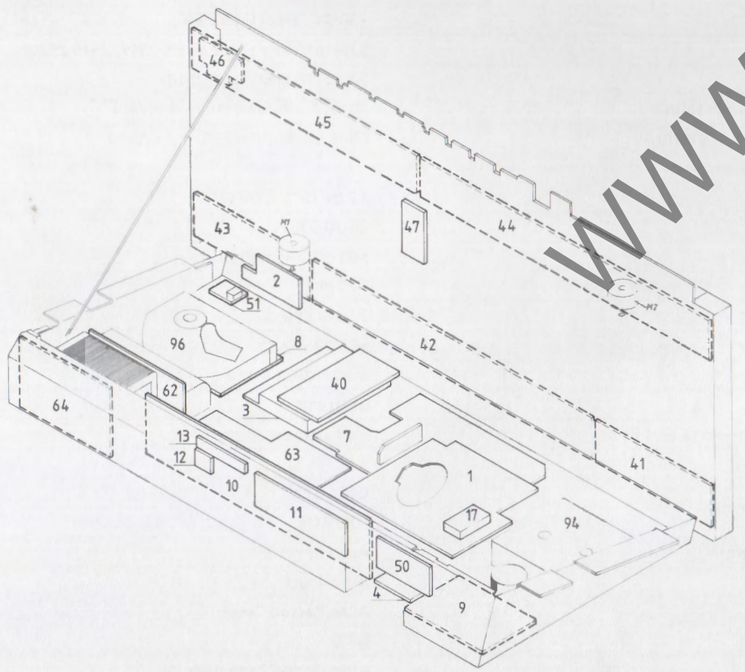
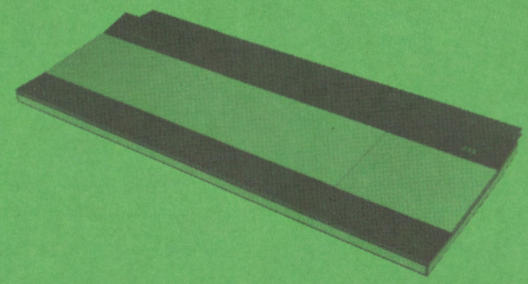


Bang&Olufsen

Beocenter 9300

Type 2516, 2517, 2518, 2519, 2520



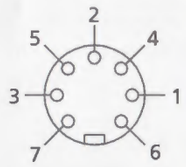
SERVICE MANUAL

Specification guidelines for service use	
Beocenter 9300	**Type 2516 EU, 2517 GB, 2518 USA-CDN, 2519 J, 2520 AUS**
Operation	Direct, sensi-touch panel
Finish	Aluminium
Dimensions W x H x D	76 x 11 x 34 cm
Weight	14 kg
Tuner	
Number of Programmes	30
FM tuner section	
FM range	87.5-108 MHz (Type 2516, 2517, 2518, 2520)
	76-90 MHz (Type 2519)
FM aerial impedance	75Ω
Usable sensitivity mono	14 dBf-1.4µV
Usable sensitivity stereo	21 d8f-3.2µV
50 dB quiting sensitivity mono	19 dBf-2.5µV
50 dB quiting sensitivity stereo	40 dBf-28µV
Signal - to - noise ratio, 65 dBf mono	75 dB
Signal - to - noise ratio, 65 dBf stereo	68 dB
Intermodulation mono	0.1%
Intermodulation stereo	0.1%
Capture ratio	1.7 dB
Adjacent channel selectivity	6 dB
Alternate channel selectivity	62 dB
Spurious response	100 dB
Image response ratio	78 dB
IF response ratio	80 dB
AM suppression	57 dB
Stereo channel separation	40 dB
Subcarrier product rejection	50 dB
AM tuner section	
LW range	150-343 kHz (Type 2516)
MW range	520-1610 kHz (Type 2516, 2517, 2519 2520)
	520-1710 kHz (Type 2518)
LW sensitivity, 20 dB S/N ratio	80 → 72 dBµV/m (10 → 4 mV/m)
MW sensitivity, 20 dB S/N ratio	68 → 60 dBµV/m (2.5 → 1 mV/m)
CD Player	
Disc types	12 cm (5"), 8 cm (3")
Frequency range	20-20,000 Hz
Signal - to - noise ratio	>95 dB A-weighted
Dynamic range	>70 dB
Harmonic distortion	0.03% at 0 dB
Channel separation	>80 dB, 1 kHz
Channel difference	< ±0.5 dB, 1 kHz
Converter system	Bitstream
Phase difference between L and R	< ±1 degree
Tape recorder	
Compact cassette	C46 - C120
Recording system	HX PRO
Tape transport system	Auto Reverse
Search system	Auto Track
Record level	Auto Record Level
Noise reduction	NR B
Tape switch	Auto Ferro/Chrome/Metal
Tape head	Amorphous

CONTENTS

Wow and flutter DIN	< 0.15%
Wow and flutter Wrms	< 0.09%
Speed deviation	< ± 1.5%
Fast forward and rewind	95 sec., C60
Frequency range chrome	30-16,000 Hz
Signal - to - noise ratio CCIR/ARM	
Metal	> 63 dB
Chrome	> 65 dB
Ferro	> 63 dB
Signal - to - noise ratio IEC/DIN	
Metal	> 54 dB
Chrome	> 56 dB
Ferro	> 54 dB
Channel separation	> 45 dB
Erasure	> 70 dB
Driveabillity 10,000 Hz	
Metal	0 dB
Chrome / Ferro	-7 dB
Distortion, Ferro	< 2%
Channel separation	> 45 dB
Erasure	> 70 dB
Erasure frequency	98 kHz
Amplifier	
Long - term max. output power IEC	2 x 80 watts/8Ω
Total harmonic distortion IHF	< 0.1 %, 30 watts / 20-20,000 Hz
Dynamic Headroom	1 dB 8Ω
Intermodulation IHF	0.1 %
Bass control at 100 Hz	7.5 dB ±2 dB
Treble control at 10.000 Hz	7.5 dB ±2 dB
Connections	

TV / AUX

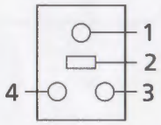


Pin 1 Left out
Pin 2 GND
Pin 3 Left in
Pin 4 Right out
Pin 5 Right in
Pin 6 Datalink
Pin 7 Not used

Power Link 1 & 2

Pin 1 Power up
Pin 2 Signal ground
Pin 3 Left channel
Pin 4 Speaker on
Pin 5 Right channel
Pin 6 Datalink
Pin 7 Data ground
Pin 8 Power failure/Overload

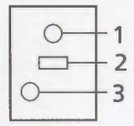
Speaker Link — Beovox speakers, 2 Sockets 4 pin



Pin 1 Signal out
Pin 2 Signal ground
Pin 3 Datalink
Pin 4 GND

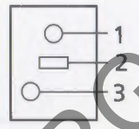
1-3
SPECIFICATION GUIDELINES

Master Control Link — Right Socket 3 pin



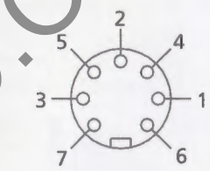
Pin 1 Right out
Pin 2 Signal ground
Pin 3 7V

Master Control Link — Left Socket 3 pin



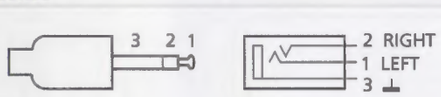
Pin 1 Left out
Pin 2 Signal ground
Pin 3 GND

Tape 2 / Phono

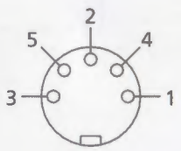


Pin 1 Left out
Pin 2 GND
Pin 3 Left in
Pin 4 Right out
Pin 5 Right in
Pin 6 Datalink
Pin 7 Datalink

Headphones — Max. 16V ±1dB, 220Ω



Line in /out — (Type 2518)



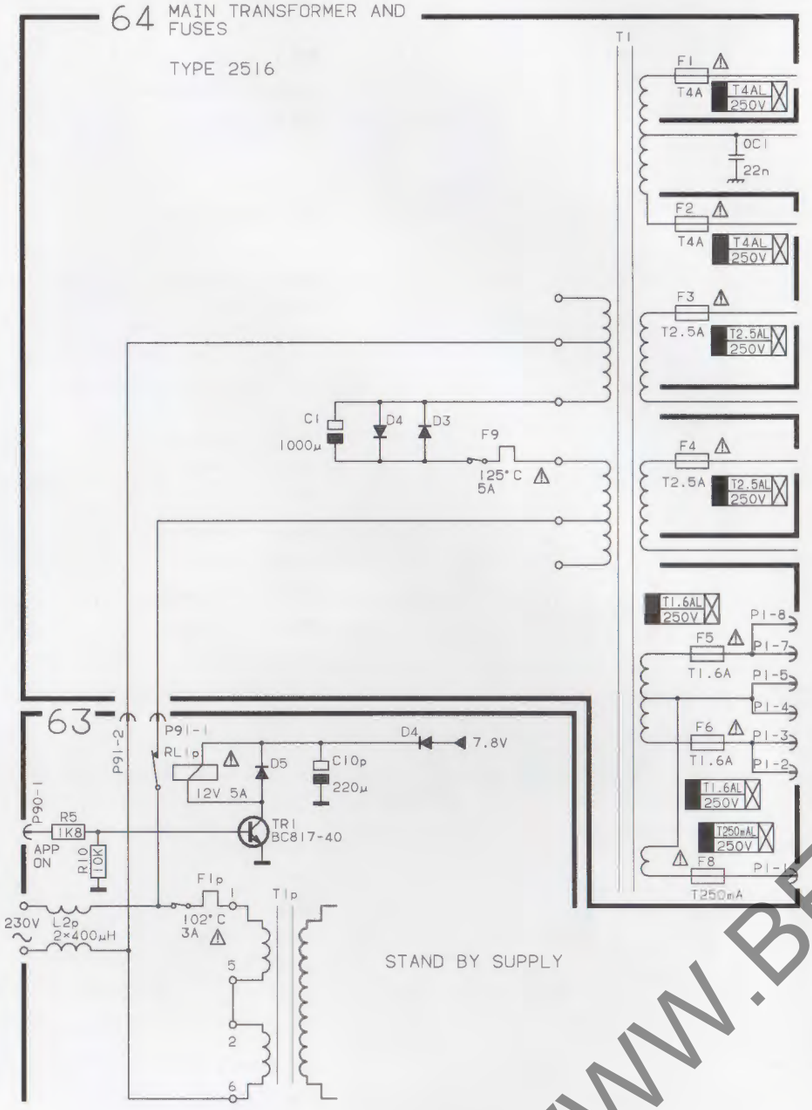
Pin 1 Left out
Pin 2 GND
Pin 3 Left in
Pin 4 Right out
Pin 5 Right in

Power Supply	Type 2516, 230V~
	Type 2517, 240 V~
	Type 2518, 120 V~
	Type 2519, 100 V~
	Type 2520, 240 V~
Power Frequency	50/60Hz
Power Consumption	Max. 200 Watts
	Standby 1.5 Watts
Optional accessories	
Beolink 1000	Type 1501, 1502 Italy
Stand ST 9500	Type 2096
Beogram LP	Beogram 7000 with RIAA bulit-in, recommended

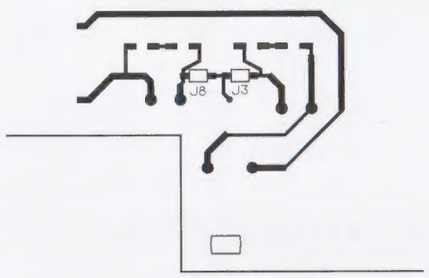
Subject to change without notice

1-4
WIRING OF TRANSFORMER

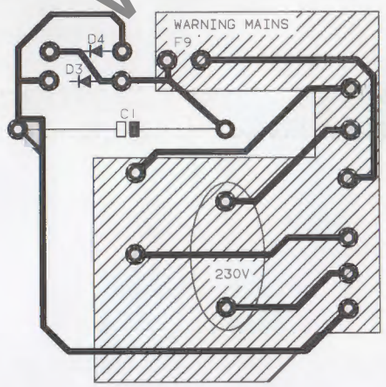
WIRING OF TRANSFORMER
Type 2516
EU 230V ~



PCB 63

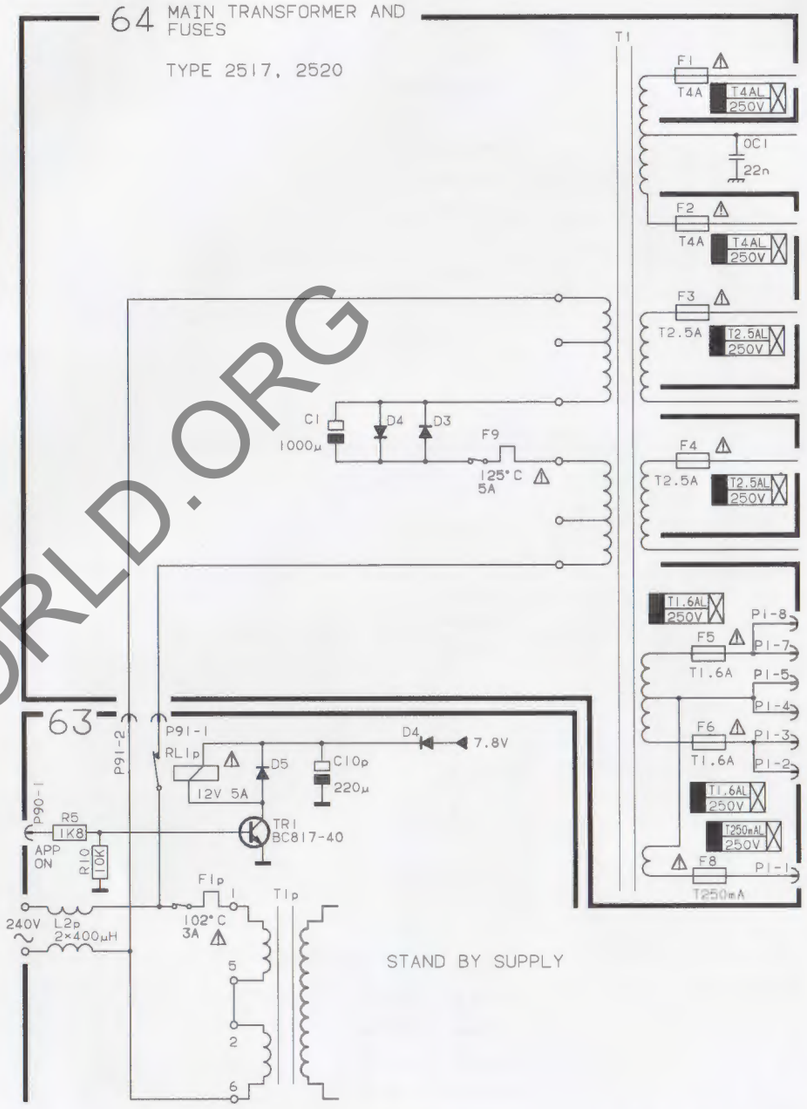


PCB 64



COPPERFOIL ON REAR SIDE

Type 2517, 2520
GB, AUS 240V ~



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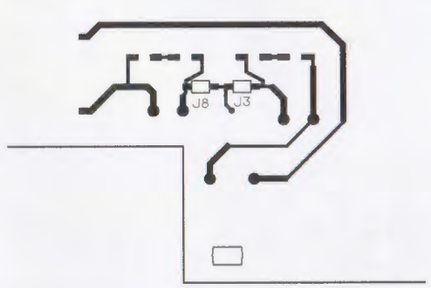
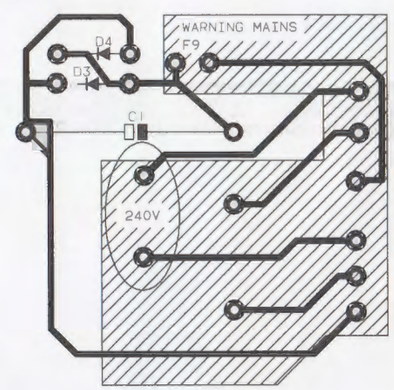


PCB 64



COPPERFOIL ON REAR SIDE

1-6
BRIEF OPERATION GUIDE

1-6
BRIEF OPERATION GUIDE

BRIEF OPERATION GUIDE

Radio

Turn on the radio — Radio

Search up/down the frequencies — Search — AM-FM — >> <<

Key in frequency (ex. 87.5 MHz) — Freq — 8 7 5

Store the station to a program number (0-20) — Programing — Store — nr. — Store

Key in exact program number — 1 5

Select another source — Tape 1, CD, Phono, Tape 2 or AUX

Switch to Stand-by — •

Remote Control

Stand-by — •

Disable the remote control function — Sound — 0 — Sound

Regain the remote control function — Sound — 1 — Sound

Compact Disc

Open the CD-lid — Load CD

Close the CD-lid — Load CD

Start playing the CD — CD

Searching through a CD — Search — >> <<

Stepping through tracks — >> <<

Pause the CD player — Stop

Resume playing after stop — CD

Select another source — Tape 1, Radio, Phono, Tape 2 or AUX

Switch to Stand-by — •

Sound Adjustment

Raises / Lowers the levels — >>>> <<<<

Bass — Sound

Balance — Sound

Treble — Sound

Store all sound levels — Programming — Sound — Store

Tape Recorder

Open the Tape-lid — Load Tape

Close the Tape-lid — Load Tape

Start playing the tape — Tape 1

Play from the beginning — 1

Play the other side — Turn

Stepping through tracks — Search — >> <<

Fast forwards/ rewinds the tape — >> <<

Pause the tape recorder — Stop

Resume playing after stop — Tape 1

Noise reduction on/off — Programming — NR

Select another source — Radio, CD, Phono, Tape 2 or AUX

Recording pause mode — Record

Stop recording pause mode — Stop

Start recording — Record

Pause the recording — Stop

Resume recording after pause — Record

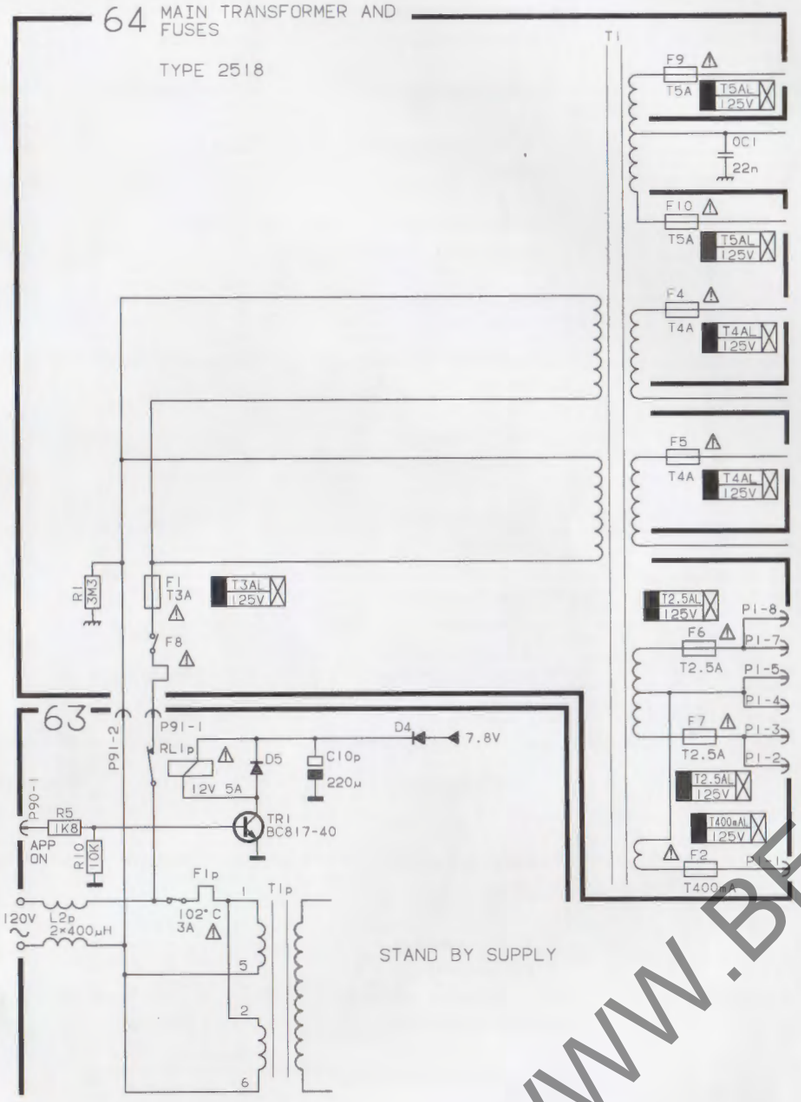
Stop recording completely — Stop — Stop

Return to approx. recording start — Return

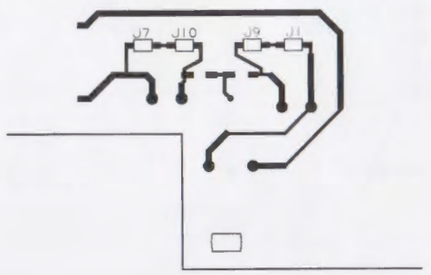
Select another source — Radio, CD, Phono, Tape 2 or AUX

Switch to Stand-by — •

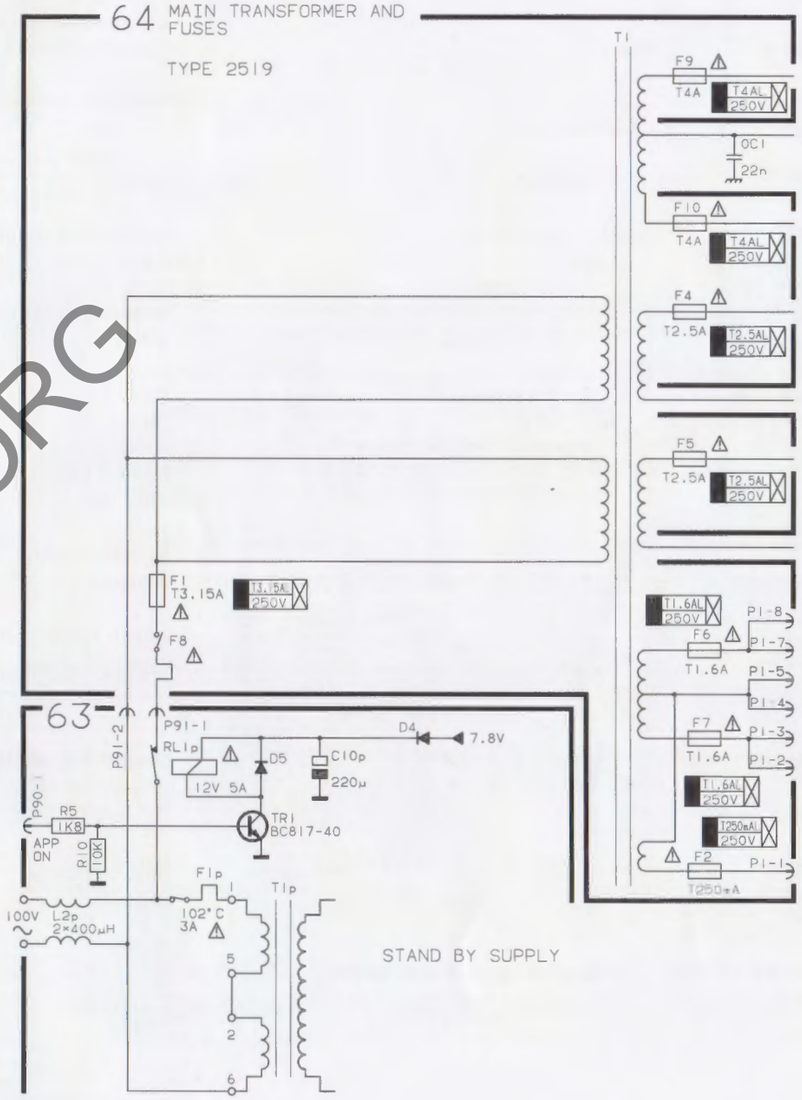
Type 2518
USA, CDN 120V ~



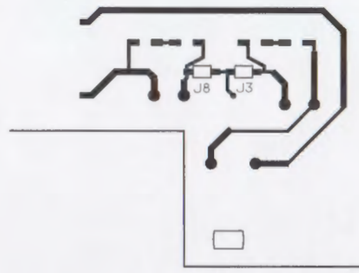
PCB 63



Type 2519
JPN 100V ~



PCB 63



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. TR102*.

Component print and coordinate system

The largest PCBs have component prints and a coordinate system on both the print and the component 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.

Control circuit

In certain control circuits the active mode is indicated by a function term or by an abbreviation. This may be e.g. $\overline{\text{ST.BY}}$.= 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 wich 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.

Supply Voltages

All supply voltages in the diagrams are indicated by an arrow and a voltage indication.

Lithium battery

ADVARSEL
LITHIUMBATTERI - EKSPLOSIONSFARE
UDSKIFTNING MÅ KUN FORETAGES AF EN SAGKYNDIG OG SOM BESKREVET I SERVICE MANUAL

WARNING
LITHIUM BATTERY - RISK OF EXPLOSION
TO BE REPLACED BY QUALIFIED SERVICEMAN ONLY AND AS DESCRIBED IN THE MANUAL

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 at the same make and type as mentioned in this service manual (see page 3-3).
Place the battery exactly like the old one.

2-1
EXPLANATION OF DIAGRAM

Ground symbols

Four different ground symbols are used in the set.

= Ground
= Signal 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.

CLASS 1
LASER PRODUCT

COMPACT disc DIGITAL AUDIO

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 opend by qualified servicemen only.

CD laserdiode

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

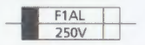
Explanation of the fuse symbols used in the set

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

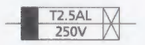
Replace with the same type 2.5 ampere 250 volts slow acting fuse.

Explanation des symboles de fusible utilisés dans l'appareil

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

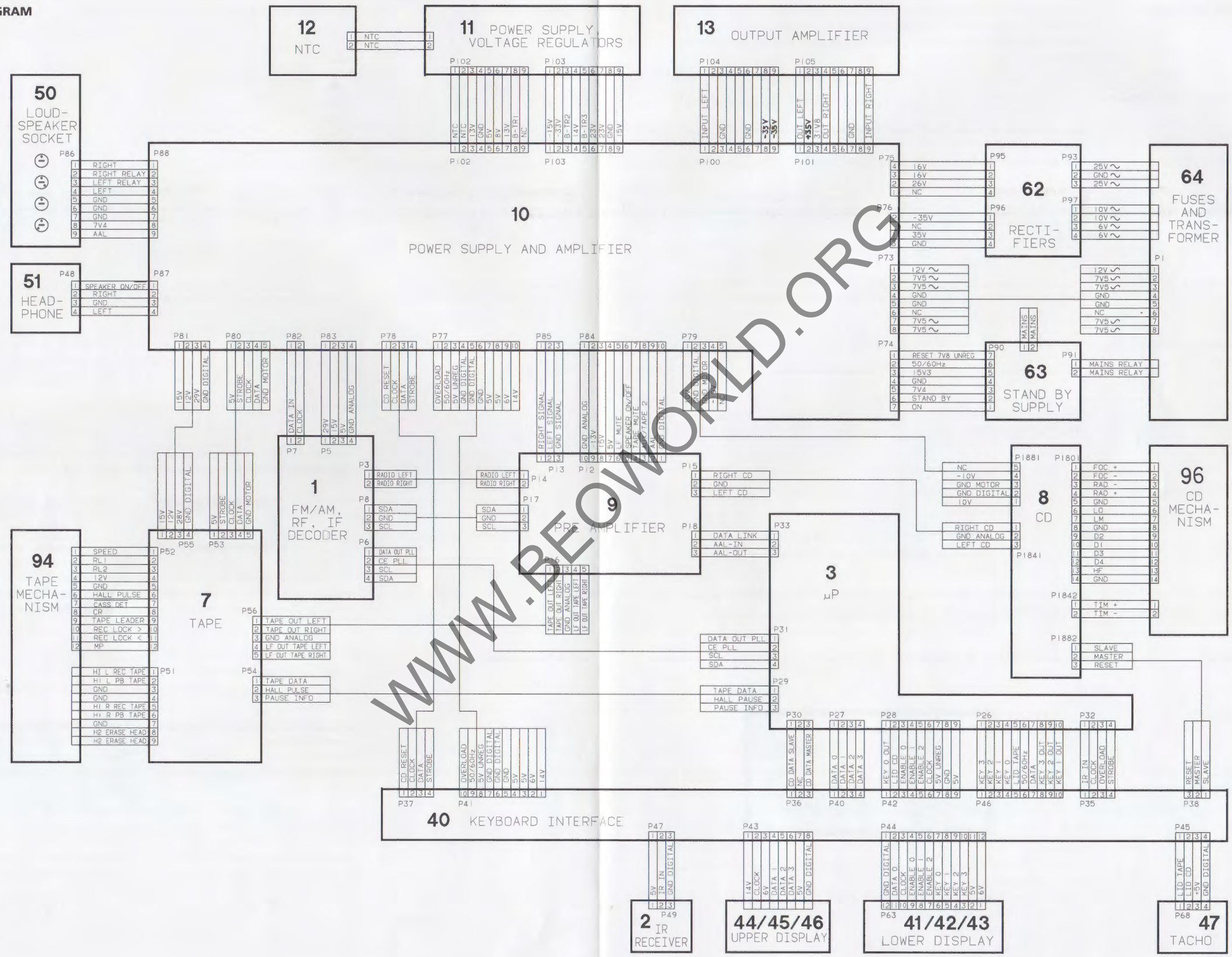


Remplacer par un fusible retardè de même type et de 2.5 ampères 250 volts.

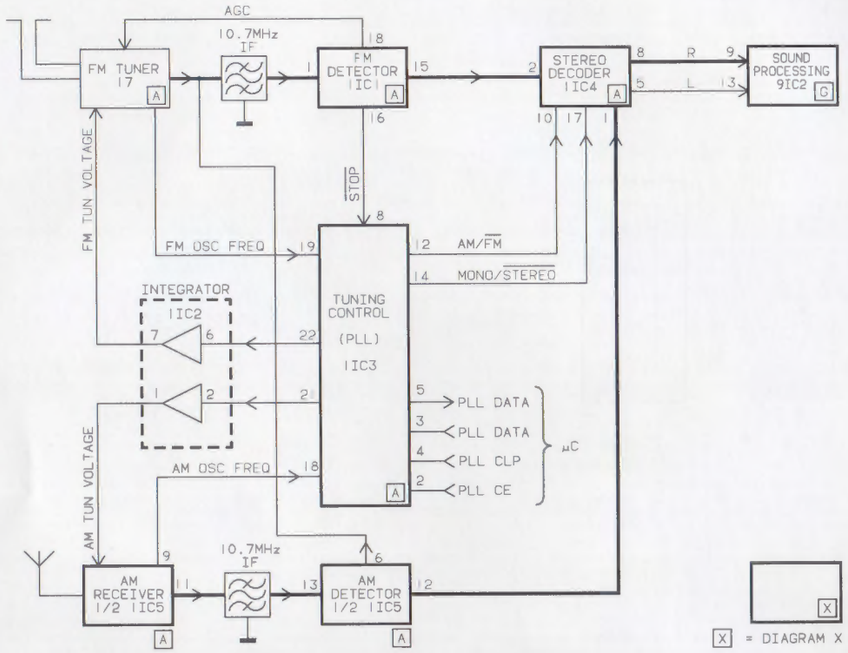


2-2
WIRING DIAGRAM

WIRING DIAGRAM



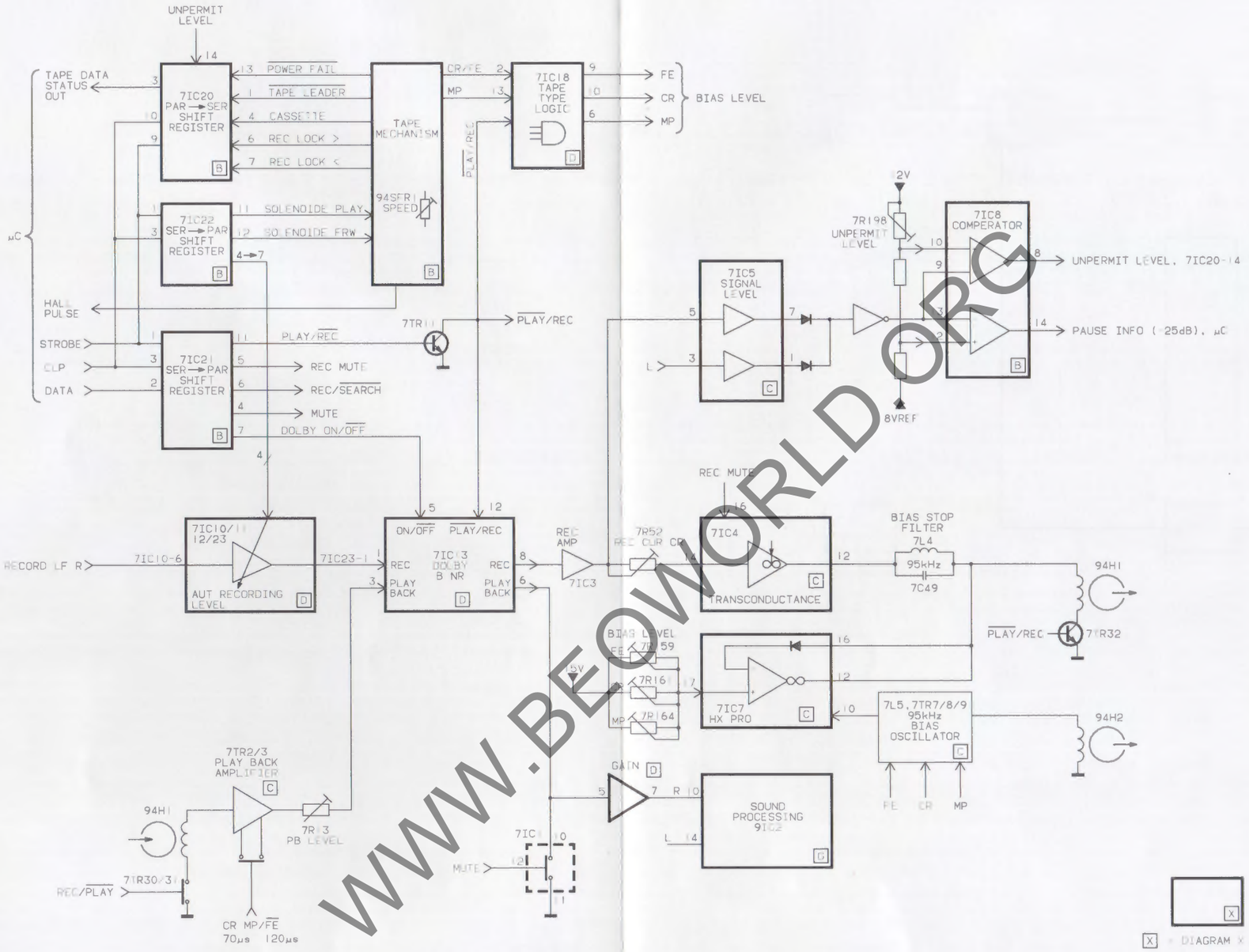
BLOCK DIAGRAM TUNER



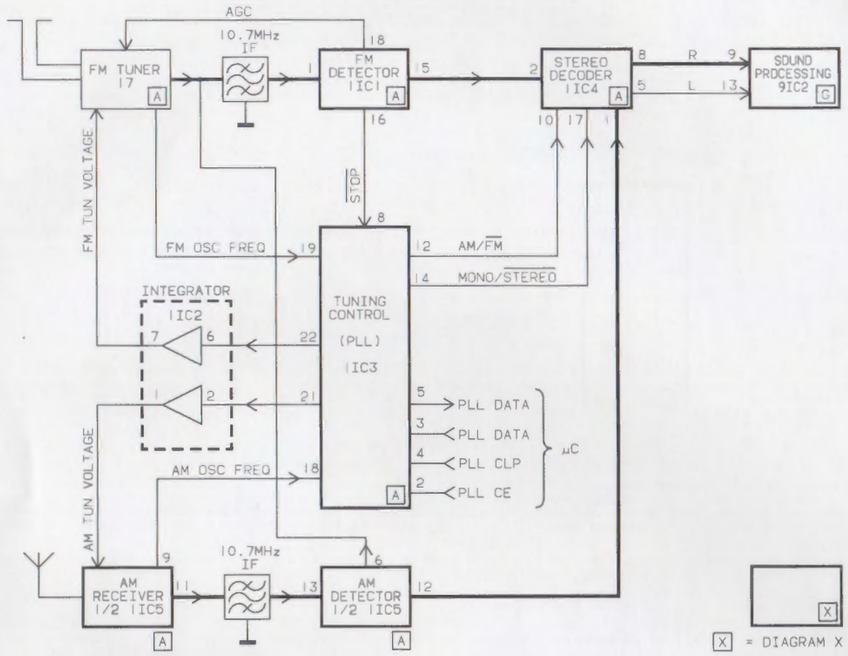
2-3
BLOCK DIAGRAM TUNER

2-4
BLOCK DIAGRAM TAPE

BLOCK DIAGRAM TAPE

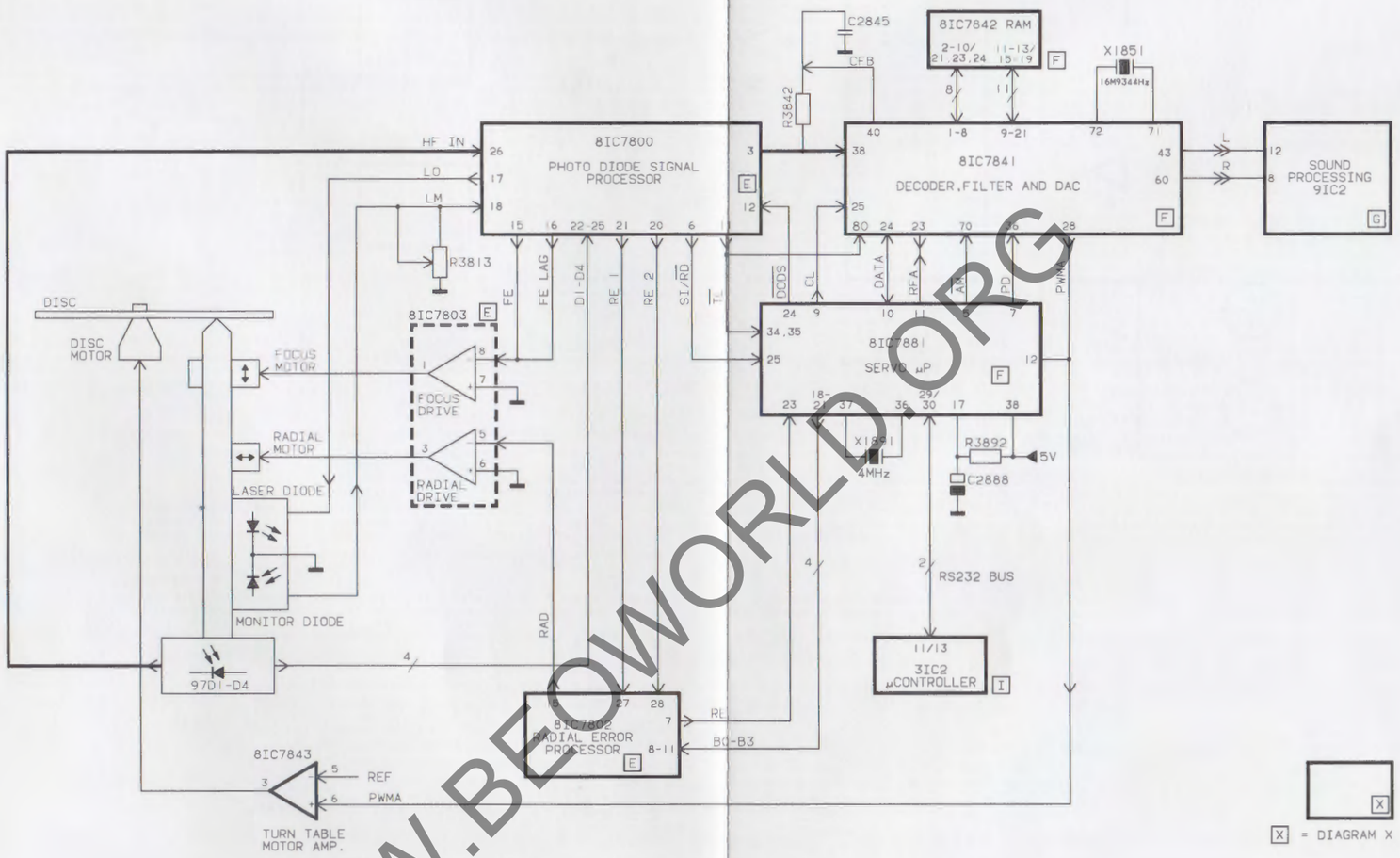


BLOCK DIAGRAM TUNER



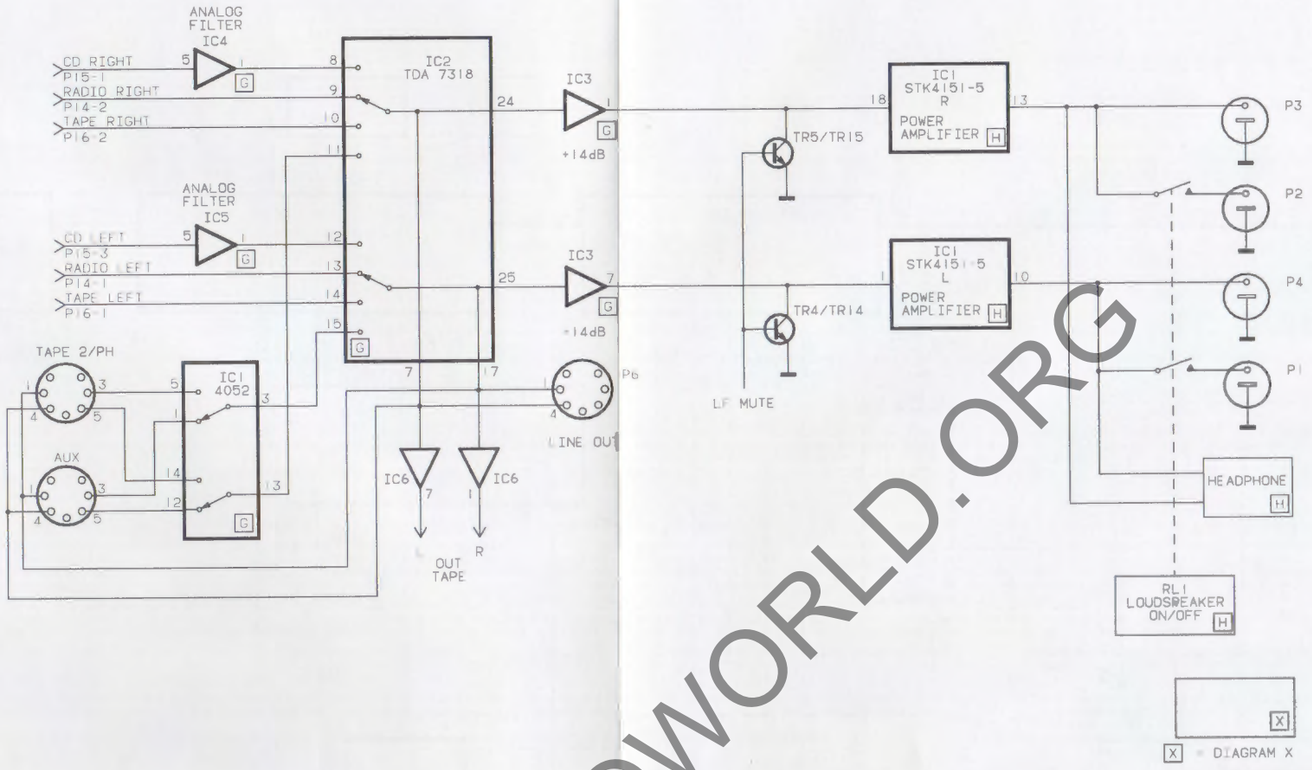
2-3
BLOCK DIAGRAM TUNER

BLOCK DIAGRAM CD

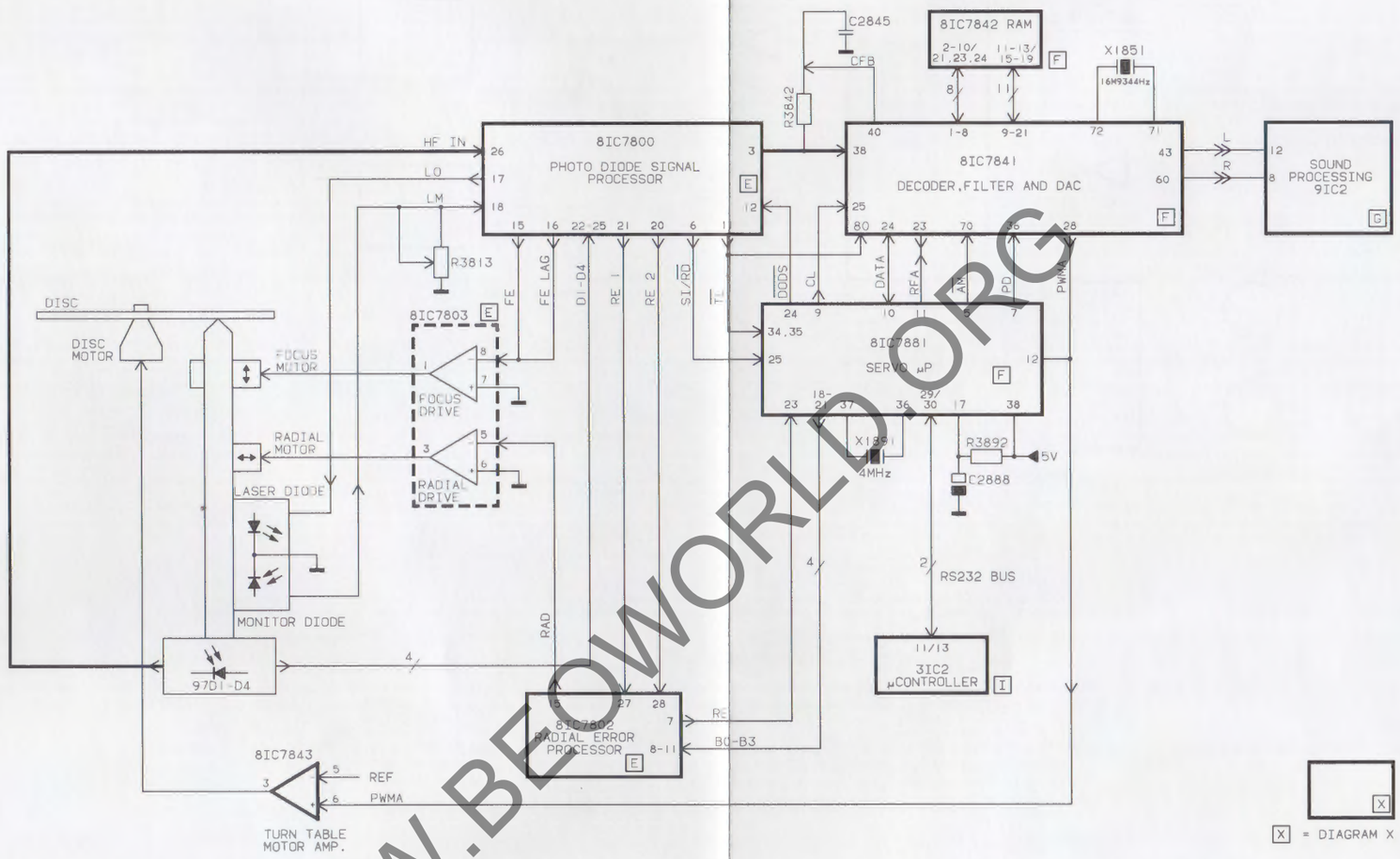


2-6
BLOCK DIAGRAM AMPLIFIER

BLOCK DIAGRAM AMPLIFIER

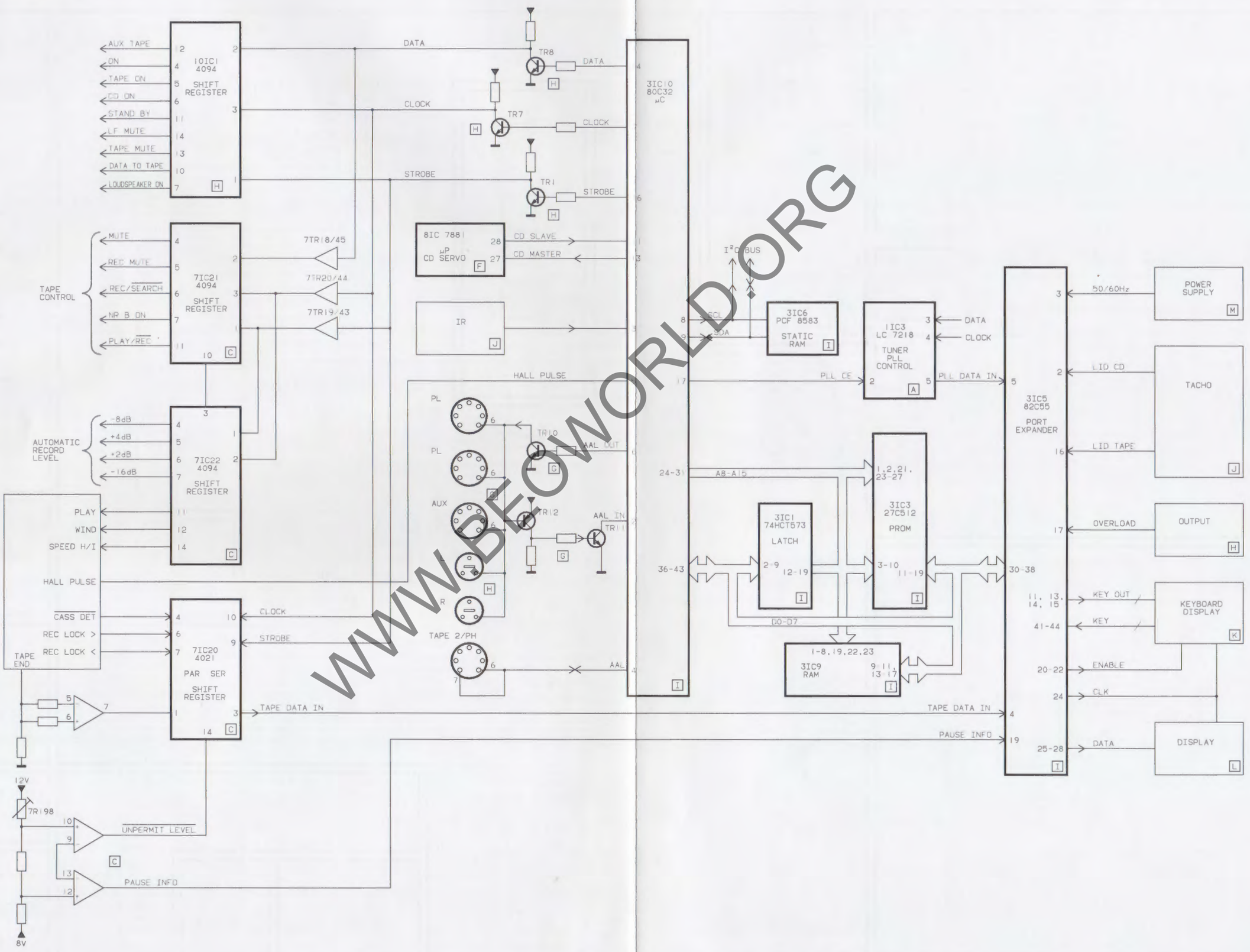


BLOCK DIAGRAM CD



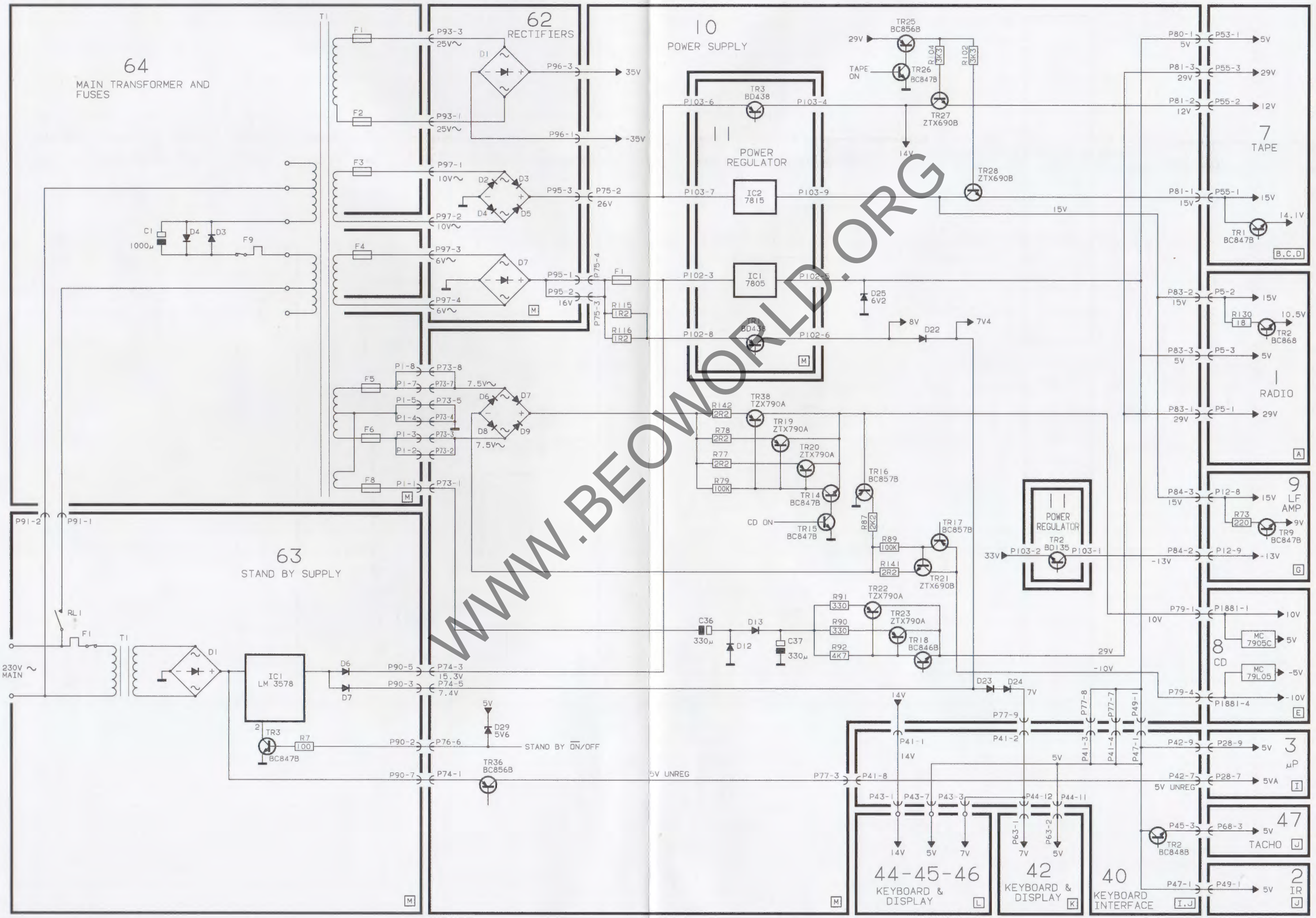
2-7 BLOCK DIAGRAM SYSTEM CONTROL 2-7

BLOCK DIAGRAM SYSTEM CONTROL



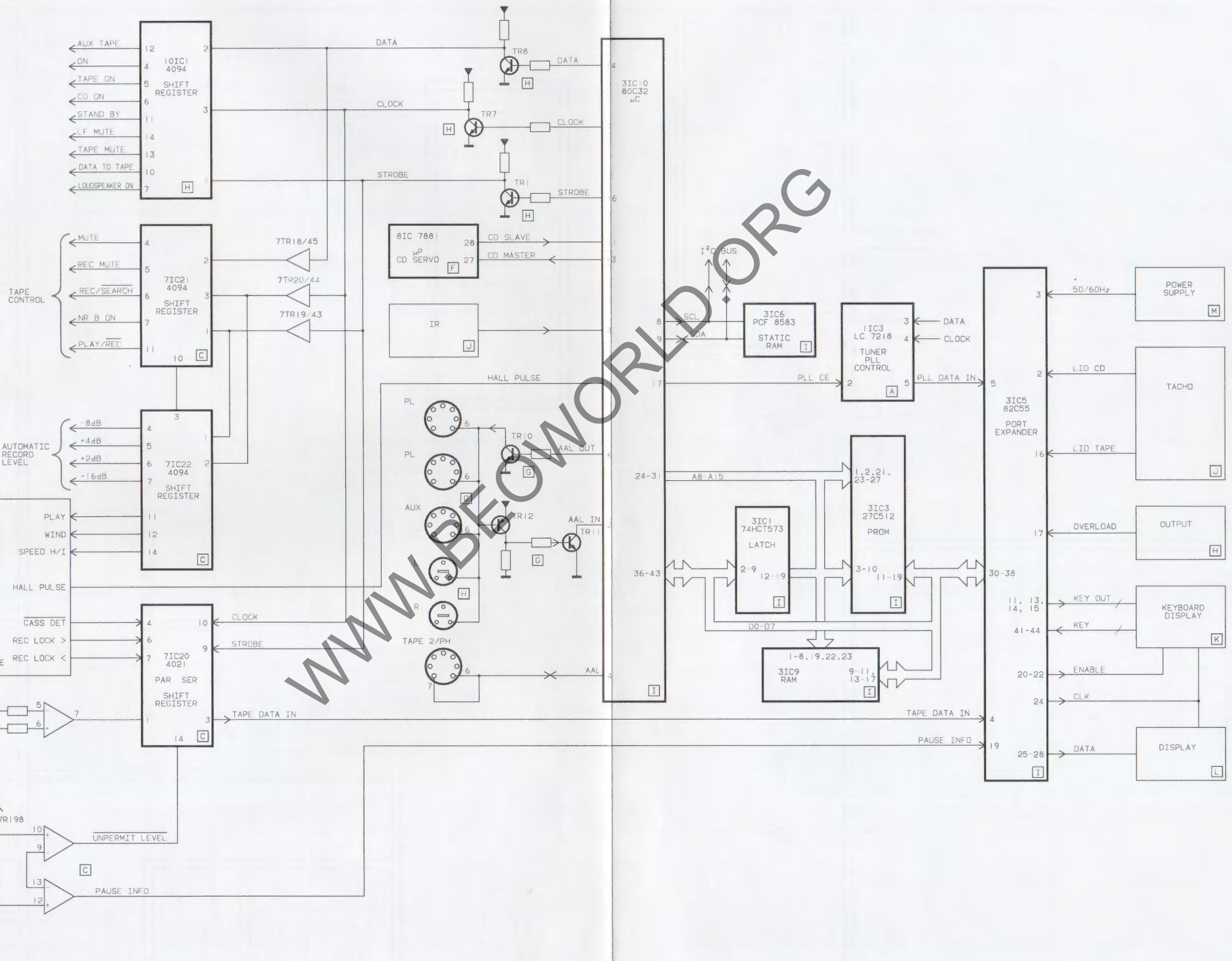
2-8
BLOCK DIAGRAM POWER SUPPLY

BLOCK DIAGRAM POWER SUPPLY



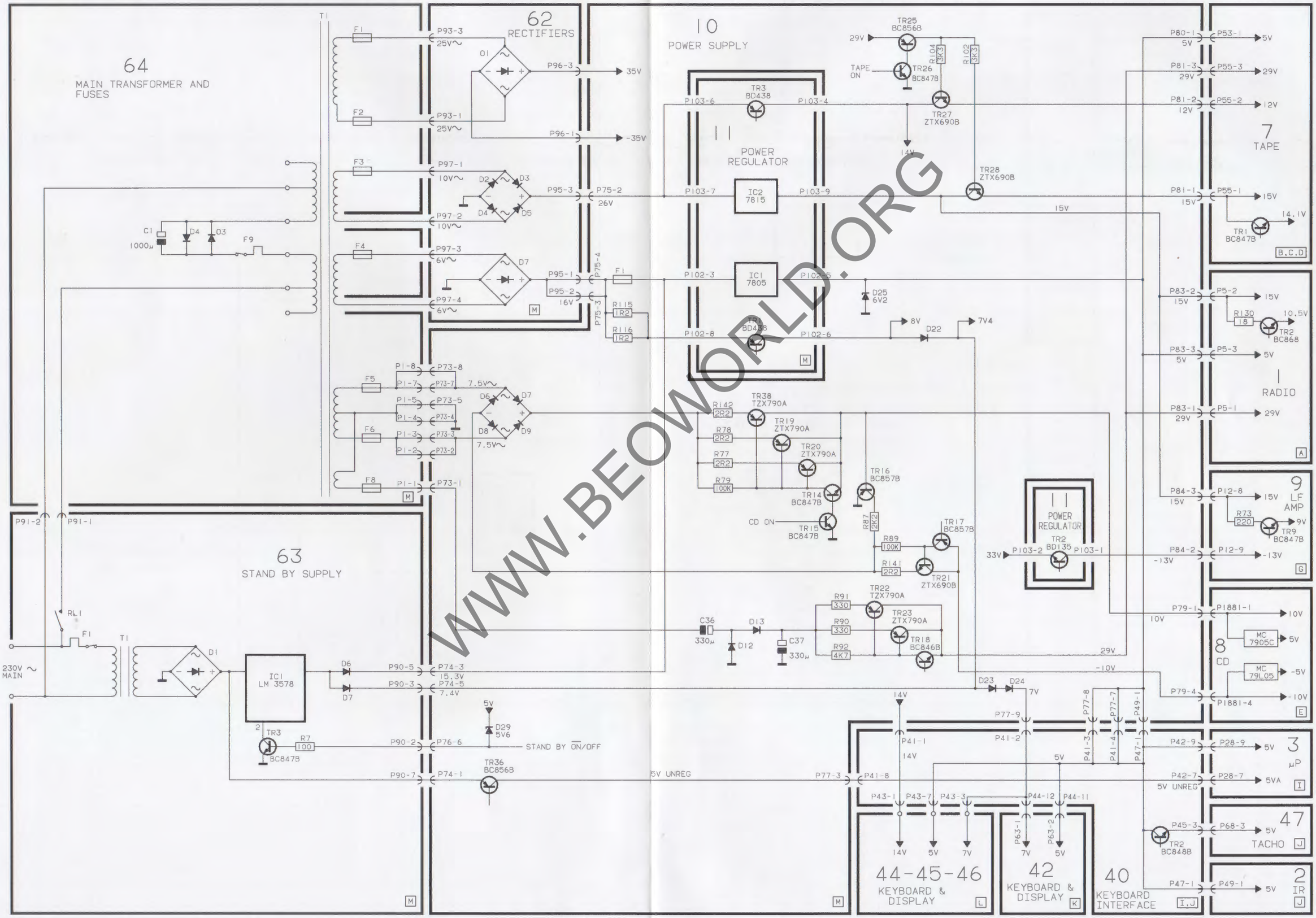
2-7
BLOCK DIAGRAM SYSTEM CONTROL

BLOCK DIAGRAM SYSTEM CONTROL

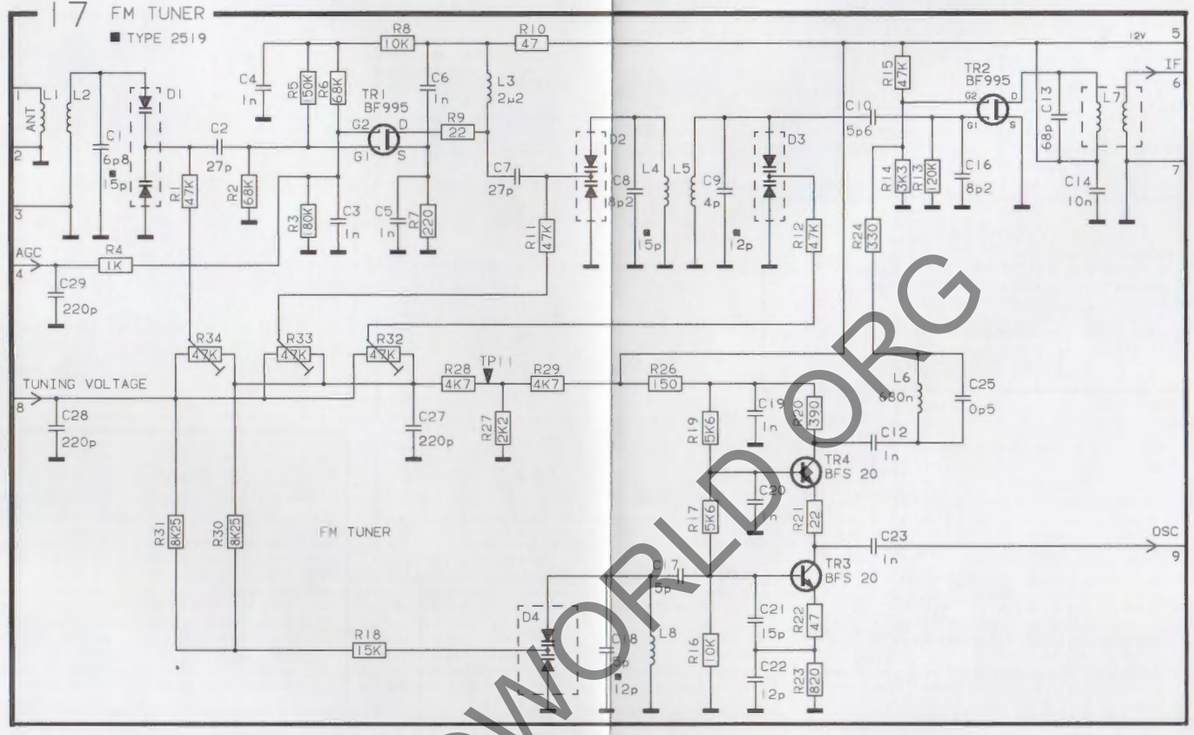


2-8
BLOCK DIAGRAM POWER SUPPLY

BLOCK DIAGRAM POWER SUPPLY



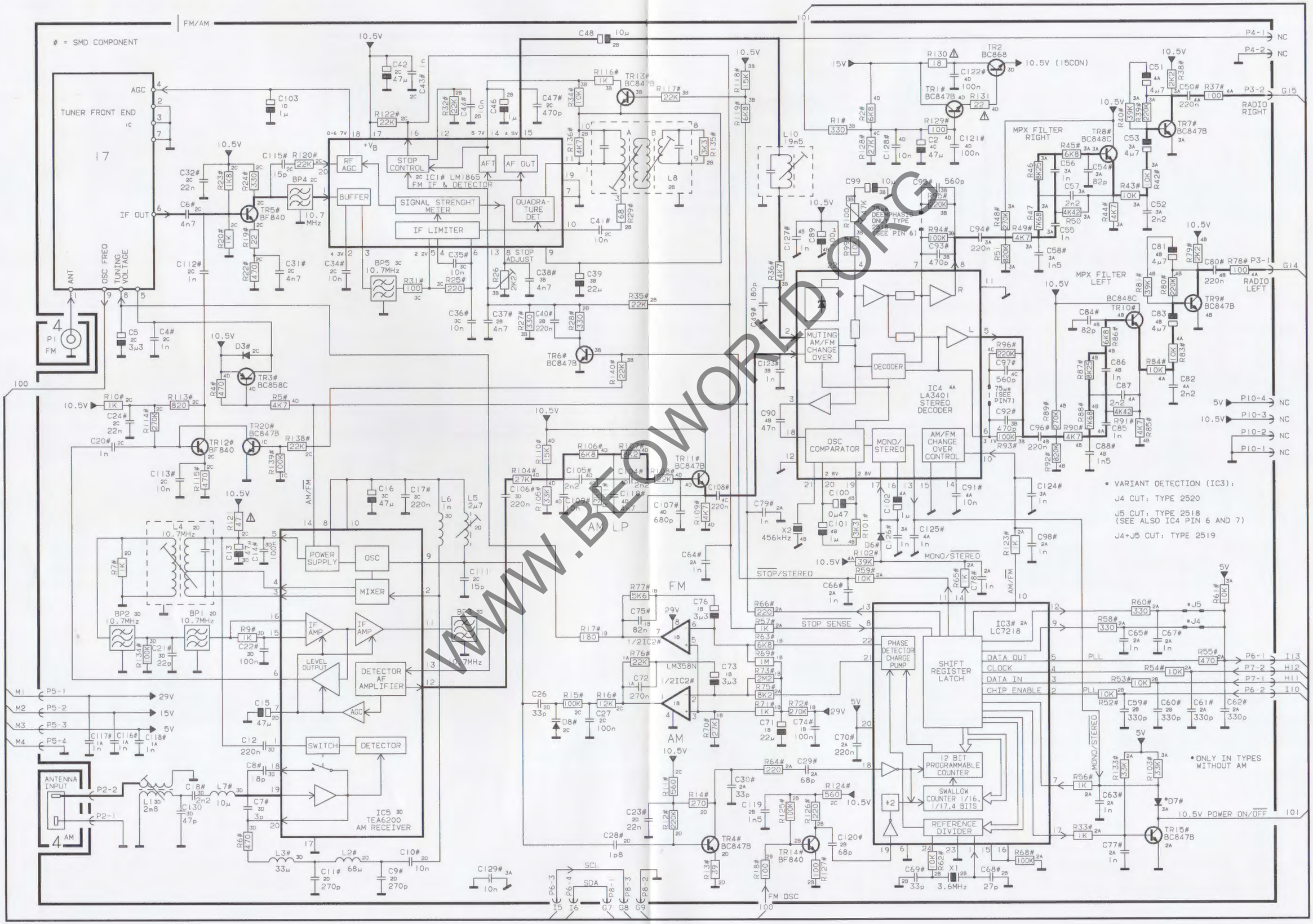
TUNER DIAGRAM



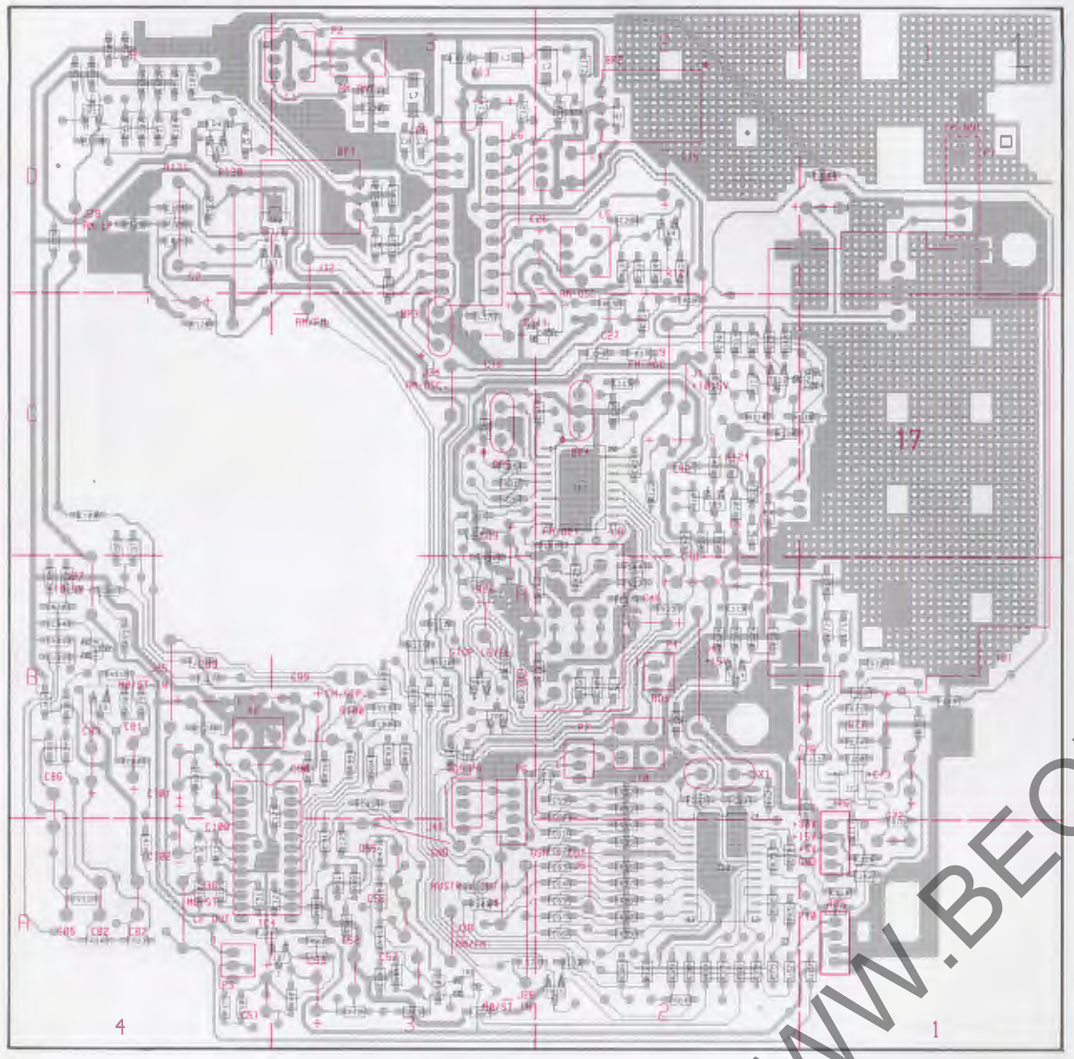
2-9
TUNER DIAGRAM
2-9

2-10
DIAGRAM A

DIAGRAM A FM/AM, RF, IF DECODER (PCB drawing see page 2-11)

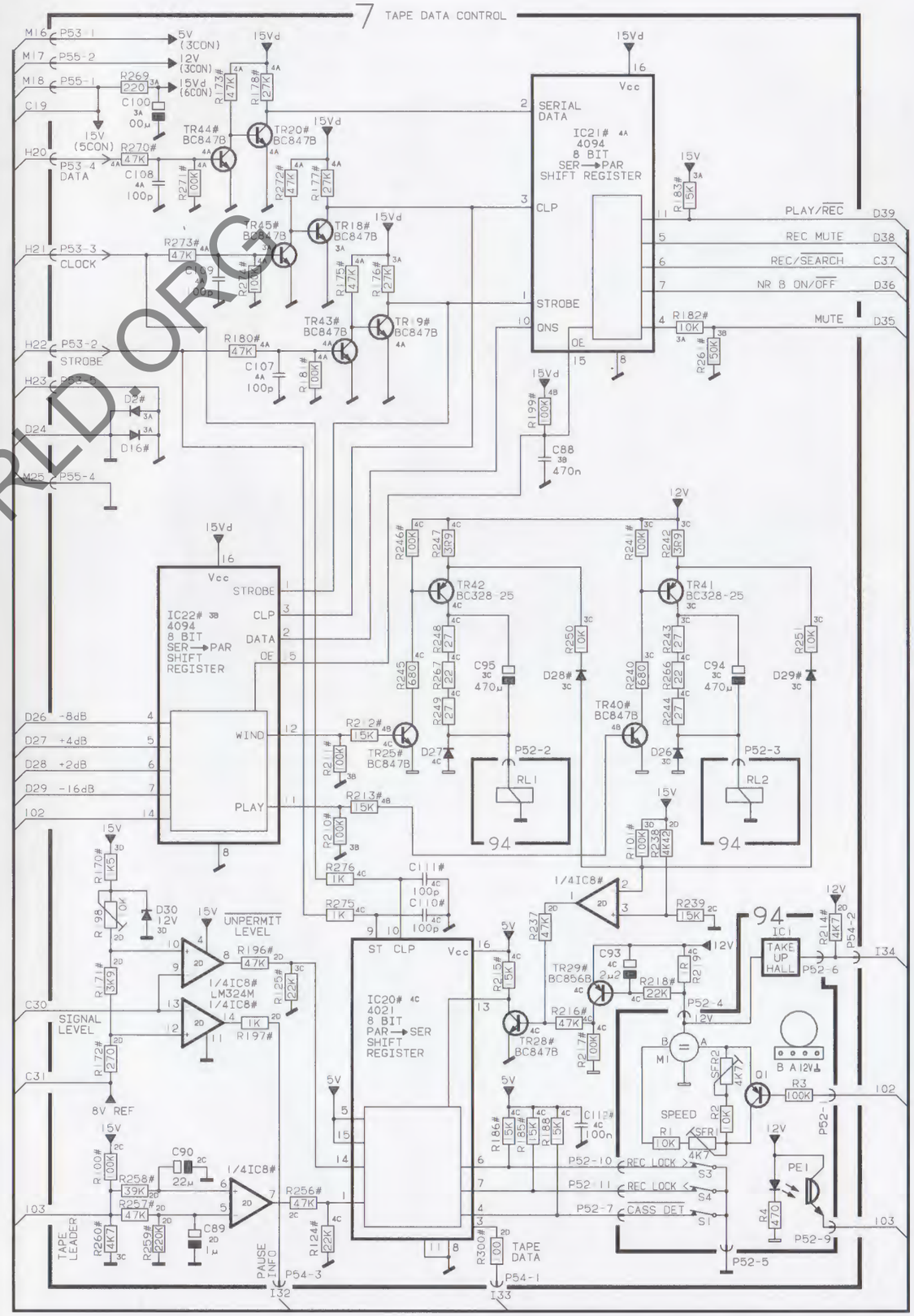


PCB 1



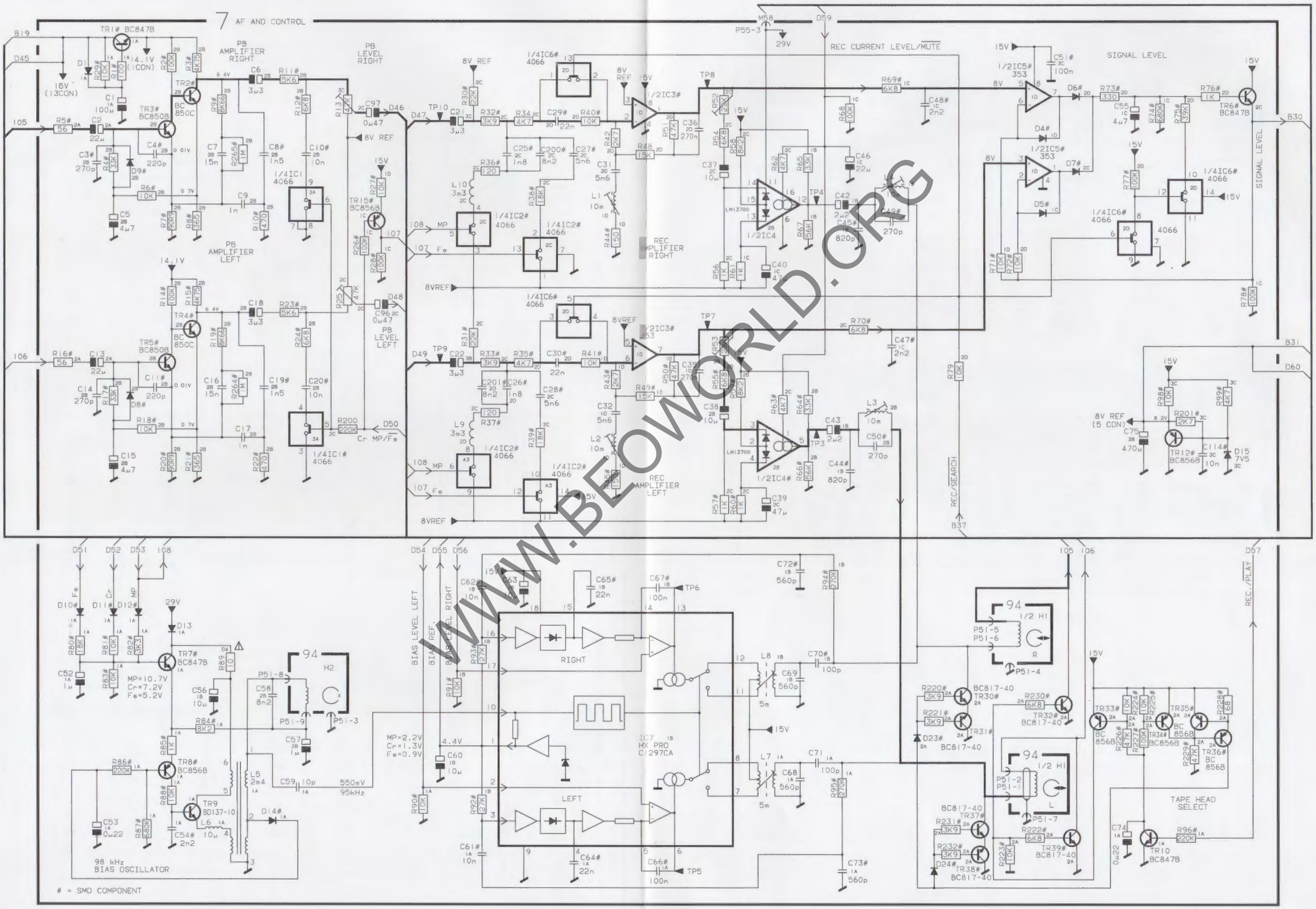
2-11
DIAGRAM B

DIAGRAM B TAPE DATA CONTROL (PCB drawing see page 2-15)



2-12
DIAGRAM C

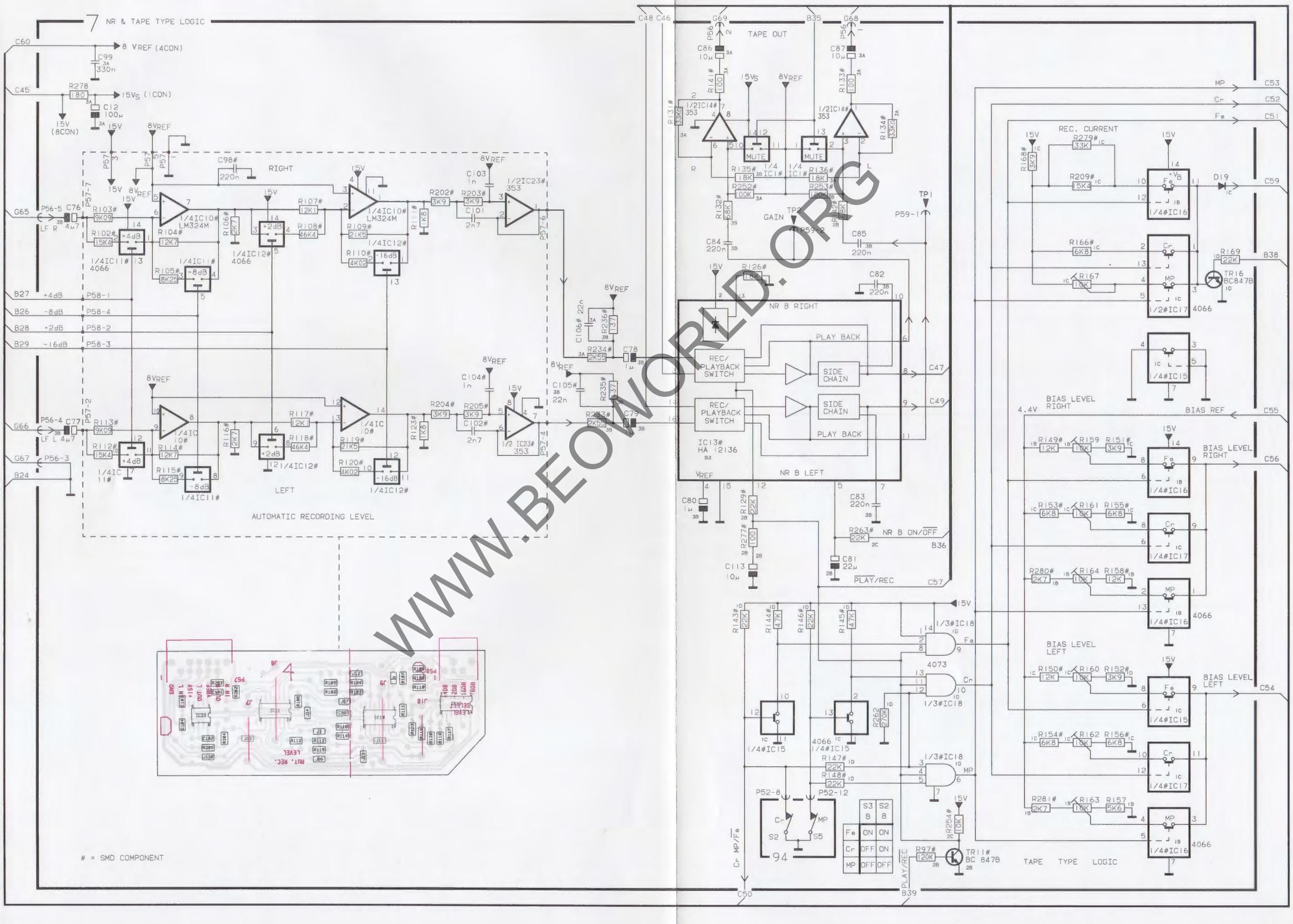
DIAGRAM C TAPE AF AND CONTROL (PCB drawing see page 2-15)



2-13
DIAGRAM D

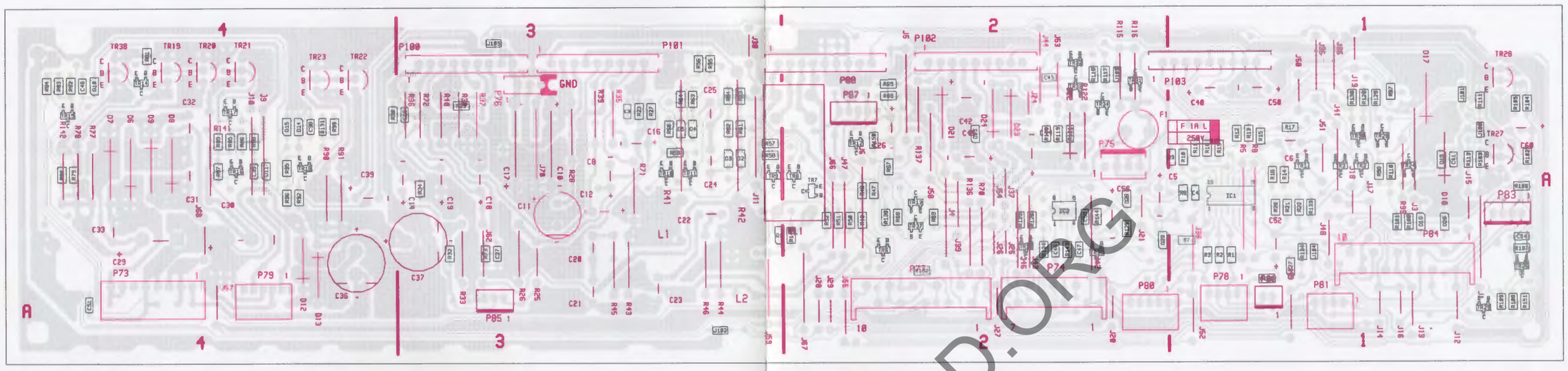
2-13

DIAGRAM D NR AND TAPE TYPE LOGIC (PCB drawing see page 2-15)

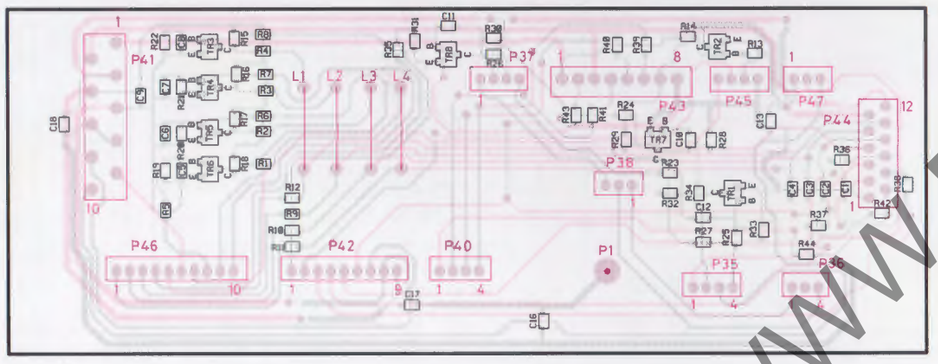


2-14
PCB DRAWINGS

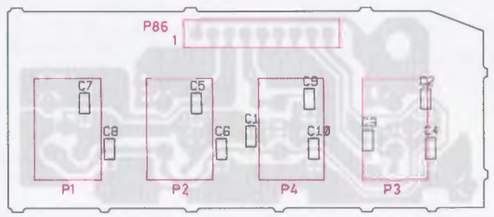
PCB 10



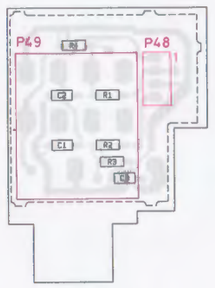
PCB 40



PCB 50

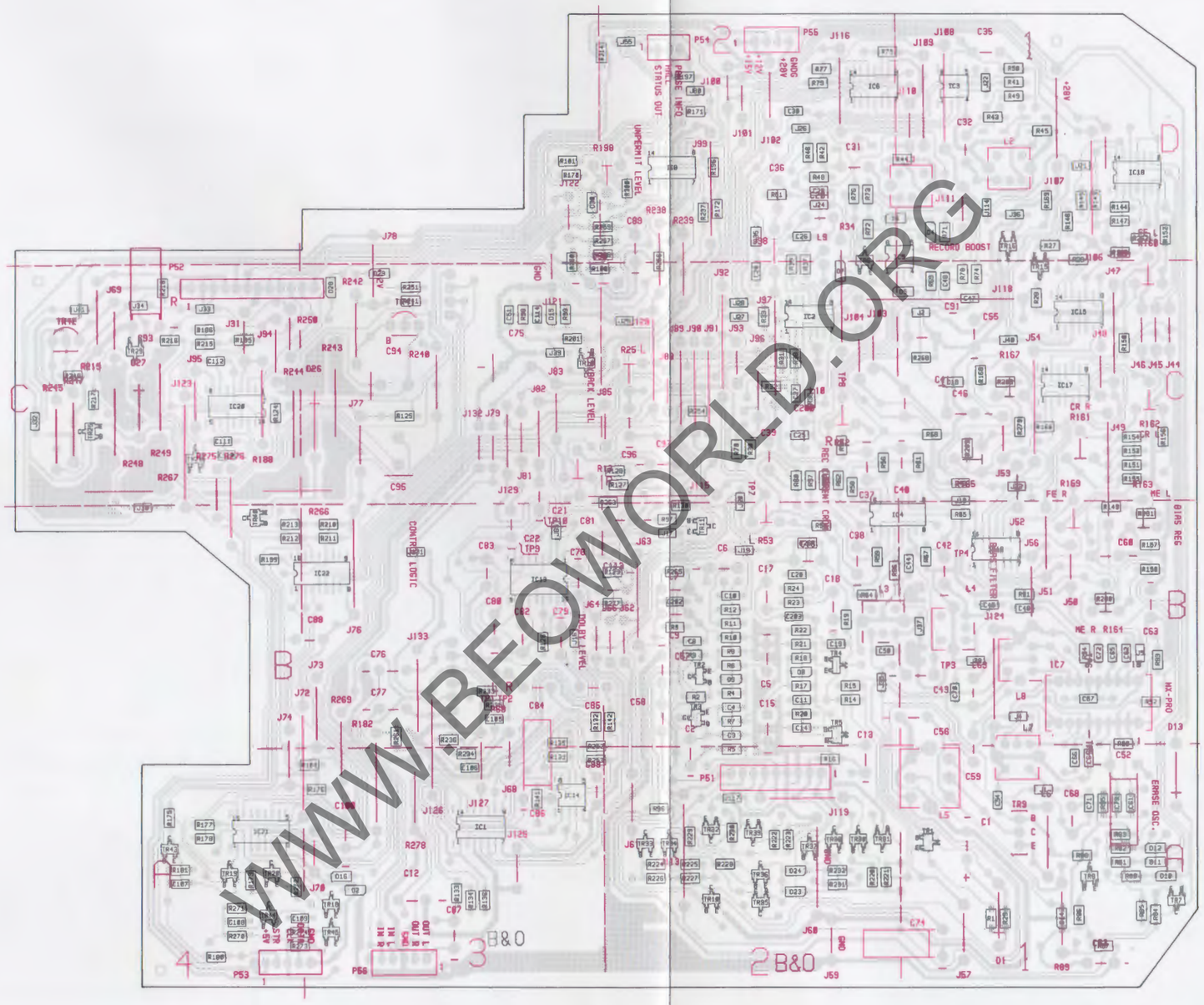


PCB 51



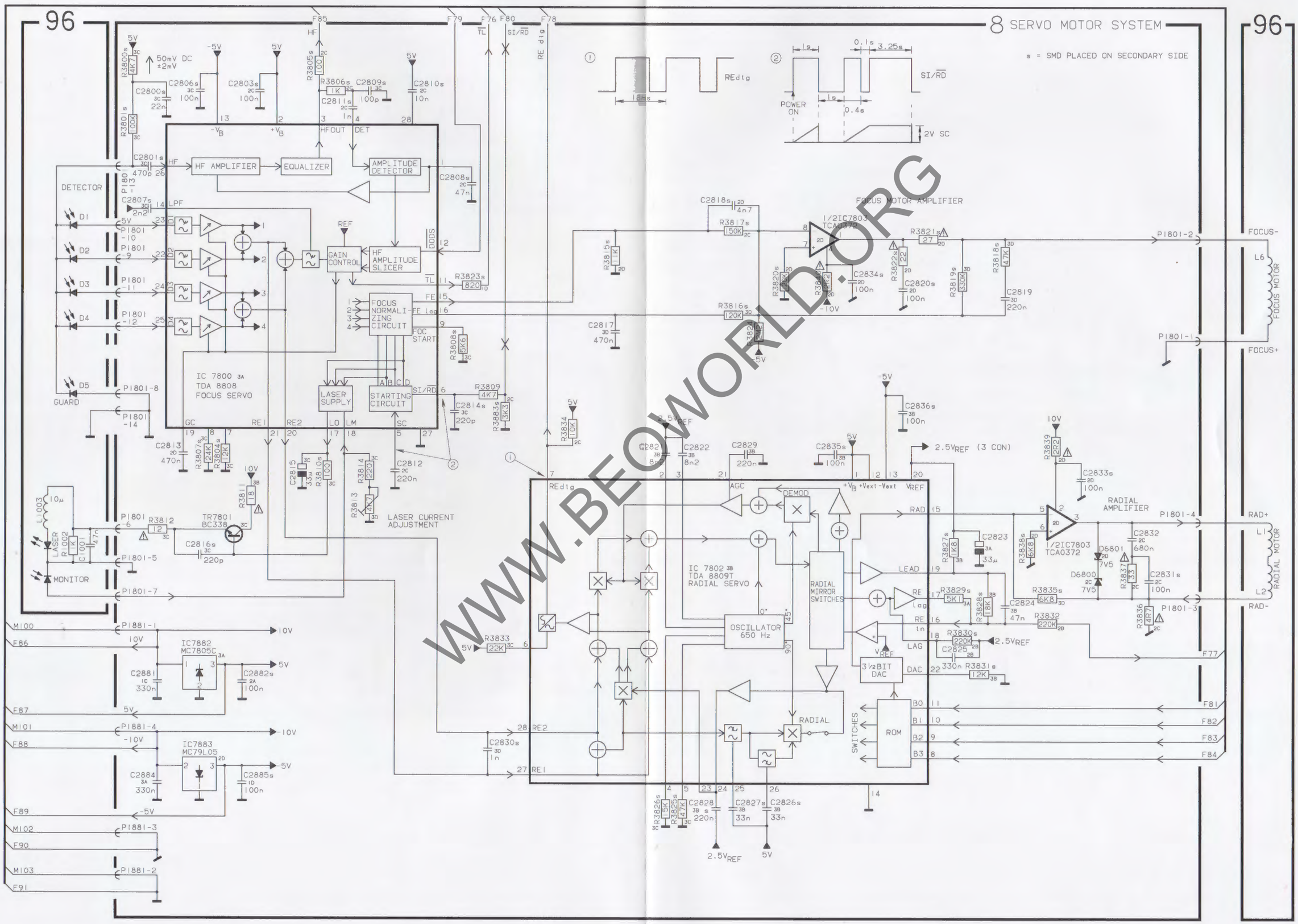
2-15
PCB DRAWING
2-15

PCB 7



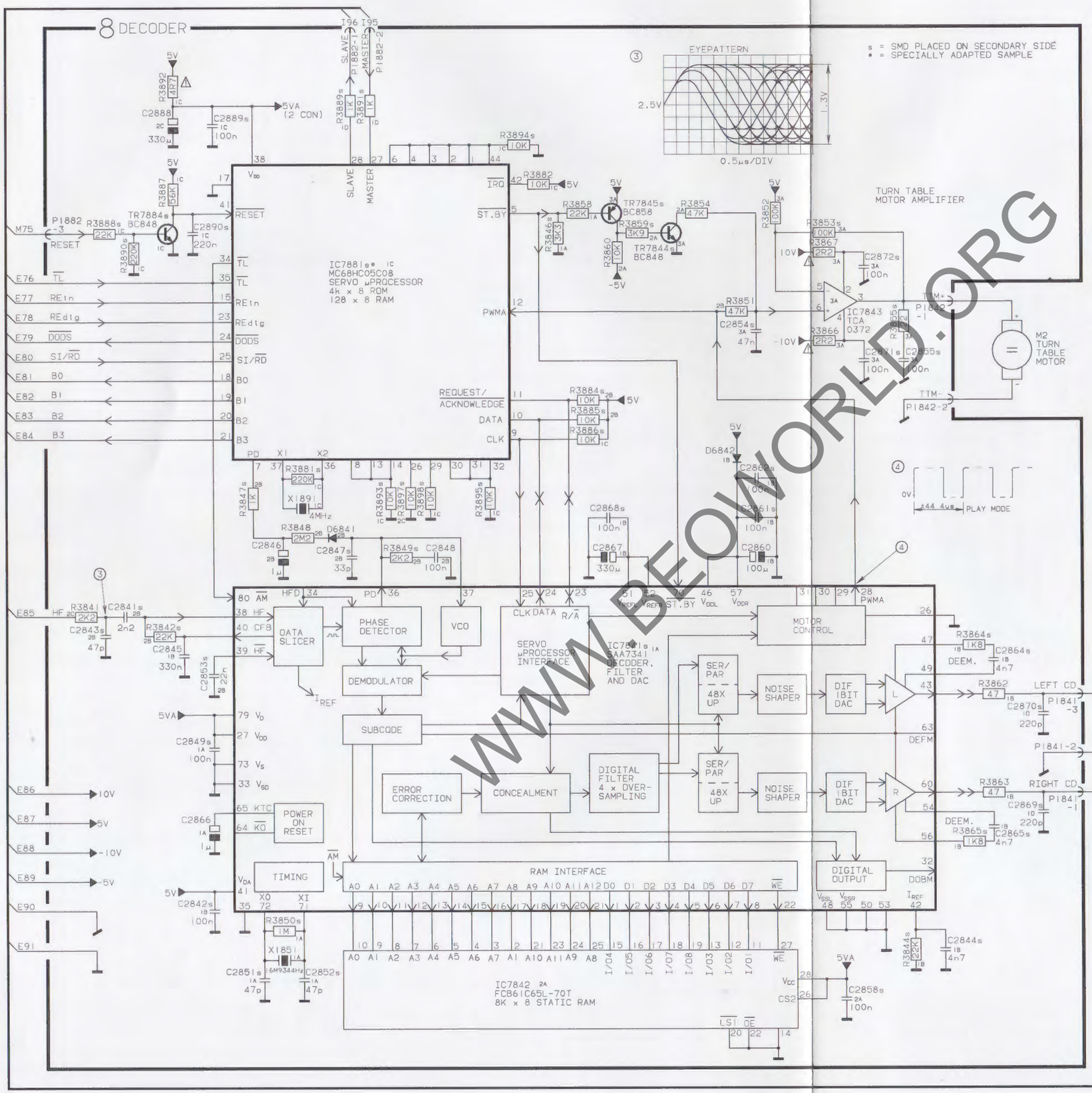
2-16
DIAGRAM E

DIAGRAM E CD SERVO (PCB drawing see page 2-17)

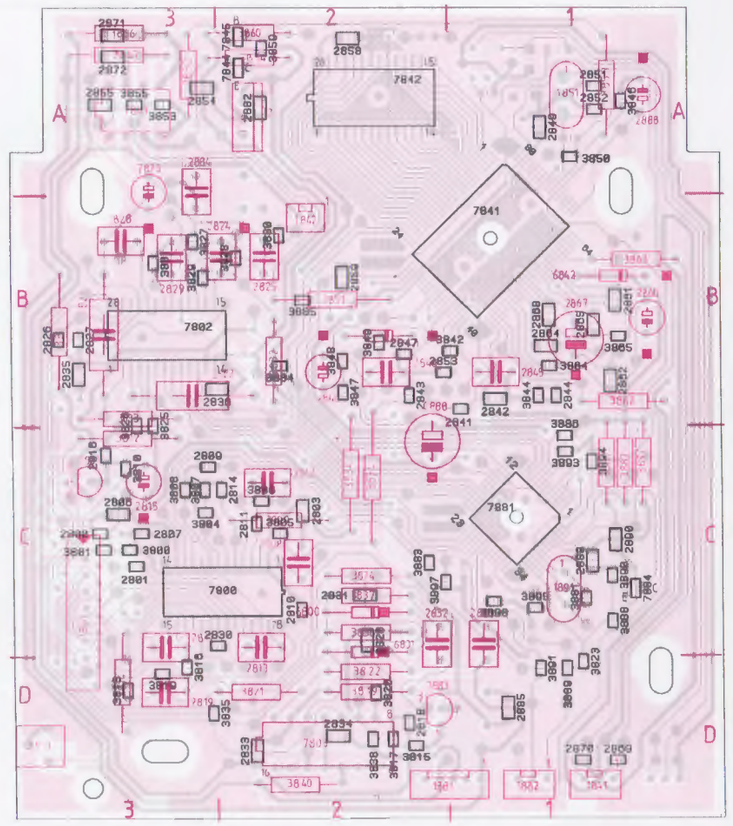


2-17
DIAGRAM F

DIAGRAM F CD DECODER

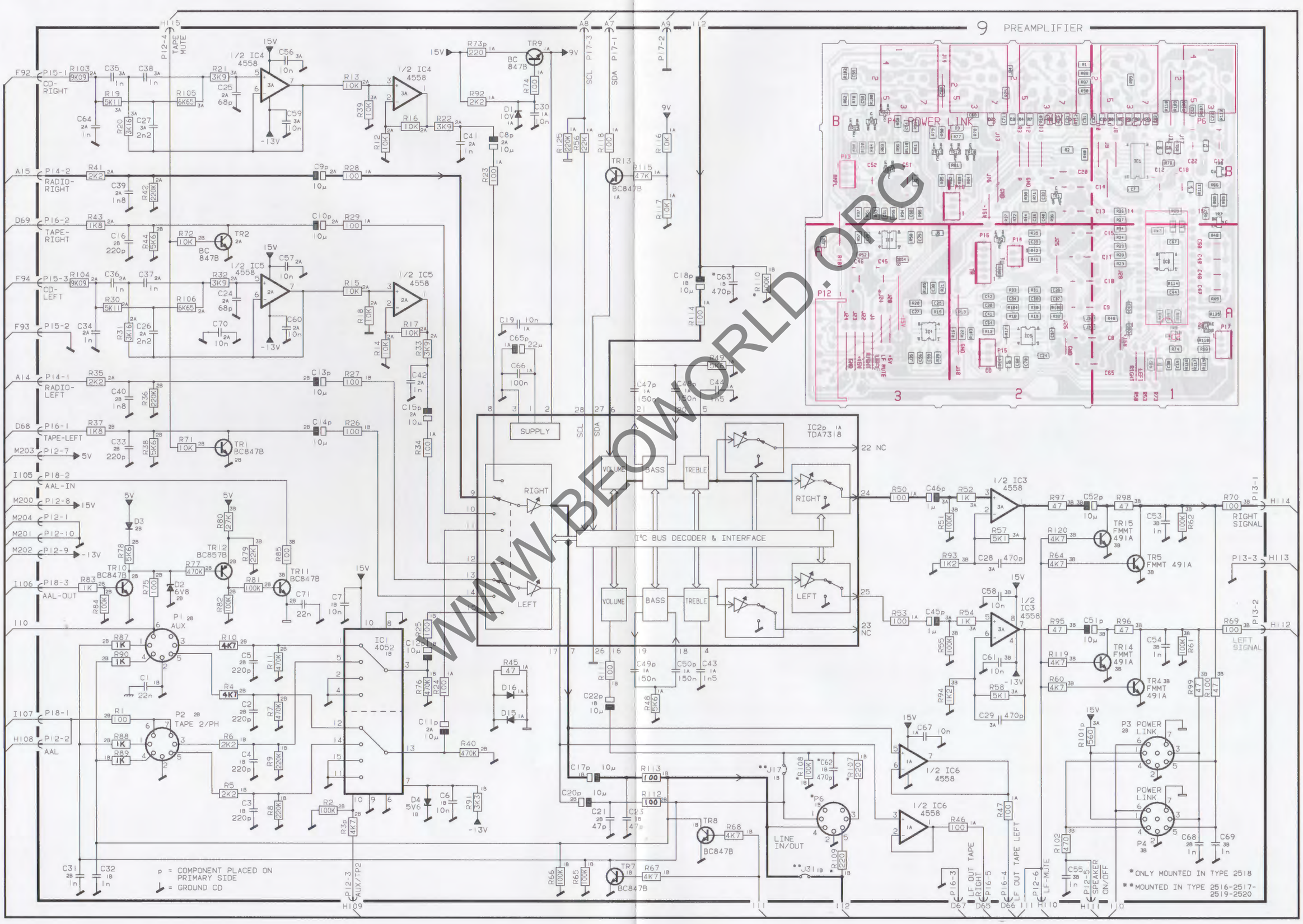


PCB 8



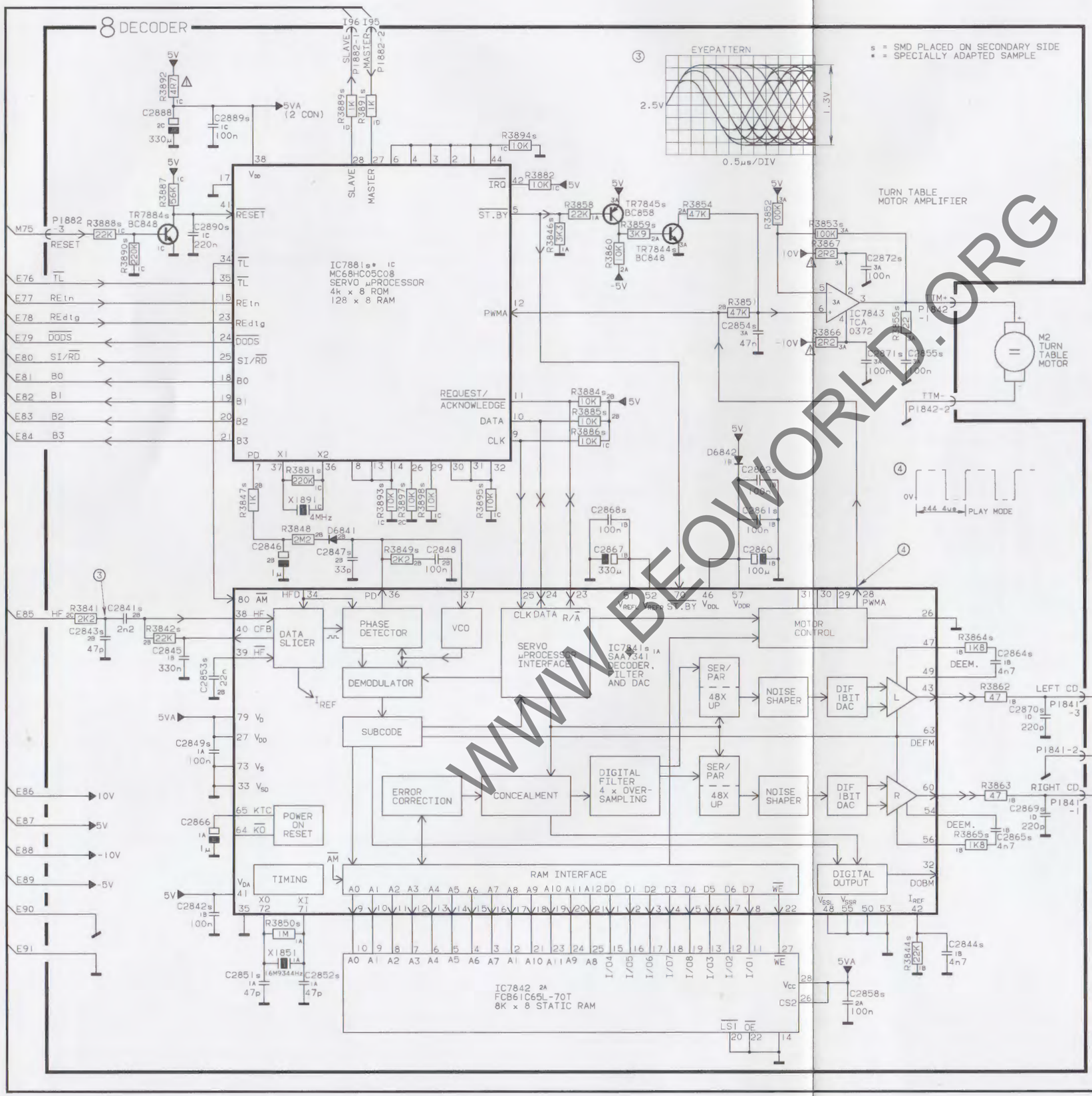
2-18
DIAGRAM G

DIAGRAM G PREAMPLIFIER

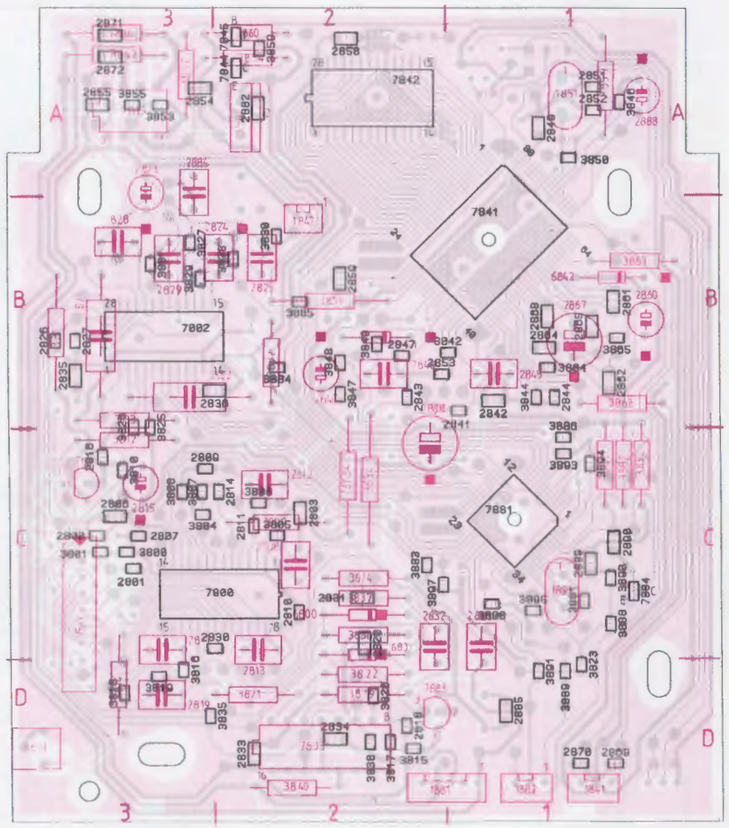


2-17
DIAGRAM F

DIAGRAM F CD DECODER

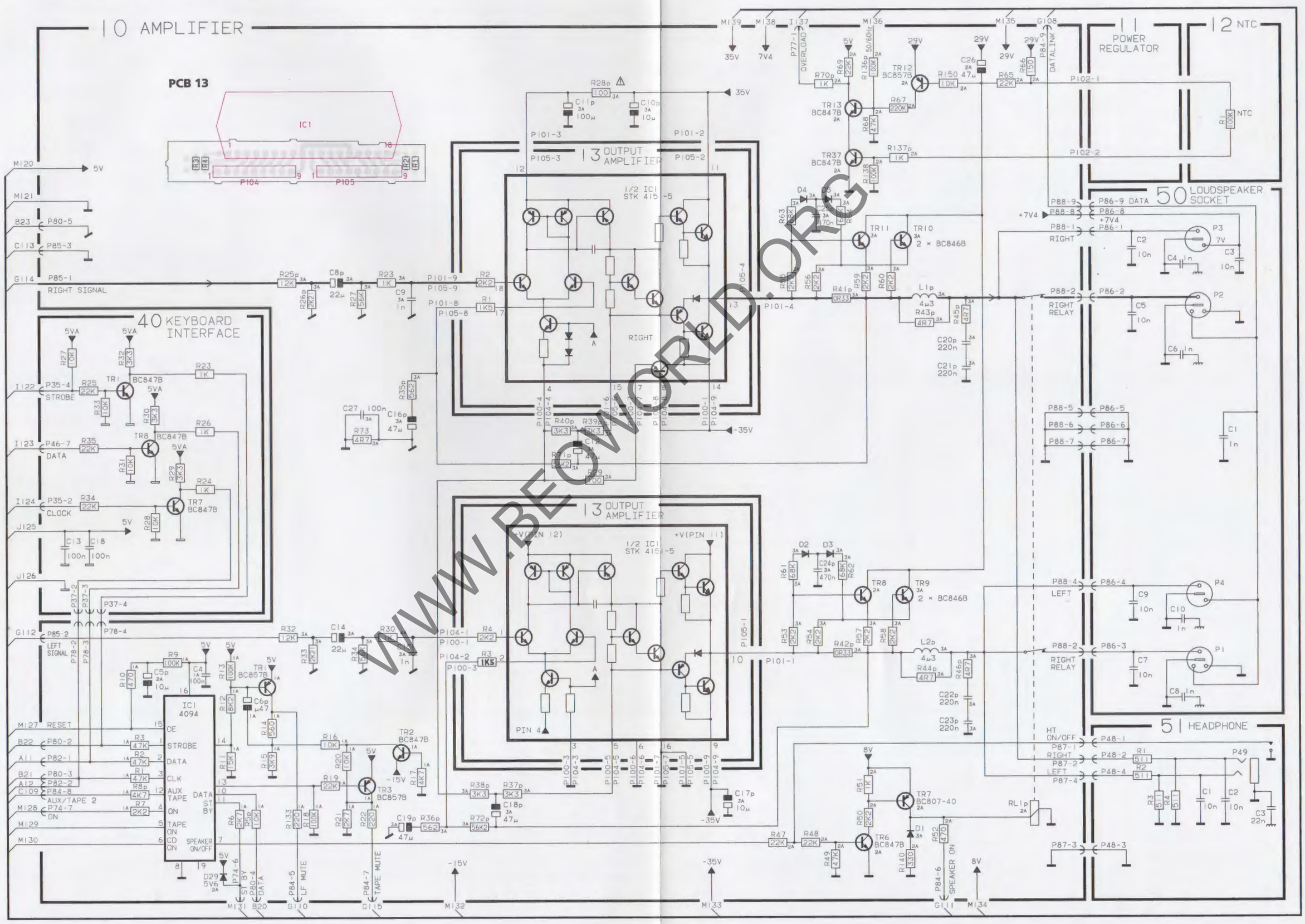


PCB 8



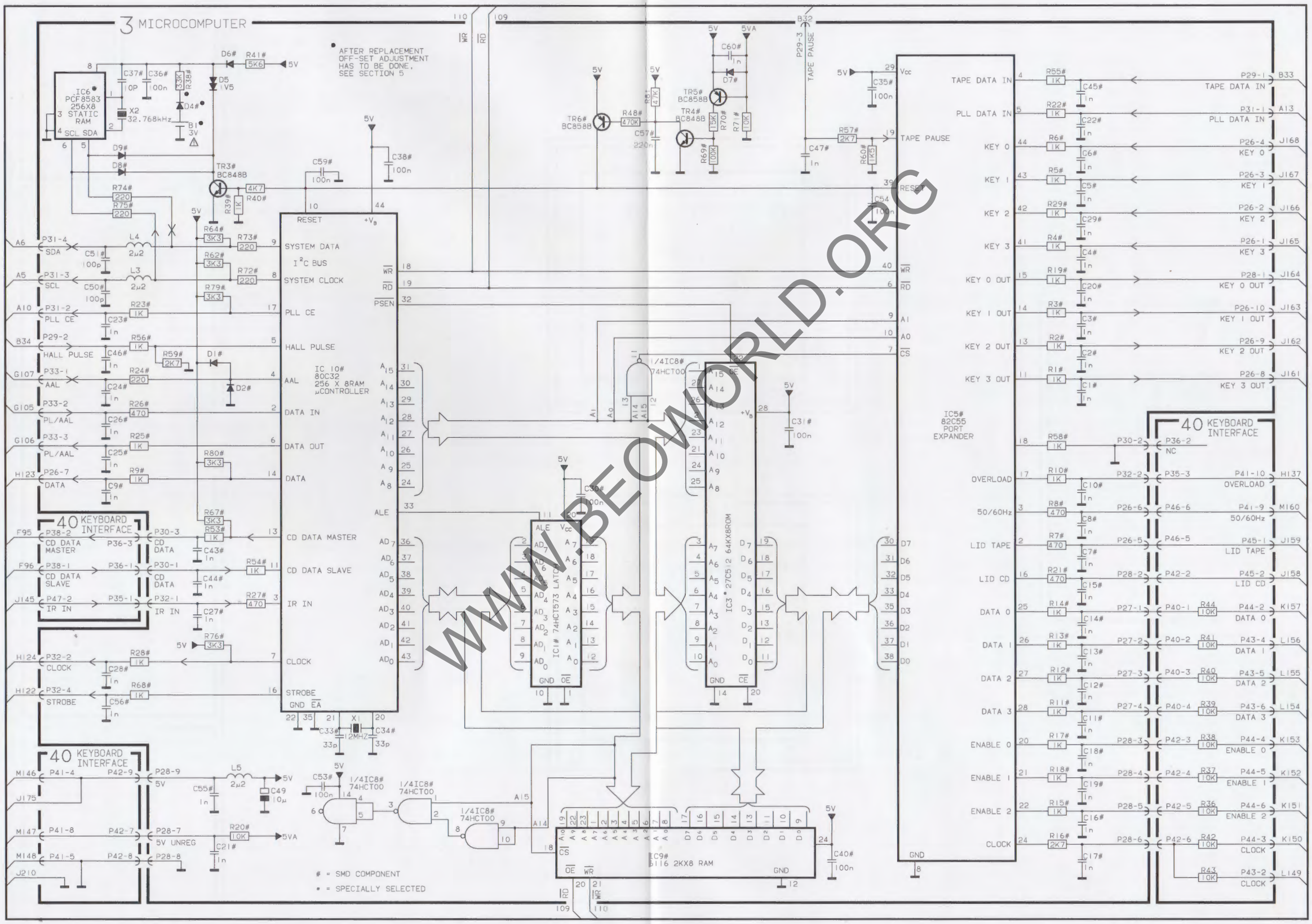
2-19
DIAGRAM H

DIAGRAM H AMPLIFIER (PCB drawings see page 2-14)



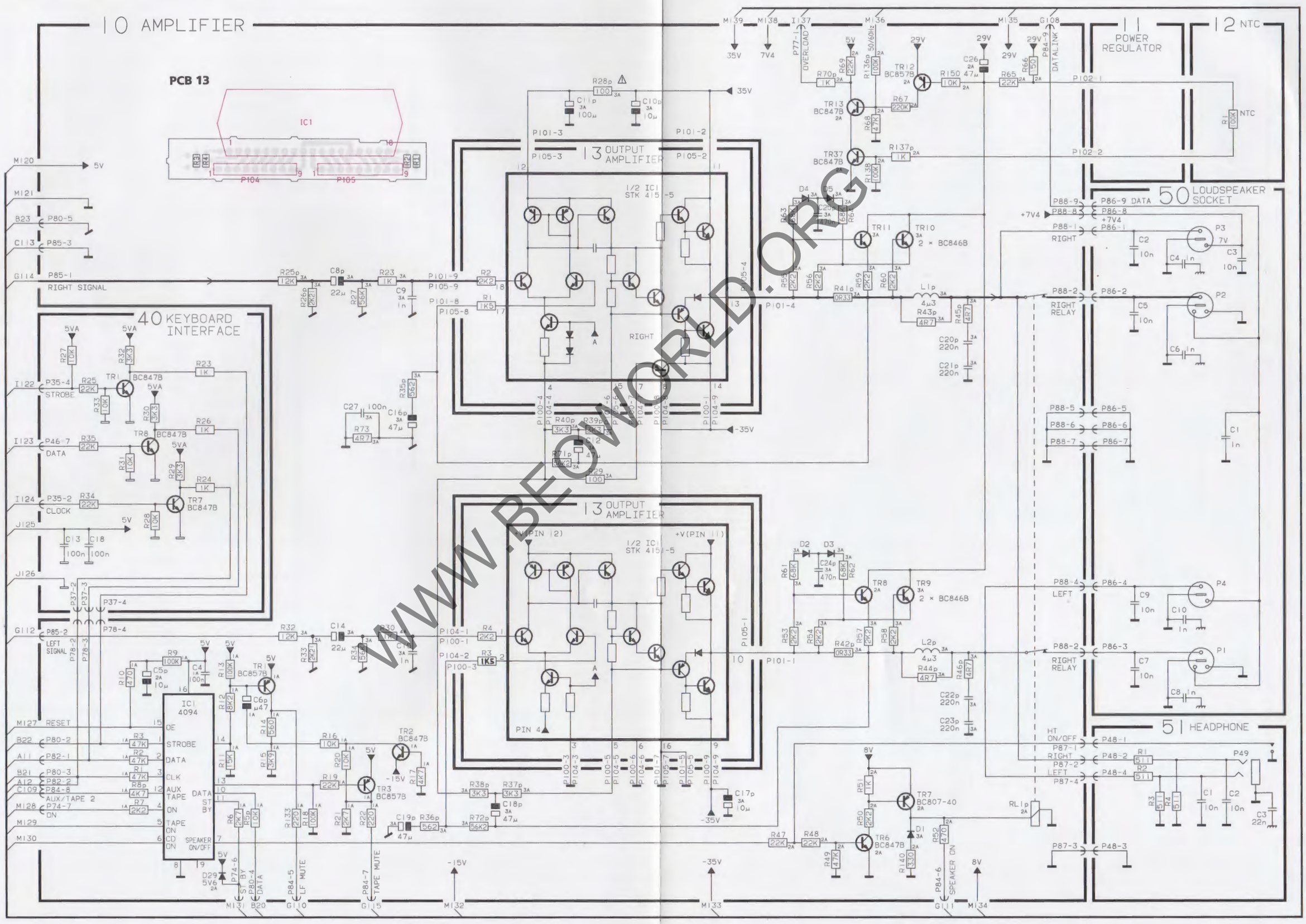
2-20
DIAGRAM I

DIAGRAM I MICROCOMPUTER, KEYBOARD INTERFACE **(PCB drawing see page 2-21)**



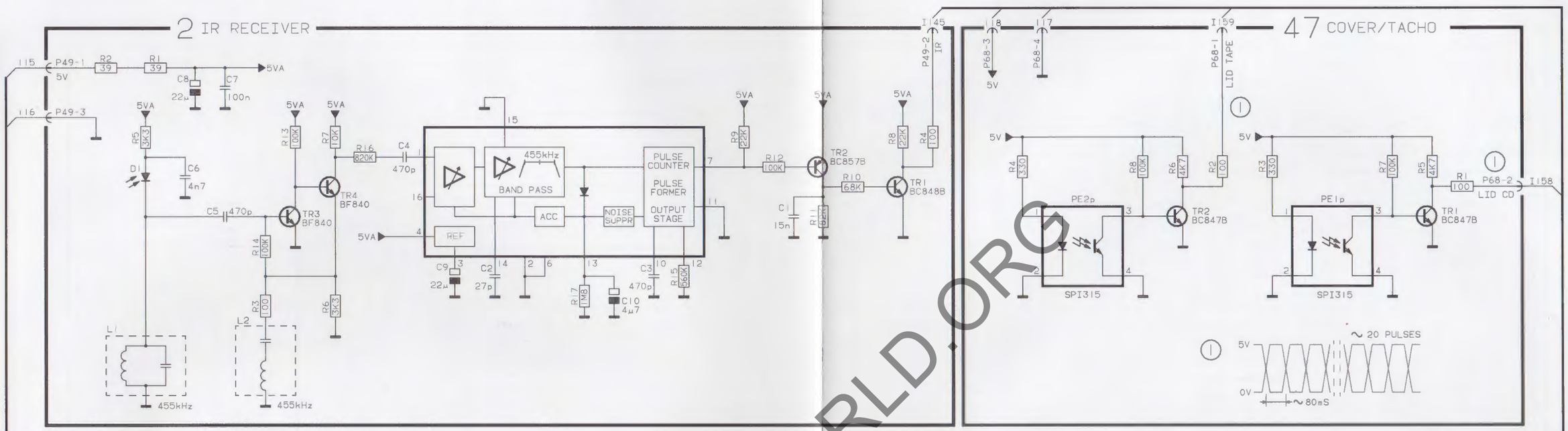
2-19 DIAGRAM H 2-19

DIAGRAM H AMPLIFIER (PCB drawings see page 2-14)

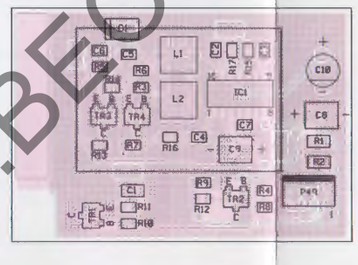


2-21
DIAGRAM J

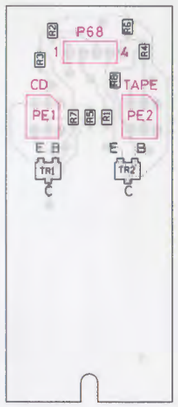
DIAGRAM J IR RECEIVER, COVER/TACHO, KEYBOARD INTERFACE **(PCB drawing for PCB 40 see page 2-14)**



PCB 2

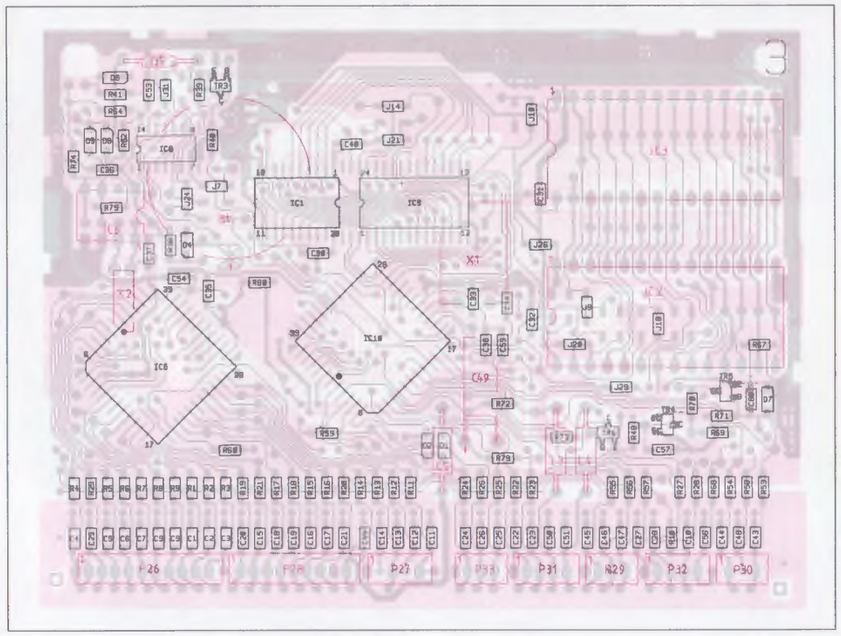


PCB 47



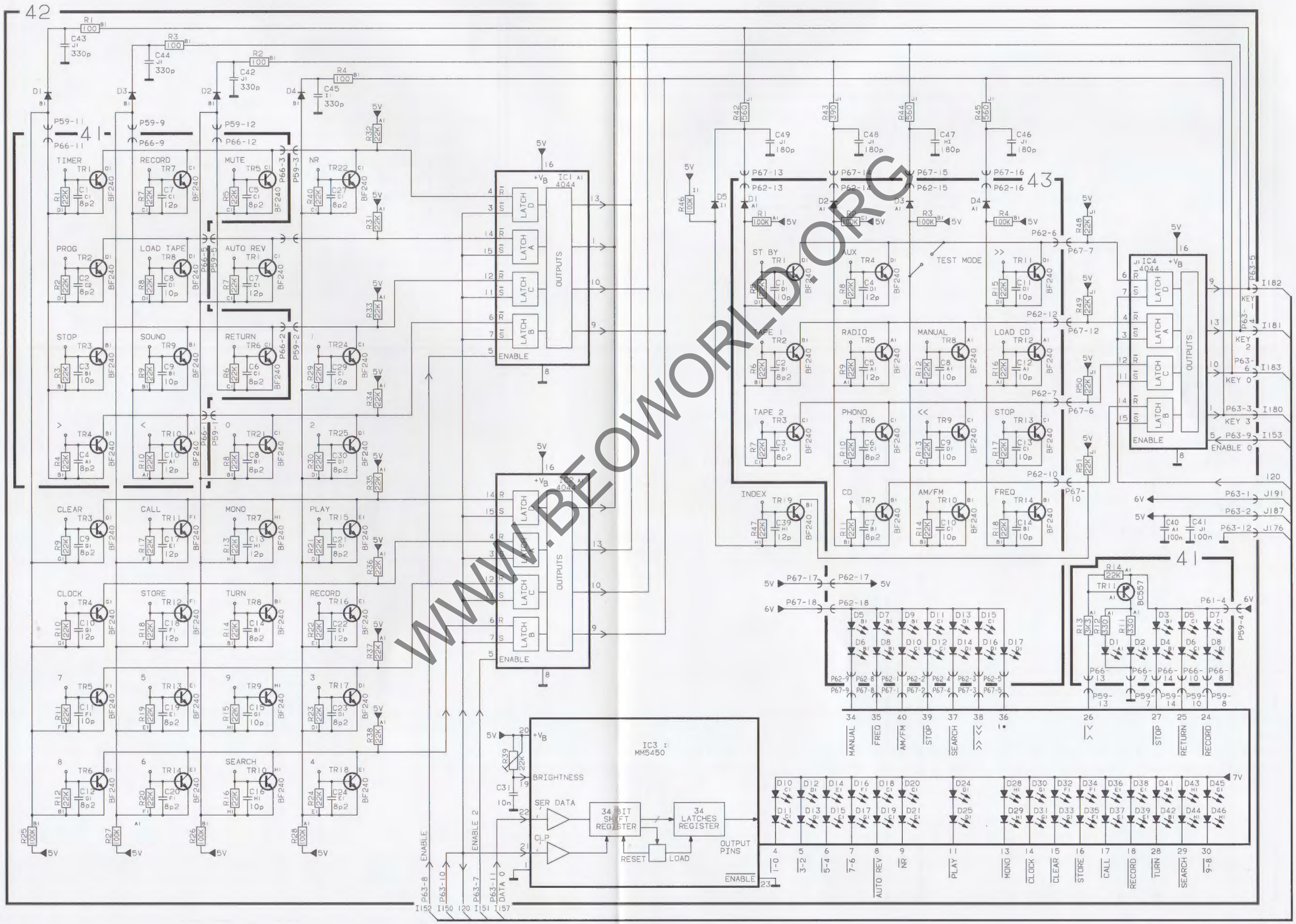
p = PLACED ON PRIMARY SIDE

PCB 3



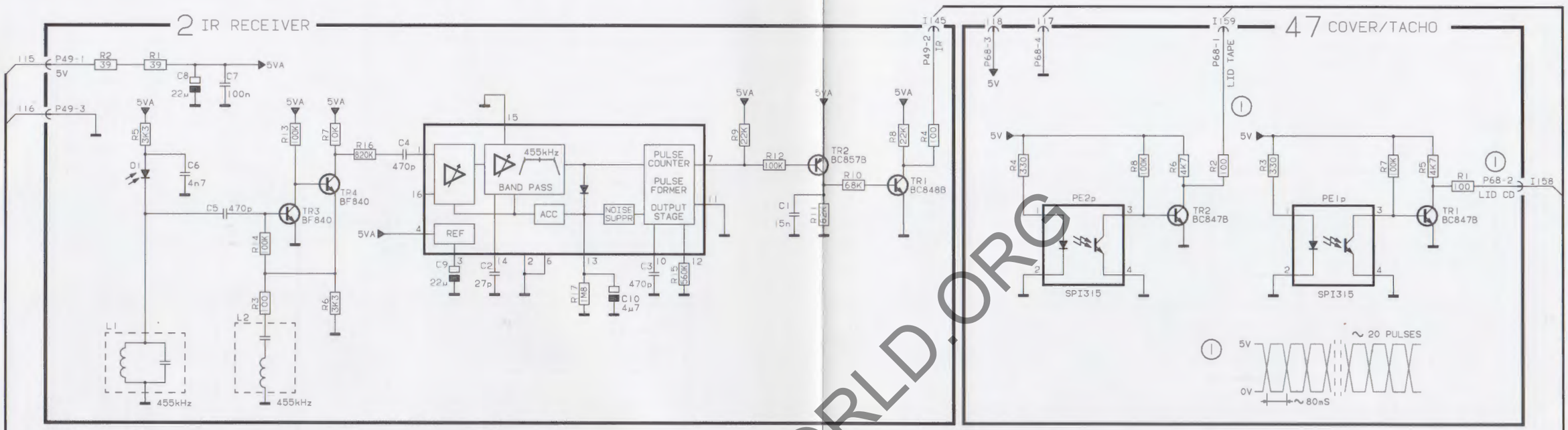
2-22
DIAGRAM K

DIAGRAM K KEYBOARD AND LOWER DISPLAY

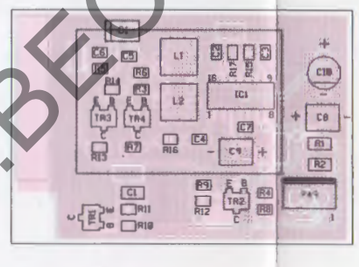


2-21
DIAGRAM J

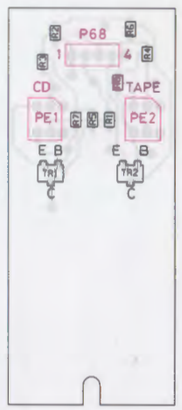
DIAGRAM J IR RECEIVER, COVER/TACHO, KEYBOARD INTERFACE (PCB drawing for PCB 40 see page 2-14)



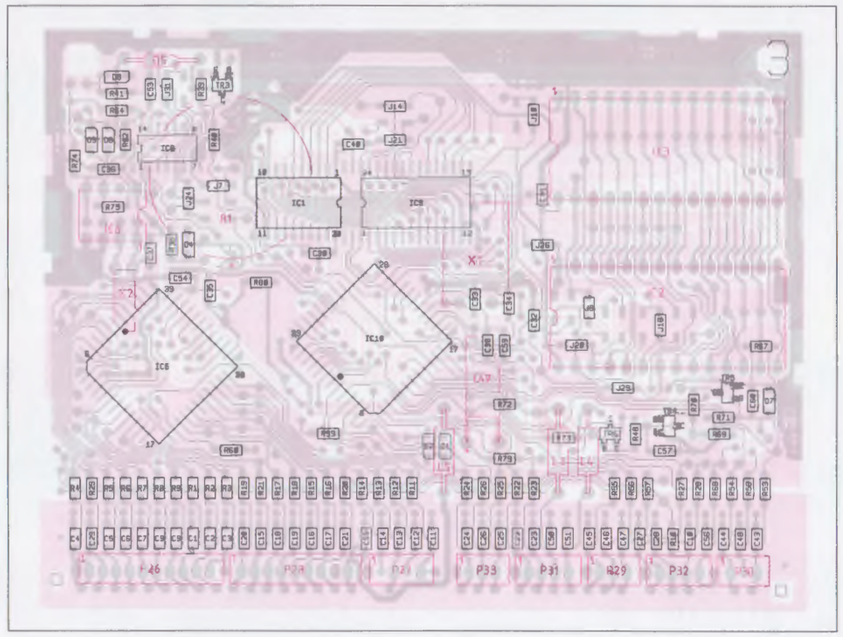
PCB 2



PCB 47



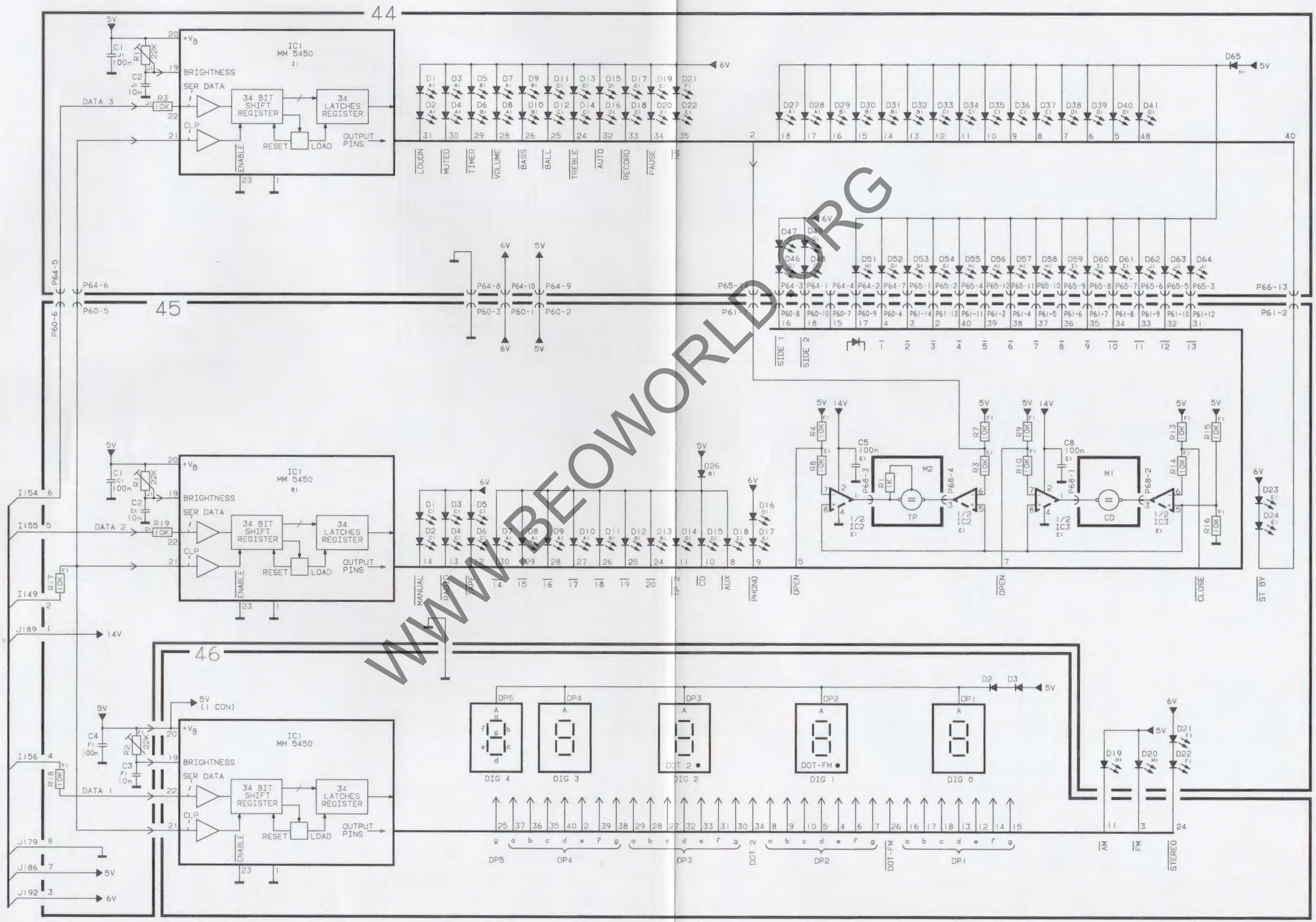
PCB 3



p = PLACED ON PRIMARY SIDE

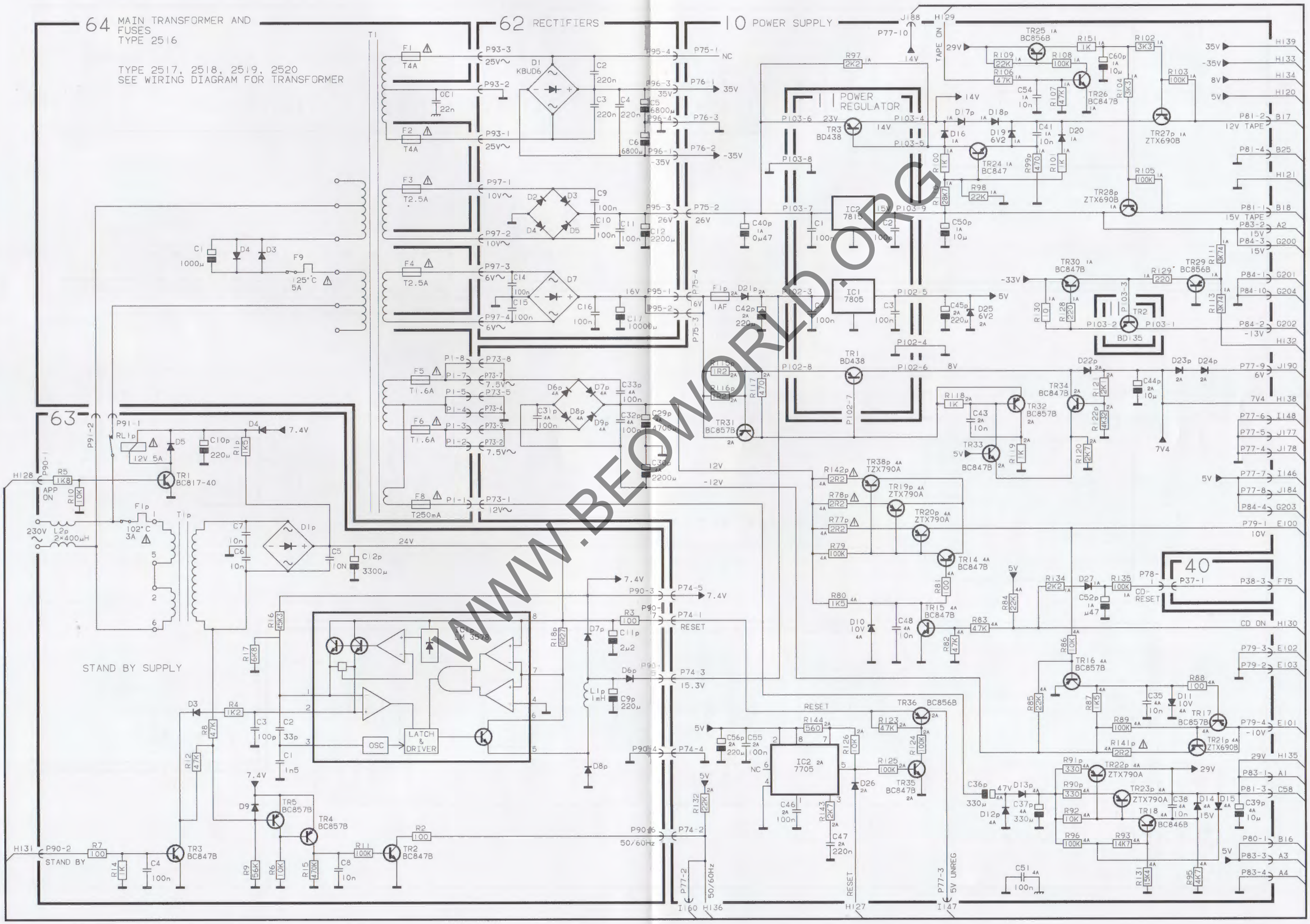
2-23 DIAGRAM L 2-23

DIAGRAM L UPPER DISPLAY



2-24
DIAGRAM M

DIAGRAM M POWER SUPPLY (PCB drawings see pages 2-14 and 2-25)



C84	4000281	82pF 5% 50V	C106	4000287	220nF -20+80% 25V
C85-	4100301	1nF 2.5% 63V	C107	4000326	680pF 5% 50V
C86			C108	4000287	220nF -20+80% 25V
C87	4100260	2.2nF 2.5% 63V	C109	4010280	10nF 10% 50V
C88	4000351	1.5nF 5% 50V	C110	4010173	4.7nF 10% 50V
C89	4200129	100µF 20% 16V	C111	4000224	15pF 5% 63V
C90	4130240	47nF 10% 63V	C112	4010132	1nF 10% 50V
C91	4010280	10nF 10% 50V	C113	4010157	10nF 10% 50V
C92-	4000286	470pF 5% 50V	C115	4000275	15pF 5% 50V
C93			C116-	4010132	1nF 10% 50V
C94	4000287	220nF -20+80% 25V	C118		
C95	4000325	560pF 5% 50V	C119	4000351	1.5nF 5% 50V
C96	4000287	220nF -20+80% 25V	C120	4000280	68pF 5% 50V
C97	4000325	560pF 5% 50V	C121-	4010166	100nF -20+80% 50V
C98	4010132	1nF 10% 50V	C122		
C99	4200510	10µF 20% 16V	C123-	4010132	1nF 10% 50V
C100	4200523	0.47µF 20% 50V	C127		
C101-	4200512	1µF 20% 50V	C128	4010280	10nF 10% 50V
C103			C129	4010157	10nF 10% 50V
C104-	4010170	2.2nF 10% 50V	C130	4000234	47pF 5% 50V
C105					

L1	8020909	Coil transformer	L6	8020747	Coil 1mH 10%
L2	8020714	Coil 68µH 10%	L7	8020772	Coil 10µH
L3	8020817	Coil 33µH	L8	8022327	Coil 10.7MHz
L4	8020803	Coil 10.7MHz	L10	8022240	Coil 19.5mH 2%
L5	8020802	Coil 10.7MHz			

X1	8090076	Crystal 3.6MHz
X2	8030087	Cer. resonator 456kHz ±1kHz

BP1-	8030219	Crystal 10.7MHz	BP3-	8030090	Cer. filter 10.7MHz
BP2			BP5		

TU1	8050111	Tuner type 2516-2517-2518-2520
	8050112	Tuner type 2519

P1	7210612	Socket FM antenne	P7	7220709	Plug 2/2 pole
P2	7220724	Plug 2/2 pole	P8	7220710	Plug 3/3 pole
P3-	7220709	Plug 2/2 pole	P10	7220711	Plug 4/4 pole
P4					
P5-	7220711	Plug 4/4 pole			
P6					

PCB 2, 8001632 IR Receiver

IC1Δ	8341165	**136**	U2506B

TR1	8320755	**51**	BC847B	TR3-	8320740	**51**	BF840
TR2	8320811	**51**	BC857B	TR4			

D1	8330145	IR detector 455kHz

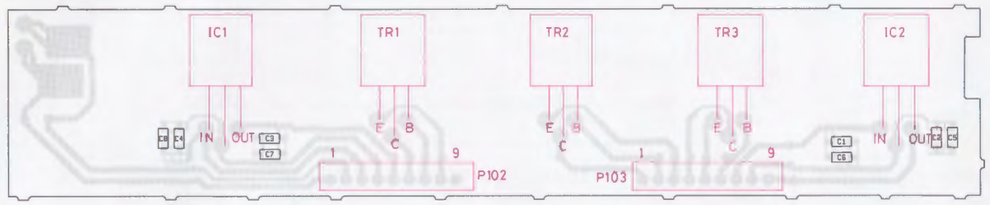
C1	4000289	15nF 10% 50V	C7	4010274	100nF -20+80% 25V
C2	4000405	27pF 5% 50V	C8-	4200898	22µF 20% 6.3V
C3-	4000420	470pF 5% 50V	C9		
C5			C10	4200972	4.7µF 20% 10V
C6	4010267	4.7nF 10% 50V			

L1-	8020744	Coil 455kHz
L2		

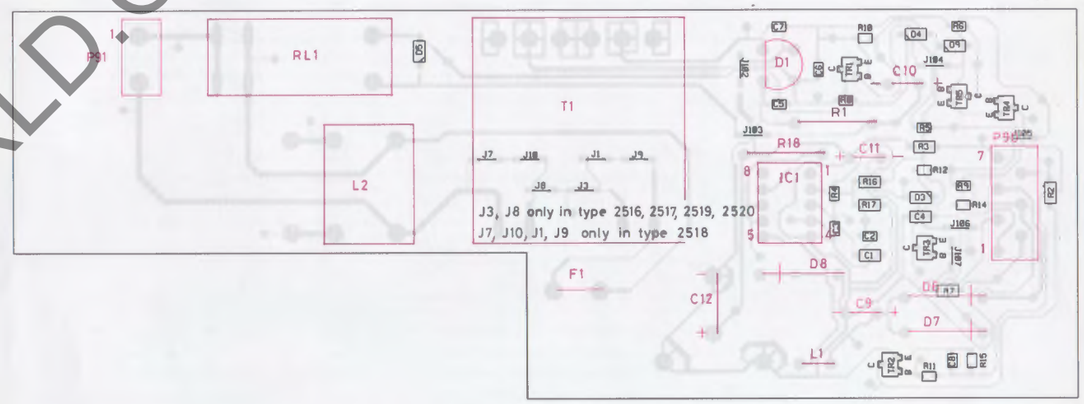
P49	7220710	Plug 3/3 pole

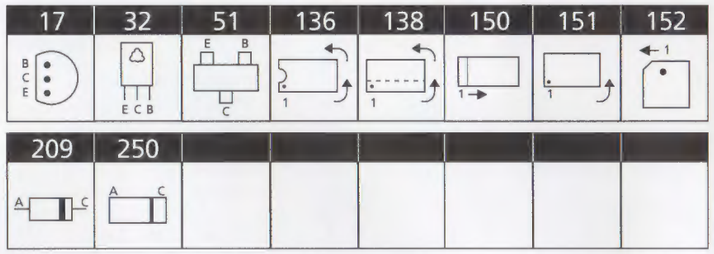
Δ *indicates that static electricity may destroy the component*

PCB 11



PCB 63





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

PCB 3, 8001611 Microcomputer

IC1Δ	8341217	**136**	74HCT573	IC8Δ	8341419	**150**	74HCT00
IC3Δ*	8342408	**136**	27C512	IC9Δ	8341276	**138**	6116
IC5Δ	8341437	**152**	82C55A	IC10Δ	8341218	**152**	µP 80C32
IC6Δ	8341105	**136**	PCF8583				

TR3-TR4	8320615	**51**	BC848B	TR5-TR6	8320616	**51**	BC858B

D1-D2	8300482	**250**	LL4148	D5	8300056	**209**	Z1.5V 10% 0.2W
D4	8300482	**250**	LL4148	D6	8300482	**250**	LL4148
				D9			

C1-	4010132		1nF 10% 50V	C49	4200510		10µF 20% 16V
C29				C50-	4000241		100pF 5% 50V
C30-	4010166		100nF -20+80% 50V	C51			
C32				C53-	4010166		100nF 50V
C33-	4000239		33pF 5% 50V	C54			
C34				C55-	4010132		1nF 10% 50V
C35-	4010166		100nF -20+80% 50V	C56			
C36				C57	4000287		220nF 25V
C37	4000219		10pF ±0.5pF 50V	C59	4010166		100nF 50V
C38-	4010166		100nF -20+80% 50V	C60	4010132		1nF 10% 50V
C40							
C43-	4010132		1nF 10% 50V				
C47							

L3-L5	8020565	Coil 2.2µH 10%

X1	8090075	Crystal 12.0MHz
X2	8090078	Crystal 32.768kHz

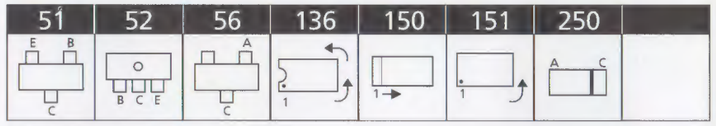
B1	8700027	Lithium battery

P26	7220717	Plug 10/10 pole
P27	7220711	Plug 4/4 pole
P28	7220716	Plug 9/9 pole
P29-	7220710	Plug 3/3 pole
P30		
P31-	7220711	Plug 4/4 pole
P32		
P33	7220710	Plug 3/3 pole

** specially selected or adapted sample*

Δ indicates that static electricity may destroy the component

LIST OF ELECTRICAL PARTS



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

PCB 1, FM/AM, RF, IF Decoder
8001413 Type 2516-2517-2518-2520
8001415 Type 2519

IC1Δ	8340995	**136**	LM 1865	IC4Δ	8340758	**136**	LA 3401
IC2Δ	8341098	**150**	LM 358	IC5Δ	8341410	**136**	TEA 6200
IC3Δ	8341409	**151**	LC 7218M				

TR1	8320755	**51**	BC 847B	TR9	8320755	**51**	BC 847B
TR2	8320723	**52**	BC 868	TR10	8320747	**51**	BC 848C
TR3	8320616	**51**	BC 858B	TR11	8320755	**51**	BC 847B
TR4	8320755	**51**	BC 847B	TR12	8320740	**51**	BF 840
TR5	8320740	**51**	BF 840	TR13	8320755	**51**	BC 847B
TR6-	8320755	**51**	BC 847B	TR14	8320740	**51**	BF 840
TR7				TR15	8320755	**51**	BC 847B
TR8	8320747	**51**	BC 848C	TR20	8320755	**51**	BC 847B

D3	8300482	**250**	LL 4148	D8	8300728	**56**	BBY 40
D6	8300482	**250**	LL 4148				

R26	5370402		2.2KΩ 30% 0.3W	R91	5011857		4.42KΩ 1% 1/4W
R46	5011859		8.25KΩ 1% 1/4W	R100	5370382		47KΩ 30% 0.1W
R47	5011858		7.68KΩ 1% 1/4W	R121	5021017		47Ω 5% 0.14W
R50	5011857		4.42KΩ 1% 1/4W	R130	5020727		18Ω 5% 1W
R87	5011859		8.25KΩ 1% 1/4W	R131	5020881		22Ω 10% 0.25W
R88	5011858		7.68KΩ 1% 1/4W				

C2	4201090		47µF 20% 16V	C42	4201090		47µF 20% 16V
C4	4010132		1nF 10% 50V	C43	4010132		1nF 10% 50V
C5	4200625		3.3µF 20% 50V	C44	4010280		10nF 10% 50V
C6	4010173		4.7nF 10% 50V	C46	4200512		1µF 20% 50V
C7	4000267		3pF ±0.25pF 50V	C47	4000286		470pF 5% 50V
C8	4000276		18pF 5% 50V	C48	4200510		10µF 20% 16V
C9	4000283		270pF 5% 50V	C49	4000282		180pF 5% 50V
C10	4010280		10nF 10% 50V	C50	4000287		220nF -20+80% 25V
C11	4000283		270pF 5% 50V	C51	4200515		4.7µF 20% 25V
C12	4000287		220nF 25V	C52	4100260		2.2nF 2.5% 63V
C13	4201090		47µF 16V	C53	4200515		4.7µF 20% 25V
C14	4010166		100nF 50V	C54	4000281		82pF 5% 50V
C15-	4201090		47µF 16V	C55-	4100301		1nF 2.5% 63V
C16				C56			
C17	4000287		220nF 25V	C57	4100260		2.2nF 2.5% 63V
C18	4010170		2.2nF 10% 50V	C58	4000351		1.5nF 5% 50V
C20	4010132		1nF 10% 50V	C59-	4000323		330pF 5% 50V
C21	4000277		22pF 5% 50V	C62			
C22	4010166		100nF 50V	C63-	4010132		1nF 10% 50V
C23-	4000290		22nF 10% 50V	C67			
C24				C68	4000278		27pF 5% 50V
C26	4000138		33pF 5% 63V	C69	4000239		33pF 5% 50V
C27	4130306		100nF 10% 63V	C70	4000287		220nF -20+80% 25V
C28	4000357		1.8pF ±0.25 50V	C71	4200525		22µF 20% 10V
C29	4000280		68pF 5% 50V	C72	4130379		270nF 10% 63V
C30	4000239		33pF 5% 50V	C73	4200625		3.3µF 20% 50V
C31	4010173		4.7nF 10% 50V	C74	4010166		100nF 50V
C32	4000290		22nF 10% 50V	C75	4010208		82nF 10% 50V
C34-	4010280		10nF 10% 50V	C76	4200625		3.3µF 20% 50V
C36				C77-	4010132		1nF 10% 50V
C37-	4010173		4.7nF 10% 50V	C79			
C38				C80	4000287		220nF -20+80% 25V
C39	4200525		22µF 20% 10V	C81	4200515		4.7µF 20% 25V
C40	4000287		220nF -20+80% 25V	C82	4100260		2.2nF 2.5% 63V
C41	4010280		10nF 10% 50V	C83	4200515		4.7µF 20% 25V

Δ indicates that static electricity may destroy the component

P51	7220716	Plug 9/9 pole	
P52	6276291	Wire bundle 12/12 pole	
P53	7220712	Plug 5/5 pole	
P54	7220710	Plug 3/3 pole	
P55	7220711	Plug 4/4 pole	
P56	7220712	Plug 5/5 pole	
P57	7220883	Contact pin 7 pole	
P58	7220900	Contact pin 4 pole	
P59	7220129	Plug 2/2 pole	

PCB 8, 8001546 CD

IC7800Δ	8341316	**138**	TDA8808T	IC7843	8341420	**136**	TCA0372
IC7802Δ	8341317	**138**	TDA8809T	IC7881Δ*	8342213	**151**	QFP44
IC7803	8341682	**136**	TCA0372	IC7882	8340065	**105**	7805
IC7841	8341749	**151**	7341	IC7883	8340943	**154**	79L05
IC7842Δ	8342212	**138**	FCB61C65L				

TR7801	8320512	**18**	BC338-25	TR7845	8320616	**51**	BC858B
TR7844	8320615	**51**	BC848B	TR7884	8320615	**51**	BC848B

D6800-D6801	8300570	**209**	HZ7C-2	D6841	8300058	**209**	1N4148
				D6842	8300544	**209**	BAT42

R3804	5011527	12KΩ 1% 1/8W	
R3807	5012211	24KΩ 1% 1/8W	
R3809	5011158	4.7KΩ 5% 1/8W	
R3811	5020629	18Ω 5% 0.3W	
R3812	5020877	12Ω 10% 0.25W	
R3813	5370370	4.7KΩ 30% 0.3W	
R3815	5012210	11KΩ 5% 1/8W	
R3821-R3822	5021459	22Ω 0.3W	
R3827	5011632	1.5KΩ 1% 1/4W	
R3828	5011838	18KΩ 1% 1/8W	
R3829	5011914	5.1KΩ 1% 1/8W	
R3831	5011527	12KΩ 1% 1/8W	
R3835	5012057	6.8KΩ 1% 1/8W	
R3836	5021458	4.7Ω 0.3W	
R3837	5021457	33Ω 0.3W	
R3839-R3840	5020488	2.2Ω 10% 0.3W	
R3841	5011353	2.2KΩ 5% 1/8W	
R3866-R3867	5020488	2.2Ω 10% 0.3W	
R3892	5021458	4.7Ω 0.3W	

C2800	4010272	22nF -20+80% 50V
C2801	4000420	470pF 5% 50V
C2803	4010220	100nF 10% 50V
C2806	4010220	100nF 10% 50V
C2807	4010263	2.2nF 10% 50V
C2808	4130517	47nF 10% 100V
C2809	4000412	100pF 5% 50V
C2810	4010271	10nF 10% 50V
C2811	4010237	1nF 20% 50V
C2812	4130281	220nF 10% 63V
C2813	4130234	470nF 10% 63V
C2814	4000416	220pF 5% 50V
C2815	4200516	47µF 20% 16V
C2816	4000416	220pF 5% 50V
C2817	4130234	470nF 10% 63V
C2818	4010267	4.7nF 10% 50V
C2819	4130281	220nF 10% 63V
C2820	4010220	100nF 10% 50V
C2821-C2822	4010308	8.2nF 1% 63V
C2823	4200516	47µF 20% 16V
C2824	4130517	47nF 10% 100V
C2825	4130479	330nF 5% 63V
C2826-C2827	4010307	33nF 10% 25V
C2828-C2829	4130281	220nF 10% 63V
C2830	4010237	1nF 20% 50V
C2831	4010220	100nF 10% 50V
C2832	4130311	680nF 10% 63V
C2833-C2836	4010220	100nF 10% 50V
C2841	4010263	2.2nF 10% 50V
C2842	4010220	100nF 10% 50V
C2843	4000408	47pF 5% 50V
C2844	4010267	4.7nF 10% 50V
C2845	4130309	330nF 10% 63V
C2846	4201171	1µF 20% 50V
C2847	4000406	33pF 5% 50V
C2848	4130306	100nF 10% 63V
C2849	4010220	100nF 10% 50V
C2851-C2852	4000404	22pF 5% 50V
C2853	4010272	22nF -20+80% 50V
C2854	4010273	47nF -20+80% 50V
C2855	4010220	100nF 10% 50V
C2858	4010220	100nF 10% 50V
C2860	4200628	100µF 20% 16V
C2861-C2862	4010220	100nF 10% 50V
C2863	4000406	33pF 5% 50V
C2864-C2865	4010173	4.7nF 10% 50V
C2866	4201171	1µF 20% 50V
C2867	4201116	330µF 20% 25V
C2868	4010220	100nF 10% 50V
C2869-C2870	4000416	220pF 5% 50V
C2871-C2872	4010220	100nF 10% 50V
C2881	4130479	330nF 5% 63V
C2882	4010220	100nF 10% 50V
C2884	4130309	330nF 10% 63V
C2885	4010220	100nF 10% 50V
C2888	4200122	220µF -20+50% 10V
C2889	4010220	100nF 10% 50V
C2890	4000287	220nF -20+80% 25V

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* *specially selected or adapted sample*

Δ *indicates that static electricity may destroy the component*

PCB 4, 8001642 Antenna Input

PCB 7, 8004913 Tape

IC1-Δ	8341024	**150**	4066	IC13Δ	8341376	**151**	HA12136
IC2Δ				IC14Δ	8341033	**138**	LF353
IC3Δ	8341033	**138**	LF353	IC15-Δ	8341024	**150**	4066
IC4Δ	8341411	**150**	LM13700	IC17Δ			
IC5Δ	8341033	**138**	LF353	IC18Δ	8341408	**138**	4073
IC6Δ	8341024	**150**	4066	IC20Δ	8341417	**138**	4021
IC7Δ	8340752	**136**	µPC1297CA	IC21-Δ	8341025	**138**	4094
IC8Δ	8341041	**138**	LM324	IC22Δ			
IC10Δ	8341041	**138**	LM324	IC23Δ	8341033	**138**	LF353
IC11-Δ	8341024	**150**	4066				
IC12Δ							

TR1	8320755	**51**	BC847B	TR25	8320755	**51**	BC847B
TR2	8320950	**51**	BC850C	TR28	8320755	**51**	BC847B
TR3	8320768	**51**	BC850B	TR29	8320753	**51**	BC856B
TR4	8320950	**51**	BC850C	TR30-TR32	8320752	**51**	BC817-40
TR5	8320768	**51**	BC850B	TR33-TR36	8320753	**51**	BC856B
TR6-TR7	8320755	**51**	BC847B	TR37-TR39	8320752	**51**	BC817-40
TR8	8320753	**51**	BC856B	TR40	8320755	**51**	BC847B
TR9	8320617	**32**	BD137-10	TR41-TR42	8320523	**17**	BC328-25
TR10-TR11	8320755	**51**	BC847B	TR43-TR45	8320755	**51**	BC847B
TR12	8320753	**51**	BC856B				
TR15	8320753	**51**	BC856B				
TR16	8320755	**51**	BC847B				
TR18-TR20	8320755	**51**	BC847B				

D1	8300409	**209**	BAV20	D19	8300482	**250**	LL4148
D2	8300482	**250**	LL4148	D23-D24	8300482	**250**	LL4148
D4-D12	8300482	**250**	LL4148	D26-D27	8300409	**209**	BAV20
D13	8300409	**209**	BAV20	D28-D29	8300482	**250**	LL4148
D14	8300482	**250**	LL4148	D30	8300639	**250**	Z12V 2%
D15	8300726	**250**	Z7.5V 2%				
D16	8300482	**250**	LL4148				

R2	5021226	100KΩ 1% 1/4W	R117	5011992	12.1KΩ 1% 1/8W
R3	5011792	4.75KΩ 1% 1/8W	R118	5011995	46.4KΩ 1% 1/8W
R7	5011870	90.9Ω 1% 1/8W	R119	5011899	21.5KΩ 1% 1/8W
R8	5011871	365Ω 1% 1/8W	R120	5011994	4.02KΩ 1% 1/8W
R9	5011849	8.66KΩ 1% 1/8W	R126	5011838	18KΩ 1% 1/8W
R13	5370382	47KΩ 30% 0.1W	R135-R136	5011838	18KΩ 1% 1/8W
R14	5021226	100KΩ 1% 1/4W			
R15	5011792	4.75KΩ 1% 1/8W	R159-R164	5370381	10KΩ 30% 0.1W
R19	5011849	8.66KΩ 1% 1/8W			
R20	5011870	90.9Ω 1% 1/8W	R167	5370381	10KΩ 30% 0.1W
R21	5011871	365Ω 1% 1/8W	R198	5370381	10KΩ 30% 0.1W
R25	5370382	47KΩ 30%	R209	5011986	15.4KΩ 1% 1/8W
R52-R53	5370403	22KΩ 30%	R233-R234	5011844	2.55KΩ 1% 1/8W
R89	5020489	10Ω 10% 0.3W	R235-R236	5011840	137Ω 1% 1/8W
R102	5011986	15.4KΩ 1% 1/8W	R238	5020770	4.42KΩ 1% 1/4W
R103	5021023	9.09KΩ 1% 1/4W	R239	5020074	15KΩ 1% 1/4W
R104	5011752	12.7KΩ 1% 1/8W	R243-R244	5021119	27Ω 5% 1W
R105	5011996	8.25KΩ 1% 1/8W			
R107	5011992	12.1KΩ 1% 1/8W	R248-R249	5021119	27Ω 5% 1W
R108	5011995	46.4KΩ 1% 1/8W			
R109	5011899	21.5KΩ 1% 1/8W			
R110	5011994	4.02KΩ 1% 1/8W	R266-R267	5011517	22Ω 5% 1W
R112	5011986	15.4KΩ 1% 1/8W			
R113	5021023	9.09KΩ 1% 1/4W			
R114	5011752	12.7KΩ 1% 1/8W			
R115	5011996	8.25KΩ 1% 1/8W			

Δ *indicates that static electricity may destroy the component*

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19	51	138	150	151	209	250	
							

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

X1851	8090137	Crystal 16.9344MHz	X1891	8090000	Crystal 4MHz
P1801	7210672	Plug 14 pole	P1881	7220712	Plug 5 pole
P1841	7220710	Plug 3 pole	P1882	7220710	Plug 3 pole
P1842	7220709	Plug 2 pole			

PCB 9, Preamplifier
8001673 Type 2516-2517-2519-2520
8001674 Type 2518

IC1	8341059	**138**	4052	IC3-	8341022	**138**	4558
IC2	8341582	**151**	TDA7318	IC6			
TR1-	8320755	**51**	BC847B	TR12	8320811	**51**	BC857B
TR2				TR13	8320755	**51**	BC847B
TR4-	8321080	**51**	FMMT491A	TR14-	8321080	**51**	FMMT491A
TR5				TR15			
TR7-	8320755	**51**	BC847B				
TR11							
D1	8300605	**250**	Z10V 5%	D4	8300562	**250**	Z5.6V 2%
D2	8300520	**250**	Z6.8V 5%	D15-	8300482	**250**	LL4148
D3	8300482	**250**	LL4148	D16			
R19	5011877		5.11KΩ 1% 1/8W	R57-	5011914		5.1KΩ 1% 1/8W
R20	5012262		3.16KΩ 1% 1/8W	R58			
R21-	5012161		3.9KΩ 1% 1/8W	R93-	5011912		1.2KΩ 1% 1/8W
R22				R94			
R30	5011877		5.11KΩ 1% 1/8W	R103-	5011879		9.09KΩ 1% 1/8W
R31	5012262		3.16KΩ 1% 1/8W	R104			
R32-	5012161		3.9KΩ 1% 1/8W	R105-	5012263		6.65KΩ 1% 1/8W
R33				R106			
C1	4000290		22nF 10% 50V	C39-	4010196		1.8nF 5% 50V
C2-	4000233		220pF 5% 50V	C40			
C5				C41-	4000391		1nF 2% 50V
C6-	4010157		10nF 10% 50V	C42			
C7				C43-	4000351		1.5nF 5% 50V
C8-	4201173		10µF 20% 50V	C44			
C15				C45-	4201171		1µF 50V
C16	4000233		220pF 5% 50V	C46			
C17-	4201173		10µF 20% 50V	C47-	4130307		150nF 10% 63V
C18				C50			
C19	4010157		10nF 10% 50V	C51-	4201173		10µF 20% 50V
C20	4201173		10µF 20% 50V	C52			
C21	4000234		47pF 5% 50V	C53-	4000345		1nF 5% 50V
C22	4201173		10µF 20% 50V	C55			
C23	4000234		47pF 5% 50V	C56-	4010157		10nF 10% 50V
C24-	4000280		68pF 5% 50V	C61			
C25				C62-	4000286		470pF 5% 50V only in
C26-	4000431		2.2nF 2% 50V	C63			type 2518
C27				C64	4000391		1nF 2% 50V
C28-	4000286		470pF 5% 50V	C65	4200824		22µF 20% 50V
C29				C66	4010220		100nF 10% 50V
C30	4010157		10nF 10% 50V	C67	4010157		10nF 10% 50V
C31-	4000345		1nF 5% 50V	C68-	4000345		1nF 5% 50V
C32				C69			
C33	4000233		220pF 5% 50V	C70	4010157		10nF 10% 50V
C34-	4000391		1nF 2% 50V	C71	4000290		22nF 10% 50V
C38							

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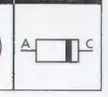
18	51	105	136	138	151	154	209
							

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

C1	4200403	100µF -20+80% 25V	C59	4000163	10pF 5% 63V
C2	4200525	22µF 20% 10V	C60	4200510	10µF 20% 16V
C3	4000283	270pF 5% 50V	C61-	4010280	10nF 10% 50V
C4	4000233	220pF 5% 50V	C62		
C5	4200515	4.7µF 20% 25V	C63	4200524	10µF 20% 25V
C6	4200625	3.3µF 20% 50V	C64-	4010216	22nF 10% 100V
C7	4130315	15nF 5% 63V	C65		
C8	4000351	1.5nF 5% 50V	C66-	4010220	100nF 10% 50V
C9	4100236	1nF 5% 63V	C67		
C10	4010280	10nF 10% 50V	C68-	4100255	560pF 5% 63V
C11	4000233	220pF 5% 50V	C69		
C12	4200403	100µF -20+80% 25V	C70-	4000241	100pF 5% 50V
C13	4200525	22µF 20% 10V	C71		
C14	4000283	270pF 5% 50V	C72-	4000344	560pF 5% 50V
C15	4200515	4.7µF 20% 25V	C73		
C16	4130315	15nF 5% 63V	C74	4200631	0.22µF 20% 50V
C17	4100236	1nF 5% 63V	C75	4200600	470µF 20% 16V
C18	4200625	3.3µF 20% 50V	C76-	4200515	4.7µF 20% 25V
C19	4000351	1.5nF 5% 50V	C77		
C20	4010280	10nF 10% 50V	C78-	4200512	1µF 20% 50V
C21-	4200625	3.3µF 20% 50V	C80		
C22			C81	4200508	22µF 20% 25V
C25-	4010196	1.8nF 5% 50V	C82-	4130333	220nF 5% 63V
C26			C83		
C27-	4010259	5.6nF 10% 50V	C84-	4130233	220nF 20% 63V
C28			C85		
C29-	4000290	22nF 10% 50V	C86-	4200510	10µF 20% 16V
C30			C87		
C31-	4100240	5.6nF 5% 63V	C88	4130313	470nF 20% 63V
C32			C89	4200512	1µF 20% 50V
C35-	4130379	270nF 10% 63V	C90	4200508	22µF 20% 25V
C36			C93	4200517	2.2µF 20% 50V
C37-	4200510	10µF 20% 16V	C94-	4200600	470µF 20% 16V
C38			C95		
C39-	4200617	47µF 20% 10V	C96-	4200523	0.47µF 20% 50V
C40			C97		
C42-	4200517	2.2µF 20% 50V	C98	4000287	220nF -20+80% 25V
C43			C99	4130236	330nF 20% 63V
C44-	4000327	820pF 5% 50V	C100	4200403	100µF -20+80% 25V
C45			C101-	4010195	2.7nF 5% 50V
C46	4200525	22µF 20% 10V	C102		
C47-	4010170	2.2nF 10% 50V	C103-	4010132	1.0nF 10% 50V
C48			C104		
C49-	4000283	270pF 5% 50V	C105-	4000290	22nF 10% 50V
C50			C106		
C51	4010220	100nF 10% 50V	C107-	4000241	100pF 5% 50V
C52	4200512	1µF 20% 50V	C111		
C53	4200631	0.22µF 20% 50V	C112	4010220	100nF 10% 50V
C54	4010170	2.2nF 10% 50V	C113	4200524	10µF 20% 25V
C55	4200515	4.7µF 20% 25V	C114	4010280	10nF 10% 50V
C56	4200561	10µF 20% 50V	C200-	4100243	8.2nF 5% 63V
C57	4200512	1µF 20% 50V	C201		
C58	4100243	8.2nF 5% 63V			

L1-	8022237	Coil 10mH	L9	8020594	Coil 3.3mH 5%
L4			L10	8020905	Coil 3.3mH 5%
L5	8020556	Coil osc. 2.4mH			
L6	8020552	Coil 10µH 10%			
L7-	8022251	Coil 5mH			
L8					

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PCB 17, FM Tuner
8050111 Type 2516-2517-2518-2520
8050112 Type 2519

● only in type 2519

TR1 TR2	8320610 8320766	**53** **53**	BF995 BF995	TR3- TR4	8320672	**51**	BFS20
D1- D4	8300301	**209**	BB204				
R30- R31	5011859		8.25KΩ 1% 1/4W	R32- R34	5370253		47KΩ 20% 0.1W
C1	4000331		6.8pF ±0.25pF 50V	C16	4000332		8.2pF ±0.5pF 50V
●C1	4000275		15pF 5% 50V	C17-	4000260		5pF ±0.5pF 50V
C2	4000257		27pF 5% 50V	C18			
C3-	4010132		1nF 10% 50V	●C18	4000228		12pF 5% 50V
C6				C19-	4010132		1nF 10% 50V
C7	4000257		27pF 5% 50V	C20			
C8	4000332		8.2pF ±0.5pF 50V	C21	4000275		15pF 5% 50V
●C8	4000275		15pF 5% 50V	C22	4000228		12pF 5% 50V
C9	4000258		4pF ±0.25pF 50V	C23	4010132		1nF 10% 50V
●C9	4000228		12pF 5% 50V	C24	4010157		10nF 10% 50V
C10	4000330		5.6pF ±0.5pF 50V	C25	4000294		0.5pF ±0.25pF 50V
C12	4010132		1nF 10% 50V	C26	4200512		1µF 20% 50V
C13	4000231		68pF 5% 50V	C27-	4000233		220pF 5% 50V
C14	4010157		10nF 10% 50V	C29			
L1	6850158		Coil 70nH	L6	8020632		Coil 0.68µH 20%
L2	6850157		Coil 115nH	L7	8020567		Coil 10.7MHz 3.2µH
L3	8020577		Coil 2.2µH 10%	L8	6850159		Coil 100nH
L4- L5	6850157		Coil 115nH				
P1	7220129		Plug 2/2 pole	P3	7220210		Plug 4/4 pole
P2	7220212		Plug 3/3 pole				

PCB 40, 8001623 Keyboard Interface

TR1- TR8	8320755	**51**	BC847B				
C1- C4	4000423		820pF 5% 50V	C9 C13-	4010274 4010274		100nF -20+80% 25V 100nF -20+80% 25V
C5- C8	4000424		1nF 5% 50V	C18 C19	4200510		10uF 20% 16V
L1- L4	8020552		Coil 10µH 10%				
P37	7220711		Plug 4/4 pole	P44	7220550		Plug 12/12 pole
P38	7220710		Plug 3/3 pole	P45	7220711		Plug 4/4 pole
P41	7220432		Plug 10/10 pole	P47	7220710		Plug 3/3 pole
P43	7220589		Plug 8/8 pole				

PCB 41, 8002745 Keyboard Lower Display, Left

TR1- TR10	8320625	**23**	BF240	TR11	8320503	**18**	BC557B
D1- D2	8330151	**246**	Led green	D3- D8	8330152	**246**	Led red
C1- C2	4000143		8.2pF ±0.25pF 63V	C7 C8-	4000149 4000144		12pF 5% 63V 10pF ±0.25pF 63V
C3- C4	4000144		10pF ±0.25pF 63V	C9 C10	4000149		12pF 5% 63V
C5- C6	4000143		8.2pF ±0.25pF 63V				
P59	7220551		Plug 14/14 pole				

P1- P2	7210600	Socket 7 pole	P13 P14	7220710 7220709	Plug 3/3 pole Plug 2/2 pole
P3- P4	7210518	Socket 8 pole	P15 P16	7220710 7220712	Plug 3/3 pole Plug 5/5 pole
P6	7210670	Socket 5 pole only in type 2518	P17- P18	7220710	Plug 3/3 pole
P12	7220432	Plug 10/10 pole			
CP1	7500126	Contact pin			
	7220265	Short-circuit plug for external socket, only in type 2518			

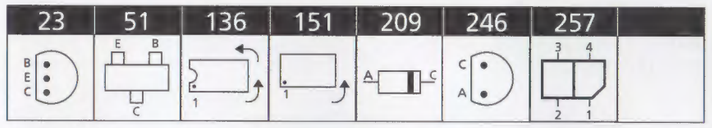
PCB 10, 8001640 Power Supply and Amplifier

IC1Δ	8341025	**138**	4094
IC2Δ	8341747	**150**	TL7705BCD

TR1	8320811	**51**	BC857B	TR22-	8321073	**19**	ZTX790A
TR2	8320755	**51**	BC847B	TR23			
TR3	8320811	**51**	BC857B	TR24	8320755	**51**	BC847B
TR6	8320755	**51**	BC847B	TR25	8320753	**51**	BC856B
TR7	8320971	**51**	BC807-40	TR26	8320755	**51**	BC847B
TR8-	8320816	**51**	BC846B	TR27-	8321072	**19**	ZTX690B
TR11				TR28			
TR12	8320811	**51**	BC857B	TR29	8320753	**51**	BC856B
TR13-	8320755	**51**	BC847B	TR30	8320755	**51**	BC847B
TR15				TR31-	8320811	**51**	BC857B
TR16-	8320811	**51**	BC857B	TR32			
TR17				TR33-	8320755	**51**	BC847B
TR18	8320816	**51**	BC846B	TR35			
TR19-	8321073	**19**	ZTX790A	TR36	8320753	**51**	BC856B
TR20				TR37	8320755	**51**	BC847B
TR21	8321072	**19**	ZTX690B	TR38	8321073	**19**	ZTX790A
D1-	8300482	**250**	LL4148	D19	8300644	**250**	Z6.2V 2%
D5				D20	8300482	**250**	LL4148
D6-	8300023	**209**	1N4002	D21	8300817	**209**	1N5819
D9				D22	8300885	**209**	1N5817
D10-	8300940	**250**	Z10V 2% 0.5W	D23-	8300023	**209**	1N4002
D11				D24			
D12-	8300023	**209**	1N4002	D25	8300644	**250**	Z6.2V 2%
D13				D26-	8300482	**250**	LL4148
D14	8300773	**250**	Z15V 2% 0.5W	D27			
D15-	8300482	**250**	LL4148	D28	8300644	**250**	Z6.2V 2%
D16				D29	8300562	**250**	Z5.6V 2%
D17-	8300023	**209**	1N4002				
D18							
R26	5020568		2.21KΩ 1% 1/4W	R93	5012185		14.7KΩ 1% 1/8W
R28	5020159		100Ω 0.3W	R110	5011987		28.7KΩ 1% 1/8W
R33	5020568		2.21KΩ 1% 1/4W	R111	5012204		3.74KΩ 1% 1/8W
R35-	5020814		562Ω 1% 1/4W	R113	5012204		3.74KΩ 1% 1/8W
R36				R121	5011854		2.1KΩ 1% 1/4W
R41-	5100175		0.33Ω 10% 2W	R122	5020213		4.32KΩ 1% 1/4W
R42				R131	5021022		15.4KΩ 1% 1/4W
R71-	5020362		56.2KΩ 1% 1/4W	R141-	5020488		2.2Ω 0.3W
R72				R142			
R77-	5020488		2.2Ω 0.3W				
R78							
C4	4010166		100nF -20+80% 50V	C14	4200824		22µF 20% 50V
C5	4201173		10µF 20% 50V	C15	4010132		1nF 10% 50V
C6	4201170		0.47µF 20% 50V	C16	4200688		47µF 20% 50V
C8	4200824		22µF 20% 50V	C17	4200342		10µF -20+50% 63V
C9	4010132		1nF 10% 50V	C18-	4200688		47µF 20% 50V
C10	4200342		10µF -20+50% 63V	C19			
C11	4201309		100µF 20% 63V	C20-	4130233		220nF 20% 63V
C12	4200688		47µF 20% 50V	C23			

Δ *indicates that static electricity may destroy the component*

⇨



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

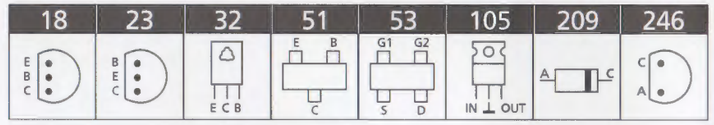
PCB 42, 8001707 Keyboard Lower Display, Center

IC1-Δ IC2Δ	8340780	**136**	4044B	IC3Δ IC4Δ	8340467 8340780	**136** **136**	MM5450N 4044B
TR1 TR3- TR19 TR21- TR22	8320625 8320625 8320625	**23** **23** **23**	BF240 BF240 BF240	TR24- TR25	8320625	**23**	BF240
D1- D5 D10- D21 D24- D25	8300058 8330152 8330152	**209** **246** **246**	1N4148 Led red Led red	D28- D39 D41- D46	8330152 8330152	**246** **246**	Led red Led red
R39	5370327		22KΩ 20% 0.1W				
C7 C8- C9 C10 C11 C12 C13 C14 C15- C16 C17- C18 C19- C21 C22	4000149 4000143 4000149 4000144 4000143 4000149 4000143 4000144 4000149 4000143 4000149		12pF 5% 63V 8.2pF ±0.25pF 63V 12pF 5% 63V 10pF ±0.25pF 63V 8.2pF ±0.25pF 63V 12pF 5% 63V 8.2pF ±0.25pF 63V 10pF ±0.25pF 63V 12pF 5% 63V 8.2pF ±0.25pF 63V 12pF 5% 63V	C23- C24 C27 C29 C30 C31 C39 C40- C41 C42- C44 C45- C49	4000143 4000143 4000149 4000143 4010142 4000149 4130230 4010118 4010109		8.2pF ±0.25pF 63V 8.2pF ±0.25pF 63V 12pF 5% 63V 8.2pF ±0.25pF 63V 10nF -20+80% 40V 12pF 5% 63V 100nF 20% 63V 330pF 10% 50V 180pF 10% 50V
P61 P62	7220551 7220552		Plug 14/14 pole Plug 18/18 pole	P63	7220550		Plug 12/12 pole

PCB 43, 8002755 Keyboard Lower Display, Right

TR1- TR14	8320625	**23**	BF240				
D1- D4	8300058	**209**	1N4148	D5- D17	8330152	**246**	Led red
C1 C2- C3 C4- C5	4000144 4000143 4000149		10pF ±0.25pF 63V 8.2pF ±0.25pF 63V 12pF 5% 63V	C6- C7 C8- C14	4000143 4000144		8.2pF ±0.25pF 63V 10pF ±0.25pF 63V
P62	7220552		Plug 18/18 pole				

Δ *indicates that static electricity may destroy the component*



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

C24- C25 C26 C27 C29 C30 C31- C33 C35 C36- C37 C38 C39 C40 C41	4130313 4200688 4010166 4200992 4200392 4130230 4010157 4201105 4010157 4201173 4201170 4010157		470nF 20% 63V 47µF 20% 50V 100nF -20+80% 50V 4700µF 20% 16V 2200µF 20% 16V 100nF 20% 63V 10nF 10% 50V 330µF 20% 63V 10nF 10% 50V 10µF 20% 50V 0.47µF 20% 50V 10nF 10% 50V	C42 C43 C44 C45 C46 C47 C48 C50 C51 C52 C54 C55 C56 C60	4201188 4010157 4201173 4201188 4010166 4000287 4010157 4201173 4010166 4201170 4010157 4010220 4200961 4201173		220µF 20% 25V 10nF 10% 50V 10µF 20% 50V 220µF 20% 25V 100nF -20+80% 50V 220nF -20+80% 25V 10nF 10% 50V 10µF 20% 50V 100nF -20+80% 50V 0.47µF 20% 50V 10nF 10% 50V 100nF 10% 50V 220µF 20% 10V 10µF 20% 50V
L1- L2	6850165		Coil 4.3µH				
RL1	7600093		Relay 9V				
F1	6604009		Fuse F1A				
P73 P74 P75 P76 P77 P78 P79- P80 P81	7220863 7220429 7220403 7229149 7220432 7220726 7220727 7220726		Plug 8 pole Plug 7/7 pole Plug 4/4 pole Socket 3 pole Plug 10/10 pole Plug 4/4 pole Plug 5/5 pole Plug 4/4 pole	P82 P83 P84 P85 P87 P88 P100- P103	7220709 7220711 7220432 7220710 7220711 7229142 7229142		Plug 2/2 pole Plug 4/4 pole Plug 10/10 pole Plug 3/3 pole Plug 4/4 pole Socket 9 pole Socket 9 pole

PCB 11, 8001701 Power Supply Voltage Regulators

IC1 IC2	8340796 8340064	**105** **105**	7805 7815				
TR1 TR2	8320428 8320239	**32** **32**	BD438 BD135	TR3	8320428	**32**	BD438
C1- C8	4010220		100nF 10% 50V				

PCB 12, 8001702 NTC

R1	5220055	NTC 100KΩ 10%

PCB 13, 8001703 Output Amplifiers

IC1	8350045	HYBRID STK4151-5

PCB 17, FM Tuner
8050111 Type 2516-2517-2518-2520
8050112 Type 2519

● only in type 2519

TR1	8320610	**53**	BF995	TR3-TR4	8320672	**51**	BFS20
TR2	8320766	**53**	BF995				
D1-D4	8300301	**209**	BB204				
R30-R31	5011859	8.25KΩ 1% 1/4W		R32-R34	5370253	47KΩ 20% 0.1W	
C1	4000331	6.8pF ±0.25pF 50V		C16	4000332	8.2pF ±0.5pF 50V	
●C1	4000275	15pF 5% 50V		C17-C18	4000260	5pF ±0.5pF 50V	
C2	4000257	27pF 5% 50V		●C18	4000228	12pF 5% 50V	
C3-C6	4010132	1nF 10% 50V		C19-C20	4010132	1nF 10% 50V	
C7	4000257	27pF 5% 50V		C21	4000275	15pF 5% 50V	
C8	4000332	8.2pF ±0.5pF 50V		C22	4000228	12pF 5% 50V	
●C8	4000275	15pF 5% 50V		C23	4010132	1nF 10% 50V	
C9	4000258	4pF ±0.25pF 50V		C24	4010157	10nF 10% 50V	
●C9	4000228	12pF 5% 50V		C25	4000294	0.5pF ±0.25pF 50V	
C10	4000330	5.6pF ±0.5pF 50V		C26	4200512	1µF 20% 50V	
C12	4010132	1nF 10% 50V		C27-C29	4000233	220pF 5% 50V	
C13	4000231	68pF 5% 50V					
C14	4010157	10nF 10% 50V					
L1	6850158	Coil 70nH		L6	8020632	Coil 0.68µH 20%	
L2	6850157	Coil 115nH		L7	8020567	Coil 10.7MHz 3.2µH	
L3	8020577	Coil 2.2µH 10%		L8	6850159	Coil 100nH	
L4-L5	6850157	Coil 115nH					
P1	7220129	Plug 2/2 pole		P3	7220210	Plug 4/4 pole	
P2	7220212	Plug 3/3 pole					

PCB 40, 8001623 Keyboard Interface

TR1-TR8	8320755	**51**	BC847B				
C1-C4	4000423	820pF 5% 50V		C9	4010274	100nF -20+80% 25V	
C5-C8	4000424	1nF 5% 50V		C13-C18	4010274	100nF -20+80% 25V	
				C19	4200510	10uF 20% 16V	
L1-L4	8020552	Coil 10µH 10%					
P37	7220711	Plug 4/4 pole		P44	7220550	Plug 12/12 pole	
P38	7220710	Plug 3/3 pole		P45	7220711	Plug 4/4 pole	
P41	7220432	Plug 10/10 pole		P47	7220710	Plug 3/3 pole	
P43	7220589	Plug 8/8 pole					

PCB 41, 8002745 Keyboard Lower Display, Left

TR1-TR10	8320625	**23**	BF240	TR11	8320503	**18**	BC557B
D1-D2	8330151	**246**	Led green	D3-D8	8330152	**246**	Led red
C1-C2	4000143	8.2pF ±0.25pF 63V		C7	4000149	12pF 5% 63V	
C3-C4	4000144	10pF ±0.25pF 63V		C8-C9	4000144	10pF ±0.25pF 63V	
C5-C6	4000143	8.2pF ±0.25pF 63V		C10	4000149	12pF 5% 63V	
P59	7220551	Plug 14/14 pole					

P1-P2	7210600	Socket 7 pole	P13	7220710	Plug 3/3 pole
			P14	7220709	Plug 2/2 pole
P3-P4	7210518	Socket 8 pole	P15	7220710	Plug 3/3 pole
			P16	7220712	Plug 5/5 pole
P6	7210670	Socket 5 pole only in type 2518	P17-P18	7220710	Plug 3/3 pole
P12	7220432	Plug 10/10 pole			
CP1	7500126	Contact pin			
	7220265	Short-circuit plug for external socket, only in type 2518			

PCB 10, 8001640 Power Supply and Amplifier

IC1Δ	8341025	**138**	4094				
IC2Δ	8341747	**150**	TL7705BCD				
TR1	8320811	**51**	BC857B	TR22-TR23	8321073	**19**	ZTX790A
TR2	8320755	**51**	BC847B				
TR3	8320811	**51**	BC857B	TR24	8320755	**51**	BC847B
TR6	8320755	**51**	BC847B	TR25	8320753	**51**	BC856B
TR7	8320971	**51**	BC807-40	TR26	8320755	**51**	BC847B
TR8-TR11	8320816	**51**	BC846B	TR27-TR28	8321072	**19**	ZTX690B
TR12	8320811	**51**	BC857B	TR29	8320753	**51**	BC856B
TR13-TR15	8320755	**51**	BC847B	TR30	8320755	**51**	BC847B
				TR31-TR32	8320811	**51**	BC857B
TR16-TR17	8320811	**51**	BC857B	TR33-TR35	8320755	**51**	BC847B
TR18	8320816	**51**	BC846B				
TR19-TR20	8321073	**19**	ZTX790A	TR36	8320753	**51**	BC856B
				TR37	8320755	**51**	BC847B
TR21	8321072	**19**	ZTX690B	TR38	8321073	**19**	ZTX790A
D1-D5	8300482	**250**	LL4148	D19-D20	8300644	**250**	Z6.2V 2%
					8300482	**250**	LL4148
D6-D9	8300023	**209**	1N4002	D21	8300817	**209**	1N5819
				D22	8300885	**209**	1N5817
D10-D11	8300940	**250**	Z10V 2% 0.5W	D23-D24	8300023	**209**	1N4002
D12-D13	8300023	**209**	1N4002	D25	8300644	**250**	Z6.2V 2%
				D26-D27	8300482	**250**	LL4148
D14	8300773	**250**	Z15V 2% 0.5W				
D15-D16	8300482	**250**	LL4148	D28	8300644	**250**	Z6.2V 2%
				D29	8300562	**250**	Z5.6V 2%
D17-D18	8300023	**209**	1N4002				
R26	5020568	2.21KΩ 1% 1/4W		R93	5012185	14.7KΩ 1% 1/8W	
R28	5020159	100Ω 0.3W		R110	5011987	28.7KΩ 1% 1/8W	
R33	5020568	2.21KΩ 1% 1/4W		R111	5012204	3.74KΩ 1% 1/8W	
R35-R36	5020814	562Ω 1% 1/4W		R113	5012204	3.74KΩ 1% 1/8W	
				R121	5011854	2.1KΩ 1% 1/4W	
R41-R42	5100175	0.33Ω 10% 2W		R122	5020213	4.32KΩ 1% 1/4W	
				R131	5021022	15.4KΩ 1% 1/4W	
R71-R72	5020362	56.2KΩ 1% 1/4W		R141-R142	5020488	2.2Ω 0.3W	
R77-R78	5020488	2.2Ω 0.3W					
C4	4010166	100nF -20+80% 50V		C14	4200824	22µF 20% 50V	
C5	4201173	10µF 20% 50V		C15	4010132	1nF 10% 50V	
C6	4201170	0.47µF 20% 50V		C16	4200688	47µF 20% 50V	
C8	4200824	22µF 20% 50V		C17	4200342	10µF -20+50% 63V	
C9	4010132	1nF 10% 50V		C18-C19	4200688	47µF 20% 50V	
C10	4200342	10µF -20+50% 63V					
C11	4201309	100µF 20% 63V		C20-C23	4130233	220nF 20% 63V	
C12	4200688	47µF 20% 50V					

Δ *indicates that static electricity may destroy the component*

PCB 44, 8001708 Upper Display, Left

IC1Δ	8340467	**151**	MM5450N				
D1-D14	8330152	**246**	Led red	D46-D49	8330152	**246**	Led red
D17-D18	8330151	**246**	Led green	D51-D64	8330152	**246**	Led red
D19-D22	8330152	**246**	Led red	D65	8300023	**209**	1N4002
D27-D41	8330151	**246**	Led green				
R1	5370327	22KΩ 20% 0.1W					
C1	4130230	100nF 20% 63V					
C2	4010142	10nF -20+80% 40V					
P64	7220549	Plug 10/10 pole					
P65	7220551	Plug 14/14 pole					

PCB 45, 8002740 Upper Display, Right

IC1Δ IC2-Δ IC3Δ	8340467 8341420	**151** **151**	MM5450N TCA0372				
D1-D24	8330152	**246**	Led red	D26	8300023	**209**	1N4002
R1-R2	5370327	22KΩ 20% 0.1W					
C1	4130230	100nF 20% 63V		C4-C5	4130230	100nF 20% 63V	
C2-C3	4010142	10nF -20+80%40V		C8	4130230	100nF 20% 63V	
P66	7220549	Plug 10/10 pole		P68	7220317	Plug 4/4 pole	
P67	7220551	Plug 14/14 pole					

PCB 46, 8002736 Counter/ Frequence Display

IC1Δ	8340467	**151**	MM5450N				
D2-D3	8300023	**209**	1N4002				
DP1-DP5	8330131		Display red				
P1	7220226	Plug 8/8 pole					

PCB 47, 8001643 Cover/Tacho

TR1-TR2	8320755	**51**	BC847B				
PE1-PE2	8330235	**257**	Optocoupler				
	3152943		Holder				
P68	7220726	Plug 4/4 pole					

Δ *indicates that static electricity may destroy the component*

PCB 64, Main Transformer and Fuses

Type 2516-2517-2520
8013533

C1	4000351	1.5nF 5% 50V		C9	4200760	220µF -20+50% 16V	
C2	4000406	33pF 5% 50V		C10	4200311	220µF -20+50% 40V	
C3	4000412	100pF 5% 50V		C11	4200517	2.2µF 20% 50V	
C4	4010166	100nF -20+80% 50V		C12	4201115	3300µF -20+50% 40V	
C5-C8	4010271	10nF 10% 50V					
L1	8020759	Coil 1mH		L2	8022295	Coil 2 x 0.4mH	
T1	8013529	Transformer for type 2516-2517-2518-2520					
	8013539	Transformer for type 2519					
RL1	7600114	Relay 12V					
F1	6609054	Fuse 3A 250V					
P1-P2	7530117	Contact pin		P90	7220429	Plug 7/7 pole	
				P91	7220406	Plug 2/2 pole	
D3-D4	8300023	**209**	1N4002				
C1	4200421	1000µF -10+50% 6.3V					
0C1	4130079	22nF 20% 250V					
F1-F2	6600068	Fuse 4AT 250V		F5-F6	6600065	Fuse 1.6AT 250V	
F3-F4	6600067	Fuse 2.5AT 250V		F8	6600064	Fuse 250mAT 250V	
				F9	6609050	Thermal fuse	
	7220863	Plug 8 pole					

Type 2518
8013534

R1	5000194	3.3MΩ					
0C1	4130079	22nF 20% 250V					
F1	6600085	Fuse 3AT 125V		F8	6609050	Thermal fuse	
F2	6600077	Fuse 400mAT 125V		F9	6600079	Fuse 5AT 125V	
F4-F5	6600056	Fuse 4AT 125V		F10			
F6-F7	6600075	Fuse 2.5AT 125V					
	7220863	Plug 8 pole					

Type 2519
8013535

0C1	4130079	22nF 20% 250V					
F1	6600021	Fuse 3.15AT 250V		F8	6609050	Thermal fuse	
F2	6600000	Fuse 250mAT 250V		F9-F10	6600010	Fuse 4AT 250V	
F4-F5	6600020	Fuse 2.5AT 250V					
F6-F7	6600022	Fuse 1.6AT 250V					
	7220863	Plug 8 pole					

94Modul, 8422069 Tape Deck

IC1	8004903	PCB, Hall cell
PE1	8004902	Opto coupler
SFR1	5370436	4.7Kohm
RL1	8020898	Solenoid, play
RL2	8020899	Solenoid, < , >
S1	7400411	Switch
S2-	7400412	Switch
S3		
S4-	7400411	Switch
S5		
M1	8400187	Motor
H1	8600115	Tape head w/wires

96Modul, 8420166
CD Mechanism

51	151	209	250				
E B C	1	A C	A C				

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

PCB 50, 8001704 Input/Output Socket

C1	4010132	1nF 10% 50V	C6	4010132	1nF 10% 50V
C2-	4010157	10nF 10% 50V	C7	4010157	10nF 10% 50V
C3			C8	4010132	1nF 10% 50V
C4	4010132	1nF 10% 50V	C9	4010157	10nF 10% 50V
C5	4010157	10nF 10% 50V	C10	4010132	1nF 10% 50V
P1-	7210521	Loudspeaker socket 4 pole			
P2					
P3	7210520	Loudspeaker socket 3 pole			
P4					
P86	7229142	Socket 9 pole			

PCB 51, 8001705 Headphone

R1-	5021384	511Ω 1% 1/4W
R4		
C1-	4010157	10nF 10% 50V
C2		
P48	7220726	Plug 4/4 pole
P49	7210391	Jack socket

PCB 62, 8001619 Rectifiers

D1	8300497		KBU6D	D7	8300497		KBU6D
D2-	8300294	**209**	1N5401				
D5							
C2-	4130104	220nF 20% 100V		C12	4200393	2200µF -10+50% 40V	
C4				C14-	4130230	100nF 20% 63V	
C5-	4200629	6800µF -10+50% 40V		C16			
C6				C17	4200636	10000µF -10+50% 25V	
C9-	4130230	100nF 20% 63V					
C11							
P93	7220185	Plug 3/3 pole		P96	7220196	Plug 3/4 pole	
P95	7220403	Plug 4/4 pole		P97	7220403	Plug 4/4 pole	

PCB 63, Stand-by Supply
8001627 Type 2516-2517-2518-2520
8001693 Type 2519

IC1Δ	8341225	**151**	LM3578				
TR1	8320752	**51**	BC817-40	TR4-	8320811	**51**	BC857B
TR2-	8320755	**51**	BC847B	TR5			
TR3							
D1	8300466		Bridge	D8	8300817	**209**	1N5819
D3-	8300606	**250**	LL4448	D9	8300606	**250**	LL4448
D5							
D6-	8300885	**209**	1N5817				
D7							
R16	5011874	45.3KΩ 1% 1/8W					
R17	5012057	6.8KΩ 1%					
R18	5020759	0.27Ω 5% 1/4W					

⇨

Δ *indicates that static electricity may destroy the component*

Top

9101	3164779	Cover
9102	3162401	Lid, set
9103	3164858	Cover
9104	2830122	Shaft
9105	3014088	Lifter w/cord
9106	3013055	Guide rail, front, left
9107	8052342	Chassis
	3170309	Insulating piece f/hinge
9108	3907059	Rubber
9109	3030105	Hinge,left
9110	2548236	Bracket
9111	3151234	Holder, left
9112	2938237	Bushing
9113	2930074	Spacer
9114	2830118	Shaft
9115	2530506	Bracket
9116	3162401	Lid, set
9117	3014088	Lifter w/cord
9118	2542727	Bracket
9119	3013056	Guide rail, rear, left
9120	2831068	Shaft
9121	2810250	Spring
9122	2641148	Plate, cord tightener
9123	3014088	Lifter w/cord
9124	2542667	Bracket
9126	2542667	Bracket
9127	3034070	Lock f/cover
9128	2732076	Belt, motor
9129	3322120	Infrared window
9131	3030104	Hinge, right
9132	2542667	Bracket
9133	2515051	Nylon bracket
9134	2732076	Belt, motor
9135	3151235	Holder, right
9136	2938237	Bushing
9137	2930074	Spacer
9139	3162405	Glass, display
9140	3162400	Glass, keyboard
9141	3164785	Ornamental cover
9142	3162401	Lid, set
9143	3164738	Cover
9144	3014088	Lifter w/cord
9145	2830122	Shaft
9146	3013055	Guide rail, rear, right
9147	2831069	Shaft
9148	3013056	Guide rail, front, right
9149	2568868	Rail, ornamental
9150	2850136	Service arm
9151	2515001	Nylon bracket
9152	2548235	Bracket

91M1	8400182	Motor, drawer
91M2	8400182	Motor, drawer

Standard Resistors:

Resistors 5% 1/2W

	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	5011047		5011072	
2.2	5011335	5010708	5010815	5011034	5011048	5011061	5011074	
2.7	5011612	5010803	5011018	5010055	5011049	5011062	5011075	
3.3	5010255	5011007	5011019	5011037		5011063	5010381	
3.9		5010782	5011021	5010700	5011051		5010392	
4.7	5010765	5011009	5011022	5010035	5010036	5011065	5011078	
5.6		5011010	5011023	5011041		5011066	5011079	
6.8	5010874	5011011	5011024	5011042	5010810	5011067	5011080	
8.2		5011012	5011026	5011043	5010038	5011068	5011081	

Resistors 5% 1/4W

	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		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	5010904	5010039	5010144	5010052	5010062	5010074		
8.2	5010880	5010056	5010068	5010154	5010091	5010505		

Resistors 5% 1/8W

	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		5011347	5011337	5010827	5011346	5011371	5011462	
3.9		5011438	5011817	5011157	5011457	5011372	5020876	
4.7	5011363	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		

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

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% 1/10W

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		5011922	5011934	5011946	5011958	5011970	5012268	
1.8		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	

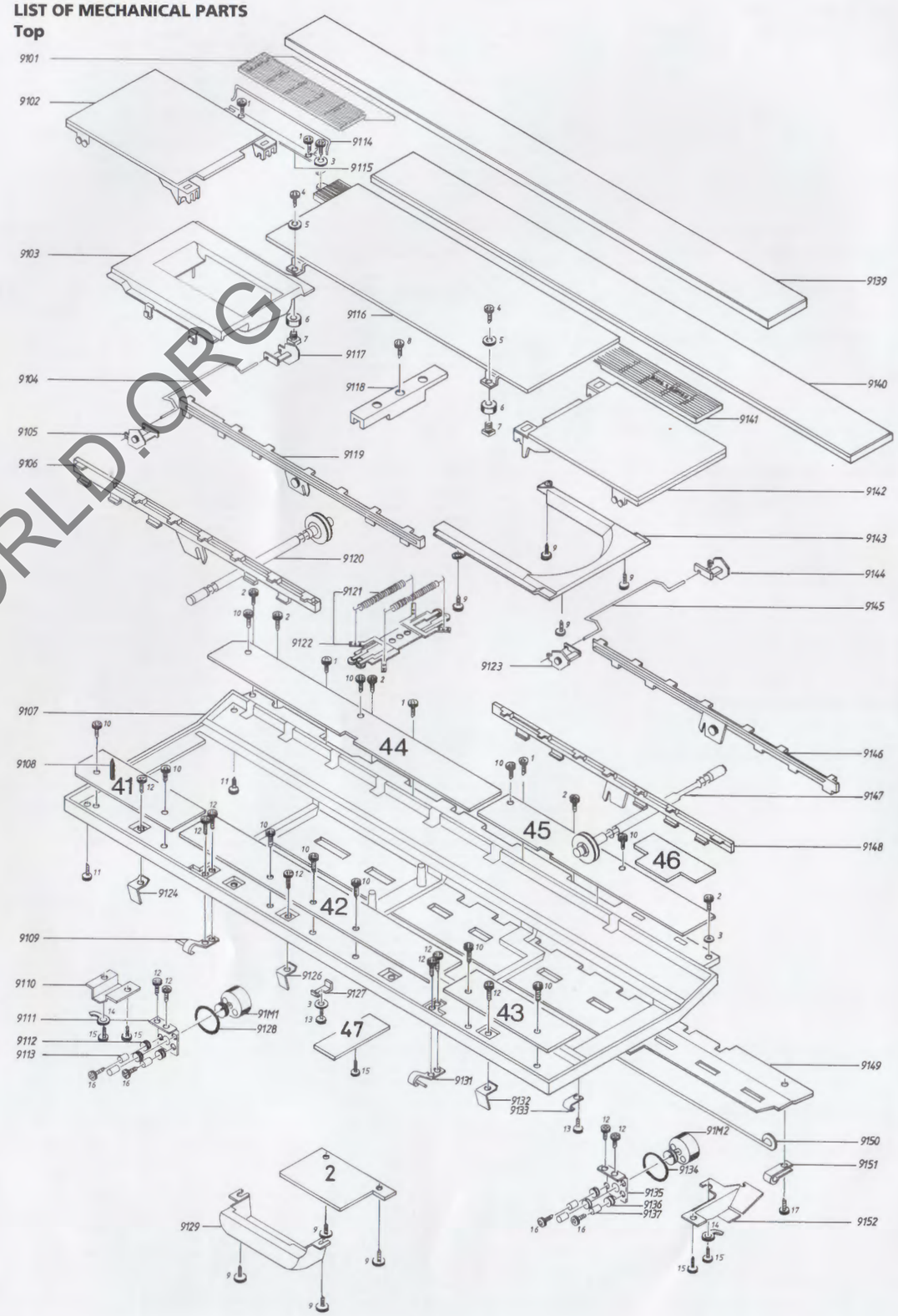
4-2

02Modul	8001632	PCB 2, IR Receiver
	3302521	Screen
41Modul	8002745	PCB 41, Keyboard Lower Display, Left
	3131257	Housing, small
	3131258	Housing, large
	3947254	Tape 50m
42Modul	8001707	PCB 42, Keyboard Lower Display, Center
	3131257	Housing, small
	3131258	Housing, large
	3947254	Tape 50m
43Modul	8002755	PCB 43, Keyboard Lower Display, Right
	3131257	Housing, small
	3131258	Housing, large
	3947254	Tape 50m
44Modul	8001708	PCB 44, Upper Display, Left
	3131257	Housing, small
	3131258	Housing, large
	3947254	Tape 50m
45Modul	8002740	PCB 45, Upper Display, Right
	3131257	Housing, small
	3131258	Housing, large
	3947254	Tape 50m
46Modul	8002736	PCB 46, Counter/Frequence Display
47Modul	8001643	PCB 47, Cover/Tacho
	3152943	Holder f/PE1 + PE2

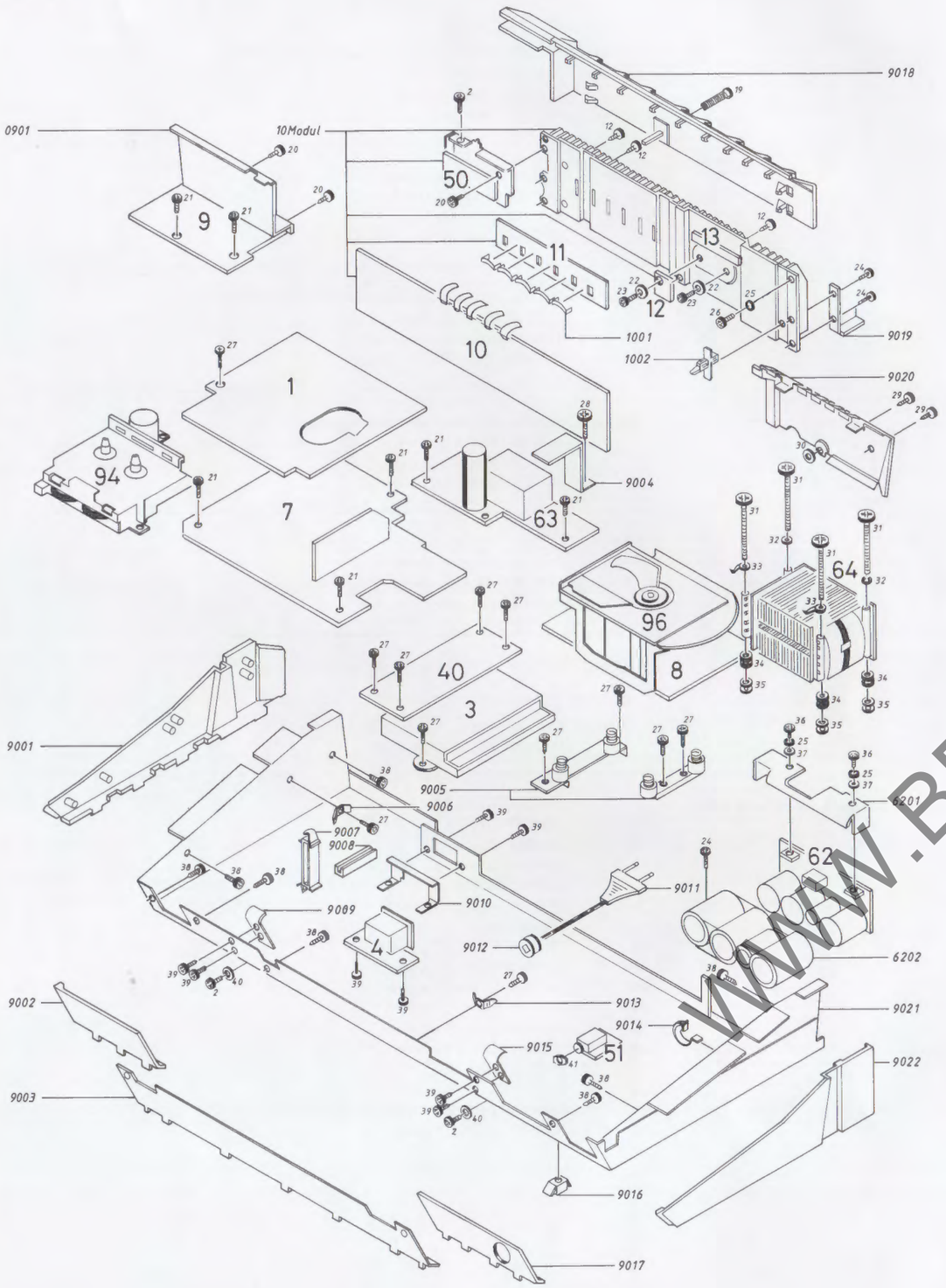
Survey of screws, washers etc.

1	2015091	Screw 3.5 x 9.5mm
2	2038094	Screw 3 x 10mm
3	2622321	Washer
4	2039034	Screw 3 x 12mm
5	2624042	Washer
6	2732091	Rubber bushing
7	2389064	Nut
8	2015070	Screw 3.5 x 25mm
9	2011040	Screw 2.5 x 5mm
10	2013099	Screw 2.9 x 5mm
11	2039037	Screw 3 x 16mm
12	2039028	Screw 3 x 8mm
13	2039062	Screw 3 x 5mm
14	7530119	Solder tag
15	2013148	Screw 3 x 6mm
16	2036016	Screw 2.6 x 6mm
17	2039907	Screw 3 x 8mm

LIST OF MECHANICAL PARTS
Top



Bottom



Bottom

9001	3470171	Side plate, left
9002	3451288	Front plate, left
9003	3450985	Front plate, middle
9004	2542768	Holder
9005	3152679	Holder w/springs
9006	7500176	Solder tag
9007	3030117	Spacer
9008	3152978	Holder f/PCB 1
9009	3030101	Hinge
9010	2542657	Bracket
9011	6271101	Mains lead, type 2516-2517
	6270328	Mains lead, type 2518
	6271119	Mains lead, type 2519
	6270297	Mains lead, type 2520
9012	2641119	Tightening piece
9013	7500176	Solder tag
9014	3152366	Wire holder
9015	3030101	Hinge
9016	2576109	Spacer
9017	3450987	Front plate, right
9018	3164584	Cover
9019	2548265	Bracket
9020	3164909	Cover
9021	3454815	Bottom incl. pos. nr. 9007-9008-9014-9016
	3035026	Rubber foot
	3333032	Rubber piece
	3170309	Insulating piece f/PCB 63
9022	3470172	Side plate, right

01Modul	8001413	PCB 1, FM/AM, RF, IF Decoder for type 2516-2517-2518-2520
	8001415	PCB 1, FM/AM, RF, IF Decoder for type 2519
03Modul	8001611	PCB 3, Microcomputer
04Modul	8001642	PCB 4, Antenna Input
07Modul	8004913	PCB 7, Tape
08Modul	8001546	PCB 8, CD
09Modul	8001673	PCB 9, Preamplifier f/type 2516-2517-2519-2520
	8001674	PCB 9, Preamplifier f/type 2518
0901	2542764	Bracket f/type 2516-2517-2519-2520
	2542765	Bracket f/type 2518
10Modul	8001640	PCB 10, Power Supply and Amplifier
1001	2819157	Spring
1002	3152981	Holder
11Modul	8001701	PCB 11, Power Supply Voltage Regulators
12Modul	8001702	PCB 12, NTC
13Modul	8001703	PCB 13, Output Amplifier
40Modul	8001623	PCB 40, Keyboard Interface
50Modul	8001704	PCB 50, Input/Output Socket

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Tape Deck Upper

94Modul	8422069	Tape Deck
9402	2938277	Bushing
9403	2576260	Spacer
9404	2938277	Bushing
9405	3112372	Slide, tape head assembly
9406	2037001	Screw, height adjustment
9407	2810257	Spring, tape head assembly
9408	2810255	Spring, slide plate
9409	3014089	Slide plate
9410	3164872	Cap, turntable
9411	2812135	Spring, turntable
9412	2726165	Turntable
9413	2851224	Arm, brake F
9414	2851223	Arm, record 2 sensor
9415	2851222	Arm, Cr sensor
9416	2851218	Arm, brake R
9417	2818101	Spring, brake F
9418	2851221	Arm, cassette sensor
9419	2851220	Arm, metal sensor
9420	2851219	Arm, record 1 sensor
9421	2818100	Spring f/switch
9422	2818099	Spring, brake R
9423	2732098	Belt f/autostop
9424	2722056	Pulley f/autostop
9425	3356056	Magnet ring
9426	2818098	Spring, arm play R
9427	2851217	Arm, play R
9429	2816256	Spring f/cassette rear
9430	2576260	Spacer
9431	2938277	Bushing
9432	2816255	Spring f/cassette front
9433	3162344	Cover f/assy mechanism
9434	2816255	Spring f/cassette front
9435	2816261	Spring, tape head assembly
9436	2037002	Screw, azimuth adjustment
9437	3131364	Housing, tape head assembly
9438	2816262	Spring, azimuth adjustment
9439	2037001	Screw, height adjustment
9440	2917027	Ball
9441	2818102	Locking spring
9442	2851225	Gear arm
9443	2818103	Spring f/gear arm
9444	2700099	Gear, tape head
9445	3164873	Cap, turntable
9446	2812136	Spring, turntable
9447	2726165	Turntable
9448	2810258	Spring f/arm, tape direction
9449	2851226	Arm, tape direction
9450	2818104	Spring, arm F
9451	2851227	Arm, play F
9452	2794146	Thrust roller F
9453	2818105	Spring, thrust roller F
9454	2311037	Wire holder
9455	2794149	Thrust roller R
9456	2810257	Spring, thrust roller R
9457	2818106	Spring, thrust roller R
9458	6141575	PCB f/tape head
9459	3634041	Mirror f/PE1
9460	3302501	Cover f/PCB f/tape head
9461	3162347	Cover f/tape mechanism
94H1	8600115	Tape head w/wires
94PE1	8004902	Opto coupler

Survey of screws and washers

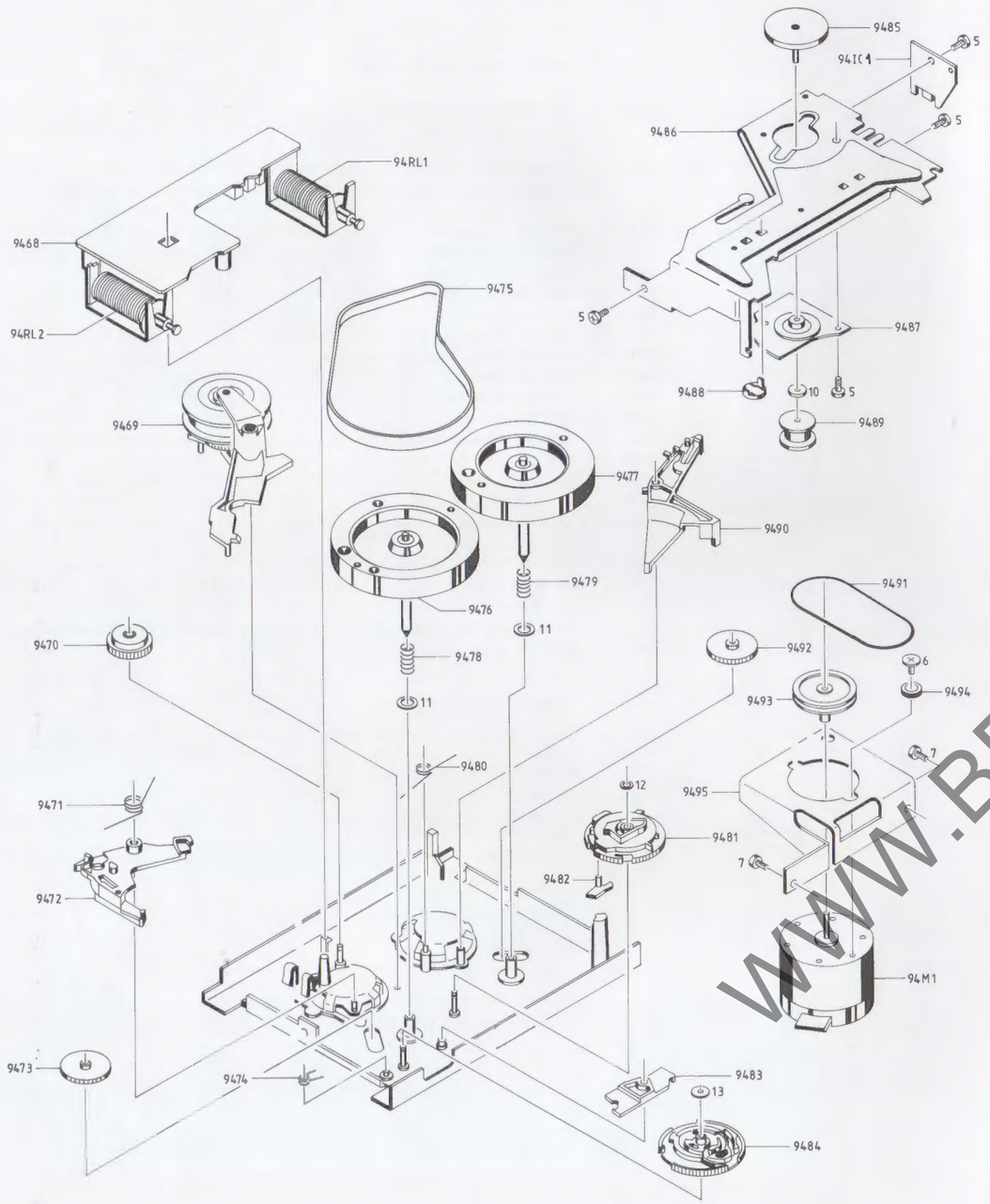
1	2038111	Screw 3 x 8mm
2	2013137	Screw 3 x 10mm
3	2036073	Screw 2.1 x 4mm
4	2013144	Screw 3 x 8mm
7	2036072	Screw 2 x 4mm
8	2622247	Washer
9	2390113	Washer
10	2390111	Washer
14	2013181	Screw 3 x 25mm
15	2013178	Screw 3 x 20mm

51Modul	8001705	PCB 51, Headphone
62Modul	8001619	PCB 62, Rectifiers
63Modul	8001627	PCB 63, Stand-by Supply f/type 2516-2517-2518-2520
	8001693	PCB 63, Stand-by Supply f/type 2519
64Modul	8013533	PCB 64, Main Transformer and Fuses f/type 2516-2517-2520
	8013534	PCB 64, Main Transformer and Fuses f/type 2518
	8013535	PCB 64, Main Transformer and Fuses f/type 2519
94Modul	8422069	Tape Deck
96Modul	8420166	CD Mechanism

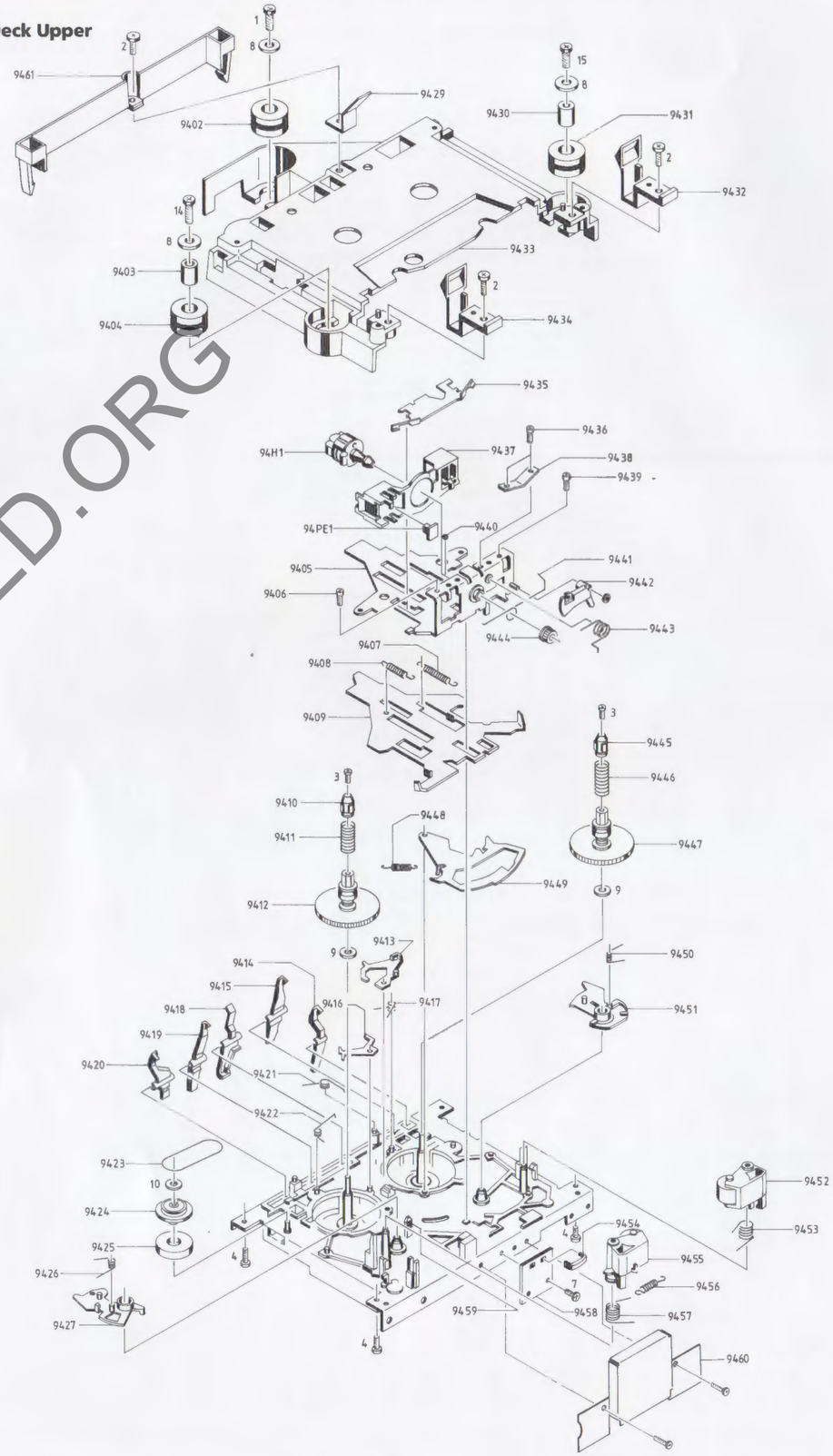
Survey of screws, washers etc.

2	2038094	Screw 3 x 10mm
12	2039028	Screw 3 x 8mm
19	2039036	Screw 3 x 30mm
20	2038095	Screw 3 x 5mm
21	2013190	Screw 3 x 8mm
22	2624013	Washer
23	2038136	Screw 3 x 16mm
24	2038098	Screw 3 x 8mm
25	2625002	Washer
26	2013138	Screw 2.9 x 6.5mm
27	2038137	Screw 3 x 6mm
28	2043053	Screw 4 x 6mm
29	2038096	Screw 3 x 5mm
30	2390106	Washer
31	2043038	Screw 4 x 70mm
32	2622022	Washer
33	7530118	Solder tag
34	2938125	Rubber bushing
35	2930106	Bushing
36	2015092	Screw 3.5 x 13mm
37	2622041	Washer
38	2013147	Screw 3 x 5mm
39	2038118	Screw 3 x 6mm
40	2624042	Washer
41	2380092	Nut

Tape Deck Lower



Tape Deck Upper



Tape Deck Upper

94Modul	8422069	Tape Deck	9434	2816255	Spring f/cassette front
9402	2938277	Bushing	9435	2816261	Spring, tape head assembly
9403	2576260	Spacer			
9404	2938277	Bushing	9436	2037002	Screw, azimuth adjustment
9405	3112372	Slide, tape head assembly	9437	3131364	Housing, tape head assembly
9406	2037001	Screw, height adjustment	9438	2816262	Spring, azimuth adjustment
9407	2810257	Spring, tape head assembly	9439	2037001	Screw, height adjustment
9408	2810255	Spring, slide plate	9440	2917027	Ball
9409	3014089	Slide plate	9441	2818102	Locking spring
9410	3164872	Cap, turntable	9442	2851225	Gear arm
9411	2812135	Spring, turntable	9443	2818103	Spring f/gear arm
9412	2726165	Turntable	9444	2700099	Gear, tape head
9413	2851224	Arm, brake F	9445	3164873	Cap, turntable
9414	2851223	Arm, record 2 sensor	9446	2812136	Spring, turntable
9415	2851222	Arm, Cr sensor	9447	2726165	Turntable
9416	2851218	Arm, brake R	9448	2810258	Spring f/arm, tape direction
9417	2818101	Spring, brake F			
9418	2851221	Arm, cassette sensor	9449	2851226	Arm, tape direction
9419	2851220	Arm, metal sensor	9450	2818104	Spring, arm F
9420	2851219	Arm, record 1 sensor	9451	2851227	Arm, play F
9421	2818100	Spring f/switch	9452	2794146	Thrust roller F
9422	2818099	Spring, brake R	9453	2818105	Spring, thrust roller F
9423	2732098	Belt f/autostop	9454	2311037	Wire holder
9424	2722056	Pulley f/autostop	9455	2794149	Thrust roller R
9425	3356056	Magnet ring	9456	2810257	Spring, thrust roller R
9426	2818098	Spring, arm play R	9457	2818106	Spring, thrust roller R
9427	2851217	Arm, play R	9458	6141575	PCB f/tape head
9429	2816256	Spring f/cassette rear	9459	3634041	Mirror f/PE1
9430	2576260	Spacer	9460	3302501	Cover f/PCB f/tape head
9431	2938277	Bushing	9461	3162347	Cover f/tape mechanism
9432	2816255	Spring f/cassette front			
9433	3162344	Cover f/assy mechanism			

94H1	8600115	Tape head w/wires

94PE1	8004902	Opto coupler

Survey of screws and washers

1	2038111	Screw 3 x 8mm
2	2013137	Screw 3 x 10mm
3	2036073	Screw 2.1 x 4mm
4	2013144	Screw 3 x 8mm
7	2036072	Screw 2 x 4mm
8	2622247	Washer
9	2390113	Washer
10	2390111	Washer
14	2013181	Screw 3 x 25mm
15	2013178	Screw 3 x 20mm

51Modul	8001705	PCB 51, Headphone

62Modul	8001619	PCB 62, Rectifiers

63Modul	8001627	PCB 63, Stand-by Supply f/type 2516-2517-2518-2520
	8001693	PCB 63, Stand-by Supply f/type 2519

64Modul	8013533	PCB 64, Main Transformer and Fuses f/type 2516-2517-2520
	8013534	PCB 64, Main Transformer and Fuses f/type 2518
	8013535	PCB 64, Main Transformer and Fuses f/type 2519

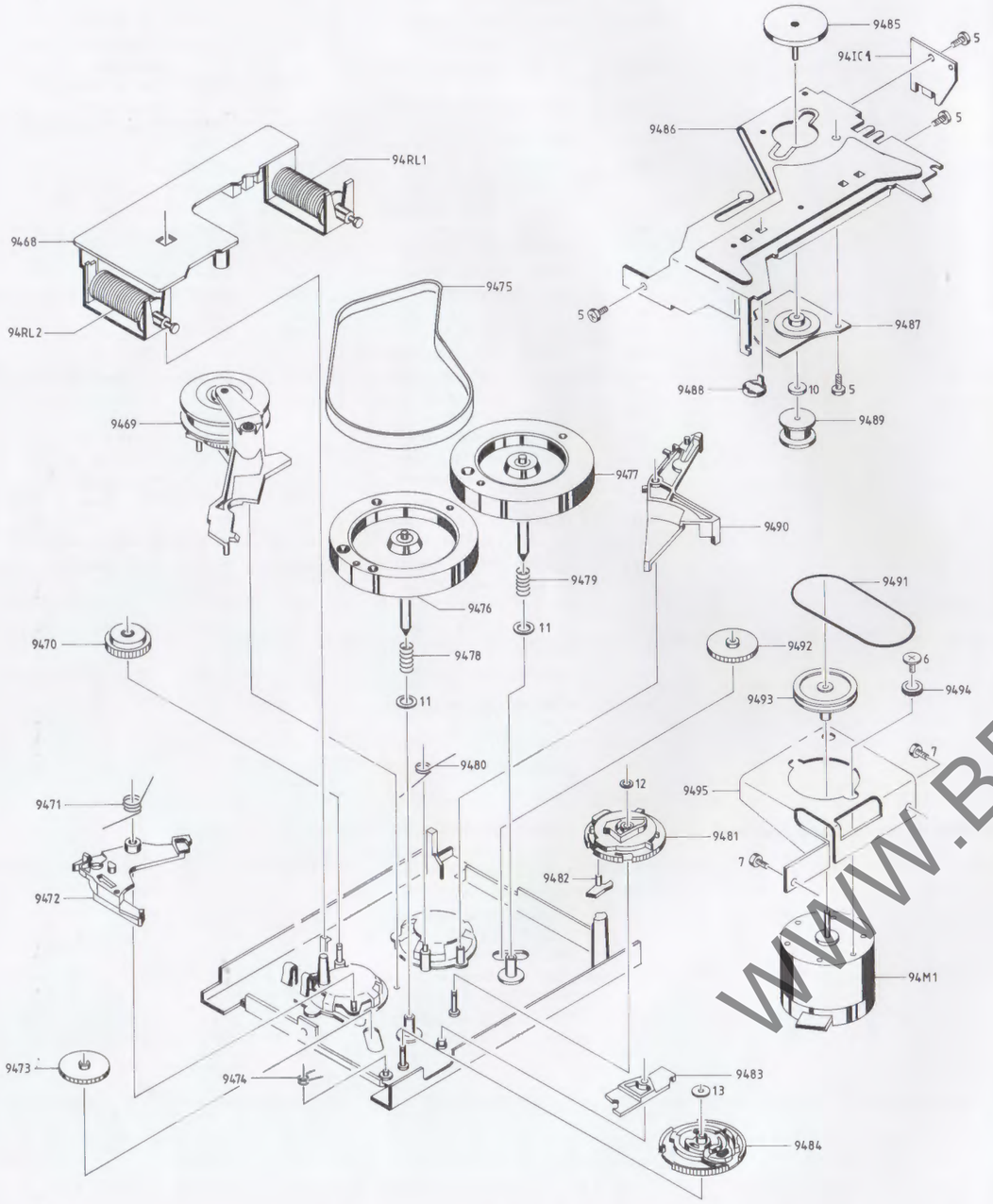
94Modul	8422069	Tape Deck

96Modul	8420166	CD Mechanism

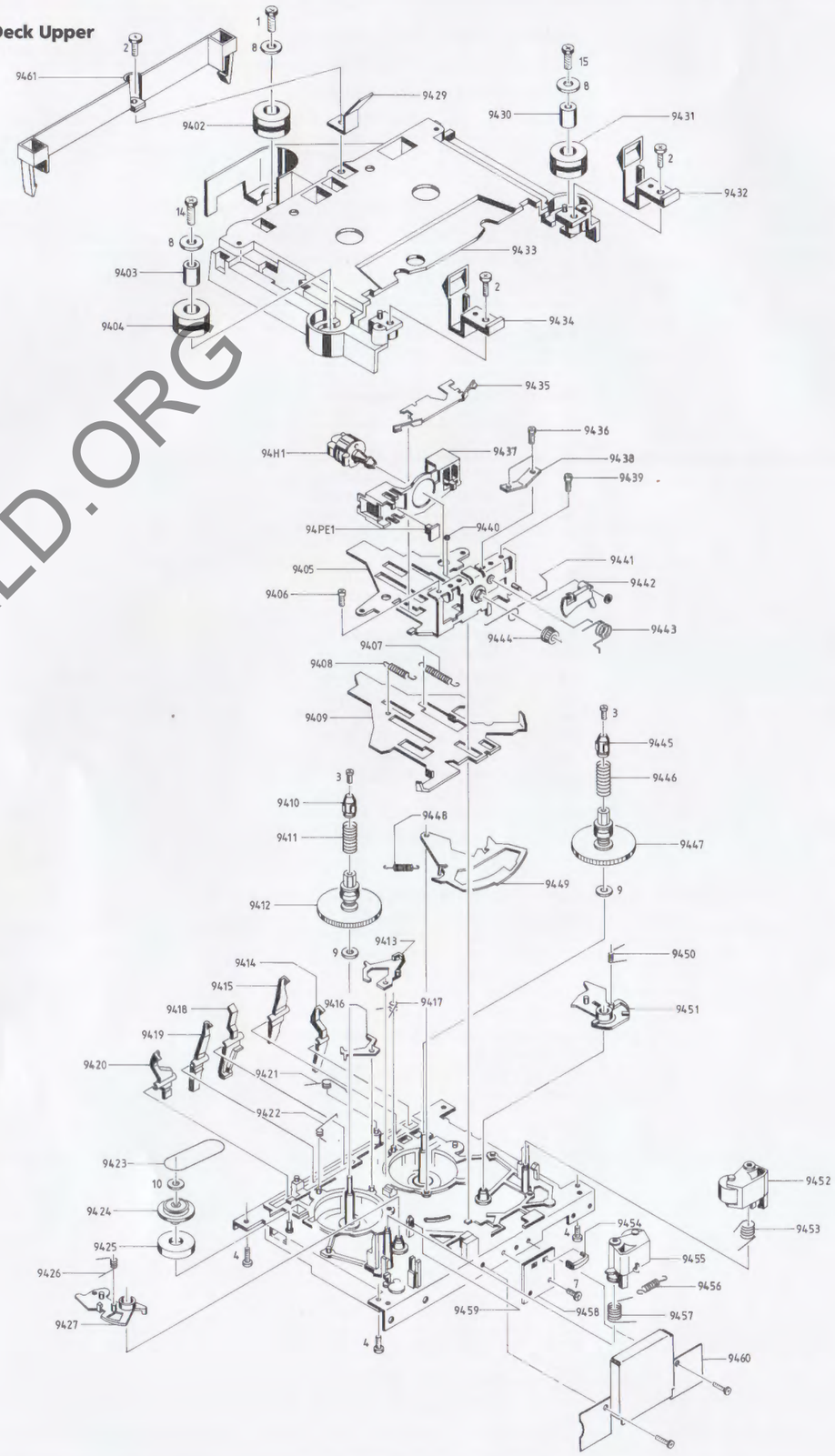
Survey of screws, washers etc.

2	2038094	Screw 3 x 10mm
12	2039028	Screw 3 x 8mm
19	2039036	Screw 3 x 30mm
20	2038095	Screw 3 x 5mm
21	2013190	Screw 3 x 8mm
22	2624013	Washer
23	2038136	Screw 3 x 16mm
24	2038098	Screw 3 x 8mm
25	2625002	Washer
26	2013138	Screw 2.9 x 6.5mm
27	2038137	Screw 3 x 6mm
28	2043053	Screw 4 x 6mm
29	2038096	Screw 3 x 5mm
30	2390106	Washer
31	2043038	Screw 4 x 70mm
32	2622022	Washer
33	7530118	Solder tag
34	2938125	Rubber bushing
35	2930106	Bushing
36	2015092	Screw 3.5 x 13mm
37	2622041	Washer
38	2013147	Screw 3 x 5mm
39	2038118	Screw 3 x 6mm
40	2624042	Washer
41	2380092	Nut

Tape Deck Lower



Tape Deck Upper



Survey of wire bundles

6276915	42P59	- 41P66
	42P63	- 40P44
	43P62	- 42P67
	44P64	- 45P60
	44P65	- 45P61
	45	- 40P43
	45P68	- 91M1/91M2
	47P68	- 40P45
6276914	10P75	- 62P95
	10P76	- 62P96
	10P88	- 50P86
	10P100	- 13P104
	10P101	- 13P105
	10P102	- 11P102
	10P103	- 11P103
6276916	10P74	- 63P90
	10P77	- 40P41
	10P81	- 7P55
	10P84	- 9P12
	10P85	- 9P13
6276917	4P1/2	- 1P1
	4P4/5	- 1P2
6276386	7P51	- Tape head
6276858	7P52	- Tape deck
6276918	40P35	- 3P32
	40P36	- 3P30
	40P38	- 8P1882
	40P40	- 3P27
	40P42	- 3P28
	40P46	- 3P26
	40P47	- 2P49
6276919	10P73	- Transformer
	63P91	- Transformer
6276761	8P1842	- CD motor
6276865	1P3	- 9P14
	1P5	- 10P83
	1P6	- 3P31
	1P7	- 10P82
	1P8	- 9P17
	3P33	- 9P15
	7P53	- 10P80
	7P54	- 3P29
	7P56	- 9P16
	8P1841	- 9P15
	8P1881	- 10P79
	40P37	- 10P78
	51P48	- 10P87

Tape Deck Lower

9468	8004901	PCB f/tape mechanism
9469	2851233	Cluth, fast foreward rewind
9470	2700104	Wheel, autostop
9471	2818108	Spring
9472	2851228	Arm
9473	2700100	Gear wheel
9474	2818107	Spring, cam wheel
9475	2732101	Belt
9476	2794147	Flywheel, right
9477	2794148	Flywheel, left
9478	2812137	Spring, flywheel
9479	2812137	Spring, flywheel
9480	2818109	Spring
9481	2700102	Cam wheel
9482	2851231	Arm
9483	2851232	Arm, pause
9484	2700103	Cam wheel
9485	2722058	Pulley
9486	3112373	Chassis, flywheels
9487	3152834	Bearing pulleys
9488	2905131	Bearing, flywheels
9489	2722059	Pulley
9490	2851230	Arm
9491	2732099	Belt
9492	2700100	Gear wheel
9493	2722060	Pulley
9494	2932133	Rubber bushing
9495	3152835	Holder, motor
94IC1	8004903	PCB, Hall cell
94S1/4/5	7400411	Switch
94S2/3	7400412	Switch
94RL1	8020898	Solenoid, play
94RL2	8020899	Solenoid, < , >
94M1	8400187	Motor

Survey of screws and washers

5	2036074	Screw 2.6 x 4mm
6	2036076	Screw f/motor
7	2036072	Screw 2 x 4mm
10	2390111	Washer
11	2390112	Washer
12	2390109	Washer
13	2390110	Washer

4-10

Parts not shown

2038123	Transport screws 3 x 6mm
2625002	Washer
3183271	Label f/transport

Packing

2777037	Cardboard f/handle
2777038	Handle
3946038	Foam foil
3397585	Foam packing
3391967	Outer carton

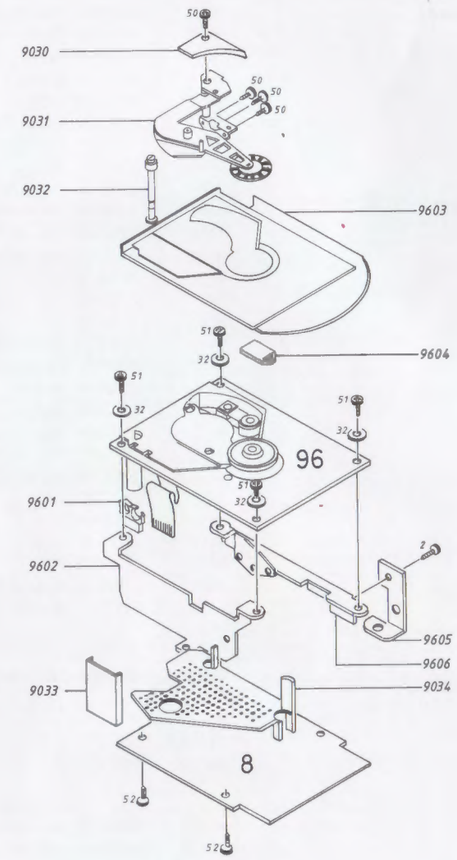
Owner's Manuals

3501542	Danish
3501543	Swedish
3501544	Finnish
3501545	English
3501546	German
3501547	Dutch
3501548	French
3501549	Italian
3501550	Spanish

Setting Up Guides

3502923	Danish
3502924	Swedish
3502925	Finnish
3502926	English
3502927	German
3502928	Dutch
3502929	French
3502930	Italian
3502931	Spanish

CD Mechanism



9030	3164737	Cover
9031	3152655	Clamper
9032	2834105	Holder
9033	2574075	Spacer
9034	3302439	Screen

96Modul	8420166	CD Mechanism
9601	3152593	Clamp
9602	2548233	Bracket
9603	3162304	Cover
9604	3164797	Cover
9605	2548242	Bracket
9606	2548243	Bracket

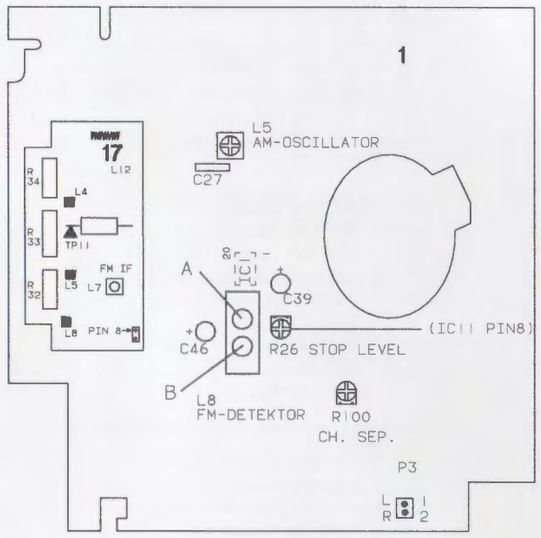
08Modul	8001546	PCB 8, CD

Survey of screws and washers

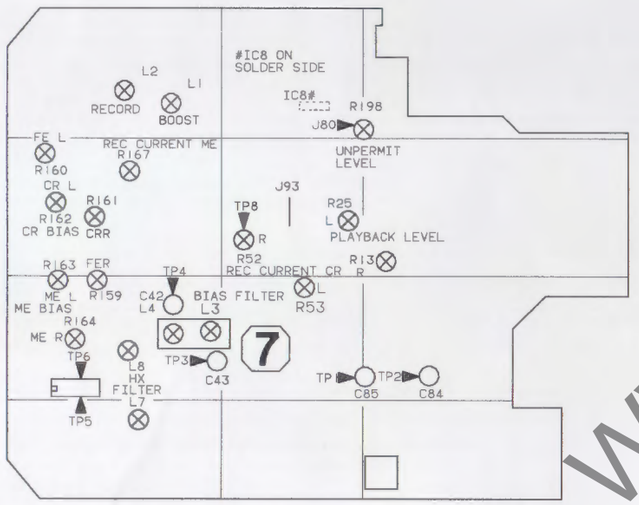
2	2038094	Screw 3 x 10mm
32	2622022	Washer
50	2036036	Screw 2.5 x 4mm
51	2039017	Screw 3 x 12mm
52	2013107	Screw 2.9 x 9.5mm

ADJUSTMENTS

PCB 1



PCB 7



TEST MODE

Test mode is used in connection with adjustments, and test mode moreover gives access to a number of test functions, see page 5-9.
Beocenter 9300 is brought into test mode in the following ways:
- Connect mains voltage
- Within 12 sec., press the following keys on the keyboard:

"Programming" "2" "5" "1" "6"

Test mode is indicated by the display in the following way:

TEST

Test mode is abandoned by disconnecting the mains voltage
or
By pressing ●. Values selected in test mode are retained.

RF ADJUSTMENTS

AM ADJUSTMENTS
Oscillator MW

No signal should be applied.
- Connect a DC voltmeter across 1C27.
- Tune the product to 150 kHz (520 kHz).
- Adjust 1L5 until the voltage across 1C27 is 2 V ±0.25V (4 V ±0.25 V).

FM ADJUSTMENTS
Replacement of FM tuner

- When the FM tuner is replaced, only the IF coil, 17L7, has to be adjusted.

IF

- Connect an oscilloscope to pin 8 of 1IC1 (1R26).
- Connect a sweep generator to the aerial input and tune to 87.5 MHz.
- Tune the product to 87.5 MHz
- Adjust 17L7 to maximum and symmetrical IF curve.

TUNER ADJUSTMENTS

(To be made only if the tuner is incorrectly adjusted).

Oscillator

No signal should be applied.
- Connect a DC voltmeter between 17TP11 and pin 8 of the tuner.
- Tune the product to 87.5 MHz and adjust 17L8 to 0V.

HF 87.5 MHz

- Connect an oscilloscope to pin 8 of 1IC1 (1R26).
- Connect a sweep generator to the aerial input and tune to 87.5 MHz.
- Tune the product to 87.5 MHz
- Adjust 17L2, 17L4, 17L5 and 17L7 to maximum and symmetrical IF curve.

HF 108 MHz

- Tune the product to 108 MHz.
- The sweep generator frequency is changed to 108 MHz, and 17R32, 17R33 and 17R34 are adjusted to maximum.

ELECTRICAL ADJUSTMENTS, TAPE RECORDER

Right/left

The specifications apply to the right channel, and those in brackets apply to the left channel.

Noise reduction

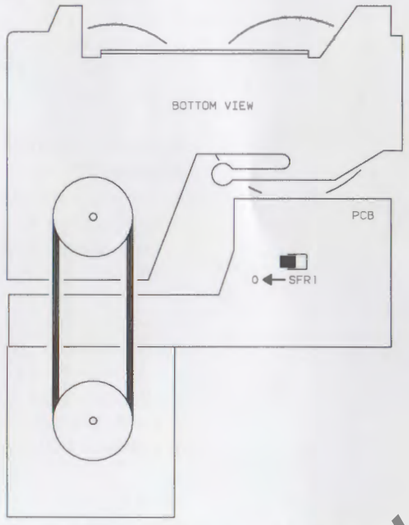
Make the electrical adjustments without Noise Reduction.
(Test mode "2" "2").

Standard tapes to be used for adjustments:

CrO_2 TDK AP512	part No. 6780066
Fe_2O_3 BASF R723 DG	part No. 6780067
METAL AP 712	part No. 6780101

Speed

- Load the wow tape, part No. 6780037. (The adjustment must be made at the centre of the tape).



- Connect a wow meter with a drift meter to the AUX socket.
- Press "Tape 1", to play-back side 1.
- Press "Turn", to play-back side 2.

The adjustment is made with SFR1 which is accessible through the hole in the PCB on the tape transport mechanism.

The adjustment is made so that the speed deviation when playing back side 1 and 2 respectively is symmetrical around 0%.

Playback level

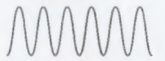
The adjustment of the playback level, using two alternative types of standard tape, will be described below:

1. DIN standard 250 n Wb/m
2. ANSI standard 200 n Wb/m

1. Load standard level tape part No. 6780035
   Connect an AF voltmeter to 7TP2 (7TP1).
   Adjust 7R13 (7R25) until 660 mV is measured in 7TP2 (7TP1).
2. Load TEAC level calibration tape MTT-150A.
   Connect an AF voltmeter to 7TP2 (7TP1).
   Adjust 7R13 (7R25) until 580 mV is measured in 7TP2 (7TP1).

Detector

- 1L8 is adjusted only in connection with a replacement of 1IC1, 1BP4 and 1BP5.
- Connect an oscilloscope to pin 8 of 1IC1 (1R26).
- Connect a DC voltmeter between positive on 1C39 and positive on 1C46.
- Connect a signal testing generator to the aerial input and adjust to 98 MHz, 50dBµV (300µV EMF), ±75 kHz, 1kHz modulation.
- Tune the radio to 98 MHz.
- Fine-tune the signal testing generator frequency to minimum distortion (2nd harmonic) in the signal, as illustrated on the curve.

CORRECT 

INCORRECT 

- Change the level at the aerial input to 72dBµV (4mV EMF).
- Adjust 1L8A to 0V ±50mV. Metal tools must not be used when adjusting 1L8.
- 1L8B can be adjusted accurately with a distortion meter connected to 9R70 (right channel).
- Screw 1L8B up such that the core is flush with the top of the box (top position).
- Adjust 1L8B downwards until the minimum harmonic distortion is present at the AF output for the first time.
- Fine-adjust 1L8A and 1L8B.
- 1L8B is typically adjusted two turns down from the top position.

FM display adjustment

- After a repair/adjustment in the FM detector circuit or after replacement of PCB1, PCB3, 3IC6, 3B1, 3D4, 3R38 or 1BP4, the indication of the received frequency has to be adjusted, even if the display shows the correct frequency.

Offset adjustment, FM

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

- Press "0" "3" (resets the offset value). The display reads: d 03
- Tune in to a known station with a known frequency by pressing "Radio" "Search" ">>".
  The display will not necessarily show the correct frequency.
- Press "Radio" "Search" "Freq", and enter the correct frequency.
- Press "Store" (within 3 seconds).
- The display will now read donE.
  Display adjustment cannot be made on AM.

Channel separation

- Connect a stereo encoder to the aerial input and adjust to 88 MHz 60dBµV, (1mV EMF), 1kHz modulation in the one channel and an unmodulated signal in the other channel.
- Connect an AF voltmeter to the unmodulated channel 1P3-2 (right) or 1P3-1 (left).
- Tune the product to 88 MHz.
- Adjust 1R100 to minimum signal in the unmodulated channel.
- Connect an AF voltmeter to the other channel, and adjust in this case the stereo encoder to an unmodulated signal.
- Check whether or not the channel separation is symmetrical; if not, readjust 1R100 until this has been achieved.

FM stop level

- Connect a signal testing generator to the aerial input and adjust to 88 MHz, 20dBµV (10µV EMF) ±75kHz.
- Connect a DC voltmeter to pin 16 of 1IC1.
- Short-circuit the base of 1TR6 to ground (see drawing of the location of SMD components).
- Turn 1R26 clockwise until it stops.
- Tune the product to 88 MHz.
- Turn 1R26 anticlockwise until pin 16 of 1IC1 switches from low to high.
- Remove the short-circuit from the base of 1TR6.

Test mode adjustment

It applies to all electrical adjustments that the product must be in test mode, see page 5-1, and in addition the automatic record level must be put out of operation, and the Noise Reduction function must be disengaged:
- Press "2" "0" (automatic record level off). The display will read d20.
- Press "2" "2" (Noise Reduction off). The display will read d22.
- Press "AUX".
- Connect an audio oscillator to the AUX input.

The product is now ready for adjustment.
- Upon completion of adjustment : press ● to leave the test mode.

Recording boost

Make this adjustment in test mode (do as described under 'test mode adjustment').
- Set the audio oscillator to 333 Hz and 400 mV.
- Load a Cr tape.
- Press "Record" "Record".
- Connect an AF voltmeter to 7TP8 (7TP7).
- Regulate the audio oscillator output level until 1 V is measured.
- Reduce the audio oscillator output level by 20 dB, and change the frequency to 18 kHz.
- Adjust 7L1 (7L2) until 760 mV is measured.

HX filter

Make this adjustment in test mode (do as described under 'test mode adjustment').
- Connect a DC voltmeter to 7TP6 (7TP5).
- Load a Cr tape.
- Press "Record" "Record".
- Adjust 7L8 (7L7) to minimum DC voltage.

Bias filter

Make this adjustment in test mode (do as described under 'test mode adjustment').
- Connect an AC voltmeter to 7TP4 (7TP3).
- Load a Cr tape.
- Press "Record" "Record".
- Adjust 7L4 (7L3) to minimum voltage.

Cr bias

Make this adjustment in test mode (do as described under 'test mode adjustment').
- Load a CrO_2 standard tape, part No. 6780066.
- Press "Record" "Record".
- Set the audio oscillator to 333 Hz and 20 mV.
- Connect an AF voltmeter to 7TP2 (7TP1).
- Regulate the audio oscillator until approx. 30 mV is measured.
- Press "Stop".
- Adjust 7R161 (7R162) until the playback levels at 333 Hz and 16 kHz are identical by first recording and then playing back 333 Hz and 16 kHz. (Less bias produces a treble boost. More bias produces a treble cut.)

Fe bias

The procedure is the same as for Cr bias, only a Fe_2O_3 standard tape, part No. 6780067, should be used, and 7R159 (7R160) should be adjusted instead.

MP bias

The procedure is the same as for Cr bias, only a metal standard tape, part No. 6780101, should be used, and 7R164 (7R163) should be adjusted instead.

Recording current, Cr

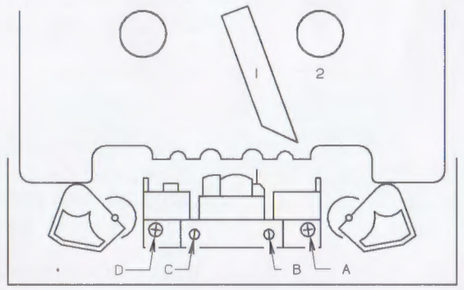
Make this adjustment in test mode (do as described under 'test mode adjustment').
- Load a CrO_2 standard tape, part No. 6780066.
- Press "Record" "Record".
- Set the audio oscillator to 333 Hz and 100 mV.
- Connect an AF voltmeter to 7TP2 (7TP1).
- Adjust the audio oscillator until approx. 200 mV is measured.
- Press "Stop".
- Adjust 7R52 (7R53) until the record level is 200 mV by first recording and then playing back 333 Hz.

MECHANICAL ADJUSTMENTS, TAPE RECORDER

Height and azimuth

To obtain correct height adjustment, height adjustment tool part No. 3624026 must be used.

Approximate adjustment can be obtained using a mirror cassette.



Height, tape guide

- Load adjustment tools 1 and 2.
- Activate the cassette detector with a finger.
- Press "Tape 1".
- Release the cassette detector.
  The tape transport mechanism is now able to run without a tape being loaded, and without going into autostop.
- Adjust A and D respectively in such a way that adjustment tool 1 can be pushed into the tape guides.
- The tape recorder can only be stopped by pressing ●.

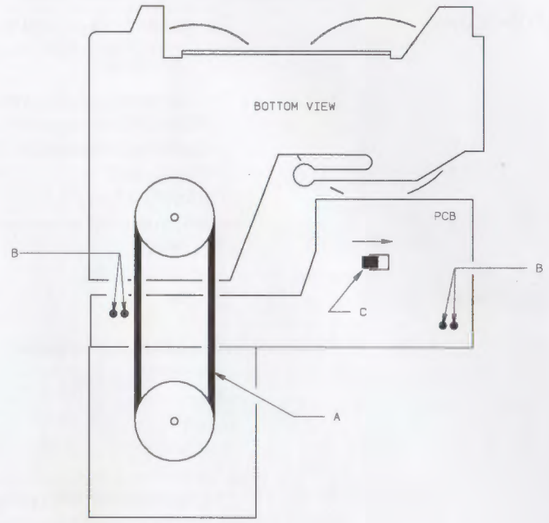
Azimuth side 1

- Load azimuth tape part No. 6780036.
- Connect the two Y inputs on an oscilloscope to right and left AUX outputs.
- Press "Tape 1" and adjust screw C until the 2 curves on the oscilloscope are in phase at maximum amplitude.

Azimuth side 2

- Press "Turn".
- Adjustment as for side 1 but using screw B.

REPAIR TIPS
Dismantling of PCB under tape transport mechanism



- Remove the belt A
- Desolder the solder points B.
- Push the looking pin C in the direction of the arrow and pull out the PCB.

Lubrication chart

The need for relubrication is negligible.
In the case of overhauls and when replacing mechanical parts the directions below should be followed.

NB!
The lubricant should only be applied in small quantities.

Capstan bearings Shafts for turntables 9412 and 9447 Bearing for pulleys 9487 Shaft on tapehead 94H1	3984022 Floil GB TS-1
Sliding surfaces between other movable parts	3984030 Barrierta L5512 (25gr.)

Replacement of CD drive mechanism

The optical pick-up is extremely sensitive to static electricity. The work site must therefore be protected against static electricity. Careless treatment of the optical pick-up may reduce its life dramatically.
The CD drive mechanism and PCB 8 must be connected when the product is connected to a mains outlet.

Recording current, MP

- The Cr adjustment must have been made.
- The procedure is the same as for recording current, Cr, only use the metal standard tape , part No. 6780101.
- The adjustment applies to both channels, and it is made by means of 7R167.

Automatic record level

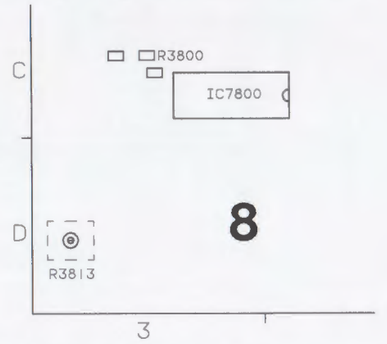
Make this adjustment in test mode (do as described under 'test mode adjustment').
- Load a Cr tape.
- Press "Record" "Record".
- Set the audio oscillator to 333 Hz and approx. 400 mV.
- Connect an AF voltmeter to 7TP2.
- Adjust the audio oscillator until 660 mV is measured.
- Connect a DC voltmeter to 7IC8, pin 9 (jumper J93) and pin 10 (jumper J80/ 7R198).
- Adjust 7R198 until 0 mV ±10mV is measured.

CD

The optical pick-up is extremely sensitive to static electricity. The work site must therefore be protected against static electricity. Careless treatment of the optical pick-up may reduce its life dramatically.
The CD drive mechanism and PCB 8 must be connected when the product is connected to a mains outlet.

Laser current

Important:
- Preset the laser current potentiometer, 8R3813, when replacing the CD drive mechanism, and check the connection to the monitor diode before connecting the product to a mains outlet.
- Open the product (see dismantling, section 6).
- Connect an ohmmeter from pin 18 to pin 27 of 8IC7800.



- Adjust 8R3813, coordinate 3D, until 1 Kohm is measured.
- Connect a DC voltmeter across 8R3800, coordinate 3C.
- Connect the product to a mains outlet, and load test disc No. 5 (CD without errors, part No. 3634031).
- Press "CD".

The voltage across 8R3800 must be higher than 15 mV, otherwise the product has to be switched off and the error found.

If the voltage across 8R3800 is higher than 15 mV, play track 1 on test disc 5, and adjust 8R3813 until 50 mV ±2 mV is measured.

NOTE:
If the voltage across 8R3800 is less than 25 mV, the CD may stop shortly after having been started. The adjustment must therefore be made immediately after starting.

TEST FUNCTIONS

The product has a number of built-in test functions. To gain access to them, the product has to be brought into test mode, see page 5-1.

The following options are available in test mode:
- display of tuner variant.
- display of SW version.
- display test.
- RAM/ROM test.
- deletion of all preset programmes.
- CD test.

Display of tuner variant

Press "0" "4"

Variant	*Display*
Europe/GB	2516
USA	2518
Japan	2519
Australia	2520

The display does not permit distinguishing between Europe and GB.

Display of SW version

Press "2" "5" The display reads X.XX

Display test

Press "2" "6" The "left" display section at the top is switched on.
Press "2" "7" The "centre" display section at the top is switched on.
Press "2" "8" The "right" display section at the top is switched on.
Press "2" "9" The "bottom" display is switched on.

RAM/ROM test

Press "1" "0"

ROM
RAM
EXT RAM

If the RAM/ROM are OK, the display will read 0 0 0
Error is indicated by E.

Deletion of all preset programmes

Press "0" "7" All preset programmes are now deleted.
The clock is set to the date 940101 and the time 00.00.00.
The display reads d7.

Tape door

Press "1" "6" Door opens
Press "1" "7" Door closes

CD door

Press "1" "8" Door opens
Press "1" "9" Door closes

Light intensity

In order to avoid reduction of display drive life, the voltage values given must not be exceeded when adjusting the light intensity.

PCB 42

- Connect a 390 ohm resistor from pin 20 to pin 31 of 42IC3 and connect a DC voltmeter across the resistor. Select testmode "2" "9" (display section at the bottom must light up).
- Adjust 42R39 until a value of 2.8 V is measured.

PCB 44

- Connect a 390 ohm resistor from pin 20 to pin 2 of 44IC1 and connect a DC voltmeter across the resistor. Select testmode "2" "6" (top left-hand display must light up).
- Adjust 44R1 until a value of 2.8 V is measured.

PCB 45

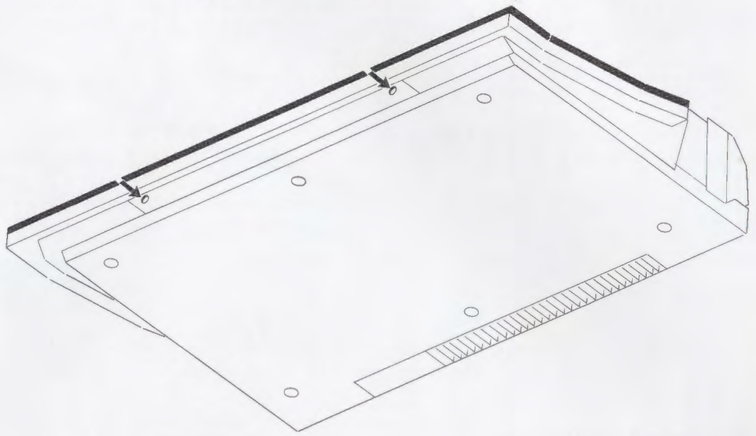
- Connect a 390 ohm resistor from pin 20 to pin 5 of 45IC1 and connect a DC voltmeter across the resistor. Select testmode "2" "7" (middle display section at the top must light up).
- Adjust 45R1 until a value of 2.8 V is measured.

PCB 46

- Connect a 100 ohm resistor from pin 20 to pin 18 of 46IC1 and connect a DC voltmeter across the resistor. Select testmode "2" "8" (top right-hand display must light up).
- Adjust 45R2 until a value of 0.7 V is measured.

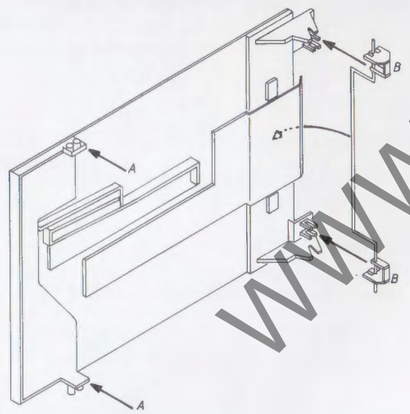
Manual opening or closing of cover

The cover over CD and TAPE can be opened and closed manually. This may be useful if the cover function is blocked or the set is not connected to the mains.
The cover axles can be rotated with a screwdriver through the holes shown, thereby opening and closing the covers.



Replacement of cover over CD and TAPE

- Place the set in service position.
- Open the cover and take out the plastic lid under the cover (4 plastic clips (TAPE), or 4 screws (CD)).
- Close the lid approx. 80% (this can be done by rotating the cover axle).
- Lift the two sliding controls at arrows A out of the control track. Pull the cover to the left.
- Raise the cover clear of locks B and then remove.



Lubrication

Lid gear system module 91: All shafts and teeths on gear-wheels	3984030 Barrierta L5512 (25gr.)

CD test

Bring the product into TEST MODE.
Press "CD". The following error messages will be displayed in test mode when playing a CD (disc without errors, part No. 3634031).

Display

2 Focus error.
Has a CD been loaded?
Does the laser switch on?
LO 8IC7800-17.
Does the FE output regulate?
FE 8IC7800-15.
Does the focus motor regulate?
FOC+ 8P1801-1/FOC- 8P1801-2.

3 Radial error.
Does the RAD output regulate?
RAD 8IC7802-15.
Does the radial motor regulate?
RAD+ 8P1801-4/RAD- 8P1801-3.

4 Turntable motor error.
Does the PWMA output regulate?
PWMA 8IC7841-28.
Does the turntable motor receive DC voltage?
TTM+ 8P1842-1/ TTM- 8P1842-2.

5 TL is low for more than 50 msec.
Check TL 8IC7800-11.

6 Jump/Step error.
Check eyepattern. HF 8C2843, test point 3.
Check data transmission. R/A, DATA and CLK 8IC7881-11/10/9.

7 Subcode error, no subcode within 3 sec.
Check data transmission.

8 TOC error.
Outside the "lead in" area while TOC (program content) is being read.
Check laser arm mechanics.

Remove the CD if one is loaded.

Press "1"	The laser switches on and searches for focus (focus is searched everytime "1" is pressed).
Press "3"	The turntable motor starts (runs anticlockwise), and the laser switches on and goes into start position.
Press "4"	The turntable motor stops, and the laser switches of and goes into stop position.
Press "5"	The laser arm is moved towards the extreme outside position.
Press "6"	The laser arm is moved towards the centre.

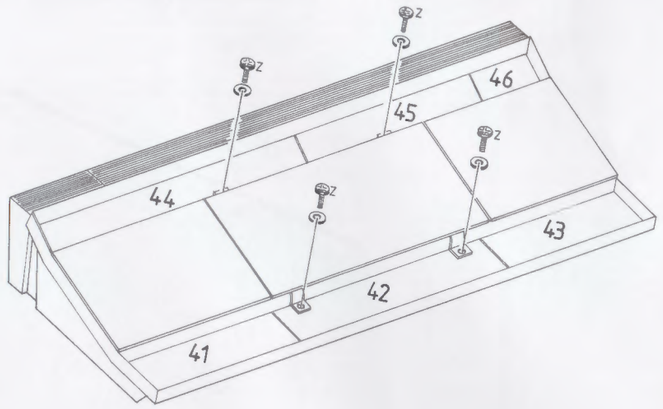
Load a CD (Load).

Press "CD"	The CD starts playing from lead in. No sound is reproduced by the speakers.
Press "Stop"	The CD brakes and stops playing back.

Test mode is abandoned by pressing ●, or by disconnecting the mains voltage.

Height adjustment of centre panel

- Remove glass panels.
- Adjust height of centre panel by adjusting the four screws Z until the edge is flush with the CD and TAPE lid.

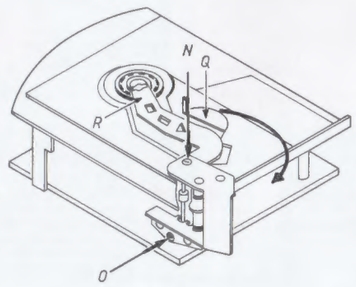


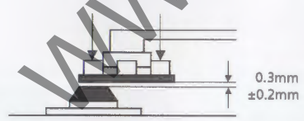
Adjustment of CD clamp

- Set top panel in service position.
- Remove clamp cover P.
- Withdraw arm Q and then clamp arm R.
- Insert CD.
- Release the arms.
- Press "CD".
- Centre clamp arm R using eccentric screw N.

Height adjustment of clamp arm

- Set CD player in service position.
- Lift CD player and hold it horizontal.
- Withdraw arm Q.
- Press CD clamp onto the clamp bearing.
- Adjust height of CD clamp using screw O to 0.3mm ±0.2mm above the CD hub.



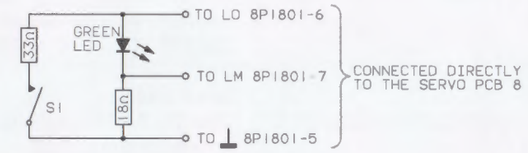


Checking the laser supply

The laser, the laser supply in 8IC7800 and the monitor diode form a feed-back system. A defect in the laser supply may result in destruction of the laser.

As it is impossible to check and repair a feed-back if one part of the system is missing, the laser supply can be checked by means of the below circuit.

The green LED replaces the laser. The voltage across the 18ohm resistor is the feed-back voltage for the monitor. The 33ohm resistor and the switch make it possible to change the power consumption from the laser supply.



- Green LED, e.g. CQY94, part No. 8330054.
- Remove the flex PCB from P1801 on the PCB8.
- Connect the above-mentioned circuit to P1801 on the PCB8.
- Connect SI (pin 6 of 8IC7800) to ground.
  When $\overline{SI}$ (Start Initialization) is low, the laser supply can be switched on in TESTMODE.
- Then press "CD" and "1".

Measure the LO voltage on pin 6 of 8P1801.

S1 open:
LO from 1.8 V to 2.3 V
LM from 170 mV to 220 mV
The green LED emits little light

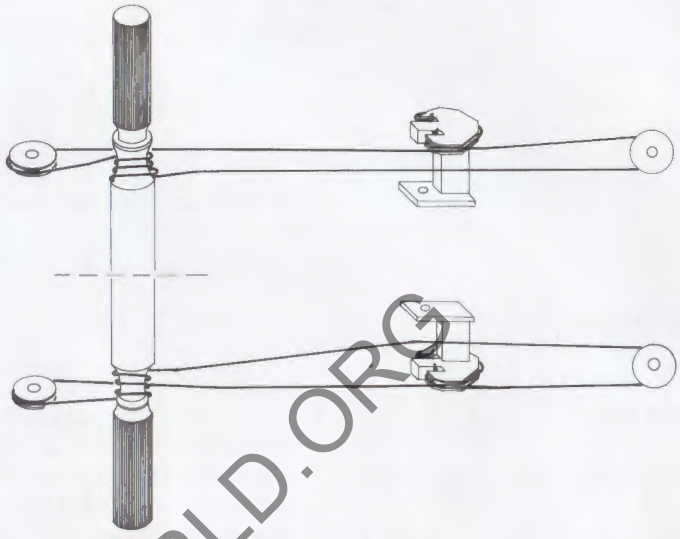
S1 closed:
LO from 1.8 V to 2.3 V
LM from 170 mV to 220 mV
The green LED emits little light

During the change from S1 closed to S1 open, the LED will shortly emit more light than usual. The feed-back system ensures that the same amount of current passes through the LED irrespective of whether S1 is open or closed.

Cord drive

The cord drive for each cover consists of 2 cords each of approx. 50 cm.

- Fix the locks B tightly in the cover (see page 5-12).
- Tie a knot before the end of the cord, then place the knot in the groove on the lock.
- Pull the cord as shown in the drawing.
- The spring-loaded arm must be parallel to the chassis. The spring must be in the middel one of the 3 holes.



Lime stains on aluminium surfaces

Lime stains on the aluminium surfaces, caused by dried water drops, can be removed by a lime dissolving solution e.g. 30% acetic acid.

Wow frequencies

Frequency	*Fault source*	*Pos. No.*
1.4 Hz	Turntable (right)	9447
1.5 Hz	Turntable (left)	9412
1.5 Hz	Thrust rollers	9452/9455
3.9 Hz	Flat belt	9475
5.6 Hz	Flywheel (right)	9476
6.1 Hz	Flywheel (left)	9477
10.1 Hz	Motor belt	9491
11 Hz	Clutch, fast forward-rewind	9469
27.9 Hz	Motor	94M1