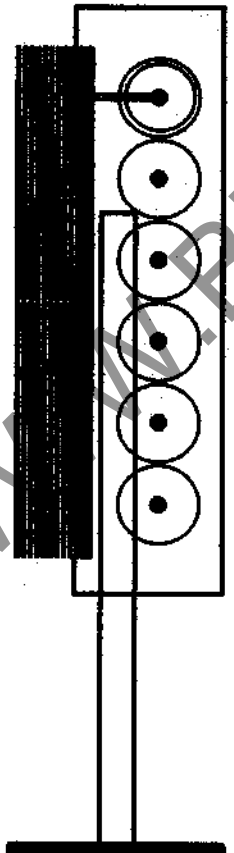
BC

BeoSound 9000

Type 2561, 2562, 2563, 2564, 2565, 2566, 2567

Service Manual
English, German, French



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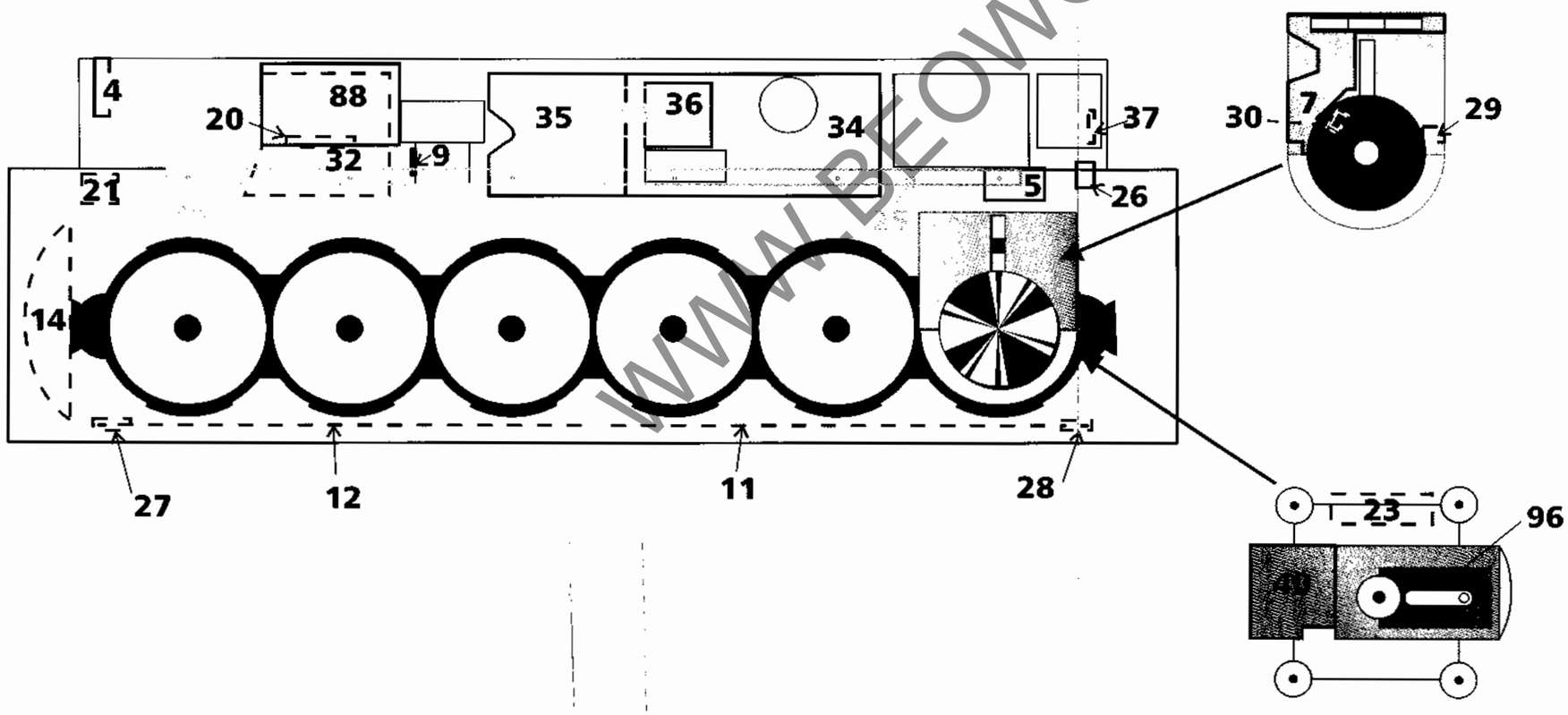


= PCB13, PCB24 and PCB25 placed on the chassis topplate

1-2 SPECIFICATION GUIDELINES BANG & OLUFSEN

SPECIFICATION GUIDELINES FOR SERVICE USE

BeoSound 9000

With FM and AM range and RDS	Type 2561 (EU), 2562 (GB), 2563 (USA-CDN), 2564 (J), 2565 (AUS), 2566 (TWN), 2567 (KOR)
Operation	Direct keyboard Beo4, BeoLink 1000

Mechanical functions

Change from playing CD1 to playing CD6 (Lid closed and known CD's)	< 6.5 sec., typical 4 sec.
Position of CD	typical ±1°

Tuner

Number of Programmes	60
Stereo / Mono selection	Automatic / manual

Tuner, FM section

Range	87.5-108 MHz 76-90 MHz f. type 2564
Aerial impedance	75 ohm
Usable sensitivity mono (30dB)	typical 11dBf - 1µV
50 dB quieting stereo	≤ 41dBf
Signal-to-noise at 65 dBf mono	≥ 69dB
Signal-to-noise at 65 dBf stereo	≥ 64dB
Frequency response	20-15000Hz
Distortion + noise mono	≤ 0.6%
Distortion + noise stereo	≤ 0.6%
Intermodulation stereo	typical 0.1%
Stereo channel separation	typical 30dB
Subcarrier product rejection	≥ 50dB

Tuner, AM section

Range	LW 153-279 kHz f. type 2561, 2562, 2565, 2566, 2567 MW 522-1611 kHz f. type 2561, 2562, 2565, 2566, 2567 MW 530-1710 kHz f. type 2563 MW 522-1629 kHz f. type 2564
Antenna	Loop 18.1µH (Special)
LW sensitivity 20 dB S/N ratio	typical 66dBµV/m (2mV/m)
MW sensitivity 20 dB S/N ratio	typical 60dBµV/m (1mV/m)
Harmonic distortion	typical 0.4 %

CD Player

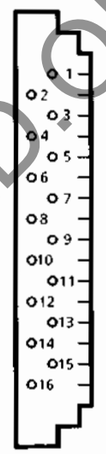
Number of CD's	6
Disc types	12 cm (5"), 8 cm (3") with adaptor
Frequency range	20-20.000 Hz ±1 dB
Signal-to-noise ratio A-weighted	typical 101 dB
Dynamic range	≥ 98 dB
Harmonic distortion	≤ 0.1%
Channel separation	≥ 50 dB
Channel difference	≤ ±1dB
Converter system	Bitstream

Preamplifier section

Harmonic distortion	≤ 0.1%
Frequency range ±1dB	10-20000Hz
Channel separation	≥ 50dB
Source separation	≥ 80dB
Signal-to-noise A-weight	≥ 90dB
Volume control	≥ 90dB
Bass control	7.0dB ±2dB at 100Hz
Treble control	7.0dB ±2dB at 10kHz

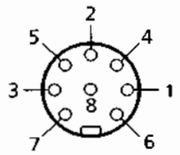
Connections

Master Link



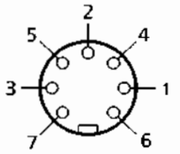
Pin 1	Data-, -0.5 V ±0.2 V in relation to Data+
Pin 2	Data+, +0.5 V ±0.2 V in relation to Data-
Pin 3	ML connect > 3 V
Pin 4-6	+supply voltage, +7 V to +15 V (in stand-by +3 V to +15 V)
Pin 7-10	Not used
Pin 11	-supply voltage, -7 V to -15 V (in stand-by -2 V to -15 V)
Pin 12	+supply voltage, +7 V to +15 V (in stand-by +3 V to +15 V)
Pin 13	Audio L- in/out, 2 V Bal, in relation to Audio L+, Rin 4.4 MΩ, Rout 150 Ω
Pin 14	Audio L+ in/out, 2 V Bal, in relation to Audio L-, Rin 4.4 MΩ, Rout 150 Ω
Pin 15	Audio R- in/out, 2 V Bal, in relation to Audio R+, Rin 4.4 MΩ, Rout 150 Ω
Pin 16	Audio R+ in/out, 2 V Bal, in relation to Audio R-, Rin 4.4 MΩ, Rout 150 Ω
Shield	GND

Power Link



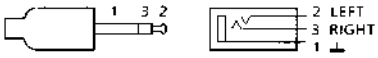
Pin 1	Power up (ON = >2.7 V -1mA)
Pin 2	Signal GND
Pin 3	Audio L out 0 V to 2 V RMS
Pin 4	Speaker ON (ON = >2.7 V -1 mA)
Pin 5	Audio R out 0 V to 2 V RMS
Pin 6	Datalink out (High = >4 V, Low = <0.2 V)
Pin 7	Data GND
Pin 8	PL+ ON

Audio Aux Link



Pin 1	Audio L out 1 V RMS, Rout 1 kΩ
Pin 2	GND
Pin 3	Audio L in 0.25 V RMS to 2 V RMS, Rin 47 kΩ
Pin 4	Audio R out 1 V RMS, Rout 1 kΩ
Pin 5	Audio R in 0.25 V RMS to 2 V RMS, Rin 47 kΩ
Pin 6-7	Not used

Headphones



Ø 3.5 mm, 220 Ω

Digital output CD

AES / EBU
IEC 958
0.5Vpp, 75Ω, 1%

Mains

Cable included
Type 2561, 2562, 2567, 230V AC
Type 2563, 2566, 120V AC
Type 2564, 100V AC
Type 2565, 240V AC

Power frequency — 50-60 Hz

Power consumption Stand.by — typical 1.0W
Power consumption — typical 15W

Dimensions

W x H x D — 86.9 x 7 x 30.1 cm
Weight — 11.5kg
Finish — Black, aluminium

Optional accessories

Beo4 — Type 1624, 1625 (I)
Wall bracket horizontal — Type 2054
Wall bracket vertical — Type 2063
Bracket — Type 2053
Stand — Type 2055
Cable cover — Type 2062
AM loop antenna — 8720047
FM antenna — 8720048

Type	Transformer	PCB5 Mains Relay	PCB34 Power Supply	PCB88 FM/AM	Mains cable
2561 EU	8013551 EU-230V AC	8005661 EU	8005657 EU	8005529 EU	6100273
2562 GB	8013551 EU-230V AC	8005661 EU	8005657 EU	8005529 EU	6100329
2563 US	8013549 US-120V AC	8005664 US	8005663 US	8005623 US	6100307
2564 JAP	8013548 JAP-100V AC	8005661 EU	8005657 EU	8005619 JAP	6100331
2565 AUS	8013550 AUS-240V AC	8005661 EU	8005657 EU	8005529 EU	6100332
2566 TWN	8013549 US-120V AC	8005664 US	8005663 US	8005529 EU	6100307
2567 KOR	8013551 EU-230V AC	8005661 EU	8005657 EU	8005529 EU	–

Subject to change without notice

BRIEF OPERATION GUIDE

For more detailed operation see User's guide.

Closeup operation:

Loading CDs

▲ Press to raise the glass door

▲ Press to lower the glass door

or

CD Press to lower the door and start playing

CD playback

CD Press to play a CD

▲ Press to play the next track on a CD

or

▼ Press to play the same track again or press twice to play the previous track

PAUSE Press to pause playback

CD Press to resume playing

Random

RANDOM Press to display [RANDOM ON] and cut in the random play function

RANDOM Press twice to display [RANDOM OFF] and cancel the random play function

● Press to switch to stand-by

Choosing a sequence of discs

CD Press to start playback of a CD

SELECT Press SELECT and [SELECT DISC] will appear on the display

Press the direct CD selection buttons next to the CDs you want to include...

SELECT Press SELECT to start clearing a sequence and play all six CDs

then

CLEAR Press to clear the sequence

Programming a series of tracks for one CD

CD Press to play CD

EDITING Press to scan the CD [EDITING?] appears on the display

then

OK Press to start scanning the tracks

▲ Press to include a track number in the series

or

▼ Press to exclude a track number from the series

[EDITING OK] appears on the display when you have included or excluded the last track...

then

OK Press to accept the track series

To clear a track series...

Choose the CD whose track series you want to clear

then

EDITING Press to access the programming option

then

CLEAR Press to clear the track series altogether

Playing edited CDs

CD Press to start playback of a CD

then

EDIT Press to display [EDIT ON] and start edited playback

EDIT Press twice to play a CD in full and cancel EDIT – [EDIT OFF] appears on the display

Positioning CDs

Load and adjust a CD manually...

Then press the direct CD selection button next to this CD to move the carriage to the CD ...

then

SELECT Press to access the positioning function for CDs

then

SELECT

then

● Press to store the position

Repeat this procedure for all the CDs you have loaded...

If you want to clear the positions for a CD, move the carriage to the CD in question...

SELECT Press to access the positioning function to clear the position

then

SELECT

then

CLEAR Press to clear the position

Naming CDs

CD Press to play CD

then

NAMING Press to access the naming function

then

▲ Press to reveal the characters or numbers one by one

or

▼

then

OK Press to move to next character position

then

OK Press to store the name

CD Press while you are naming CDs or track series in order to automatically store the name and exit the naming function

To clear a name, follow this procedure...

NAMING Press to access the naming function

then

CLEAR Press to clear the name

then

CD Press to return to normal source operation

Listing CDs

CD Press to play CD

NAMING Press to access the naming list [CD LIST] appears briefly,

then

NAMING then the name of the current CD appears

▲ Press to list the names one by one and return to names further up the list

or

▼

CLEAR Press to clear a name while the appropriate name is displayed

● Press to store the position

1-5 BRIEF OPERATION GUIDE 1-5

Playing your radio programs

RADIO — Press to turn on the radio

▲ or ▼ — Press to step through your radio programs

● — Press to switch to stand-by

Presetting radio stations

RADIO — Press to turn on the radio

TUNE — Press to start the tuning function

A.MEM — Press to select [AM] or [FM], switches from one to the other, check display for an indication of which one you have chosen

then

▲ or ▼ — Press to search for a radio station up or down the frequency band

then

OK — Press to accept the station you have found

P.NO — Press to change the displayed program number

then

▲ or ▼ — Press to select for a program number – up or down

then

OK — Press to store your new radio program – [STORED] appears on the display

Fine tuning a radio station

RADIO — Press to turn on the radio program you want to fine tune

TUNE — Press to start the fine tuning function

then

TUNE

▲ or ▼ — Press to fine tune your program towards a higher or lower frequency

then

OK — Press to accept your fine tuned program

then

OK — Press again to store program and program number

Mono/stereo reception

RADIO — Press to turn on the relevant radio program

TUNE — Press to choose [MONO] or [STEREO]

then

TUNE

then

TUNE

then

▲ or ▼ — Press to switch from stereo to mono

OK — Press to store your new tuning on the program number

Clearing presets...

RADIO — Press to turn on the radio

▲ or ▼ — Press to search for program number

CLEAR — Press to clear the program

then

OK — Press to confirm the clearing of the radio program

Naming radio programs

RADIO — Press to turn on the radio program you want to name

NAMING — Press to start the naming function.
The first of the twelve character positions blinks, indicating that you can start "writing" a name

▲ or ▼ — Press to reveal the characters one by one
Press to reveal previously shown characters

then

OK — Press to move to the next character position

then

OK — Press to store the name of the radio station [NAMING OK] will appear on the display

or

RADIO — Press to store the name and exit the naming function
You can press RADIO at any time to store and exit the naming function

To clear a name...

NAMING — Press to access the naming function

then

CLEAR — Press to clear the name

Playing auxiliary sources

A.AUX — Press to select extra equipment

Adjusting sound

VOL ^ — Press to raise the volume

VOL v — Press to lower the volume

TREBLE — Press to access treble

BASS — Press to access bass

BALANCE — Press to access balance

▲ or ▼ — Press to raise or lower the treble and bass levels; or adjust the balance between the left and the right speaker

LOUDNESS — Press to see the status of the loudness adjustment function – [LOUDNESS ON] or [LOUDNESS OFF]. Press LOUDNESS again to change the setting

OK — Press to accept all sound levels - [SOUND OK?] appears on the display

then

OK — Press to store all sound levels

If you have not stored your sound adjustments...

RESET — Press to reset the sound levels to their previously stored settings

Switching displays, example

RADIO — Press to turn on the radio

OK — Press repeatedly to change the radio display indication

Programming Timers

TIMER — Press to start programming timers

then

▲ or ▼ — Press to choose a source for your Timer or choose a Timer stand-by

then

OK — Press to accept the Timer

Then program when you want the Timer to start and stop...

▲ or ▼ — Press repeatedly until you have found the exact time for starting a Timer play

then

OK — Press to accept start

Repeat the procedure with the ▲ and ▼ buttons and OK to program the exact timer for stopping a Timer

To program a [SINGLE DATE] Timer...

▲ or ▼ — Press to display the date you want to program a Timer for

then

OK — Press to accept the selection

then

OK — Press to store your Timer programming and return to normal source operations

Checking or clearing Timers

CHECK — Press to check your timers

then

▲ or ▼ — Press to see timer programming number, source and program number of individual timer entries

OK — Press repeatedly to display the details of a particular programming

When the display reads [OK ?]

then

▲ or ▼ — Press to display [NEXT ?] to see your next timer programming entry

then

OK — Press to see your next entry – If there are no more entries, [NO MORE], will appear on the display

CLEAR — Press clear while information regarding a timer programming is displayed on the display – [CLEARED] will appear on the display after pressing CLEAR

Setting and using the built-in clock

CLOCK — Press to call up the built-in clock

then

▲ or ▼ — Press to set time, date/month or year...

then

OK — Press to accept the changes and reveal the next display - Repeat this setting procedure for date/month and year...

When you have set or changed the year, the display now reads [CLOCK OK?]

then

OK — Press to store your new setting of the clock

CLOCK — Press to show the clock

CLOCK — Press to see the date and year

To display the clock permanently...

CLOCK — Press when Date and Year is displayed and change the display to time and ON e.g. [14:40 ON] – press again to cancel the permanent showing of the clock e.g. [14:41 OFF].

Option programming Beo4

hold ●

while pressing

LIST — Until the Beo4 display reads OPTIONS?

then

GO

LIST — Until the display reads A:OPT

then

0 — Disable the remote control function

or

1 — Enable the remote control function

Option programming BeoLink 1000

SOUND 0 STORE — Disable the remote control function

or

SOUND 1 STORE — Enable the remote control function

Automatic demonstration

The product can be brought into automatic demonstration mode in which it plays back 90 randomly chosen tracks. Each track is played back for 20 seconds.

Load six CD's with at least ten tracks each.

Bring the product into stand-by.

Press: SHIFT 9 1 9 9 6.
The remote control terminal must be in audio mode.
(SHIFT is found under LIST on Beo4)

The automatic demonstration can be stopped by bringing BeoSound 9000 into stand-by, which is done by actuating stand-by on the product.

During the automatic demonstration the sound will be muted. Demute the product if you want sound.

Locking of glass lid

The glass lid can be locked so that it cannot be operated on the product.

Press: SHIFT 9 0 3 6 9.
The remote control terminal must be in audio mode.

The display reads: LOCK.

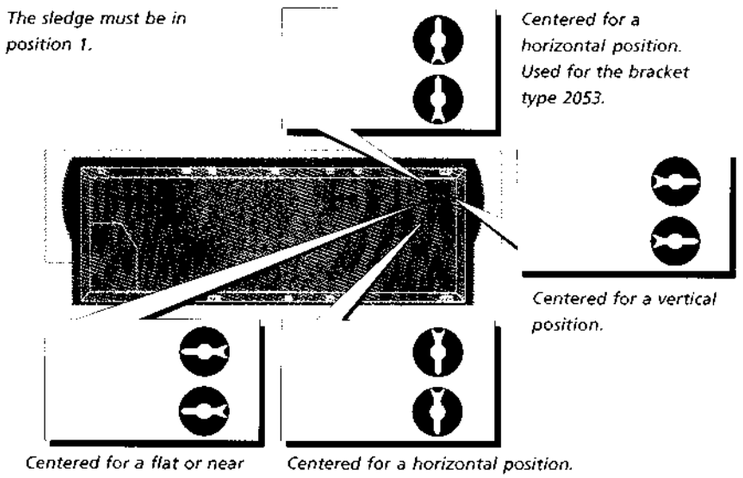
The function is stopped by pressing: SHIFT 9 0 3 6 9.
The remote control terminal must be in audio mode.

SHIFT is found under LIST on Beo4

The display reads: UNLOCK.

Centering the CD drive mechanism

The sledge must be in position 1.



Centered for a horizontal position. Used for the bracket type 2053.

Centered for a vertical position.

Centered for a flat or near flat position. This is the factory setup.

Centered for a horizontal position. Used for the bracket type 2054.

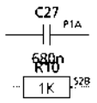
2-1 EXPLANATION OF DIAGRAM BANG & OLUFSEN

EXPLANATION OF DIAGRAM

Type numbers of transistors and ICs are indicated on the diagrams. If the position is followed by an asterisk the spare part number must always be used because the component in question has been specially selected, e.g. IC4*.

Component print and coordinate system

The largest PCBs have component prints and a coordinate system on both the primary and the secondary side.
On the diagrams every component has a coordinate number.
This indicates in which coordinate on the PCB the component is situated.
The coordinate numbers are written in smaller print types than the position numbers.



= C27 is placed on the primary side in coordinate 1A.

= R10 is placed on the secondary side in coordinate 2B.

Control circuit

In certain control circuits the active mode is indicated by a function term or by an abbreviation. This may be e.g. ST.BY. = low in the stand-by mode or ST.BY. = high in the stand-by mode.

Wiring connections

The wiring connections on the diagrams are assembled in 'bundles'.
The individual wires are provided with one of the following codes:

INTERNAL CONNECTION ON ONE DIAGRAM PAGE

Internal connections on a diagram page are indicated by a number.
The bend of the wire indicates in which direction the other end of the wire is found.

CONNECTION TO ANOTHER DIAGRAM PAGE

A connection to another diagram page is indicated by a number as well as by a letter of the diagram to which the connection leads.

Ground symbols

Three different ground symbols are used in the set.

= Ground

= Chassis

= Coarse ground

Symbol of safety components

When replacing components with this symbol, components with identical part numbers must be used. The new component must be mounted in the same way as the one replaced.

Measuring conditions

All DC voltages have been measured in relation to ground with a voltmeter with an input impedance of 10 Mohms.
The DC voltages are stated in volts (V), e.g. 0.7V.
All oscillograms and AC voltages have been measured in relation to ground with an oscilloscope or a voltmeter with an input resistance of 1Mohm.
AC voltages are stated in millivolts (mV), e.g. 660mV.

Caution

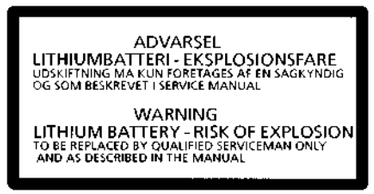
The use of any controls, adjustments or procedures other than those specified herein may result in hazardous radiation exposure.

The black and yellow label on the compact disc player serves as a warning that the apparatus contains a laser system and is classified as a class 1 laser product. The apparatus must be opened by qualified servicemen only.

CD laserdiode

Wavelength	780 nm ±20 nm, 30°C
Effect	2 mW ±0.1 mW, 30°C

Lithium battery



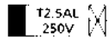
WARNING

Short-circuit and overcharging of some types of lithium batteries may result in a violent explosion.
When replacing the lithium battery in this set, note the following:
Use **only** batteries of the same make and type as mentioned in this service manual (see page 3-9).
Place the battery exactly like the old one.

Explanation of the fuse symbols used in the set

Replace with the same type 1 ampere 250 volts quick acting fuse.

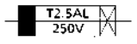
Replace with the same type 2.5 ampere 250 volts slow acting fuse.



Explanation des symboles de fusible utilisés dans l'appareil

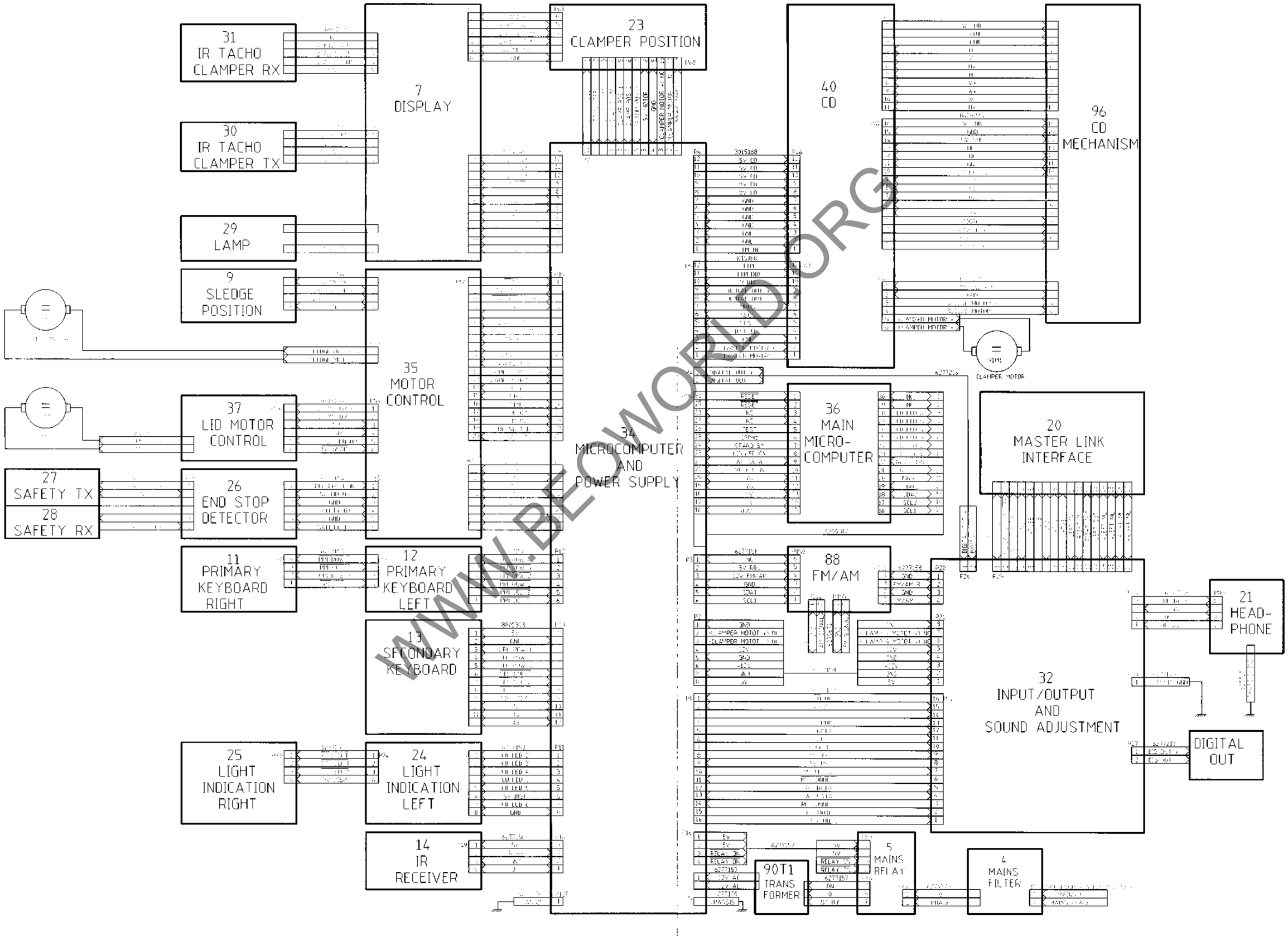
Remplacer par un fusible rapide de même type et de 1 ampères 250 volts.

Remplacer par un fusible retardè de même type et de 2.5 ampères 250 volts.

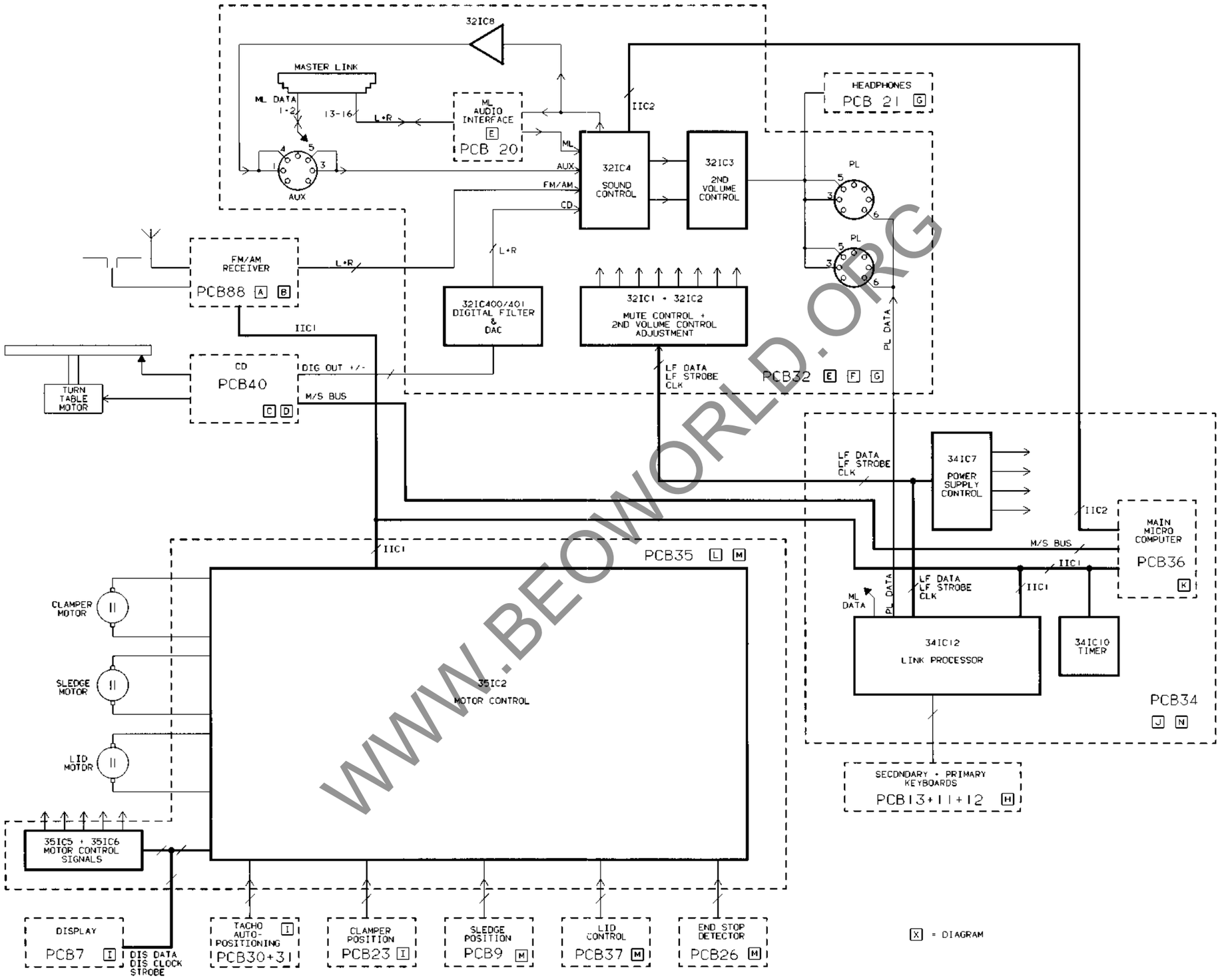


2-2 WIRING DIAGRAM 2-2

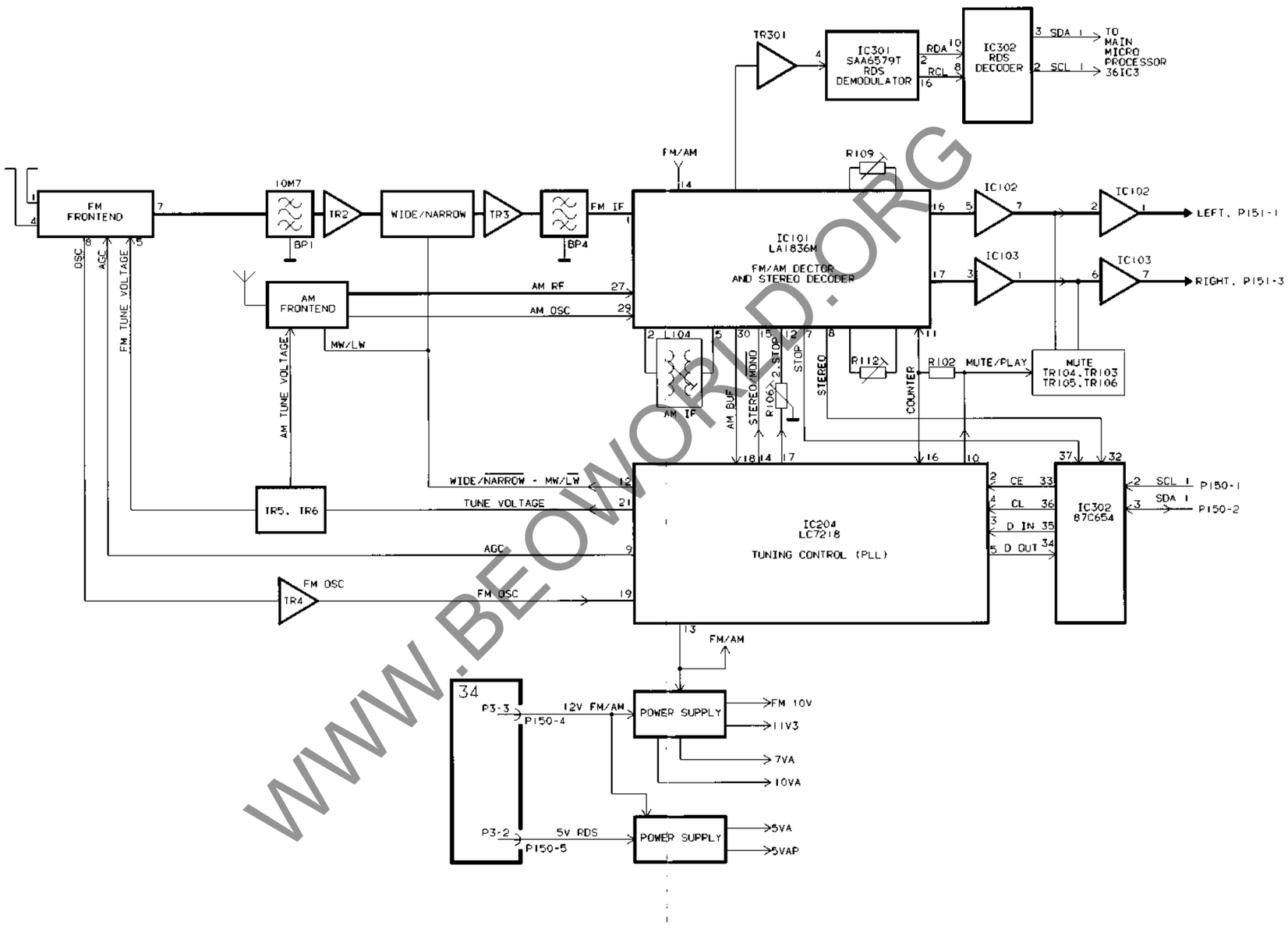
WIRING DIAGRAM



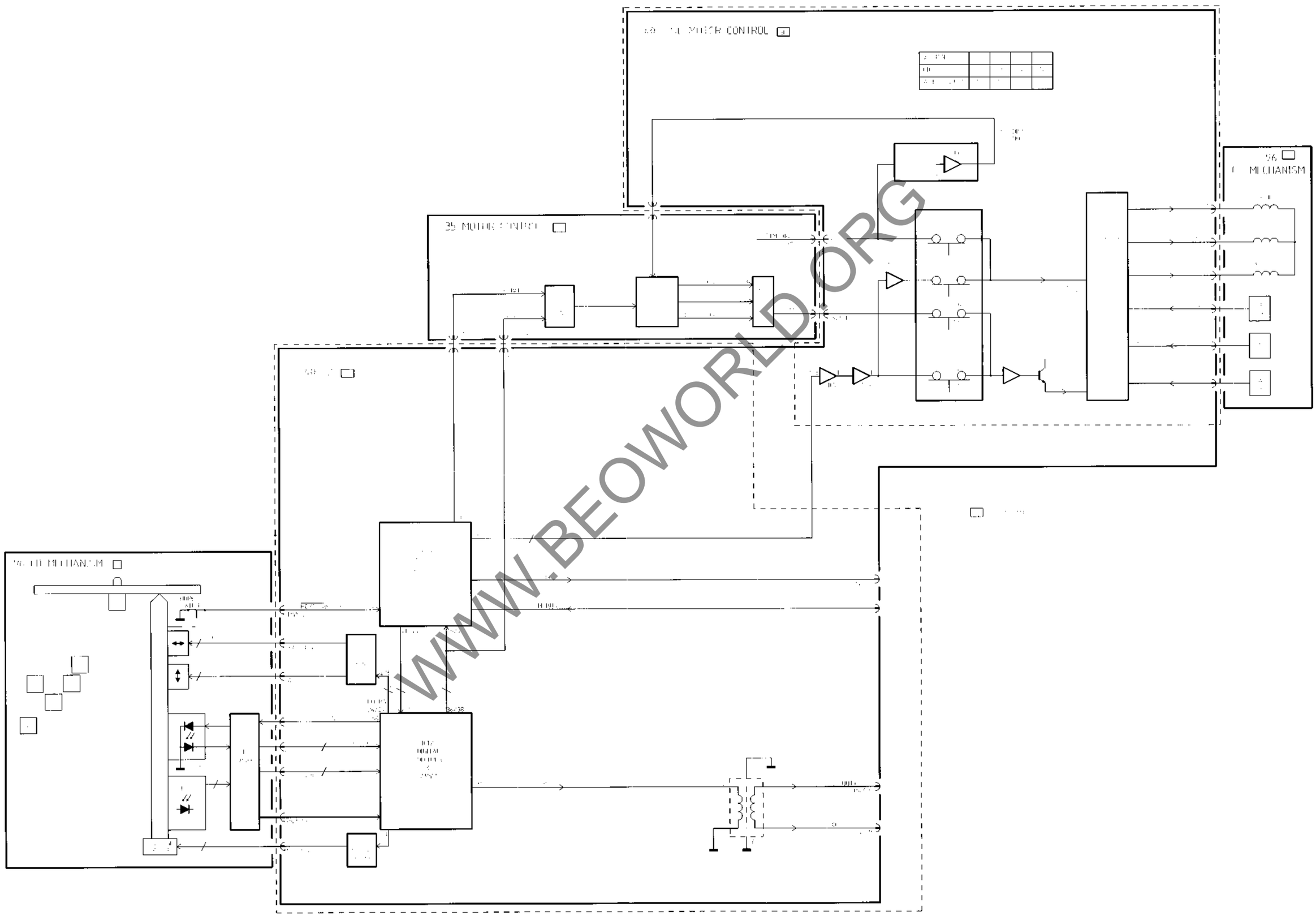
OVERALL BLOCK DIAGRAM



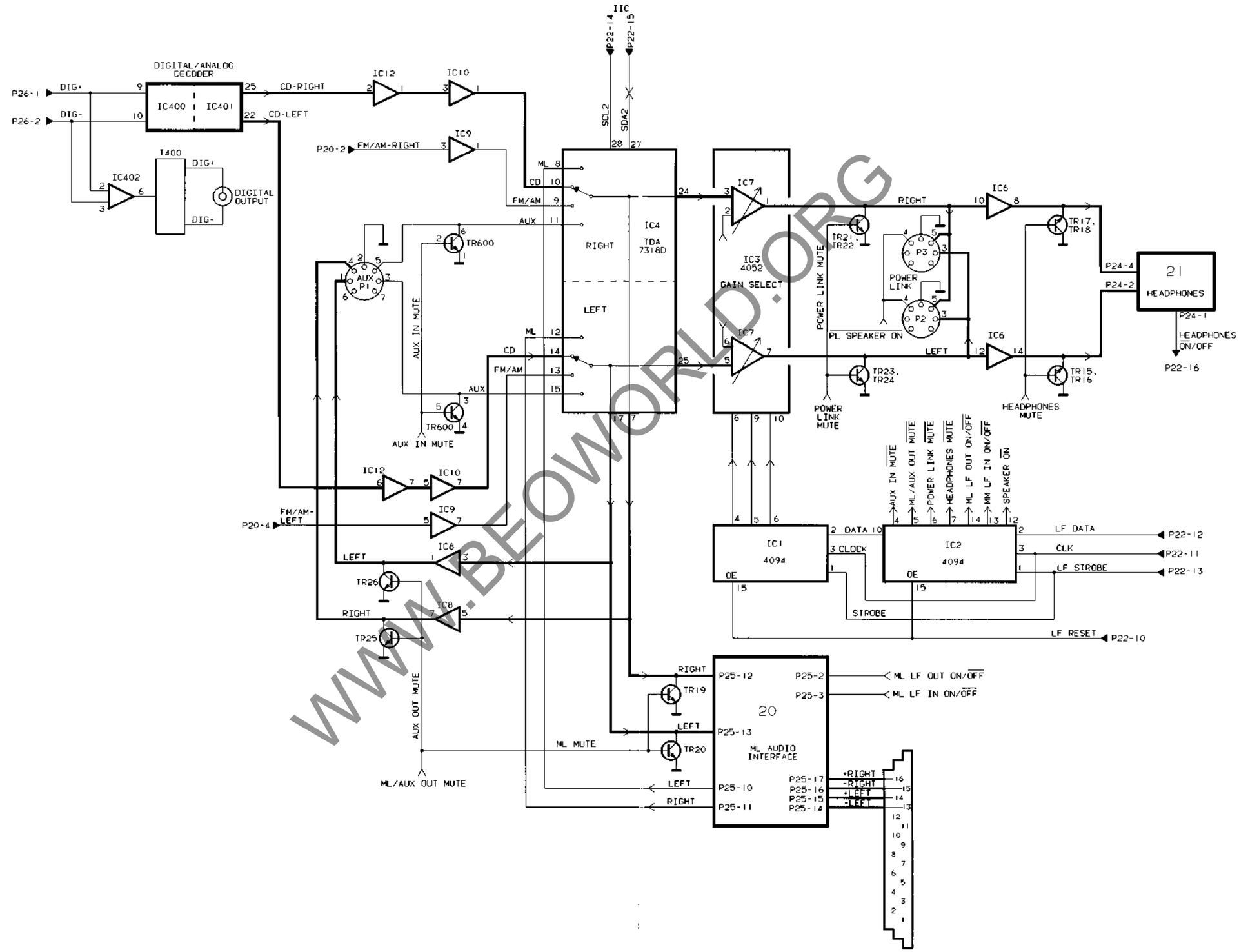
BLOCK DIAGRAM FOR TUNER



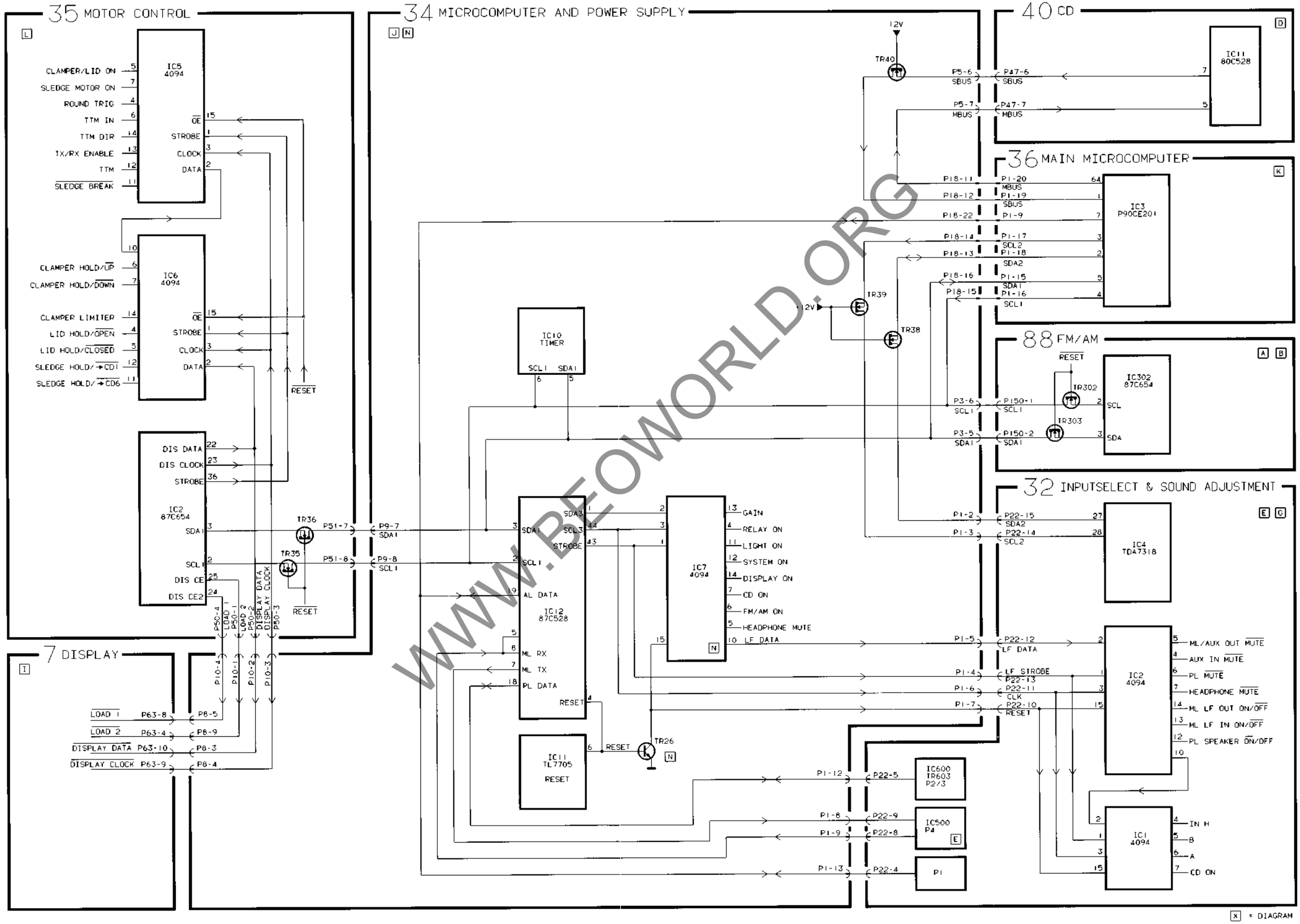
BLOCK DIAGRAM FOR CD



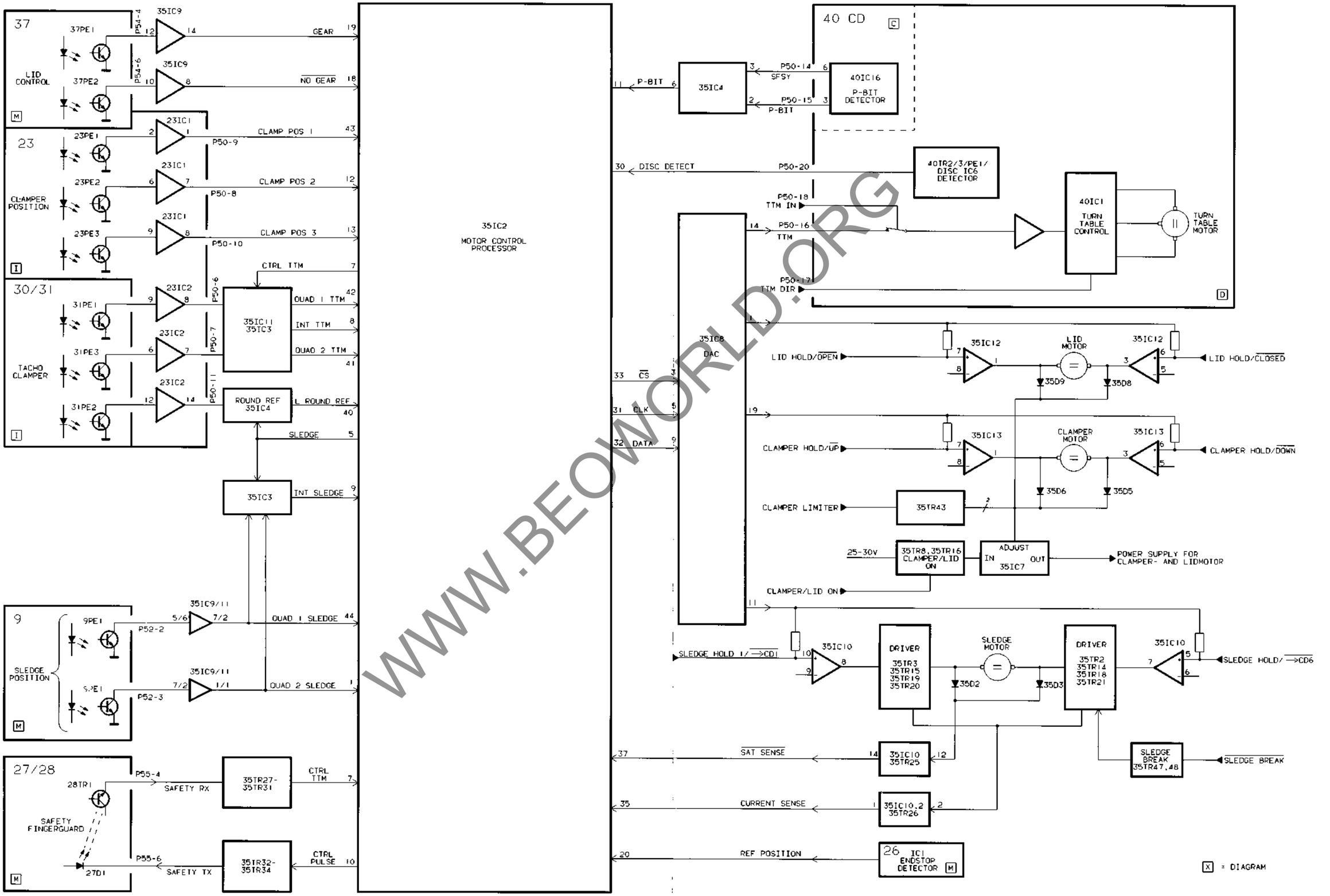
BLOCK DIAGRAM FOR INPUT/OUTPUT SELECT



BLOCK DIAGRAM FOR DATA



BLOCK DIAGRAM FOR MOTOR CONTROL



BLOCK DIAGRAM FOR POWER SUPPLY

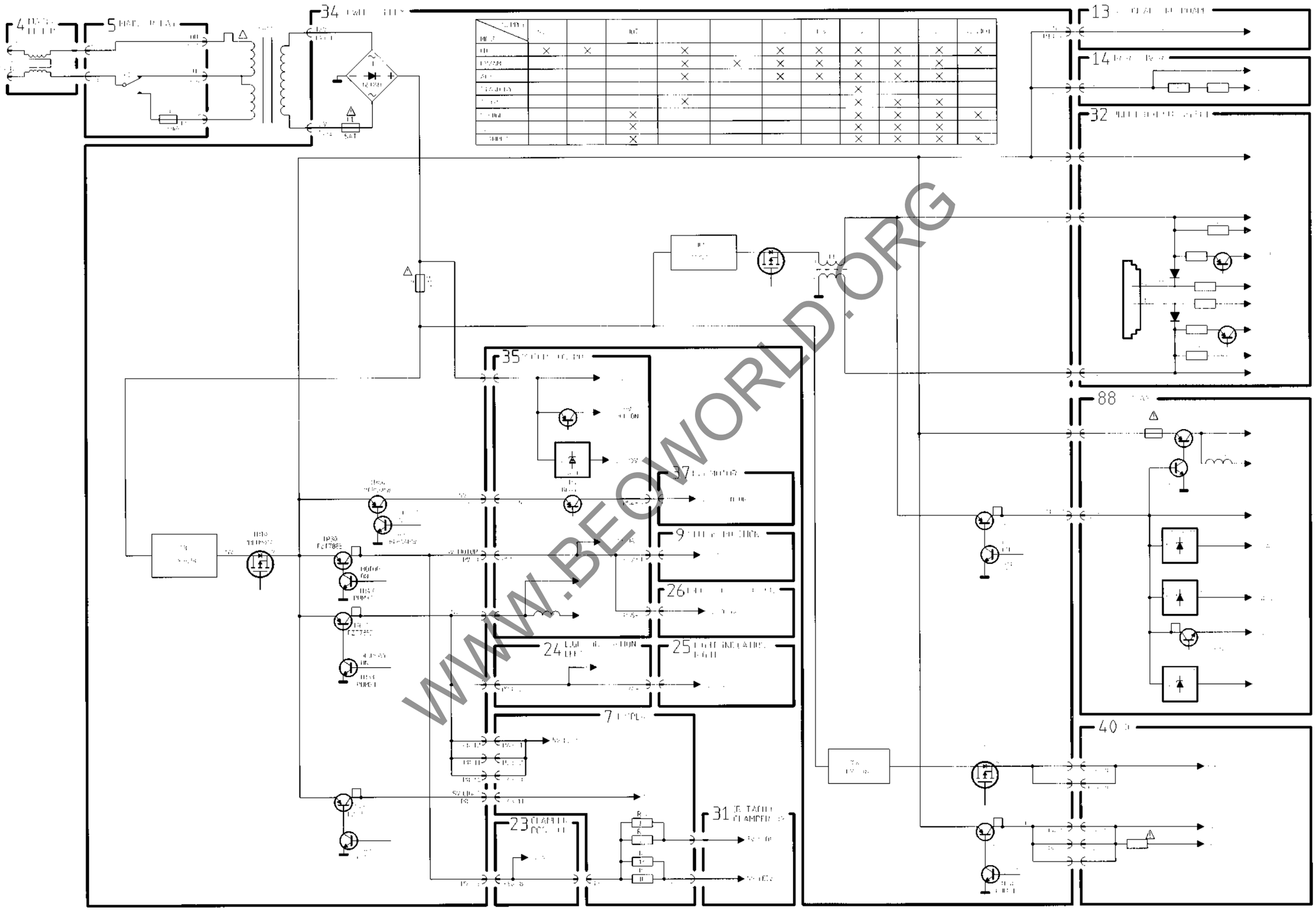


DIAGRAM A FM/AM – RDS **PCB drawings for PCB88 see page 2-12**

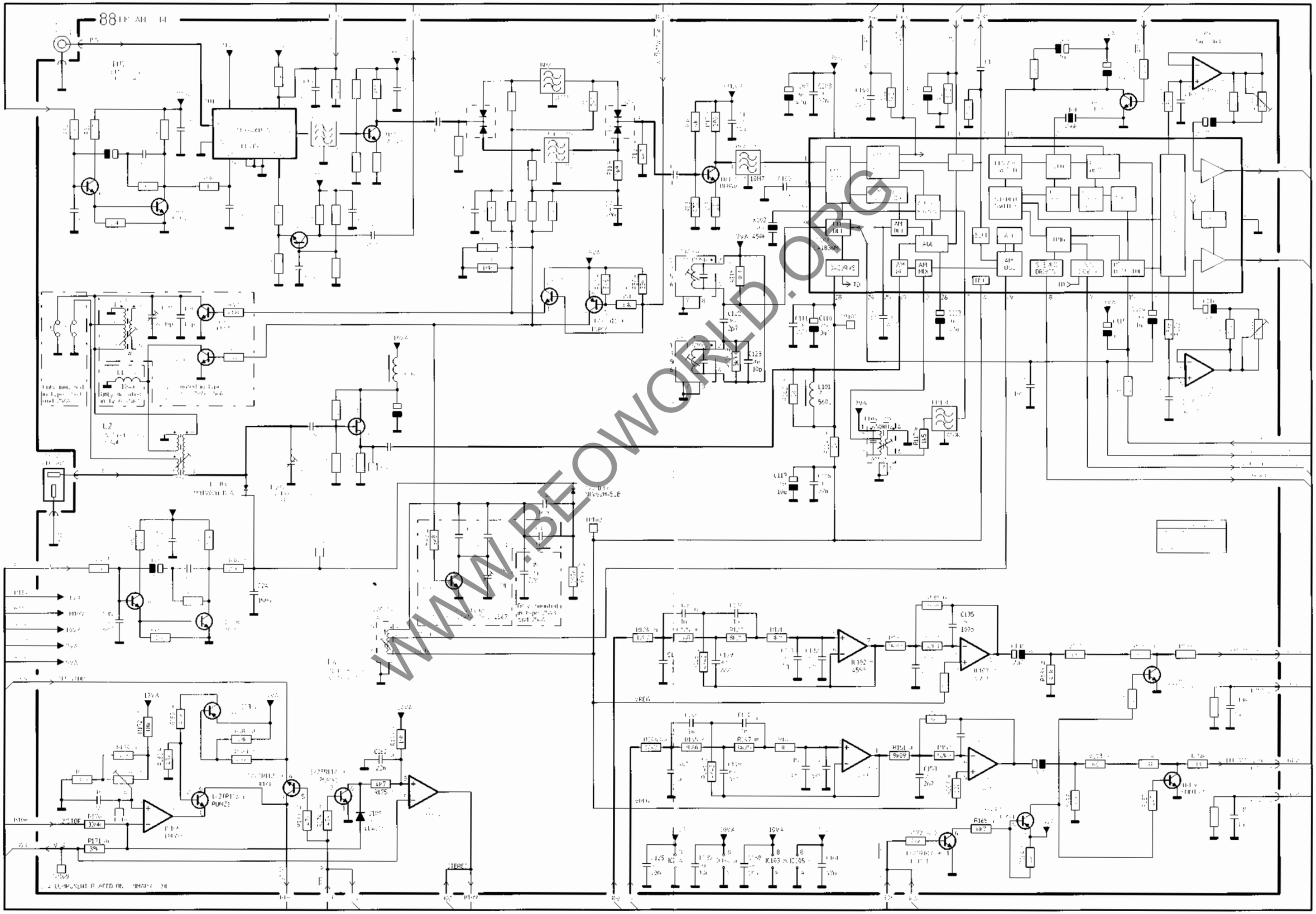
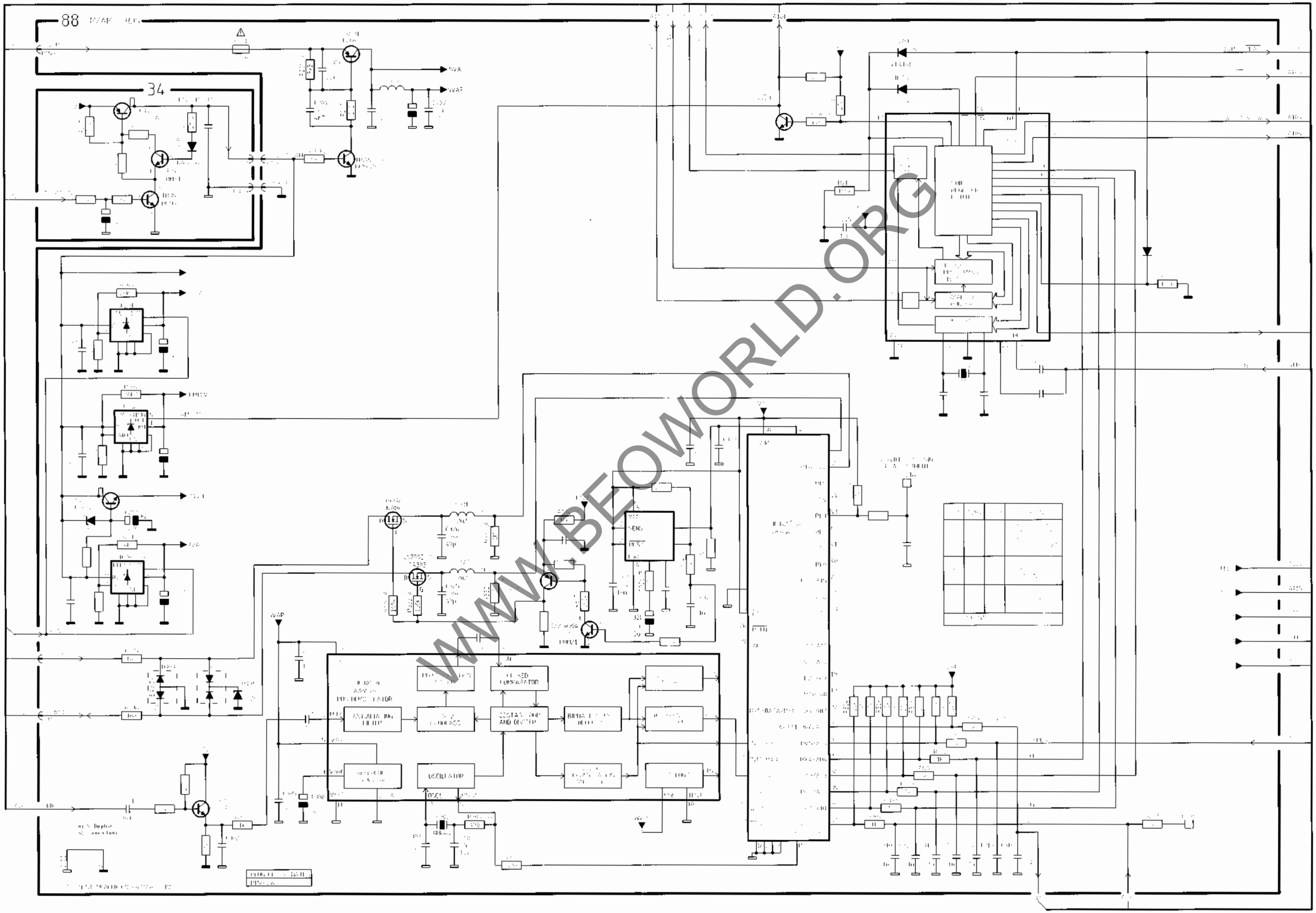
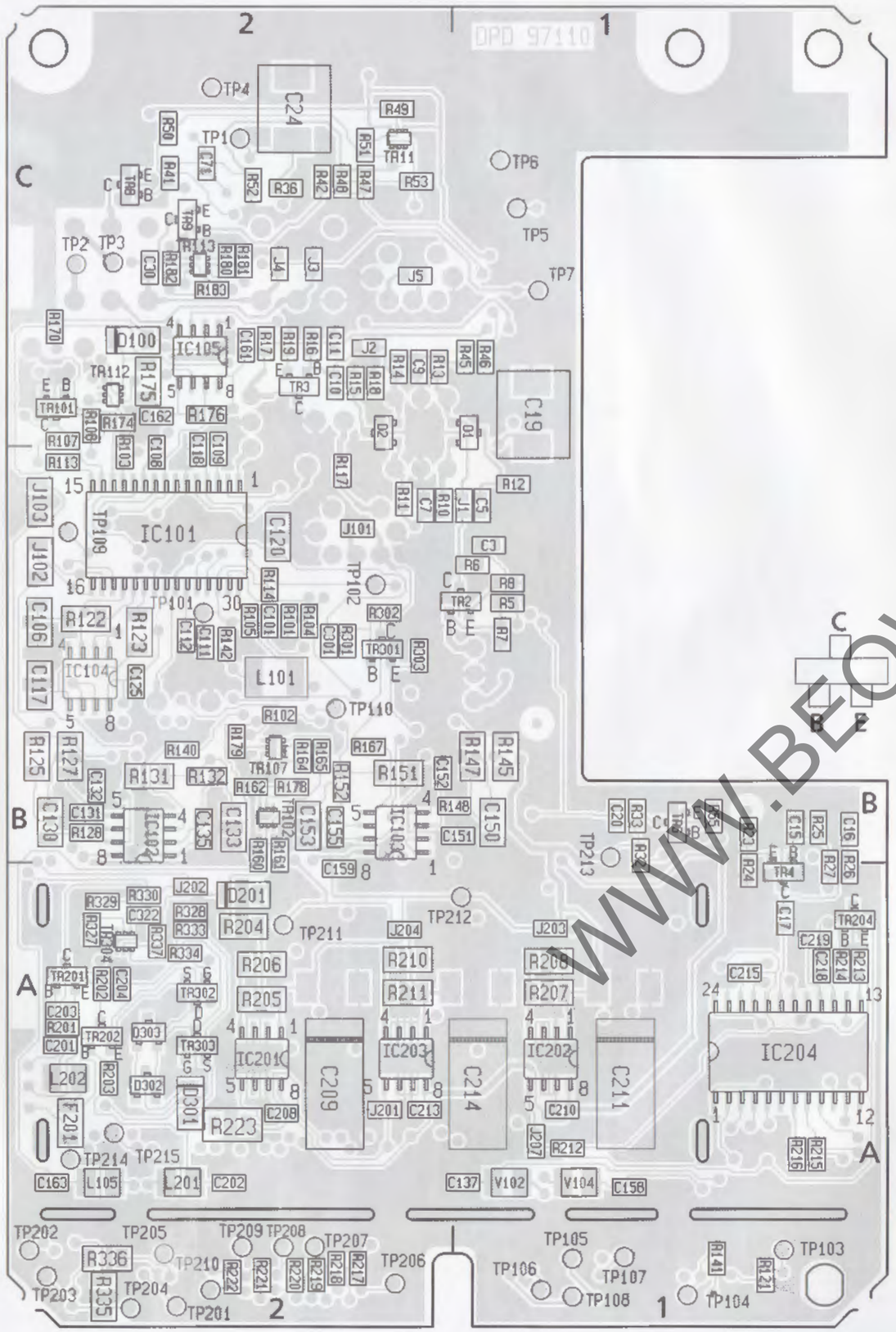


DIAGRAM B FM/AM – RDS **PCB drawings for PCB34 see page 2-21 and for PCB88 see page 2-12**



2-12 PCB DRAWING 2-12

PCB88, FM/AM – RDS, 4 layer PCB



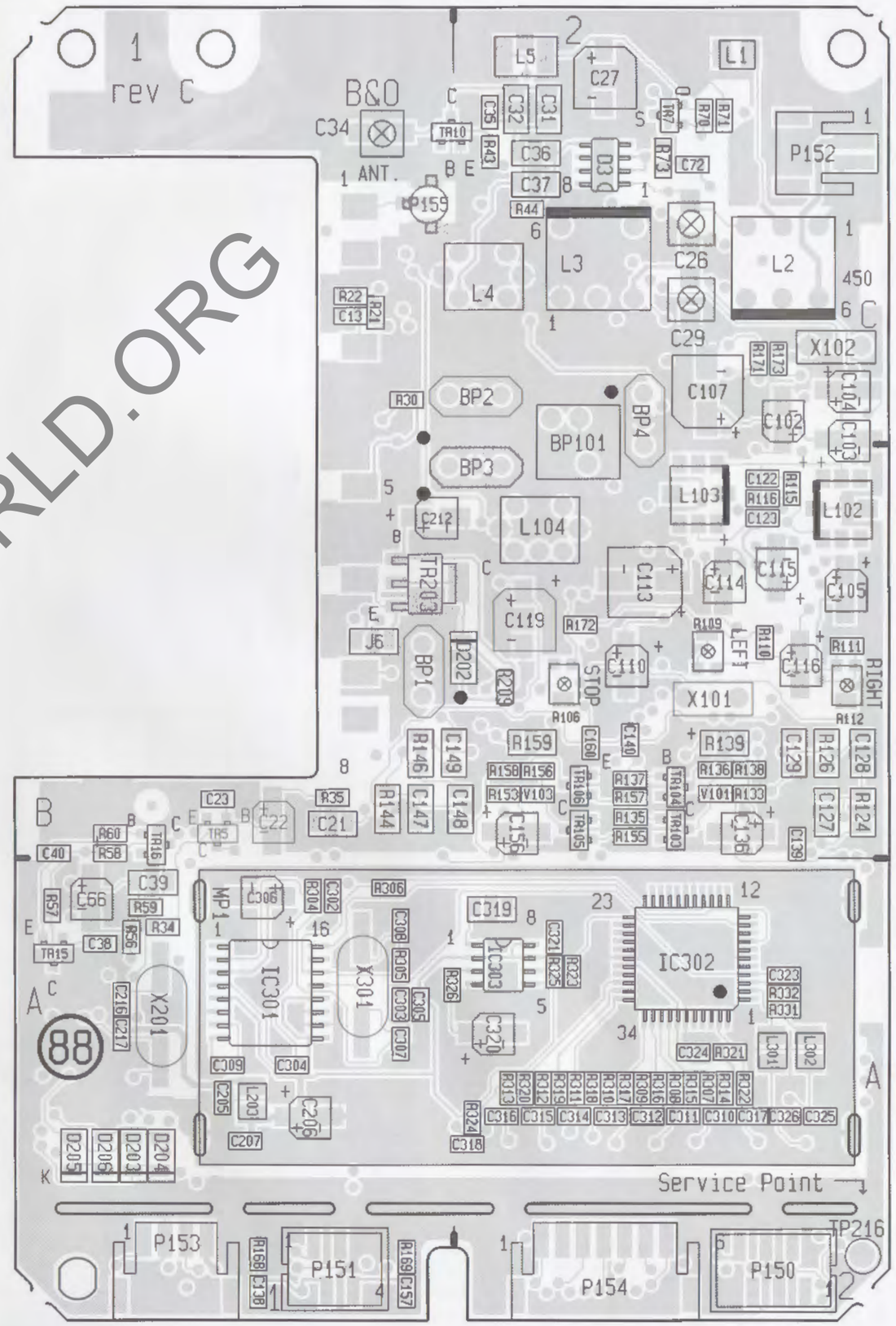
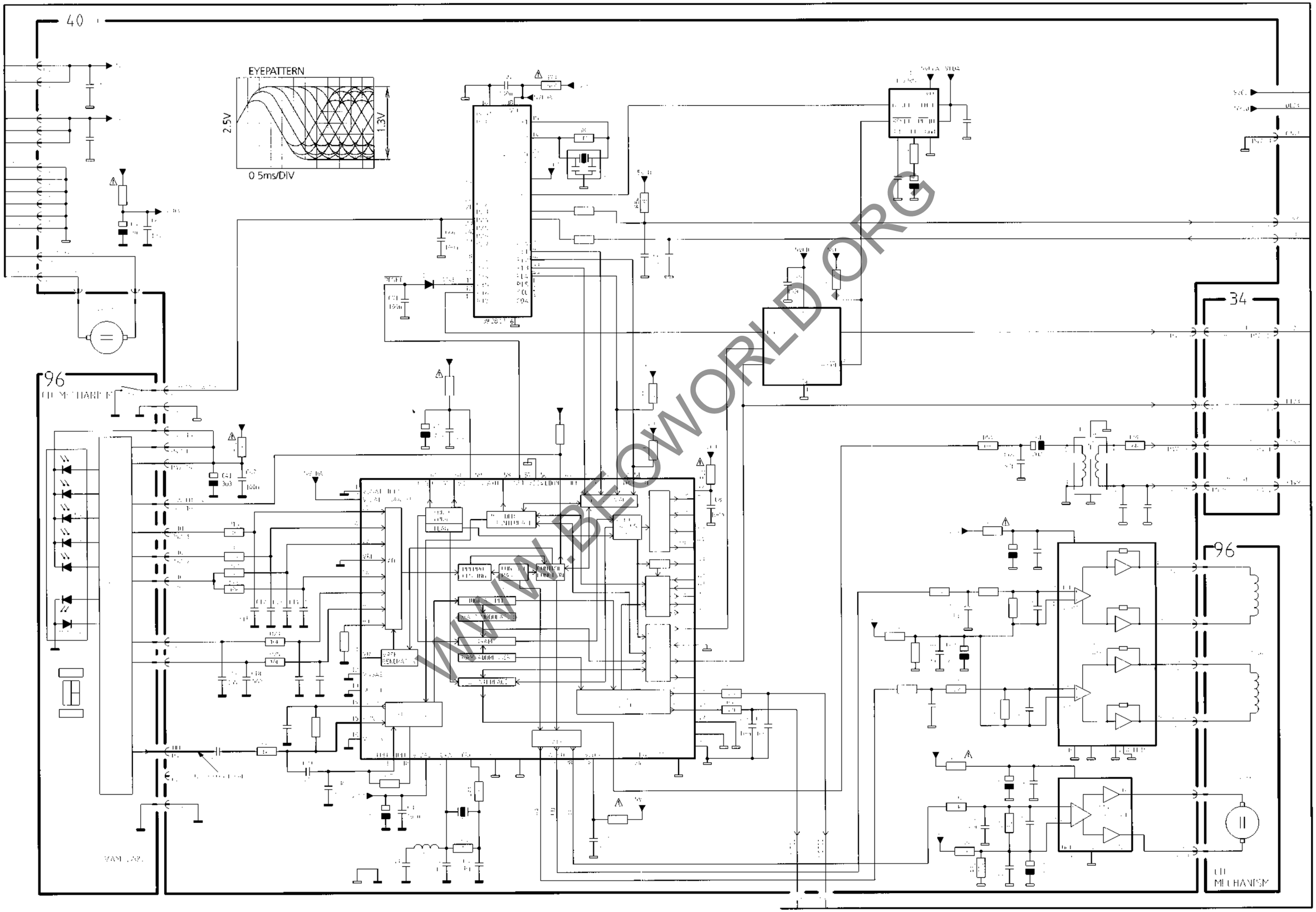
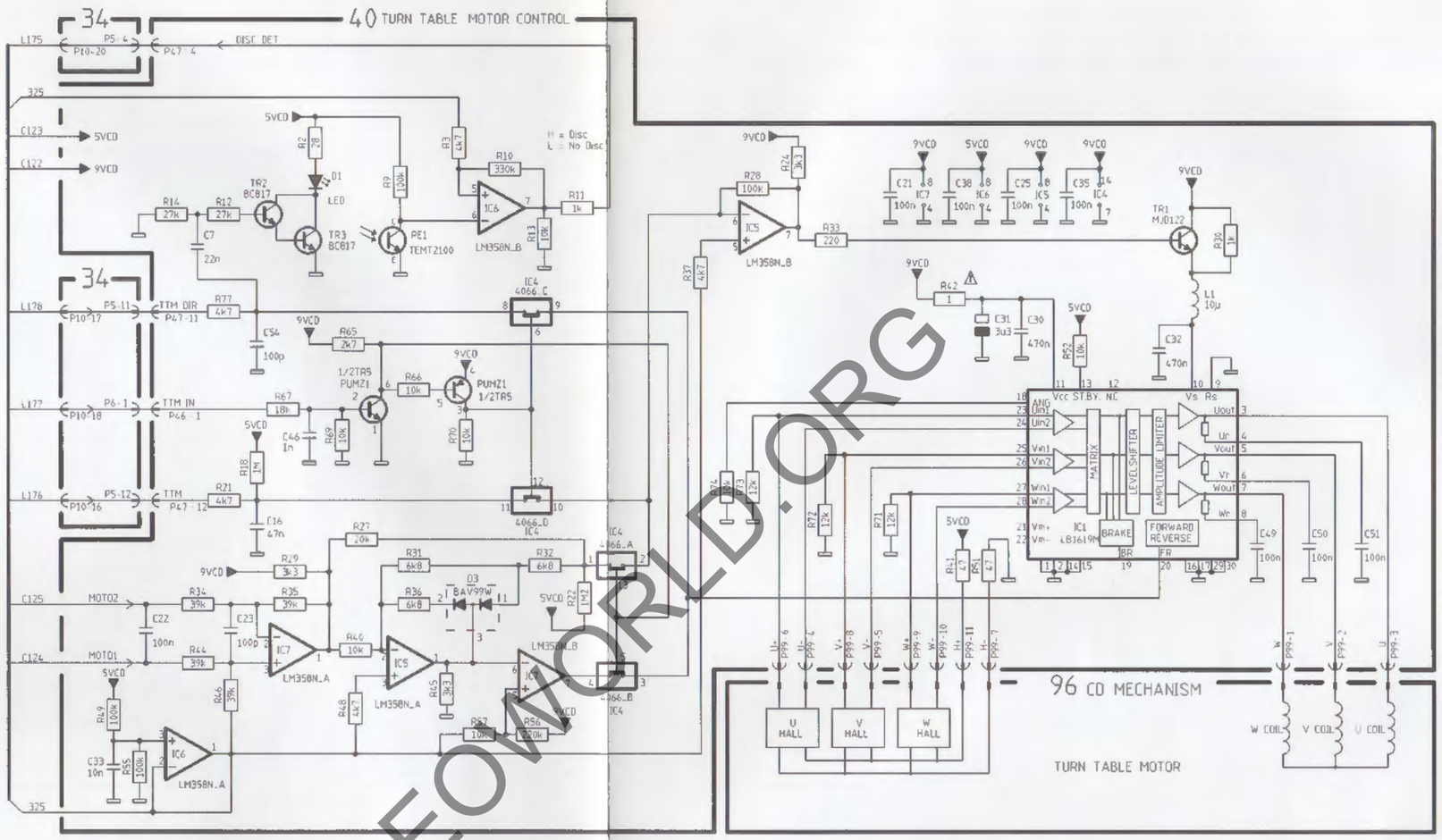


DIAGRAM C CD **PCB drawings for PCB40 see page 2-14**



2-14 DIAGRAM D 2-14

DIAGRAM D TURN TABLE MOTOR CONTROL



PCB40, CD, 4 layer PCB

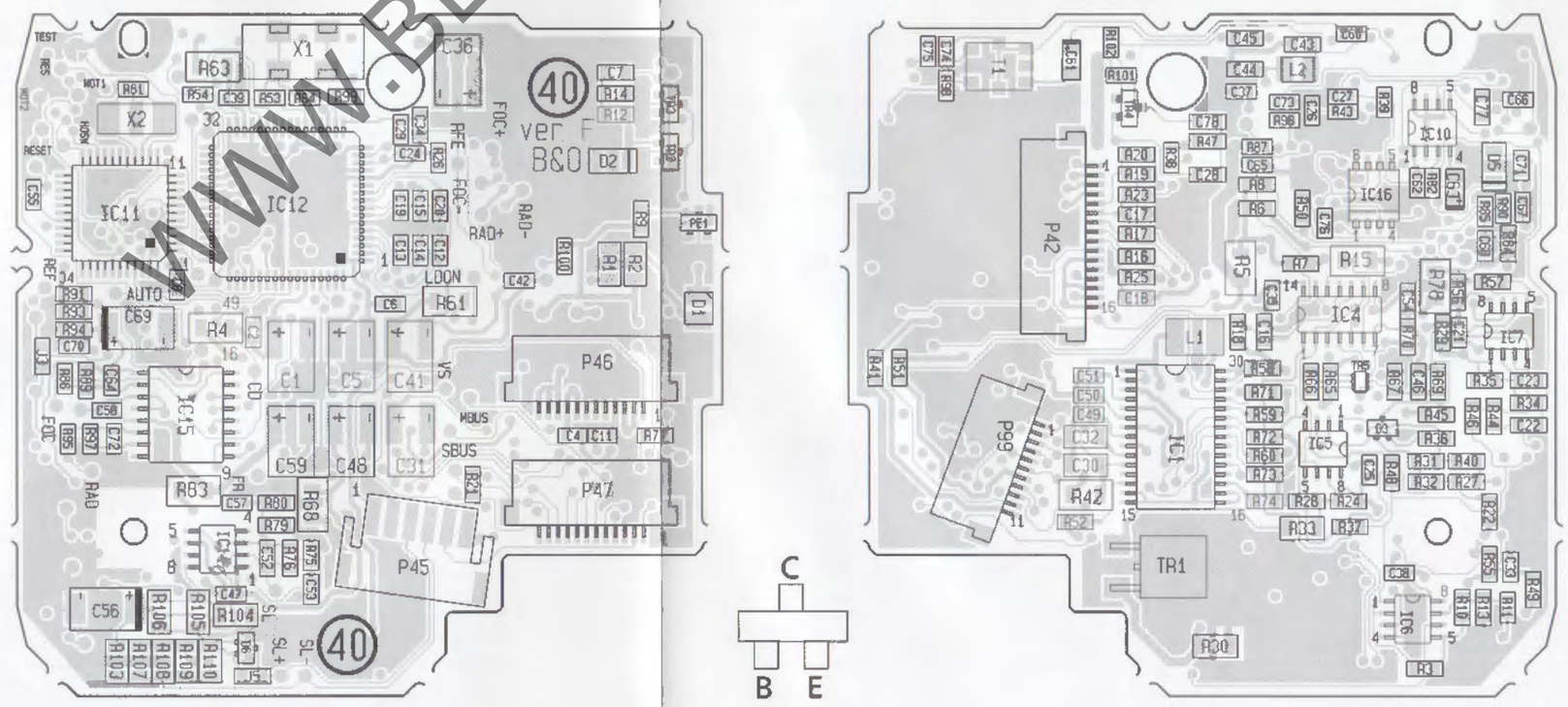


DIAGRAM E MASTER LINK **PCB drawings for PCB32 see page 2-18**

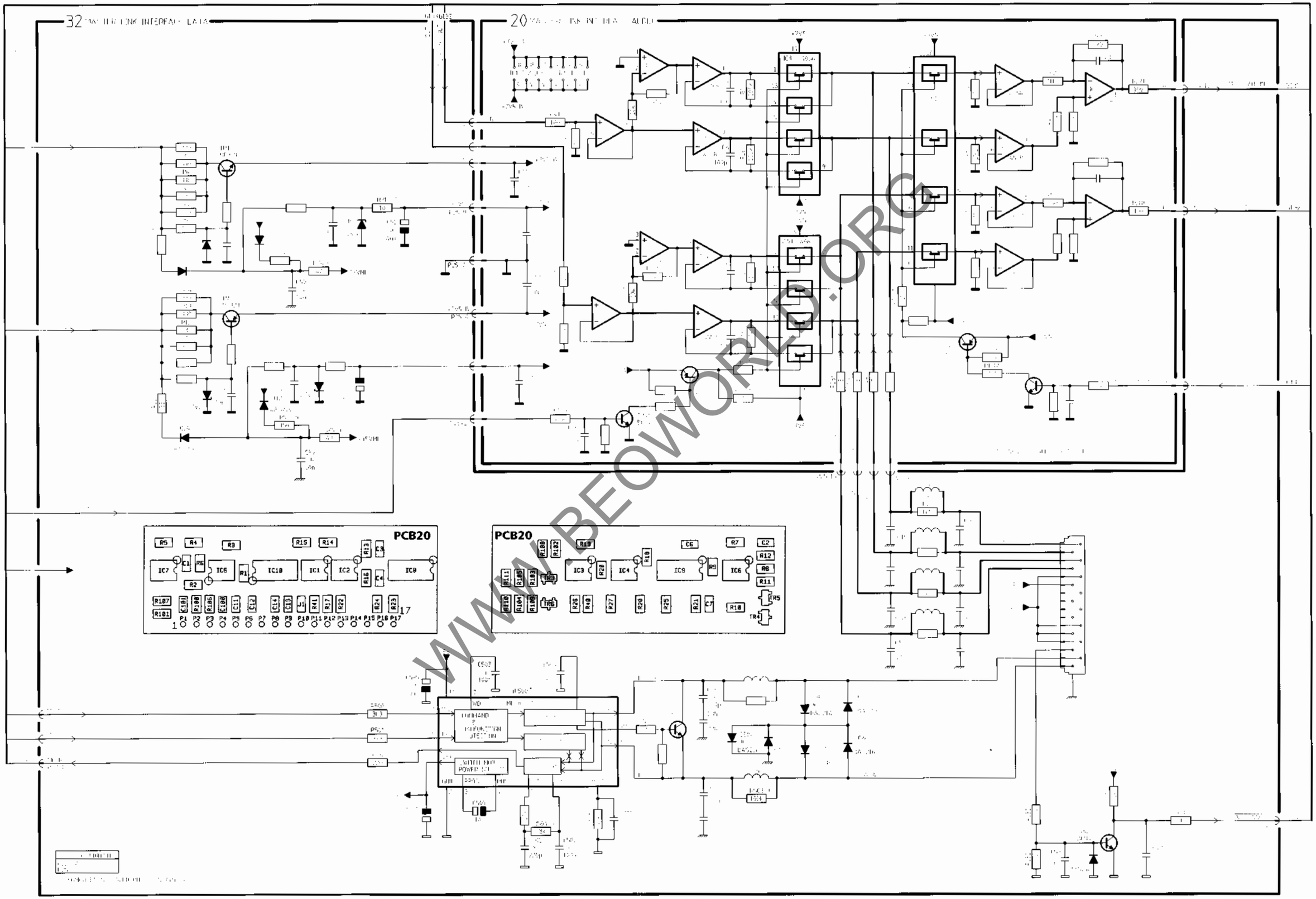


DIAGRAM F DIGITAL/ANALOG DECODER **PCB drawings for PCB32 see page 2-18**

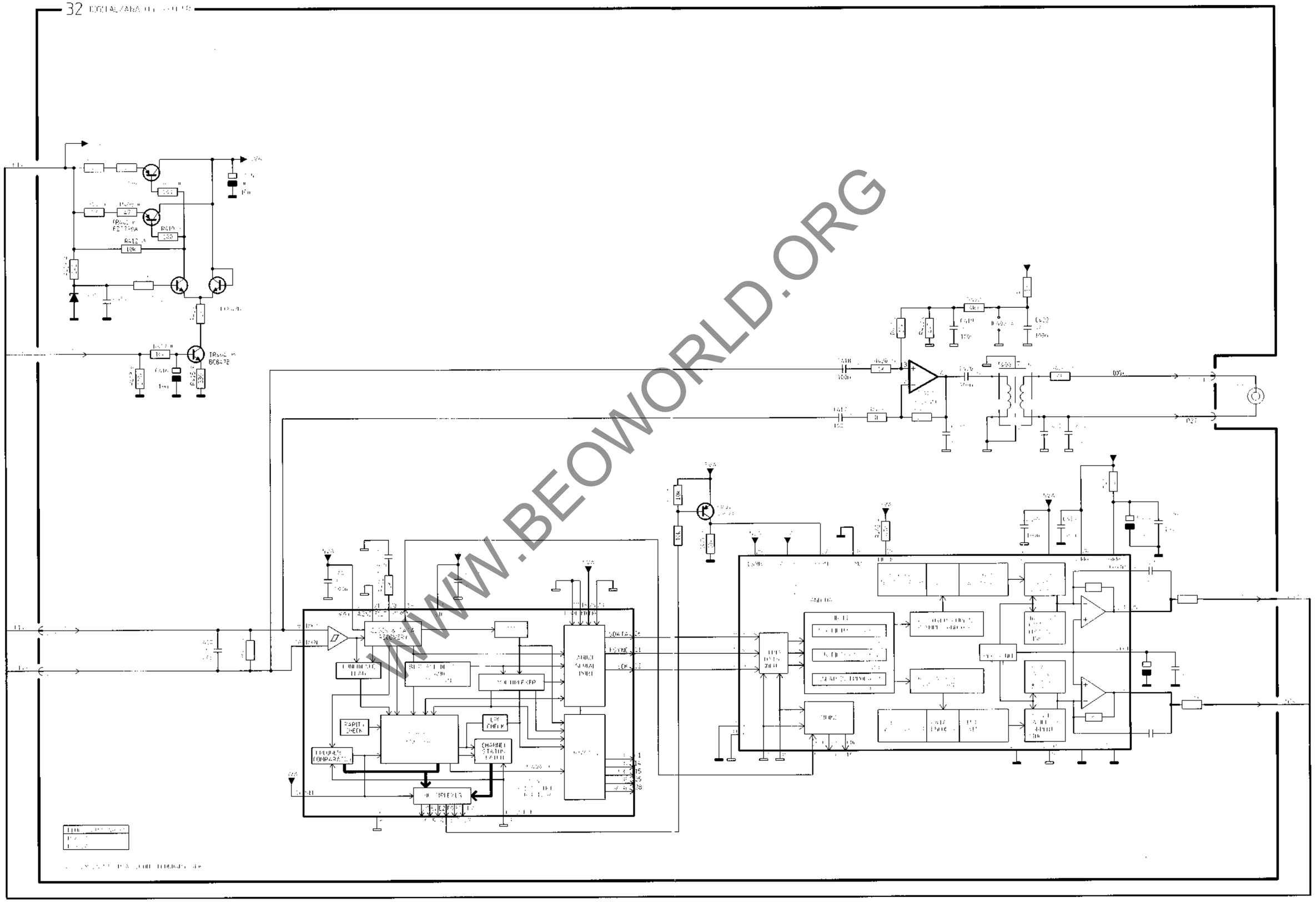
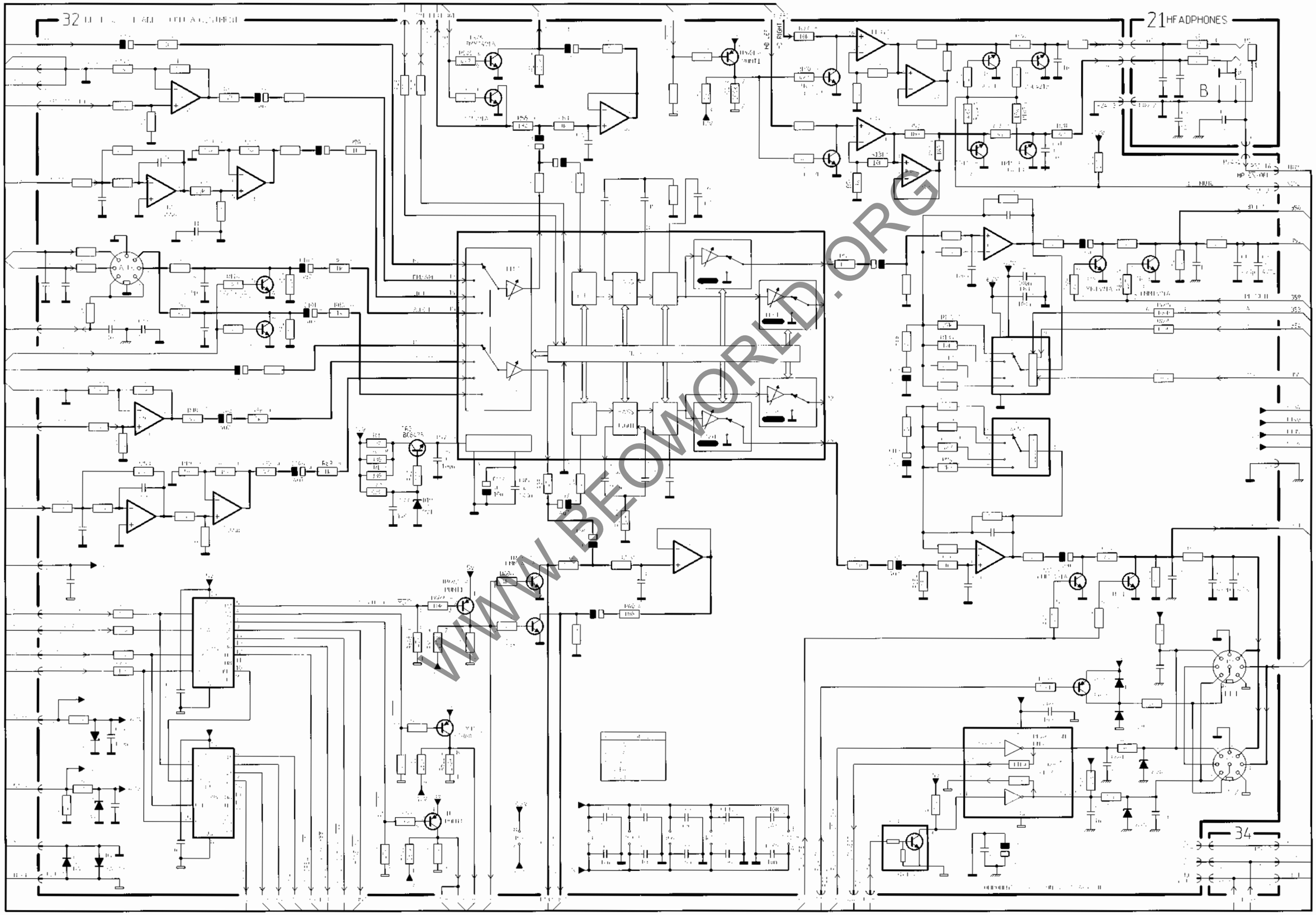
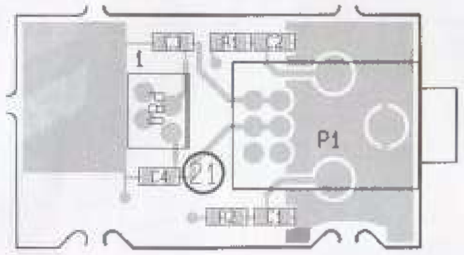


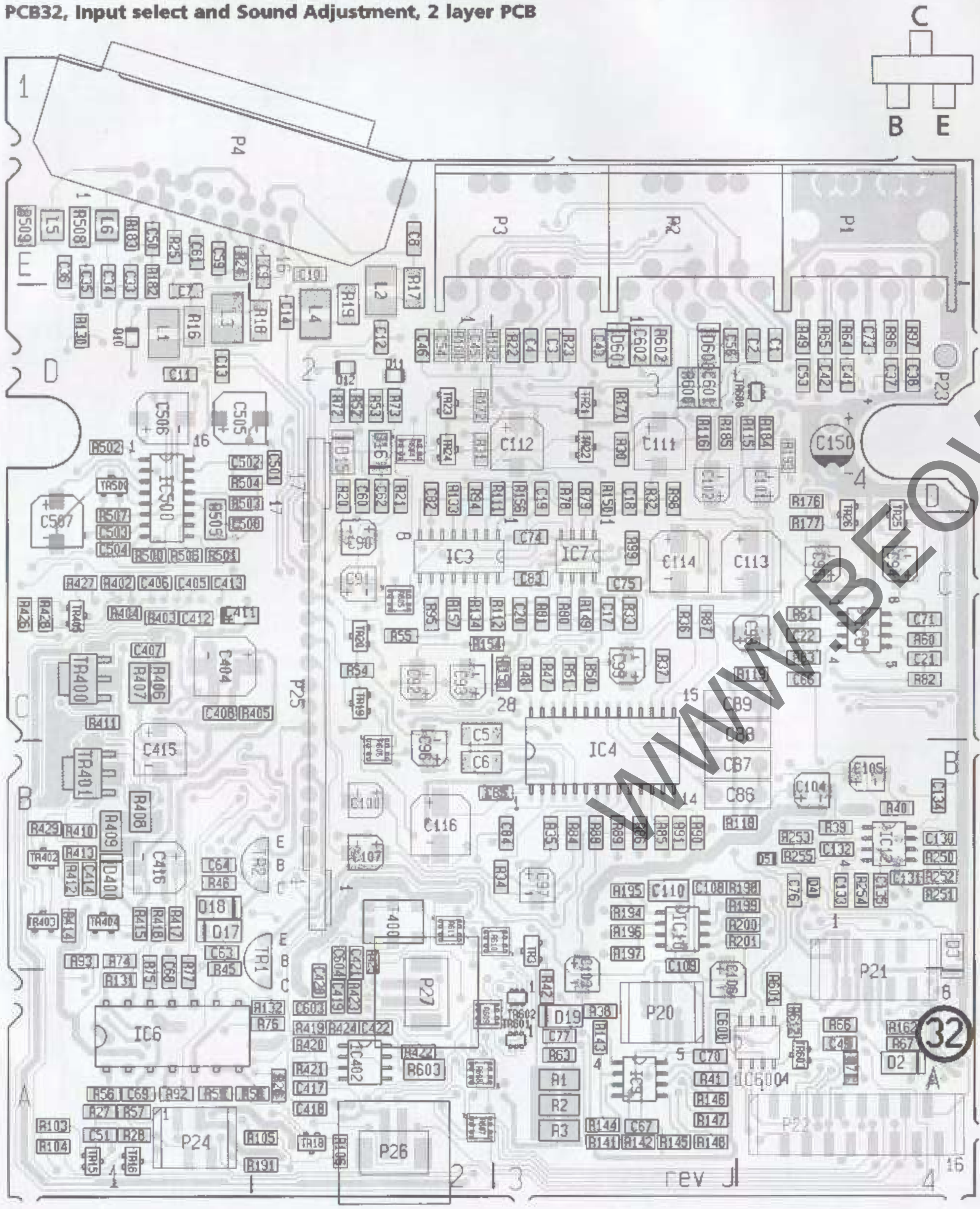
DIAGRAM G INPUT SELECT AND SOUND ADJUSTMENT **PCB drawings for PCB21 and PCB32 see page 2-18**



PCB21, Headphone, 4 layer PCB



PCB32, Input select and Sound Adjustment, 2 layer PCB



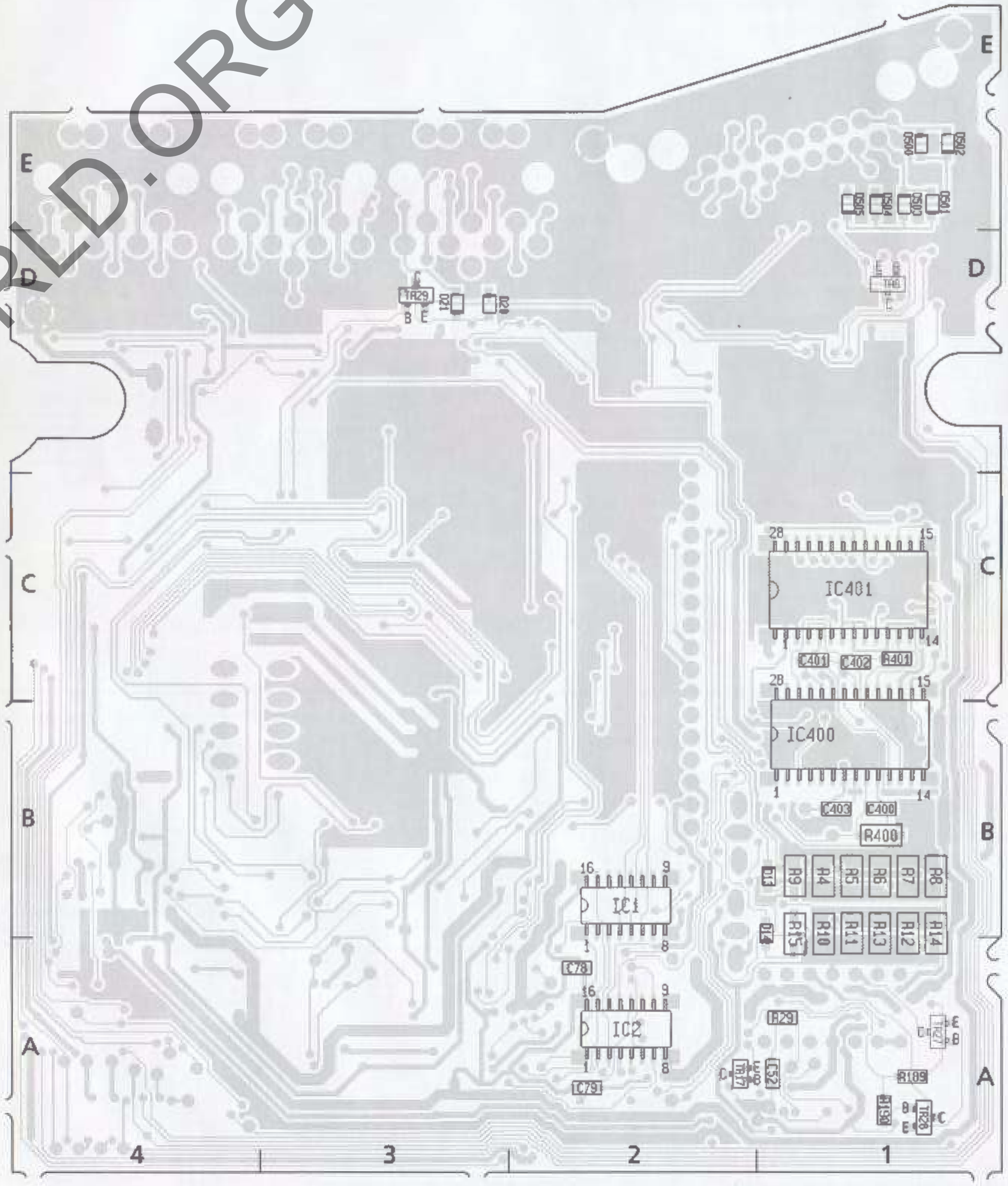
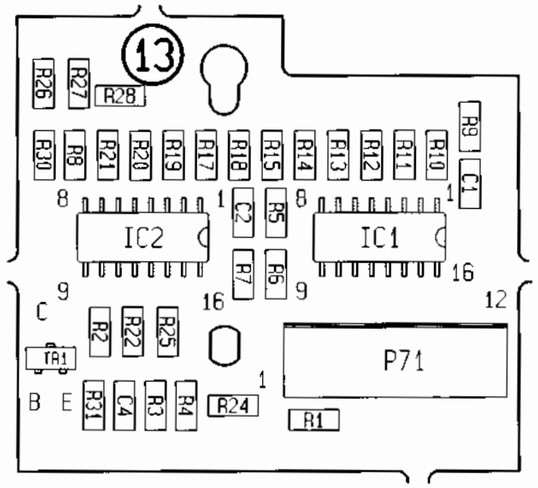
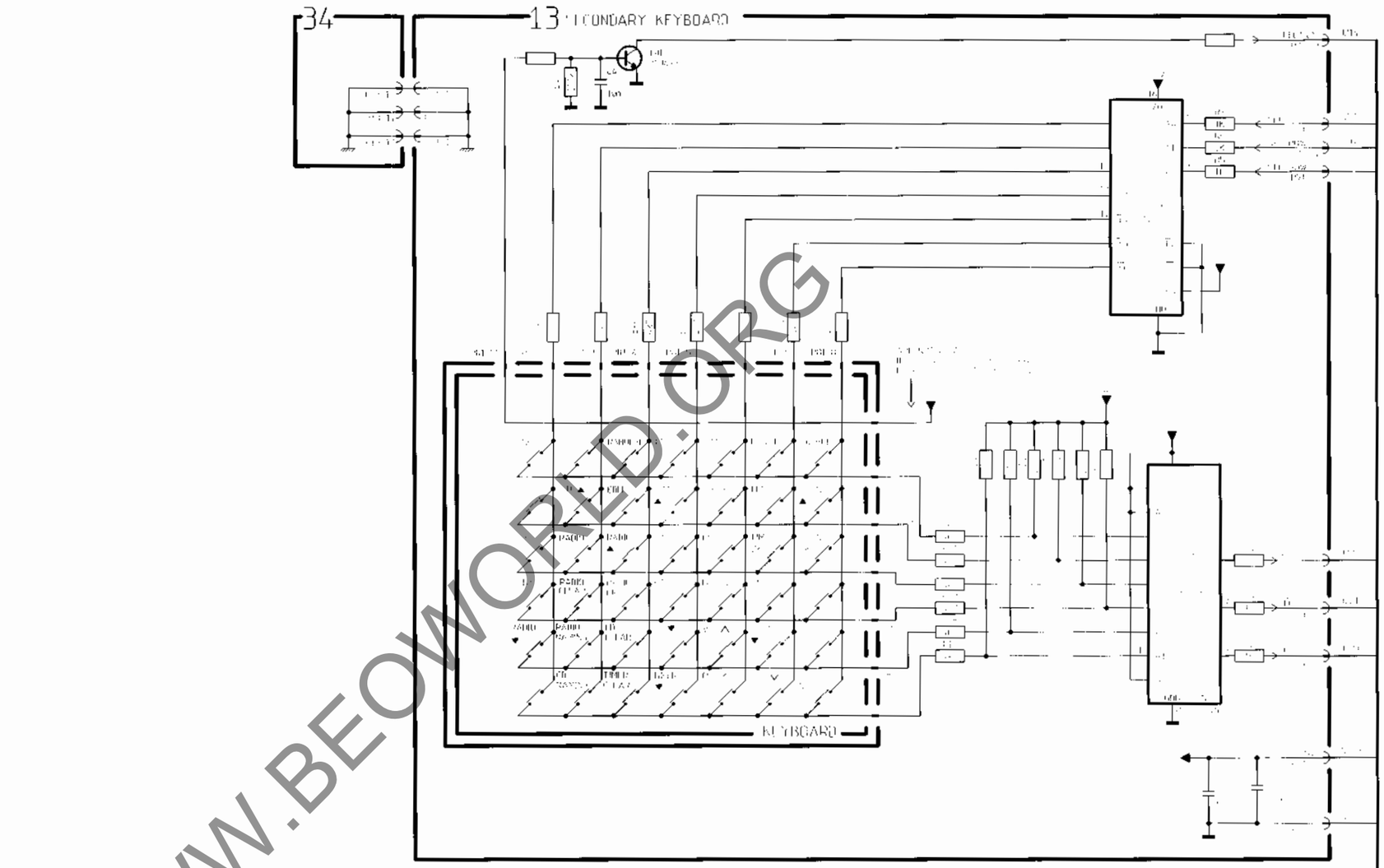
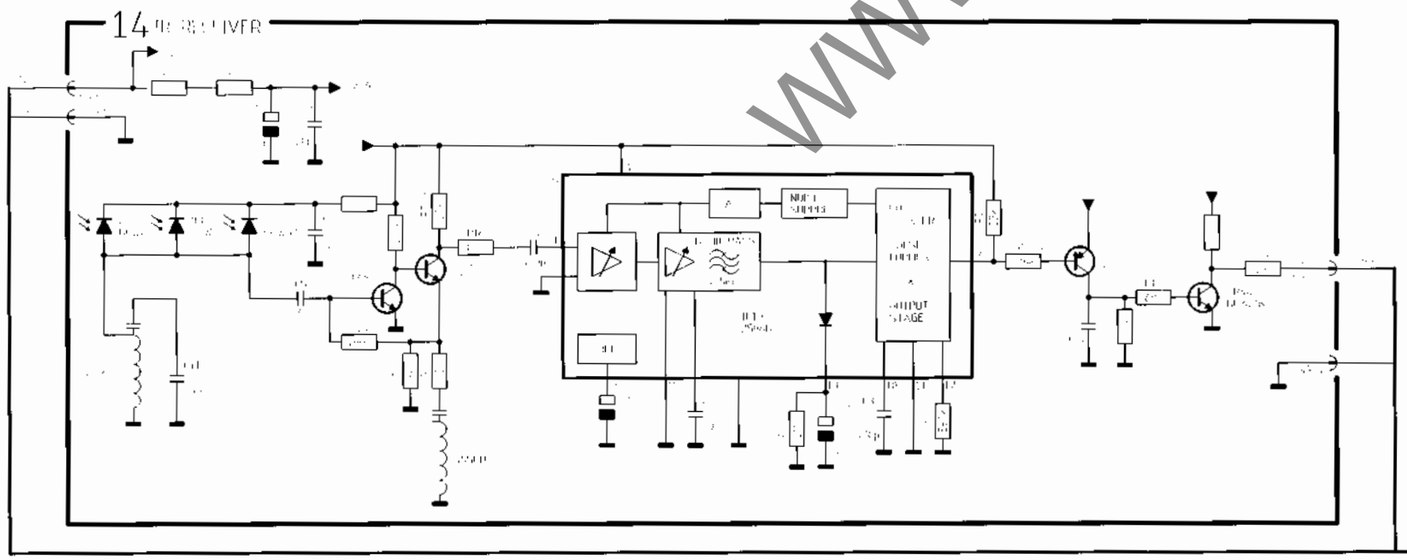


DIAGRAM H KEYBOARDS AND IR RECEIVER **PCB drawings for PCB14 see page 2-28**

PCB13, Secondary Keyboard, 2 layer PCB







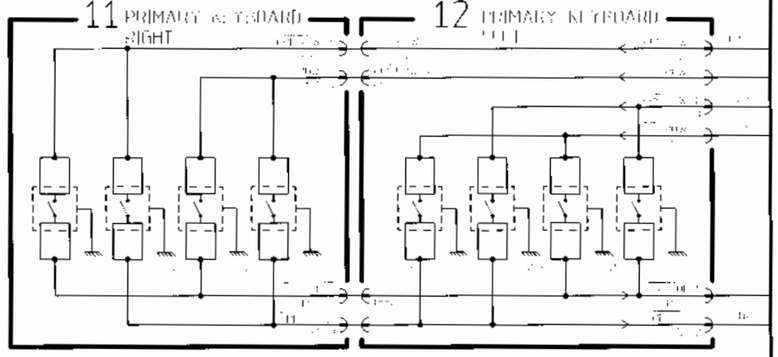
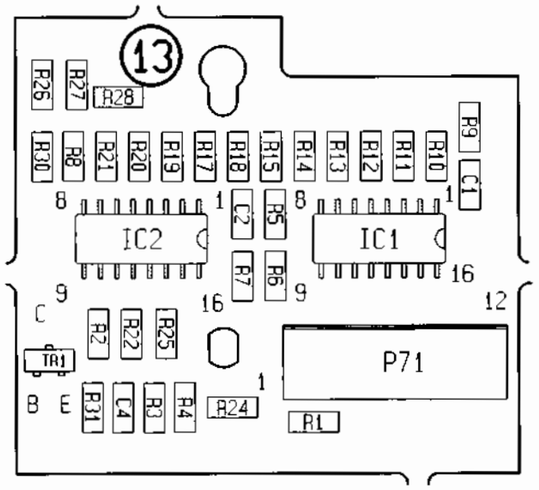
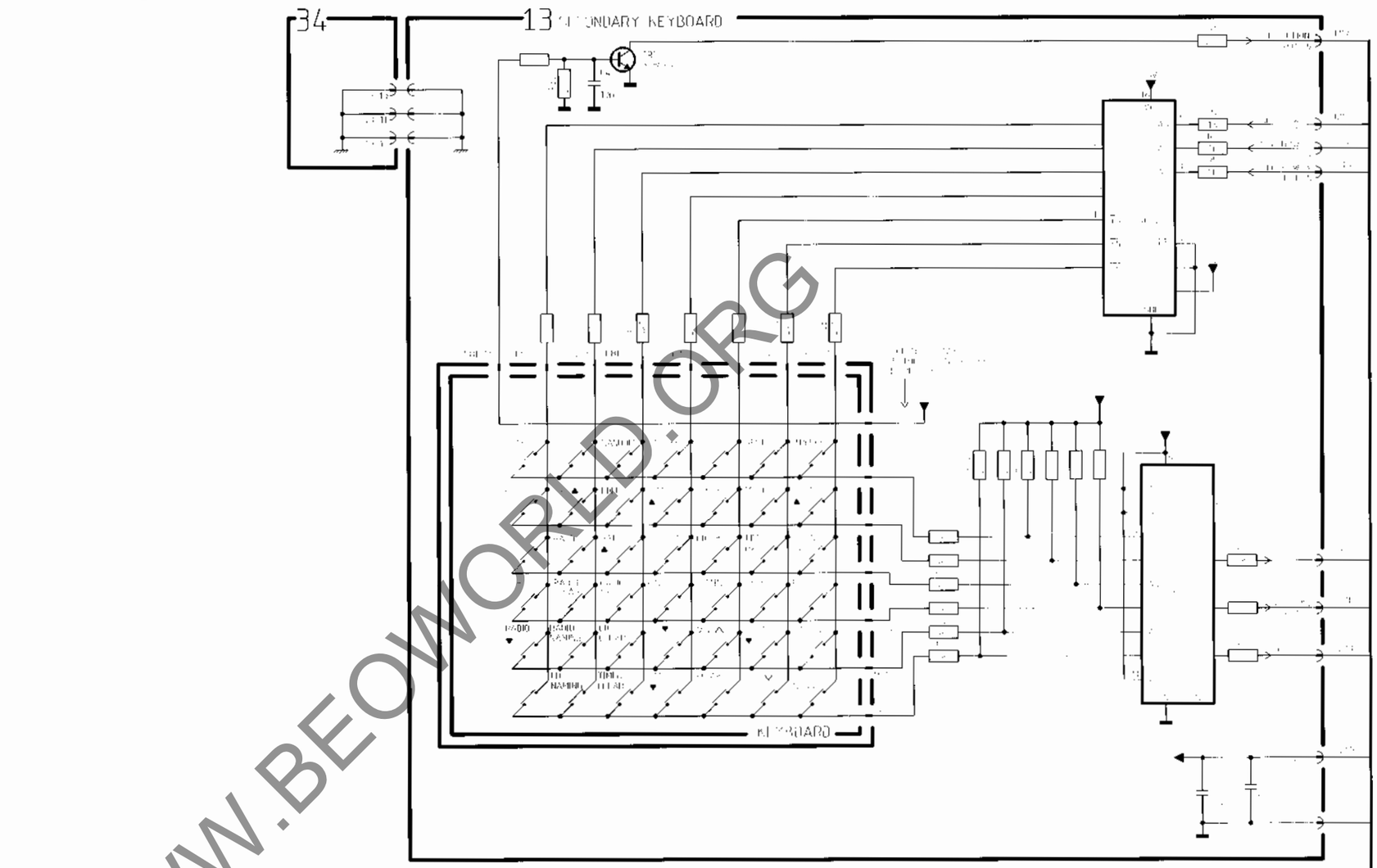
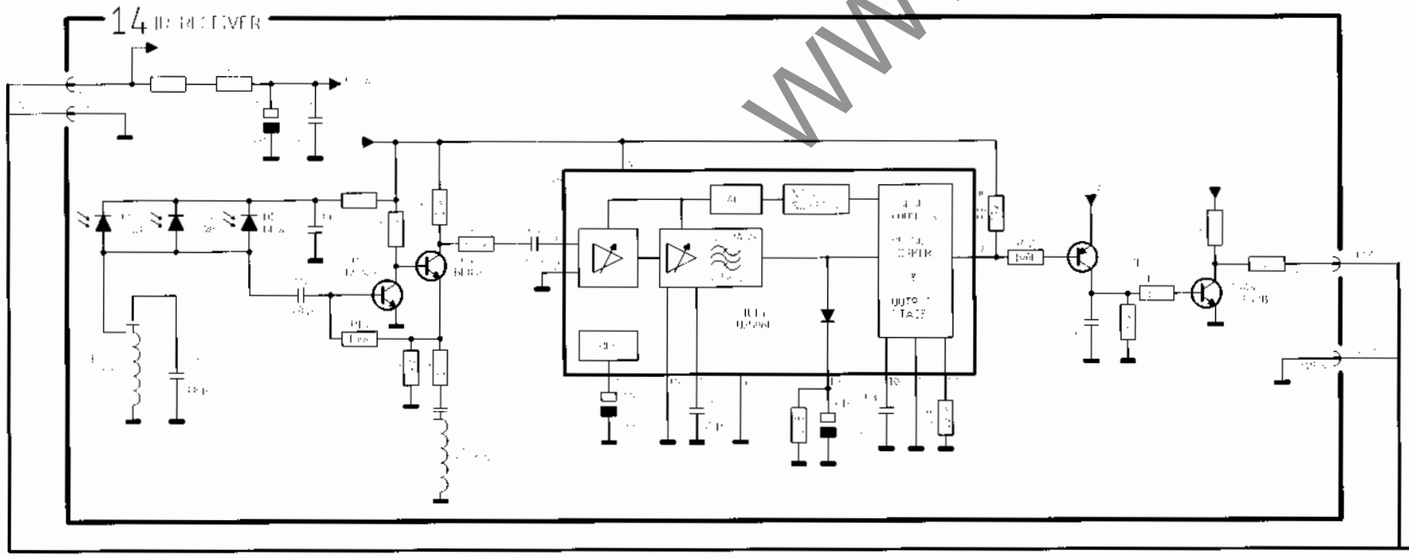


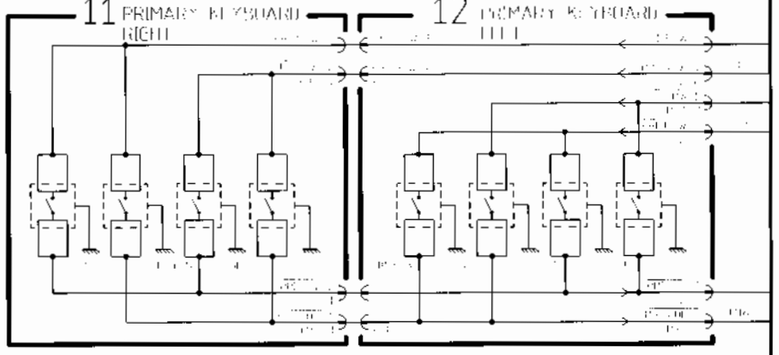
DIAGRAM H KEYBOARDS AND IR RECEIVER **PCB drawings for PCB14 see page 2-28**

PCB13, Secondary Keyboard, 2 layer PCB





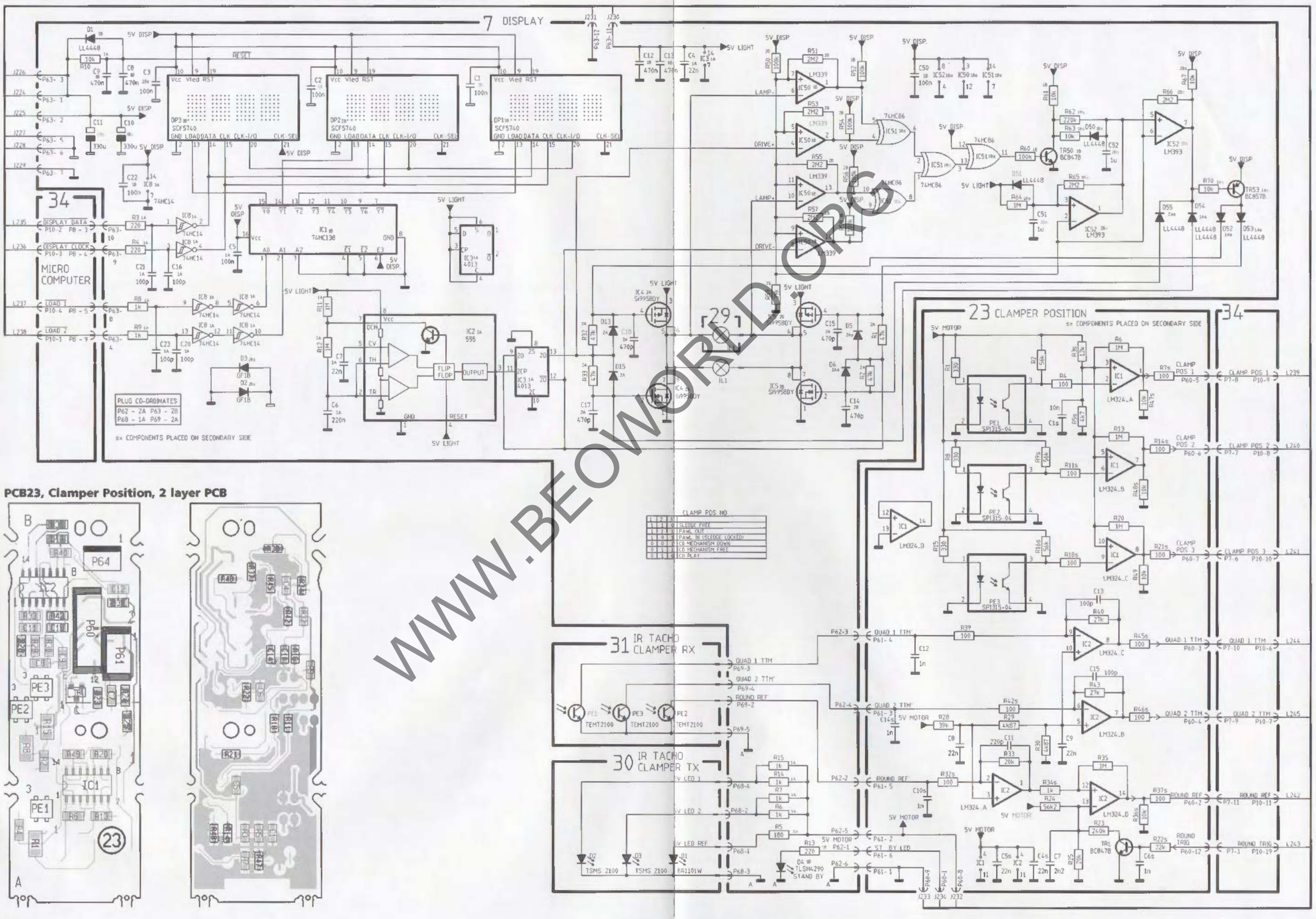




2-20 DIAGRAM I 2-20

DIAGRAM I DISPLAY AND CLAMPER POSITION

PCB drawings for PCB7 see page 2-29



PCB23, Clamper Position, 2 layer PCB

2-21 PCB DRAWING BANG & OLUFSEN

PCB34, Microcomputer and Power Supply, 4 layer PCB

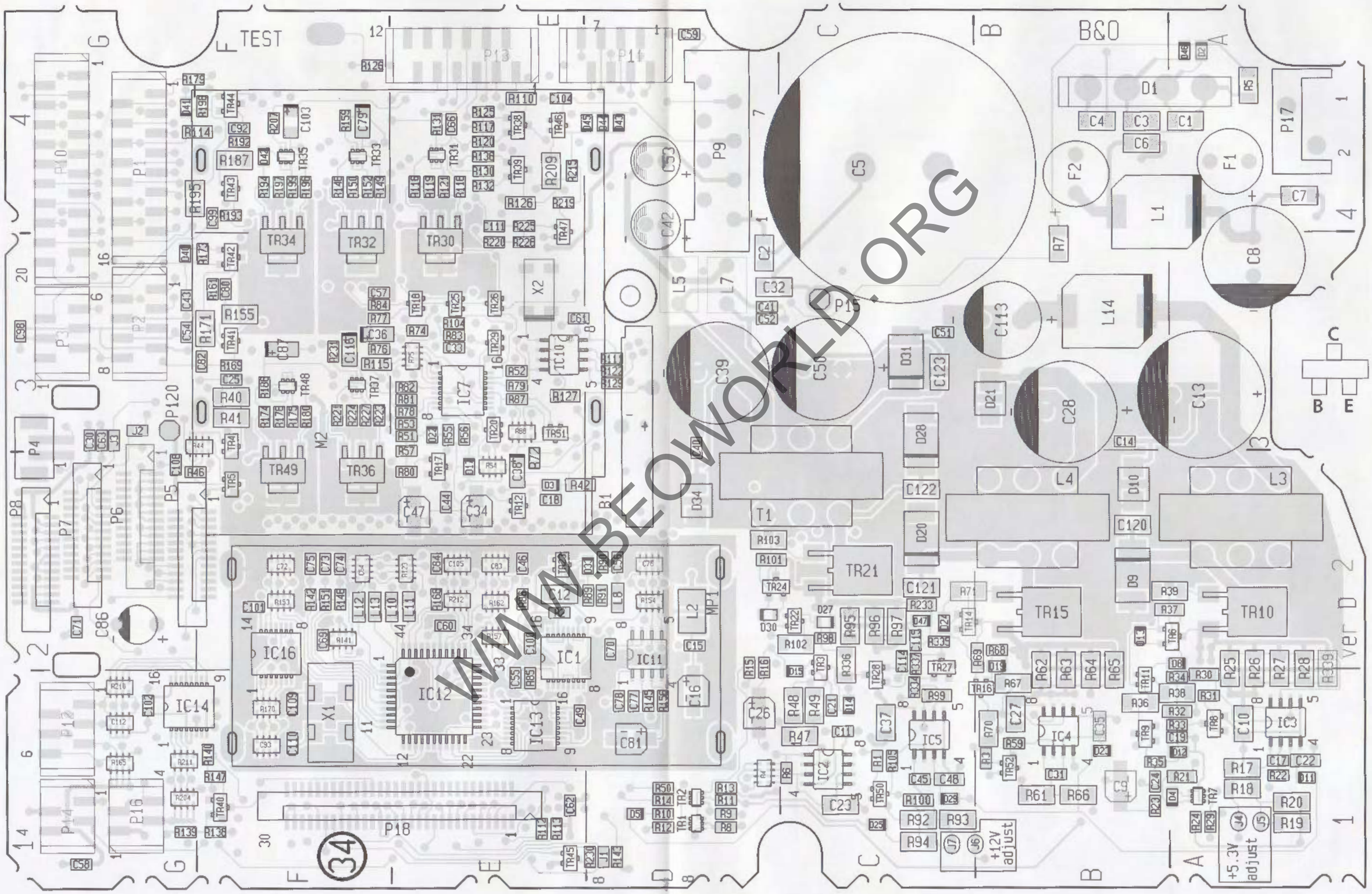


DIAGRAM J MICROCOMPUTER **PCB drawing for PCB34 see page 2-21 and for PCB24 see page 2-28**

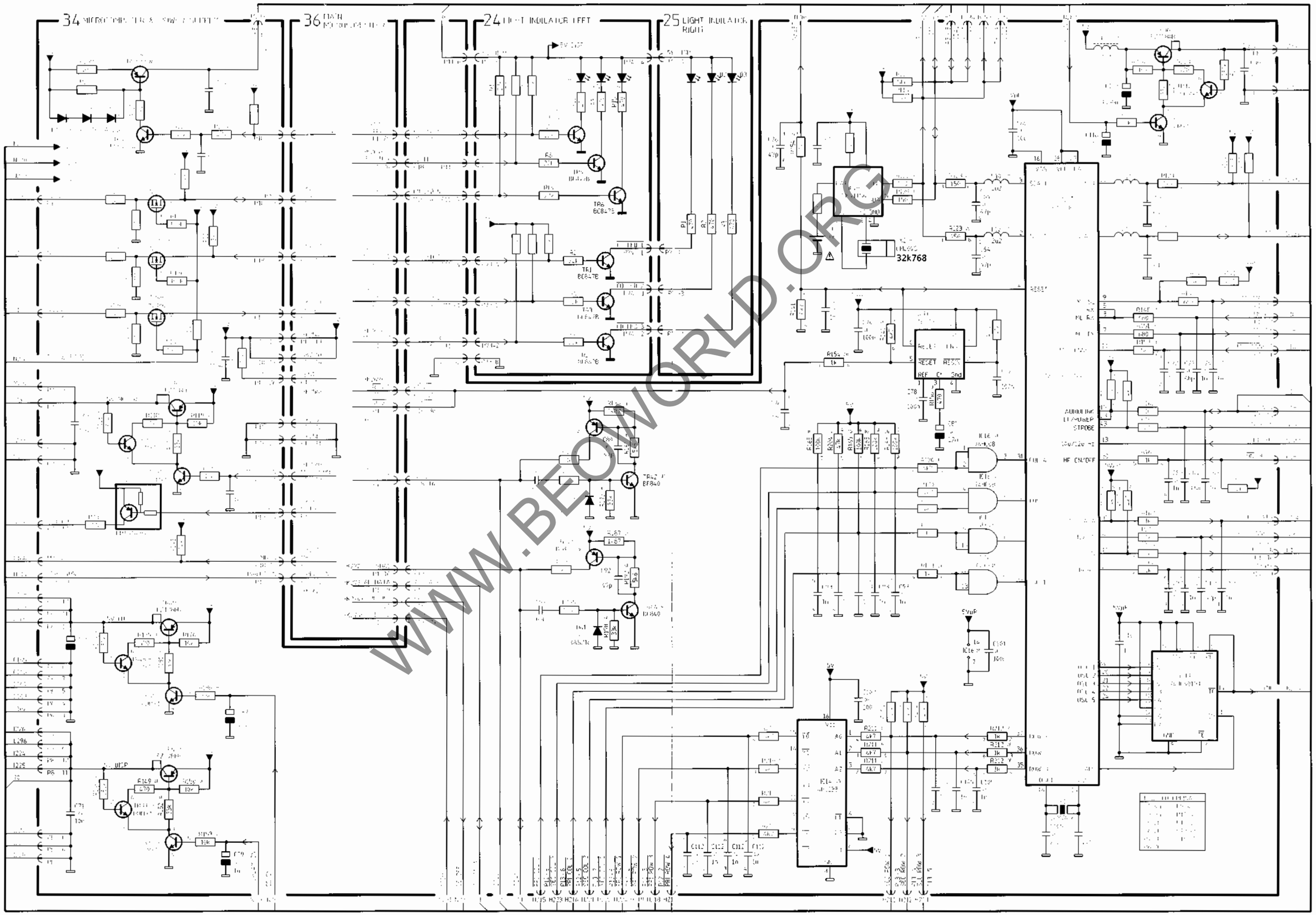


DIAGRAM K MAIN MICROCOMPUTER

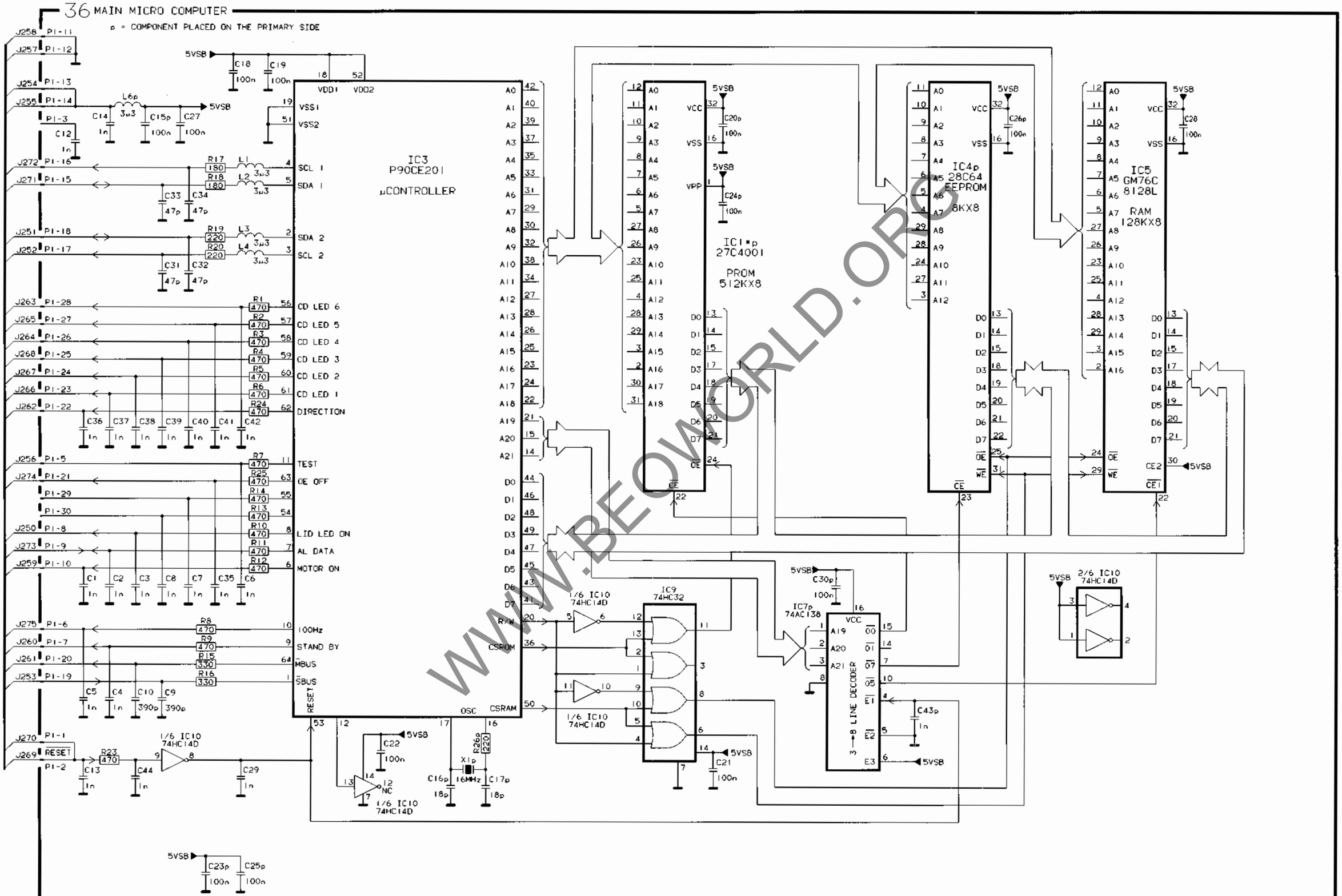
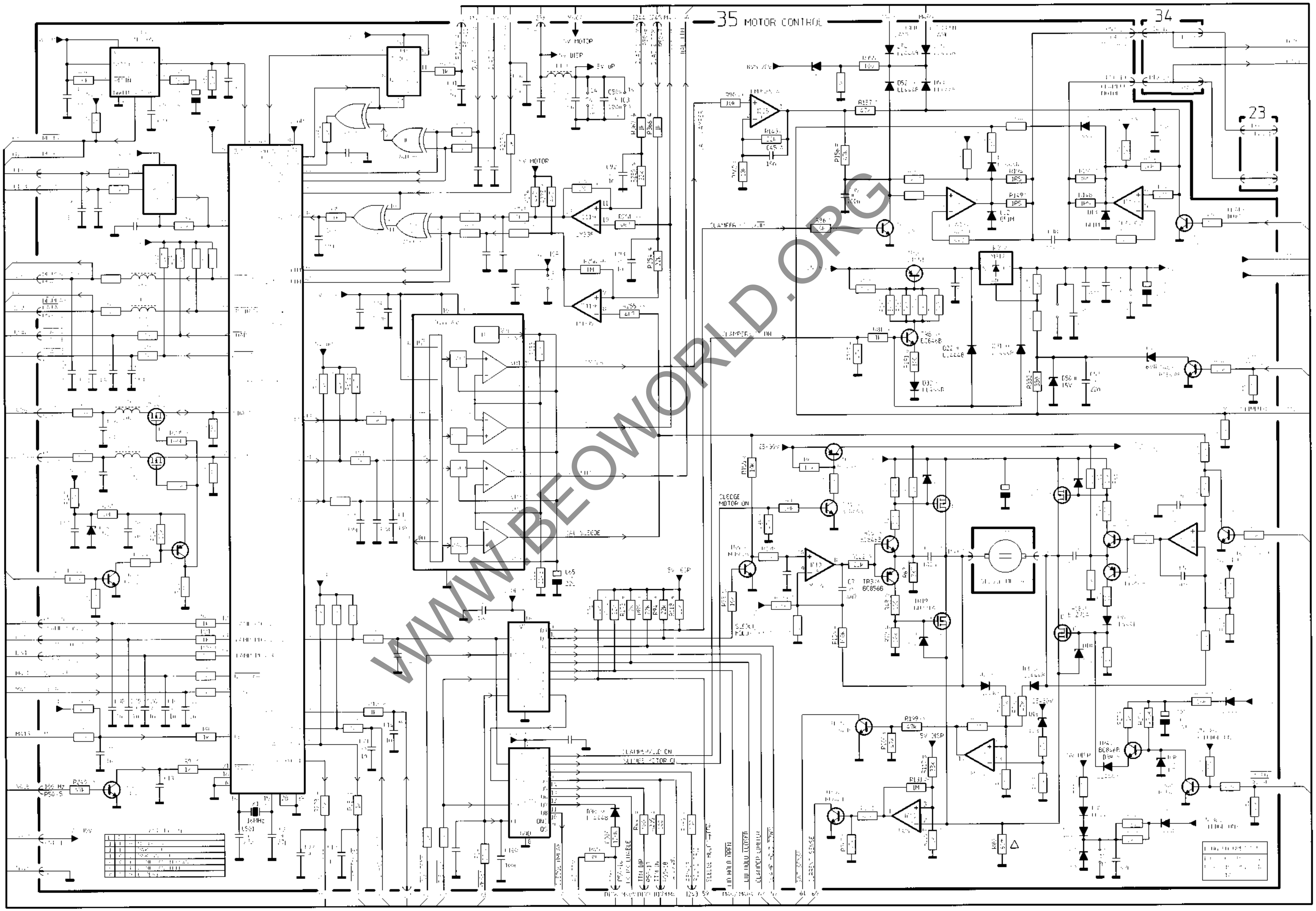
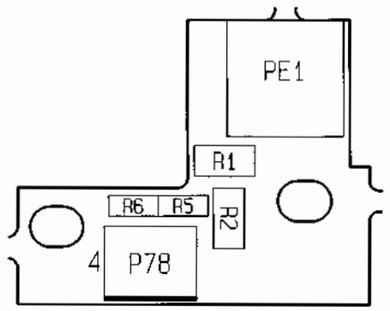


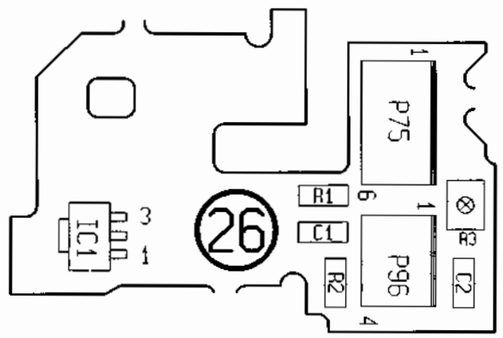
DIAGRAM L MOTOR CONTROL **PCB drawing for PCB35 see page 2-26**



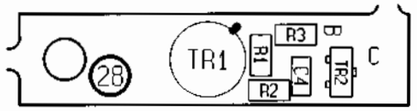
PCB9, Sledge Position, 2 layer PCB



PCB26, End Stop Detector, 2 layer PCB



PCB28, Safety RX, 2 layer PCB



PCB37, Lid Motor, 2 layer PCB

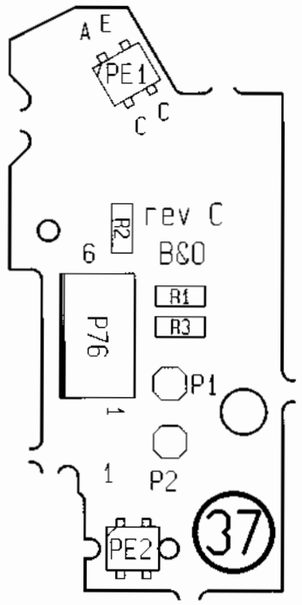
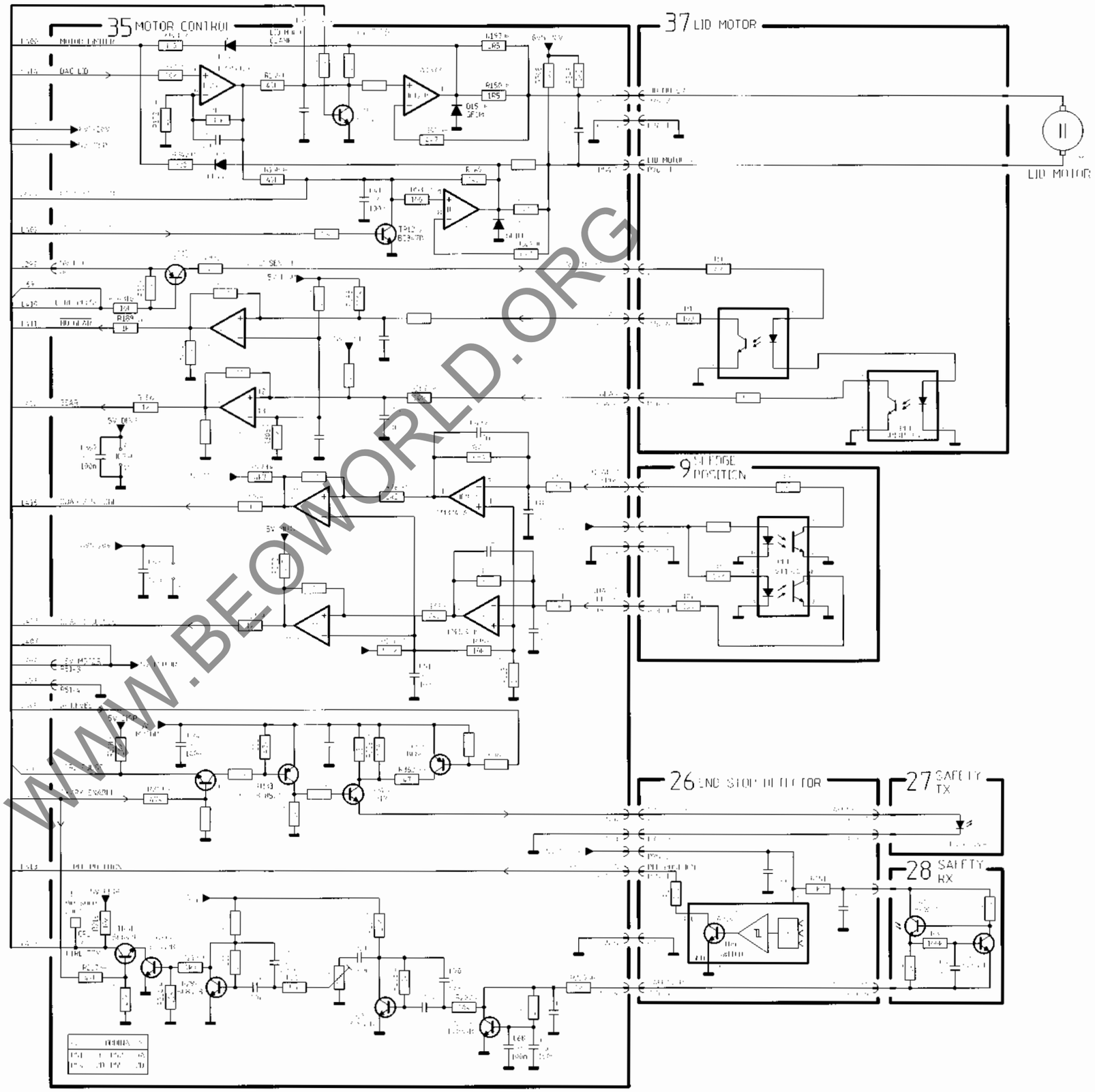


DIAGRAM M MOTOR CONTROL AND DETECTION **PCB drawing for PCB35 see page 2-26**



2-26 PCB DRAWING 2-26

PCB35, Motor Control, 4 layer PCB

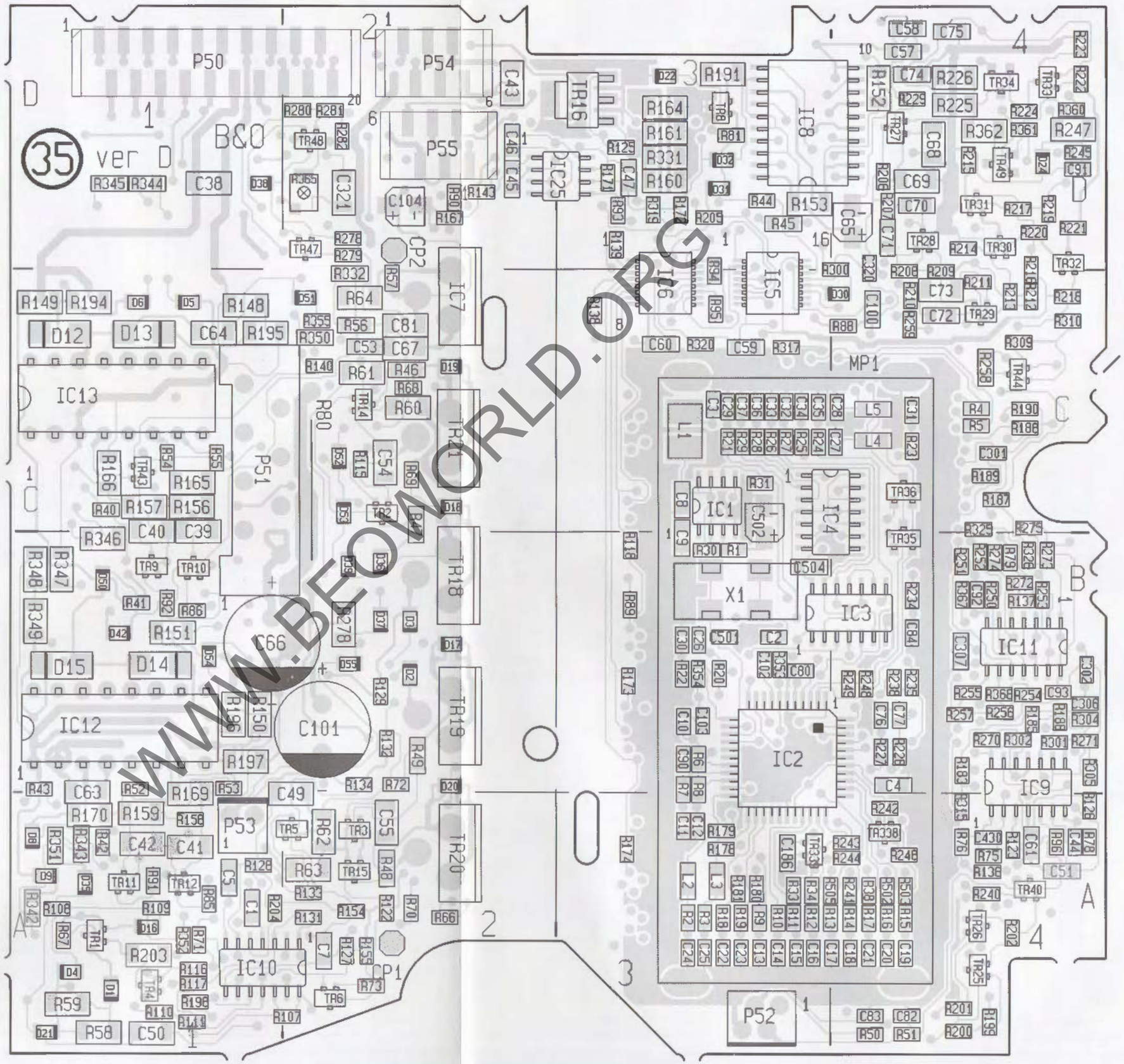


DIAGRAM N POWER SUPPLY **PCB drawing for PCB5 see page 2-28**

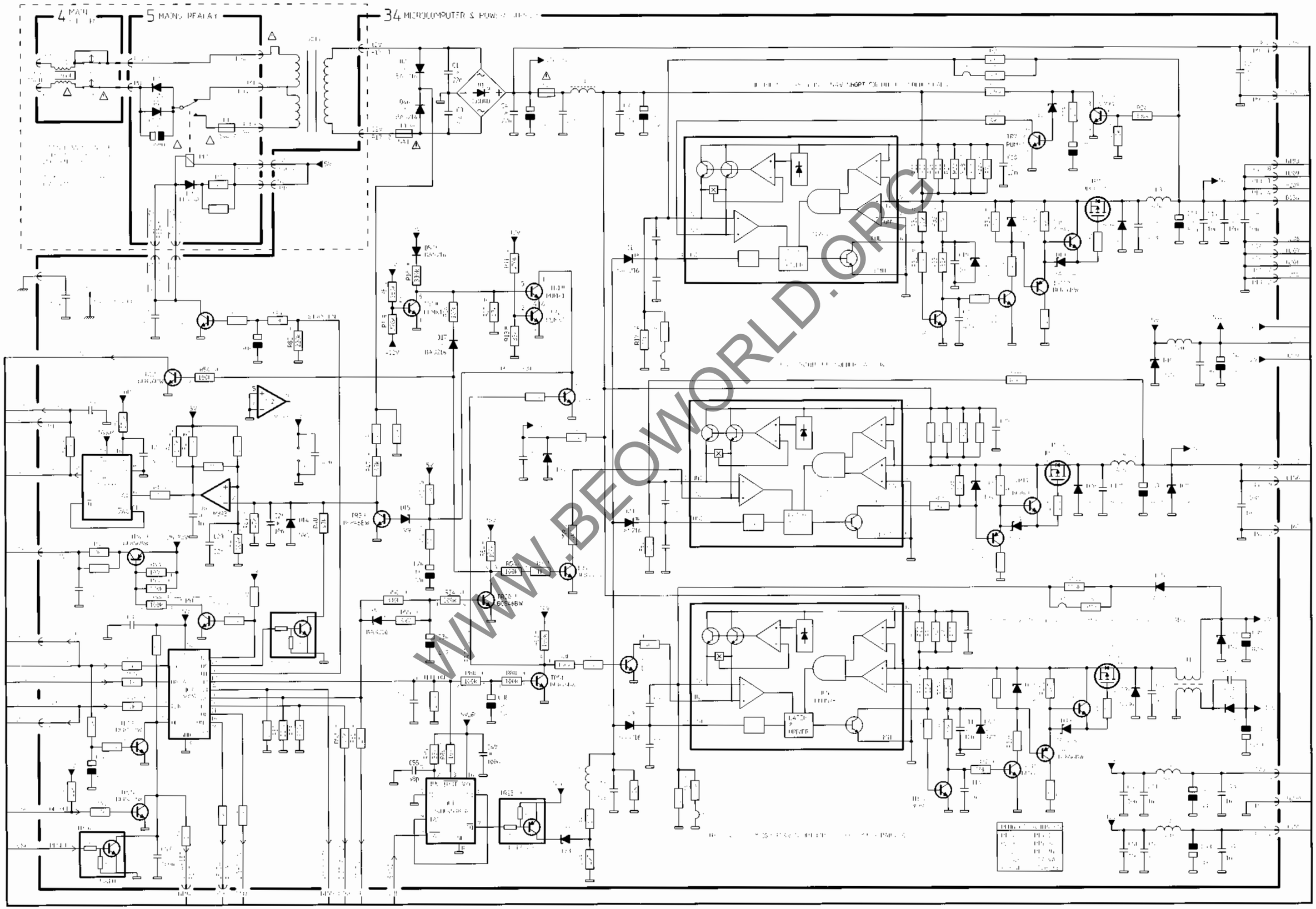
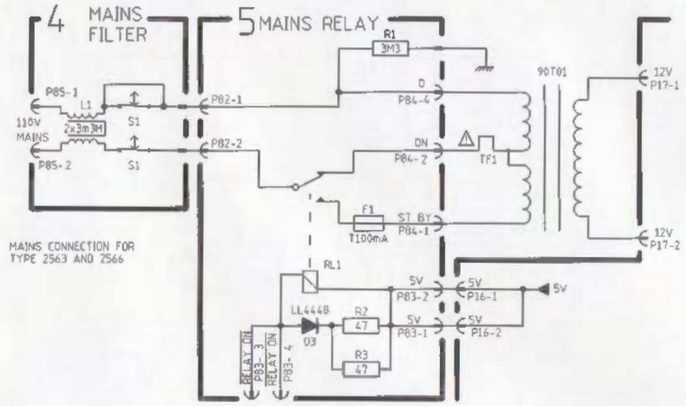
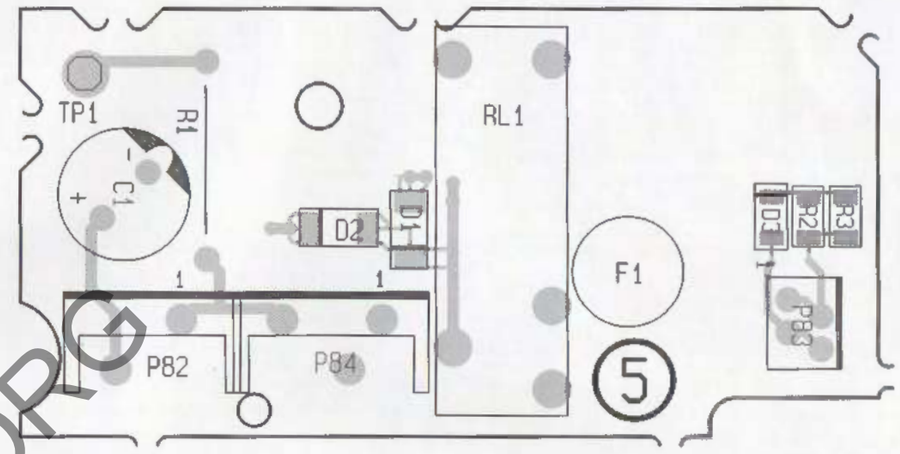


DIAGRAM O MAINS RELAY USA

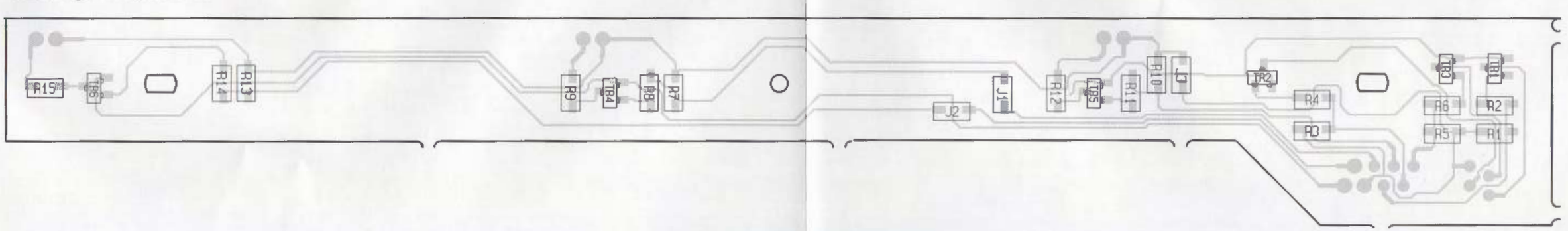


PCB5, Mains Relay, 4 layer PCB



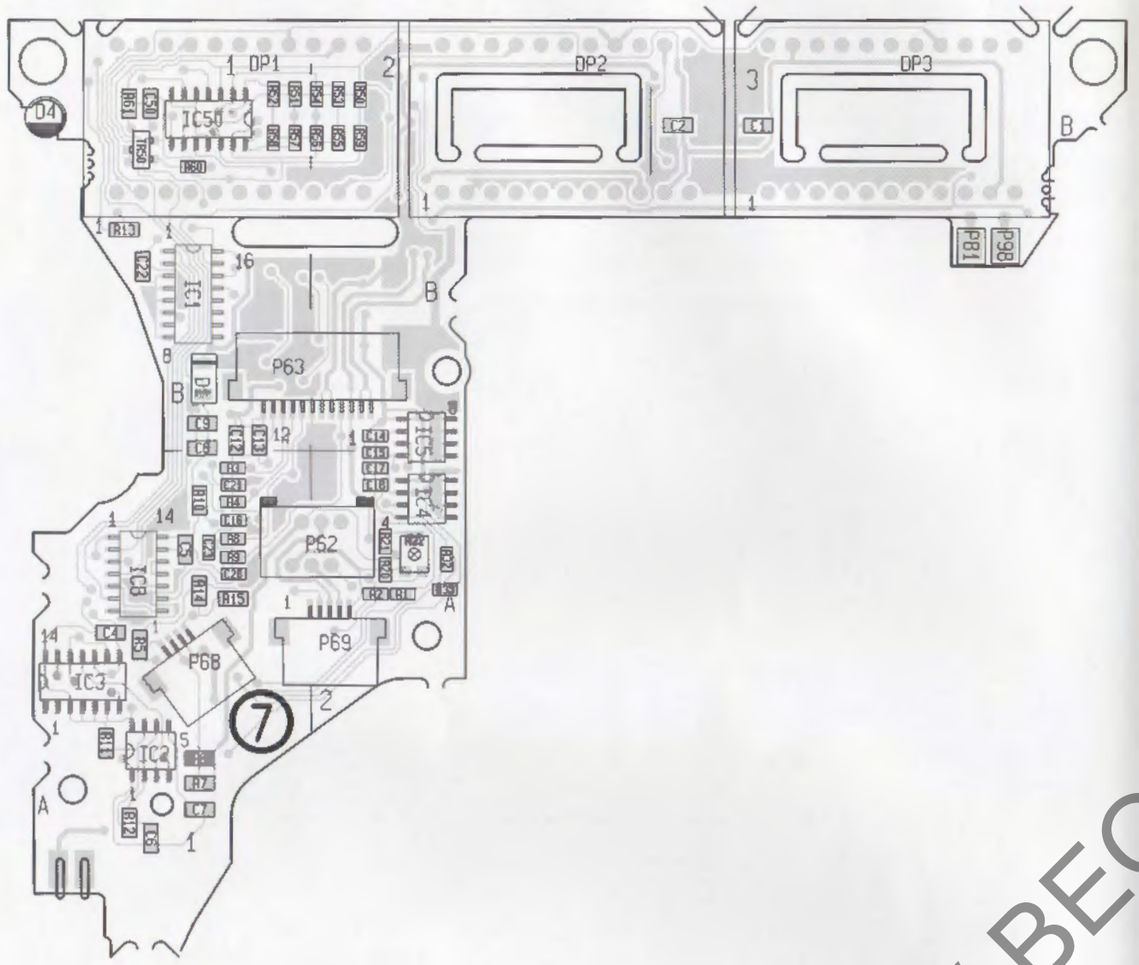
PCB14, IR Receiver, 4 layer PCB

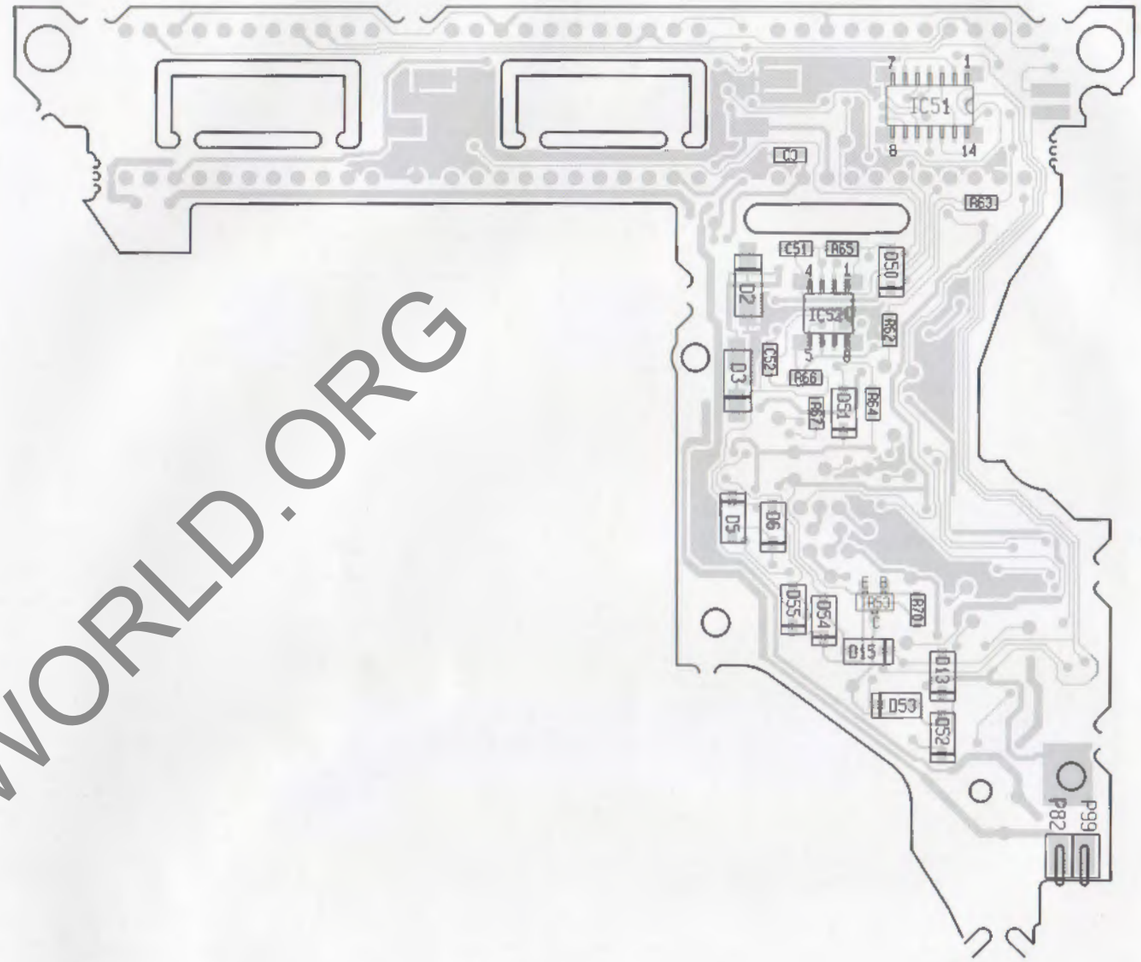
PCB24, Light indication, left



2-29 PCB DRAWINGS BANG & OLUFSEN

PCB7, Display, 2 layer PCB





PCB14, 8005299 IR receiver

IC1Δ	8341165 **138**	U2506B			
TR1	8320755 **51**	BC847B	TR3-	8320740 **51**	BF840
TR2	8320811 **51**	BC857B	TR4		
D1-	8330145 **244**	880nm Receive			
D3					
R5-	5013243	3.3KΩ 1% 1/16W			
R6					
C1	4000289	15nF 10% 50V	C7	4010274	100nF -20+80% 25V
C2	4000405	27pF 5% 50V	C8-	4200898	22µF 20% 6.3V
C3-	4000420	470pF 5% 50V	C9		
C5			C10	4200897	4.7µF 20% 25V
C6	4010271	10nF 10% 50V	C11	4001141	330pF 5% 50V
L1-	8020744	Coil 455kHz			
L2					
P49	7211053	Socket 4 pole			

PCB20, 8001736 ML interface

IC1Δ-	8341022 **151**	4558	IC8Δ–	8341024 **151**	4066
IC7Δ			IC10Δ		
TR3	8320811 **51**	BC857B	TR6	8320811 **51**	BC857B
TR4-	8320755 **51**	BC847B			
TR5					
R2	5011841	11.8KΩ 1% 1/8W	R14-	5011557	10KΩ 1% 1/8W
R4	5011841	11.8KΩ 1% 1/8W	R15		
R5-	5011531	5.9KΩ 1% 1/8W	R19-	5011557	10KΩ 1% 1/8W
R6			R20		
R8	5011841	11.8KΩ 1% 1/8W	R23-	5011571	75Ω 1% 1/8W
R10	5011841	11.8KΩ 1% 1/8W	R26		
R11-	5011531	5.9KΩ 1% 1/8W			
R12					
C1-	4000277	22pF 5% 50V	C11-	4010166	100nF -20+80% 50V
C2			C14		
C3-	4000241	100pF 5% 50V	C100-	4000345	1.0nF 5% 50V
C4			C101		
C6-	4000241	100pF 5% 50V			
C7					

PCB21, 8005301 Headphone

C1-	4011110	1.0nF 10% 50V
C2		
C3-	4010271	10nF 10% 50V
C4		
P1	7210510	Jack socket
P80	7211221	Socket 4 pole

Δ indicates that static electricity may destroy the component

LIST OF ELECTRICAL PARTS

51	138	209	250	256	265		
							

Resistors not referred to are standard, see page 3-16 and 3-17

PCB4, 8005311 Mains filter

L1▲	8022318	Coil 2 x 3.3mH
S1▲	7400433	Mains switch 2 pole
P85	7221057	Plug 2/3 pole

PCB5, 8005661 Mains relay
Type 2561, 2562, 2564, 2565, 2567

D1-	8300915 **209**	GF 1M	D3	8301045 **250**	BAS216
D2					
C1	4200821	1000µF -20+50% 6.3V			
RL1▲	7600120	Relay 5V			
F1▲	6600084	Fuse 100mAT 250V			
P82	7221057	Plug 2/3 pole	P84	7221163	Plug 4/3 pole
P83	7211221	Socket 4 pole			

PCB5, 8005664 Mains relay
Type 2563, 2566

R1	5000194	3.3MΩ 10% 1/2W
F1▲	6600148	Fuse 100mAT 125V

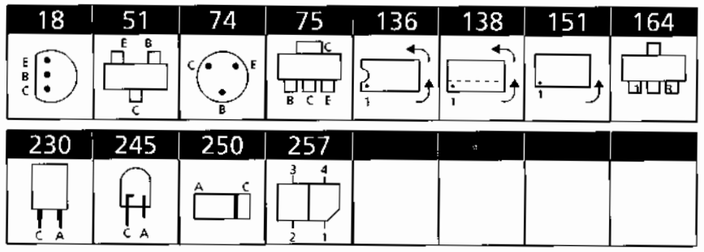
Other electrical parts like PCB5, type 2561, 2562, 2564, 2565, 2567

PCB 7, 8005364 Display

IC1Δ	8342095 **138**	74HC138	IC8Λ	8341277 **138**	74HC14
IC2Λ	8342270 **138**	TIMER 555	IC50Λ	8341857 **138**	LM339
IC3Δ	8340740 **138**	4013	IC51Λ	8340433 **138**	74HC86
IC4Δ-	8342681 **138**	SI9958DY	IC52Λ	8341812 **138**	LM393
IC5Λ					
TR50	8320755 **51**	BC847B	TR53	8320811 **51**	BC857B
D1	8300606 **250**	LL4448	D13	8300606 **250**	LL4448
D2-	8300907 **256**	GF1B	D15	8300606 **250**	LL4448
D3			D50-	8300606 **250**	LL4448
D4	8330387 **265**	Led red	D55		
D5-	8300606 **250**	LL4448			
D6					
R59	5013256	39KΩ 1% 1/16W			
C1-	4010274-	100nF -20+80% 25V	C7	4010315	22nF 10% 25V
C3			C8-	4010321	470nF -20+80% 16V
C4	4010272	22nF -20+80% 50V	C9		
C5	4010274	100nF -20+80% 25V	C10-	4201448	330µF 20% 6.3V
C6	4010314	220nF -20+80% 25V	C11		

▲ symbol of safety component, see page 2-1

Δ indicates that static electricity may destroy the component



Resistors not referred to are standard, see page 3-16 and 3-17

PCB23, 8005371 Clamper position

IC1Δ- IC2Δ	8341041 **151** LM324				
TR1	8320755 **51** BC847B				
PE1Δ- PE3Δ	8330235 **257** Optocoupler				
R23 R24 R25 R28	5012278 240KΩ 1% 1/10W 5012316 56.2KΩ 1% 1/10W 5012366 20KΩ 1% 1/10W 5012239 39KΩ 1% 1/10W	R29- R30 R33	5012290 4.87KΩ 1% 1/10W 5012366 20KΩ 1% 1/10W		
C1 C4- C5 C6 C7 C8- C9	4010271 10nF 10% 50V 4010274 100nF -20+80% 25V 4010237 1.0nF 10% 50V 4010263 2.2nF 10% 50V 4010272 22nF -20+80% 50V	C10 C11 C12 C13 C14 C15	4010237 1.0nF 10% 50V 4000415 180pF 5% 50V 4010237 1.0nF 10% 50V 4000412 100pF 5% 50V 4010237 1.0nF 10% 50V 4000412 100pF 5% 50V		
P60 P61	7211123 Socket 12 pole 7221167 Plug 6 pole	P64	7220709 Plug 2/2 pole		

PCB24, 8005304
Light indication, left

TR1- TR6	8320755 **51** BC847B				
D4- D6	8330387 **230** Led red				
P73	6276998 Plug 8 pole	P74	6276913 Plug 4 pole		

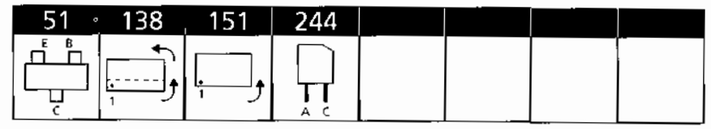
PCB25, 8005305
Light indication, right

D1- D3	8330387 **230** Led red				

PCB26, 8005315
End stop detector

IC1Δ	8342715 **164** A3141ELT				
C1	4010274 100nF -20+80% 25V	C2	4010323 1µF -20+80% 16V		
P75	7211054 Socket 6 pole	P96	7211053 Socket 4 pole		

Δ indicates that static electricity may destroy the component



Resistors not referred to are standard, see page 3-16 and 3-17

C12- C13	4010321 470nF -20+80% 16V	C20- C21	4001135 100pF 5% 50V
C14- C15	4001143 470pF 5% 50V	C22 C23	4010274 100nF -20+80% 25V 4001135 100pF 5% 50V
C16	4001135 100pF 5% 50V	C50	4010274 100nF -20+80% 25V
C17- C18	4001143 470pF 5% 50V	C51- C52	4010323 1µF -20+80% 16V
IL1	8230125 Bulb, 190mA 6.3V		
P62 P63	7211134 Socket 6 pole 7210893 Socket 12 pole	P68 P69	7210889 Socket 4 pole 7211133 Socket 5 pole

PCB9, 8005312 Sledge position

PE1Δ	8330388 TCVT1300		
R1- R2	5011853 158Ω 1% 1/4W		
P78	7211221 Socket 4 pole		

PCB11, 8005295
Main keyboard, right

S1- S4	7400429 Switch 1 pole		
P97	7211136 Socket 4 pole		

PCB12, 8005296
Main keyboard, left

S1- S4	7400429 Switch 1 pole		
P72 P98	7211054 Socket 7211136 Socket 4 pole		

PCB13, 8005313
Secondary keyboard

IC1Δ	8342095 **151** 74HC138	IC2Δ	8342297 **151** 74HC147
TR1	8320755 **51** BC847B		
C1- C2	4010316 100nF 10% 25V	C4	4010271 10nF 10% 50V
P71	7211057 Socket 12 pole		

Δ indicates that static electricity may destroy the component

PCB27, 8005377 Safety TX

D1	8330266	**245**	TSHA4480				

PCB28, 8005303 Safety RX

TR1	8330363	**74**	BPW77	TR2	8320755	**51**	BC847B
C4	4010323	1µF -20+80% 16V					

PCB29, 8005309 Lamp

IL1	8230125	Bulb, 190mA 6.3V

PCB30, 8001865
IR transmitter, tacho clamper

PCB31, 8001866
IR receiver, tacho clamper

PCB32, 8005399 Input/Output select and sound adj. with DAC

IC1Δ- IC2Δ	8341025	**138**	4094	IC12Δ	8341022	**138**	4558
				IC400Δ	8342869	**151**	CS8412
IC3Δ	8341059	**138**	4052	IC401Δ	8342497	**151**	TDA1305
IC4Δ	8342238	**151**	TDA7318D	IC402Δ	8342950	**151**	EL2045CS
IC6Δ	8340205	**151**	LF347	IC500Δ*	8342500	**151**	Asic-ML Data
IC7Δ- IC10Δ	8341022	**138**	4558	IC600Δ*	8342900	**151**	Asic-PL Data

TR1	8320512	**18**	BC338-25	TR400- TR401	8321171	**75**	FZT790A
TR2	8320523	**18**	BC328-25				
TR3	8320755	**51**	BC847B	TR402- TR404	8320755	**51**	BC847B
TR6	8320755	**51**	BC847B				
TR15- TR18	8320941	**51**	2SC4213	TR405	8320811	**51**	BC857B
	8320941	**51**	2SC4213	TR500	8321159	**51**	FMMT489
TR19- TR26	8321080	**51**	FMMT491A	TR600	8321198	**136**	PUMX1
				TR601- TR602	8321197	**136**	PUMT1
TR27- TR28	8320755	**51**	BC847B				
				TR603	8321202	**51**	PDTC114EU
TR29	8320811	**51**	BC857B				

D2- D3	8300644	**250**	Z6.2V 2% 0.5W	D19	8300762	**250**	Z9.1V 2% 0.5W
				D20- D21	8301045	**250**	BAS216
D4- D5	8301045	**250**	BAS216				
				D400	8300563	**250**	Z5.1V 2% 0.5W
D10- D14	8301045	**250**	BAS216	D500- D505	8301045	**250**	BAS216
D15- D16	8300636	**250**	Z7.5V 5% 0.5W	D600- D601	8300520	**250**	Z6.8V 5% 0.5W
D17- D18	8300723	**250**	Z8.2V 2% 0.5W				

R141- R148	5012331		10KΩ 1% 1/10W	R600	5021484		100Ω 1% 1/4W
				R602	5021484		100Ω 1% 1/4W
R194- R201	5012331		10KΩ 1% 1/10W	R604	5030052		4 x 4.7KΩ 5% 1/16W
				R605	5030054		4 x 100KΩ 5% 1/16W
R250	5012290		4.87KΩ 1% 1/10W	R606	5030052		4 x 4.7KΩ 5% 1/16W
R251	5012297		5.62KΩ 1% 1/10W	R607	5030050		4 x 10KΩ 5% 1/16W
R253	5012290		4.87KΩ 1% 1/10W	R608	5030053		4 x 47KΩ 5% 1/16W
R254	5012297		5.62KΩ 1% 1/10W	R609	5030050		4 x 10KΩ 5% 1/16W
R400	5021391		75Ω 1% 1/4W	R610	5030055		4 x 180KΩ 5% 1/16W
R406- R409	5021524		47Ω 1% 1/4W	R611	5030054		4 x 100KΩ 5% 1/16W
R425	5013223		68Ω 1% 1/16W				
R505	5011599		49.9KΩ 1% 1/8W				

** specially selected or adapted sample*

Δ indicates that static electricity may destroy the component

PCB34, 8005657
Microcomputer & Power supply
Type 2561, 2562, 2564, 2565, 2567

IC1Δ	8343327	**138**	74HC4538	IC11Δ	8341747	**138**	TL7705BCD
IC2Δ	8341812	**138**	LM393	IC12Δ*	8343286	**152**	83C524
IC3Δ- IC5Δ	8342673	**151**	ILM3578	IC13Δ	8343328	**138**	74HC40103
				IC14Δ	8343330	**138**	74HC138
IC7Δ	8343333	**138**	4094	IC16Δ	8343331	**138**	74HC08
IC10Δ	8342397	**138**	MK41T56				

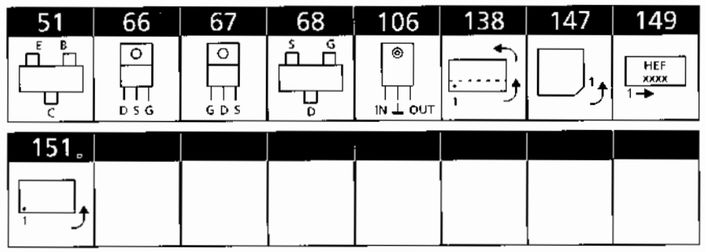
TR1- TR2	8321198	**136**	PUMX1	TR27- TR28	8320740	**51**	BF840
TR3	8321187	**51**	BC846BW	TR29	8321208	**51**	PDTC144EU
TR4	8321188	**51**	BC856BW	TR30	8321193	**75**	FZT788B
TR5	8321187	**51**	BC846BW	TR31	8321198	**136**	PUMX1
TR6	8320936	**51**	BC847C	TR32	8321193	**75**	FZT788B
TR7	8321198	**136**	PUMX1	TR33	8321198	**136**	PUMX1
TR8- TR9	8320740	**51**	BF840	TR34	8321171	**52**	FZT790A
				TR35	8321198	**136**	PUMX1
TR10	8321125	**69**	IRFR9024	TR36	8321193	**75**	FZT788B
TR11	8321188	**51**	BC856BW	TR37	8321198	**136**	PUMX1
TR12	8321187	**51**	BC846BW	TR38- TR40	8320856	**68**	2N7002
TR14	8320936	**51**	BC847C				
TR15	8321125	**69**	IRFR9024	TR41	8321188	**51**	BC856BW
TR16	8321188	**51**	BC856BW	TR42	8320740	**51**	BF840
TR17	8320752	**51**	BC817-40	TR43	8321188	**51**	BC856BW
TR18	8321187	**51**	BC846BW	TR44	8320740	**51**	BF840
TR20	8321187	**51**	BC846BW	TR45	8321207	**51**	PDTA143EU
TR21	8321125	**69**	IRFR9024	TR46	8321188	**51**	BC856BW
TR22	8321188	**51**	BC856BW	TR47	8321187	**51**	BC846BW
TR23	8321207	**51**	PDTA143EU	TR48	8321198	**136**	PUMX1
TR24	8320936	**51**	BC847C	TR49	8321193	**75**	FZT788B
TR25	8321187	**51**	BC846BW	TR50- TR52	8321187	**51**	BC846BW
TR26	8321208	**51**	PDTC144EU				

D1	8300949		Bridge 200V	D21	8301104	**250**	SM6T15C
D2	8301045	**250**	BAS216	D22- D23	8301045	**250**	BAS216
D3	8301072	**256**	Z10V 2% 0.4W				
D4	8301061	**256**	Z3.9V 2% 0.4W	D24	8301218	**256**	BAT254
D5	8301045	**250**	BAS216	D25	8301045	**250**	BAS216
D8	8301072	**256**	Z10V 2% 0.4W	D27	8301072	**256**	Z10V 2% 0.4W
D9	8301118	**250**	SS36	D28	8301118	**250**	SS36
D10	8301103	**250**	SM6T7V5CA	D29	8301045	**250**	BAS216
D11	8301045	**250**	BAS216	D30	8301218	**256**	BAT254
D12	8301061	**256**	Z3.9V 2% 0.4W	D31	8301118	**250**	SS36
D13	8301218	**256**	BAT254	D33	8301059	**256**	Z3.3V 2% 0.4W
D14	8301064	**256**	Z5.1V 2% 0.4W	D34	8301104	**250**	SM6T15C
D15	8301061	**256**	Z3.9V 2% 0.4W	D40- D46	8301045	**250**	BAS216
D17	8301045	**250**	BAS216				
D19	8301072	**256**	Z10V 2% 0.4W	D47	8301061	**256**	Z3.9V 2% 0.4W
D20	8301118	**250**	SS36				

R4	5030054		4 x 100KΩ 5% 1/16W	R70- R71	5021484		100Ω 1% 1/4W
R5	5021508		47KΩ 1% 1/4W				
R7	5021508		47KΩ 1% 1/4W	R75	5030051		4 x 1KΩ 5% 1/16W
R17	5012382		10KΩ 0.1% 1/4W	R88	5030054		4 x 100KΩ 5% 1/16W
R18	5023035		560KΩ 1% 1/4W	R92	5012382		10KΩ 0.1% 1/4W
R19	5023052		470KΩ 1%1/4W	R93	5012169		220KΩ 1% 1/4W
R20	5012175		43.2KΩ 1% 1/4W	R94	5023032		3.3MΩ 1% 1/4W
R25- R28	5021542		0.22Ω 5% 1/4W	R95- R97	5021542		0.22Ω 5% 1/4W
R38- R39	5021484		100Ω 1% 1/4W	R100	5012392		110KΩ 1% 1/10W
				R102- R103	5021484		100Ω 1% 1/4W
R40- R41	5012200		2.2KΩ 1% 1/4W				
				R112- R113	5013246		5.6KΩ 1% 1/16W
R44	5030054		4 x 100KΩ 5% 1/16W				
R47- R49	5021508		47KΩ 1% 1/4W	R116	5013264		180KΩ 1% 1/16W
				R123	5030059		4 x 150Ω 5% 1/16W
R54	5030054		4 x 100KΩ 5% 1/16W	R141	5030052		4 x 4.7KΩ 5% 1/16W
R61	5012382		10KΩ 0.1% 1/4W	R142	5013235		680Ω 1% 1/16W
R62- R65	5021542		0.22Ω 5% 1/4W	R143	5013247		6.8KΩ 1% 1/16W
				R146	5013264		180KΩ 1% 1/16W
R66	5011843		80.6KΩ 1% 1/8W	R148	5013235		680Ω 1% 1/16W

** specially selected or adapted sample*

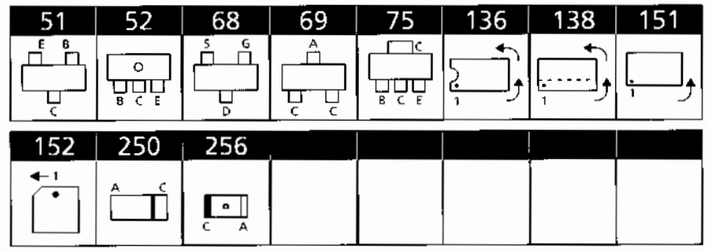
Δ indicates that static electricity may destroy the component



Resistors not referred to are standard, see page 3-16 and 3-17

R151	5013235	680Ω 1% 1/16W	R187	5012209	1.87KΩ 1% 1/4W
R153-	5030051	4 x 1KΩ 5% 1/16W	R192	5013246	5.6KΩ 1% 1/16W
R154			R195	5012209	1.87KΩ 1% 1/4W
R155	5012209	1.87KΩ 1% 1/4W	R204	5030054	4 x 100KΩ 5% 1/16W
R157	5030052	4 x 4.7KΩ 5% 1/16W	R209	5021484	100Ω 1% 1/4W
R161	5013246	5.6KΩ 1% 1/16W	R210-	5030052	4 x 4.7KΩ 5% 1/16W
R162	5030051	4 x 1KΩ 5% 1/16W	R211		
R165	5030054	4 x 100KΩ 5% 1/16W	R212	5030051	4 x 1KΩ 5% 1/16W
R170	5030052	4 x 4.7KΩ 5% 1/16W	R221	5013264	180KΩ 1% 1/16W
R171	5012209	1.87KΩ 1% 1/4W	R339	5021542	0.22Ω 5% 1/4W
R174	5013264	180KΩ 1% 1/16W			

C1-	4010216	22nF 10% 100V	C49	4011135	100nF -20%+80% 16V
C4			C50	4201407	820µF 20% 25V
C5	4201179	15000µF 20% 50V	C51	4011122	10nF 10% 50V
C6-	4010216	22nF 10% 100V	C52	4011110	1.0nF 10% 50V
C7			C53	4201254	33µF 20% 16V
C8	4201406	330µF 20% 50V	C54	4011110	1.0nF 10% 50V
C9	4200898	22µF 20% 6V3	C55	4001133	68pF 5% 50V
C10	4010216	22nF 10% 100V	C56-	4001135	100pF 5% 50V
C11	4011135	100nF -20%+80% 16V	C57		
C12	4010216	22nF 10% 100V	C58-	4011122	10nF 10% 50V
C13	4201178	8200µF 20% 10V	C59		
C14-	4011122	10nF 10% 50V	C60-	4011135	100nF -20%+80% 16V
C15			C62		
C16	4200898	22µF 20% 6V3	C63	4011122	10nF 10% 50V
C17	4001127	22pF 5% 50V	C64	4011057	4 x 47pF 10% 50V
C18-	4011122	10nF 10% 50V	C66	4011122	10nF 10% 50V
C19			C69	4011110	1.0nF 10% 50V
C21	4011122	10nF 10% 50V	C70	4011135	100nF -20%+80% 16V
C22	4000442	2.2nF 5% 50V	C71	4011122	10nF 10% 50V
C23	4010216	22nF 10% 100V	C72	4011056	4 x 1nF 10% 50V
C24	4001131	47pF 5% 50V	C73	4001133	68pF 5% 50V
C25	4011135	100nF -20%+80% 16V	C74-	4011110	1.0nF 10% 50V
C26	4200898	22µF 20% 6V3	C75		
C27	4010216	22nF 10% 100V	C76	4011056	4 x 1nF 10% 50V
C28	4201407	820µF 20% 25V	C77-	4011135	100nF -20%+80% 16V
C30	4011122	10nF 10% 50V	C78		
C31	4001127	22pF 5% 50V	C79	4201348	1µF 10% 16V
C32	4010220	100nF 10% 50V	C80	4001131	47pF 5% 50V
C33	4011135	100nF -20%+80% 16V	C81	4200898	22µF 20% 6.3V
C34	4200916	4.7µF 20% 25V	C82	4001133	68pF 5% 50V
C35	4000442	2.2nF 5% 50V	C83	4011056	4 x 1nF 10% 50V
C36	4201348	1µF 10% 16V	C84	4001141	330pF 5% 50V
C37	4010216	22nF 10% 100V	C86	4200972	4.7µF 20% 10V
C38	4201348	1µF 10% 16V	C87	4201362	2.2µF 10% 10V
C39	4201407	820µF 20% 25V	C92	4001131	47pF 5% 50V
C40	4011122	10nF 10% 50V	C93	4011056	4 x 1nF 10% 50V
C41	4011110	1.0nF 10% 50V	C98	4011122	10nF 10% 50V
C42	4201254	33µF 20% 16V	C99	4001133	68pF 5% 50V
C43-	4011110	1.0nF 10% 50V	C100-	4011135	100nF -20%+80% 16V
C44			C102		
C45	4001127	22pF 5% 50V	C103	4201348	1µF 10% 16V
C46	4011110	1.0nF 10% 50V	C104	4011122	10nF 10% 50V
C47	4200916	4.7µF 20% 25V	C105	4011056	4 x 1nF 10% 50V
C48	4000442	2.2nF 5% 50V	C108	4011122	10nF 10% 50V



Resistors not referred to are standard, see page 3-16 and 3-17

C1-	4000420	470pF 5% 50V	C113-	4201164	47µF 20% 10V
C4			C114		
C5-	4000351	1.5nF 5% 50V	C116	4201391	10µF 20% 50V
C6			C130	4000414	150pF 5% 50V
C7-	4000408	47pF 5% 50V	C131	4000457	1.5nF 5% 50V
C14			C132	4000414	150pF 5% 50V
C17-	4000412	100pF 5% 50V	C133	4000457	1.5nF 5% 50V
C22			C134-	4010271	10nF 10% 50V
C33-	4000416	220pF 5% 50V	C135		
C38			C150	4200972	4.7µF 20% 10V
C41-	4000424	1nF 5% 50V	C400	4000408	47pF 5% 50V
C42			C401	4010274	100nF -20+80% 25V
C43	4010237	1.0nF 10% 50V	C402	4010273	47nF -20+80% 50V
C45-	4000424	1nF 5% 50V	C403	4010274	100nF -20+80% 25V
C46			C404	4201164	47µF 20% 10V
C49-	4010237	1.0nF 10% 50V	C405-	4000424	1nF 5% 50V
C50			C406		
C51-	4000424	1nF 5% 50V	C407-	4010274	100nF -20+80% 25V
C52			C408		
C53	4010237	1.0nF 10% 50V	C411	4201348	1µF 10% 16V
C54	4010271	10nF 10% 50V	C412-	4010274	100nF -20+80% 25V
C56	4010271	10nF 10% 50V	C414		
C59-	4010271	10nF 10% 50V	C415-	4201163	10µF 20% 35V
C64			C416		
C66-	4010271	10nF 10% 50V	C417-	4010274	100nF -20+80% 25V
C71			C422		
C73	4010271	10nF 10% 50V	C500	4010237	1.0nF 10% 50V
C74-	4010274	100nF -20+80% 25V	C501	4000416	220pF 5% 50V
C79			C502	4000412	100pF 5% 50V
C82-	4010274	100nF -20+80% 25V	C503	4010316	100nF 10% 25V
C85			C504	4010274	100nF -20+80% 25V
C86-	4130307	150nF 10% 63V	C505-	4201163	10µF 20% 35V
C89			C507		
C90-	4200916	4.7µF 20% 25V	C600	4010274	100nF -20+80% 25V
C107			C601-	4010132	1.0nF 10% 50V
C108-	4010271	10nF 10% 50V	C602		
C109			C603	4000408	47pF 5% 50V
C110	4000281	82pF 5% 50V	C604	4000416	220pF 5% 50V
C111-	4201163	10µF 20% 35V			
C112					

L1-	8020705	Coil 100µH 10%	L5-	8020821	Coil 2.2µH 5%
L4			L6		

T400	8021159	Transformer 796KHz

P1	7210418	Socket 7 pole	P24	7211221	Socket 4 pole
P2-	7210689	Socket 8 pole	P26	7221272	Plug 2/2 pole
P3			P27	7221181	Plug 2 pole
P4	7210904	Socket 16 pole			
P20	7211221	Socket 4 pole			
P21	7211223	Socket 8 pole			
P22	7211227	Socket 16 pole			
P23	7500296	Contact pin			

C66	4201330	220µF 20% 50V	C100	4010274	100nF -20+80% 25V
C67-	4010220	100nF 10% 50V	C101	4200858	220µF 20% 50V
C69			C102-	4001141	330pF 5% 50V
C70	4000409	56pF 5% 50V	C103		
C71	4010307	33nF 10% 25V	C104	4200916	4.7µF 20% 25V
C72	4000414	150pF 5% 50V	C186	4010274	100nF -20+80% 25V
C73	4010216	22nF 10% 100V	C301-	4011110	1.0nF 10% 50V
C74-	4010274	100nF -20+80% 25V	C302		
C75			C306	4011110	1.0nF 10% 50V
C76-	4011110	1.0nF 10% 50V	C307	4010274	100nF -20+80% 25V
C77			C320	4011110	1.0nF 10% 50V
C80	4011110	1.0nF 10% 50V	C321	4010220	100nF 10% 50V
C81	4010220	100nF 10% 50V	C430	4011110	1.0nF 10% 50V
C82-	4001141	330pF 5% 50V	C501	4001127	22pF 5% 50V
C83			C502	4200916	4.7µF 20% 25V
C84	4011110	1.0nF 10% 50V	C504	4010274	100nF -20+80% 25V
C90-	4011110	1.0nF 10% 50V			
C93					

L1	8020772	Coil 10µH 20%
L2-	8021079	Coil 2.2µH 10%
L5		

X1	8090182	Crystal 16MHz

CP1	7530117	Contact pin

P50	7211229	Socket 20 pole	P53	7221159	Plug 2 pole
P51	7221133	Plug 8/8 pole	P54-	7211222	Socket 6 pole
P52	7211053	Socket 4 pole	P55		

MP1	3302352	Screen

PCB36, 8005683
Main microcomputer

IC1Δ*	8343406	**152**	27C040	IC4Δ	8341576	**152**	EEPROM 28C64

MP1	3162339	Cover	MP2	3304142	Shield

PCB37, 8005314 Lid motor

PE1Δ- PE2Δ	8330235	**257**	Optocoupler

P76	7211075	Socket 6 pole

PCB40, 8005430
CD VAM 1205 without DAC

IC1Δ	8342559	**151**	LB1619M	IC11Δ*	8343438	**147**	83C524
IC4Δ	8341024	**150**	4066	IC12Δ	8342941	**147**	SAA7376GP
IC5Δ-	8341098	**138**	LM358	IC14Δ	8343083	**149**	TDA7072AT
IC7Δ				IC15Δ	8342495	**138**	TDA7073A
IC10Δ	8341612	**138**	TL7705	IC16Δ	8343365	**152**	PIC12C508

TR1	8321184	**75**	MJD122	TR5	8321196	**136**	PUMZ1
TR2- TR3	8320752	**51**	BC817-40				

D1	8330422	**269**	IR emitter	D5	8300482	**250**	LL4148
D3	8301035	**267**	BAV99W				

PE1	8330360	**270**	Photo transistor

** specially selected or adapted sample*

Δ indicates that static electricity may destroy the component

C109- C110	4001127	22pF 5% 50V	C114	4001131	47pF 5% 50V
			C115	4011122	10nF 10% 50V
C111	4011122	10nF 10% 50V	C116	4201348	1µF 10% 16V
C112	4011056	4 x 1nF 10% 50V	C120- C123	4000466	470pF 5% 100V
C113	4201337	1000µF 20% 10V			

L1	8021113	Coil 47µH 10%	L7	8020916	Coil 47µH 5%
L2	8020772	Coil 10µH 20%	L8	8021079	Coil 2.2µH 10%
L3- L4	8020914	Coil 470µH 15%	L10- L13	8021079	Coil 2.2µH 10%
L5	8020916	Coil 47µH 5%	L14	8021113	Coil 47µH 10%

T1	8021268	Transformer 2 x 470µH

X1	8090200	Crystal 14.7456MHz	X2	8090230	Crystal 32.768KHz

B1▲*	8700029	Lithium battery

F1▲	6600145	Fuse 5AT 250V	F2▲	6600155	Fuse 1.6AT 250V

P1	7211227	Socket 16 pole	P11	7211223	Socket 8 pole
P2	7211223	Socket 8 pole	P12	7211222	Socket 6 pole
P3	7211222	Socket 6 pole	P13	7211225	Socket 12 pole
P4	7221272	Plug 2/2 pole	P14	7211221	Socket 4 pole
P5- P8	7211234	Socket 12 pole	P15	6030359	Ground wire
			P16	7211221	Socket 4 pole
P9	7221133	Plug 8/8 pole	P17	7221057	Plug 2/3 pole
P10	7211229	Socket 20 pole	P20	7211235	Socket 30 pole

MP1	3302352	Screen

PCB34, 8005663
Microcomputer & Power supply
Type 2563, 2566

F1	6600137	Fuse 5AT 125V
F2	6600116	Fuse 1.6AT 125V

Other electrical parts like PCB34, type 2561, 2562, 2564, 2565, 2567

PCB35, 8005658 Motor Control

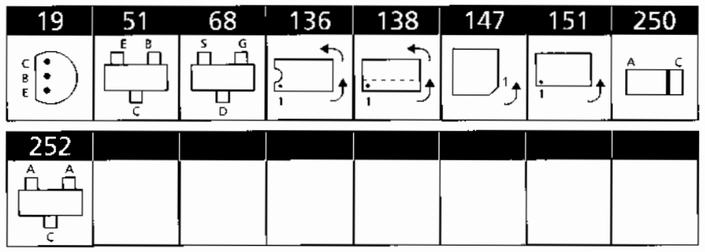
IC1Δ	8341747	**138**	TL7705BCD	IC8Δ	8342552	**138**	DAC 0854
IC2Δ*	8343407	**147**	87C654	IC9Δ- IC10Δ	8341041	**138**	LM324
IC3Δ	8340433	**138**	74HC86				
IC4Δ	8340571	**138**	74HC74	IC11Δ	8341857	**138**	LM339
IC5Δ- IC6Δ	8343333	**149**	4094B	IC12Δ- IC13Δ	8341682	**151**	TCA0372
IC7Δ	8340244	**106**	LM317	IC25Δ	8341098	**138**	LM358

TR1- TR3	8321188	**51**	BC856BW	TR33	8321188	**51**	BC856BW
				TR34	8320752	**51**	BC817-40
TR4- TR6	8321187	**51**	BC846BW	TR35- TR36	8320856	**68**	2N7002
TR8- TR12	8321187	**51**	BC846BW	TR40	8321187	**51**	BC846BW
				TR43	8321187	**51**	BC846BW
TR14- TR15	8321187	**51**	BC846BW	TR44	8321188	**51**	BC856BW
				TR47- TR48	8321187	**51**	BC846BW
TR16	8321176	**51**	FZT951				
TR18- TR19	8321016	**67**	BUZ71A	TR49	8320971	**51**	BC807-40
				TR338	8321188	**51**	BC856BW
TR20- TR21	8321154	**66**	BUZ271	TR339	8321187	**51**	BC846BW
TR25- TR32	8321187	**51**	BC846BW				

▲ symbol of safety component, see page 2-1

** specially selected or adapted sample*

Δ indicates that static electricity may destroy the component



Resistors not referred to are standard, see page 3-16 and 3-17

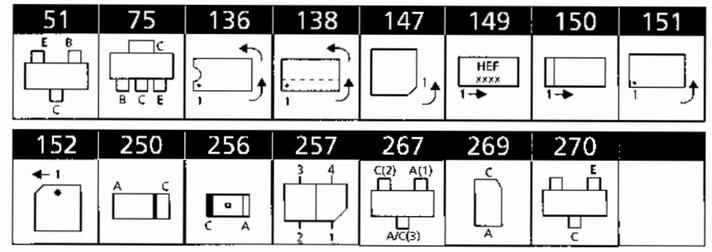
R2	5021490	28Ω 1% 1/4W	R42	5024000	1Ω
R4▲-	5024001	2.2Ω	R44	5012239	39KΩ 1% 1/10W
R5▲			R46	5012239	39KΩ 1% 1/10W
R15▲	5024001	2.2Ω	R61▲	5024001	2.2Ω
R21	5012332	4.7KΩ 1% 1/10W	R63▲	5024001	2.2Ω
R27	5012366	20KΩ 1% 1/10W	R68▲	5024000	1Ω
R28	5012240	100KΩ 1% 1/10W	R76	5013236	820Ω 1% 1/16W
R30	5012154	1KΩ 1% 1/8W	R78▲	5024001	2.2Ω
R31-	5012237	6.8KΩ 1% 1/10W	R83▲	5024000	1Ω
R32			R86-	5013250	12KΩ 1% 1/16W
R34-	5012239	39KΩ 1% 1/10W	R87		
R35			R95-	5013250	12KΩ 1% 1/16W
R36	5012237	6.8KΩ 1% 1/10W	R96		
R40	5012331	10KΩ 1% 1/10W	R98	5013223	68Ω 1% 1/16W

C1	4201359	3.3µF 20% 16V	C43	4000424	1nF 5% 50V
C2	4011135	100nF -20%+80% 16V	C44-	4000400	10pF 5% 50V
C4	4011135	100nF -20%+80% 16V	C45		
C5	4201359	3.3µF 20% 16V	C46	4010237	1.0nF 10% 50V
C6	4011135	100nF -20%+80% 16V	C47	4011135	100nF -20%+80% 16V
C7	4010315	22nF 10% 25V	C48	4201359	3.3µF 20% 16V
C8	4011135	100nF -20%+80% 16V	C49-	4011135	100nF -20%+80% 16V
C11	4011135	100nF -20%+80% 16V	C51		
C12-	4001139	220pF 5% 50V	C52	4000424	1nF 5% 50V
C15			C53	4011135	100nF -20%+80% 16V
C16	4010273	47nF -20%+80% 50V	C54	4000412	100pF 5% 50V
C17	4010261	1.5nF 10% 50V	C55	4011135	100nF -20%+80% 16V
C18	4000421	560pF 5% 50V	C56	4201349	47µF 10V 20%
C19-	4001139	220pF 5% 50V	C57-	4011135	100nF -20%+80% 16V
C20			C58		
C21	4011135	100nF -20%+80% 16V	C59	4201359	3.3µF 20% 16V
C22	4010274	100nF -20%+80% 25V	C60	4001131	47pF 5% 50V
C23	4000412	100pF 5% 50V	C61	4201362	2.2µF 10V 10%
C24	4011126	22nF 10% 25V	C62	4011135	100nF -20%+80% 16V
C25-	4011135	100nF -20%+80% 16V	C63	4201348	1µF 16V 10%
C27			C64	4011122	10nF 10% 50V
C28	4000423	820pF 5% 50V	C65	4001141	330pF 5% 50V
C29	4001131	47pF 5% 50V	C66	4011135	100nF -20%+80% 16V
C30	4010282	470nF -20%+80% 25V	C67-	4001139	220pF 5% 50V
C31	4201359	3.3µF 20% 16V	C68		
C32	4010282	470nF -20%+80% 25V	C69	4201349	47µF 20% 10V
C33	4011122	10nF 10% 50V	C70-	4011135	100nF -20+80% 16V
C34	4000442	2.2nF 5% 50V	C71		
C35	4011135	100nF -20%+80% 16V	C72	4011123	12nF 10% 25V
C36	4201359	3.3µF 20% 16V	C73	4001141	330pF 5% 50V
C37-	4011135	100nF -20%+80% 16V	C74	4001139	220pF 5% 50V
C39			C75-	4011135	100nF -20%+80% 16V
C41	4201359	3.3µF 20% 16V	C76		
C42	4011135	100nF -20%+80% 16V	C77	4000442	2.2nF 5% 50V

L1	8021135	Coil 10µH	L2	8020822	Coil 3.3µH 5%

T1	8021159	Transformer 796KHz

▲ *symbol of safety component, see page 2-1*



Resistors not referred to are standard, see page 3-16 and 3-17

D1-	8301045	**250** BAS216	D30-	8301045	**250** BAS216
D6			D32		
D8-	8301045	**250** BAS216	D35-	8301045	**250** BAS216
D9			D37		
D12-	8300915	**250** GF1M	D38	8301074	**256** Z12V 2% 0.4W
D15			D39	8301045	**250** BAS216
D16	8301059	**256** Z3.3V 2% 0.4W	D42	8301067	**250** Z6.8V 2% 0.4W
D17-	8301076	**256** Z15V 2% 0.4W	D50	8301077	**256** Z16V 2% 0.4W
D20			D51	8301056	**256** Z2.7V 2% 0.4W
D21	8301081	**256** Z24V 2% 0.4W	D52-	8301045	**250** BAS216
D22	8301045	**250** BAS216	D55		
D24	8301076	**256** Z15V 2% 0.4W			

R45	5012239	39KΩ 1% 1/10W	R169-	5023000	1.2KΩ 1% 1/4W
R58-	5012200	2.2KΩ 1% 1/4W	R170		
R64			R171	5013256	39KΩ 1% 1/16W
R75	5013235	680Ω 1% 1/16W	R191	5021484	100Ω 1% 1/4W
R78	5013235	680Ω 1% 1/16W	R194-	5021151	1.5Ω 1% 1/4W
R80	5012142	60mΩ	R197		
R148-	5021151	1.5Ω 1% 1/4W	R203	5021225	10KΩ 1% 1/4W
R151			R212	5013256	39KΩ 1% 1/16W
R152	5023002	11.3KΩ 1% 1/4W	R225	5011903	180Ω 1% 1/4W
R153	5021225	10KΩ 1% 1/4W	R226	5011853	158Ω 1% 1/4W
R156-	5021508	47KΩ 1% 1/4W	R247	5021225	10KΩ 1% 1/4W
R157			R278	5021225	10KΩ 1% 1/4W
R159	5021508	47KΩ 1% 1/4W	R280	5013264	180KΩ 1% 1/16W
R160-	5021372	5.36KΩ 1% 1/4W	R331	5021372	5.36KΩ 1% 1/4W
R161			R346-	5012200	2.2KΩ 1% 1/4W
R164	5021372	5.36KΩ 1% 1/4W	R349		
R165-	5012209	1.87KΩ 1% 1/4W	R362	5023026	39.2Ω 1% 1/4W
R166			R365	5370470	10KΩ

C1	4010274	100nF -20+80% 25V	C32-	4001141	330pF 5% 50V
C2	4001127	22pF 5% 50V	C35		
C3	4011110	1.0nF 10% 50V	C36-	4011110	1.0nF 10% 50V
C4	4010274	100nF -20+80% 25V	C37		
C5	4010267	4.7nF 10% 50V	C38	4000287	220nF -20+80% 25V
C7	4010267	4.7nF 10% 50V	C39-	4010220	100nF 10% 50V
C8-	4010274	100nF -20+80% 25V	C42		
C9			C43	4000287	220nF -20+80% 25V
C10-	4011110	1.0nF 10% 50V	C44	4011110	1.0nF 10% 50V
C14			C45	4010271	10nF 10% 50V
C15-	4001141	330pF 5% 50V	C46	4010274	100nF -20+80% 25V
C17			C47	4010271	10nF 10% 50V
C18-	4011110	1.0nF 10% 50V	C49-	4010220	100nF 10% 50V
C19			C50		
C20	4001141	330pF 5% 50V	C51	4010271	10nF 10% 50V
C21	4011110	1.0nF 10% 50V	C53	4010272	22nF -20+80% 50V
C22-	4001141	330pF 5% 50V	C54-	4010220	100nF 10% 50V
C25			C55		
C26	4011110	1.0nF 10% 50V	C57-	4010274	100nF -20+80% 25V
C27-	4001131	47pF 5% 50V	C61		
C28			C63-	4010220	100nF 10% 50V
C29-	4011110	1.0nF 10% 50V	C64		
C31			C65	4200898	22µF 20% 6V3

L2	8020992	Coil 340µH	L104	8020989	Coil 450KHz
L3	8020993	Coil 2.6mH	L201-L202	6000064	Jumper
L4	8020994	Coil 106µH			
L5	8021128	Coil 560µH	L203	8020821	Coil 2.2µH 5%
L101	8021128	Coil 560µH	L301-L302	8020821	Coil 2.2µH 5%
L102-L103	8021161	Coil 11.32MHz			

BP1-BP2	8030251	Cer. filter 10.7MHz	BP4	8030251	Cer. filter 10.7MHz
BP3	8030266	Cer. filter 10.7MHz	BP101	8030248	Cer. filter 450kHz

TU1	8050147	Tuner FE415-G11

X101	8030279	Crystal 456KHz	X201	8090209	Crystal 7.2MHz
X102	8030299	Crystal 450KHz	X301	8090206	Crystal 8.664MHz

F201▲	6604039	Fuse 200mA 32V

P150	7211222	Socket 6 pole	P152	7221082	Plug 2/2 pole
P151	7211221	Socket 4 pole	P155	7211209	Socket, coax

PCB88, 8005623 FM/AM and RDS

Type 2563

D205	8300482	**250** LL4148			

C35	4001127	22pF 5% 50V	C106	4000459	3.3nF 5% 50V
C36	4001084	560pF 2% 50V	C117	4000459	3.3nF 5% 50V

L1	8021003	Coil 100µH	L4	8021148	Coil 90µH

Other electrical parts like PCB88, type 2561, 2562, 2565, 2566, 2567

PCB88, 8005619 FM/AM and RDS

Type 2564

D203	8300482	**250** LL4148	D205	8300482	**250** LL4148

C26	4340038	6-30pF	C36	4001084	560pF 2% 50V
C35	4001127	22pF 5% 50V			

L2	8021154	Coil	L4	8021148	Coil 90µH

TU1	8050150	Tuner

Other electrical parts like PCB88, type 2561, 2562, 2565, 2566, 2567

▲ *symbol of safety component, see page 2-1*

X1	8090157	Crystal 33.868MHz	X2	8030246	Crystal 12MHz

P42	7210895	Socket 16 pole	P99	7211146	Socket 11 pole
P45	7221157	Plug 6/6 pole			
P46-P47	7211148	Socket 12 pole			

PCB88, 8005529 FM/AM and RDS

Type 2561, 2562, 2565, 2566, 2567

IC101Δ	8342538	**151**	LA1836M	IC204Δ	8341409	**151**	LC7218M
IC102Δ-IC104Δ	8341022	**138**	4558	IC301Δ	8342568	**151**	SAA6579T
				IC302Δ*	8343440	**147**	87C654
IC105Δ	8341812	**151**	LM393	IC303Δ	8341747	**138**	TL7705BCD
IC201Δ-IC203Δ	8342668	**151**	LM2931				

TR2-TR4	8320740	**51**	BF840	TR106	8321080	**51**	FMMT491A
				TR107	8321196	**136**	PUMZ1
TR5	8320950	**51**	BC850C	TR112	8321198	**136**	PUMX1
TR6	8320936	**51**	BC847C	TR113	8321196	**136**	PUMZ1
TR7	8320611	**51**	BF512	TR201	8320971	**51**	BC807-40
TR8-TR10	8320752	**51**	BC817-40	TR202	8320755	**51**	BC847B
				TR203	8321170	**19**	FZT690B
TR11	8321196	**136**	PUMZ1	TR204	8320755	**51**	BC847B
TR15	8320950	**51**	BC850C	TR301	8320755	**51**	BC847B
TR16	8320936	**51**	BC847C	TR302-TR303	8320856	**68**	2N7002
TR101	8320755	**51**	BC847B				
TR104	8321080	**51**	FMMT491A	TR304	8321196	**136**	PUMZ1

D1-D2	8300895	**252**	BAV70	D204	8300482	**250**	LL4148
				D301	8300520	**250**	Z6.8V 5%
D3	8301007	**151**	HN1V02H-B	D302	8300895	**252**	BAV70
D100	8300482	**250**	LL4148	D303	8300894	**252**	BAW56
D202	8300687	**250**	Z2.7V 5% 0.4W				

R6	5013232	390Ω 1% 1/16W	R127	5011996	8.25KΩ 1% 1/8W
R10-R11	5013244	3.9KΩ 1% 1/16W	R128	5013244	3.9KΩ 1% 1/16W
			R131	5011879	9.09KΩ1% 1/8W
R13-R14	5013244	3.9KΩ 1% 1/16W	R132	5012391	52.3KΩ 1% 1/10W
			R136	5013223	68Ω 1% 1/16W
R17	5013232	390Ω 1% 1/16W	R138	5013219	33Ω 1% 1/16W
R22	5013252	18KΩ 1% 1/16W	R139	5011879	9.09KΩ 1% 1/8W
R23	5013223	68Ω 1% 1/16W	R144	5011752	12.7KΩ 1% 1/8W
R25	5013238	1.2KΩ 1% 1/16W	R145	5011858	7.68KΩ 1% 1/4W
R30	5013242	2.7KΩ 1% 1/16W	R146	5011857	4.42KΩ 1% 1/4W
R35	5013244	3.9KΩ 1% 1/16W	R147	5011996	8.25KΩ 1% 1/8W
R41-R43	5013247	6.8KΩ 1% 1/16W	R148	5013244	3.9KΩ 1% 1/16W
			R151	5011879	9.09KΩ 1% 1/8W
R49	5013246	5.6KΩ 1% 1/16W	R152	5012391	52.3KΩ 1% 1/10W
R59	5013248	8.2KΩ 1% 1/16W	R156	5013223	68Ω 1% 1/16W
R101	5013244	3.9KΩ 1% 1/16W	R158	5013219	33Ω 1% 1/16W
R102-R103	5013248	8.2KΩ 1% 1/16W	R159	5011879	9.09KΩ 1% 1/8W
			R171	5013256	39KΩ 1% 1/16W
R106	5370470	10KΩ	R172	5013252	18KΩ 1% 1/16W
R107	5013242	2.7KΩ 1% 1/16W	R175	5012155	4.7KΩ 1% 1/8W
R109	5370470	10KΩ	R176	5012331	10KΩ 1% 1/10W
R112	5370470	10KΩ	R201	5013243	3.3KΩ 1% 1/16W
R115-R116	5013243	3.3KΩ 1% 1/16W	R203	5013256	39KΩ 1% 1/16W
			R205	5011595	26.7KΩ 1% 1/8W
R117	5013239	1.5KΩ 1% 1/16W	R206	5011601	200KΩ 1% 1/8W
R122-R123	5023007	19.6KΩ 1% 1/4W	R207	5011595	26.7KΩ 1% 1/8W
			R208	5011601	200KΩ 1% 1/8W
R124	5011752	12.7KΩ 1% 1/8W	R210	5011880	130KΩ 1% 1/8W
R125	5011858	7.68KΩ 1% 1/4W	R211	5011595	26.7KΩ 1% 1/8W
R126	5011857	4.42KΩ 1% 1/4W			

** specially selected or adapted sample*

Δ indicates that static electricity may destroy the component

V101	5013223	68Ω 1% 1/16W	V103	5013223	68Ω 1% 1/16W

Mechanical part numbers

90M1	8400214	Gear motor
90M2	8400213	Sledge motor, complete w/wire
90T1	8013551	Transformer 230V f/type 2561, 2562, 2567
	8013549	Transformer 120V f/type 2563, 2566
	8013548	Transformer 100V f/type 2564
	8013550	Transformer 240V f/type 2565
90P1	6270671	FM socket
90P2	6276977	AM socket
90P3	7219095	Socket f/digital output
91M1	8400212	Clamper motor

Standard resistors
Resistors 5% 1/2 W

	x1	x10	x100	x1k	x10k	x100k	x1M	x10M
1.0		5011000	5011013	5011028	5011044	5010313	5011069	5011083
1.2	5011406	5011001	5011014	5011030	5011045	5011058	5010421	
1.5	5010727	5011002	5011015	5011031	5011046	5011059	5011071	
1.8	5010857	5010787	5011016	5011033			5011072	
2.2	5011335	5010708	5010815	5011034	5011048	5011061	5011074	
2.7	5011612	5010803	5011018	5010055	5011049	5011062	5011075	
3.3	5012147	5011007	5011019	5011037		5011063	5010381	
3.9		5010782	5011021	5010700	5011051		5010392	
4.7	5010765	5011009	5011022	5010035		5011065	5011078	
5.6		5011010	5011023	5011041		5011066		
6.8	5010874	5011011	5011024	5011042	5010810	5011067	5011080	
8.2		5011012	5011026	5011043	5010038	5011068	5011081	

Resistors 5% 1/4 W

	x1	x10	x100	x1k	x10k	x100k	x1M	x10M
1.0	5010592	5010506	5010065	5010040	5010059	5010049	5010054	5010638
1.2		5010595	5010128	5010153	5010046	5010047	5010665	
1.5	5011348	5010468	5010057	5010247	5010053	5010063	5010093	
1.8		5010822	5010362	5010066	5010135	5010072	5010791	
2.2	5010682	5010448	5010092	5010064	5010079	5010120	5010245	
2.7	5010925	5010403	5010000	5010298	5010141	5010083	5010431	
3.3	5011860	5010253	5010044	5010076	5010075	5010117	5010848	
3.9	5011377	5010622	5010070	5010069	5010060	5010073	5010714	
4.7	5010888	5010411	5010058	5010048	5010045	5010077	5011513	
5.6	5010706	5010151	5010067	5010041	5010061	5010071	5010658	
6.8	5010874	5010039	5010144	5010052	5010062	5010074		
8.2	5010880	5010056	5010068	5010154	5010091	5010505		

Resistors 5% 1/8 W

	x1	x10	x100	x1k	x10k	x100k	x1M	x10M
1.0		5011464	5011357	5010816	5010935	5011440	5011459	5020875
1.2		5011351	5011084	5011442	5011338	5011341	5011175	
1.5		5011463	5011443	5011178	5011364	5011398	5011460	
1.8			5011350	5011361	5011344	5011468		
2.2	5011032	5011376	5010886	5011353	5010833	5011369	5011342	
2.7		5011471	5011355	5011362	5011366	5011370	5011478	
3.3		5011519	5011337	5010827	5011346	5011371	5011462	
3.9		5011438	5011883	5011157	5011457	5011372	5020876	
4.7		5011038	5011441	5011363	5010937	5011343	5011611	
5.6		5011412	5011358	5010885	5011166	5011340		
6.8		5011356	5011336	5010839	5011367	5011458		
8.2		5011466	5011354	5011339	5011368	5011373		

250

Resistors not referred to are standard, see page 3-16 and 3-17

C3	4011122 10nF 10% 50V	C138	4011110 1.0nF 10% 50V
C5	4011122 10nF 10% 50V	C139	4011122 10nF 10% 50V
C7	4011122 10nF 10% 50V	C140	4011126 22nF 10% 25V
C9-	4011122 10nF 10% 50V	C147-	4000391 1.0nF 2% 50V
C11		C148	
C13	4001143 470pF 5% 50V	C149	4000431 2.2nF 2% 50V
C15-	4001143 470pF 5% 50V	C150	4000391 1.0nF 2% 50V
C16		C151	4001130 39pF 5% 50V
C17	4001135 100pF 5% 50V	C152	4001118 3.9pF 5% 50V
C19	4130633 150nF 5% 63V	C153	4000431 2.2nF 2% 50V
C20	4011122 10nF 10% 50V	C155	4000392 100pF 2% 50V
C21	4010209 47nF 10% 50V	C156	4201292 2.2µF 20% 50V
C22	4201257 1µF 20% 50V	C157	4011110 1.0nF 10% 50V
C23	4011118 4.7nF 10% 50V	C159	4011122 10nF 10% 50V
C24	4130633 150nF 5% 63V	C160	4011126 22nF 10% 25V
C26	4340042 3-10pF	C161	4011130 47nF 10% 16V
C27	4201163 10µF 20% 35V	C162	4011126 22nF 10% 25V
C29	4340038 6-30pF	C203	4011126 22nF 10% 25V
C30	4001134 82pF 5% 50V	C204	4011118 4.7nF 10% 50V
C31-	4000233 220pF 5% 50V	C205	4011110 1.0nF 10% 50V
C32		C206	4201257 1µF 20% 50V
C34	4340038 6-30pF	C207	4011122 10nF 10% 50V
C36	4000432 180pF 2% 50V	C208	4011135 100nF -20%+80% 16V
C37	4000347 330pF 2% 50V	C209	4201443 100µF 20% 16V
C38	4011118 4.7nF 10% 50V	C210	4011135 100nF -20%+80% 16V
C39	4010209 47nF 10% 50V	C211	4201443 100µF 20% 16V
C40	4011122 10nF 10% 50V	C212	4200916 4.7µF 20% 25V
C66	4201292 2.2µF 20% 50V	C213	4011135 100nF -20%+80% 16V
C71-	4011130 47nF 10% 16V	C214	4201443 100µF 20% 16V
C72		C215	4011122 10nF 10% 50V
C101	4011126 22nF 10% 25V	C216-	4001128 27pF 5% 50V
C102-	4201257 1µF 20% 50V	C217	
C103		C218	4011122 10nF 10% 50V
C104	4201162 0.47µF 20% 50V	C219	4011110 1.0nF 10% 50V
C105	4200916 4.7µF 20% 25V	C301	4001134 82pF 5% 50V
C106	4000431 2.2nF 2% 50V	C302	4011110 1.0nF 10% 50V
C107	4201164 47µF 20% 10V	C303	4011122 10nF 10% 50V
C108-	4011126 22nF 10% 25V	C304	4001141 330pF 5% 50V
C109		C305	4011122 10nF 10% 50V
C110	4201161 3.3µF 20% 50V	C306	4201292 2.2µF 20% 50V
C111	4011126 22nF 10% 25V	C307	4001131 47pF 5% 50V
C112	4011118 4.7nF 10% 50V	C308	4001134 82pF 5% 50V
C113	4201164 47µF 20% 10V	C309	4001143 470pF 5% 50V
C114-	4201257 1µF 20% 50V	C310-	4011110 1.0nF 10% 50V
C115		C318	
C116	4200916 4.7µF 20% 25V	C319	4010220 100nF 10% 50V
C117	4000431 2.2nF 2% 50V	C320	4201257 1µF 20% 50V
C118	4011126 22nF 10% 25V	C321	4011122 10nF 10% 50V
C119	4201163 10µF 20% 35V	C322-	4011110 1.0nF 10% 50V
C120	4000351 1.5nF 5% 50V	C323	
C122	4001116 2.7pF 5% 50V	C324	4011122 10nF 10% 50V
C123	4001123 10pF ±0.25pF 50V	C325-	4001131 47pF 5% 50V
C125	4011122 10nF 10% 50V	C326	
C127-	4000391 1.0nF 2% 50V		
C128			
C129	4000431 2.2nF 2% 50V		
C130	4000391 1.0nF 2% 50V		
C131	4001130 39pF 5% 50V		
C132	4001118 3.9pF 5% 50V		
C133	4000431 2.2nF 2% 50V		
C135	4000392 100pF 2% 50V		
C136	4201292 2.2µF 20% 50V		

Resistors SMD 2% 1/8 W
SMD 5% 1/8 W

Glue dots, approx. 200, part no. 3181932

	5%	2%	2%	2%	2%	2%	5%	2%
	x1	x10	x100	x1k	x10k	x100k	x1M	x10M
1.0	5011623	5011647	5011218	5011227	5011241	5011256	5011267	5011730
1.1	5011624	5011648	5011669	5011681	5011689	5011694	5011707	
1.2	5011625	5011649	5011219	5011682	5011490	5011257	5011708	
1.3	5011626	5011650	5011670	5011683	5011242	5011258	5011709	
1.5	5011627	5011651	5011220	5011228	5011243	5011259	5011710	
1.6	5011628	5011652	5011671	5011684	5011690	5011695	5011711	
1.8	5011629	5011653	5011672	5011229	5011244	5011260	5011712	
2.0	5011630	5011654	5011673	5011685	5011691	5011696	5011713	
2.2	5011216	5011655	5011674	5011230	5011245	5011261	5011714	
2.4	5011634	5011656	5011675	5011686	5011246	5011697	5011715	
2.7	5011635	5011657	5011497	5011231	5011247	5011262	5011716	
3.0	5011731	5011658	5011499	5011500	5011692	5011698	5011717	
3.3	5011217	5011659	5011676	5011232	5011248	5011263	5011718	
3.6	5011636	5011660	5011677	5011687	5011249	5011264	5011719	
3.9	5011637	5011661	5011221	5011233	5011491	5011699	5011720	
4.3	5011638	5011662	5011498	5011688	5011492	5011700	5011721	
4.7	5011639	5011269	5011222	5011234	5011250	5011265	5011722	
5.1	5011640	5011663	5011678	5011235	5011493	5011701	5011723	
5.6	5011641	5011664	5011223	5011236	5011251	5011702	5011724	
6.2	5011642	5011665	5011224	5011237	5011693	5011703	5011725	
6.8	5011643	5011666	5011225	5011238	5011252	5011704	5011726	
7.5	5011644	5011667	5011679	5011239	5011253	5011705	5011727	
8.2	5011645	5011270	5011226	5011240	5011254	5011266	5011728	
9.1	5011646	5011668	5011680	5011489	5011255	5011706	5011729	

Resistors SMD 5% 1/10 W

Glue dots, approx. 200, part no. 3181932

	x1	x10	x100	x1k	x10k	x100k	x1M	x10M
0.0	6000072							
1.0		5011920	5011932	5011944	5011956	5011968	5011980	5012275
1.2	5012326	5011921	5011933	5011945	5011957	5011969	5012267	
1.5	5012379	5011922	5011934	5011946	5011958	5011970	5012268	
1.8	5012380	5011923	5011935	5011947	5011959	5011971	5011989	
2.2		5011924	5011936	5011948	5011960	5011972	5012220	
2.7		5011925	5011937	5011949	5011961	5011973	5012269	
3.3		5011926	5011938	5011950	5011962	5011974	5012261	
3.9		5011927	5011939	5011951	5011963	5011975	5012270	
4.7		5011928	5011940	5011952	5011964	5011976	5012271	
5.6		5011929	5011941	5011953	5011965	5011977	5012272	
6.8		5011930	5011942	5011954	5011966	5011978	5012273	
8.2		5011931	5011943	5011955	5011967	5011979	5012274	

Resistors SMD 5% 1/16 W

	x1	x10	x100	x1k	x10k	x100k	x1M	x10M
1.0	5013201	5013213	5013225	5013237	5013249	5013261	5013273	5013285
1.2	5013202	5013214	5013226			5013262	5013274	
1.5	5013203	5013215	5013227			5013263		
1.8	5013204	5013216	5013228	5013240			5013276	
2.2	5013205	5013217	5013229	5013241	5013253	5013265	5013277	
2.7	5013206	5013218			5013254	5013266	5013278	
3.3	5013207		5013231		5013255	5013267	5013279	
3.9	5013208	5013220				5013268	5013280	
4.7	5013209	5013221	5013233	5013245	5013257	5013269	5013281	
5.6	5013210	5013222	5013234		5013258	5013270	5013282	
6.8	5013211	5013223	5013235		5013259	5013271	5013283	
8.2	5013212	5013224			5013260	5013272	5013284	

LIST OF MECHANICAL PARTS
Top

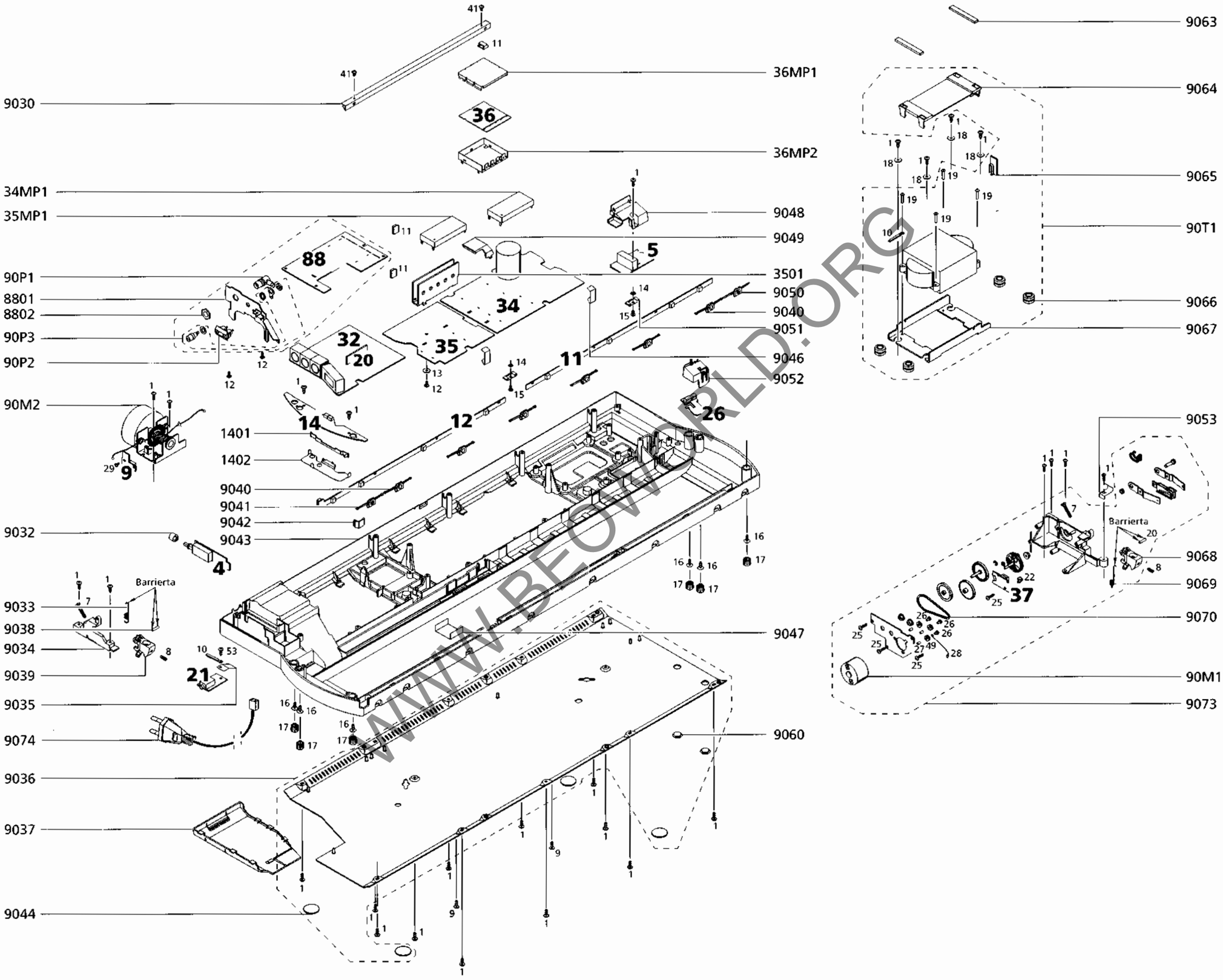
13Modul	8005313	Secondary Keyboard
24Modul	8005304	Light indication, left
25Modul	8005305	Light indication, right
27Modul	8005377	Safety TX
28Modul	8005303	Safety RX
9001	3162485	Glass lid
9002	3160059	Cover
9003	3169064	Secondary keyboard
9004	3030123	Hinge f/cover, right
9005	3114446	Chassis top plate, complete
9006	3458925	Top plate, complete
9007	3375163	Lens
9008	2622510	Holder f/lens f/5 mm diode
9009	3151325	Disc holder, front
9010	3322176	Window, right
9011	2810283	Spring f/disc holder, rear
9012	2810282	Spring f/disc holder, front
9013	3031528	Holder f/springs, rear
9014	3031527	Holder f/springs, front
9015	3947582	Tape
9016	2569447	Guide rail, front
9017	3160063	Cover for chassis top plate
9018	3030124	Hinge f/cover, left
9019	2816288	Spring, chassis connection
9020	3333021	Contact rubber
9021	3114445	Damper f/cover
9022	3356064	Magnet
9023	3031533	Holder f/hinge
9024	3151324	Disc holder rear
9025	3322175	Window, left
9026	3947581	Tape
9027	2569448	Guide rail, rear
	3984049	Barrierta

Survey of screws etc.

1	2013137	Screw 3 x 10mm
2	3103328	Damper
3	3341104	Damper
4	2038111	Screw 3 x 8mm
5	2732129	O-ring
6	2054005	Screw 3 x 8mm
11	2515059	Holder f/wire

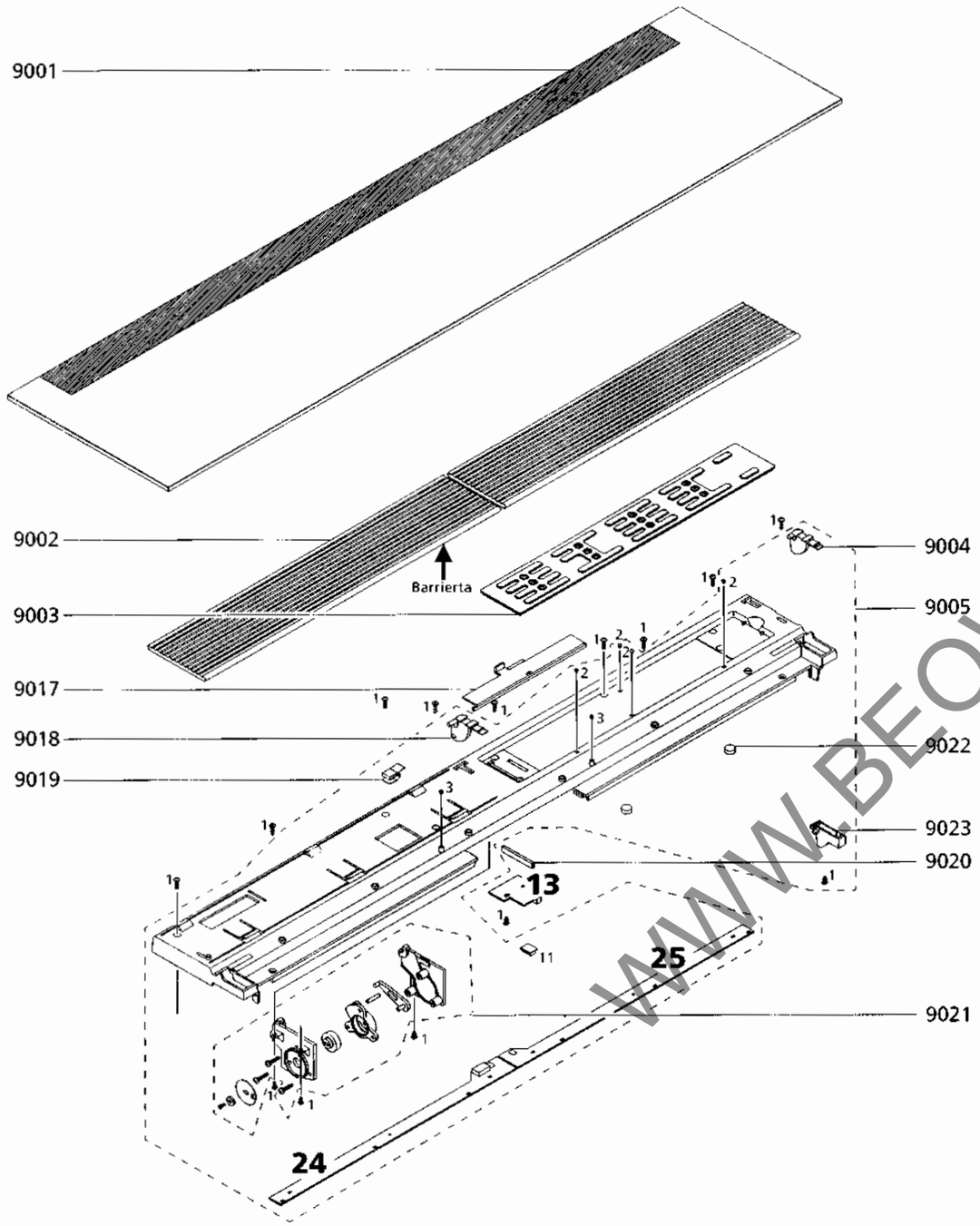
4-3 LIST OF MECHANICAL PARTS

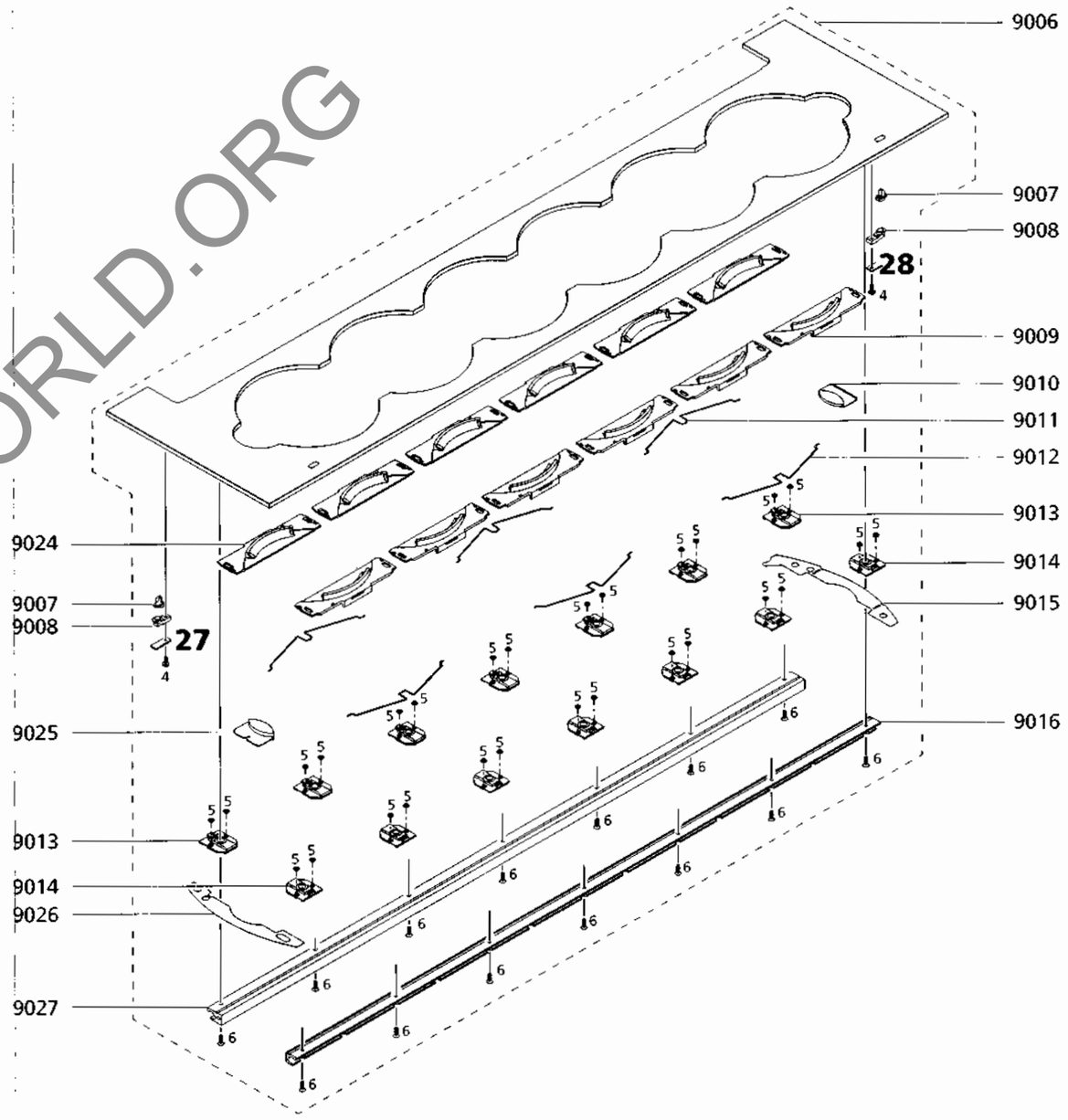
Chassis



4-2 LIST OF MECHANICAL PARTS 4-2

Top





4-4 LIST OF MECHANICAL PARTS 4-4

Chassis

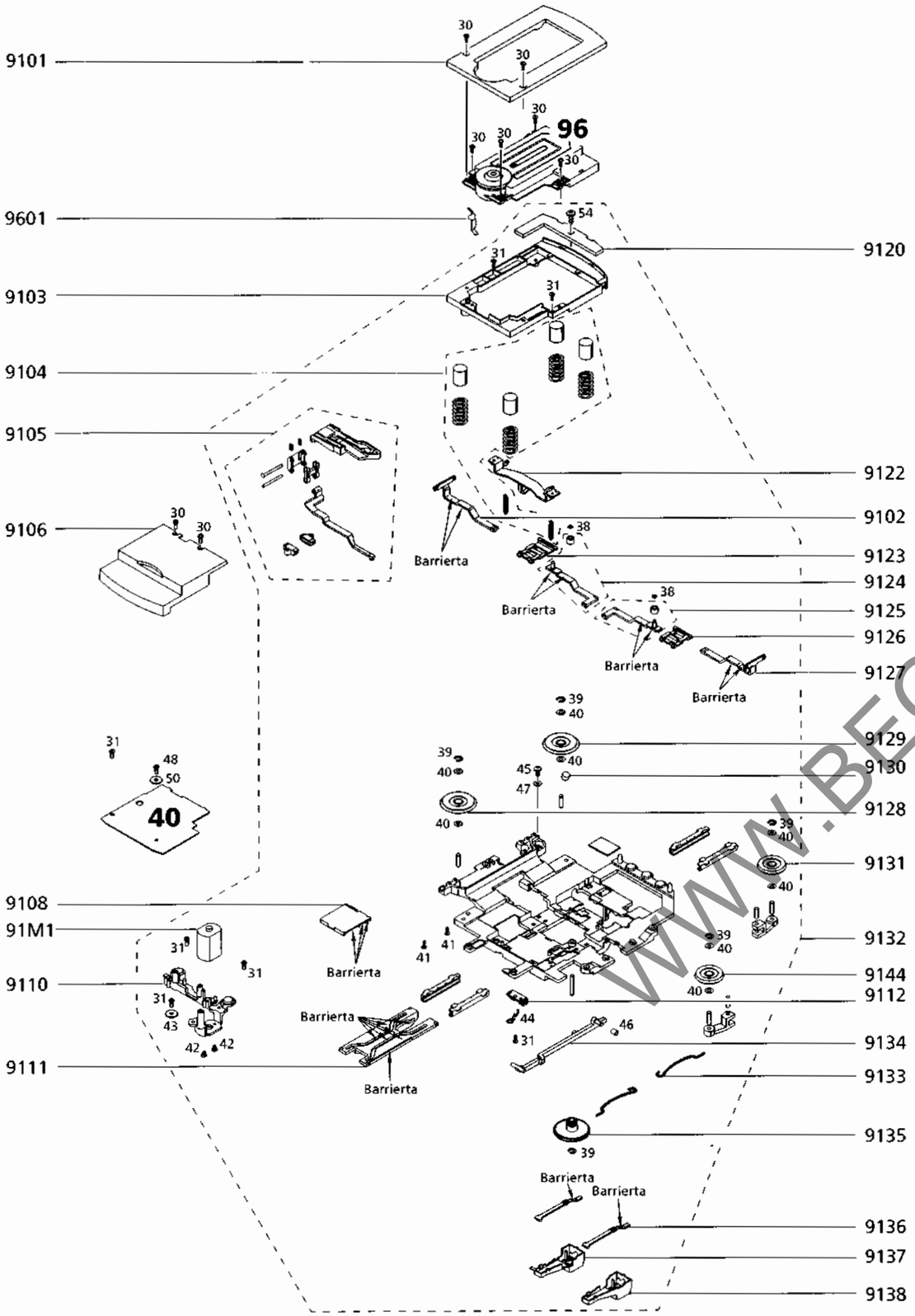
04Modul	8005311	Mains filter
05Modul	8005661	Mains relay f/type 2561, 2562, 2564, 2565, 2567
	8005664	Mains relay f/type 2563, 2566
09Modul	8005312	Sledge Position
11Modul	8005295	Main Keyboard, right
12Modul	8005296	Main Keyboard, left
14Modul	8005299	IR Reciever
1401	3302560	Shield, plastic
1402	3302555	Shield
20Modul	8001736	ML Interface
21Modul	8005301	Headphone
26Modul	8005315	End stop detector
32Modul	8005399	Input/output Select and sound adjustment
34Modul	8005657	Microcomputer & Power supply
34MP1	3302352	Shield
35Modul	8005658	Motor control
3501	3358312	Heat sink
35MP1	3302352	Shield
36Modul	8005683	Main microcomputer
36MP1	3162339	Cover
36MP2	3304142	Shield
37Modul	8005314	Lid motor
88Modul	8005529	FM/AM-RDS f/type 2561, 2562, 2565, 2566, 2567
	8005623	FM/AM-RDS f/type 2563
	8005619	FM/AM-RDS f/type 2564
8801	2530545	Holder f/PCB88
8802	2380170	Nut f/FM socket
9030	3300149	Shield
9032	2776517	Button, on/off
9033	2810292	Spring f/glass lid, left
9034	3031338	Fitting f/hinge, glass lid
9035	2815045	Spring, chassis connection
9036	3454845	Rear panel
9037	3162436	Cover
9038	2830161	Axle
9039	3131407	Hinge f/glass lid, left
9040	2776487	Button, select
9041	2776493	Button, stand by
9042	3322158	IR window
9043	3114453	Chassis
9044	3103326	Foot
9046	2816290	Spring, chassis connection
9047	3302589	Shield f/ribbon cables
9048	3160058	Cover f/PCB5
9049	3302561	Cover f/ribbon cables
9050	2776494	Button, load
9051	3151322	Holder f/screw
9052	3162505	Cover f/PCB26
9053	2815049	Spring, chassis connection
9060	3341088	Plastic plug
9063	3947350	Foam tape
9064	3302568	Cover f/transformer
9065	3302562	Shield f/wire
9066	2938277	Bush
9067	3124131	Fittings
9068	3131384	Hinge f/glass lid, right
9069	2810291	Spring f/glass lid, right
9070	2732120	Rubber belt
9073	2755051	Gearbox, complete
9074	6100273	Mains cable f/ type 2561
	6100329	Mains cable f/type 2562
	6100307	Mains cable f/type 2563, 2566
	6100331	Mains cable f/type 2564
	6100332	Mains cable f/type 2565
90M1	8400214	Gear motor
90M2	8400213	Sledge motor complete w/wire
90P1	6270671	FM socket
90P2	6276977	AM socket
90P3	7219095	Socket f/digital output
90T1	8013551	Transformer 230V AC f/type 2561, 2562, 2567
	8013549	Transformer 120V AC f/type 2563, 2566
	8013548	Transformer 100V AC f/type 2564
	8013550	Transformer 240V AC f/type 2565
	3984049	Barrierta

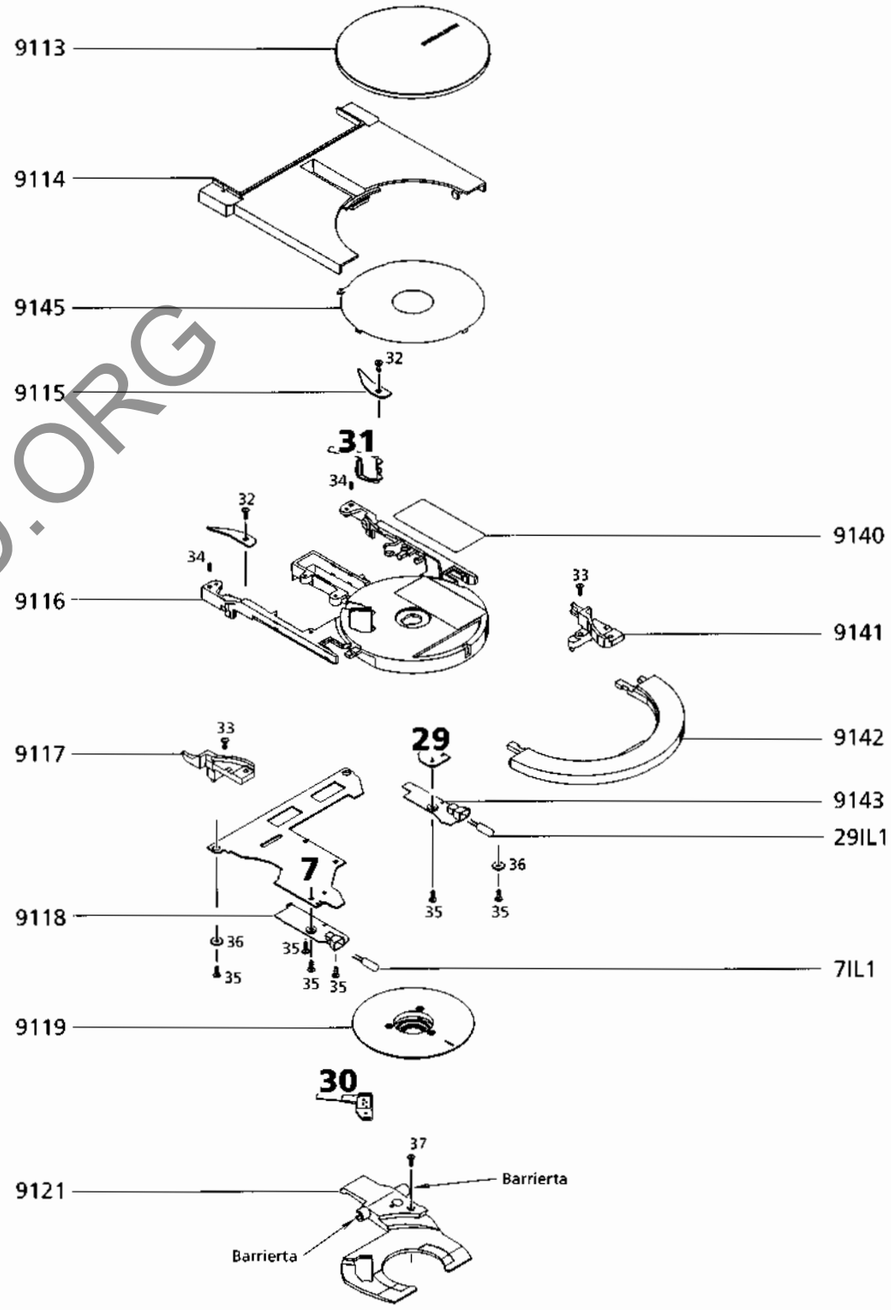
Survey of screws etc.

1	2013137	Screw 3 x 10mm
7	2058018	Screw 4 x 25mm
8	2072115	Pointed screw 4 x 8mm
9	2011050	Screw 3 x 8mm
10	7530119	Solder tag
11	2515059	Holder f/wire
12	2038137	Screw 3 x 6mm
13	2625002	Washer
14	2390106	Lock washer
15	2058006	Screw 3 x 5mm
16	2058007	Screw 3 x 10mm
17	3341110	Plug
18	2622490	Washer
19	2039064	Screw 3 x 12mm
20	2830161	Axle 3 x 13.8mm
22	3151388	Holder f/optocoupler
25	2054012	Screw 3 x 10mm
26	2036061	Screw 2.6 x 6.5mm
27	2930074	Bush 2.6 x 3.2 x 4.8mm
28	6032961	GND wire
29	2038117	Screw 3 x 4mm
41	2011043	Screw 2.2 x 6mm
49	2938306	Bushing
53	2052009	Screw 3 x 8mm

4-5 LIST OF MECHANICAL PARTS BANG & OLUFSEN

Sledge





Sledge

07Modul	8005364	Display
71L1	8230125	Bulb, 190mA 6.3V
29Modul	8005309	Lamp
291L1	8230125	Bulb, 190mA 6.3V
30Modul	8001865	IR transmitter, tacho clamper
31Modul	8001866	IR Receiver, tacho clamper
40Modul	8005430	CD VAM 1205 without DAC
96Modul	8420225	CD mechanism VAM 1205 (Turntable black)
		WARNING! Static electricity may destroy the component
9601	2815050	Spring, chassis connection
9101	3458908	Cover f/CD mechanism
9102	2854206	Arm f/release of CD
9103	3114427	Chassis f/CD mechanism
9104	2810293	Springs f/CD mechanism complete
9105	2854204	Clamper arm
9106	3459011	Cover f/CD PCB
9108	3014128	Holder
9110	3151333	Holder f/springs
9111	3014120	Guide f/clamping
9112	3031534	Holder f/rocker arm
9113	3162462	Cover f/CD clamper
9114	3162477	Top plate for CD mechanism
9115	2810281	Flat spring
9116	3114431	Clamper
9117	2570088	Clamper holder, left
9118	3358331	Heat sink, left
9119	3151354	Holder, clamper
9120	3342058	Counterbalance
9121	2854207	Clamper arm
9122	2854198	Arm f/pull springs
9123	3014112	Holder f/arms, rear
9124	2854203	Arm f/pawl, rear
9125	2854202	Arm f/pawl, front
9126	3014111	Holder f/arms, front
9127	2854206	Arm f/release of CD
9128	3032030	Sledge wheel, rear
9129	3032030	Sledge wheel, rear
9130	3356065	Magnet f/endstop detector
9131	3032031	Sledge wheel, front
9132	3114447	Sledge complete
9133	2810280	Spring f/sledge wheel
9134	2854196	Rocker arm
9135	2700105	Gearwheel
9136	2854205	Adjustment arm f/pull spring
9137	3131399	House f/adjustment arm, rear
9138	3131401	House f/adjustment arm, front
9140	3181048	Lable, laser
9141	2570084	Clamper holder, right
9142	3370164	Lens f/light
9143	3358332	Heat sink, right
9144	3032031	Sledge wheel, front
9145	3302594	Cover
91M1	8400212	Clamper motor
	3984049	Barrierta

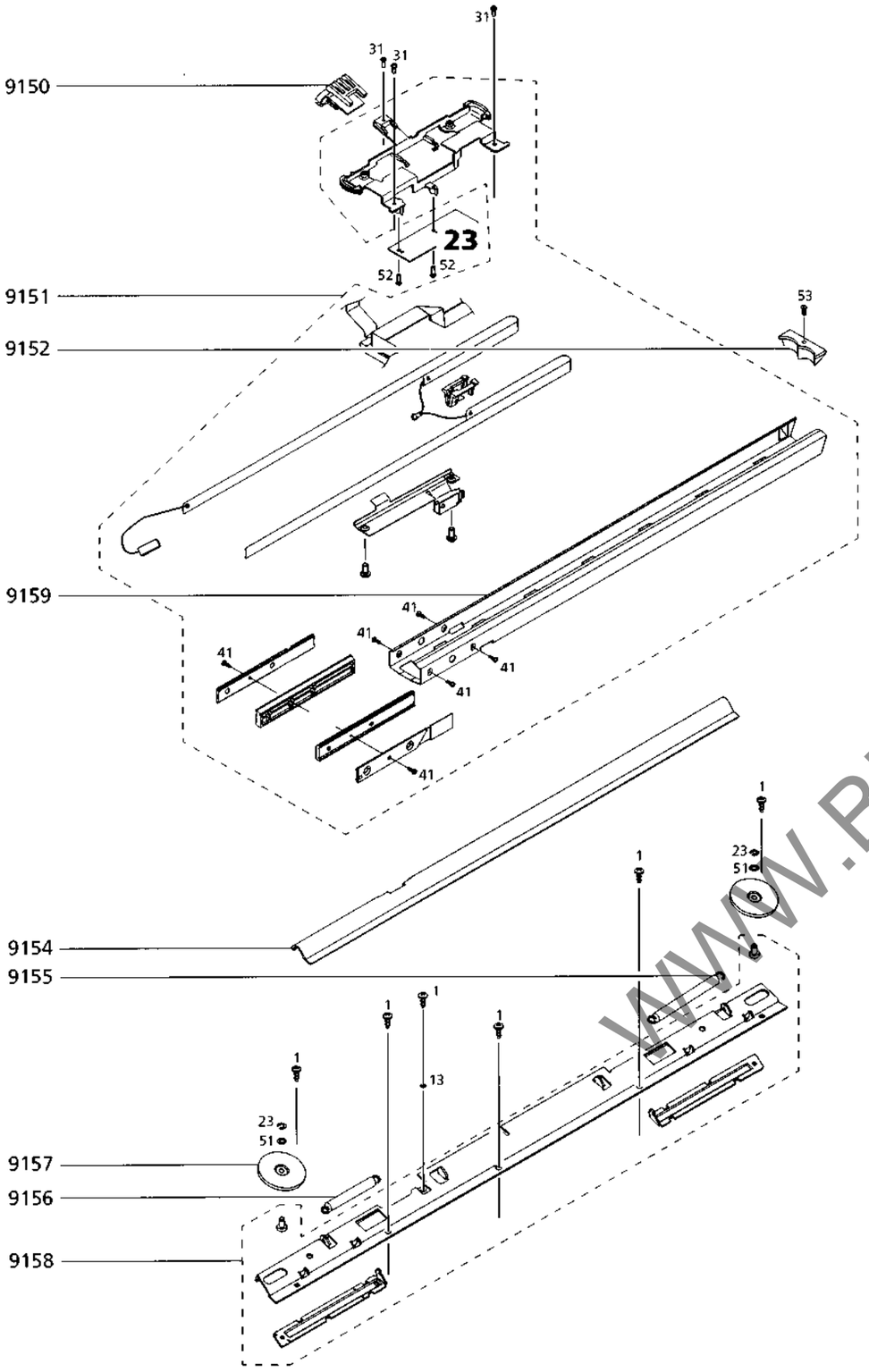
4-6 LIST OF MECHANICAL PARTS 4-6

Survey of screws etc.

30	2052007	Screw 2.5 x 6mm
31	2058013	Screw 2.5 x 6mm
32	2058011	Screw 3 x 5mm
33	2058015	Screw 2.5 x 10mm
34	2072116	Pointed screw 3 x 4mm
35	2054003	Screw 2.2 x 4.5mm
36	2625044	Washer
37	2052004	Screw 2.2 x 5mm
38	2622110	Washer
39	2390001	Washer
40	2620020	Washer
41	2011043	Screw 2.2 x 6mm
42	2058008	Screw 2 x 2mm
43	2622041	Washer
44	7530087	Solder tag
45	2036036	Screw 2.5 x 4mm
46	3333022	Damper f/rocker arm
47	2622379	Washer
48	2036082	Screw 2.5 x 8mm
50	2625044	Washer
54	2052009	Screw 3 x 8mm

4-7 LIST OF MECHANICAL PARTS BANG & OLUFSEN

Guide f/wire and ribbon cables



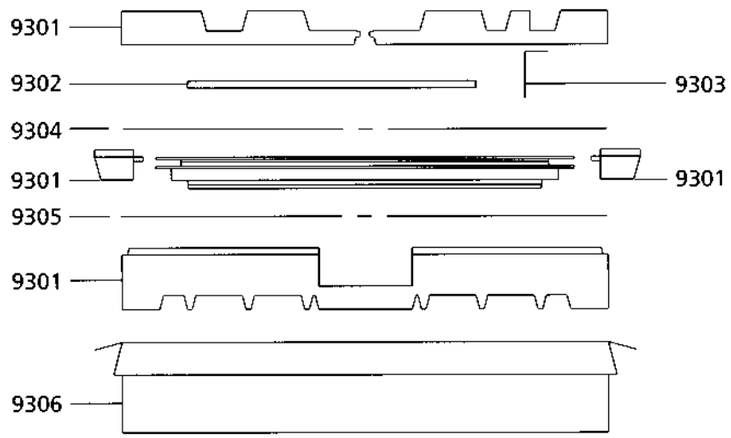
Guide f/wire and ribbon cables

23Modul	8005371	Clamper position
9150	2510178	Holder
9151	3015188	Ribbon cables complete with guide
9152	3151463	Holder
9154	2560284	Cover
9155	2810277	Spring f/wire, right
9156	2810278	Spring f/wire, left
9157	3032029	Wheel f/wire
9158	3031535	Fittings f/wire
9159	3014098	Guide f/ribbon cables

Survey of screws etc.

1	2013137	Screw 3 x 10mm
13	2625002	Washer
23	2390002	Washer
31	2058013	Screw 2.5 x 6mm
41	2011043	Screw 2.2 x 6mm
51	2622499	Washer
52	2036064	Screw 2.5 x 5mm
53	2013150	Screw 2.5 x 8mm

Packing

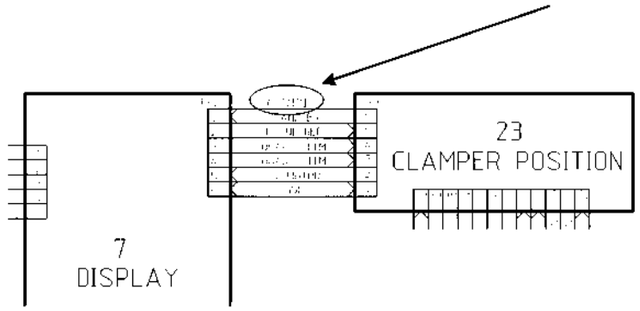


9301	3397920	Foam packing, set
9302	3397983	Insert f/cover
9303	3392468	Insert f/clamper
9304	3946038	Foil 1 x 1m
9305	3946038	Foil 1 x 1m
9306	3392228	Outer carton
	2777037	Holder f/handle
	2777038	Handle

4-8 LIST OF MECHANICAL PARTS 4-8

Wire bundles

See wiring diagram page 2-2.
The part no. is printed on the diagram above the wire bundle, as shown.



Accessories

8720047	AM loop antenna
8720048	FM antenna

Owners manual

3501928	Danish
3501929	Swedish
3501930	Finnish
3501931	English, EU
3501932	German
3501933	Dutch
3501934	French
3501935	Italian
3501936	Spanish
3501937	English, US
3501938	French, Canadian
3501939	Portuguese
3501940	Japanese
3501941	Taiwanese

Setting-up guide

3505617	Danish
3505618	Swedish
3505619	Finnish
3505620	English, EU
3505621	German
3505622	Dutch
3505623	French
3505624	Italian
3505625	Spanish
3505626	English, US
3505627	French, Canadian
3505642	Portuguese
3505628	Japanese
3505940	Taiwanese

Product Informations

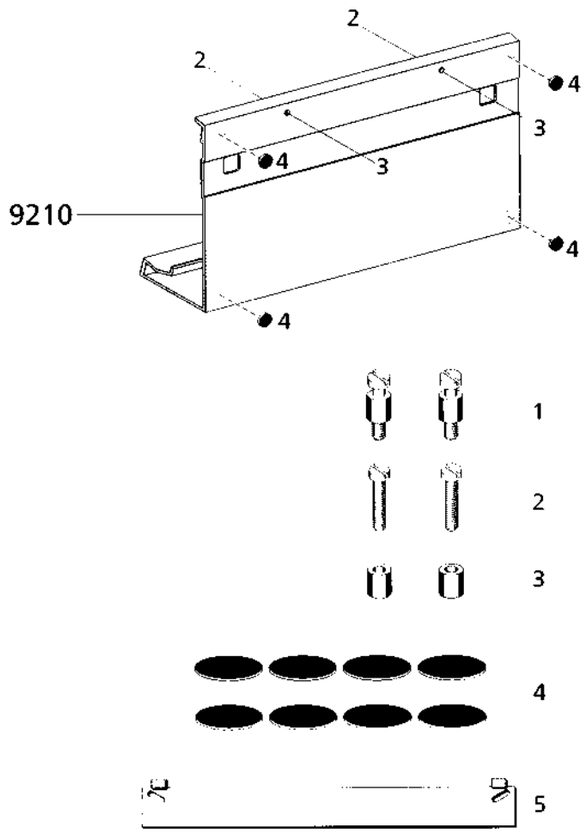
3507000	English
3507001	Danish
3507002	German
3507003	French

Circuit descriptions

3540273	English
3540274	Danish
3540275	German
3540276	French
3540277	Dutch

4-9 LIST OF MECHANICAL PARTS

Bracket 2053



9210	2569423	Bracket

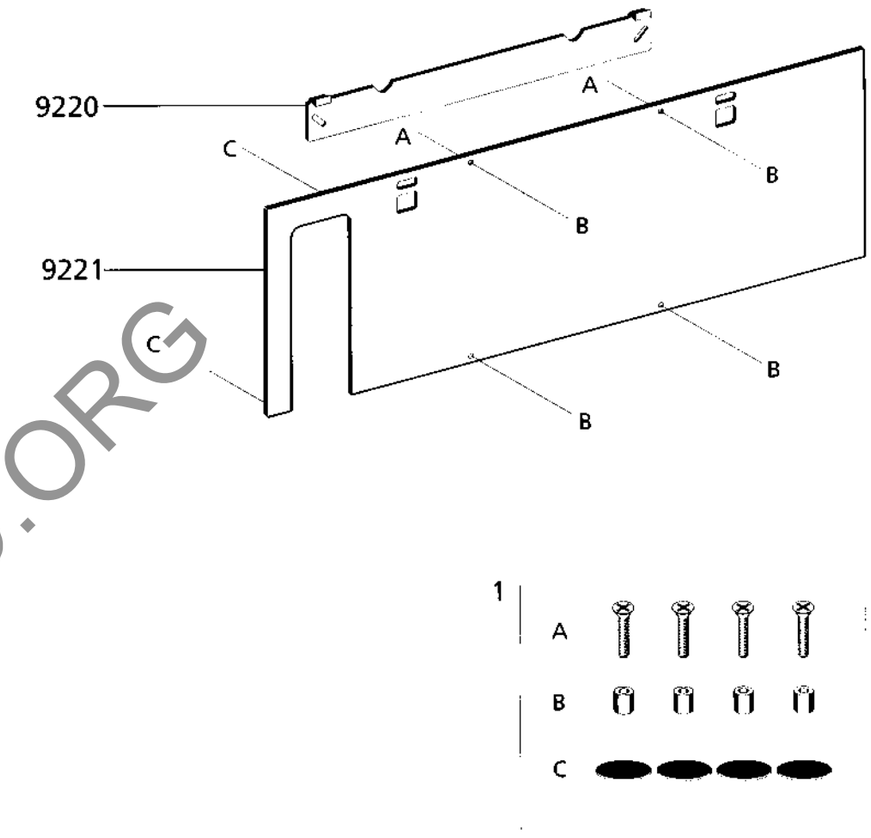
Survey of screws etc.

1	2930133	Adjustment bushing
2	2042211	Screw 4 x 12mm
3	2930132	Bushing
4	3103326	Foot, 1 piece
5	2569438	Wall profile

Parts not shown

	3103372	Foot, set incl. screws
	3040037	Red adjustment key
	3390455	Bag w/parts
	3392440	Outer carton
	3397970	Foam packing
	3502941	Setting-up guide
	3504533	Setting-up guide

Wall Bracket horizontal 2054



9220	2569470	Wall profile
9221	3452692	Rear plate

Survey of screws etc.

1	3390533	Bag w/parts

Parts not shown

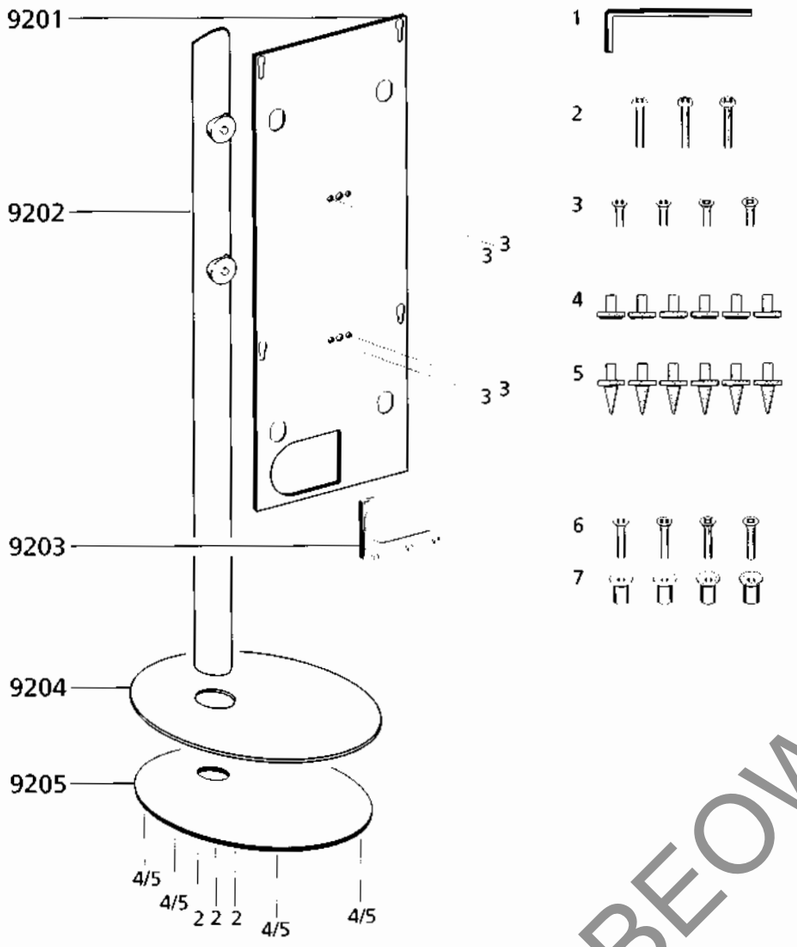
	3392518	Packing, complete
	3502942	Setting-up guide

Cable cover 2062

	2569440	Profile
	3031545	Bracket
	3392517	Packing, complete

4-10 LIST OF MECHANICAL PARTS 4-10

Stand 2055



9201	3452683	Back plate
9202	2569450	Tube
9203	3162463	Cover
9204	3162435	Cover plate, aluminium
9205	2752027	Iron foot

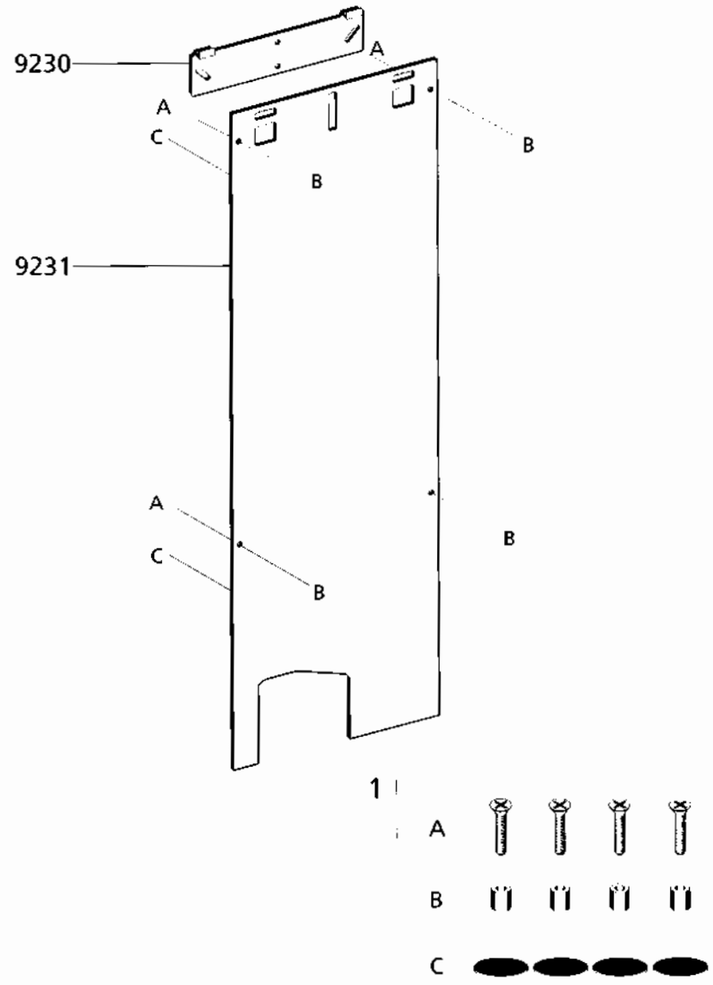
Survey of screws etc.

1	3040023	Allen key
2	2058009	Allen screw 4 x 25mm
3	2058010	Screw 4 x 12mm
4	3103392	Foot, "Soft"
5	3103390	Foot, "Spike" adjustable
6	2058012	Screw 4 x 20mm
7	2930135	Bushing

Parts not shown

	3040037	Red adjustment key
	3390550	Bag w/parts
	3397971	Foam, 1 piece
	3392442	Wrapper
	3502950	Setting-up guide

Wall Bracket Vertical 2063



9230	2569471	Wall profile
9231	3452693	Rear plate

Survey of screws etc.

1	3390533	Bag w/parts

Parts not shown

	3392518	Packing, complete
	3502984	Setting-up guide

5-1 ADJUSTMENT

Adjustment

Before adjustments on PCB88, short circuit Servicepoint (TP216) to ground. The Service point must be short circuit under the adjustments. After adjustments remember to remove the short circuit.

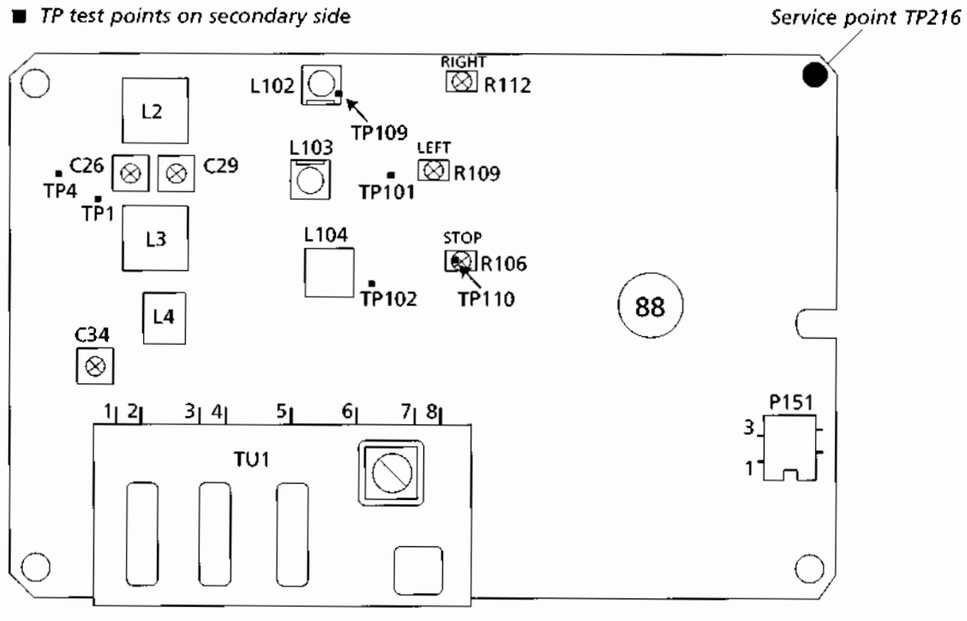
Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (type 2561, 2562, 2563, 2565, 2566, 2567)			108MHz	check	Tuner pin 5	7...9V
			87.5MHz	check	Tuner pin 5	1.3...2V
FM 76 - 90MHz (type 2564)			90MHz	check	Tuner pin 5	7...9V
			76MHz	check	Tuner pin 5	1.3...2V
LW/MW 153 - 279kHz (type 2561, 2562, 2565, 2566, 2567)			153kHz	check	TP1	1V ± 0.3V
			279kHz	1L4	TP1	8.5V ±0.1V
			522kHz	check	TP1	1.25 ±0.3V
			1611kHz	1C34	TP1	8.5V ±0.1V
MW 522 - 1611kHz (type 2564)			522kHz	check	TP1	1 ±0.3V
			1629kHz	1L4	TP1	8.5V ±0.1V
MW 530-1710kHz (type 2563)			530kHz	check	TP1	1 ±0.3V
			1710kHz	1L4	TP1	8.5V ±0.1V
FM DETECTOR Before adjustment, carry out manual offset adjustment see page 5-3 (english), 5-19 (deutsch), 5-36 (french)						
FM 87.5 - 108MHz (type 2561, 2562, 2563, 2565, 2566, 2567)	98MHz 1mV mod = 1kHz stereo	FM antenna	98MHz	1L102	TP101-TP102*	0V ± 50mV
				1L103	P151-1	minimum distortion
FM 76 - 90MHz (type 2564)	83MHz 1mV mod = 1kHz stereo	FM antenna	83 MHz	1L102	TP101-TP102*	0V ± 50mV
				1L103	P151-1	minimum distortion
LF OUTPUT						
FM 87.5 - 108MHz (type 2561, 2562, 2563, 2565, 2566, 2567)	98MHz 1 mV mod = 1kHz Δ f 75kHz	FM antenna	98MHz	1R109/ 1R112	P151-1/ P151-3	$1V_{RMS}$ ± 50mV
FM 76 - 90MHz (type 2564)	83MHz 1mV mod = 1kHz Δ f 75kHz	FM antenna	83MHz	1R109/ 1R112	P151-1/ P151-3	$1V_{RMS}$ ± 50mV
SEARCH SENSITIVITY						
FM 87.5 - 108MHz (type 2561, 2562, 2563, 2565, 2566, 2567)	98MHz 25dBf 14dBµV 5µV	FM antenna	98MHz	1R106	TP109-TP110	Adjust to 0V ±50mV
FM 76 - 90MHz (type 2564)	83MHz 25dBf 14dBµV 5µV	FM antenna	83MHz	1R106	TP109-TP110	Adjust to 0V ±50mV

AM-RF Check varicap aligment before adjustment						
AM mod = 1kHz 30% AM (type 2561, 2562, 2565, 2566, 2567)	155kHz	AM antenna**	155kHz	1L3	TP 4	maximum amplitude
	270kHz	AM antenna**	270kHz	1C29	TP 4	maximum amplitude
	558kHz	AM antenna**	558kHz	1L2	TP 4	maximum amplitude
	1494kHz	AM antenna**	1494kHz	1C26	TP 4	maximum amplitude
AM mod = 1kHz 30% AM (type 2564)	558kHz	AM antenna**	558kHz	1L2	TP 4	maximum amplitude
	1494kHz	AM antenna**	1494kHz	1C26	TP 4	maximum amplitude
AM mod = 1kHz 30% AM (type 2563)	560kHz	AM antenna**	560kHz	1L2	TP 4	maximum amplitude
	1600kHz	AM antenna**	1600kHz	1C26	TP 4	maximum amplitude
AM-IF						
AM (type 2564)	1494kHz Δ f = 10kHz fmod = as low as posible	TP 4 via 100nF	1494kHz	1L104	P151-1	symmetrical and max. height

* Measurement between TP testpoints
** Input via inductive coupling

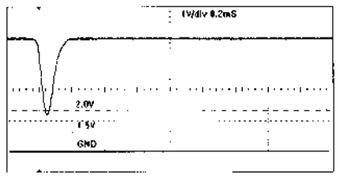
Repeat

■ *TP test points on secondary side*



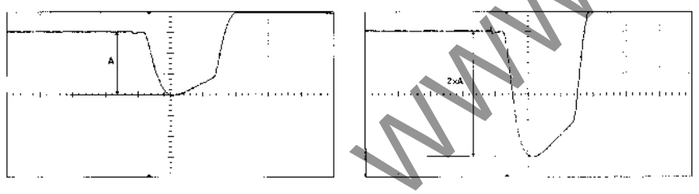
Adjustment of sensitivity of finger protection system

1. Install the glass lid, and close the lid. (Important!)
2. Switch off the product at the mains switch.
3. Connect an ohmmeter between ground and the middle pin on 35R365, and adjust to minimum value.
4. Connect an oscilloscope (DC) to 35CP1 (coordinate 2A).
5. Switch on the product.
6. Select CD6. The sledge will now try to move but it must stop.
7. Adjust by means of 35R365 until the bottom of the pulse is between 1.5 and 2V.



After approx. 30 seconds the pulses will disappear.

8. Switch off the mains, and then short-circuit 35CP1 to ground which is the chassis of the cooling plate.
9. Connect an oscilloscope (set to position AC) to the middle pin on 35R365.
10. Switch on the product.
11. Select CD6. The sledge will now try to move but it must stop.



12. Then measure the pulse height.
13. Now adjust by means of 35R365 until the pulse has twice the amplitude measured under point 12 above.
14. Switch off the mains. Remove the short-circuiting lead between 35CP1 and ground.
15. Switch the product back on, and select CD6. The sledge will now move quickly to the CD6 position.
16. Then select CD1 and check with a finger that the sledge is able to stop.
17. Open the glass lid.

18. Select CD6, and the sledge will now move slowly towards the CD6 position.

19. Then select CD1 and check with a finger that the sledge is able to stop.

Mechanical adjustments

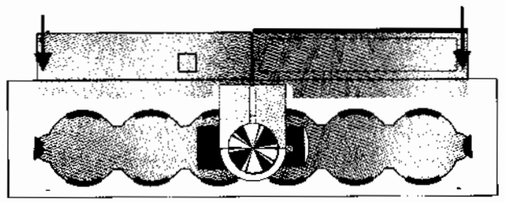
Adjustment of CD mechanism

See Brief Operation Guide, page 1-5.

Adjustment of lid

Remove the left aluminium plate (see point 2 under dismantling for further information, if necessary) and open the lid covering the secondary keyboard.

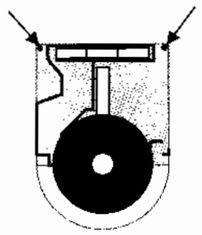
Adjust the lid until it is parallel with the top plate (15 mm).



Adjustment of clamper arm

Remove the top plate for the clamper arm (see point 7 under dismantling for further information, if necessary).

Adjust the clamper until it is parallel with the top plate.



Manual offset adjustment

If EEPROM 36IC4 has been replaced or the detector circuit has been repaired, the following offset adjustment has to be made.

To be able to make a correct adjustment the offset adjustment first has to be "reset". This is done by bringing the product into test mode - see page 5-6.

No aerial signal may be connected to the product.

Select radio as source

press 02

press 0 0 0 0

The display reads:

TM 02 ERROR

Install a 12 Kohm resistor between TP101 and TP102

The product must have been switched on for at least 2 minutes before the adjustment is made.

Make the adjustment in test mode - see page 5-6

Connect an aerial signal

press 02

The display reads:

FREQ?

Enter the frequency of a known station (4 digits), e.g. 98.5MHz = 0985

The product will now carry out an offset adjustment.

The display reads:

MAN. OFFSET

If there is an error, the display will read:

TM 02 ERROR

Remove the resistor that was installed between TP101 and TP102 when the adjustment has been completed.

Adjust the FM detector - see page 5-1.

TEST MODE 03
(TM = SHIFT 90258)
Display of status of offset

enter 03

OFFSET X

If no offset adjustment has been carried out, the display will read:

TM 03 ERROR

Adjustment of autopositioning

See TESTMODE 73 on page 5-13

IIC ERR

IIC ERR is the component on the IIC bus which has last caused an error in the communication

98 = The 34IC12 Link processor

102 = The 88IC302 FM/AM processor

104 = The 35IC2 Motor processor

136 = 32IC4 Sound control

208 = 34IC10 Clock

CD ERROR

CD ERROR is the last CD error occurred

2 = Focus error; it has not been possible to find focus.

3 = Radial error

4 = Motor error; the CD has not reached the correct speed.

5 = PLL error; the CD is not running at the correct speed.

6 = Step error on the sledge motor.

7 = Subcode error; it has not been possible to read the subcode.

8 = TOC error; it is not possible to read lead-in.

20 = Communication error on the M/S bus.

22 = Communication error on the M/S bus, check sum error.

23 = Communication error on the M/S bus, buffer full.

37 = Communication error on the M/S bus, unknown command.

SER ERROR

SER ERROR is the last error occurred on the M/S bus

1 = S/W communication error.

2 = S/W communication error.

3 = Communication error; check the bus and the components connected to it.

4 = Communication error; check the bus and the components connected to it.

5 = Communication error; check the bus and the components connected to it.

6 = Communication error; check the bus and the components connected to it.

7 = S/W communication error.

TEST MODES

Because of the high complexity of BeoSound 9000 it is important to use the built-in test and service functions in connection with servicing the product.

A good approach to finding the error is Test mode 27 in which a number of different error reports can be seen.

Remember always to execute TEST MODES 71 + 73, see page 5-13, after a repair.

Option 0-1

Since BeoSound 9000 is in option 0 if PL speakers are not connected, the option has to be changed to 1 - see the Brief operation guide for further information, if necessary.

Option 1 can be obtained by short-circuiting pins 2 and 4 in one of the Power Link sockets.

Test and service functions can be selected by means of Beo4 or BL1000.

To gain access to these functions, the product has to be brought into test mode, and that is done by bringing the product into stand-by and then pressing:

SHIFT 9 0 2 5 8, the remote control terminal must be in audio mode

(SHIFT is found under LIST. If the Beo4 display does not read "SHIFT", add this feature to the list in the following way:
Press •, keep the key depressed and press LIST. Now release both keys. Press LIST until the Beo4 display reads "ADD?" press "GO", press "LIST" until the display reads "SHIFT". Press GO to add "SHIFT" to the list, and press EXIT to abandon the set-up function.)

The display reads:

TESTMODE ON

Test mode is abandoned by disconnecting the mains voltage or by bringing the product into stand-by.

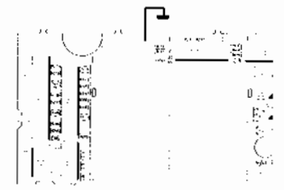
The display reads:

TESTMODE OFF

In some error situations BeoSound 9000 goes into stand-by. It is possible to bring the product into a condition in which this stand-by is ignored.

This condition is activated by connecting mains voltage while the point TEST is shorted to ground.

PCB34



THIS MEANS THAT THERE IS A RISK OF THE SLEDGE GETTING OUT OF CONTROL. CONSEQUENTLY, THIS CONDITION SHOULD BE USED ONLY WHEN NECESSARY.

When the product is in this condition the test mode is also activated. The condition is abandoned by disconnecting the mains voltage.

SLG ERROR

SLG ERROR is the last sledge error occurred

13 = The IR beam in the finger protection system has been broken while the sledge was moving.

30 = A counter error has been registered on the signal from the sledge tacho. It is registered at 35IC2 pins 1, 44, 5 and 9.

31 = Microprocessor 35IC2 cannot register pulses from 9PE1.

32 = Microprocessor 35IC2 cannot register the signal REF. POS from the end stop detector at pin 20.
This error also occurs if the tacho system is not working.

33 = The clamper cannot go to the desired position. The reason may be that it is blocked or that there is an error on PCB23, clamper position, or that the motor driver is defective.

38 = 35IC2 pin 35 registers that the sledge uses too much current. The reason may be that the sledge is blocked or that the sledge control is defective.

39 = The disc detector is not operating. Carry out test mode 71 to test the circuit.

40 = 35IC2 pin 37 registers that the sledge uses too much current. The reason may be that the sledge is blocked or that the sledge control is defective.

41 = The sledge is blocked, or the power supply to the sledge control may be too low.

42 = The finger protection circuit is out of operation. Use test mode 71 during troubleshooting.

PLT ERROR

PLT ERROR is the last lid error occurred

17 = Position error; the lid may be blocked, the lid motor may be defective, or the optocouplers 37PE1 and 37PE2 may be defective.

37 = (Occurs during test mode 71 only.) Position error; the lid may be blocked, the motor may be defective, or the optocouplers 37PE1 and 37PE2 may be defective.

APS ERROR

APS ERROR is the last autopositioning error occurred

10 = P bit has not been detected. If a CD-I Ready disc for example has been played back at some point or if there is an error in the detection circuit. The error has been detected at pin 11 of 35IC2.

11 = Too many P bits have been detected. May be caused by scratches in the disc.

12 = Information that the turntable tacho has been adjusted. Data in EEPROM has been lost.

14 = An error has occurred in connection with scanning of the turntable motor position. The position is not stored in the EEPROM. Optocoupler/tacho may be defective.

15 = It has taken more than 5 seconds to carry out autopositioning. The turntable motor driver may be defective.

WRONG SRC/TM

Having selected test mode, select CD before using test modes associated with CD and select radio before using test modes associated with radio.

If you select a test mode that is not valid, e.g. a CD test while CD has not been selected, the display will read:

WRONG SRC/TM

TEST MODE 27
(TM = SHIFT 90258)
Error detection:

In test mode it is possible to see the last errors (maximum 5) that have occurred in connection with Master Link, IIC bus, CD, M/S bus, sledge, lid, autopositioning, and power supply. The various error types are displayed by pressing GO (PLAY on BL 1000).

You may switch among the individual errors under each heading by pressing "STEP UP". If you press "STEP DOWN", you switch between the error type and the time at which the error was registered. For example, the hour 15:31:38 on 17 September 1996 will be displayed as:

960917153138

The possibility of displaying more errors and the time of the registration of the errors is available only if the Application (36IC1) software is version 1.4 or higher.

enter 27

The error registration is reset by stepping through the displayed errors until the display reads:

CLEAR ERRS?

press GO (BL1000 PLAY)

Display:

ERRS CLEARED

If you do not wish to delete the errors, press STOP instead

Error code 99 indicates that it has not been possible to read the error code in the EPROM.

ML ERROR

ML ERROR is the last error occurred on Master Link

8 = Link is kept low.

It is impossible to transmit on Master Link because it is pulled low. The error may occur if there is an error in the Master Link driver circuit, or because a short circuit has occurred on the Master Link.

16 = Link is kept high.

It is impossible to transmit on Master Link because it is pulled high. The error may occur either because the pull-up resistance in the system has become too low or as a result of an error in the data receiver circuit.

32 = Address configuration is not possible.

Disconnect all products from the Master Link system and reconnect them one by one until the error shows up.

18 = It has not been possible to make a correct adjustment of the autopositioning circuit. The optocoupler circuit may be defective.

19 = The signal ROUND REF from PCB31 IR tacho clamper RX is missing.

34 = A counter error has occurred in connection with an adjustment (test mode 73). Check the signals QUAD 1 TTM and QUAD 2 TTM from PCB31 IR tacho clamper RX.

35 = (Occurs during test mode 73 only.) It has not been possible to carry out a correct adjustment of the autopositioning circuit. The optocoupler/tacho circuit may be defective.

36 = (Occurs during test mode 73 only.) The signal ROUND REF from PCB31 IR tacho clamper RX is missing.

39 = The disc detector is not operating. Carry out test mode 71 to test the circuit.

PWR ERROR

PWR ERROR is the last power error occurred.

20 = Mains drop-out while the sledge was moving.

TEST MODE 28
(TM = SHIFT 90258)
Check of EEPROM, 36IC4

enter 28

If the EEPROM is OK, the display will read MEMORY +++

If there is an error in the EEPROM, the display will read MEMORY ++-

TEST MODE 31
(TM = SHIFT 90258)
Deletion of all programming

The function can only be carried out if no errors are registered in the product. See "Error detection", page 5-7, for further information, if necessary.

enter 31

Set the product to the following values:

Option:	1
Volume:	32
Balance:	0
Bass:	0
Treble:	0
Loudness:	OFF
Radio programmes:	deleted.
CD library:	deleted.
Timer programming:	deleted.

When the function has been completed, the display will read:

DEFAULTS SET

TEST MODE 20
(TM = SHIFT 90258)
Display test:

enter 20

The display reads: HHHHHHHHHHHH
IIIIIIIIIIII
############

Switching among the various displays is achieved by pressing GO (BL1000 PLAY).

TEST MODE 63
(TM = SHIFT 90258)
Start of CD turntable motor

(Before executing this test, carry out test mode 61 with CD; otherwise the turntable motor will run in the reverse direction.)

enter 63

The display reads:

TURNTBL ON

Must be completed with test mode 64.

TEST MODE 64
(TM = SHIFT 90258)
Stop of CD turntable motor

enter 64

The display reads:

TURNTBL OFF

The CD stops in a random position (not in autoposition).

TEST MODE 65
(TM = SHIFT 90258)
Laser arm towards extreme outside position

enter 65

The display reads:

LIGHTPEN OUT

Must be completed with test mode 66.

TEST MODE 66
(TM = SHIFT 90258)
Laser arm is moved towards the centre

enter 66

The display reads:

LIGHTPEN IN

TEST MODE 67
(TM = SHIFT 90258)
Starting the CD

enter 67

The display reads:

CD PLAY

TEST MODE 68
(TM = SHIFT 90258)
Stopping the CD

enter 68

The display reads:

CD STOP

TEST MODE 71
(TM = SHIFT 90258)
Test/adjustment of sledge functions

CD's must be loaded in positions 6, 5, 4, 3 and 2. There must be no CD in position 1, the position closest to the LOAD button.

The CD must be stopped when the test is activated.

The lid must be shut.

enter 71

The following sequence is executed:

1. End stop is found, the sledge runs slowly.
   This tests the following: sledge tacho, sledge motor, calibration end stop switch.

2. Lid opens and closes.
   This tests the following: optocoupler for glass lid.

3. Test of finger protection circuit.

4. The sledge runs the longest possible distance slowly once, then quickly twice. This tests the sledge tacho for phase errors between quad 1 and quad 2 (the finger protection circuit is cut out during the test). When the sledge is running it must run "properly".

5. The lid opens.

6. Autocalibration of CD positions.
   This tests the following: Calibration, disc detector, sledge motor, sledge tacho, clamper motor, clamper optocoupler, and jaws.
   The clamper is noise-optimized during the autocalibration.

7. The sledge runs to the original position, i.e. the sledge position prior to activation of sledge test.

If the test is o.k., the display will read:

OK 71

If an error has occurred, the error code in question will be displayed. Switching among the various error codes is carried out by pressing GO (BL1000 PLAY), see error detection on page 5-7.

TEST MODE 73
(TM = SHIFT 90258)
Adjustment of autopositioning

The sledge must be placed in a position in which a CD is loaded.

The CD must be stopped.

Test mode 71 must have been executed.

There must be a cover on the clamper when autopositioning is executed.

enter 73

If the test is o.k., the display will read:

APS ADJUSTED

If an error has occurred, the applicable error code can be seen under test mode 27. Switching among the various error codes is carried out by pressing GO (BL1000 PLAY), see error detection on page 5-7.

USA only: Remember to carry out the special adjustment procedure - use the intermediate PCB you have received.

TEST MODE 22
(TM = SHIFT 90258)
Test of primary and secondary keyboards:

enter 22

When activating the various functions on the primary and secondary keyboards, the applicable function is described on the display.

End the test by pressing STOP on Beo4/BL1000.

TEST MODE 26
(TM = SHIFT 90258)
Test of mains frequency:

In connection with troubleshooting in the power-supply unit the 100/120Hz circuit can be tested.

enter 26

When 100/120Hz is detected, the display will read:

FREQUENCY OK

If other frequencies are detected, the display will read:

TM 26 ERROR

TEST MODE 72
(TM = SHIFT 90258)
Release of sledge (test of clamper function)

The product must be in CD mode.

enter 72

The display reads:

RELEASE SLG

When test mode 72 has been used the mains voltage to the product has to be disconnected to ensure correct calibration.

CD TEST MODE

In connection with the test mode the CD has reduced operation.

To gain access to the CD test modes CD must be chosen as source.

Discs do not have to be loaded into the product.

TEST MODE 61
(TM = SHIFT 90258)
Focus on

enter 61

The display reads:

CD FOCUS ON

The laser switches on, and focus is searched each time 61 is entered.

The light pen can be seen when test mode 65 is executed.

Must be completed with test mode 62.

TEST MODE 62
(TM = SHIFT 90258)
Focus off

enter 62

The display reads:

CD FOCUS OFF

The laser switches off.

REPAIR TIPS

Voltage to sledge motor

Disconnect the voltage supply to the sledge motor while servicing (lift 35P53).

Repair of autopositioning

TM 73 (see page 5-13) is used in connection with repair of autopositioning. The circuit can be measured each time the test is run. Use a storage oscilloscope, if necessary.

Only the signals SWAB and SDAB can be measured during lead-in, i.e. during ordinary play-back of a CD.

Autopositioning errors of less than 5 degrees may occur in rare cases.

WHY DOES THE PRODUCT NOT WORK?

If the product does not work, the reason may be one of the following:

When the glass lid is not installed the sledge may stop during movement. That is because the IR beam in the finger protection system transmits at reduced power when the lid is closed. Run the lid hinges to the open position for maximum IR transmitter power (see test mode 74, if required).

A lid acknowledgment must be given for the product to operate. The lid may be subject to an adjustment error so than no acknowledgment is received.

If there is no 100/120Hz at pin 6 of 36P1, the product will not operate.

If the finger protection beam is broken, the sledge cannot move.

If end stops have not been detected, the product will not operate.

If the optocouplers is the product are affected by external light the product will not operate.

SERVICE INFORMATION

TEST MODE 23
(TM = SHIFT 90258)
Display of SW versions:

enter 23

The product contains five microprocessors. The individual SW versions are displayed by pressing GO (BL1000 PLAY).

APP	x.x	(36IC3)
LINK	x.x	(34IC12)
MOTOR	x.x	(35IC2)
TUNER	x.x	(88IC302)
CD	x.x	(40IC11)

The SW version can be displayed only after tuner/CD has been selected as source. If that source has not been selected the display may read:

TUNER X.X

Select the source. Then select test mode 23 again, and the SW version can be displayed.

TEST MODE 24
(TM = SHIFT 90258)
Display of operation counters:

enter 24

The product contains 7 counters:

STANDBY
RADIO
CD
RANDOM
A.AUX
ML
ON-OFF

The individual timers are selected by pressing GO (PLAY on BL 1000).

The values are used in connection with error message feedback. If the figures are preceded by a +, that too has to be included in the feedback.

Times are x 10 hours.

On/off is the actual number x 10.

TEST MODE 04
(TM = SHIFT 90258)
Display of tuner variant

enter 04

The display shows the tuner actually installed.

TEST MODE 32
(TM = SHIFT 90258)
Display of type and serial numbers

press 32

The display shows

TYPENO. xxxx

Press GO (PLAY on BL 1000)

Display shows NO.xxxxxxxx (serial number).

CD

In connection with repair of the CD the following tips may be useful:

THE PHOTO DIODES AND THE LASER ARE MORE SENSITIVE TO STATIC ELECTRICITY THAN THE MOS IC'S. OMISSION TO TAKE THIS INTO CONSIDERATION DURING SERVICING MAY REDUCE THEIR LIVES DRAMATICALLY. SO BE SURE THAT THE WORK SITE IS PROTECTED AGAINST STATIC ELECTRICITY.

The product may not be connected to the mains while the CD mechanism or PCB40 are removed.

Focus can be checked by placing a CD over the light pen. The light pen will now "follow" the CD (up/down).

In normal operation the CD will first search for Focus, and when that has been found it will start the turntable motor, i.e. if the motor cannot start, the reason may be that focus has not been found.

The CD can run without clamper and disc detector. In test mode select CD as source. Move the sledge to position 1, disconnect the voltage supply to the sledge motor while servicing the CD (lift 35P53), load a CD, press CD, and the CD can now be played back.

By using one of the flat cables provided at the back of the service manual (type 252x - 3538847) the display can be engaged by connecting 7P63 and 34P8.

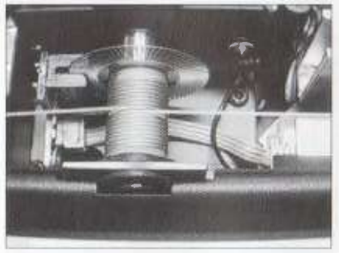
In connection with test modes the CD has reduced operation.

If the clamper arm is not installed, no tacho pulses will come from the autopositioning system, and the turntable motor may therefore run in the reverse direction.

SLEDGE

In connection with repair of the sledge function the following tips may be useful:

The wire for the sledge must be placed correctly; otherwise periodic errors may occur.



GLASS LID

The glass lid may be "pulled" out of mesh. The product has been designed in that way in order to allow the customer to remove his CD's without switching on the power supply to the product.

MISCELLANEOUS

When replacing the top, the number label must be transferred to the new top.

SERVICE

TEST MODE 21
(TM = SHIFT 90258)
Opening of ML output: (used if no ML product is connected during service)

The signal is taken from the AUX socket and output at ML

enter 21

The display reads:

ML OUT OPEN

TEST MODE 25
(TM = SHIFT 90258)
Opening of ML input: (used if no ML product is connected during service)

The signal is taken from the ML socket and output at PL and AUX.

enter 25

The display reads:

ML IN OPEN

TEST MODE 74
(TM = SHIFT 90258)
Changing transmitter power for the finger protection circuit

press 74

The display shows:

SAFEGUARD_TM

The IR transmitter power for the finger protection circuit has now been set to the maximum value.

The function can be disconnected only by switching off the product by means of the mains switch.

REPLACEMENT OF COMPONENTS

Replacement of the EEPROM, 36IC4

The programming carried out by the customer will be lost when 36IC4 is replaced.

REMEMBER to carry out test modes 71 and 73 (see page 5-13).

Replacement of PCB34 and/or PCB36

When PCB34 and/or PCB36 are replaced, the EEPROM, 36IC4, must be transferred to the new module, because that is where the customer's CD library, for example, is stored.

Replacement of 7DP1, 7DP2 or 7DP3

When display 7DP1, 7DP2 or 7DP3 is replaced, all 3 displays must be replaced to ensure an uniform light intensity.

Replacement of 29IL1 and 7IL1

When 29IL1 or 7IL1 is replaced, both light bulbs must be replaced.

Replacement of Light indicator (PCB's24 and 25)

When either Light indicator PCB's is replaced, it MUST be fixed again with double-sided adhesive tape.

Replacement of PCB35, PCB27, PCB28 and the mechanical parts of the finger protection system

Remember to carry out adjustment of the sensitivity of the finger protection system (see page 5-4).