

Service  
Service  
**Service**

**MFX450/17**



# Service Manual

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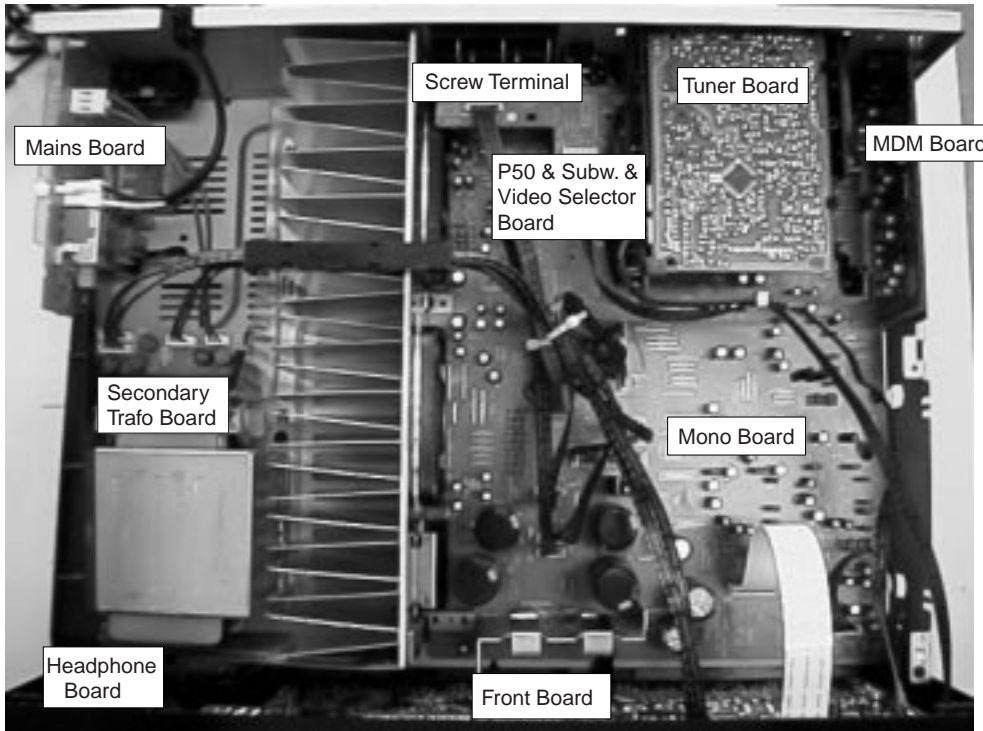
Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

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**PHILIPS**

## LOCATION OF PRINTED CIRCUIT BOARDS



## SPECIFICATION

### General

Mains voltage	: 120V
Mains frequency	: 60Hz
Power consumption	: ≤ 2W at stby
Dimension. wxhxd	: 435x138x350 mm
Remote control	: Multibrand/Universal

### Amplifier

Output power		
Stereo mode (L+R)	: 2x50W FTC	(40Hz-20kHz, 0,7%THD, 6Ω)
Surround mode		
L + R	: 2x60W (1kHz, 0,7%THD, 6Ω)	
Center	: 60W (1kHz, 0,7%THD, 6Ω)	
Surround Left+Right	: 2x60W (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	—1kHz	: ≤ -65dB
(1W)	250Hz – 10kHz	: ≤ -60dB
Crosstalk between channels	-1kHz	: ≤ -55dB
(1W)	250Hz – 10kHz	: ≤ -50dB
Frequency response	: ≤ 10Hz – ≥ 30kHz (-1dB)	
Power stage protection	: Shortcircuit	
Temperature	: DC (Vout ≥ 10V) for ±1sec	
	: Transformer (≥140° Celcius)	
	: Heatsink (≥ 140° Celcius)	

### Audio Selector

Analog 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
6 CH/DVD	: 250mV	impedance ≥ 47kΩ
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
	: 1 x optical
Output	: 1 x cinch

### Video Selector - CVBS

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 ≤ -30dB Ref: 1kHz=0dB)	: 100Hz	+6 dB		
	: 10kHz	+2,5 dB		
Tone control (Ref: 1kHz=0dB)				
	: Bass 100Hz	-9dB → +9dB		
	: Treble 10kHz	-9dB → +9dB		
DSC settings		100Hz	1kHz	10kHz
Personal	dB	0	0	0
Movie	dB	+ 4	+2	+4
Speech	dB	- 4	+1	- 2
Music	dB	+ 4	- 1	+2
Multimedia	dB	+ 7	+3	+6

### 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 - (ECO5)

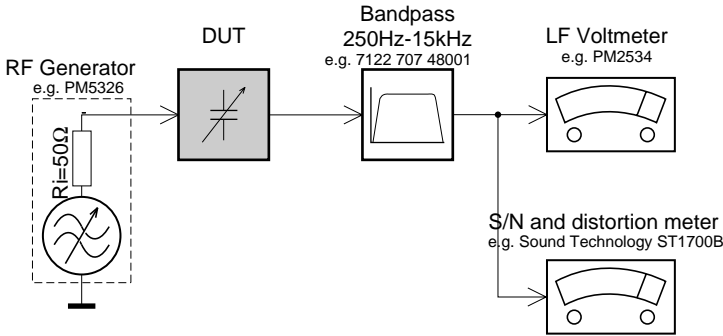
FM		
Tuning range	: 87.5 – 108MHz	
Grid	: 100kHz	
IF frequency	: 10.7MHz ±25kHz	
Aerial input	: 300 Ω clickfit	
Sensitivity at 26dB S/N	: ≤ 2μV	
Selectivity at 300kHz	: ≥ 55dB	
Image rejection	: ≥ 48dB	
Distortion at RF=1mV,dev.75kHz	: ≤ 0,9%	
-3dB Limiting point	: ≤ 2μV	
Crosstalk at RF=1mV,dev.40kHz	: ≥ 27dB	
MW		
Tuning range	: 530 - 1700kHz	
Grid	: 10kHz	
IF frequency	: 450kHz ±1kHz	
Aerial input	: Frame aerial	
Sensitivity at 26dB S/N	: ≤ 3,5mV/m	
Selectivity at 9kHz bandwidth	: ≥ 18dB	
IF rejection	: ≥ 64dB	
Image rejection	: ≥ 28dB	
Distortion at RF=50mV,m=80%	: ≤ 3%	

# SERVICE TOOL

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

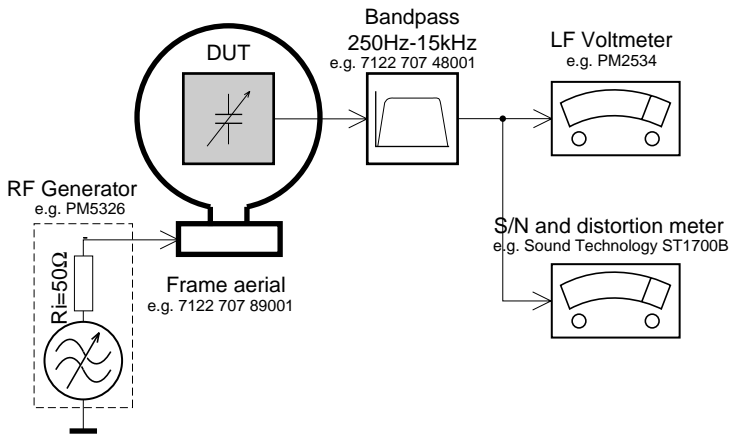
## MEASUREMENT SETUP

### 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.



**(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.

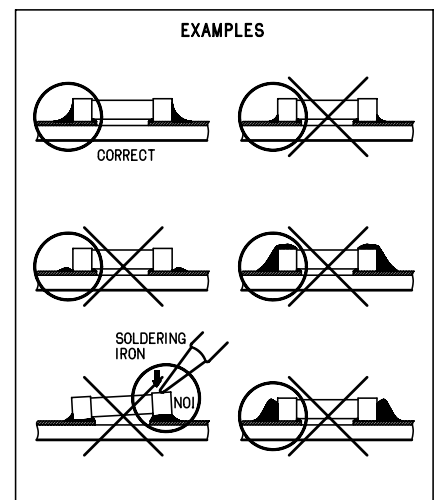
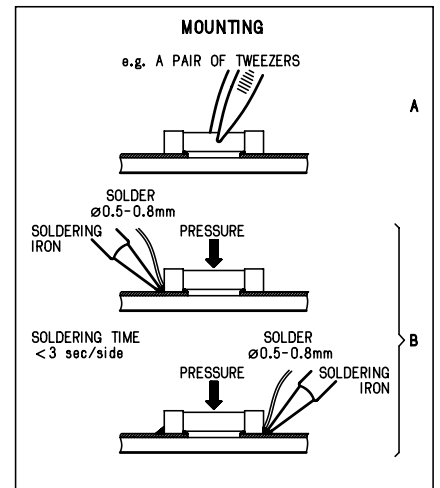
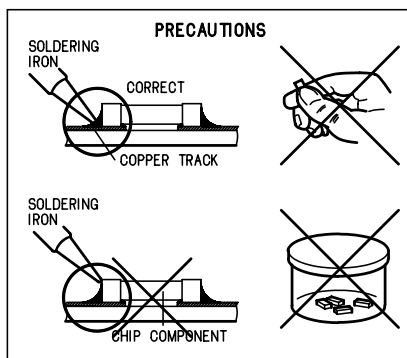
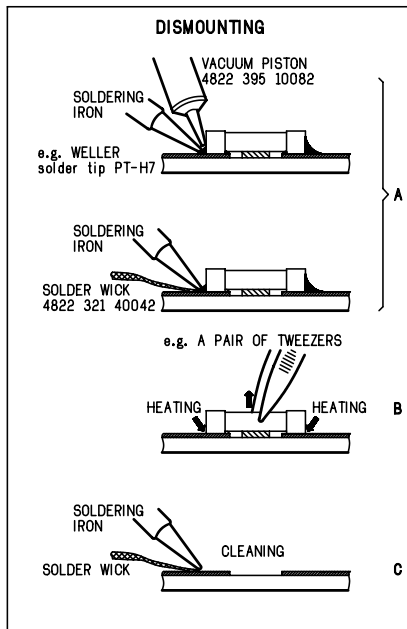
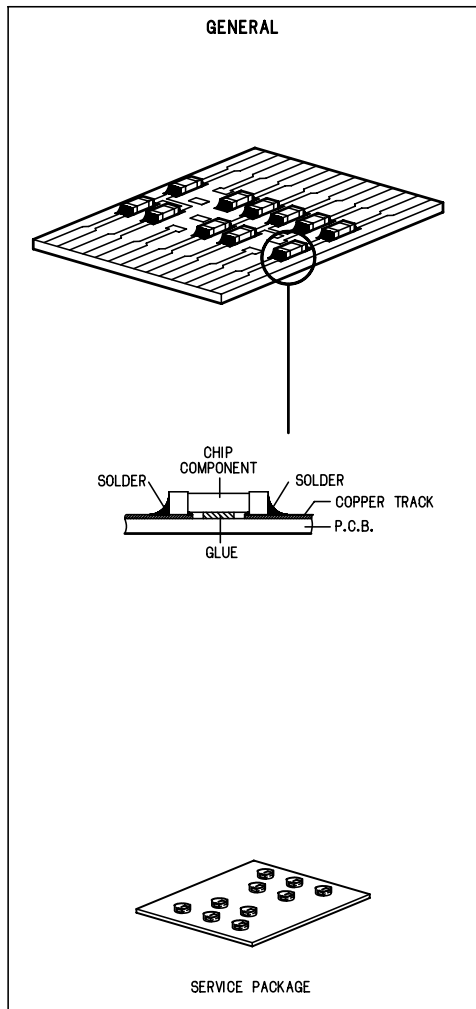
**(I) AVVERTIMENTO**

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 cauzione alla loro manipolazione. Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.  
Assicursarsi 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

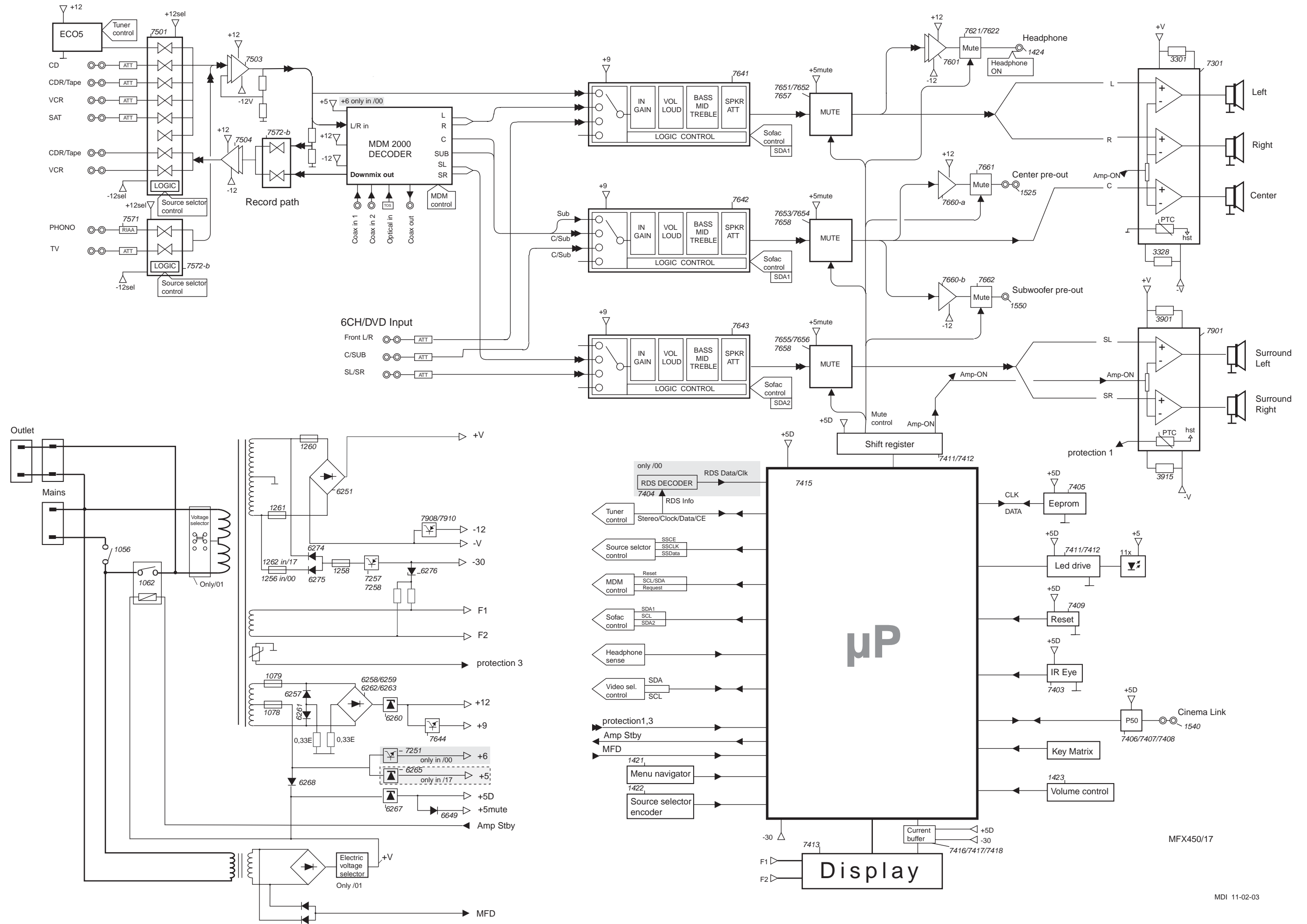
# HANDLING CHIP COMPONENTS



## 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		
fmute	Fast mute		
<b>G</b>			
gnd d	Ground digital		
gnd s	Ground signal		
<b>H</b>			
hp gnd	Headphone ground		
hp l	Headphone Left		
hp on	Headphone On		
hp r	Headphone Right		
hst	Heatsink temperature		
<b>L</b>			
ls c	Loudspeaker Center		
ls gnd	Loudspeaker ground		
ls l	Loudspeaker Left		
ls r	Loudspeaker Right		
<b>M</b>			
mdm	Multi channel Decoding Module		
mdm c out	— Center out		
mdm gnd	— ground		
mdm l dmix	— Downmix Left		
mdm l in	— Left in		
mdm l out	— Left out		
mdm r dmix	— Downmix Right		
mdm r in	— Right in		
mdm r out	— Right out		
mdm req	— request		
mdm rst	— reset		
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		

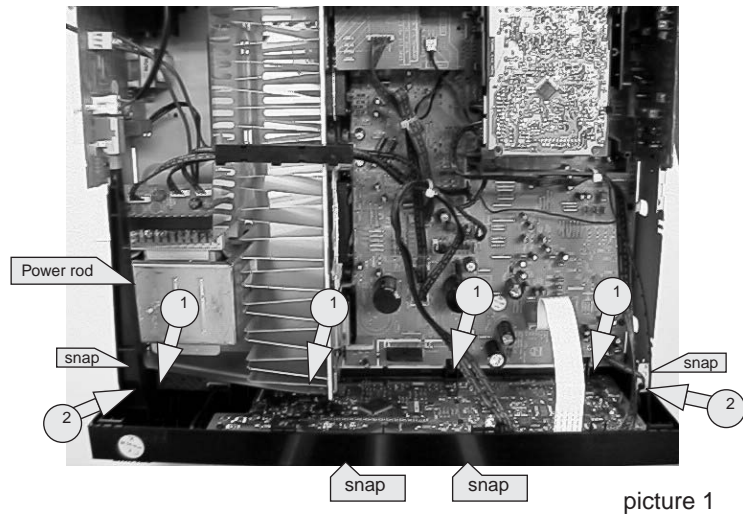
# BLOCKDIAGRAM



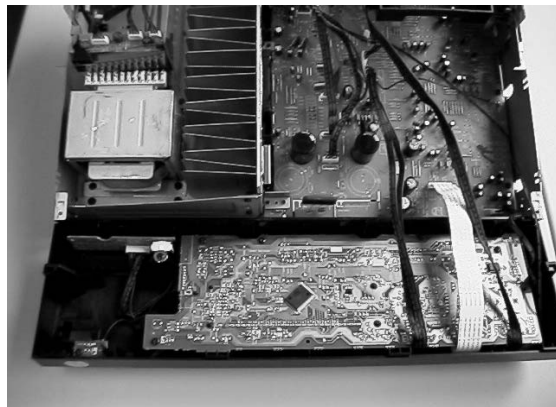
MF450/17

**DISMANTLING HINTS**

Dismantling of Front

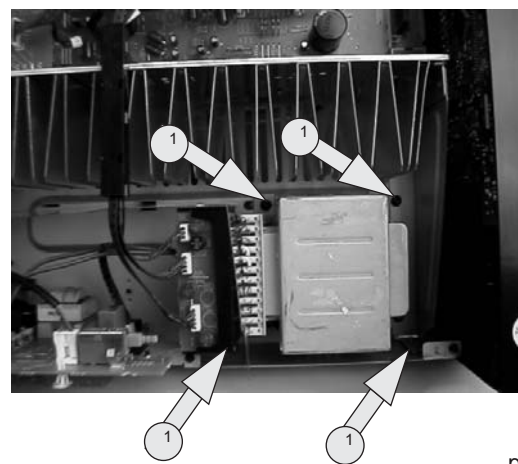


- 1) Remove top cover
- 2) Remove power rod
- 3) Remove 6 x screw as shown in picture 1
- 4) Release two snaps (left & right side front)
- 5) Release two snaps on the bottom side front
- 6) Tipp down front as shown in picture 2



picture 2

Dismantling of mainstrafo

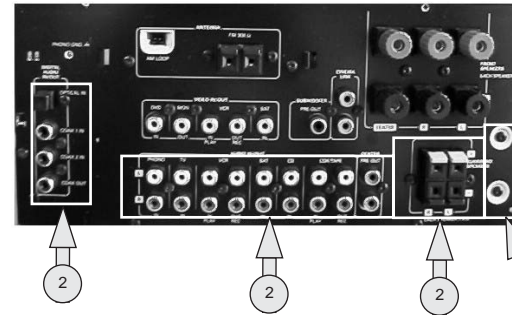


- 1) Remove power rod
- 2) Remove 4x screw as shown in picture 8

picture 8

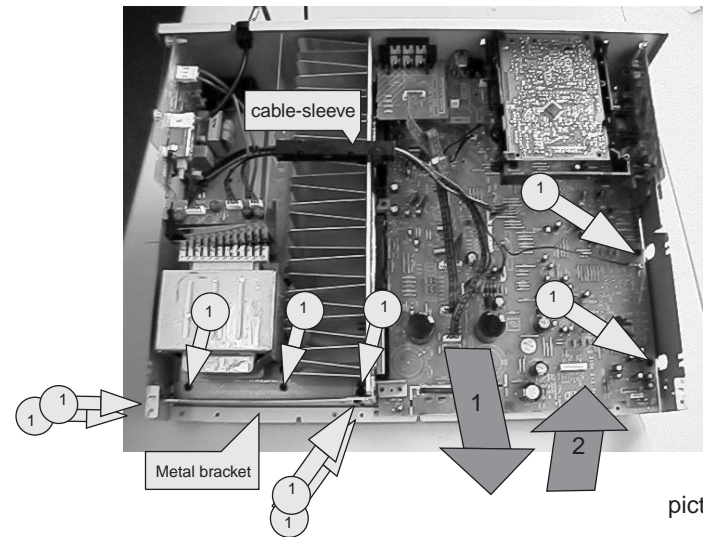
Dismantling of mono board

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



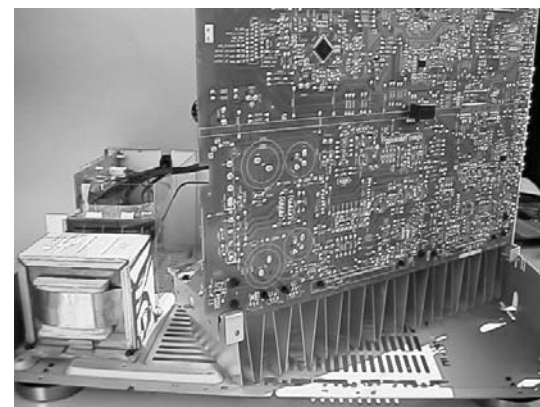
picture 3

- 3) Remove 12 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



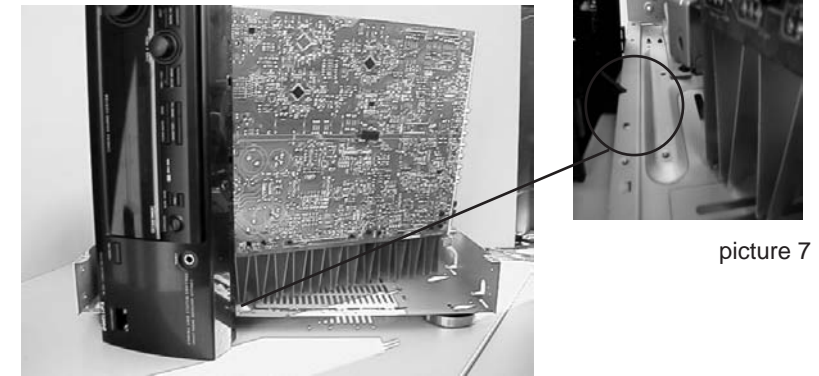
picture 5

Legend

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

Service position monoboard

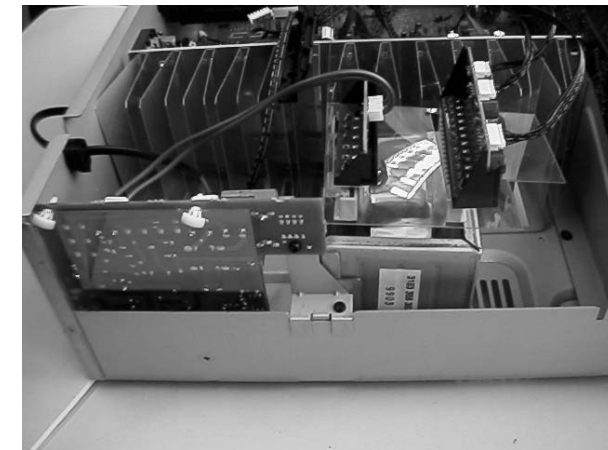
- 1) Bring front in position as shown in picture 6
  - 2) Snap nok of front in bottom to make front stable . See picture 7
  - 3) Connect front wiring back to monoboard.
- \*The tuner module doesn't have to be connected. Use an other source (pe.CD)



picture 7

picture 6

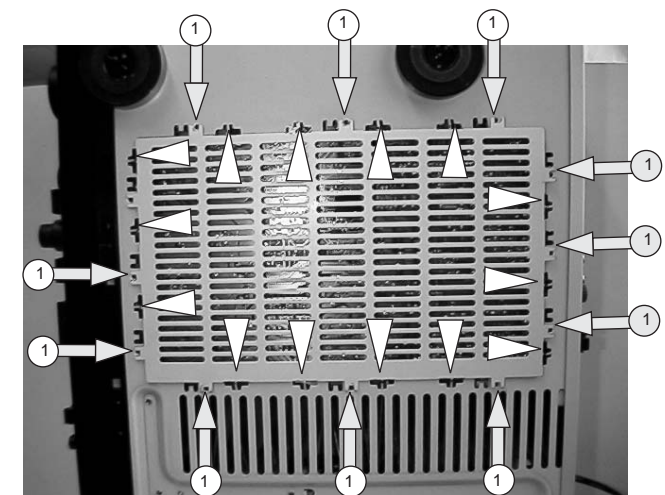
Service position main trafo



picture 9

- 1) Put main trafo as shown in picture 9

Handling service cover



picture 10

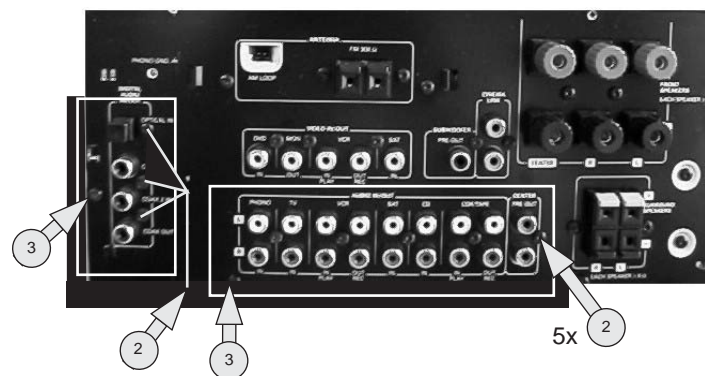
- 1) To open the service cover cut 14 x lugs between cover and bottom . See picture 10 (▽)
  - 2) To close the service cover put 11 x screw in mentioned holes. See picture 10
- Service codenumber 12x Torx M3x6mm screw with big head = 4822 502 14659



**DISMANTLING HINTS**

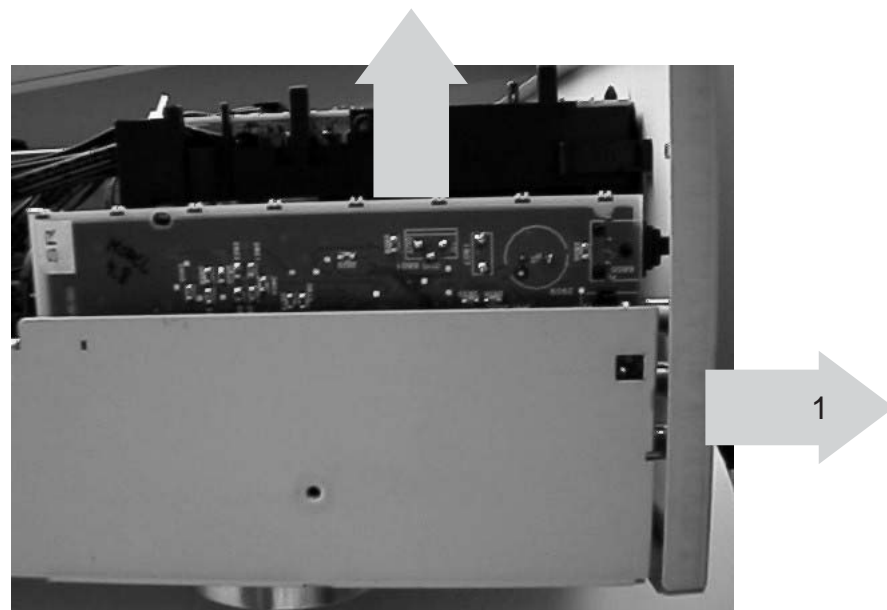
Dismantling of MDM module

1) Remove all the screws mentioned in the arial . 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

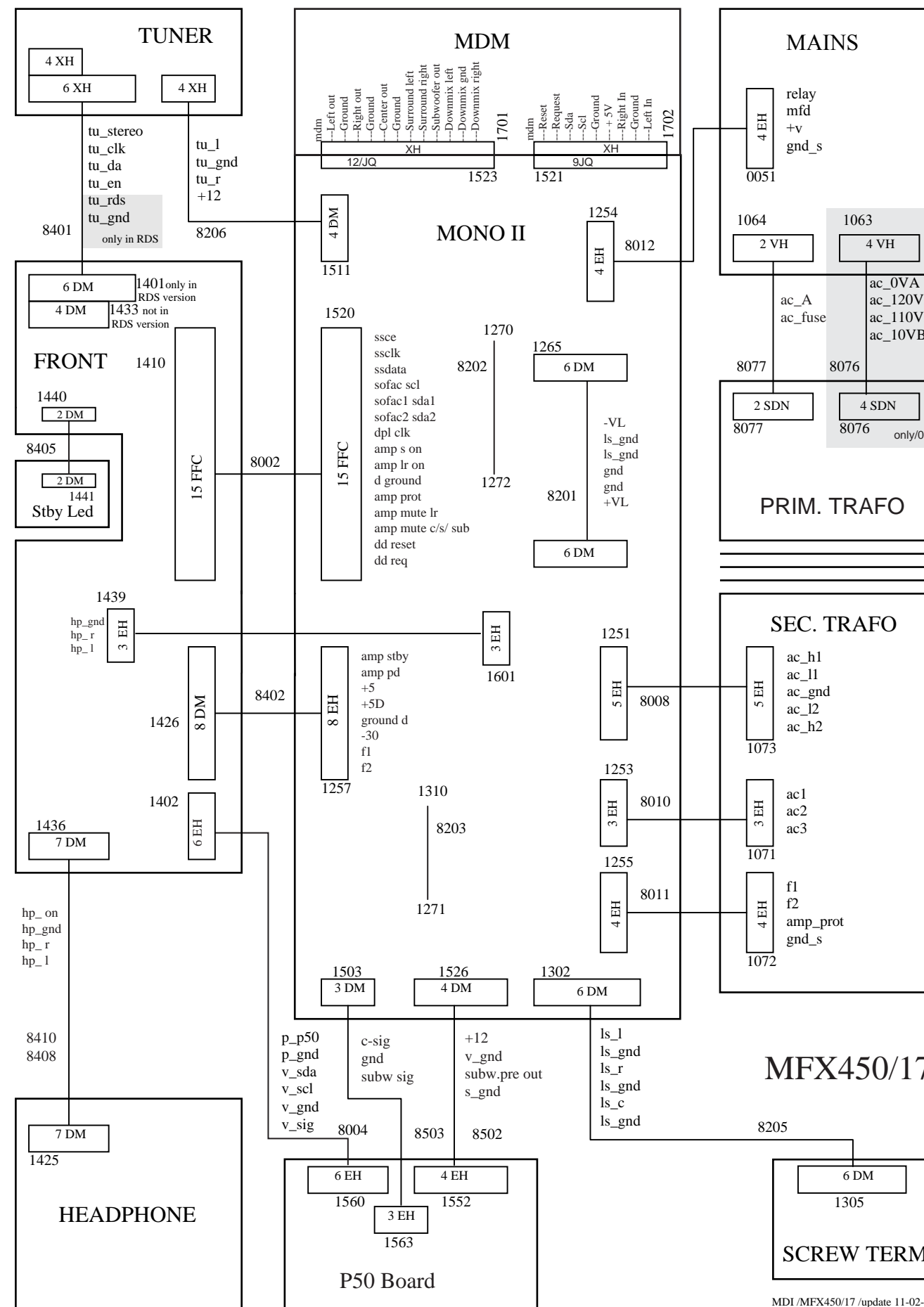


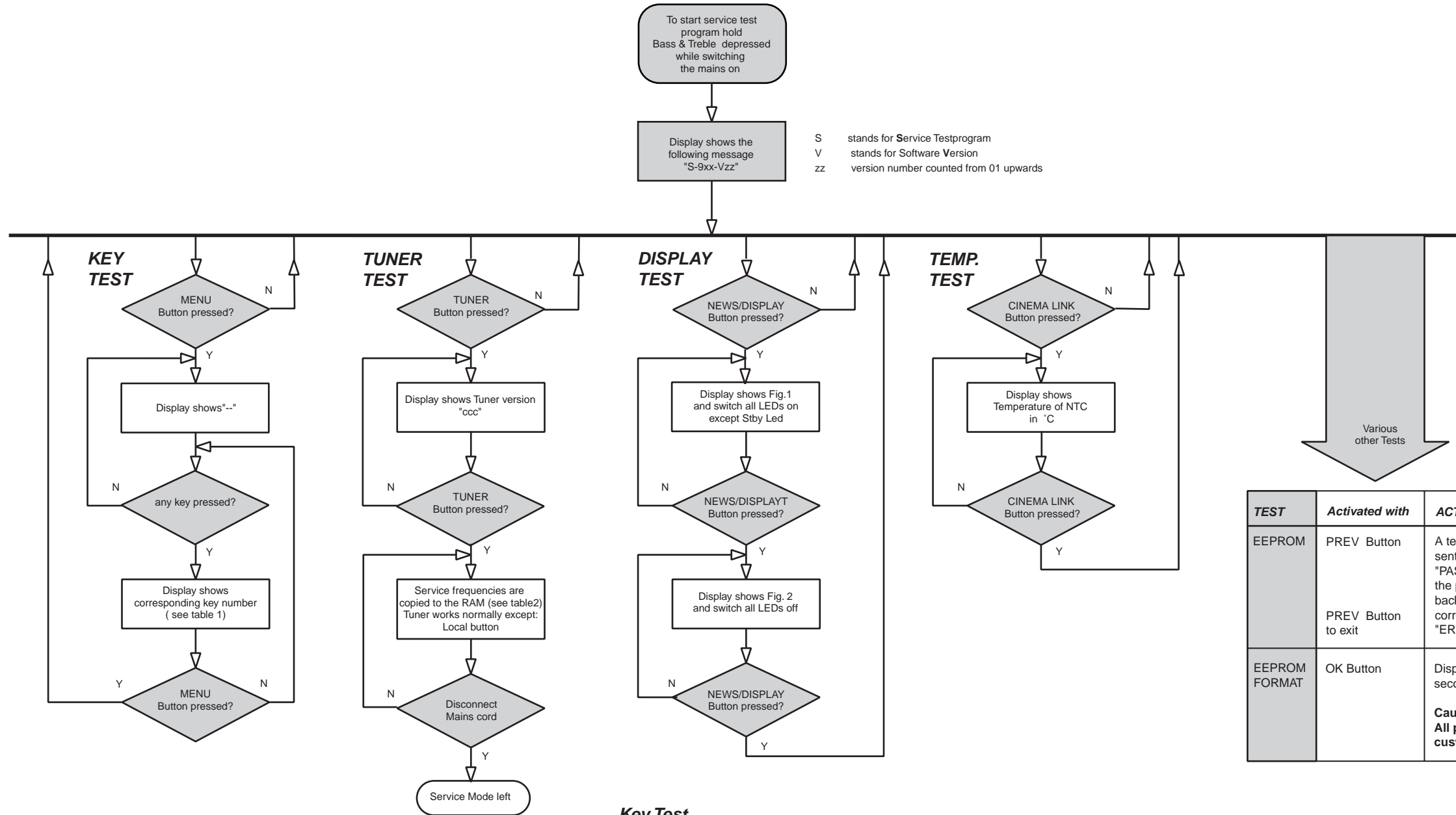
picture12

**Legend**

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

**WIRING DIAGRAM**





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	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. 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 "Grid10" 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
3D Surr.	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  
Button News T/A change in Display in /01/17 version  
Button Front A/V not in FR965

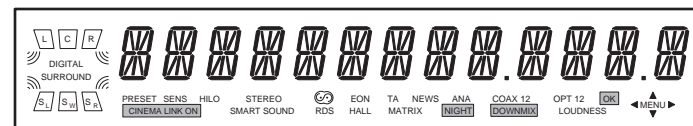


Figure 1

**Default Data**

Source =Tuner---Mode=stereo---Volume=10---SubwooferVol=0  
LeftVolume=0---CenterVolume=0---Right Volume=0  
RearVolume=0---RearLVolume=0---RearRVolume=0---Bass=0  
Treble=0---Loudness=Off---Smart Sound=Personal---Center Present=Yes---RearPresent=Yes---FrontSize=Large  
Subwooferpresent=Yes--- CenterSize=Small---RearSize=Small  
EffectIncr3D=100--DigInputCoax1=DVD  
L/RDist=4meter---CenterDist=3meter---RearDist=2meter  
For USA /17:  
L/RDist=13Feet---CenterDist=10Feet---RearDist=7Feet.  
For /01: AM grid is 9kHz  
: FM grid is 50kHz

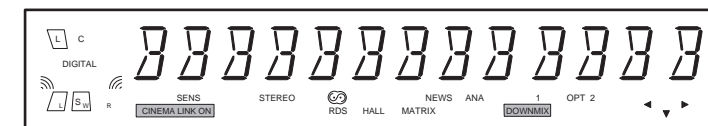
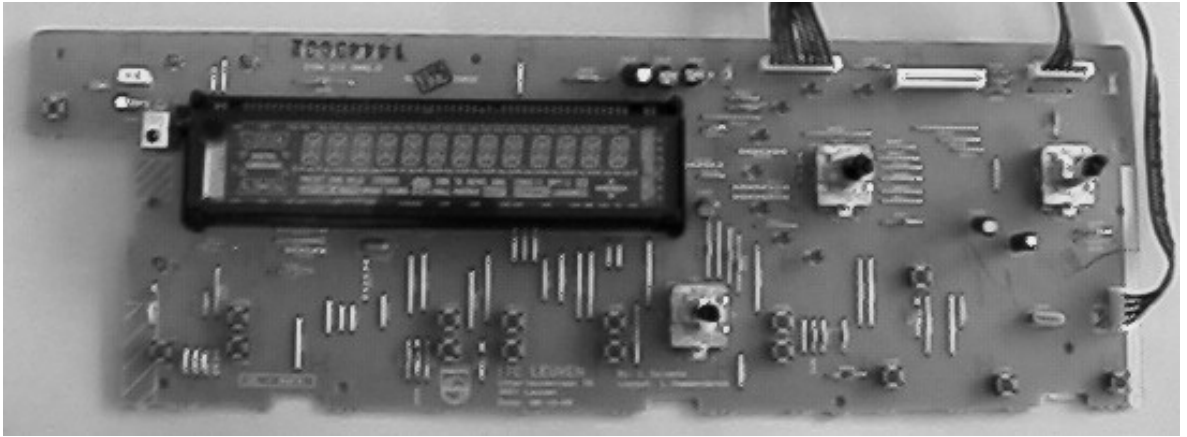


Figure 2

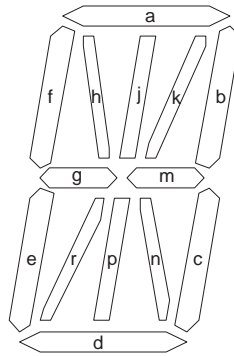
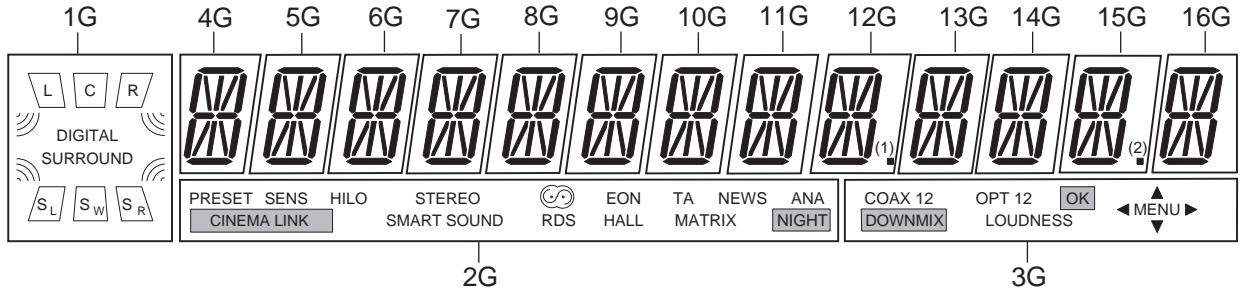


# ***FRONT BOARD***

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# FTD DISPLAY PIN CONNECTIONS



	1G	2G	3G	4G~11G	12G	13G, 14G	15G	16G
P1	L	MATRIX	DOWNMIX	a	a	a	a	a
P2	R	NIGHT	COAX	j p	j p	j p	j p	j p
P3	C	ANA	1(coax)	h	h	h	h	h
P4	(C)	LO	2(coax)	k	k	k	k	k
P5	(S <sub>L</sub> )	CINEMA LINK	OPT	b	b	b	b	b
P6	(S <sub>R</sub> )	EON	1(opt)	f	f	f	f	f
P7	S <sub>w</sub>	HALL	2(opt)	m	m	m	m	m
P8	S <sub>(L)</sub>	HI	LOUDNESS	g	g	g	g	g
P9	L	NEWS	▼	c	c	c	c	c
P10	S <sub>(R)</sub>	PRESET	MENU	e	e	e	e	e
P11	R	RDS	▶	r	r	r	r	r
P12		SMART SOUND	OK	n	n	n	n	n
P13		STEREO	◀	d	d	d	d	d
P14	SURROUND	TA	▲	-	■(1)	-	■(2)	-
P15	DIGITAL	SENS	-	-	-	-	-	-

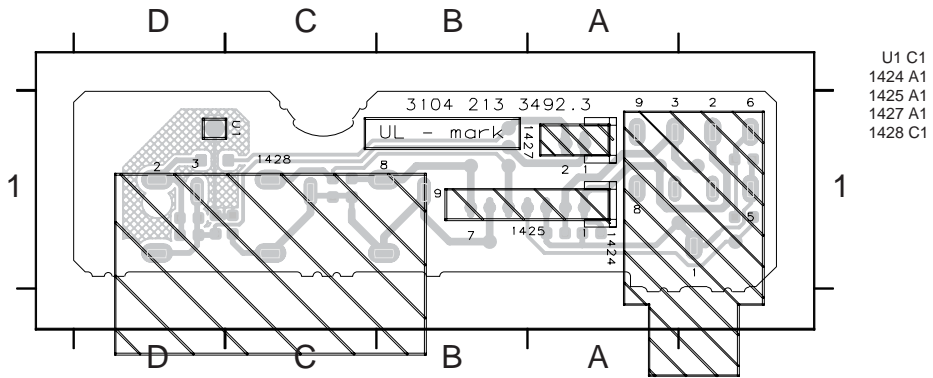
## Pin Connection

Pin numbers	5 4 4 4 4 4 4 4 4 4 4 3 3 3 3 3 3 3 3 3 2 2 2 2 2 2 2 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 9 8 7 6 5 4 3 2 1
Connection	1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 N N N N N N N N N N P P P P P P P P P P P P N N N N N N N N N N N N N N F F G G G G G G G G G G G G G G G C C C C C C 5 4 3 2 1 0 9 8 7 6 5 4 3 2 1 C C C C C C C C C C P P 1 1

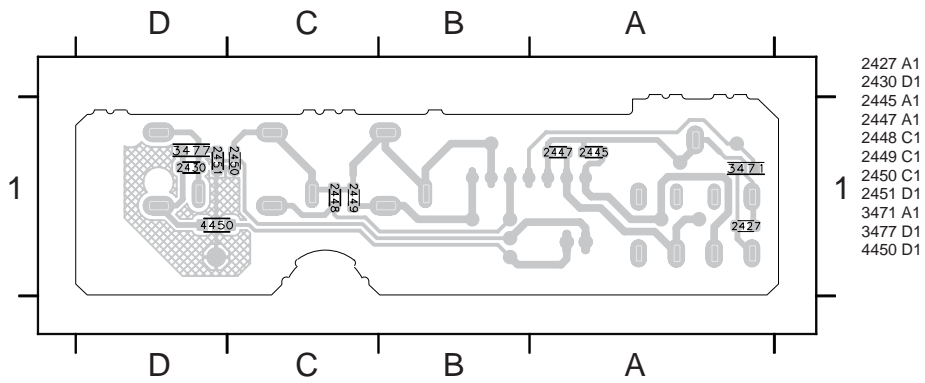
Pin numbers	6 6 6 5 5 5 5 5 5 5 5 2 1 0 9 8 7 6 5 4 3 2 1
Connection	F F N N N N N N N N N N 2 2 P P C C C C C C C C

Note: FI, F2 ----- Filament  
 NC ----- No connection  
 NP ----- No pin  
 1G ~ 16G ----- Grid

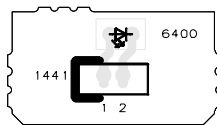
### HEADPHONE BOARD - COMPONENT VIEW



### HEADPHONE BOARD - COPPER SIDE VIEW

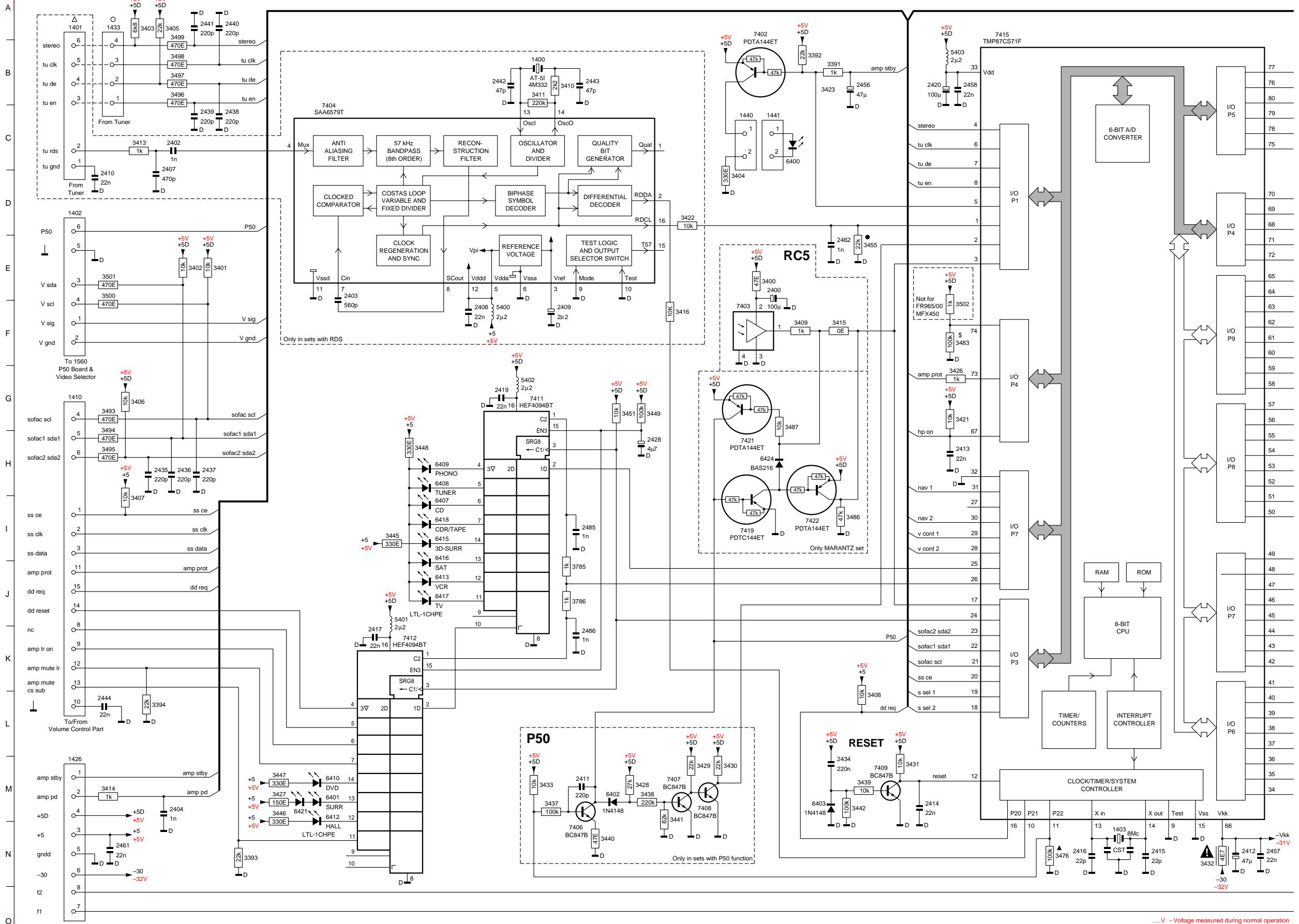


### LED BOARD - COMPONENT VIEW



Part A

FRONT PART FR965 - FR975 - MFX450 Part A

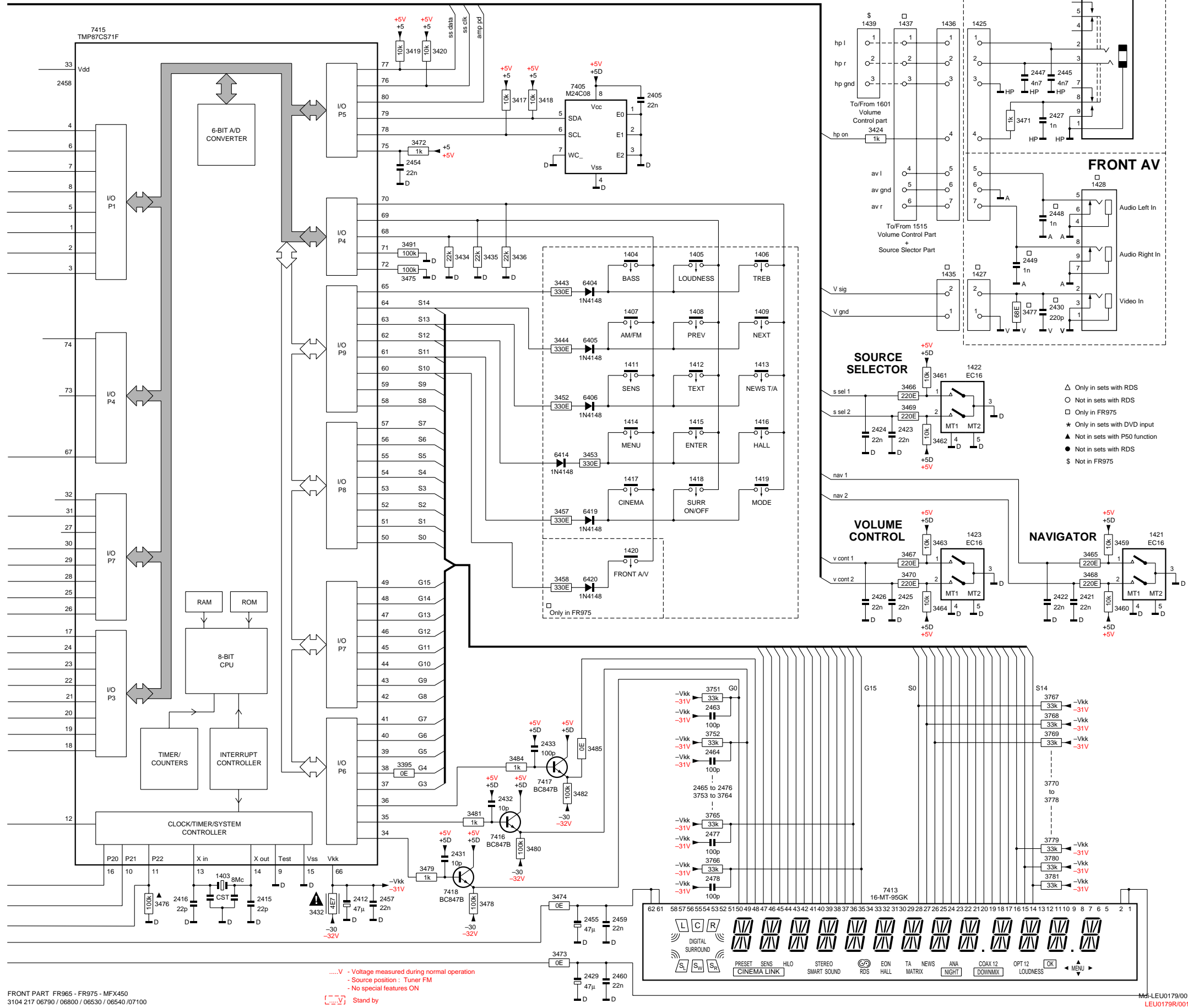


To FRONT PART B

.....V - Voltage measured during normal operation  
 - Source position - Tuner FM  
 - No special features ON  
 .....V Stand by [ ] Mdl-LEU0179/0015

Part B

FRONT PART FR965 - FR975 - MFX450 Part B

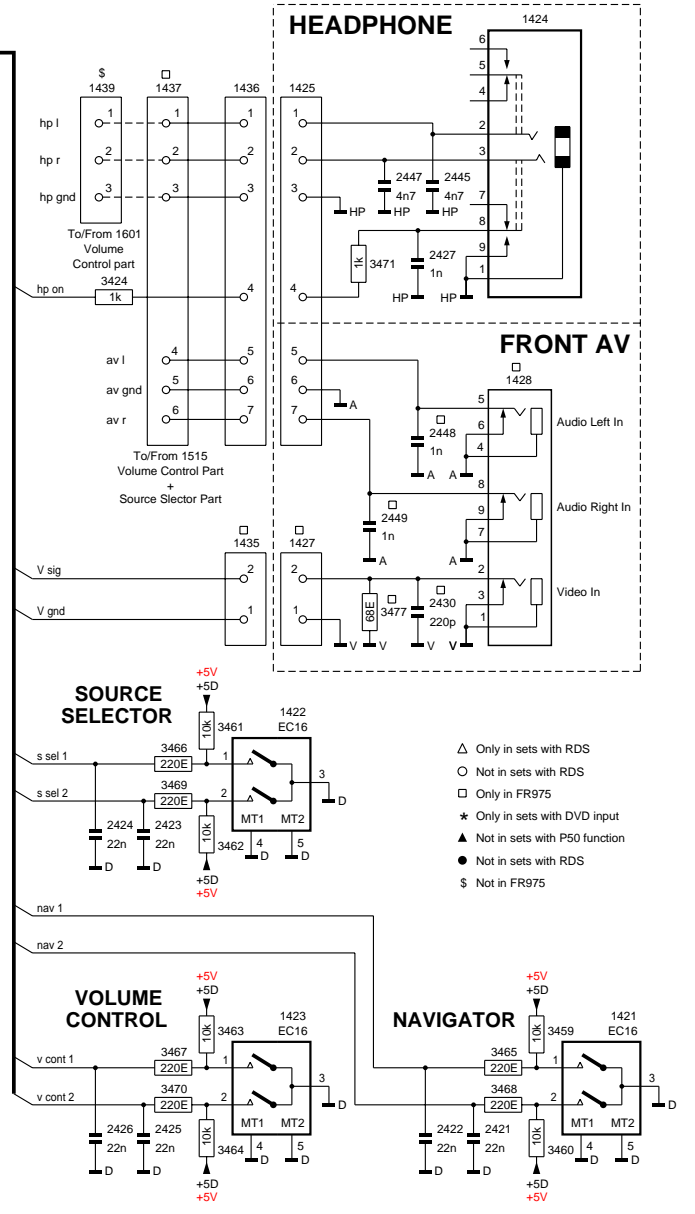


FRONT PART FR965 - FR975 - MFX450  
 3104 217 06790 / 06800 / 06530 / 06540 / 07100

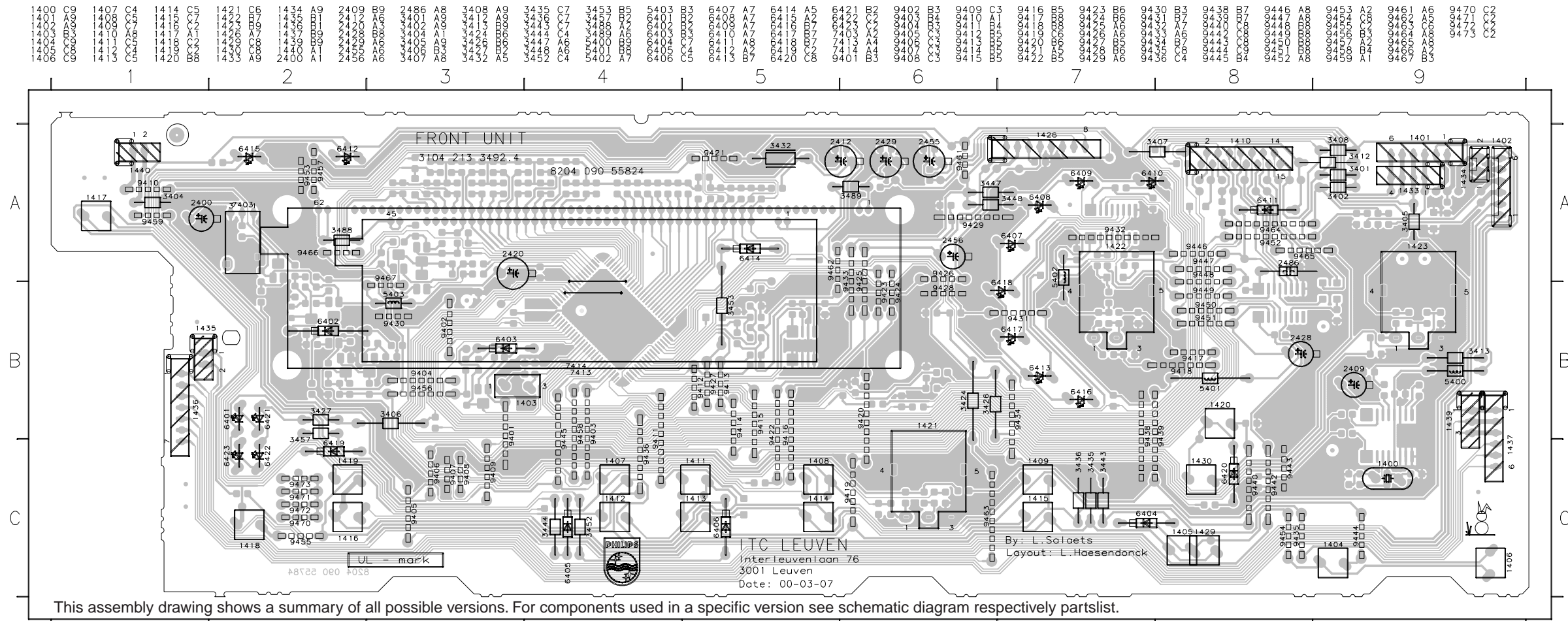
.....V - Voltage measured during normal operation  
 - Source position: Tuner FM  
 - No special features ON  
 Stand by

M-LU0179/0015  
 LEU0179R/0015

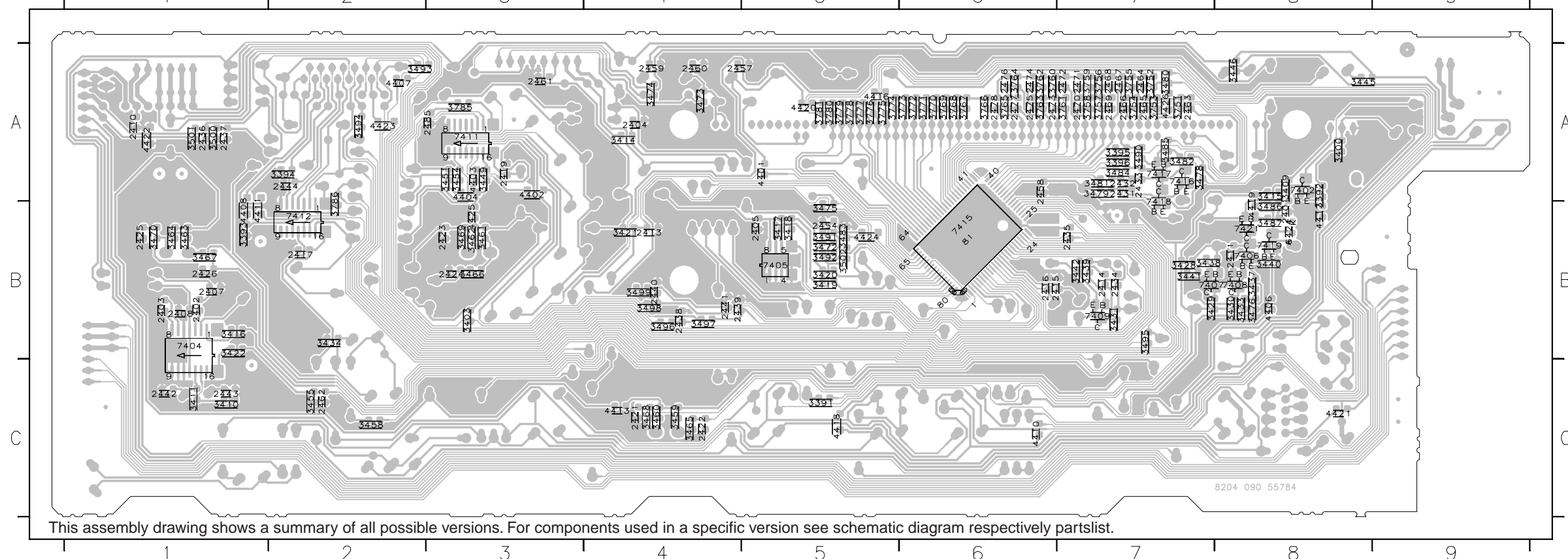
To FRONT PART A



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	I12
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		
1439	A27	3453	H23		
1440	C12	3455	E14		
1441	C12	3457	H22		
2400	E12	3458	I22		
2402	C3	3459	I30		
2403	E6	3460	J30		
2404	M3	3461	F28		
2405	B24	3462	G28		
2407	D3	3463	I28		
2408	F8	3464	J28		
2409	F9	3465	I30		
2410	D2	3466	G27		
2411	M9	3467	I27		
2412	N19	3468	I30		
2413	H15	3469	G27		
2414	M14	3470	I27		
2415	N18	3471	C29		
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	M22		
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	M24		
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	J9		
2465	L24	5400	F8		
2476	L25	5401	J6		
2477	M24	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	J7		
3410	B9	6418	I7		
3411	B9	6419	H23		
3413	C2	6420	I23		
3414	M2	6421	M5		
3415	F13	6424	H12		
3416	F11	7402	A12		
3417	B22	7403	F12		



244001	244002	244003	244004	244005	244006	244007	244008	244009	244010	244011	244012	244013	244014	244015	244016	244017	244018	244019	244020	244021	244022	244023	244024	244025	244026	244027	244028	244029	244030	244031	244032	244033	244034	244035	244036	244037	244038	244039	244040	244041	244042	244043	244044	244045	244046	244047	244048	244049	244050	244051	244052	244053	244054	244055	244056	244057	244058	244059	244060	244061	244062	244063	244064	244065	244066	244067	244068	244069	244070	244071	244072	244073	244074	244075	244076	244077	244078	244079	244080	244081	244082	244083	244084	244085	244086	244087	244088	244089	244090	244091	244092	244093	244094	244095	244096	244097	244098	244099	244100
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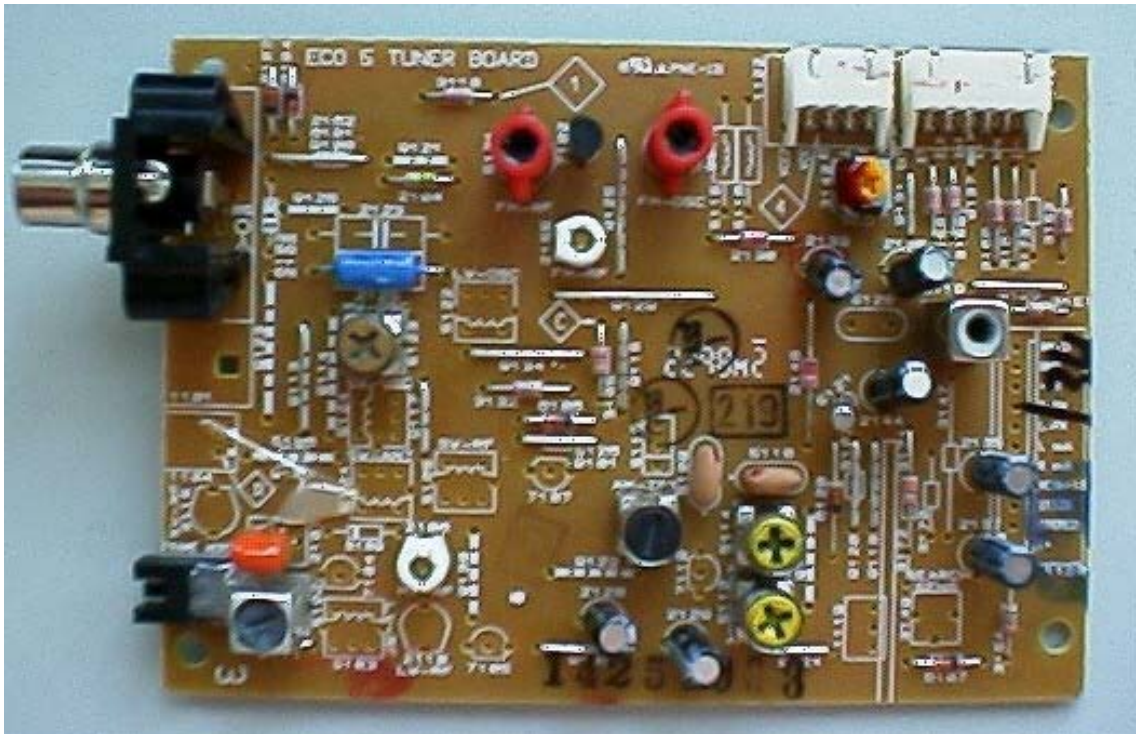
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## ELECTRICAL PARTSLIST - FRONT BOARD

## MISCELLANEOUS

1403	4822 242 72066	CRYSTAL 8,00MHz	2461	5322 122 32654	CER2 0805 X7R 63V 22N PM10 R	3449	4822 117 10837	100K	1%	0,1W	3777	4822 051 20333	33K00	5%	0,1W
1404	4822 276 13114	SWITCH,PUSH BUTTON	2462	5322 122 31647	1NF10%X7R 63V	3451	4822 117 10833	10K	1%	0,1W	3778	4822 051 20333	33K00	5%	0,1W
1405	4822 276 13114	SWITCH,PUSH BUTTON	2463	5322 122 32531	100PF 5%NP0 50V	3452	4822 116 52219	330E	5%	0,5W	3779	4822 051 20333	33K00	5%	0,1W
1406	4822 276 13114	SWITCH,PUSH BUTTON	2464	5322 122 32531	100PF 5%NP0 50V	3453	4822 116 52219	330E	5%	0,5W	3780	4822 051 20333	33K00	5%	0,1W
1407	4822 276 13114	SWITCH,PUSH BUTTON	2465	5322 122 32531	100PF 5%NP0 50V	3455	4822 051 20223	22K00	5%	0,1W	3781	4822 051 20333	33K00	5%	0,1W
			2466	5322 122 32531	100PF 5%NP0 50V	3457	4822 116 52219	330E	5%	0,5W	3785	4822 051 10102	1K00	2%	0,25W
			2467	5322 122 32531	100PF 5%NP0 50V	3459	4822 117 10833	10K	1%	0,1W					
1408	4822 276 13114	SWITCH,PUSH BUTTON	2468	5322 122 32531	100PF 5%NP0 50V	3460	4822 117 10833	10K	1%	0,1W	3786	4822 051 10102	1K00	2%	0,25W
1409	4822 276 13114	SWITCH,PUSH BUTTON	2469	5322 122 32531	100PF 5%NP0 50V	3461	4822 117 10833	10K	1%	0,1W	4401	4822 051 20008	OR00 JUMP.	(0805)	
1410	4822 265 10981	15FE-BT-VK-N	2470	5322 122 32531	100PF 5%NP0 50V	3462	4822 117 10833	10K	1%	0,1W	4402	4822 051 20008	OR00 JUMP.	(0805)	
1411	4822 276 13114	SWITCH,PUSH BUTTON	2471	5322 122 32531	100PF 5%NP0 50V	3463	4822 117 10833	10K	1%	0,1W	4403	4822 051 20008	OR00 JUMP.	(0805)	
1412	4822 276 13114	SWITCH,PUSH BUTTON				3464	4822 117 10833	10K	1%	0,1W	4404	4822 051 20008	OR00 JUMP.	(0805)	
			2472	5322 122 32531	100PF 5%NP0 50V						4406	4822 051 20008	OR00 JUMP.	(0805)	
1413	4822 276 13114	SWITCH,PUSH BUTTON	2473	5322 122 32531	100PF 5%NP0 50V	3465	4822 117 11503	220R	1%	0,1W	4407	4822 051 20008	OR00 JUMP.	(0805)	
1414	4822 276 13114	SWITCH,PUSH BUTTON	2474	5322 122 32531	100PF 5%NP0 50V	3466	4822 117 11503	220R	1%	0,1W	4408	4822 051 20008	OR00 JUMP.	(0805)	
1415	4822 276 13114	SWITCH,PUSH BUTTON	2475	5322 122 32531	100PF 5%NP0 50V	3467	4822 117 11503	220R	1%	0,1W	4409	4822 051 20008	OR00 JUMP.	(0805)	
1416	4822 276 13114	SWITCH,PUSH BUTTON	2476	5322 122 32531	100PF 5%NP0 50V	3468	4822 117 11503	220R	1%	0,1W	4410	4822 051 20008	OR00 JUMP.	(0805)	
1417	4822 276 13114	SWITCH,PUSH BUTTON				3469	4822 117 11503	220R	1%	0,1W	4411	4822 051 20008	OR00 JUMP.	(0805)	
			2477	5322 122 32531	100PF 5%NP0 50V						4413	4822 051 20008	OR00 JUMP.	(0805)	
1418	4822 276 13114	SWITCH,PUSH BUTTON	2478	5322 122 32531	100PF 5%NP0 50V	3470	4822 117 11503	220R	1%	0,1W	4416	4822 051 20008	OR00 JUMP.	(0805)	
1419	4822 276 13114	SWITCH,PUSH BUTTON	2485	5322 122 31647	1NF10%X7R 63V	3471	4822 051 10102	1K00	2%	0,25W	4417	4822 051 20008	OR00 JUMP.	(0805)	
1421	4822 273 10372	SWITCH,ROTARY	2486	4822 122 33197	1NF 10% 50V	3472	4822 051 10102	1K00	2%	0,25W	4418	4822 051 20008	OR00 JUMP.	(0805)	
1422	4822 273 10372	SWITCH,ROTARY	RESISTORS			3473	4822 051 20008	OR00 JUMP.	(0805)		4420	4822 051 20008	OR00 JUMP.	(0805)	
1423	4822 273 10365	ROTARY ENCODER 24P	3391	4822 051 10102	1K00 2% 0,25W	3474	4822 051 20008	OR00 JUMP.	(0805)		4421	4822 051 20008	OR00 JUMP.	(0805)	
			3392	4822 051 20223	22K00 5% 0,1W	3475	4822 117 10837	100K	1%	0,1W	4422	4822 051 20008	OR00 JUMP.	(0805)	
1424	4822 265 11584	1P YKB21-5209	3393	4822 051 20223	22K00 5% 0,1W	3478	4822 117 10837	100K	1%	0,1W	4423	4822 051 20008	OR00 JUMP.	(0805)	
8002	4822 320 12706	FLEXIBLE FOIL 15P 220MM	3394	4822 051 20223	22K00 5% 0,1W	3479	4822 051 10102	1K00	2%	0,25W	4424	4822 051 20008	OR00 JUMP.	(0805)	
CAPACITORS			3395	4822 051 20008	OR00 JUMP. (0805)	3480	4822 117 10837	100K	1%	0,1W	4425	4822 051 20008	OR00 JUMP.	(0805)	
2400	4822 124 41584	100UF 20% 10V	3400	4822 051 20479	47R00 5% 0,1W	3481	4822 051 10102	1K00	2%	0,25W					
2404	5322 122 31647	1NF10%X7R 63V	3401	4822 050 21003	10K00 1% 0,6W	3482	4822 117 10837	100K	1%	0,1W	4426	4822 051 20008	OR00 JUMP.	(0805)	
2405	5322 122 32654	CER2 0805 X7R 63V 22N PM10 R	3402	4822 050 21003	10K00 1% 0,6W	3483	4822 117 10837	100K	1%	0,1W	COILS & FILTERS				
2411	4822 122 33575	220PF 5% NP0 63V CASE 0805	3403	4822 117 11507	6K8 1% 0,1W	3484	4822 051 10102	1K00	2%	0,25W	5401	4822 157 11477	LAL02TB2R2J		
2412	4822 124 41751	47UF 20% 50V	3404	4822 116 52219	330E 5% 0,5W	3485	4822 051 20008	OR00 JUMP.	(0805)	5402	4822 157 11477	LAL02TB2R2J			
			3405	4822 116 52257	22K 5% 0,5W	3489	4822 117 10837	100K	1%	0,1W	5403	4822 157 11477	LAL02TB2R2J		
2413	5322 122 32654	CER2 0805 X7R 63V 22N PM10 R	3406	4822 050 21003	10K00 1% 0,6W	3493	4822 051 20471	470R00	5%	0,1W	DIODES				
2414	5322 122 32654	CER2 0805 X7R 63V 22N PM10 R	3407	4822 050 21003	10K00 1% 0,6W	3494	4822 051 20471	470R00	5%	0,1W	6400	9322 100 14682	LTL1214A		
2415	5322 122 32658	22PF 5% 50V	3408	4822 050 21003	10K00 1% 0,6W	3495	4822 051 20471	470R00	5%	0,1W	6401	4822 130 82978	LTL-16KPE-P		
2416	5322 122 32658	22PF 5% 50V	3409	4822 051 10102	1K00 2% 0,25W	3496	4822 051 20471	470R00	5%	0,1W	6402	4822 130 30621	1N4148		
2417	5322 122 32654	CER2 0805 X7R 63V 22N PM10 R				3497	4822 051 20471	470R00	5%	0,1W	6403	4822 130 30621	1N4148		
			3414	4822 051 10102	1K00 2% 0,25W					6404	4822 130 30621	1N4148			
2419	5322 122 32654	CER2 0805 X7R 63V 22N PM10 R	3415	4822 051 20008	OR00 JUMP. (0805)	3498	4822 051 20471	470R00	5%	0,1W	6405	4822 130 30621	1N4148		
2420	4822 124 23432	100UF20% 10V	3417	4822 117 10833	10K 1% 0,1W	3499	4822 051 20471	470R00	5%	0,1W	6406	4822 130 30621	1N4148		
2421	5322 122 32654	CER2 0805 X7R 63V 22N PM10 R	3418	4822 117 10833	10K 1% 0,1W	3500	4822 051 20471	470R00	5%	0,1W	6407	4822 130 82978	LTL-16KPE-P		
2422	5322 122 32654	CER2 0805 X7R 63V 22N PM10 R	3419	4822 117 10833	10K 1% 0,1W	3501	4822 051 20471	470R00	5%	0,1W	6408	4822 130 82978	LTL-16KPE-P		
2423	5322 122 32654	CER2 0805 X7R 63V 22N PM10 R				3751	4822 051 20333	33K00	5%	0,1W	6409	4822 130 82978	LTL-16KPE-P		
			3420	4822 117 10833	10K 1% 0,1W						6410	4822 130 82978	LTL-16KPE-P		
2424	5322 122 32654	CER2 0805 X7R 63V 22N PM10 R	3421	4822 117 10833	10K 1% 0,1W	3752	4822 051 20333	33K00	5%	0,1W	6411	4822 130 82978	LTL-16KPE-P		
2425	5322 122 32654	CER2 0805 X7R 63V 22N PM10 R	3424	4822 050 11002	1K00 1% 0,4W	3753	4822 051 20333	33K00	5%	0,1W	6412	4822 130 82978	LTL-16KPE-P		
2426	5322 122 32654	CER2 0805 X7R 63V 22N PM10 R	3426	4822 050 11002	1K00 1% 0,4W	3754	4822 051 20333	33K00	5%	0,1W	6413	4822 130 82978	LTL-16KPE-P		
2427	5322 122 31647	1NF10%X7R 63V	3427	4822 116 83868	150R 5% 0,5W	3755	4822 051 20333	33K00	5%	0,1W	6414	4822 130 30621	1N4148		
2428	4822 124 40769	4,7UF20% 100V				3756	4822 051 20333	33K00	5%	0,1W	6415	4822 130 82978	LTL-16KPE-P		
			3428	4822 051 20273	27K00 5% 0,1W						6416	4822 130 82978	LTL-16KPE-P		
2429	4822 124 41751	47UF 20% 50V	3429	4822 051 20223	22K00 5% 0,1W	3757	4822 051 20333	33K00	5%	0,1W	6417	4822 130 82978	LTL-16KPE-P		
2431	2238 861 18109	CER1 0805 NP0 50V 10P PM1 R	3430	4822 051 20223	22K00 5% 0,1W	3758	4822 051 20333	33K00	5%	0,1W	6418	4822 130 82978	LTL-16KPE-P		
2432	2238 861 18109	CER1 0805 NP0 50V 10P PM1 R	3431	4822 117 10833	10K 1% 0,1W	3759	4822 051 20333	33K00	5%	0,1W	6419	4822 130 30621	1N4148		
2433	2238 861 18109	CER1 0805 NP0 50V 10P PM1 R	3432	▲ 4822 052 10478	4R70 5% 0,33W	3760	4822 051 20333	33K00	5%	0,1W	6421	4822 130 82978	LTL-16KPE-P		
2434	4822 126 14076	220N 25V. P8020				3761	4822 051 20333	33K00	5%	0,1W	TRANSISTORS & ICs				
			3433	4822 117 10833	10K 1% 0,1W						7402	4822 130 11607	PDTA144ET		
2435	4822 122 33575	220PF 5% NP0 63V CASE 0805	3434	4822 051 20223	22K00 5% 0,1W	3762	4822 051 20333	33K00	5%	0,1W	7403	4822 130 10165	GPIU28XP		
2436	4822 122 33575	220PF 5% NP0 63V CASE 0805	3435	4822 116 52257	22K 5% 0,5W	3763	4822 051 20333	33K00	5%	0,1W	7405	4822 209 17445	M24C08-MN6		
2437	4822 122 33575	220PF 5% NP0 63V CASE 0805	3436	4822 116 52257	22K 5% 0,5W	3764	4822 051 20333	33K00	5%	0,1W	7406	5322 130 60159	BC846B		
2438	4822 122 33575	220PF 5% NP0 63V CASE 0805	3437	4822 117 10837	100K 1% 0,1W	3765	4822 051 20333	33K00	5%	0,1W	7407	5322 130 60159	BC846B		
2439	4822 122 33575	220PF 5% NP0 63V CASE 0805				3766	4822 051 20333	33K00	5%	0,1W					
			3438	3198 021 52240	RST SM 0805 220K PM5 COL R						7408	5322 130 60159	BC846B		
2440	4822 122 33575	220PF 5% NP0 63V CASE 0805	3439	4822 117 10833	10K 1% 0,1W	3767	4822 051 20333	33K00	5%	0,1W	7409	5322 130 60159	BC846B		
2441	4822 122 33575	220PF 5% NP0 63V CASE 0805	3440	4822 051 20479	47R00 5% 0,1W	3768	4822 051 20333	33K00	5%	0,1W	7411	5322 209 11306	HEF4094BT		
2444	5322 122 32654	CER2 0805 X7R 63V 22N PM10 R	3441	4822 117 11149	82K 1% 0,1W	3769	4822 051 20333	33K00	5%	0,1W	7412	5322 209 11306	HEF4094BT		
2445	5322 126 10223	4,7NF10%X7R 63V	3442	4822 117 10837	100K 1% 0,1W	3770	4822 05								

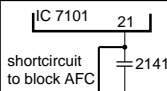
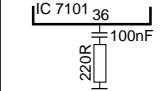
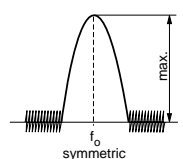
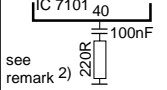

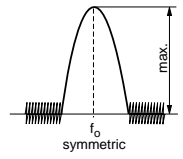
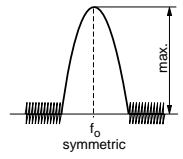


# ***TUNER BOARD ECO5***

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**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	1	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	1	8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-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	1	8V ±0.2V
			153kHz	check		1.1V ±0.4V
<b>MW</b> FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123	1	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> <b>MW</b>		C  continuous wave V <sub>RF</sub> = 10mV		5114	2	0 ± 2 mV DC
<i>AM RF <sup>3)</sup></i>						
<b>MW <sup>4)</sup></b> FM/MW/LW- and FM/MW-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	4	
	560kHz		560kHz	5102		

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

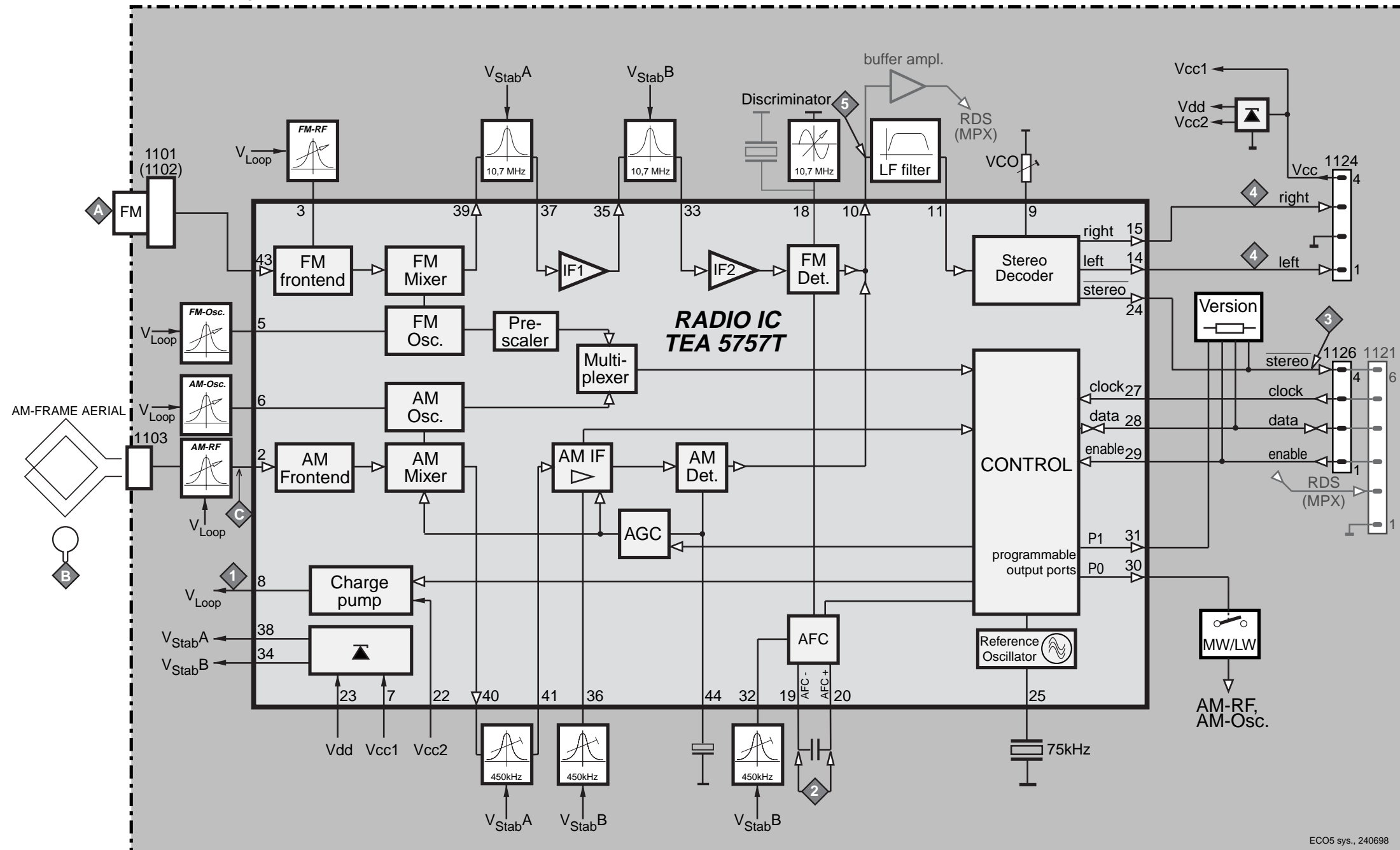
ECO5, descr. coil, 090797

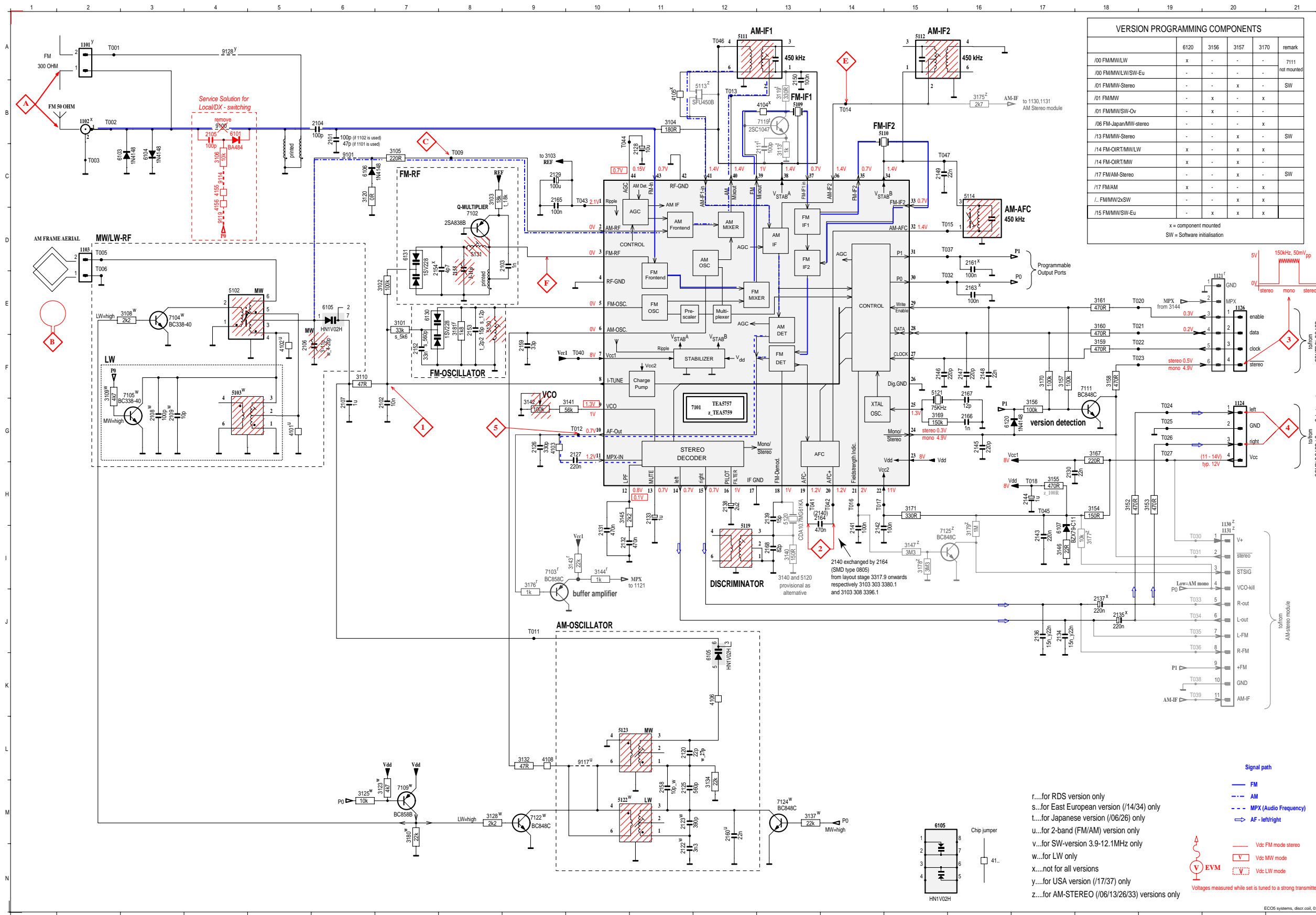
- 1) If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)
- 2) RC network serves for damping the IF-filter while adjusting the other one.
- 3) For AM RF adjustments the original frame antenna has to be used !
- 4) MW has to be aligned before LW.

↑ Repeat

BLOCKDIAGRAM

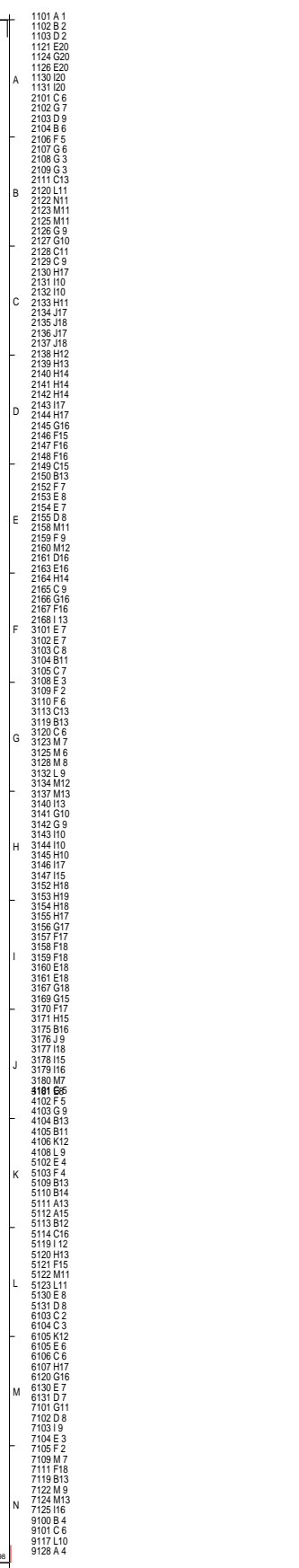
**TUNER BOARD**  
**ECO 5 systems**



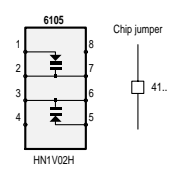


	6120	3156	3157	3170	remark
/00 FMMW/LW	x	-	-	-	7111
/00 FMMW/LW/SW-Eu	-	-	-	-	not mounted
/01 FMMW-Stereo	-	-	x	-	SW
/01 FMMW	-	x	-	x	
/01 FMMW/SW-Ov	-	x	-	-	
/06 FM-Japan/MW-stereo	-	-	-	x	
/13 FMMW-Stereo	-	-	x	-	SW
/14 FM-OIRT/MW/LW	x	-	x	x	
/14 FM-OIRT/MW	x	-	x	-	
/17 FM/AM-Stereo	-	-	x	-	SW
/17 FM/AM	x	-	-	x	
/L FMMW/2xSW	-	-	x	x	
/15 FMMW/SW-Eu	-	x	x	x	

x = component mounted  
SW = Software initialisation

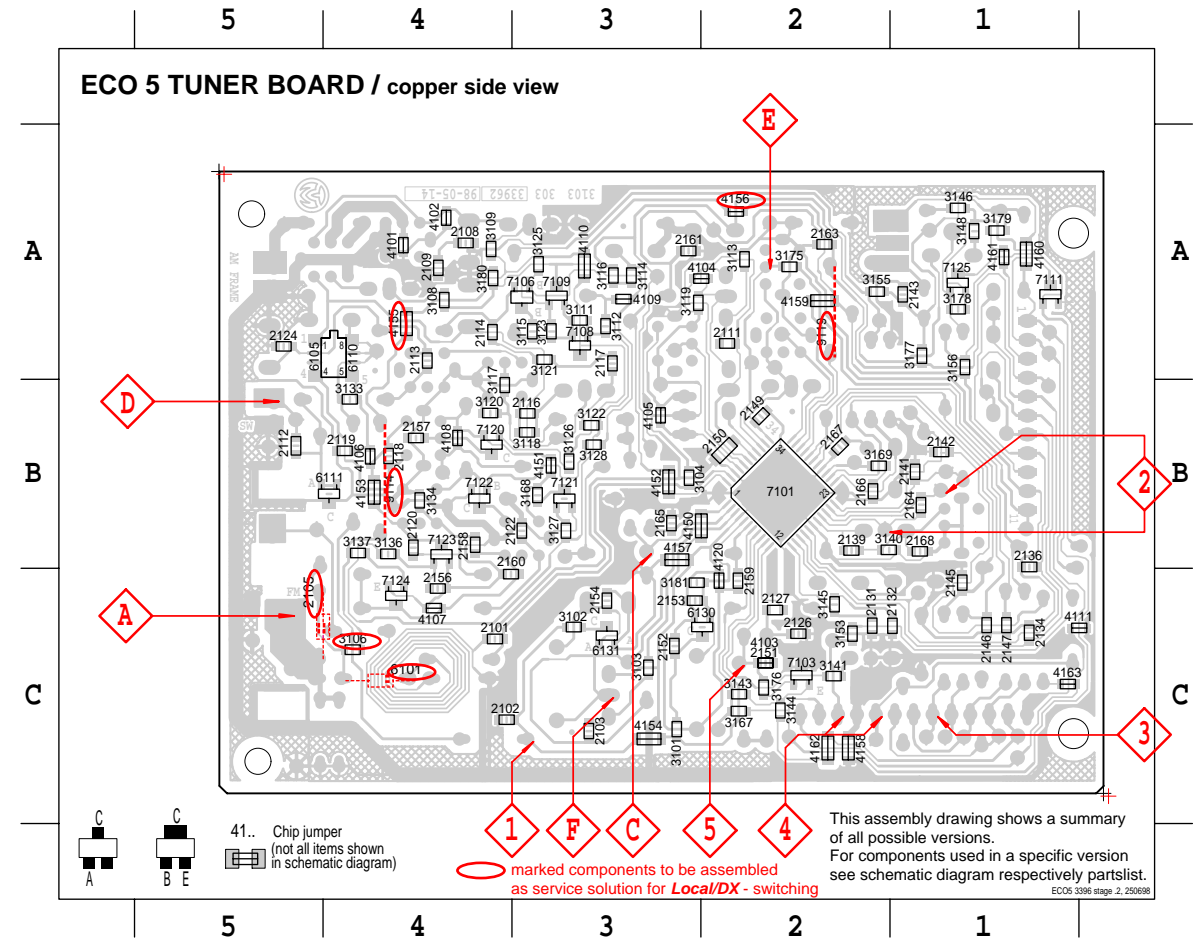
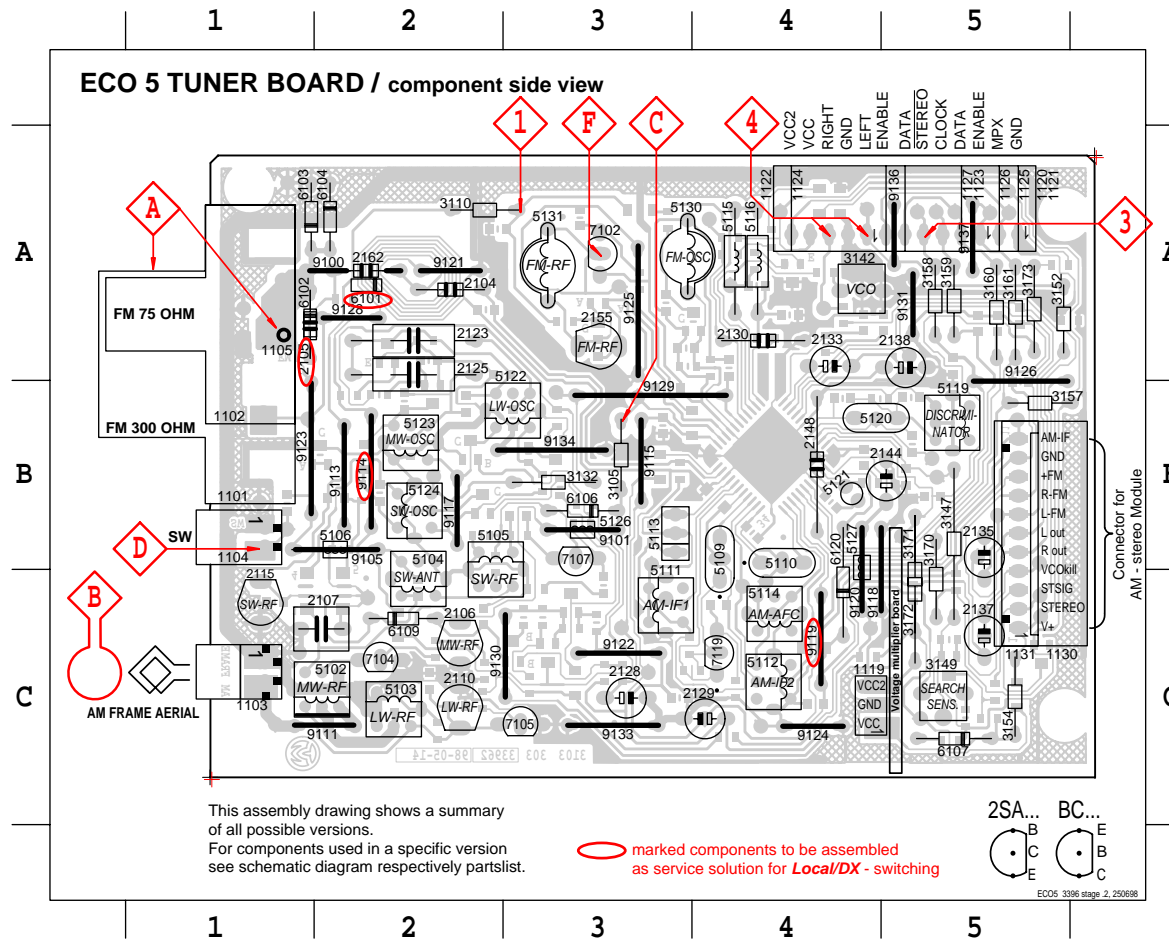


r....for RDS version only  
s....for East European version (/14/34) only  
t....for Japanese version (/06/26) only  
u....for 2-band (FM/AM) version only  
v....for SW-version 3.9-12.1MHz only  
w....for LW only  
x....not for all versions  
y....for USA version (/17/37) only  
z....for AM-STEREO (/06/13/26/33)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



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	9113 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	



## 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 &amp; 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

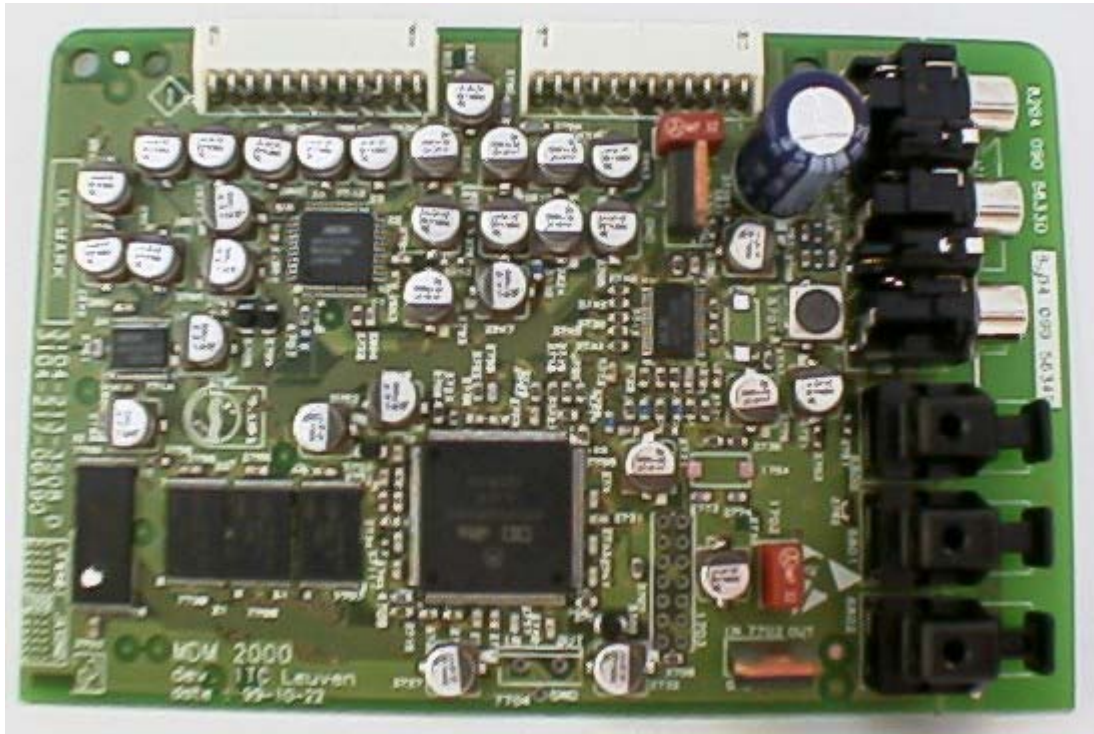
## DIODES

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 &amp; ICs

7101 482220990924 TEA5757HV1  
 7102 482213060093 2SA838B  
 7111 532213042136 BC848C



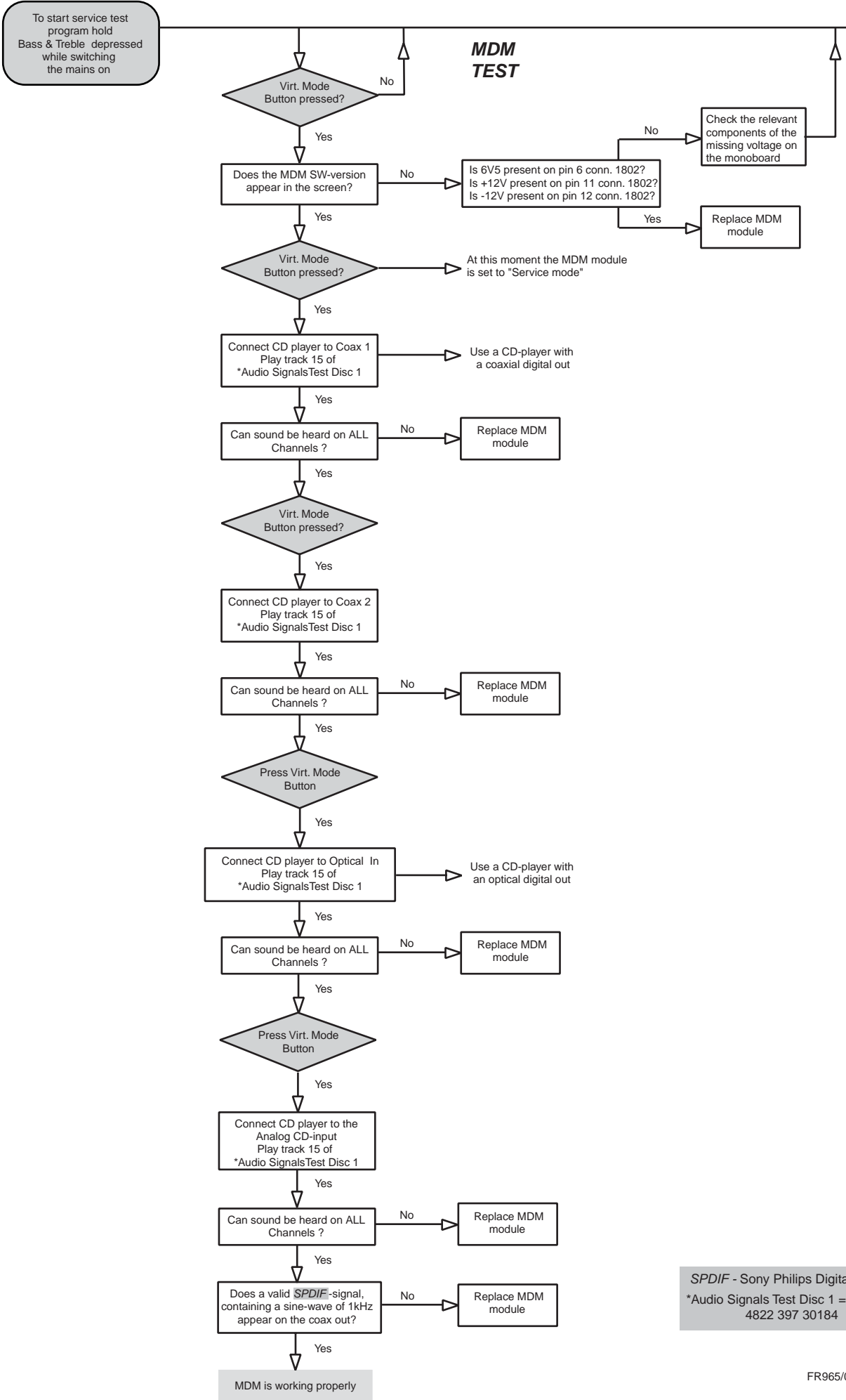
# ***MULTI-CHANNEL DECODING MODULE***

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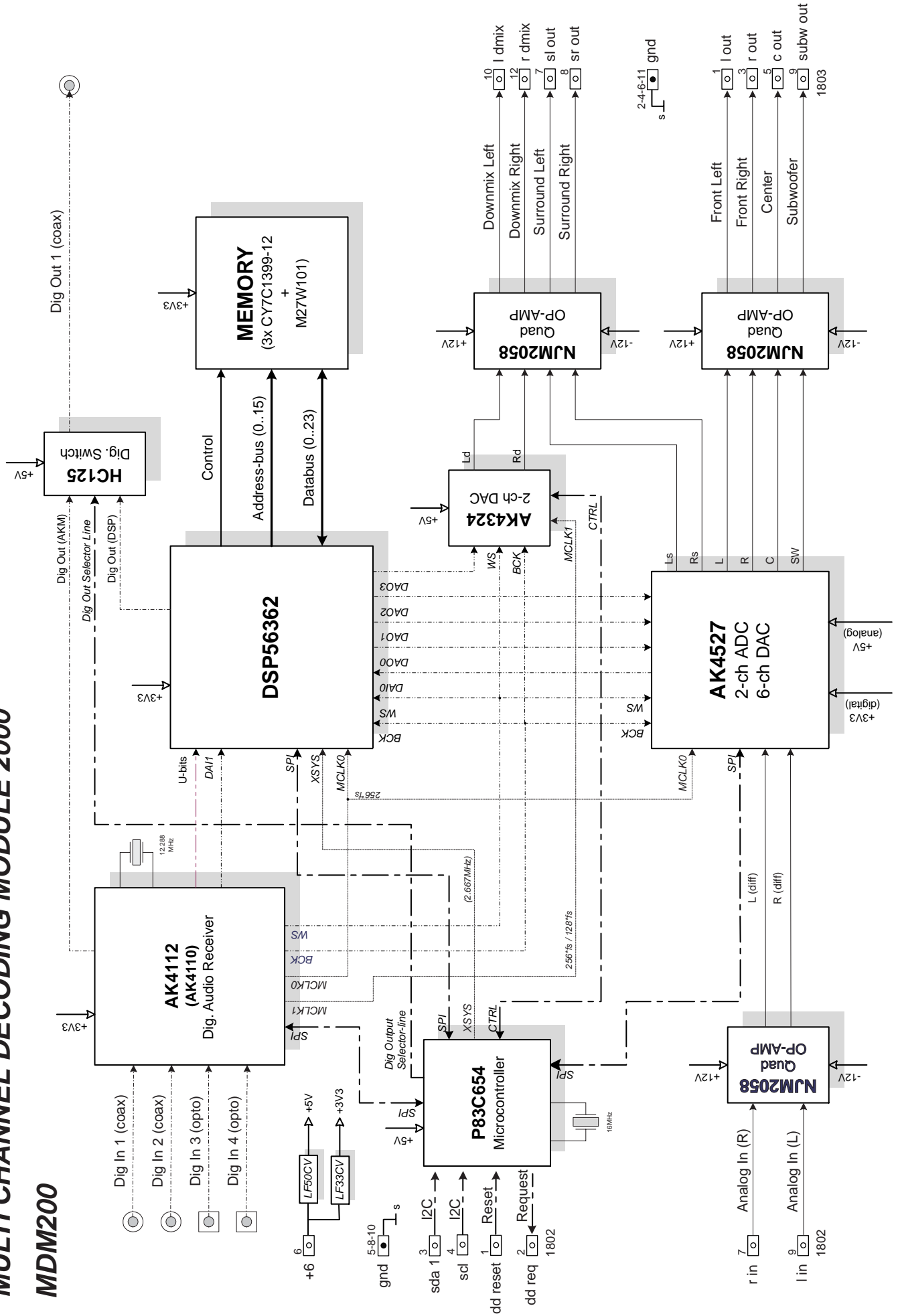
# MULTI-CHANNEL DECODING MODULE - Troubleshooting



SPDIF - Sony Philips Digital Inter Face  
\*Audio Signals Test Disc 1 = SBC429  
4822 397 30184

BLOCK-DIAGRAM

**MULTI CHANNEL DECODING MODULE 2000**  
**MDM200**

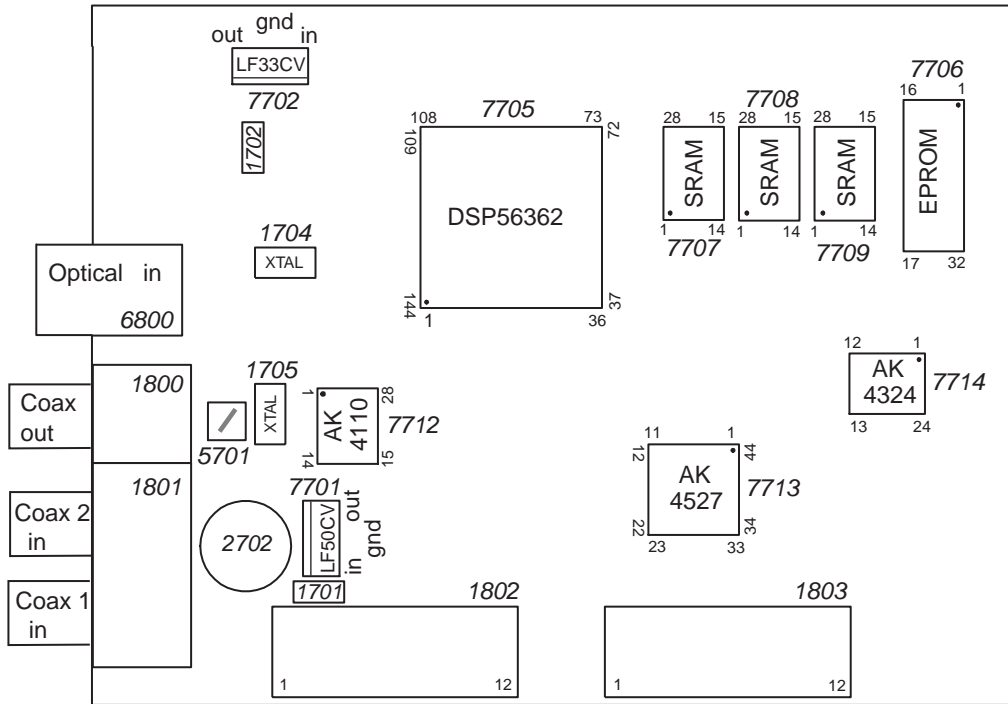


**ELECTRICAL PARTSLIST - MDM MODULE**

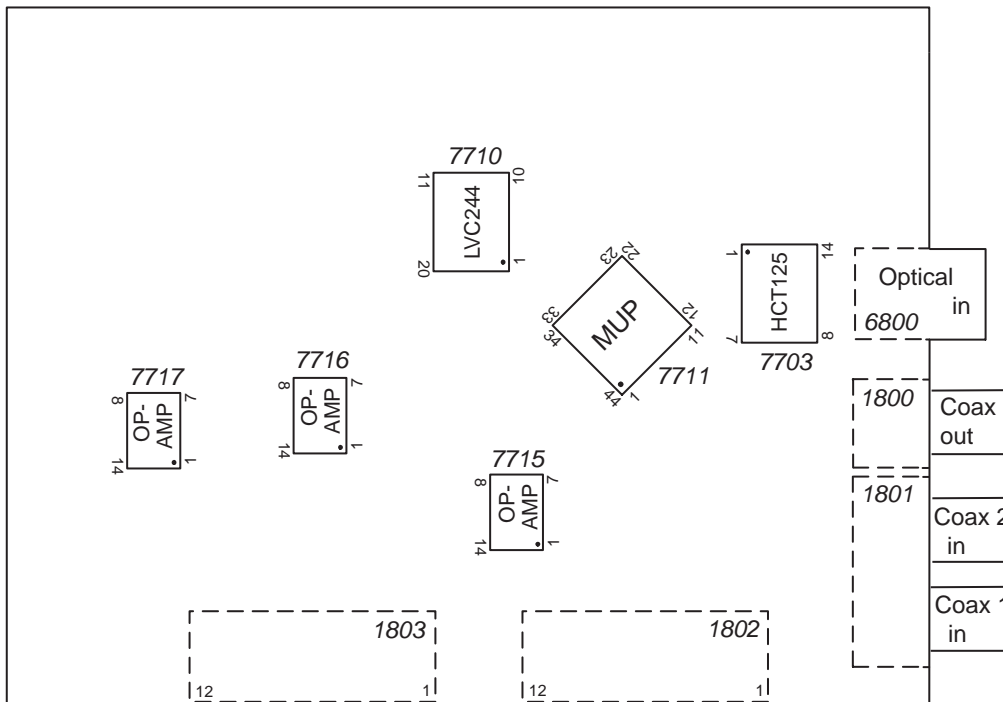
1003	3104 217 06780	MDM MODULE for FR965	2702	4822 123 14025	16V 2200U 20%
1701	4822 252 51172	FUSE 0,315A	6800	4822 218 11487	CONN. FIBER-GLASS GP1F32R
1702	4822 252 51172	FUSE 0,315A	7701	9322 146 09687	LF50CV
1704	2422 543 01118	CRYSTAL 16MHZ	7702	4822 209 16978	LF33CV
1705	2422 543 01132	CRYSTAL 12MH28			
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			

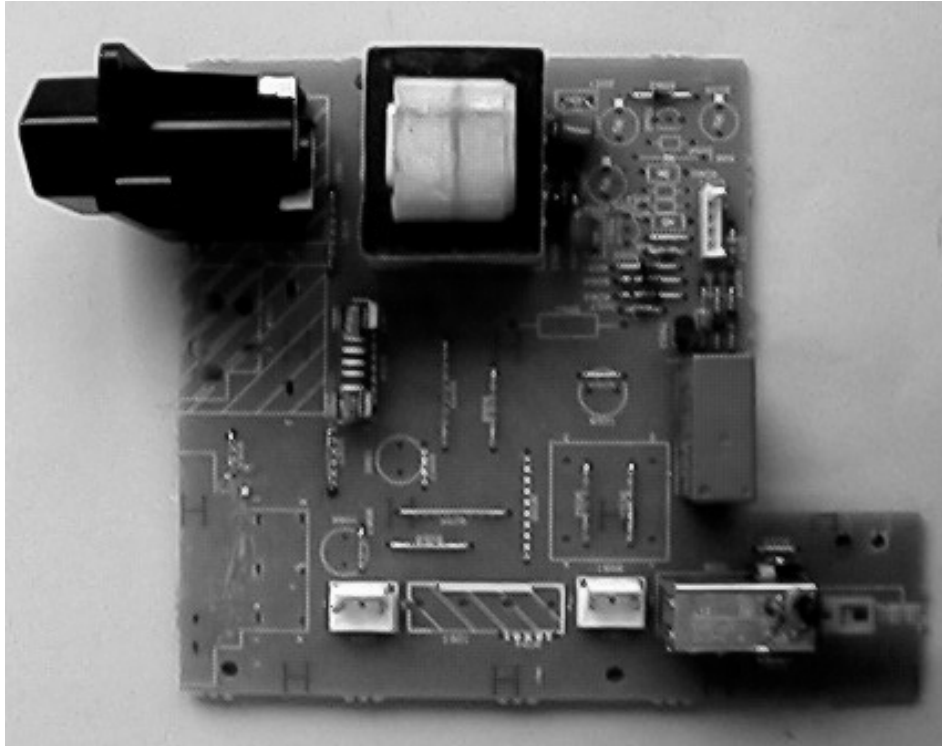
Note: Only the parts mentioned in this list are normal service parts.

Component side view



Copper side view

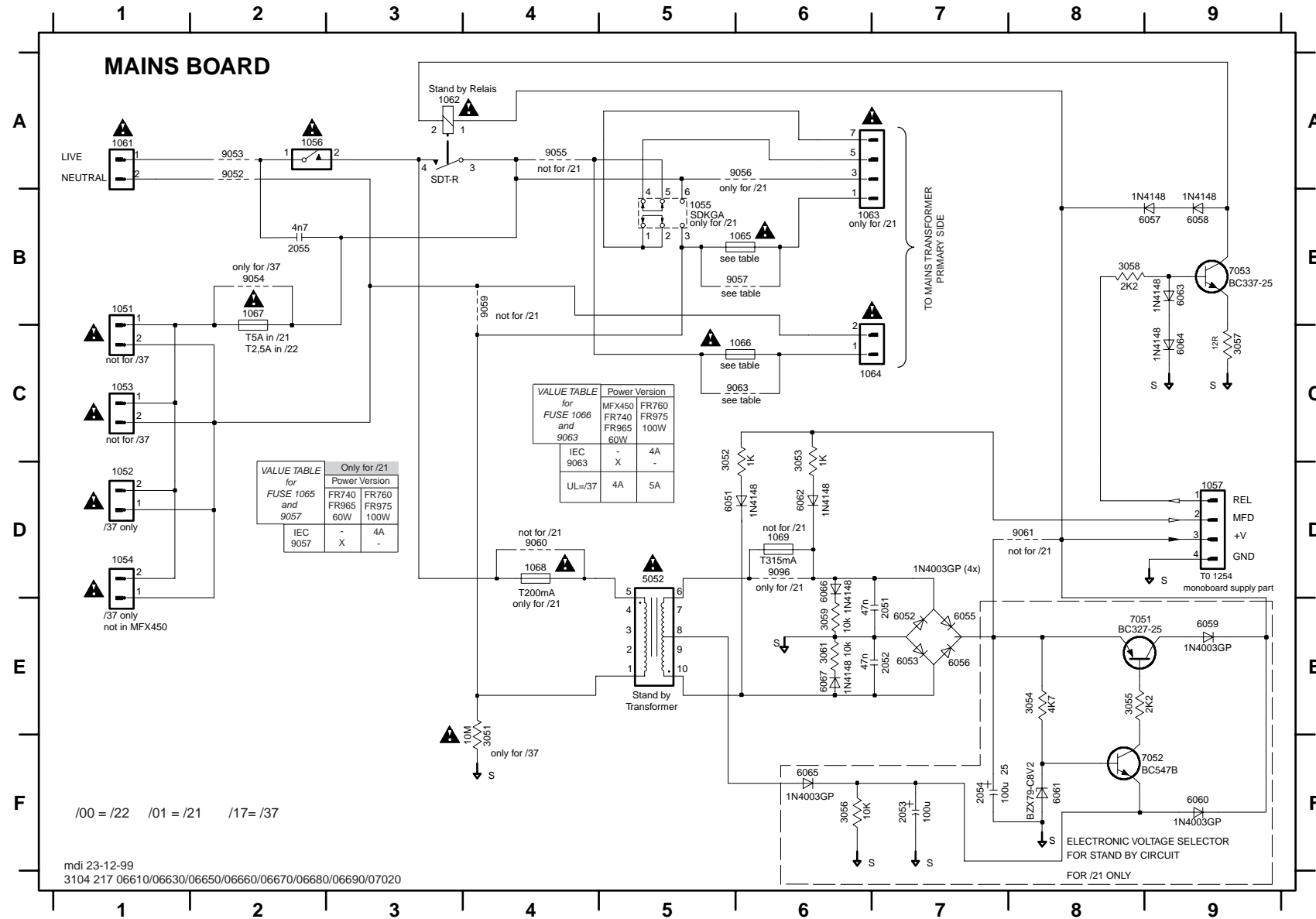




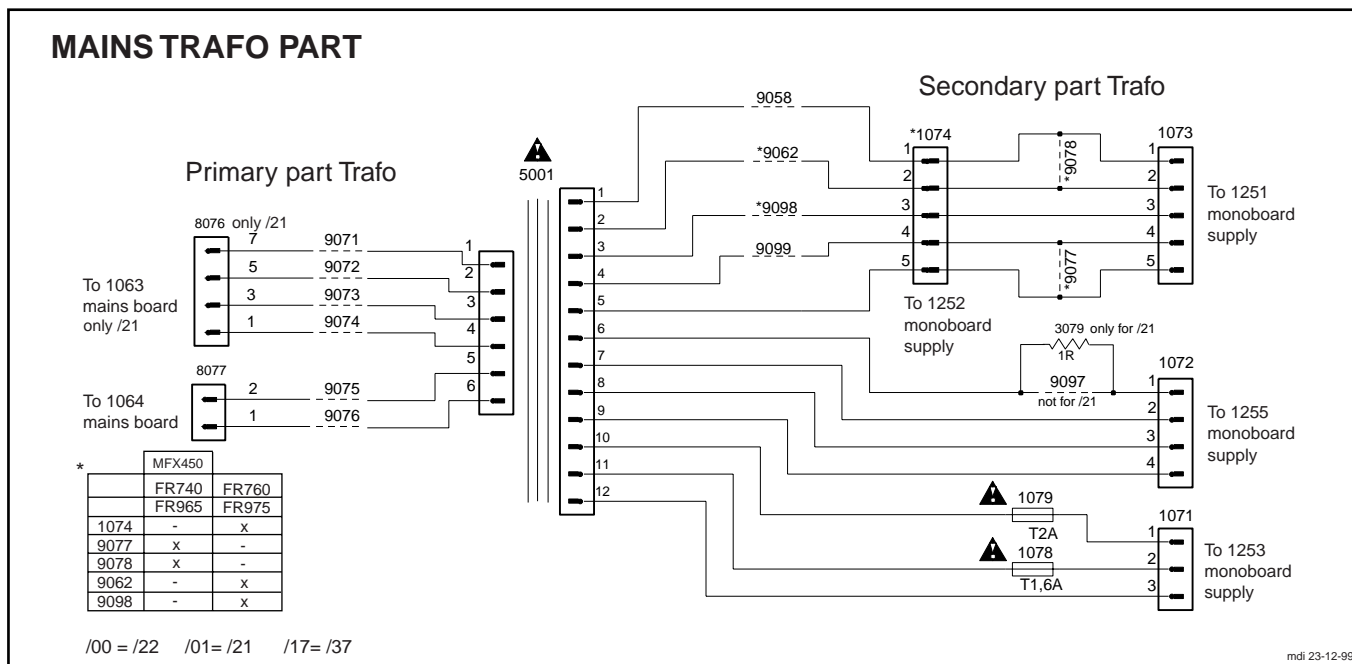
# ***MAINS BOARD***

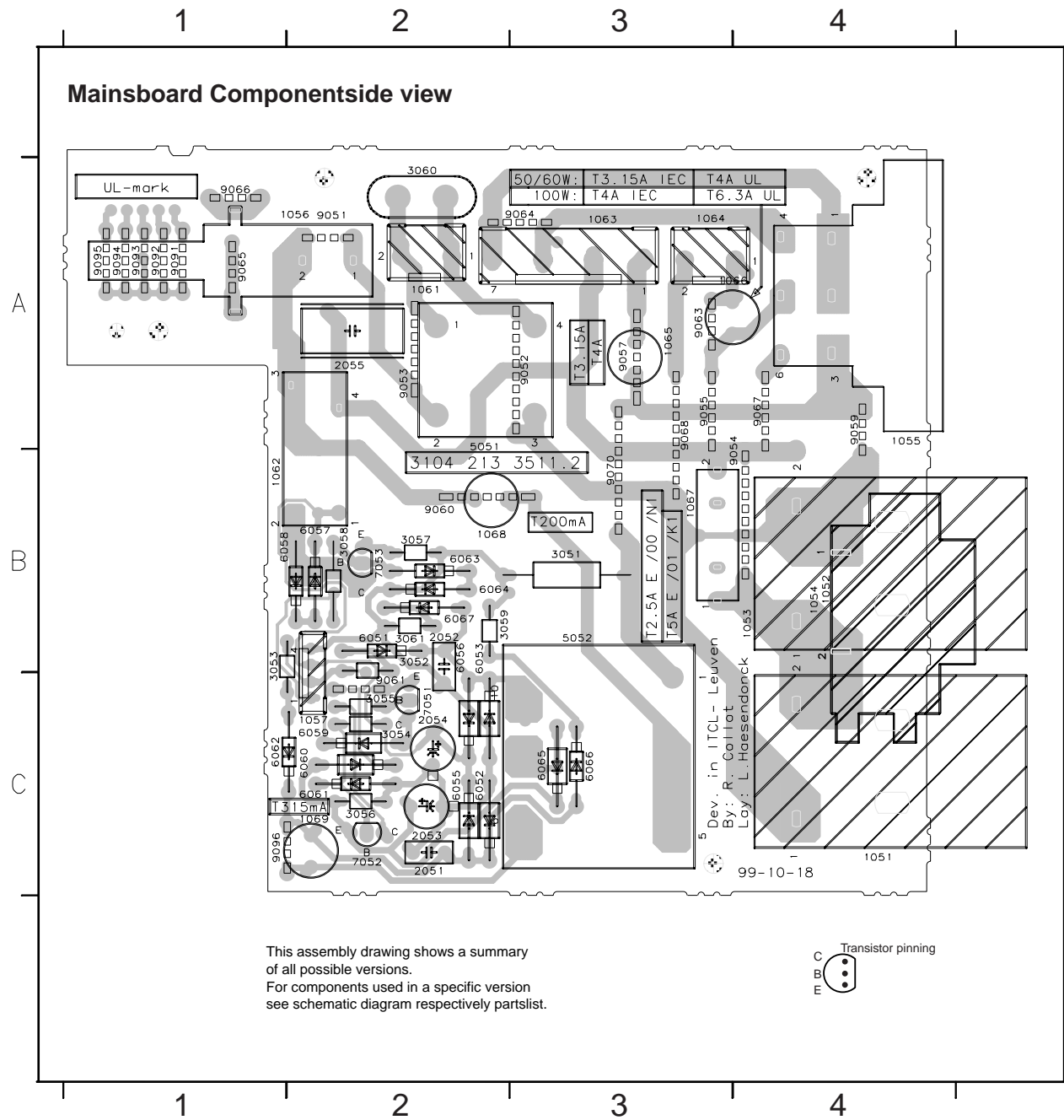
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Component Layout Trafo board .....	9-4
Partslist .....	9-5

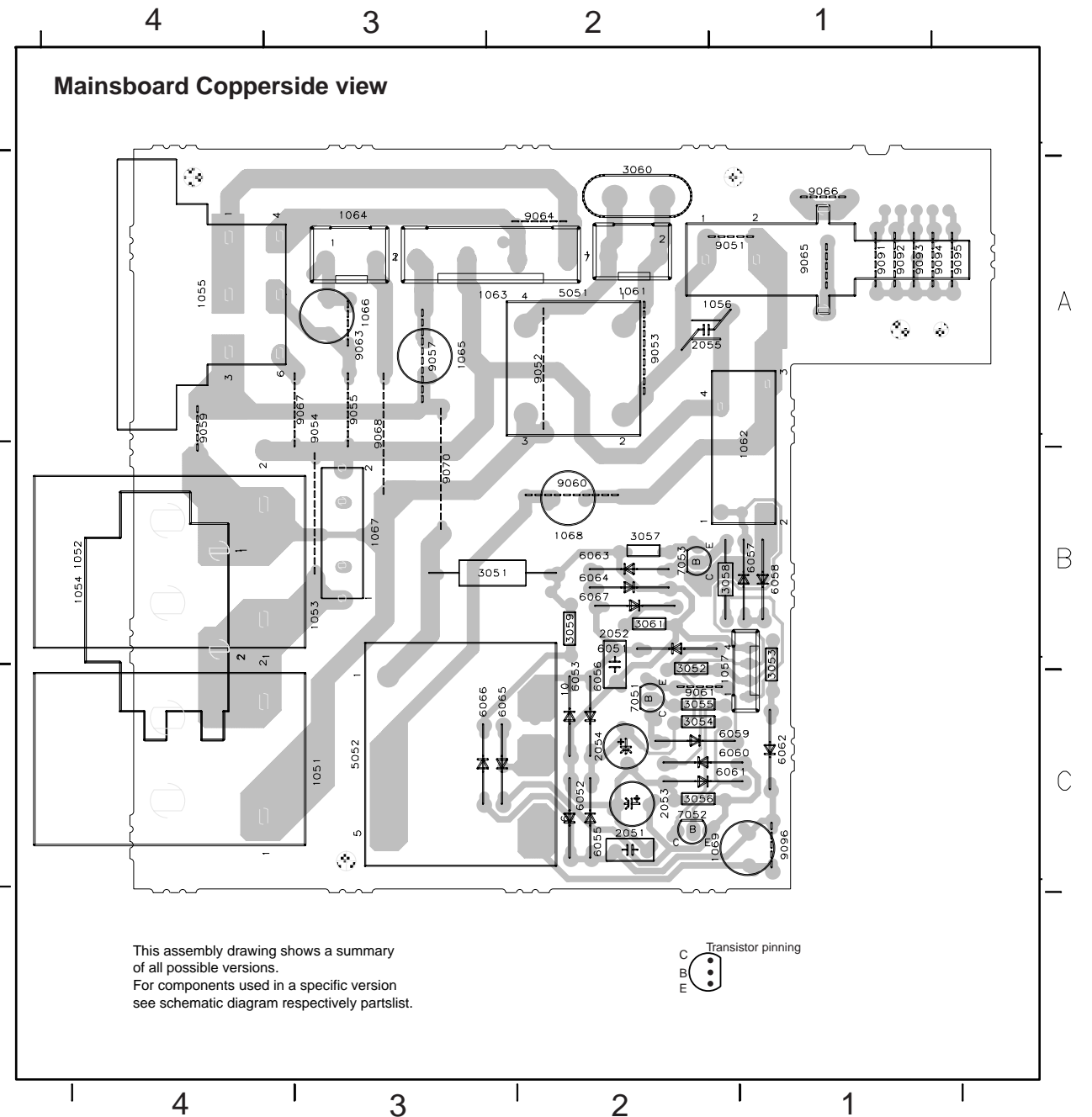


- 0051 D9
- 1051 B1
- 1052 D1
- 1053 C1
- 1054 D1
- 1055 B5
- 1056 A2
- 1057 D9
- 1061 A1
- 1062 A3
- 1063 B6
- 1064 C6
- 1065 B6
- 1066 C6
- 1067 B2
- 1068 D4
- 1069 D6
- 2051 E7
- 2052 E7
- 2053 F7
- 2054 F7
- 2055 B2
- 3051 F4
- 3052 C6
- 3053 C6
- 3054 E8
- 3055 E8
- 3056 F6
- 3057 C9
- 3058 B8
- 3059 E6
- 3061 E6
- 5051 A2
- 5052 D5
- 6051 D6
- 6052 E7
- 6053 E6
- 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





- 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 C2
- 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



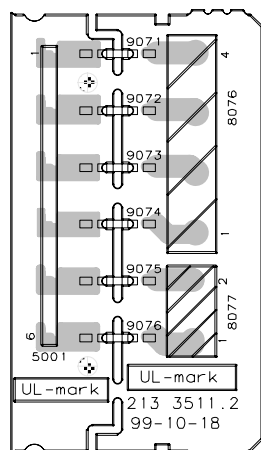
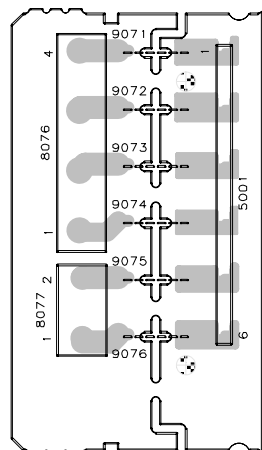
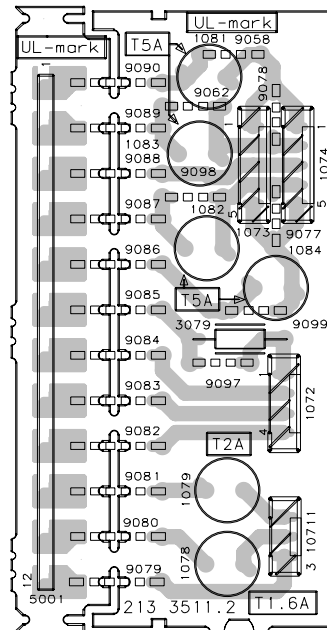
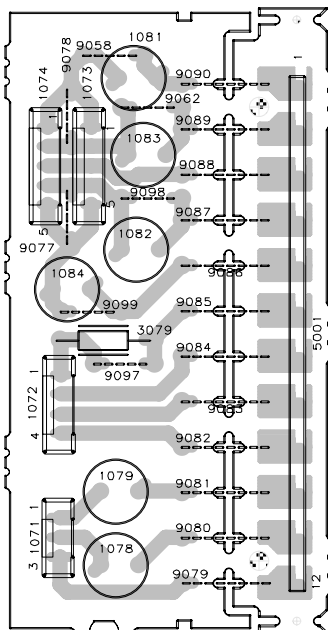
**TRAFO BOARD**

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**

---

1052	4822 265 11605	MAINS OUTLET
1056 ▲	4822 276 13224	MAINS SWITCH
1061 ▲	4822 265 20723	MAINS INLET
1062	4822 280 10391	RELAY
1064 ▲	4822 265 20723	B2P3-VH
1066 ▲	4822 253 10126	FUSE 4A
1069 ▲	4822 071 53151	FUSE 315mA
1078 ▲	4822 071 51602	FUSE 6A
1079 ▲	9965 000 07788	FUSE 2A

**CAPACITORS**

---

2051	4822 121 43526	47NF 5% 250V
2052	4822 121 43526	47NF 5% 250V
2055 ▲	4822 126 14084	4,7NF 20% 250V

**RESISTORS**

---

3051 ▲	4822 053 21106	10M00 5% 0,5W
3052 ▲	4822 050 11002	1K00 1% 0,4W
3053	4822 050 11002	1K00 1% 0,4W
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

**TRAFO**

---

5052 ▲	4822 146 11142	STBY TRAFO
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**DIODES**

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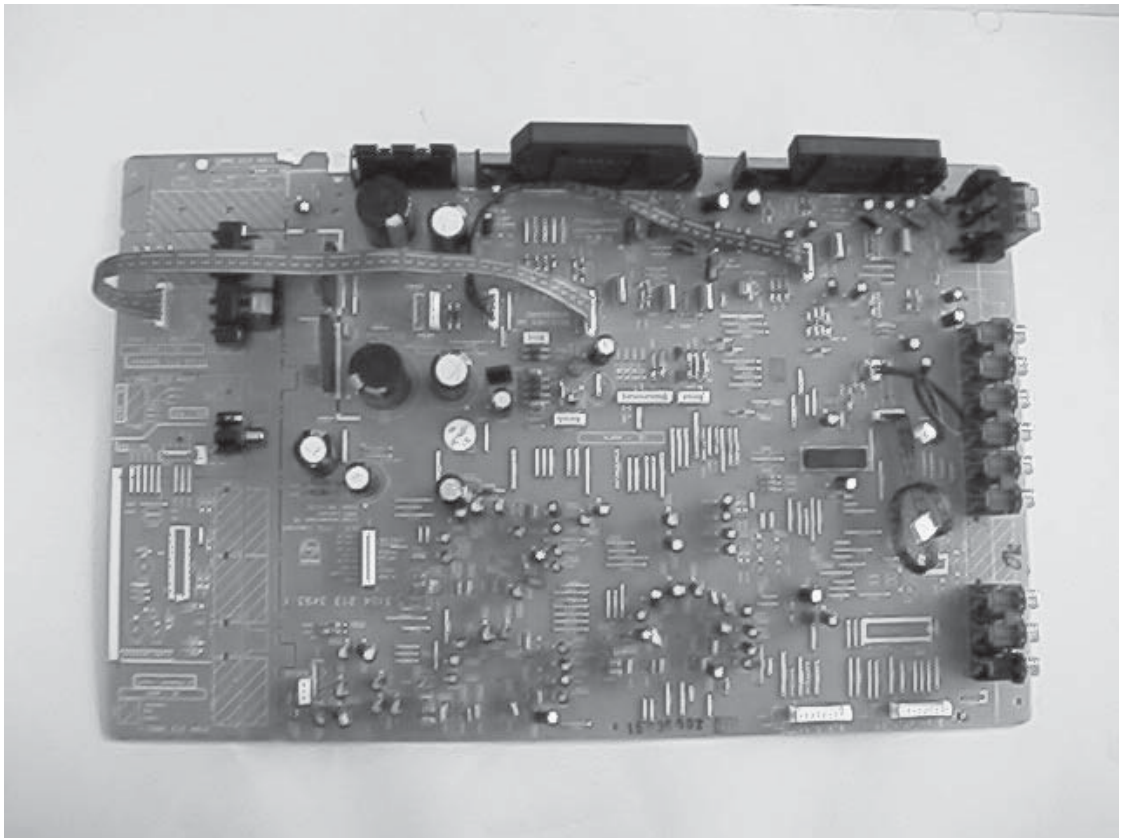
6051	4822 130 30621	1N4148
6052	4822 130 31878	1N4003G
6053	4822 130 31878	1N4003G
6055	4822 130 31878	1N4003G
6056	4822 130 31878	1N4003G
6057	4822 130 30621	1N4148
6058	4822 130 30621	1N4148
6062	4822 130 30621	1N4148
6063	4822 130 30621	1N4148
6064	4822 130 30621	1N4148
6066	4822 130 30621	1N4148
6067	4822 130 30621	1N4148

**TRANSISTORS**

---

7053	4822 130 40981	BC337-25
------	----------------	----------





# ***MONO2 BOARD***

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**MEASUREMENT REFERENCES TO LAYOUT ON PAGE 10-9****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 10-9****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**

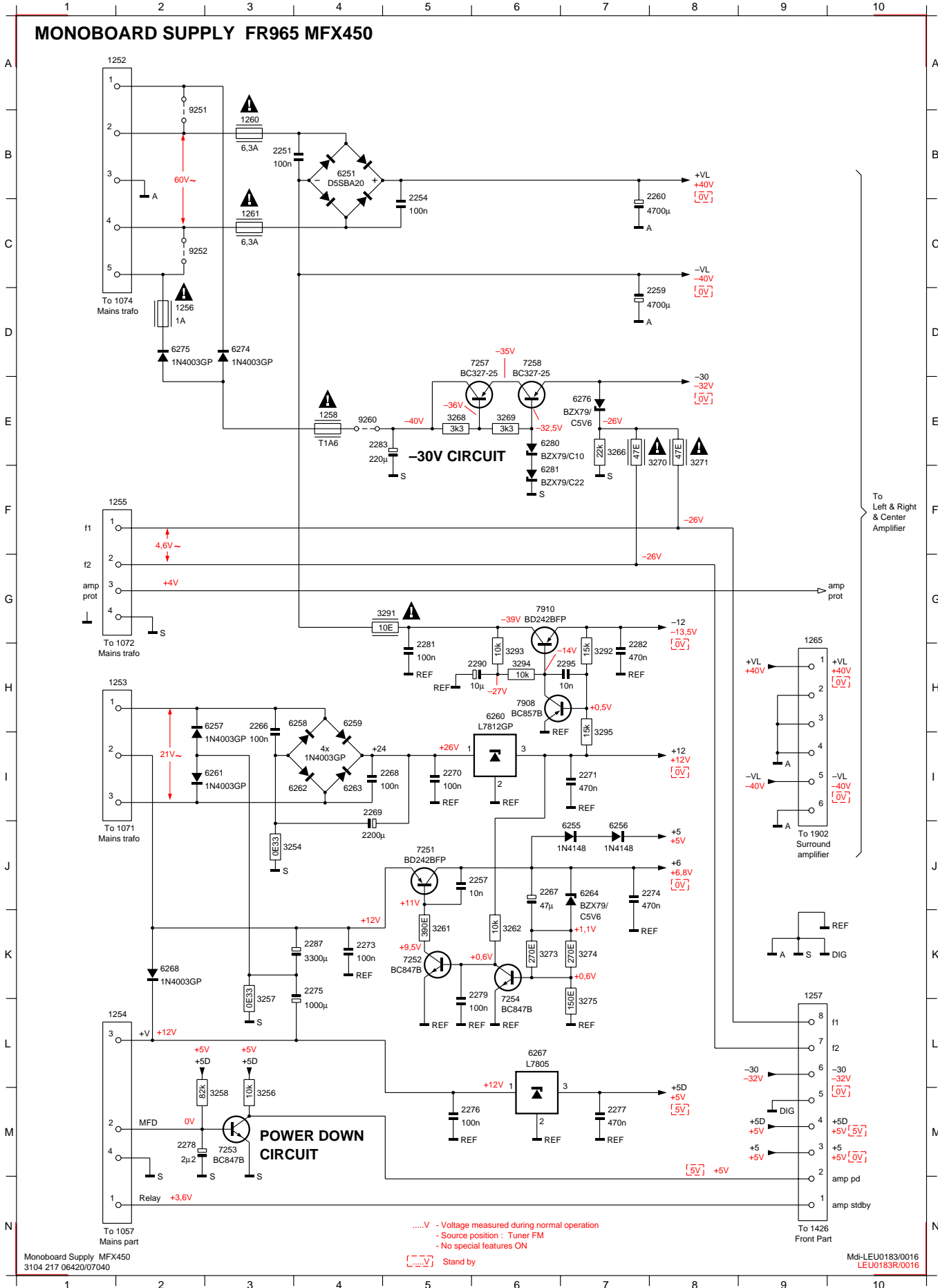
Tr7621	Can be measure via Test point on component side monoboard	Funtionality
B	TP 96	-1,5V
C	TP 97	Ground
E	TP 98	Headphone Amp L out

**Tr 7658**

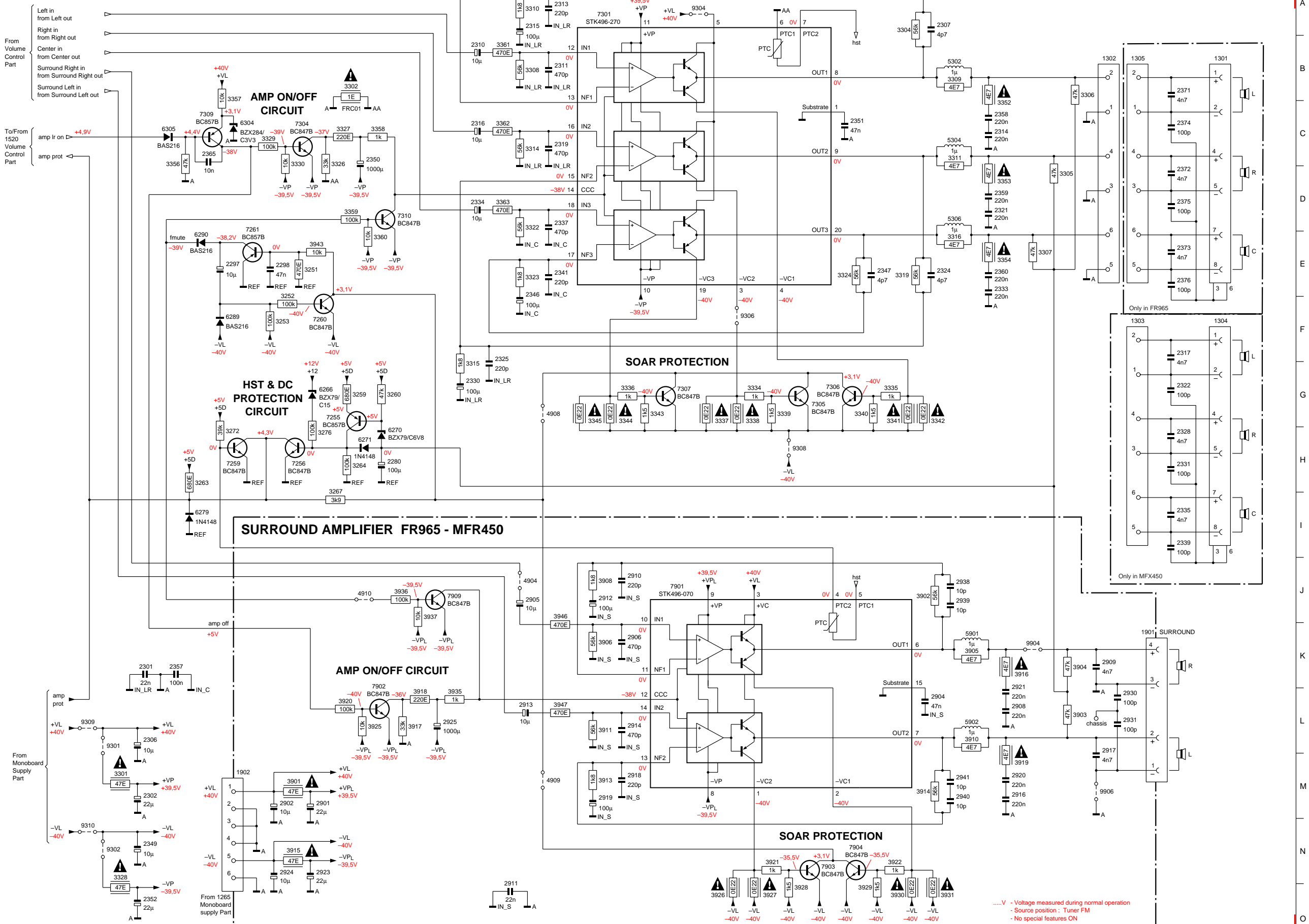
Tr7658	Can be measure via Test point on component side monoboard	Funtionality
B	TP 83	5V
C	TP 84	-13V
E	TP 85	5V

1252	A1	1258	E4	2257	J5	2269	I4	2276	M5	2283	E4	3257	L3	3269	E6	3291	G4	6255	J7	6261	I3	6274	D3	7252	K5	7910	G6
1253	H1	1260	B3	2259	D7	2270	I5	2277	M7	2287	K4	3258	M3	3270	E8	3292	H7	6256	J7	6262	I3	6275	D2	7253	M3	9251	B2
1254	L1	1261	C3	2260	C7	2271	I7	2278	M2	2290	H5	3261	K5	3271	E8	3293	H6	6257	H3	6263	I4	6276	E7	7254	L6	9252	C2
1255	F1	1265	G9	2266	H3	2273	K4	2279	K5	2295	H6	3262	K6	3273	K6	3294	H6	6258	H3	6264	J7	6280	E6	7257	D5	9260	E4
1256	D2	2251	B3	2267	J6	2274	J7	2281	H5	3254	J3	3266	E7	3274	K7	3295	I7	6259	H4	6267	L6	6281	F6	7258	D6		
1257	K9	2254	C5	2268	I4	2275	K4	2282	H7	3256	M3	3268	E5	3275	L7	6251	B4	6260	H6	6268	K2	7251	J5	7908	H6		

**MONOBOARD SUPPLY FR965 MFX450**



### LEFT & RIGHT & CENTER AMPLIFIER FR965 - MFX450



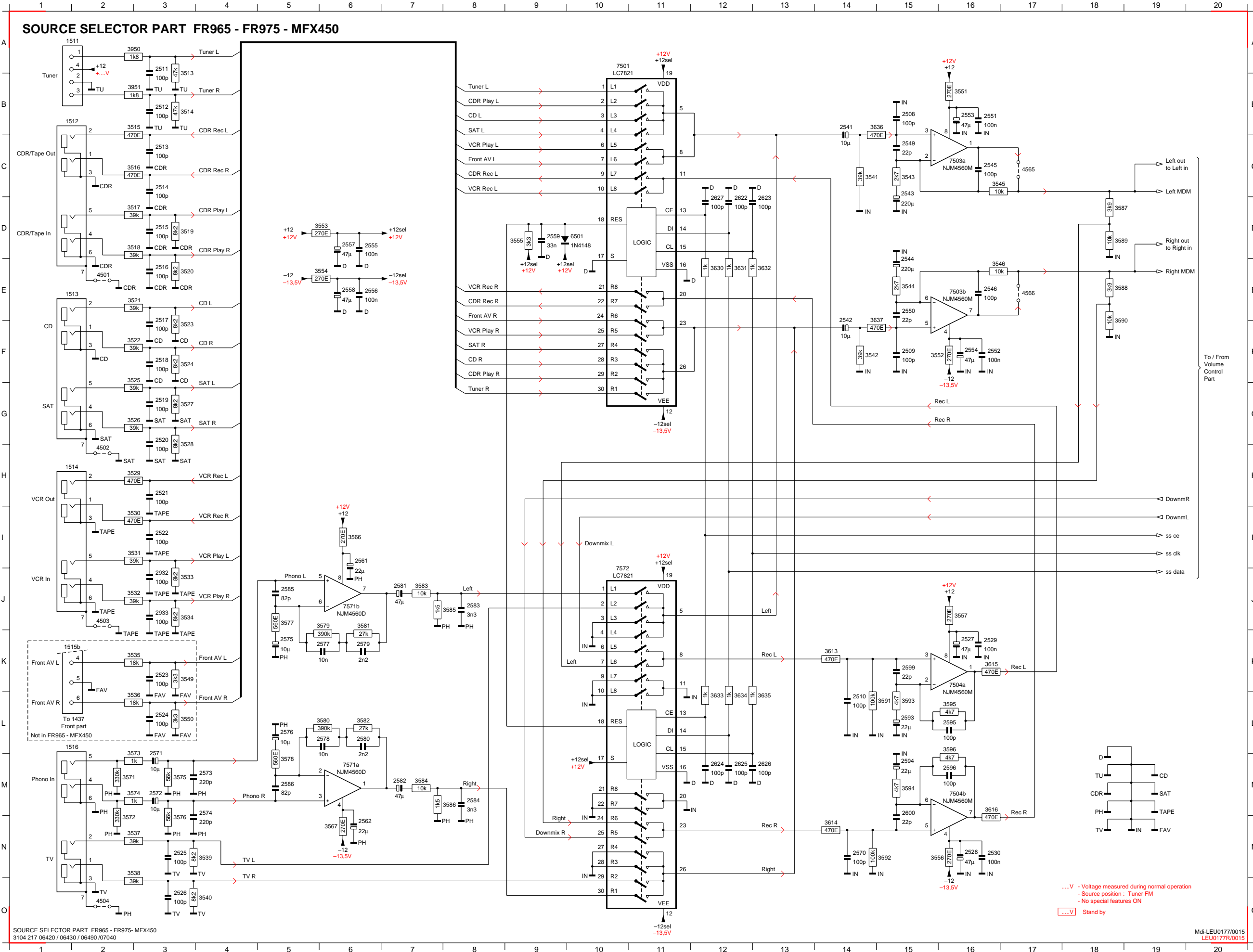
LEFT & RIGHT & CENTER & SURROUND AMPLIFIER  
3104 217 06420/07040

Mdi-LEU0173/0016  
LEU0173R/0016

1301	B19	3359	D6
1302	B18	3360	E6
1305	B18	3361	B8
1901	K18	3362	C8
1902	M4	3363	D8
2280	H7	3901	M5
2297	E4	3902	J15
2298	E5	3903	L17
2301	K3	3904	K17
2302	M3	3905	K15
2306	L3	3906	K10
2307	A15	3908	J10
2310	B8	3910	L15
2311	B9	3911	L10
2313	A9	3913	M10
2314	C16	3914	M15
2315	A9	3915	N5
2316	C8	3916	K16
2319	C9	3917	L7
2321	D16	3918	L7
2324	E15	3919	M16
2325	F8	3920	L6
2330	G8	3921	N12
2333	E16	3922	N14
2334	D8	3925	L6
2337	D9	3926	O12
2341	E9	3927	O12
2346	F9	3928	O13
2347	E14	3929	O14
2349	N3	3930	O14
2350	C6	3931	O15
2351	C14	3935	L8
2352	O3	3936	J7
2357	K3	3937	J7
2358	C16	3943	E5
2359	D16	3946	J9
2360	E16	3947	L9
2365	C4	4904	J9
2371	B19	4908	G9
2372	D19	4909	M9
2373	E19	4910	J6
2374	C19	5302	B15
2375	D19	5304	C15
2376	E19	5306	D15
2901	M6	5901	K15
2902	M5	5902	L15
2904	L15	6266	G6
2905	J9	6270	H7
2906	K10	6271	I6
2908	L16	6279	I4
2909	K18	6289	F4
2910	J10	6290	F4
2911	O8	6304	C4
2912	J10	6305	C3
2913	L9	7255	G6
2914	L10	7256	H5
2916	M16	7259	H4
2917	L18	7260	F5
2918	M10	7261	E4
2919	M10	7301	A10
2920	M16	7304	C5
2921	L16	7305	G13
2923	N6	7306	G13
2924	N5	7307	C11
2925	L7	7309	C4
2930	L18	7310	D7
2931	L18	7901	J11
2938	J15	7902	L6
2939	J15	7903	N13
2940	M15	7904	N14
2941	M15	7909	J8
3251	E5	9301	L2
3252	F5	9302	N2
3253	F5	9304	A11
3259	G6	9306	F12
3260	G7	9308	H13
3263	H4	9309	L2
3264	H6	9310	N2
3267	I6	9904	K16
3272	H4	9906	M18
3276	H6		
3301	M2		
3302	B6		
3304	A14		
3305	D17		
3306	B17		
3307	E17		
3308	B9		
3309	B15		
3310	A9		
3311	C15		
3314	C9		
3315	G8		
3316	E15		
3319	E14		
3322	D9		
3323	E9		
3324	E13		
3326	D6		
3327	C6		
3328	N2		
3329	C5		
3330	D5		
3334	G12		
3335	G14		
3336	G10		
3337	G12		
3338	G12		
3339	G13		
3340	G14		
3341	G14		
3342	G15		
3343	G11		
3344	G10		
3345	G10		
3352	C16		
3353	D16		
3354	E16		
3356	D3		
3357	C4		
3358	C6		

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

### SOURCE SELECTOR PART FR965 - FR975 - MFX450

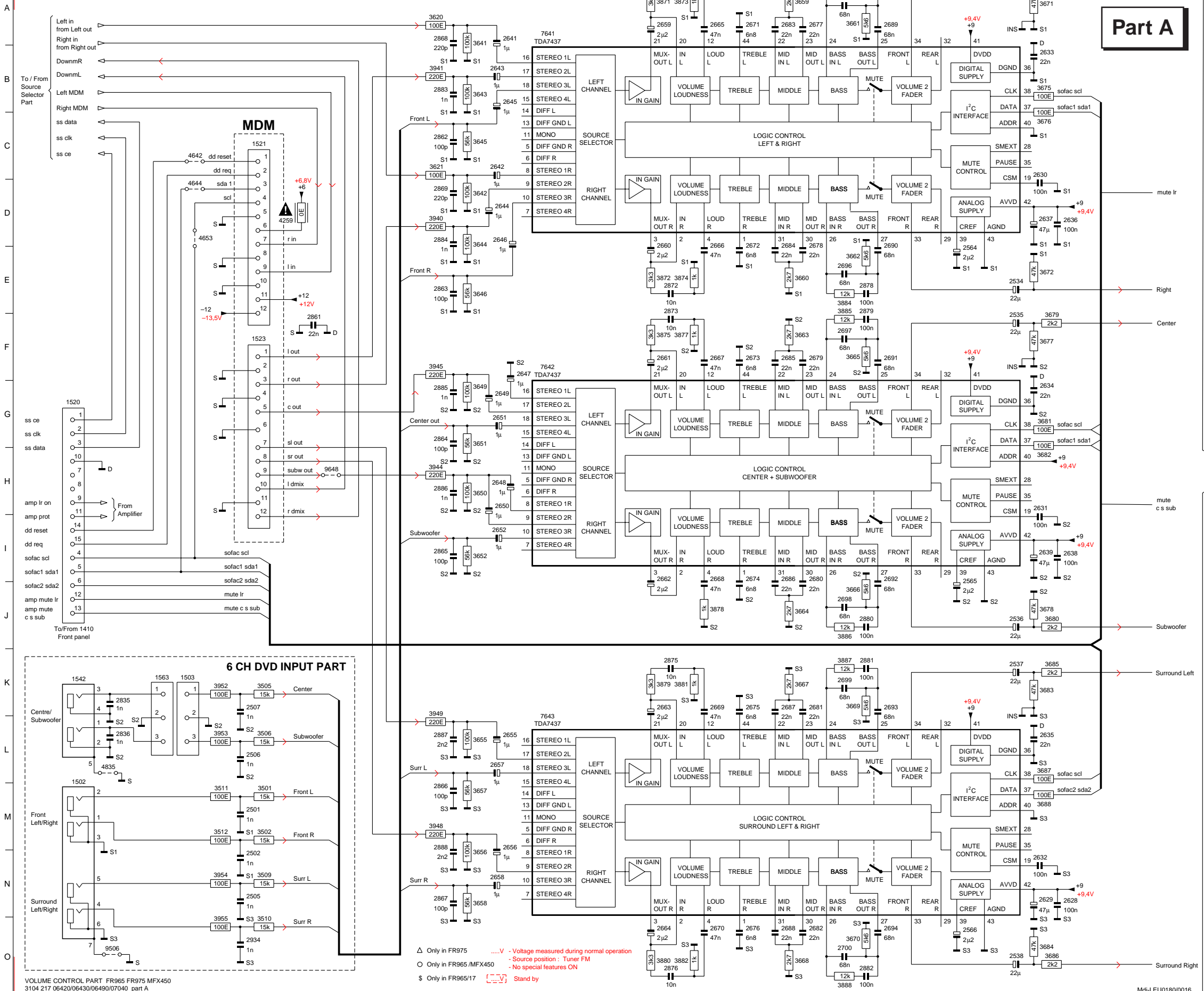


1511	A1	3557	J16
1512	B1	3566	I6
1513	E1	3567	N6
1514	H1	3571	M2
1515b	K1	3572	N2
1516	L1	3573	M2
2508	B15	3574	M2
2509	F15	3575	M3
2510	L14	3576	N3
2511	A3	3577	J5
2512	B3	3578	M5
2513	C3	3579	J5
2514	C3	3580	L5
2515	D3	3581	J6
2516	E3	3582	L6
2517	F3	3583	J7
2518	F3	3584	M7
2519	G3	3585	J8
2520	G3	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	M15
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	C15	3632	E13
2550	E15	3633	L12
2551	B16	3634	L12
2552	F16	3635	L13
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	7571a	M6
2578	L5	7571b	J6
2579	K6	7572	J10
2580	L6		
2581	J7		
2582	M7		
2583	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		
3524	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		

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

### VOLUME CONTROL PART FR965 - FR975 - MFX450 - Part A

# Part A



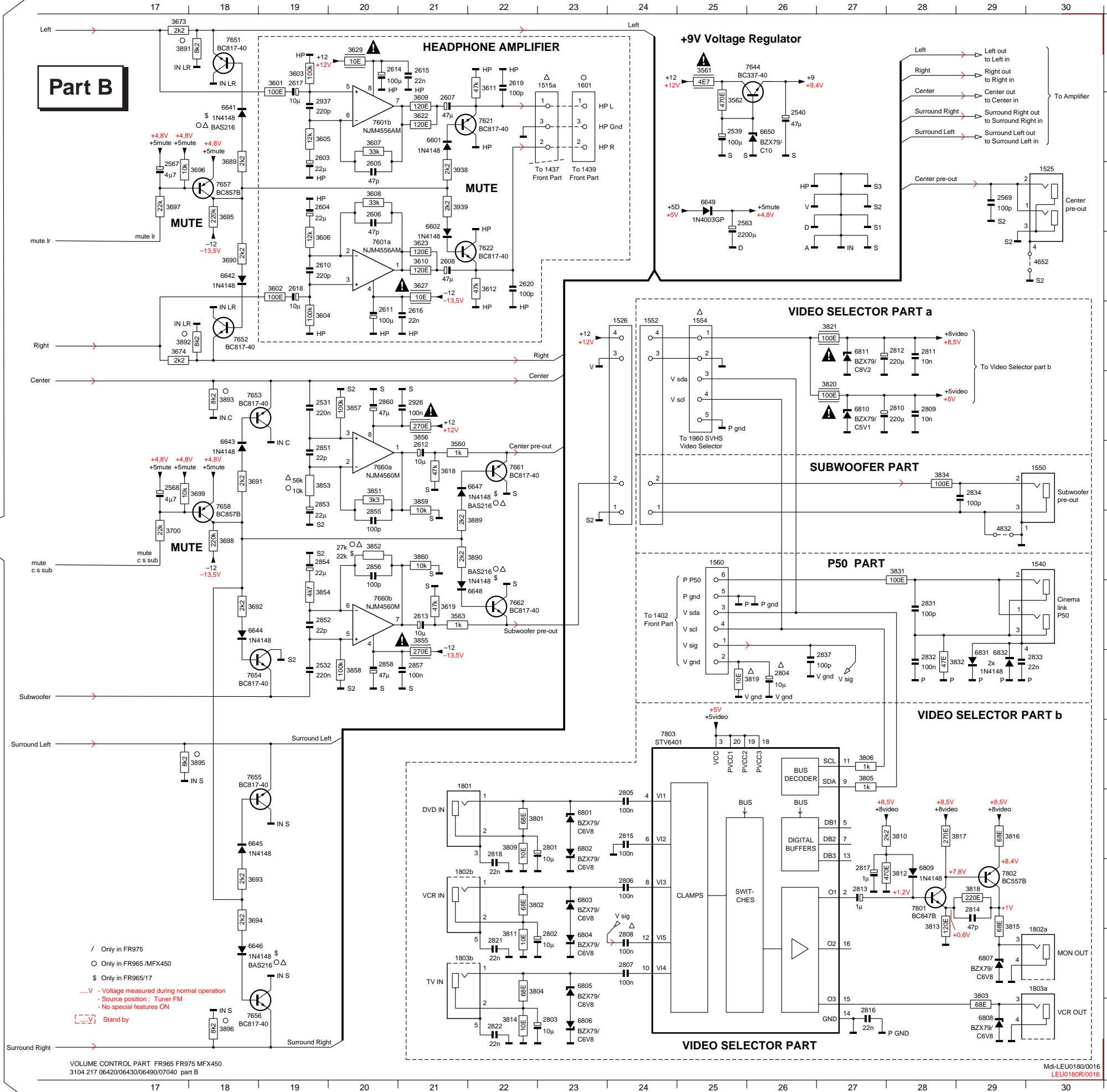
### To Volume Control PART B

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	J16	7601a	D20
1601	A23	2809	F28	3679	F16	7601b	B20
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	M28	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	2821	N22	3689	C18	7654	J18
2531	F19	2822	O22	3690	D18	7655	K18
2532	J19	2831	I28	3691	H18	7656	O18
2533	A15	2832	J28	3692	I18	7657	C18
2534	E15	2833	J30	3693	M18	7658	O18
2535	F15	2834	C29	3694	M19	7659a	C20
2536	J15	2835	K2	3695	H18	7660b	I20
2537	K15	2836	L2	3696	C18	7661	G22
2538	O15	2837	J27	3697	C17	7662	I22
2539	B25	2851	J19	3698	H18	7801	M28
2540	B26	2852	I19	3699	G18	7802	M29
2563	C25	2853	G19	3700	H17	7803	K24
2564	E15	2854	H19	3801	L22	9506	O2
2565	J15	2855	H20	3802	M22	9648	H5
2566	O15	2856	H20	3803	N29		
2567	C17	2857	J21	3804	N22		
2568	G17	2858	J20	3805	K27		
2569	C29	2860	F20	3806	K27		
2603	B19	2861	F5	3809	L22		
2604	C19	2862	C7	3810	L28		
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2607	B21	2865	I7	3813	N28		
2608	D21	2866	M7	3814	O22		
2610	D19	2867	N7	3815	N29		
2611	E20	2868	A7	3816	L29		
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2613	I21	2871	A10	3818	M29		
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2615	A21	2873	E10	3820	F27		
2616	E21	2875	K10	3821	E27		
2617	A19	2876	O10	3831	H28		
2618	D19	2877	A13	3832	J28		
2619	A22	2878	F13	3834	G28		
2620	D22	2879	E13	3851	G20		
2628	N16	2880	J13	3852	H20		
2629	N16	2881	K13	3853	G19		
2630	C16	2882	O13	3854	I19		
2631	H16	2883	B7	3855	I21		
2632	N16	2884	D7	3856	F21		
2633	B16	2885	G7	3857	F20		
2634	G16	2886	H7	3858	J20		
2635	L16	2887	L7	3859	G21		
2636	D16	2888	M7	3860	H21		
2637	D16	2926	F21	3871	A10		
2638	I16	2934	O4	3872	E10		
2639	I16	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	G8	3560	G21	3883	A13		
2650	H8	3561	A25	3884	E13		
2651	G8	3562	B25	3885	E13		
2652	I8	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	I10	3608	C20	3895	K18		
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2664	O10	3610	D21	3938	C21		
2665	A11	3611	A22	3939	C21		
2666	E11	3612	D22	3940	D7		
2667	F11	3618	G22	3941	B7		
2668	I11	3619	I21	3944	H7		
2669	K11	3620	A7	3945	F7		
2670	O11	3621	C7	3948	M7		
2671	A11	3622	B21	3949	K7		
2672	E11	3623	D21	3952	K3		
2673	F11	3622	D21	3953	L3		
2674	I11	3629	A20	3954	N3		
2675	K11	3641	B7	3955	O3		
2676	O11	3642	D7	4259	D4		
2677	A12	3643	B7	4642	C3		
2678	E12	3644	E7	4644	D3		
2679	F12	3645	C7	4652	D30		
2680	I12	3646	E7	4653	D3		
2681	K12	3649	G7	4832	H29		
2682	O12	3650	H7	4835	L2		
2683	A12	3651	G7	6601	B21		
2684	E12	3652	L7	6602	C21		
2685	F12	3655	L7	6641	B18		
2686	I12	3656	N7	6642	D18		
2687	K12	3657	M7	6643	G18		
2688	O12	3658	N7	6644	I18		
2689	A13	3659	A12	6645	L18		
2690	E13	3660	E12	6646	N18		
2691	F13	3661	A13	6647	G22		
2692	I13	3662	E13	6648	I22		
2693	K13	3663	F12	6649	C25		

VOLUME CONTROL PART FR965 FR975 MFX450  
3104 217 06420/06430/06490/07040 part A

Mdi-LEU0180/0016

VOLUME CONTROL PART FR965 - FR975 - MFX450 - Part B



**Part B**

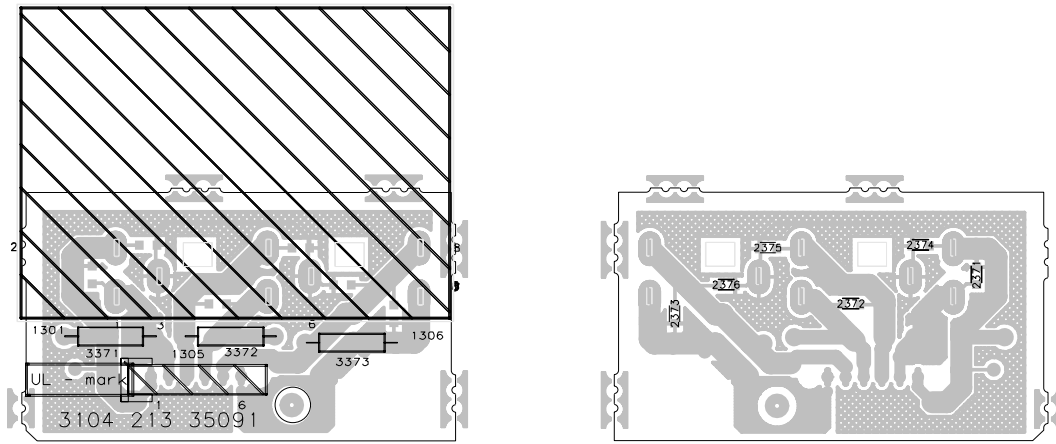
From Volume Control PART A

/ Only in FR975  
 \$ Only in FR965/MFX450  
 O Only in FR965/17  
 ...V - Voltage measured during normal operation  
 - Source position : Tuner FM  
 - No special features ON  
 Stand by

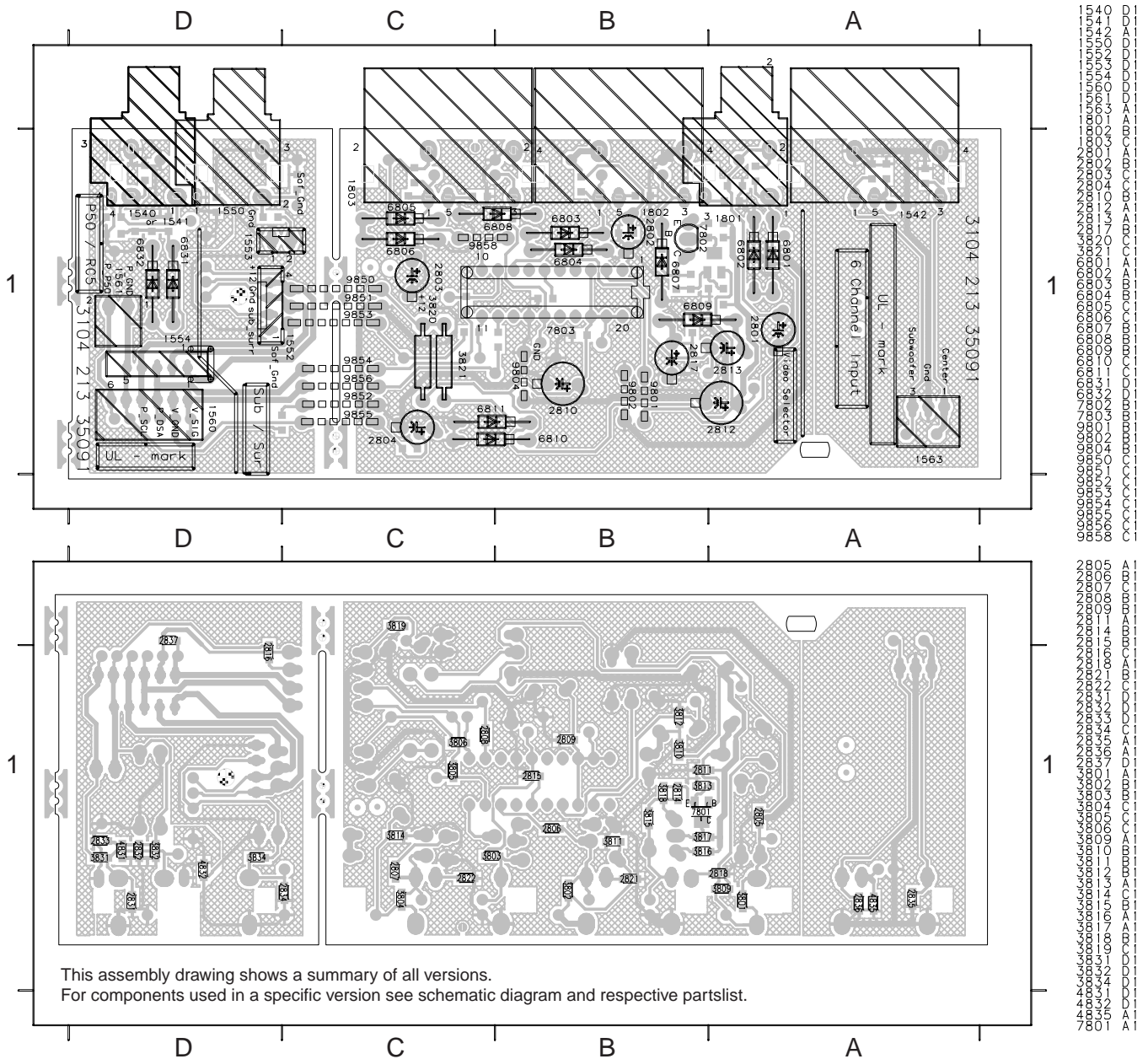
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1503	K3	2695	A13	3665	F13	6801	L23
1515a	A23	2696	E13	3666	J13	6802	L23
1520	F11	2697	F13	3667	K12	6803	M23
1521	C4	2698	J13	3668	O12	6804	N23
1523	F4	2699	K13	3669	K13	6805	N23
1525	C30	2700	O13	3670	O13	6806	O23
1526	E24	2801	L23	3671	A16	6807	N29
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	J16	7601a	D20
1601	A23	2809	F28	3679	F16	7601b	B20
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
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2531	F19	2822	O22	3690	D18	7655	K18
2532	J19	2831	I28	3691	G18	7656	O18
2533	A15	2832	J28	3692	I18	7657	C18
2534	E15	2833	J30	3693	M18	7658	G18
2535	F15	2834	G29	3694	M18	7659a	G20
2536	J15	2835	K2	3695	C18	7660b	I20
2537	K15	2836	L2	3696	C18	7661	G22
2538	O15	2837	J27	3697	C17	7662	I22
2539	B25	2851	G19	3698	H18	7801	M28
2540	B26	2852	I19	3699	G18	7802	M29
2563	C25	2853	G19	3700	H17	7803	K24
2564	E15	2854	H19	3801	L22	9506	O2
2565	J15	2855	H20	3802	M22	9648	H5
2566	O15	2856	H20	3803	N29		
2567	C17	2857	J21	3804	N22		
2568	G17	2858	J20	3805	K27		
2569	C29	2860	F20	3806	K27		
2603	B19	2861	F5	3809	L22		
2604	C19	2862	C7	3810	L28		
2605	C20	2863	E7	3811	N22		
2606	C20	2864	G7	3812	M28		
2607	B21	2865	I7	3813	N28		
2608	D21	2866	M7	3814	O22		
2610	D19	2867	N7	3815	N29		
2611	E20	2868	A7	3816	L29		
2612	G21	2869	D7	3817	L28		
2613	I21	2871	A10	3818	M29		
2614	A20	2872	E10	3819	J25		
2615	A21	2873	E10	3820	F27		
2616	E21	2875	K10	3821	E27		
2617	A19	2876	O10	3831	J28		
2618	D19	2877	A13	3832	J28		
2619	A19	2878	E13	3834	G28		
2620	D22	2879	E13	3851	G20		
2628	N16	2880	J13	3852	H20		
2629	N16	2881	K13	3853	G19		
2630	C16	2882	O13	3854	I19		
2631	H16	2883	B7	3855	I21		
2632	N16	2884	D7	3856	F21		
2633	B16	2885	G7	3857	F20		
2634	G16	2886	H7	3858	J20		
2635	L16	2887	L7	3859	G21		
2636	D16	2888	M7	3860	H21		
2637	D16	2926	F21	3871	A10		
2638	I16	2934	O4	3872	A10		
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2641	A8	3501	M4	3874	E20		
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	G8	3560	G21	3883	A13		
2650	H8	3561	A25	3884	E13		
2651	G8	3562	B25	3885	E13		
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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	I10	3608	C20	3895	K18		
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2664	O10	3610	D21	3938	C21		
2665	A11	3611	A22	3939	C21		
2666	E11	3612	D22	3940	D7		
2667	F11	3618	G21	3941	B7		
2668	I11	3619	I21	3944	H7		
2669	K11	3620	A7	3945	F7		
2670	O11	3621	C7	3948	M7		
2671	A11	3622	B21	3949	K7		
2672	E11	3623	D21	3952	K3		
2673	F11	3627	D21	3953	L3		
2674	I11	3629	A20	3954	N3		
2675	K11	3641	B7	3955	O3		
2676	O11	3642	D7	4259	D4		
2677	A12	3643	B7	4642	C3		
2678	E12	3644	E7	4644	D3		
2679	F12	3645	C7	4652	D30		
2680	I12	3646	E7	4653	D3		
2681	K12	3649	G7	4832	H29		
2682	O12	3650	H7	4835	L2		
2683	A12	3651	G7	6601	B21		
2684	E12	3652	I7	6602	C21		
2685	F12	3655	L7	6641	B18		
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2687	K12	3657	M7	6643	G18		
2688	O12	3658	N7	6644	I18		
2689	A13	3659	A12	6645	L18		
2690	E13	3660	E12	6646	N18		
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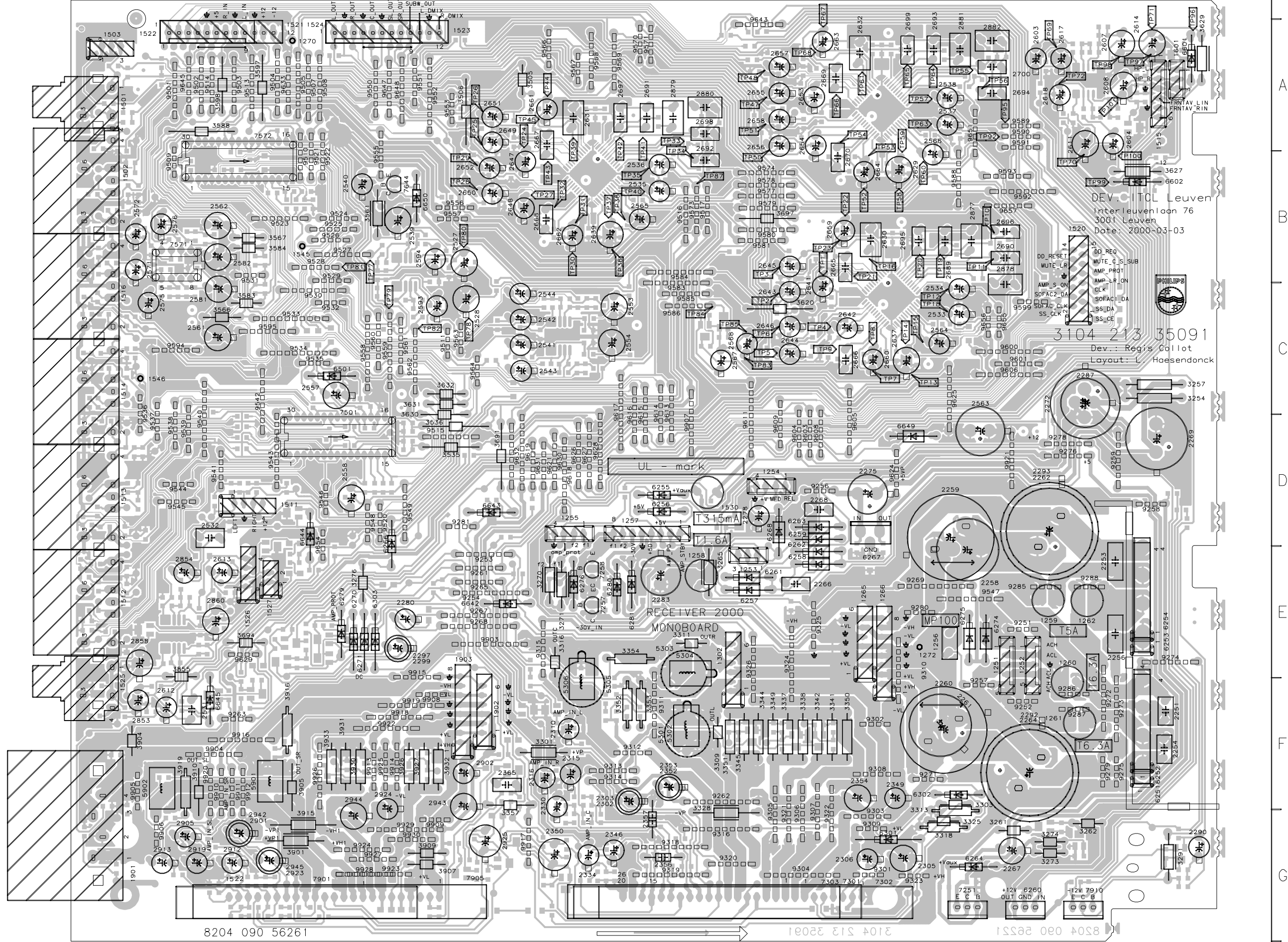
**SPEAKER BOARD - COMPONENT VIEW & COPPER SIDE VIEW**



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



**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 35091 8204 090 56261

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

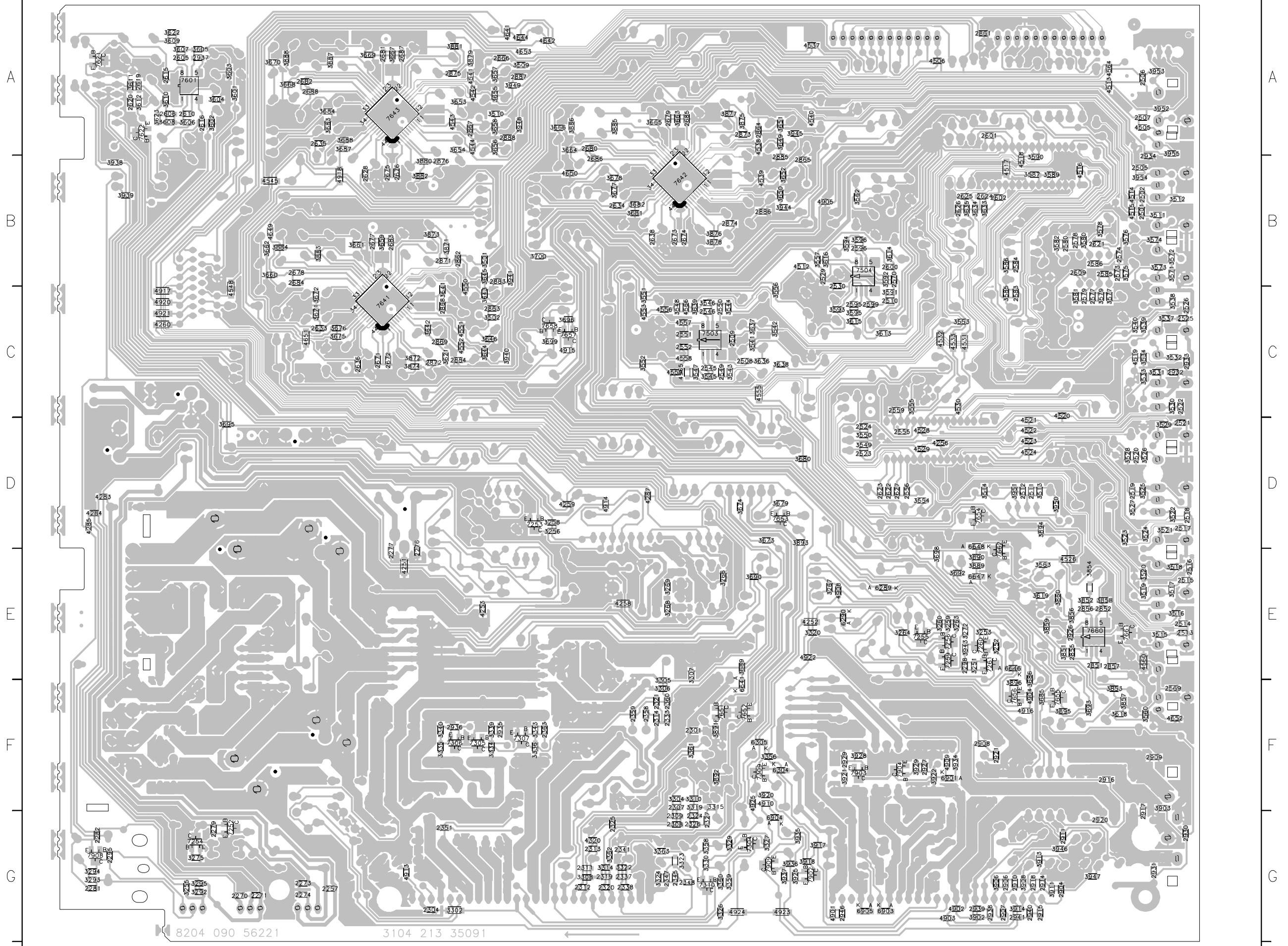
## MONO2 BOARD - MAPPING COMPONENT SIDE VIEW

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1252	E8	2310	F4	2644	C6	3273	G8	5901	F2	9273	F8	9537	D1	9621	D4
1253	E6	2315	F4	2645	B6	3274	G8	5902	F1	9274	E9	9538	D1	9624	D7
1254	D6	2316	F4	2646	C6	3276	E3	6251	F9	9275	F8	9539	D1	9625	C7
1255	D4	2330	F4	2647	B4	3291	G9	6252	F9	9276	D8	9540	D2	9626	D4
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1257	D5	2346	G5	2649	A4	3303	F7	6254	E9	9279	F8	9542	C2	9628	D5
1258	E5	2349	F7	2650	B4	3309	F5	6255	D5	9280	E7	9543	D2	9629	E2
1259	E8	2350	G4	2651	A4	3311	E5	6256	D5	9281	D3	9544	D1	9630	D4
1260	F8	2352	F5	2652	B4	3313	G7	6257	E6	9285	E8	9545	D1	9631	D4
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1262	E8	2354	F6	2654	A6	3318	G7	6259	D6	9287	F8	9547	E7	9633	A2
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1266	E7	2357	G5	2656	A6	3328	G5	6261	E6	9301	G7	9549	D3	9645	A1
1270	A2	2365	F4	2657	A6	3337	F6	6262	E6	9302	F7	9550	A3	9647	A3
1272	E7	2527	B3	2658	A6	3338	F6	6263	D6	9303	G7	9551	A3	9648	A3
1302	E6	2528	C3	2659	B6	3341	F6	6264	G7	9304	G6	9552	A3	9651	A7
1501	A1	2531	F1	2660	C7	3342	F6	6266	D3	9305	G6	9553	A3	9654	D2
1502	B1	2532	D2	2661	A4	3344	F6	6267	D7	9306	G6	9555	B3	9655	C8
1503	A1	2533	C7	2662	B4	3345	F6	6268	D6	9307	G6	9556	B3	9656	C7
1511	D2	2534	C7	2663	A6	3349	F6	6270	E3	9308	F7	9557	B3	9657	B8
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1514	C1	2537	A7	2666	C6	3352	F5	6275	E7	9311	F5	9560	C3	9905	F1
1515	A9	2538	A7	2667	A4	3353	F5	6276	E4	9312	F5	9561	C3	9906	G1
1516	C1	2539	B3	2668	B4	3354	E5	6279	E3	9313	F5	9562	C3	9907	D5
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1523	A3	2543	C4	2690	B8	3535	D3	6302	F7	9318	G5	9567	A4	9911	F2
1524	A3	2544	C4	2691	A5	3536	D3	6303	E3	9319	G5	9568	A4	9912	F2
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1545	B2	2561	C2	2696	B8	3584	B2	6643	D4	9324	E6	9574	B6	9917	G4
1546	C1	2562	B2	2697	A5	3588	A1	6644	D2	9325	E6	9577	B6	9918	F3
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1902	F4	2565	B5	2700	A7	3620	C6	6650	B3	9502	A1	9580	B6	9921	D8
1903	F3	2566	B7	2853	F1	3627	B9	7251	G7	9503	A2	9581	B6	9922	F3
2251	F9	2567	C5	2854	E1	3629	A9	7257	E4	9504	A2	9583	C5	9923	G3
2253	E8	2568	C6	2858	E1	3630	D3	7258	E4	9505	A2	9584	B5	9924	G3
2254	F9	2571	B1	2860	E2	3631	C3	7301	G5	9507	A2	9585	C5	9925	F3
2256	E8	2572	B1	2877	B7	3632	C3	7302	G6	9508	A2	9586	C5	9926	F2
2258	E7	2575	C1	2878	C8	3691	D4	7303	G5	9509	B1	9588	B7	9927	G3
2259	D7	2576	B1	2879	A5	3694	E2	7501	D3	9510	B2	9589	A8	9928	G3
2260	F7	2581	C2	2880	A5	3697	B6	7571	B1	9511	C3	9590	A8	9929	G3
2261	F7	2582	B2	2881	A7	3855	E1	7572	B2	9513	A2	9591	A8	9930	G3
2262	D8	2593	C3	2882	A7	3901	G2	7644	B3	9514	A2	9592	B8		
2264	F8	2594	B3	2901	G2	3904	F1	7901	G2	9515	D3	9593	B8		
2266	E6	2603	A8	2902	F3	3905	F2	7905	G3	9516	B5	9594	C1		
2267	G8	2604	A8	2905	G1	3907	G3	7910	G8	9517	B5	9595	C2		
2268	D6	2607	A8	2912	G2	3909	G3	9251	E8	9520	D3	9599	C8		
2269	D9	2608	A8	2913	G1	3910	F1	9252	F8	9521	B2	9600	C8		
2272	C8	2611	A8	2919	G1	3915	G2	9253	E4	9522	B2	9601	C8		
2275	D7	2612	F1	2923	G2	3916	F2	9254	E4	9523	B2	9603	D6		
2278	D6	2613	E2	2924	F3	3919	F1	9256	D6	9524	B3	9604	D6		
2280	E3	2614	A9	2925	G4	3926	F3	9257	F7	9525	B2	9605	D6		
2283	E5	2617	A8	2942	G2	3927	F3	9258	D9	9526	B2	9606	C8		
2287	C8	2618	A8	2943	F3	3930	F3	9259	D8	9527	B3	9608	D6		
2290	G9	2629	B7	2944	G3	3931	F3	9261	E4	9528	B2	9609	D6		
2292	F8	2630	B7	2945	G2	3932	F3	9262	F5	9529	B2	9611	D6		
2293	D8	2631	A4	3254	C9	3933	F2	9263	F2	9530	C2	9613	C5		
2297	E3	2632	A6	3257	C9	5301	F5	9265	E4	9531	B2	9614	C5		
2299	E3	2637	C7	3261	G8	5302	F5	9267	E4	9532	C2	9615	D5		
2302	F5	2639	B5	3262	G8	5303	E5	9268	E4	9533	C2	9616	D5		
2303	F5	2641	C6	3265	E5	5304	E5	9269	E7	9534	C2	9617	C5		
2305	G7	2642	C6	3270	E4	5305	F4	9271	F7	9535	C2	9618	D4		

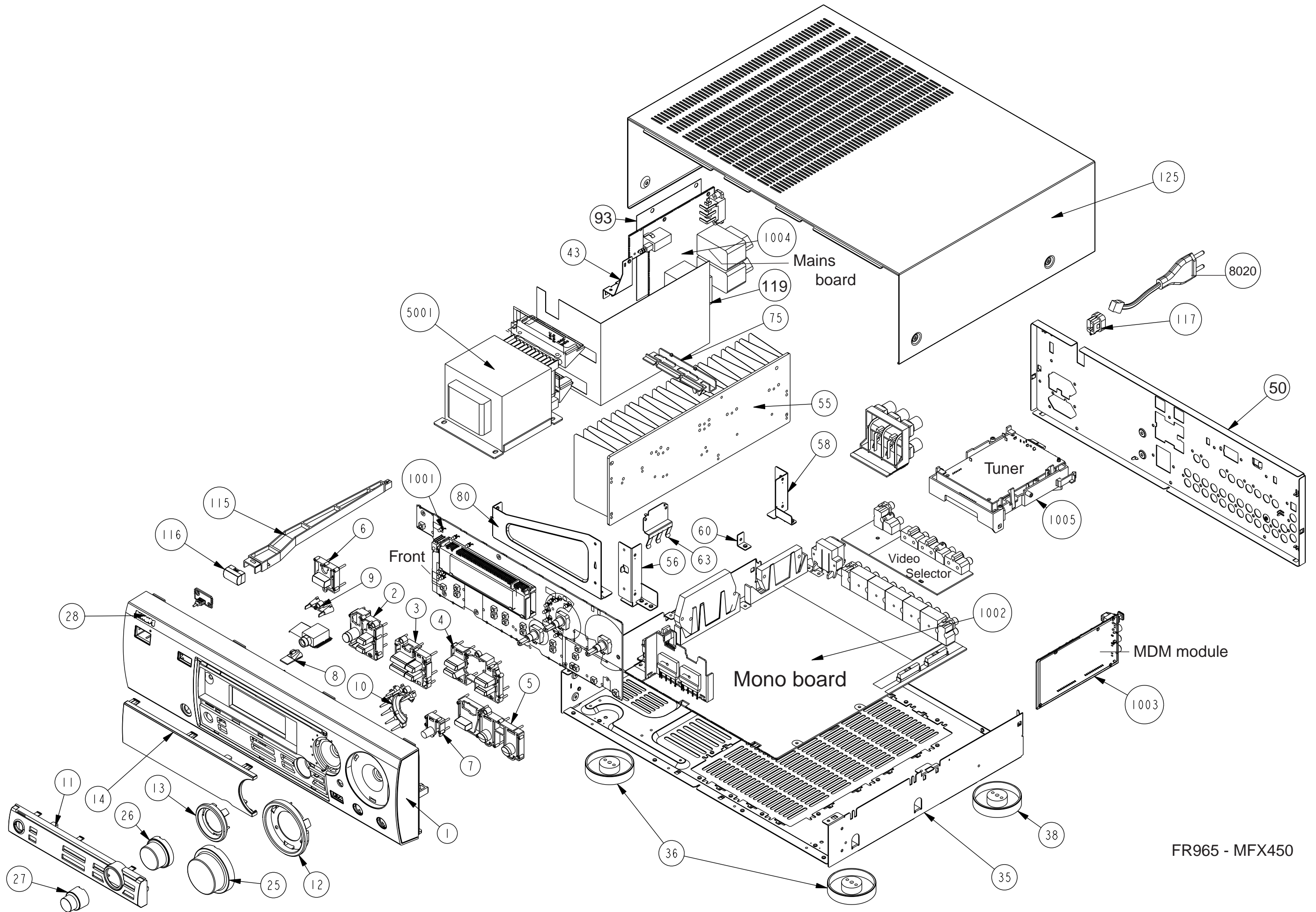
## MONO2 BOARD - MAPPING COPPER SIDE VIEW

2257	G2	2550	C5	2862	B3	3295	G1	3546	C5	3644	C3	3879	A3	4513	A8	4925	F5
2270	G1	2551	C5	2863	C3	3302	G3	3547	C5	3645	B3	3880	B3	4514	B8	6289	E6
2271	G1	2552	C5	2864	A5	3304	F5	3548	C5	3646	C3	3881	A3	4515	B8	6290	E6
2273	G2	2555	D6	2865	B5	3305	F4	3549	D6	3649	A5	3882	B3	4516	B8	6304	F5
2274	G2	2556	D6	2866	A3	3306	F4	3550	D6	3650	B5	3883	B2	4517	B7	6305	F5
2276	E3	2559	C6	2867	A3	3307	E5	3551	C4	3651	A5	3884	B1	4518	B7	6641	F5
2277	E2	2569	F8	2868	C3	3308	G4	3552	C4	3652	B5	3885	A4	4519	C8	6646	E7
2279	G1	2570	B6	2869	C3	3310	F5	3553	C7	3653	A3	3886	A4	4520	C7	6647	E7
2281	G1	2573	B8	2871	B3	3314	G4	3554	D6	3654	A3	3887	A2	4521	D7	6648	D7
2282	G1	2574	B8	2872	C3	3315	F5	3555	C6	3655	A3	3888	A2	4522	D7	6901	F7
2295	G1	2577	C8	2873	A5	3319	F5	3556	C5	3656	A3	3889	E7	4523	D7	6903	G6
2298	E7	2578	B8	2874	B5	3320	E6	3557	B6	3657	A3	3890	E7	4524	D7	6904	G5
2301	F5	2579	C8	2875	A3	3322	G4	3560	F8	3658	A3	3891	F5	4526	E7	6905	G6
2304	G3	2580	B7	2876	B3	3323	G4	3562	B6	3659	B2	3892	F5	4528	D6	7252	G1
2307	F5	2583	C7	2883	B3	3324	G4	3563	E7	3660	B1	3893	D5	4529	D6	7253	D3
2308	G5	2584	B7	2884	C3	3326	G5	3571	B8	3661	B2	3894	D7	4530	C7	7254	G1
2309	G5	2585	B8	2885	B5	3327	G5	3572	B8	3662	B1	3895	F7	4531	C7	7255	E6
2311	G4	2586	B8	2886	B5	3329	G5	3573	B8	3663	A5	3896	F7	4532	C7	7256	E7
2312	G4	2595	C6	2887	A3	3330	G5	3574	B8	3664	A4	3902	G7	4533	C7	7259	E7
2313	G4	2596	B6	2888	A3	3334	F3	3575	B8	3665	A4	3903	F8	4537	A6	7260	E7
2314	F4	2599	C6	2904	G7	3335	F3	3576	B8	3666	A4	3906	G7	4538	A5	7261	E7
2319	G4	2600	B6	2906	G7	3336	F3	3577	C8	3667	A2	3908	G7	4539	B5	7304	G5
2320	G4	2601	A7	2907	G7	3339	F3	3578	B8	3668	A2	3911	G7	4540	A6	7305	F3
2321	F4	2602	B7	2908	F7	3340	F3	3579	C8	3669	A2	3913	G7	4541	A3	7306	F3
2324	G5	2605	A1	2909	F8	3343	F3	3580	B8	3670	A1	3914	G7	4542	A3	7307	F3
2325	G4	2606	A1	2910	G7	3356	F5	3581	C8	3671	C2	3917	G6	4543	A3	7309	F5
2326	G5	2609</															

# 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.



FR965 - MFX450

SCALE 0.250

**PARTSLIST - EXPLODED VIEW****MECHANICAL PARTS**

1	3104 217 53421	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 BT
6	4822 410 12437	BUTTONS EASY LINK
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 52800	ORNAMENTAL PLATE ASSY
12	3104 217 52130	RING KNOB VOLUME
13	3104 217 52140	RING KNOB SOURCE SEL.
14	3104 217 52900	WINDOW DISPLAY ASSY
25	4822 410 12438	KNOB VOLUME (BL)
26	4822 410 12439	KNOB SOURCE SELECTOR
27	4822 410 12441	KNOB MENU NAV
28	3104 217 53441	BADGE MAGNAVOX ASSY
36	3139 247 50570	FOOT ASSY FOIL DVD825
38	3139 247 50560	FOOT ASSY BLACK
115	4822 535 10638	POWER ROD
116	4822 462 11176	POWER CAP
117	4822 532 60948	BUSCH
125	4822 442 01817	COVERPLATE BLACK

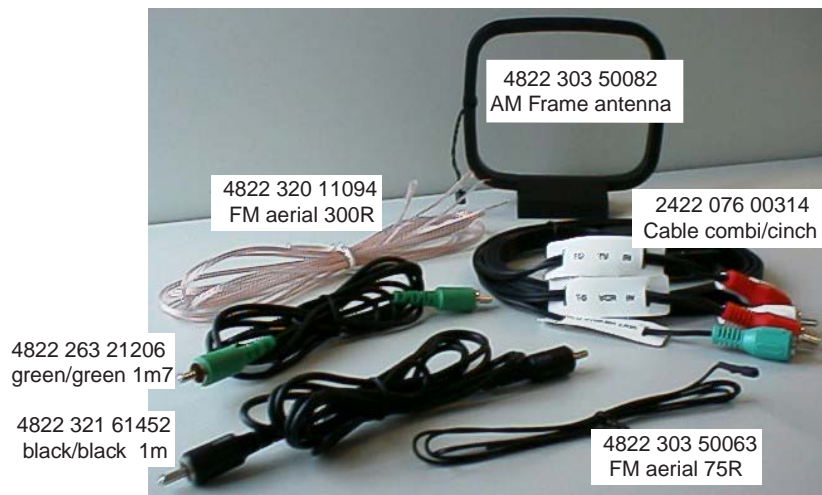
**ELECTRICAL PARTS**

1003	3104 217 06780	MDM 2000 V2
5001 ▲	3104 218 31010	TRAFO FR963/17
8020 ▲	3139 118 77230	MAINSCORD UL

**MISCELLANEOUS PARTS**

4822 320 11094	FM AERIAL 300R
4822 263 21206	CABLE CINCH (green) / CINCH (green)
4822 303 50082	AM LOOP ANTENNA
3139 238 03621	REMOTE CONTROL RC1145103/00
4822 321 61452	CABLE ASSY CINCH (black) / CINCH (black)
3140 115 30000	I.F.U. MFX450/17
3139 119 00361	BOX SPK ASSY MCS990/17

note: Only the parts mentioned in this list are normal service parts



**ELECTRICAL PARTSLIST - MONO2 BOARD**

MISCELLANEOUS			CAPACITORS		
1256	▲ 4822 252 51173	FUSE 1A	2315	4822 124 40433	47UF20% 25V
1258	▲ 4822 071 51602	FUSE 1.6A	2316	4822 124 40248	10UF20% 63V
1260	▲ 4822 252 51123	FUSE 6,3A	2317	5322 126 10223	4,7NF10%X7R 63V
1261	▲ 4822 252 51123	FUSE 6,3A	2319	5322 122 32268	CER1 0805 NP0 63V 470P PM5
1304	4822 265 11607	6P CONN. LS	2321	4822 126 13473	220NF80-20% 50V
1502	4822 267 31823	CONN. CINCH	2322	5322 122 32531	100PF 5%NP0 50V
1512	4822 267 31823	CONN. CINCH	2324	5322 122 32287	4,7PF 5%NP0 50V
1513	4822 267 31823	CONN. CINCH	2325	4822 122 33575	220PF 5% NP0 63V 0805
1514	4822 267 31823	CONN. CINCH	2328	5322 126 10223	4,7NF10%X7R 63V
1516	4822 267 31823	CONN. CINCH	2330	4822 124 40433	47UF20% 25V
1520	4822 265 10981	CINCH 1P	2331	5322 122 32531	100PF 5%NP0 50V
1521	2422 025 11067	CON BM V 12P F 2.50	2333	4822 126 13473	220NF80-20% 50V
1523	2422 025 11067	CON BM V 12P F 2.50	2334	4822 124 40248	10UF20% 63V
1525	4822 265 11608	2P YKC21-4053	2335	5322 126 10223	4,7NF10%X7R 63V
1540	4822 265 20542	CONN. CINCH	2337	5322 122 32268	0805 NP0 63V 470P PM5
1542	2422 026 05134	CONN. CINCH	2339	5322 122 32531	100PF 5%NP0 50V
1550	4822 267 31729	CINCH 1P	2341	4822 122 33575	220PF 5% NP0 63V 0805
1801	4822 267 31996	CONN. 1P	2346	4822 124 40433	47UF20% 25V
1802	4822 265 11619	CINCH 2P	2347	5322 122 32287	4,7PF 5%NP0 50V
1803	4822 265 11619	CINCH 2P	2349	4822 124 40248	10UF20% 63V
1901	4822 265 11609	CONN. CLICK 4P	2350	4822 124 40184	1000UF20% 10V
CAPACITORS			2351	4822 126 13751	47NF10% X7R 63V
2251	5322 121 42578	100NF 5% 250V	2352	4822 124 81151	22UF 50V
2254	5322 121 42578	100NF 5% 250V	2357	2020 561 90365	CER2 TUB Y5V 50V 100N
2257	4822 122 33177	10NF 20% X7R 50V	2358	4822 126 13473	220NF80-20% 50V
2259	4822 124 80415	4700UF20% 50V	2359	4822 126 13473	220NF80-20% 50V
2260	4822 124 80415	4700UF20% 50V	2360	4822 126 13473	220NF80-20% 50V
2266	5322 121 42386	100NF 5% 63V	2365	4822 121 43693	10NF 100V
2267	4822 124 41751	47UF 20% 50V	2501	5322 126 10511	1NF 5%NP0 50V
2268	5322 121 42386	100NF 5% 63V	2502	5322 126 10511	1NF 5%NP0 50V
2269	4822 124 11583	2200UF 20% 35V	2505	5322 126 10511	1NF 5%NP0 50V
2270	4822 126 14585	100NF 10% X7R 0805 50V	2506	5322 126 10511	1NF 5%NP0 50V
2271	4822 126 14583	470NF 10% 16V XTR 0805	2507	5322 126 10511	1NF 5%NP0 50V
2272	4822 124 12328	6800UF 25V	2508	5322 122 32531	100PF 5%NP0 50V
2273	4822 126 14585	100NF 10% X7R 0805 50V	2509	5322 122 32531	100PF 5%NP0 50V
2274	4822 126 14583	470NF 10% 16V XTR 0805	2510	5322 122 32531	100PF 5%NP0 50V
2275	4822 124 81144	1000U 16V	2511	5322 122 32531	100PF 5%NP0 50V
2276	4822 126 14585	100NF 10% X7R 0805 50V	2512	5322 122 32531	100PF 5%NP0 50V
2277	4822 126 14583	470NF 10% 16V XTR 0805	2513	5322 122 32531	100PF 5%NP0 50V
2278	4822 124 22652	2,2UF20% 50V	2514	5322 122 32531	100PF 5%NP0 50V
2279	4822 126 14585	100NF 10% X7R 0805 50V	2515	5322 122 32531	100PF 5%NP0 50V
2280	4822 124 41584	100UF 20% 10V	2516	5322 122 32531	100PF 5%NP0 50V
2281	4822 126 14585	100NF 10% X7R 0805 50V	2517	5322 122 32531	100PF 5%NP0 50V
2282	4822 126 14583	470NF 10% 16V XTR 0805	2518	5322 122 32531	100PF 5%NP0 50V
2283	4822 124 11769	220UF 20% 50V	2519	5322 122 32531	100PF 5%NP0 50V
2290	4822 124 40248	10UF20% 63V	2520	5322 122 32531	100PF 5%NP0 50V
2295	4822 122 33177	10NF 20% X7R 50V	2521	5322 122 32531	100PF 5%NP0 50V
2297	4822 124 40248	10UF20% 63V	2522	5322 122 32531	100PF 5%NP0 50V
2298	4822 126 13751	47NF10% X7R 63V	2525	5322 122 32531	100PF 5%NP0 50V
2301	5322 122 32654	CER2 0805 X7R 63V 22N PM10	2526	5322 122 32531	100PF 5%NP0 50V
2302	4822 124 81151	22UF 50V	2527	4822 124 41751	47UF 20% 50V
2306	4822 124 40248	10UF20% 63V	2528	4822 124 41751	47UF 20% 50V
2307	5322 122 32287	4,7PF 5%NP0 50V	2529	4822 126 14585	100NF 10% X7R 0805 50V
2310	4822 124 40248	10UF20% 63V	2530	4822 126 14585	100NF 10% X7R 0805 50V
2311	5322 122 32268	CER1 0805 NP0 63V 470P PM5	2531	4822 121 42408	220NF 5% 63V
2313	4822 122 33575	220PF 5% NP0 63V CASE 0805	2532	4822 121 42408	220NF 5% 63V
2314	4822 126 13473	220NF80-20% 50V	2533	4822 124 81151	22UF 50V

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

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
2542	4822 124 40248	10UF20%	63V
2543	4822 124 11912	220UF 20%	6,3V
2544	4822 124 11912	220UF 20%	6,3V
2545	5322 122 32531	100PF 5%NPO	50V
2546	5322 122 32531	100PF 5%NPO	50V
2549	5322 122 32658	22PF 5%	50V
2550	5322 122 32658	22PF 5%	50V
2551	4822 126 14585	100NF 10% X7R 0805	50V
2552	4822 126 14585	100NF 10% X7R 0805	50V
2553	4822 124 41751	47UF 20%	50V
2554	4822 124 41751	47UF 20%	50V
2555	4822 126 14585	100NF 10% X7R 0805	50V
2556	4822 126 14585	100NF 10% X7R 0805	50V
2557	4822 124 41751	47UF 20%	50V
2558	4822 124 41751	47UF 20%	50V
2559	4822 126 12105	CER2 0805 X7R 50V	33NF PM5
2561	4822 124 40764	22UF	100 V
2562	4822 124 40764	22UF	100 V
2563	4822 123 14025	16V 2200U	20%
2564	4822 124 22652	2,2UF20%	50V
2565	4822 124 22652	2,2UF20%	50V
2566	4822 124 22652	2,2UF20%	50V
2567	4822 124 40769	4,7UF20%	100V
2568	4822 124 40769	4,7UF20%	100V
2569	5322 122 32531	100PF 5%NPO	50V
2570	5322 122 32531	100PF 5%NPO	50V
2571	4822 124 40248	10UF20%	63V
2572	4822 124 40248	10UF20%	63V
2573	4822 122 33575	220PF 5% NPO	63V CASE 0805
2574	4822 122 33575	220PF 5% NPO	63V CASE 0805
2575	4822 124 40248	10UF20%	63V
2576	4822 124 40248	10UF20%	63V
2577	4822 122 33177	10NF 20% X7R	50V
2578	4822 122 33177	10NF 20% X7R	50V
2579	4822 122 33127	2,2NF10%X7R	63V
2580	4822 122 33127	2,2NF10%X7R	63V
2581	4822 124 41751	47UF 20%	50V
2582	4822 124 41751	47UF 20%	50V
2583	4822 122 33891	3,3NF10%X7R	63V
2584	4822 122 33891	3,3NF10%X7R	63V
2585	5322 126 10184	820P 5% 50V NPO	08053
2586	5322 126 10184	820P 5% 50V NPO	08053
2593	4822 124 81151	22UF	50V
2594	4822 124 81151	22UF	50V
2595	5322 122 32531	100PF 5%NPO	50V
2596	5322 122 32531	100PF 5%NPO	50V
2599	5322 122 32658	22PF 5%	50V
2600	5322 122 32658	22PF 5%	50V
2603	4822 124 81151	22UF	50V
2604	4822 124 81151	22UF	50V

**CAPACITORS**

2605	4822 126 13692	47PF 1% NPO	63V
2606	4822 126 13692	47PF 1% NPO	63V
2607	4822 124 41751	47UF 20%	50V
2608	4822 124 41751	47UF 20%	50V
2610	4822 122 33575	220PF 5% NPO	63V CASE 0805
2611	4822 124 40207	100UF20%	25V
2612	4822 124 40248	10UF20%	63V
2613	4822 124 40248	10UF20%	63V
2614	4822 124 40207	100UF20%	25V
2615	5322 122 32654	CER2 0805 X7R	63V 22N PM10
2616	5322 122 32654	CER2 0805 X7R	63V 22N PM10
2617	4822 124 40248	10UF20%	63V
2618	4822 124 40248	10UF20%	63V
2619	5322 122 32531	100PF 5%NPO	50V
2620	5322 122 32531	100PF 5%NPO	50V
2622	5322 122 32531	100PF 5%NPO	50V
2623	5322 122 32531	100PF 5%NPO	50V
2624	5322 122 32531	100PF 5%NPO	50V
2625	5322 122 32531	100PF 5%NPO	50V
2626	5322 122 32531	100PF 5%NPO	50V
2627	5322 122 32531	100PF 5%NPO	50V
2628	4822 126 14585	100NF 10% X7R	0805 50V
2629	4822 124 41751	47UF 20%	50V
2630	5322 121 42386	100NF 5%	63V
2631	5322 121 42386	100NF 5%	63V
2632	5322 121 42386	100NF 5%	63V
2633	5322 122 32654	CER2 0805 X7R	63V 22N PM10
2634	5322 122 32654	CER2 0805 X7R	63V 22N PM10
2635	5322 122 32654	CER2 0805 X7R	63V 22N PM10
2636	4822 126 14585	100NF 10% X7R	0805 50V
2637	4822 124 41751	47UF 20%	50V
2638	4822 126 14585	100NF 10% X7R	0805 50V
2639	4822 124 41751	47UF 20%	50V
2641	4822 124 21913	1UF20%	63V
2642	4822 124 21913	1UF20%	63V
2643	4822 124 21913	1UF20%	63V
2644	4822 124 21913	1UF20%	63V
2645	4822 124 21913	1UF20%	63V
2646	4822 124 21913	1UF20%	63V
2647	4822 124 21913	1UF20%	63V
2648	4822 124 21913	1UF20%	63V
2649	4822 124 21913	1UF20%	63V
2650	4822 124 21913	1UF20%	63V
2651	4822 124 21913	1UF20%	63V
2652	4822 124 21913	1UF20%	63V
2655	4822 124 21913	1UF20%	63V
2656	4822 124 21913	1UF20%	63V
2657	4822 124 21913	1UF20%	63V
2658	4822 124 21913	1UF20%	63V
2659	4822 124 22652	2,2UF20%	50V
2660	4822 124 22652	2,2UF20%	50V
2661	4822 124 22652	2,2UF20%	50V
2662	4822 124 22652	2,2UF20%	50V
2663	4822 124 22652	2,2UF20%	50V
2664	4822 124 22652	2,2UF20%	50V
2665	4822 121 43526	47NF 5%	250V
2666	4822 121 43526	47NF 5%	250V
2667	4822 121 43526	47NF 5%	250V



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

2668	4822 121 43526	47NF 5%	250V
2669	4822 121 43526	47NF 5%	250V
2670	4822 121 43526	47NF 5%	250V
2671	5322 122 31866	6,8NF10%X7R	63V
2672	5322 122 31866	6,8NF10%X7R	63V
2673	5322 122 31866	6,8NF10%X7R	63V
2674	5322 122 31866	6,8NF10%X7R	63V
2675	5322 122 31866	6,8NF10%X7R	63V
2676	5322 122 31866	6,8NF10%X7R	63V
2677	5322 122 32654	CER2 0805 X7R 63V 22N	PM10
2678	5322 122 32654	CER2 0805 X7R 63V 22N	PM10
2679	5322 122 32654	CER2 0805 X7R 63V 22N	PM10
2680	5322 122 32654	CER2 0805 X7R 63V 22N	PM10
2681	5322 122 32654	CER2 0805 X7R 63V 22N	PM10
2682	5322 122 32654	CER2 0805 X7R 63V 22N	PM10
2683	5322 122 32654	CER2 0805 X7R 63V 22N	PM10
2684	5322 122 32654	CER2 0805 X7R 63V 22N	PM10
2685	5322 122 32654	CER2 0805 X7R 63V 22N	PM10
2686	5322 122 32654	CER2 0805 X7R 63V 22N	PM10
2687	5322 122 32654	CER2 0805 X7R 63V 22N	PM10
2688	5322 122 32654	CER2 0805 X7R 63V 22N	PM10
2689	5322 121 42465	68NF 5%	63V
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
2805	4822 126 14585	100NF 10% X7R 0805	50V
2806	4822 126 14585	100NF 10% X7R 0805	50V
2807	4822 126 14585	100NF 10% X7R 0805	50V
2809	5322 122 34098	10NF10%X7R	63V
2810	4822 124 40196	220UF20%	16V
2811	5322 122 34098	10NF10%X7R	63V
2812	4822 124 40196	220UF20%	16V
2813	4822 124 21913	1UF20%	63V
2814	4822 126 13692	47PF 1% NPO	63V
2815	4822 126 14585	100NF 10% X7R 0805	50V
2816	5322 122 32654	0805 X7R 63V 22N	PM10
2817	4822 124 21913	1UF20%	63V
2818	5322 122 32654	0805 X7R 63V 22N	PM10
2821	5322 122 32654	0805 X7R 63V 22N	PM10
2822	5322 122 32654	0805 X7R 63V 22N	PM10
2831	5322 122 32531	100PF 5%NPO	50V
2832	4822 126 14585	100NF 10% X7R 0805	50V
2833	5322 122 32654	0805 X7R 63V 22N	PM10 R
2834	5322 122 32531	100PF 5%NPO	50V
2835	5322 122 32531	100PF 5%NPO	50V
2836	5322 122 32531	100PF 5%NPO	50V
2837	5322 122 32531	100PF 5%NPO	50V

**CAPACITORS**

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%NPO	50V
2856	5322 122 32531	100PF 5%NPO	50V
2857	4822 126 14585	100NF 10% X7R 0805	50V
2858	4822 124 41751	47UF 20%	50V
2860	4822 124 41751	47UF 20%	50V
2861	5322 122 32654	0805 X7R 63V 22N	PM10 R
2862	5322 122 32531	100PF 5%NPO	50V
2863	5322 122 32531	100PF 5%NPO	50V
2864	5322 122 32531	100PF 5%NPO	50V
2865	5322 122 32531	100PF 5%NPO	50V
2866	5322 122 32531	100PF 5%NPO	50V
2867	5322 122 32531	100PF 5%NPO	50V
2868	4822 122 33575	220PF 5% NPO 63V	0805
2869	4822 122 33575	220PF 5% NPO 63V	0805
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
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%NPO	50V
2884	5322 126 10511	1NF 5%NPO	50V
2885	5322 126 10511	1NF 5%NPO	50V
2886	5322 126 10511	1NF 5%NPO	50V
2887	4822 122 33127	2,2NF10%X7R	63V
2888	4822 122 33127	2,2NF10%X7R	63V
2901	4822 124 81151	22UF	50V
2902	4822 124 40248	10UF20%	63V
2904	4822 126 13751	47NF10% X7R	63V
2905	4822 124 40248	10UF20%	63V
2906	5322 122 32268	0805 NPO 63V 470P	PM5
2908	4822 126 13473	220NF80-20%	50V
2909	5322 126 10223	4,7NF10%X7R	63V
2910	4822 122 33575	220PF 5% NPO 63V	0805
2911	5322 122 32654	0805 X7R 63V 22N	PM10 R
2912	4822 124 40433	47UF20%	25V
2913	4822 124 40248	10UF20%	63V
2914	5322 122 32268	0805 NPO 63V 470P	PM5
2916	4822 126 13473	220NF80-20%	50V
2917	5322 126 10223	4,7NF10%X7R	63V
2918	4822 122 33575	220PF 5% NPO 63V	0805
2919	4822 124 40433	47UF20%	25V
2920	4822 126 13473	220NF80-20%	50V
2921	4822 126 13473	220NF80-20%	50V
2923	4822 124 81151	22UF	50V
2924	4822 124 40248	10UF20%	63V
2925	4822 124 40184	1000UF20%	10V
2926	4822 126 14585	100NF 10% X7R 0805	50V
2930	5322 122 32531	100PF 5%NPO	50V

## ELECTRICAL PARTSLIST - MONO2 BOARD

## CAPACITORS

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 0805
2938	5322 122 32448	10PF 5% NP0 63V 0805
2939	5322 122 32448	10PF 5% NP0 63V 0805
2940	5322 122 32448	10PF 5% NP0 63V 0805
2941	5322 122 32448	10PF 5% NP0 63V 0805

## RESISTORS

3251	4822 051 20471	470R00 5% 0,1W
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	10K00 1% 0,6W
3263	4822 117 10361	680R 1% 0,1W
3264	4822 117 10837	100K 1% 0,1W
3266	4822 051 20223	22K00 5% 0,1W
3267	4822 051 20392	3K90 5% 0,1W
3268	4822 051 20332	3K30 5% 0,1W
3269	4822 051 20332	3K30 5% 0,1W
3270 ▲	4822 052 10479	47R00 5% 0,33W
3271 ▲	4822 052 10479	47R00 5% 0,33W
3272	4822 051 20393	39K00 5% 0,1W
3273	4822 116 83872	220R 5% 0,5W
3274	4822 116 83876	270R 5% 0,5W
3275	4822 117 10353	150R 1% 0,1W
3276	4822 116 52234	100K 5% 0,5W
3291 ▲	4822 052 10109	10R00 5% 0,33W
3292	4822 116 83933	15K 1% 0,1W
3293	4822 117 10833	10K 1% 0,1W
3294	4822 117 10833	10K 1% 0,1W
3295	4822 116 83933	15K 1% 0,1W
3301 ▲	4822 052 10479	47R00 5% 0,33W
3302 ▲	4822 117 11151	1R 5%
3304	4822 117 11148	56K 1% 0,1W
3305	4822 117 10834	47K 1% 0,1W
3306	4822 117 10834	47K 1% 0,1W
3307	4822 117 10834	47K 1% 0,1W
3308	4822 117 11148	56K 1% 0,1W
3309	4822 050 24708	4R70 1% 0,6W
3310	4822 051 20182	1K80 5% 0,1W
3311	4822 050 24708	4R70 1% 0,6W
3314	4822 117 11148	56K 1% 0,1W
3315	4822 051 20182	1K80 5% 0,1W
3316	4822 050 24708	4R70 1% 0,6W
3319	4822 117 11148	56K 1% 0,1W
3322	4822 117 11148	56K 1% 0,1W
3323	4822 051 20182	1K80 5% 0,1W
3324	4822 117 11148	56K 1% 0,1W
3326	4822 051 20333	33K00 5% 0,1W
3327	4822 117 11503	220R 1% 0,1W

## RESISTORS

3328 ▲	4822 052 10479	47R00 5% 0,33W
3329	4822 117 10837	100K 1% 0,1W
3330	4822 117 10833	10K 1% 0,1W
3334	4822 051 10102	1K00 2% 0,25W
3335	4822 051 10102	1K00 2% 0,25W
3336	4822 051 10102	1K00 2% 0,25W
3337 ▲	4822 117 11744	0R22 5% 1W
3338 ▲	4822 117 11744	0R22 5% 1W
3339	4822 117 11139	1K5 1% 0,1W
3340	4822 117 11139	1K5 1% 0,1W
3341 ▲	4822 117 11744	0R22 5% 1W
3342 ▲	4822 117 11744	0R22 5% 1W
3343	4822 117 11139	1K5 1% 0,1W
3344 ▲	4822 117 11744	0R22 5% 1W
3345 ▲	4822 117 11744	0R22 5% 1W
3352 ▲	4822 053 10478	4R70 5% 1W
3353 ▲	4822 053 10478	4R70 5% 1W
3354 ▲	4822 053 10478	4R70 5% 1W
3356	4822 117 10834	47K 1% 0,1W
3357	4822 050 21003	10K00 1% 0,6W
3358	4822 051 10102	1K00 2% 0,25W
3359	4822 117 10837	100K 1% 0,1W
3360	4822 117 10833	10K 1% 0,1W
3361	4822 051 20471	470R00 5% 0,1W
3362	4822 051 20471	470R00 5% 0,1W
3363	4822 051 20471	470R00 5% 0,1W
3501	4822 116 83933	15K 1% 0,1W
3502	4822 116 83933	15K 1% 0,1W
3505	4822 116 52244	15K 5% 0,5W
3506	4822 116 52244	15K 5% 0,5W
3509	4822 116 83933	15K 1% 0,1W
3510	4822 116 83933	15K 1% 0,1W
3511	4822 117 11373	100R 1% RC12H 0805
3512	4822 117 11373	100R 1% RC12H 0805
3513	4822 117 10834	47K 1% 0,1W
3514	4822 117 10834	47K 1% 0,1W
3515	4822 051 20471	470R00 5% 0,1W
3516	4822 051 20471	470R00 5% 0,1W
3517	4822 051 20393	39K00 5% 0,1W
3518	4822 051 20393	39K00 5% 0,1W
3519	4822 051 20822	8K20 5% 0,1W
3520	4822 051 20822	8K20 5% 0,1W
3521	4822 051 20393	39K00 5% 0,1W
3522	4822 051 20393	39K00 5% 0,1W
3523	4822 051 20822	8K20 5% 0,1W
3524	4822 051 20822	8K20 5% 0,1W
3525	4822 051 20393	39K00 5% 0,1W
3526	4822 051 20393	39K00 5% 0,1W
3527	4822 051 20822	8K20 5% 0,1W
3528	4822 051 20822	8K20 5% 0,1W
3529	4822 051 20471	470R00 5% 0,1W
3530	4822 051 20471	470R00 5% 0,1W
3531	4822 051 20393	39K00 5% 0,1W
3532	4822 051 20393	39K00 5% 0,1W
3533	4822 051 20822	8K20 5% 0,1W
3534	4822 051 20822	8K20 5% 0,1W
3537	4822 051 20393	39K00 5% 0,1W
3538	4822 051 20393	39K00 5% 0,1W

## ELECTRICAL PARTSLIST - MONO2 BOARD

## RESISTORS

3539	4822 051 20822	8K20	5%	0,1W
3540	4822 051 20822	8K20	5%	0,1W
3541	4822 051 20393	39K00	5%	0,1W
3542	4822 051 20393	39K00	5%	0,1W
3543	4822 117 12955	2K7	1%	0,1W 0805
3544	4822 117 12955	2K7	1%	0,1W 0805
3545	4822 117 10833	10K	1%	0,1W
3546	4822 117 10833	10K	1%	0,1W
3551	4822 117 11504	270R	1%	0,1W
3552	4822 117 11504	270R	1%	0,1W
3553	4822 117 11504	270R	1%	0,1W
3554	4822 117 11504	270R	1%	0,1W
3555	4822 051 20332	3K30	5%	0,1W
3556	4822 117 11504	270R	1%	0,1W
3557	4822 117 11504	270R	1%	0,1W
3560	4822 051 10102	1K00	2%	0,25W
3561	▲ 4822 052 10478	4R70	5%	0,33W
3562	4822 051 20471	470R00	5%	0,1W
3563	4822 051 10102	1K00	2%	0,25W
3566	4822 116 83876	270R	5%	0,5W
3567	4822 116 83876	270R	5%	0,5W
3571	4822 051 20334	330K00	5%	0,1W
3572	4822 051 20334	330K00	5%	0,1W
3573	4822 051 10102	1K00	2%	0,25W
3574	4822 051 10102	1K00	2%	0,25W
3575	4822 117 11148	56K	1%	0,1W
3576	4822 117 11148	56K	1%	0,1W
3577	4822 051 20561	560R00	5%	0,1W
3578	4822 051 20561	560R00	5%	0,1W
3579	4822 051 20394	390K00	5%	0,1W
3580	4822 051 20394	390K00	5%	0,1W
3581	4822 051 20273	27K00	5%	0,1W
3582	4822 051 20273	27K00	5%	0,1W
3583	4822 050 21003	10K00	1%	0,6W
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	3K90	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 117 11373	100R	1%	RC12H 0805
3602	4822 117 11373	100R	1%	RC12H 0805
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

## RESISTORS

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 117 11373	100R	1%	RC12H 0805
3622	4822 051 20121	120R00	5%	0,1W
3623	4822 051 20121	120R00	5%	0,1W
3627	▲ 4822 052 10109	10R00	5%	0,33W
3629	▲ 4822 052 10109	10R00	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	470R00	5%	0,1W
3637	4822 051 20471	470R00	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
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	5%	0,1W 0805
3674	4822 117 11449	2K2	5%	0,1W 0805
3675	4822 117 11373	100R	1%	RC12H 0805
3676	4822 117 11373	100R	1%	RC12H 0805
3677	4822 117 10834	47K	1%	0,1W
3678	4822 117 10834	47K	1%	0,1W
3679	4822 117 11449	2K2	5%	0,1W 0805
3680	4822 117 11449	2K2	5%	0,1W 0805
3681	4822 117 11373	100R	1%	RC12H 0805

## ELECTRICAL PARTSLIST - MONO2 BOARD

## RESISTORS

3682	4822 117 11373	100R	1%	RC12H 0805
3683	4822 117 10834	47K	1%	0,1W
3684	4822 117 10834	47K	1%	0,1W
3685	4822 117 11449	2K2	5%	0,1W 0805
3686	4822 117 11449	2K2	5%	0,1W 0805
3687	4822 117 11373	100R	1%	RC12H 0805
3688	4822 117 11373	100R	1%	RC12H 0805
3689	4822 117 11449	2K2	5%	0,1W 0805
3690	4822 117 11449	2K2	5%	0,1W 0805
3691	4822 116 52256	2K2	5%	0,5W
3692	4822 117 11449	2K2	5%	0,1W 0805
3693	4822 117 11449	2K2	5%	0,1W 0805
3694	4822 116 52256	2K2	5%	0,5W
3695	3198 021 52240	RST SM 0805	220K	PM5
3696	4822 117 10833	10K	1%	0,1W
3697	4822 116 52257	22K	5%	0,5W
3698	3198 021 52240	RST SM 0805	220K	PM5
3699	4822 117 10833	10K	1%	0,1W
3700	4822 051 20223	22K00	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	1K00	2%	0,25W
3806	4822 051 10102	1K00	2%	0,25W
3809	4822 051 20109	10R00	5%	0,1W
3810	4822 117 11449	2K2	5%	0,1W 0805
3811	4822 051 20109	10R00	5%	0,1W
3812	4822 051 20471	470R00	5%	0,1W
3813	4822 051 20121	120R00	5%	0,1W
3814	4822 051 20109	10R00	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
3820 ▲	4822 053 10101	100R00	5%	1W
3821 ▲	4822 053 10101	100R00	5%	1W
3831	4822 117 11373	100R	1%	RC12H 0805
3832	4822 051 20479	47R00	5%	0,1W
3834	4822 117 11373	100R	1%	RC12H 0805
3851	4822 051 20332	3K30	5%	0,1W
3852	4822 051 20273	27K00	5%	0,1W
3853	4822 117 10833	10K	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
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

## RESISTORS

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	5%	0,1W 0805
3890	4822 117 11449	2K2	5%	0,1W 0805
3891	4822 051 20822	8K20	5%	0,1W
3892	4822 051 20822	8K20	5%	0,1W
3893	4822 051 20822	8K20	5%	0,1W
3895	4822 051 20822	8K20	5%	0,1W
3896	4822 051 20822	8K20	5%	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
3908	4822 051 20182	1K80	5%	0,1W
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 10102	1K00	2%	0,25W
3922	4822 051 10102	1K00	2%	0,25W
3925	4822 117 10833	10K	1%	0,1W
3926 ▲	4822 117 11744	0R22	5%	1W
3927 ▲	4822 117 11744	0R22	5%	1W
3928	4822 117 11139	1K5	1%	0,1W
3929	4822 117 11139	1K5	1%	0,1W
3930 ▲	4822 117 11744	0R22	5%	1W
3931 ▲	4822 117 11744	0R22	5%	1W
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	5%	0,1W 0805
3939	4822 117 11449	2K2	5%	0,1W 0805
3940	4822 117 11503	220R	1%	0,1W
3941	4822 117 11503	220R	1%	0,1W
3943	4822 117 10833	10K	1%	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
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

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

3952	4822 117 11373	100R 1% RC12H 0805
3953	4822 117 11373	100R 1% RC12H 0805
3954	4822 117 11373	100R 1% RC12H 0805
3955	4822 117 11373	100R 1% RC12H 0805
4251	4822 051 20008	0R00 JUMP. (0805)
4252	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)

**RESISTORS**

4642	4822 051 20008	0R00 JUMP. (0805)
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)
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)
4908	4822 051 20008	0R00 JUMP. (0805)
4909	4822 051 20008	0R00 JUMP. (0805)
4910	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**

5302	4822 157 62255	COIL
5304	4822 157 62255	COIL
5306	4822 157 62255	COIL
5901	4822 157 62255	COIL
5902	4822 157 62255	COIL

**DIODES**

6251	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-C5V6
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
6274	4822 130 31878	1N4003G
6275	4822 130 31878	1N4003G
6276	4822 130 34173	BZX79-C5V6
6279	4822 130 30621	1N4148
6280	4822 130 61219	BZX79-B10
6281	4822 130 34441	BZX79-B22
6289	4822 130 83757	MCL4148
6290	4822 130 83757	MCL4148
6304	4822 130 11411	BZX284-C3V3
6305	4822 130 83757	MCL4148
6501	4822 130 30621	1N4148
6601	4822 130 30621	1N4148
6602	4822 130 30621	1N4148

**ELECTRICAL PARTSLIST - MONO2 BOARD****DIODES**

6641	4822 130 83757	MCL4148
6642	4822 130 30621	1N4148
6643	4822 130 30621	1N4148
6644	4822 130 30621	1N4148
6645	4822 130 30621	1N4148
6646	4822 130 83757	MCL4148
6647	4822 130 83757	MCL4148
6648	4822 130 83757	MCL4148
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

**TRANSISTORS & ICs****TRANSISTORS & ICs**

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
7802	▲ 4822 130 44568	BC557B
7803	4822 209 16886	STV6401
7901	4822 209 17385	STK496-070
7902	4822 130 60511	BC847B
7903	4822 130 60511	BC847B
7904	4822 130 60511	BC847B
7908	4822 130 60373	BC856B
7909	4822 130 60511	BC847B
7910	9322 139 22687	BD242BFP

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	4822 130 60511	BC847B
7261	4822 130 60373	BC856B
7301	4822 209 17447	STK496-270
7304	4822 130 60511	BC847B
7305	4822 130 60511	BC847B
7306	4822 130 60511	BC847B
7307	4822 130 60511	BC847B
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