-A 100 KOHM
R69	4822 100 20694	ESTR.SK10-A 100 KOHM
R102	4822 100 20694	ESTR.SK10-A 100 KOHM
▲R141	4822 116 82473	KSW SI A 33 OHM 5%
▲R153	4822 116 82473	KSW SI A 33 OHM 5%
▲R158	4822 116 82473	KSW SI A 33 OHM 5%
▲R163	4822 116 82473	KSW SI A 33 OHM 5%
▲R167	4822 116 82473	KSW SI A 33 OHM 5%
▲R172	4822 116 82473	KSW SI A 33 OHM 5%
▲R176	4822 116 82473	KSW SI A 33 OHM 5%
▲R182	4822 116 53666	KSW SI A 47 OHM 5%
▲R323	4822 116 53666	KSW SI A 47 OHM 5%
▲R327	4822 116 53666	KSW SI A 47 OHM 5%
▲R332	4822 052 10129	KSW SI A 12OHM 5%
		SEMICONDUCTORS
D1	5322 130 34052	DIODE 1N4151 PHI/TFK
D2	5322 130 34052	DIODE 1N4151 PHI/TFK
D3	4822 130 81002	DIODE SVC321 SPA/B/C
D4	4822 130 81002	DIODE SVC321 SPA/B/C
D5	4822 130 81002	DIODE SVC321 SPA/B/C
D6	4822 130 81002	DIODE SVC321 SPA/B/C
D7	5322 130 34052	DIODE 1N4151 PHI/TFK
D8	5322 130 34052	DIODE 1N4151 PHI/TFK
D9	5322 130 34052	DIODE 1N4151 PHI/TFK
D12	5322 130 34052	DIODE 1N4151 PHI/TFK
D14	5322 130 34052	DIODE 1N4151 PHI/TFK
D15	5322 130 34052	DIODE 1N4151 PHI/TFK
D16	5322 130 34052	DIODE 1N4151 PHI/TFK
D17	5322 130 34052	DIODE 1N4151 PHI/TFK
D18	5322 130 34052	DIODE 1N4151 PHI/TFK
D19	5322 130 34052	DIODE 1N4151 PHI/TFK
D20	5322 130 34052	DIODE 1N4151 PHI/TFK
D23	5322 130 82122	Z DIODE 10 C 0,5W
D30	5322 130 34052	DIODE 1N4151 PHI/TFK
D101	4822 130 30621	DIODE 1N4148 ITT/TID
D102	4822 130 30621	DIODE 1N4148 ITT/TID
D103	4822 130 31438	DIODE 1N4001-GA
D104	4822 130 31438	DIODE 1N4001-GA
D105	4822 130 31438	DIODE 1N4001-GA
D106	4822 130 31438	DIODE 1N4001-GA
D107	4822 130 80515	Z DIODE 5,1 C 0,5W
D108	4822 130 31438	DIODE 1N4001-GA
D109	4822 130 31438	DIODE 1N4001-GA
D110	4822 130 31438	DIODE 1N4001-GA

REF. DESIG.	PART NO.	DESCRIPTION
		CHASSIS CIRCUIT BOARD, MAINS UNIT SWITCH CIRCUIT BOARD:
		SEMICONDUCTORS
D111	4822 130 83182	Z DIODE ZPY 16ITT
D112	4822 130 83181	Z DIODE ZPY 6,2ITT
D113	4822 130 83184	Z DIODE 10 C 1,3W
D114	4822 130 83183	ZD/ZPY12ITT/BZX85C
D136	5322 130 34052	DIODE 1N4151 PHI/TFK
D141	4822 130 30971	DIODE BA 243
D142	4822 130 30971	DIODE BA 243
D143	4822 130 30971	DIODE BA 243
D144	4822 130 30971	DIODE BA 243
D300	4822 130 34189	DIODE BAV 20
D301	4822 130 34189	DIODE BAV 20
D302	4822 130 34189	DIODE BAV 20
D303	4822 130 80638	DIODE BA 282
D304	4822 130 80638	DIODE BA 282
D305	4822 130 80638	DIODE BA 282
D306	4822 130 80638	DIODE BA 282
D307	4822 130 81003	DIODE KV 1310
D308	4822 130 81003	DIODE KV 1310
D309	4822 130 81003	DIODE KV 1310
D310	4822 130 34189	DIODE BAV 20
D311	4822 130 81003	DIODE KV 1310
IC1	4822 209 73435	IC LC 7217
IC2	4822 209 73434	IC LA 3401
IC3	4822 209 71785	IC LA 1266
IC4	5322 130 42221	IC 7812 3%
IC5	4822 209 61801	IC TA 7061 BP
IC10	4822 209 80891	IC MC 78 M 05 CT
T1	5322 130 44647	TRANS.BC 368
T2	4822 130 42121	TRANS.2 SK 30 ATM-Y1
T3	4822 130 44196	TRANS.BC 548 C
T6	4822 130 44197	TRANS.BC 558 B
T7	4822 130 44197	TRANS.BC 558 B
T8	4822 130 44197	TRANS.BC 558 B
T11	4822 130 40937	TRANS.BC 548 B
T12	4822 130 40937	TRANS.BC 548 B
T15	4822 130 44197	TRANS.BC 558 B
T16	4822 130 40937	TRANS.BC 548 B
T17	4822 130 40937	TRANS.BC 548 B
T18	4822 130 60163	TRANS.2 SC 1047 C
T19	4822 130 60163	TRANS.2 SC 1047 C
T21	4822 130 40937	TRANS.BC 548 B
T22	4822 130 41124	TRANS.BC 560 B
T23	4822 130 41096	TRANS.BC 550 C
T24	4822 130 40937	TRANS.BC 548 B
T141	4822 130 40902	TRANS.BF 240
T142	4822 130 40937	TRANS.BC 548 B
T143	4822 130 44197	TRANS.BC 558 B
T144	4822 130 40902	TRANS.BF 240
T145	4822 130 44197	TRANS.BC 558 B
T146	4822 130 40902	TRANS.BF 240
T147	4822 130 40902	TRANS.BF 240
T301	4822 130 61298	FE-TRANS.2 SK 544 E
T302	4822 130 41817	TRANS.BF 982-I
T303	4822 130 40902	TRANS.BF 240
T304	4822 130 61298	FE-TRANS.2 SK 544 E
T305	4822 130 40902	TRANS.BF 240
T306	4822 130 44237	TRANS.BF 450

REF. DESIG.	PART NO.	DESCRIPTION
		MISCELLANEOUS
DP1	4822 130 91187	DISPLAY
F1	4822 157 62292	IF-FILTER 7X7
F2	4822 157 62297	CER.FILTER
F3	4822 157 62297	CER.FILTER
F4	4822 157 62297	CER.FILTER
F5	4822 157 62297	CER.FILTER
F6	4822 157 62297	CER.FILTER
F8	4822 242 72289	AM-IF SFL 450 J3
F11	4822 157 62302	FILTER 10X10 335
F12	4822 156 11104	FILTER PILOT LPF-V20
F13	4822 156 11104	FILTER PILOT LPF-V20
F15	4822 214 51727	FILTER
L1	4822 156 11094	MW COIL
L2	4822 156 11095	LW COIL
L3	4822 156 11091	COIL (LW OSC.)
L4	4822 156 11089	COIL (MW-OSC.)
L5	4822 157 53632	CHOKE 39 MH 5%
L6	4822 157 62293	COIL
L10	4822 157 70177	AX 0411-GA 2,2UH
L11	4822 157 62299	AX 0309-GA 3,3UH
L12	4822 157 62299	AX 0309-GA 3,3UH
L301	4822 157 62299	AX 0309-GA 3,3UH
L302	4822 157 62299	AX 0309-GA 3,3UH
L303	4822 157 62299	AX 0309-GA 3,3UH
L304	4822 157 62299	AX 0309-GA 3,3UH
L305	4822 156 11099	FM COIL 7/115/A
L306	4822 156 11096	FM COIL 1/3/A
L307	4822 157 60206	HF CHOKE
L308	4822 156 11098	FM COIL 7/113/A
L309	4822 156 11097	FM COIL 7/114/A
L311	4822 157 53631	AX 0309-GA 1,5UH
L312	4822 157 53628	AX 0309-GA 2,2UH
▲ L001	4822 146 21693	MAINS TRANSFORMER
Q1	4822 242 72294	QUARTZ 7,2 MHZ
Q2	4822 242 72295	CER.RES10 CSB456 F11
▲ S101	4822 276 12472	MAINS SWITCH (SDLCIP)
▲ SI101	4822 070 35009	FS.250 MA/T L250V
▲ SI102	4822 070 35001	FS.500 MA/T L250V

REF. DESIG.	PART NO.	DESCRIPTION
		CONTROL CIRCUIT BOARD:
		SEMICONDUCTORS
D1	5322 130 34052	DIODE 1N4151 PHI/TFK
D2	5322 130 34052	DIODE 1N4151 PHI/TFK
IC1	4822 209 31818	IC M38112194 MIT MOS
IC2	4822 209 31819	IC XLS 93 C 66 P
IC3	4822 209 80631	IC LM339N RAY/NSC/TI
IC4	4822 209 31821	IC SMD IC SA 6579T
T1	4822 130 40937	TRANS.BC548 B
T2	4822 130 40937	TRANS.BC548 B
T3	4822 130 40937	TRANS.BC548 B
T4	4822 130 44197	TRANS.BC558 B
T5	4822 130 44197	TRANS.BC558 B
T6	4822 130 44197	TRANS.BC558 B
T7	4822 130 40937	TRANS.BC548 B
		MISCELLANEOUS
L1	4822 157 70178	DR AX 0309-GA 22UH
L2	4822 157 70179	DR AX 0309-GA 47UH
Q1	4822 242 72296	CER.RES.87 4,19MHZ
Q3	4822 242 81319	QUARZ 4,332 MHZ
S000	4822 276 12471	TOUCHCONTROL KHH1091

NOTE ON SAFETY:
Symbol ▲ Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symbol ▲. Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.