

# Service Service Service

FR994/00S/17



# Service Manual

For repair information please refer to Service Manual of FR975/00/01C/17 & MX980D/37  
(service code number = 3104 215 50060)



FR994/00S & MX999/22S is equal to FR975/00 except the following:  
FR994/17 & MX999/37 is equal to FR975/17C except the following:

#### Miscellaneous

MX999/22S		MX999/37	
9965 000 11841	FRONT SPK SILVER MX999FS	9965 000 11856	FRONT SPK BLACK MX999FS
9965 000 11842	CENTER SPK SILVER MX999CS	9965 000 11857	CENTER SPK BLACK MX999CS
9965 000 11843	REAR SPK SILVER MX999RS	9965 000 11858	REAR SPK BLACK MX999RS
9965 000 11844	KEYHOLE BRACKET, MOUNTING	9965 000 11855	KEYHOLE BRACKET, MOUNTING
3104 219 04460	REMOTE CONTROL		
3104 217 06780	MDM 2000 V2 module		

#### Electrical:

Led 6401,6421 are deleted

Led 6407,6408,6409,6410,6412,6413,6415,6416,6417,6418 red colour led  
is changed into orange colour led code number : 4822 130 11589

Item 7415 changed into TMP87CS71F - MX970	code number : 3139 110 53181
Item 1301 changed into 1304	code number : 4822 265 11607
Item 2371 changed into 2317 4n7	code number : 5322 126 10223
Item 2372 changed into 2322 100p	code number : 5322 122 32531
Item 2373 changed into 2328 4n7	code number : 5322 126 10223
Item 2374 changed into 2331 100p	code number : 5322 122 32531
Item 2375 changed into 2335 4n7	code number : 5322 126 10223
Item 2376 changed into 2339 100p	code number : 5322 122 32531

Mainstrafo 5001for FR994/00S changed into	code number : 3104 218 31030
Mainstrafo 5001for FR994/17changed into	code number : 3104 218 31040

Mains Outled 1053 are deleted in FR994/00S

Mains Outled 1054 are deleted in FR994/17

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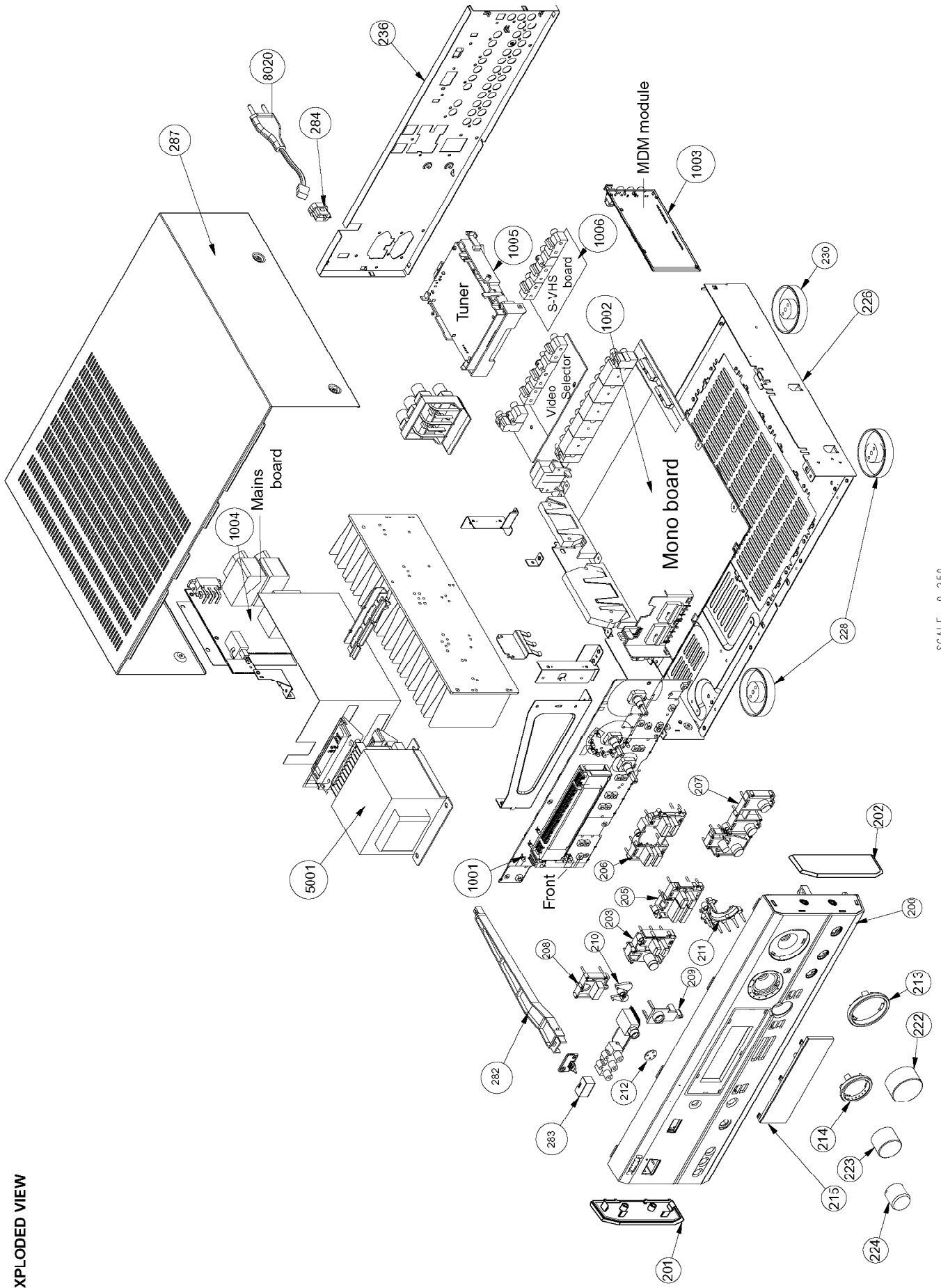
**Mechanical:** the following items are changed into:

Item	Code number	Description
200	3104 217 53350	FRONT ASSY FR994/00S
200	3104 217 53370	FRONT ASSY FR994/17
201	3141 017 74420	CAP END LEFT FR994/00S
201	3141 014 24480	CAP END LEFT FR994/17
202	3141 017 74430	CAP END RIGHT FR994/00S
202	3141 014 24490	CAP END RIGHT FR994/17
203	3141 017 74440	BUTTONS SURR. FR994/00S
203	3141 017 74280	BUTTONS SURR. FR994/17
205	3141 017 74450	BUTTONS TUNER FR994/00S
205	3141 017 74290	BUTTONS TUNER FR994/17
206	3141 017 74460	BUTTONS MENU FR994/00S
206	3141 017 74300	BUTTONS MENU FR994/17
207	3141 017 74600	BUTTONS BASS FR994/00S
207	3141 017 74580	BUTTONS BASS FR994/17
208	3141 017 74480	BUTTONS EASY LINK FR994/00S
208	3141 017 74320	BUTTONS EASY LINK FR994/17
209	3141 017 75200	RING SURR. FR994/00S
209	3141 014 24660	RING SURR. FR994/17
210	3141 014 24200	LIGHT GUIDE VIRTUAL/HALL
211	3141 014 24210	LIGHT GUIDE SELECTOR
212	3141 014 24290	LENS IR FR994/00S
212	3141 014 24650	LENS IR FR994/17
213	3141 017 74490	RING KNOB VOLUME FR994/00S
213	3141 014 24630	RING KNOB VOLUME FR994/17
214	3141 017 74500	RING KNOB SOURCE SEL.FR994/00S
214	3141 014 24640	RING KNOB SOURCE SEL. FR994/17
215	3141 017 74350	WINDOW DISPLAY ASSY FR994/00S
215	3141 017 74900	WINDOW DISPLAY ASSY FR994/17
222	3141 017 74520	KNOB VOLUME FR994/00S
222	3141 017 74360	KNOB VOLUME FR994/17
223	3141 017 74530	KNOB SOURCE SEL. FR994/00S
223	3141 017 74370	KNOB SOURCE SEL. FR994/17
224	3141 017 74540	KNOB MENU NAV FR994/00S
224	3141 017 74380	KNOB MENU NAV FR994/17
228	3139 247 50570	LEG SILVER
230	3139 247 50560	LEG BLACK
282	4822 535 10638	POWER ROD
283	3141 017 74550	POWER CAP FR994/00S
283	3141 017 74390	POWER CAP FR994/17
287	3104 211 29730	COVER PLATE SILVER FR994/00S
287	4822 442 01817	COVER PLATE BLACK FR994/17

EXPLODED VIEW

2-1

2-1



SCALE 0.250

Service  
Service  
**Service**

**MX980D/37**



# Service Manual



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Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

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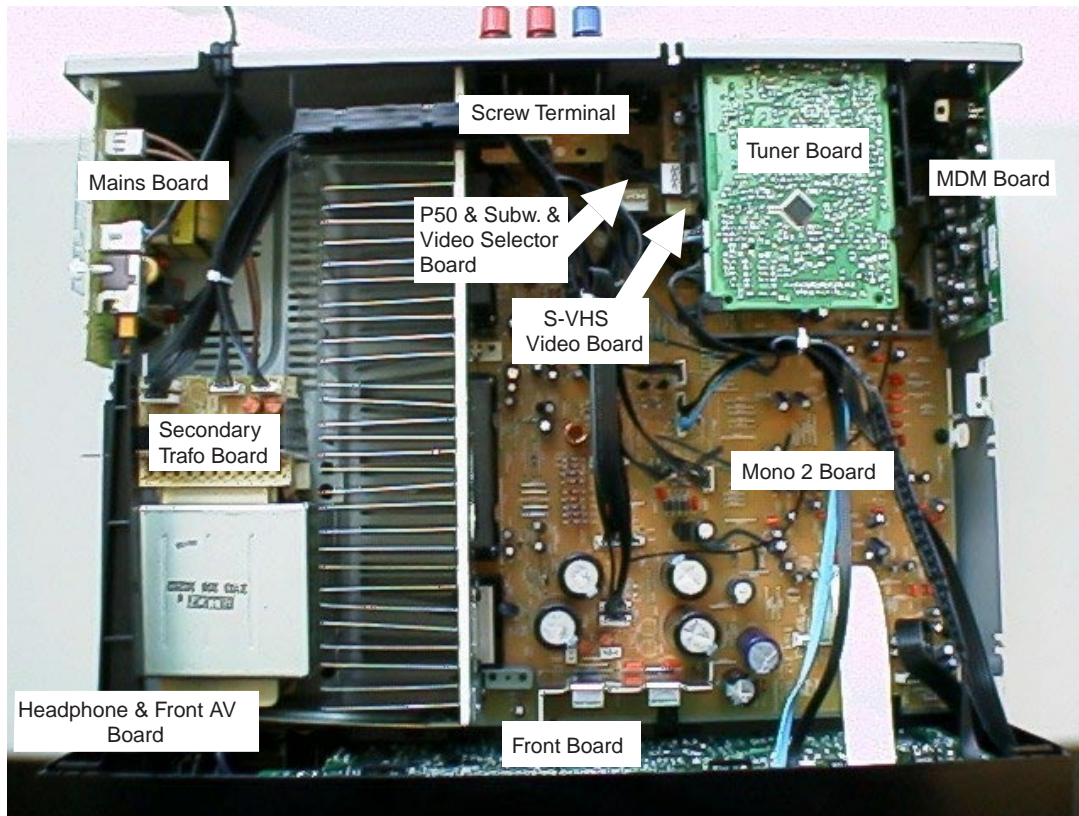
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## LOCATION OF PRINTED CIRCUIT BOARDS



## SYSTEM INFORMATION

Receiver	Front speaker	Center speaker	Surround speaker	Subwoofer
MX 980D/37 include :				
FR975/17	2 x Home Cinema Speaker 100W	Home Cinema Center Speaker 100W	2 x Home Cinema Speaker 100W	FB201V/17

## VERSION VARIATIONS

Features & Board in used	Type & Versions	FR975		
		/00	/01C	/17
Front colour		Black	Champagne	Black
Tuner board - Tuner 95		x	-	-
Tuner board - ECO 5		-	x	x
RDS		x	-	-
Antenna input FM		Coaxial 75R	Coaxial 75R	Clickfit 300R
Mains cord type		IEC	IEC	UL polarized
Mains outlet type		IEC	IEC	UL polarized
Mains voltage		230V	110-127 / 220-240	120V
Voltage selector		-	x	-

## SPECIFICATION FR975

### General

Mains voltage	: 230V for /00 : 110-127V / 220-240 switchable only /01/01C : 120V for /17
Mains frequency	: 50Hz for /00 : 50/60Hz for /01/01C : 60Hz for /17
Power consumption	: ≤ 2W at stby : ≤ 3W at stby 240V/01/01C
Dimension. wxhxd	: 435x138x350 mm
Remote control	: Multibrand/Universal

### Amplifier

Output power	
Stereo mode (L+R)	: 2x100W DIN only /00/01 (1kHz, 0,7%THD, 6Ω) : 2x80W FTC only /17 (40Hz-20kHz 0,7%THD, 6Ω)
Surround mode	
L+R	: 2x100W (1kHz, 0,7%THD, 6Ω)
Center	: 100W (1kHz, 0,7%THD, 6Ω)
Surround Left+Right	: 2x100W (1kHz, 0,7%THD, 6Ω)
Distortion (5W)	
1kHz	: ≤ 0,05%
40Hz - 20kHz	: ≤ 0,2%
Headphone	: 6,3mm stereo jack with switch
Output level	: 3V EMF, 60Ω
Crosstalk between source (1W)	—1kHz : ≤ -65dB 250Hz – 10kHz : ≤ -60dB
Crosstalk between channels (1W)	-1kHz : ≤ -55dB 250Hz – 10kHz : ≤ -50dB
Frequency response	: ≤ 10Hz – ≥ 20kHz (-3dB) Limit
Power stage protection	: Shortcircuit : DC (Vout ≥ 10V) for ±1sec
Temperature	: Transformer (≥ 140° Celcius) : Heatsink (≥ 140° Celcius)

### Audio Selector

Input sensitivity	
Phono	: 5mV impedance 47kΩ/220pf
CD	: 250mV impedance ≥ 47kΩ
CDR/TAPE	: 250mV impedance ≥ 47kΩ
VCR	: 250mV impedance ≥ 47kΩ
TV	: 250mV impedance ≥ 47kΩ
SAT	: 250mV impedance ≥ 47kΩ
6CH / DVD	: 250mV impedance ≥ 47kΩ
FRONT AV	: 250mV impedance ≥ 22kΩ
Output level	
CDR/TAPE	: 250mV impedance ≤ 1kΩ
VCR	: 250mV impedance ≤ 1kΩ
Output level (variable)	
Subwoofer pre-out	: 800mV impedance ≤ 1kΩ
Center pre-out	: 800mV impedance ≤ 1kΩ

### Digital Selector

Input	: 2 x cinch : 2 x optical
Output	: 1 x cinch

### Video Selector - CVBS

Input sensitivity	
DVD/VCR/TV/Front AV	: 1 Vpp impedance 75Ω
Output level	
Monitor/VCR	: 1 Vpp impedance 75Ω
Frequency response	: ≤ 50Hz → ≥ 6MHz

### Video Selector - SVHS

Input sensitivity	
DVD/VCR/TV	: 1 Vpp impedance 75Ω
Output level	
Monitor/VCR	: 1 Vpp impedance 75Ω
Frequency response	: ≤ 50Hz → ≥ 6MHz

### Tone controle

Loudness	
(volume ≤ -20dB Ref: 1kHz=0dB)	: 100Hz +6 dB : 10kHz +2,5 dB
Tone control (Ref: 1kHz=0dB)	
	: Bass 100Hz -9dB → +9dB : Treble 10kHz -9dB → +9dB

### Multi Channel Decoder - MDM2000

MPEG5.1 / MPEG 7.1 (7.1 downmix to 5.1)
Dolby Digital (AC-3)
Digital Theater Systems (DTS)
Linear PCM (up to 96kHz, 24 bits resolution)
Automatic audio/data type detection (AC-3,dts,MPEG-2,PCM)
Dolby Pro Logic
MPEG-2 dual mono channel selection I/II
Virtual Dolby Surround (422/423)
Virtual MPEG Digital (522/523)
Virtual Dolby Digital (522/523)
Virtual DTS Surround (522/523)
Multi - Front / Multi - rear / Natural Surround
Digital Bass Management
Parallel Stereo Downmix
Four Stereo (224)
Volume Control
Noise Generator (test tone)
Surround mode selector
Delay Center and Surround Left , Surround Right

### Tuner - (Tuner95 & ECO5)

RDS	: Only in /00
FM	
Tuning range	: 87.5 – 108MHz
Grid	: 50kHz : 100kHz only for /17 : 50 & 100kHz for /01/01C*
IF frequency	: 10.7MHz ±25kHz
Aerial input	: 75 Ω coaxial : 300 Ω clickfit only for /17
Sensitivity at 26dB S/N	: ≤ 2μV
Selectivity at 300kHz	: ≥ 55dB
Image rejection	: ≥ 100dB [48dB]
Distortion at RF=1mV,dev.75kHz	: ≤ 0,8% [0,9%]
-3dB Limiting point	: ≤ 2μV
Crosstalk at RF=1mV,dev.40kHz	: ≥ 35dB [27dB] : ≥ 22dB only for /17
MW	
Tuning range	: 522 -1611kHz for /00 : 531 -1602kHz for/01/01C* : 530 -1700kHz for/01/01C* : 530 -1700kHz for /17
Grid	: 9kHz for /00 : 9 & 10kHz for /01/01C* : 10kHz for /17
IF frequency	: 450kHz ±1kHz
Aerial input	: Frame aerial
Sensitivity at 26dB S/N	: ≤ 1,5mV/m [3,5mV/m]
Selectivity at 9kHz	: ≥ 23dB [18dB]
IF rejection	: ≥ 50dB [64dB]
Image rejection	: ≥ 33dB [28dB]
Distortion at RF=50mV,m=80%	: ≤ 3%
LW only in /00	
Tuning range	: 153 - 279kHz
Grid	: 3kHz
IF frequency	: 450kHz ±1kHz
Aerial input	: Frame aerial
Sensitivity at 26dB S/N	: ≤ 2,8mV/m
Selectivity at 9kHz	: ≥ 26dB : ≥ 24dB only for /17
IF rejection	: ≥ 100dB
Image rejection	: ≥ 45dB
Distortion at RF=50mV,m=80%	: ≤ 3%dB

[...] Values indicated are for "ECO 5 Tuner" only

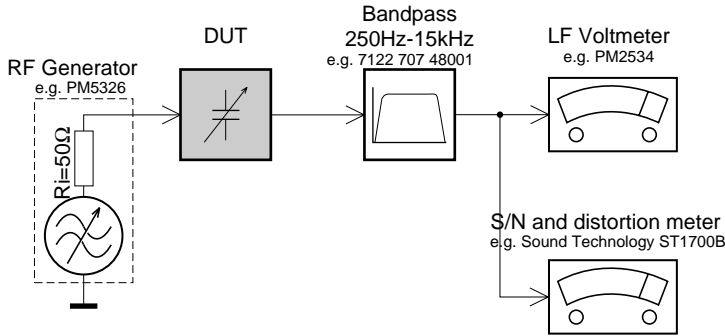
\* Setting is software controlled

# SERVICE TOOL

Audio Signals Test Disc 1 ..... 4822 397 30184

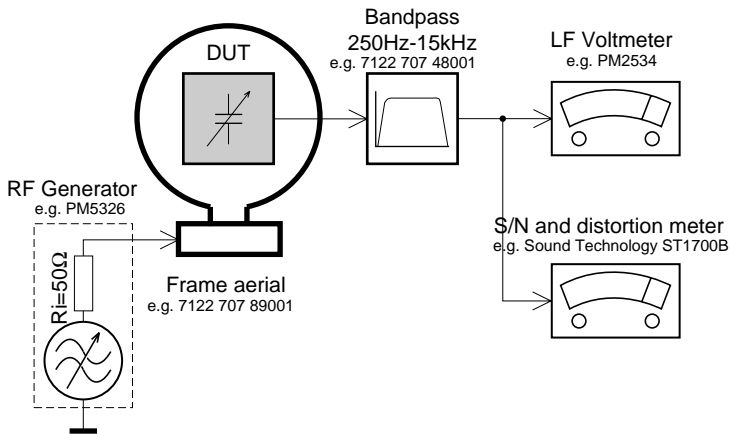
## MEASUREMENT SETUP

### Tuner FM



Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilotone (19kHz, 38kHz).

### Tuner AM (MW,LW)



To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday's cage. Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

## SAFETY

**(GB)** Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used. Safety components are marked by the symbol

**(F)** Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utilisées les pièces de rechange identiques à celles spécifiées. Les composants de sécurité sont marqués

**(D)** Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Gerätes darf nicht verändert werden. Für Reparaturen sind Originalersatzteile zu verwenden. Sicherheitsbauteile sind durch das Symbol



**(NL)** Veiligheidsbepalingen vereisen, dat het apparaat in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast. De Veiligheidsonderdelen zijn aangeduid met het symbool

**(I)** Le norme di sicurezza estigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambiaggio identici a quelli specificati. Componenti di sicurezza sono marcati con

# WARNING

**(GB) WARNING**

All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.  
When repairing, make sure that you are connected with the same potential as the mass of the set via a wristband with resistance. Keep components and tools at this potential.

**(F) ATTENTION**

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD). Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.  
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfilez le bracelet serti d'une résistance de sécurité.  
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

**ESD**



**(D) WARNUNG**

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD). Unsorgfältige Behandlung im Reparaturfall kann die Lebensdauer drastisch reduzieren.  
Sorgen Sie dafür, daß sie im Reparaturfall über ein Pulsarmband mit Widerstand mit dem Massepotential des Gerätes verbunden sind.  
Halten Sie Bauteile und Hilfsmittel ebenfalls auf diesem Potential.

**(NL) WAARSCHUWING**

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD). Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen. Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.  
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

**(I) AVVERTIMENTO**

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).  
La loro longevità potrebbe essere fortemente ridotta in caso di non osservazione della più grande cautela alla loro manipolazione. Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.  
Assicursi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

**(GB) AVAILABLE ESD PROTECTION EQUIPMENT :**

anti-static table mat	large 1200x650x1.25mm	4822 466 10953
	small 600x650x1.25mm	4822 466 10958
anti-static wristband		4822 395 10223
connection box (3 press stud connections, 1M )		4822 320 11307
extendible cable (2m, 2M , to connect wristband to connection box)		4822 320 11305
connecting cable (3m, 2M , to connect table mat to connection box)		4822 320 11306
earth cable (1M , to connect any product to mat or to connection box)		4822 320 11308
KIT ESD3 (combining all 6 prior products - small table mat)		4822 310 10671
wristband tester		4822 344 13999

# HANDLING CHIP COMPONENTS

**GENERAL**

**DISMOUNTING**

**MOUNTING**

**PRECAUTIONS**

**EXAMPLES**

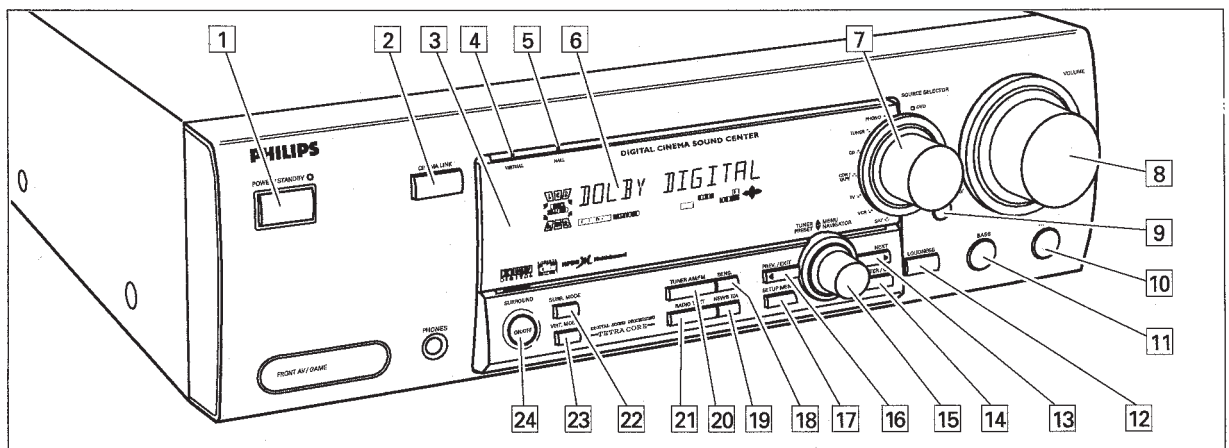
## ABBREVIATIONS

<b>A</b>		<b>P</b>	
ac 0VA	AC 0 Voltage	p gnd	P50 ground
ac 10VB	AC 10 Voltage	p p50	Cinema link P50 code
ac 110VB	AC 110 Voltage	<b>S</b>	
ac 120VB	AC 120 Voltage	s gnd	Surround ground
ac gnd	AC ground	sofac scl	Sofac I <sup>2</sup> C clock
ac h1	AC high voltage 1	sofac1 sda1	Sofac 1 I <sup>2</sup> C data1
ac h2	AC high voltage 2	sofac2 sda2	Sofac 2 I <sup>2</sup> C data2
ac l1	AC low voltage 1	ss ce	Source selector chipenable
ac l2	AC low voltage 2	ss clk	Source selector clock
ac1	AC voltage 1	ss data	Source selector data
ac2	AC voltage 2	surr pre-out	Surround pre-out
ac3	AC voltage 3	<b>T</b>	
amp lr on	Amplifier Left - Right On	tu clk	Tuner clock
amp mute c s	Amplifier mute center surround	tu da	Tuner data
amp mute c s sub	Amplifier mute center surround subwoofer	tu en	Tuner enable
amp mute lr	Amplifier mute Left - Right	tu gnd	Tuner ground
amp pd	Amplifier power down	tu l	Tuner Left
amp prot	Amplifier protection	tu r	Tuner Right
amp s on	Amplifier surround On	tu rds	Tuner RDS
amp stby	Amplifier Standby	tu stereo	Tuner stereo
av gnd	Audio ground	<b>V</b>	
av l	Audio Left	v gnd	Video ground
av r	Audio Right	v scl	Video I <sup>2</sup> C clock
A/V	Audio/Video	v sda	Video I <sup>2</sup> C data
<b>F</b>		v sig	Video signal
f1	Filament 1	v sub sur	Video subwoofer surround
f2	Filament 2	<b>G</b>	
fmute	Fast mute	gnd d	Ground digital
<b>G</b>		gnd s	Ground signal
<b>H</b>		<b>L</b>	
hp gnd	Headphone ground	ls c	Loudspeaker Center
hp l	Headphone Left	ls gnd	Loudspeaker ground
hp on	Headphone On	ls l	Loudspeaker Left
hp r	Headphone Right	ls r	Loudspeaker Right
hst	Heatsink temperature	<b>M</b>	
<b>L</b>		mdm	Multi channel <u>D</u> ecoding <u>M</u> odule
ls c	Loudspeaker Center	mdm c out	— Center out
ls gnd	Loudspeaker ground	mdm gnd	— ground
ls l	Loudspeaker Left	mdm l dmix	— Downmix Left
ls r	Loudspeaker Right	mdm l in	— Left in
<b>M</b>		mdm l out	— Left out
mdm	Multi channel <u>D</u> ecoding <u>M</u> odule	mdm r dmix	— Downmix Right
mdm c out	— Center out	mdm r in	— Right in
mdm gnd	— ground	mdm r out	— Right out
mdm l dmix	— Downmix Left	mdm req	— request
mdm l in	— Left in	mdm rst	— reset
mdm l out	— Left out	mdm scl	— I <sup>2</sup> C clock
mdm r dmix	— Downmix Right	mdm sda	— I <sup>2</sup> C data
mdm r in	— Right in	mdm sl out	— surround Left out
mdm r out	— Right out	mdm sr out	— surround Right out
mdm req	— request	mdm sub out	— subwoofer out
mdm rst	— reset	mfd	Mains failure detection
mdm scl	— I <sup>2</sup> C clock		
mdm sda	— I <sup>2</sup> C data		
mdm sl out	— surround Left out		
mdm sr out	— surround Right out		
mdm sub out	— subwoofer out		
mfd	Mains failure detection		



## INSTRUCTIONS FOR USE

## CONTROLS



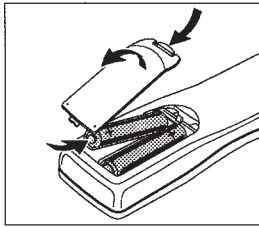
- 1 POWER / STANDBY** ..... Switches the receiver on and off.
- 2 CINEMA LINK** ..... Switches the system control bus between the receiver and the TV on and off.
- 3** ..... Sensor for the infrared remote control.
- 4 VIRTUAL** ..... Control light for virtual surround.
- 5 HALL** ..... Control light for HALL.
- 6** ..... Display
- 7 SOURCE SELECTOR** ..... Selects the different audio and video connectors.
- 8 VOLUME** ..... Increases and decreases the volume level.
- 9 FRONT AV** ..... Selects the FRONT AV / GAME input (FR 975 only).
- 10 TREBLE** ..... Adjusts the treble when used in combination with VOLUME.
- 11 BASS** ..... Adjusts the bass when used in combination with VOLUME.
- 12 LOUDNESS** ..... Switches LOUDNESS on and off.
- 13 NEXT ►** ..... TUNER: searches radio stations. MENU: switches to the next menu level.
- 14 ENTER / OK** ..... Confirms selected menu values.
- 15 TUNER PRESET ◄ MENU NAVIGATOR**  
TUNER: switches to the next and previous stored radio station. MENU: moves upwards and downwards.
- 16 ◀ PREV. / EXIT** ..... TUNER: searches radio stations. MENU: switches to the previous menu level.
- 17 SETUP MENU** ..... Switches the menu on and off.
- 18 SENS.** ..... Switches between low and high tuner sensitivity.
- 19 NEWS/TA** ..... Switches the RDS news and RDS traffic announcement on and off.
- 20 TUNER AM/FM** ..... Switches the wavebands of the tuner.
- 21 RADIO TEXT** ..... Scrolls through the different RDS information.
- 22 SURR. MODE** ..... Switches through the different speaker configurations.
- 23 VIRT. MODE** ..... Scrolls through the different virtual surround sound modes.
- 24 SURROUND ON/OFF** ..... Switches between the last selected surround mode and stereo.

**INSTRUCTIONS FOR USE**

**REMOTE CONTROL**

**Remote control usage**

Open the battery compartment of the remote control and insert 2 alkaline batteries, type **AA** (R06, UM-3).



Remove batteries if they are flat or the remote control is not going to be used for a long time.

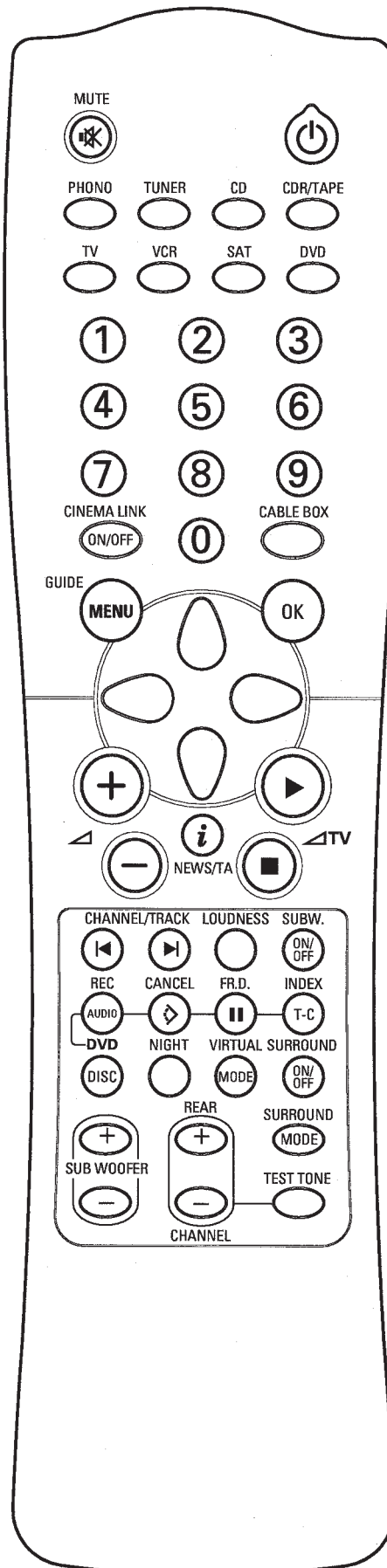
**Batteries contain chemical substances, so they should be disposed of properly.**

The buttons on the remote control work the same way as the corresponding ones on the receiver.

**Important!**

You have to press a source button for longer than 1 second to switch the sound source on the receiver. Pressing a source button for less than 1 second will only switch the remote control to use the commands for the selected product.














The remote control remains tuned to the selected source until another source button on the remote control is pressed. This enables you to operate additional sources (i. e. winding a tape) without changing the source on the receiver.



## INSTRUCTIONS FOR USE

## REMOTE CONTROL

**Remote control buttons**

-  MUTE .....Mutes the sound of the receiver.
-  .....Switches the receiver to standby.
- PHONO, TUNER, CD,  
CDR/TAPE, TV,  
VCR, SAT, DVD.....Switches the remote control to the  
commands of the different products.  
Selects the sources if pressed longer  
than 1 second. SAT only works with  
*digital* satellite receivers.
- 1-0.....Keys in numbers for tracks, stations or  
frequencies. Numbers consisting of  
two figures must be keyed in within  
2 seconds.
- CINEMA LINK ON/OFF...Switches the system connection  
between the receiver and the TV on  
and off.
- CABLE BOX.....Without function.
- MENU** GUIDE .....TUNER: Switches the receiver menu  
on and off.  
DVD, TV: Switches the DVD/TV menu  
on and off.
- OK.....Confirms menu options.
- Arrow buttons .....TUNER: Moves in the menus.  
Right/left arrows are tuning up/down.  
CD, CDR: Left/right arrows are  
searching backwards/forwards,  
up/down arrows are selecting the  
next/previous track.
- +  .....Increases the receiver volume.
-  .....Decreases the receiver volume.
-  NEWS/TA.....Switches the functions NEWS and  
TRAFFIC ANNOUNCEMENT on and off.  
TV: Switches teletext on and off.  
SAT: Switches the information text on  
and off.
-   .....Increases the TV volume.  
CD, CDR, VCR, DVD: Starts playback.
-   .....Decreases the TV volume.  
CD, CDR, VCR, DVD: Stops playback.
-  CHANNEL/TRACK ...Selects the previous preset tuner  
station.  
VCR: Rewinds the tape.  
CD, CDR, DVD: Selects the previous  
track.  
TV: Selects the previous channel.
-  CHANNEL/TRACK ...Selects the next preset tuner station.  
VCR: Fast forwards the tape.  
CD, CDR, DVD: Selects the next track.  
TV: Selects the next channel.
- LOUDNESS .....Switches LOUDNESS on and off.
- SUBW. ON/OFF .....Switches the subwoofer on and off.
- REC, DVD AUDIO.....CDR, VCR: Starts recording.  
DVD: Switches audio tracks.
- CANCEL, DVD  .....CD, CDR, SAT, VCR: Clears a  
program, cancels selections.  
DVD: Switches the view angle.
- FR.D., DVD  .....TUNER: Switches to FREQUENCY  
DIRECT.  
CD, CDR, VCR, DVD: Pauses playback.
- INDEX, DVD T-C.....VCR: Switches the index search on  
and off.  
SAT: Switches the themes on and off.  
DVD: Switches between title and  
chapter.
- DISC.....CD-, CDR-, DVD-Changers:  
Switches to the next disc.
- NIGHT .....Switches NIGHT MODE on and off.
- VIRTUAL MODE .....Scrolls through the different virtual  
surround sound modes.
- SURROUND ON/OFF .....Switches SURROUND SOUND on and off.
- + / - SUBWOOFER...Increases/decreases the subwoofer  
volume.
- + / - REAR .....Increases/decreases the volume of the  
rear speakers. While test tone is on,  
the volume of the speakers you are  
hearing can be increased/decreased  
with these buttons.
- SURROUND MODE.....Scrolls through the different surround  
modes.
- TEST TONE .....Switches the test tone on and off.  
While test tone is on, the volume of  
the speakers you are hearing can be  
increased/decreased with  
+ / - REAR.



## INSTRUCTIONS FOR USE

## REMOTE CONTROL

### Programming the universal remote control


You can identify the universal remote control by the inscription **Multibrand/Universal**.

The universal remote control must be programmed to use the codes for your appliances of different brands. This is done by keying in a 4-digit code or by scanning the codes until the correct one is found. We recommend to using the 4-digit code. This method is faster and more reliable. The code scanning method should only be used if you cannot find the code for one of your appliances. The code table can be found at the end of the booklet.

#### **Important!**




*The buttons of the remote control must be used for programming, not the buttons of the receiver or other appliances.*

#### **Programming with the 4-digit code**

- 1 Keep the source button for the appliance which should be controlled and  pressed for 3 seconds.
- 2 Key in the 4-digit code for the appliance (codetable at the end of the booklet).

*Notes:* – If more than 4 digits are entered, the remote control will recognize only the ones keyed in first.  
– If you do not key in a code within 30 seconds the remote control will switch off the programming function without changing the code.  
– To program a new appliance, simply overwrite the old code by entering a new one.

#### **Scanning the codetable**

- 1 Switch on the appliance which should be controlled.
  - 2 Keep the source button for the appliance which should be controlled and  pressed for 3 seconds.
  - 3 Press and release  again.
    - The remote control sends the codes for channel up or standby (depending on the selected source) for one brand after the other.
  - 4 As soon as the appliance reacts – switches to the next channel or to standby – press  to confirm the code.
    - The identified code will be used.
- If the set does not react within 2 minutes, the code for this appliance is not stored in the remote control. The code of the remote control will remain unchanged.

*Note: When taking out the batteries of the remote control for more than 1 minute the codes must be reprogrammed.*

Once you have found and tested the codes for your various appliances, you may want to write them down here.

PHONO .....

TUNER.....

CD .....

CDR/TAPE .....


TV .....

VCR .....

SAT .....

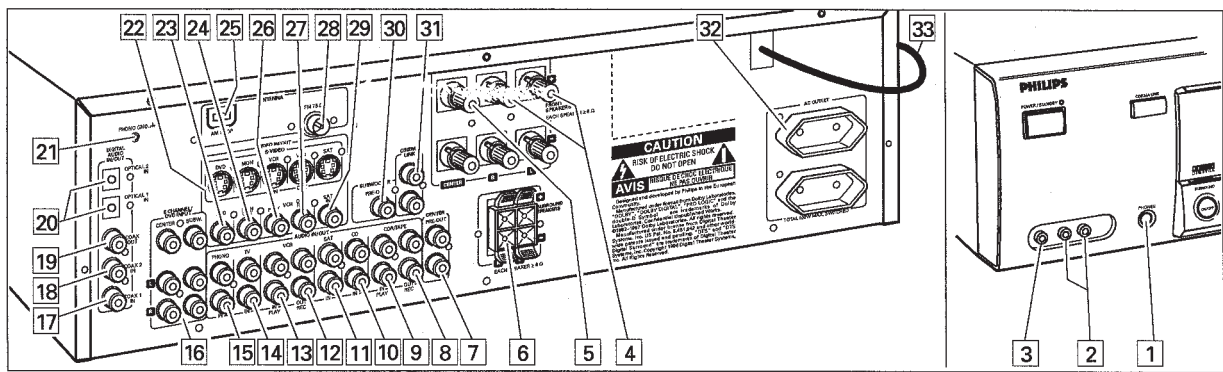
DVD .....


#### **Resetting the remote control**

- 1 Keep one of the source buttons and  pressed for 3 seconds.
- 2 Key in the 3-digit code 981.
  - The remote control is now reset to all its original Philips codes.

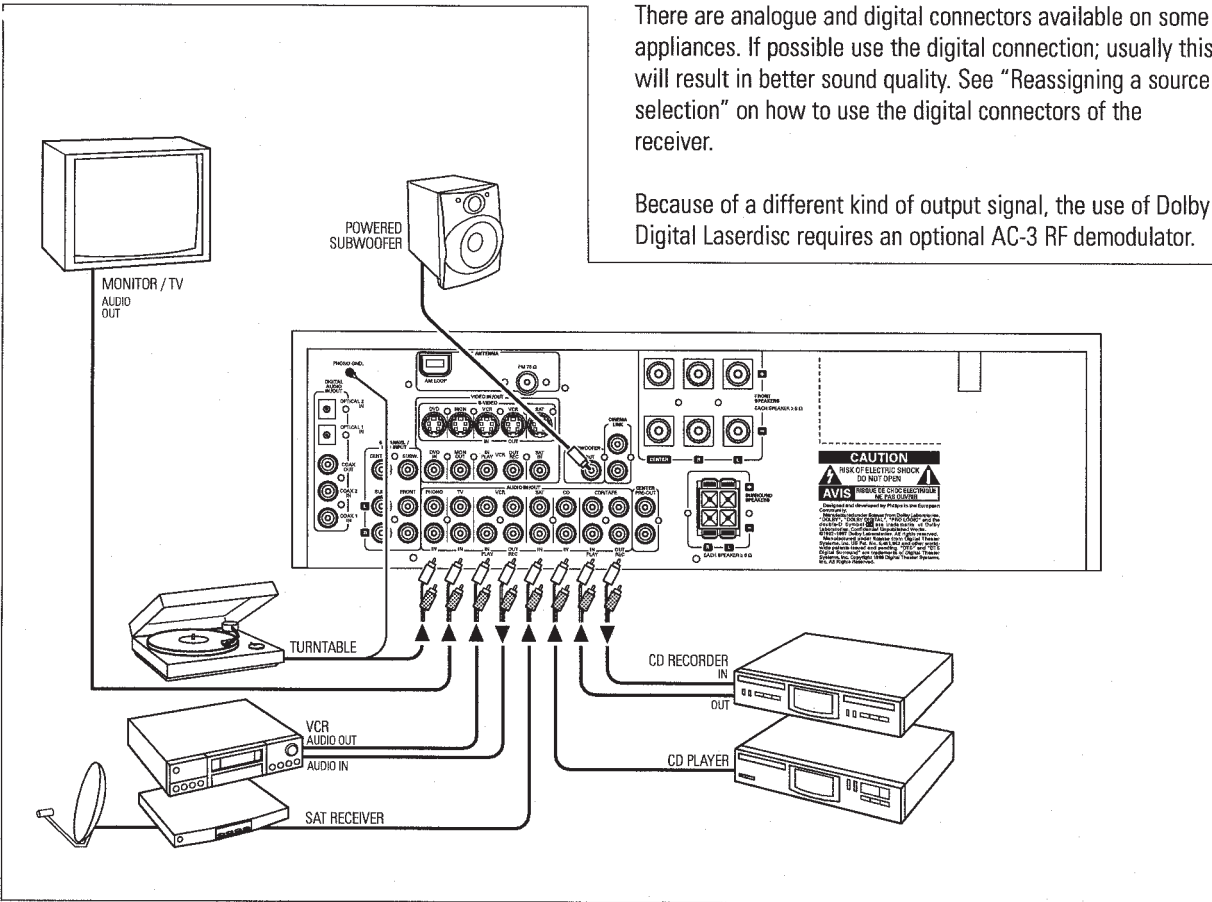
## INSTRUCTIONS FOR USE

## CONNECTORS

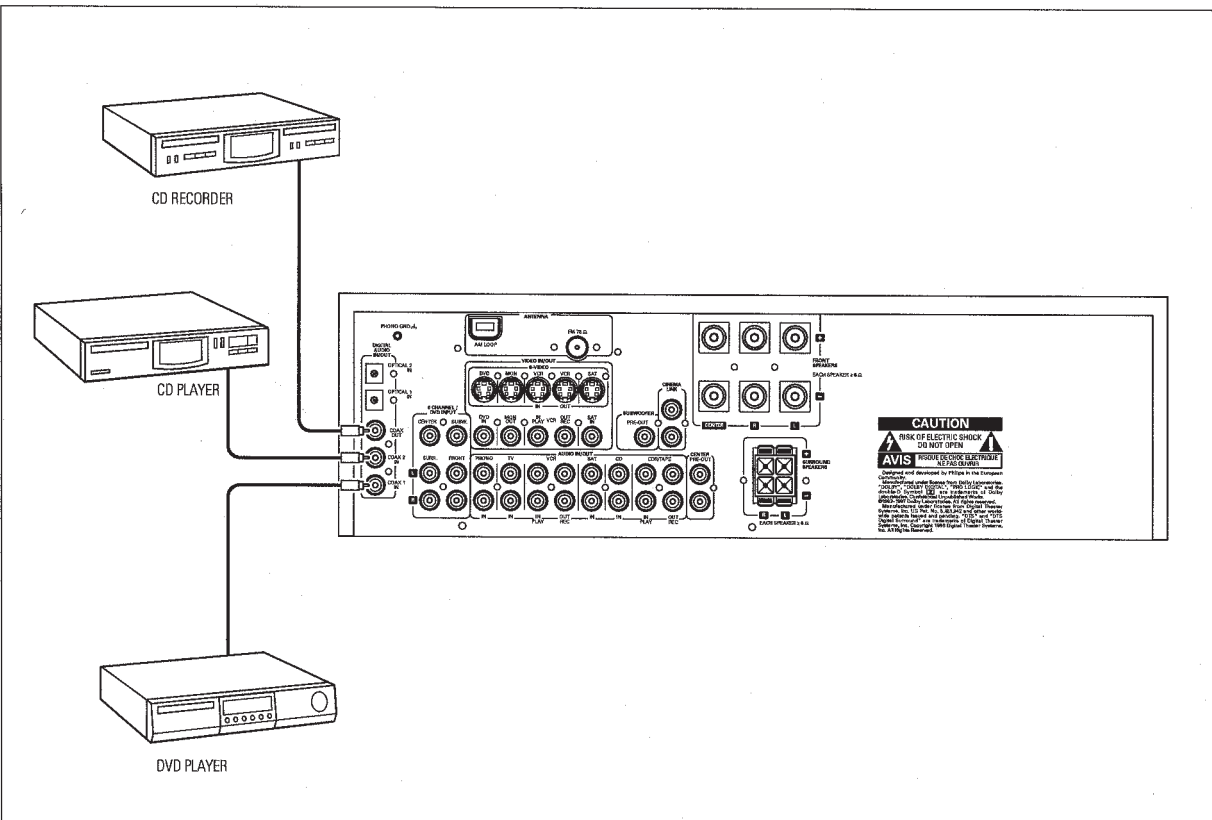


Connectors	Connectors name	Connect to:
6.3 mm headphone socket at the front	<b>1 PHONES</b>	A headphone with a 6.3 mm plug.
Audio and video inputs at the front (FR 975 only)	<b>2 FRONT AV / GAME</b>	Left and right audio out sockets of appliances such as video cameras and game consoles.
	<b>3 FRONT AV / GAME</b>	Video out sockets of appliances such as video cameras and game consoles.
FRONT SPEAKERS	<b>4 R, L</b>	Right and left front speaker.
SURROUND SPEAKERS	<b>5 CENTER</b>	Center speaker.
	<b>6 R, L</b>	Right and left surround speaker.
AUDIO IN/OUT	<b>8 CDR/TAPE OUT</b>	Input of a CD recorder or a tape deck.
	<b>9 CDR/TAPE IN</b>	Output of a CD recorder or a tape deck.
	<b>10 CD IN</b>	Output of a CD player.
	<b>11 SAT IN</b>	Output of a satellite system.
	<b>12 VCR OUT</b>	Input of a video recorder.
	<b>13 VCR IN</b>	Output of a video recorder.
	<b>14 TV IN</b>	Output of a TV.
	<b>15 PHONO IN</b>	Output of a turntable with MM coil.
	<b>21 PHONO GND</b> 	Ground cable of a turntable.
	6 CHANNEL / DVD INPUT	<b>16 6 CHANNEL / DVD INPUT</b>
DIGITAL AUDIO IN/OUT	<b>17 COAX 1 IN</b>	Coaxial output of digital appliances (default input for source DVD).
	<b>18 COAX 2 IN</b>	Coaxial output of digital appliances.
	<b>19 COAX OUT</b>	Coaxial input of digital appliances such as CD recorders or MD recorders.
	<b>20 OPTICAL IN</b>	Optical output of digital appliances such as DVD players, CD players, CD recorders or MD players (FR 965 only).
	<b>20 OPTICAL 1 (2) IN</b>	Optical output of digital appliances such as DVD players, CD players, CD recorders or MD players (FR 975 only).
VIDEO IN/OUT	<b>22 S-VIDEO</b>	S-Video inputs/outputs of video appliances for better video quality (FR 975 only).
	<b>23 DVD IN</b>	Output of a DVD player.
	<b>24 MON OUT</b>	Input of a monitor (e. g. the TV).
	<b>26 VCR IN</b>	Output of a video recorder.
	<b>27 VCR OUT</b>	Input of a video recorder (for recording).
	<b>29 SAT IN</b>	Output of a satellite system.
Antenna connectors	<b>25 AM LOOP</b>	Frame antenna supplied.
	<b>28 FM 75 Ω</b>	Wire antenna supplied or exterior antenna.
Preamplified outputs	<b>7 CENTER PRE-OUT</b>	Input of a TV when it is used as the centre speaker (only possible when the CINEMA LINK system bus is connected).
	<b>30 SUBWOOFER PRE-OUT</b>	Input of a powered subwoofer.
System control bus	<b>31 CINEMA LINK</b>	System control bus sockets of a Philips TV with CINEMA LINK.
Mains outlets (not on all versions)	<b>32 AC OUTLET</b>	Supplies same voltage as mains. Up to 100 W total permitted load.
Mains lead	<b>33</b>	<b>After all other connections have been made,</b> connect the mains lead to the wall socket.

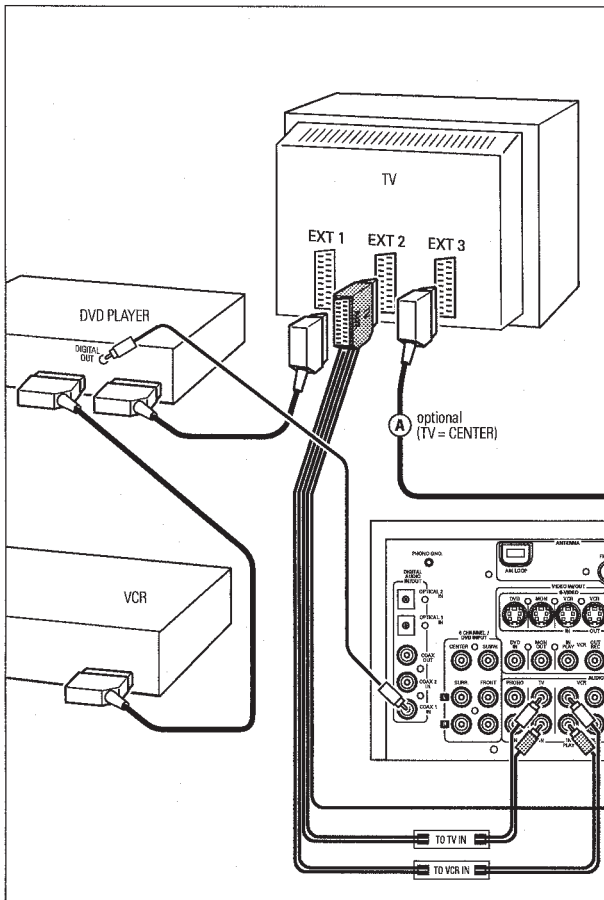
**Analogue audio connections**



**Digital audio connections**

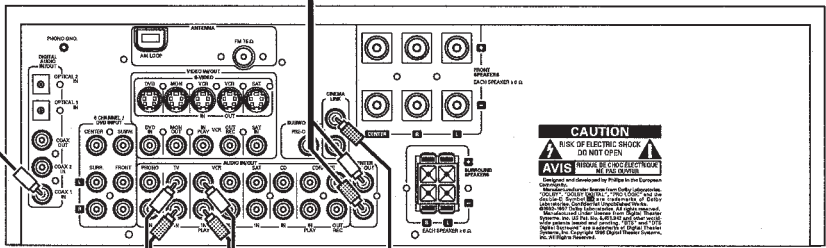


**System control bus, CINEMA LINK**

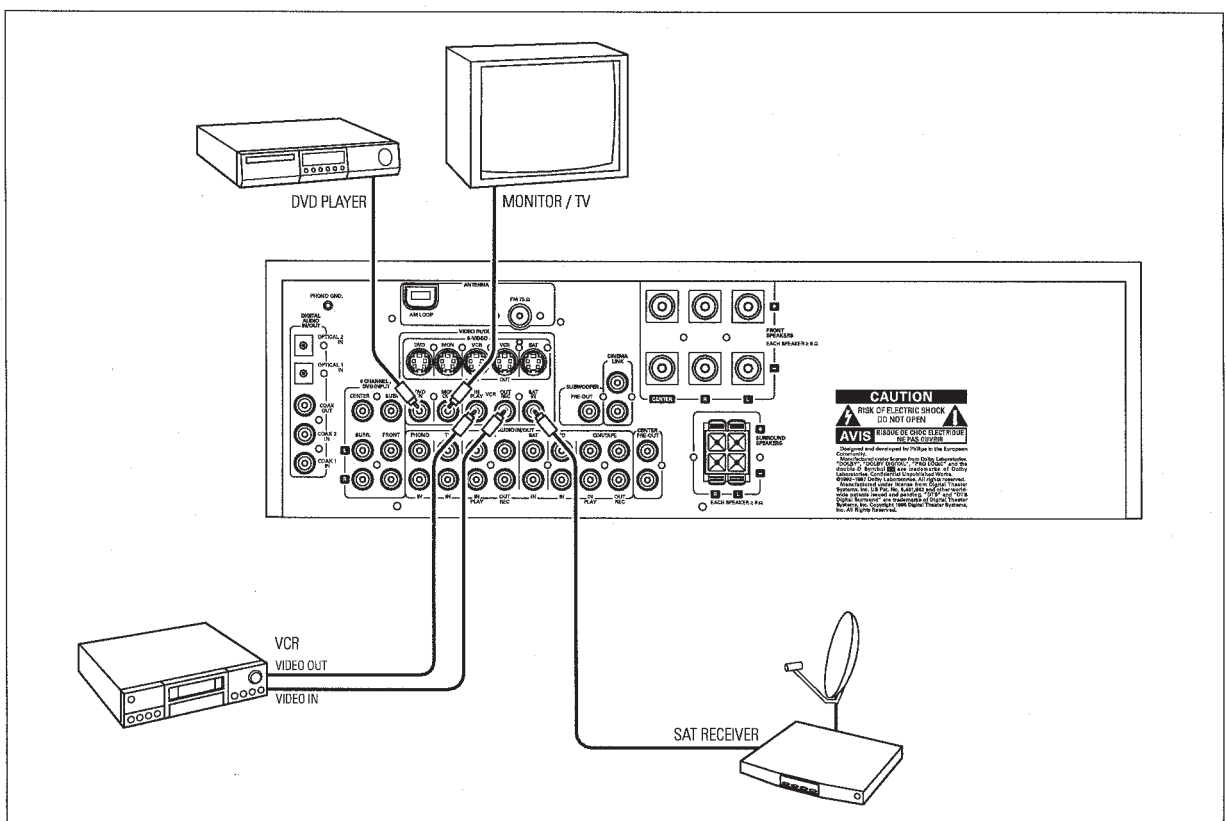


If the receiver and your Philips TV (or even better in addition a Philips VCR or DVD player) with Cinemalink are connected with the CINEMA LINK system bus control, some extra system benefits are offered:

- Upon starting a source, the system will automatically switch to that input.
- You may control the system via the TV screen. Depending on the language of the TV, this can be done in your preferred language.
- The TV can function as the center speaker of your system, making a separate center speaker unnecessary. (The cable (A) has to be purchased separately.)
- By pressing the standby button on the remote control, you can switch the complete system to standby.



**Video connections**



## INSTRUCTIONS FOR USE

## CONNECTIONS

### Mains

*The type plate is located on the rear of the receiver.*

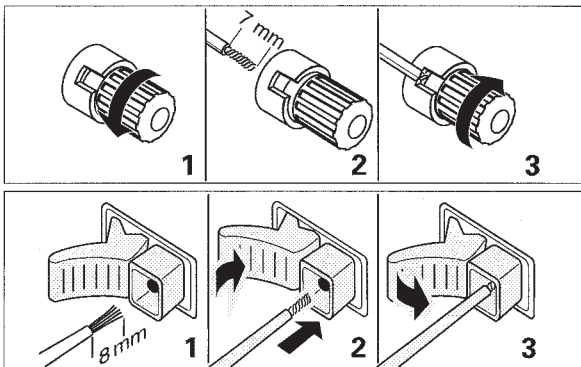
- 1 Check whether the mains voltage as shown on the type plate corresponds to your local mains voltage. If it does not, consult your dealer or service organization.
- 2 Connect the mains cable to the wall socket.

To disconnect the set from the mains completely, remove the mains plug from the wall socket.

**For users in the U. K.: please follow the instructions on page 2.**

### Speaker connections

Some of the speaker connections on the receiver are screw connectors and some are click-fit connectors. Use them as shown below.



- 1 Always connect the coloured (or marked) wire to the coloured terminal and the black (or unmarked) wire to the black terminal.
- 2 Connect:
  - Left front speaker to L (red and black)
  - Right front speaker to R (red and black)
  - Center speaker to CENTER (blue and black)
  - Left surround speaker to SURROUND L (grey and black)
  - Right surround speaker to SURROUND R (grey and black)

### TV as the center speaker

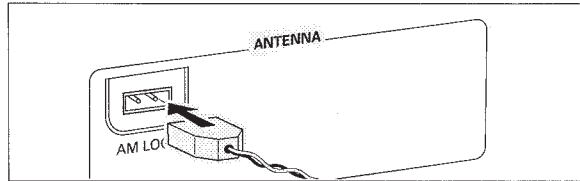
You may use your Philips TV with CINEMA LINK as the center speaker. For TVs with a scart connector an additional audio cinch-to-scart cable is needed. For TV's with cinch connectors additional cinch cables are needed. These cables must be connected to the blue CENTER PRE-OUT connector on the back. Look into the instruction manual of your TV on how to use it as the center speaker.

### Antenna connections

#### AM (MW) antenna

The loop antenna supplied is for indoor use only. Position the antenna as far away as possible from the receiver, the TV, the cables, a DVD player, a VCR and other radiation sources.

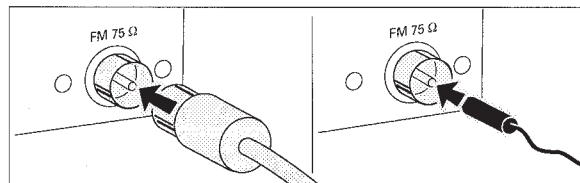
- 1 Fit the plug of the frame antenna to AM LOOP as shown below.
- 2 Turn the antenna for optimum reception.



#### FM antenna

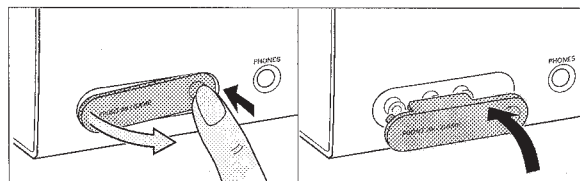
The wire antenna supplied can only be used to receive nearby stations. For better reception we recommend using a cable antenna system or an outdoor antenna.

- 1 Fit the supplied wire antenna to FM 75  $\Omega$  as shown below.
  - 2 Move the antenna in different positions for optimum reception.
- If you are using a cable antenna system or an outdoor antenna, fit the antenna plug to FM 75  $\Omega$  instead of the wire antenna.



### FRONT AV / GAME cap (FR 975 only)

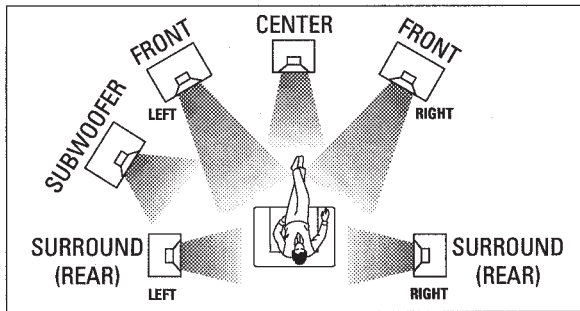
- To remove the FRONT AV / GAME cap, press on the right side of the cap.
- Insert the cap from below to close the compartment.





## INSTRUCTIONS FOR USE

## SYSTEM SETUP



### Positioning of the speakers

#### General hints for positioning

Avoid positioning the speakers in a corner or on the floor as this will boost the bass tones too much. Placing the speakers behind curtains, furniture, etc. will reduce the treble response. The listener should always be able to "see" the speakers.

Each room has different acoustic characteristics and the positioning possibilities are often limited. You can find the best position for your speakers by referring to the picture above.

As a minimum we recommend 5 speakers (2 front, a center, 2 surround) for good surround sound. It is possible to reproduce some kind of surround sound with fewer speakers. This is done by redirecting the signals which are foreseen for the missing speakers to the existing ones. See "Menus" on how to set up the receiver correctly for the number and size of the speakers used.

#### Positioning the front speakers

The front speakers should be placed right and left in front of the listening position like usual stereo speakers.

#### Positioning the center speaker

The center speaker should be placed in the center between the two front speakers, e. g. underneath or on top of the TV. The best height for the center speaker is the height of the listener's ears (while seated).

#### Positioning the surround speakers

The surround speakers should face each other and be in line with, or slightly behind the listener.

#### Positioning the subwoofer

A subwoofer can be used to enhance the bass performance of your system dramatically. The subwoofer can be positioned anywhere in the room, because it is not possible to locate the source of deep tones. Nevertheless, you should not place the subwoofer in the middle of a room, since the bass could be severely weakened. Do not place any object on the subwoofer.

### Speaker setup and testing

The relative volume of the speakers must be adjusted for optimal surround sound. You should be at your usual listening position when adjusting the speaker volume. See "Receiver menus" on how to set up the receiver for the used speakers. Ideally, the volume in the listening position should be the same from all speakers.

- 1 Press POWER / STANDBY to switch on the receiver.
- 2 Press TEST TONE on the remote control.
  - A test tone coming from the different speakers, except the subwoofer, is heard.
- 3 Press + / - REAR on the remote control to increase/decrease the volume of the actual speaker. The best result is achieved when all speakers have equal volume in the listening position.
- 4 Press TEST TONE on the remote control.
  - The test tone stops.

*Note: If you are not completely satisfied with the volume settings, we recommend making minor adjustments to them during surround sound playback.*

### Power handling

If the receiver is used at very high power it can produce distortions which may seriously damage your speakers. If distortions occur, reduce the volume and the tone controls to a level where the sound is acceptable again.

**To avoid overheating of the set a safety circuit has been built in. Therefore your set may disconnect under extreme conditions. If this happens, switch the set off and let it cool down before reusing it.**

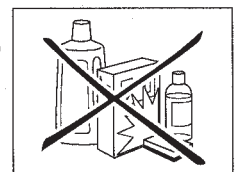
### Headphones

Connecting headphones to PHONES will switch off the speakers. The receiver switches to STEREO and surround sound will be reduced to a stereo signal which is reproducible by standard headphones.

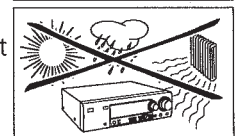
Disconnecting the headphones switches on the speakers again. If you wish to enjoy surround sound again, switch the receiver back to surround sound.

### Maintenance

Clean the receiver with a soft, slightly dampened, lint-free cloth. Do not use any cleaning agents as they may have a corrosive effect.



Do not expose the receiver to humidity, rain, sand or excessive heat (caused by heating equipment or direct sunlight).



# INSTRUCTIONS FOR USE

## DISPLAY

### Display

The display of the receiver is divided into 4 sections, which are to be used for the following:

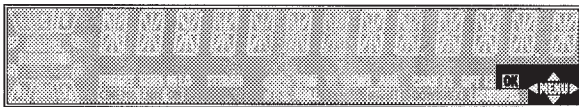
### Speaker diagram



A rectangle with a letter in it shows that a speaker has been selected in the setup menu. However, the subwoofer indicator will only light when a subwoofer signal is available. If only a letter is shown, this speaker is not used and its sound is reproduced by the other speakers.

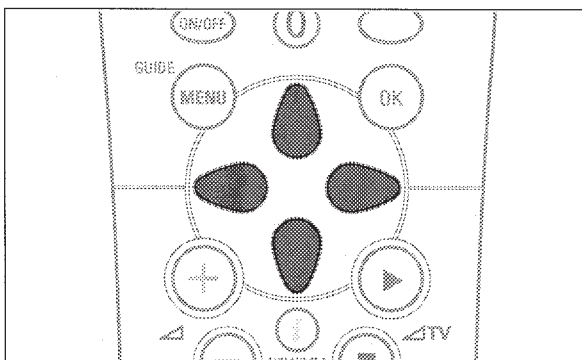
- .....virtual surround sound
- SURROUND**.....surround sound is reproduced
- DIGITAL SURROUND** ....digital surround sound is reproduced
- L, R** .....front left and right speaker
- C**.....center speaker
- SL, SR** .....surround speakers
- SW**.....subwoofer

### Menu indication

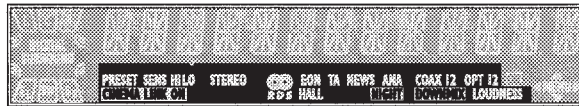


These signs show you if the menu is on or off and indicate in which direction you may move.

- MENU** .....menu is on
- .....You may move backwards to the previous menu topic using ◀ PREV. / EXIT ("left" key on the remote control).
- .....You may move up in an option list using MENU NAVIGATOR ("up" key on the remote control).
- .....You may move down in an option list using MENU NAVIGATOR ("down" key on the remote control).
- .....You may move forward to the next menu topic using NEXT ▶ ("right" key on the remote control).
- OK**.....You may confirm the displayed value.



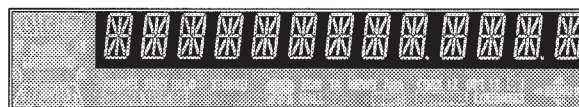
### Status lights



Signs showing you various settings and information about the status of the receiver.

- PRESET** .....Tuner is tuned to a preset radio station.
- SENS HI**.....Tuner is switched to high sensitivity.
- SENS LO** .....Tuner is switched to low sensitivity.
- CINEMA LINK ON** .....CINEMA LINK is active
- STEREO**.....An FM station is being received in stereo.
- .....An RDS station is being received.
- EON**.....An RDS station with EON is being received.
- HALL**.....HALL effect is on.
- TA** .....RDS traffic announcement is on
- NEWS**.....RDS news announcement is on
- ANA** .....Analogue input is being used for the playing source.
- NIGHT** .....NIGHT MODE is on.
- COAX 1** .....Coaxial digital input COAX 1 is being used for the playing source.
- COAX 2** .....Coaxial digital input COAX 2 is being used for the playing source.
- DOWNMIX** .....Incoming multi channel signals are being reduced to fewer output signals (depending on the number of speakers).
- OPT** .....Optical digital input OPTICAL IN is being used for the playing source (FR 965 only).
- OPT 1** .....Optical digital input OPTICAL 1 IN is being used for the playing source (FR 975 only).
- OPT 2** .....Optical digital input OPTICAL 2 IN is being used for the playing source (FR 975 only).
- LOUDNESS** .....LOUDNESS is switched on.

### Information area



This area is used for feedback of the receiver, tuner frequencies, menu options, values and scrolling text messages.

### Receiver menu

The receiver is equipped with a menu system. The menu is used for the setup of the receiver. The different menu options are related to each other in a logical way. Let's assume you have no center speaker connected, and therefore switched *CENTER SPEAKR* to *NO*. If you try to use *VOL CENTER*, a message will be scrolled that this is not possible (*INSTALL CENTER SPEAKER*).

The menu always works the same way. Arrows in the display show you the possible moving directions.

- 1 Press **SETUP MENU**.  
→ **MENU**, and \* *EFFECTS* is displayed.
- **You can exit the menu at any time by pressing SETUP MENU.**
- 2 Turn **◆ MENU NAVIGATOR** until the desired option (or a value) is displayed.
- 3 Press **NEXT ►** to choose the displayed option (or **ENTER / OK** to confirm a value).
- You can leave any option (values remain unchanged) by pressing **◀ PREV. / EXIT**.

#### Menu structure

- \* *EFFECTS*
  - Switches sound effects.
  - *VIRT SURR*  
virtual surround: 0...100 %
- \* *VOL BALANCE*
  - Adjusts the relative volume balance between the connected speakers.
  - *TEST TONE*  
Test tone: on/off
  - *VOL FRONT-L*  
Volume front left speaker: -50...+50
  - *VOL FRONT-R*  
Volume front right speaker: -50...+50
  - *VOL CENTER*  
Volume center speaker: -50...+50
  - *VOL REAR-L*  
Volume rear left speaker: -50...+50
  - *VOL REAR-R*  
Volume rear right speaker: -50...+50
  - *VOL SUBWOOFER*  
Volume subwoofer: -50...+50

Note: When using the 6 CHANNEL / DVD INPUT the values below cannot be changed.

- \* *SPEAKR SETUP*
  - Selects the used speakers.
  - *SUBW PRESENT*  
Subwoofer present: yes/no
  - *CENTER SPEAKR*  
Center speaker present: yes/no
  - *REAR SPEAKR*  
Rear speakers present: yes/no
- \* *SPEAKR SIZES*
  - Chooses the speaker sizes of the used speakers, for optimal sound reproduction. *LARGE* indicates a speaker which can reproduce frequencies lower than 50 Hz. If *SUBW PRESENT* is set to *NO*, *FRONT SIZE* can only be set to *LARGE*. If *FRONT SIZE* is set to *SMALL*, *CENTER SIZE* can only be set to *SMALL* and consequently a subwoofer must be connected.
  - *FRONT SIZE*  
Left and right front speakers: small/large
  - *CENTER SIZE*  
Center speaker: small/large
  - *REAR SIZE*  
Rear speakers: small/large
- \* *SPK DISTANCE*
  - Distance between the usual listening position and the speakers. This defines the delay time for the surround sound.
  - *DISTANCE L/R*  
Distance to front speakers: 1...10 m
  - *DISTANCE CNTR*  
Distance to center speaker: 1...10 m
  - *DISTANCE REAR*  
Distance to rear speakers: 1...10 m



## \* SELECT INPUT

Assigns the audio input connectors to the different source selections chosen with SOURCE SELECTOR (see "SOURCE SELECTION" for details).

- COAX 1  
Digital coaxial input 1, COAX 1 IN
- COAX 2  
Digital coaxial input 2, COAX 2 IN
- OPT (FR 965 only)  
Digital optical input, OPTICAL IN
- OPT 1 (FR 975 only)  
Digital optical input, OPTICAL 1 IN
- OPT 2 (FR 975 only)  
Digital optical input, OPTICAL 2 IN
- SAT IN  
Analogue audio input SAT IN
- VCR IN  
Analogue audio input VCR IN
- TV IN  
Analogue audio input TV IN
- CDR IN  
Analogue audio input CDR IN
- CD IN  
Analogue audio input CD IN
- 6 CH IN  
Analogue audio input 6 CHANNEL / DVD INPUT

## \* TUNER

Setup for preset radio stations (see "TUNER" for details).

- AUTO INSTALL  
Stores radio stations automatically
- MAN INSTALL  
Stores radio stations manually
- GIVE NAME  
Allows to assign names to stored radio stations
- RESHUFFLE  
Resorts stored radio stations

**TV menu**

If the receiver is connected to a Philips CINEMA LINK TV via the CINEMA LINK system control bus sockets (see "CONNECTIONS"), you may use the TV to set up the system. An option called RECEIVER will be added to the TV menu.

If CINEMA LINK is on, adjustments on the receiver will be shown on the TV screen for a few seconds. Consult the instruction booklet of your TV on how to use the TV menu. The options offered may vary by TV model.

**Switching the connection**

- Press CINEMA LINK to switch the connection between the receiver and the TV either on or off.
  - If the connection is switched on, **CINEMA LINK ON** is displayed.

*Note: We recommend switching CINEMA LINK off during recording. This avoids unwanted interruptions due to switching TV functions.*

If CINEMA LINK is switched on and the TV menu is active, TV MENU is displayed and the menu and sound functions on the receiver are locked.

## INSTRUCTIONS FOR USE

## SOURCE SELECTION

**SOURCE SELECTOR**

When selecting a source by turning SOURCE SELECTOR, the audio and video inputs with the corresponding name are activated. The incoming signal is reproduced by all audio and – if the source includes a video signal – video outputs of the receiver. It is possible to reassign a source selection to other than these standard inputs.

**Source selected.....Connectors used**

DVD.....	COAX 1 digital audio input and DVD IN video input
PHONO.....	PHONO IN audio input
TUNER .....	The tuner part of the receiver is used, all inputs are switched off.
CD.....	CD IN audio input
CDR/TAPE.....	CDR/TAPE IN audio input
TV.....	TV IN audio input and no video input
VCR.....	VCR IN audio input and VCR IN video input
SAT .....	SAT IN audio input and SAT IN video input

**6 CHANNEL / DVD INPUT selection**

The 6 CHANNEL / DVD INPUT connectors can be assigned to any of the available sources (excluding TUNER and PHONO). The assignment can be done via the \* *SELECT INPUT* option in the menu. See below for more details.

**Reassigning a source selection**

If a source is selected with SOURCE SELECTOR the standard audio input is used. To change this, the source selection must be reassigned to another audio input.

Example: Reassigning **CD** from the analogue CD IN audio input to the digital COAX 2 IN audio input.

- 1 Choose \* *SELECT INPUT* from the menu and press **NEXT ▶**.
- 2 Turn SOURCE SELECTOR to select the source which should be reassigned (e. g. **CD**).  
→The name of the source is displayed and the light of the source flashes.
- 3 Turn **◆** MENU NAVIGATOR to select the input connectors which should be used (e. g. **CD** → **COAX2**).
- 4 Press ENTER / OK to confirm your selection.  
→**STORED** is displayed briefly.
- 5 This source selection is now using the chosen audio input (e. g. **CD** uses the COAX 2 IN input connectors, **COAX 2** lights when switching to CD).

**Using one source selection for two or more appliances**

You may assign more than one source to a source selection. This can be useful when products are connected one after the other in a chain.

Example: A VCR is connected to the TV but only the TV is connected to the receiver. Both SOURCE SELECTOR settings, TV as well as VCR, have to use the TV input connectors.

- 1 Choose \* *SELECT INPUT* from the menu and press **NEXT ▶**.
- 2 Turn SOURCE SELECTOR to select the source which should be reassigned (e. g. **VCR**).  
→The name of the source is displayed and the light of the source flashes.
- 3 Turn **◆** MENU NAVIGATOR to select the input connectors which should be used (e. g. **VCR** → **TV IN**).
- 4 Press ENTER / OK to confirm your selection.  
→**STORED** is displayed briefly.
- 5 This source selection is now using the chosen audio input (e. g. **VCR** uses the TV IN input connectors, **VCR (TV IN)** is displayed briefly when switching to VCR).

**About 6 CHANNEL / DVD INPUT**

The 6 CHANNEL / DVD INPUT can be used to connect a device with a built-in multichannel decoder (e.g. Dolby Digital, DTS, etc.) and 6-channel output connector, i. e. a high end DVD player.

When using the 6 CHANNEL / DVD INPUT audio input, the receiver works as a multichannel amplifier. The source reproduces surround sound and sends it to the receiver divided into the necessary channels. Therefore the SURROUND ON/OFF, HALL and SURR. MODE button have no effect since the provided signal is already multichannel.

From a source which is connected to the 6 CHANNEL / DVD INPUT audio input cannot be recorded.

## INSTRUCTIONS FOR USE

## PLAYBACK, RECORDING

### Playing a source

- 1 Press POWER / STANDBY to switch on the receiver.
- 2 Turn SOURCE SELECTOR to select a source.
  - The name of the source is displayed.
- You can select the FRONT AV / GAME input by pressing FRONT AV (FR 975 only).
- 3 Start playback of the source as usual.

### Adjusting the sound

- Turn VOLUME to adjust the volume.
  - VOLUME and the volume level between 0 and 50 is displayed.
- 1 Press BASS or TREBLE.
  - BASS or TREBLE and the actual value are displayed briefly. Then TURN VOLUME KNOB TO CHANGE is scrolled.
- 2 Turn VOLUME to adjust the bass or treble.
  - BASS or TREBLE and the actual value are displayed.

*Note: If VOLUME is not turned within 5 seconds or if any other control is used, the bass or treble adjustment is switched off.*

- If a subwoofer is connected, press SUBW. ON/OFF to increase the bass performance.

*Note: In case of digital surround sound, a subwoofer signal will only be available when supported by the source material.*

- Press LOUDNESS to switch loudness either on or off.
  - LOUDNESS is displayed if loudness is on.

### Recording from a source

If you wish to record from a source you must select it with SOURCE SELECTOR. The incoming signal is reproduced by all audio and – if the source includes a video signal – video outputs of the receiver. The sound settings do not affect the recording.

- 1 Turn SOURCE SELECTOR (or press FRONT AV – FR 975 only) to select the source you want to record from.
  - The name of the source is displayed.
- 2 Prepare the desired recording appliance. It must be connected to one of the outputs of the receiver.
- 3 Start recording on the recording appliance.
- 4 Start the playback of the source as usual.

*Notes: – The audio and video signal of VCR IN is not reproduced by VCR OUT. The same applies to the audio signal of CDR/TAPE IN to CDR/TAPE OUT.*  
*– We recommend not to use the digital output COAX OUT of the receiver to record from an analogue source. Use the analogue output CDR/TAPE instead.*  
*– From a source which is connected to the 6 CHANNEL / DVD INPUT audio input cannot be recorded.*

### Recording from the digital output

It is possible to connect a digital recorder to the digital output of the receiver. In this way, all signals coming from the digital inputs can be recorded directly on the connected audio recorder. The receiver will also convert all signals coming from the analogue inputs to the digital output.





The receiver can be used to record digitally a multichannel surround sound audio signal (Dolby Digital, DTS or MPEG) from, for example, DVD to CD-R. The receiver will convert the digital multichannel signal into a stereo signal without loss of relevant sound information.

*Notes: – When recording a Dolby Digital, DTS or MPEG signal, each track must be recorded individually.*  
*– Digital recording is not possible when the digital source material is copy-protected.*

## INSTRUCTIONS FOR USE

## SURROUND SOUND

**About surround sound**

Surround sound gives you a complete new listening sensation. You will have the feeling of being in the middle of the action, because sound is coming from everywhere around you. Look out for TV broadcasts, audio and video tapes and discs with the , ,  or  **Multichannel** marks which are encoded for multichannel surround sound. You should prefer Dolby Digital, DTS or MPEG Multichannel to get the best out of your receiver.

The FR 965 and FR 975 are able to reproduce DTS surround sound. DTS is a premium multichannel surround sound system available on DVD discs, laserdiscs and audio discs. Consult your software dealer on the availability of DTS software in your region.

Notice that DVD discs do not always carry full multichannel surround. To be sure that a disc is multichannel encoded consult your dealer.

Most ordinary stereo tapes and discs can be replayed using surround sound settings with good results. If the reproduction is distorted in surround mode, switch to normal stereo mode.

The availability of the various surround sound modes described depends on the number of speakers used and the incoming sound information.

**Switching surround sound**

With surround sound on, you can switch through the different surround modes. Note that the possibilities are related to speaker setup defined in the receivers menu.

If a digital surround signal is detected, the receiver will scroll either *DOLBY DIGITAL*, *DTS* or *MPEG*.

- 1 Press SURROUND ON/OFF to switch on the surround sound.
  - The surround mode in use is scrolled.
- 2 Press SURR. MODE repeatedly to listen to the different surround modes (if available).
  - The chosen mode and the speakers used are displayed. If the incoming multichannel signals are reduced to fewer output signals, **DOWNMIX** is displayed.
- 3 Press VIRTUAL MODE as often as necessary to switch through the virtual surround sound modes:
  - 1 × to activate *3D SURROUND*
  - 2 × to activate *MULTI FRONT*
  - 3 × to activate *MULTI REAR*
  - 4 × to activate *NATURAL SURROUND*
  - A light indicates if a virtual surround sound mode is on.
    - Ⓜ-signs indicate which virtual surround sound mode is active.
- 4 Press SURROUND ON/OFF to switch off the surround sound.
  - SURROUND OFF* is scrolled.

## INSTRUCTIONS FOR USE

## SURROUND SOUND

### Surround sound settings

#### HALL

The sound reproduction is enhanced and a slight echo is added. This gives the impression of being in a large room. Can only be used in stereo mode.

#### SURROUND

The surround mode enables normal surround sound reproduction with 4 or 5 speakers. Depending on the source material, Dolby Surround Pro Logic, Dolby Digital, DTS or MPEG is reproduced.

#### PRO LOGIC, DOLBY DIGITAL, DTS, MPEG

In addition to SURROUND, the surround mode used – depending on the source material – will be displayed. In case of digital surround, the sound format AC-3 (for Dolby Digital), DTS or MPEG (for MPEG 2 Multichannel) will be displayed, followed by the sound channels, available on the source (e. g. DVD).

Example: **AC-3 3/2.1** Dolby Digital, 3 front channels, 2 surround channels and a subwoofer channel.  
**MPEG 2/0.0** MPEG Multichannel, stereo sound only.  
**AC-3 3/1.0** Dolby Digital, 3 front channels, 1 (mono) surround channel without subwoofer signal.  
**DTS 3/2.1** DTS, 3 front channels, 2 surround channels and a subwoofer channel.

#### FRONT-3 STEREO

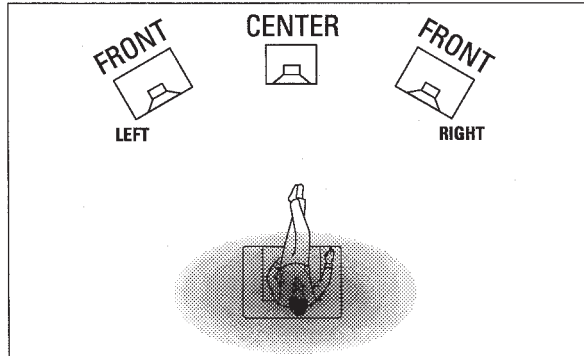
The surround sound is muted. 3 Stereo lets you listen to surround sound without using the surround speakers.

#### STEREO

All sound is reproduced and played through the front left and right speakers. This enables standard stereo reproduction.

### Virtual Surround

Your receiver is able to reproduce one or more forms of virtual surround sound. Virtual surround gives a more real life sound impression by creating phantom speakers in addition to or instead of real speakers. The position of the listener influences the surround effect. The area where the effect is best is shown in grey.



The level of virtual surround sound effect can be adjusted in the setup menu. The following surround sound modes are available:

#### 3D SURROUND

No rear speakers are needed. The sound of the rear channel is simulated by the front speakers. Surround sound is simulated through the front left, right and center speakers.

#### MULTI FRONT

Phantom speakers are created next to the left and right front speaker.

#### MULTI REAR

Phantom speakers are created next to the left and right rear speaker.

#### NATURAL SURROUND

Phantom speakers are created next to the left and right front and rear speakers.

*Note: The availability of MULTI FRONT and MULTI REAR depends on the sound channels on the source material.*

#### NIGHT MODE (only on the remote control)

The loud parts of the sound are lowered and the soft passages are raised. You can enjoy surround sound without disturbing sleeping children or neighbours. Night mode only works with Dolby Digital and MPEG, and only if supported by the source material.



## INSTRUCTIONS FOR USE

## TUNER

### Tuning to radio stations

You can search for radio stations by scanning the frequency band. You can also key in the frequency of a known radio station. If an FM station is being broadcast and received in stereo, **STEREO** is shown.

#### Searching for radio stations

- 1 Turn SOURCE SELECTOR to select the tuner.  
→ **TUNER** is displayed.
  - 2 Select a waveband by pressing TUNER AM/FM repeatedly.  
→ The selected waveband is displayed.
  - 3 Keep ◀ or ▶ pressed for approximately 1 second.  
→ **SEARCH** is displayed and the tuner tunes to a station with sufficient strength.
  - 4 Repeat this procedure until you find the desired station.
- To fine tune to a weak transmitter, briefly press ◀ or ▶ as often as necessary for optimum reception.

#### Tuning to a radio station by frequency (with the remote control only)

- 1 Press TUNER.  
→ **TUNER** is displayed.
- 2 Press FR. D..  
→ **\_** is displayed.
- 3 Use 1-0 to key in the frequency of a radio station.

*Note: Only valid numbers within the frequency range of the tuner can be keyed in.*

### Switching FM sensitivity

You can switch the tuner to a lower search sensitivity, to search only for stations with a strong signal (FM only).

- 1 Turn SOURCE SELECTOR to select the tuner.  
→ **TUNER** is displayed.
- 2 Press SENS. on the receiver.  
→ Either **SENS HI** or **SENS LO** is displayed for 5 seconds.

*Note: While searching for radio stations, the actual sensitivity is displayed. In this case, **SENS LO** means the tuner is only looking for radio stations with a strong signal.*

### Storing radio stations

You may store up to 30 radio stations in the memory. The receiver can select and program radio stations by itself or you can choose them yourself.

#### Automatic programming

- 1 Choose \* **TUNER** from the menu and press NEXT ▶.
- 2 Choose **AUTO INSTALL** and press NEXT ▶.  
→ The preset number where programming will start, the waveband and **AUTO** are displayed.
- 3 Turn TUNER PRESET ⬇ to change the preset number where programming should start.
- 4 Use TUNER AM/FM to switch to the desired waveband.
- 5 Press ENTER / OK to start programming.  
→ **AUTO INSTALL** flashes and all available radio stations are programmed, this may take a few minutes. Programming is done when **AUTO INSTALL** stops flashing.

#### Manual programming

- 1 Choose \* **TUNER** from the menu and press NEXT ▶.
- 2 Choose **MAN INSTALL** and press NEXT ▶.  
→ A preset number, the waveband and the frequency are displayed.
- 3 Turn TUNER PRESET ⬇ to change to the preset number where the radio station should be stored.
- 4 Tune to the desired radio station (see "Searching for radio stations").
- 5 Press ENTER / OK to confirm your selection.  
→ **STORED** is displayed briefly. The radio station is programmed at the chosen preset number.
- 6 Select and store all desired radio stations this way.

**Tuning to stored radio stations**

- 1 Turn SOURCE SELECTOR to TUNER to select the tuner.  
→ TUNER is displayed.
- 2 Turn TUNER PRESET  $\blacklozenge$  to select a preset radio station.  
→ PRESET, the preset number and station are displayed.

**Resorting stored radio stations**

After programming radio stations, you might want to change their sequence. RESHUFFLE allows you to exchange the positions of presets.

- 1 Choose \* TUNER from the menu and press NEXT  $\blacktriangleright$ .
- 2 Choose RESHUFFLE and press NEXT  $\blacktriangleright$ .  
→ PRESET, a preset number and station are displayed.
- 3 Turn TUNER PRESET  $\blacklozenge$  to select a preset station.
- 4 Press ENTER / OK to confirm the selection.  
→ The selected preset number SWAP  $\langle \rightarrow \rangle$  and a second preset number are displayed.
- 5 Turn TUNER PRESET  $\blacklozenge$  to select the other preset station.
- 6 Press ENTER / OK to confirm the exchange.  
→ RESHUFFLED is displayed briefly and these two preset numbers are swapped.

**Naming radio stations**

It is possible to assign a name to any of the preset radio stations. RDS station names also can be overwritten.


- 1 Choose \* TUNER from the menu and press NEXT  $\blacktriangleright$ .
- 2 Choose GIVE NAME and press NEXT  $\blacktriangleright$ .  
→ A preset radio station is displayed.
- 3 Turn TUNER PRESET  $\blacklozenge$  to select the preset to be renamed.
- 4 Press ENTER / OK to confirm your selection.  
→ The existing name or \_\_\_\_\_ is displayed.
- 5 Turn TUNER PRESET  $\blacklozenge$  to select a letter and NEXT  $\blacktriangleright$  or  $\blacktriangleleft$  PREV. to move to the next or previous position.
- 6 After you have entered the entire name, press ENTER / OK to confirm.  
→ STORED is displayed and the name is stored.

*Note: If you want to use the transmitted RDS station name again, simply clear the given name.*

**Clearing station names**

- 1 Use the menu option \* TUNER, choose GIVE NAME.  
→ A preset radio station is displayed.
- 2 Turn  $\blacklozenge$  MENU NAVIGATOR to select the name to be cleared.
- 3 Press ENTER / OK to confirm your selection.
- 4 Press  $\blacktriangleleft$  PREV. while the first letter is flashing.  
→ CL is flashing to the left of the station name.
- 5 Press ENTER / OK to clear the station name.  
**Or, if you have changed your mind,**  
press  $\blacktriangleleft$  PREV. to leave the station name as it is.

**RDS** 

**Radio Data System** is a service that allows FM stations to send additional information. If you are receiving an RDS station,  and the station name are displayed.

**Switching through different RDS information**

- Press RADIO TEXT on the receiver repeatedly to switch through the following information (if available):
  - Radio text messages
  - RDS clock
  - Frequency
  - Station name

*Note: The time signal broadcasted from certain RDS stations may not always be accurate.*

**RDS News and Traffic Announcement**

It is possible to set up the tuner in such a way that any playback is interrupted by news or traffic information of a chosen RDS station. Announcement functions only work if the necessary RDS signals are being broadcast.

If RDS stations are also carrying an EON signal (**E**nhanced **O**ther **N**etworks), **EON** is displayed. This signal enables the tuner to search not only the chosen RDS station, but the whole EON station network for news and traffic information.

- 1** Tune to the desired RDS station.
- 2** Press NEWS/TA:
  - Once** to display **NEWS**, this switches on the news announcement function.
  - Twice** to display **TA**, this switches on the traffic announcement function.
  - Three times** to display **TA** and **NEWS**, this switches on both announcement functions.
- 3** Select and play any other source as usual.
  - While news or traffic information is being broadcast the receiver will switch to tuner and **NEWS** or **TA** will flash.
- 4** Press NEWS/TA until the display indication disappears to switch off the function(s).
  - or**
  - Press NEWS/TA during an announcement to switch off the function(s).

*Note: Be sure to switch the news and traffic announcement off during recording, otherwise these announcements also will be recorded.*



**Remote Control / Remote Control Buttons**

The following should be read instead of the original text

- ⊘ MUTE ..... Mutes the sound of the receiver in all modes, except TV.  
Mutes the sound of your Philips TV set if your remote control is in TV mode.
- ⏻ ..... Switches the source selected on your remote control (e.g. VCR, TV) to standby.  
When pressed longer than 2 seconds, the receiver switches to standby.

**Connections / Analog Audio Connections**

Please read the following text as additional to the text

DTS Digital Surround™ is a discrete 5.1-channel digital audio format available on CD, LD, and DVD software which consequently cannot be decoded and played back inside most CD, LD, or DVD players. For this reason, when DTS-encoded software is played back through the analog outputs of the CD, LD, or DVD player, excessive noise will be exhibited. To avoid possible damage to the audio system, proper precautions should be taken by the customer if the analog outputs are connected directly to the receiver.

To enjoy DTS Digital Surround™ playback, a DTS-compatible player has to be connected to one of the digital inputs of the receiver.

**System Setup**

Please read the following new chapter after the "Positioning the Speakers" chapter in this section:

**Receiver Adjustment**

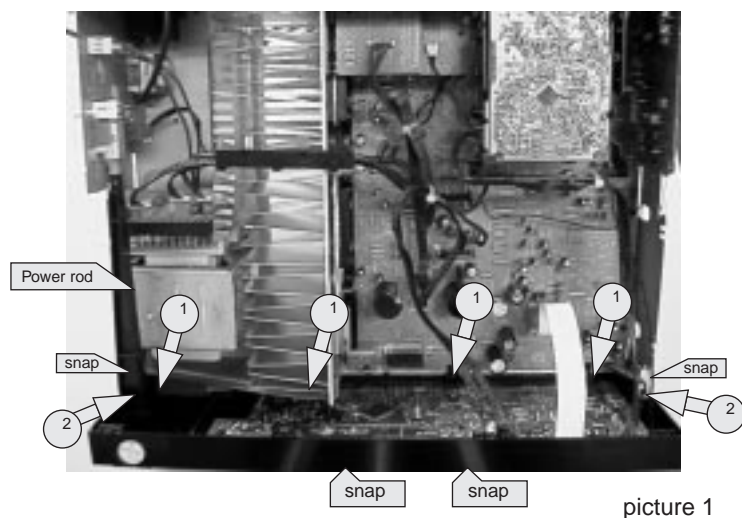
Once the number and position of loudspeakers has been fixed, you can adjust the initial receiver settings for optimal surround sound with the actual setup:

- 1 Set what speakers have been connected to the receiver (see "Menus / Speaker Setup")  
Note: The initial setting of your receiver is:  
two front speakers left and right: present (cannot be altered)  
center speaker: present  
two rear speakers: present  
subwoofer: present
- 2 Select the size of the speakers (SMALL or LARGE) (see "Menus: Speaker Sizes" )  
Select *SMALL* if your speaker is able to reproduce low notes down to at least 80–100 Hz.  
Select *LARGE* if your speaker is able to reproduce low notes down to at least 50 Hz.  
(As a rule of thumb, a *LARGE* speaker has a cone diameter of at least 12 cms (5 inches).)  
See the specification sheets of your loudspeakers.  
Note: The initial setting of your receiver is: all speakers set to *LARGE*.
- 3 Set the distance from the speakers to the listener's position (see "Menus: Speaker Distance" )  
Note: The initial setting of your receiver is: all speakers set at a distance of 3 meters.

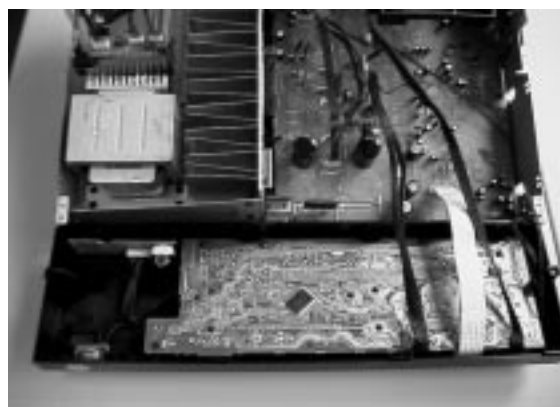
*General note:* Use the initial settings if you prefer that your receiver does not correct automatically for speaker sizes and distances.

### DISMANTLING HINTS

#### Dismantling of Front

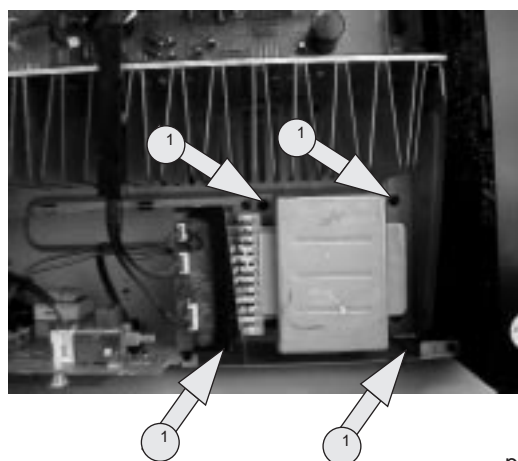


- 1) Remove top cover
- 2) Remove power rod
- 3) Remove 6 x screw as shown in picture 1
- 4) Release two snaps (left & right side front)
- 5) Release two snaps on the bottom side front
- 6) Tipp down front as shown in picture 2



picture 2

#### Dismantling of maintrafo

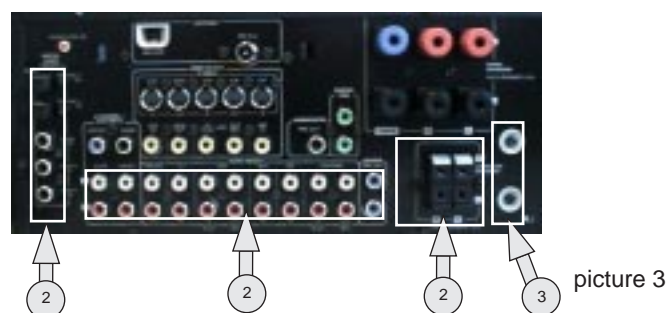


picture 8

- 1) Remove power rod
- 2) Remove 4x screw as shown in picture 8

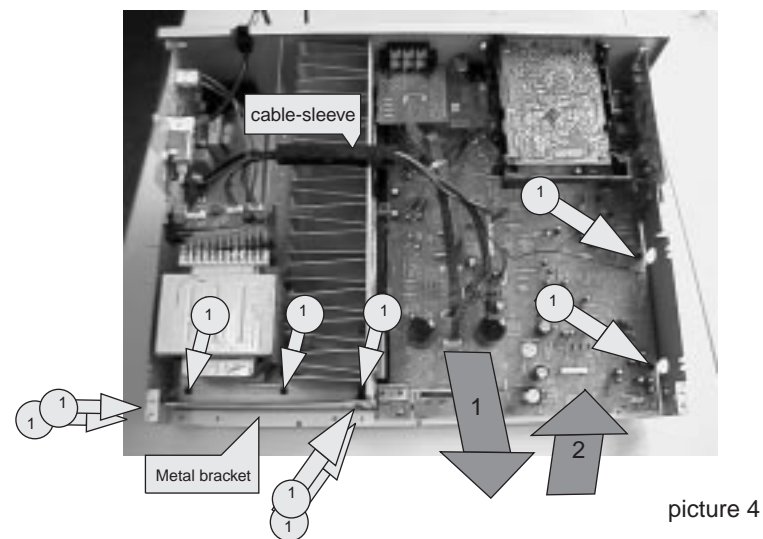
#### Dismantling of mono board

- 1) Remove front . See picture 1
- 2) Remove whole front (disconnect the wires on the mono board coming from front)



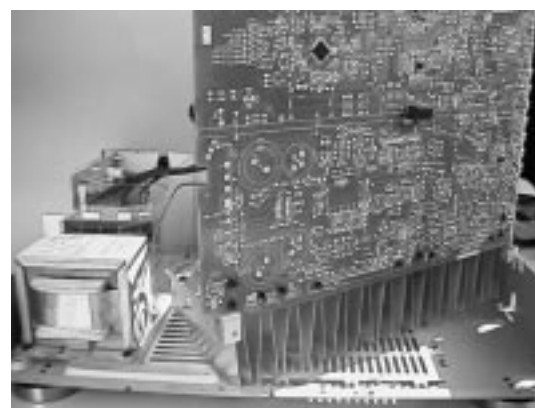
picture 3

- 3) Remove 14 x screws shown in mentioned aria . See picture 3



picture 4

- 4) Remove wires out the cable-sleeve.
- 5) Remove 7 x screw and remove metal bracket
- 6) Remove 2 x screw on mono board . See picture 4
- 7) Remove mono board as shown arrow 1 & 2 . See picture 4
- 8) Bring the mono board in the service position as shown in picture 5



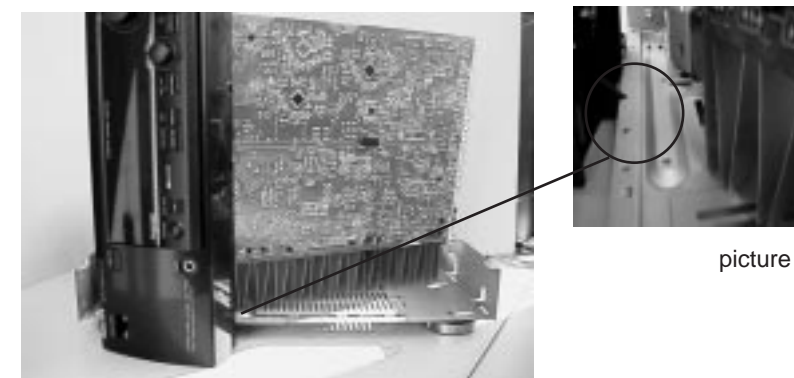
picture 5

#### Legend

- = Torx M3x6mm ( screw with big head )
- = Torx 3x10mm
- = Torx M3x6mm

#### Service position monoboard

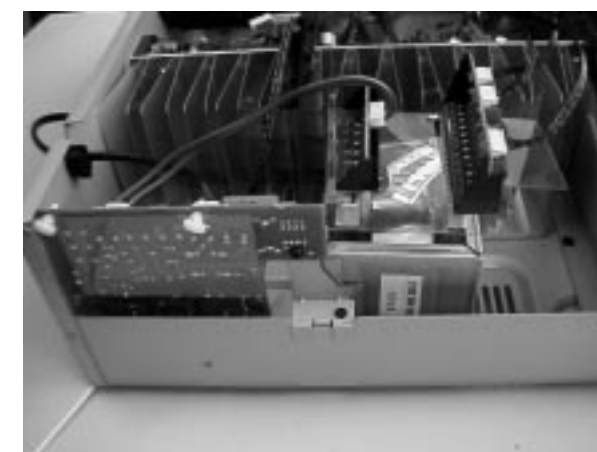
- 1) Bring front in position as shown in picture 6
  - 2) Snap nok of front in bottom to make front stable . See picture 7
  - 3) Connect front wiring back to monoboard.
- \*The tuner module doesn't have to be connected. Use an other source (pe.CD)



picture 7

picture 6

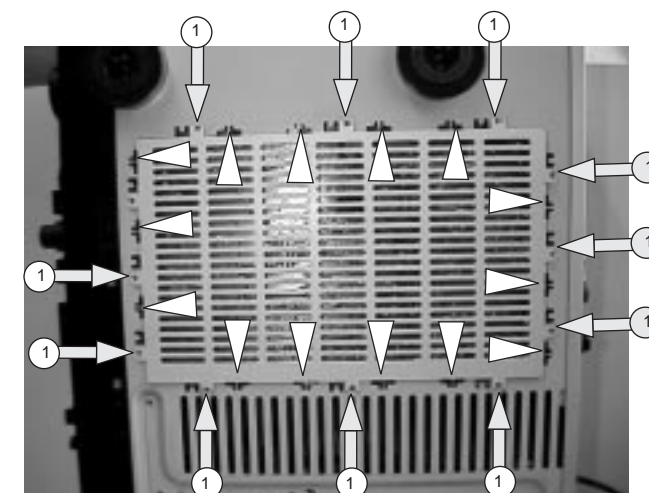
#### Service position main trafo



picture 9

- 1) Put main trafo as shown in picture 9

#### Handling service cover



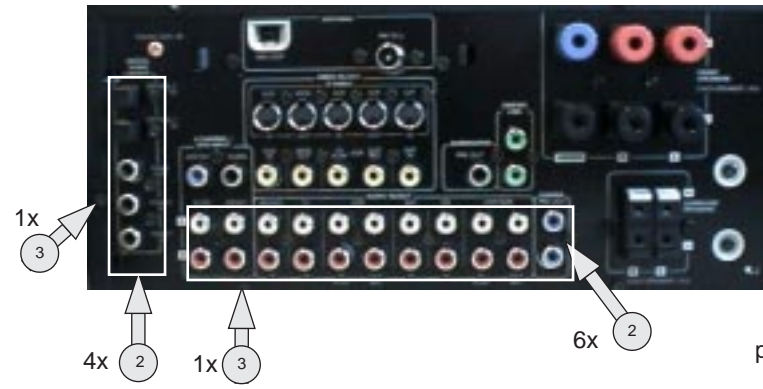
picture 10

- 1) To open the service cover cut 14 x lugs between cover and bottom . See picture 10 (▽)
  - 2) To close the service cover put 11 x screw in mentioned holes. See picture 10
- Service codenumber 12x Torx M3x6mm screw with big head = 4822 502 14659

DISMANTLING HINTS

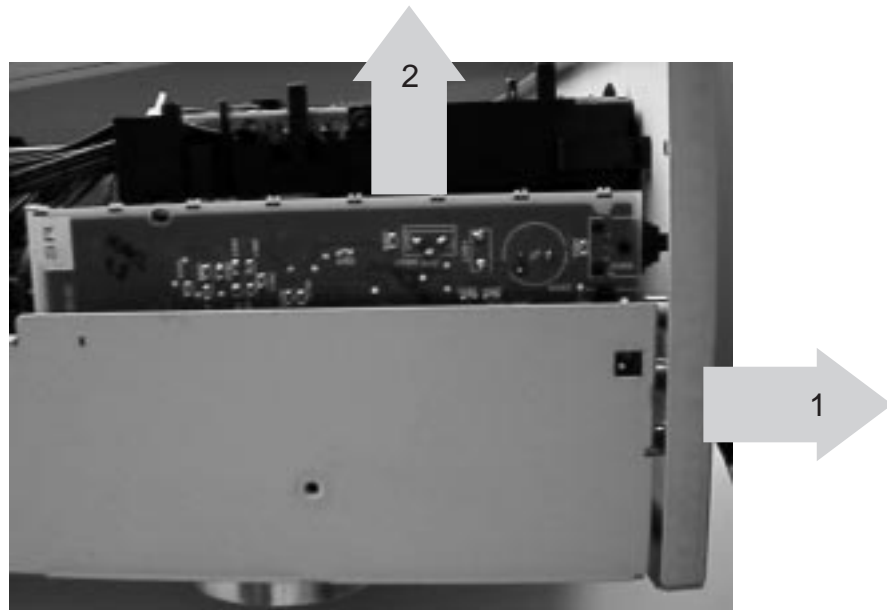
Dismantling of MDM module

1) Remove all the screws mentioned in the aerial . See picture 11



picture11

2) Remove backplate a little backwards. See arrow 1 (picture 12)  
 3) Pull module out the set as shown in picture 12

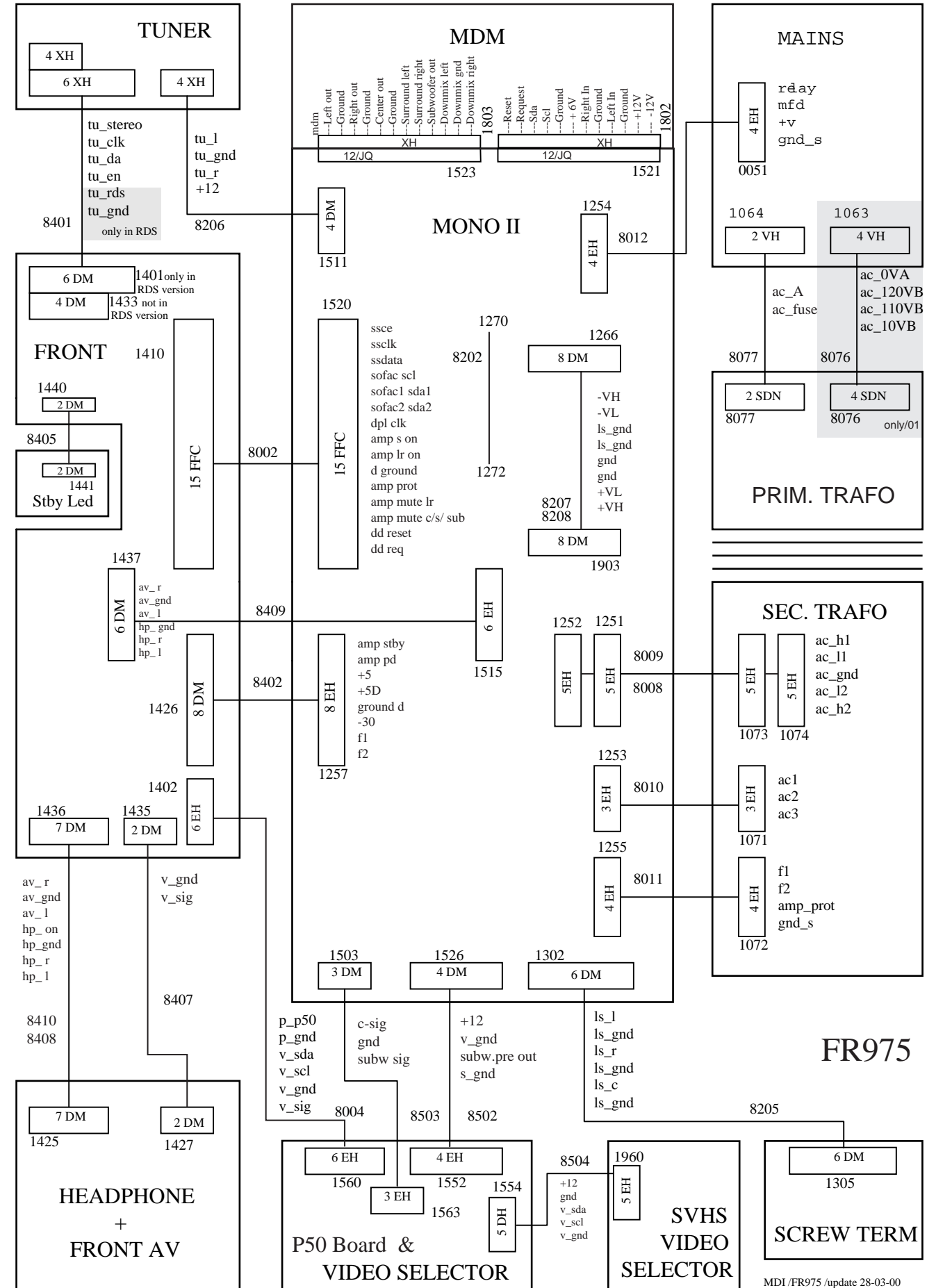


picture12

Legend

- ① → = Torx M3x6mm ( screw with big head )
- ② → = Torx 3x10mm
- ③ → = Torx M3x6mm

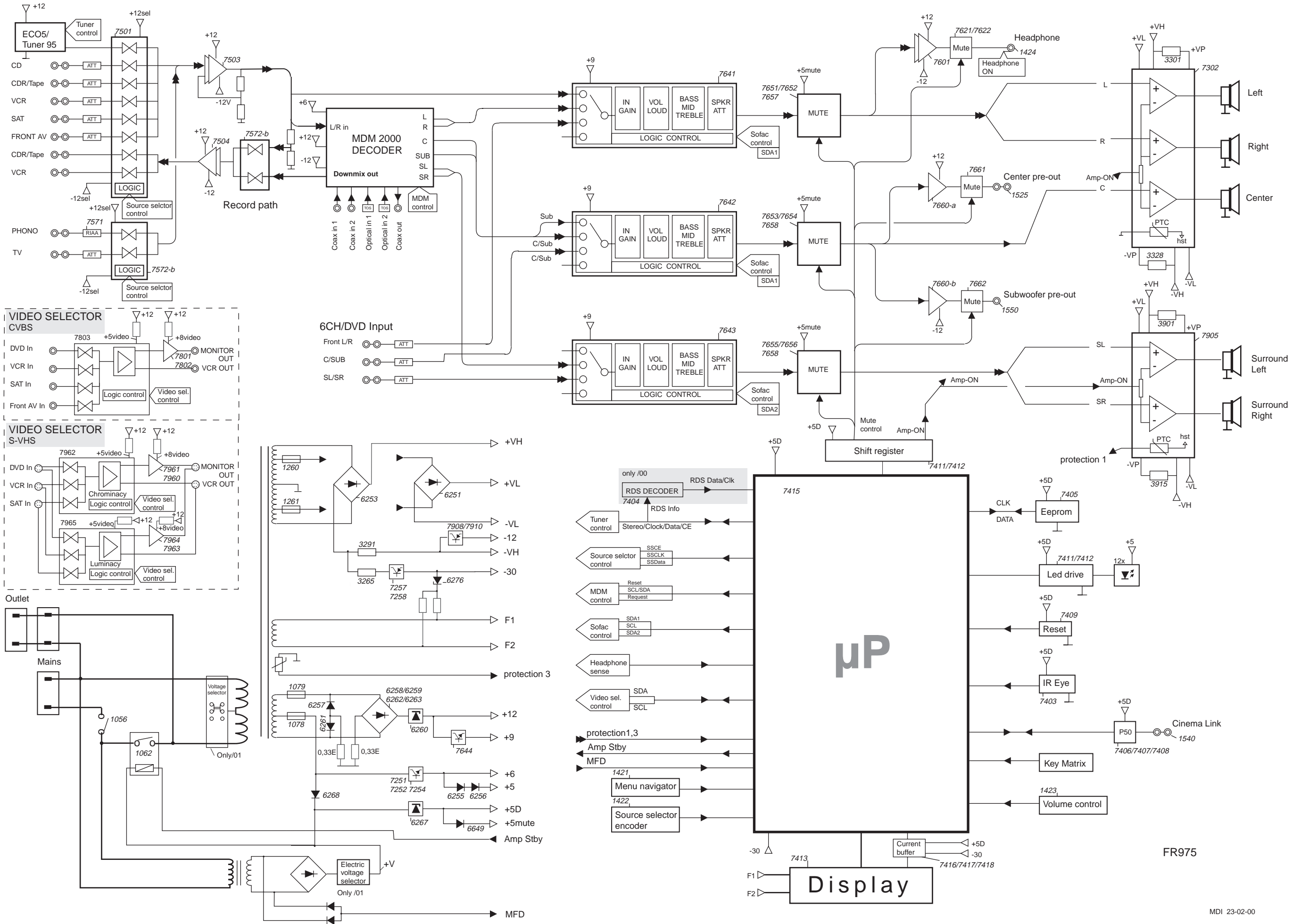
WIRING DIAGRAM



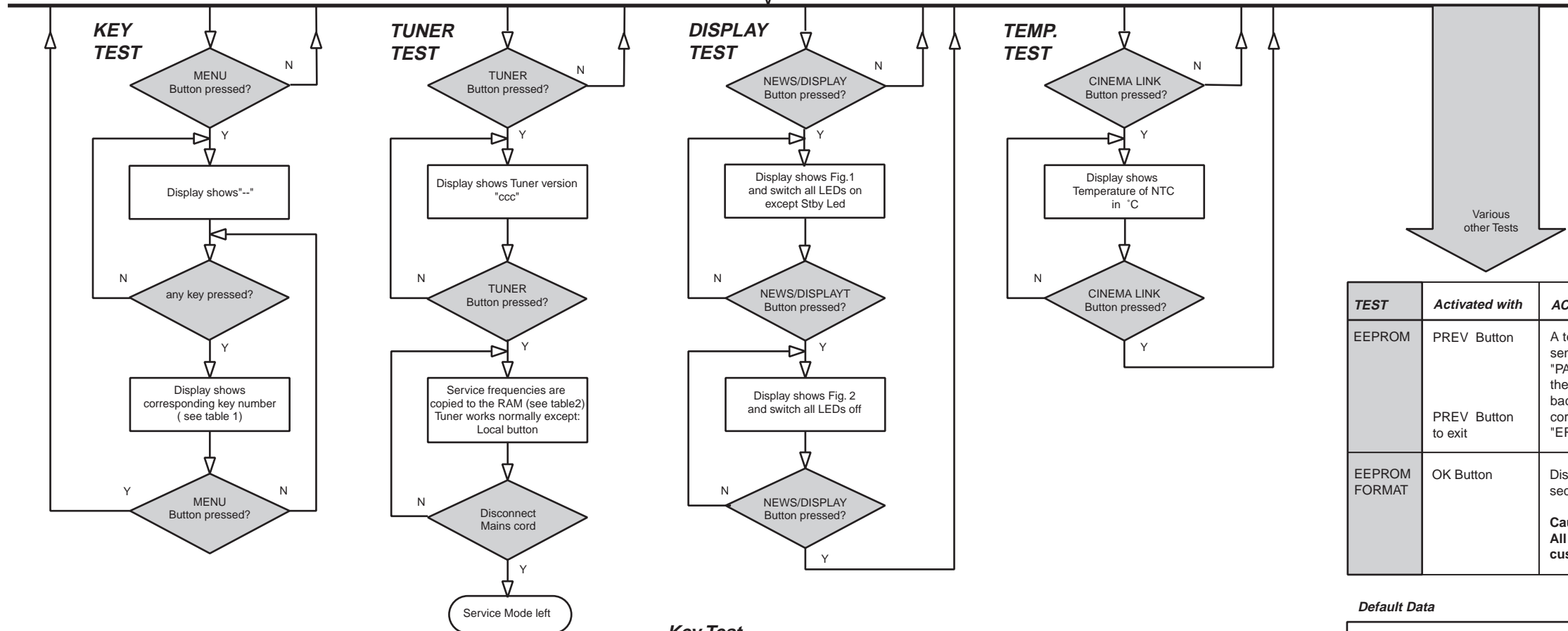
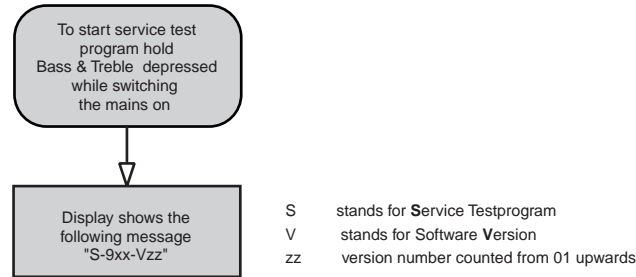
MDI /FR975 /update 28-03-00



# BLOCKDIAGRAM



FR975



TEST	Activated with	ACTION
EEPROM	PREV Button	A test pattern will be sent to the Eeprom. "PASS" is displayed if the µProcessor read back the test pattern correctly, otherwise "ERR" will be displayed.
EEPROM FORMAT	PREV Button to exit OK Button	Display shows "NEW" for 1 second. <b>Caution!</b> All presets from the customer will be Lost

**Tuner Test**

Display info Version	Europe "EUR" /00	East Eur. 3-band "EEL" /14	East Eur. 2-band "EEU" /14	USA "USA" /17	Oversea "OSE" /01
Preset 1	87.5MHz	65.81MHz	65.81MHz	87.5MHz	87.5MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz
3	531kHz	74MHz	74MHz	530kHz	531kHz
4	1602kHz	87.5MHz	87.5MHz	1700kHz	1602kHz
5	558kHz	531kHz	531kHz	560kHz	558kHz
6	1494kHz	1602kHz	1602kHz	1500kHz	1494kHz
7	153kHz	558kHz	558kHz	98MHz	----
8	279kHz	1494kHz	1494kHz	----	----
9	198kHz	153kHz	98MHz	----	----
10	98MHz	279kHz	70.01MHz	----	----
11	----	198kHz	----	----	98MHz

This table is valid for all types of tuners. Table 2  
Customer presets will not be changed after this Tuner test.  
If a station is tuned then the display flag "OK" will be ON otherwise it will be OFF.  
If the tuned frequency is carrying RDS information, the display flag "RDS" will be ON.  
Oversea version: the tuning grid can be switched between 9kHz and 10kHz by pressing the key "TUNER" for longer than 2 seconds. "Grid 9" or "Grid 10" will be shown accordingly.  
Grid 9kHz is in FM 50kHz, Grid 10kHz is in FM 100kHz  
Europe version: the LW can be switched On and Off by pressing the key "TUNER" for longer than 2 seconds. LW OFF or LW ON will be shown accordingly.

**Key Test**

Key	Number	Key	Number	Key	Number
Cinema	1	Sens	7	Loudness	13
Surr. on/off	2	*News T/A	8	Bass	14
Surr. Mode	3	Prev.Exit	9	Treble	15
Virt. Mode	4	Setup Menu	--	*Front A/V	16
Tuner	5	Next	11		
*Radio Text	6	Enter/OK	12		

\*Button Radio Text change in Name/Frequency in /01/17 version Table 1  
Button News T/A change in Display in /01/17 version  
Button Front A/V not in FR965

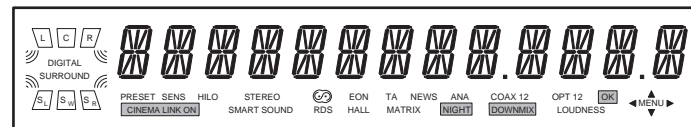


Figure 1

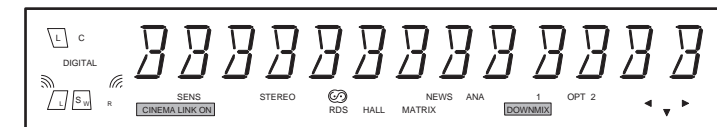
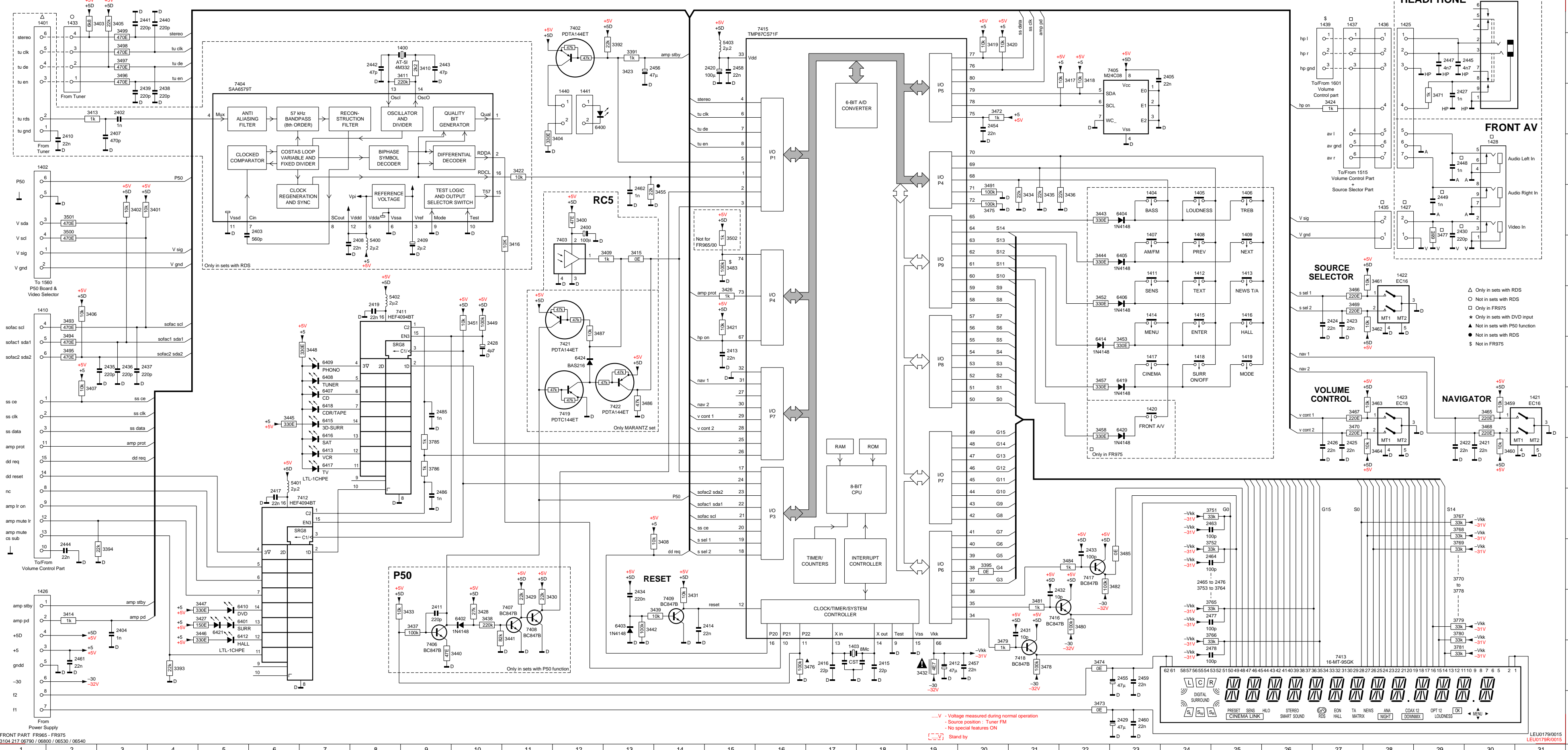


Figure 2

mdi 04-04-00



FRONT PART FR965 - FR975



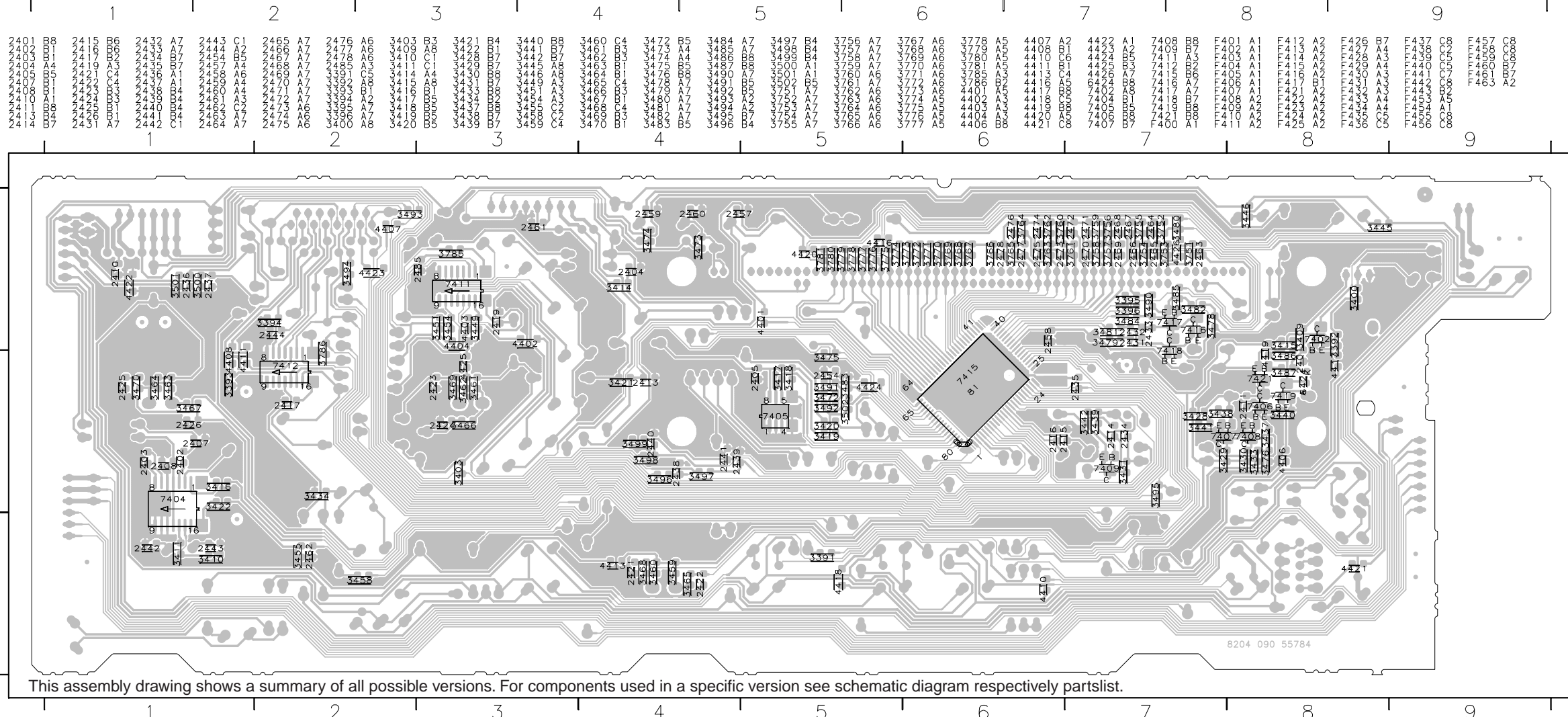
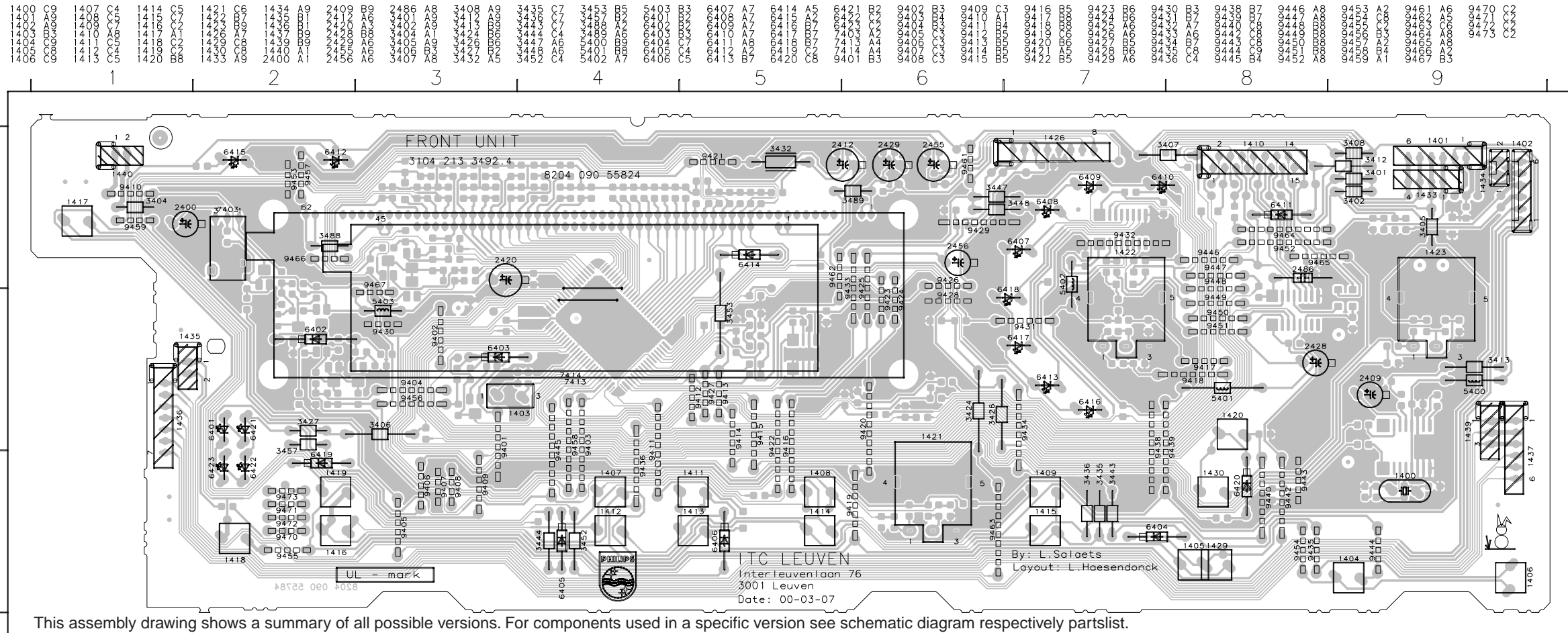
FRONT PART FR965 - FR975  
 3104 217 06790 / 06800 / 06530 / 06540

...V - Voltage measured during normal operation  
 - Source position: Tuner FM  
 - No special features ON  
 Stand by

1400	B8	3418	B22	7404	C5
1401	A1	3419	B20	7405	B22
1402	D1	3420	B20	7406	N9
1403	N17	3421	G15	7407	M11
1404	E23	3422	D11	7408	M11
1405	E24	3423	B13	7409	M14
1406	E25	3424	C27	7411	G8
1407	F23	3426	G15	7412	K6
1408	F24	3427	M4	7413	N27
1409	F25	3428	M10	7415	A16
1410	G1	3429	M11	7416	M21
1411	F23	3430	M11	7417	L22
1412	F24	3431	M14	7418	N21
1413	F25	3432	N19	7419	H12
1414	G23	3433	M9	7421	H12
1415	G24	3434	E21	7422	I13
1416	G25	3435	E21		
1417	H23	3436	E22		
1418	H24	3437	M9		
1419	H25	3438	M10		
1420	I23	3439	M13		
1421	I31	3440	N10		
1422	F28	3441	N11		
1423	I28	3442	M13		
1424	A30	3443	E22		
1425	A28	3444	F22		
1426	M1	3445	I6		
1427	E28	3446	M4		
1428	D30	3447	M4		
1433	A2	3448	H7		
1435	E28	3449	G10		
1436	A28	3451	G10		
1437	A27	3452	G22		
1438	E2	3453	H22		
1440	C12	3455	E14		
1441	C12	3457	H22		
2400	E12	3458	I22		
2402	C2	3459	L22		
2403	E6	3460	J30		
2404	M3	3461	F28		
2405	B24	3462	G28		
2407	D3	3463	H28		
2408	F8	3464	J28		
2409	F9	3465	I30		
2410	D2	3466	G27		
2411	M9	3467	M20		
2412	N19	3468	I30		
2413	H15	3469	G27		
2414	M14	3470	I27		
2415	N18	3471	C20		
2416	N17	3472	C20		
2417	K6	3473	O22		
2419	G8	3474	N22		
2420	B15	3475	E20		
2421	J30	3476	N16		
2422	J29	3477	F29		
2423	G27	3478	N21		
2424	G27	3479	N20		
2425	J27	3480	N22		
2426	J27	3481	M21		
2427	C29	3482	L23		
2428	H10	3483	F15		
2429	O23	3484	L22		
2430	E29	3485	L23		
2431	M21	3486	I13		
2432	M21	3487	G12		
2433	L22	3491	E20		
2434	M13	3493	G2		
2435	H3	3494	H2		
2436	H3	3495	H2		
2437	H3	3496	B3		
2438	C4	3497	B3		
2439	C3	3498	B3		
2440	A4	3499	A3		
2441	A3	3500	E2		
2442	B8	3501	E2		
2443	B9	3502	F15		
2444	L2	3751	K24		
2445	B29	3752	L24		
2447	B29	3753	N24		
2448	D29	3764	M25		
2449	E29	3765	M24		
2454	C20	3766	M24		
2455	N23	3767	K29		
2456	B13	3768	K29		
2457	N20	3769	L29		
2458	B15	3770	L29		
2459	N23	3778	M29		
2460	O23	3779	M29		
2461	N2	3780	M29		
2462	E13	3781	N29		
2463	K24	3785	J9		
2464	L24	3786	I9		
2465	L24	5400	F8		
2466	L24	5401	F8		
2476	L25	5401	J6		
2477	N24	5402	G8		
2478	N24	5403	B15		
2485	I9	6400	C12		
2486	K9	6401	M5		
3391	B13	6402	M10		
3392	B13	6403	M13		
3393	N4	6404	E23		
3394	L3	6405	F23		
3395	L20	6406	G23		
3400	E12	6407	I7		
3401	E4	6408	H7		
3402	E3	6409	H7		
3403	A2	6410	M5		
3404	D12	6412	M5		
3405	A3	6413	J7		
3406	G2	6414	H22		
3407	I2	6415	I7		
3408	L14	6416	I7		
3409	F12	6417	I7		
3410	B9	6418	I7		
3411	B8	6419	H23		
3413	C2	6420	I23		
3414	M2	6421	M5		
3415	F13	6424	H12		
3416	F11	7402	A12		
3417	B22	7403	F12		

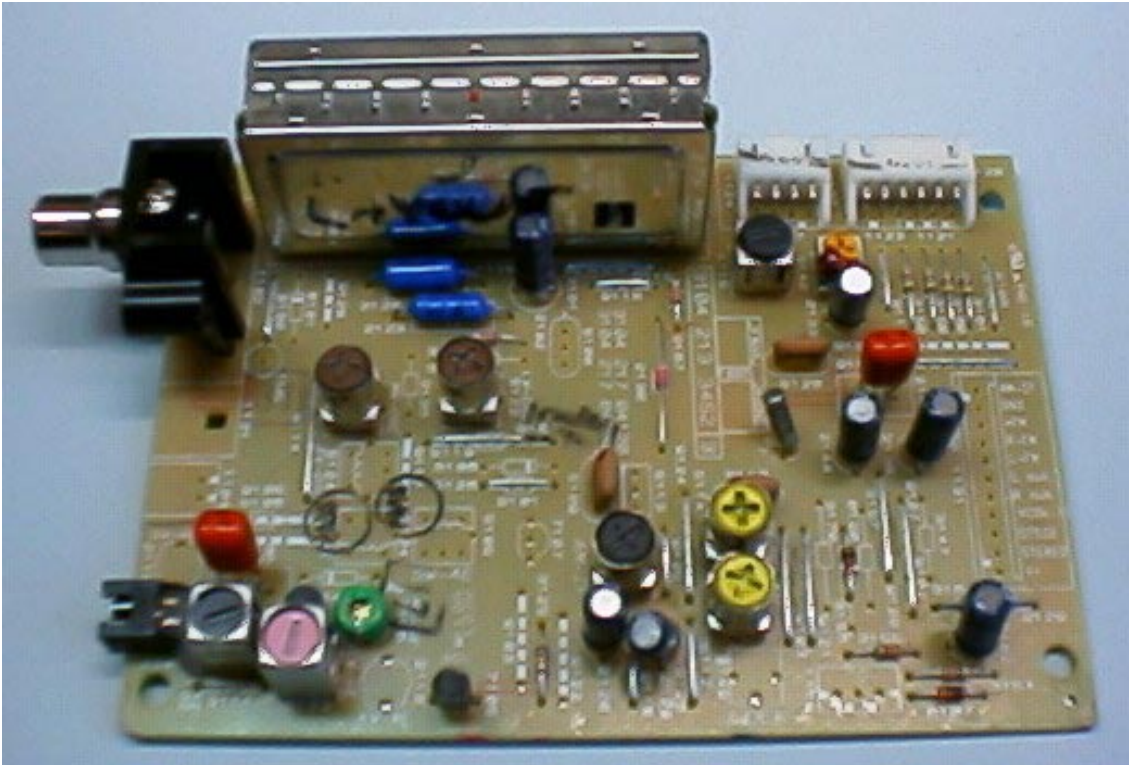


FRONT BOARD - COMPONENT & COPPER SIDE VIEW







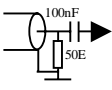




# ***TUNER 95 BOARD***


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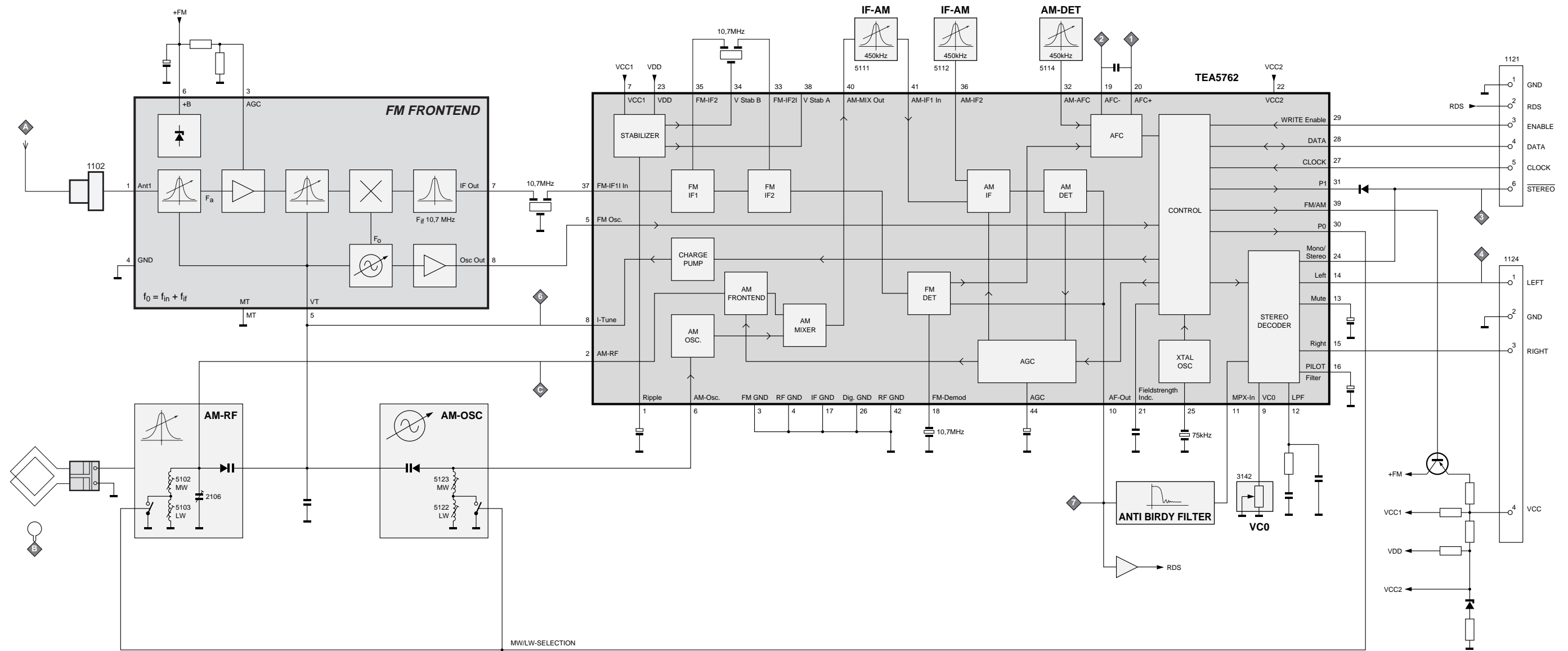
**TUNER 95 bis Adjustment Table (FM, MW, LW with Frame antenna)**

Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
<b>VARICAP ALIGNMENT</b>						
<b>FM</b> (50) 87.5 - 108 MHz			108 MHz	check	6	7 ... 9V
			87.5 MHz	check		1.3 ... 2V
<b>MW</b> (9) 531 - 1602 kHz			1602 kHz	5123		8.3V ± 0.2V
			531 kHz	check		1V ± 0.4V
<b>LW</b> (3) 153 - 279 kHz			279 kHz	5122		8.3V ± 0.2V
			153 kHz	check		1V ± 0.4V
<b>FM - DETECTION</b>						
<b>FM</b>	98 Mhz 1mV continuous wave  <i>short pin 21 (IC7101) to ground</i>	A	98 MHz	5107	1 2	0mV ± 3mV
<b>FM - VCO</b>						
<b>FM</b>	98 Mhz 1 mV continuous wave	A	98 MHz	3142	3	152kHz ± 1 kHz
<b>DISTORTION</b>						
<b>FM</b>	98 Mhz 1 mV 90 % L + 9 % pilot mod = 1kHz	A	98MHz	mixcoil inside Tuner 1110	4	Distortion minimum
<b>AM - IF</b>						
<b>MW</b>	450kHz $\Delta f = 10\text{kHz}$ Low as possible Swept signal		MW	5111	7	symmetrical and max. height 
				5112		
	450kHz continuous wave	C		5114	1 2	
<b>AM - RF</b>						
<b>MW</b>	558kHz Mod = 1kHz 30 % AM 1494 kHz	B	558kHz	5102	7	MAX 
			1494kHz	2106		
<b>LW</b>	198kHz mod = 1kHz 30 % AM		*	198kHz		

\* Signal send via a frame antenna  
(..) = tuning grid in kHz

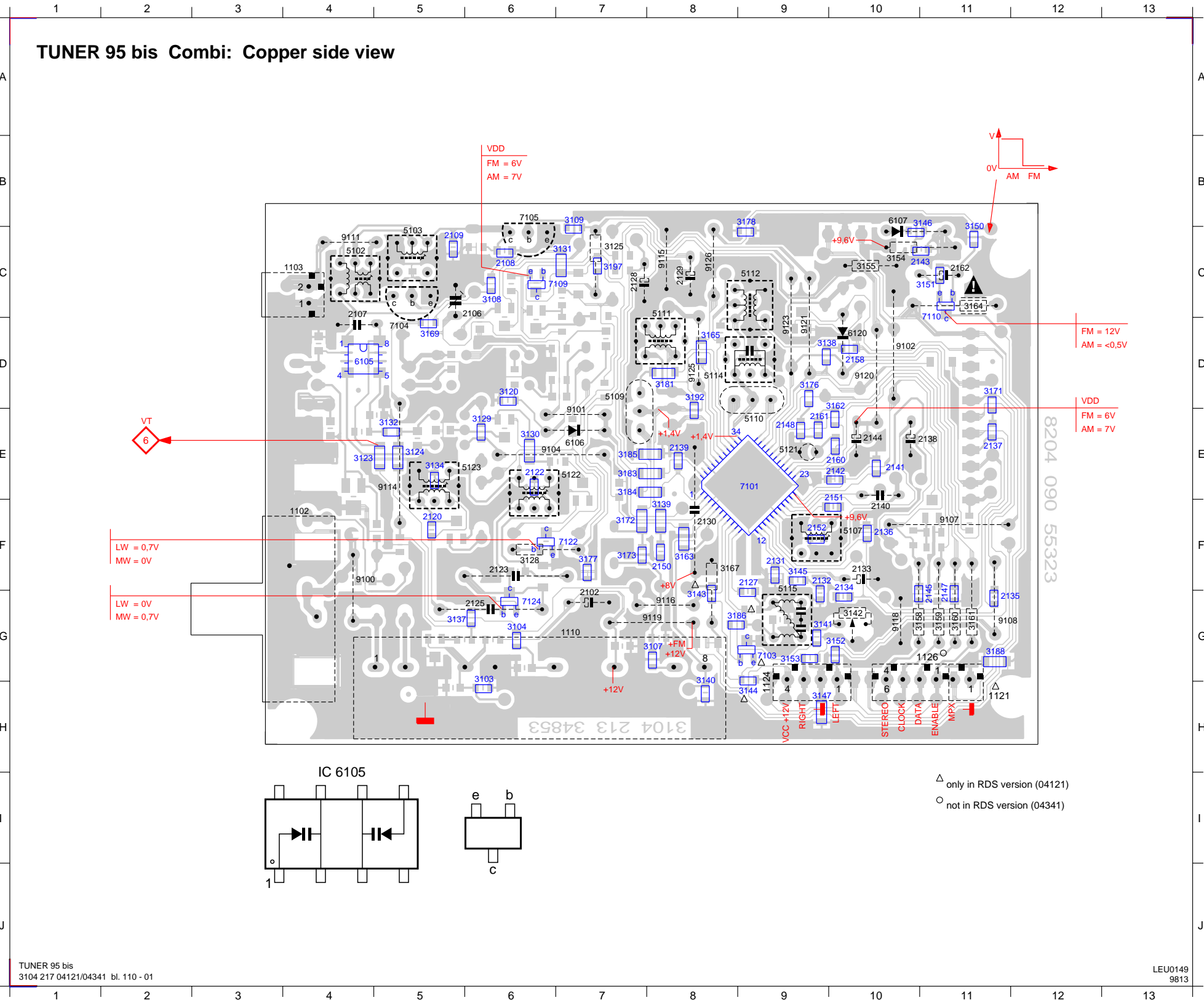
 repeat

adjtable for 3104 217 04121/04341





1102	F4	2107	C4	2128	C7	2136	G10	2144	E10	2160	E9	3120	D6	3132	E5	3143	G8	3153	G9	3163	F8	3176	D9	3188	G11	5111	C8	6106	E7	7110	D11	9108	G11	9121	D9
1103	C4	2108	C6	2129	C8	2137	E11	2145	G11	2161	E9	3123	E4	3134	E5	3144	H9	3154	C10	3164	C11	3177	F7	3192	D8	5112	C9	6107	B10	7122	F7	9111	C4	9123	D9
1110	G7	2109	C5	2130	F8	2138	E10	2147	G11	2162	C11	3124	E5	3137	G5	3145	F9	3155	C10	3165	D8	3178	B8	3197	C7	5114	D8	6120	D10	7124	G6	9114	E5	9125	D8
1121	H11	2120	F5	2131	F9	2139	E8	2148	E9	3103	H6	3125	C7	3138	D9	3146	B10	3158	G11	3167	F8	3181	D8	5102	C4	5115	G9	7101	E9	9100	F4	9115	C8	9126	C8
1124	H9	2122	E6	2132	F9	2140	F10	2150	F8	3104	G6	3128	F6	3139	F8	3147	H9	3159	G11	3169	D5	3183	E7	5103	C5	5121	E9	7103	G9	9101	E7	9116	G8		
1126	G10	2123	F6	2133	F10	2141	E10	2151	F9	3107	G7	3129	E6	3140	H8	3150	C11	3160	G11	3171	D11	3184	E7	5107	F10	5122	E7	7104	D5	9102	D10	9118	G10		
2102	G7	2125	G6	2134	G10	2142	E9	2152	F9	3108	C6	3130	E6	3141	G9	3151	C10	3161	G11	3172	F7	3185	E7	5109	D7	5123	E5	7105	B6	9104	E6	9119	G7		
2106	C5	2127	F9	2135	G11	2143	C10	2158	D10	3109	B7	3131	C6	3142	G10	3152	G9	3162	D9	3173	F7	3186	G8	5110	E9	6105	D4	7109	C6	9107	F11	9120	D10		







## ELECTRICAL PARTSLIST - TUNER 95 BOARD

## MISCELLANEOUS

1102 4822 267 10283 YKD31-0432  
 1103 4822 265 31184 S2B-XH-A-BK  
 1110 4822 210 10739 FE415-G23

## CAPACITORS

2102 4822 124 80791 470UF20%16V  
 2106 4822 125 60102 5P2-30P N750100V  
 2107 4822 121 51252 470NF 5%63V  
 2108 4822 126 13695 82PF 1% NP063V  
 2109 5322 122 32658 22PF 5% 50V

2120 5322 122 32659 33PF5%50V  
 2122 5322 126 10465 3,9NF 10% X7R 50V 08  
 2123 4822 121 10766 390PF 1% 630V KP464  
 2125 4822 121 10578 560P1%630V  
 2127 4822 122 32927 220NF +80-20%Y5V 50V

2128 4822 124 41579 10UF 20% 50V  
 2129 4822 124 40242 1UF20%63V  
 2130 4822 126 11585 22NF+80-20% Y5V 25V  
 2131 4822 122 33325 470NF 16V  
 2132 4822 122 33325 470NF 16V

2133 4822 124 40242 1UF20%63V  
 2134 4822 126 13188 15NF 5% X7R63V  
 2135 4822 122 32927 220NF +80-20%Y5V 50V  
 2136 4822 126 13188 15NF 5% X7R63V  
 2137 4822 122 32927 220NF +80-20%Y5V 50V

2138 4822 124 41576 2,2UF 20% 50V  
 2139 4822 126 10002 100NF20%Y5V 25V  
 2140 4822 121 51252 470NF 5%63V  
 2141 4822 122 31947 100NF20%Y5V 63V  
 2142 4822 122 31947 100NF20%Y5V 63V

2143 4822 122 32927 220NF +80-20%Y5V 50V  
 2144 4822 124 40242 1UF20%63V  
 2145 4822 122 33575 220PF5%NPO50V  
 2147 4822 122 33575 220PF5%NPO50V  
 2148 4822 122 33809 22NF20%Y5V 50V

2150 4822 122 31947 100NF20%Y5V 63V  
 2151 4822 126 14236 50V 15P 5%  
 2152 4822 126 13695 82PF 1% NP063V  
 2158 4822 122 31947 100NF20%Y5V 63V  
 2160 4822 122 32139 12PF 2%NP0 63V

2161 5322 122 34123 1NF10%X7R 50V  
 2162 4822 124 81151 22UF 50V

## RESISTORS

3103 4822 051 20008 0R00 JUMP. (0805)  
 3104 4822 051 10102 1K002% 0,25W  
 3107 4822 051 20829 82R005%0,1W  
 3108 4822 117 11449 2K2 1%0,1W  
 3109 4822 117 11449 2K2 1%0,1W

3110 4822 051 20008 0R00 JUMP. (0805)  
 3111 4822 051 20008 0R00 JUMP. (0805)  
 3120 4822 051 20008 0R00 JUMP. (0805)  
 3123 4822 051 10008 0R005% 0,25W  
 3124 4822 051 10008 0R005% 0,25W

3125 4822 116 83864 10K5%0,5W  
 3128 4822 116 52256 2K2 5%0,5W  
 3129 4822 051 20008 0R00 JUMP. (0805)  
 3130 4822 051 10008 0R005% 0,25W  
 3131 4822 051 10008 0R005% 0,25W

3132 4822 051 20008 0R00 JUMP. (0805)  
 3134 4822 051 20223 22K005%0,1W  
 3135 4822 051 20008 0R00 JUMP. (0805)  
 3137 4822 117 10833 10K1%0,1W  
 3138 4822 051 20008 0R00 JUMP. (0805)

3139 4822 051 10008 0R005% 0,25W  
 3140 4822 051 20331 330R005%0,1W  
 3141 4822 117 11148 56K1%0,1W  
 3142 4822 100 11163 100K30%LIN0,1W  
 3143 4822 051 20223 22K005%0,1W

3144 4822 051 10102 1K002% 0,25W  
 3145 4822 117 11449 2K2 1%0,1W  
 3146 4822 051 20479 47R005%0,1W  
 3147 4822 051 10008 0R005% 0,25W  
 3150 4822 051 20472 4K705%0,1W

3151 4822 051 20683 68K005%0,1W  
 3152 4822 051 20471 470R005%0,1W  
 3153 4822 051 20471 470R005%0,1W  
 3154 4822 116 83868 150R5%0,5W  
 3155 4822 116 52219 330E5%0,5W

3158 4822 116 83883 470R5%0,5W  
 3159 4822 116 83883 470R5%0,5W  
 3160 4822 116 83883 470R5%0,5W  
 3161 4822 116 83883 470R5%0,5W  
 3162 4822 051 20224 220K005%0,1W

3163 4822 051 10008 0R005% 0,25W  
 3164 4822 052 10478 4R705% 0,33W  
 3165 4822 051 10008 0R005% 0,25W  
 3167 4822 116 83872 220R5%0,5W  
 3169 4822 051 20008 0R00 JUMP. (0805)

3171 4822 051 20008 0R00 JUMP. (0805)  
 3172 4822 051 10008 0R005% 0,25W  
 3173 4822 051 20008 0R00 JUMP. (0805)  
 3176 4822 051 20008 0R00 JUMP. (0805)  
 3177 4822 051 20223 22K005%0,1W

## ELECTRICAL PARTSLIST - TUNER 95 BOARD

## RESISTORS

3178 4822 051 10008 0R005% 0,25W  
 3181 4822 051 10008 0R005% 0,25W  
 3183 4822 051 10008 0R005% 0,25W  
 3184 4822 051 10008 0R005% 0,25W  
 3185 4822 051 10008 0R005% 0,25W

3186 4822 051 10102 1K002% 0,25W  
 3188 4822 051 10008 0R005% 0,25W  
 3192 4822 051 20008 0R00 JUMP. (0805)  
 3197 4822 051 20472 4K705%0,1W

COILS & FILTERS

5102 4822 157 71634 MW AERIAL  
 5103 4822 157 71635 LW AERIAL  
 5107 4822 157 11443 2U4 10M7  
 5109 4822 157 71639 SFE10,7MJA10H-A-TF21  
 5110 4822 242 70665 SFE10,7MS3-A

5111 4822 158 60511 AM-1F  
 5112 4822 157 70302 F7MCS-12216N  
 5114 4822 157 70302 F7MCS-12216N  
 5115 4822 157 71636 BIRDIE COIL  
 5121 4822 242 10261 T6252F00 (75KHZ)

5122 4822 157 60517 110,00 UH8%  
 5123 4822 157 60517 110,00 UH8%

## DIODES

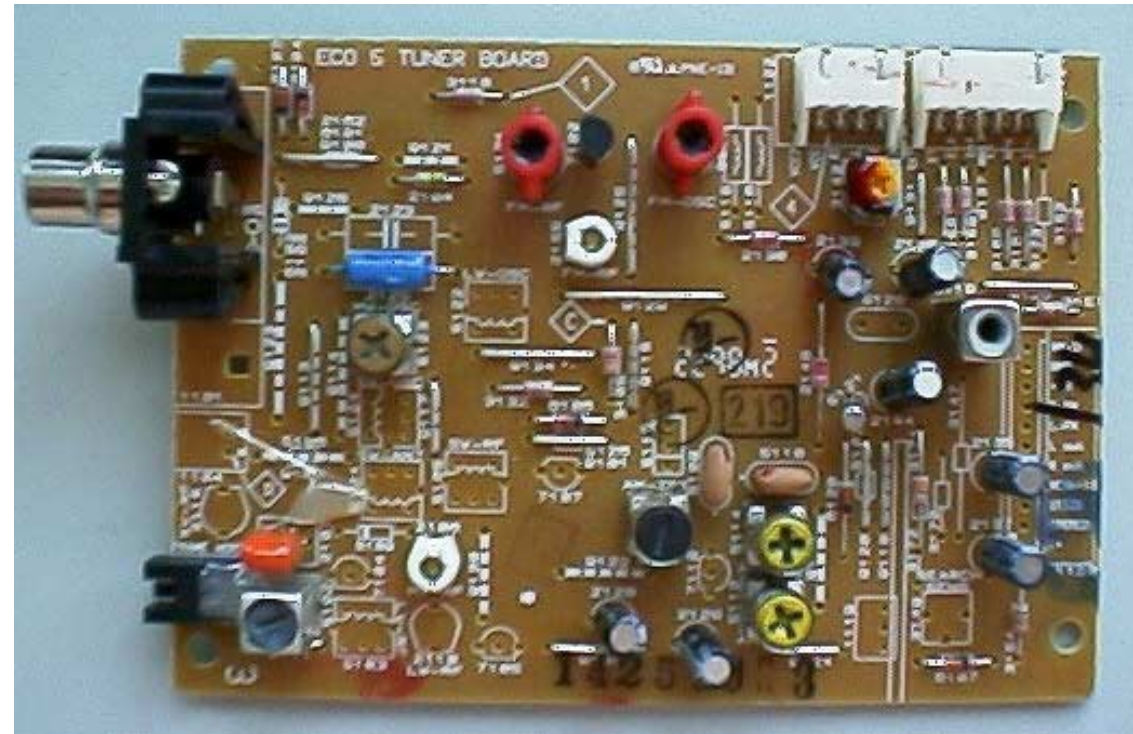
6105 4822 130 83075 HN1V02H-B  
 6106 4822 130 30621 1N4148  
 6107 4822 130 34488 BZX79-B11  
 6120 4822 130 30621 1N4148

## TRANSISTORS &amp; INTERGRATED CIRCUITS

7101 4822 209 90315 TEA5762H/V1  
 7103 4822 130 42513 BC858C  
 7104 5322 130 44779 BC338-40  
 7105 5322 130 44779 BC338-40  
 7109 5322 130 41983 BC858B

7110 5322 130 41983 BC858B  
 7122 5322 130 42136 BC848C  
 7124 5322 130 42136 BC848C

BLOCKDIAGRAM

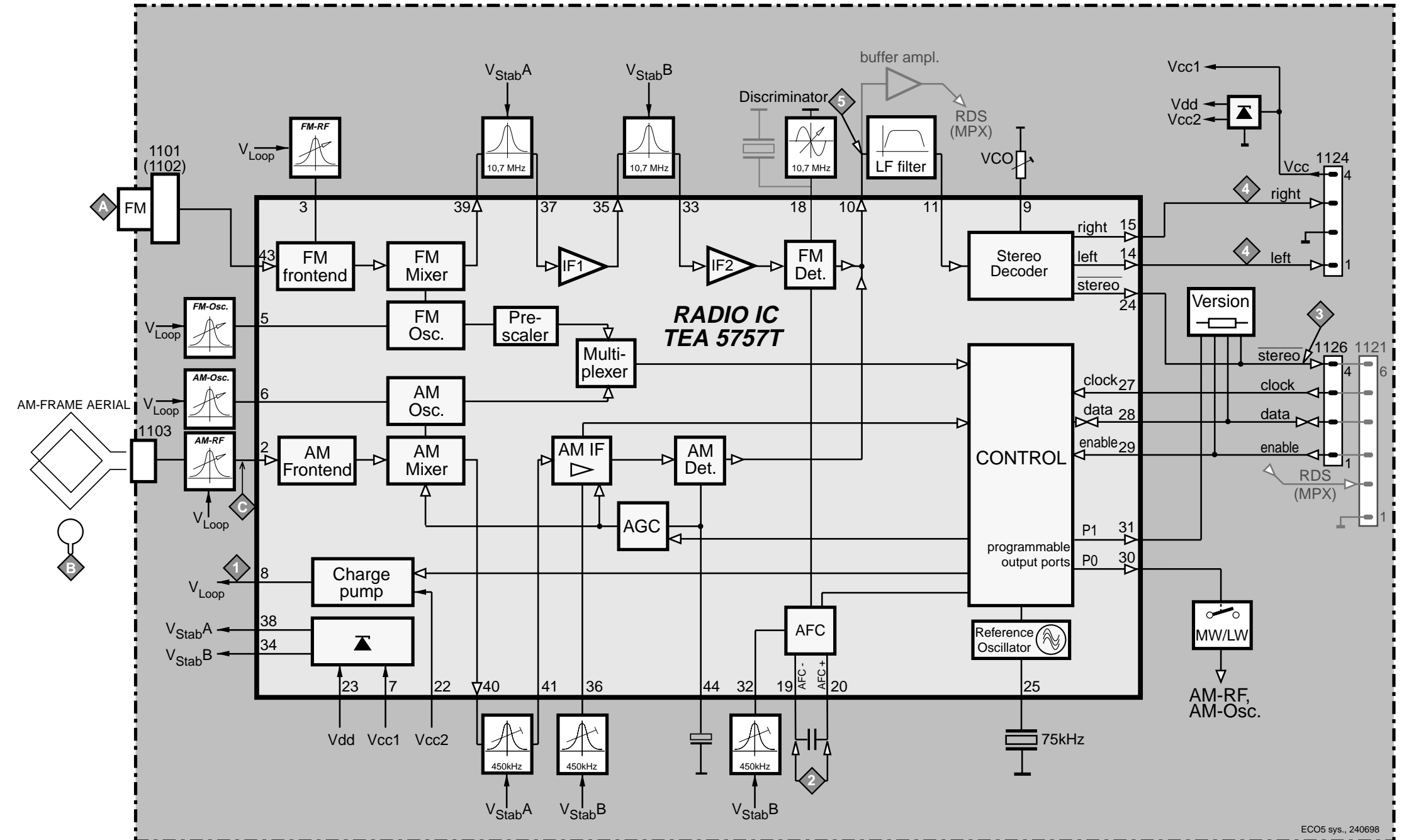


# TUNER BOARD ECO5

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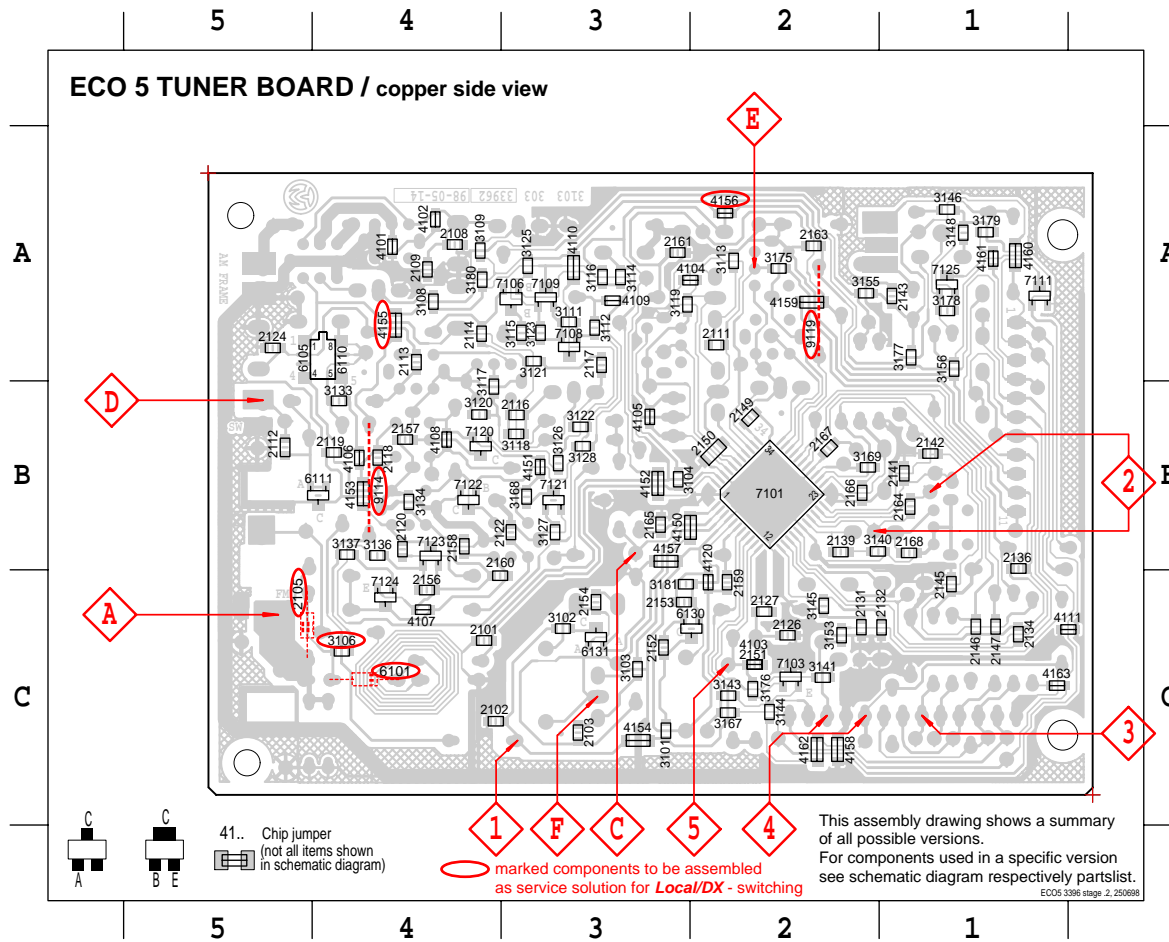
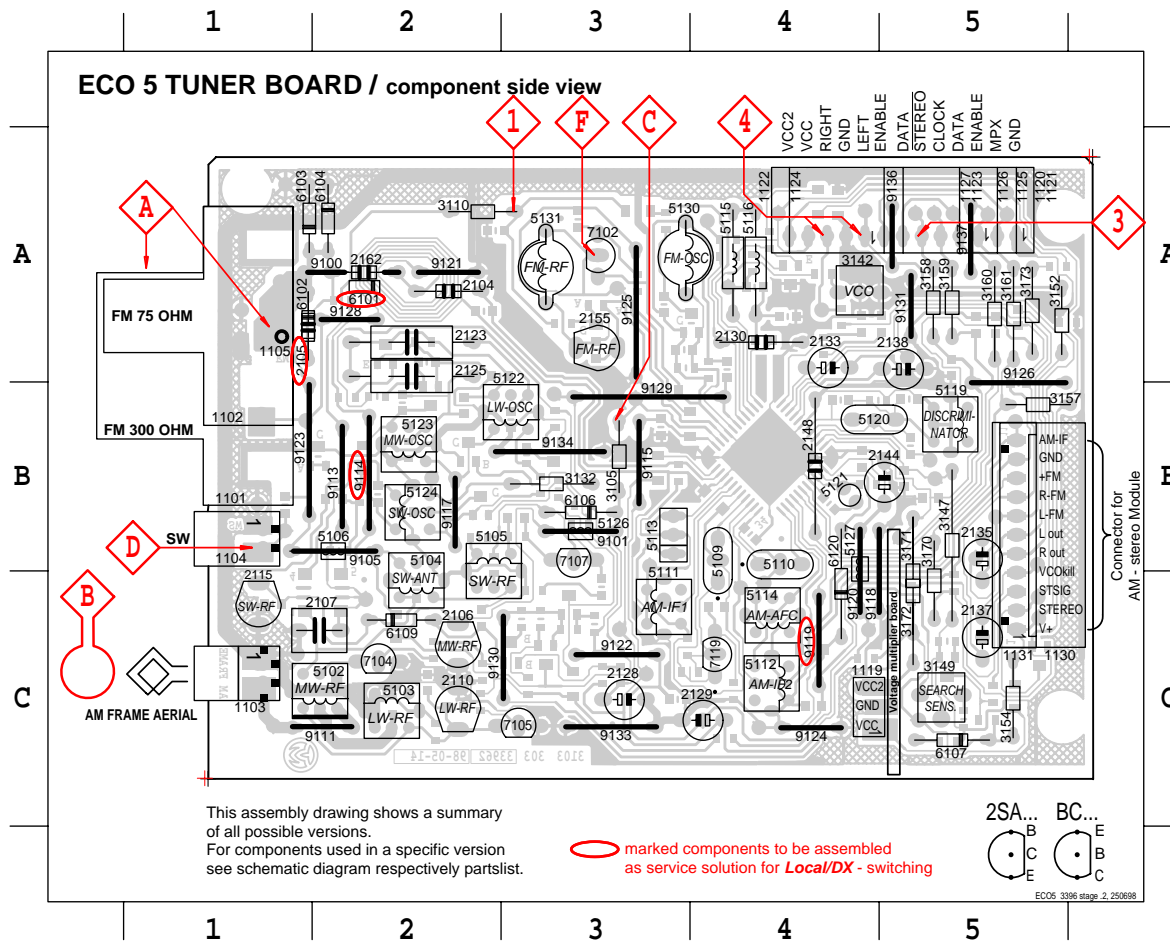
## TUNER BOARD ECO 5 systems





1101 A1	2106 C2	2137 C5	3149 C5	3173 A5	5114 C4	5130 A3	7104 C2	9117 B2	9129 B3
1102 A1	2107 C2	2138 A5	3152 A5	5102 C2	5115 A4	5131 A3	7105 C3	9118 B4	9130 C3
1103 C1	2110 C2	2144 B5	3154 C5	5103 C2	5116 A4	6101 A2	7107 B3	9119 C4	9131 A5
1104 B1	2115 C1	2148 B4	3157 B5	5104 C2	5119 B5	6102 A1	7119 C4	9120 B4	9133 C3
1105 A1	2123 A2	2155 A3	3158 A5	5105 B2	5120 B4	6103 A1	9100 A2	9121 A2	9134 B3
1119 C5	2125 A2	2162 A2	3159 A5	5106 B2	5121 B4	6104 A2	9101 B3	9122 C3	9136 A5
1120 A5	2128 C3	3105 B3	3160 A5	5109 B4	5122 B3	6106 B3	9105 B2	9123 B1	9137 A5
1130 B5	2129 C4	3110 A2	3161 A5	5110 B4	5123 B2	6107 C5	9111 C2	9124 C4	
1131 B5	2130 A4	3132 B3	3170 C5	5111 C3	5124 B2	6109 C2	9112 B2	9125 A3	
2104 A2	2133 A4	3142 A4	3171 C5	5112 C4	5126 B3	6120 C4	9114 B2	9126 B5	
2105 A1	2135 B5	3147 B5	3172 C5	5113 B3	5127 B4	7102 A3	9115 B3	9128 A2	

2101 C4	2118 B4	2139 B2	2153 C3	2166 B2	3112 A3	3123 A3	3143 C2	3175 A2	4105 B3	4153 B4	6105 A4	7120 B4
2102 C4	2119 B4	2141 B1	2154 C3	2167 B2	3113 A2	3125 A3	3144 C2	3176 C2	4106 B4	4154 C3	6110 A4	7121 B3
2103 C3	2120 B4	2142 B1	2156 C4	2168 B1	3114 A3	3126 B3	3145 C2	3177 A1	4107 C4	4155 A4	6111 B4	7122 B4
2108 A4	2122 B3	2143 A1	2157 B4	3101 C3	3115 A3	3127 B3	3146 A1	3178 A1	4108 B4	4156 A2	6130 C2	7123 B4
2109 A4	2124 A5	2145 C1	2158 B4	3102 C3	3116 A3	3128 B3	3148 A1	3179 A1	4109 A3	4157 B3	6131 C3	7124 C4
2111 A2	2126 C2	2146 C1	2159 C2	3103 C3	3117 B4	3133 B4	3153 C2	3180 A4	4110 A3	4158 C2	7101 B2	7125 A1
2112 B5	2127 C2	2147 C1	2160 C4	3104 B3	3118 B3	3134 B4	3155 A2	3181 C3	4111 C1	4159 A2	7103 C2	
2113 A4	2131 C2	2149 B2	2161 A3	3106 C4	3119 A3	3136 B4	3156 A1	4101 A4	4120 C2	4160 A1	7106 A3	
2114 A4	2132 C1	2150 B2	2163 A2	3108 A4	3120 B4	3137 B4	3167 C2	4102 A4	4150 B2	4161 A1	7108 A3	
2116 B3	2134 C1	2151 C2	2164 B1	3109 A4	3121 A3	3140 B2	3168 B3	4103 C2	4151 B3	4162 C1	7109 A3	
2117 A3	2136 B1	2152 C3	2165 B3	3111 A3	3122 B3	3141 C2	3169 B2	4104 A2	4152 B3	4163 C1	7111 A1	



**TUNER ADJUSTMENT TABLE ( ECO5 FM/MW- and FM/MW/LW - versions with AM-frame aerial )**

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
<i>VARICAP ALIGNMENT</i>						
<b>FM</b> 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130		8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
<b>MW</b> FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FMMW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123	1	6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
<b>LW</b> 153 - 279kHz			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
<b>MW</b> FM/MW/LW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
<i>FM IF</i>						
<b>FM</b>	10.7MHz, 50mV continuous wave	F		5119	2	0 ± 3 mV DC
<i>FM RF</i>						
<b>FM</b> 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	A mod=1kHz Δf=±22.5kHz	108MHz	2155	4	MAX
	87.5MHz (65.81MHz)		87.5MHz (65.81MHz)	5131		
<i>VCO</i>						
<b>FM</b>	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz <sup>1)</sup>
<i>AM IF</i>						
<b>MW</b>	450kHz  connect pin 6 of IC 7101 (AM Osc.) with short wire to ground (pin 4)	C Δf=±15kHz V <sub>RF</sub> = 3mV		5111	4	
				5112		
<b>AM AFC</b>		C continuous wave V <sub>RF</sub> = 10mV		5114	2	0 ± 2 mV DC
<b>MW</b>						
<i>AM RF<sup>3)</sup></i>						
<b>MW<sup>4)</sup></b> FMMW/LW- and FMMW-version (9kHz grid) 531 - 1602kHz	1494kHz	B	1494kHz	2106	4	
	558kHz		558kHz	5102		
<b>LW</b>	198kHz		198kHz	5103		
<b>MW</b> FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz	Δf = ±30kHz V <sub>RF</sub> as low as possible	1500kHz	2106		
	560kHz		560kHz	5102		

Use service test program. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

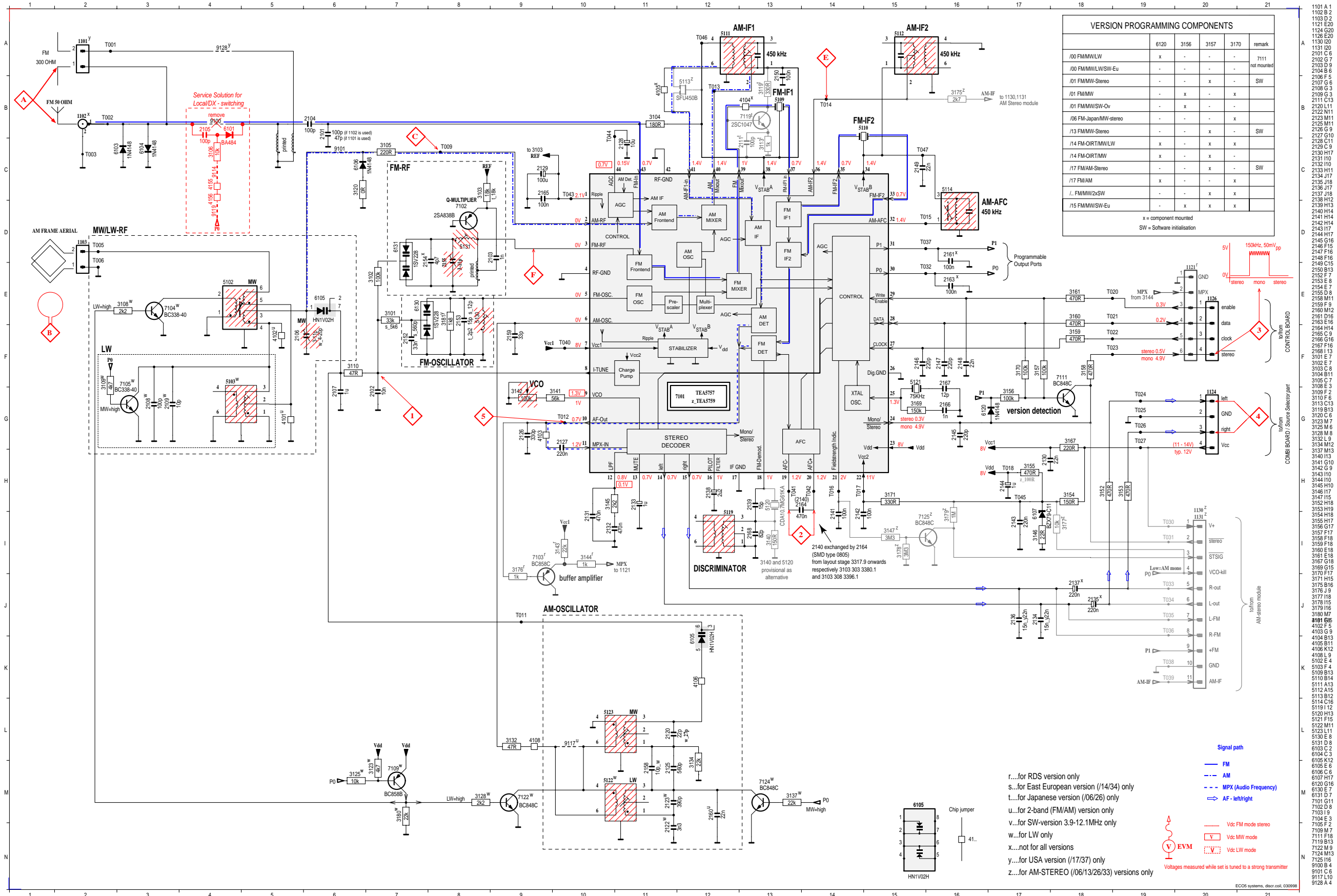
<sup>1)</sup> If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

<sup>2)</sup> RC network serves for damping the IF-filter while adjusting the other one.

<sup>3)</sup> For AM RF adjustments the original frame antenna has to be used!

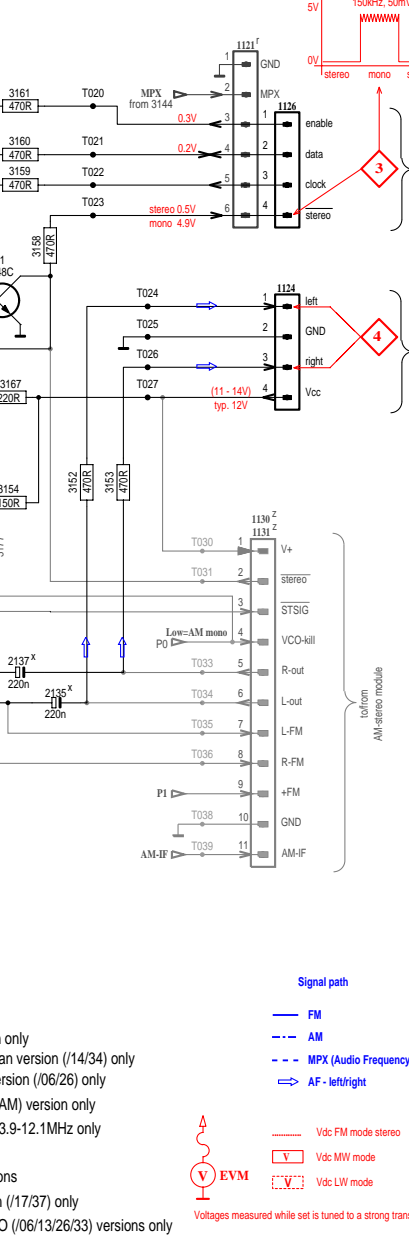
<sup>4)</sup> MW has to be aligned before LW.

↑ Repeat



VERSION PROGRAMMING COMPONENTS					
	6120	3156	3157	3170	remark
/00 FMMW/LW	x	-	-	-	7111
/00 FMMW/LW/SW-Eu	-	-	-	-	not mounted
/01 FMMW-Stereo	-	-	x	-	SW
/01 FMMW	-	x	-	x	
/01 FMMW/SW-Qv	-	x	-	-	
/06 FMMW/Japan/MW-sterio	-	-	-	x	
/13 FMMW-Stereo	-	-	x	-	SW
/14 FM-QIRT/MW/LW	x	-	x	x	
/17 FM/AM-Stereo	-	-	x	-	SW
/17 FM/AM	x	-	-	x	
/1 FMMW/2xSW	-	-	x	x	
/15 FMMW/SW-Eu	-	x	x	x	

x = component mounted  
SW = Software initialisation



r...for RDS version only  
 s...for East European version (/14/34) only  
 t...for Japanese version (/06/26) only  
 u...for 2-band (FM/AM) version only  
 v...for SW-version 3.9-12.1MHz only  
 w...for LW only  
 x...not for all versions  
 y...for USA version (/17/37) only  
 z...for AM-STEREO (/06/13/26/33) versions only

**Signal path**  
 — FM  
 - - - AM  
 - - - MPX (Audio Frequency)  
 <-> AF - left/right

**Chip jumper**  
 H11V02H

**Voltage measurement symbols:**  
 V: Vdc FM mode stereo  
 V: Vdc MW mode  
 V: Vdc LW mode  
 V: Vdc FM mode mono  
 V: Vdc MW mode mono  
 V: Vdc LW mode mono

**Notes:**  
 Voltages measured while set is tuned to a strong transmitter

1101 A 1  
 1102 B 2  
 1103 D 2  
 1121 E 20  
 1124 G 20  
 1126 E 20  
 1130 D 20  
 1131 D 20  
 2101 C 6  
 2102 G 7  
 2103 D 9  
 2104 B 6  
 2106 F 5  
 2107 G 6  
 2108 G 3  
 2109 G 3  
 2111 C 13  
 2120 L 11  
 2121 B 11  
 2123 M 11  
 2125 M 11  
 2126 G 9  
 2127 G 10  
 2128 C 11  
 2129 C 9  
 2130 H 17  
 2131 H 10  
 2132 H 10  
 2133 H 11  
 2134 J 17  
 2135 J 18  
 2136 J 17  
 2137 H 18  
 2138 H 12  
 2139 H 13  
 2140 H 14  
 2141 H 14  
 2142 H 14  
 2143 J 17  
 2144 H 17  
 2145 G 16  
 2146 F 15  
 2147 F 16  
 2148 F 16  
 2149 C 15  
 2150 B 13  
 2152 F 7  
 2153 E 8  
 2154 E 8  
 2158 M 11  
 2159 F 9  
 2160 M 12  
 2161 D 16  
 2163 E 16  
 2164 H 14  
 2165 C 9  
 2166 G 16  
 2167 F 16  
 2168 J 13  
 3101 E 7  
 3102 E 7  
 3103 C 8  
 3104 B 11  
 3105 C 7  
 3108 E 3  
 3109 F 2  
 3110 F 6  
 3113 C 13  
 3120 C 6  
 3125 M 6  
 3128 M 8  
 3132 E 9  
 3134 M 12  
 3137 M 13  
 3141 G 10  
 3142 G 9  
 3143 H 10  
 3144 H 10  
 3145 H 10  
 3146 J 15  
 3152 H 18  
 3153 H 19  
 3154 H 18  
 3155 H 17  
 3156 G 17  
 3157 F 17  
 3158 F 18  
 3159 F 18  
 3160 E 18  
 3161 E 18  
 3162 E 18  
 3168 G 15  
 3170 F 17  
 3171 H 15  
 3172 H 18  
 3173 H 9  
 3174 H 8  
 3175 H 8  
 3176 J 9  
 3177 H 8  
 3178 H 8  
 3179 H 16  
 3180 M 7  
 3181 G 5  
 4102 F 5  
 4103 G 9  
 4104 B 13  
 4105 B 11  
 4106 K 12  
 4108 L 9  
 5102 E 4  
 5103 F 4  
 5109 B 13  
 5110 B 14  
 5111 A 13  
 5112 A 13  
 5113 B 12  
 5114 C 16  
 5119 L 12  
 5120 H 13  
 5121 F 15  
 5122 M 11  
 5123 L 11  
 5130 E 8  
 5131 D 8  
 6103 C 2  
 6104 C 3  
 6105 K 12  
 6106 E 6  
 6106 C 6  
 6107 H 7  
 6120 G 16  
 6130 E 7  
 6131 D 7  
 7101 G 11  
 7102 D 8  
 7103 J 9  
 7104 E 3  
 7105 F 2  
 7109 M 9  
 7111 F 18  
 7119 B 13  
 7122 M 9  
 7124 M 13  
 7125 L 16  
 9100 B 4  
 9101 C 6  
 9117 L 10  
 9128 A 4

**ELECTRICAL PARTSLIST - ECO5 TUNER BOARD****MISCELLANEOUS**

1101 482226731505 Antenna Socket 300R only in /17  
 1102 482226710283 Antenna Socket 75R only in /01

**CAPACITORS**

2101 532212232531 100PF 5%NP0 50V only in /01  
 2101 482212613692 47PF 1% NP0 63V only in /17  
 2102 482212233177 10NF 20% X7R 50V  
 2103 532212234123 1NF10%X7R 50V  
 2104 482212233195 100PF 10% 50V

2106 482212560101 3P0-11P N450 100V  
 2107 482212151319 1UF 10% 63V  
 2120 532212232658 22PF 5% 50V  
 2125 482212151381 560PF 5% 400V  
 2126 532212231863 63V 330PF PM5

2127 482212613473 220NF80-20% 50V  
 2128 482212441579 10UF 20% 50V  
 2129 482212441584 100UF 20% 10V  
 2130 482212611585 22NF+80-20% Y5V 25V  
 2131 482212613482 470NF80/20% 16V

2132 482212613482 470NF80/20% 16V  
 2133 482212440242 1UF20% 63V  
 2134 482212613188 15NF 5% X7R 63V only in /01  
 2134 532212232654 22NF10%X7R 63V only in /17  
 2135 482212440746 0,22UF20% 63V

2136 482212613188 15NF 5% X7R 63V only in /01  
 2136 532212232654 22NF10%X7R 63V only in /17  
 2137 482212440746 0,22UF20% 63V  
 2138 482212441576 2,2UF 20% 50V  
 2139 482212614236 50V 15P 5%

2141 482212610002 100NF20%Y5V 25V  
 2142 482212610002 100NF20%Y5V 25V  
 2143 482212613473 220NF80-20% 50V  
 2144 482212440242 1UF20% 63V  
 2145 482212233575 220PF 5% NP0 63V

2146 482212233575 220PF 5% NP0 63V  
 2147 482212233575 220PF 5% NP0 63V  
 2148 482212611585 22NF+80-20% Y5V 25V  
 2149 532212232654 22NF10%X7R 63V  
 2150 482212231947 100NF20%Y5V 63V

2152 482212612105 50V 33NF PM5  
 2153 482212232504 15PF 2% NP0 50V 1206  
 2155 482212560101 3P0-11P N450 100V  
 2159 532212232659 33PF 5% 50V  
 2160 532212232654 22NF10%X7R 63V

2164 482212613482 470NF80/20% 16V  
 2165 482212610002 100NF20%Y5V 25V  
 2166 532212234123 1NF10%X7R 50V  
 2167 482212232139 12PF 2%NP0 63V  
 2168 482212613695 82PF 1% NP0 63V

**RESISTORS**

3101 482205120333 33K00 5% 0,1W  
 3102 482205120104 100K00 5% 0,1W  
 3103 482211710965 18K 1% 0,1W  
 3104 482211711448 180R 1% 0,1W  
 3105 482211683872 220R 5% 0,5W

3110 482211652195 47E 5% 0,5W  
 3120 482205120008 0R00 JUMP. (0805)  
 3132 482211652195 47E 5% 0,5W  
 3134 482205120223 22K00 5% 0,1W  
 3141 482211711148 56K 1% 0,1W

3142 482210011163 100K 30%LIN 0,1W  
 3145 482211711449 2K2 1% 0,1W  
 3146 482205120229 22R 5% 0,1W  
 3152 482211683883 470R 5% 0,5W  
 3153 482205120471 470R 5% 0,1W

3154 482211683868 150R 5% 0,5W  
 3155 482205120471 470R 5% 0,1W  
 3156 482205120104 100K 5% 0,1W only in /01  
 3158 482211683883 470R 5% 0,5W  
 3159 482211683883 470R 5% 0,5W

3160 482211683883 470R 5% 0,5W  
 3161 482211683883 470R 5% 0,5W  
 3167 482211711503 220R 1% 0,1W  
 3169 482205120154 150K 5% 0,1W  
 3170 482211652234 100K 5% 0,5W

3171 482211652219 330E 5% 0,5W  
 4101 482205120008 0R00 JUMP. (0805)  
 4102 482205120008 0R00 JUMP. (0805)  
 4103 482205120008 0R00 JUMP. (0805)  
 4104 482205120008 0R00 JUMP. (0805)

4105 482205120008 0R00 JUMP. (0805)  
 4106 482205120008 0R00 JUMP. (0805)  
 4108 482205120008 0R00 JUMP. (0805)  
 4111 482205120008 0R00 JUMP. (0805)  
 4120 482205120008 0R00 JUMP. (0805)

4150 482205110008 0R00 5% 0,25W  
 4152 482205110008 0R00 5% 0,25W  
 4153 482205110008 0R00 5% 0,25W  
 4154 482205110008 0R00 5% 0,25W  
 4157 482205110008 0R00 5% 0,25W

4158 482205110008 0R00 5% 0,25W  
 4159 482205110008 0R00 5% 0,25W

**COILS & FILTERS**

5102 482215771634 MW RF COIL  
 5109 482224270665 SFE 10,7MHz  
 5110 482224270665 SFE 10,7MHz  
 5111 482215860511 AM-IF Filter 10,7MHz  
 5112 482215770302 AM-IF Filter 10,7MHz

5114 482215770302 AM-IF Filter 10,7MHz  
 5119 482215711443 Discriminator 10,7MHz

5121 482224210261 Quartz 75kHz  
 5123 482215760517 Osc Coil MW  
 5130 482215630947 RF-Coil 1,5T  
 5131 482215630947 RF-Coil 1,5T

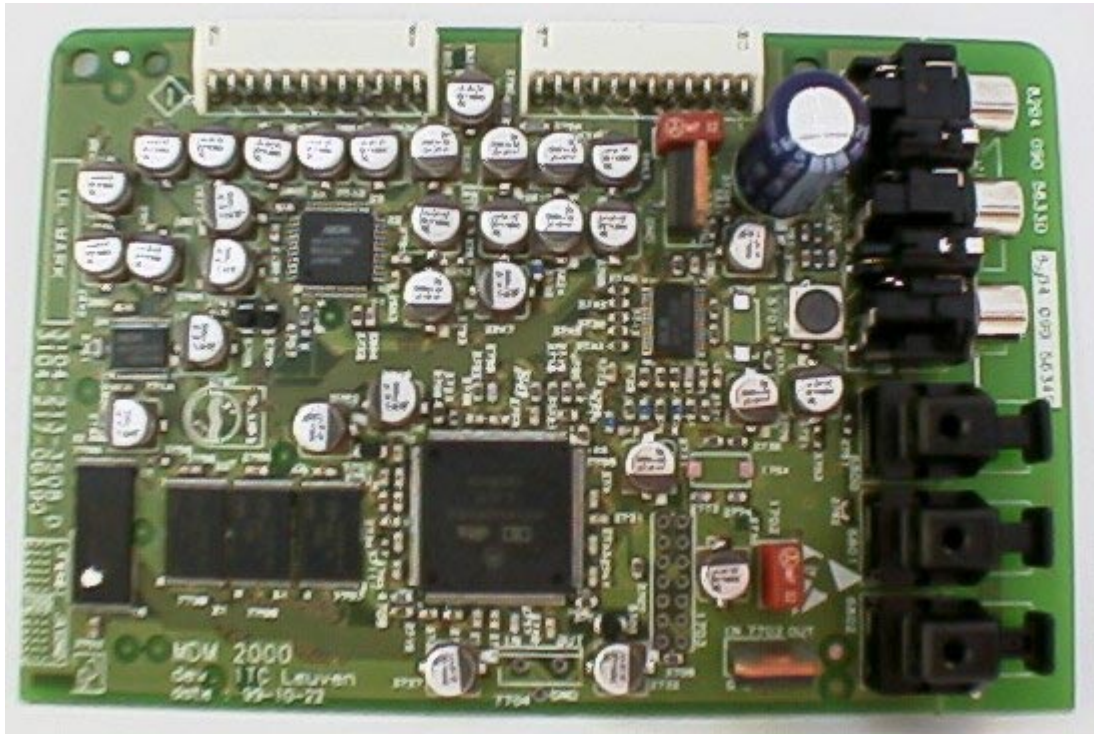
**DIODES**

6103 482213030621 1N4148  
 6104 482213030621 1N4148  
 6105 482213083075 HN1V02H-B  
 6106 482213030621 1N4148  
 6107 482213034488 BZX79-B11

6120 482213030621 1N4148 only in /17  
 6130 482213082833 1SV228  
 6131 482213082833 1SV228

**TRANSISTORS & ICs**

7101 482220990924 TEA5757H/V1  
 7102 482213060093 2SA838B  
 7111 532213042136 BC848C



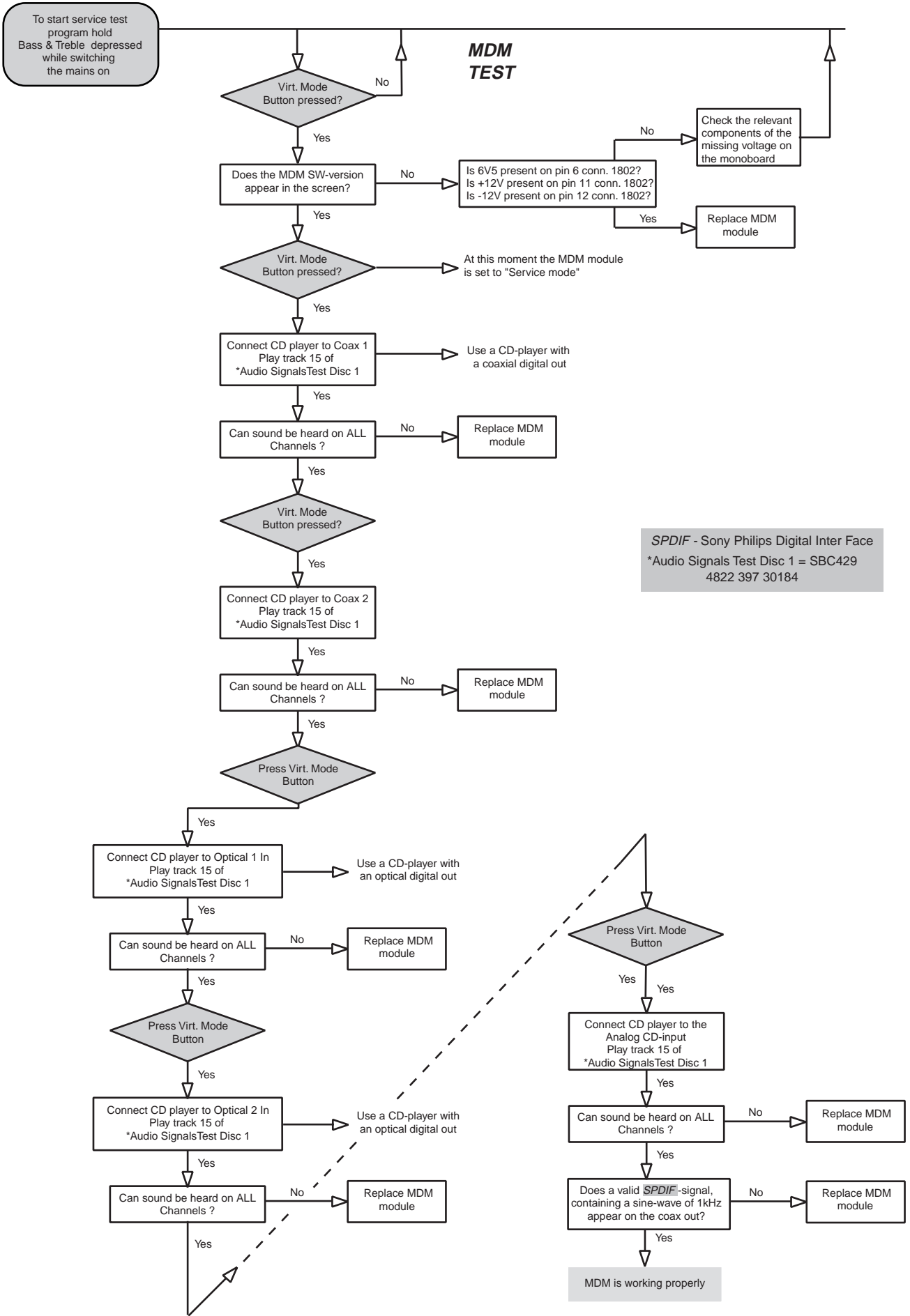
# ***MULTI-CHANNEL DECODING MODULE***

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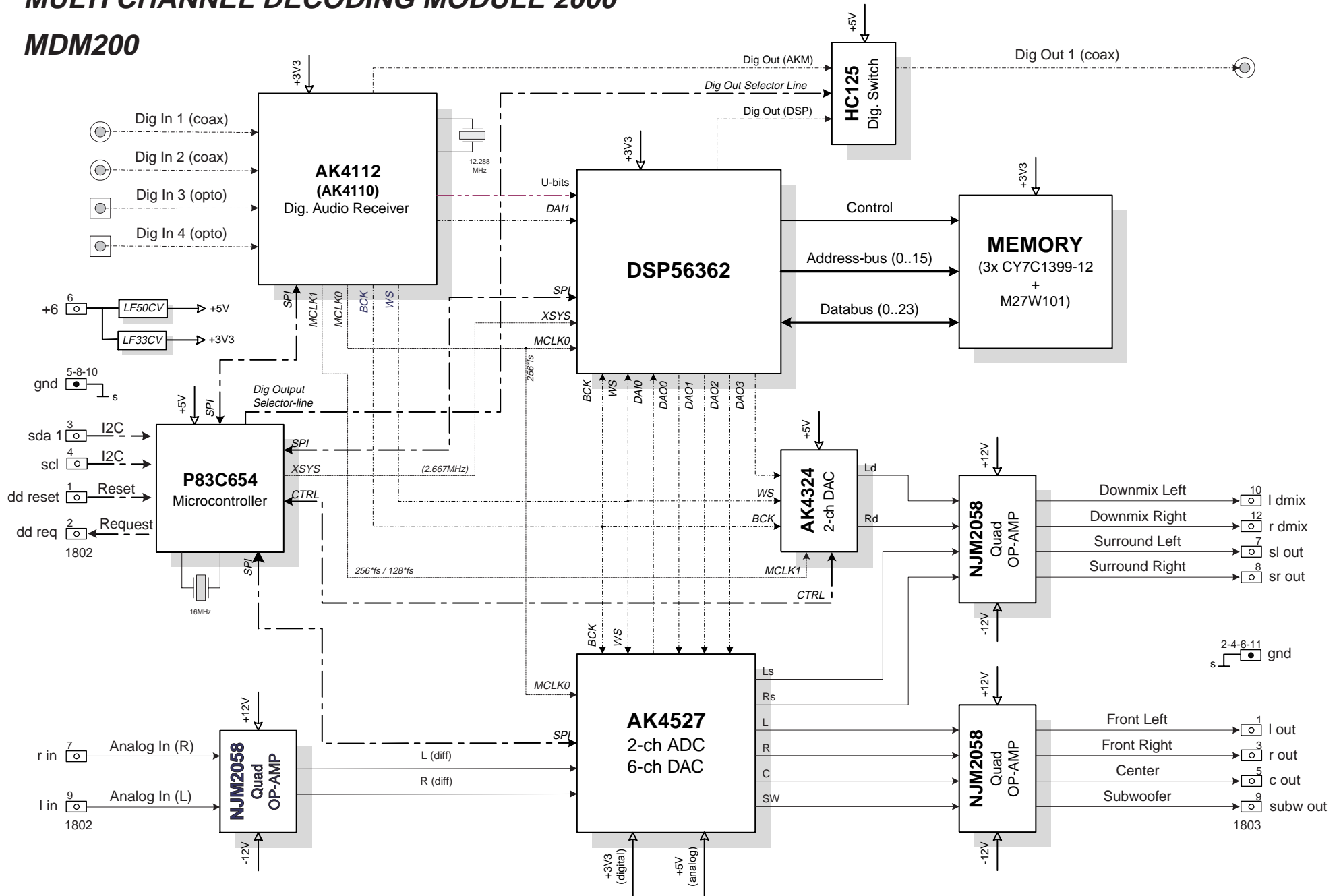


# MULTI-CHANNEL DECODING MODULE - Troubleshooting



# MULTI CHANNEL DECODING MODULE 2000

## MDM200

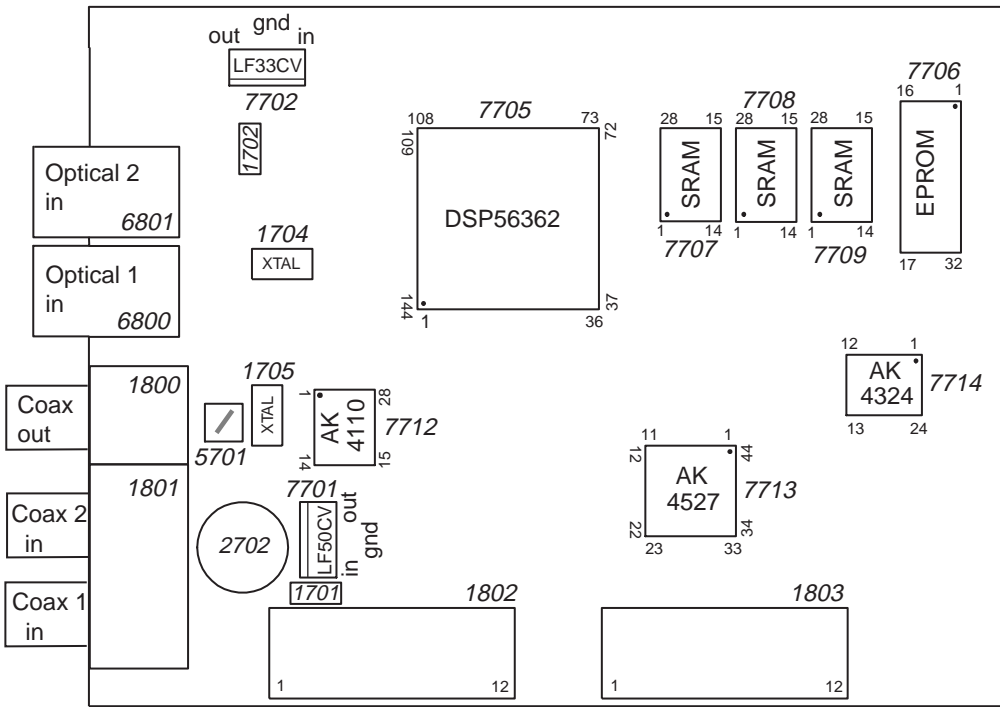


**ELECTRICAL PARTSLIST - MDM MODULE**

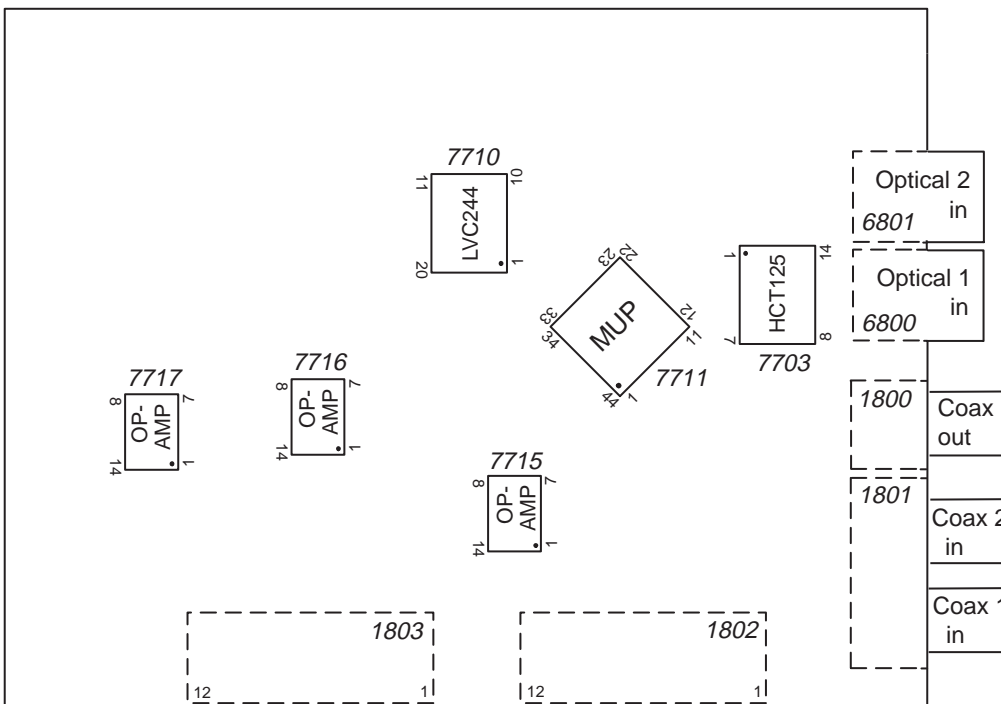
1003	3104 217 06390	MDM 2000 MODULE	2702	4822 123 14025	16V 2200U 20%
1701	4822 252 51172	FUSE 0,315A	6800	4822 218 11487	CONN. FIBER-GLASS GP1F32R
1702	4822 252 51172	FUSE 0,315A	6801	4822 218 11487	CONN. FIBER-GLASS GP1F32R
1704	2422 543 01118	CRYSTAL 16MHZ	7701	9322 146 09687	LF50CV
1705	2422 543 01132	CRYSTAL 12MH28	7702	4822 209 16978	LF33CV
1800	4822 267 31729	COAX OUT CONN.			
1801	4822 267 31448	COAX IN CONNECTOR			
1802	2422 025 10253	CON 12P. MALE			
1803	2422 025 10253	CON 12P. MALE			

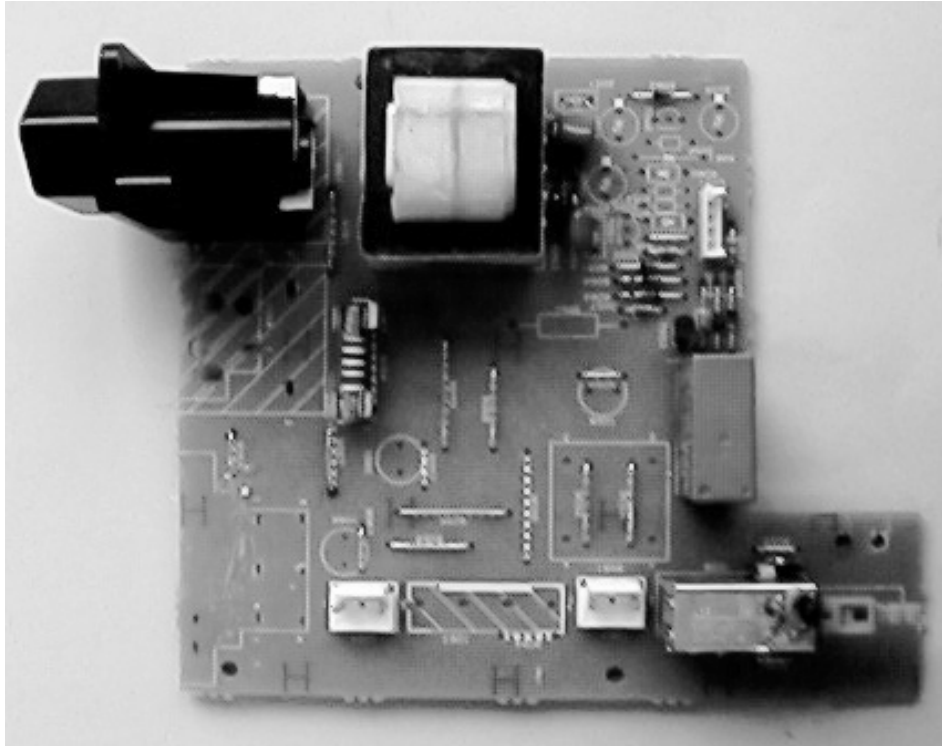
Note: Only the parts mentioned in this list are normal service parts.

Component side view



Copper side view



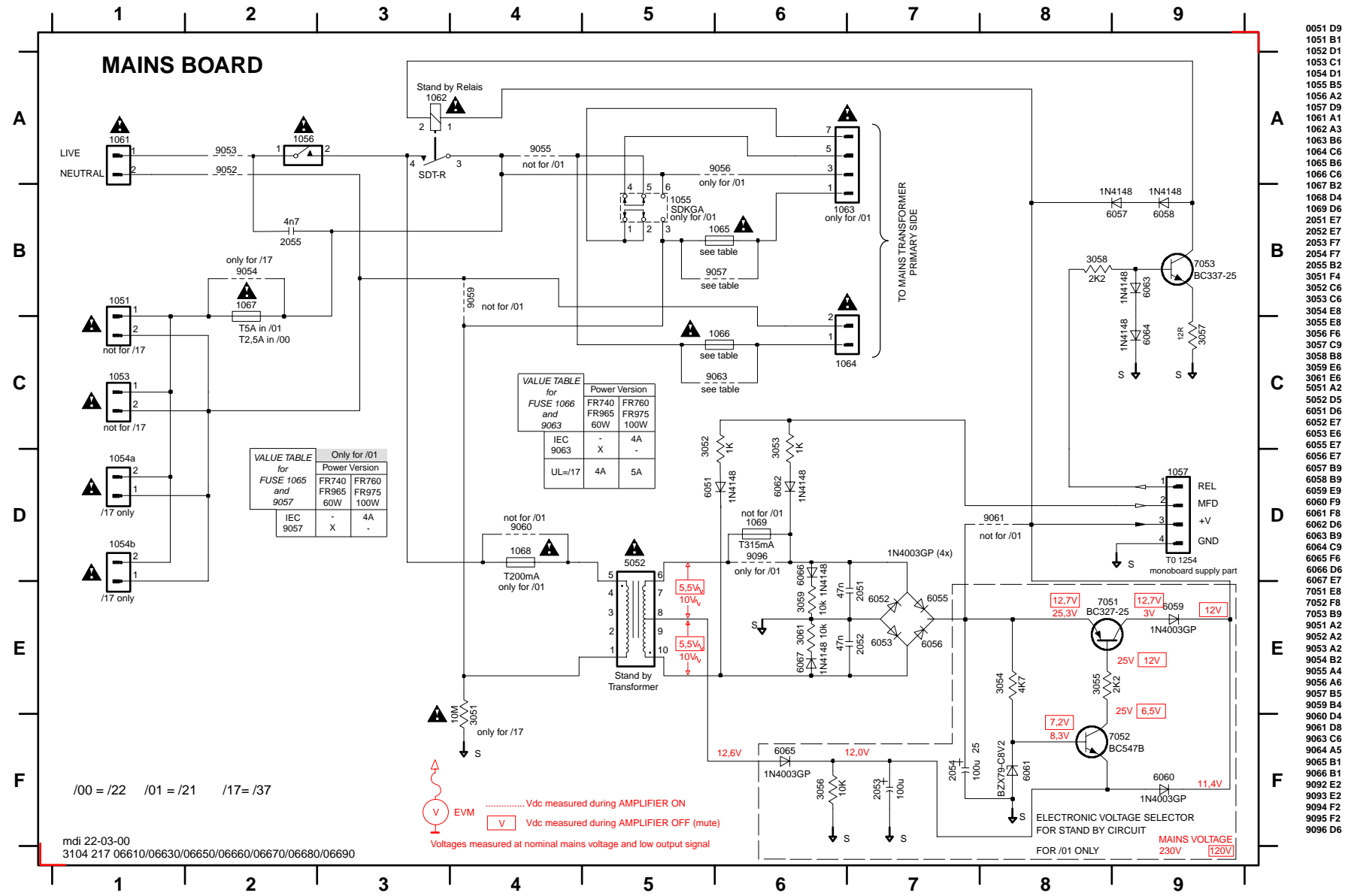


# ***MAINS BOARD***

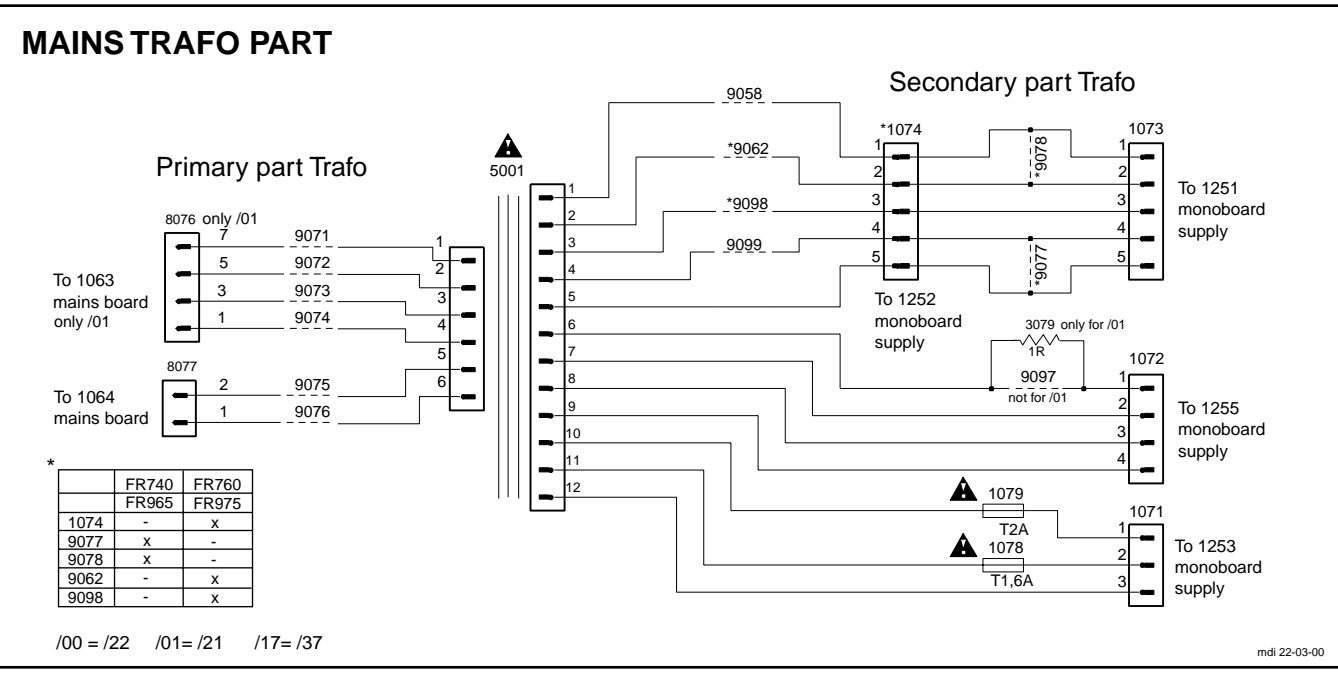
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Circuit diagram .....	9-2
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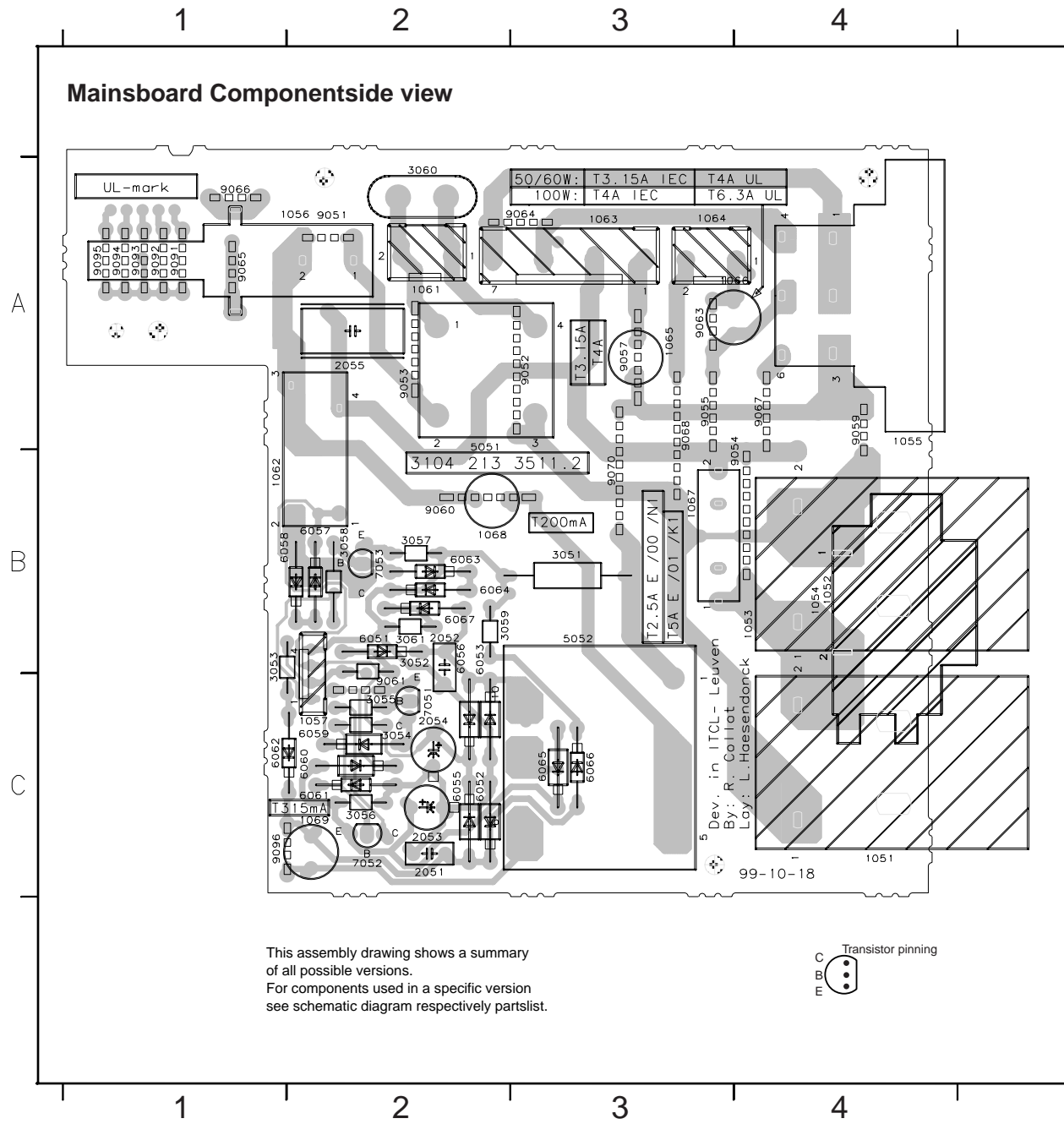
MAINS BOARD - CIRCUIT DIAGRAM



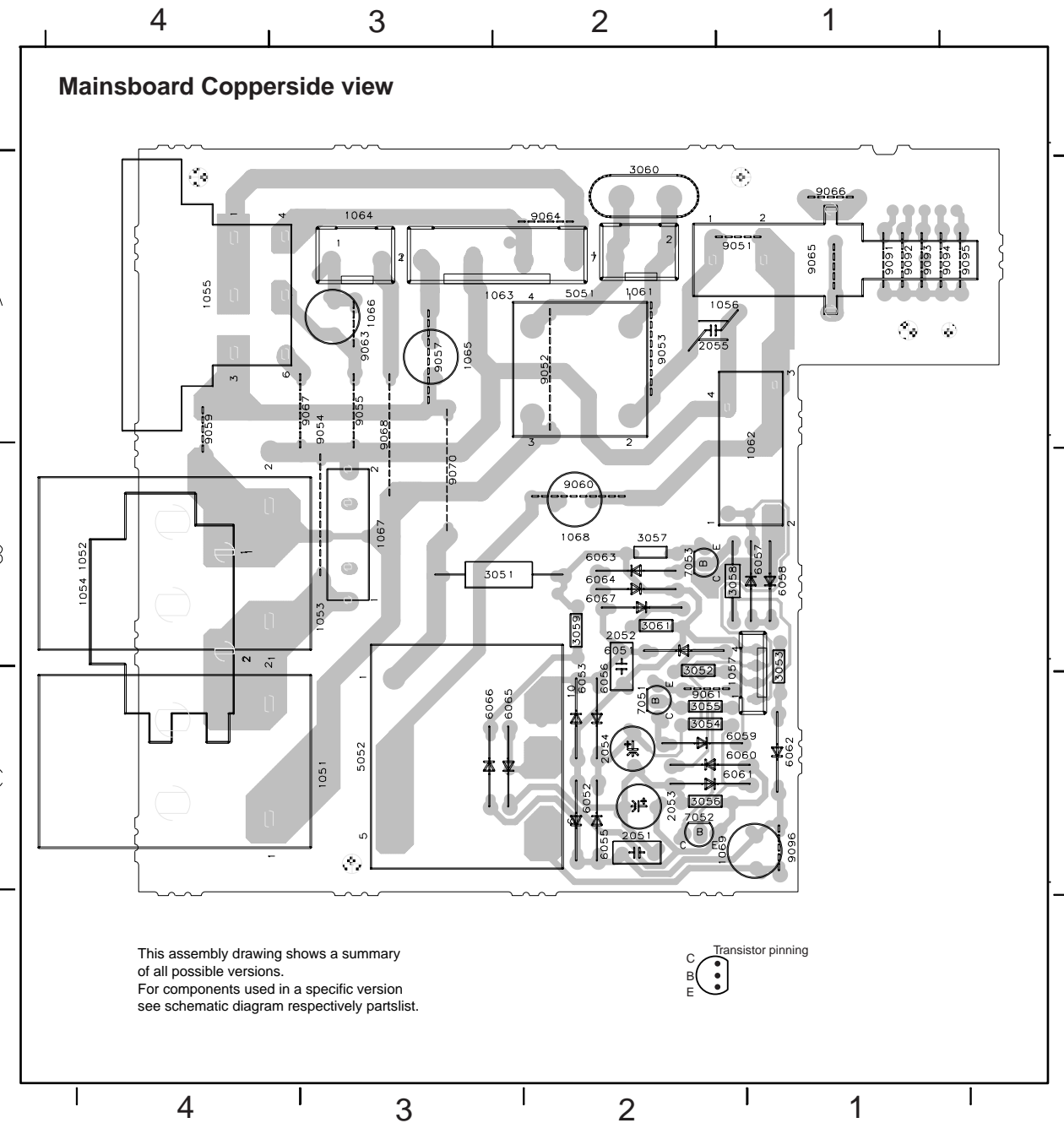
- 0051 D9
- 1051 B1
- 1052 D1
- 1053 C1
- 1054 D1
- 1055 B5
- 1056 A2
- 1057 D9
- 1061 A1
- 1062 A3
- 1063 B6
- 1064 C6
- 1065 B6
- 1066 C6
- 1067 B2
- 1068 D4
- 1069 D6
- 2051 E7
- 2052 E7
- 2053 F7
- 2054 F7
- 2055 B2
- 3051 F4
- 3052 C6
- 3053 C6
- 3054 E8
- 3055 E8
- 3056 F6
- 3057 C9
- 3058 B8
- 3059 E6
- 3061 E6
- 5051 A2
- 5052 D5
- 6051 D6
- 6052 E7
- 6053 E5
- 6055 E7
- 6056 E7
- 6057 B9
- 6058 B9
- 6059 E9
- 6060 F9
- 6061 F8
- 6062 D6
- 6063 B9
- 6064 C9
- 6065 F6
- 6066 D6
- 6067 E7
- 7051 E8
- 7052 F8
- 7053 B9
- 9051 A2
- 9052 A2
- 9053 A2
- 9054 B2
- 9055 A4
- 9056 A6
- 9057 B5
- 9059 B4
- 9060 D4
- 9061 D8
- 9063 C6
- 9064 A5
- 9065 B1
- 9066 B1
- 9092 E2
- 9093 E2
- 9094 F2
- 9095 F2
- 9096 D6



**MAINS BOARD - COMPONENTSIDE VIEW & COPPERSIDE VIEW**



- 1051 C4
- 1052 B4
- 1053 B4
- 1054 B4
- 1055 A4
- 1056 A2
- 1057 C2
- 1061 A2
- 1062 A2
- 1063 A3
- 1064 A3
- 1065 A3
- 1066 A3
- 1067 B3
- 1068 B2
- 1069 C2
- 2051 C2
- 2052 B2
- 2053 C2
- 2054 A2
- 2055 A2
- 3051 B3
- 3052 B2
- 3053 B2
- 3054 C2
- 3055 C2
- 3056 C2
- 3057 B2
- 3058 B2
- 3059 B2
- 3060 A2
- 3061 B2
- 5051 A2
- 5052 C3
- 6051 B2
- 6052 C2
- 6053 C2
- 6055 C2
- 6056 C2
- 6057 B2
- 6058 B2
- 6059 C2
- 6060 C2
- 6061 C2
- 6062 C2
- 6063 B2
- 6064 B2
- 6065 C3
- 6066 C3
- 6067 B2
- 7051 C2
- 7052 C2
- 7053 B2
- 9051 A2
- 9052 A3
- 9053 A2
- 9054 B4
- 9055 A3
- 9057 A3
- 9059 A4
- 9060 B2
- 9061 C2
- 9063 A3
- 9064 A3
- 9065 A1
- 9066 A1
- 9067 A4
- 9068 A3
- 9070 B3
- 9091 A1
- 9092 A1
- 9093 A1
- 9094 A1
- 9095 A1
- 9096 C2



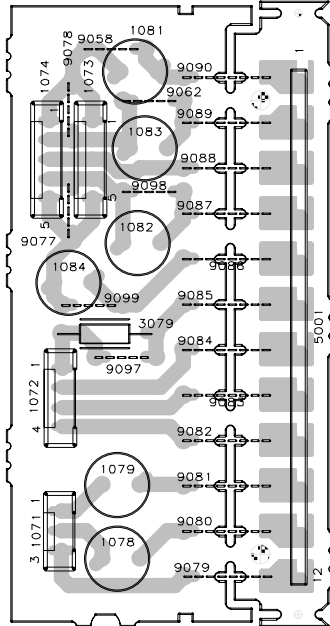


TRAFO BOARD

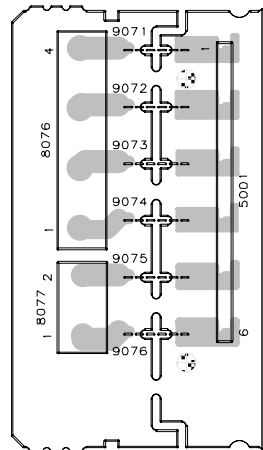
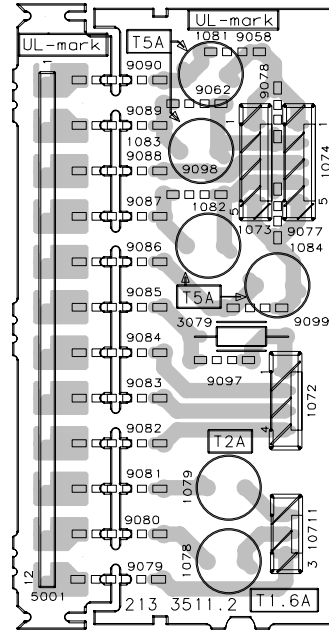
Copperside view

Componentside view

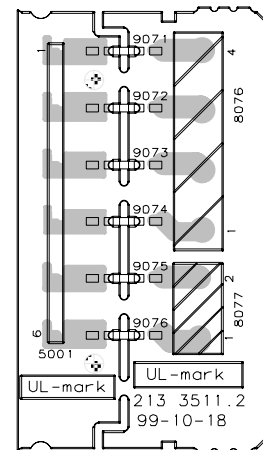
Interconnection Board  
Transformer secondary



Interconnection Board  
Transformer secondary



Interconnection Board  
Transformer primary



Interconnection Board  
Transformer primary

**ELECTRICAL PARTSLIST - MAINS BOARD****MISCELLANEOUS**

1051 ▲ 4822 267 31994 MAINS OUTLET only in /00/01C  
 1053 ▲ 4822 267 31994 MAINS OUTLET only in /00/01C  
 1054 ▲ 2422 030 00301 MAINS OUTLET only in /17  
 1055 ▲ 4822 272 10269 VOLTAGE SEL. only in /01C  
 1056 ▲ 4822 276 13224 MAINS SWITCH

1061 ▲ 4822 265 20723 MAINS INLET  
 1062 ▲ 4822 280 10391 RELAY  
 1063 ▲ 4822 267 10728 B4P7-VH only in /01C  
 1064 ▲ 4822 265 20723 B2P3-VH  
 1065 ▲ 4822 071 54002 FUSE 4A only in /01C

1066 ▲ 4822 071 54002 FUSE 4A only in /00/01C  
 1066 ▲ 4822 071 55002 FUSE 5A only in /17  
 1067 ▲ 2422 086 10912 FUSE 2,5A only in /00  
 1067 ▲ 2422 086 10915 FUSE 5A only in /01C  
 1068 ▲ 4822 071 52001 FUSE 200MA only in /01C

1069 ▲ 4822 071 53151 FUSE 315MA only in /00/17  
 1078 ▲ 4822 071 51602 FUSE 1.6A  
 1079 ▲ 4822 071 52002 FUSE 2A

**CAPACITORS**

2051 4822 121 43526 47NF 5% 250V  
 2052 4822 121 43526 47NF 5% 250V  
 2053 4822 124 40207 100UF20% 25V only in /01C  
 2054 4822 124 40207 100UF20% 25V only in /01C  
 2055 4822 126 14084 4,7NF 20% 250V

**RESISTORS**

3051 ▲ 4822 053 21106 10M only in /17  
 3052 4822 050 11002 1K00 1% 0,4W  
 3053 4822 050 11002 1K00 1% 0,4W  
 3054 4822 116 52283 4K7 5% 0,5W only in /01C  
 3055 4822 116 52256 2K2 5% 0,5W only in /01C  
  
 3056 4822 050 21003 10K 1% 0,6W only in /01C  
 3057 4822 052 10129 12R00 5% 0,33W  
 3058 4822 116 52256 2K2 5% 0,5W  
 3059 4822 050 21003 10K00 1% 0,6W  
 3061 4822 050 21003 10K00 1% 0,6W  
  
 3079 4822 052 10108 1R 5% 0,33W only in /01C

**TRAFO**

5052 ▲ 4822 146 11143 STBY TRAFO for /00  
 5052 ▲ 4822 146 11144 STBY TRAFO for /01C  
 5052 ▲ 4822 146 11142 STBY TRAFO for /17

**DIODES**

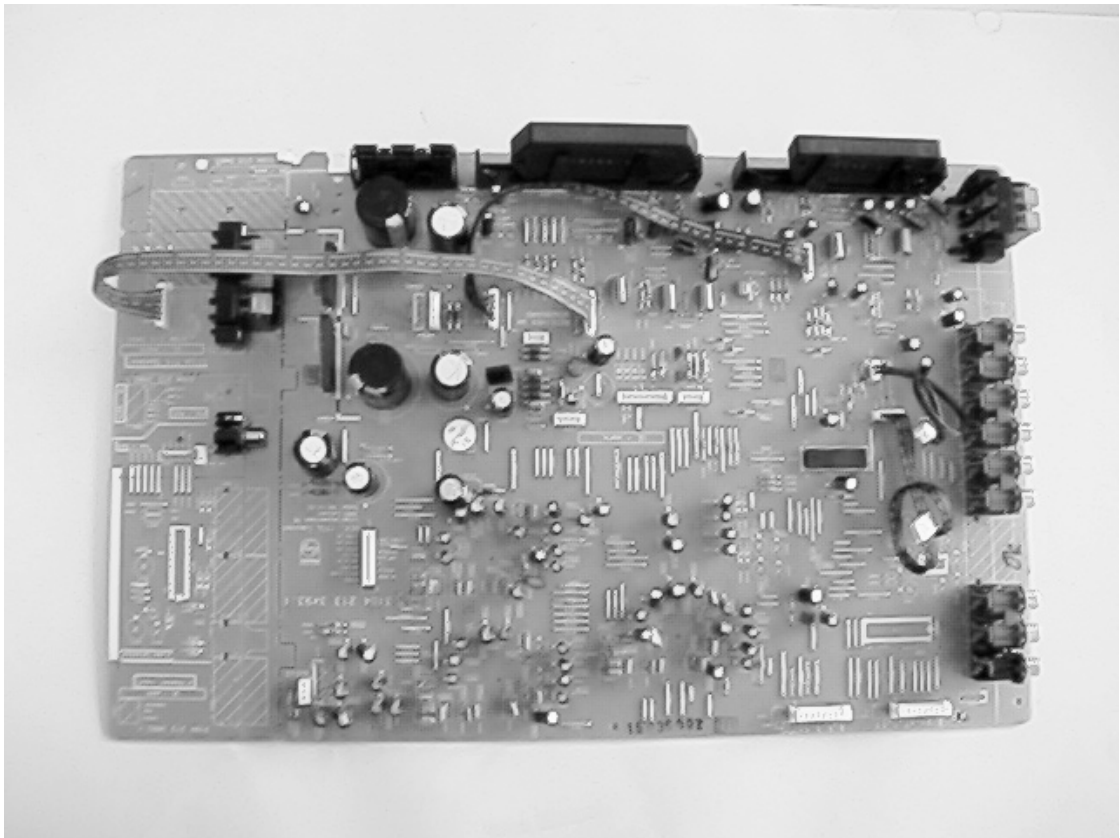
6051 4822 130 30621 1N4148  
 6052 4822 130 31878 1N4003G  
 6053 4822 130 31878 1N4003G  
 6055 4822 130 31878 1N4003G  
 6056 4822 130 31878 1N4003G  
  
 6057 4822 130 30621 1N4148  
 6058 4822 130 30621 1N4148  
 6059 4822 130 31878 1N4003G only in /01C  
 6060 4822 130 31878 1N4003G only in /01C  
 6061 4822 130 34382 BZX79-B8V2 only in /01C  
  
 6062 4822 130 30621 1N4148  
 6063 4822 130 30621 1N4148  
 6064 4822 130 30621 1N4148  
 6065 4822 130 31878 1N4003G only in /01C

**DIODES**

6066 4822 130 30621 1N4148  
 6067 4822 130 30621 1N4148

**TRANSISTORS**

7051 4822 130 41246 BC327-25 only in /01C  
 7052 4822 130 40959 BC547B only in /01C  
 7053 4822 130 40981 BC337-25



# ***MONO2 BOARD***

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**MEASUREMENT REFERENCES TO LAYOUT ON PAGE 10-8****IC7643**

IC 7643 Pin	Can be measure via Test point on component side monoboard	Funtionality
17	TP 47	MDM Surround L in
18	TP 48	6 CH Surround L in
9	TP 50	MDM Surround R in
10	TP 51	6 CH Surround R in
3	TP 52	4,7V
2	TP 53	4,7V
4	TP 54	4,7V
26	TP 55	4,7V
27	TP 56	4,7V
33	TP 57	Surround Right out
36/40/43	TP 58	Ground
41/42	TP 59	9,4V
39	TP 60	4,7V
19	TP 61	8,7V
34	TP 63	Surround Left out
25	TP 64	4,7V
24	TP 65	4,7V
12	TP 66	4,7V
20	TP 67	4,7V
21	TP 68	4,7V

**IC7504**

IC 7504 Pin	Can be measure via Test point on component side monoboard	Funtionality
5 via R3614	TP 77	Rec - in Right
4	TP 78	-13,5V
7 via R3616	TP 79	Rec - out Right
8	TP 80	12V
3 via R3613	TP 81	Rec - in Left
1 via R3615	TP 82	Rec - out Left

**MEASUREMENT REFERENCES TO LAYOUT ON PAGE 10-8**

**IC7641**

IC 7641 Pin	Can be measure via Test point on component side monoboard	Funtionality
16	TP 1	Left in
17	TP 2	MDM Left in
18	TP 3	6 CH Front left in
8	TP 4	Right in
9	TP 5	MDM Right in
10	TP 6	6 CH Front Right in
3	TP 7	4,7V
2	TP 8	4,7V
4	TP 9	4,7V
26	TP 10	4,7V
27	TP 11	4,7V
33	TP 12	Right out
36/40/43	TP 13	Ground
41/42	TP 14	9,4V
39	TP 15	4,7V
19	TP 16	8,7V
34	TP 18	Left out
25	TP 19	4,7V
24	TP 20	4,7V
12	TP 21	4,7V
20	TP 22	4,7V
21	TP 23	4,7V

**IC7642**

IC 7642 Pin	Can be measure via Test point on component side monoboard	Funtionality
16	TP 24	4,7V
17	TP 25	MDM Center in
18	TP 26	6 CH Center in
8	TP 27	MDM Subwoofer in
9	TP 28	MDM Subwoofer in
10	TP 29	6 CH Subwoofer in
3	TP 30	4,7V
2	TP 31	4,7V
4	TP 32	4,7V
26	TP 33	4,7V
27	TP 34	4,7V
33	TP 35	Subwoofer out
36/43	TP 36	Ground
40/41/42	TP 37	9,4V
39	TP 38	4,7V
19	TP 39	8,7V
34	TP 40	Center out
25	TP 41	4,7V
24	TP 42	4,7V
12	TP 43	4,7V
20	TP 44	4,7V
21	TP 45	4,7V

**IC7601**

IC 7601 Pin	Can be measure via Test point on component side monoboard	Funtionality
5	TP 69	Headphone Amp L in
4	TP 70	-13,5V
8	TP 71	12V
3	TP 72	Headphone Amp R in

**Tr 7622**

Tr7622	Can be measure via Test point on component side monoboard	Funtionality
B	TP 99	-0,5V
C	TP 100	Ground
E	TP 101	Headphone Amp R out

**IC7503**

IC 7503 Pin	Can be measure via Test point on component side monoboard	Funtionality
5	TP 73	Right in
4	TP 74	-12V
8	TP 75	11V
3	TP 76	Left in

**Tr 7653**

Tr7653	Can be measure via Test point on component side monoboard	Funtionality
B	TP 86	-1,8V
E	TP 88	Center mute

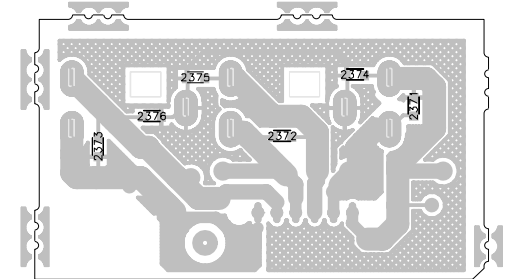
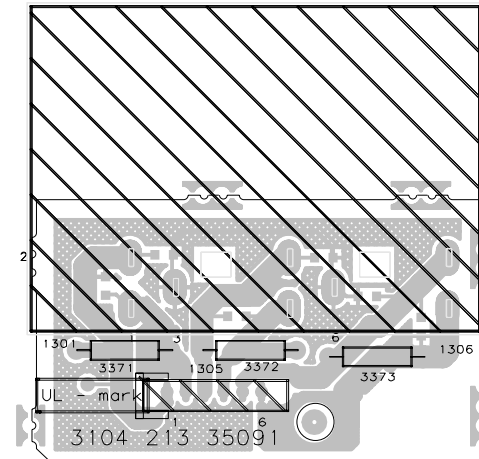
**Tr 7621**

Tr7621	Can be measure via Test point on component side monoboard	Funtionality
B	TP 96	-1,5V
C	TP 97	Ground
E	TP 98	Headphone Amp L out

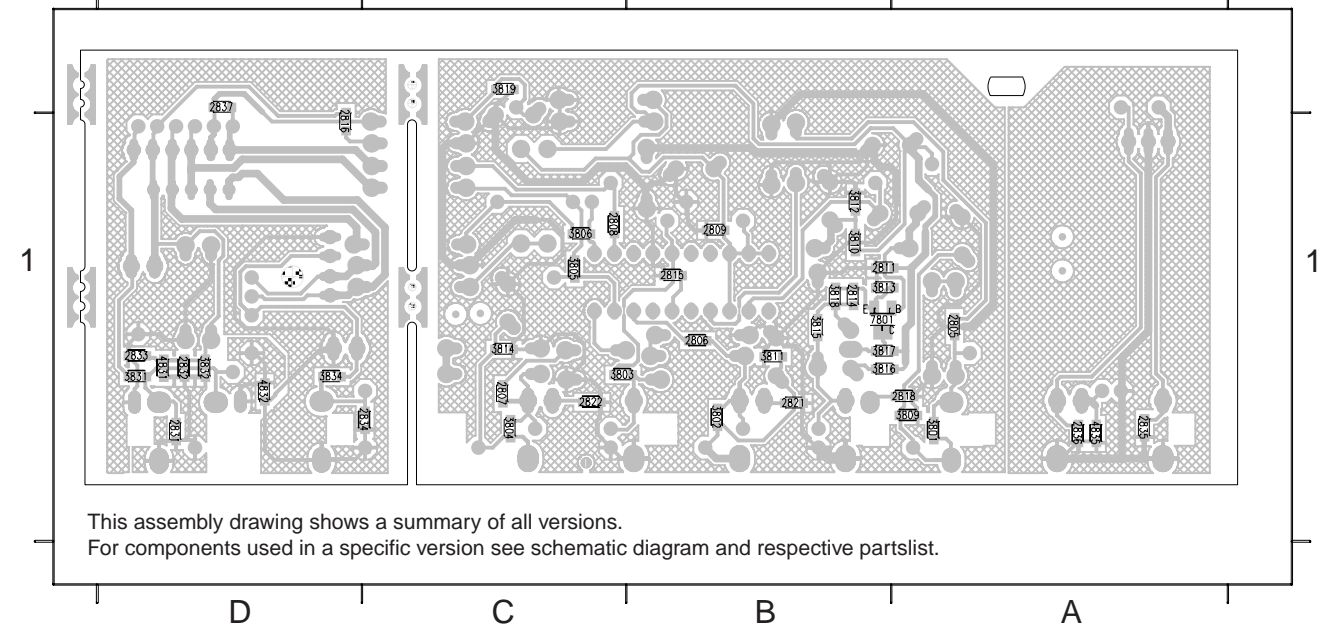
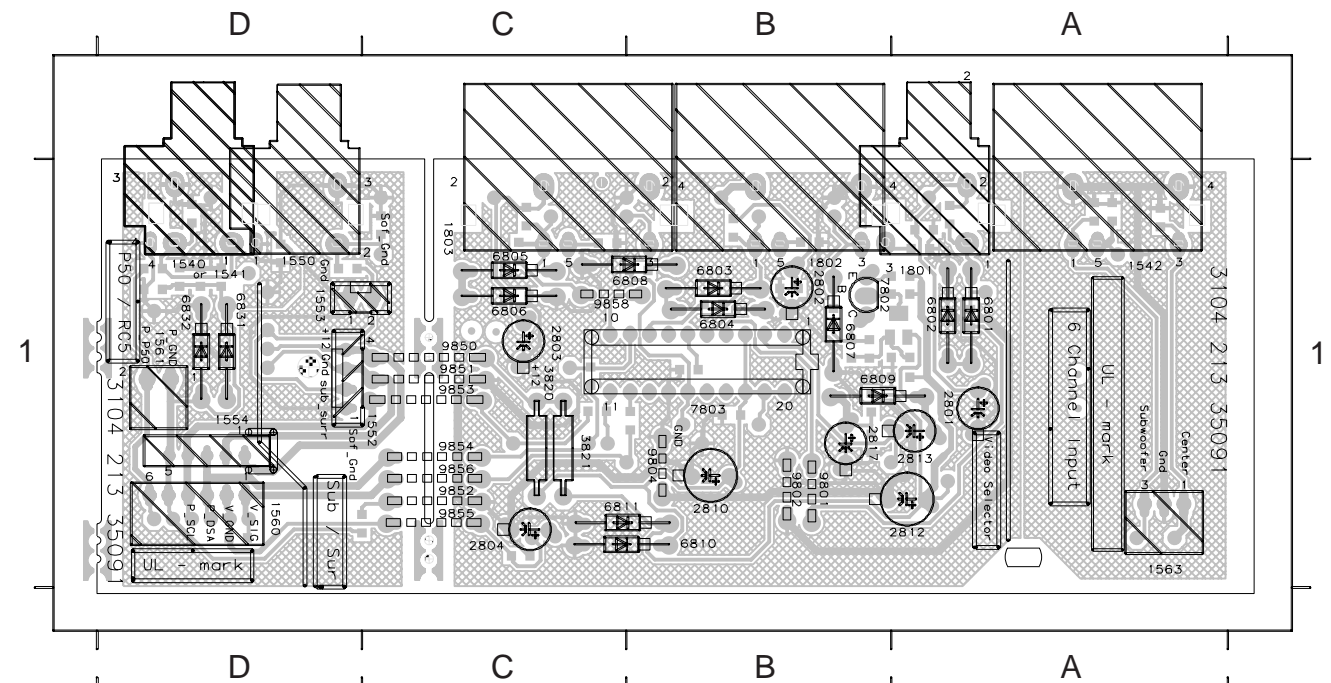
**Tr 7658**

Tr7658	Can be measure via Test point on component side monoboard	Funtionality
B	TP 83	5V
C	TP 84	-13V
E	TP 85	5V

**SCREW TERMINAL BOARD - COMPONENT VIEW & COPPER SIDE VIEW**



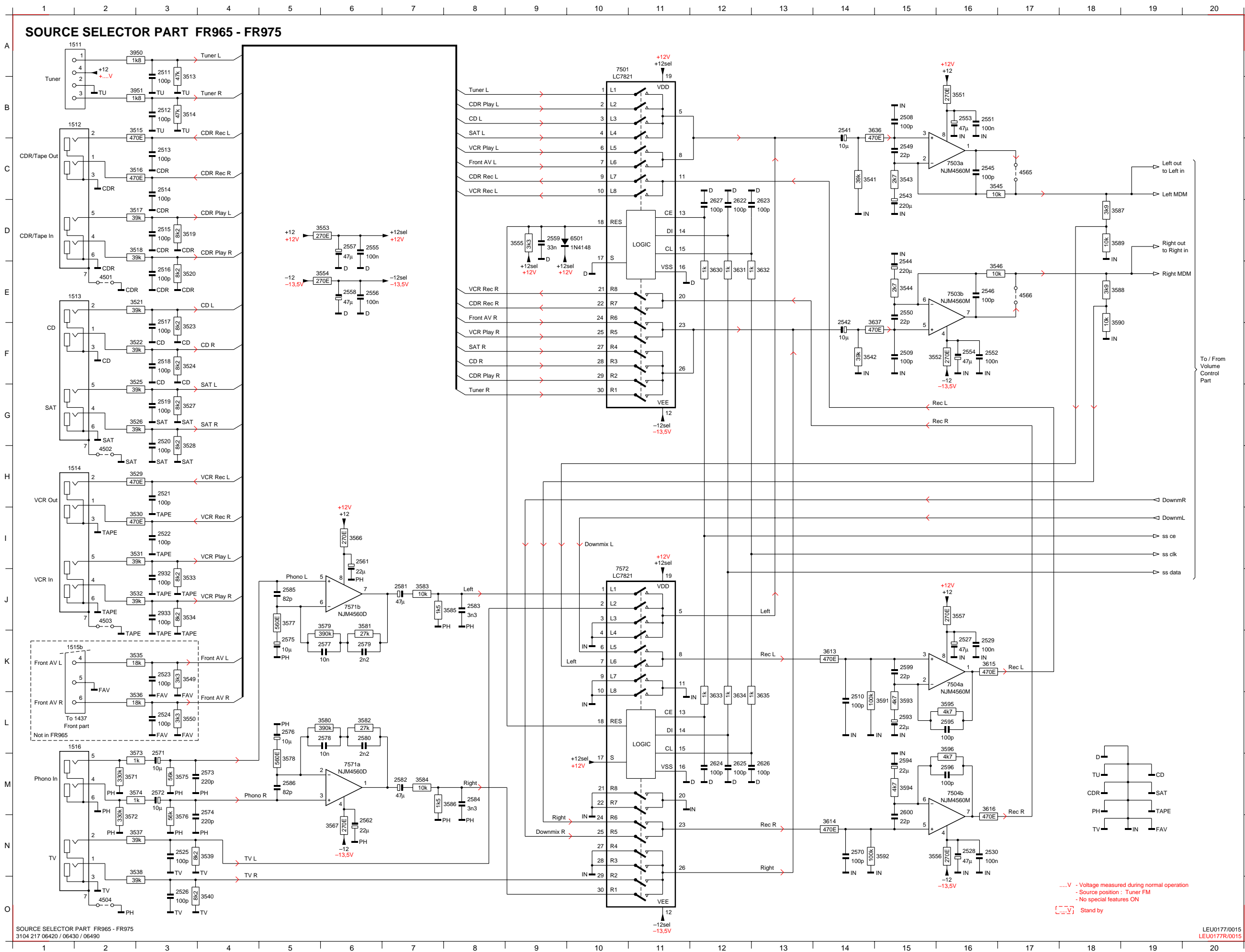
**P50/RC5 VIDEO SELECTOR BOARD - COMPONENT VIEW & COPPER SIDE VIEW**



This assembly drawing shows a summary of all versions.  
For components used in a specific version see schematic diagram and respective partslist.

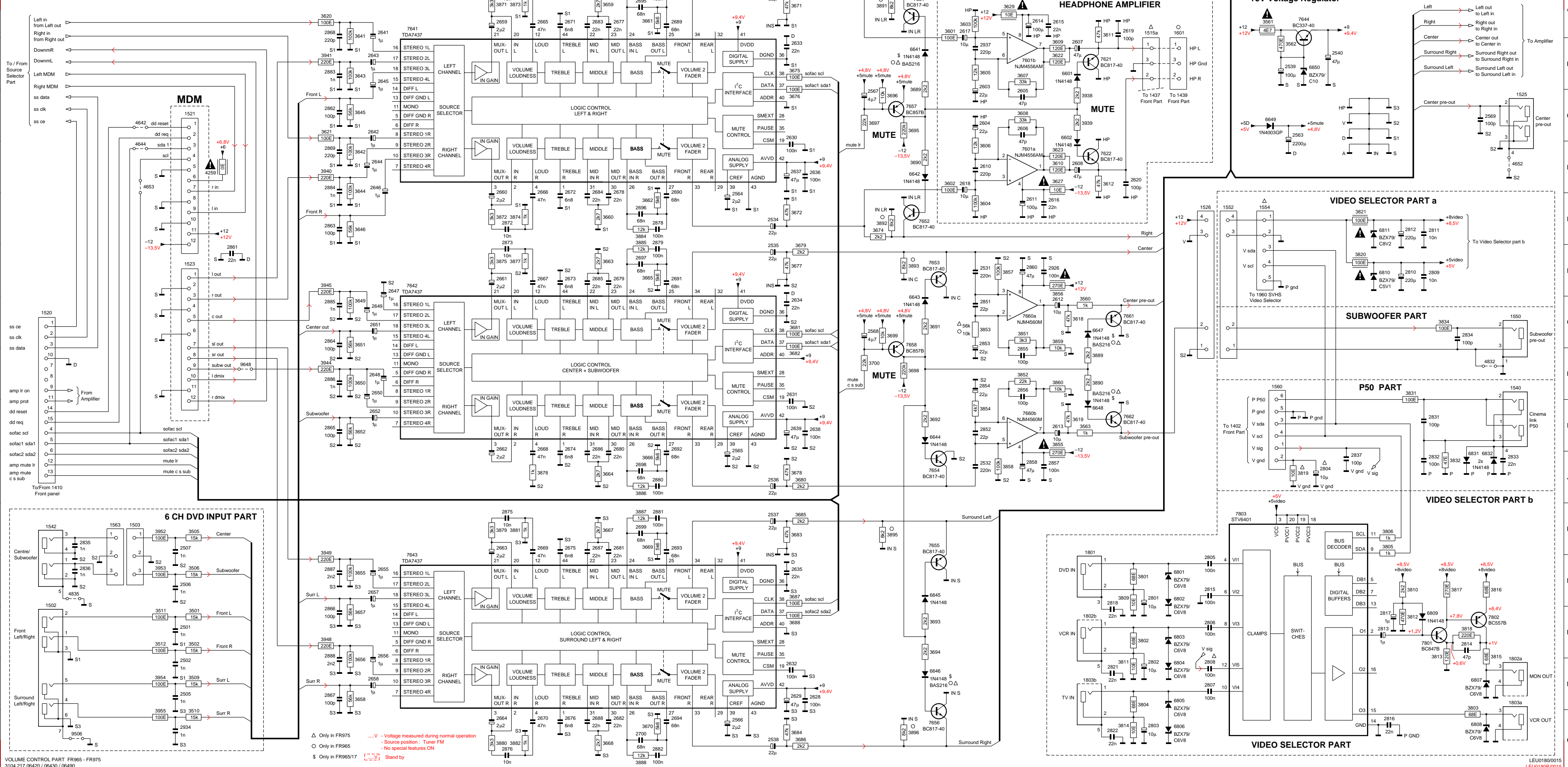


SOURCE SELECTOR PART FR965 - FR975



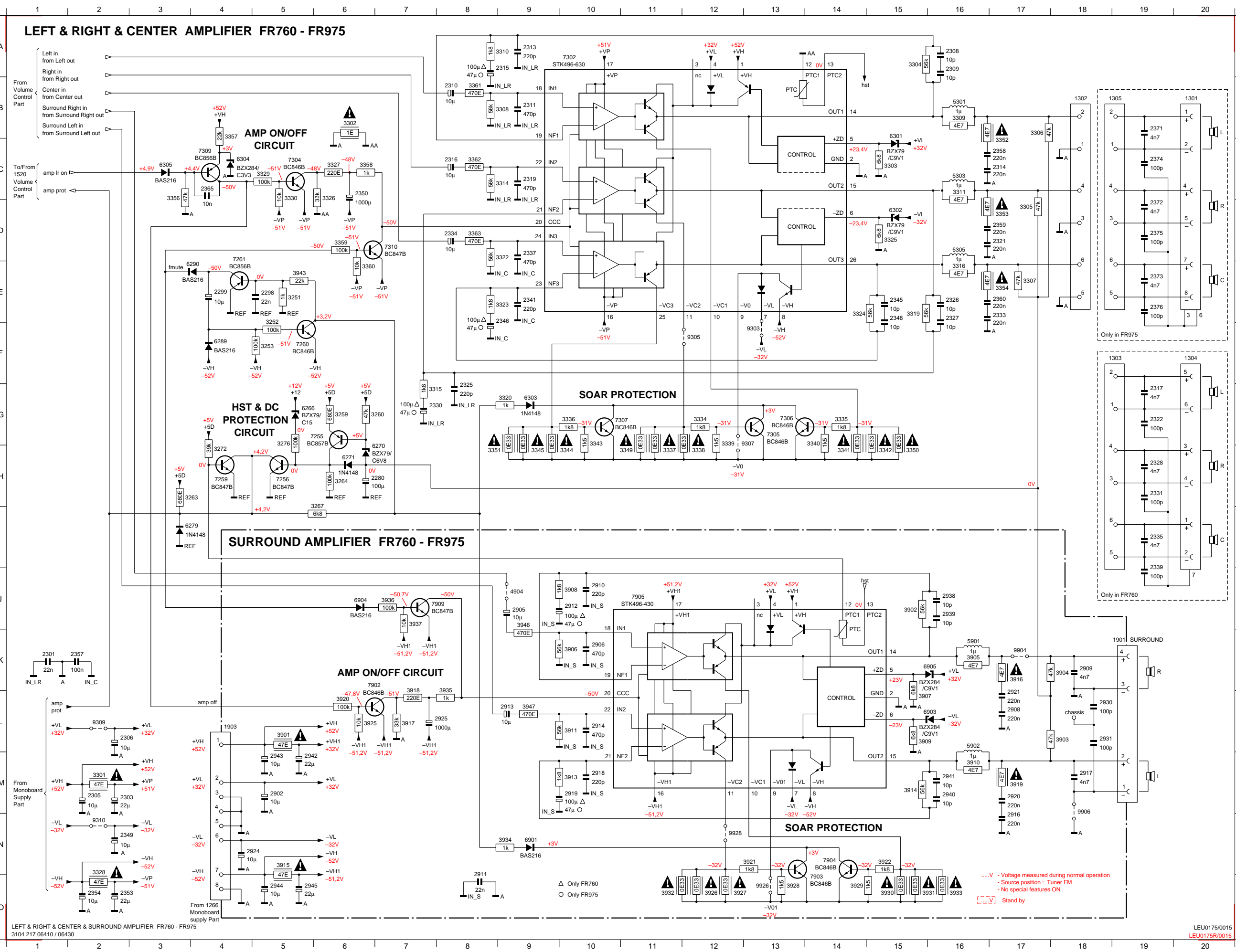
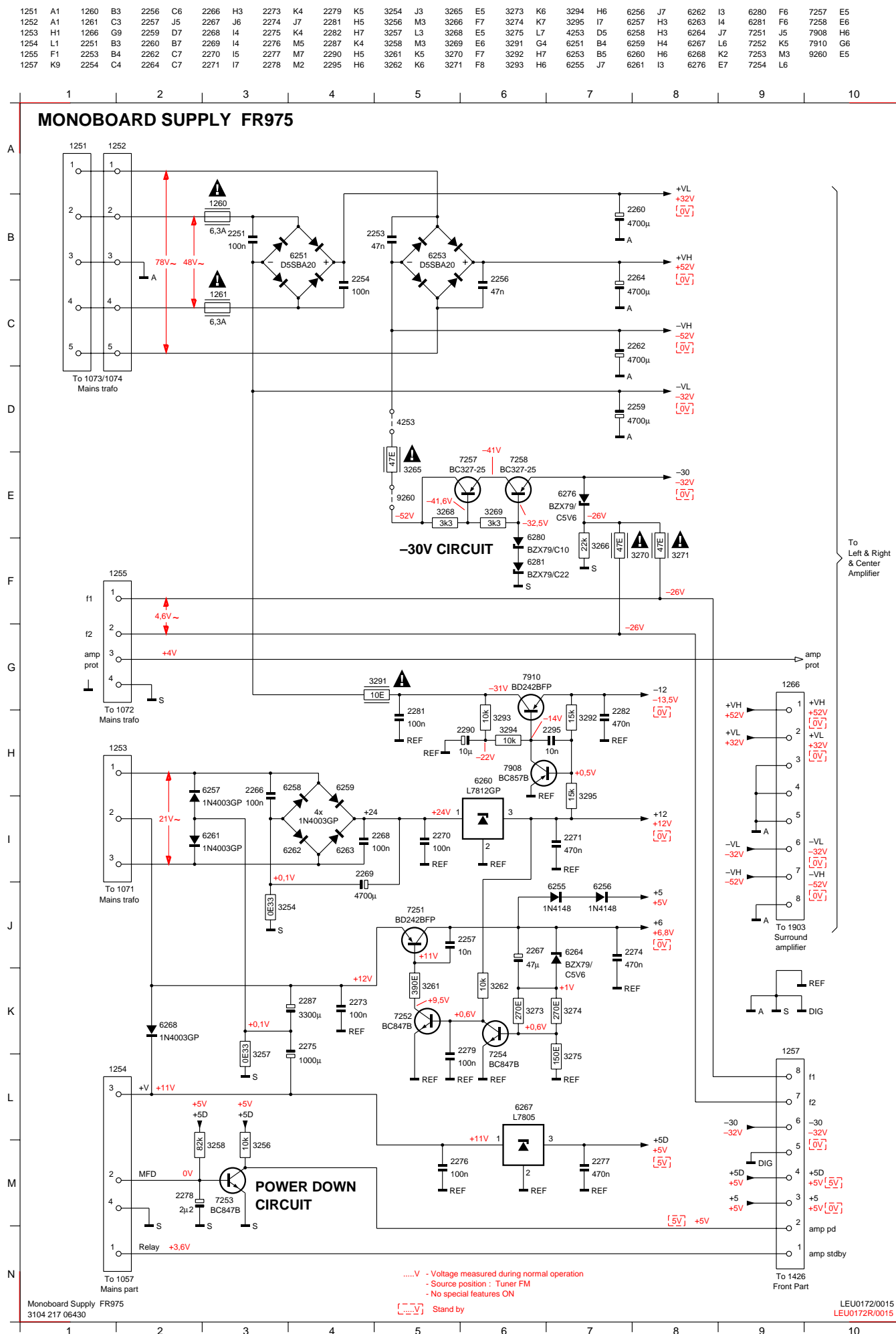
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1512	B1	3566	I6
1513	E1	3567	N6
1514	H1	3571	M2
1515b	K1	3572	N2
1516	L1	3573	M2
2508	B15	3574	M2
2509	F15	3575	M3
2510	L14	3576	N3
2511	A3	3577	J5
2512	B3	3578	M5
2513	C3	3579	J5
2514	C3	3580	L5
2515	D3	3581	J6
2516	E3	3582	L6
2517	F3	3583	J7
2518	F3	3584	M7
2519	G3	3585	J8
2520	G3	3586	M8
2521	H3	3587	D18
2522	I3	3588	E18
2523	K3	3589	D18
2524	L3	3590	F18
2525	N3	3591	L15
2526	O3	3592	N15
2527	K16	3593	L15
2528	N16	3594	M15
2529	K16	3595	L16
2530	N16	3596	L16
2541	B14	3613	K14
2542	F14	3614	N14
2543	C15	3615	K16
2544	E15	3616	M16
2545	C16	3630	E12
2546	E16	3631	E12
2549	C16	3632	E12
2550	E15	3633	L12
2551	B16	3634	L12
2552	F16	3635	L13
2553	B16	3636	B14
2554	F16	3637	F14
2555	D6	3950	A2
2556	E6	3951	B2
2557	D6	4501	E2
2558	E6	4502	H2
2559	D9	4503	J2
2561	I6	4504	O2
2562	N6	4565	C17
2570	N14	4566	E17
2571	M3	6501	D10
2572	M3	7501	A10
2573	M4	7503a	C16
2574	M4	7503b	E16
2575	K5	7504a	K16
2576	L5	7504b	M16
2577	K5	7511a	M6
2578	L5	7511b	J6
2579	K6	7572	J10
2580	L6		
2581	J7		
2582	J8		
2584	M8		
2585	J5		
2586	M5		
2593	L15		
2594	M15		
2595	L16		
2596	M16		
2599	K15		
2600	M15		
2622	D12		
2623	D13		
2624	M12		
2625	M12		
2626	M13		
2627	D12		
2932	J3		
2933	J3		
3513	B3		
3514	B3		
3515	B2		
3516	C2		
3517	D2		
3518	D2		
3519	D3		
3520	E3		
3521	E2		
3522	F2		
3523	F3		
3525	F2		
3526	G2		
3527	G3		
3528	H3		
3529	H2		
3530	I2		
3531	I2		
3532	J2		
3533	J3		
3534	J3		
3535	K2		
3536	L2		
3537	N2		
3538	N2		
3539	N4		
3540	O4		
3541	C14		
3542	F14		
3543	C15		
3544	E15		
3545	C16		
3546	E16		
3549	K3		
3550	L3		
3551	B16		
3552	F15		
3553	D5		
3554	E5		
3555	D9		
3556	N15		

VOLUME CONTROL PART FR965 - FR975



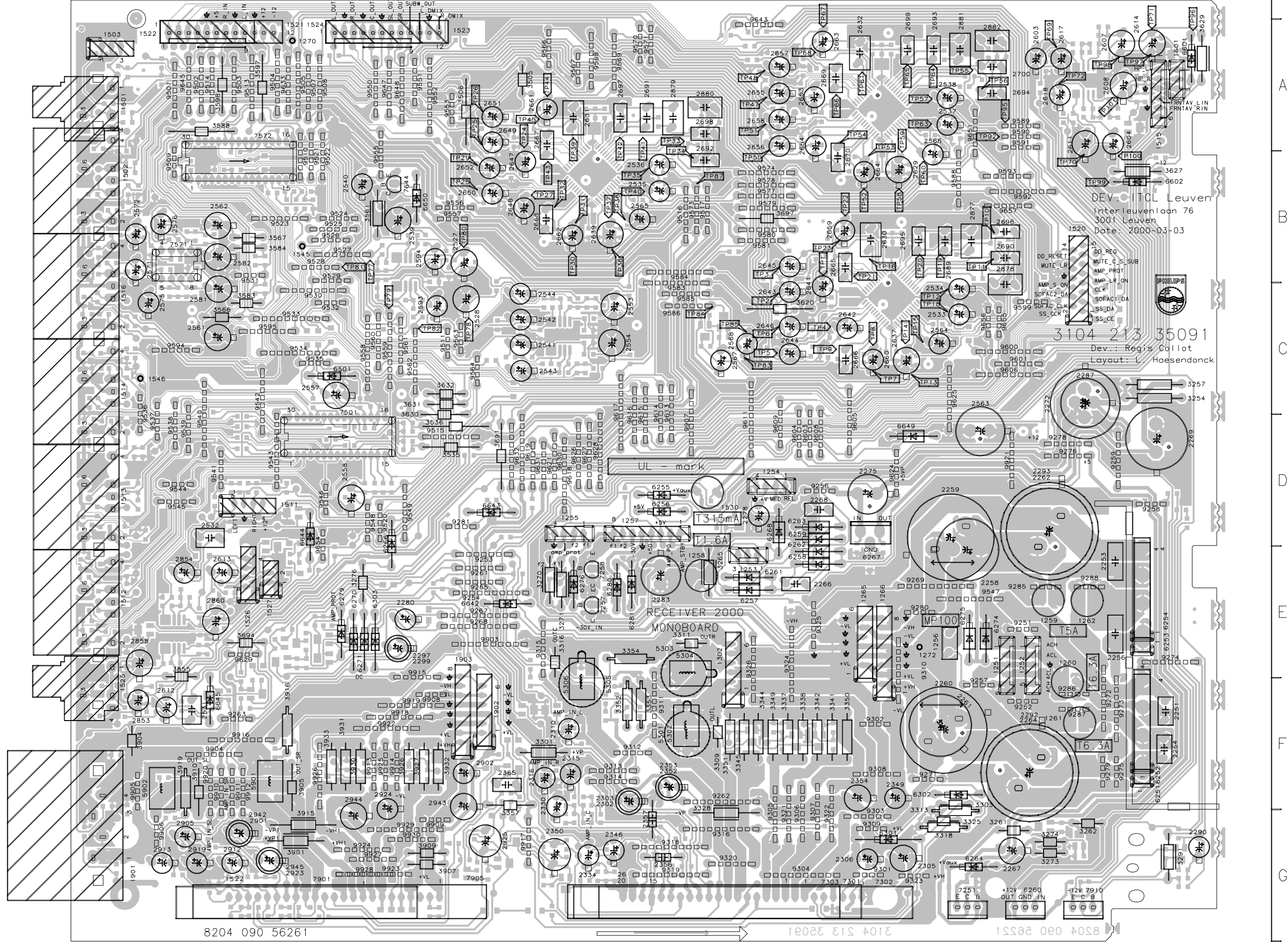
VOLUME CONTROL PART FR965 - FR975  
3104 217 06420 / 06430 / 06490

1502	M1	2694	O13	3664	J12	6650	B26
1503	K3	2695	A13	3665	F13	6801	L23
1515a	A23	2696	E13	3666	J13	6802	L23
1520	G1	2697	F13	3667	K12	6803	M23
1521	C4	2698	J13	3668	O12	6804	N23
1523	F4	2699	K13	3669	K13	6805	N23
1525	C30	2700	O13	3670	O13	6806	O23
1526	E24	2801	L23	3671	A16	6807	N29
1540	H30	2802	N23	3672	E16	6808	O29
1542	K1	2803	O23	3673	A17	6809	M28
1550	G30	2804	J26	3674	E17	6810	F27
1552	E24	2805	L24	3675	B16	6811	E27
1554	E25	2806	M24	3676	C16	6831	J29
1560	H25	2807	N24	3677	F16	6832	J29
1563	K2	2808	N24	3678	H16	7601a	B20
1601	A23	2809	F28	3679	F16	7601b	D20
1801	K21	2810	F28	3680	J16	7621	B22
1802a	N30	2811	E28	3681	G16	7622	D22
1802b	M21	2812	E28	3682	H16	7641	A8
1803a	N30	2813	M27	3683	K16	7642	F8
1803b	N21	2814	M29	3684	O16	7643	L8
2501	M4	2815	L24	3685	K16	7644	A25
2502	N4	2816	O27	3686	O16	7651	A18
2505	N4	2817	M27	3687	L16	7652	E18
2506	L4	2818	L22	3688	M16	7653	F18
2507	K4	2819	F22	3689	C18	7654	J18
2531	F19	2822	O22	3690	D18	7655	K18
2532	J19	2831	I28	3691	G18	7656	O18
2533	A15	2832	J28	3692	H18	7657	C18
2534	E15	2833	J30	3693	M18	7658	G18
2535	F15	2834	K32	3694	M18	7659	G20
2536	J15	2835	K2	3695	C18	7660b	I20
2537	K15	2836	L2	3696	C18	7661	G22
2538	O15	2837	J20	3697	C17	7662	I22
2539	D22	2839	E19	3698	H18	7601	M28
2540	B26	2852	I19	3699	H18	7802	M29
2563	C25	2853	G19	3700	H17	7803	K24
2564	E15	2854	H19	3801	L22	9506	O2
2565	F15	2855	G20	3802	N29	9648	H5
2566	O15	2856	H20	3803	N29		
2567	C17	2857	J21	3804	N22		
2568	G17	2858	J20	3805	K27		
2569	C29	2860	F22	3806	K27		
2603	B19	2861	F5	3809	L28		
2604	C19	2862	C7	3810	L28		
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2613	I21	2871	A10	3818	J29		
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2615	A21	2873	E10	3820	F27		
2616	E21	2874	A10	3821	E27		
2617	A19	2876	O10	3831	H28		
2618	D19	2877	A13	3832	J28		
2619	A22	2878	E13	3834	G28		
2620	D22	2879	E19	3835	H28		
2628	N16	2880	J13	3852	H20		
2629	N16	2881	K13	3853	G19		
2630	C16	2882	O13	3854	I19		
2631	H16	2883	G17	3855	K19		
2632	N16	2884	D7	3856	F21		
2633	B16	2885	G7	3857	F20		
2634	G16	2886	H7	3858	J20		
2635	L16	2887	A7	3859	A10		
2636	D16	2888	M7	3860	H21		
2637	D16	2889	F21	3871	A10		
2638	H16	2934	O4	3872	E10		
2639	H16	2937	B19	3873	A10		
2641	A8	3501	M4	3874	E10		
2642	C7	3502	M4	3875	F10		
2643	B7	3505	K4	3877	F10		
2644	D8	3506	L4	3878	J11		
2645	B8	3509	N4	3879	K10		
2646	D8	3510	O4	3880	O10		
2647	F8	3511	M3	3881	K10		
2648	H8	3512	M3	3882	O10		
2649	C8	3560	G21	3883	A13		
2648	H8	3561	A25	3884	E13		
2651	G8	3562	B25	3885	E13		
2652	H8	3563	I21	3886	J13		
2655	L8	3601	A19	3887	K13		
2656	M8	3602	D19	3888	O13		
2657	L7	3603	A19	3889	H22		
2658	N7	3604	E19	3890	H22		
2659	A10	3605	B19	3891	A17		
2660	E10	3606	D19	3892	E17		
2661	F10	3607	B20	3893	F18		
2662	H10	3608	C20	3895	K18		
2663	K10	3609	B21	3896	C18		
2664	O10	3610	A21	3897	D18		
2665	A11	3611	A22	3939	O21		
2666	E11	3612	D22	3940	D7		
2667	F11	3618	G21	3941	B7		
2668	H11	3619	I21	3944	H7		
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2670	O11	3621	C7	3948	M7		
2671	A11	3622	B21	3949	K7		
2672	E11	3623	D21	3954	K3		
2673	F11	3627	D21	3953	L3		
2674	H11	3629	A20	3954	N3		
2675	K11	3641	B7	3955	O3		
2676	O11	3642	D7	3959	O4		
2677	A12	3643	B7	4642	O3		
2678	E12	3644	E7	4644	D3		
2679	F12	3645	C7	4652	D30		
2680	H12	3646	E7	4653	D31		
2681	K12	3649	G7	4832	H29		
2682	O12	3650	H7	4833	L2		
2683	A12	3651	G7	6601	B21		
2684	E12	3652	F7	6602	C21		
2685	F12	3655	L7	6641	B18		
2686	H12	3656	N7	6642	D18		
2687	K12	3657	M7	6643	G18		
2688	O12	3658	N7	6644	H18		
2689	A13	3659	A12	6645	L16		
2690	E13	3660	E12	6646	N18		
2691	F13	3661	A13	6647	G22		
2692	H13	3662	F12	6648	C22		
2693	K13	3663	F12	6649	D22		





MONO2 BOARD - COMPONENT SIDE VIEW



DEV. ITCL Leuven  
 Interleuvenlaan 76  
 3001 Leuven  
 Date: 2000-03-03

3104 213 35091  
 Dev.: Regis Collot  
 Layout: L. Haesendonck

8204 090 56261 3104 213 32081 8204 090 29251

This assembly drawing shows a summary of all versions. For components used in a specific version see schematic diagram and respective partslist.

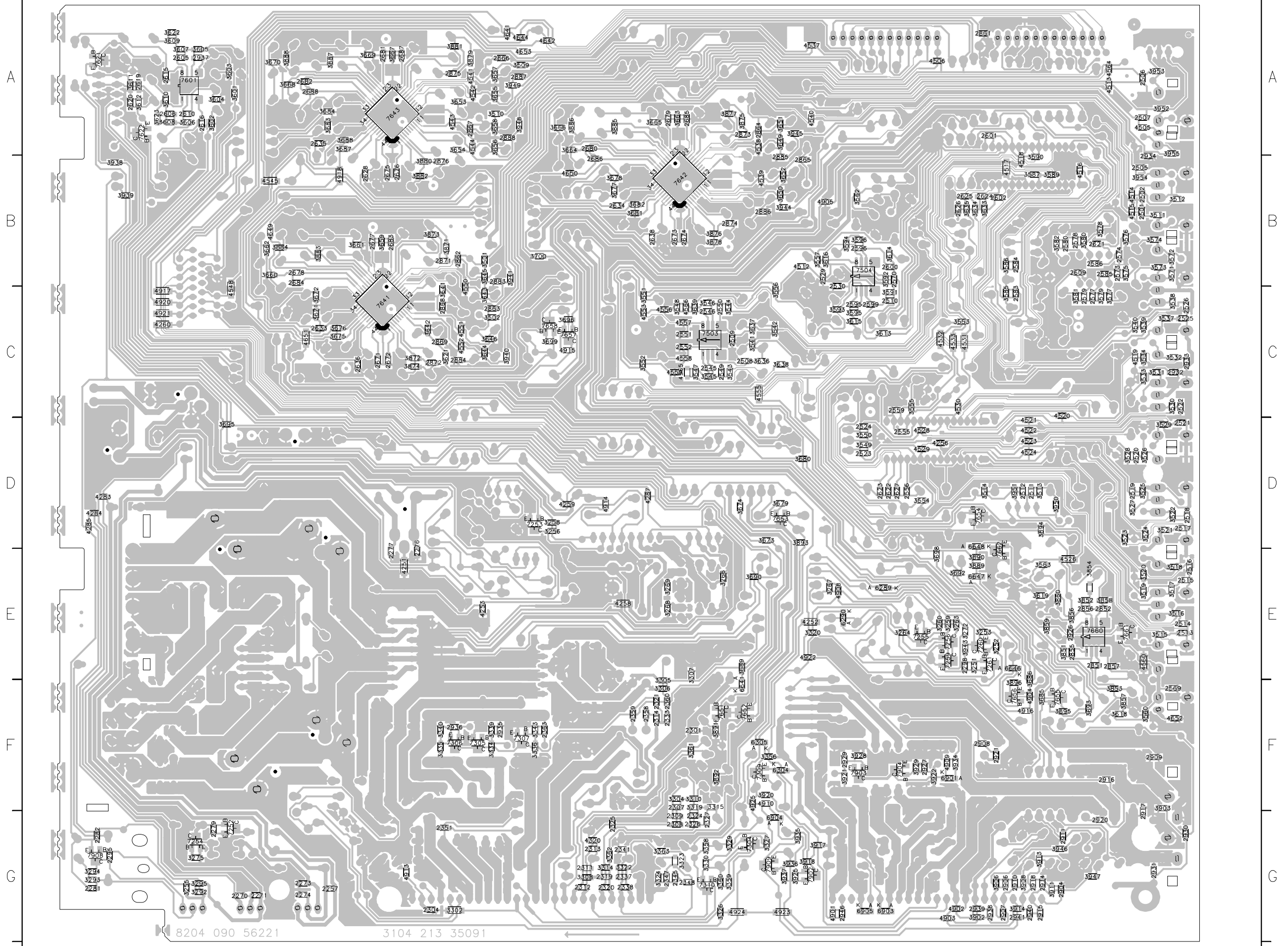




10-10

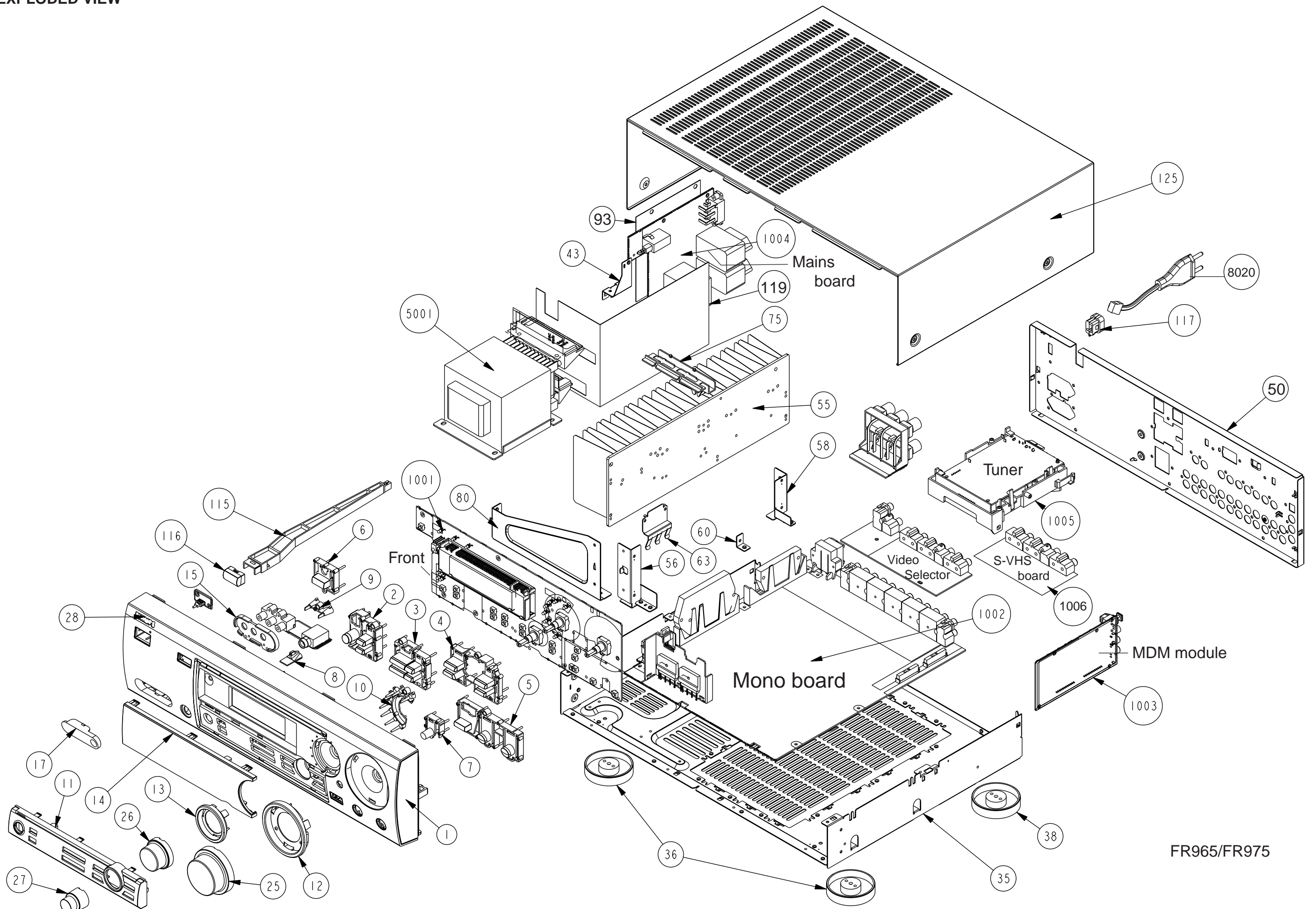
10-10

# MONO2 BOARD - COPPER SIDE VIEW



This assembly drawing shows a summary of all versions. For components used in a specific version see schematic diagram and respective partslist.

EXPLODED VIEW



FR965/FR975

SCALE 0.250



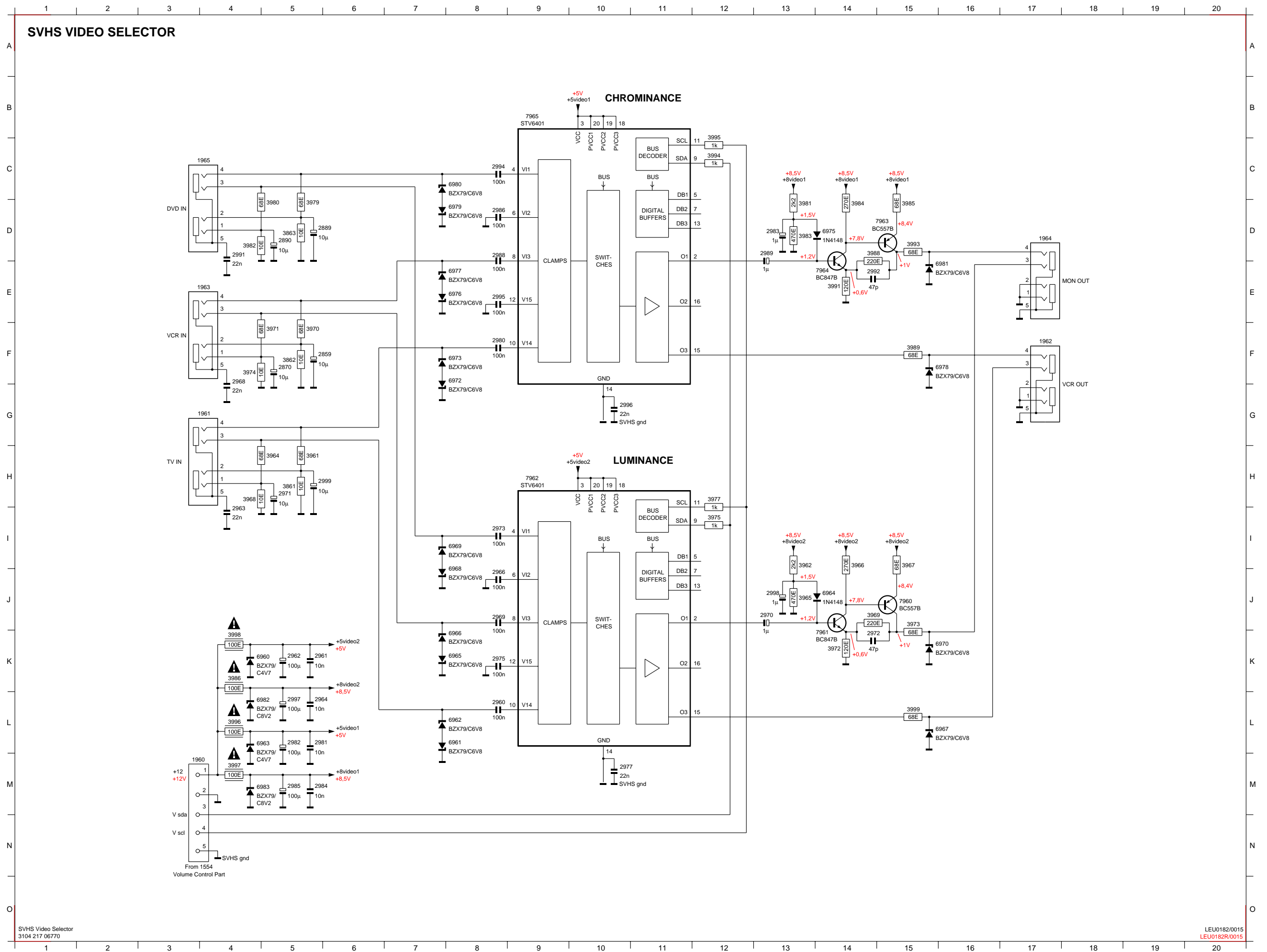
## ***S-VHS VIDEO BOARD***

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# SVHS VIDEO SELECTOR



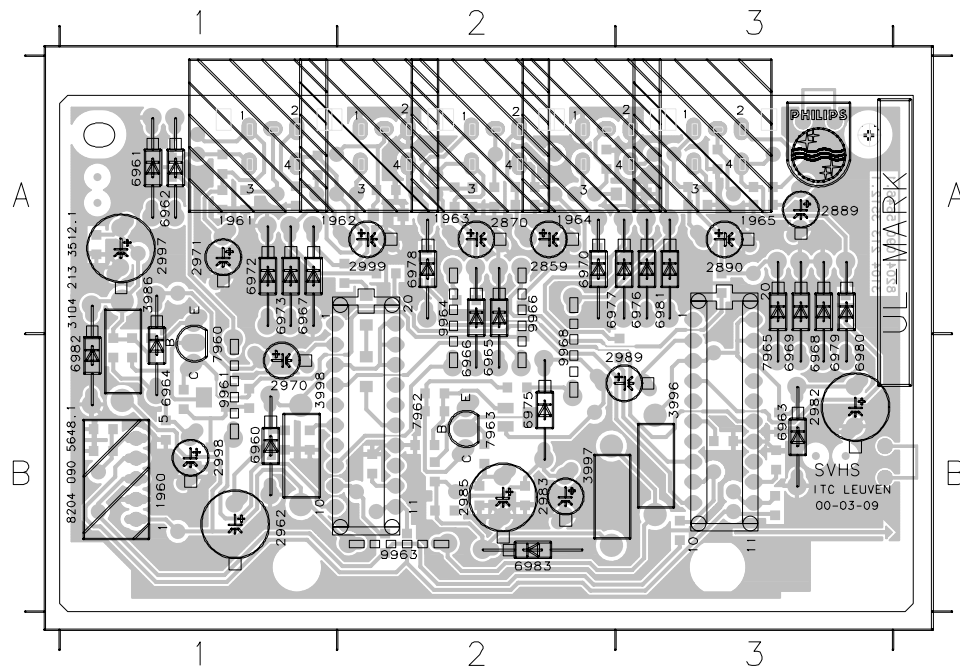
- 1960 M3
- 1961 G3
- 1962 F17
- 1963 E3
- 1964 D17
- 1965 C3
- 2859 F5
- 2870 F5
- 2889 D5
- 2890 D5
- 2960 L8
- 2961 K5
- 2962 K5
- 2963 I4
- 2964 L5
- 2966 J8
- 2968 F4
- 2969 J8
- 2970 J13
- 2971 H5
- 2972 K14
- 2973 I8
- 2975 K8
- 2977 M10
- 2980 F8
- 2981 L5
- 2982 L5
- 2984 D13
- 2985 M5
- 2986 D8
- 2988 D8
- 2989 D13
- 2991 I4
- 2992 E14
- 2994 C8
- 2995 E8
- 2996 G10
- 2997 L5
- 2998 J13
- 2999 H5
- 3861 H5
- 3862 F5
- 3863 D5
- 3961 H5
- 3962 I13
- 3964 H5
- 3965 J13
- 3966 I14
- 3967 I15
- 3968 H4
- 3969 J14
- 3970 F5
- 3971 F5
- 3972 K14
- 3973 J15
- 3974 F4
- 3975 I12
- 3977 H12
- 3979 D5
- 3980 D5
- 3981 D13
- 3982 D4
- 3983 D13
- 3984 D14
- 3985 D15
- 3986 K4
- 3988 D14
- 3989 F15
- 3991 E14
- 3993 D15
- 3994 C12
- 3995 C12
- 3996 L4
- 3997 M4
- 3998 K4
- 3999 L15
- 6960 K4
- 6961 L8
- 6962 L8
- 6963 L4
- 6964 J14
- 6965 K8
- 6966 K8
- 6967 L15
- 6968 J8
- 6969 I8
- 6970 K15
- 6972 F8
- 6973 F8
- 6975 D14
- 6976 E8
- 6977 E8
- 6978 F15
- 6979 D8
- 6980 C8
- 6981 E15
- 6982 L4
- 6983 M4
- 7960 J15
- 7961 K14
- 7962 H9
- 7963 D14
- 7964 E14
- 7965 B9

SVHS Video Selector  
3104 217 06770

LEU0182/0015  
LEU0182R/0015

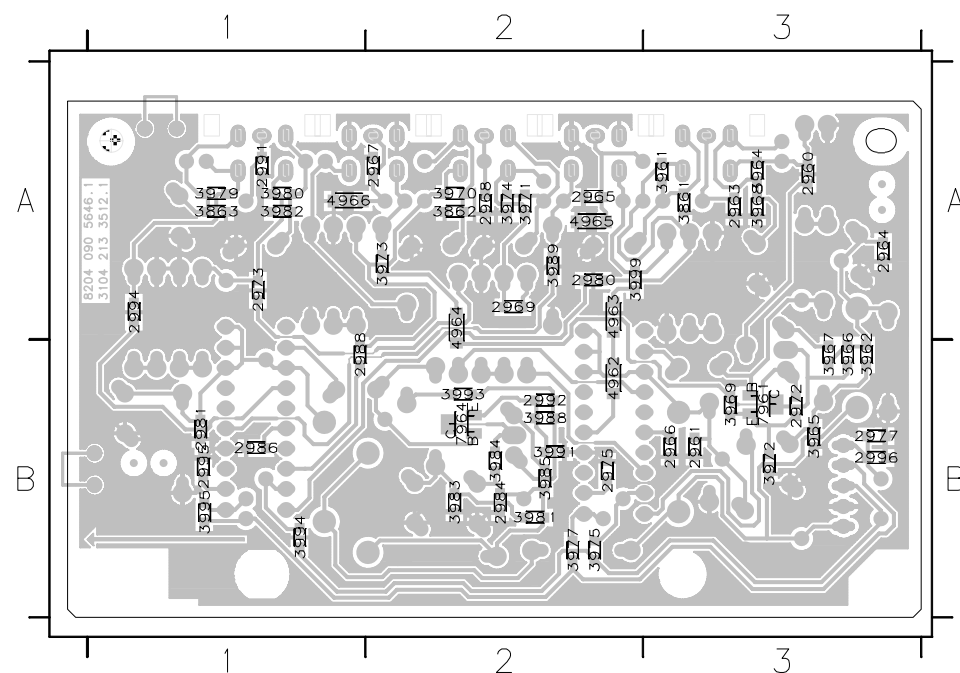
S-VHS VIDEO SELECTOR BOARD

Component side view



1961 2422 026 05158 SOC MDIN H 4P  
 1962 2422 026 05158 SOC MDIN H 4P  
 1963 2422 026 05158 SOC MDIN H 4P  
 1964 2422 026 05158 SOC MDIN H 4P  
 1965 2422 026 05158 SOC MDIN H 4P  
 2859 4822 124 11947 10UF 20% 16V  
 2870 4822 124 11947 10UF 20% 16V  
 2889 4822 124 11947 10UF 20% 16V  
 2890 4822 124 11947 10UF 20% 16V  
 2960 4822 126 14585 100NF 10% 50V  
 2961 5322 122 34098 10NF10% 63V  
 2962 4822 124 41643 100UF 20% 16V  
 2963 5322 122 32654 22NF10% 63V  
 2964 5322 122 34098 10NF10% 63V  
 2966 4822 126 14585 100NF 10% 50V  
 2968 5322 122 32654 22NF10% 63V  
 2969 4822 126 14585 100NF 10% 50V  
 2970 4822 124 22651 1UF20% 50V  
 2971 4822 124 11947 10UF 20% 16V  
 2972 4822 126 13692 47PF 1% NPO 63V  
 2973 4822 126 14585 100NF 10% 50V  
 2975 4822 126 14585 100NF 10% 50V  
 2977 5322 122 32654 22NF10% 63V  
 2980 4822 126 14585 100NF 10% 50V  
 2981 5322 122 34098 10NF10% 63V  
 2982 4822 124 41643 100UF 20% 16V  
 2983 4822 124 22651 1UF20% 50V  
 2984 5322 122 34098 10NF10% 63V  
 2985 4822 124 41643 100UF 20% 16V  
 2986 4822 126 14585 100NF 10% 50V  
 2988 4822 126 14585 100NF 10% 50V  
 2989 4822 124 22651 1UF20% 50V  
 2991 5322 122 32654 22NF10% 63V  
 2992 4822 126 13692 47PF 1% NPO 63V  
 2994 4822 126 14585 100NF 10% 50V  
 2995 4822 126 14585 100NF 10% 50V  
 2996 5322 122 32654 22NF10% 63V  
 2997 4822 124 41643 100UF 20% 16V  
 2998 4822 124 22651 1UF20% 50V  
 2999 4822 124 11947 10UF 20% 16V

Copperside view



3861 4822 051 20109 10R00 5% 0,1W  
 3862 4822 051 20109 10R00 5% 0,1W  
 3863 4822 051 20109 10R00 5% 0,1W  
 3961 4822 117 12521 68R 1% 0,1W  
 3962 4822 117 11449 2K2 1% 0,1W  
 3964 4822 117 12521 68R 1% 0,1W  
 3965 4822 051 20471 470R00 5% 0,1W  
 3966 4822 117 11504 270R 1% 0,1W  
 3967 4822 117 12521 68R 1% 0,1W  
 3968 4822 051 20109 10R00 5% 0,1W  
 3969 4822 117 11503 220R 1% 0,1W  
 3970 4822 117 12521 68R 1% 0,1W  
 3971 4822 117 12521 68R 1% 0,1W  
 3972 4822 051 20121 120R00 5% 0,1W  
 3973 4822 117 12521 68R 1% 0,1W  
 4966 4822 051 20008 0R00 JUMP. (0805)  
 4962 4822 051 20008 0R00 JUMP. (0805)  
 4963 4822 051 20008 0R00 JUMP. (0805)  
 4964 4822 051 20008 0R00 JUMP. (0805)  
 4965 4822 051 20008 0R00 JUMP. (0805)  
 4966 4822 051 20008 0R00 JUMP. (0805)

ELECTRICAL PARTSLIST - S-VHS VIDEO SELECTOR BOARD

MISCELLANEOUS

1961	2422 026 05158	SOC MDIN H 4P
1962	2422 026 05158	SOC MDIN H 4P
1963	2422 026 05158	SOC MDIN H 4P
1964	2422 026 05158	SOC MDIN H 4P
1965	2422 026 05158	SOC MDIN H 4P

CAPACITORS

2859	4822 124 11947	10UF 20% 16V
2870	4822 124 11947	10UF 20% 16V
2889	4822 124 11947	10UF 20% 16V
2890	4822 124 11947	10UF 20% 16V
2960	4822 126 14585	100NF 10% 50V
2961	5322 122 34098	10NF10% 63V
2962	4822 124 41643	100UF 20% 16V
2963	5322 122 32654	22NF10% 63V
2964	5322 122 34098	10NF10% 63V
2966	4822 126 14585	100NF 10% 50V
2968	5322 122 32654	22NF10% 63V
2969	4822 126 14585	100NF 10% 50V
2970	4822 124 22651	1UF20% 50V
2971	4822 124 11947	10UF 20% 16V
2972	4822 126 13692	47PF 1% NPO 63V
2973	4822 126 14585	100NF 10% 50V
2975	4822 126 14585	100NF 10% 50V
2977	5322 122 32654	22NF10% 63V
2980	4822 126 14585	100NF 10% 50V
2981	5322 122 34098	10NF10% 63V

2982	4822 124 41643	100UF 20% 16V
2983	4822 124 22651	1UF20% 50V
2984	5322 122 34098	10NF10% 63V
2985	4822 124 41643	100UF 20% 16V
2986	4822 126 14585	100NF 10% 50V
2988	4822 126 14585	100NF 10% 50V
2989	4822 124 22651	1UF20% 50V
2991	5322 122 32654	22NF10% 63V
2992	4822 126 13692	47PF 1% NPO 63V
2994	4822 126 14585	100NF 10% 50V
2995	4822 126 14585	100NF 10% 50V
2996	5322 122 32654	22NF10% 63V
2997	4822 124 41643	100UF 20% 16V
2998	4822 124 22651	1UF20% 50V
2999	4822 124 11947	10UF 20% 16V

RESISTORS

3861	4822 051 20109	10R00 5% 0,1W
3862	4822 051 20109	10R00 5% 0,1W
3863	4822 051 20109	10R00 5% 0,1W
3961	4822 117 12521	68R 1% 0,1W
3962	4822 117 11449	2K2 1% 0,1W
3964	4822 117 12521	68R 1% 0,1W
3965	4822 051 20471	470R00 5% 0,1W
3966	4822 117 11504	270R 1% 0,1W
3967	4822 117 12521	68R 1% 0,1W
3968	4822 051 20109	10R00 5% 0,1W
3969	4822 117 11503	220R 1% 0,1W
3970	4822 117 12521	68R 1% 0,1W
3971	4822 117 12521	68R 1% 0,1W
3972	4822 051 20121	120R00 5% 0,1W
3973	4822 117 12521	68R 1% 0,1W

3974	4822 051 20109	10R00 5% 0,1W
3975	4822 051 10102	1K00 2% 0,25W
3977	4822 051 10102	1K00 2% 0,25W
3979	4822 117 12521	68R 1% 0,1W
3980	4822 117 12521	68R 1% 0,1W
3981	4822 117 11449	2K2 1% 0,1W
3982	4822 051 20109	10R00 5% 0,1W
3983	4822 051 20471	470R00 5% 0,1W
3984	4822 117 11504	270R 1% 0,1W
3985	4822 117 12521	68R 1% 0,1W
3986	4822 053 10101	100R00 5% 1W
3988	4822 117 11503	220R 1% 0,1W
3989	4822 117 12521	68R 1% 0,1W
3991	4822 051 20121	120R00 5% 0,1W
3993	4822 117 12521	68R 1% 0,1W
3994	4822 051 10102	1K00 2% 0,25W
3995	4822 051 10102	1K00 2% 0,25W
3996	4822 053 10101	100R00 5% 1W
3997	4822 053 10101	100R00 5% 1W
3998	4822 053 10101	100R00 5% 1W
3999	4822 117 12521	68R 1% 0,1W
4962	4822 051 20008	0R00 JUMP. (0805)
4963	4822 051 20008	0R00 JUMP. (0805)
4964	4822 051 20008	0R00 JUMP. (0805)
4965	4822 051 20008	0R00 JUMP. (0805)
4966	4822 051 20008	0R00 JUMP. (0805)

DIODES

6960	4822 130 34174	BZX79-B4V7
6961	4822 130 34278	BZX79-B6V8
6962	4822 130 34278	BZX79-B6V8
6963	4822 130 34174	BZX79-B4V7
6964	4822 130 30621	1N4148
6965	4822 130 34278	BZX79-B6V8
6966	4822 130 34278	BZX79-B6V8
6967	4822 130 34278	BZX79-B6V8
6968	4822 130 34278	BZX79-B6V8
6969	4822 130 34278	BZX79-B6V8
6970	4822 130 34278	BZX79-B6V8
6972	4822 130 34278	BZX79-B6V8
6973	4822 130 34278	BZX79-B6V8
6975	4822 130 30621	1N4148
6976	4822 130 34278	BZX79-B6V8

6977	4822 130 34278	BZX79-B6V8
6978	4822 130 34278	BZX79-B6V8
6979	4822 130 34278	BZX79-B6V8
6980	4822 130 34278	BZX79-B6V8
6981	4822 130 34278	BZX79-B6V8
6982	4822 130 34382	BZX79-B8V2
6983	4822 130 34382	BZX79-B8V2

TRANSISTORS

7960	4822 130 44568	BC557B
7961	4822 130 60511	BC847B
7962	4822 209 16886	STV6401
7963	4822 130 44568	BC557B
7964	4822 130 60511	BC847B
7965	4822 209 16886	STV6401



**PARTSLIST - EXPLODED VIEW****MECHANICAL PARTS FR975/00/17**

1	3104 217 52810	FRONT CABINET ASSY
2	4822 410 12442	BUTTON HINGE ASSY SURR.
3	4822 410 12435	BUTTONS HINGE TUNER
4	4822 410 12443	BUTTON HINGE ASSY MENU
5	4822 410 12436	BUTTONS HINGE BASS TREBLE
6	4822 410 12437	BUTTONS EASY LINK
7	4822 410 12478	BUTTON HINGE A/V
8	4822 380 10274	LIGHT GUIDE SURROUND
9	3104 214 38460	LIGHT GUIDE VIRTUAL/HALL
10	4822 380 10277	LIGHT GUIDE SELECTOR
11	3104 217 52760	ORNAMENTAL PLATE FR975/00
11	3104 217 52800	ORNAMENTAL PLATE FR975/17
12	3104 217 52130	RING KNOB VOLUME
13	3104 217 52140	RING KNOB SOURCE SELECTOR
14	3104 217 52910	WINDOW DISPLAY FR975/00
14	3104 217 52900	WINDOW DISPLAY FR975/17
15	4822 426 10895	BACKPLATE A/V
17	4822 442 01879	COVER PLATE ASSY
25	4822 410 12438	KNOB VOLUME
26	4822 410 12439	KNOB SOURCE SELECTOR
27	4822 410 12441	KNOB MENU NAV
28	4822 459 10887	BADGE PHILIPS
36	4822 691 10773	LEG SILVER
38	4822 691 10773	LEG SILVER
115	4822 535 10638	POWER ROD
116	4822 462 11176	POWER CAP
117	4822 532 60948	BUSCH, PLASTIC
125	4822 442 01817	COVERPLATE

**ELECTRICAL PARTS**

1003	3104 217 06390	MDM2000 Module
5001 ▲	4822 146 11165	MAINS TRAFO FR975/00
5001 ▲	4822 146 11169	MAINSTRAFO FR975/01C
5001 ▲	4822 146 21225	MAINS TRAFO FR975/17
8020 ▲	4822 321 11139	MAINS CORD FR975/00/01C
8020 ▲	3139 118 77230	MAINSCORD UL FR975/17

**MISCELLANEOUS PARTS FR975/00/01C/17**

4822 303 50063	FM AERIAL 75R only in /00/01C
4822 320 11094	FM AERIAL 300R only in /17
4822 303 50082	AM FRAME
2422 076 00314	COMB/CINCH only in /00
4822 263 21206	CINCH/CINCH only in /01C/17
4822 321 61452	CABLE ASSY CINCH/CINCH
3104 219 04310	REMOTE CONTROL
3103 306 17010	INSTR.FOR.USE
3103 306 17020	INSTR.FOR.USE /01C

4822 263 21206  
green/green 1m74822 321 61452  
black/black 1m**MECHANICAL PARTS FR975/01C**

1	3104 217 52820	FRONT ASSY
2	3104 217 52570	BUTTON SURROUND
3	3104 217 52620	BUTTON TUNER
4	3104 217 52560	BUTTON MENU
5	3104 217 52630	BUTTON BASS TREBLE
6	3104 217 52550	BUTTON EASY LINK
7	3104 217 52640	BUTTON A/V ASSY
8	4822 380 10274	LIGHT GUIDE SURROUND
9	3104 214 38460	LIGHT GUIDE VIRTUAL/HALL
10	4822 380 10277	LIGHT GUIDE SELECTOR
11	3104 217 52780	ORNAMENTAL PLATE ASSY
12	3104 217 52410	RING KNOB VOL.ASSY
13	3104 217 52420	RING KNOB
14	3104 217 52920	WINDOW DISPLAY ASSY
15	3104 214 38930	BACKPLATE A/V
17	3104 217 52540	COVER PLATE ASSY
25	3104 217 52380	KNOB VOLUME ASSY
26	3104 217 52390	KNOB SOURCE
27	3104 217 52400	KNOB MENU NAV.
28	4822 459 10887	BADGE PHILIPS
36	3104 217 52530	LEG CHAMPAGNE
38	3104 217 52530	LEG CHAMPAGNE
115	4822 535 10638	POWER ROD
116	3104 217 52650	POWER CAP ASSY
117	4822 532 60948	BUSH, PLASTIC
125	4822 442 01817	COVERPLATE

**MISCELLANEOUS PARTS MX980D/37**

3104 219 04231	FRONT SPEAKER 100W
3104 219 04241	CENTER SPEAKR 100W
3104 219 04231	SURROUND SPEAKER 100W
3104 219 03730	SUBWOOFER FB201V/1
4822 320 12719	CORD SET FRONT SPEAKER
4822 320 12721	CORD SET CENTER SPEAKER
4822 320 12722	CORD SET SURR. SPEAKER



**ELECTRICAL PARTSLIST - MONO2 BOARD****MISCELLANEOUS**

1260	▲	4822 252 51123	FUSE6,3A
1261	▲	4822 252 51123	FUSE 6,3A
1301		2422 015 19403	SCREW 6P LS
1502		4822 267 31823	CINCH
1512		4822 267 31823	CINCH
1513		4822 267 31823	CINCH
1514		4822 267 31823	CINCH
1516		4822 267 31823	CINCH
1520		4822 265 10981	CINCH 1P
1521		2422 025 11067	CON BM V 12P
1523		2422 025 11067	CON BM V 12P
1525		4822 265 11608	CINCH 2P
1540		4822 265 20542	CINCH 2P
1542		2422 026 05134	CINCH 2P
1550		4822 267 31729	CINCH 1P
1801		4822 267 31996	CONN. 1P
1802		4822 265 11619	CINCH 2P
1803		4822 265 11619	CINCH 2P
1901		4822 265 11609	CON. CLICK 4P

**CAPACITORS**

2251		5322 121 42578	100NF 5% 250V
2253		4822 121 43526	47NF 5% 250V
2254		5322 121 42578	100NF 5% 250V
2256		4822 121 43526	47NF 5% 250V
2257		4822 122 33177	10NF 20% X7R 50V
2259		4822 124 80415	4700UF20% 50V
2260		4822 124 80415	4700UF20% 50V
2262		4822 124 12423	4700UF 20% 63V
2264		4822 124 12423	4700UF 20% 63V
2266		5322 121 42386	100NF 5% 63V
2267		4822 124 41751	47UF 20% 50V
2268		5322 121 42386	100NF 5% 63V
2269		4822 124 80563	4700UF 35V
2270		4822 126 13838	100NF 50V P80M20
2271		4822 126 14583	470NF 10% 16V
2272		4822 124 12328	6800UF 16V
2273		4822 126 14585	100NF 10% 50V
2274		4822 126 14583	470NF 10% 16V
2275		4822 124 81144	1000U 16V
2276		4822 126 14585	100NF 10% 50V
2277		4822 126 14583	470NF 10%
2278		4822 124 22652	2,2UF20% 50V
2279		4822 126 14585	100NF 10% 50V
2280		4822 124 41584	100UF 20% 10V
2281		4822 126 13838	100NF 50V P80M20
2282		4822 126 14583	470NF 10% 16V
2290		4822 124 40248	10UF20% 63V
2295		4822 122 33177	10NF 20% X7R 50V
2298		5322 122 32654	22NF10%X7R 63V
2299		5322 124 40641	10UF 20% 100V
2301		5322 122 32654	22NF10%X7R 63V
2303		4822 124 40764	22UF 100 V
2305		5322 124 40641	10UF 20% 100V
2306		4822 124 40248	10UF20% 63V
2308		5322 122 32448	10PF 5% NP0 63V
2309		5322 122 32448	10PF 5% NP0 63V
2310		4822 124 40248	10UF20% 63V
2311		5322 122 32268	470PF 10% 50V
2313		4822 122 33575	220PF 5% NP0 63V
2314		4822 126 13473	220NF80-20% 50V
2315		4822 124 40433	47UF 20% 10V
2316		4822 124 40248	10UF20% 63V
2319		5322 122 32268	470PF 10% 50V
2321		4822 126 13473	220NF80-20% 50V

**CAPACITORS**

2325		4822 122 33575	220PF 5% NP0 63V
2326		5322 122 32448	10PF 5% NP0 63V
2327		5322 122 32448	10PF 5% NP0 63V
2330		4822 124 40433	47UF 20% 10V
2333		4822 126 13473	220NF80-20% 50V
2334		4822 124 40248	10UF20% 63V
2337		5322 122 32268	470PF 10% 50V
2341		4822 122 33575	220PF 5% NP0 63V
2345		5322 122 32448	10PF 5% NP0 63V
2346		4822 124 40433	47UF 20% 10V
2348		5322 122 32448	10PF 5% NP0 63V
2349		4822 124 40248	10UF20% 63V
2350		4822 124 40181	220UF20% 10V
2353		4822 124 40764	22UF 100 V
2354		5322 124 40641	10UF 20% 100V
2357		4822 126 12882	100NF+80-20% 50V
2358		4822 126 13473	220NF80-20% 50V
2359		4822 126 13473	220NF80-20% 50V
2360		4822 126 13473	220NF80-20% 50V
2365		4822 121 41857	10NF 5% 250V
2371		5322 126 10223	4,7NF10%X7R 63V
2372		5322 126 10223	4,7NF10%X7R 63V
2373		5322 126 10223	4,7NF10%X7R 63V
2374		5322 122 32531	100PF 5%NP0 50V
2375		5322 122 32531	100PF 5%NP0 50V
2376		5322 122 32531	100PF 5%NP0 50V
2501		5322 126 10511	1NF 5%NP0 50V
2502		5322 126 10511	1NF 5%NP0 50V
2505		5322 126 10511	1NF 5%NP0 50V
2506		5322 126 10511	1NF 5%NP0 50V
2507		5322 126 10511	1NF 5%NP0 50V
2508		5322 122 32531	100PF 5%NP0 50V
2509		5322 122 32531	100PF 5%NP0 50V
2510		5322 122 32531	100PF 5%NP0 50V
2511		5322 122 32531	100PF 5%NP0 50V
2512		5322 122 32531	100PF 5%NP0 50V
2513		5322 122 32531	100PF 5%NP0 50V
2514		5322 122 32531	100PF 5%NP0 50V
2515		5322 122 32531	100PF 5%NP0 50V
2516		5322 122 32531	100PF 5%NP0 50V
2517		5322 122 32531	100PF 5%NP0 50V
2518		5322 122 32531	100PF 5%NP0 50V
2519		5322 122 32531	100PF 5%NP0 50V
2520		5322 122 32531	100PF 5%NP0 50V
2521		5322 122 32531	100PF 5%NP0 50V
2522		5322 122 32531	100PF 5%NP0 50V
2523		5322 122 32531	100PF 5%NP0 50V
2524		5322 122 32531	100PF 5%NP0 50V
2525		5322 122 32531	100PF 5%NP0 50V
2526		5322 122 32531	100PF 5%NP0 50V
2527		4822 124 41751	47UF 20% 50V
2528		4822 124 41751	47UF 20% 50V
2529		4822 126 13838	100NF 50V P80M20
2530		4822 126 13838	100NF 50V P80M20
2531		4822 121 42408	220NF 5% 63V
2532		4822 121 42408	220NF 5% 63V
2533		4822 124 81151	22UF 50V
2534		4822 124 81151	22UF 50V
2535		4822 124 81151	22UF 50V
2536		4822 124 81151	22UF 50V
2537		4822 124 81151	22UF 50V
2538		4822 124 81151	22UF 50V
2539		4822 124 40207	100UF20% 25V
2540		4822 124 40433	47UF20% 25V
2541		4822 124 40248	10UF20% 63V

**ELECTRICAL PARTSLIST - MONO2 BOARD**

CAPASITORS			CAPACITORS		
2542	4822 124 40248	10UF20% 63V	2622	5322 122 32531	100PF 5%NP0 50V
2543	4822 124 11912	220UF 20% 6,3V	2623	5322 122 32531	100PF 5%NP0 50V
2544	4822 124 11912	220UF 20% 6,3V	2624	5322 122 32531	100PF 5%NP0 50V
2545	5322 122 32531	100PF 5%NP0 50V	2625	5322 122 32531	100PF 5%NP0 50V
2546	5322 122 32531	100PF 5%NP0 50V	2626	5322 122 32531	100PF 5%NP0 50V
2549	5322 122 32658	22PF 5% 50V	2627	5322 122 32531	100PF 5%NP0 50V
2550	5322 122 32658	22PF 5% 50V	2628	4822 126 14585	100NF 10% 50V
2551	4822 126 13838	100NF 50V P80M20	2629	4822 124 41751	47UF 20% 50V
2552	4822 126 13838	100NF 50V P80M20	2630	5322 121 42386	100NF 5% 63V
2553	4822 124 41751	47UF 20% 50V	2631	5322 121 42386	100NF 5% 63V
2554	4822 124 41751	47UF 20% 50V	2632	5322 121 42386	100NF 5% 63V
2555	4822 126 13838	100NF 50V P80M20	2633	5322 122 32654	22NF10%X7R 63V
2556	4822 126 13838	100NF 50V P80M20	2634	5322 122 32654	22NF10%X7R 63V
2557	4822 124 41751	47UF 20% 50V	2635	5322 122 32654	22NF10%X7R 63V
2558	4822 124 41751	47UF 20% 50V	2636	4822 126 14585	100NF 10% 50V
2559	4822 126 12105	CER2 50V 33NF PM5	2637	4822 124 41751	47UF 20% 50V
2561	4822 124 40764	22UF 100 V	2638	4822 126 14585	100NF 10% 50V
2562	4822 124 40764	22UF 100 V	2639	4822 124 41751	47UF 20% 50V
2563	4822 123 14025	16V 2200U 20%	2641	4822 124 21913	1UF20% 63V
2564	4822 124 22652	2,2UF20% 50V	2642	4822 124 21913	1UF20% 63V
2565	4822 124 22652	2,2UF20% 50V	2643	4822 124 21913	1UF20% 63V
2566	4822 124 22652	2,2UF20% 50V	2644	4822 124 21913	1UF20% 63V
2567	4822 124 40769	4,7UF20% 100V	2645	4822 124 21913	1UF20% 63V
2568	4822 124 40769	4,7UF20% 100V	2646	4822 124 21913	1UF20% 63V
2569	5322 122 32531	100PF 5%NP0 50V	2647	4822 124 21913	1UF20% 63V
2570	5322 122 32531	100PF 5%NP0 50V	2648	4822 124 21913	1UF20% 63V
2571	4822 124 40248	10UF20% 63V	2649	4822 124 21913	1UF20% 63V
2572	4822 124 40248	10UF20% 63V	2650	4822 124 21913	1UF20% 63V
2573	4822 122 33575	220PF 5% NP0 63V	2651	4822 124 21913	1UF20% 63V
2574	4822 122 33575	220PF 5% NP0 63V	2652	4822 124 21913	1UF20% 63V
2575	4822 124 40248	10UF20% 63V	2655	4822 124 21913	1UF20% 63V
2576	4822 124 40248	10UF20% 63V	2656	4822 124 21913	1UF20% 63V
2577	4822 122 33177	10NF 20% X7R 50V	2657	4822 124 21913	1UF20% 63V
2578	4822 122 33177	10NF 20% X7R 50V	2658	4822 124 21913	1UF20% 63V
2579	4822 122 33127	2,2NF10%X7R 63V	2659	4822 124 22652	2,2UF20% 50V
2580	4822 122 33127	2,2NF10%X7R 63V	2660	4822 124 22652	2,2UF20% 50V
2581	4822 124 41751	47UF 20% 50V	2661	4822 124 22652	2,2UF20% 50V
2582	4822 124 41751	47UF 20% 50V	2662	4822 124 22652	2,2UF20% 50V
2583	4822 122 33891	3,3NF10%X7R 63V	2663	4822 124 22652	2,2UF20% 50V
2584	4822 122 33891	3,3NF10%X7R 63V	2664	4822 124 22652	2,2UF20% 50V
2585	4822 126 13695	82PF 1% NP0 63V	2665	4822 121 43526	47NF 5% 250V
2586	4822 126 13695	82PF 1% NP0 63V	2666	4822 121 43526	47NF 5% 250V
2593	4822 124 81151	22UF 50V	2667	4822 121 43526	47NF 5% 250V
2594	4822 124 81151	22UF 50V	2668	4822 121 43526	47NF 5% 250V
2595	5322 122 32531	100PF 5%NP0 50V	2669	4822 121 43526	47NF 5% 250V
2596	5322 122 32531	100PF 5%NP0 50V	2670	4822 121 43526	47NF 5% 250V
2599	5322 122 32658	22PF 5% 50V	2671	5322 122 31866	6,8NF10%X7R 63V
2600	5322 122 32658	22PF 5% 50V	2672	5322 122 31866	6,8NF10%X7R 63V
2603	4822 124 81151	22UF 50V	2673	5322 122 31866	6,8NF10%X7R 63V
2604	4822 124 81151	22UF 50V	2674	5322 122 31866	6,8NF10%X7R 63V
2605	4822 126 13692	47PF 1% NP0 63V	2675	5322 122 31866	6,8NF10%X7R 63V
2606	4822 126 13692	47PF 1% NP0 63V	2676	5322 122 31866	6,8NF10%X7R 63V
2607	4822 124 41751	47UF 20% 50V	2677	5322 122 32654	22NF10%X7R 63V
2608	4822 124 41751	47UF 20% 50V	2678	5322 122 32654	22NF10%X7R 63V
2610	4822 122 33575	220PF 5% NP0 63V	2679	5322 122 32654	22NF10%X7R 63V
2611	4822 124 40207	100UF20% 25V	2680	5322 122 32654	22NF10%X7R 63V
2612	4822 124 40248	10UF20% 63V	2681	5322 122 32654	22NF10%X7R 63V
2613	4822 124 40248	10UF20% 63V	2682	5322 122 32654	22NF10%X7R 63V
2614	4822 124 40207	100UF20% 25V	2683	5322 122 32654	22NF10%X7R 63V
2615	5322 122 32654	22NF10%X7R 63V	2684	5322 122 32654	22NF10%X7R 63V
2616	5322 122 32654	22NF10%X7R 63V	2685	5322 122 32654	22NF10%X7R 63V
2617	4822 124 40248	10UF20% 63V	2686	5322 122 32654	22NF10%X7R 63V
2618	4822 124 40248	10UF20% 63V	2687	5322 122 32654	22NF10%X7R 63V
2619	5322 122 32531	100PF 5%NP0 50V	2688	5322 122 32654	22NF10%X7R 63V
2620	5322 122 32531	100PF 5%NP0 50V	2689	5322 121 42465	68NF 5% 63V

**ELECTRICAL PARTSLIST - MONO2 BOARD****CAPACITORS**

2690	5322 121 42465	68NF 5%	63V
2691	5322 121 42465	68NF 5%	63V
2692	5322 121 42465	68NF 5%	63V
2693	5322 121 42465	68NF 5%	63V
2694	5322 121 42465	68NF 5%	63V
2695	5322 121 42465	68NF 5%	63V
2696	5322 121 42465	68NF 5%	63V
2697	5322 121 42465	68NF 5%	63V
2698	5322 121 42465	68NF 5%	63V
2699	5322 121 42465	68NF 5%	63V
2700	5322 121 42465	68NF 5%	63V
2801	4822 124 22833	10UF	50V
2802	4822 124 22833	10UF	50V
2803	4822 124 22833	10UF	50V
2804	4822 124 22833	10UF	50V
2805	4822 126 14585	100NF 10%	50V
2806	4822 126 14585	100NF 10%	50V
2807	4822 126 14585	100NF 10%	50V
2808	4822 126 14585	100NF 10%	50V
2809	5322 122 34098	10NF10%X7R	63V
2810	4822 124 40196	220UF20%	16V
2811	5322 122 34098	10NF10%	63V
2812	4822 124 40196	220UF20%	16V
2813	4822 124 21913	1UF20%	63V
2814	4822 126 13692	47PF 1% NP0	63V
2815	4822 126 14585	100NF 10%	50V
2816	5322 122 32654	22NF10%	63V
2817	4822 124 21913	1UF20%	63V
2818	5322 122 32654	22NF10%X7R	63V
2821	5322 122 32654	22NF10%X7R	63V
2822	5322 122 32654	22NF10%X7R	63V
2831	5322 122 32531	100PF 5%NP0	50V
2832	4822 126 14585	100NF 10%	50V
2833	5322 122 32654	22NF10%X7R	63V
2834	5322 122 32531	100PF 5%NP0	50V
2835	5322 122 32531	100PF 5%NP0	50V
2836	5322 122 32531	100PF 5%NP0	50V
2837	5322 122 32531	100PF 5%NP0	50V
2851	5322 122 32658	22PF 5%	50V
2852	5322 122 32658	22PF 5%	50V
2853	4822 124 81151	22UF	50V
2854	4822 124 81151	22UF	50V
2855	5322 122 32531	100PF 5%NP0	50V
2856	5322 122 32531	100PF 5%NP0	50V
2857	4822 126 14585	100NF 10%	50V
2858	4822 124 41751	47UF 20%	50V
2860	4822 124 41751	47UF 20%	50V
2861	5322 122 32654	22NF10%X7R	63V
2862	5322 122 32531	100PF 5%NP0	50V
2863	5322 122 32531	100PF 5%NP0	50V
2864	5322 122 32531	100PF 5%NP0	50V
2865	5322 122 32531	100PF 5%NP0	50V
2866	5322 122 32531	100PF 5%NP0	50V
2867	5322 122 32531	100PF 5%NP0	50V
2868	4822 122 33575	220PF 5% NP0	63V
2869	4822 122 33575	220PF 5% NP0	63V
2871	4822 122 33177	10NF 20% X7R	50V
2872	4822 122 33177	10NF 20% X7R	50V
2873	4822 122 33177	10NF 20% X7R	50V
2875	4822 122 33177	10NF 20% X7R	50V
2876	4822 122 33177	10NF 20% X7R	50V
2877	5322 121 42386	100NF 5%	63V
2878	5322 121 42386	100NF 5%	63V
2879	5322 121 42386	100NF 5%	63V

**CAPACITORS**

2880	5322 121 42386	100NF 5%	63V
2881	5322 121 42386	100NF 5%	63V
2882	5322 121 42386	100NF 5%	63V
2883	5322 126 10511	1NF 5%NP0	50V
2884	5322 126 10511	1NF 5%NP0	50V
2885	5322 126 10511	1NF 5%NP0	50V
2886	5322 126 10511	1NF 5%NP0	50V
2887	4822 122 33127	2,2NF10%X7R	63V
2888	4822 122 33127	2,2NF10%X7R	63V
2902	4822 124 40248	10UF20%	63V
2905	4822 124 40248	10UF20%	63V
2906	5322 122 32268	470PF 10%	50V
2908	4822 126 13473	220NF80-20%	50V
2909	5322 126 10223	4,7NF10%X7R	63V
2910	4822 122 33575	220PF 5% NP0	63V
2911	5322 122 32654	22NF10%X7R	63V
2912	4822 124 40433	47UF 20%	10V
2913	4822 124 40248	10UF20%	63V
2914	5322 122 32268	470PF 10%	50V
2916	4822 126 13473	220NF80-20%	50V
2917	5322 126 10223	4,7NF10%X7R	63V
2918	4822 122 33575	220PF 5% NP0	63V
2919	4822 124 40433	47UF 20%	10V
2920	4822 126 13473	220NF80-20%	50V
2921	4822 126 13473	220NF80-20%	50V
2924	4822 124 40248	10UF20%	63V
2925	4822 124 40181	220UF20%	10V
2926	4822 126 14585	100NF 10%	50V
2930	5322 122 32531	100PF 5%NP0	50V
2931	5322 122 32531	100PF 5%NP0	50V
2932	5322 122 32531	100PF 5%NP0	50V
2933	5322 122 32531	100PF 5%NP0	50V
2934	5322 126 10511	1NF 5%NP0	50V
2937	4822 122 33575	220PF 5% NP0	63V
2938	5322 122 32448	10PF 5% NP0	63V
2939	5322 122 32448	10PF 5% NP0	63V
2940	5322 122 32448	10PF 5% NP0	63V
2941	5322 122 32448	10PF 5% NP0	63V
2942	4822 124 40764	22UF	100 V
2943	5322 124 40641	10UF 20%	100V
2944	5322 124 40641	10UF 20%	100V
2945	4822 124 40764	22UF	100 V

**RESISTORS**

3251	4822 051 10102	1K 2%	0,25W
3252	4822 117 10837	100K 1%	0.1W
3253	4822 117 10837	100K 1%	0.1W
3254	▲ 4822 117 11342	0R33 5%	2W
3256	4822 117 10833	10K 1%	0,1W
3257	▲ 4822 117 11342	0R33 5%	2W
3258	4822 117 11149	82K 1%	0,1W
3259	4822 117 10361	680R 1%	0,1W
3260	4822 117 10834	47K 1%	0,1W
3261	4822 116 83881	390R 5%	0,5W
3262	4822 050 21003	10K 1%	0,6W
3263	4822 117 10361	680R 1%	0,1W
3264	4822 117 10837	100K 1%	0.1W
3265	▲ 4822 052 10479	47R 5%	0,33W
3266	4822 051 20223	22K 5%	0,1W
3267	4822 117 11507	6K8 1%	0,1W
3268	4822 051 20332	3K3 5%	0,1W
3269	4822 051 20332	3K3 5%	0,1W
3270	▲ 4822 052 10479	47R 5%	0,33W
3271	▲ 4822 052 10479	47R 5%	0,33W
3272	4822 051 20393	39K00 5%	0,1W



**ELECTRICAL PARTSLIST - MONO2 BOARD**

RESISTORS					RESISTORS				
3273	4822 116 83872	220R	5%	0,5W	3510	4822 116 83933	15K	1%	0,1W
3274	4822 116 83876	270R	5%	0,5W	3511	4822 051 20101	100R	5%	0,1W
3275	4822 117 10353	150R	1%	0,1W	3512	4822 051 20101	100R	5%	0,1W
3276	4822 116 52234	100K	5%	0,5W	3513	4822 117 10834	47K	1%	0,1W
3291 ▲	4822 052 10109	10R	5%	0,33W	3514	4822 117 10834	47K	1%	0,1W
3292	4822 116 83933	15K	1%	0,1W	3515	4822 051 20471	470R	5%	0,1W
3293	4822 117 10833	10K	1%	0,1W	3516	4822 051 20471	470R	5%	0,1W
3294	4822 117 10833	10K	1%	0,1W	3517	4822 051 20393	39K	5%	0,1W
3295	4822 116 83933	15K	1%	0,1W	3518	4822 051 20393	39K	5%	0,1W
3301 ▲	4822 052 10479	47R00	5%	0,33W	3519	4822 051 20822	8K2	5%	0,1W
3302 ▲	4822 117 11151	1R	5%		3520	4822 051 20822	8K2	5%	0,1W
3303	4822 116 83961	6K8	5%		3521	4822 051 20393	39K00	5%	0,1W
3304	4822 117 11148	56K	1%	0,1W	3522	4822 051 20393	39K00	5%	0,1W
3305	4822 117 10834	47K	1%	0,1W	3523	4822 051 20822	8K20	5%	0,1W
3306	4822 117 10834	47K	1%	0,1W	3524	4822 051 20822	8K20	5%	0,1W
3307	4822 117 10834	47K	1%	0,1W	3525	4822 051 20393	39K00	5%	0,1W
3308	4822 117 11148	56K	1%	0,1W	3526	4822 051 20393	39K00	5%	0,1W
3309	4822 050 24708	4R70	1%	0,6W	3527	4822 051 20822	8K20	5%	0,1W
3310	4822 051 20182	1K80	5%	0,1W	3528	4822 051 20822	8K20	5%	0,1W
3311	4822 050 24708	4R70	1%	0,6W	3529	4822 051 20471	470R00	5%	0,1W
3314	4822 117 11148	56K	1%	0,1W	3530	4822 051 20471	470R00	5%	0,1W
3315	4822 051 20182	1K80	5%	0,1W	3531	4822 051 20393	39K00	5%	0,1W
3316	4822 050 24708	4R70	1%	0,6W	3532	4822 051 20393	39K00	5%	0,1W
3319	4822 117 11148	56K	1%	0,1W	3533	4822 051 20822	8K20	5%	0,1W
3320	4822 051 10102	1K00	2%	0,25W	3534	4822 051 20822	8K20	5%	0,1W
3322	4822 117 11148	56K	1%	0,1W	3535	4822 116 52251	18K	5%	0,5W
3323	4822 051 20182	1K80	5%	0,1W	3536	4822 116 52251	18K	5%	0,5W
3324	4822 117 11148	56K	1%	0,1W	3537	4822 051 20393	39K00	5%	0,1W
3325	4822 116 83961	6K8	5%		3538	4822 051 20393	39K00	5%	0,1W
3326	4822 051 20333	33K00	5%	0,1W	3539	4822 051 20822	8K2	5%	0,1W
3327	4822 117 11503	220R	1%	0,1W	3540	4822 051 20822	8K2	5%	0,1W
3328 ▲	4822 052 10479	47R00	5%	0,33W	3541	4822 051 20393	39K00	5%	0,1W
3329	4822 117 10837	100K	1%	0,1W	3542	4822 051 20393	39K00	5%	0,1W
3330	4822 117 10833	10K	1%	0,1W	3543	4822 117 12955	2K7 1%	0,1W 0805	
3334	4822 051 20182	1K80	5%	0,1W	3544	4822 117 12955	2K7 1%	0,1W 0805	
3335	4822 051 20182	1K80	5%	0,1W	3545	4822 117 10833	10K	1%	0,1W
3336	4822 051 20182	1K80	5%	0,1W	3546	4822 117 10833	10K	1%	0,1W
3337 ▲	4822 117 11342	0R33	5%	2W	3549	4822 051 20332	3K3	5%	0,1W
3338 ▲	4822 117 11342	0R33	5%	2W	3550	4822 051 20332	3K3	5%	0,1W
3339	4822 117 11139	1K5	1%	0,1W	3551	4822 117 11504	270R	1%	0,1W
3340	4822 117 11139	1K5	1%	0,1W	3552	4822 117 11504	270R	1%	0,1W
3341 ▲	4822 117 11342	0R33	5%	2W	3553	4822 117 11504	270R	1%	0,1W
3342 ▲	4822 117 11342	0R33	5%	2W	3554	4822 117 11504	270R	1%	0,1W
3343	4822 117 11139	1K5	1%	0,1W	3555	4822 051 20332	3K30	5%	0,1W
3344 ▲	4822 117 11342	0R33	5%	2W	3556	4822 117 11504	270R	1%	0,1W
3345 ▲	4822 117 11342	0R33	5%	2W	3557	4822 117 11504	270R	1%	0,1W
3349 ▲	4822 117 11342	0R33	5%	2W	3560	4822 051 10102	1K00	2%	0,25W
3350 ▲	4822 117 11342	0R33	5%	2W	3561 ▲	4822 052 10478	4R70	5%	0,33W
3351 ▲	4822 117 11342	0R33	5%	2W	3562	4822 051 20471	470R00	5%	0,1W
3352 ▲	4822 053 10478	4R70	5%	1W	3563	4822 051 10102	1K00	2%	0,25W
3353 ▲	4822 053 10478	4R70	5%	1W	3566	4822 116 83876	270R	5%	0,5W
3354 ▲	4822 053 10478	4R70	5%	1W	3567	4822 116 83876	270R	5%	0,5W
3356	4822 117 10834	47K	1%	0,1W	3571	4822 051 20334	330K00	5%	0,1W
3357	4822 116 52257	22K	5%	0,5W	3572	4822 051 20334	330K00	5%	0,1W
3358	4822 051 10102	1K00	2%	0,25W	3573	4822 051 10102	1K00	2%	0,25W
3359	4822 117 10837	100K	1%	0,1W	3574	4822 051 10102	1K00	2%	0,25W
3360	4822 117 10833	10K	1%	0,1W	3575	4822 117 11148	56K	1%	0,1W
3361	4822 051 20471	470R00	5%	0,1W	3576	4822 117 11148	56K	1%	0,1W
3362	4822 051 20471	470R00	5%	0,1W	3577	4822 051 20561	560R00	5%	0,1W
3363	4822 051 20471	470R00	5%	0,1W	3578	4822 051 20561	560R00	5%	0,1W
3501	4822 116 83933	15K	1%	0,1W	3579	4822 051 20394	390K00	5%	0,1W
3502	4822 116 83933	15K	1%	0,1W	3580	4822 051 20394	390K00	5%	0,1W
3505	4822 116 52244	15K	5%	0,5W	3581	4822 051 20273	27K00	5%	0,1W
3506	4822 116 52244	15K	5%	0,5W	3582	4822 051 20273	27K00	5%	0,1W
3509	4822 116 83933	15K	1%	0,1W	3583	4822 050 21003	10K00	1%	0,6W



**ELECTRICAL PARTSLIST - MONO2 BOARD**

## RESISTORS

3584	4822 050 21003	10K00	1%	0,6W
3585	4822 117 11139	1K5	1%	0,1W
3586	4822 117 11139	1K5	1%	0,1W
3587	4822 051 20392	3K9	5%	0,1W
3588	4822 116 52276	3K9	5%	0,5W
3589	4822 117 10833	10K	1%	0,1W
3590	4822 117 10833	10K	1%	0,1W
3591	4822 117 10837	100K	1%	0,1W
3592	4822 117 10837	100K	1%	0,1W
3593	4822 051 20472	4K70	5%	0,1W
3594	4822 051 20472	4K70	5%	0,1W
3595	4822 051 20472	4K70	5%	0,1W
3596	4822 051 20472	4K70	5%	0,1W
3601	4822 051 20101	100R00	5%	0,1W
3602	4822 051 20101	100R00	5%	0,1W
3603	4822 117 10837	100K	1%	0,1W
3604	4822 117 10837	100K	1%	0,1W
3605	4822 117 11383	12K	1%	0,1W
3606	4822 117 11383	12K	1%	0,1W
3607	4822 051 20333	33K00	5%	0,1W
3608	4822 051 20333	33K00	5%	0,1W
3609	4822 051 20121	120R00	5%	0,1W
3610	4822 051 20121	120R00	5%	0,1W
3611	4822 117 10834	47K	1%	0,1W
3612	4822 117 10834	47K	1%	0,1W
3613	4822 051 20471	470R00	5%	0,1W
3614	4822 051 20471	470R00	5%	0,1W
3615	4822 051 20471	470R00	5%	0,1W
3616	4822 051 20471	470R00	5%	0,1W
3618	4822 117 10834	47K	1%	0,1W
3619	4822 117 10834	47K	1%	0,1W
3620	4822 116 52175	100E	5%	0,5W
3621	4822 051 20101	100R00	5%	0,1W
3622	4822 051 20121	120R00	5%	0,1W
3623	4822 051 20121	120R00	5%	0,1W
3627 ▲	4822 052 10109	10R	5%	0,33W
3629 ▲	4822 052 10109	10R	5%	0,33W
3630	4822 050 11002	1K00	1%	0,4W
3631	4822 050 11002	1K00	1%	0,4W
3632	4822 050 11002	1K00	1%	0,4W
3633	4822 051 10102	1K00	2%	0,25W
3634	4822 051 10102	1K00	2%	0,25W
3635	4822 051 10102	1K00	2%	0,25W
3636	4822 051 20471	470R	5%	0,1W
3637	4822 051 20471	470R	5%	0,1W
3641	4822 117 10837	100K	1%	0,1W
3642	4822 117 10837	100K	1%	0,1W
3643	4822 117 10837	100K	1%	0,1W
3644	4822 117 10837	100K	1%	0,1W
3645	4822 117 11148	56K	1%	0,1W
3646	4822 117 11148	56K	1%	0,1W
3649	4822 117 10837	100K	1%	0,1W
3650	4822 117 10837	100K	1%	0,1W
3651	4822 117 11148	56K	1%	0,1W
3652	4822 117 11148	56K	1%	0,1W
3655	4822 117 10837	100K	1%	0,1W
3656	4822 117 10837	100K	1%	0,1W
3657	4822 117 11148	56K	1%	0,1W
3658	4822 117 11148	56K	1%	0,1W
3659	4822 117 12955	2K7	1%	0,1W 0805
3660	4822 117 12955	2K7	1%	0,1W 0805
3661	4822 051 20562	5K6	5%	0,1W 0805
3662	4822 051 20562	5K6	5%	0,1W 0805
3663	4822 117 12955	2K7	1%	0,1W 0805

## RESISTORS

3664	4822 117 12955	2K7	1%	0,1W 0805
3665	4822 051 20562	5K6	5%	0,1W 0805
3666	4822 051 20562	5K6	5%	0,1W 0805
3667	4822 117 12955	2K7	1%	0,1W 0805
3668	4822 117 12955	2K7	1%	0,1W 0805
3669	4822 051 20562	5K6	5%	0,1W 0805
3670	4822 051 20562	5K6	5%	0,1W 0805
3671	4822 117 10834	47K	1%	0,1W
3672	4822 117 10834	47K	1%	0,1W
3673	4822 117 11449	2K2	1%	0,1W
3674	4822 117 11449	2K2	1%	0,1W
3675	4822 051 20101	100R	5%	0,1W
3676	4822 051 20101	100R	5%	0,1W
3677	4822 117 10834	47K	1%	0,1W
3678	4822 117 10834	47K	1%	0,1W
3679	4822 117 11449	2K2	1%	0,1W
3680	4822 117 11449	2K2	1%	0,1W
3681	4822 051 20101	100R	5%	0,1W
3682	4822 051 20101	100R	5%	0,1W
3683	4822 117 10834	47K	1%	0,1W
3684	4822 117 10834	47K	1%	0,1W
3685	4822 117 11449	2K2	1%	0,1W
3686	4822 117 11449	2K2	1%	0,1W
3687	4822 051 20101	100R	5%	0,1W
3688	4822 051 20101	100R	5%	0,1W
3689	4822 117 11449	2K2	1%	0,1W
3690	4822 117 11449	2K2	1%	0,1W
3691	4822 116 52256	2K2	5%	0,5W
3692	4822 117 11449	2K2	1%	0,1W
3693	4822 117 11449	2K2	1%	0,1W
3694	4822 116 52256	2K2	5%	0,5W
3695	4822 117 13579	220K	1%	0,1W
3696	4822 117 10833	10K	1%	0,1W
3697	4822 116 52257	22K	5%	0,5W
3698	4822 117 13579	220K	1%	0,1W
3699	4822 117 10833	10K	1%	0,1W
3700	4822 051 20223	22K	5%	0,1W
3801	4822 117 12521	68R	1%	0,1W
3802	4822 117 12521	68R	1%	0,1W
3803	4822 117 12521	68R	1%	0,1W
3804	4822 117 12521	68R	1%	0,1W
3805	4822 051 10102	1K	2%	0,25W
3806	4822 051 10102	1K	2%	0,25W
3809	4822 051 20109	10R	5%	0,1W
3810	4822 117 11449	2K2	1%	0,1W
3811	4822 051 20109	10R	5%	0,1W
3812	4822 051 20471	470R	5%	0,1W
3813	4822 051 20121	120R	5%	0,1W
3814	4822 051 20109	10R	5%	0,1W
3815	4822 117 12521	68R	1%	0,1W
3816	4822 117 12521	68R	1%	0,1W
3817	4822 117 11504	270R	1%	0,1W
3818	4822 117 11503	220R	1%	0,1W
3819	4822 051 20109	10R	5%	0,1W
3820	4822 053 10101	100R	5%	1W
3821	4822 053 10101	100R	5%	1W
3831	4822 051 20101	100R	5%	0,1W
3832	4822 051 20479	47R	5%	0,1W
3834	4822 051 20101	100R	5%	0,1W
3851	4822 051 20332	3K3	5%	0,1W
3852	4822 051 20223	22K	5%	0,1W
3853	4822 117 11148	56K	1%	0,1W
3854	4822 051 20472	4K70	5%	0,1W
3855	4822 116 83876	270R	5%	0,5W
3856	4822 117 11504	270R	1%	0,1W

**ELECTRICAL PARTSLIST - MONO2 BOARD****RESISTORS**

3857	4822 117 10837	100K	1%	0.1W
3858	4822 117 10837	100K	1%	0.1W
3859	4822 117 10833	10K	1%	0.1W
3860	4822 117 10833	10K	1%	0.1W
3871	4822 051 20332	3K30	5%	0,1W
3872	4822 051 20332	3K30	5%	0,1W
3873	4822 051 10102	1K00	2%	0,25W
3874	4822 051 10102	1K00	2%	0,25W
3875	4822 051 20332	3K30	5%	0,1W
3877	4822 051 10102	1K00	2%	0,25W
3878	4822 051 10102	1K00	2%	0,25W
3879	4822 051 20332	3K30	5%	0,1W
3880	4822 051 20332	3K30	5%	0,1W
3881	4822 051 10102	1K00	2%	0,25W
3882	4822 051 10102	1K00	2%	0,25W
3883	4822 117 11383	12K	1%	0,1W
3884	4822 117 11383	12K	1%	0,1W
3885	4822 117 11383	12K	1%	0,1W
3886	4822 117 11383	12K	1%	0,1W
3887	4822 117 11383	12K	1%	0,1W
3888	4822 117 11383	12K	1%	0,1W
3889	4822 117 11449	2K2	1%	0,1W
3890	4822 117 11449	2K2	1%	0,1W
3901 ▲	4822 052 10479	47R00	5%	0,33W
3902	4822 117 11148	56K	1%	0,1W
3903	4822 117 10834	47K	1%	0,1W
3904	4822 116 83884	47K	5%	0,5W
3905	4822 050 24708	4R70	1%	0,6W
3906	4822 117 11148	56K	1%	0,1W
3907	4822 116 83961	6K8	5%	
3908	4822 051 20182	1K80	5%	0,1W
3909	4822 116 83961	6K8	5%	
3910	4822 050 24708	4R70	1%	0,6W
3911	4822 117 11148	56K	1%	0,1W
3913	4822 051 20182	1K80	5%	0,1W
3914	4822 117 11148	56K	1%	0,1W
3915 ▲	4822 052 10479	47R00	5%	0,33W
3916 ▲	4822 053 10478	4R70	5%	1W
3917	4822 051 20333	33K00	5%	0,1W
3918	4822 117 11503	220R	1%	0,1W
3919 ▲	4822 053 10478	4R70	5%	1W
3920	4822 117 10837	100K	1%	0.1W
3921	4822 051 20182	1K80	5%	0,1W
3922	4822 051 20182	1K80	5%	0,1W
3925	4822 117 10833	10K	1%	0,1W
3926 ▲	4822 117 11342	0R33	5%	2W
3927 ▲	4822 117 11342	0R33	5%	2W
3928	4822 117 11139	1K5	1%	0,1W
3929	4822 117 11139	1K5	1%	0,1W
3930 ▲	4822 117 11342	0R33	5%	2W
3931 ▲	4822 117 11342	0R33	5%	2W
3932 ▲	4822 117 11342	0R33	5%	2W
3933 ▲	4822 117 11342	0R33	5%	2W
3934	4822 051 10102	1K00	2%	0,25W
3935	4822 051 10102	1K00	2%	0,25W
3936	4822 117 10837	100K	1%	0.1W
3937	4822 117 10833	10K	1%	0,1W
3938	4822 117 11449	2K2	1%	0,1W
3939	4822 117 11449	2K2	1%	0,1W
3940	4822 117 11503	220R	1%	0.1W
3941	4822 117 11503	220R	1%	0.1W
3943	4822 051 20223	22K00	5%	0,1W
3944	4822 117 11503	220R	1%	0.1W
3945	4822 117 11503	220R	1%	0.1W
3946	4822 051 20471	470R00	5%	0,1W

**RESISTORS**

3947	4822 051 20471	470R00	5%	0,1W
3948	4822 117 11503	220R	1%	0.1W
3949	4822 117 11503	220R	1%	0.1W
3950	4822 051 20182	1K80	5%	0,1W
3951	4822 051 20182	1K80	5%	0,1W
3952	4822 051 20101	100R00	5%	0,1W
3953	4822 051 20101	100R00	5%	0,1W
3954	4822 051 20101	100R00	5%	0,1W
3955	4822 051 20101	100R00	5%	0,1W
4251	4822 051 20008	0R00 JUMP.		(0805)
4252	4822 051 20008	0R00 JUMP.		(0805)
4253	4822 051 20008	0R00 JUMP.		(0805)
4256	4822 051 20008	0R00 JUMP.		(0805)
4258	4822 051 20008	0R00 JUMP.		(0805)
4259	4822 051 20008	0R00 JUMP.		(0805)
4260	4822 051 20008	0R00 JUMP.		(0805)
4283	4822 051 20008	0R00 JUMP.		(0805)
4284	4822 051 20008	0R00 JUMP.		(0805)
4285	4822 051 20008	0R00 JUMP.		(0805)
4287	4822 051 20008	0R00 JUMP.		(0805)
4320	4822 051 20008	0R00 JUMP.		(0805)
4506	4822 051 20008	0R00 JUMP.		(0805)
4513	4822 051 20008	0R00 JUMP.		(0805)
4514	4822 051 20008	0R00 JUMP.		(0805)
4515	4822 051 20008	0R00 JUMP.		(0805)
4516	4822 051 20008	0R00 JUMP.		(0805)
4517	4822 051 20008	0R00 JUMP.		(0805)
4518	4822 051 20008	0R00 JUMP.		(0805)
4519	4822 051 20008	0R00 JUMP.		(0805)
4520	4822 051 20008	0R00 JUMP.		(0805)
4521	4822 051 20008	0R00 JUMP.		(0805)
4522	4822 051 20008	0R00 JUMP.		(0805)
4523	4822 051 20008	0R00 JUMP.		(0805)
4524	4822 051 20008	0R00 JUMP.		(0805)
4526	4822 051 20008	0R00 JUMP.		(0805)
4528	4822 051 20008	0R00 JUMP.		(0805)
4529	4822 051 20008	0R00 JUMP.		(0805)
4530	4822 051 20008	0R00 JUMP.		(0805)
4531	4822 051 20008	0R00 JUMP.		(0805)
4532	4822 051 20008	0R00 JUMP.		(0805)
4533	4822 051 20008	0R00 JUMP.		(0805)
4537	4822 051 20008	0R00 JUMP.		(0805)
4538	4822 051 20008	0R00 JUMP.		(0805)
4539	4822 051 20008	0R00 JUMP.		(0805)
4540	4822 051 20008	0R00 JUMP.		(0805)
4541	4822 051 20008	0R00 JUMP.		(0805)
4542	4822 051 20008	0R00 JUMP.		(0805)
4543	4822 051 20008	0R00 JUMP.		(0805)
4544	4822 051 20008	0R00 JUMP.		(0805)
4545	4822 051 20008	0R00 JUMP.		(0805)
4548	4822 051 20008	0R00 JUMP.		(0805)
4550	4822 051 20008	0R00 JUMP.		(0805)
4551	4822 051 20008	0R00 JUMP.		(0805)
4552	4822 051 20008	0R00 JUMP.		(0805)
4553	4822 051 20008	0R00 JUMP.		(0805)
4555	4822 051 20008	0R00 JUMP.		(0805)
4556	4822 051 20008	0R00 JUMP.		(0805)
4557	4822 051 20008	0R00 JUMP.		(0805)
4558	4822 051 20008	0R00 JUMP.		(0805)
4559	4822 051 20008	0R00 JUMP.		(0805)
4560	4822 051 20008	0R00 JUMP.		(0805)
4564	4822 051 20008	0R00 JUMP.		(0805)
4565	4822 051 20008	0R00 JUMP.		(0805)
4566	4822 051 20008	0R00 JUMP.		(0805)
4642	4822 051 20008	0R00 JUMP.		(0805)

**ELECTRICAL PARTSLIST - MONO2 BOARD****RESISTORS**

4644	4822 051 20008	0R00 JUMP. (0805)
4651	4822 051 20008	0R00 JUMP. (0805)
4652	4822 051 20008	0R00 JUMP. (0805)
4653	4822 051 20008	0R00 JUMP. (0805)
4832	4822 051 20008	0R00 JUMP. (0805)
4835	4822 051 20008	0R00 JUMP. (0805)
4901	4822 051 20008	0R00 JUMP. (0805)
4902	4822 051 20008	0R00 JUMP. (0805)
4903	4822 051 20008	0R00 JUMP. (0805)
4904	4822 051 20008	0R00 JUMP. (0805)
4905	4822 051 20008	0R00 JUMP. (0805)
4913	4822 051 20008	0R00 JUMP. (0805)
4917	4822 051 20008	0R00 JUMP. (0805)
4918	4822 051 20008	0R00 JUMP. (0805)
4920	4822 051 20008	0R00 JUMP. (0805)
4921	4822 051 20008	0R00 JUMP. (0805)
4922	4822 051 20008	0R00 JUMP. (0805)
4923	4822 051 20008	0R00 JUMP. (0805)
4924	4822 051 20008	0R00 JUMP. (0805)
4925	4822 051 20008	0R00 JUMP. (0805)

**FILTERS**

5301	4822 157 70599	COIL
5303	4822 157 70599	COIL
5305	4822 157 70599	COIL
5901	4822 157 62255	COIL
5902	4822 157 62255	COIL

**DIODES**

6251	4822 130 82078	D5SBA20
6253	4822 130 82078	D5SBA20
6255	4822 130 30621	1N4148
6256	4822 130 30621	1N4148
6257	4822 130 31878	1N4003G
6258	4822 130 31878	1N4003G
6259	4822 130 31878	1N4003G
6260	4822 209 33575	L7812CP
6261	4822 130 31878	1N4003G
6262	4822 130 31878	1N4003G
6263	4822 130 31878	1N4003G
6264	4822 130 34173	BZX79-B5V6
6266	4822 130 34281	BZX79-B15
6267	4822 209 31841	L7805CP
6268	4822 130 31878	1N4003G
6270	4822 130 34278	BZX79-B6V8
6271	4822 130 30621	1N4148
6276	4822 130 34173	BZX79-B5V6
6279	4822 130 30621	1N4148
6280	4822 130 61219	BZX79-B10
6281	4822 130 34441	BZX79-B22
6289	4822 130 83757	BAS216
6290	4822 130 83757	BAS216
6301	4822 130 30862	BZX79-B9V1
6302	4822 130 30862	BZX79-B9V1
6303	4822 130 30621	1N4148
6304	4822 130 11411	BZX284-C3V3
6305	4822 130 83757	BAS216
6501	4822 130 30621	1N4148
6601	4822 130 30621	1N4148
6602	4822 130 30621	1N4148
6641	4822 130 83757	BAS216
6642	4822 130 30621	1N4148
6643	4822 130 30621	1N4148
6644	4822 130 30621	1N4148
6645	4822 130 30621	1N4148
6646	4822 130 83757	BAS216

**DIODES**

6647	4822 130 83757	BAS216
6648	4822 130 83757	BAS216
6649	4822 130 31878	1N4003G
6650	4822 130 61219	BZX79-B10
6801	4822 130 34278	BZX79-B6V8
6802	4822 130 34278	BZX79-B6V8
6803	4822 130 34278	BZX79-B6V8
6804	4822 130 34278	BZX79-B6V8
6805	4822 130 34278	BZX79-B6V8
6806	4822 130 34278	BZX79-B6V8
6807	4822 130 34278	BZX79-B6V8
6808	4822 130 34278	BZX79-B6V8
6809	4822 130 30621	1N4148
6810	4822 130 34233	BZX79-B5V1
6811	4822 130 34382	BZX79-B8V2
6831	4822 130 30621	1N4148
6832	4822 130 30621	1N4148
6901	4822 130 83757	BAS216
6903	4822 130 11047	BZX284-C9V1
6904	4822 130 83757	BAS216
6905	4822 130 11047	BZX284-C9V1

**TRANSISTORS**

7251	9322 139 22687	BD242BFP
7252	4822 130 60511	BC847B
7253	4822 130 60511	BC847B
7254	4822 130 60511	BC847B
7255	4822 130 60373	BC856B
7256	4822 130 60511	BC847B
7257	4822 130 41246	BC327-25
7258	4822 130 41246	BC327-25
7259	4822 130 60511	BC847B
7260	5322 130 60159	BC846B
7261	4822 130 60373	BC856B
7302	4822 209 17507	STK496-630
7304	5322 130 60159	BC846B
7305	5322 130 60159	BC846B
7306	5322 130 60159	BC846B
7307	5322 130 60159	BC846B
7309	4822 130 60373	BC856B
7310	4822 130 60511	BC847B
7501	4822 209 72748	LC7821
7503	4822 209 83357	NJM4560M
7504	4822 209 83357	NJM4560M
7571	4822 209 70157	NJM4560DD
7572	4822 209 72748	LC7821
7601	4822 209 31378	NJM4556MB
7621	4822 130 42615	BC817-40
7622	4822 130 42615	BC817-40
7641	4822 209 17386	TDA7437T
7642	4822 209 17386	TDA7437T
7643	4822 209 17386	TDA7437T
7644	4822 130 40855	BC337
7651	4822 130 42615	BC817-40
7652	4822 130 42615	BC817-40
7653	4822 130 42615	BC817-40
7654	4822 130 42615	BC817-40
7655	4822 130 42615	BC817-40
7656	4822 130 42615	BC817-40
7657	4822 130 60373	BC856B
7658	4822 130 60373	BC856B
7660	4822 209 83357	NJM4560M
7661	4822 130 42615	BC817-40
7662	4822 130 42615	BC817-40
7801	4822 130 60511	BC847B

**ELECTRICAL PARTSLIST - MONO2 BOARD**

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TRANSISTORS

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7802	4822 130 44568	BC557B
7803	4822 209 16886	STV6401
7902	5322 130 60159	BC846B
7903	5322 130 60159	BC846B
7904	5322 130 60159	BC846B
7905	4822 209 17384	STK411-230E
7908	4822 130 60373	BC856B
7909	4822 130 60511	BC847B
7910	9322 139 22687	BD242BFP