

Service Service Service



Service Manual

SERVICING

For servicing FW-R7, the set can be divided into two parts:

1. Except for the CD-R/W module the set has to be repaired on component level.
2. The **CD-R/W module** will be **exchanged completely** in case of a failure.
The defective CD-R/W module has to be returned for central repair.

Available circuit descriptions: *The Basics of Compact Disc Recordable/Rewritable*
3rd generation Compact Disc Recording

4822 725 25242
3104 125 40100



Table of Contents

Location of printed circuit boards	1-2
Technical specification	2-1
Measurement setup	2-2
RC-5 codes.	2-3
Brief operating instructions.	2-4
Warnings & safety	3-1
Service Testprogram	3-2
Wiring Diagram.	4-1
Block/Leveldiagram	5-1
Front Board	6
Tuner Board	7
Audio Frequency Board (AF7)	8

Power Board.	9
3 Disc Changer Module	10
CD R/W Module	11
Exploded view of set.	12-1
Partslist of set.	12-3

**CLASS 1
LASER PRODUCT**

© Copyright 2000 Philips Consumer Electronics B.V. Eindhoven, The Netherlands
All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise without the prior permission of Philips.

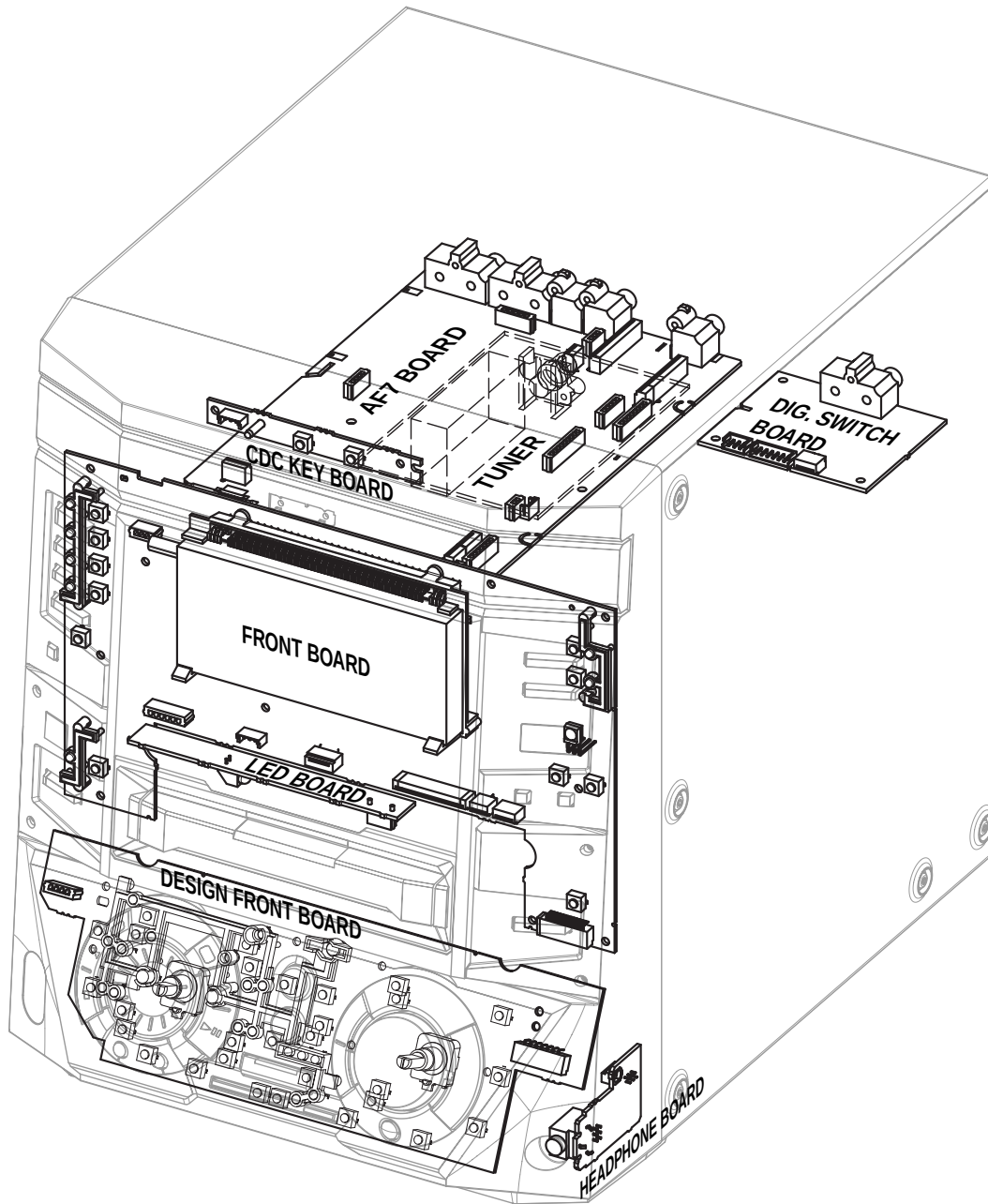
Published by HB 0016 Service Audio Printed in The Netherlands Subject to modification

GB 3103 785 25050



PHILIPS

Location of Printed Circuit Boards



Technical Specification

General:

Mains voltage	: 120 / 240V switchable (for /21)
	: 230V (for /22)
	: 120V (for /37)
Mains frequency	: 50 ~ 60Hz
Power consumption	: 76W at 1/8 P _{RATED}
	: 175W at max output
	: ≤15W at Stand by
	: ≤2W at ECO Stand by

Tuner:

FM

Tuning range	: 87.5MHz - 108MHz
Grid	: 100kHz
IF	: 10.7MHz
Aerial input	: 75Ω
Sensitivity Mono	: < 7μV (26dB S/N)
d (RF=1mV,Δf=75kHz)	: 3% - typ. 2%
IF rejection	: > 60dB
Image rejection	: > 25dB
-3dB Limiting Point	: < 23.5dBf

MW

Tuning range	: 531kHz - 1062kHz
Grid	: 9kHz
IF	: 450kHz ±1kHz
Sensitivity at 26dB S/N	: < 4.0mV/m
d (RF=50mV,m=80%)	: < 5% - typ. 3%
IF rejection	: > 45dB
Image rejection	: > 28dB

Amplifier:

Output power	: 2 x 50W at 6Ω
Headphone	: 3.5mm stereo jack
Frequency response	: 20Hz - 20kHz (-3dB) Limit
Equalizer	: Digital Sound Control

Input sensitivity

Aux/Line	: 500mV ±2dB
----------	--------------

CDC unit:

Frequency response within	: 20Hz - 20kHz at ±3dB
Signal/Noise ratio	: > 94dB (A-weighted)
Distortion at 1kHz,0dB	: -90dB
Channel unbalance	: < 0.3dB
Channel crosstalk at 1kHz	: -60dB
De-emphasis	: 0 or 15/50 μS
Laser	
Output power	: ≤500μW
Wave length	: 780nm ±20nm

CDR unit:

CD Playback:

Frequency response within	: 20Hz - 20kHz at ±3dB
Signal/Noise ratio	: > 90dB (A-weighted)
Distortion at 1kHz,0dB	: -80dB
Channel unbalance	: < 1dB
Channel crosstalk at 1kHz	: -60dB
De-emphasis	: 0 or 15/50 μS

Analog recording - digital playback:

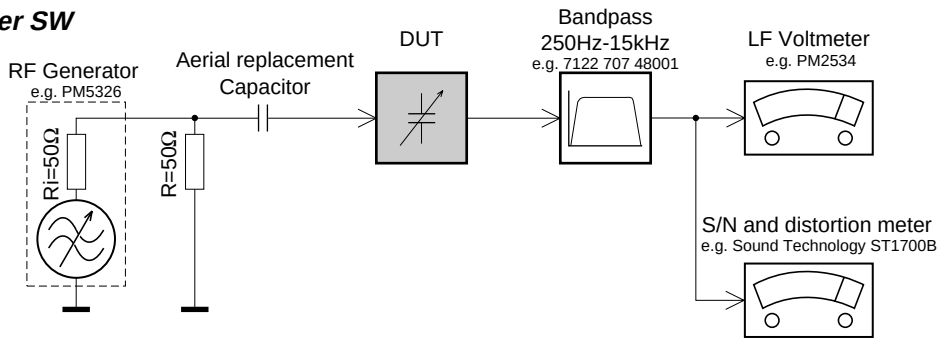
Frequency response within	: 20Hz - 20kHz at ±3dB
Signal/Noise ratio	: > 84dB (A-weighted)
Distortion at 1kHz,0dB	: -77dB
Channel unbalance	: < 1dB
Channel crosstalk at 1kHz	: -60dB
De-emphasis	: 0 or 15/50 μS

Laser

Output power	: ≤1mW during reading
	: ≤20mW during writing
	Laser class 3B
Wave length	: 780nm ±20nm

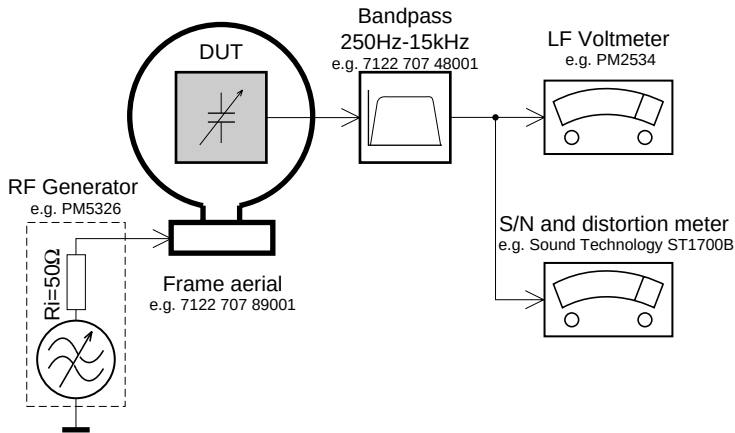
Measurement Setup

Tuner SW



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

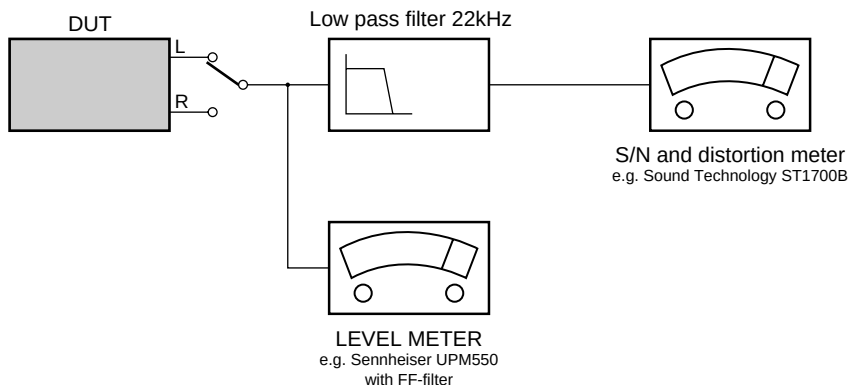
Tuner AM (MW,LW)



To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday's cage.

CD

Use Audio Signal Disc SBC429 4822 397 30184 (replaces test disc 3)
L.P.F. = 13th order filter 4822 395 30204



RC5 Codes

<i>Remote control key</i>	<i>System Code</i>	<i>Command Code</i>	<i>Remote control key</i>	<i>System Code</i>	<i>Command Code</i>
Standby	17,20, 21, 26	12	ALARM	16	89
CD1	20	55	SLEEP	16	38
CD2	20	56	BRIGHTNESS	16	71
CD3	20	57	REPEAT	20, 26	29
CDR	26	63	SHUFFLE	20, 26	28
Tuner	17	63	TRACK INCREMENT	26	114
Aux	21	63	VOLUME +	16	16
1(ABC)	17,20, 21, 26	01	VOLUME -	16	17
2 (DEF)	17,20, 21, 26	02	▶	20, 26	53
3 (GHI)	17,20, 21, 26	03	⏸	20, 26	48
4 (JKL)	17,20, 21, 26	04	◀	17,20, 21, 26	33
5 (MN)	17,20, 21, 26	05	▶	17,20, 21, 26	32
6 (OPQ)	17,20, 21, 26	06	◀◀ CD, CDR MODE	20, 26	50
7 (RST)	17,20, 21, 26	07	◀◀ AUX, TUNER MODE	17, 21	31
8 (UVW)	17,20, 21, 26	08	▶▶ CD, CDR MODE	20, 26	52
9 (XYZ)	17,20, 21, 26	09	▶▶ AUX, TUNER MODE	17, 21	30
0 (Space)	17,20, 21, 26	00	■	20, 26	54
YES	17,20, 21, 26	87	INCREDIBLE SURROUND	16	64
NO	17,20, 21, 26	49	PURE	16	52
EDIT (TEXT)	17,20, 21, 26	82	LOUDNESS	16	50
PROGRAM	20, 26	36	BALANCE L	16	27
PROGRAM TUNER MODE	17	122	BALANCE R	16	26
MUTE	16	13			

Service Tools

TORX T10 screwdriver with shaftlength 150mm4822 395 50423

TORX screwdriver set SBC 1634822 295 50145

Audio signal disc SBC 4294822 397 30184

Playability test disc SBC4444822 397 30245

Test disc 5 (disc without errors) +

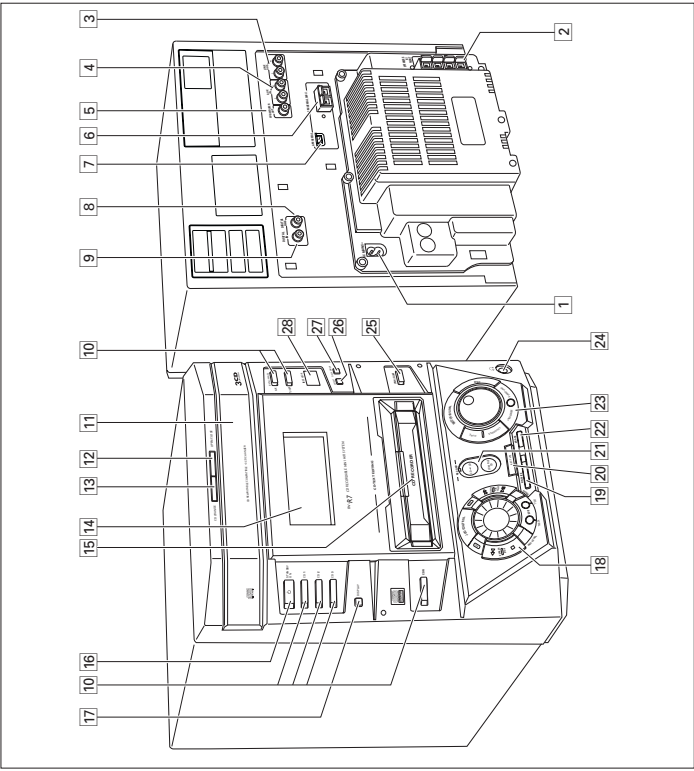
Test disc 5A (disc with dropout errors, black spots and fingerprints)

SBC 426/426A4822 397 30096

Burn in test disc (65 min. 1kHz signal at -30dB level without "pause") ...4822 397 30155

CONTROLS AND CONNECTIONS

English



On the back

- 1 AC MAINS ~ After all other connections have been made, connect the power cord to the power outlet. For optimal performance use only the original power cable.
- 2 SPEAKERS 6 Ω FRONT L/R connect to the supplied speakers
- 3 LINE OUT L/R connect to the analog audio input of an additional appliance
- 4 AUX IN L/R connect to the analog audio output of an additional appliance
- 5 SUBWOOFER OUT connect to the input of a subwoofer
- 6 FM AERIAL 300 Ω connect the supplied wire antenna here
- 7 AM AERIAL connect the supplied loop antenna here
- 8 DIGITAL OUT connect to the coaxial input of a digital appliance
- 9 DIGITAL IN connect to the coaxial output of a digital appliance

CONTROLS AND CONNECTIONS

English

On the front

- 10 Source selection CD 1, CD 2, CD 3 selects the CD changer, switches to CD 1, CD 2 or CD 3
- CDR TUNER selects the CD recorder
- DIGITAL / ANALOG AUX selects the input for an additional appliance
- 11 OPEN/CLOSE opens and closes the CD changer tray
- 12 CD CHANGE selects the next disc tray
- 13 CD RECORDER CD recorder tray
- 14 STANDBY ON switches the unit on and to standby
- 15 DISPLAY selects display information/text
- 16 Multiple function control Rotary control: JOG CONTROL CDC, CDR, selects the previous/next track TUNER, selects the previous/next preset tuner station
- 17 YES confirms a selection
- 18 SEARCH CDC, CDR, searches forward, reviews the tracks in a program, controls the cursor in different menus
- 19 TUNER, tunes to a higher radio frequency
- 20 PLAY/PAUSE starts and interrupts playback/recording
- 21 PROG opens/closes the program menu
- 22 EDIT TEXT enters/exits the text edit menu
- 23 EDIT TRACK enters/exits the track edit menu
- 24 REC LEVEL enables the rotary control to adjust the level for recordings
- 25 STOP stops CD play/record, closes program memory
- 26 SEARCH CDC, CDR, searches backward, reviews the tracks in a program, controls the cursor in different menus
- 27 TUNER, tunes to a lower radio frequency
- 28 NO cancels a selection
- 19 FINALIZE finalizes and unfinalizes recordings
- 20 REC TYPE enters/exits the recording menu
- 21 RECORD CD-CD selects high speed recording and automatic finalizing of current CD
- 22 COMPILE CD selects high speed recording and automatic finalizing of current program erases recordings
- 23 ERASE Sound control MASTER VOLUME adjusts the volume
- 24 DSC DIGITAL SOUND CONTROL selects sound characteristics creates an incredibly wide stereo effect
- 25 INCREDIBLE SURROUND boosts treble and bass
- 26 PURE switches DSC settings on/off
- 27 3.5 mm headphone jack Note: Connecting the headphones will switch off the speakers.
- 28 OPEN/CLOSE opens and closes the CD recorder tray
- 29 CD TEXT switches through CD text information
- 30 CLOCK/TIMER selects the clock function, activates and deactivates the timer
- 31 IR SENSOR sensor for the infrared remote control

Note: You will recognize that various keys will be illuminated on the unit depending on the different modes or programs you are in. This is for your guidance in order to facilitate the finding of the relevant keys for selection.

INSTALLATION

Power

The type plate is located on the rear of the unit.

- 1 Check whether the power voltage as shown on the type plate corresponds to your local power voltage. If it does not, consult your dealer or service organization.
- 2 **Make sure all connections have been made before switching on the power supply.**
- 3 Connect the supplied power cable to AC MAINS ~ and to the power outlet. This switches on the power supply.

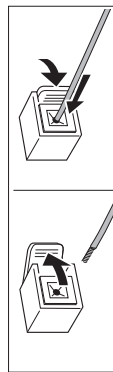
For optimal performance use only the original power cable.

When the unit is switched to standby, it is still consuming some power. To disconnect the unit from the power completely, remove the power cable from the power outlet.

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

Speaker connections

The speaker connections are click-fit connectors. Use them as shown below.



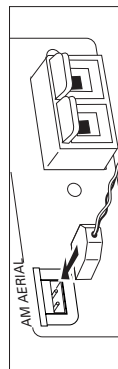
- 1 Connect the colored (or marked) wire to the red terminal and the black (or unmarked) wire to the black terminal.
- 2 Connect:
 - Left speaker to L (red and black)
 - Right speaker to R (red and black)

Antenna connections

AM antenna

The supplied loop antenna is for indoor use only.

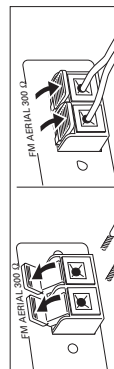
- 1 Fit the plug of the loop antenna to AM AERIAL as shown below.
- 2 Position the antenna as far as possible from a TV, VCR or other radiation sources.
- 3 Turn the antenna for optimum reception.



FM antenna

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

- 1 Open the FM AERIAL 300 Ω click-fits by pushing the lever down as shown below.
- 2 Insert each wire of the antenna into one hole.
- 3 Close the click-fits using the lever.
- 4 Move the antenna in different positions for optimum reception.

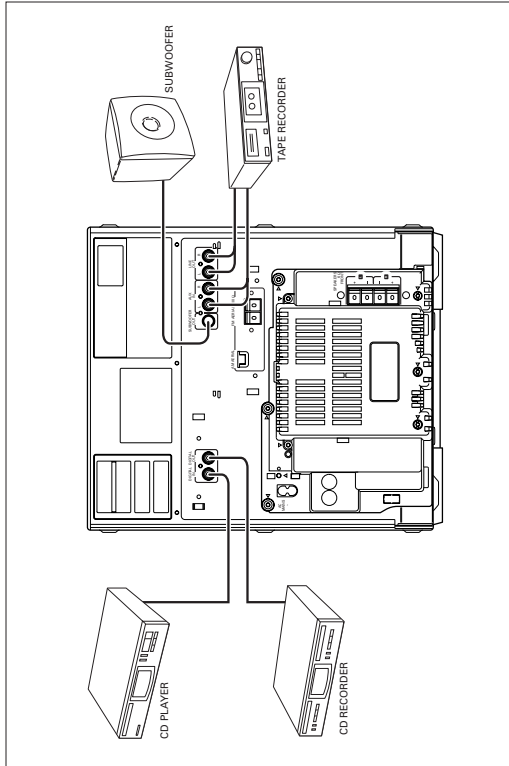


The unit complies with the FCC-Rules, Part 15 and with 21 CFR 1040.10. Operation is subject to the following two conditions:

1. **This device may not cause harmful interference, and**
2. **This device must accept any interference received, including interference that may cause undesired operation.**

English

INSTALLATION



Analog audio connections

AUX IN L/R

It is possible to use an additional appliance, e.g. tape recorder, TV or VCR, with the unit.

- 1 Insert the red plug of a cinch cable to the red jack AUX IN R and insert the white plug to the white jack AUX IN L.
- 2 Connect the other end of the cinch cable to the audio outputs of the additional appliance.
- 3 Press DIGITAL / ANALOG AUX repeatedly to select the analog input for the appliance.
→ PUX: AnalLog is displayed.
- 4 Operate your appliance as usual and adjust volume and sound with the unit.

Note: It is not possible to connect a turntable directly to AUX IN L/R. If you wish to use a turntable with the unit, you have to connect an amplifier to AUX IN L/R on the unit. Then connect the turntable to the amplifier.

LINE OUT L/R

You can use these outputs for playback or recording on any analog audio equipment e.g. amplifier or tape recorder.

- Use a cinch cable to connect the analog audio inputs of the additional appliance with LINE OUT L/R on the unit and operate your appliance as usual.

Digital audio connections

DIGITAL IN

You can use this coaxial input for recordings from any digital audio equipment with a digital coaxial output e.g. CD player or DVD player.

- 1 Use a coaxial cable to connect the coaxial output of the additional appliance with DIGITAL IN on the unit.
- 2 Press DIGITAL / ANALOG AUX repeatedly to select the digital input for the appliance.
→ PUX: DigIt a.1 is displayed.
- 3 Operate your appliance as usual.

DIGITAL OUT

You can use this coaxial output for recordings on any digital audio equipment with a digital coaxial input e.g. CD recorder.

- Use a coaxial cable to connect the coaxial input of the additional appliance with DIGITAL OUT on the unit and operate your appliance as usual.

Connecting a subwoofer

A subwoofer can be used to enhance the bass performance of your unit dramatically.

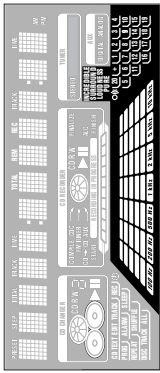
- 1 Use a cinch cable to connect the input of the subwoofer with SUBWOOFER OUT at the unit.
- 2 Follow the instructions supplied with the subwoofer.

English

DISPLAY

English

CD Recorder		 current program is being recorded with high speed dubbing and auto finalize
COMPLETE CDR		
FM TUNER		 FM station is being recorded with current disc is being recorded with high speed dubbing and auto finalize
CD → CD		
AUX		 material from an external source is being recorded
		 playback is activated playback is interrupted
RECORDING IN PROGRESS		
		 status of recording progress is shown pre-recorded CD, finalized CDR or CDRW inserted
CD R		 unfinalized CDR inserted
CD RW		 unfinalized CDRW inserted
FINALIZE		 (un)finalizing will start
A/C		 auto level control is active



Status lights and flags



Music calendar

.....spectrum analyzer

Remote control batteries

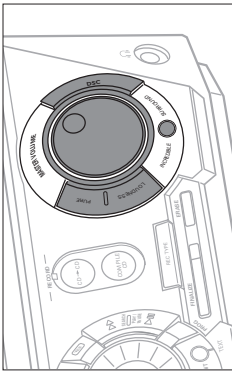
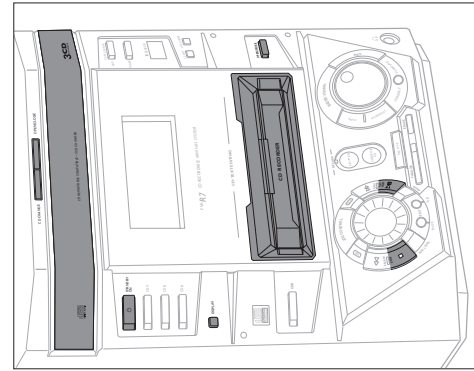
Do not use old and new or different types of batteries in combination.



12

13

Brief Operating Instructions

BASIC FUNCTIONS	BASIC FUNCTIONS
English	English BASIC FUNCTIONS  MUTE This feature allows you to temporarily switch off the sound without switching off the unit. 1 Press MUTE on the remote control to switch off the sound. → Mute is displayed and playback/recording will be continued without sound. 2 Press MUTE on the remote control again to switch on the sound again. Speaker balance It is possible to adjust the relative volume balance between the connected front speakers. - Press L BALANCE or R BALANCE on the remote control to adjust the relative volume of the left or right front speaker. → Balance L (or R) and the actual volume of the left (or right) front speaker are displayed. → When the volume of both speakers is balanced, Balance L=R is displayed. Demo mode The demo mode displays various features of the unit and will start automatically. - If any source key is pressed: → The unit switches to the selected source. If STANDBY ON is pressed: → The unit switches to standby. After a few seconds, the demonstration will start again. Cancelling the demo mode - Keep STOP on the unit pressed for at least 3 seconds to cancel the demo mode. → The demo mode is cancelled permanently. The unit switches to standby. A few seconds later the unit switches to an economy power save mode. 3 CD changer: Press OPEN/CLOSE on the unit again to close the tray. → The tray is closed and Reading is displayed. → If an uninitialized disc is inserted, Initializing will be displayed. → CD, the disc tray number, the total number of tracks and the total playing time of the disc in the last selected disc tray are displayed. The track numbers light up in the music calendar. CD recorder: Press OPEN/CLOSE on the unit again to close the tray. → The tray is closed and Reading is displayed. → If an uninitialized disc is inserted, Initializing will be displayed. → CDR, the total number of tracks and the total playing time of the disc are displayed. The track numbers light up in the music calendar. Playing a CD(RW) 1 Press PLAY/PAUSE ▷ (▶ on the remote control) to start playback. CD changer: → CD, the disc tray number, the current track number and elapsed playing time are displayed. The current track number is also blinking in the music calendar. CD recorder: → CDR, the current track number and elapsed playing time are displayed. The current track number is also blinking in the music calendar. - To switch through the following information, repeatedly press DISPLAY on the unit: → Track number, remaining playing time of current track → Track number, remaining playing time of disc → Track number, actual playing time of current track 2 Press STOP □ (■ on the remote control) to stop playback. CD changer: → CD, the disc tray number, the total number of tracks and the total playing time of the disc are displayed. CD recorder: → CDR, the total number of tracks and the total playing time of the disc are displayed. - To switch through the following information, repeatedly press DISPLAY on the unit: → Total number of tracks, total playing time of disc → CD text is displayed. - You can interrupt playback by pressing PLAY/PAUSE ▷ (■ on the remote control). → The time where playback was interrupted is blinking. - To resume playback press PLAY/PAUSE ▷ (▶ on the remote control) again.  Switching on, switching to standby - To switch the unit on press STANDBY ON on the unit. - To switch the unit to standby press STANDBY ON again on the unit (○ on the remote control). Loading the CD changer, CD recorder Important! 1) This system is designed for regular CD(RW)s. Therefore, do not use any accessories such as disc stabilizer rings or CD treatment sheets, etc. as offered on the market, because they may cause jamming of the changer mechanism. 2) Do not load more than one disc into one disc tray. 1 CD changer: Press OPEN/CLOSE on the unit to open the CD changer tray. → Open. CDR is displayed and the tray is opened. CD recorder: Press OPEN/CLOSE on the unit to open the CD recorder tray. → Open. CDR is displayed and the tray is opened. 2 CD changer: You can load up to three discs in the CD changer for continuous playback without interruption. Insert an audio disc (printed side up) in the right disc tray. • You can load another disc in the left disc tray. • To insert a third audio disc, press CD CHANGE on the unit. → The CD carousel will rotate until the empty disc tray is at the right hand side. CD recorder: Insert an audio disc (printed side up) in the tray.

PROGRAM		PROGRAM	
English	English	English	17

BASIC FUNCTIONS

Selecting a disc on the CD changer

- Press either CD 1, CD 2 or CD 3 to select a particular disc.

Selecting a track and searching

- Rotate JOG CONTROL (press ◀ or ▶) on the remote control) to skip to the beginning of the previous or next track on the selected disc.
 - Playback continues with the selected track.

Selecting a track when playback is stopped

- Rotate JOG CONTROL (press ◀ or ▶) on the remote control) to skip to the required track number.

- Press PLAY/PAUSE ▷||| (▶ on the remote control) to start playback.
 - Playback starts with the selected track.

Note: Instead of using ◀ or ▶ on the remote control, you can also directly key in the required track number by using the numerical keys. For 2-digit numbers, press the keys in rapid succession.

Searching for a passage during playback

- Keep ◀◀ SEARCH or ▷▷ SEARCH (◀◀ or ▷▷ on the remote control) pressed to find a particular passage in a backward or forward direction.
 - Searching is started and playback continues at a low volume. After 3 seconds, the search speeds up with volume muted.

- Release the key at the desired passage.
 - Normal playback continues.

Note: During SHUFFLE, while repeating a track or while playing a program, searching is only possible within the current track.

SHUFFLE and REPEAT

Repeating a track, the disc or the program

- Repeatedly press REPEAT on the remote control during playback to select either:
 - REPEAT TRACK: The current track is played repeatedly.
 - REPEAT DISC: The entire selected disc is played repeatedly.
 - REPEAT ALL: All discs in the CD changer (or the program) are (is) played repeatedly.

- Playback starts in the chosen mode.

- To return to normal playback, press REPEAT on the remote control until the display indication disappears.

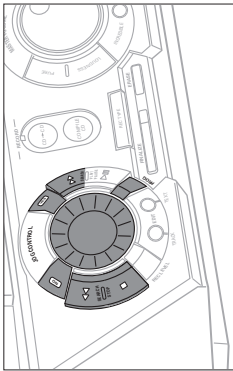
Note: REPEAT DISC is not possible during SHUFFLE or while playing a program.

Playing tracks in random order

- Press SHUFFLE on the remote control during playback.
 - SHUFFLE is shown and either all tracks of the program or of the loaded discs in the CD changer or CD recorder are played in random order.

- To return to normal playback, press SHUFFLE again.

CD text



Programming track numbers

You can select tracks and store them either in the CD changer or CD recorder memory. If you use the program for playback you can choose one of the two memories, else if you like to specify tracks for recording, use the CD changer memory only! You can store any track more than once.

- Load the desired disc(s) in the disc tray(s).
- Press either CD 1, CD 2, CD 3, or CDR to select the disc.
- Press PROG on the unit (PROGRAM on the remote control).
 - PROG starts blinking and Pr-og-r-am is displayed.
- If either CD 1, CD 2 or CD 3 is selected:
 - Rotate JOG CONTROL to select either:
 - CD1 (or 2, 3) ALL: All tracks of CD 1 (or 2, 3) will be programmed.
 - CD1 (or 2, 3) and track number: The track number of CD 1 (or 2, 3) will be programmed.

If CDR is selected:

Rotate JOG CONTROL (press the numerical keys on the remote control; for 2-digit numbers, press the keys in rapid succession) to select a track number.

- Press YES to store your selection in the memory.
 - The number of programmed tracks (STEP), Pr-og and the total program time are displayed. The track number blinks in the music calendar.
- Select and store all desired tracks in this way.
- Press PROG on the unit (PROGRAM on the remote control) to end programming.
 - PROG stays shown and the program is currently available.

Note: If the maximum number of programmable tracks is reached, the display shows Pr-og-r-am full.

Erasing a track from the program

- If necessary, press STOP □ on the unit (■ on the remote control) to stop playback.
- Press either CD 1, CD 2, CD 3, or CDR to select the desired memory.
- Press PROG (PROGRAM on the remote control), followed by ◀◀ SEARCH or ▷▷ SEARCH (◀◀ or ▷▷ on the remote control) to move through the program steps.
 - The track number at the selected step and the total program time are displayed.
- Press NO to remove the track from the program.
 - Cleared is displayed briefly.
 - The next programmed track number will move up to this position and is displayed together with the step number and the remaining total program time.

Clearing the program

- If necessary, press STOP □ on the unit (■ on the remote control) to stop playback.
- Press NO.
 - Clear- Prog? is displayed.
- Press YES to clear the program.
 - Pr-og Cleared will be displayed and PROG goes off.

Note: When you open the CD recorder tray or the CD changer tray the respective program will be cleared.

Making a program for recording

- Select and store all desired tracks in the CD changer memory (see "Programming track numbers").
- Enter the recording menu (see "Internal recording").
 - If the total time of the program is of larger size than the remaining recording time of the CDRW:
 - Not fitting! will be displayed briefly, followed by the remaining recording time and Record- Prog?
 - If you nevertheless start recording, only those tracks of the program that fit onto the CDRW will be recorded in entirety.
 - To change the program, press NO.
 - Edit- Prog-r-am will be displayed briefly, PROG and the time of the program start blinking. Now you can change the program (see "Programming track numbers", "Erasing a track from the program" and "Clearing the program").

Brief Operating Instructions

ABOUT RECORDING

Basic information

The CD recorder deck offers you 3 main functions:

- **Recording** from the internal CD changer and tuner or from a selected external source
- **Finalizing** your CDR(W) discs and **unfinalizing** your CDRW discs
- **Erasing** a CDRW disc

The recording procedure is the same for CDR and CDRW discs. **Make sure the CDR(W) is absolutely free of scratches and dust particles.**

For recordings, the minimum track length is 4 seconds. You can record up to a maximum of 99 tracks on a disc. The minimum of recording time left on the disc is 7 seconds. Otherwise Does not fit is displayed and you cannot enter the record standby mode.

DO NOT FORGET TO FINALIZE!

Finalizing a CDR(W) disc is a simple procedure, necessary to:
— play a recorded CDR on a standard CD player or
— play a recorded CDRW on a CDRW compatible CD player and CD recorder.

Copyright protection

The Serial Copy Management System (SCMS) prevents the making of a digital copy from a digital copy. The system allows making a digital recording from the original, however in some countries this may require the authorization of copyright holders.

When you try to record copy protected material from an external source, Copy Protect will be displayed. No further digital recording is possible then.

When you try to record copy protected material from the internal CD changer, no digital recording is possible, however the CD recorder will automatically switch to analog recording.

Recording CD text

If the original CD has CD Text, this text will be recorded automatically, provided that the CD text is not copy protected. In that case, recording of CD text will not be possible and Text Protect will be displayed.

Direct Line Recording (DLR)

The CD recorder is equipped with the high-performance Direct Line Recording technique. It ensures a perfect recording of the source material, meaning a true "bit for bit" recording. DLR will always become active when you make normal recordings in listen mode.

Auto Level Control (ALC)

Auto Level Control ensures that the tracks on the recorded disc have a similar volume level. At all times the already recorded tracks of the CDR(W) disc will be taken as reference for the volume level of the following recordings. ALC is active when ALC is shown.

Auto level control becomes active when:

- COMPLETE CD is being used,
- a disc, a track or a track edit is being high speed recorded and the CDR(W) has recordings on it,
- a program (consisting from more than one disc) from the CD changer is being high speed recorded, or
- CD—CD is being used and the CDR(W) has recordings on it.

Auto level control will not become active when:

- CD—CD is being used and the CDR(W) has no recordings on it,
- making recordings from the FM tuner,
- making recordings from an external source, or
- making normal recordings in listen mode.

REC LEVEL key

You can adjust the reference record level. This is also possible when ALC is active. This feature can be used for fading your recordings in or out.

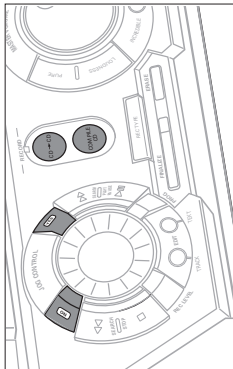
- 1 Keep REC LEVEL on the unit pressed to enable the rotary control to adjust the record level.
 - 2 Turn the rotary control to the left to adjust the desired record level.
 - > The actual record level (in dB) will be displayed.
- The record level is reset after the unit has been switched to standby.

Recording modes

For internal recordings you can record from the internal CD changer or tuner. You can choose from the following recording modes:

- **High speed recording and automatic finalizing:**
Fast and easy! Record and finalize your CDR(W) in one quick step while the sound is muted. You can record the current CD or a program from the CD changer.
- **High speed recording:**
Record your CDR(W) fast while the sound is muted. You can record an entire CD, a track, a program or a track edit from the CD changer.
- **Normal recording and listening:**
Listen to the recording while you are making it. You can record an entire CD, a track, a program or a track edit from the CD changer.
- **Manual recording:**
Start and stop your recording manually while listening to it. You can do radio recordings from the FM tuner.

High speed recording and automatic finalizing



High speed recording and automatic finalizing of the current disc

- 1 Make sure the CDR(W) is absolutely free of scratches and dust particles.
 - 2 Press CD—CD on the unit to enter the recording mode.
 - > Both decks will be selected in the display, the arrow starts blinking. The remaining recording time of the CDR(W), the total playing time of the source CD and Record CD1 for 2, 3! are displayed.
 - 3 Press YES to start recording and finalizing.
 - > The arrow lights, **RECORDING IN PROGRESS** is shown, high speed recording and finalizing start, and the actual recording time remaining starts to count down.
- Note: If a program was already available before pressing CD—CD, this will be ignored. **PROG** goes off and the current disc will be recorded. After finishing the recording, **PROG** is shown and the program is available again.

English

INTERNAL RECORDING

High speed recording and automatic finalizing (optional) of the current program

- 1 Make sure the CDR(W) is absolutely free of scratches and dust particles.
 - 2 Press COMPLETE CD on the unit to enter the record mode.
 - > Both decks will be selected in the display, the arrow starts blinking. The remaining recording time of the CDR(W), the total playing time of the source CD and Record Prog? are displayed.
 - 3 Press either:
YES to confirm,
or
NO to change the program.
 - > **PROG** starts blinking. Now you can change the program (see "Program") and return to the record mode by pressing COMPLETE CD.
 - 4 Auto Fin? is displayed.
Press either:
YES, if the CDR(W) is to be finalized after recording,
or
NO, if the CDR(W) is not to be finalized after recording.
 - > The arrow lights, **RECORDING IN PROGRESS** is shown, high speed recording and finalizing (if selected) start and the actual recording time remaining starts to count down.
- Note: If no program is available and you press COMPLETE CD, you enter immediately into the program menu. Start your programming and return to the record mode by pressing PROGRAM or COMPLETE CD.

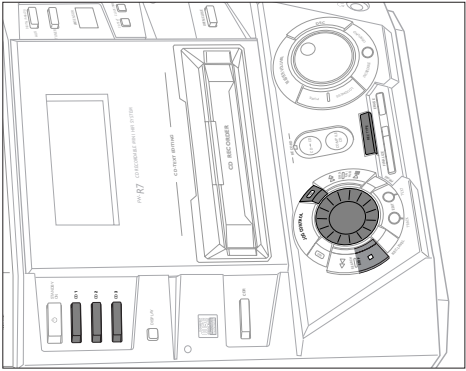
DO NOT FORGET TO FINALIZE!

Finalizing a CDR(W) disc is a simple procedure, necessary to:
— play a recorded CDR on a standard CD player or
— play a recorded CDRW on a CDRW compatible CD player and CD recorder.

Brief Operating Instructions

INTERNAL RECORDING

English



High speed recording

High speed recording of an entire disc, a track, a program or a track edit

1 Make sure the CDR(W) is absolutely free of scratches and dust particles.

2 Press either CD 1, CD 2 or CD 3 to select the disc from which you wish to record.

3 Press REC TYPE on the unit to enter into the recording menu.

4 Rotate JOG CONTROL to select one of the following high speed recording modes:

If a disc from the CD changer is selected:

- CD Fast?: for high speed recording of an entire disc
 - Continue with step 5.
- Track Fast?: for high speed recording of a track
 - Press YES to confirm.
- Rotate JOG CONTROL to select the track
 - Rec. Tr- and the track number is displayed.
- Continue with step 6.

If CD changer program mode is available:

- Prog Fast?: for high speed recording of the selected disc or of the program

If CD changer track edit mode is available:

- A-B Fast?: for high speed recording of the A-B track

5 Press YES to confirm your selection.

- Both decks will be selected in the display, the arrow starts blinking. The remaining recording time of the CDR(W), the total recording time of the CDR(W) and either Record CD1 (or 2, 3?), Record Prog? or Record A-B? is displayed.

Note: When the CDR(W) already contains a recording, ALC will also become active and ALC will be shown.

6 Press YES to start high speed recording.

- The arrow lights. RECORDING IN PROGRESS is shown, high speed recording starts and the actual recording time remaining starts to count down.

- To stop recording, press STOP □ on the unit.

Normal recording and listening

Normal recording and listening of an entire disc, a track, a program or a track edit

1 Make sure the CDR(W) is absolutely free of scratches and dust particles.

2 Follow steps 2 and 3 of "High speed recording".

3 Rotate JOG CONTROL to select one of the following normal record options:

If CD changer is selected:

- CD Listen?: for listening to the entire disc during normal recording
 - Track Listen?: for listening to the track during normal recording
 - Press YES to confirm.
- Rotate JOG CONTROL to select the desired track.
 - Rec. Tr- and the track number is displayed.
- Continue with step 6 of "High speed recording".

If CD changer program mode is available:

- Prog Listen?: for listening to the program during normal recording

If CD changer track edit mode is available:

- A-B Listen?: for listening to the A-B track during normal recording

4 Follow steps 5 and 6 of "High speed recording".

- To stop recording, press STOP □ on the unit.

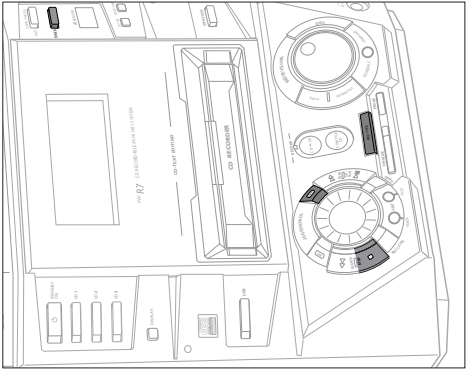
DO NOT FORGET TO FINALIZE!

Finalizing a CDR(W) disc is a simple procedure, necessary to:

- play a recorded CDR on a standard CD player or
- play a recorded CDRW on a CDRW compatible CD player and CD recorder.

INTERNAL RECORDING

English



Manual recording

Manual recording from the FM tuner

1 Make sure the CDR(W) is absolutely free of scratches and dust particles.

2 Press TUNER repeatedly to select the FM tuner. Then select the desired radio station (see "Tuning to radio stations").

3 Press REC TYPE on the unit to enter the recording menu.

- FM Tuner? is displayed.

4 Press YES to confirm.

- Mai % and Record? are displayed.

5 Press YES to start recording.

- The arrow lights. RECORDING IN PROGRESS is shown, manual recording starts and the actual recording time remaining starts to count down.

6 Press STOP □ to stop recording.

DO NOT FORGET TO FINALIZE!

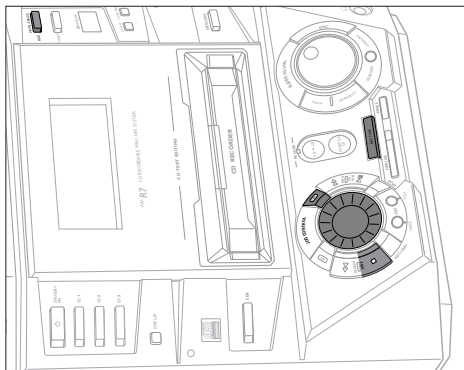
Finalizing a CDR(W) disc is a simple procedure, necessary to:

- play a recorded CDR on a standard CD player or
- play a recorded CDRW on a CDRW compatible CD player and CD recorder.

Brief Operating Instructions

EXTERNAL RECORDING

English



Analog or digital recording?

When making recordings from an external source, we recommend to do analog recording only if digital recording is not possible. Digital recording will usually result in better sound quality.

Recording with automatic start

Recording of an entire disc or a track with automatic start
1 Make sure the CDR(W) is absolutely free of scratches and dust particles.

2 Repeatedly press DIGITAL / ANALOG AUX to select the input for the external source from which you want to record.
→ RUX: Digital is displayed if the digital input is selected.
→ RUX: Analog is displayed if the analog input is selected.

3 Press REC TYPE on the unit to enter the recording menu.

4 Rotate JOG CONTROL to select either:

→ RUX: CD?: for recording with synchronized start of an entire disc
→ RUX: Track?: for recording with synchronized start of a track

5 Press YES to confirm your selection.

→ Start: Source, RUX and the remaining recording time of the CDR(W) are displayed.

6 Start playback on the selected source.

→ The CD recorder starts to record simultaneously and **RECORDING IN PROGRESS** is shown. The remaining recording time on the CDR(W) is displayed.

Note: If you start playback on the selected source within a track, recording starts at the beginning of the next track or after 2.7 seconds of silence in analog recordings.

EXTERNAL RECORDING

Automatic track increment

In recording mode, tracks will be incremented automatically so that the track numbers are in the same position as the original.

- To **switch** the automatic track increment function **on**, press as often as necessary TRACK INCR. on the remote control during stop when CDR is selected.
→ Rux to Tr: ON is displayed and the function is on. Track increments are now automatically detected from digital source material. In analog source material, a silence of 2.7 seconds or more is detected as a track increment.

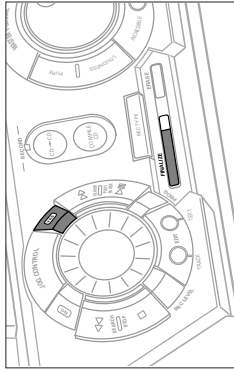
- To **switch** the automatic track increment function **off**, press as often as necessary TRACK INCR. on the remote control during stop when CDR is selected.
→ Rux to Tr: OFF is displayed and the function is off.

Track numbers can now be incremented manually by pressing TRACK INCR. on the remote control during recording. The minimum track length is 4 seconds.

Notes: – Track numbers cannot be changed after recording.

– The automatic track increment only works with consumer sources with a digital output signal according to the IEC 959 (consumer part) audio standard. DAT, DVD and DCC do not deliver this signal.

English



Finalizing CDR(W) discs

Finalizing a CDR(W) disc is a simple procedure, necessary to:

- play a recorded CDR on a standard CD player
- play a recorded CDRW on a CDRW compatible CD player and CD recorder,
- avoid further unwanted recordings on a disc, or
- avoid erasure of tracks on a CDRW.

Notes: – Finalizing will take about 2-4 minutes.

– After finalization of the CDR(W), **CDRW** changes to **CD** on the display.
– During finalization no other operating commands can be executed.

Auto finalizing

When using either CD-CD or COMPILE CD, your recordings will be finalized automatically (see "High speed recording and automatic finalizing").

Manual finalizing when recording is in progress

1 Press FINALIZE on the unit during recording.

→ Rux to Finalize? is displayed.

2 Press YES to confirm.

→ **FINALIZE** is shown. The finalization will start after recording and the actual finalizing time left will start to count down.

Manual finalizing when recording is stopped

1 Insert the CDR(W) you want to finalize in the CD recorder tray.

2 Press CDR to select the CD recorder.

3 Press FINALIZE on the unit.

→ **Finalize?** is displayed.

4 Press YES to start finalizing.

→ **FINALIZE** is shown, **Finalize** is displayed and the actual finalizing time left starts to count down.

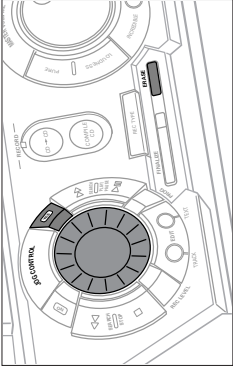
Unfinalizing CDRW discs

If you want to record (or erase) on (from) a finalized CDRW, you have to unfinalize it first.

Notes: — Unfinalizing will take approximately 2 minutes.
— After unfinalizing of the CDRW, CD changes to CDRW on the display.
— When unfinalizing a CDRW with CD text on it available, this text will be transferred to the CD recorder memory. In case the memory is full, you have to erase text (see "Erasing from the memory") or to finalize another disc first in order to obtain memory space.

- 1 Press YES to unfinalize in the CD recorder tray.
- 2 Press CDR to select the CD recorder.
- 3 Press FINALIZE on the unit.
→ Unfinalize? is displayed.
- 4 Press YES to start unfinalizing.
→ Unfinal is displayed and the operation time remaining starts to count down.

Erasing from a CDRW disc



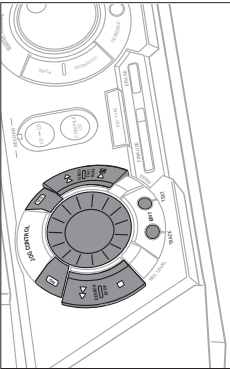
It is possible to erase one or more tracks (starting from the end of the last track) or the entire CDRW.

- Erasing an entire CDRW
- 1 Insert the CDRW you want to erase in the CD recorder tray.
- 2 Press CDR to select the CD recorder.
- 3 Press ERASE to enter the erasing menu.
- 4 Rotate JOG CONTROL to select:
→ Erase Disc?: for erasing the entire disc

- 5 Press YES to confirm your selection.
→ Erase?, the total playing time and the total number of tracks to be erased are displayed. All track numbers will blink in the music calendar.
- 6 Press YES to start erasing.
→ Erase is displayed and the operation time remaining starts to count down. The track number of the actual erased track will go off in the music calendar.
- Erasing one or more tracks
- 1 Insert the CDRW from which you want to erase tracks in the CD recorder tray.
- 2 Press CDR to select the CD recorder.
- 3 Press ERASE to enter the erasing menu.
- 4 Rotate JOG CONTROL to select the track number(s) you wish to erase.
→ Erase and the track number (e.g. 10+?) are displayed.
• To select more tracks to be erased, repeat step 4.

Note: When erasing more tracks, the tracks to be erased must be selected in sequence, starting from the last recorded track. Example: The CDRW has 5 tracks recorded on it. Now, you can erase tracks 5 and 4. You can also erase tracks 5, 4 and 3, but you cannot erase tracks 5 and 3!

- All track numbers selected for erasing will blink in the music calendar. The remaining track numbers light up.
- 5 Press YES to confirm your selection.
→ Erase? is displayed.
- 6 Press YES to start erasing.
→ Erase is displayed and the operation time remaining starts to count down. The track number of the currently erased track will go off in the music calendar.



EDIT TEXT (on CD recorder only)

Storing text during stop mode

After you have recorded your CDRW you can enter text, e.g. names to discs and tracks. The text will be displayed during playback. You can enter up to 60 characters per text field. Only use an unfinalized CDR or CDRW (finalized CDRW must be unfinalized first).

1 If necessary, press STOP on the unit (on the remote control) to stop playback.

2 Press CDR to select the CD recorder.

3 Press EDIT TEXT on the unit to enter the text edit menu.
→ CD TEXT EDIT is blinking. Text Edit is displayed.

4 Press YES to confirm.

5 Rotate JOG CONTROL to select either:
→ Artist: for editing the CD artist.
→ Album Title: for editing the CD title.
→ Artist Tr. 1 or (2, 3,...) for editing the artist of track 1 or (2, 3,...).
→ Title Tr. 1 or (2, 3,...) for editing the title of track 1 or (2, 3,...).

6 Press YES to confirm the selection.

7 Rotate JOG CONTROL (press the alphabet keys on the remote control) to select a character.

8 Press YES to confirm the selection.
→ The cursor moves to the next character space.

9 Repeat steps 7 and 8 for adding further characters.

10 Press EDIT TEXT to save the characters that have been selected and to exit to the last position in the text editing menu.
→ Update is displayed.

English

Storing text during recording

You can store and edit text even while recording a single track or single CD, or when recording from an external source or tuner. Editing text during finalizing is not possible. Make sure, when using high speed recording and automatic finalizing, to enter the text before finalizing starts, otherwise automatic finalizing will be cancelled.

- Follow steps 3–10 of "Storing text during stop mode".
- Note: Editing text is not possible when a copy protected track is analog recorded. Editing is stopped, CD Text Saved is displayed and your text is saved for later editing.

Auto copied text

When an artist's name has been stored for a track, it will be copied automatically into the next track.

- Press either:
EDIT TEXT to confirm the copied text,
or
NO to delete the copied text and enter new text.
- Inserting a space
- 1 Press << SEARCH or >> SEARCH (<< or >> on the remote control) to move to the position where the space is to be inserted.
→ The position starts blinking.

- 2 Press YES to confirm the position of the insert character.
→ A space will be inserted, text will move to the right.

Deleting and substituting a character

1 Press << SEARCH or >> SEARCH (<< or >> on the remote control) to move to the character's position to be deleted or substituted.
→ The character starts blinking.

- 2 If you want to delete the character:
- Press NO.
→ The character is deleted and the text is shifted one position to the left.

If you want to substitute the character

Rotate JOG CONTROL (press the alphabet keys on the remote control) to select a new character.

Press YES to confirm the selection.

• To change another character, press << SEARCH or >> SEARCH (<< or >> on the remote control).

Brief Operating Instructions

FEATURES

Erasing text

- 1 Press EDIT TEXT to enter the text edit menu.
→ **CD TEXT EDIT** is blinking. **Text Edit** is displayed.
- 2 Rotate JOG CONTROL to select the text erase menu.
→ **Text Erase** is displayed.
- 3 Press YES to confirm.
- 4 Rotate JOG CONTROL to select one of the following:
→ **FL1 Text**: All text of the selected disc is chosen to be erased in one step.
→ **FL1bum Artist**: CD artist's name is chosen to be erased.
→ **FL1bum Title**: CD title is chosen to be erased.
→ **FL1st Tr 1 or (2, 3, ...)**: artist's name of track 1 or (2, 3, ...) is chosen to be erased.
→ **FL1st Tr 1 or (2, 3, ...)**: title of track 1 or (2, 3, ...) is chosen to be erased.
- 5 Press YES to confirm your selection.
→ **Erase?** or **Erase FL1?** is displayed.
- 6 Press YES to start erasing.
→ **Update** is displayed and the chosen text is erased.

Erasing from the memory

When the text memory of your CD recorder is full, the messages **Memory Full** and **Fullsize Disc** will be displayed. If you still want to add a new disc to the text memory, you either have to erase another disc from the memory or you have to finalize another disc.

- 1 Press EDIT TEXT to enter the text edit menu.
→ **CD TEXT EDIT** is blinking. **Text Edit** is displayed.
- 2 Rotate JOG CONTROL to select the memory view menu.
→ **Text Memory** is displayed.
- 3 Press YES to confirm.
- 4 Rotate JOG CONTROL to select the disc you wish to erase from the text memory.
- 5 Press YES to confirm.
→ **Erase Memory** is displayed.
- 6 Press YES to confirm the text erasure of that particular disc.

Note: If there are no discs stored in the text memory, Memory Empty will be displayed.

Track editing (on CD changer only)

You can create a "track" by marking a passage of music within one track on the current disc. This new "track" can be used for recording or playing. The minimum track length is 4 seconds.

- 1 Press EDIT TRACK on the unit.
→ **EDIT TRACK** starts blinking. **Track** and the current track number are displayed. The current track number also blinks in the music calendar.
- 2 Rotate JOG CONTROL until the desired track number is displayed.
- 3 Press YES to confirm the selected track.
→ The marker position A and the track time will be displayed. The first 4 seconds of the track will be played continuously.
- 4 Press PLAY/PAUSE ▷ on the unit to play to the desired start position of your new "track" (The initial position of marker A is always the start of the chosen track).
- 5 Press YES to confirm the position of marker A.
→ The marker position B and the new "track" time will be displayed. The first 4 seconds before marker position B until marker position B will be played continuously.
- 6 Press PLAY/PAUSE ▷ on the unit to play to the stop position of your new "track" (the initial position of marker B is always the position of marker A plus 4 seconds).
- 7 Press YES to confirm the marked passage.
→ **EDIT TRACK** is shown, A-B and the track edit time are displayed.

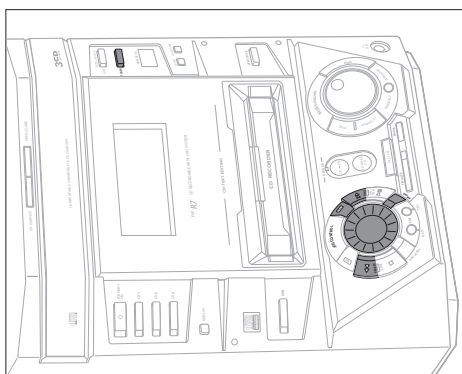
Note: If you open the CD changer tray, the edit is deleted.

Clearing the track edit

- 1 Press NO during stop.
→ **Clear A-B?** is displayed.
- 2 Press YES to clear the markers.
→ The markers A-B are cleared.

TUNER

English



Tuning to radio stations

- 1 Press TUNER to select the tuner.
→ **Tuner** is scrolled.
- 2 Press TUNER again to select the desired waveband.
→ The selected waveband is displayed.
- 3 Keep <◁ SEARCH or ▷▷ SEARCH (◁◁ or ▷▷ on the remote control) pressed for more than a half second.
→ The selected waveband and searching are displayed. The radio tunes to a station with sufficient signal strength.
- 4 Repeat searching until you find the desired station.
- 5 To tune to a weak station, briefly press <◁ SEARCH or ▷▷ SEARCH (◁◁ or ▷▷ on the remote control) as often as necessary for optimum reception.

Storing radio stations

It is possible to store up to 40 radio stations. Stations can be selected and programmed automatically or you can do that yourself. Programming will overwrite your former presets starting from the last active preset station. After programming the last stored preset station will be tuned.

Automatic programming

If no preset is tuned, automatic programming starts at preset number one.

- 1 Follow steps 1 and 2 of "Tuning to radio stations".

- 2 Keep PROG (PROGRAM on the remote control) pressed for more than 2 seconds.
→ **Full-Program** is displayed, **PROG** and the current preset number in the music calendar start blinking.
→ All available radio stations for the selected waveband are stored automatically. **PROG** goes off, the preset number, the waveband and the frequency of the last preset station are displayed briefly.
- 3 To store radio stations for another waveband, repeat steps 1-2. Make sure to select the next available preset number first before proceeding, otherwise already programmed radio stations may be erased.
- 4 To exit the automatic programming, press PROG (PROGRAM on the remote control).

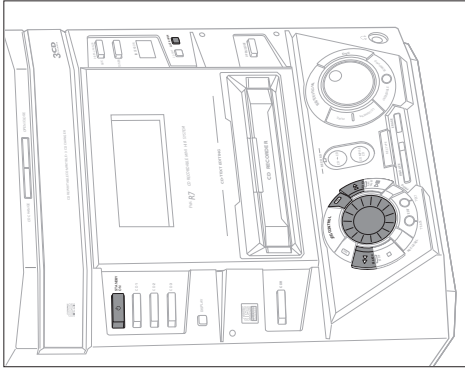
Note: Strong stations will always automatically be programmed first, followed by the weak stations.

Manual programming

- 1 Follow steps 1 and 2 of "Tuning to radio stations".
- 2 Keep PROG (PROGRAM on the remote control) pressed for less than 2 seconds.
→ **PROG** and the current preset number in the music calendar start flashing.
- 3 Press <◁ SEARCH or ▷▷ SEARCH (◁◁ or ▷▷ on the remote control) to tune to the desired radio station.
- 4 To allocate the radio station to another preset number, rotate JOG CONTROL (press ◁ or ▷ on the remote control).
- 5 Press YES to confirm the setting.
→ **PROG** goes off, the preset number, the waveband and the frequency of the preset station are displayed.
- 6 To exit manual programming, press PROG (PROGRAM on the remote control).

Tuning to preset stations

- Use JOG CONTROL (◁ or ▷ on the remote control) until the preset number of the desired station is displayed.



English

CLOCK/TIMER

You can select different timer functions which will be activated at a chosen time. Make sure the clock is set before using one of these features.

Sleep timer

You can set a certain period of time before the unit switches off.

- 1 Press SLEEP on the remote control until the desired sleeper time is displayed.
 - SLEEP is shown and SLEEP 60 min, 45 min, 30 min, 15 min is displayed or SLEEP OFF is displayed.
- 2 As soon as the desired time is displayed, do not press SLEEP again.
 - After the chosen time has elapsed, the unit switches to standby.
- To deactivate the sleep timer, press SLEEP on the remote control until SLEEP OFF is displayed.

Alarm timer

Alarm timer setting

The unit can be used as an alarm clock, whereby the tuner, CD recorder or CD changer starts playback automatically at a preset time.

- 1 Press $\odot$ STANDBY ON as often as necessary on the unit to switch the unit to standby.
- 2 Press CLOCK/TIMER on the unit.
- 3 Rotate JOG CONTROL to select the alarm timer.
 - F1 Alarm is displayed, ALARM is blinking.
- 4 Press YES to confirm the selection.
 - The hour digit is blinking.
- 5 Rotate JOG CONTROL to set the hour.
- 6 Use $\leftarrow$ SEARCH or $\rightarrow$ SEARCH on the unit to move from hour to minutes.
- 7 Rotate JOG CONTROL to set the minutes.
- 8 Press YES to confirm the time settings.
- 9 Rotate JOG CONTROL to select the source you want to be woken up with.
- 10 Press YES on the unit to confirm the source selection.
- To stop the alarm, press $\odot$ STANDBY ON on the unit.

Clock setting

Manual clock setting

- 1 Press $\odot$ STANDBY ON as often as necessary on the unit to switch the unit to standby.
- 2 Press CLOCK/TIMER on the unit.
- 3 Rotate JOG CONTROL to select the clock.
 - Clock is displayed and $\odot$ starts blinking.
- 4 Press YES to confirm the selection.
 - The day of the week digit blinks.
- 5 Rotate JOG CONTROL to set the day.
- 6 Use $\leftarrow$ SEARCH or $\rightarrow$ SEARCH on the unit to move from day of the week to hour.
- 7 Rotate JOG CONTROL to set the hour.
- 8 Repeat steps 6 and 7 to set the minutes.
- 9 Press YES to confirm the settings.

CLOCK/TIMER

Record timer

Record timer setting

The unit can do recordings automatically from an external source or from a preset radio station at a preset time.

- 1 Follow steps 1 and 2 of "Alarm timer setting".
- 2 Rotate JOG CONTROL to select the record timer.
 - Rec. Timer is displayed, REC is shown and $\odot$ starts blinking.
- 3 Press YES on the unit to confirm the selection.
 - The hour digit for the start of recording blinks.
- 4 Rotate JOG CONTROL to set the hour of start of recording.
- 5 Use $\leftarrow$ SEARCH or $\rightarrow$ SEARCH on the unit to move from hour to minutes of start of recording.
- 6 Rotate JOG CONTROL to set the minutes of start of recording.
- 7 Continue this procedure by using $\leftarrow$ SEARCH or $\rightarrow$ SEARCH to move on to hour and minutes of end of recording and to the day of the week. After each move, always rotate JOG CONTROL to do the settings.
- 8 Press YES to confirm the settings.
- 9 Rotate JOG CONTROL to select from which you want to record.

If you have chosen the tuner as source:

Rotate JOG CONTROL again to select a preset radio station and confirm this selected station by pressing YES.

- 10 Press YES on the unit to confirm the source selection.
- To stop the recording press STOP $\square$ on the unit.

Switching the alarm and record timer on/off

- Press TIMER ON/OFF on the remote control repeatedly to switch the alarm and/or record timer on or off:
 - ALARM is shown and F1 Alarm ON is displayed when the alarm timer is on.
 - REC is shown and REC. Timer ON is displayed when the record timer is on.
- ALARM and REC are shown, REC+F1 Alarm ON is displayed when the alarm and record timer are on.
- ALARM and REC go off, REC+F1 Alarm OFF is displayed when the alarm and record timer are off.

TECHNICAL DATA

Subject to modification without notice.

General

AC Power120 V / 60 Hz
Power consumption

Active66 W
Standby< 22 W
Economy power save mode< 2 W
Dimensions, w x h x d10.4 x 12.2 x 15.7 in.
Weight (without speakers)9 kg

Amplifier

Output power2 x 50 W FTC, 6 Ω , 1 kHz, THD 10%
Frequency response40–16,000 Hz FTC, +0.5/-1.5 dB
S/N ratio $\geq$ 80 dBA (IEC)

Input sensitivity

AUX IN L/R800 mV
DIGITAL IN500 mV_{pp} (75 Ω)/12–56 kHz
Output

Impedance speakers $\geq$ 6 Ω
Impedance headphones32 Ω –600 Ω
LINE OUT L/R500 mV
DIGITAL OUT500 mV_{pp} (75 Ω)/44.1 kHz
SUBWOOFER OUT1 V

CD changer

Number of programmable tracks40
Frequency range20–20,000 Hz
S/N ratio $\geq$ 92 dBA
Cross talk $\leq$ -65 dB (1 kHz)
Total harmonic distortion $\leq$ -84 dB (1 kHz)

CD recorder

Number of programmable tracks99
CD playback

Frequency range20–20,000 Hz
S/N ratio playback $\geq$ 92 dBA
Cross talk $\leq$ -65 dB (1 kHz)
Total harmonic distortion $\leq$ -84 dB (1 kHz)

Analog recording, digital playback

Frequency range20–20,000 Hz
S/N ratio playback $\geq$ 86 dBA
Cross talk $\leq$ -65 dB (1 kHz)
Total harmonic distortion $\leq$ -81 dB (1 kHz)

Laser (CD recorder)

TypeSemiconductor laser GaAlAs
Wave length775–795 nm (at 25° C)
Output power25 mW (Read), 35 mW (Write)
Beam divergence60 degree

Tuner

Wave range
FM87.5–108.0 MHz
AM530–1,700 kHz

Speakers

System3 way bass reflex
Impedance6 Ω
Woofer1 x 6.5"
Tweeter1 x 2.5", Ferro fluid cooled
Tweeter1 x 1", Polydome
Dimensions, h x w x d12.2 x 9.4 x 12.7 in.
Weight4.6 kg/each

Brief Operating Instructions

TROUBLESHOOTING

English

WARNING

Under no circumstances should you try to repair the unit yourself as this will invalidate the guarantee. Do not open the unit as there is a risk of electric shock.

If a fault occurs, first check the points listed, before taking the unit for repair.

If you are unable to solve a problem by following these hints, consult your dealer or service center.

LASER SAFETY

This unit employs a laser. Only a qualified service person should remove the cover or attempt to service this device, due to possible eye injury.

PROBLEM	POSSIBLE CAUSE	SOLUTION
No sound, no power	Volume is not correctly adjusted.	Adjust the volume.
	Headphones are connected.	Disconnect headphones.
	Speakers are wrongly or not connected.	Make sure speakers are properly connected.
	Power cable is not securely connected.	Connect power cable properly.
No reaction to controls	Electrostatic discharge	Disconnect the unit from power supply, then reconnect after a few seconds.
Poor radio reception	Weak radio signal	Direct the antenna for optimum reception.
	Antenna is positioned near a radiation source such as a TV, VCR, computer, etc.	Change the position of the interfering unit or try to switch it off.
Poor bass sound	Speakers are not in phase.	Connect the colored (or marked) wires to the colored terminals and the black (or unmarked) wires to the black terminals.
Bad sound	Badly matched setting for the given type of music or sound.	Correct the sound settings on the unit.
Remote control does not function properly	Batteries are inserted incorrectly.	Insert batteries correctly.
	Batteries are flat.	Insert new batteries.
	Distance to the unit is too large.	Reduce distance.
Insert Disc indication	The CD(RW) is scratched badly or dirty.	Replace or clean the disc.
	No CD(RW) inserted or inserted upside down.	Insert a CD(RW), with label facing upwards.
	The laser lens is steamed up.	Wait until the lens has cleared.
Wrong Disc indication, Use Audio CD indication	No digital audio disc is inserted.	Insert a digital audio disc marked with "Digital Audio" and the special logo.
Disc Recover indication	Power loss	Wait a few minutes. The disc is being repaired.
Disc Error indication	Disc Recover was not able to repair the disc.	The disc can still be played, but not recorded or finalized further.
Check Input indication	Wrong input is chosen.	Select the correct input.
	No correct digital source is detected after starting recording.	Make sure the connection cable is properly connected.
Does not record	CDR(W) is scratched or dirty.	Make sure the CDR(W) is absolutely free of scratches and dust particles.
	The inserted disc is not recordable.	Insert a digital CDR(W) and make sure it is unfinalized.
	Recording process is interrupted (power loss, mechanical shock).	Start recording again.
Recorded disc does not play in another standard CD player	The inserted CDR(W) is not finalized.	Finalize the CDR(W).
	The CDRW is inserted in a non-CDRW compatible CD player.	Insert the CDRW in a CDRW compatible CD player.

Warnings & Safety

(GB) WARNING

All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.

When repairing, make sure that you are connected with the same potential as the mass of the set via a wristband with resistance. Keep components and tools at this potential.

(F) ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD). Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.

Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.

Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

ESD



(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD). Unsorgfältige Behandlung im Reparaturfall kann die Lebensdauer drastisch reduzieren.

Sorgen Sie dafür, daß Sie im Reparaturfall über ein Pulsarmband mit Widerstand mit dem Massepotential des Gerätes verbunden sind.

Halten Sie Bauteile und Hilfsmittel ebenfalls auf diesem Potential.

(NL) WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).

Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen. Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.

Houd componenten en hulpmiddelen ook op hetzelfde potentiaal.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).

La loro longevità potrebbe essere fortemente ridotta in caso di non osservazione della più grande cauzione alla loro manipolazione. Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.

Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

(GB) AVAILABLE ESD PROTECTION EQUIPMENT :

anti-static table mat large 1200x650x1.25mm
small 600x650x1.25mm

anti-static wristband

connection box (3 press stud connections, 1MΩ)

extendible cable (2m, 2MΩ, to connect wristband to connection box)

connecting cable (3m, 2MΩ, to connect table mat to connection box)

earth cable (1MΩ, to connect any product to mat or to connection box)

KIT ESD3 (combining all 6 prior products - small table mat)

wristband tester

4822 466 10953

4822 466 10958

4822 395 10223

4822 320 11307

4822 320 11305

4822 320 11306

4822 320 11308

4822 310 10671

4822 344 13999

(GB)

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

Safety components are marked by the symbol

(F)

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.

Les composants de sécurité sont marqués

SAFETY



(D)

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Gerätes darf nicht verändert werden. Für Reparaturen sind Originalersatzteile zu verwenden.

Sicherheitsbauteile sind durch das Symbol markiert.

(NL)

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

(I)

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

(GB)

DANGER: Invisible laser radiation when open.
AVOID DIRECT EXPOSURE TO BEAM.

**CLASS 1
LASER PRODUCT**

(S) Varning !

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

(DK) Advarsel !

Usynlig laserstrålning ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for strålning.

(FIN) Varoitut !

Avatussa laitteessa ja suojauslaitteiden ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen !

(GB)

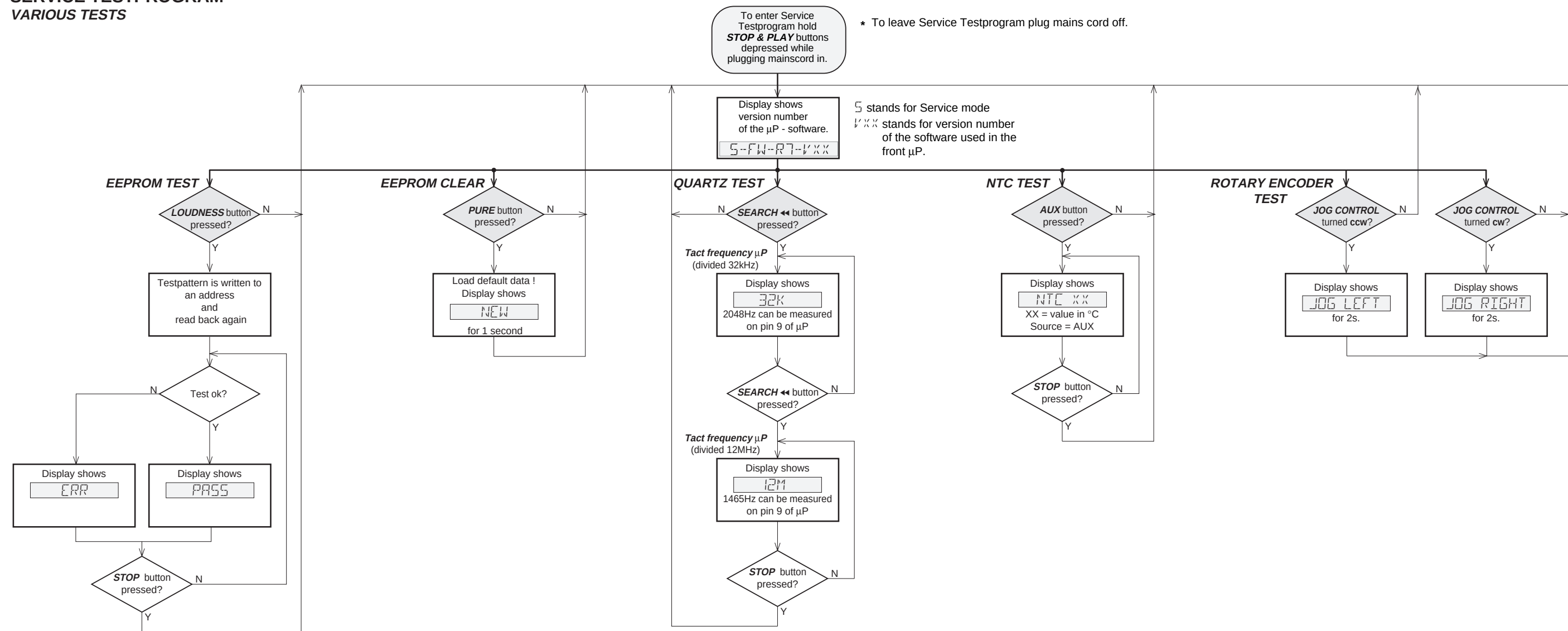
After servicing and before returning the set to customer perform a leakage current measurement test from all exposed metal parts to earth ground, to assure no shock hazard exists.

The leakage current must not exceed 0.5mA.

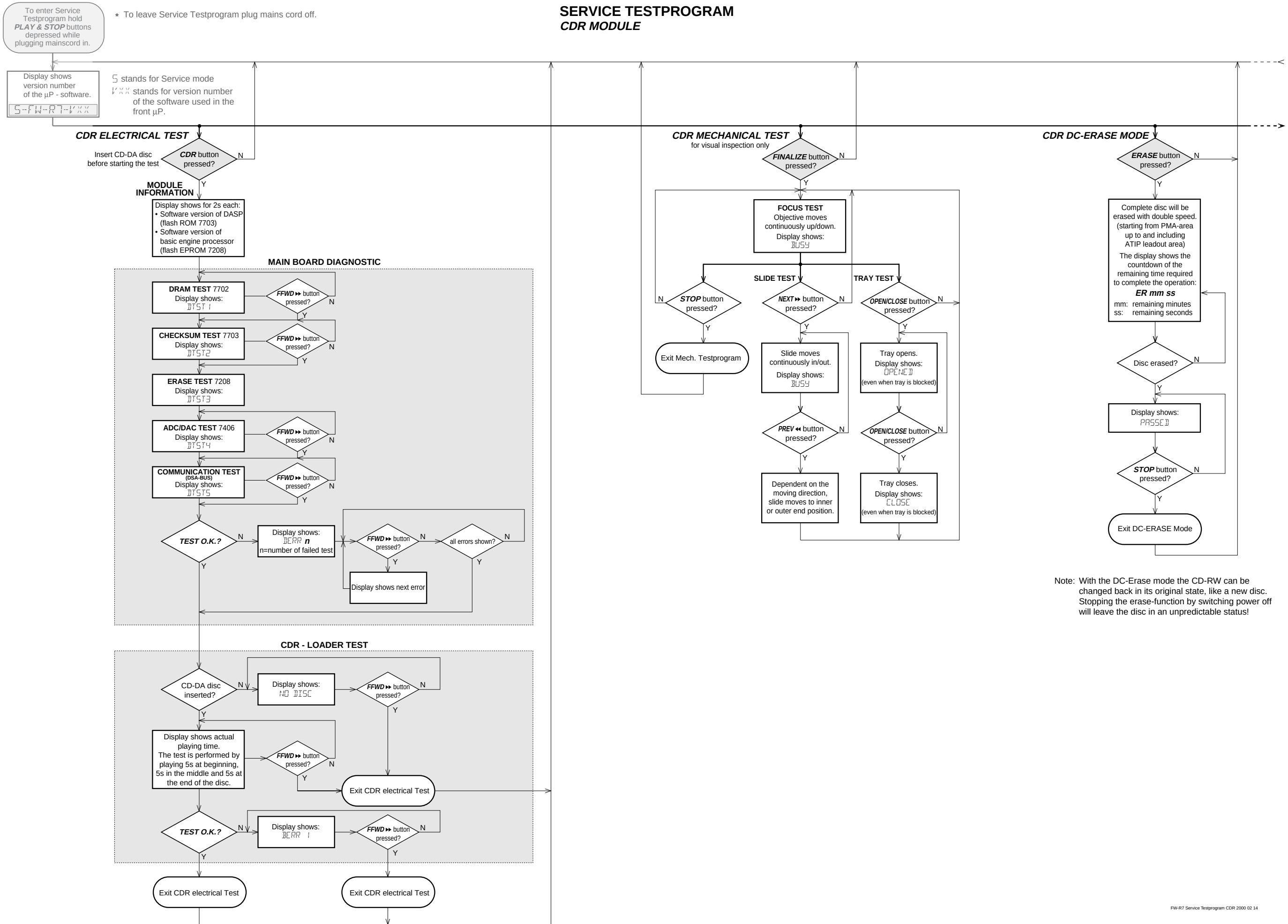
(F)

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

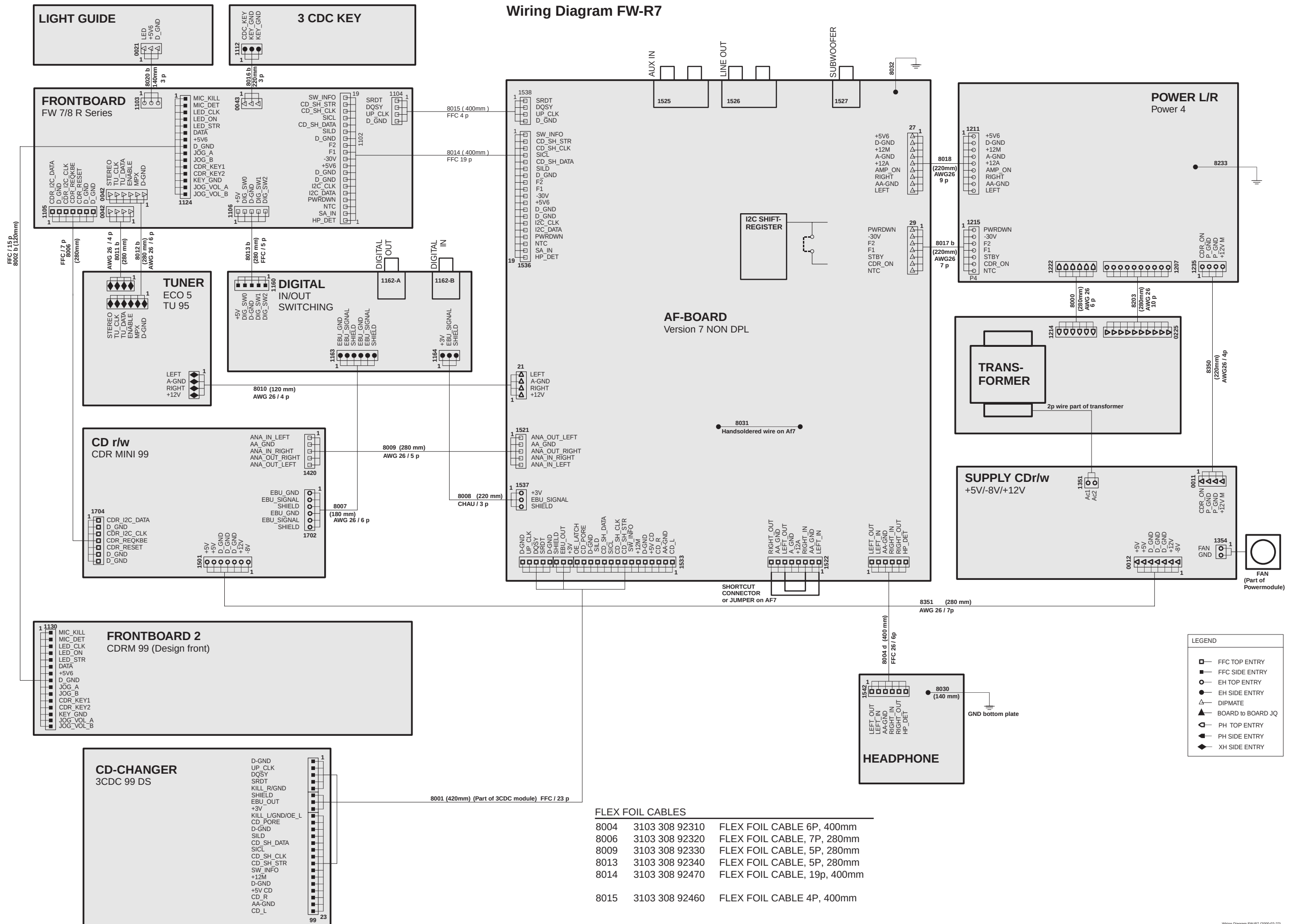
SERVICE TESTPROGRAM VARIOUS TESTS



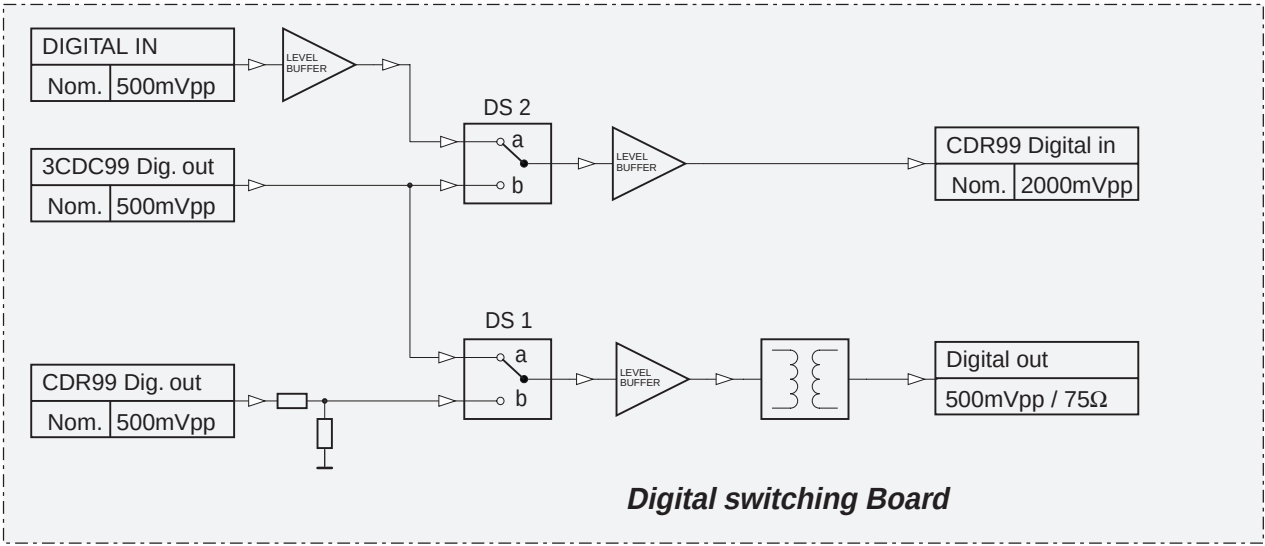
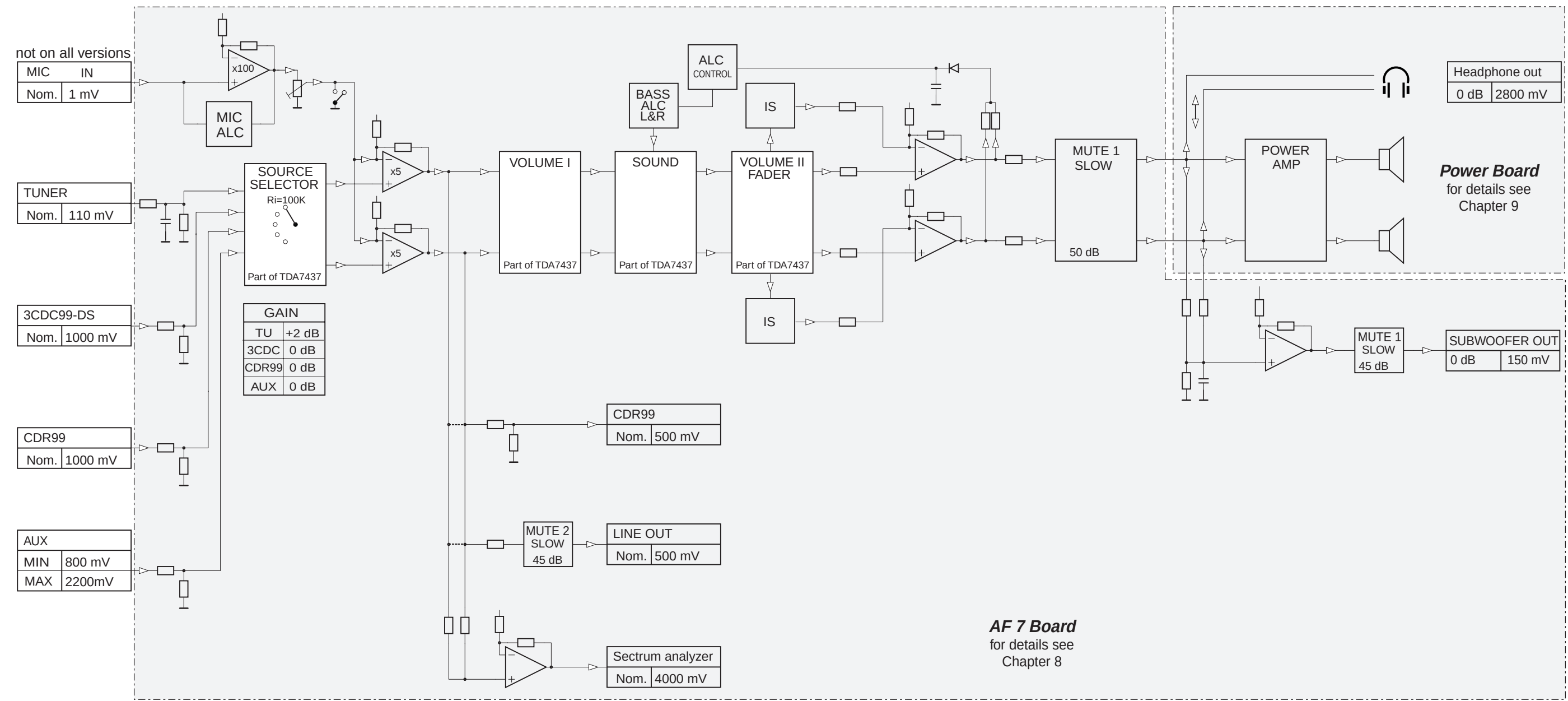
SERVICE TESTPROGRAM **CDR MODULE**

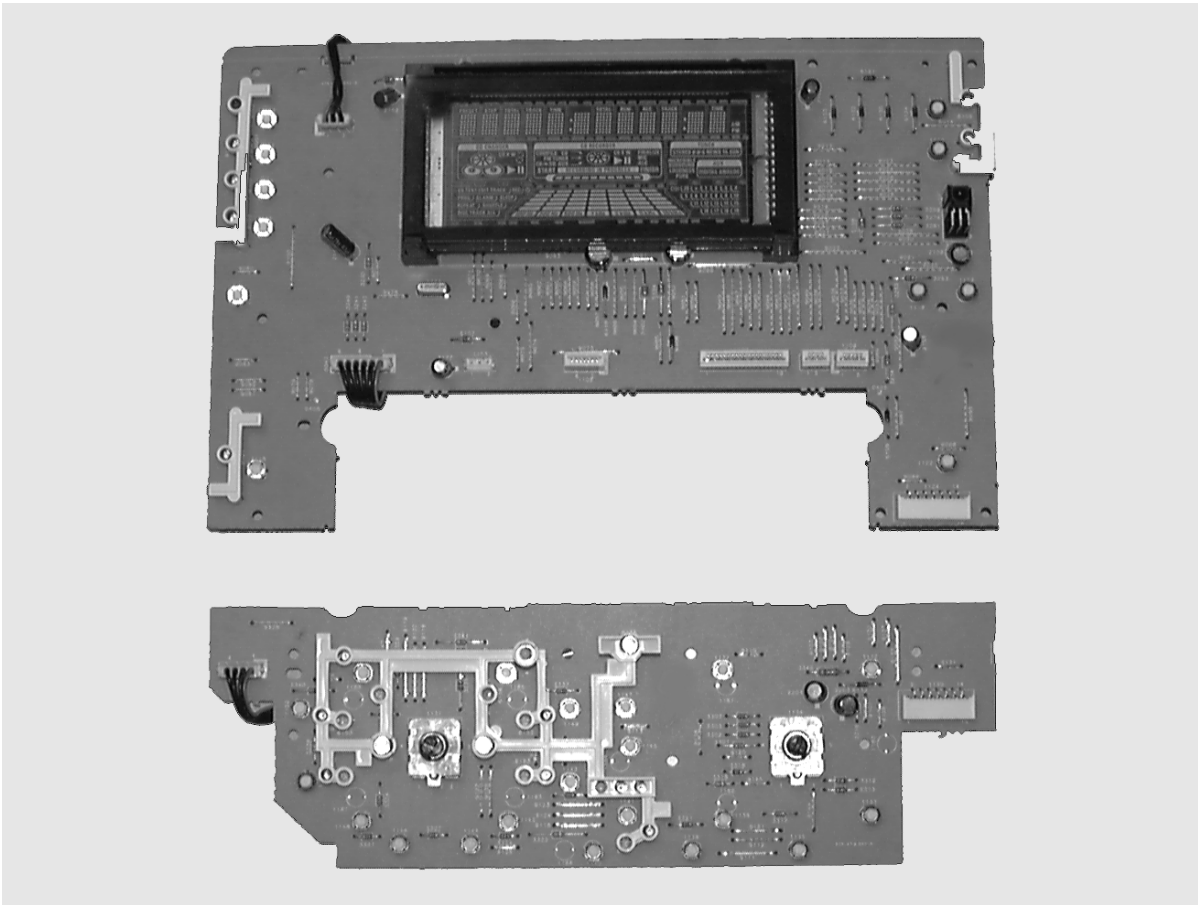


Wiring Diagram FW-R7



Block / Leveldiagram





Front Board

TABLE OF CONTENTS

Block Diagram6-2

3CDC-Key Board

 Circuit Diagram6-1

 Component Layout.....6-1

Digital Switching Board

 Component Layout.....6-1

 Circuit Diagram6-3

Light Guide Board

 Component Layout.....6-3

 Circuit Diagram6-3

Technical Front Board

 Component Layout Copperside view6-4

 Circuit Diagram6-5

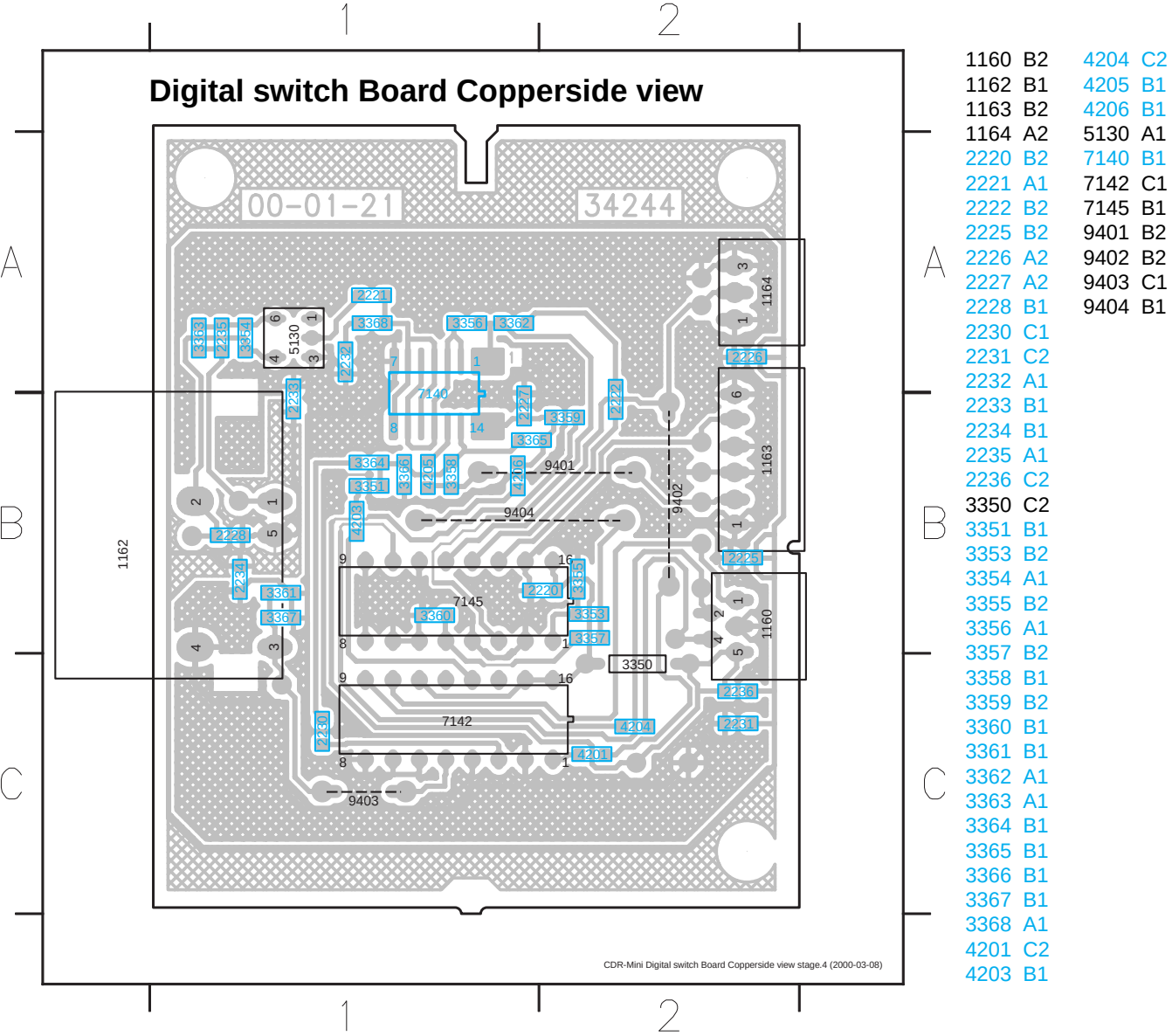
 Component Layout Copperside view6-7

Design Front Board

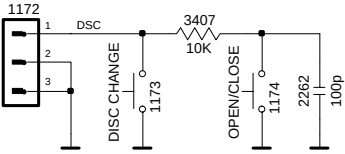
 Component Layout.....6-8

 Circuit Diagram6-9

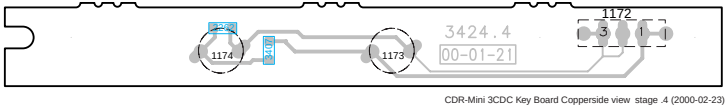
Electrical Partslist6-10



3 CDC-Key

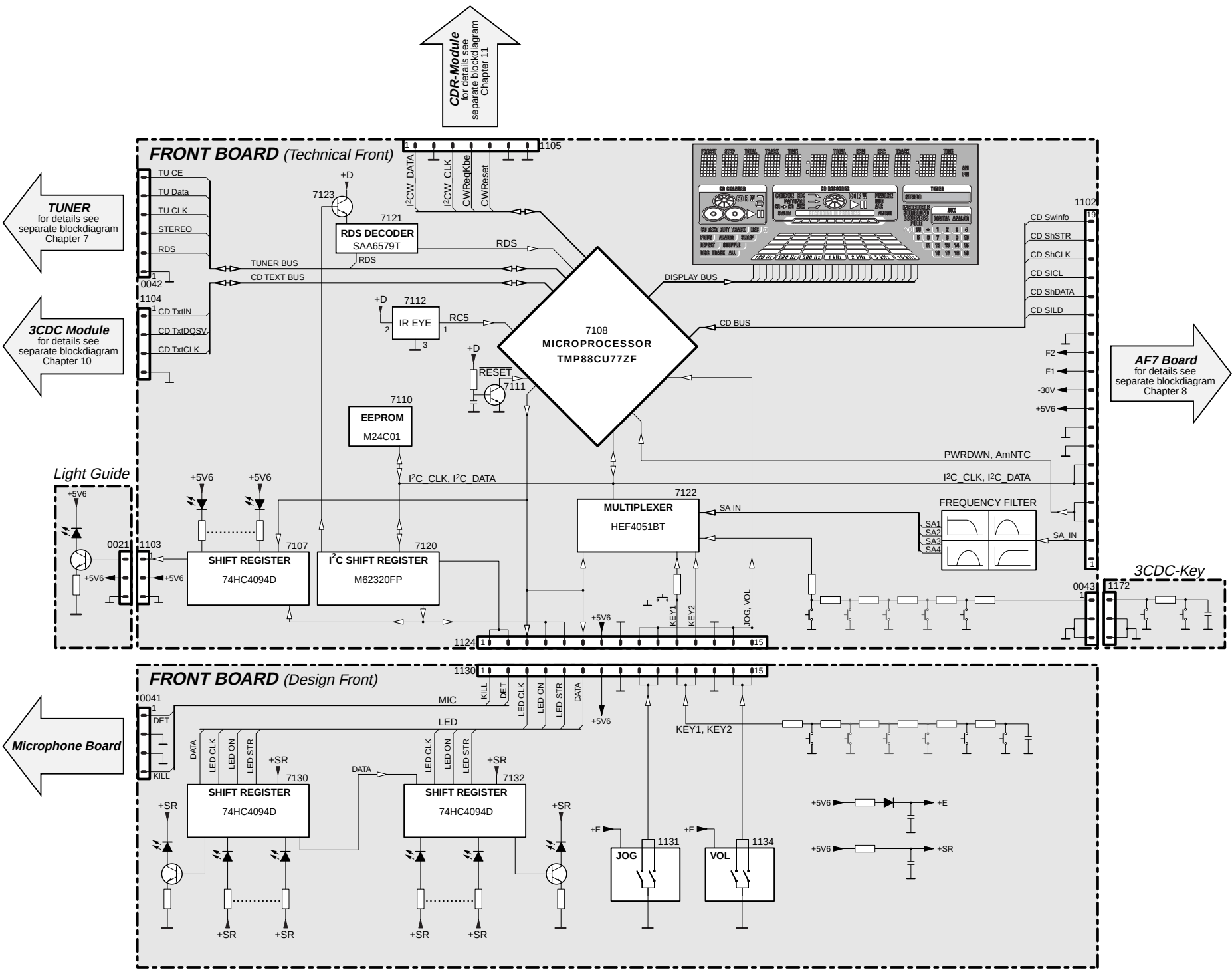


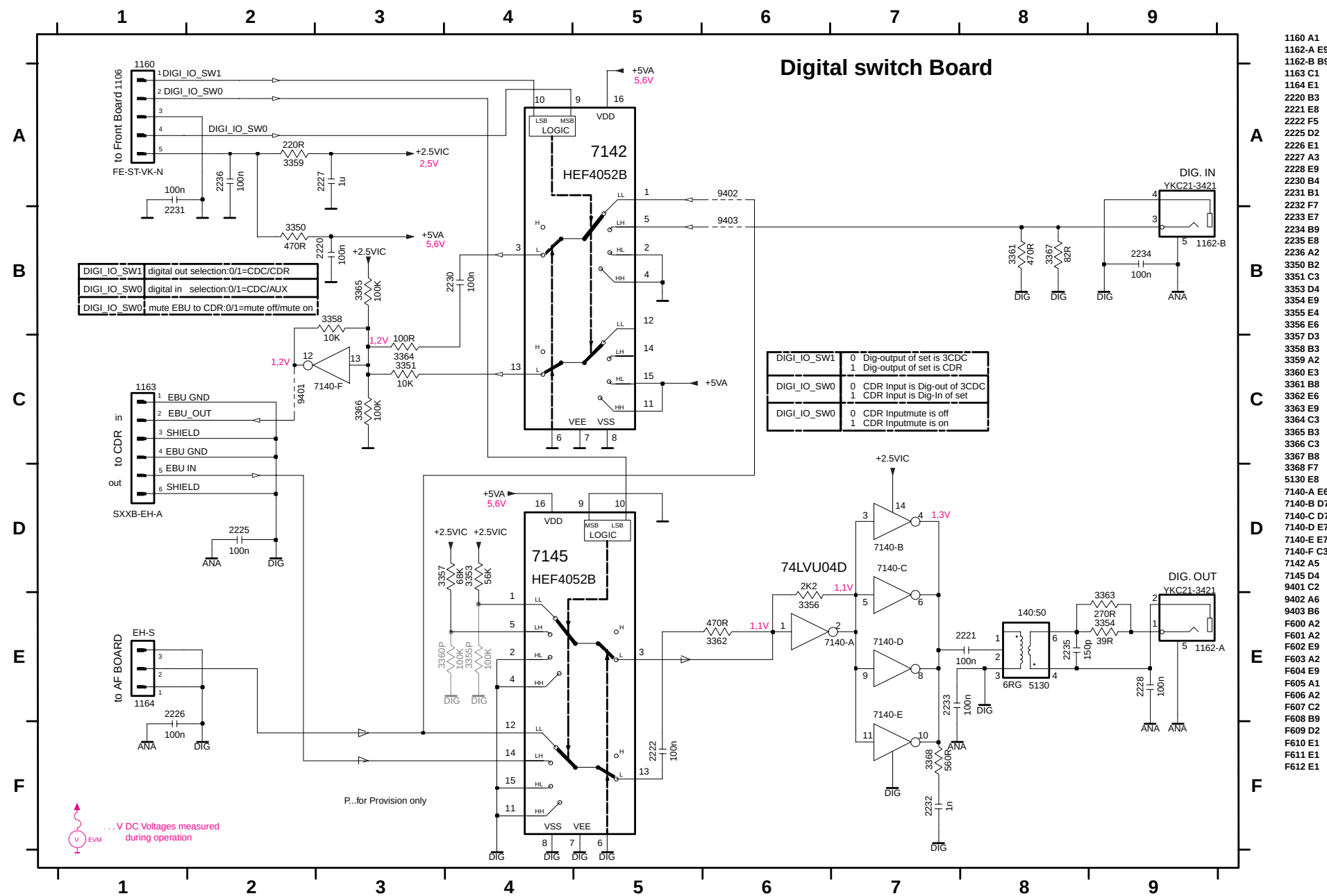
3CDC Key Board Copperside view



CDR-Mini 3CDC Key Board Copperside view stage .4 (2000-02-23)

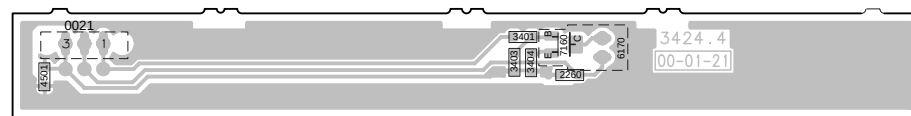
Blockdiagram





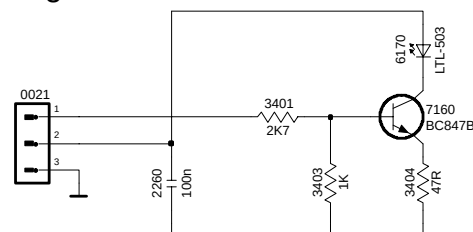
1160 A1
1162-A E9
1162-B B9
1163 C1
1164 E1
2220 B3
2221 E8
2222 F5
2225 D2
2226 E1
2227 A3
2228 E9
2230 B4
2231 B1
2232 F7
2233 E7
2234 B9
2235 E8
2236 A2
3350 B2
3351 C3
3353 D4
3354 E9
3355 E4
3356 E6
3357 D3
3358 B3
3359 A2
3360 E3
3361 B8
3362 E6
3363 E9
3364 C3
3365 B3
3366 C3
3367 B8
3368 F7
5130 E8
7140-A E6
7140-B D7
7140-C D7
7140-D E7
7140-E E7
7140-F C3
7142 A5
7145 D4
9401 C2
9402 A6
9403 B6
F600 A2
F601 A2
F602 E9
F603 A2
F604 E9
F605 A1
F606 A2
F607 C2
F608 B9
F609 D2
F610 E1
F611 E1
F612 E1

Light Guide Copperside view



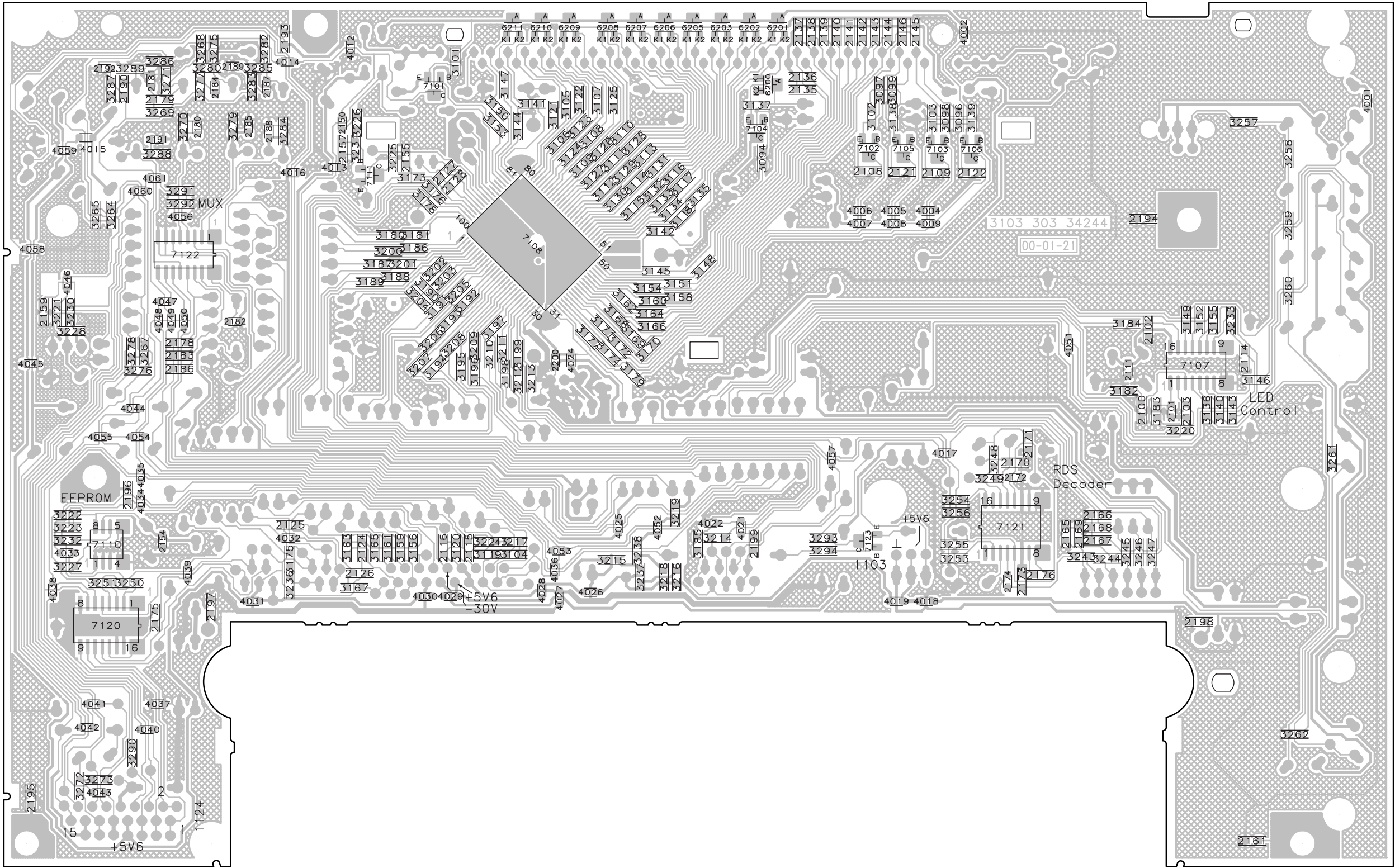
CDR-Mini LED Board Copperside view stage 4 (2000-02-23)

Light Guide Board

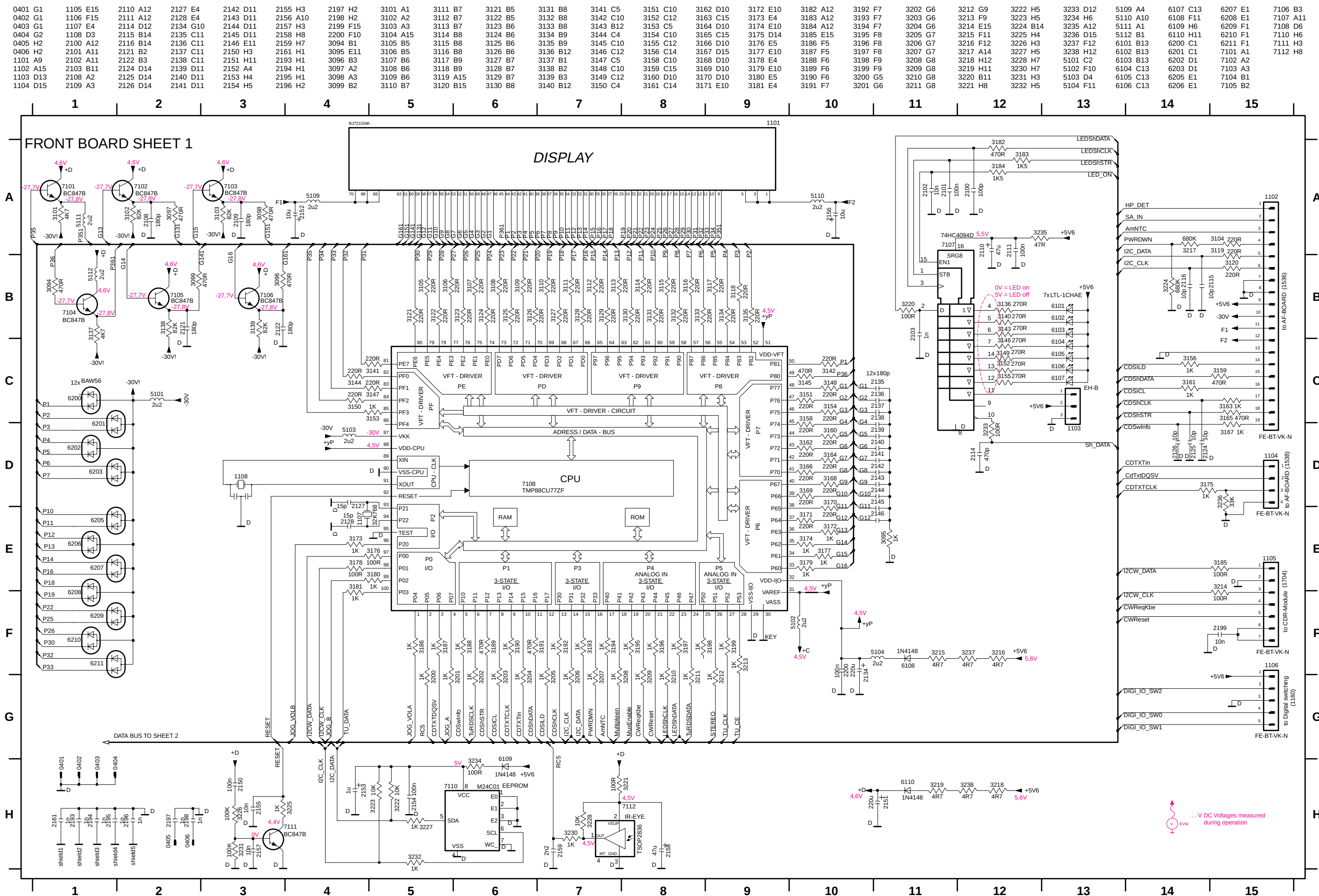


2100 B6	2116 C3	2136 A5	2145 A5	2166 C6	2175 C1	2185 A2	2194 A6	3097 A5	3107 A3	3116 A4	3125 A4	3134 A4	3143 B7	3152 B7	3162 B4	3171 B4	3180 A2	3189 B2	3198 B3	3207 B3	3216 C4	3225 A2	3237 C4	3250 C1	3260 B7	3271 A1
2101 B6	2121 A5	2137 A5	2146 A5	2167 C6	2176 C6	2186 B1	2195 D1	3098 A5	3108 A3	3117 A4	3126 A4	3135 A4	3144 A3	3153 A3	3163 C2	3172 B4	3181 A3	3190 B3	3199 B3	3208 B3	3217 C3	3226 A2	3238 C4	3251 C1	3261 B7	3272 D1
2102 B6	2122 A5	2138 A5	2150 A2	2168 C6	2178 B1	2187 A2	2196 C1	3099 A5	3109 A3	3118 A4	3127 A3	3136 B7	3145 A4	3154 B4	3164 B2	3173 A3	3182 B6	3191 B3	3200 A2	3209 B3	3218 C4	3227 C1	3243 C6	3253 C5	3262 D7	3273 D1
2103 B6	2124 C2	2139 A5	2154 C1	2169 C6	2179 A1	2188 A2	2197 C2	3101 A3	3110 A4	3119 C3	3128 A4	3137 A4	3146 B7	3155 B7	3165 C2	3174 B4	3183 B6	3192 B3	3201 A3	3210 B3	3219 C4	3228 B1	3244 C6	3254 C5	3264 A1	3275 A2
2108 A5	2125 C2	2140 A5	2155 A3	2170 B6	2180 A1	2189 A2	2198 C7	3102 A5	3111 A4	3120 C3	3129 A4	3138 A5	3147 A3	3156 C3	3166 B2	3175 C2	3184 B6	3193 B3	3202 A3	3211 B3	3220 B6	3229 B1	3245 C6	3255 C5	3265 A1	3276 B1
2109 A5	2126 C2	2141 A5	2157 A2	2171 B6	2181 A1	2190 A1	2199 C4	3103 A5	3112 A4	3121 A3	3130 A4	3139 A5	3148 A4	3158 B4	3167 C2	3176 A3	3185 C4	3194 B3	3203 B3	3212 B3	3221 B1	3231 A2	3246 C6	3256 C5	3267 B1	3277 A1
2111 B6	2127 A3	2142 A5	2159 B1	2172 C6	2182 B2	2191 A1	2200 B3	3104 C3	3113 A4	3122 A3	3131 A4	3140 B7	3149 B6	3159 C2	3168 B4	3177 B3	3186 A3	3195 B3	3204 B3	3213 B3	3222 C1	3232 C1	3247 C6	3257 A7	3268 A1	3278 B1
2114 B7	2128 A3	2143 A5	2161 D7	2173 C6	2183 B1	2192 A1	3094 A5	3105 A3	3114 A4	3123 A3	3132 A4	3141 A3	3150 A3	3160 B4	3169 B4	3178 A3	3187 A2	3196 B3	3205 B3	3214 C4	3223 C1	3233 B7	3248 B5	3258 A7	3269 A1	3279 A2
2115 C3	2135 A5	2144 A5	2165 C6	2174 C6	2184 A2	2193 A2	3096 A5	3106 A3	3115 A4	3124 A3	3133 A4	3142 A4	3151 B4	3161 C2	3170 B4	3179 B4	3188 B2	3197 B3	3206 B3	3215 C4	3224 C3	3236 C2	3249 C5	3259 A7	3270 A1	3280 A2

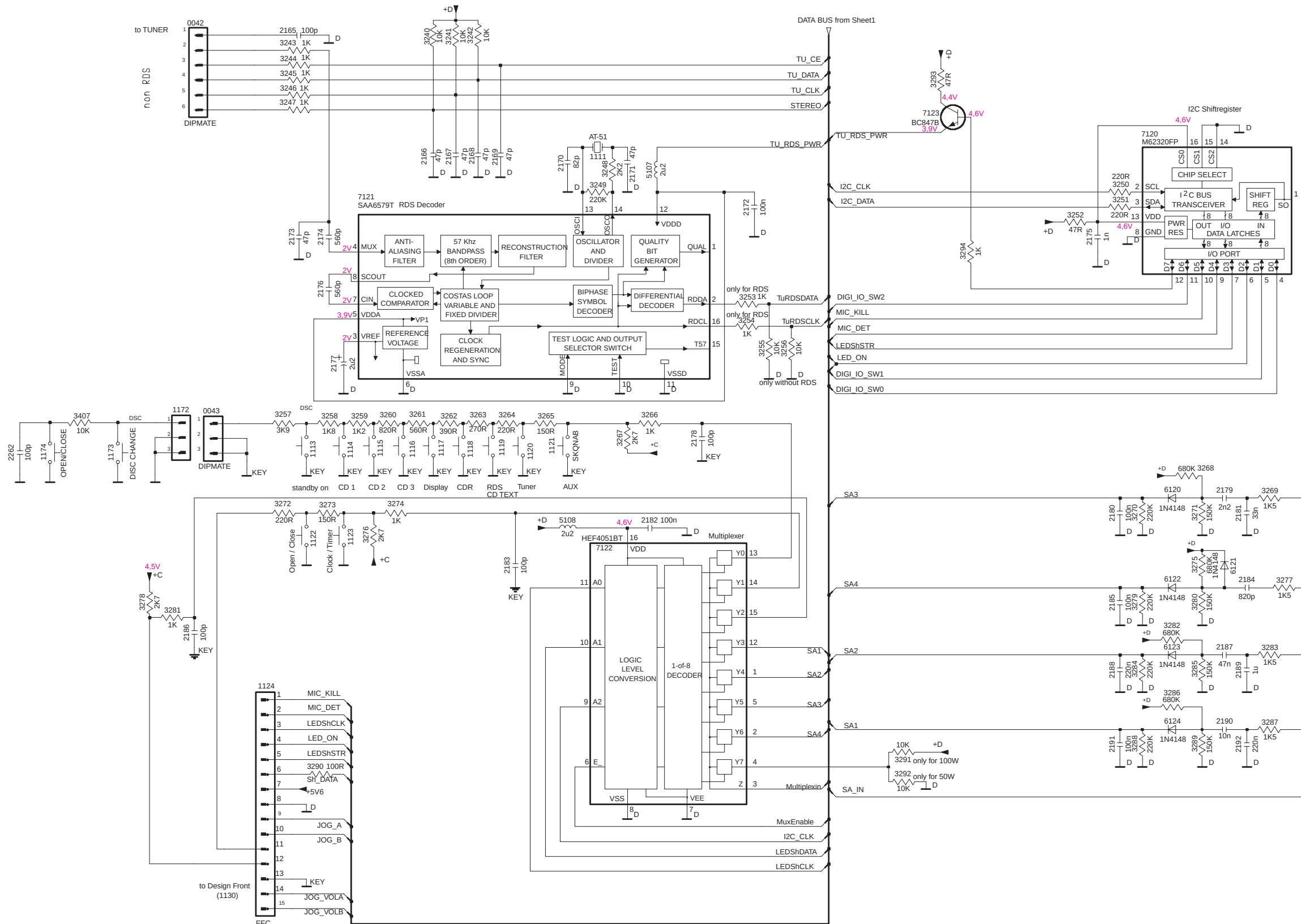
Front Board Copperside view



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



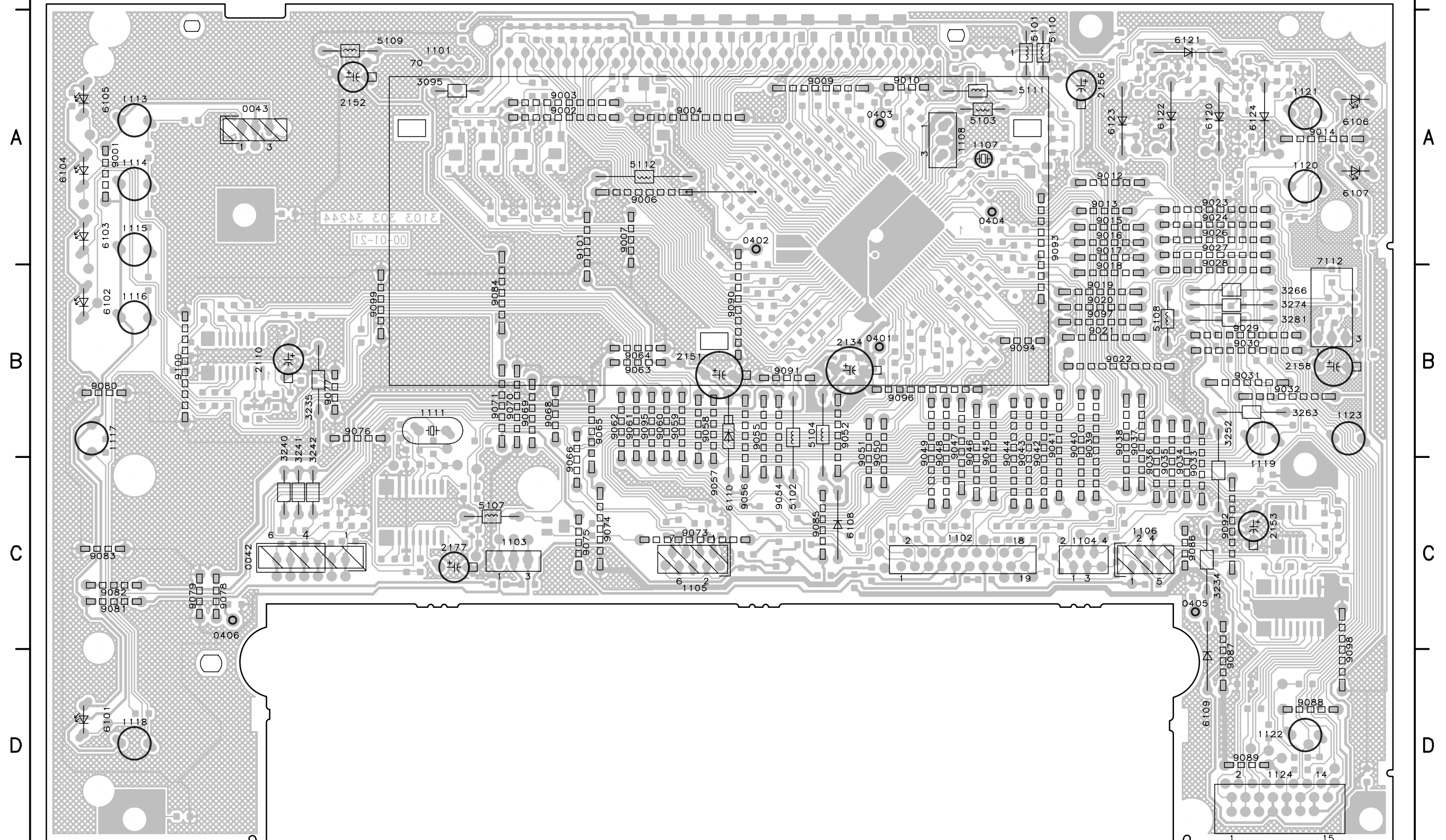
FRONT BOARD SHEET 2



0042 A3	F427 E10
0043 E3	F478 A3
1111 B6	F479 A3
1113 E4	F480 A3
1114 E4	F481 A3
1115 E4	F482 A3
1116 E5	F483 B3
1117 E5	F484 C6
1118 E5	F485 B7
1119 E6	F486 C7
1120 E6	F487 D8
1121 E6	F488 D8
1122 F4	F489 E3
1123 F4	F490 E3
1124 G3	F491 G4
1165 A3	F492 G4
1166 B5	F493 G4
1167 B5	F494 H4
1168 B5	F495 H4
1169 B5	F496 H4
1270 B6	F497 H4
2171 B7	F498 H4
2172 C8	F499 H4
2173 C4	F500 H4
2174 C4	F501 I3
2175 C11	F502 I3
2176 C4	F503 I4
2177 D4	F504 I4
2178 E7	F505 I4
2179 E12	F506 H8
2180 E11	
2181 E13	
2182 F7	
2183 F6	
2184 F11	
2185 F11	
2186 G3	
2187 G12	
2188 G11	
2189 G13	
2190 G12	
2191 H11	
2192 H13	
2240 A5	
2241 A5	
2242 A5	
2243 A3	
2244 A3	
2245 A3	
2246 A3	
2247 B3	
2248 B7	
2249 B6	
2250 B11	
2251 B11	
2252 C11	
2253 C8	
2254 D8	
2255 D8	
2256 D8	
2257 D3	
2258 E4	
2259 E4	
2260 D4	
2261 D5	
2262 E5	
2263 D5	
2264 D6	
2265 E6	
2266 E7	
2267 E7	
2268 E12	
2269 E13	
2270 E12	
2271 E12	
2272 E3	
2273 E4	
2274 E5	
2275 F12	
2276 F4	
2277 F13	
2278 F2	
2279 F12	
2280 F12	
2281 F2	
2282 G12	
2283 G13	
2284 G12	
2285 G12	
2286 G12	
2287 G13	
2288 H12	
2289 H12	
2290 H4	
2291 H9	
2292 H9	
2293 A10	
2294 C10	
5107 B7	
5108 F6	
6120 E12	
6121 F13	
6122 F12	
6123 G12	
6124 G12	
7120 B12	
7121 B4	
7122 F6	
7123 B10	
F424 G10	
F425 G10	
F426 F10	

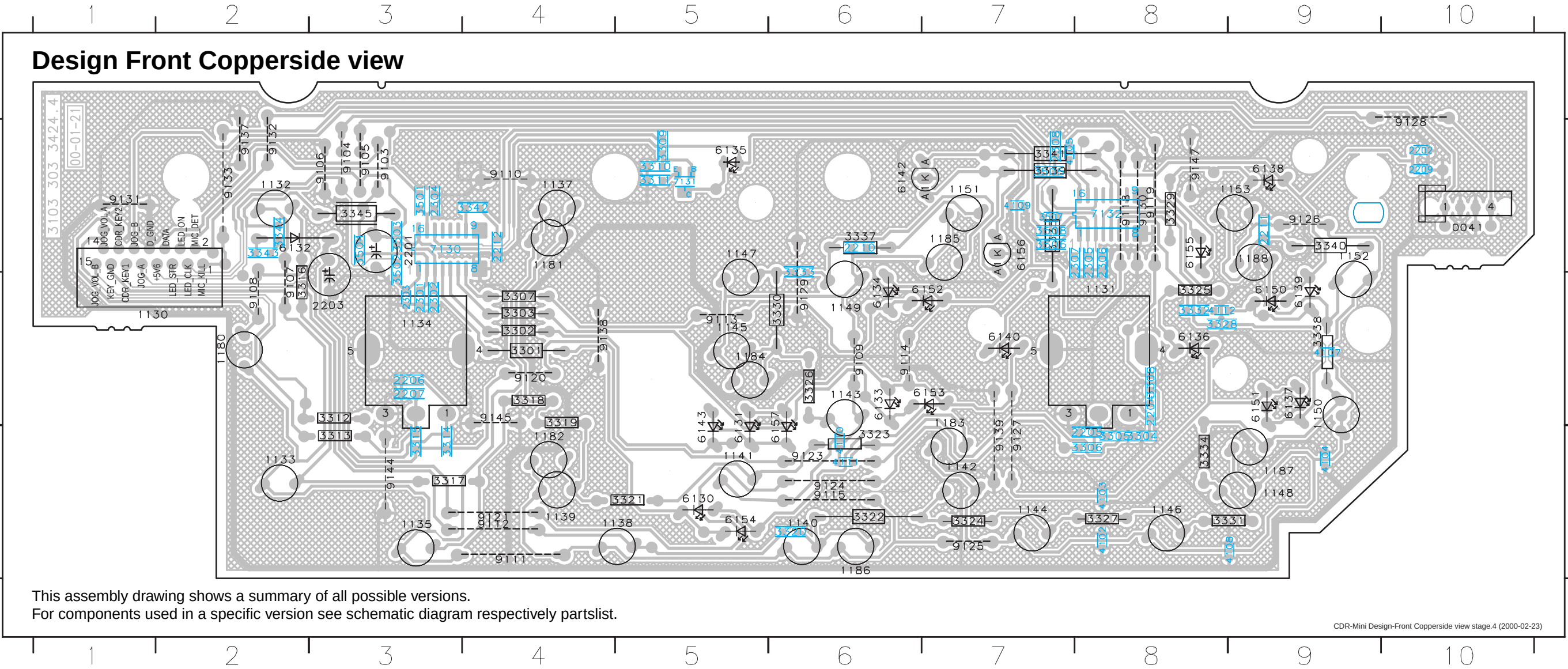
0042 C2	0406 C1	1107 A5	1117 B1	1124 D7	2158 B7	3242 B2	5102 C4	5111 A6	6106 A7	6122 A6	9004 A4	9014 A7	9021 B6	9029 B7	9036 C6	9043 B6	9050 B5	9058 B4	9065 B3	9074 C3	9081 C1	9088 D7	9095 B4
0043 A2	1101 A3	1108 A5	1118 D1	2110 B2	2177 C3	3252 B7	5103 A5	5112 A4	6107 A7	6123 A6	9006 A4	9015 A6	9022 B6	9030 B7	9037 B6	9044 B5	9051 B5	9059 B4	9066 C3	9075 C3	9082 C1	9089 D7	9096 B5
0401 B5	1102 C5	1111 B3	1119 C7	2134 B5	3095 A2	3263 B7	5104 B4	6101 D1	6108 C5	6124 A7	9007 A4	9016 A6	9023 A7	9031 B7	9038 B6	9045 B5	9052 B5	9060 B4	9068 B3	9076 B2	9083 C1	9090 B4	9097 B6
0402 A4	1103 C3	1113 A1	1120 A7	2151 B4	3234 C7	3266 B7	5107 C3	6102 B1	6109 D7	7112 A7	9009 A5	9017 A6	9024 A7	9032 B7	9039 B6	9046 B5	9054 C4	9061 B4	9069 B3	9077 B2	9084 B3	9091 B4	9098 D7
0403 A5	1104 C6	1114 A1	1121 A7	2152 A2	3235 B2	3274 B7	5108 B6	6103 A1	6110 C4	9001 A1	9010 A5	9018 B6	9026 A7	9033 C6	9040 B6	9047 B5	9055 B4	9062 B3	9070 B3	9078 C1	9085 C4	9092 C7	9099 B2
0404 A5	1105 C4	1115 A1	1122 D7	2153 C7	3240 B2	3281 B7	5109 A2	6104 A1	6120 A7	9002 A3	9012 A6	9019 B6	9027 A7	9034 C6	9041 B6	9048 B5	9056 C4	9063 B4	9071 B3	9079 C1	9086 C6	9093 A6	9100 B1
0405 C6	1106 C6	1116 B1	1123 B7	2156 A6	3241 B2	5101 A6	5110 A6	6105 A1	6121 A6	9003 A3	9013 A6	9020 B6	9028 A7	9035 C6	9042 B6	9049 B5	9057 C4	9064 B4	9073 C4	9080 B1	9087 D7	9094 B6	9101 A3

Front Board Componentside view

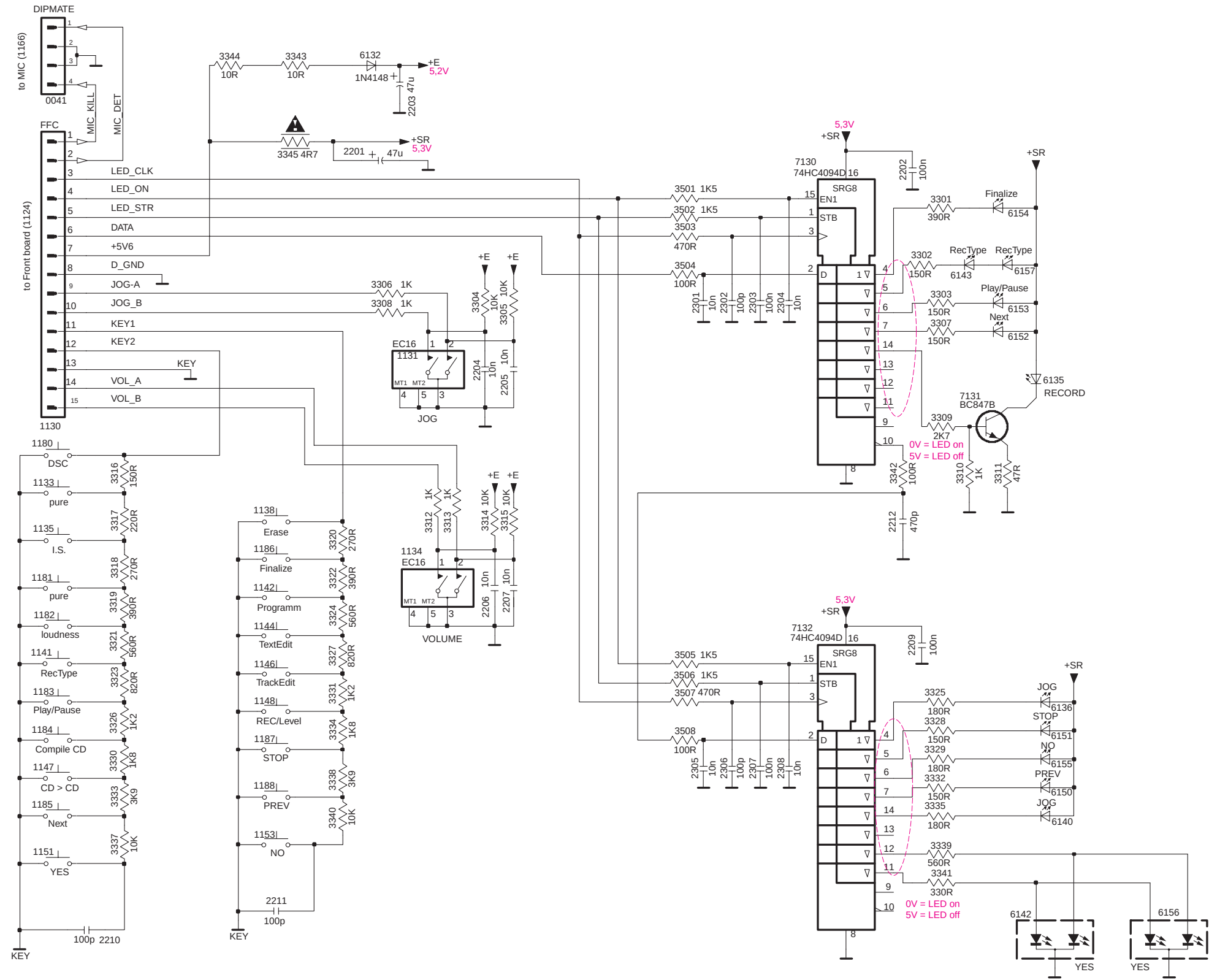


This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

0041 A10	1139 C4	1148 C9	1183 B7	2204 B8	2304 A3	3305 C8	3318 B4	3327 C8	3337 A6	3501 A3	4103 C8	6130 C5	6139 B9	6155 A8	9106 A3	9115 C6	9127 C7	9139 C7
1130 B1	1140 C6	1149 B6	1184 B5	2205 C8	2305 A8	3306 C8	3319 B4	3328 B8	3338 B9	3502 A3	4104 C9	6131 C5	6140 B7	6156 A7	9107 B2	9118 A8	9128 A10	9144 C3
1131 B8	1141 C5	1150 B9	1185 A7	2206 B3	2306 A8	3307 B4	3320 C6	3329 A8	3339 A7	3503 A3	4105 A7	6132 A2	6142 A6	6157 C6	9108 B2	9119 A8	9129 B6	9145 B4
1132 A2	1142 C7	1151 A7	1186 C6	2207 B3	2307 A7	3312 B3	3321 C5	3330 B6	3340 A9	3504 A3	4107 B9	6133 B6	6143 C5	7130 A3	9109 B6	9120 B4	9130 A8	9147 A8
1133 C2	1143 B6	1152 A9	1187 C9	2211 A9	2308 A7	3313 C3	3322 C6	3331 C9	3341 A7	3505 A7	4108 C9	6134 B6	6150 B9	7131 A5	9110 A4	9121 C4	9131 A1	
1134 B3	1144 C7	1153 A9	1188 A9	2212 A4	3301 B4	3314 C3	3323 C6	3332 B8	3342 A4	3506 A7	4109 A7	6135 A5	6151 B9	7132 A8	9111 C4	9123 C6	9132 A2	
1135 C3	1145 B5	1180 B2	2201 A3	2301 B3	3302 B4	3315 C3	3324 C7	3333 A6	3343 A2	3507 A7	4110 C6	6136 B8	6152 B7	9103 A3	9112 C4	9124 C6	9133 A2	
1137 A4	1146 C8	1181 A4	2202 A10	2302 B3	3303 B4	3316 B2	3325 B8	3334 C8	3344 A2	3508 A7	4111 C6	6137 B9	6153 B7	9104 A3	9113 B5	9125 C7	9137 A2	
1138 C5	1147 A5	1182 C4	2203 B3	2303 B3	3304 C8	3317 C3	3326 B6	3335 A7	3345 A3	4102 C8	4112 B8	6138 A9	6154 C5	9105 A3	9114 B6	9126 A9	9138 B4	



Design Front



ELECTRICAL PARTSLIST FRONT BOARD

MISCELLANEOUS					CAPACITORS				
1101	3103 308 52930	DISPLAY, BJ721GNK			2134	4822 124 12245	220µF	20%	16V
1102	8203 303 90420	FLEX FOIL CONNECTOR 19P			2135 ©	4822 126 10326	180pF	5%	
1104	4822 267 10733	FFC SOCKET, 4P			2136 ©	4822 126 10326	180pF	5%	
1105	4822 267 10953	FLEX FOIL CONNECTOR 7P			2137 ©	4822 126 10326	180pF	5%	
1106	4822 267 10954	FFC SOCKET, 5P			2138 ©	4822 126 10326	180pF	5%	
1113	4822 276 13775	TACT SWITCH			2139 ©	4822 126 10326	180pF	5%	
1114	4822 276 13775	TACT SWITCH			2140 ©	4822 126 10326	180pF	5%	
1115	4822 276 13775	TACT SWITCH			2141 ©	4822 126 10326	180pF	5%	
1116	4822 276 13775	TACT SWITCH			2142 ©	4822 126 10326	180pF	5%	
1117	4822 276 13775	TACT SWITCH			2143 ©	4822 126 10326	180pF	5%	
1118	4822 276 13775	TACT SWITCH			2144 ©	4822 126 10326	180pF	5%	
1119	4822 276 13775	TACT SWITCH			2145 ©	4822 126 10326	180pF	5%	
1120	4822 276 13775	TACT SWITCH			2146 ©	4822 126 10326	180pF	5%	
1121	4822 276 13775	TACT SWITCH			2150 ©	4822 126 14585	100nF	10%	50V
1122	4822 276 13775	TACT SWITCH			2151	4822 124 12245	220µF	20%	16V
1123	4822 276 13775	TACT SWITCH			2152	4822 124 22833	10µF	20%	50V
1124	4822 265 10979	FLEX FOIL CONNECTOR 15P			2153	4822 124 21913	1µF	20%	63V
1130	4822 265 10979	FLEX FOIL CONNECTOR 15P			2154 ©	4822 126 13838	100nF	10%	50V
1131	8203 303 84410	JOG ENCODER			2155 ©	4822 122 33177	10nF	20%	50V
1134	8203 303 84730	VOL ENCODER			2156	4822 124 22833	10µF	20%	50V
1135	4822 276 13775	TACT SWITCH			2157 ©	4822 122 33177	10nF	20%	50V
1138	4822 276 13775	TACT SWITCH			2158	4822 124 81286	47µF	20%	16V
1141	4822 276 13775	TACT SWITCH			2159 ©	4822 122 33127	2,2nF	10%	63V
1142	4822 276 13775	TACT SWITCH			2161 ©	5322 122 31647	1nF	10%	63V
1144	4822 276 13775	TACT SWITCH			2165 ©	5322 122 32531	100pF	5%	50V
1146	4822 276 13775	TACT SWITCH			2166 ©	4822 126 13692	47pF	1%	63V
1147	4822 276 13775	TACT SWITCH			2167 ©	4822 126 13692	47pF	1%	63V
1148	4822 276 13775	TACT SWITCH			2168 ©	4822 126 13692	47pF	1%	63V
1151	4822 276 13775	TACT SWITCH			2169 ©	4822 126 13692	47pF	1%	63V
1153	4822 276 13775	TACT SWITCH			2170 ©	4822 126 13695	82pF	1%	63V
1160	4822 267 10958	FFC-CONNECTOR, 5P, SIDE ENTRY			2171 ©	4822 126 13692	47pF	1%	63V
1162	4822 267 31448	CINCH SOCKET, 2-FOLD			2172 ©	4822 126 14585	100nF	10%	50V
1173	4822 276 13775	TACT SWITCH			2173 ©	4822 126 13692	47pF	1%	63V
1174	4822 276 13775	TACT SWITCH			2174 ©	5322 116 80853	560pF	5%	63V
1180	4822 276 13775	TACT SWITCH			2175 ©	5322 122 31647	1nF	10%	63V
1181	4822 276 13775	TACT SWITCH			2176 ©	4822 122 33173	560pF	10%	63V
1182	4822 276 13775	TACT SWITCH			2177	4822 124 22652	2,2µF	20%	50V
1183	4822 276 13775	TACT SWITCH			2178 ©	5322 122 32531	100pF	5%	50V
1184	4822 276 13775	TACT SWITCH			2179 ©	4822 122 33127	2,2nF	10%	63V
1185	4822 276 13775	TACT SWITCH			2180 ©	4822 126 14076	220nF	20%	25V
1186	4822 276 13775	TACT SWITCH			2180 ©	4822 126 14585	100nF	10%	50V
1187	4822 276 13775	TACT SWITCH			2181 ©	4822 126 12105	33nF	5%	63V
1188	4822 276 13775	TACT SWITCH			2182 ©	4822 126 14585	100nF	10%	50V
					2183 ©	5322 122 32531	100pF	5%	50V
					2184 ©	5322 126 10184	820pF	5%	50V
CAPACITORS					2185 ©	4822 126 13482	470nF	20%	16V
2100 ©	5322 122 32531	100pF	5%	50V	2185 ©	4822 126 14585	100nF	10%	50V
2101 ©	4822 126 14585	100nF	10%	50V	2186 ©	5322 122 32531	100pF	5%	50V
2102 ©	4822 122 33177	10nF	20%	50V	2187 ©	4822 126 13751	47nF	10%	50V
2103 ©	4822 122 33177	10nF	20%	50V	2188 ©	4822 126 14076	220nF	20%	25V
2103 ©	5322 122 31647	1nF	10%	63V	2189 ©	4822 126 14043	1µF	20%	16V
2108 ©	4822 126 10326	180pF	5%		2190 ©	4822 122 33177	10nF	20%	50V
2109 ©	4822 126 10326	180pF	5%		2191 ©	4822 126 14076	220nF	20%	25V
2110	4822 124 40433	47µF	20%	25V	2191 ©	4822 126 14585	100nF	10%	50V
2111 ©	4822 126 14585	100nF	10%	50V	2192 ©	4822 126 14076	220nF	20%	25V
2114 ©	5322 122 34099	470pF	10%	63V	2193 ©	5322 122 31647	1nF	10%	63V
2115 ©	5322 122 32448	10pF	5%	50V	2194 ©	5322 122 31647	1nF	10%	63V
2116 ©	5322 122 32448	10pF	5%	50V	2195 ©	5322 122 31647	1nF	10%	63V
2121 ©	4822 126 10326	180pF	5%		2196 ©	5322 122 31647	1nF	10%	63V
2122 ©	4822 126 10326	180pF	5%		2197 ©	5322 122 31647	1nF	10%	63V
2124 ©	5322 122 32448	10pF	5%	50V	2198 ©	5322 122 31647	1nF	10%	63V
2125 ©	5322 122 32448	10pF	5%	50V	2199 ©	4822 122 33177	10nF	20%	50V
2126 ©	5322 122 32448	10pF	5%	50V	2200 ©	4822 126 14585	100nF	10%	50V
2127 ©	4822 126 13486	15pF	2%	63V	2201	4822 124 81286	47µF	20%	16V
2128 ©	4822 126 13486	15pF	2%	63V					

ELECTRICAL PARTSLIST FRONT BOARD

CAPACITORS					RESISTORS				
2202 ©	4822 126 14585	100nF	10%	50V	3128 ©	4822 117 11503	220Ω	5%	0,1W
2203	4822 124 81286	47µF	20%	16V	3129 ©	4822 117 11503	220Ω	5%	0,1W
2204 ©	4822 122 33177	10nF	20%	50V	3130 ©	4822 117 11503	220Ω	5%	0,1W
2205 ©	4822 122 33177	10nF	20%	50V	3131 ©	4822 117 11503	220Ω	5%	0,1W
2206 ©	4822 122 33177	10nF	20%	50V	3132 ©	4822 117 11503	220Ω	5%	0,1W
2207 ©	4822 122 33177	10nF	20%	50V	3133 ©	4822 117 11503	220Ω	5%	0,1W
2209 ©	4822 126 14585	100nF	10%	50V	3134 ©	4822 117 11503	220Ω	5%	0,1W
2210 ©	5322 122 32531	100pF	5%	50V	3135 ©	4822 117 11503	220Ω	5%	0,1W
2211 ©	5322 122 32531	100pF	5%	50V	3136 ©	4822 117 11504	270Ω	1%	0,1W
2212 ©	5322 122 34099	470pF	10%	63V	3137 ©	4822 051 20472	4,7kΩ	5%	0,1W
2220 ©	4822 126 14585	100nF	10%	50V	3138 ©	4822 117 11149	82kΩ	1%	0,1W
2221 ©	4822 126 14585	100nF	10%	50V	3139 ©	4822 117 11149	82kΩ	1%	0,1W
2222 ©	4822 126 14585	100nF	10%	50V	3140 ©	4822 117 11504	270Ω	1%	0,1W
2227 ©	4822 126 14043	1µF	20%	16V	3141 ©	4822 117 11503	220Ω	5%	0,1W
2228 ©	4822 126 14585	100nF	10%	50V	3142 ©	4822 117 11503	220Ω	5%	0,1W
2230 ©	4822 126 14585	100nF	10%	50V	3143 ©	4822 117 11504	270Ω	1%	0,1W
2232 ©	5322 126 10511	1nF	5%	50V	3144 ©	4822 117 11503	220Ω	5%	0,1W
2234 ©	4822 126 14585	100nF	10%	50V	3145 ©	4822 051 20471	470Ω	5%	0,1W
2235 ©	5322 122 33538	150pF	5%	63V	3146 ©	4822 117 11504	270Ω	1%	0,1W
2260 ©	4822 126 14585	100nF	10%	50V	3147 ©	4822 117 11503	220Ω	5%	0,1W
2262 ©	5322 122 32531	100pF	5%	50V	3148 ©	4822 117 11503	220Ω	5%	0,1W
2301 ©	4822 122 33177	10nF	20%	50V	3149 ©	4822 117 11504	270Ω	1%	0,1W
2302 ©	5322 122 32531	100pF	5%	50V	3150 ©	4822 117 11503	220Ω	5%	0,1W
2303 ©	4822 126 14585	100nF	10%	50V	3151 ©	4822 117 11503	220Ω	5%	0,1W
2304 ©	4822 122 33177	10nF	20%	50V	3152 ©	4822 117 11504	270Ω	1%	0,1W
2305 ©	4822 122 33177	10nF	20%	50V	3153 ©	4822 051 10102	1kΩ	2%	0,25W
2306 ©	5322 122 32531	100pF	5%	50V	3154 ©	4822 117 11503	220Ω	5%	0,1W
2307 ©	4822 126 14585	100nF	10%	50V	3155 ©	4822 117 11504	270Ω	1%	0,1W
2308 ©	4822 122 33177	10nF	20%	50V	3156 ©	4822 051 10102	1kΩ	2%	0,25W
					3158 ©	4822 117 11503	220Ω	5%	0,1W
RESISTORS					3159 ©	4822 051 20471	470Ω	5%	0,1W
3094 ©	4822 051 20471	470Ω	5%	0,1W	3160 ©	4822 117 11503	220Ω	5%	0,1W
3095	4822 050 11002	1kΩ	5%	0,2W	3161 ©	4822 051 10102	1kΩ	2%	0,25W
3096 ©	4822 051 20471	470Ω	5%	0,1W	3162 ©	4822 117 11503	220Ω	5%	0,1W
3097 ©	4822 051 20471	470Ω	5%	0,1W	3163 ©	4822 051 10102	1kΩ	2%	0,25W
3098 ©	4822 051 20471	470Ω	5%	0,1W	3164 ©	4822 117 11503	220Ω	5%	0,1W
3099 ©	4822 051 20471	470Ω	5%	0,1W	3165 ©	4822 051 20471	470Ω	5%	0,1W
3101 ©	4822 051 20472	4,7kΩ	5%	0,1W	3166 ©	4822 117 11503	220Ω	5%	0,1W
3102 ©	4822 117 11149	82kΩ	1%	0,1W	3167 ©	4822 051 10102	1kΩ	2%	0,25W
3103 ©	4822 117 11149	82kΩ	1%	0,1W	3168 ©	4822 117 11503	220Ω	5%	0,1W
3104 ©	4822 117 11503	220Ω	5%	0,1W	3169 ©	4822 117 11503	220Ω	5%	0,1W
3105 ©	4822 117 11503	220Ω	5%	0,1W	3170 ©	4822 117 11503	220Ω	5%	0,1W
3106 ©	4822 117 11503	220Ω	5%	0,1W	3171 ©	4822 117 11503	220Ω	5%	0,1W
3107 ©	4822 117 11503	220Ω	5%	0,1W	3172 ©	4822 051 10102	1kΩ	2%	0,25W
3108 ©	4822 117 11503	220Ω	5%	0,1W	3173 ©	4822 051 10102	1kΩ	2%	0,25W
3109 ©	4822 117 11503	220Ω	5%	0,1W	3174 ©	4822 051 10102	1kΩ	2%	0,25W
3110 ©	4822 117 11503	220Ω	5%	0,1W	3175 ©	4822 051 10102	1kΩ	2%	0,25W
3111 ©	4822 117 11503	220Ω	5%	0,1W	3176 ©	4822 051 20101	100Ω	5%	0,1W
3112 ©	4822 117 11503	220Ω	5%	0,1W	3177 ©	4822 051 10102	1kΩ	2%	0,25W
3113 ©	4822 117 11503	220Ω	5%	0,1W	3178 ©	4822 051 20101	100Ω	5%	0,1W
3114 ©	4822 117 11503	220Ω	5%	0,1W	3179 ©	4822 051 10102	1kΩ	2%	0,25W
3115 ©	4822 117 11503	220Ω	5%	0,1W	3180 ©	4822 051 10102	1kΩ	2%	0,25W
3116 ©	4822 117 11503	220Ω	5%	0,1W	3181 ©	4822 051 10102	1kΩ	2%	0,25W
3117 ©	4822 117 11503	220Ω	5%	0,1W	3182 ©	4822 051 20471	470Ω	5%	0,1W
3118 ©	4822 117 11503	220Ω	5%	0,1W	3183 ©	4822 117 11139	1,5kΩ	1%	0,1W
3119 ©	4822 117 11503	220Ω	5%	0,1W	3184 ©	4822 117 11139	1,5kΩ	1%	0,1W
3120 ©	4822 117 11503	220Ω	5%	0,1W	3185 ©	4822 051 20101	100Ω	5%	0,1W
3121 ©	4822 117 11503	220Ω	5%	0,1W	3186 ©	4822 051 10102	1kΩ	2%	0,25W
3122 ©	4822 117 11503	220Ω	5%	0,1W	3187 ©	4822 051 10102	1kΩ	2%	0,25W
3123 ©	4822 117 11503	220Ω	5%	0,1W	3188 ©	4822 051 10102	1kΩ	2%	0,25W
3124 ©	4822 117 11503	220Ω	5%	0,1W	3189 ©	4822 051 20471	470Ω	5%	0,1W
3125 ©	4822 117 11503	220Ω	5%	0,1W	3190 ©	4822 051 10102	1kΩ	2%	0,25W
3126 ©	4822 117 11503	220Ω	5%	0,1W	3191 ©	4822 051 20471	470Ω	5%	0,1W
3127 ©	4822 117 11503	220Ω	5%	0,1W	3192 ©	4822 051 10102	1kΩ	2%	0,25W

ELECTRICAL PARTSLIST FRONT BOARD**RESISTORS**

3193 ©	4822 051 10102	1kΩ	2%	0,25W
3194 ©	4822 051 10102	1kΩ	2%	0,25W
3195 ©	4822 051 10102	1kΩ	2%	0,25W
3196 ©	4822 051 10102	1kΩ	2%	0,25W
3197 ©	4822 051 10102	1kΩ	2%	0,25W
3198 ©	4822 051 10102	1kΩ	2%	0,25W
3199 ©	4822 051 10102	1kΩ	2%	0,25W
3200 ©	4822 051 10102	1kΩ	2%	0,25W
3201 ©	4822 051 10102	1kΩ	2%	0,25W
3202 ©	4822 051 10102	1kΩ	2%	0,25W
3203 ©	4822 051 10102	1kΩ	2%	0,25W
3204 ©	4822 051 10102	1kΩ	2%	0,25W
3205 ©	4822 051 10102	1kΩ	2%	0,25W
3206 ©	4822 051 10102	1kΩ	2%	0,25W
3207 ©	4822 051 10102	1kΩ	2%	0,25W
3208 ©	4822 051 10102	1kΩ	2%	0,25W
3209 ©	4822 051 10102	1kΩ	2%	0,25W
3210 ©	4822 051 10102	1kΩ	2%	0,25W
3211 ©	4822 051 10102	1kΩ	2%	0,25W
3212 ©	4822 051 10102	1kΩ	2%	0,25W
3213 ©	4822 051 10102	1kΩ	2%	0,25W
3214 ©	4822 051 20101	100Ω	5%	0,1W
3215 ©	4822 051 20478	4,7Ω	5%	0,1W
3216 ©	4822 051 20478	4,7Ω	5%	0,1W
3217 ©	4822 051 20684	680kΩ	5%	0,1W
3218 ©	4822 051 20478	4,7Ω	5%	0,1W
3219 ©	4822 051 20478	4,7Ω	5%	0,1W
3220 ©	4822 051 20101	100Ω	5%	0,1W
3221 ©	4822 051 20101	100Ω	5%	0,1W
3222 ©	4822 117 10833	10kΩ	1%	0,1W
3223 ©	4822 117 10833	10kΩ	1%	0,1W
3224 ©	4822 051 20684	680kΩ	5%	0,1W
3225 ©	4822 051 10102	1kΩ	2%	0,25W
3226 ©	4822 117 10837	100kΩ	1%	0,1W
3227 ©	4822 051 10102	1kΩ	2%	0,25W
3228 ©	4822 117 10833	10kΩ	1%	0,1W
3230 ©	4822 051 10102	1kΩ	2%	0,25W
3231 ©	4822 117 10837	100kΩ	1%	0,1W
3232 ©	4822 051 10102	1kΩ	2%	0,25W
3233 ©	4822 051 20101	100Ω	5%	0,1W
3234	4822 116 52175	100Ω	5%	0,5W
3235	4822 116 52195	47Ω	5%	0,5W
3236 ©	4822 051 20333	33kΩ	5%	0,1W
3237 ©	4822 051 20478	4,7Ω	5%	0,1W
3238 ©	4822 051 20478	4,7Ω	5%	0,1W
3240	4822 050 21003	10kΩ	2%	0,25W
3241	4822 050 21003	10kΩ	2%	0,25W
3242	4822 050 21003	10kΩ	2%	0,25W
3243 ©	4822 051 10102	1kΩ	2%	0,25W
3244 ©	4822 051 10102	1kΩ	2%	0,25W
3245 ©	4822 051 10102	1kΩ	2%	0,25W
3246 ©	4822 051 10102	1kΩ	2%	0,25W
3247 ©	4822 051 10102	1kΩ	2%	0,25W
3248 ©	4822 117 11449	2,2kΩ	1%	0,1W
3249 ©	4822 117 13579	220kΩ	1%	0,1W
3250 ©	4822 117 11503	220Ω	5%	0,1W
3251 ©	4822 117 11503	220Ω	5%	0,1W
3252	4822 116 52195	47Ω	5%	0,5W
3253 ©	4822 051 10102	1kΩ	2%	0,25W
3254 ©	4822 051 10102	1kΩ	2%	0,25W
3255 ©	4822 117 10833	10kΩ	1%	0,1W
3256 ©	4822 117 10833	10kΩ	1%	0,1W
3257 ©	4822 051 20392	3,9kΩ	5%	0,1W
3258 ©	4822 051 20182	1,8kΩ	5%	0,1W

RESISTORS

3259 ©	4822 051 20122	1,2kΩ	5%	0,1W
3260 ©	4822 117 11454	820Ω	1%	
3261 ©	4822 051 20561	560Ω	5%	0,1W
3262 ©	4822 051 20391	390Ω	5%	0,1W
3263	4822 116 83876	270Ω	5%	0,16W
3264 ©	4822 117 11503	220Ω	5%	0,1W
3265 ©	4822 117 10353	150Ω	5%	0,1W
3266	4822 050 11002	1kΩ	5%	0,2W
3267 ©	4822 117 12955	2,7kΩ	1%	0,1W
3268 ©	4822 051 20684	680kΩ	5%	0,1W
3269 ©	4822 117 11139	1,5kΩ	1%	0,1W
3270 ©	4822 051 20474	470kΩ	5%	0,1W
3270 ©	4822 117 13579	220kΩ	1%	0,1W
3271 ©	4822 051 20154	150kΩ	5%	0,1W
3271 ©	4822 117 10834	47kΩ	1%	0,1W
3272 ©	4822 117 11503	220Ω	5%	0,1W
3273 ©	4822 117 10353	150Ω	5%	0,1W
3274	4822 050 11002	1kΩ	5%	0,2W
3275 ©	4822 051 20684	680kΩ	5%	0,1W
3276 ©	4822 117 12955	2,7kΩ	1%	0,1W
3277 ©	4822 117 11139	1,5kΩ	1%	0,1W
3278 ©	4822 117 12955	2,7kΩ	1%	0,1W
3279 ©	4822 051 20474	470kΩ	5%	0,1W
3279 ©	4822 117 13579	220kΩ	1%	0,1W
3280 ©	4822 051 20154	150kΩ	5%	0,1W
3280 ©	4822 117 10834	47kΩ	1%	0,1W
3281	4822 050 11002	1kΩ	5%	0,2W
3282 ©	4822 051 20684	680kΩ	5%	0,1W
3283 ©	4822 117 11139	1,5kΩ	1%	0,1W
3284 ©	4822 051 20474	470kΩ	5%	0,1W
3284 ©	4822 117 13579	220kΩ	1%	0,1W
3285 ©	4822 051 20154	150kΩ	5%	0,1W
3285 ©	4822 117 10834	47kΩ	1%	0,1W
3286 ©	4822 051 20684	680kΩ	5%	0,1W
3287 ©	4822 117 11139	1,5kΩ	1%	0,1W
3288 ©	4822 051 20474	470kΩ	5%	0,1W
3288 ©	4822 117 13579	220kΩ	1%	0,1W
3289 ©	4822 051 20154	150kΩ	5%	0,1W
3289 ©	4822 117 10834	47kΩ	1%	0,1W
3290 ©	4822 051 20101	100Ω	5%	0,1W
3292 ©	4822 117 10833	10kΩ	1%	0,1W
3293 ©	4822 051 20479	47Ω	5%	0,1W
3294 ©	4822 051 10102	1kΩ	2%	0,25W
3301	4822 116 83881	390Ω	5%	0,5W
3302	4822 116 83868	150Ω	5%	0,5W
3302	4822 116 83881	390Ω	5%	0,5W
3303	4822 116 83868	150Ω	5%	0,5W
3304 ©	4822 117 10833	10kΩ	1%	0,1W
3305 ©	4822 117 10833	10kΩ	1%	0,1W
3306 ©	4822 051 10102	1kΩ	2%	0,25W
3307	4822 116 83868	150Ω	5%	0,5W
3308 ©	4822 051 10102	1kΩ	2%	0,25W
3309 ©	4822 117 12955	2,7kΩ	1%	0,1W
3310 ©	4822 051 10102	1kΩ	2%	0,25W
3311 ©	4822 051 20479	47Ω	5%	0,1W
3312	4822 050 11002	1kΩ	5%	0,2W
3313	4822 050 11002	1kΩ	5%	0,2W
3314 ©	4822 117 10833	10kΩ	1%	0,1W
3315 ©	4822 117 10833	10kΩ	1%	0,1W
3316	4822 116 83868	150Ω	5%	0,5W
3317	4822 116 83872	220Ω	5%	0,5W
3318	4822 116 83876	270Ω	5%	0,16W
3319	4822 116 83881	390Ω	5%	0,5W
3320 ©	4822 117 11504	270Ω	1%	0,1W

ELECTRICAL PARTSLIST FRONT BOARD**RESISTORS**

3321	4822 116 52226	560Ω	5%	0,5W
3322	4822 116 83881	390Ω	5%	0,5W
3323	4822 116 52231	820Ω	5%	0,5W
3324	4822 116 52226	560Ω	5%	0,5W
3325	4822 116 52213	180Ω	5%	0,5W

3326	4822 116 52207	1,2kΩ	5%	0,5W
3327	4822 116 52231	820Ω	5%	0,5W
3328 ©	4822 117 10353	150Ω	5%	0,1W
3329	4822 116 52213	180Ω	5%	0,5W
3330	4822 116 52249	1,8kΩ	5%	0,16W

3331	4822 116 52207	1,2kΩ	5%	0,5W
3332 ©	4822 117 10353	150Ω	5%	0,1W
3333 ©	4822 051 20392	3,9kΩ	5%	0,1W
3334	4822 116 52249	1,8kΩ	5%	0,16W
3335	4822 116 52213	180Ω	5%	0,5W

3337	4822 050 21003	10kΩ	2%	0,25W
3338	4822 116 52276	3,9kΩ	5%	0,5W
3339	4822 116 52226	560Ω	5%	0,5W
3340	4822 050 21003	10kΩ	2%	0,25W
3341	4822 116 52219	330Ω	5%	0,5W

3342 ©	4822 051 20101	100Ω	5%	0,1W
3343 ©	4822 051 20109	10Ω	5%	0,1W
3344 ©	4822 051 20109	10Ω	5%	0,1W
3345	4822 052 10478	4,7Ω	5%	NFR
3350	4822 116 83883	470Ω	5%	0,16W

3351 ©	4822 117 10833	10kΩ	1%	0,1W
3353 ©	4822 117 11148	56kΩ	1%	0,1W
3354 ©	4822 051 20399	39Ω	5%	0,1W
3356 ©	4822 117 11449	2,2kΩ	1%	0,1W
3357 ©	4822 051 20683	68kΩ	5%	0,1W

3358 ©	4822 117 10833	10kΩ	1%	0,1W
3359 ©	4822 117 11503	220Ω	5%	0,1W
3362 ©	4822 051 20471	470Ω	5%	0,1W
3364 ©	4822 051 20101	100Ω	5%	0,1W
3366 ©	4822 117 10837	100kΩ	1%	0,1W

3367 ©	4822 051 20829	82Ω	5%	0,1W
3368 ©	4822 051 20561	560Ω	5%	0,1W
3401 ©	4822 117 12955	2,7kΩ	1%	0,1W
3403 ©	4822 051 10102	1kΩ	2%	0,25W
3404 ©	4822 051 20479	47Ω	5%	0,1W

3407 ©	4822 117 10833	10kΩ	1%	0,1W
3501 ©	4822 117 11139	1,5kΩ	1%	0,1W
3502 ©	4822 117 11139	1,5kΩ	1%	0,1W
3503 ©	4822 051 20471	470Ω	5%	0,1W
3504 ©	4822 051 20101	100Ω	5%	0,1W

3505 ©	4822 117 11139	1,5kΩ	1%	0,1W
3506 ©	4822 117 11139	1,5kΩ	1%	0,1W
3507 ©	4822 051 20471	470Ω	5%	0,1W
3508 ©	4822 051 20101	100Ω	5%	0,1W
4001 ©	4822 051 20008CHIP JUMPER 0805			

4002 ©	4822 051 20008CHIP JUMPER 0805			
4004 ©	4822 051 20008CHIP JUMPER 0805			
4005 ©	4822 051 20008CHIP JUMPER 0805			
4006 ©	4822 051 20008CHIP JUMPER 0805			
4007 ©	4822 051 20008CHIP JUMPER 0805			

4008 ©	4822 051 20008CHIP JUMPER 0805			
4009 ©	4822 051 20008CHIP JUMPER 0805			
4012 ©	4822 051 20008CHIP JUMPER 0805			
4013 ©	4822 051 20008CHIP JUMPER 0805			
4014 ©	4822 051 20008CHIP JUMPER 0805			

4015 ©	4822 051 20008CHIP JUMPER 0805			
4016 ©	4822 051 20008CHIP JUMPER 0805			
4017 ©	4822 051 20008CHIP JUMPER 0805			
4018 ©	4822 051 20008CHIP JUMPER 0805			

RESISTORS

4019 ©	4822 051 20008CHIP JUMPER 0805			
4021 ©	4822 051 20008CHIP JUMPER 0805			
4022 ©	4822 051 20008CHIP JUMPER 0805			
4024 ©	4822 051 20008CHIP JUMPER 0805			
4025 ©	4822 051 20008CHIP JUMPER 0805			

4026 ©	4822 051 20008CHIP JUMPER 0805			
4027 ©	4822 051 20008CHIP JUMPER 0805			
4028 ©	4822 051 20008CHIP JUMPER 0805			
4029 ©	4822 051 20008CHIP JUMPER 0805			
4030 ©	4822 051 20008CHIP JUMPER 0805			

4031 ©	4822 051 20008CHIP JUMPER 0805			
4032 ©	4822 051 20008CHIP JUMPER 0805			
4033 ©	4822 051 20008CHIP JUMPER 0805			
4034 ©	4822 051 20008CHIP JUMPER 0805			
4035 ©	4822 051 20008CHIP JUMPER 0805			

4036 ©	4822 051 20008CHIP JUMPER 0805			
4037 ©	4822 051 20008CHIP JUMPER 0805			
4038 ©	4822 051 20008CHIP JUMPER 0805			
4039 ©	4822 051 20008CHIP JUMPER 0805			
4040 ©	4822 051 20008CHIP JUMPER 0805			

4041 ©	4822 051 20008CHIP JUMPER 0805			
4042 ©	4822 051 20008CHIP JUMPER 0805			
4043 ©	4822 051 20008CHIP JUMPER 0805			
4044 ©	4822 051 20008CHIP JUMPER 0805			
4045 ©	4822 051 20008CHIP JUMPER 0805			

4046 ©	4822 051 20008CHIP JUMPER 0805			
4047 ©	4822 051 20008CHIP JUMPER 0805			
4048 ©	4822 051 20008CHIP JUMPER 0805			
4049 ©	4822 051 20008CHIP JUMPER 0805			
4050 ©	4822 051 20008CHIP JUMPER 0805			

4051 ©	4822 051 20008CHIP JUMPER 0805			
4052 ©	4822 051 20008CHIP JUMPER 0805			
4053 ©	4822 051 20008CHIP JUMPER 0805			
4054 ©	4822 051 20008CHIP JUMPER 0805			
4055 ©	4822 051 20008CHIP JUMPER 0805			

4056 ©	4822 051 20008CHIP JUMPER 0805			
4057 ©	4822 051 20008CHIP JUMPER 0805			
4058 ©	4822 051 20008CHIP JUMPER 0805			
4059 ©	4822 051 20008CHIP JUMPER 0805			
4060 ©	4822 051 20008CHIP JUMPER 0805			

4061 ©	4822 051 20008CHIP JUMPER 0805			
4102 ©	4822 051 20008CHIP JUMPER 0805			
4103 ©	4822 051 20008CHIP JUMPER 0805			
4104 ©	4822 051 20008CHIP JUMPER 0805			
4105 ©	4822 051 20008CHIP JUMPER 0805			

4106 ©	4822 051 20008CHIP JUMPER 0805			
4107 ©	4822 051 20008CHIP JUMPER 0805			
4108 ©	4822 051 20008CHIP JUMPER 0805			
4109 ©	4822 051 20008CHIP JUMPER 0805			
4110 ©	4822 051 20008CHIP JUMPER 0805			

4111 ©	4822 051 20008CHIP JUMPER 0805			
4112 ©	4822 051 20008CHIP JUMPER 0805			
4201 ©	4822 051 20008CHIP JUMPER 0805			
4203 ©	4822 051 20008CHIP JUMPER 0805			
4204 ©	4822 051 20008CHIP JUMPER 0805			

4205 ©	4822 051 20008CHIP JUMPER 0805			
4206 ©	4822 051 20008CHIP JUMPER 0805			
4501 ©	4822 051 20008CHIP JUMPER 0805			

COILS

1107	4822 242 70938	CRYSTAL 32,768kHz
1108	5322 242 73686	CERAMIC RESONATOR, 12MHZ
1111	4822 242 72195	XTAL 4,332MHz
5101	4822 156 21721	2,2μH

ELECTRICAL PARTSLIST FRONT BOARD**COILS**

5102	4822 156 21721	2,2μH
5103	4822 156 21721	2,2μH
5104	4822 156 21721	2,2μH
5107	4822 156 21721	2,2μH
5108	4822 156 21721	2,2μH
5109	4822 156 21721	2,2μH
5110	4822 156 21721	2,2μH
5111	4822 156 21721	2,2μH
5112	4822 156 21721	2,2μH
5130	2422 536 00019	TRANSFORMER, DIGITAL OUT

DIODES

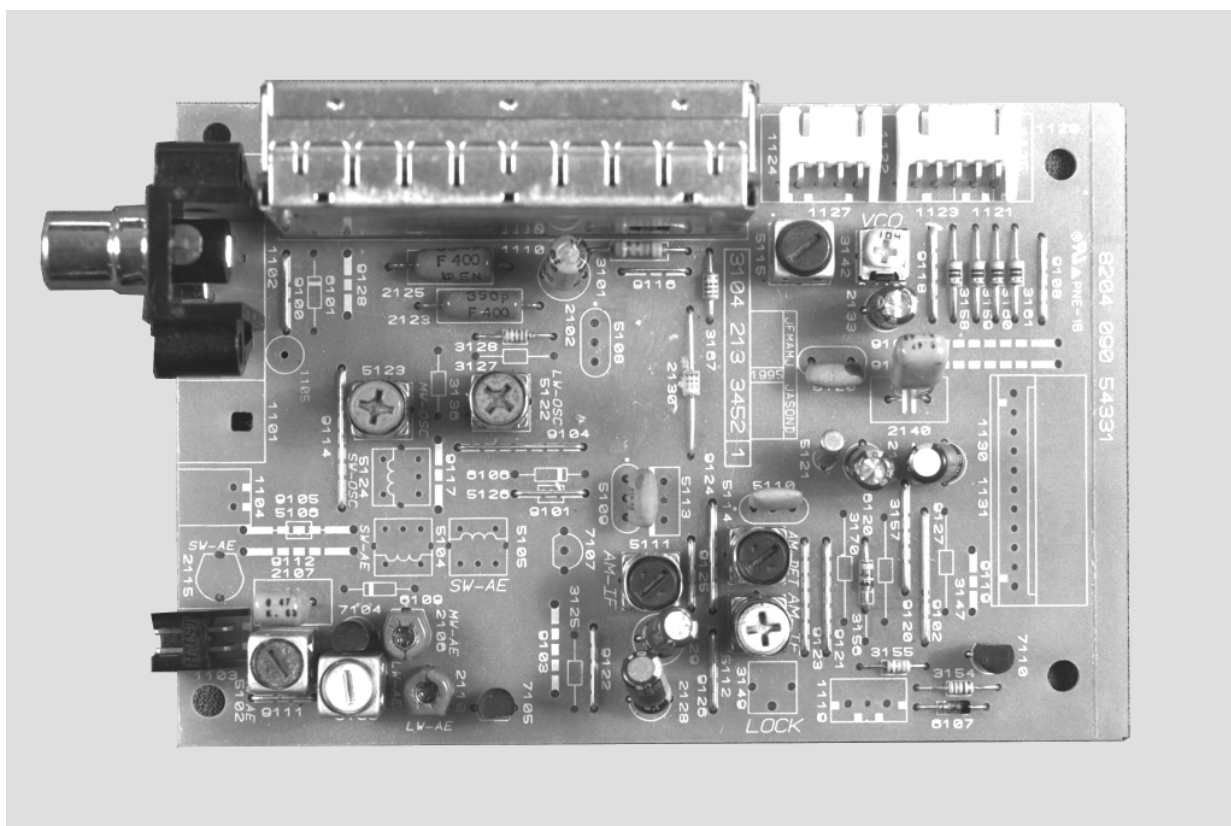
6101	4822 130 11589	LED, LTL-1CHAE
6102	4822 130 11589	LED, LTL-1CHAE
6103	4822 130 11589	LED, LTL-1CHAE
6104	4822 130 11589	LED, LTL-1CHAE
6105	9322 131 65675	LED, LTL-1CHEE
6106	4822 130 11589	LED, LTL-1CHAE
6107	4822 130 11589	LED, LTL-1CHAE
6108	4822 130 30621	1N4148
6109	4822 130 30621	1N4148
6110	4822 130 30621	1N4148
6120	4822 130 30621	1N4148
6121	4822 130 30621	1N4148
6122	4822 130 30621	1N4148
6123	4822 130 30621	1N4148
6124	4822 130 30621	1N4148
6132	4822 130 30621	1N4148
6135	8203 303 84440	LED 5MM BLUE
6136	8203 303 84850	LED, LTL2R3KFK-071A
6140	8203 303 84850	LED, LTL2R3KFK-071A
6143	4822 130 11589	LED, LTL-1CHAE
6150	4822 130 11589	LED, LTL-1CHAE
6151	4822 130 11589	LED, LTL-1CHAE
6152	4822 130 11589	LED, LTL-1CHAE
6153	4822 130 11589	LED, LTL-1CHAE
6154	4822 130 11589	LED, LTL-1CHAE
6155	4822 130 11589	LED, LTL-1CHAE
6156	8203 303 84450	LED 5MM AMBER/H.E.RED
6157	4822 130 11589	LED, LTL-1CHAE
6170	8203 303 84430	LED 5MM 90 DEGREE BLUE
6200	5322 130 30691	BAW56
6201	5322 130 30691	BAW56
6202	5322 130 30691	BAW56
6203	5322 130 30691	BAW56
6205	5322 130 30691	BAW56
6206	5322 130 30691	BAW56
6207	5322 130 30691	BAW56
6208	5322 130 30691	BAW56
6209	5322 130 30691	BAW56
6210	5322 130 30691	BAW56
6211	5322 130 30691	BAW56

TRANSISTORS

7101 ©	4822 130 60511	BC847B
7102 ©	4822 130 60511	BC847B
7103 ©	4822 130 60511	BC847B
7104 ©	4822 130 60511	BC847B
7105 ©	4822 130 60511	BC847B
7106 ©	4822 130 60511	BC847B
7111 ©	4822 130 60511	BC847B
7123 ©	4822 130 60511	BC847B
7131 ©	4822 130 60511	BC847B
7160 ©	4822 130 60511	BC847B

INTEGRATED CIRCUITS

7107 ©	4822 209 15449	74HC4094D, SHIFT REGISTER
7108 ©	8203 303 90210	TMP88CU77ZF, μP
7110 ©	9322 131 04668	M24C01, EEPROM
7112	9322 137 14667	IR RECEIVER TSOP2836ZC1
7112	9322 155 22667	IR RECEIVER TSOP2836
7120 ©	4822 209 17345	M62320FP, I2C SHIFT REGISTER
7121	4822 209 31981	SAA6579T/V1
7122 ©	5322 209 11446	HEF4051BT, MULTIPLEXER
7130 ©	4822 209 15449	74HC4094D, SHIFT REGISTER
7132 ©	4822 209 15449	74HC4094D, SHIFT REGISTER
7140 ©	4822 209 17235	74LVU04D, 6-FOLD INVERTER
7142	4822 209 10263	HEF4052BP, SELECTOR IC
7145	4822 209 10263	HEF4052BP, SELECTOR IC



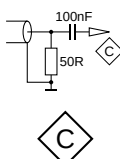
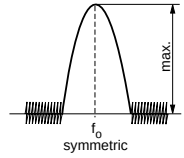
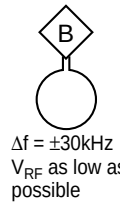
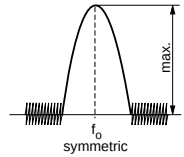
Tuner 95

(3 Band RDS Tuner)

TABLE OF CONTENTS

Adjustment table	7A-2
Blockdiagram	7A-3
Circuit Diagram	7A-4
Component Layout.....	7A-5
Electrical Partslist	7A-6

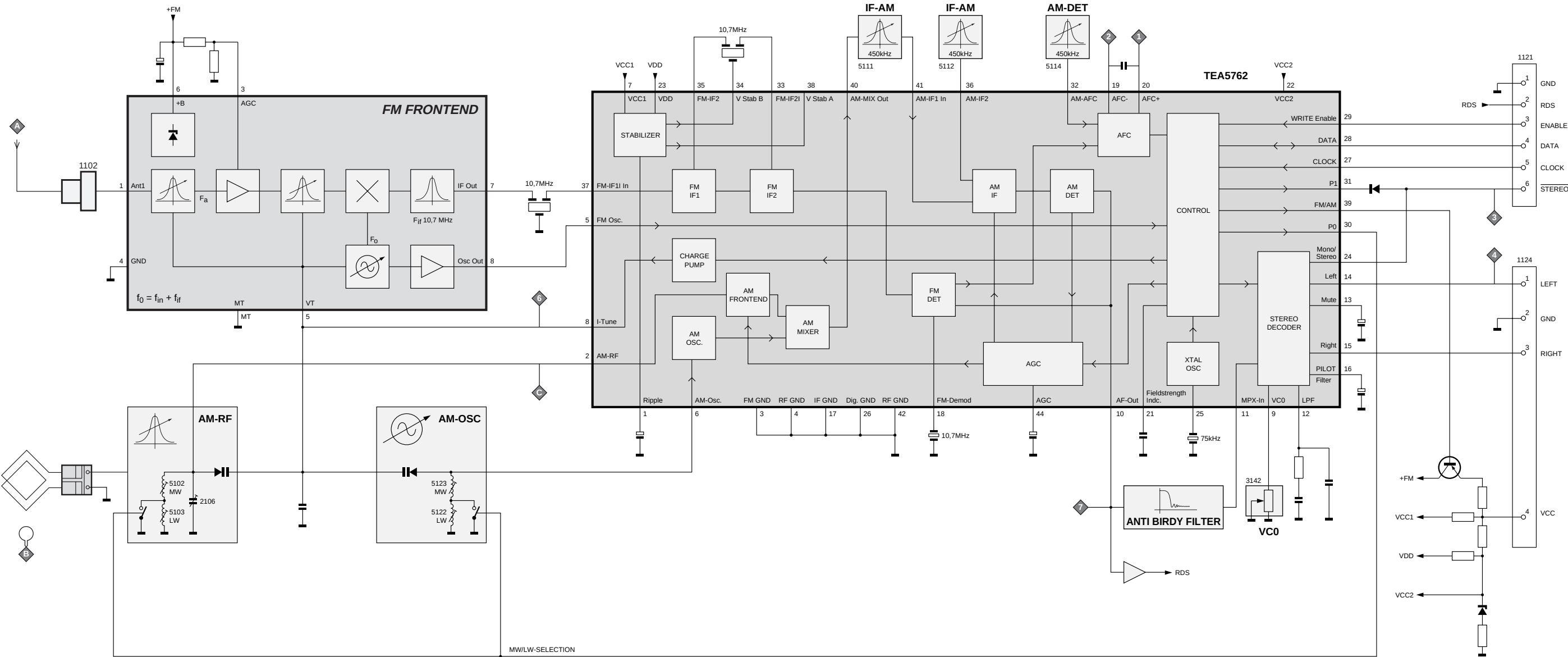
TUNER ADJUSTMENT TABLE (TUNER 95 FM/MW/LW - version with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (50kHz grid)			108MHz	check		7...9V
			87.5MHz	check		1.3...2V
MW 531 - 1602kHz (9kHz grid)			1602kHz	5123		8.3V ±0.2V
			531kHz	check		1V ±0.4V
LW 153 - 279kHz (3kHz grid)			279kHz	5122		8.3V ±0.2V
			153kHz	check		1V ±0.4V
FM - IF						
FM	98MHz 1mV continuous wave shortcircuit pin 21 of IC7108 to ground		98MHz	5107	 	0mV ±3mV
FM - VCO						
FM	98MHz 1mV continuous wave		98MHz	3142		152kHz ±1kHz ¹⁾
DISTORTION						
FM	98MHz 1mV 90% Left + 9% pilot mod=1kHz		98MHz	mixcoil inside tuner 1110		min. distortion
AM IF						
MW	450kHz Δf=10kHz as low as possible		MW	5111		
				5112		
				450kHz continuous wave		5114
AM RF ²⁾						
MW	558kHz		558kHz	5102		
	1494kHz		1494kHz	2106		
LW	198kHz		198kHz	5103		

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

²⁾ For AM RF adjustments the original frame antenna has to be used !

BLOCK DIAGRAM TUNER95



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21

A

TUNER 95 Copper side view

VDD
FM = 6V
AM = 7V

V
0V
AM FM

VT
6

LW = 0,7V
MW = 0V

LW = 0V
MW = 0,7V

IC 6105

3104 213 34853

△ only in RDS version (04121)
○ not in RDS version (04341)

TUNER 95 bis
3104 217 04121/04341 bl. 110 - 01

LEU0149
9813

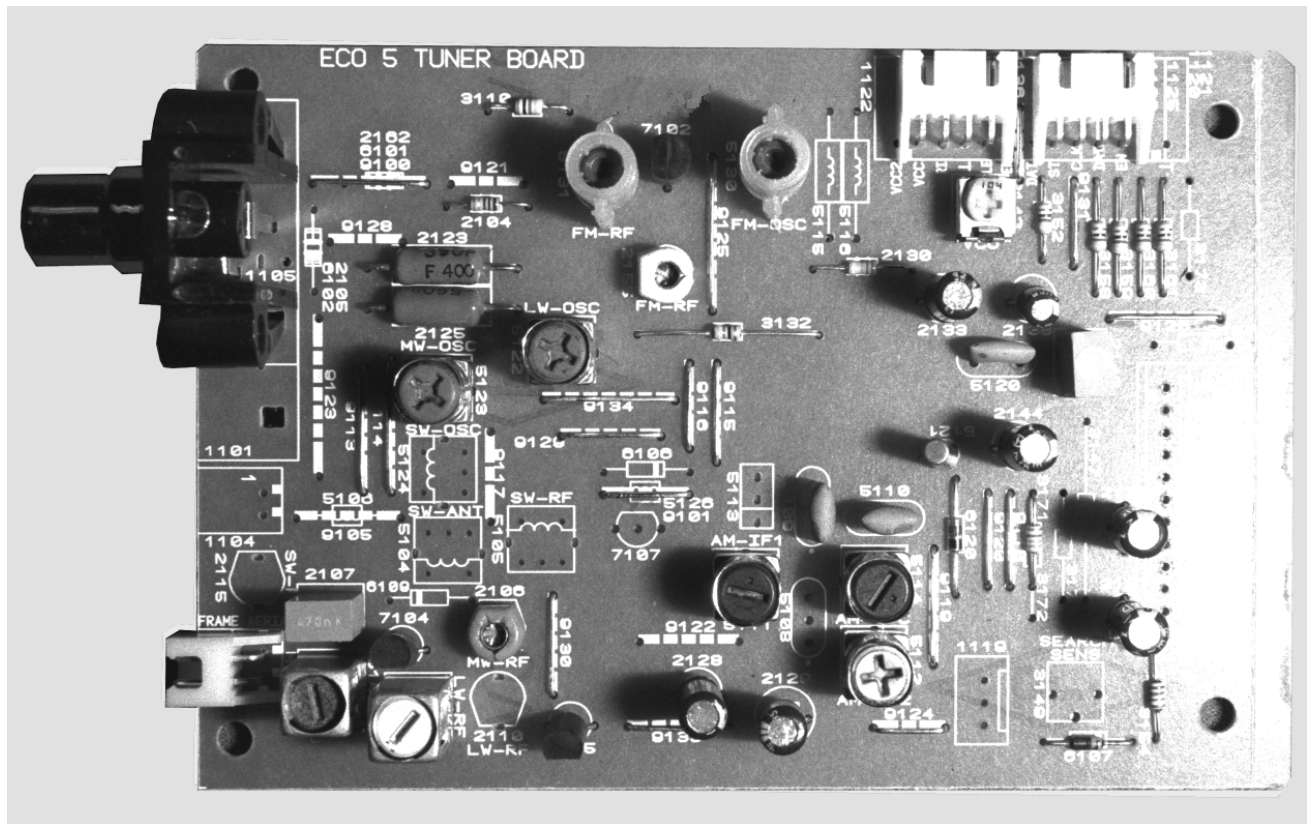
ELECTRICAL PARTSLIST TUNER 95

MISCELLANEOUS				
1102	4822 267 10283	SOCKET COAX, IEC 75Ω		
1103	4822 265 31184	JST CONNECTOR 2 POLE		
1110	4822 210 10492	FRONTEND ASSY /02/08		
1110	4822 210 10739	FM-FRONTEND FE415-G23		
CAPACITORS				
2102	4822 124 80791	470μF	20%	16V
2106	4822 125 60102	30pF	TRIMCAP	
2107	4822 121 51252	470nF	5%	63V
2108 ©	4822 126 13695	82pF	1%	63V
2109 ©	5322 122 32658	22pF	5%	50V
2120 ©	5322 122 32659	33pF	5%	50V
2122 ©	5322 126 10465	3,9nF	10%	63V
2123	4822 121 10766	390pF	1%	630V
2125	4822 121 10578	560pF	1%	630V
2127 ©	4822 122 32927	220nF	10%	63V
2128	4822 124 41579	10μF	20%	50V
2129	4822 124 40242	1μF	20%	63V
2130	4822 126 11585	22nF	20%	50V
2131 ©	4822 122 33325	470nF	20%	50V
2132 ©	4822 122 33325	470nF	20%	50V
2133	4822 124 40242	1μF	20%	63V
2134 ©	4822 126 13188	15nF	5%	63V
2135 ©	4822 122 32927	220nF	10%	63V
2136 ©	4822 126 13188	15nF	5%	63V
2137 ©	4822 122 32927	220nF	10%	63V
2138	4822 124 41576	2,2μF	20%	50V
2140	4822 121 51252	470nF	5%	63V
2141 ©	4822 122 31947	100nF	20%	50V
2142 ©	4822 122 31947	100nF	20%	50V
2143 ©	4822 122 32927	220nF	10%	63V
2144	4822 124 40242	1μF	20%	63V
2145 ©	4822 122 33575	220pF	5%	50V
2147 ©	4822 122 33575	220pF	5%	50V
2148 ©	4822 122 33575	220pF	5%	50V
2150 ©	4822 122 31947	100nF	20%	50V
2158 ©	4822 122 31947	100nF	20%	50V
2160 ©	4822 122 32139	12pF	5%	63V
2161 ©	5322 122 34123	1nF	10%	50V
2162	4822 124 81151	22μF	20%	50V
RESISTORS				
3090	4822 116 52206	120Ω	5%	0,5W
3091	4822 116 52206	120Ω	5%	0,5W
3092	4822 116 52219	330Ω	5%	0,5W
3102 ©	4822 117 13579	220kΩ	1%	0,1W
3103 ©	4822 051 20184	180kΩ	5%	0,1W
3104 ©	4822 051 10102	1kΩ	2%	0,25W
3107 ©	4822 051 20829	82Ω	5%	0,1W
3108 ©	4822 117 11449	2,2kΩ	1%	0,1W
3109 ©	4822 117 11449	2,2kΩ	1%	0,1W
3120 ©	4822 051 20008	CHIP JUMPER 0805		
3123 ©	4822 051 10008	CHIP JUMPER 1206		
3124 ©	4822 051 10008	CHIP JUMPER 1206		
3125	4822 116 83864	10kΩ	5%	0,5W
3128	4822 116 52256	2,2kΩ	5%	0,16W
3129 ©	4822 051 20008	CHIP JUMPER 0805		
3130 ©	4822 051 10008	CHIP JUMPER 1206		
3131 ©	4822 051 10008	CHIP JUMPER 1206		
3132 ©	4822 051 20008	CHIP JUMPER 0805		
3134 ©	4822 051 20223	22kΩ	5%	0,1W
3137 ©	4822 117 10833	10kΩ	1%	0,1W

RESISTORS						
3140 ©	4822 051 20331	330Ω	5%	0,1W		
3141 ©	4822 117 11148	56kΩ	1%	0,1W		
3142	4822 100 11163	100kΩ TRIMPOT LIN.				
3143 ©	4822 051 20223	22kΩ	5%	0,1W		
3144 ©	4822 051 10102	1kΩ	2%	0,25W		
3145 ©	4822 117 11449	2,2kΩ	1%	0,1W		
3146 ©	4822 051 20479	47Ω	5%	0,1W		
3150 ©	4822 051 20472	4,7kΩ	5%	0,1W		
3151 ©	4822 051 20683	68kΩ	5%	0,1W		
3152 ©	4822 051 20471	470Ω	5%	0,1W		
3153 ©	4822 051 20471	470Ω	5%	0,1W		
3154	4822 116 83868	150Ω	5%	0,5W		
3155	4822 116 52219	330Ω	5%	0,5W		
3158	4822 116 83883	470Ω	5%	0,16W		
3159	4822 116 83883	470Ω	5%	0,16W		
3160	4822 116 83883	470Ω	5%	0,16W		
3161	4822 116 83883	470Ω	5%	0,16W		
3162 ©	4822 117 13579	220kΩ	1%	0.1W		
3163 ©	4822 051 10008	CHIP JUMPER 1206				
3164	4822 052 10478	4,7Ω	5%	NFR		
3167	4822 116 83872	220Ω	5%	0,5W		
3169 ©	4822 051 20008	CHIP JUMPER 0805				
3172 ©	4822 051 10008	CHIP JUMPER 1206				
3181 ©	4822 051 10008	CHIP JUMPER 1206				
3183 ©	4822 051 10008	CHIP JUMPER 1206				
3184 ©	4822 051 10008	CHIP JUMPER 1206				
3185 ©	4822 051 10008	CHIP JUMPER 1206				
3186 ©	4822 051 10102	1kΩ	2%	0,25W		
3188 ©	4822 051 10008	CHIP JUMPER 1206				
3191 ©	4822 117 10353	150Ω	5%	0,1W		
3192 ©	4822 051 20008	CHIP JUMPER 0805				
3197 ©	4822 051 20472	4,7kΩ	5%	0,1W		
COILS						
5102	4822 157 71634	RF-COIL MW				
5103	4822 157 71635	RF-COIL LW				
5109	4822 157 71639	FM-IF FILTER 10,7MHz				
5110	4822 242 70665	FM-IF FILTER 10,7MHz				
5111	4822 158 60511	AM-IF FILTER 450kHz				
5112	4822 157 70302	AM-IF FILTER 450kHz				
5114	4822 157 70302	AM-IF FILTER 450kHz				
5115	4822 157 71636	ANTI BIRDY FILTER				
5120	4822 242 10251	CER. DISCR. 10.7MG61KA-TF21				
5121	4822 242 10261	QUARTZ 75kHz				
5122	4822 157 60517	RF-COIL AM				
5123	4822 157 60517	RF-COIL AM				
DIODES						
6105 ©	4822 130 83075	HN1V02H				
6106	4822 130 30621	1N4148				
6107	4822 130 34488	BZX79-C11				
6120	4822 130 30621	1N4148				
TRANSISTORS						
7103 ©	4822 130 42513	BC858C				
7104	5322 130 44779	BC338-40				
7105	5322 130 44779	BC338-40				
7109 ©	5322 130 41983	BC858B				
7110 ©	5322 130 41983	BC858B				
7122 ©	5322 130 42136	BC848C				
7124 ©	5322 130 42136	BC848C				

ELECTRICAL PARTSLIST TUNER 95

INTEGRATED CIRCUITS		
7101	4822 209 90315	TEA5762H/V1, RADIO IC



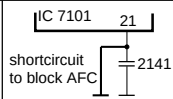
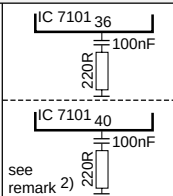
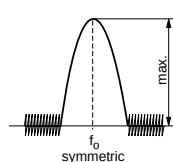
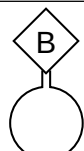
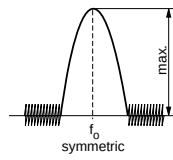
Tuner ECO 5

(3 Band Tuner)

TABLE OF CONTENTS

Adjustment table	7B-2
Blockdiagram	7B-3
Circuit Diagram	7B-4
Component Layout.....	7B-5
Electrical Partslist	7B-6

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

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

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

ECO5, discr. coil, 090797

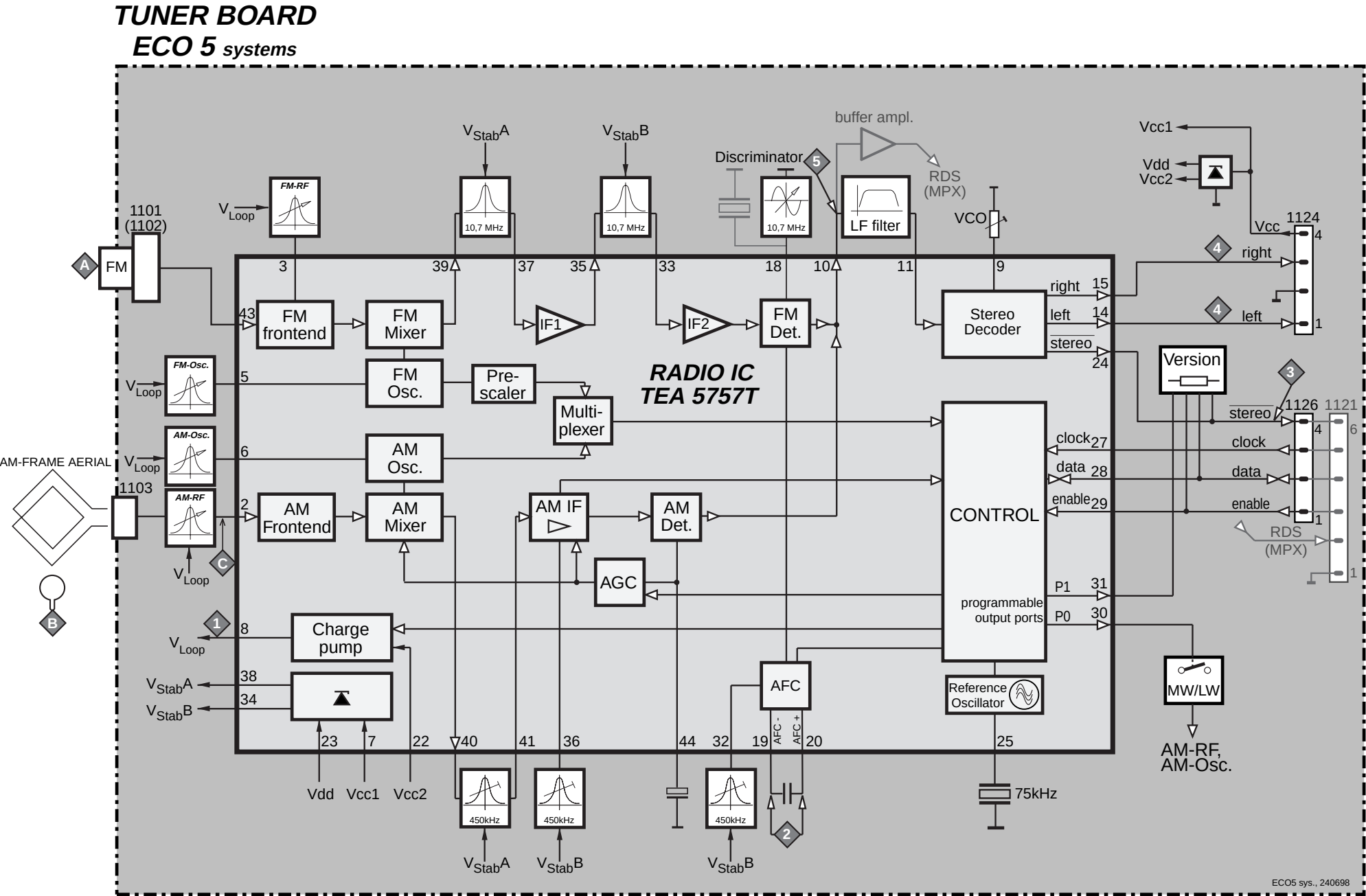
¹⁾ If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

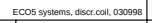
²⁾ RC network serves for damping the IF-filter while adjusting the other one.

³⁾ For AM RF adjustments the original frame antenna has to be used !

⁴⁾ MW has to be aligned before LW.

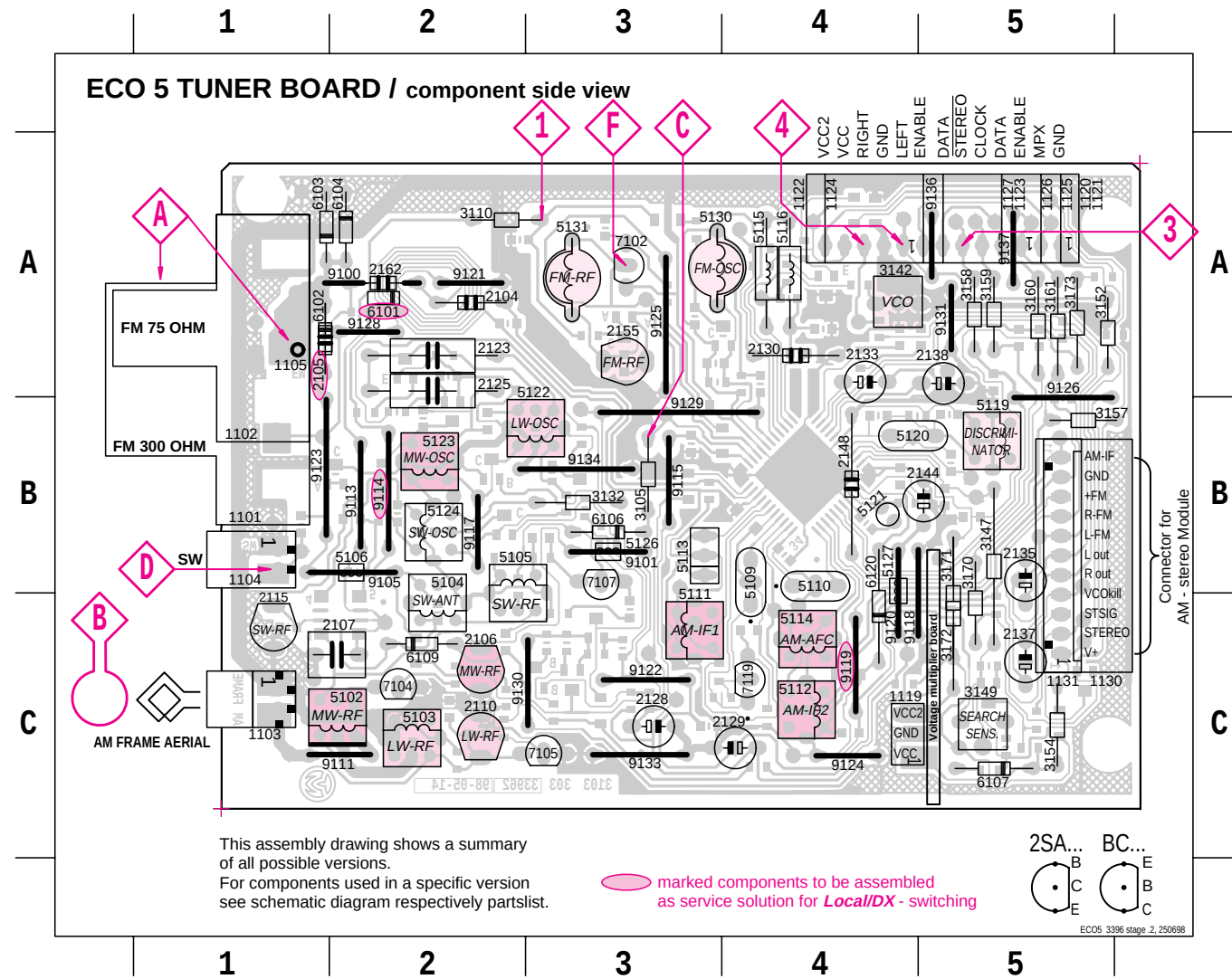
BLOCK DIAGRAM TUNER ECO5



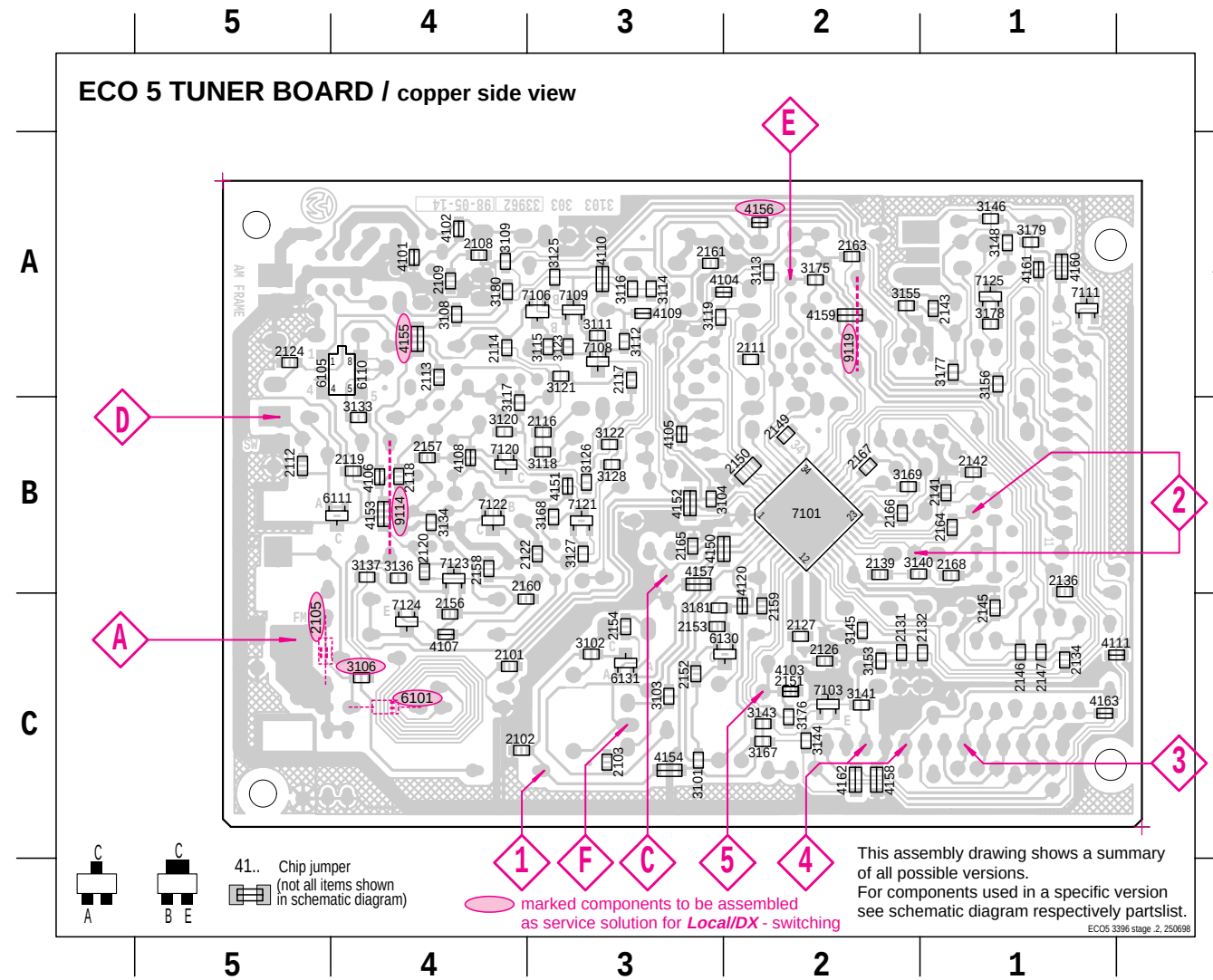
ECO5 systems, discr.coll, 030998

ECO5 systems, discr.coll, 030998

1101 A1	2106 C2	2137 C5	3149 C5	3173 A5	5114 C4	5130 A3	7104 C2	9117 B2	9129 B3
1102 A1	2107 C2	2138 A5	3152 A5	5102 C2	5115 A4	5131 A3	7105 C3	9118 B4	9130 C3
1103 C1	2110 C2	2144 B5	3154 C5	5103 C2	5116 A4	6101 A2	7107 B3	9119 C4	9131 A5
1104 B1	2115 C1	2148 B4	3157 B5	5104 C2	5119 B5	6102 A1	7119 C4	9120 B4	9133 C3
1105 A1	2123 A2	2155 A3	3158 A5	5105 B2	5120 B4	6103 A1	9100 A2	9121 A2	9134 B3
1119 C5	2125 A2	2162 A2	3159 A5	5106 B2	5121 B4	6104 A2	9101 B3	9122 C3	9136 A5
1120 A5	2128 C3	3105 B3	3160 A5	5109 B4	5122 B3	6106 B3	9105 B2	9123 B1	9137 A5
1130 B5	2129 C4	3110 A2	3161 A5	5110 B4	5123 B2	6107 C5	9111 C2	9124 C4	
1131 B5	2130 A4	3132 B3	3170 C5	5111 C3	5124 B2	6109 C2	9113 B2	9125 A3	
2104 A2	2133 A4	3142 A4	3171 C5	5112 C4	5126 B3	6120 C4	9114 B2	9126 B5	
2105 A1	2135 B5	3147 B5	3172 C5	5113 B3	5127 B4	7102 A3	9115 B3	9128 A2	



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



ELECTRICAL PARTSLIST TUNER ECO5

MISCELLANEOUS

1101	4822 267 31505	SOCKET 2P CLICKFIT
1102	4822 267 10283	SOCKET COAX, IEC 75Ω
1103	4822 265 31184	JST CONNECTOR 2 POLE

CAPACITORS

2101 ©	4822 126 13692	47pF	1%	63V
2101 ©	5322 122 32531	100pF	5%	50V
2102 ©	4822 122 33177	10nF	20%	50V
2103 ©	5322 122 31647	1nF	10%	63V
2104	4822 122 33195	100pF	10%	50V

2106	4822 125 60101	3-11pF TRIMCAP		
2107	4822 121 51319	1μF	20%	50V
2120 ©	5322 122 32658	22pF	5%	50V
2125	4822 121 10673	560PF	1%	630V
2126 ©	5322 122 31863	330pF	5%	50V

2127 ©	4822 126 13473	220nF	20%	50V
2128	4822 124 40248	10μF	20%	63V
2129	4822 124 41584	100μF	20%	10V
2130	4822 126 11585	22nF	20%	50V
2131 ©	4822 126 13482	470nF	20%	16V

2132 ©	4822 126 13482	470nF	20%	16V
2133	4822 124 21913	1μF	20%	63V
2134 ©	4822 126 13188	15nF	5%	63V
2134 ©	5322 122 32654	22nF	10%	63V
2135	4822 124 40746	0,22μF	20%	63V

2136 ©	4822 126 13188	15nF	5%	63V
2136 ©	5322 122 32654	22nF	10%	63V
2137	4822 124 40746	0,22μF	20%	63V
2138	4822 124 22652	2,2μF	20%	50V
2139 ©	4822 126 14236	15pF	5%	50V

2141 ©	4822 126 13838	100nF	10%	50V
2142 ©	4822 126 13838	100nF	10%	50V
2143 ©	4822 126 13473	220nF	20%	50V
2144	4822 124 21913	1μF	20%	63V
2145 ©	4822 122 33575	220pF	5%	50V

2146 ©	4822 122 33575	220pF	5%	50V
2147 ©	4822 122 33575	220pF	5%	50V
2148	4822 126 11585	22nF	20%	50V
2149 ©	5322 122 32654	22nF	10%	63V
2150 ©	4822 122 33496	100nF	10%	63V

2152 ©	4822 126 12105	33nF	5%	63V
2153 ©	4822 126 13486	15pF	2%	63V
2155	4822 125 60101	3-11pF TRIMCAP		
2159 ©	5322 122 32659	33pF	5%	50V
2160 ©	5322 122 32654	22nF	10%	63V

2164 ©	4822 126 13482	470nF	20%	16V
2165 ©	4822 126 13838	100nF	10%	50V
2166 ©	5322 122 31647	1nF	10%	63V
2167 ©	4822 122 33926	12pF	5%	50V
2168 ©	4822 126 13695	82pF	1%	63V

RESISTORS

3101 ©	4822 051 20333	33kΩ	5%	0,1W
3102 ©	4822 117 10837	100kΩ	1%	0,1W
3103 ©	4822 117 10965	18kΩ	2%	0,1W
3104 ©	4822 117 11448	180Ω	10%	0,1W
3105	4822 116 83872	220Ω	5%	0,5W

3110	4822 116 52195	47Ω	5%	0,5W
3120 ©	4822 051 20008	CHIP JUMPER 0805		
3132	4822 116 52195	47Ω	5%	0,5W
3134 ©	4822 051 20223	22kΩ	5%	0,1W
3141 ©	4822 117 11148	56kΩ	1%	0,1W

RESISTORS

3142	4822 100 12159	TRIMPOT. 100kΩ
3145 ©	4822 117 11449	2,2kΩ 1% 0,1W
3146 ©	4822 051 20229	22Ω 5% 0,1W
3152	4822 116 83883	470Ω 5% 0,16W
3153 ©	4822 051 20471	470Ω 5% 0,1W

3154	4822 116 83868	150Ω 5% 0,5W
3155 ©	4822 051 20471	470Ω 5% 0,1W
3156 ©	4822 117 10837	100kΩ 1% 0,1W
3158	4822 116 83883	470Ω 5% 0,16W
3159	4822 116 83883	470Ω 5% 0,16W

3160	4822 116 83883	470Ω 5% 0,16W
3161	4822 116 83883	470Ω 5% 0,16W
3167 ©	4822 117 11503	220Ω 5% 0,1W
3169 ©	4822 051 20154	150kΩ 5% 0,1W
3170	4822 116 52234	100kΩ 5% 0,5W

3171	4822 116 52219	330Ω 5% 0,5W
4101 ©	4822 051 20008	CHIP JUMPER 0805
4102 ©	4822 051 20008	CHIP JUMPER 0805
4103 ©	4822 051 20008	CHIP JUMPER 0805
4104 ©	4822 051 20008	CHIP JUMPER 0805

4105 ©	4822 051 20008	CHIP JUMPER 0805
4106 ©	4822 051 20008	CHIP JUMPER 0805
4108 ©	4822 051 20008	CHIP JUMPER 0805
4111 ©	4822 051 20008	CHIP JUMPER 0805
4120 ©	4822 051 20008	CHIP JUMPER 0805

4150 ©	4822 051 20008	CHIP JUMPER 0805
4152 ©	4822 051 20008	CHIP JUMPER 0805
4153 ©	4822 051 20008	CHIP JUMPER 0805
4154 ©	4822 051 20008	CHIP JUMPER 0805
4157 ©	4822 051 20008	CHIP JUMPER 0805

4158 ©	4822 051 20008	CHIP JUMPER 0805
4159 ©	4822 051 20008	CHIP JUMPER 0805

COILS

5102	4822 157 71634	RF-COIL MW
5109	4822 242 70665	FM-IF FILTER 10,7MHz
5110	4822 242 70665	FM-IF FILTER 10,7MHz
5111	4822 158 60511	AM-IF FILTER 450kHz
5112	4822 157 70302	AM-IF FILTER 450kHz

5114	4822 157 70302	AM-IF FILTER 450kHz
5119	4822 157 11443	DISCRIMINATOR COIL
5121	4822 242 10261	QUARTZ 75kHz
5123	4822 157 60517	RF-COIL AM
5130	4822 157 11843	RF COIL 1,5 TURNS

5131	4822 157 11843	RF COIL 1,5 TURNS
------	----------------	-------------------

DIODES

6103	4822 130 30621	1N4148
6104	4822 130 30621	1N4148
6105 ©	4822 130 83075	HN1V02H
6106	4822 130 30621	1N4148
6107	4822 130 34488	BZX79-C11

6120	4822 130 30621	1N4148
6130 ©	4822 130 82833	1SV228
6131 ©	4822 130 82833	1SV228

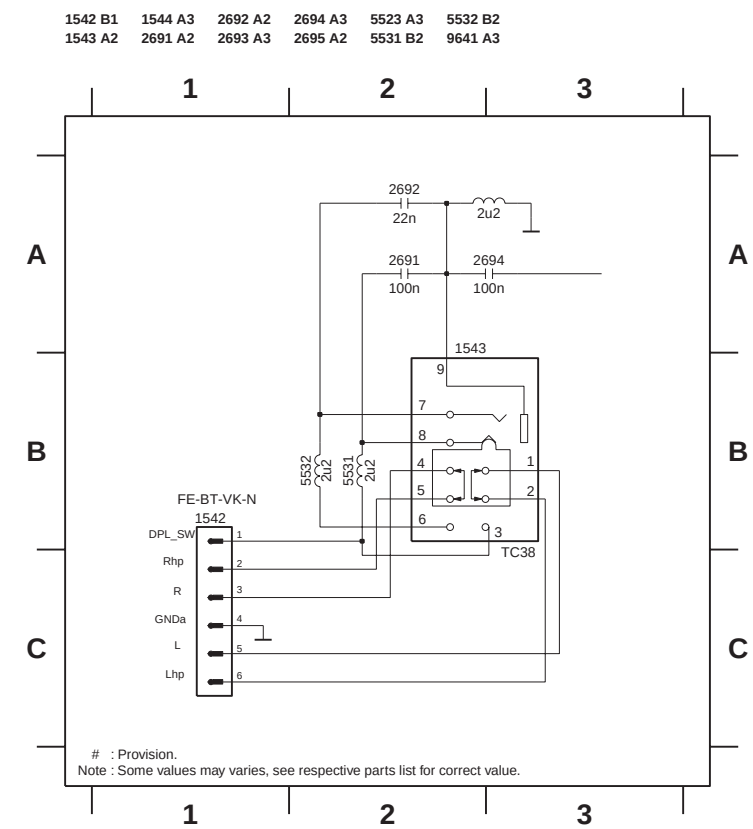
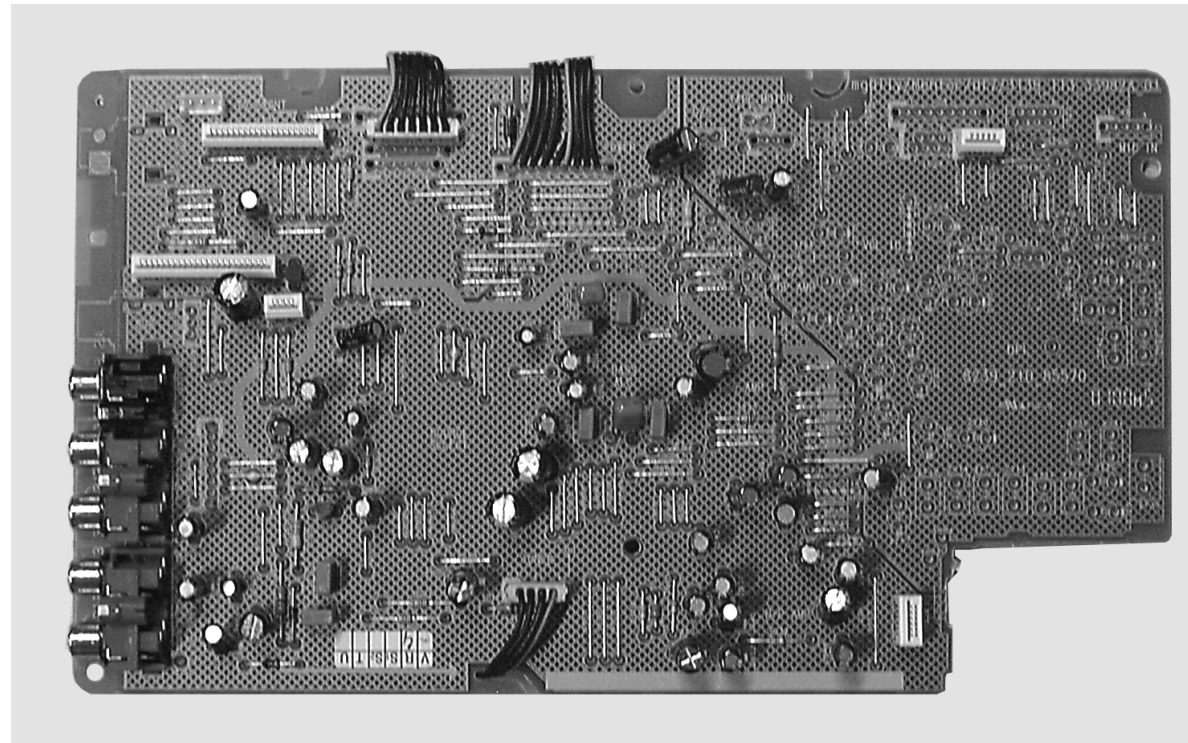
TRANSISTORS

7102	4822 130 60093	2SA838B
7111 ©	5322 130 42755	BC847C

INTEGRATED CIRCUITS

7101 ©	4822 209 90924	TEA5757H/V1, RADIO IC
--------	----------------	-----------------------

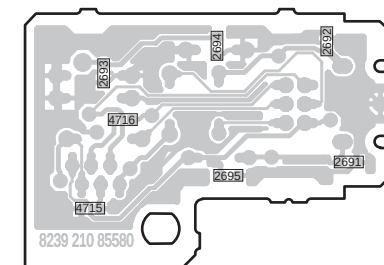
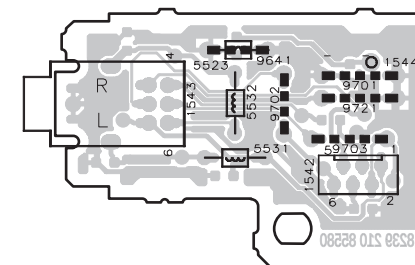
ELECTRICAL PARTSLIST TUNER ECO5



Headphone Board

Componentside view

Copperside view

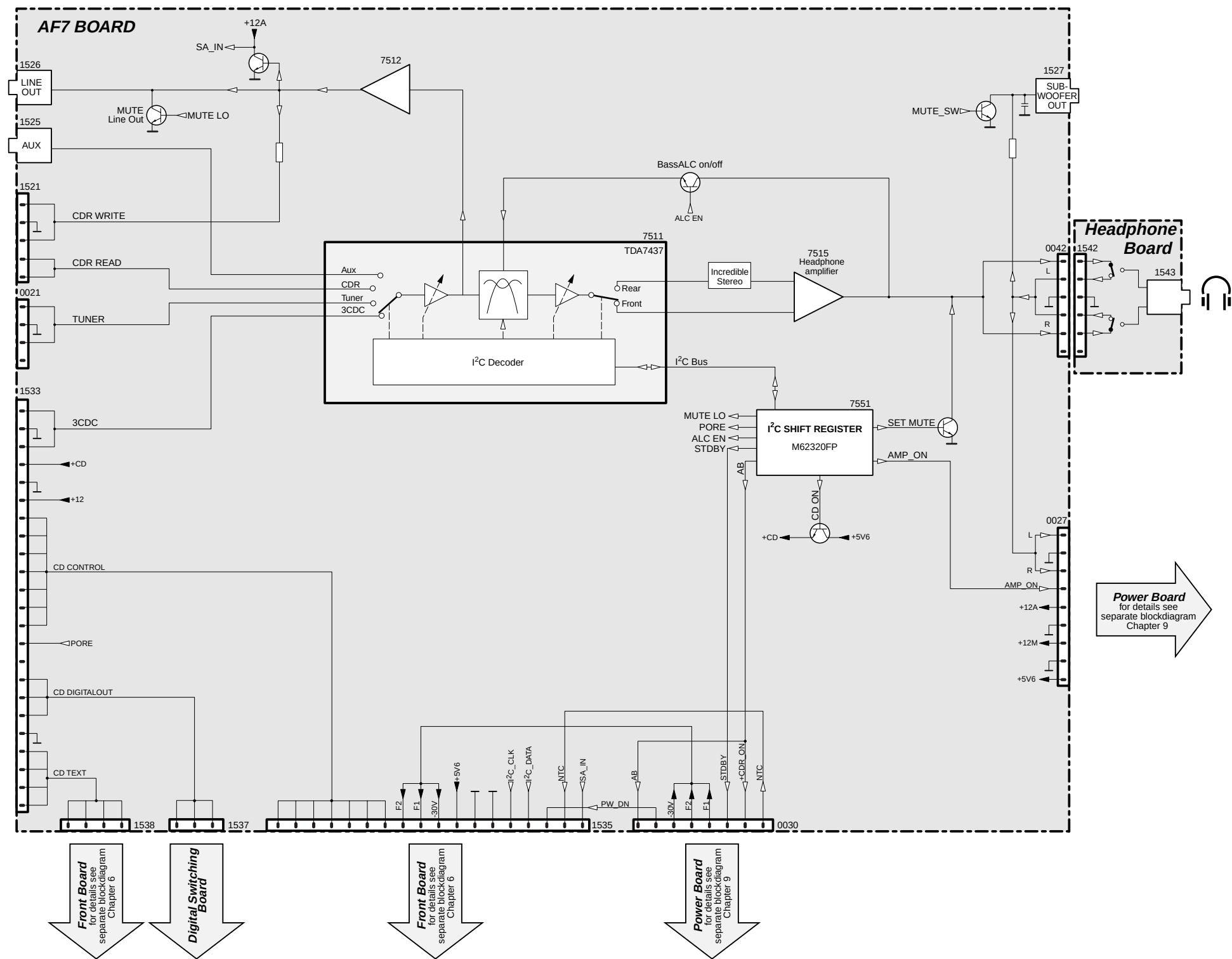


AF7 Board

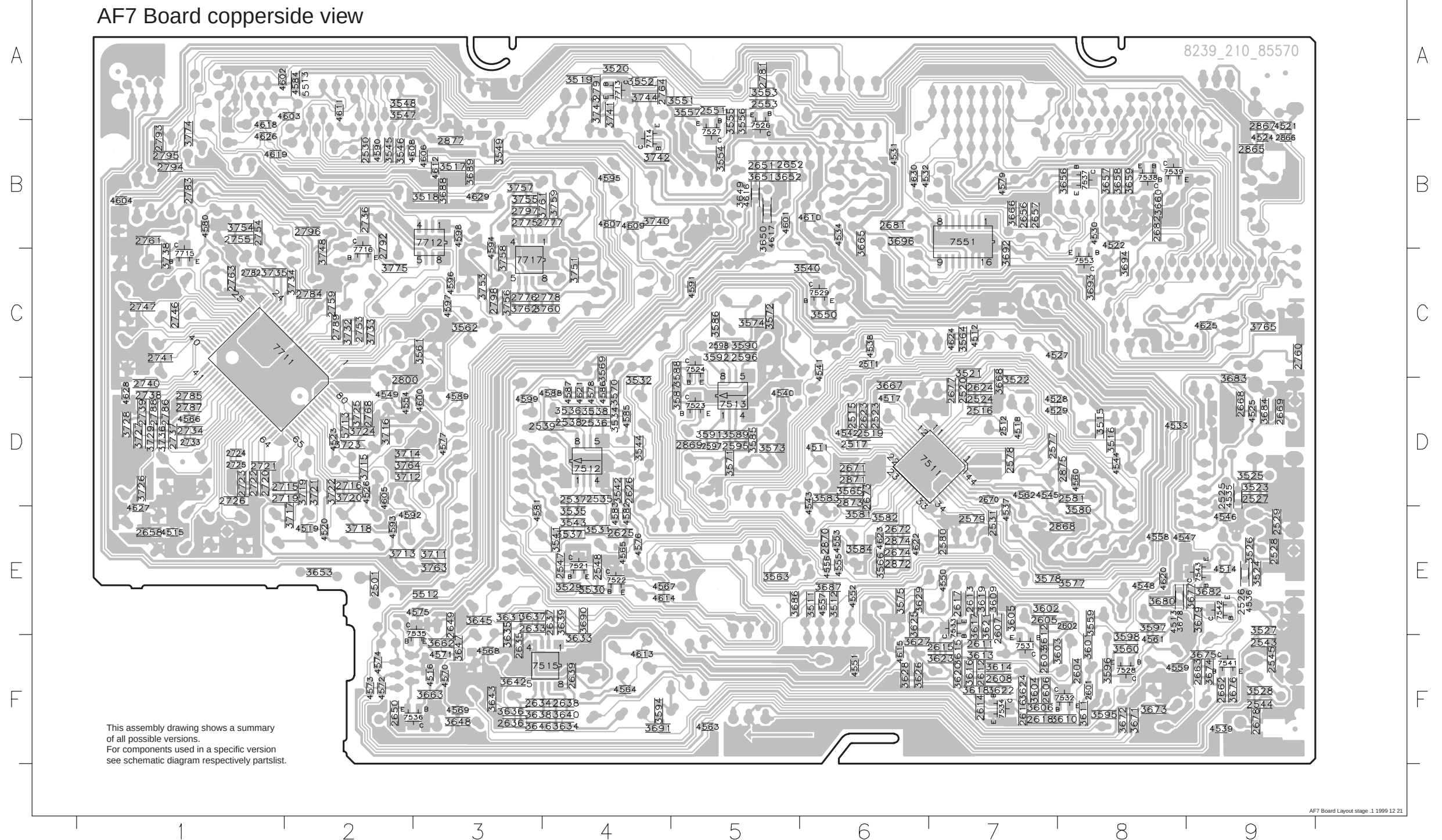
TABLE OF CONTENTS

Circuit Diagram Headphone Board.....	8-1
Component Layout Headphone Board	8-1
Circuit Diagram AF7 Bord.....	8-2
Component Layout AF7 Bord	8-4
Electrical Partslist	8-6

Power Board
for details see
separate block diagram
Chapter 9



2501 E2	2545 F9	2613 E7	2662 F9	2734 D1	2783 B1	2873 D6	3534 D4	3560 F8	3588 C5	3617 E7	3645 E3	3675 F9	3716 D2	3744 A4	4517 D6	4541 C6	4565 E4	4589 D3	4613 F4	7515 F4	7712 B3
2511 C6	2547 E4	2614 F7	2663 F9	2736 B2	2784 C2	2874 E6	3535 E4	3561 C3	3589 D5	3618 F7	3646 F3	3676 F9	3717 E2	3748 C2	4518 D7	4542 D6	4566 D1	4590 B2	4614 E4	7521 E4	7713 A4
2512 D7	2548 E4	2615 F7	2668 D9	2737 D1	2785 D1	2875 D8	3536 D4	3562 C3	3590 C5	3619 E7	3647 F3	3677 E9	3718 E2	3751 C4	4519 E2	4543 D6	4567 E4	4591 C5	4615 F6	7522 E4	7714 B4
2515 D6	2551 A5	2616 F7	2669 D9	2738 D1	2786 D1	2877 B3	3537 E4	3563 E5	3591 D5	3620 F7	3648 F3	3678 E8	3719 D2	3753 C3	4520 E2	4544 D8	4568 F3	4592 E2	4616 B5	7523 D5	7715 C1
2516 D7	2553 A5	2617 E7	2670 D7	2739 D1	2787 D1	2878 D1	3511 E6	3538 D4	3564 C7	3621 E7	3649 B5	3679 E9	3720 D2	3754 B1	4521 B9	4545 D7	4569 F3	4593 E2	4617 B5	7524 C5	
2517 D6	2577 D7	2618 F7	2671 D6	2740 D1	2788 D1	2879 D1	3512 E6	3540 C6	3565 D6	3622 F7	3650 B5	3680 E8	3721 D2	3755 B3	4522 B8	4546 E9	4570 F3	4594 B3	4618 B1	7526 B5	7716 C2
2519 D6	2578 D7	2623 D6	2672 E6	2741 C1	2789 C2	2879 C2	3515 D8	3541 E4	3566 E6	3623 F7	3651 B5	3682 E9	3722 D2	3756 C3	4523 D2	4547 E8	4571 F3	4595 B4	4619 B1	7527 B5	
2520 D7	2579 E7	2624 D7	2673 D6	2742 D1	2791 A4	2879 A4	3516 D8	3542 D4	3569 C4	3624 F7	3652 B5	3683 D9	3723 D2	3757 B3	4524 B9	4548 E8	4572 F2	4596 C3	4620 E8	7528 F8	
2523 D6	2580 E7	2625 E4	2674 E6	2747 C1	2792 B2	2879 B2	3517 B3	3543 E4	3570 D4	3625 E6	3653 E2	3684 D9	3724 D2	3758 C3	4525 D9	4549 D2	4573 F2	4597 C3	4621 D4	7529 C6	
2524 D7	2581 D8	2626 D4	2677 D7	2753 C2	2793 B1	2879 B1	3518 B3	3544 D4	3571 D5	3626 F6	3656 B8	3686 E5	3725 D2	3759 B4	4526 D2	4550 E7	4574 F2	4598 B3	4622 E6	7531 F7	
2525 D9	2595 D5	2633 E3	2678 F9	2754 B1	2794 B1	2879 B1	3519 A4	3545 B2	3572 C5	3627 F6	3657 B8	3687 E6	3726 D1	3760 C4	4527 C7	4551 F6	4575 E3	4599 D3	4623 E6	7532 F8	
2526 E9	2596 C5	2634 F3	2681 B6	2755 B1	2795 B1	2879 B1	3520 A4	3546 B2	3573 D5	3628 F6	3658 B8	3688 B3	3727 D1	3761 B3	4528 D7	4552 E6	4576 E4	4600 D3	4624 C7	7533 E7	
2527 D9	2597 D5	2635 F3	2682 B8	2759 C2	2796 B2	2879 B2	3521 C7	3547 A2	3574 C5	3629 E6	3659 B8	3689 B3	3728 D1	3762 C3	4529 D7	4553 E6	4577 D3	4601 B5	4625 C9	7534 F7	
2528 E9	2598 C5	2636 F3	2715 D2	2760 C9	2797 B3	2879 B3	3522 D7	3548 A2	3575 E6	3630 F7	3660 B8	3690 E4	3729 D1	3763 E3	4530 B8	4554 D2	4578 D4	4602 A1	4626 B1	7535 E3	
2529 E9	2601 F8	2637 E4	2716 D2	2761 B1	2798 C3	2879 C3	3523 D9	3549 B3	3577 E8	3631 E3	3662 F3	3691 F4	3732 C2	3764 D2	4531 B6	4555 E6	4579 B7	4603 A2	4627 E1	7536 F2	
2530 B2	2602 E8	2638 F4	2719 D2	2763 C1	2800 D2	2879 D2	3524 E9	3550 C6	3578 E7	3634 F4	3663 F3	3692 C7	3733 C2	3765 C9	4532 B6	4556 E6	4580 B1	4604 B1	4628 D1	7537 B8	
2531 E7	2603 F7	2639 F4	2720 D1	2764 A4	2865 B9	2879 B9	3525 D9	3551 A5	3580 E8	3635 E3	3665 B6	3693 C8	3734 C2	3774 B1	4533 D8	4557 E6	4581 E3	4605 D2	4629 B3	7538 B8	
2535 D4	2604 F8	2649 E3	2721 D1	2768 D2	2866 B9	2879 B9	3526 E9	3552 A4	3581 E6	3636 F3	3666 B7	3694 C8	3735 C1	3775 C2	4534 B6	4558 E8	4582 E4	4606 B3	4630 B6	7539 B8	
2536 D4	2605 E7	2650 F2	2722 D1	2775 B3	2867 B9	2879 B9	3527 E9	3553 A5	3582 E6	3637 E3	3667 D6	3696 B6	3736 D1	4511 D6	4535 D9	4559 F8	4583 E4	4607 B4	4631 E3	7541 F9	
2537 D4	2606 F7	2651 B5	2723 D1	2776 C3	2868 E8	2879 E8	3528 F9	3554 B5	3583 D6	3638 F3	3668 D7	3711 E3	3738 C1	4512 C7	4536 E9	4560 D8	4584 A2	4608 B2	4632 A2	7542 E9	
2538 D4	2607 E7	2652 B5	2724 D1	2777 B4	2869 D5	2879 D5	3529 E4	3555 B5	3584 E6	3639 E4	3671 F8	3712 D2	3740 B4	4513 E8	4537 E7	4561 F8	4585 D4	4609 B4	4633 D2	7543 E9	
2539 D3	2608 F7	2656 B7	2725 D1	2778 C4	2870 E6	2879 E6	3530 E4	3556 B5	3585 D5	3640 F4	3672 F8	3713 E2	3741 A4	4514 E9	4538 C6	4562 D7	4586 D4	4610 B6	4634 D2	7544 F9	
2543 F9	2611 F7	2657 B7	2726 D1	2781 A5	2871 D6	2879 D6	3531 E4	3557 A5	3586 C5	3642 F3	3673 F8	3714 D2	3742 B4	4515 E1	4539 F9	4563 F5	4587 D4	4611 A2	4635 D2	7545 C8	
2544 F9	2612 F7	2658 E1	2733 D1	2782 C1	2872 E6	2879 E6	3532 D4	3558 E8	3587 D5	3643 F3	3674 F9	3715 D2	3743 A4	4516 F3	4540 D5	4564 F4	4588 D4	4612 B3	4636 D2	7546 C8	

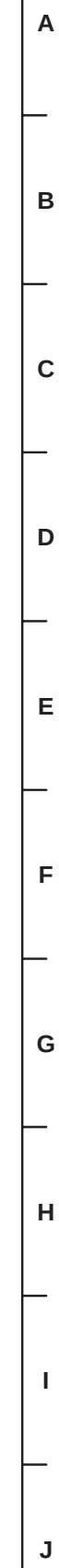


A



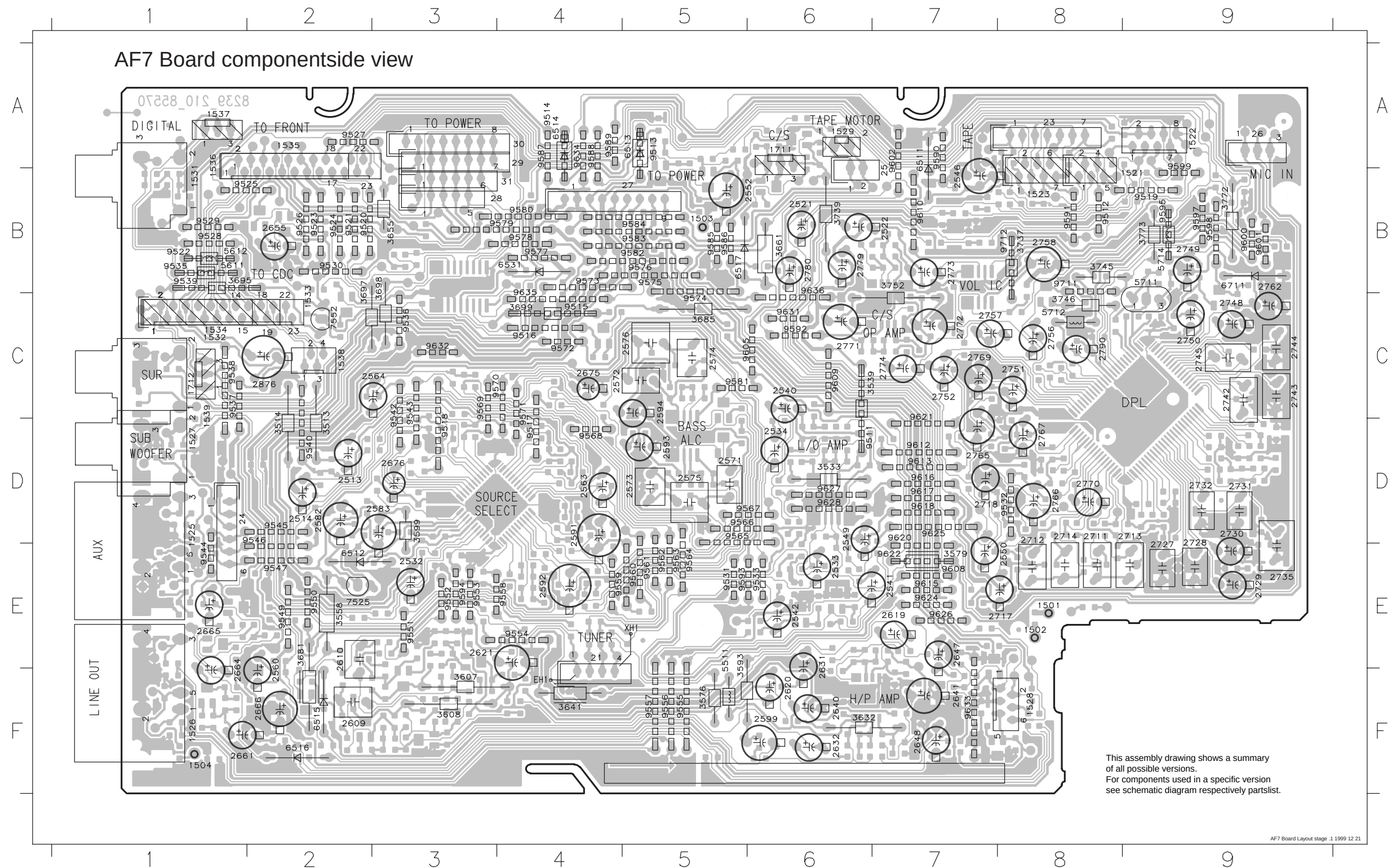
Incredible Surround Circuit





0021	E1	2617	C15	3552	J2	3651	E20
0026	H1	2618	F15	3553	J3	3652	E20
0027	D21	2619	B16	3554	I3	3655	D16
0030	H20	2620	F15	3555	I3	3656	D16
1521	A1	2621	J10	3556	J3	3657	D17
1525	C1	2623	C3	3557	J3	3658	D17
1526	H1	2624	C3	3558	I14	3660	D17
1527	F21	2625	C6	3559	I14	3661	C18
1528	C21	2626	I7	3560	I14	3662	D18
1533	G22	2631	C16	3563	B6	3663	D18
1535	G21	2632	E15	3564	J7	3667	C3
1537	H22	2633	C16	3565	C8	3668	C3
1538	G22	2634	E16	3566	G8	3671	E19
2216	F15	2635	B16	3569	I12	3672	E19
2355	D17	2636	F16	3570	J12	3673	E19
2511	E2	2637	C17	3571	B10	3674	F18
2512	E2	2638	E17	3572	I8	3675	F18
2513	D3	2639	F17	3573	B10	3676	G18
2514	F3	2640	F17	3574	I9	3677	F18
2515	D4	2641	J13	3575	C13	3678	F19
2516	F4	2647	B18	3576	G13	3679	G19
2517	F11	2648	E18	3577	E11	3680	F19
2519	E4	2649	D18	3578	E11	3681	F20
2520	F4	2650	D18	3579	H1	3682	G19
2521	E3	2651	E20	3580	G11	3683	F20
2522	F3	2652	E20	3581	C9	3684	F20
2523	C4	2661	F18	3582	H9	3686	E1
2524	C4	2662	G18	3583	C9	3687	F1
2527	C2	2663	F18	3584	H9	3688	F3
2528	D2	2664	F18	3585	A10	3689	E3
2531	G11	2665	F19	3586	H9	3690	F15
2532	G11	2666	F19	3587	A10	3691	F16
2533	C6	2668	F20	3588	J9	3692	J16
2534	H6	2669	G21	3589	B9	3693	I15
2535	C6	2670	D10	3590	I8	3694	I16
2536	I6	2671	C8	3591	B9	3695	I15
2537	B6	2672	G8	3592	I7	3696	J16
2539	I6	2673	C8	3593	F15	3697	E11
2540	J12	2674	G8	3594	F16	3698	E12
2541	C5	2675	D7	3595	G14	3699	J17
2542	I5	2676	G7	3596	H14	3773	I14
2543	G2	2677	E5	3597	G13	3929	J10
2544	H2	2681	I16	3598	I14	4517	E5
2545	H1	2682	H22	3599	C10	4518	F5
2547	G4	2784	I14	3601	D12	4535	C2
2548	H3	2868	C10	3602	F12	4536	C2
2549	A5	2869	C9	3603	C13	4578	H6
2550	I5	2870	G9	3604	E13	4618	B2
2551	J2	2871	C8	3605	C13	4619	B2
2552	I3	2872	G8	3606	F13	4630	I20
2553	J2	2873	C8	3607	B14	5511	F17
2560	G13	2874	G8	3608	E14	5734	F15
2563	D7	2876	I10	3609	C14	6512	H10
2564	G7	3511	E1	3610	F14	6514	I10
2571	B10	3512	E1	3611	E13	6515	H14
2572	H8	3513	D3	3612	E13	6516	D18
2573	B10	3514	F3	3613	D13	6531	I16
2574	H9	3515	D3	3614	F13	7511	D6
2575	B10	3516	F3	3615	D14	7512-AC6	
2576	H9	3517	E3	3616	G13	7512-B16	
2577	C8	3518	F3	3617	D14	7513-AA9	
2578	G8	3519	J1	3618	F14	7513-BH8	
2579	C13	3520	J1	3619	D14	7515-AB17	
2580	G12	3521	C3	3620	F14	7515-BE17	
2581	H11	3522	C3	3621	C14	7521	G3
2582	H11	3525	C2	3622	E14	7522	H3
2583	H10	3526	C2	3623	C15	7523	A10
2591	C10	3527	G2	3624	E15	7524	I9
2592	H9	3528	H2	3625	C15	7525	G10
2593	B9	3529	H4	3626	E15	7526	J3
2594	I8	3530	H3	3627	C15	7527	J3
2595	A9	3531	C6	3628	E15	7528	H14
2596	H8	3532	H6	3631	B16	7529	H4
2597	B9	3533	C6	3632	E16	7531	C14
2598	I7	3534	I6	3633	C16	7532	F14
2599	G16	3535	B6	3634	E16	7533	D15
2601	E13	3536	H6	3635	B16	7535	D18
2602	E13	3537	B6	3636	F16	7536	D18
2603	C14	3538	H6	3637	C16	7537	D17
2604	E14	3539	I6	3638	E16	7538	D17
2605	C14	3540	H4	3639	C17	7539	D17
2606	F14	3541	C5	3640	E17	7541	G18
2607	B14	3542	I5	3641	F17	7542	F19
2608	E14	3543	A6	3642	I13	7543	F19
2609	D13	3544	J6	3643	J13	7551	H17
2610	F13	3545	B1	3645	E17	7552	I15
2611	D14	3546	B1	3646	E17	7553	J16
2612	F14	3547	B1	3647	B18		
2613	D15	3548	B1	3648	E18		
2614	F15	3550	H4	3649	D20		
2615	C15	3551	J2	3650	E20		

21 E4	1504 F1	1535 A2	2534 D6	2573 D5	2619 E7	2666 F2	2731 D9	2757 C7	2780 B6	3608 F3	3745 B8	6513 A5	9515 C4	9528 B1	9543 C3	9557 F5	9570 C4	9583 B5	9597 B9	9616 D7	9633 F7
23 A8	1521 B8	1536 A2	2540 C6	2574 C5	2620 F6	2675 C4	2732 D9	2758 B8	2790 C8	3632 F6	3746 C8	6514 A4	9516 C4	9529 B1	9544 E1	9558 E4	9571 C4	9584 B5	9598 B9	9617 D7	9634 A4
24 D1	1522 A9	1537 A1	2541 E7	2575 D5	2621 E4	2676 D3	2735 E9	2762 B9	2876 C2	3641 F4	3752 C7	6515 F2	9517 D4	9530 B2	9545 D2	9559 E4	9572 C4	9585 B5	9599 B9	9618 D7	9635 C4
25 A6	1523 B8	1538 C2	2542 E6	2576 C5	2631 E6	2711 E8	2742 C9	2765 D8	3513 D2	3655 B3	3772 B9	6516 F2	9518 D3	9531 E5	9546 D2	9560 E5	9573 B4	9586 B5	9600 B9	9620 E7	9636 C6
26 A9	1525 E1	1539 C1	2546 A7	2582 D2	2632 F6	2712 E8	2743 C9	2766 D8	3514 D2	3661 B6	3773 B9	6517 B5	9519 B9	9532 D8	9547 E2	9561 E5	9574 C5	9587 A4	9601 B9	9621 D7	9711 C8
27 B4	1526 F1	1711 A6	2549 D7	2583 D3	2640 F6	2713 E9	2744 C9	2767 D8	3533 D6	3681 F2	5511 F5	6531 B4	9520 B2	9533 E6	9549 E2	9562 E5	9575 B5	9588 A4	9602 A7	9622 E7	9712 B8
28 B3	1527 D1	1712 C1	2550 E8	2591 D5	2641 F7	2714 E8	2745 C9	2769 C7	3539 C6	3685 C5	5611 B1	6711 B9	9521 B2	9535 B1	9550 E2	9563 E5	9576 B5	9589 A4	9605 C6	9624 E7	
29 A3	1528 F8	2513 D2	2552 B6	2592 E4	2647 E7	2717 E8	2748 C9	2770 D8	3558 E2	3695 B1	5612 B1	7525 E2	9522 B1	9536 C3	9551 E3	9564 E5	9577 B4	9590 A7	9608 E7	9625 D7	
30 A3	1529 A6	2514 D2	2560 F2	2593 D5	2648 F7	2718 D8	2749 B9	2771 C6	3576 F5	3697 C2	5711 B9	7552 C2	9523 B2	9537 C1	9552 E3	9565 D5	9578 B4	9591 B8	9609 C6	9626 E7	
31 A3	1531 B1	2521 B6	2563 D4	2594 C5	2655 B2	2727 E9	2750 C9	2772 C7	3579 E7	3698 C3	5712 C8	9511 C6	9524 B2	9538 C1	9553 E3	9566 D5	9579 B4	9592 C6	9610 B7	9627 D6	
1501 E8	1532 C1	2522 B6	2564 C3	2599 F6	2661 F1	2728 E9	2751 C8	2773 B7	3593 F5	3699 C4	5714 B9	9512 B8	9525 B1	9539 B1	9554 E4	9567 D6	9580 B4	9593 E5	9612 D7	9628 D6	
1502 E8	1533 C1	2532 E3	2571 D5	2609 F2	2664 E1	2729 E9	2752 C7	2774 C7	3599 D3	3737 B8	6511 B7	9513 A5	9526 B2	9540 D2	9555 F5	9568 D4	9581 C5	9594 E3	9613 D7	9631 C6	
1503 B5	1534 C1	2533 E6	2572 C5	2610 E3	2665 E1	2730 D9	2756 C8	2779 B6	3607 F3	3739 B6	6512 E2	9514 A4	9527 A2	9542 C3	9556 F5	9569 C3	9582 B5	9595 B9	9615 E7	9632 C3	



ELECTRICAL PARTSLIST AF7 BOARD

MISCELLANEOUS					CAPACITORS				
1521	4822 267 10954	FFC SOCKET, 5P			2579 ©	5322 122 31647	1nF	10%	63V
1525	4822 267 20452	CINCH SOCKET 2P			2580 ©	5322 122 31647	1nF	10%	63V
1526	4822 267 20452	CINCH SOCKET 2P			2581 ©	4822 122 33127	2,2nF	10%	63V
1527	4822 267 31729	CINCH SOCKET, 1P			2582	4822 124 40207	100µF	20%	25V
1528	4822 267 10731	FFC SOCKET, 6P			2583	4822 124 40207	100µF	20%	25V
1533	4822 267 10757	FFC SOCKET, 23P, TOP ENTRY			2591	4822 124 80144	220µF	20%	25V
1535	4822 265 11553	FFC SOCKET, 19P			2592	4822 124 80144	220µF	20%	25V
1538	4822 267 10733	FFC SOCKET, 4P			2593	4822 124 40433	47µF	20%	25V
1542	4822 267 10731	FFC SOCKET, 6P			2594	4822 124 40433	47µF	20%	25V
1543	4822 265 11529	HEADPHONE SOCKET			2595 ©	5322 122 34099	470pF	10%	63V
CAPACITORS					2596 ©	5322 122 34099	470pF	10%	63V
2501 ©	4822 126 13838	100nF	10%	50V	2597 ©	4822 122 33575	220pF	5%	50V
2511 ©	4822 126 13838	100nF	10%	50V	2598 ©	4822 122 33575	220pF	5%	50V
2512 ©	4822 126 13838	100nF	10%	50V	2599	4822 124 41751	47µF	20%	16V
2513	4822 124 40769	4,7µF	20%	100V	2601 ©	4822 126 12105	33nF	5%	63V
2514	4822 124 40769	4,7µF	20%	100V					
					2602 ©	4822 126 12105	33nF	5%	63V
2515 ©	5322 122 32531	100pF	5%	50V	2603 ©	4822 122 33891	3,3nF	10%	63V
2516 ©	5322 122 32531	100pF	5%	50V	2604 ©	4822 122 33891	3,3nF	10%	63V
2517 ©	4822 126 14585	100nF	10%	50V	2605 ©	5322 122 34099	470pF	10%	63V
2519 ©	5322 122 32531	100pF	5%	50V	2606 ©	5322 122 34099	470pF	10%	63V
2520 ©	5322 122 32531	100pF	5%	50V					
					2607 ©	4822 126 14585	100nF	10%	50V
2521	4822 124 40769	4,7µF	20%	100V	2608 ©	4822 126 14585	100nF	10%	50V
2522	4822 124 40769	4,7µF	20%	100V	2609	4822 121 51252	470nF	5%	63V
2523 ©	5322 122 32658	22pF	5%	50V	2610	4822 121 51252	470nF	5%	63V
2524 ©	5322 122 32658	22pF	5%	50V	2611 ©	4822 126 10847	1,8nF	10%	50V
2527 ©	5322 122 34099	470pF	10%	63V					
					2612 ©	4822 126 10847	1,8nF	10%	50V
2528 ©	5322 122 34099	470pF	10%	63V	2613 ©	5322 122 31647	1nF	10%	63V
2529 ©	4822 126 13838	100nF	10%	50V	2614 ©	5322 122 31647	1nF	10%	63V
2531 ©	5322 122 32654	22nF	10%	63V	2615 ©	4822 122 33575	220pF	5%	50V
2532	4822 124 40433	47µF	20%	25V	2616 ©	4822 122 33575	220pF	5%	50V
2533	4822 124 40769	4,7µF	20%	100V					
					2617 ©	5322 122 34099	470pF	10%	63V
2534	4822 124 40769	4,7µF	20%	100V	2618 ©	5322 122 34099	470pF	10%	63V
2535 ©	4822 122 32535	680pF			2619	4822 124 40769	4,7µF	20%	100V
2536 ©	4822 122 32535	680pF			2620	4822 124 40769	4,7µF	20%	100V
2537 ©	4822 126 13486	15pF	2%	63V	2621	4822 124 40207	100µF	20%	25V
2538 ©	4822 126 13486	15pF	2%	63V					
					2623 ©	4822 126 14043	1µF	20%	16V
2539 ©	5322 122 32531	100pF	5%	50V	2624 ©	4822 126 14043	1µF	20%	16V
2540	4822 124 12245	220µF	20%	16V	2625 ©	4822 122 33575	220pF	5%	50V
2541	4822 124 21913	1µF	20%	63V	2626 ©	4822 122 33575	220pF	5%	50V
2542	4822 124 21913	1µF	20%	63V	2631	4822 124 40769	4,7µF	20%	100V
2543 ©	4822 122 33127	2,2nF	10%	63V					
					2632	4822 124 40769	4,7µF	20%	100V
2544 ©	4822 122 33127	2,2nF	10%	63V	2633 ©	5322 122 34099	470pF	10%	63V
2545 ©	4822 126 13838	100nF	10%	50V	2634 ©	5322 122 34099	470pF	10%	63V
2547 ©	5322 122 32448	10pF	5%	50V	2635 ©	5322 122 32531	100pF	5%	50V
2548 ©	5322 122 32448	10pF	5%	50V	2636 ©	5322 122 32531	100pF	5%	50V
2549	4822 124 40769	4,7µF	20%	100V					
					2637 ©	4822 126 13692	47pF	1%	63V
2550	4822 124 40769	4,7µF	20%	100V	2638 ©	4822 126 13692	47pF	1%	63V
2551 ©	4822 126 14585	100nF	10%	50V	2639 ©	5322 122 32654	22nF	10%	63V
2552	4822 124 41751	47µF	20%	16V	2640	4822 124 40433	47µF	20%	25V
2553 ©	4822 126 13486	15pF	2%	63V	2641	4822 124 40207	100µF	20%	25V
2560	5322 124 41948	0,47µF	20%	50V					
					2647	4822 124 81151	22µF	20%	50V
2563	4822 124 40746	0,22µF	20%	63V	2648	4822 124 81151	22µF	20%	50V
2564	4822 124 40746	0,22µF	20%	63V	2649 ©	5322 122 32531	100pF	5%	50V
2571	4822 121 42408	220nF	5%	63V	2650 ©	5322 122 32531	100pF	5%	50V
2572	4822 121 42408	220nF	5%	63V	2651 ©	5322 122 32654	22nF	10%	63V
2573	4822 121 51252	470nF	5%	63V					
					2652 ©	5322 122 32654	22nF	10%	63V
2574	4822 121 51252	470nF	5%	63V	2655	4822 124 40769	4,7µF	20%	100V
2575	4822 121 51319	1µF	20%	50V	2661	4822 124 21913	1µF	20%	63V
2576	4822 121 51319	1µF	20%	50V	2662 ©	5322 122 31647	1nF	10%	63V
2577 ©	4822 122 33127	2,2nF	10%	63V	2663 ©	5322 122 32448	10pF	5%	50V
2578 ©	4822 122 33127	2,2nF	10%	63V					

ELECTRICAL PARTSLIST AF7 BOARD

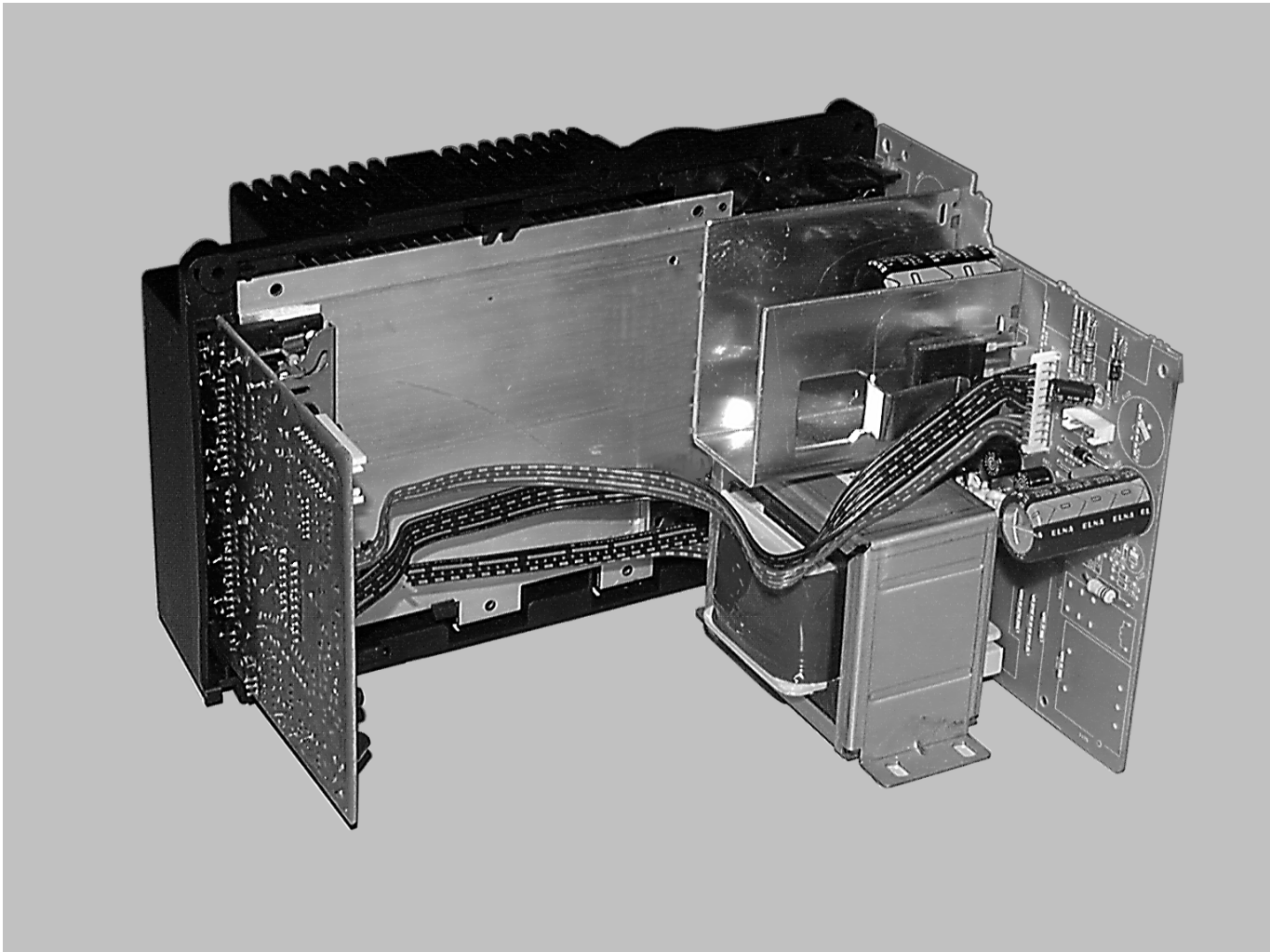
CAPACITORS					RESISTORS				
2664	4822 124 21913	1µF	20%	63V	3543 ©	4822 051 20332	3,3kΩ	5%	0,1W
2665	4822 124 40248	10µF	20%	63V	3544 ©	4822 051 20332	3,3kΩ	5%	0,1W
2666	4822 124 40207	100µF	20%	25V	3545 ©	4822 117 11139	1,5kΩ	1%	0,1W
2668 ©	5322 122 34099	470pF	10%	63V	3546 ©	4822 117 11139	1,5kΩ	1%	0,1W
2669 ©	4822 126 13838	100nF	10%	50V	3547 ©	4822 117 10965	18kΩ	2%	0,1W
2670 ©	4822 126 13838	100nF	10%	50V	3548 ©	4822 117 10965	18kΩ	2%	0,1W
2671 ©	4822 126 13838	100nF	10%	50V	3550 ©	4822 117 10834	47kΩ	1%	0,1W
2672 ©	4822 126 13838	100nF	10%	50V	3551 ©	4822 051 20154	150kΩ	5%	0,1W
2673 ©	5322 122 32654	22nF	10%	63V	3552 ©	4822 051 20154	150kΩ	5%	0,1W
2674 ©	5322 122 32654	22nF	10%	63V	3553 ©	4822 051 20334	330kΩ	5%	0,1W
2675	5322 124 41948	0,47µF	20%	50V	3554 ©	4822 117 10353	150Ω	5%	0,1W
2676	5322 124 41948	0,47µF	20%	50V	3555 ©	4822 051 20391	390Ω	5%	0,1W
2677 ©	5322 122 34098	10nF	10%	50V	3556 ©	4822 051 20122	1,2kΩ	5%	0,1W
2681 ©	4822 126 14585	100nF	10%	50V	3557 ©	4822 117 11149	82kΩ	1%	0,1W
2682 ©	5322 122 34098	10nF10%50V			3558	4822 053 20225	2,2MΩ	5%	0,25W
2691 ©	5322 122 32654	22nF	10%	63V	3559 ©	4822 051 20225	2,2MΩ	5%	0,1W
2692 ©	5322 122 32654	22nF	10%	63V	3560 ©	4822 051 20475	4,7MΩ	5%	0,1W
2694 ©	4822 126 13838	100nF	10%	50V	3563 ©	4822 117 12955	2,7kΩ	1%	0,1W
2781 ©	5322 122 32654	22nF	10%	63V	3564 ©	4822 117 12955	2,7kΩ	1%	0,1W
2784 ©	5322 122 32531	100pF	5%	50V	3565 ©	4822 051 20472	4,7kΩ	5%	0,1W
2868 ©	4822 126 14585	100nF	10%	50V	3566 ©	4822 051 20472	4,7kΩ	5%	0,1W
2869 ©	4822 126 14043	1µF	20%	16V	3569 ©	4822 051 20472	4,7kΩ	5%	0,1W
2870 ©	4822 126 14043	1µF	20%	16V	3570 ©	4822 051 20472	4,7kΩ	5%	0,1W
2871 ©	5322 122 32654	22nF	10%	63V	3571 ©	4822 051 20472	4,7kΩ	5%	0,1W
2872 ©	5322 126 10223	4,7nF	10%	63V	3572 ©	4822 051 20472	4,7kΩ	5%	0,1W
2873 ©	5322 126 10223	4,7nF	10%	63V	3573 ©	4822 051 20472	4,7kΩ	5%	0,1W
2874 ©	5322 122 32654	22nF	10%	63V	3574 ©	4822 051 20472	4,7kΩ	5%	0,1W
2876	4822 124 80791	470µF	20%	16V	3575 ©	4822 117 11503	220Ω	5%	0,1W
RESISTORS					3576	4822 116 83872	220Ω	5%	0,5W
3511 ©	4822 051 10102	1kΩ	2%	0,25W	3577 ©	4822 051 20471	470Ω	5%	0,1W
3512 ©	4822 051 10102	1kΩ	2%	0,25W	3578 ©	4822 051 20471	470Ω	5%	0,1W
3513	4822 116 52243	1,5kΩ	5%	0,16W	3579	4822 052 10478	4,7Ω	5%	NFR
3514	4822 116 52243	1,5kΩ	5%	0,16W	3580 ©	4822 117 12955	2,7kΩ	1%	0,1W
3515 ©	4822 051 20471	470Ω	5%	0,1W	3581 ©	4822 117 11449	2,2kΩ	1%	0,1W
3516 ©	4822 051 20471	470Ω	5%	0,1W	3582 ©	4822 117 11449	2,2kΩ	1%	0,1W
3517 ©	4822 051 20332	3,3kΩ	5%	0,1W	3583 ©	4822 117 11503	220Ω	5%	0,1W
3518 ©	4822 051 20332	3,3kΩ	5%	0,1W	3584 ©	4822 117 11503	220Ω	5%	0,1W
3519 ©	4822 051 20333	33kΩ	5%	0,1W	3585 ©	4822 117 10834	47kΩ	1%	0,1W
3520 ©	4822 051 20333	33kΩ	5%	0,1W	3586 ©	4822 117 10834	47kΩ	1%	0,1W
3521 ©	4822 117 10965	18kΩ	2%	0,1W	3587 ©	4822 051 20154	150kΩ	5%	0,1W
3522 ©	4822 117 10965	18kΩ	2%	0,1W	3588 ©	4822 051 20154	150kΩ	5%	0,1W
3525 ©	4822 117 12955	2,7kΩ	1%	0,1W	3589 ©	4822 117 11449	2,2kΩ	1%	0,1W
3526 ©	4822 117 12955	2,7kΩ	1%	0,1W	3590 ©	4822 117 11449	2,2kΩ	1%	0,1W
3527 ©	4822 051 10102	1kΩ	2%	0,25W	3591 ©	4822 051 20223	22kΩ	5%	0,1W
3528 ©	4822 051 10102	1kΩ	2%	0,25W	3592 ©	4822 051 20223	22kΩ	5%	0,1W
3529 ©	4822 117 11449	2,2kΩ	1%	0,1W	3593	4822 116 52264	27kΩ	5%	0,5W
3530 ©	4822 117 11449	2,2kΩ	1%	0,1W	3594 ©	4822 051 20273	27kΩ	5%	0,1W
3531 ©	4822 117 11449	2,2kΩ	1%	0,1W	3595 ©	4822 051 20333	33kΩ	5%	0,1W
3532 ©	4822 117 11449	2,2kΩ	1%	0,1W	3596 ©	4822 117 10837	100kΩ	1%	0,1W
3533	4822 116 52234	100kΩ	5%	0,5W	3597 ©	4822 051 20105	1MΩ	5%	0,1W
3534 ©	4822 117 10837	100kΩ	1%	0,1W	3598 ©	4822 051 20475	4,7MΩ	5%	0,1W
3535 ©	4822 051 20124	120kΩ	5%	0,1W	3599	4822 116 52175	100Ω	5%	0,5W
3536 ©	4822 051 20124	120kΩ	5%	0,1W	3601 ©	4822 051 20332	3,3kΩ	5%	0,1W
3537 ©	4822 051 20333	33kΩ	5%	0,1W	3602 ©	4822 051 20332	3,3kΩ	5%	0,1W
3538 ©	4822 051 20333	33kΩ	5%	0,1W	3603 ©	4822 051 20684	680kΩ	5%	0,1W
3539	4822 052 10339	33Ω	5%	NFR	3604 ©	4822 051 20684	680kΩ	5%	0,1W
3540 ©	4822 117 10833	10kΩ	1%	0,1W	3605 ©	4822 117 13579	220kΩ	1%	0,1W
3541 ©	4822 051 10102	1kΩ	2%	0,25W	3606 ©	4822 117 13579	220kΩ	1%	0,1W
3542 ©	4822 051 10102	1kΩ	2%	0,25W	3607	4822 050 21003	10kΩ	2%	0,25W
					3608	4822 050 21003	10kΩ	2%	0,25W

ELECTRICAL PARTSLIST AF7 BOARD

RESISTORS					RESISTORS				
3609	© 4822 117 10833	10kΩ	1%	0,1W	3679	© 4822 051 20391	390Ω	5%	0,1W
3610	© 4822 117 10833	10kΩ	1%	0,1W	3680	© 4822 051 20471	470Ω	5%	0,1W
3611	© 4822 051 20562	5,6kΩ	5%	0,1W	3681	© 4822 052 10229	22Ω	5%	0,33W
3612	© 4822 051 20562	5,6kΩ	5%	0,1W	3682	© 4822 051 10102	1kΩ	2%	0,25W
3613	© 4822 051 20562	5,6kΩ	5%	0,1W	3683	© 4822 051 20471	470Ω	5%	0,1W
3614	© 4822 051 20562	5,6kΩ	5%	0,1W	3684	© 4822 051 20392	3,9kΩ	5%	0,1W
3615	© 4822 051 20562	5,6kΩ	5%	0,1W	3686	© 4822 117 11383	12kΩ	1%	0,1W
3616	© 4822 051 20562	5,6kΩ	5%	0,1W	3687	© 4822 117 11383	12kΩ	1%	0,1W
3617	© 4822 051 20822	8,2kΩ	5%	0,1W	3688	© 4822 051 20471	470Ω	5%	0,1W
3618	© 4822 051 20822	8,2kΩ	5%	0,1W	3689	© 4822 051 20471	470Ω	5%	0,1W
3619	© 4822 051 20822	8,2kΩ	5%	0,1W	3690	© 4822 051 20109	10Ω	5%	0,1W
3620	© 4822 051 20822	8,2kΩ	5%	0,1W	3691	© 4822 051 20109	10Ω	5%	0,1W
3621	© 4822 051 20822	8,2kΩ	5%	0,1W	3692	© 4822 117 10833	10kΩ	1%	0,1W
3622	© 4822 051 20822	8,2kΩ	5%	0,1W	3693	© 4822 051 20562	5,6kΩ	5%	0,1W
3623	© 4822 117 10834	47kΩ	1%	0,1W	3694	© 4822 051 20562	5,6kΩ	5%	0,1W
3624	© 4822 117 10834	47kΩ	1%	0,1W	3695	© 4822 116 81154	2,2Ω	5%	0,5W
3625	© 4822 051 10102	1kΩ	2%	0,25W	3696	© 4822 117 11449	2,2kΩ	1%	0,1W
3626	© 4822 051 10102	1kΩ	2%	0,25W	3697	© 4822 116 83883	470Ω	5%	0,16W
3627	© 4822 117 11503	220Ω	5%	0,1W	3698	© 4822 116 83883	470Ω	5%	0,16W
3628	© 4822 117 11503	220Ω	5%	0,1W	3699	© 4822 050 11002	1kΩ	5%	0,2W
3629	© 4822 117 11454	820Ω	1%		3773	© 4822 050 11002	1kΩ	5%	0,2W
3631	© 4822 117 11454	820Ω	1%		4516	© 4822 051 20008	CHIP JUMPER 0805		
3632	© 4822 116 52231	820Ω	5%	0,5W	4517	© 4822 051 20008	CHIP JUMPER 0805		
3633	© 4822 051 20562	5,6kΩ	5%	0,1W	4518	© 4822 051 20008	CHIP JUMPER 0805		
3634	© 4822 051 20562	5,6kΩ	5%	0,1W	4519	© 4822 051 20008	CHIP JUMPER 0805		
3635	© 4822 117 10833	10kΩ	1%	0,1W	4520	© 4822 051 20008	CHIP JUMPER 0805		
3636	© 4822 117 10833	10kΩ	1%	0,1W	4521	© 4822 051 20008	CHIP JUMPER 0805		
3637	© 4822 117 10834	47kΩ	1%	0,1W	4522	© 4822 051 20008	CHIP JUMPER 0805		
3638	© 4822 117 10834	47kΩ	1%	0,1W	4524	© 4822 051 20008	CHIP JUMPER 0805		
3639	© 4822 117 11507	6,8kΩ	1%	0,1W	4525	© 4822 051 20008	CHIP JUMPER 0805		
3640	© 4822 117 11507	6,8kΩ	1%	0,1W	4526	© 4822 051 20008	CHIP JUMPER 0805		
3641	▲ 4822 052 10109	10Ω	5%	NFR	4527	© 4822 051 20008	CHIP JUMPER 0805		
3642	© 4822 051 20472	4,7kΩ	5%	0,1W	4528	© 4822 051 20008	CHIP JUMPER 0805		
3643	© 4822 051 20472	4,7kΩ	5%	0,1W	4529	© 4822 051 20008	CHIP JUMPER 0805		
3645	© 4822 051 20479	47Ω	5%	0,1W	4531	© 4822 051 20008	CHIP JUMPER 0805		
3646	© 4822 051 20479	47Ω	5%	0,1W	4532	© 4822 051 20008	CHIP JUMPER 0805		
3647	© 4822 051 20479	47Ω	5%	0,1W	4533	© 4822 051 20008	CHIP JUMPER 0805		
3648	© 4822 051 20479	47Ω	5%	0,1W	4534	© 4822 051 20008	CHIP JUMPER 0805		
3649	© 4822 051 20479	47Ω	5%	0,1W	4535	© 4822 051 20008	CHIP JUMPER 0805		
3650	© 4822 051 20479	47Ω	5%	0,1W	4536	© 4822 051 20008	CHIP JUMPER 0805		
3651	© 4822 051 20392	3,9kΩ	5%	0,1W	4537	© 4822 051 20008	CHIP JUMPER 0805		
3652	© 4822 051 20392	3,9kΩ	5%	0,1W	4538	© 4822 051 20008	CHIP JUMPER 0805		
3655	© 4822 050 21003	10kΩ	2%	0,25W	4540	© 4822 051 20008	CHIP JUMPER 0805		
3656	© 4822 117 10833	10kΩ	1%	0,1W	4541	© 4822 051 20008	CHIP JUMPER 0805		
3657	© 4822 051 10102	1kΩ	2%	0,25W	4542	© 4822 051 20008	CHIP JUMPER 0805		
3658	© 4822 051 20562	5,6kΩ	5%	0,1W	4543	© 4822 051 20008	CHIP JUMPER 0805		
3660	© 4822 051 20472	4,7kΩ	5%	0,1W	4544	© 4822 051 20008	CHIP JUMPER 0805		
3661	© 4822 053 20475	4,7MΩ	5%	0,25W	4545	© 4822 051 20008	CHIP JUMPER 0805		
3662	© 4822 051 10102	1kΩ	2%	0,25W	4546	© 4822 051 20008	CHIP JUMPER 0805		
3663	© 4822 051 10102	1kΩ	2%	0,25W	4547	© 4822 051 20008	CHIP JUMPER 0805		
3667	© 4822 051 20392	3,9kΩ	5%	0,1W	4548	© 4822 051 20008	CHIP JUMPER 0805		
3668	© 4822 051 20392	3,9kΩ	5%	0,1W	4549	© 4822 051 20008	CHIP JUMPER 0805		
3671	© 4822 117 13579	220kΩ	1%	0,1W	4550	© 4822 051 20008	CHIP JUMPER 0805		
3672	© 4822 117 13579	220kΩ	1%	0,1W	4551	© 4822 051 20008	CHIP JUMPER 0805		
3673	© 4822 117 12955	2,7kΩ	1%	0,1W	4552	© 4822 051 20008	CHIP JUMPER 0805		
3674	© 4822 051 20334	330kΩ	5%	0,1W	4553	© 4822 051 20008	CHIP JUMPER 0805		
3675	© 4822 051 20392	3,9kΩ	5%	0,1W	4554	© 4822 051 20008	CHIP JUMPER 0805		
3676	© 4822 051 20101	100Ω	5%	0,1W	4555	© 4822 051 20008	CHIP JUMPER 0805		
3677	© 4822 051 20471	470Ω	5%	0,1W	4556	© 4822 051 20008	CHIP JUMPER 0805		
3678	© 4822 117 13579	220kΩ	1%	0,1W	4557	© 4822 051 20008	CHIP JUMPER 0805		

ELECTRICAL PARTSLIST AF7 BOARD

RESISTORS		RESISTORS	
4558	© 4822 051 20008 CHIP JUMPER 0805	4630	© 4822 051 20008 CHIP JUMPER 0805
4559	© 4822 051 20008 CHIP JUMPER 0805	4715	© 4822 051 20008 CHIP JUMPER 0805
4560	© 4822 051 20008 CHIP JUMPER 0805	4716	© 4822 051 20008 CHIP JUMPER 0805
4561	© 4822 051 20008 CHIP JUMPER 0805	COILS	
4562	© 4822 051 20008 CHIP JUMPER 0805		
4563	© 4822 051 20008 CHIP JUMPER 0805	5511	© 4822 157 62552 2,2μH
4564	© 4822 051 20008 CHIP JUMPER 0805	5523	© 4822 157 62552 2,2μH
4565	© 4822 051 20008 CHIP JUMPER 0805	5531	© 4822 157 62552 2,2μH
4567	© 4822 051 20008 CHIP JUMPER 0805	5532	© 4822 157 62552 2,2μH
4568	© 4822 051 20008 CHIP JUMPER 0805	DIODES	
4569	© 4822 051 20008 CHIP JUMPER 0805		
4570	© 4822 051 20008 CHIP JUMPER 0805	6512	© 4822 130 30862 BZX79-C9V1
4571	© 4822 051 20008 CHIP JUMPER 0805	6514	© 4822 130 31878 1N4003G
4572	© 4822 051 20008 CHIP JUMPER 0805	6515	© 4822 130 30621 1N4148
4573	© 4822 051 20008 CHIP JUMPER 0805	6516	© 4822 130 30621 1N4148
4574	© 4822 051 20008 CHIP JUMPER 0805	6531	© 4822 130 30621 1N4148
4575	© 4822 051 20008 CHIP JUMPER 0805	TRANSISTORS	
4576	© 4822 051 20008 CHIP JUMPER 0805		
4577	© 4822 051 20008 CHIP JUMPER 0805	7521	© 4822 130 60511 BC847B
4579	© 4822 051 20008 CHIP JUMPER 0805	7522	© 4822 130 60511 BC847B
4580	© 4822 051 20008 CHIP JUMPER 0805	7523	© 4822 130 60511 BC847B
4581	© 4822 051 20008 CHIP JUMPER 0805	7524	© 4822 130 60511 BC847B
4582	© 4822 051 20008 CHIP JUMPER 0805	7525	© 4822 130 40959 BC547B
4583	© 4822 051 20008 CHIP JUMPER 0805	7526	© 4822 130 60373 BC856B
4585	© 4822 051 20008 CHIP JUMPER 0805	7527	© 4822 130 60511 BC847B
4586	© 4822 051 20008 CHIP JUMPER 0805	7528	© 4822 130 60511 BC847B
4587	© 4822 051 20008 CHIP JUMPER 0805	7529	© 4822 130 60373 BC856B
4588	© 4822 051 20008 CHIP JUMPER 0805	7531	© 4822 130 60511 BC847B
4589	© 4822 051 20008 CHIP JUMPER 0805	7532	© 4822 130 60511 BC847B
4591	© 4822 051 20008 CHIP JUMPER 0805	7533	© 4822 130 60511 BC847B
4592	© 4822 051 20008 CHIP JUMPER 0805	7534	© 4822 130 60511 BC847B
4593	© 4822 051 20008 CHIP JUMPER 0805	7535	© 4822 130 42804 BC817-25
4595	© 4822 051 20008 CHIP JUMPER 0805	7536	© 4822 130 42804 BC817-25
4597	© 4822 051 20008 CHIP JUMPER 0805	7537	© 4822 130 60511 BC847B
4599	© 4822 051 20008 CHIP JUMPER 0805	7538	© 4822 130 60511 BC847B
4600	© 4822 051 20008 CHIP JUMPER 0805	7539	© 4822 130 60373 BC856B
4601	© 4822 051 20008 CHIP JUMPER 0805	7541	© 4822 130 60511 BC847B
4602	© 4822 051 20008 CHIP JUMPER 0805	7542	© 4822 130 60511 BC847B
4603	© 4822 051 20008 CHIP JUMPER 0805	7543	© 4822 130 42804 BC817-25
4605	© 4822 051 20008 CHIP JUMPER 0805	7552	© 4822 130 41246 BC327-25
4606	© 4822 051 20008 CHIP JUMPER 0805	7553	© 4822 130 60511 BC847B
4607	© 4822 051 20008 CHIP JUMPER 0805	INTEGRATED CIRCUITS	
4608	© 4822 051 20008 CHIP JUMPER 0805		
4609	© 4822 051 20008 CHIP JUMPER 0805	7511	© 4822 209 17386 TDA7437T, Selector&Sound processor
4611	© 4822 051 20008 CHIP JUMPER 0805	7512	© 4822 209 83357 NJM4560M, 2-FOLD OP-AMP.
4612	© 4822 051 20008 CHIP JUMPER 0805	7513	© 4822 209 83357 NJM4560M, 2-FOLD OP-AMP.
4613	© 4822 051 20008 CHIP JUMPER 0805	7515	© 4822 209 31378 NJM4556M, 2-FOLD OP-AMP.
4614	© 4822 051 20008 CHIP JUMPER 0805	7551	© 4822 209 17345 M62320FP, I2C SHIFT REGISTER
4615	© 4822 051 20008 CHIP JUMPER 0805		
4618	© 4822 051 20008 CHIP JUMPER 0805		
4619	© 4822 051 20008 CHIP JUMPER 0805		
4620	© 4822 051 20008 CHIP JUMPER 0805		
4621	© 4822 051 20008 CHIP JUMPER 0805		
4622	© 4822 051 20008 CHIP JUMPER 0805		
4623	© 4822 051 20008 CHIP JUMPER 0805		
4624	© 4822 051 20008 CHIP JUMPER 0805		
4625	© 4822 051 20008 CHIP JUMPER 0805		
4626	© 4822 051 20008 CHIP JUMPER 0805		
4627	© 4822 051 20008 CHIP JUMPER 0805		
4629	© 4822 051 20008 CHIP JUMPER 0805		



POWER 4-CDR Module

stage .6

TABLE OF CONTENTS

Circuit description9-2

Component layout9-6

Circuit diagram Supply part9-7

Component layout9-8

Circuit diagram Power stage9-9

Circuit diagram CDR-Supply part9-10

Component layout CDR-Supply part9-11

Partslist9-11

CIRCUIT DESCRIPTION FOR POWER4-MODULE

Supply-part

General (pos. numbers refer to circuit diagram chapter 9-7)

The primary circuitry depends on the version:

- Versions with fixed primary voltage: 100VAC for /26
120VAC for /37
220-240VAC for /22/25/30/33/34

Versions /22/25/26/37 use radial type-fuse 1201, versions /30/33/34 use glass tube fuse 1202.

For correct replacement see service printing on printed board respectively version table in circuit diagram or partslist.

- Version with switchable primary voltage: 110-127/220-240VAC for /21
In version /21 voltage selector 1210 is built-in and each primary winding is protected separately (fuses 1201 and 1200).
For correct replacement see service printing on printed board respectively version table in circuit diagram or partslist.
- European versions – “low power standby feature”
For detailed description see below.

Circuit details:

• Low power standby feature

An additional small standby transformer, connected in series to the mains transformer, reduces power consumption in standby-mode.

In case power is switched on, the control line ECO is low → relay 1208 is activated → standby transformer 5211 is shortened and out of work.

When the set is switched off (standby) the control line ECO is high → relay 1208 is not activated → standby transformer 5211 is now connected in series to the primary winding of the mains transformer 1008. As the impedance of the standby transformer is much higher than the impedance of the mains transformer, the mainsvoltage is divided by approx. 85% (standby transformer) to 15% (mains transformer). Thus the mains transformer delivers very low secondary voltage → power consumption is less than 100mW.

Via standby transformer and rectifiers 6209-6212 the supply voltage +C is substituted. The 5,6V regulator is still working and so the microprocessor is kept running.

• DC voltages +A, +B1/+B2, +C

These voltages supply the Super Class G amplifier, described later in this chapter.

The whole power supply is optimized for the special characteristic of this type of amplifier. For that reason several “tricky” details have been applied to ensure optimal efficiency and symmetrical load to the mains transformer.

Generation of +A

Common full wave rectifying with bridge rectifier 6201, using 100% secondary winding of mains transformer (pin 9-15).

Generation of +B1/+B2

The power supply is designed to cover both, 2-channel and 4-channel application.

While for 2-channel application only one supply voltage +B1 is sufficient, 4-channel application requires an additional supply part +B2 which supplies the Center/Surround-amplifiers and the +12V-regulator (current required by 4 amplifiers would overload a single rectifier).

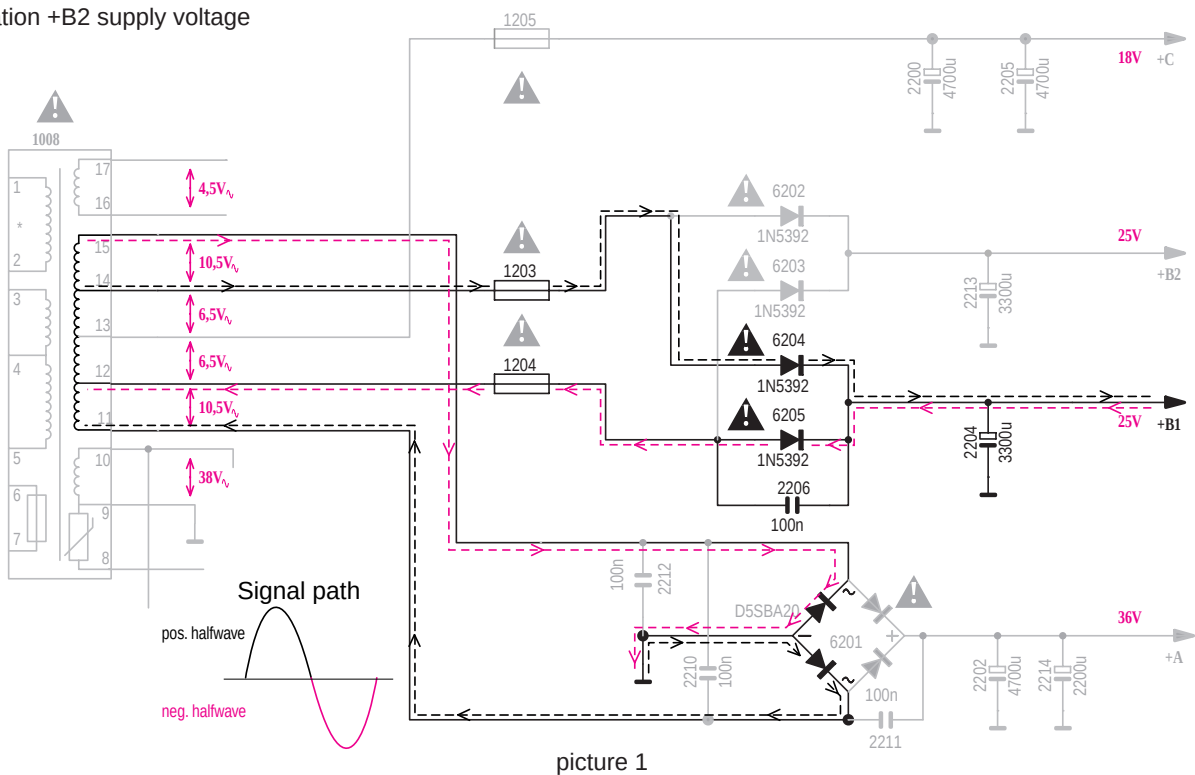
The supply for 2-channel versions consists of one full wave rectifier:

- 2 diodes of bridge rectifier 6201, with 6204/6205 for generation of +B1
- +B2 is connected in parallel with a bridge wire.

The supply for 4-channel versions consists of two separate full wave rectifiers:

- 2 diodes of bridge rectifier 6201, with 6204/6205 (for +B1) and
 - 2 diodes of bridge rectifier 6201, with 6202/6203 (for +B2),
using approx. 70% secondary winding of mains transformer (pin 9-14 respectively pin 12-15).
- As example for generation of +B2 see picture 1.

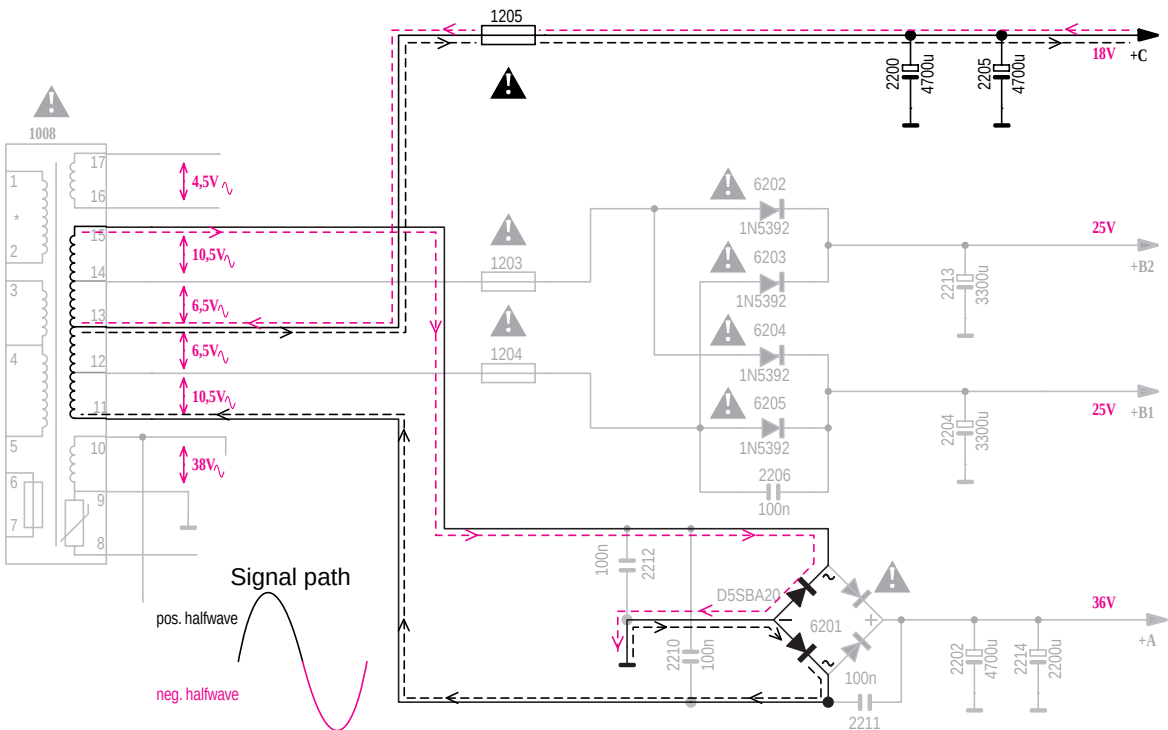
Generation +B2 supply voltage



picture 1

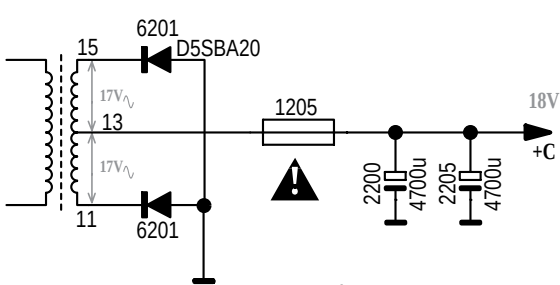
Generation of +C

Full wave rectifying with 2 diodes of bridge rectifier 6201, using 50% secondary winding of mains transformer (pin 13-15/13-11). See pictures 2 and 3 below.



picture 2

Simplified



picture 3

Circuit details (continued):

- **Supply voltages for FTD (Fluorescent Tube Display)**

The FTD requires two supply voltages, delivered by separate windings of the mains transformer:

- 4,5VAC for FTD heating (transformer pin 16/17)
- -30V stabilized by the -30V regulator located on the amplifier part. The supply part delivers -35V unstabilized (transformer pin 9/10), typical value: -35V...-45V.

- **Stabilized +5V6**

Stabilizer 7201 generates the supply voltage +5V6 for the microprocessor. In fault condition the output voltage can rise up to approx. 17V, which would definitely damage the device. Therefore an overvoltage protection for the +5V6 supply is implemented.

Whenever the output of stabilizer rises above 7,5V, the base of 7202 reaches 0,7V (7,5V - voltage drop on 6207), the transistor switches through and short circuits the input voltage. This causes the safety resistor 3204 to blow out and interrupt immediately.

- **Temperature monitoring**

The mains transformer is equipped with a NTC, embedded in the secondary winding (pin 8/9). Via the NTC line the temperature of the mains transformer is continuously monitored by the microprocessor. Further actions depend on the software of the set. Usually the set will be switched to standby mode when the transformer is overheated.

- **Power down (PWDN) monitoring**

In order to enable proper switch off conditions the mains supply is monitored by the microprocessor via the PWDN line.

In case of mains supply interrupts the PWDN line becomes low, while the +5V6 is still stable. This enables the microprocessor to take actions for a safe shut-down (e.g. mute, reset of electronics, release of head support of tape deck).

Amplifier part**+12V-regulator** (*pos. numbers refer to circuit diagram chapter 9-9*)

Is used to supply all motors (+12M) and all analogue circuits (+12A) in the set. +12C is provisional only.

- **Power on/off:**

Switching on/off is done via the STBY-line from the microprocessor. H=ON, L=OFF

If the STBY line is high - transistor 7222 is conductive. Base of 7224 becomes less positive than the emitter. This causes transistor 7224 to switch through and supply the base of 7221. Consequently 7221 switches through too.

Via 3218 transistor 3228 is conductive as soon as B2 is available. Consequently switching transistor 7227 is also switched through.

If the STBY line is switched to low level base current for 7222 is blocked. In turn 7224 and 7221 are blocked. → OFF.

- **Regulation:**

Key components are power-transistor 7221, reference diode 6221 and transistor 7223.

After power is switched on via the STBY line as described above the +12A increases until 7223 becomes conductive via reference diode 6221 → 7223 reduces base current of 7221 → +12A is stable (typical +12,4V).

In normal operating mode 7227 is always switched through as described above.

- **Protections:**

In case of overcurrent (typical 2,5A) 7227 gets out of saturation → 7226 becomes conductive → 7225 becomes conductive via 6225 → 7228 is blocked (no base current anymore) → 7227 is blocked too → no +12V.

Restarting is only possible with power OFF → ON.

In case of overvoltage (more than +15V on emitter of 7221) 7225 is now activated via 6233 → 7228 is blocked (no base current anymore) → 7227 is blocked too → no +12V.

These protections are implemented for saving the set-electronic in any fault-condition.

-30V-regulator

- Grid supply for the FTD switched by the microprocessor.

Simple regulation with 6251 as reference. Typical value: -29V. Maximum current: 30mA

Circuit details (continued):**VCD- Supply:**

Is a provision for versions with a Video CD Player.

This circuitry consists of a switched supply with a regulator to 5,1V ($\pm 0,15V$).

- **Switching on/off** is done via the VCD_ON line from the microprocessor (H=on, L=off). If the VCD_ON line is high - transistor 7236 becomes conductive. This causes transistor 7238 to switch through. +5VCD is available. If the VCD_ON is low - transistor 7236 is blocked → no base current through 7238 → transistor 7238 is blocked too → +5VCD is switched off.
- **Regulation** is done via Z- diode 6244 and transistor 7237. If the +5VCD exceeds 5,1V the basis of transistor 7237 becomes higher than 0,6V via Z- diode 6244. Consequently transistor 7237 becomes conductive. This causes a reduced base current through 7236. Transistor 7236 becomes less conductive and reduces the base current trough 7238. Transistor 7238 becomes less conductive too and reduces the +5VCD.

Amplifier:

Attention: In the POWER 4 module the power amplifier IC AN7164 is used as a bridge-amplifier.
Any connection from output to ground will destroy the outpout stages!

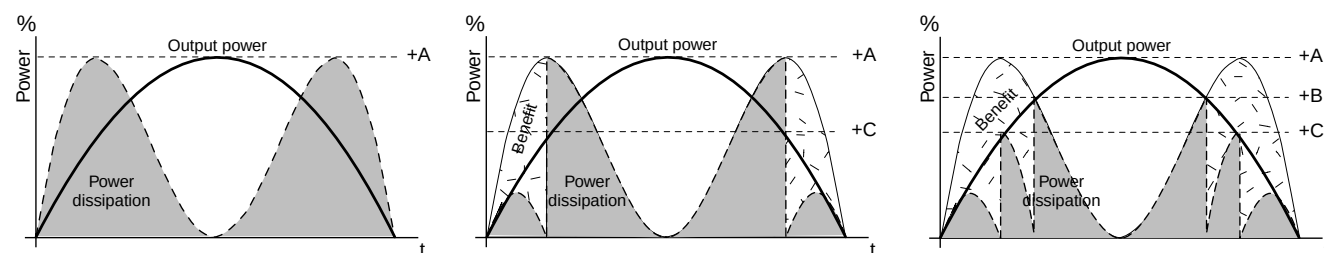
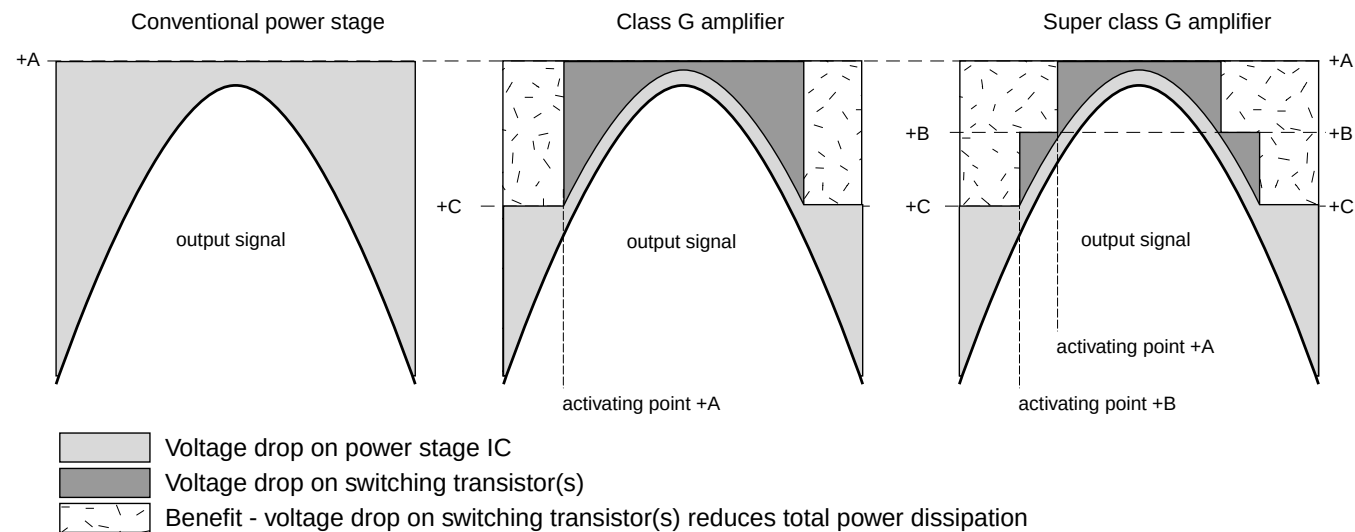
- Via the AMP_ON control line, connected to pins 6 (Stby), the power amplifiers are switched on/off by the μP .
High level (approx. 4,5V): power amplifiers switched on
Low level (approx. 0V): power amplifiers switched off
- Super class G - operation

The power amplifiers operate as so-called super class G - amplifiers:

The supply pins 12 (Vcc) are not just connected to one fixed DC-supply as in conventional amplifiers.

Dependent on the output power there are three different DC-voltages supplied to the power amplifiers:

- ⇒ +C (+18V) for low output power
- ⇒ +B (+25V) for medium output power
- ⇒ +A (+36V) for high output power

Principle / benefit of Super Class G

- advantages:
 - best efficiency
 - less power drawn from the mains transformer than by conventional operating amplifiers reduces transformer heating.
 - reduced power dissipation at the amplifier ICs results in
 - less junction temperature and better reliability
 - possibility of higher output power with smaller cooling fin
 - smaller size
- Functional description of the super class G - circuitry used in Power4-module

The DC-level on the amplifier output pins is normally $V_{cc}/2$.

With low signals +C is supplying the amplifiers via decoupling diode 6312. The DC-level on the output pins is therefore approx. 8,6V and approx. 8V on the base of 7315.

When the output signal increases, also DC-level on base of 7315 increases via diodes 6305, 6306, 6307 and 6308. At a certain output power 7315 becomes slightly conductive and enables low base current for 7304 which becomes conductive too and pulls gate of FET 7303 up to a more positive level. Thus FET 7303 begins to switch through and connects the higher DC supply +B1 slowly to the power stages.

This does not end up in a hard switching but in a smooth regulating because V_{cc} is coupled back to the emitter of 7315 via Zener diode 6310. As soon as V_{cc} increases also the level on emitter 7315 is increased by a 3,9V lower level than V_{cc} .

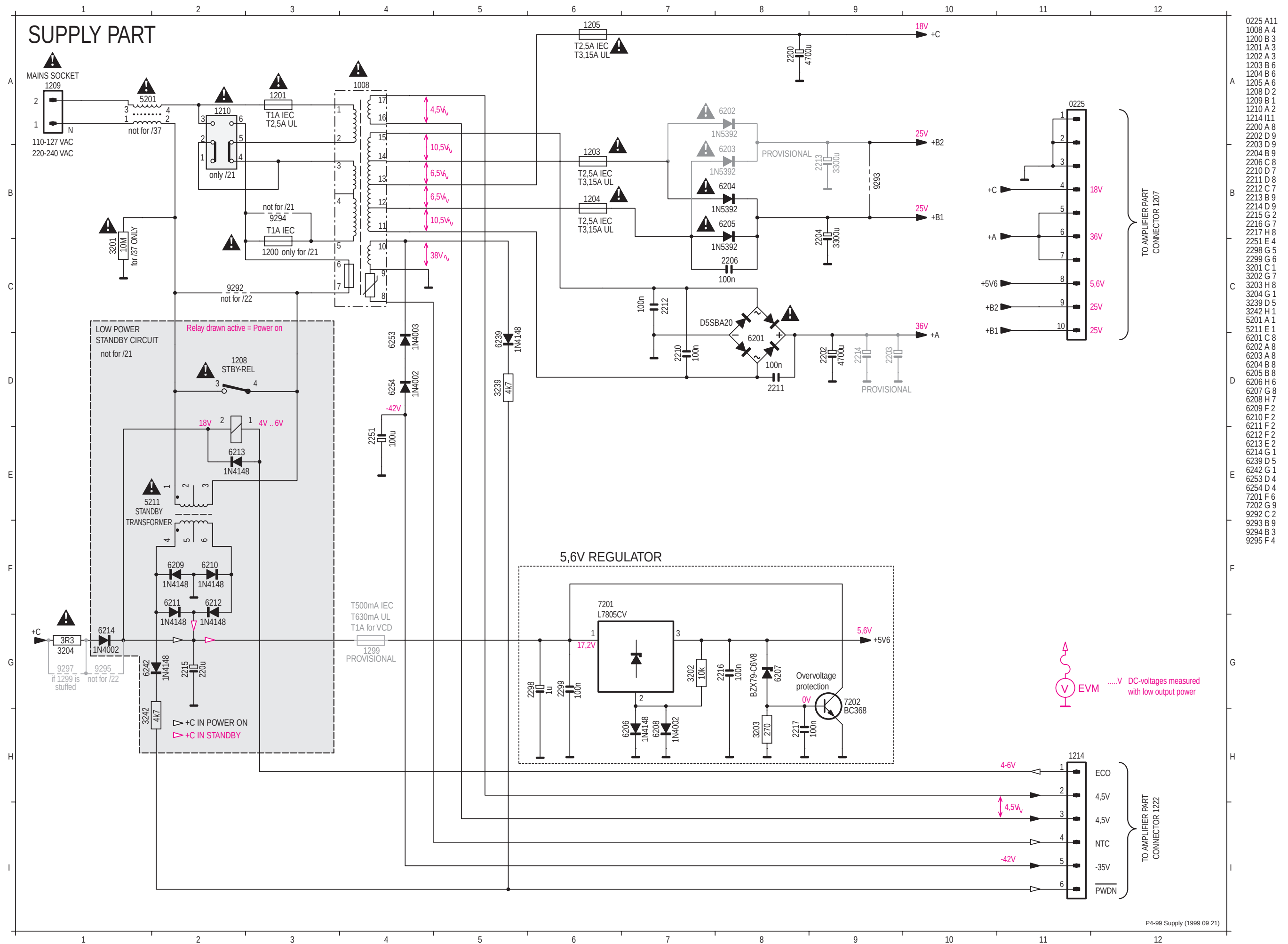
When the output power is increased further +B1 would not be high enough to enable undistorted output signal. The more the output level increases the more increases the DC-level on base of 7315 which causes the transistor more and more conducting until the summary of the voltage drop on 3340+E/B 7304+3342 becomes approx. 1,4V. Now the necessary VBE for a darlington-type transistor is obtained, 7305 begins to switch through and connects the again higher DC supply +A slowly to the power stages. 7305 regulates +A, same as described before for +B.

7322 and 7316 switch the ripple capacitor 2355, dependent on the output power.

With low output power the DC-level on base 7322 is approx. 8V. Via Zener diode 6310 and resistor 3333 the emitter is pulled to V_{cc} (+C at low levels). 7322 is switched through and in turn 7316. The ripple capacitor 2325 is connected to ground and functions as in normal amplifiers. Hum is suppressed and good S/N-ratio is guaranteed even during silent music passages.

When the supply voltage has to be switched to a higher level the DC-level of the ripple capacitor has to increase in the same relation, otherwise the reference voltages inside the IC would not fit to the actual V_{cc} . Because of the different delays this relation cannot be obtained and a continuously connected capacitor to the ripple input would cause distortion. For that reason the ripple capacitor 2325 is disconnected as soon as the output power exceeds a certain value. When the output signal increases, also DC-level on base of 7322 increases via diodes 6305, 6306, 6307 and 6308. 7322 blocks and in turn 7316. The ripple capacitor 2325 is disconnected from ground. The circuitry is designed so that 2325 is disconnected just before 7303 begins to switch +B through (see above).

- For Center/Surround-amplifier the function of the Super Class G circuit is similar. Instead of +B1 there +B2 is connected.
- For the /37-versions with two channel-application the so called MATRIX SURROUND is added. The 2 surround-speakers are added in a way, that in case of STEREO a high signal can be measured (up to 10W per speaker at 6 Ohm). In MONO only a few 100mW are available. Result: The widening of the STEREO base is increased without any additional electronic or amplifier.
- In all four channel versions a pre-amplifier out for SURROUND is available to add a wireless speaker system (e.g. FB206,FB208).



9365 A 2	9329 B 7	9313 B 8	9298 D 6	9285 E 8	7301 C 9	7211 A 7	6305 D 8	6235 A 8	6208 C 4	5201 D 5	3314 D 7	3301 C 9	3242 C 1	3221 B 7	2346 E 7	2312 D 7	2298 D 4	2217 D 4	1360 D 6	1211 A 9	0014 E 3
9366 A 9	9330 D 8	9314 B 7	9299 D 5	9286 E 9	7302 C 7	7221 C 6	6306 D 7	6236 A 9	6209 C 1	5211 A 1	3316 D 8	3302 C 7	3243 A 8	3222 B 7	2374 B 9	2313 D 8	2299 D 4	2218 E 9	1361 D 8	1212 D 4	0025 D 2
9367 A 8	9331 D 7	9315 D 3	9300 B 8	9287 E 9	7303 C 9	7222 B 7	6307 D 8	6239 D 2	6210 C 1	5301 D 9	3317 C 8	3303 C 9	3244 A 8	3223 A 6	3201 B 1	2314 D 6	2301 C 9	2221 A 6	2200 E 5	1213 E 9	1008 A 3
9368 E 1	9335 A 8	9316 E 9	9301 A 4	9288 E 9	7304 D 9	7223 A 6	6308 E 6	6242 C 1	6211 B 1	5302 D 8	3321 A 9	3304 C 7	3246 A 8	3224 A 6	3202 C 4	2317 B 9	2302 C 7	2222 B 6	2202 E 4	1214 D 1	1200 B 1
9369 A 9	9336 B 8	9317 D 8	9302 C 3	9289 E 9	7305 C 8	7224 B 7	6309 D 9	6243 B 9	6212 B 1	5303 D 7	3326 D 6	3305 C 9	3247 A 7	3225 B 7	3203 C 4	2319 C 9	2303 C 9	2225 B 6	2204 C 1	1215 A 9	1201 C 5
9370 A 6	9338 B 8	9318 E 2	9303 A 9	9290 E 9	7315 D 9	7225 B 6	6310 D 9	6244 A 7	6213 C 1	5304 D 7	3327 C 9	3306 C 8	3248 A 8	3226 B 7	3204 E 2	2320 C 7	2304 C 8	2226 A 7	2206 C 1	1218 B 8	1202 C 5
9397 A 7	9339 D 4	9320 D 2	9304 B 9	9291 A 5	7316 B 8	7226 C 6	6312 C 8	6245 A 7	6214 E 1	6201 D 2	3328 B 9	3307 B 9	3250 A 7	3227 B 7	3211 A 7	2323 C 7	2305 C 8	2227 C 6	2210 D 2	1219 B 8	1203 C 2
	9340 B 8	9321 D 7	9305 C 8	9292 A 1	7322 B 9	7227 C 6	6313 C 8	6251 B 9	6215 A 6	6202 C 1	3333 B 9	3308 B 9	3251 A 9	3228 B 6	3215 B 6	2324 C 9	2306 C 7	2228 B 6	2211 C 2	1222 A 9	1204 C 2
	9350 B 8	9322 B 9	9307 D 8	9293 D 1	8233 B 7	7228 B 6	6314 C 9	6252 A 9	6225 B 6	6203 D 1	3340 D 9	3309 B 9	3252 B 9	3229 B 6	3216 B 6	2325 B 9	2307 C 8	2236 A 7	2212 D 2	1235 A 6	1205 C 5
	9353 B 4	9323 C 3	9308 D 9	9294 A 2	9281 E 8	7236 A 8	6315 C 7	6253 E 1	6226 A 7	6204 C 1	3341 C 9	3310 B 9	3253 A 9	3230 B 6	3217 B 6	2329 D 9	2308 C 6	2251 D 1	2213 D 1	1299 E 2	1207 B 8
	9354 C 1	9324 D 8	9309 D 7	9295 E 1	9282 E 8	7237 A 7	7201 D 4	6254 E 1	6228 A 7	6205 D 1	3342 D 9	3311 D 9	3254 A 9	3235 A 6	3218 C 7	2341 C 9	2309 D 9	2252 D 1	2214 D 4	1303 E 7	1208 B 1
	9361 B 7	9325 E 2	9310 C 1	9296 E 2	9283 E 8	7238 A 8	7202 D 4	6300 B 8	6233 B 6	6206 C 5	3343 C 9	3312 D 9	3255 E 1	3239 D 1	3219 B 6	2342 C 7	2310 D 7	2253 A 9	2215 C 1	1304 E 1	1209 E 5
	9364 A 2	9328 B 7	9311 A 7	9297 E 2	9284 E 8	7251 A 9	7203 E 9	6301 B 9	6234 B 6	6207 C 4	3344 C 7	3313 D 7	3256 A 9	3241 A 8	3220 B 6	2345 E 8	2311 D 8	2297 E 9	2216 D 4	1305 E 9	1210 A 5

9

8

7

6

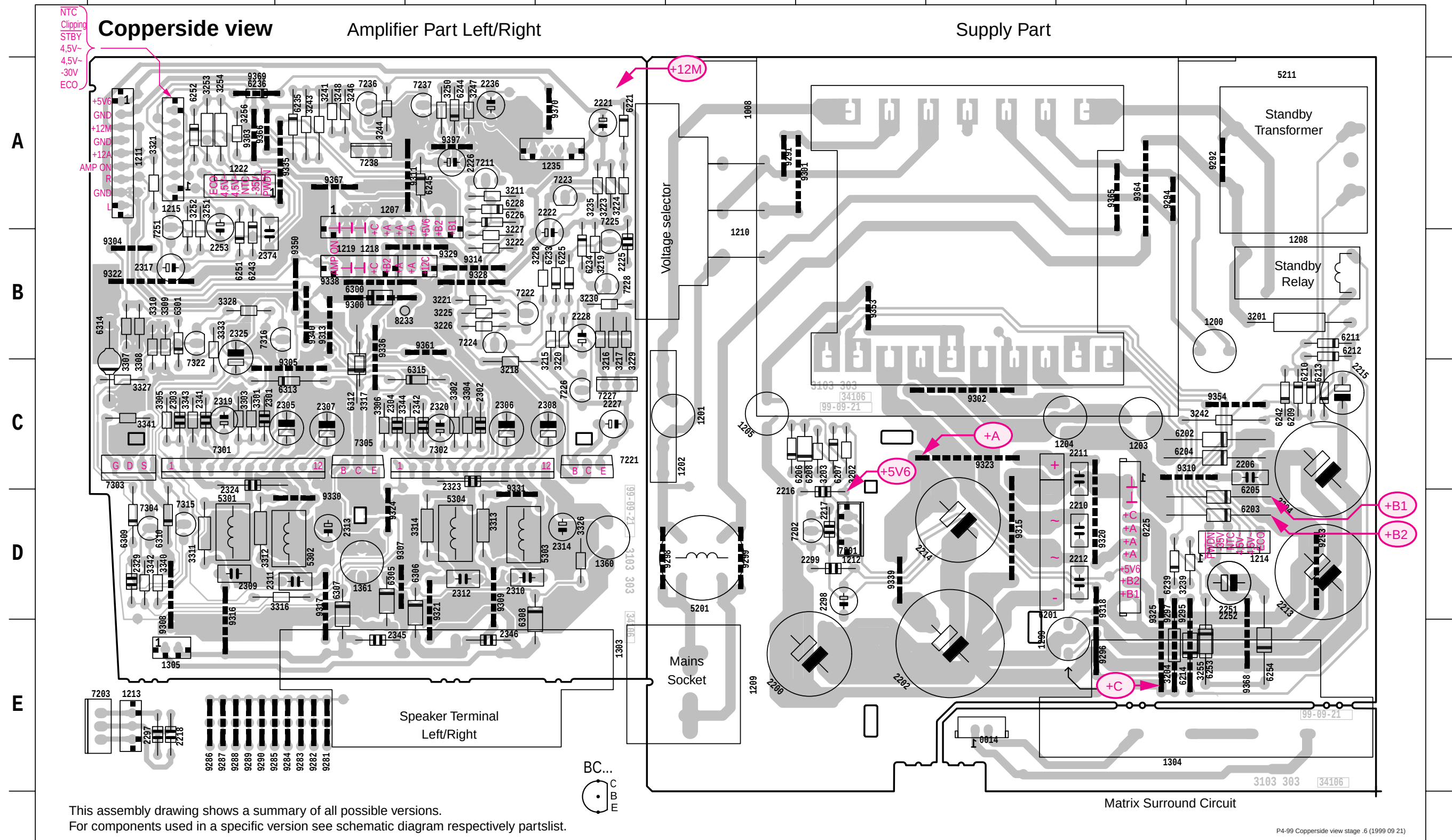
5

4

3

2

1



9

8

7

6

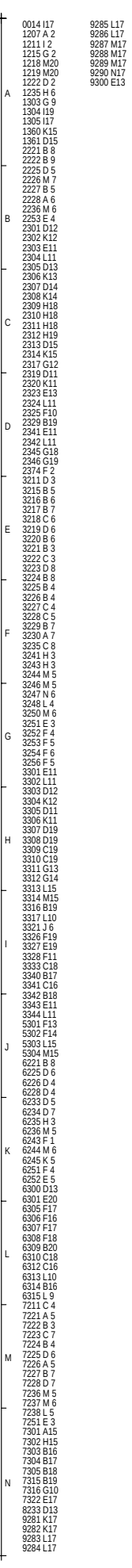
5

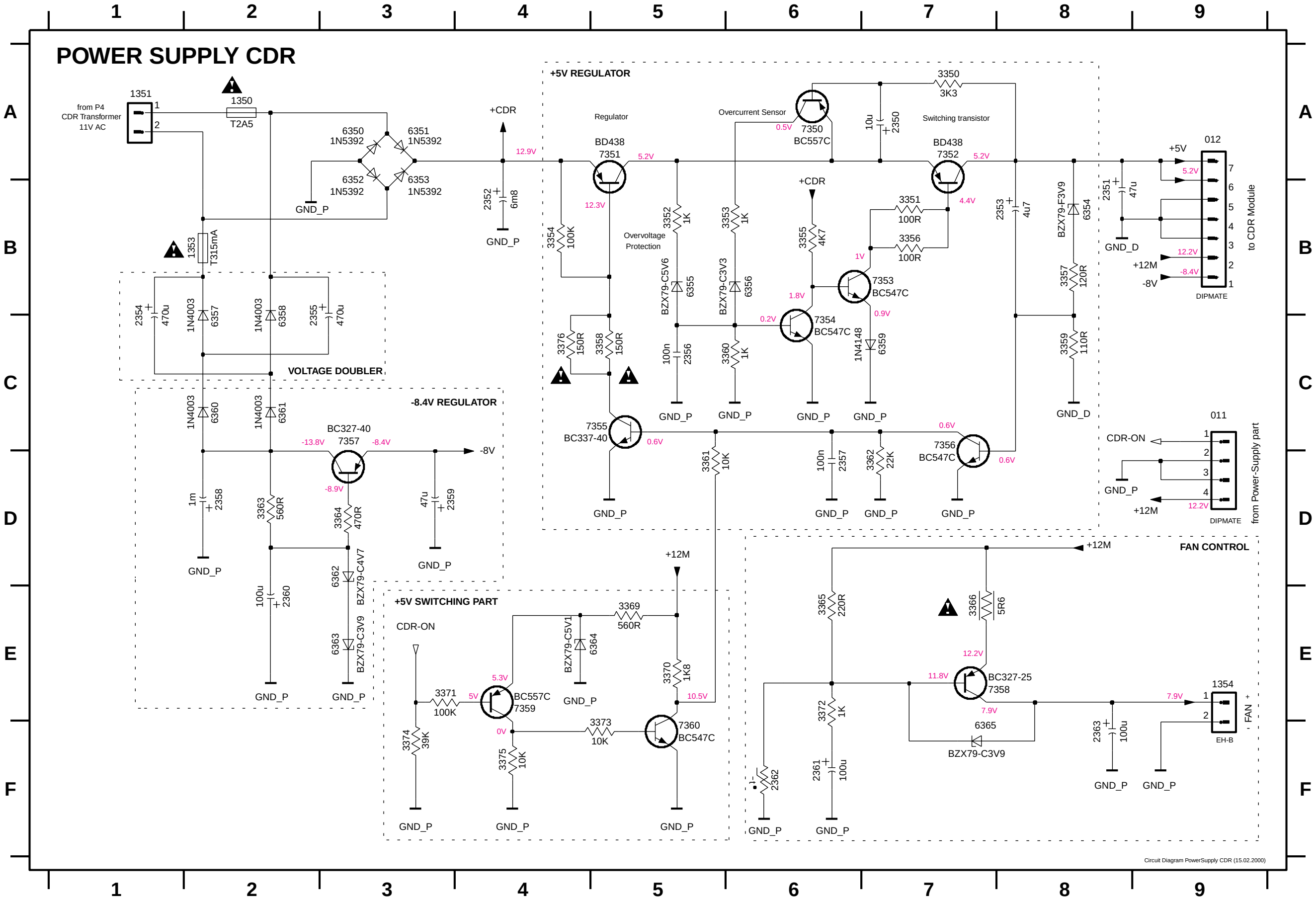
4

3

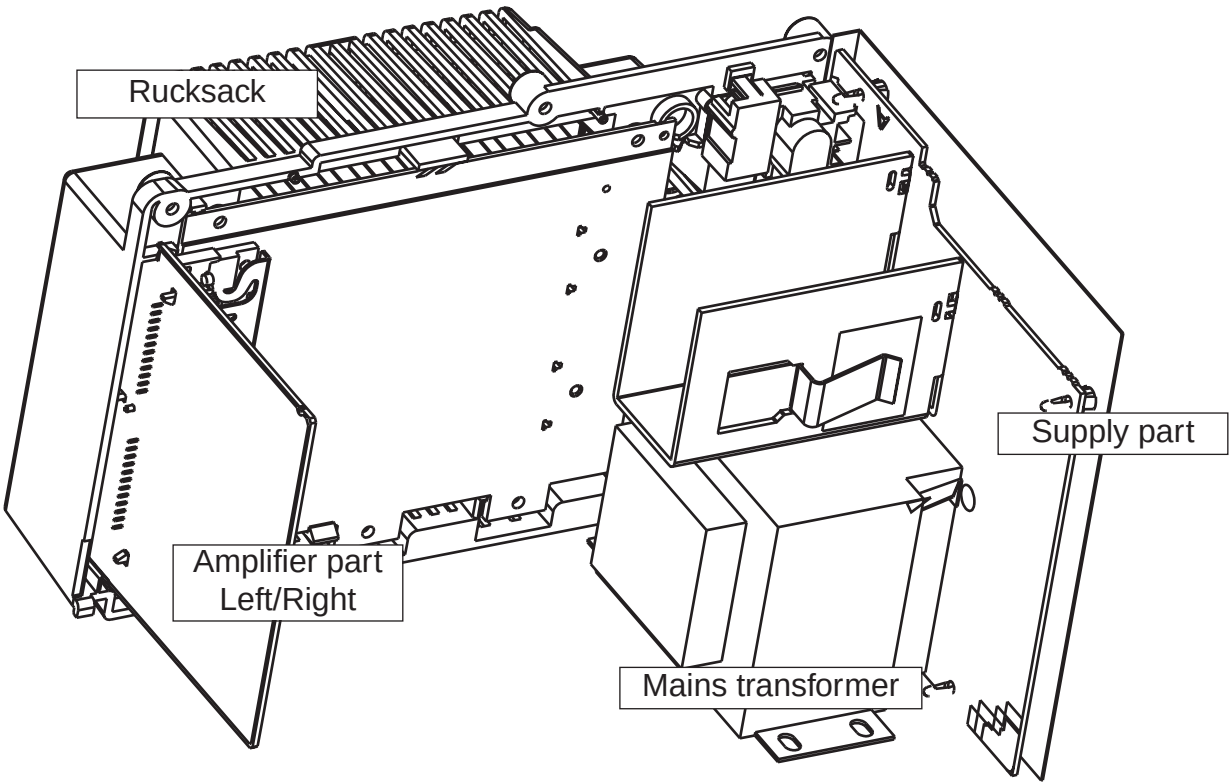
2

1





PARTSLIST POWER4 MODULE



MECHANICAL PARTSLIST POWER4 MODULE

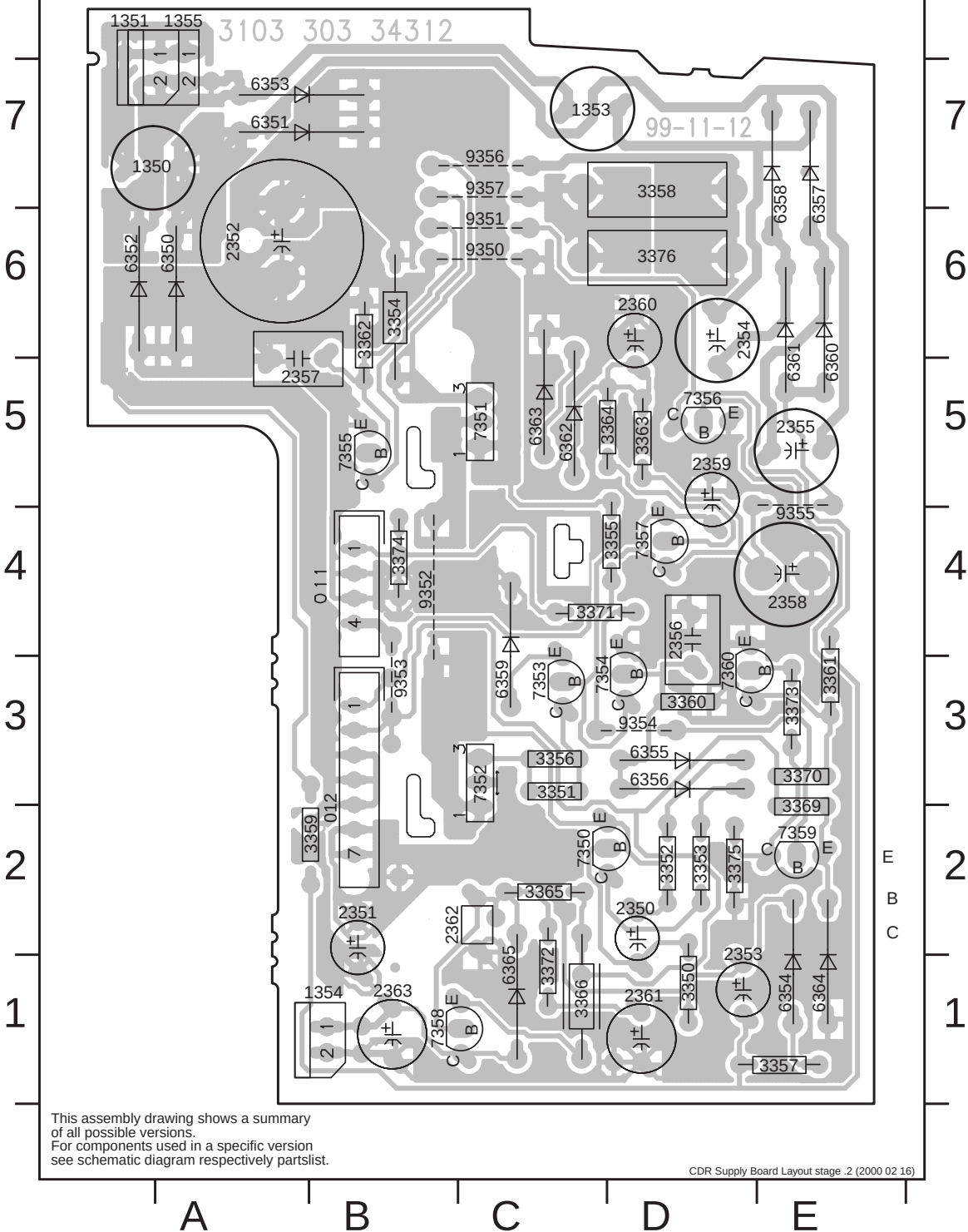
0201	4822 426 10607	RUCKSACK	0255	4822 255 40179	SPRING CLIP TO220
0215	4822 492 11735	SPRING TRANSISTOR	1003	4822 361 11161	KD1206PTS3, FAN
0222	3103 304 07050	INSULATING WASHER (TO126)			

ELECTRICAL PARTSLIST POWER4 MODULE

MISCELLANEOUS			CAPACITORS			
1200	4822 071 51002	FUSE T1A	2210	5322 121 42386	100nF	5% 63V
1201	4822 071 51002	FUSE T1A	2211	5322 121 42386	100nF	5% 63V
1201	4822 253 50137	FUSE T 2,5A UL	2212	5322 121 42386	100nF	5% 63V
1203	4822 071 52502	FUSE T 2,5A	2215	4822 124 80144	220µF	20% 25V
1203	4822 252 51121	FUSE T3,15A UL	2216	4822 126 12882	100nF	20% 50V
1204	4822 071 52502	FUSE T 2,5A	2217	4822 126 12882	100nF	20% 50V
1204	4822 252 51121	FUSE T3,15A UL	2221	4822 124 40248	10µF	20% 63V
1205	4822 071 52502	FUSE T 2,5A	2222	4822 124 40433	47µF	20% 25V
1205	4822 252 51121	FUSE T3,15A UL	2225	4822 126 12882	100nF	20% 50V
1208	2422 132 07402	RELAY 1P 12V	2227	4822 124 22652	2,2µF	20% 50V
1209	4822 265 31015	MAINS SOCKET, IEC	2228	4822 124 40248	10µF	20% 63V
1209	4822 265 31016	MAINS SOCKET, UL	2251	4822 124 40255	100µF	20% 50V
1210	4822 272 10269	VOLTAGE SELECTOR	2253	4822 124 41407	0,47µF	20% 63V
1303	4822 267 31176	SPEAKER TERMINAL	2299	4822 126 12882	100nF	20% 50V
1350	4822 071 52502	FUSE T 2,5A	2301	4822 126 11714	4,7nF	20% 16V
1353	4822 071 53151	FUSE 315mA	2302	4822 126 11714	4,7nF	20% 16V
1360	4822 252 11225	FUSE F3,15A IEC 250V	2303	4822 126 11714	4,7nF	20% 16V
1360	4822 252 11226	FUSE F4A UL/CSA 250V	2304	4822 126 11714	4,7nF	20% 16V
1361	4822 252 11225	FUSE F3,15A IEC 250V	2305	4822 124 40207	100µF	20% 25V
1361	4822 252 11226	FUSE F4A UL/CSA 250V	2306	4822 124 40207	100µF	20% 25V
5211	3103 308 30590	TRANSFORMER, STANDBY /37	2307	4822 124 40207	100µF	20% 25V
5211	4822 146 10756	TRANSFORMER, STANDBY	2308	4822 124 40207	100µF	20% 25V
CAPACITORS			2309	4822 121 43526	47nF	5% 100V
2200	2020 012 93403	4700µF 20% 25V	2310	4822 121 43526	47nF	5% 100V
2202	4822 124 80415	4700µF 20% 50V	2311	4822 121 43526	47nF	5% 100V
2204	4822 124 42367	3300µF 20% 35V	2312	4822 121 43526	47nF	5% 100V
2206	5322 121 42386	100nF 5% 63V	2313	4822 124 21913	1µF	20% 63V
2309	4822 124 21913	1µF 20% 63V	2314	4822 124 21913	1µF	20% 63V
			2317	4822 124 40433	47µF	20% 25V
			2319	4822 124 40433	47µF	20% 25V

011	B4	2352	B7	2361	D1	3356	C3	3365	C2	3376	D6	6358	E7	7351	C5	7360	E3
012	B3	2353	E2	2362	C2	3357	E1	3366	D1	6350	A6	6359	C4	7352	C3	9350	C6
1350	A7	2354	E5	2363	B1	3358	D7	3369	E2	6351	A7	6360	E6	7353	C3	9351	C6
1351	A7	2355	E5	3350	D1	3359	B3	3370	E3	6352	A6	6361	E6	7354	D3	9352	C4
1353	D7	2356	D4	3351	C2	3360	D3	3371	D4	6353	A7	6362	D5	7355	B5	9353	B3
1354	B1	2357	B5	3352	D2	3361	E3	3372	C1	6354	E1	6363	C5	7356	D5	9354	D3
1355	A7	2358	E4	3353	D2	3362	B5	3373	E3	6355	D3	6364	E1	7357	D4	9355	E4
2350	D2	2359	D5	3354	B6	3363	D5	3374	B4	6356	D3	6365	C1	7358	C1	9356	C7
2351	B2	2360	D6	3355	D4	3364	D5	3375	E2	6357	E7	7350	D2	7359	E2	9357	C6

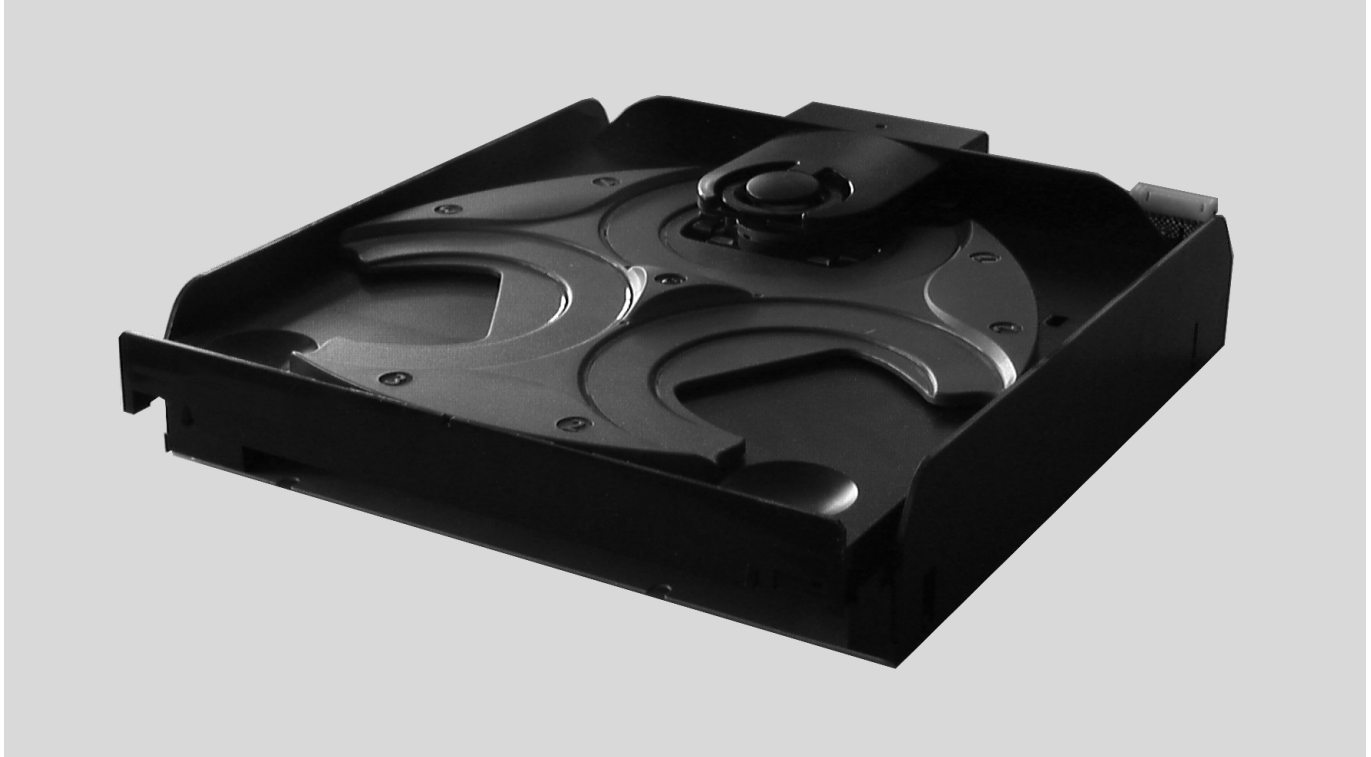
Component Layout bottom side view



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram respectively partslist.
CDR Supply Board Layout stage .2 (2000 02 16)

ELECTRICAL PARTSLIST POWER4 MODULE

CAPACITORS						RESISTORS					
2320	4822 124 40433	47µF	20%	25V		3304	4822 116 83881	390Ω	5%	0,5W	
2323	4822 126 11714	4,7nF	20%	16V		3305	4822 116 52219	330Ω	5%	0,5W	
2324	4822 126 11714	4,7nF	20%	16V		3306	4822 116 52219	330Ω	5%	0,5W	
2325	4822 124 40248	10µF	20%	63V		3307	4822 116 52228	680Ω	5%	0,5W	
2329	4822 122 33848	47pF	5%	50V		3308	4822 116 52228	680Ω	5%	0,5W	
2341	4822 126 11714	4,7nF	20%	16V		3309	4822 116 52231	820Ω	5%	0,5W	
2342	4822 126 11714	4,7nF	20%	16V		3310	4822 116 52231	820Ω	5%	0,5W	
2345	4822 126 12882	100nF	20%	50V		3311	4822 050 24708	4,7Ω	1%	0,6W	
2346	4822 126 12882	100nF	20%	50V		3312	4822 050 24708	4,7Ω	1%	0,6W	
2350	4822 124 11947	10µF	20%	16V		3313	4822 050 24708	4,7Ω	1%	0,6W	
2351	4822 124 40433	47µF	20%	25V		3314	4822 050 24708	4,7Ω	1%	0,6W	
2352	4822 124 12328	6800µF	20%	16V		3316	4822 116 83883	470Ω	5%	0,16W	
2353	4822 124 40769	4,7µF	20%	100V		3317	4822 116 52249	1,8kΩ	5%	0,16W	
2354	4822 124 80791	470µF	20%	16V		3321	4822 116 52276	3,9kΩ	5%	0,5W	
2355	4822 124 80791	470µF	20%	16V		3326	4822 116 52283	4,7kΩ	5%	0,5W	
2356	5322 121 42386	100nF	5%	63V		3327	4822 116 52219	330Ω	5%	0,5W	
2357	5322 121 42386	100nF	5%	63V		3328	4822 050 21003	10kΩ	2%	0,25W	
2358	4822 124 81144	1000µF	20%	16V		3333	4822 116 83884	47kΩ	5%	0,16W	
2359	4822 124 40433	47µF	20%	25V		3340	4822 116 52219	330Ω	5%	0,5W	
2360	4822 124 41584	100µF	20%	10V		3341	4822 116 52283	4,7kΩ	5%	0,5W	
2361	4822 124 23052	100µF	20%	16V		3342	4822 116 52269	3,3kΩ	5%	0,5W	
2363	4822 124 23052	100µF	20%	16V		3343	4822 116 83872	220Ω	5%	0,5W	
2374	4822 121 43526	47nF	5%	100V		3344	4822 116 83872	220Ω	5%	0,5W	
RESISTORS						3350	4822 116 52269	3,3kΩ	5%	0,5W	
2362	4822 117 12063	10kΩ		NTC		3351	4822 116 52175	100Ω	5%	0,5W	
3201 ▲	4822 053 21106	10MΩ	5%	0,5W		3352	4822 050 11002	1kΩ	5%	0,2W	
3202	4822 050 21003	10kΩ	2%	0,25W		3353	4822 050 11002	1kΩ	5%	0,2W	
3203	4822 116 83876	270Ω	5%	0,16W		3354	4822 116 52234	100kΩ	5%	0,5W	
3204 ▲	4822 052 10338	3,3Ω		NFR25		3355	4822 116 52283	4,7kΩ	5%	0,5W	
3356						3356	4822 116 52175	100Ω	5%	0,5W	
3211	4822 116 52176	10Ω	5%	0,5W		3357	4822 116 52206	120Ω	5%	0,5W	
3215	4822 116 52244	15kΩ	5%	0,5W		3358 ▲	4822 053 11151	150Ω	5%	2W	
3216	4822 050 11002	1kΩ	5%	0,2W		3359	4822 050 21101	110Ω	1%	0,6W	
3217	4822 050 11002	1kΩ	5%	0,2W		3360	4822 050 11002	1kΩ	5%	0,2W	
3218	4822 050 21003	10kΩ	2%	0,25W		3361	4822 050 21003	10kΩ	2%	0,25W	
3219	4822 116 52269	3,3kΩ	5%	0,5W		3362	4822 116 52257	22kΩ	5%	0,5W	
3220	4822 116 52269	3,3kΩ	5%	0,5W		3363	4822 116 52226	560Ω	5%	0,5W	
3221	4822 116 83884	47kΩ	5%	0,16W		3364	4822 116 83883	470Ω	5%	0,16W	
3222	4822 050 23303	33kΩ	1%	0,6W		3365	4822 116 83872	220Ω	5%	0,5W	
3223	4822 116 52206	120Ω	5%	0,5W		3366 ▲	4822 052 10568	5,6Ω	5%	0,33W	
3224	4822 116 83868	150Ω	5%	0,5W		3369	4822 116 52226	560Ω	5%	0,5W	
3225	4822 116 83876	270Ω	5%	0,16W		3370	4822 116 52249	1,8kΩ	5%	0,16W	
3226	4822 050 11002	1kΩ	5%	0,2W		3371	4822 116 52234	100kΩ	5%	0,5W	
3227	4822 116 52256	2,2kΩ	5%	0,16W		3372	4822 050 11002	1kΩ	5%	0,2W	
3228	4822 050 11002	1kΩ	5%	0,2W		3373	4822 050 21003	10kΩ	2%	0,25W	
3229	4822 050 11002	1kΩ	5%	0,2W		3374	4822 116 83882	39kΩ	5%	0,5W	
3230	4822 116 52269	3,3kΩ	5%	0,5W		3375	4822 050 21003	10kΩ	2%	0,25W	
3235	4822 116 52199	68Ω	5%	0,16W		3376 ▲	4822 053 11151	150Ω	5%	2W	
3239	4822 116 52283	4,7kΩ	5%	0,5W		COILS					
3241	4822 116 52249	1,8kΩ	5%	0,16W		5201 ▲	4822 157 11832	400µH			
3242	4822 116 52283	4,7kΩ	5%	0,5W		5301	4822 157 62255	COIL 18,5 TURNS			
3243	4822 116 52249	1,8kΩ	5%	0,16W		5302	4822 157 62255	COIL 18,5 TURNS			
3251	4822 116 52283	4,7kΩ	5%	0,5W		5303	4822 157 62255	COIL 18,5 TURNS			
3252	4822 116 52256	2,2kΩ	5%	0,16W		5304	4822 157 62255	COIL 18,5 TURNS			
3253 ▲	4822 052 10479	47Ω	5%	0,3W		DIODES					
3254 ▲	4822 052 10479	47Ω	5%	0,3W		6201 ▲	4822 130 82078	D5SBA20			
3256	4822 116 52257	22kΩ	5%	0,5W		6204 ▲	5322 130 80686	1N5392			
3301	4822 116 83961	6,8kΩ	5%	0,16W		6205 ▲	5322 130 80686	1N5392			
3302	4822 116 83961	6,8kΩ	5%	0,16W		6206	4822 130 30621	1N4148			
3303	4822 116 83881	390Ω	5%	0,5W		6207	4822 130 34278	BZX79-C6V8			



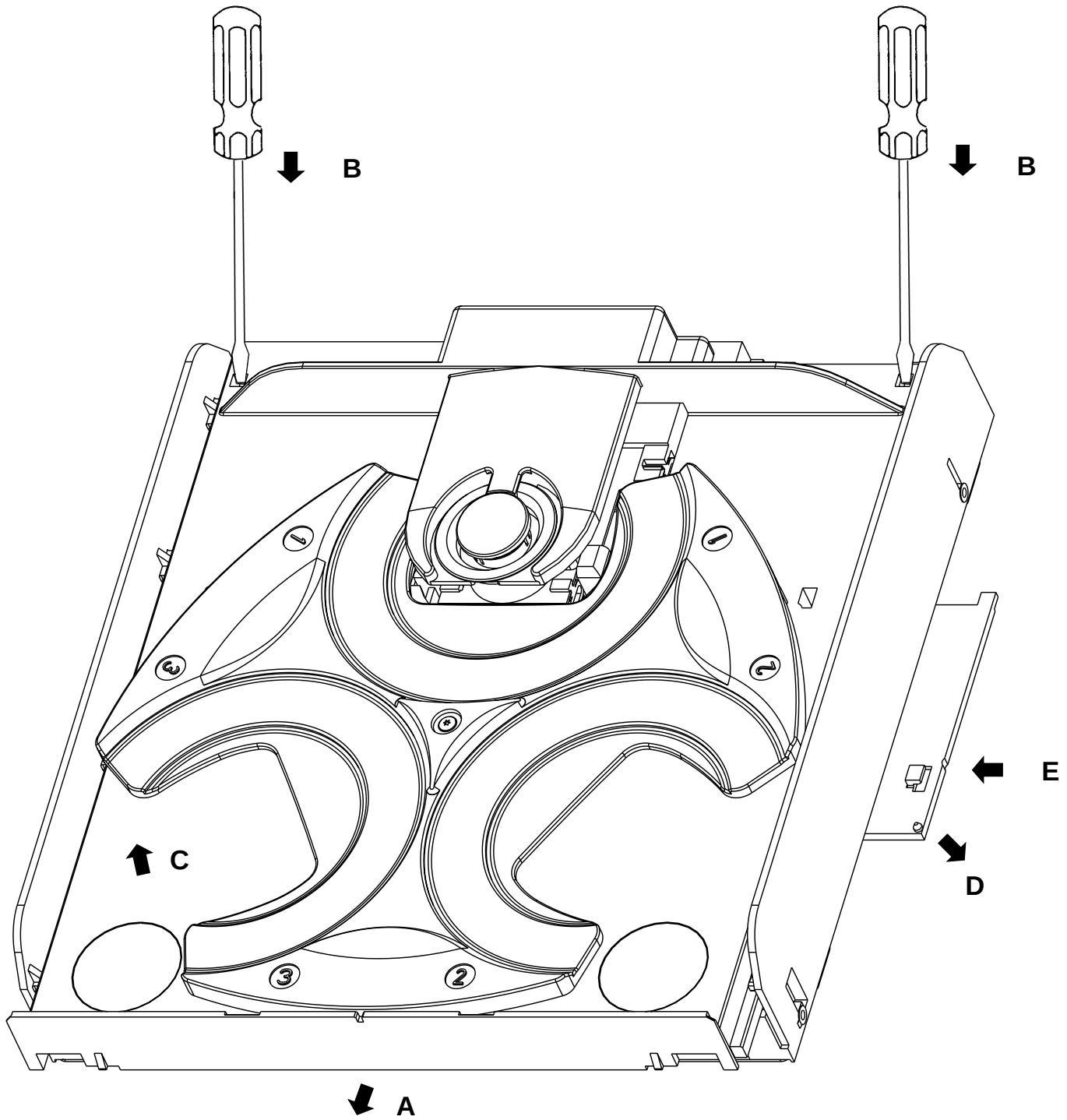
3CDC99-DS Module **(3 Disc Carousel Changer)**

TABLE OF CONTENTS

Dismantling Hints.....	10-2
Servicing Hints.....	10-3
Lubrication Instructions.....	10-4
ESD Warnings.....	10-6
Blockdiagram.....	10-7
Wiring	10-8
Circuit Diagram part1.....	10-9
Component Layout	10-10
Circuit Diagram part2.....	10-11
Exploded View	10-12
Mechanical Partslist.....	10-13
Electrical Partslist	10-15



Dismantling Hints



Dismantling of Drawer

- A Pull drawer outwards
- B Unlock drawer with screwdriver
- C Lift drawer to demount from chassis

Dismantling of Flex Plate

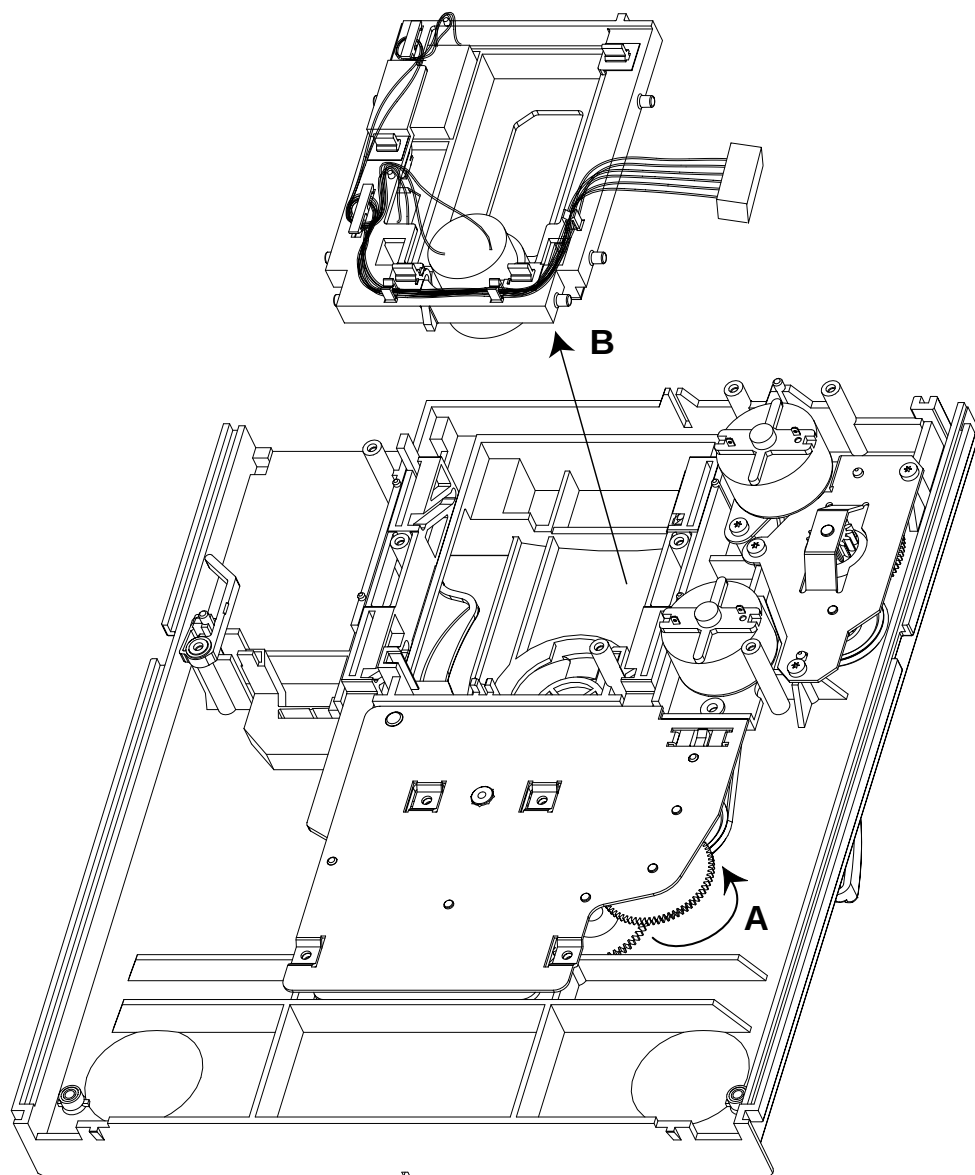
- D Lift plate to unlock pin from bottom plate
- E Move plate inwards to demount from bottom plate

Servicing Hints

Replacement of CD Drive

See also exploded view of changer mechanism.

1. Dismantle printed circuit board: remove 5 screws.
2. Disconnect flexfoil cable and JST connector.
Pay attention to WARNING!
3. Loosen 2 screws (pos 107,108) and remove CD drive-lockings (pos 105,106).
4. Turn gearwheel (pos 42) of disc change mechanism by finger to move CD drive support in upper position as shown in picture below (A).
5. Dismantle CD drive support (pos 95) (B).
6. Replace CD drive (pos 100). The wire tree of JST connector has to be desoldered and resoldered on the new CD drive again.

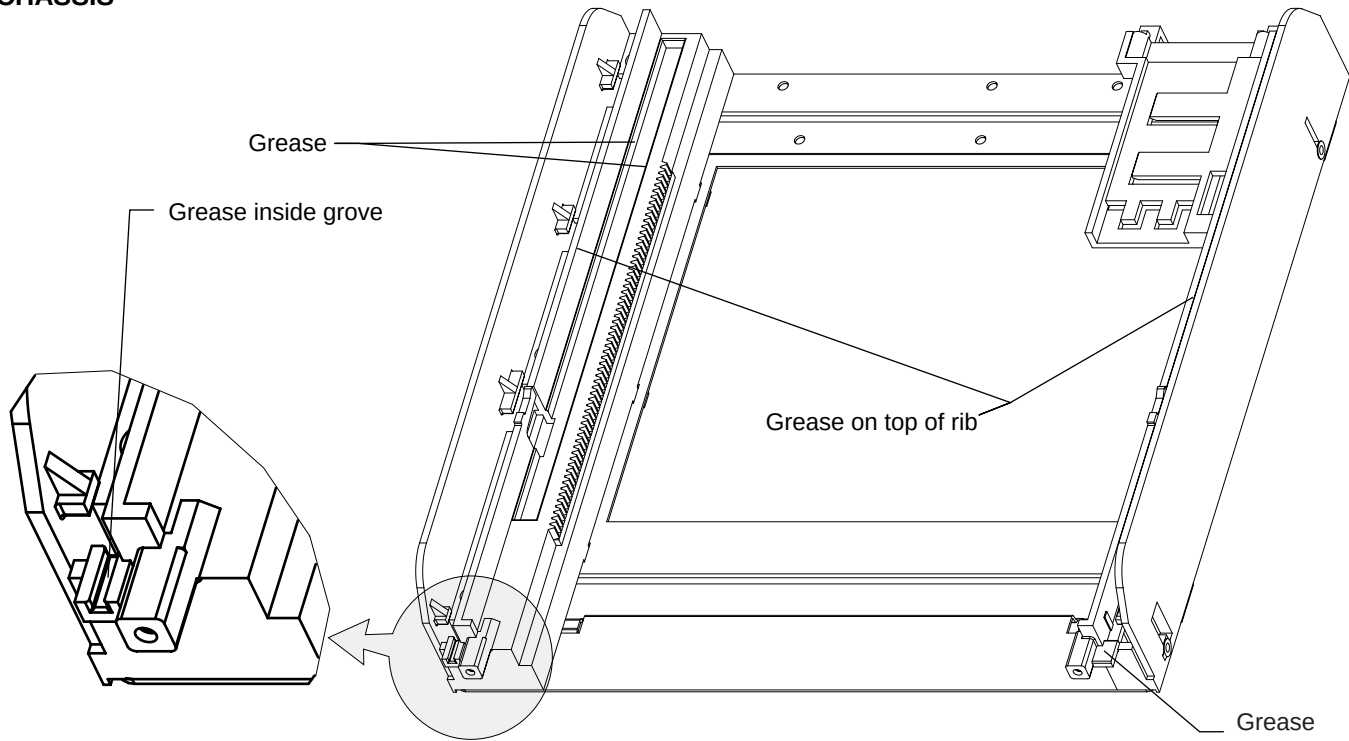


Mounting of Carousel

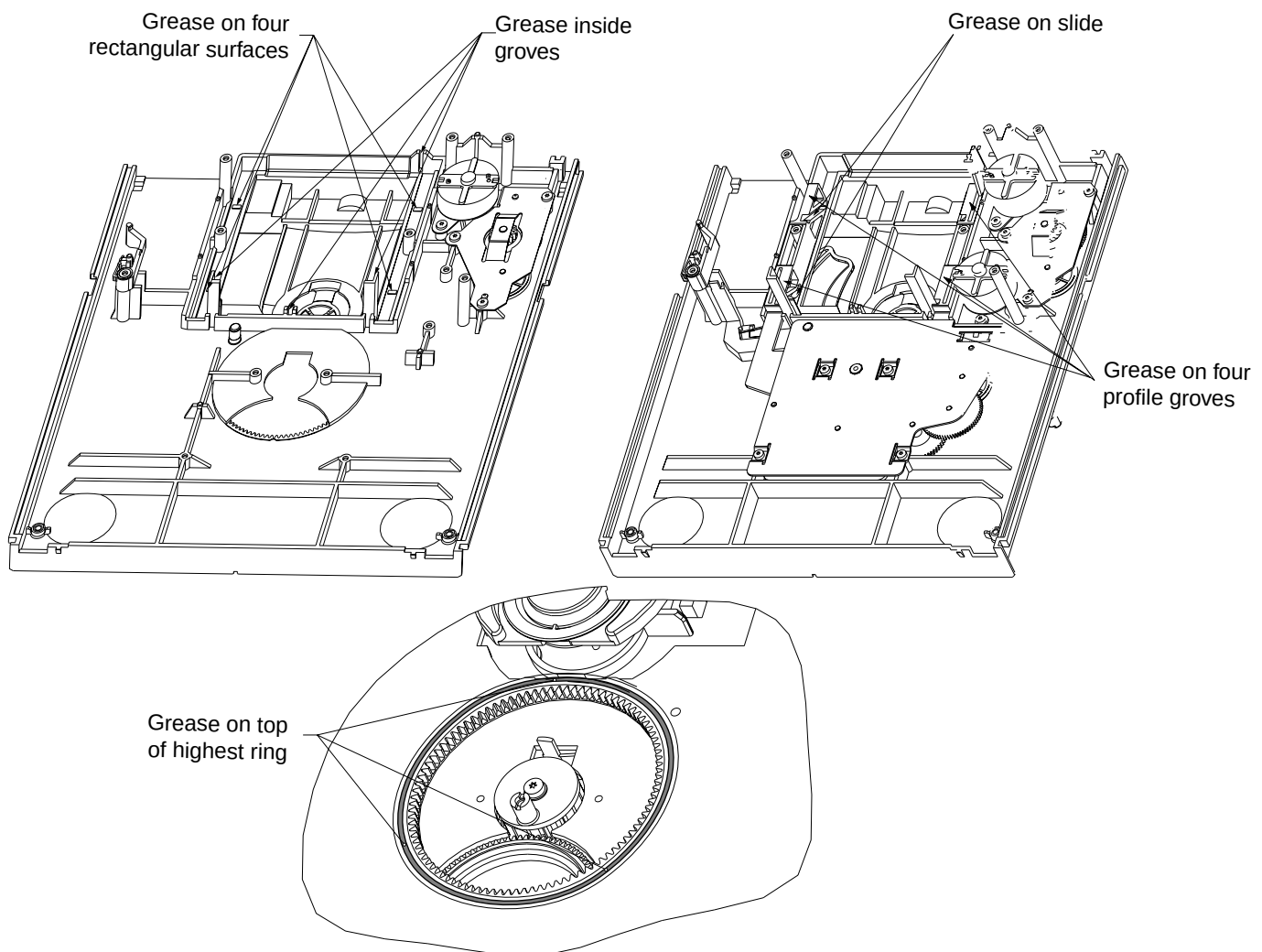
1. Turn gearwheel (pos 42) of disc change mechanism by finger until CD drive is in play position.
2. Mount carousel (pos 115) so that disc is positioned right on turntable. Carousel position number doesn't matter.

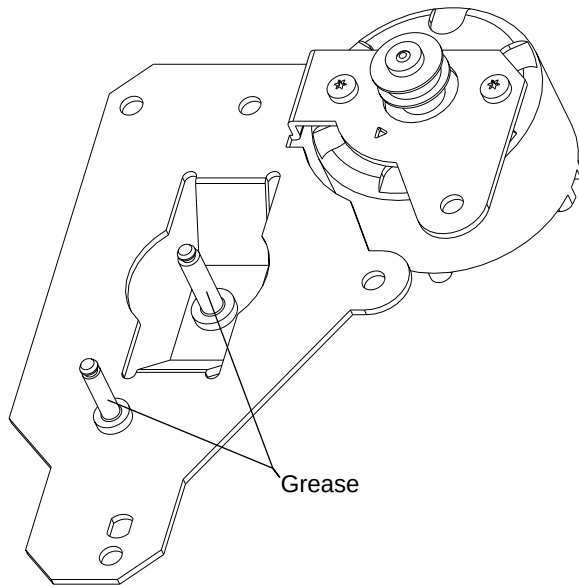
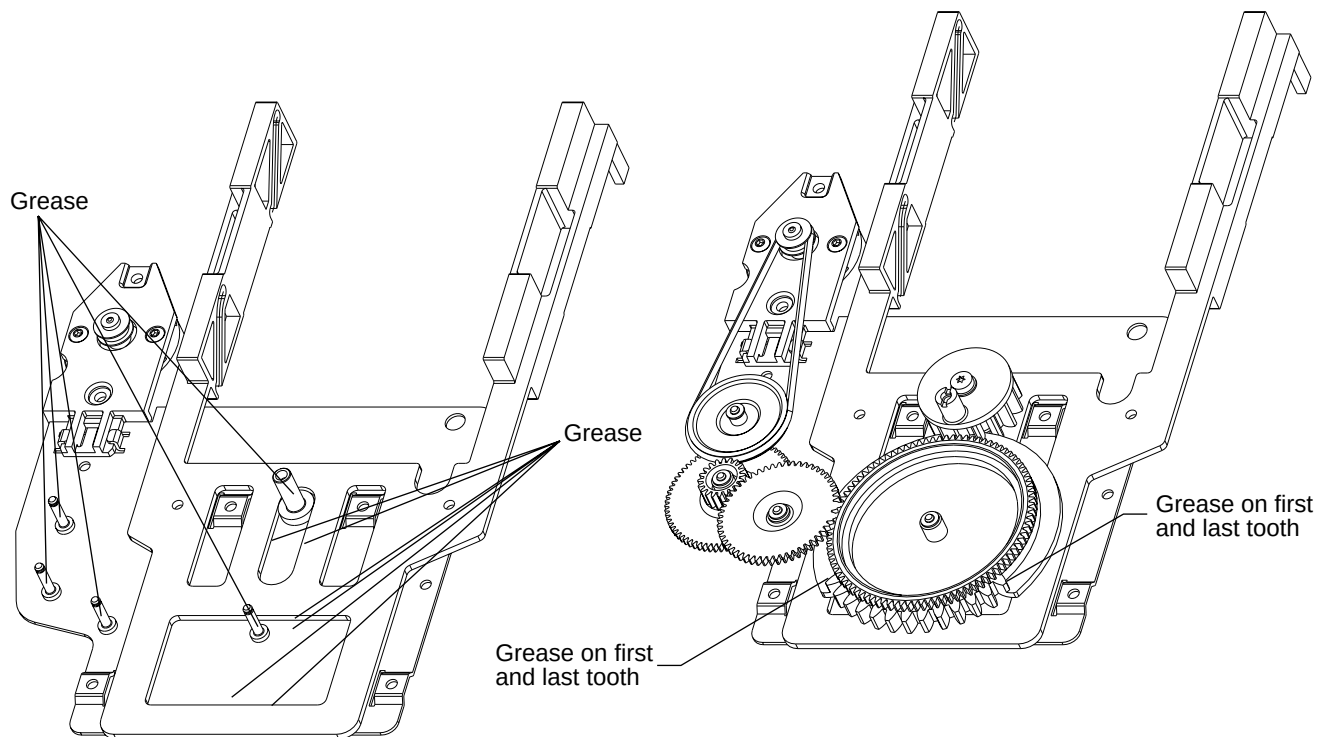
Lubrication Instructions

CHASSIS



DRAWER



DRAWER MECHANISM**DISC CHANGE MECHANISM**

Use only grease **Polylub GLY 801** service codenumber 4822 390 10136

WARNING

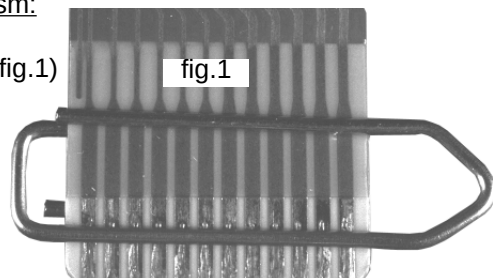
CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CD MECHANISM. THAT'S WHY, BESIDES THE SAFETY MEASURES LIKE

- **SWITCH OFF POWER SUPPLY**
- **ESD PROTECTION**

ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

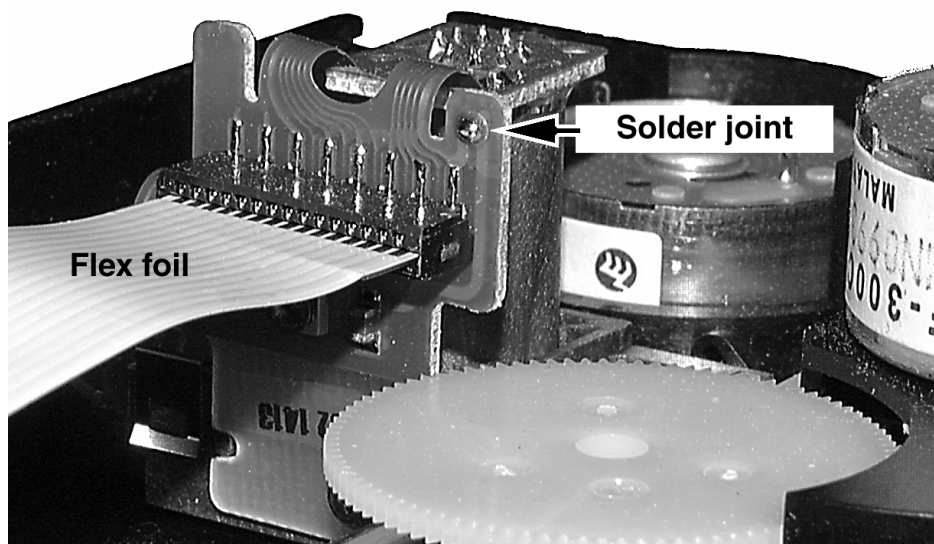
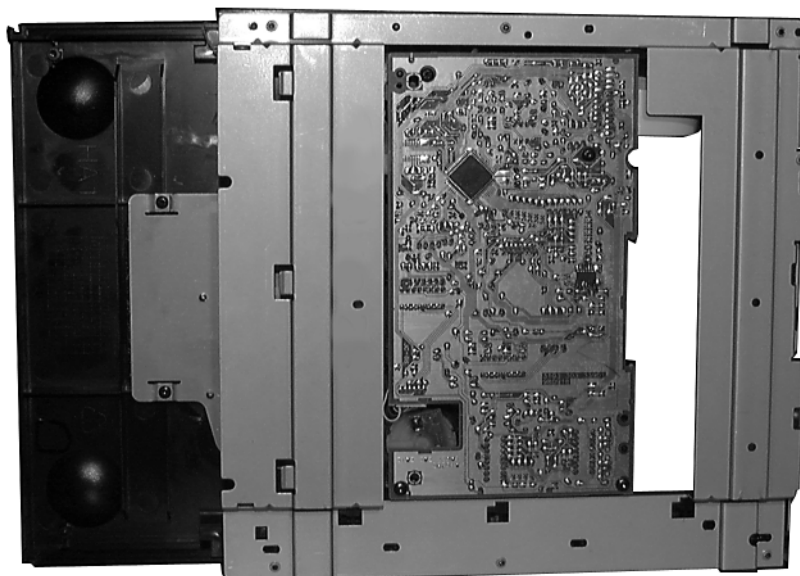
The following steps have to be done when replacing the CD mechanism:

1. Disconnect flexfoil cable from old CD drive
2. Put a paper clip onto the flexfoil cable to short-circuit connections (fig.1)
3. Remove old CD drive
4. Remove paper clip from flexfoil cable
5. Connect flexfoil cable to new CD drive
6. Position new CD drive on its studs
7. Remove soldered short-circuit from Laserunit (see below)

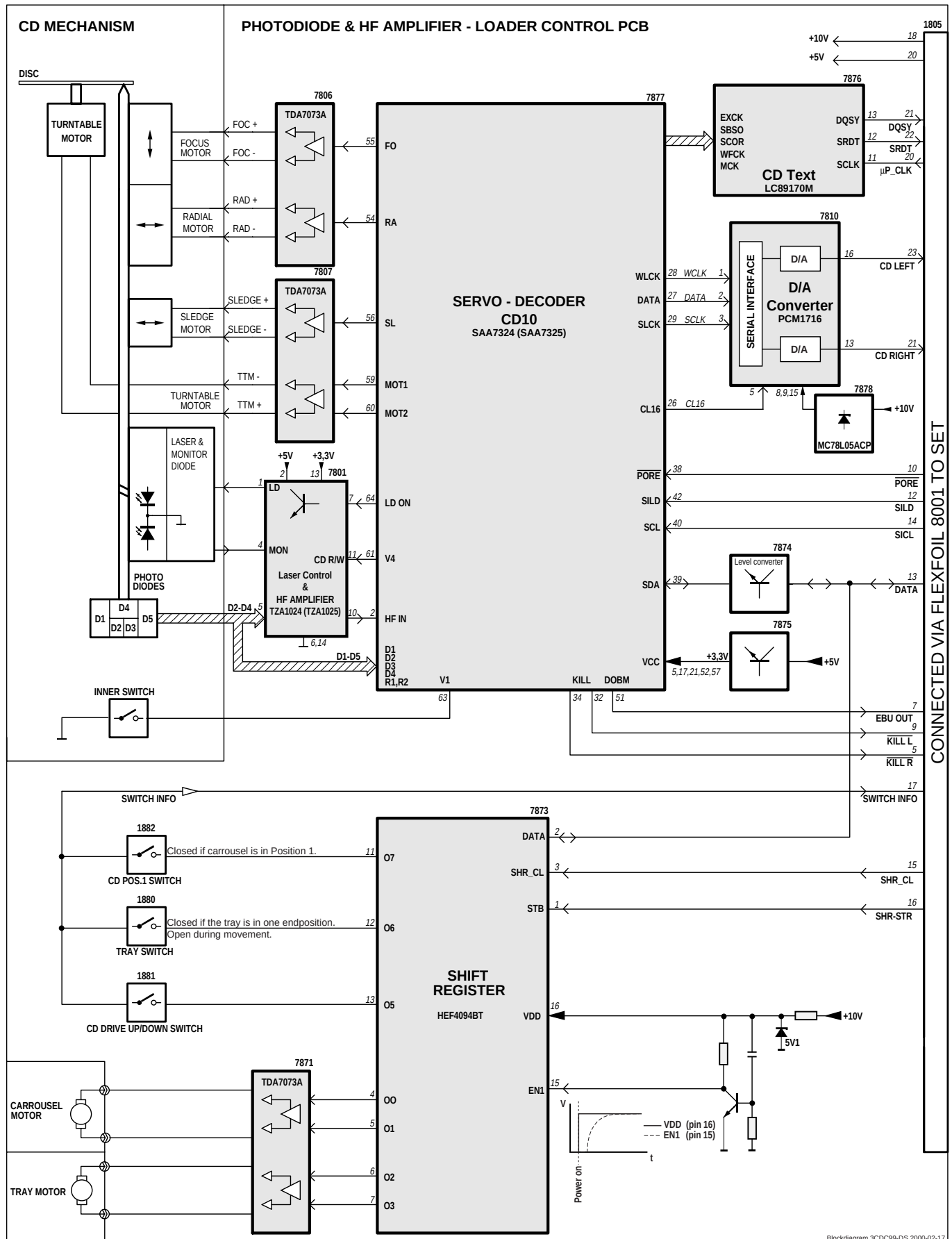


Attention: The laser diode of this CD drive is protected against ESD by a solder joint which shortcircuits the laser diode to ground.

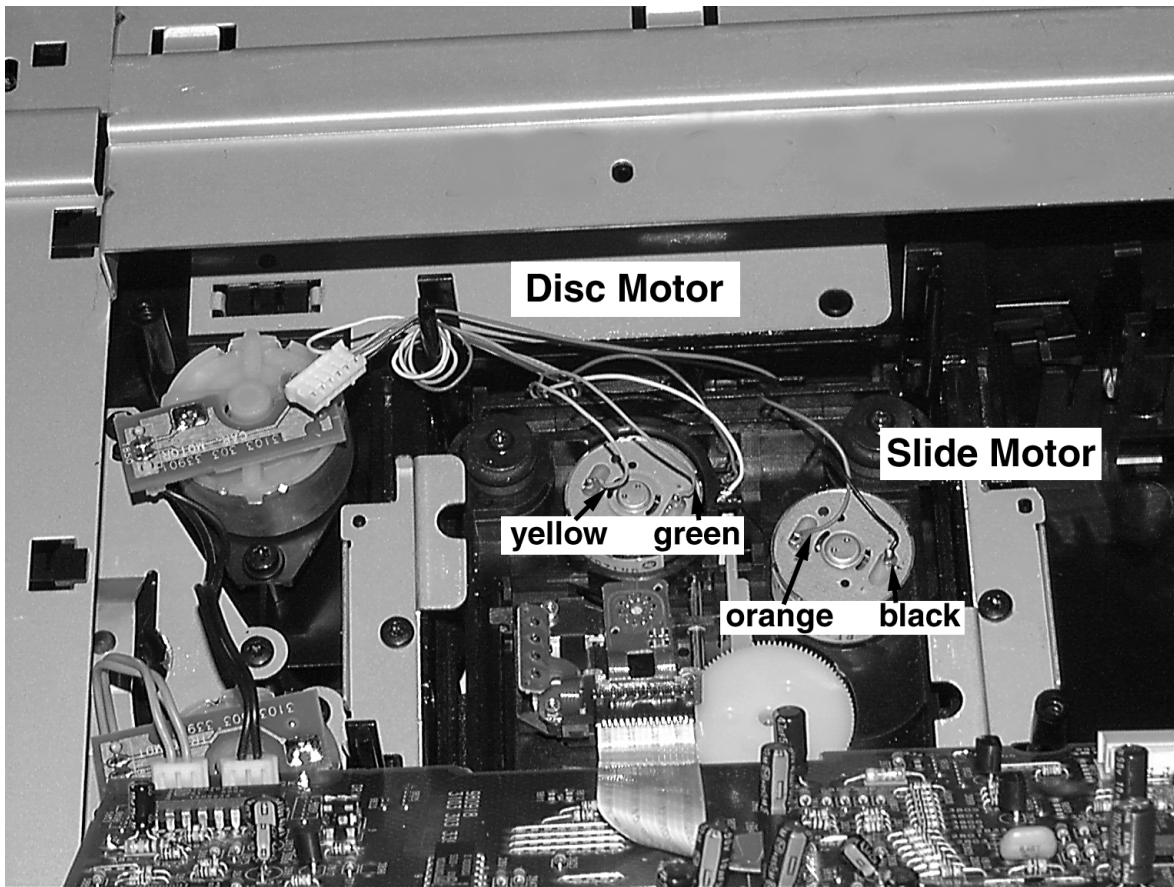
For proper functionality of the CD drive this solder joint must be removed **after** connecting the drive to the set.

**Service Position**

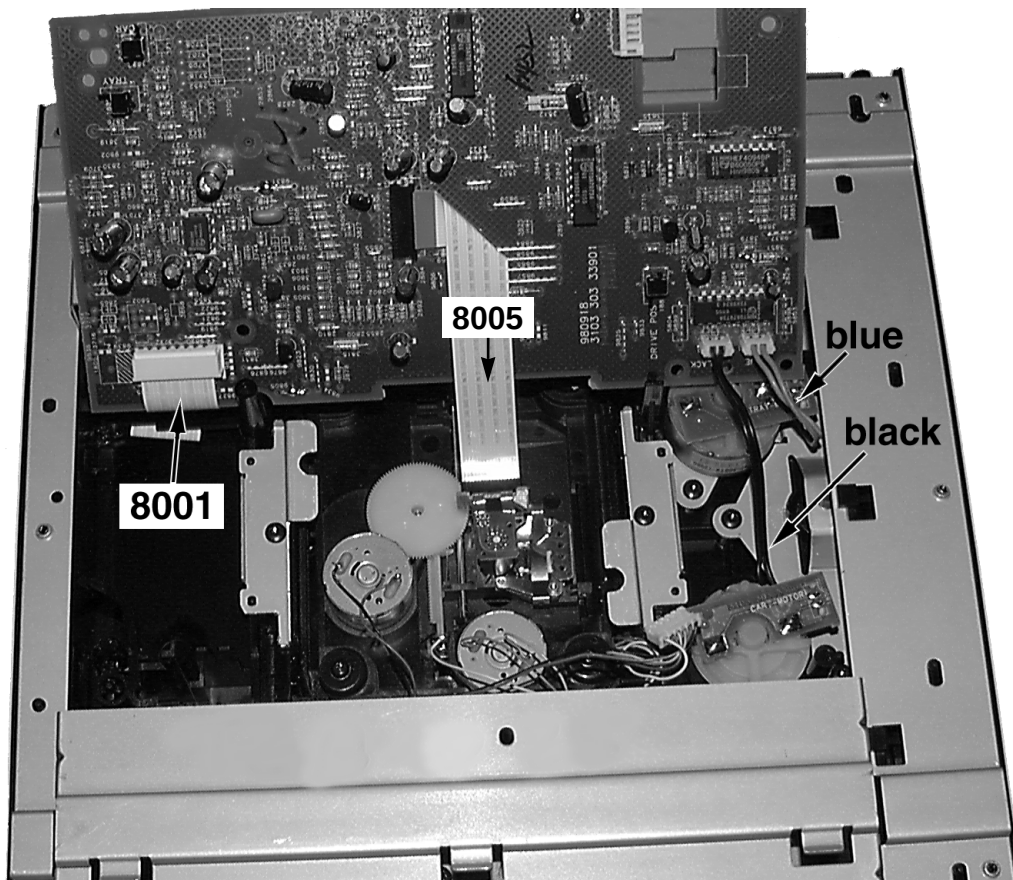
Blockdiagram



Wiring of CD Drive

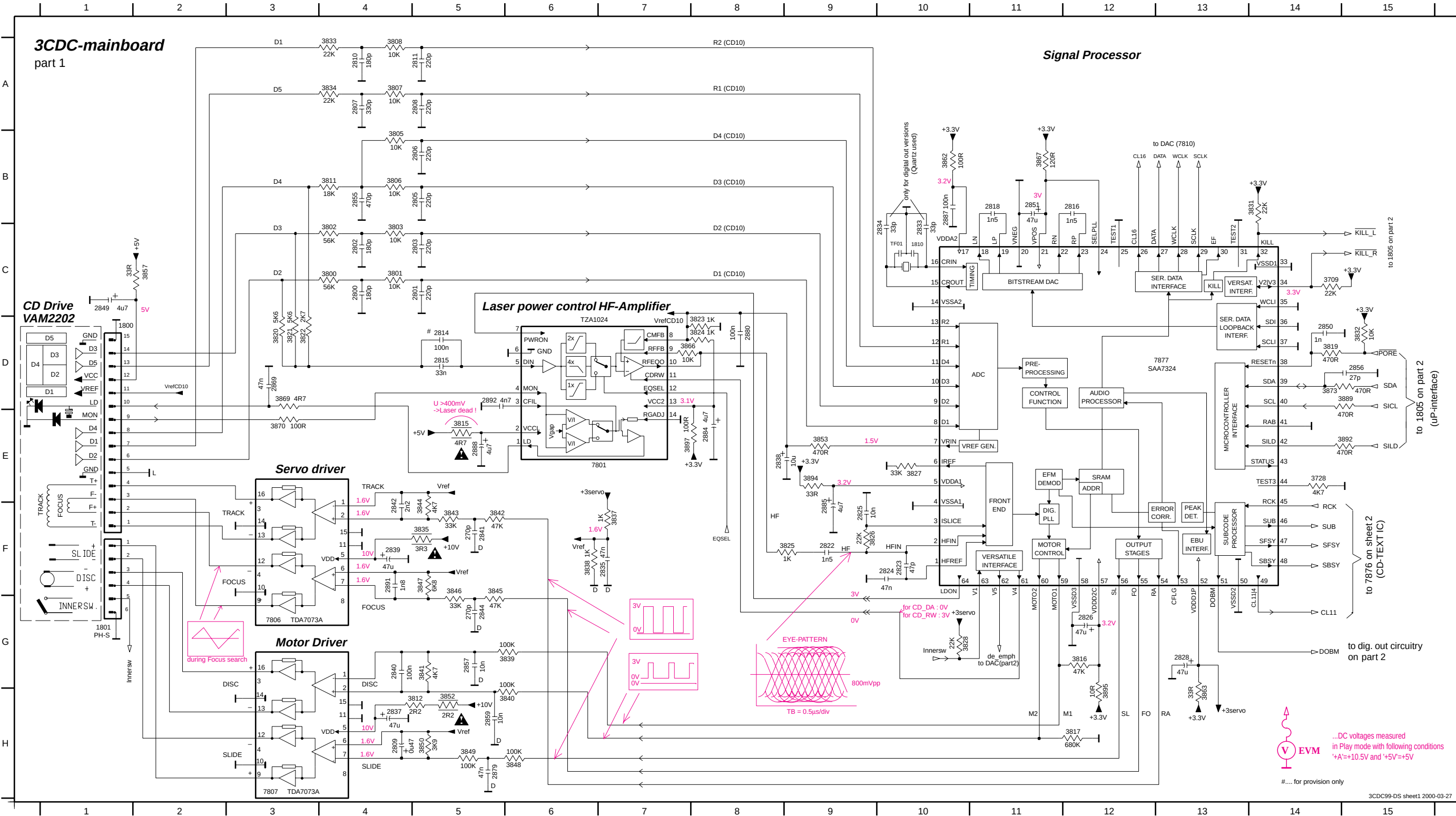


Pict. 1



Pict. 2

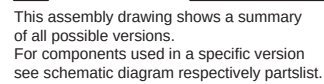
1800 D2	2803 C5	2810 A4	2822 F9	2833 C10	2840 G4	2851 B11	2879 H5	2891 F4	3802 C4	3811 B4	3820 D3	3826 F9	3834 A4	3841 G5	3847 F5	3857 C2	3870 E3	3897 E7
1801 G1	2805 B5	2811 A5	2823 F10	2834 C10	2841 F5	2855 B4	2880 D8	2892 D5	3803 C4	3812 H5	3821 D3	3827 E10	3835 F5	3842 F5	3848 H6	3862 B10	3873 D14	7801 E7
1810 C10	2806 B5	2814 D5	2824 F10	2835 F7	2842 F4	2856 D15	2885 E8	3709 C14	3805 B4	3815 E5	3822 D3	3828 G10	3837 F7	3843 F5	3849 H5	3863 H13	3889 D15	7806 G3
2800 C4	2807 A4	2815 D5	2825 F9	2837 H4	2844 G5	2857 G5	2885 F9	3728 E14	3806 B4	3816 G12	3823 D8	3831 B14	3838 F6	3844 F5	3850 H5	3866 D7	3892 E15	7807 H3
2801 C5	2808 A5	2816 B12	2826 G12	2838 E8	2849 C1	2859 H5	2887 B10	3800 C4	3807 A4	3817 H12	3824 D8	3832 D15	3839 G6	3845 F5	3852 H5	3867 B11	3894 E9	7877 D12
2802 C4	2809 H4	2818 B11	2828 G13	2839 F4	2850 D14	2869 D3	2888 E5	3801 C4	3808 A4	3819 D14	3825 F9	3833 A4	3840 H6	3846 F5	3853 E9	3869 D3	3895 H12	



...DC voltages measured
in Play mode with following conditions
'A'=+10.5V and '+5V'=+5V

#.... for provision only

Mapping



1800	E3	3714	H2	3886	J3
1801	H5	3715	H3	3887	I3
1805	A1	3716	A2	3888	I3
1810	D3	3718	C5	3889	B5
1876	J1	3728	B5	3890	I3
1878	I1	3730	B5	3891	I3
1880	A5	3731	C5	3892	C4
1881	I2	3760	B3	3893	I3
1882	B5	3761	B3	3894	D4
2800	D2	3762	B3	3895	D5
2801	D3	3763	C4	3896	H3
2802	E2	3764	C2	3897	F1
2803	D3	3766	B3	3899	C2
2804	D5	3768	J4	5803	J1
2805	D3	3769	J4	5804	I1
2806	D3	3800	D2	5805	A1
2807	D2	3801	D2	6871	H4
2808	D3	3802	D3	6872	I4
2809	E5	3803	D2	6873	I4
2810	D2	3805	D2	6874	H4
2811	D3	3806	D2	6875	I4
2812	C2	3807	D2	6876	C1
2814	E2	3808	D2	6877	A3
2815	E1	3809	D5	7801	F2
2816	C4	3811	D2	7806	H3
2818	C3	3812	G4	7807	F5
2822	F4	3814	D2	7810	B3
2823	D4	3815	D1	7812	H3
2824	D4	3816	E5	7871	I1
2825	D4	3817	E4	7873	J4
2826	D4	3819	B5	7874	C1
2828	D5	3820	E2	7875	C2
2829	J2	3821	E2	7876	C5
2830	C2	3822	E3	7877	C4
2831	B2	3823	F1	7878	C2
2832	B2	3824	F1	9805	C1
2833	D2	3825	G3	9806	E2
2834	C2	3826	E4	9807	G5
2835	E5	3827	E3	9808	F1
2837	F4	3828	F4	9809	F4
2838	F4	3831	C2	9810	B3
2839	H4	3832	A2	9813	D1
2840	E5	3833	F2	9815	A2
2841	E5	3834	F2	9817	A5
2842	G4	3835	H4	9818	B1
2844	E5	3837	E5	9819	B2
2849	E4	3838	D5	9820	B2
2850	B4	3839	E5	9821	A4
2851	C3	3840	E5	9823	C1
2852	C5	3841	E5	9825	H1
2853	C5	3842	E5	9826	A1
2854	B3	3843	G4	9828	A5
2855	E2	3844	G4	9830	D1
2856	C4	3845	E5	9831	C4
2857	G5	3846	G4	9832	E5
2858	C3	3847	G3	9833	H1
2859	G5	3848	E5	9834	D1
2860	B3	3849	E5	9835	A1
2861	A2	3850	E5	9836	D5
2862	B4	3851	J2	9837	J3
2863	C3	3852	G5	9838	A1
2864	D5	3853	F4	9839	A1
2865	A3	3854	B2	9841	E4
2869	F2	3855	B2	9842	E4
2870	J1	3857	G4	9844	F4
2871	I1	3858	B2	9845	D5
2872	I4	3859	A2	9849	A4
2873	I2	3862	C3	9851	D5
2875	I3	3863	D5	9852	E5
2876	B3	3864	B3	9853	E4
2877	J3	3865	C3	9855	E3
2878	J3	3866	F2	9856	E3
2879	E5	3867	C3	9857	G2
2880	F2	3868	B2	9858	G3
2881	I3	3869	G2	9859	G3
2882	A3	3870	G2	9861	G5
2884	E2	3871	I3	9862	G5
2885	E3	3872	A2	9863	G2
2887	C4	3873	B5	9864	F3
2888	E1	3874	A3	9876	C1
2891	G3	3875	C1	9884	G3
2892	E2	3876	A2	9885	G2
2893	J3	3877	I3	9886	C3
3700	C5	3878	D1	9887	H4
3705	D5	3879	J3	9888	H4
3706	C5	3880	I2	9889	H4
3707	C5	3881	I2	9898	J1
3708	C5	3882	J3	9899	I1
3709	B4	3883	J2		
3711	B5	3884	I2		
3713	I3	3885	J3		

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



3CDC mainboard / part 2

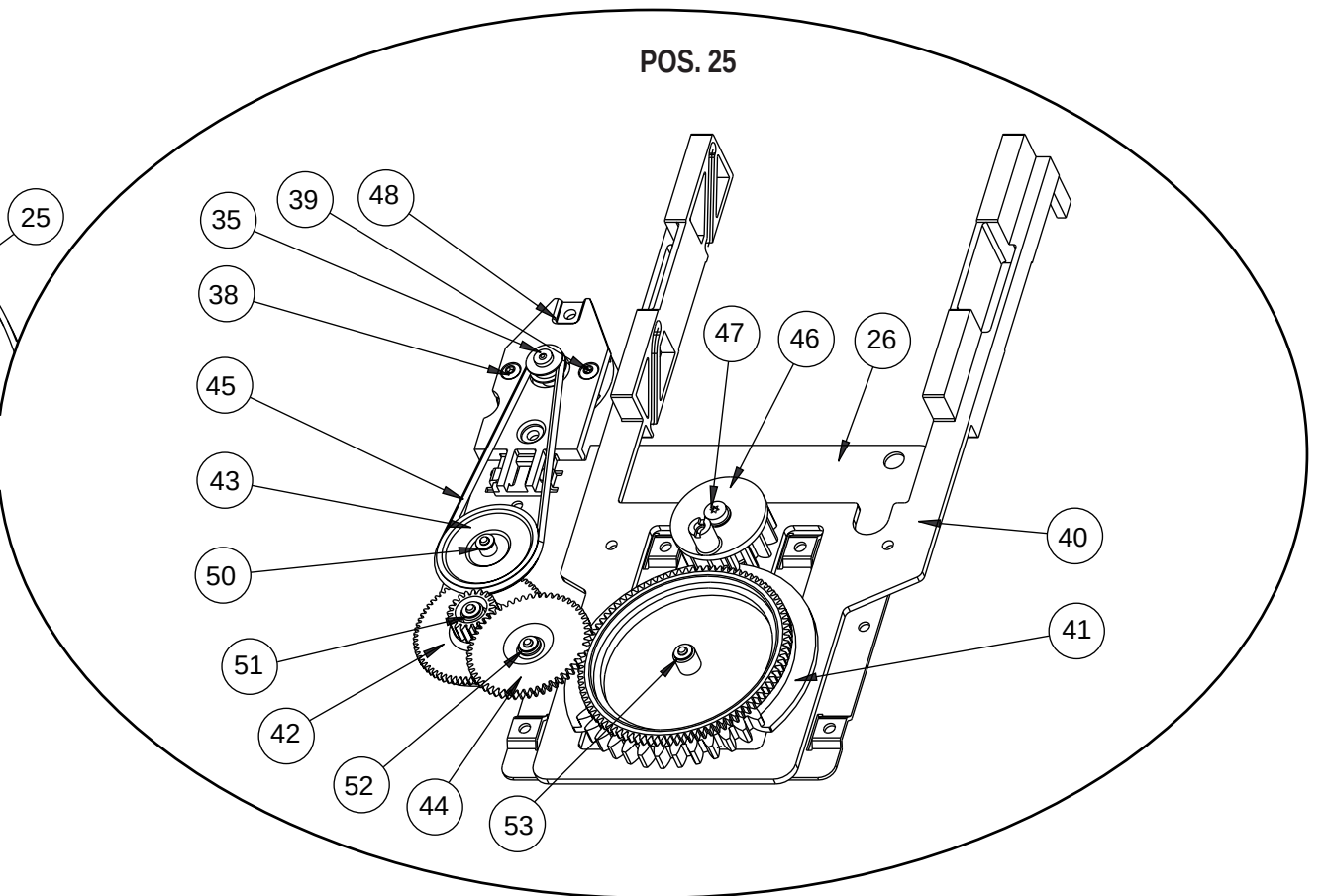
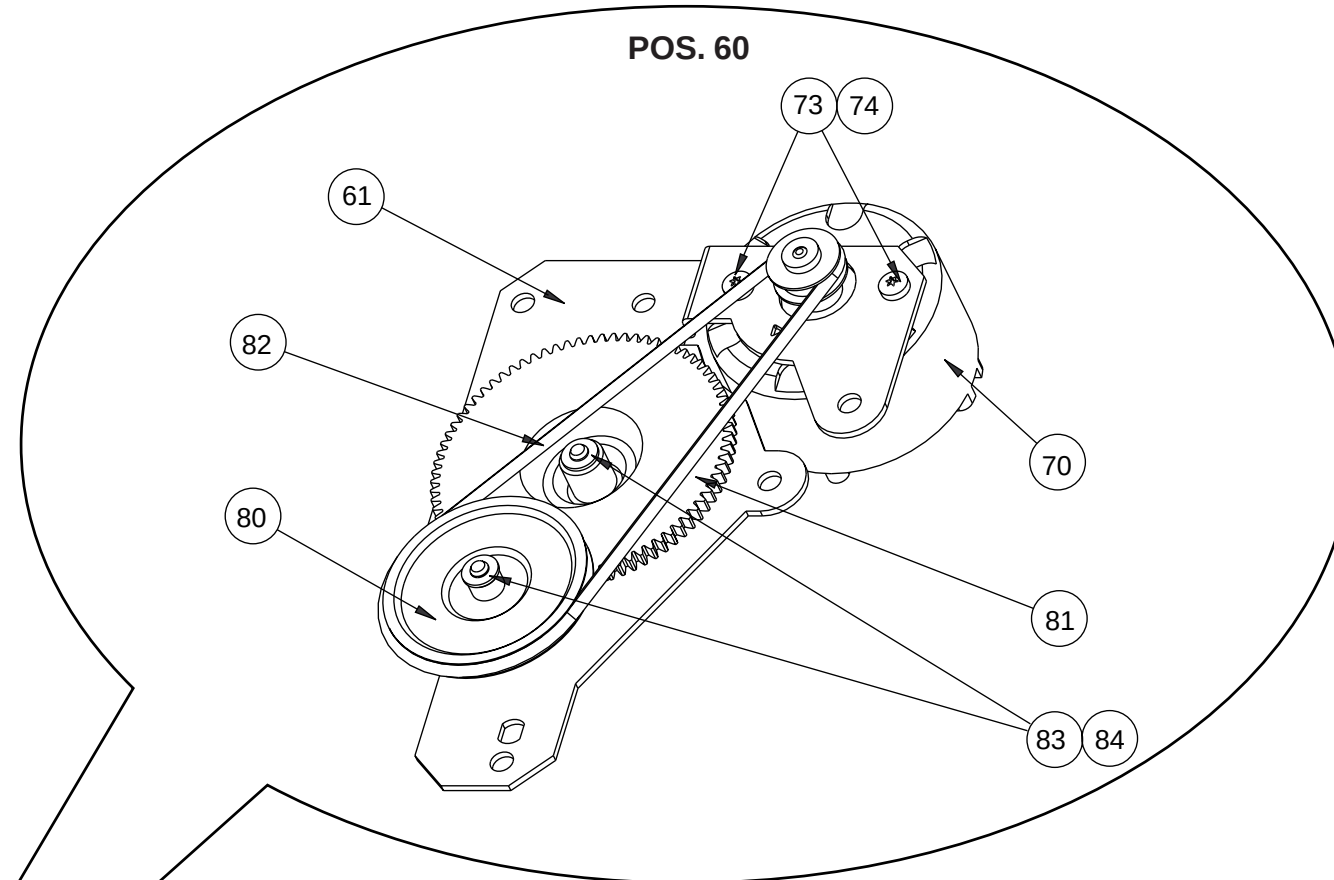
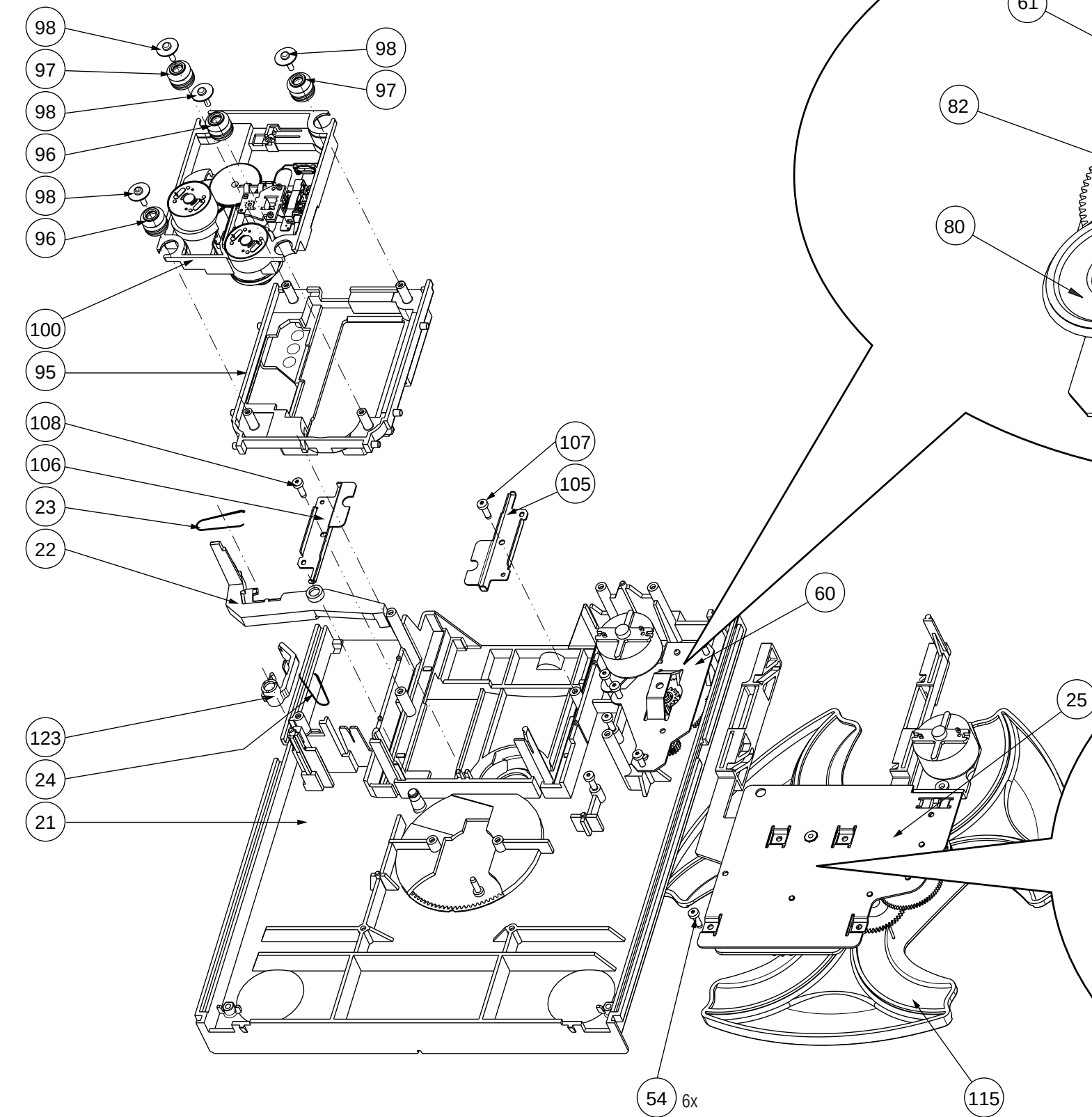
The schematic illustrates the internal components and connections of the 3CDC mainboard, part 2. Key sections include:

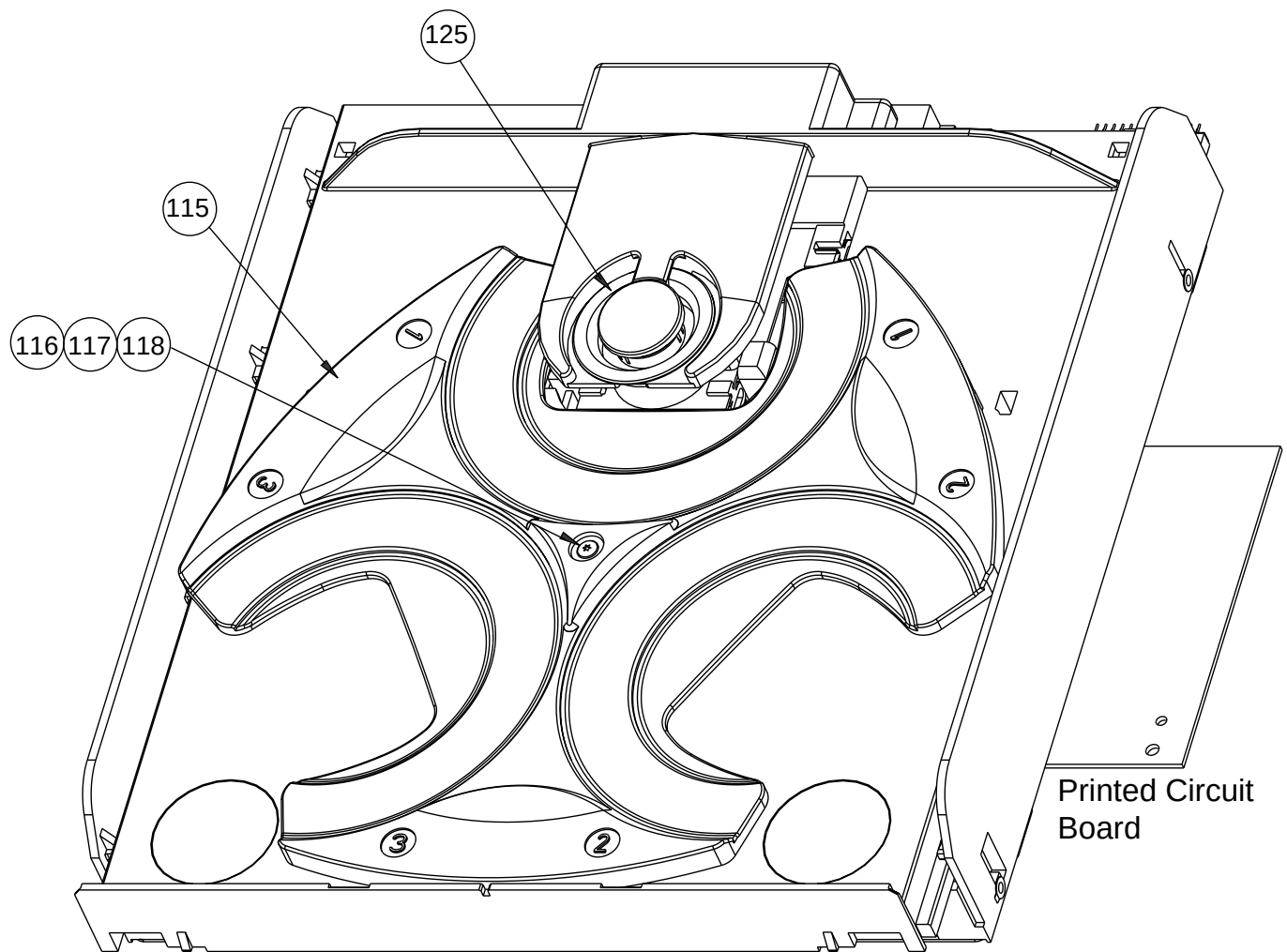
- DAC (PCM1716):** A digital-to-analog converter with pins for LRCIN, DIN, BCKIN, CLKO, XT1, XTO, DGND, VDD, VCC 2R, AGND 2R, EXTR, NC, VOUT R, AGND 1, VCC 1, and VCC 2L. It is connected to various resistors and capacitors for signal conditioning.
- Changer Control logic (HEF4094BP):** A quad NAND Schmitt trigger used for controlling the changer. It has pins for VSS, VDD, D, CP, STR, STB, EN1, SRG8, and OE_LATCH. It is connected to SW_INFO, POS 1 rec, TRAY POS, DRIVE UP/DOWN, and other control signals.
- CD-Text circuitry (TDA7073A):** A CD-ROM text decoder with pins for EXCK, SBSO, SCOR, WFCK, MCK, XMODE, GND, CPU INTERF, DQSY, SRDT, SCLK, DQSY, SRDT, and TEST. It is connected to a 32 x 8 PORT RAM and a CRC CHECK block.
- Motor Drivers:** Two RF-500TB motor drivers are shown, one for the TRAY-MOTOR and one for the CAROUSEL-MOTOR. They are connected to DIPMATE and various resistors and capacitors.
- Output enable delay circuitry:** A circuit using a 7812 BC547B transistor to provide a delay for the output enable signal.
- Connector Board:** The schematic shows the connection to a connector board on the rear side of the module, including pins for LEFT, RIGHT, GND, +5V(+5.6V), +10V, SW_INFO, SHR_STR, SHR_CL, SICL, DATA, SILD, GND, PORE, KILL_L, +3V, EBU_Out, EBU_GND, KILL_R, SRDT, DQSY, uP_CLK, and GND.

...DC voltages measured in Play mode with following conditions
*A'=+10.5V and *5V'=+5V

#.... for provision only

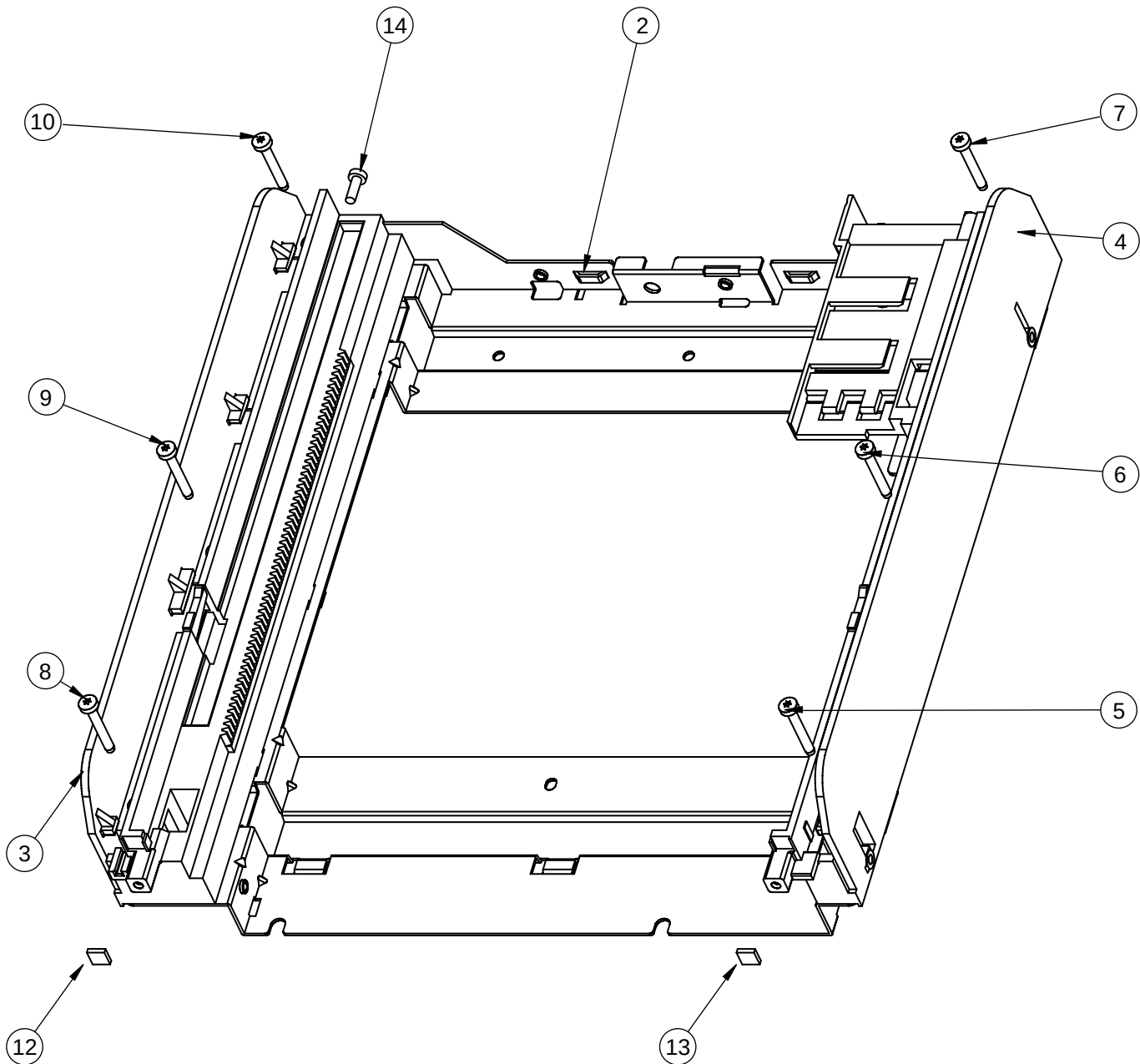
3CDC99-DS sheet2 2000-03-27




MECHANICAL PARTSLIST 3CDC-99 MODULE

0003	4822 463 11235	GUIDING LEFT	0040	4822 463 11237	SLIDE
0004	4822 463 11236	GUIDING RIGHT	0041	4822 522 10509	CONTROL DISC
0012	4822 466 12146	RUBBER	0042	4822 522 10492	GEAR WHEEL
0013	4822 466 12146	RUBBER	0043	4822 528 10937	PULLEY
0021	4822 418 10403	DRAWER	0044	4822 522 10493	IDLER WHEEL
0022	4822 402 11236	BRACKET TUMBLER	0045	4822 358 10115	BELT
0023	4822 492 11721	SPRING	0046	4822 466 10735	ECCENTRIC GEAR WHEEL
0024	4822 492 11721	SPRING	0050	4822 532 12364	WASHER
0038	4822 502 12548	SCREW M2,6x3,5	0051	4822 532 12364	WASHER
0039	4822 502 12548	SCREW M2,6x3,5	0052	4822 532 12364	WASHER

continued on next page



MECHANICAL PARTSLIST 3CDC-99 MODULE

0053	4822 532 12364	WASHER	0097	4822 529 10387	RUBBER DAMPER CD DRIVE, FRONT
0073	4822 502 12548	SCREW M2,6X3,5	0100	9305 022 30201	VAM2202/01
0074	4822 502 12548	SCREW M2,6X3,5	0115	4822 466 10736	CAROUSEL
0080	4822 528 10937	PULLEY	0117	4822 532 12365	BUSH DRAWER
0081	4822 522 10494	GEAR DRAWER	0123	4822 402 11237	SWITCH-BRACKET
0082	4822 358 10115	BELT	0125	4822 401 11708	DISC CLAMP VAM DRIVE 3CDC
0083	4822 532 12364	WASHER			
0084	4822 532 12364	WASHER			
0095	4822 404 10985	SUPPORT-VAM			
0096	4822 529 10387	RUBBER DAMPER CD DRIVE, FRONT			

ELECTRICAL PARTSLIST 3CDC-99 MODULE**MISCELLANEOUS**

0035	4822 361 10753	CAROUSEL MOTOR
0070	4822 361 10753	TRAY MOTOR
1800	4822 265 10925	FFC SOCKET, 15P
1805	4822 265 11533	FFC SOCKET, 23P
1880	4822 276 13503	SWITCH
1881	4822 276 13503	SWITCH
1882	4822 276 13503	SWITCH
8001	3103 308 92020	FLEX FOIL CABLE 23P, 420mm
8005	3103 308 91820	FLEX FOIL CABLE 15P, 95mm

CAPACITORS

2800	4822 126 10053	180pF	10%	50V
2801	4822 122 10466	220pF	10%	50V
2802	4822 126 10053	180pF	10%	50V
2803	4822 122 10466	220pF	10%	50V
2804	4822 124 40769	4,7μF	20%	100V
2805	4822 122 10466	220pF	10%	50V
2806	4822 122 10466	220pF	10%	50V
2807	4822 126 12787	330pF	10%	50V
2808	4822 122 10466	220pF	10%	50V
2809	5322 124 41948	0,47μF	20%	50V
2810	4822 126 10053	180pF	10%	50V
2811	4822 122 10466	220pF	10%	50V
2812	4822 126 12785	47nF	20%	50V
2815	4822 126 13174	33nF	20%	16V
2816	4822 126 12878	1,5nF	10%	16V
2818	4822 126 12878	1,5nF	10%	16V
2822	4822 126 12878	1,5nF	10%	16V
2823	4822 122 33848	47pF	5%	50V
2824	4822 126 12785	47nF	20%	50V
2825	4822 121 51387	10nF	20%	16V
2826	4822 124 80231	47μF	20%	16V
2828	4822 124 40433	47μF	20%	25V
2829	4822 124 21732	10μF	20%	25V
2830	4822 121 51387	10nF	20%	16V
2831	4822 122 10577	3,3nF	10%	16V
2832	4822 122 10577	3,3nF	10%	16V
2833	4822 122 33069	33pF	5%	50V
2834	4822 122 33069	33pF	5%	50V
2835	4822 126 12785	47nF	20%	50V
2837	4822 124 40433	47μF	20%	25V
2838	4822 124 40248	10μF	20%	63V
2839	4822 124 40433	47μF	20%	25V
2840	4822 126 12882	100nF	20%	50V
2841	4822 126 12702	270pF	10%	50V
2842	4822 126 12339	2,2nF	10%	16V
2844	4822 126 12702	270pF	10%	50V
2849	4822 124 40769	4,7μF	20%	100V
2850	4822 122 33197	1nF	10%	50V
2851	4822 124 40433	47μF	20%	25V
2852	4822 126 12785	47nF	20%	50V
2853	4822 126 11585	22nF	20%	50V
2854	4822 126 12785	47nF	20%	50V
2855	4822 122 33519	470pF	10%	50V
2856	4822 122 33848	47pF	5%	50V
2857	4822 121 51387	10nF	20%	16V
2858	4822 124 81151	22μF	20%	50V
2859	4822 121 51387	10nF	20%	16V
2860	4822 124 41596	22μF	20%	50V
2861	4822 124 41596	22μF	20%	50V
2862	4822 124 11912	220μF	20%	6,3V

CAPACITORS

2863	4822 124 11912	220μF	20%	6,3V
2865	4822 126 12882	100nF	20%	50V
2869	4822 126 12785	47nF	20%	50V
2872	4822 126 12785	47nF	20%	50V
2873	4822 124 12233	47μF	20%	25V
2875	4822 126 11585	22nF	20%	50V
2876	4822 126 12785	47nF	20%	50V
2877	4822 122 33848	47pF	5%	50V
2878	4822 122 10466	220pF	10%	50V
2879	4822 126 12785	47nF	20%	50V
2880	4822 126 12882	100nF	20%	50V
2881	4822 124 40769	4,7μF	20%	100V
2882	4822 124 81151	22μF	20%	50V
2884	4822 124 40769	4,7μF	20%	100V
2885	4822 124 40769	4,7μF	20%	100V
2887	4822 126 12882	100nF	20%	50V
2888	4822 124 40769	4,7μF	20%	100V
2891	4822 122 10576	1,8nF	10%	16V
2892	4822 126 11714	4,7nF	20%	16V
2893	4822 122 10466	220pF	10%	50V

RESISTORS

3700	4822 116 83883	470Ω	5%	0,16W
3705	4822 116 83872	220Ω	5%	0,5W
3706	4822 116 83883	470Ω	5%	0,16W
3707	4822 116 83883	470Ω	5%	0,16W
3708	4822 116 83883	470Ω	5%	0,16W
3709	4822 116 52257	22kΩ	5%	0,5W
3711	4822 050 21003	10kΩ	2%	0,25W
3713	4822 116 52257	22kΩ	5%	0,5W
3714	4822 050 21003	10kΩ	2%	0,25W
3715	4822 116 52234	100kΩ	5%	0,5W
3716	4822 116 52175	100Ω	5%	0,5W
3718	4822 116 52283	4,7kΩ	5%	0,5W
3728	4822 116 52283	4,7kΩ	5%	0,5W
3730	4822 050 23303	33kΩ	1%	0,6W
3731	4822 050 21003	10kΩ	2%	0,25W
3760	4822 050 11002	1kΩ	5%	0,2W
3761	4822 050 11002	1kΩ	5%	0,2W
3762	4822 050 11002	1kΩ	5%	0,2W
3763	4822 116 52231	820Ω	5%	0,5W
3764	4822 052 10338	3,3Ω		NFR25
3766	4822 050 21003	10kΩ	2%	0,25W
3768	4822 116 52283	4,7kΩ	5%	0,5W
3769	4822 050 21003	10kΩ	2%	0,25W
3800	4822 116 52291	56kΩ	5%	0,5W
3801	4822 050 21003	10kΩ	2%	0,25W
3802	4822 116 52291	56kΩ	5%	0,5W
3803	4822 050 21003	10kΩ	2%	0,25W
3805	4822 050 21003	10kΩ	2%	0,25W
3806	4822 050 21003	10kΩ	2%	0,25W
3807	4822 050 21003	10kΩ	2%	0,25W
3808	4822 050 21003	10kΩ	2%	0,25W
3809	4822 116 83883	470Ω	5%	0,16W
3811	4822 116 52251	18kΩ	5%	0,5W
3812	4822 053 10228	2,2Ω	5%	1W
3814	4822 116 52191	33Ω	5%	0,5W
3815	4822 052 10478	4,7Ω	5%	NFR
3816	4822 116 83884	47kΩ	5%	0,16W
3817	4822 116 52298	680kΩ	5%	0,5W
3819	4822 116 83883	470Ω	5%	0,16W
3820	4822 116 52289	5,6kΩ	5%	0,16W

ELECTRICAL PARTSLIST 3CDC-99 MODULE**RESISTORS**

3821	4822 116 52289	5,6kΩ	5%	0,16W
3822	4822 116 52263	2,7kΩ	5%	0,5W
3823	4822 050 11002	1kΩ	5%	0,2W
3824	4822 050 11002	1kΩ	5%	0,2W
3825	4822 050 11002	1kΩ	5%	0,2W
3826	4822 116 52257	22kΩ	5%	0,5W
3827	4822 050 23303	33kΩ	1%	0,6W
3828	4822 116 52257	22kΩ	5%	0,5W
3831	4822 116 52257	22kΩ	5%	0,5W
3832	4822 050 21003	10kΩ	2%	0,25W
3833	4822 116 52257	22kΩ	5%	0,5W
3834	4822 116 52257	22kΩ	5%	0,5W
3835	4822 052 10338	3,3Ω		NFR25
3837	4822 050 11002	1kΩ	5%	0,2W
3838	4822 050 11002	1kΩ	5%	0,2W
3839	4822 116 52234	100kΩ	5%	0,5W
3840	4822 116 52234	100kΩ	5%	0,5W
3841	4822 116 52283	4,7kΩ	5%	0,5W
3842	4822 116 83884	47kΩ	5%	0,16W
3843	4822 050 23303	33kΩ	1%	0,6W
3844	4822 116 52283	4,7kΩ	5%	0,5W
3845	4822 116 83884	47kΩ	5%	0,16W
3846	4822 050 23303	33kΩ	1%	0,6W
3847	4822 116 83961	6,8kΩ	5%	0,16W
3848	4822 116 52234	100kΩ	5%	0,5W
3849	4822 116 52234	100kΩ	5%	0,5W
3850	4822 116 52276	3,9kΩ	5%	0,5W
3851	4822 052 10338	3,3Ω		NFR25
3852	4822 052 10228	2,2Ω	5%	0,33W
3853	4822 116 83883	470Ω	5%	0,16W
3854	4822 116 52175	100Ω	5%	0,5W
3855	4822 116 52175	100Ω	5%	0,5W
3857	4822 116 52191	33Ω	5%	0,5W
3858	4822 116 52257	22kΩ	5%	0,5W
3859	4822 116 52257	22kΩ	5%	0,5W
3862	4822 116 52175	100Ω	5%	0,5W
3863	4822 116 52191	33Ω	5%	0,5W
3864	4822 116 52176	10Ω	5%	0,5W
3865	4822 116 52176	10Ω	5%	0,5W
3866	4822 050 21003	10kΩ	2%	0,25W
3867	4822 116 52206	120Ω	5%	0,5W
3869	4822 050 24708	4,7Ω	1%	0,6W
3870	4822 116 52175	100Ω	5%	0,5W
3871	4822 050 21003	10kΩ	2%	0,25W
3872	4822 050 21003	10kΩ	2%	0,25W
3873	4822 116 83883	470Ω	5%	0,16W
3874	4822 050 21003	10kΩ	2%	0,25W
3875	4822 050 21003	10kΩ	2%	0,25W
3876	4822 116 52234	100kΩ	5%	0,5W
3877	4822 050 21003	10kΩ	2%	0,25W
3878	4822 050 21003	10kΩ	2%	0,25W
3879	4822 050 21003	10kΩ	2%	0,25W
3880	4822 116 52219	330Ω	5%	0,5W
3881	4822 050 21003	10kΩ	2%	0,25W
3882	4822 116 83884	47kΩ	5%	0,16W
3883	4822 116 52234	100kΩ	5%	0,5W
3884	4822 116 52276	3,9kΩ	5%	0,5W
3885	4822 116 52234	100kΩ	5%	0,5W
3886	4822 116 83884	47kΩ	5%	0,16W
3887	4822 116 83883	470Ω	5%	0,16W

RESISTORS

3888	4822 050 21003	10kΩ	2%	0,25W
3889	4822 116 83883	470Ω	5%	0,16W
3890	4822 050 11002	1kΩ	5%	0,2W
3891	4822 050 11002	1kΩ	5%	0,2W
3892	4822 116 83883	470Ω	5%	0,16W
3893	4822 116 83883	470Ω	5%	0,16W
3894	4822 116 52191	33Ω	5%	0,5W
3895	4822 116 52176	10Ω	5%	0,5W
3897	4822 116 52175	100Ω	5%	0,5W
3899	4822 116 52175	100Ω	5%	0,5W

COILS

1810	4822 242 10849	CRYSTAL 8,46MHz
------	----------------	-----------------

DIODES

6871	4822 130 30621	1N4148
6872	4822 130 30621	1N4148
6873	4822 130 30621	1N4148
6874	4822 130 30621	1N4148
6875	3198 010 55180	DIO REG BZX79-B5V1

6877	3198 010 53980	DIO REG BZX79-B3V9
------	----------------	--------------------

TRANSISTORS

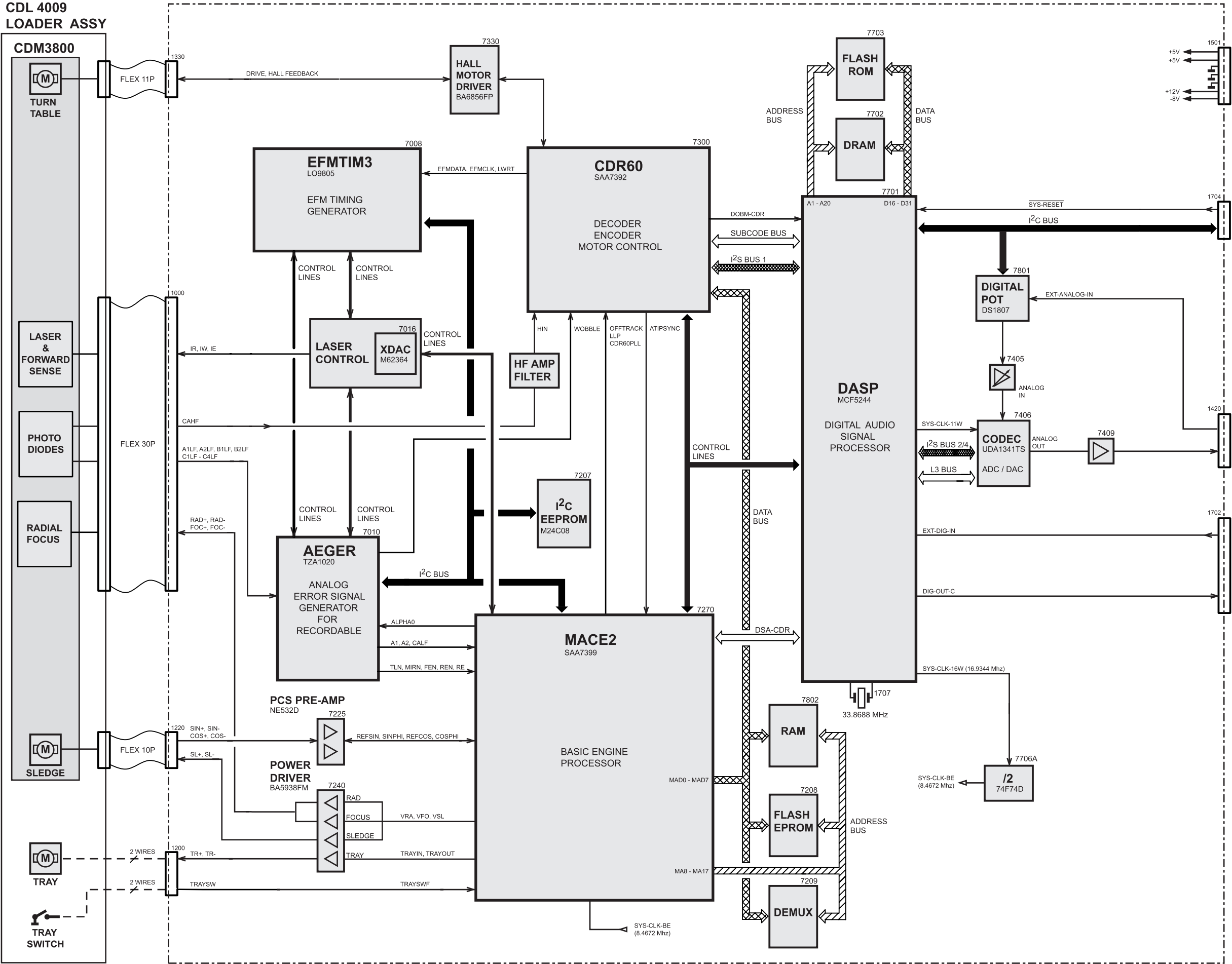
7812	4822 130 40959	BC547B
7874	4822 130 40959	BC547B
7875	4822 130 40959	BC547B

INTEGRATED CIRCUITS

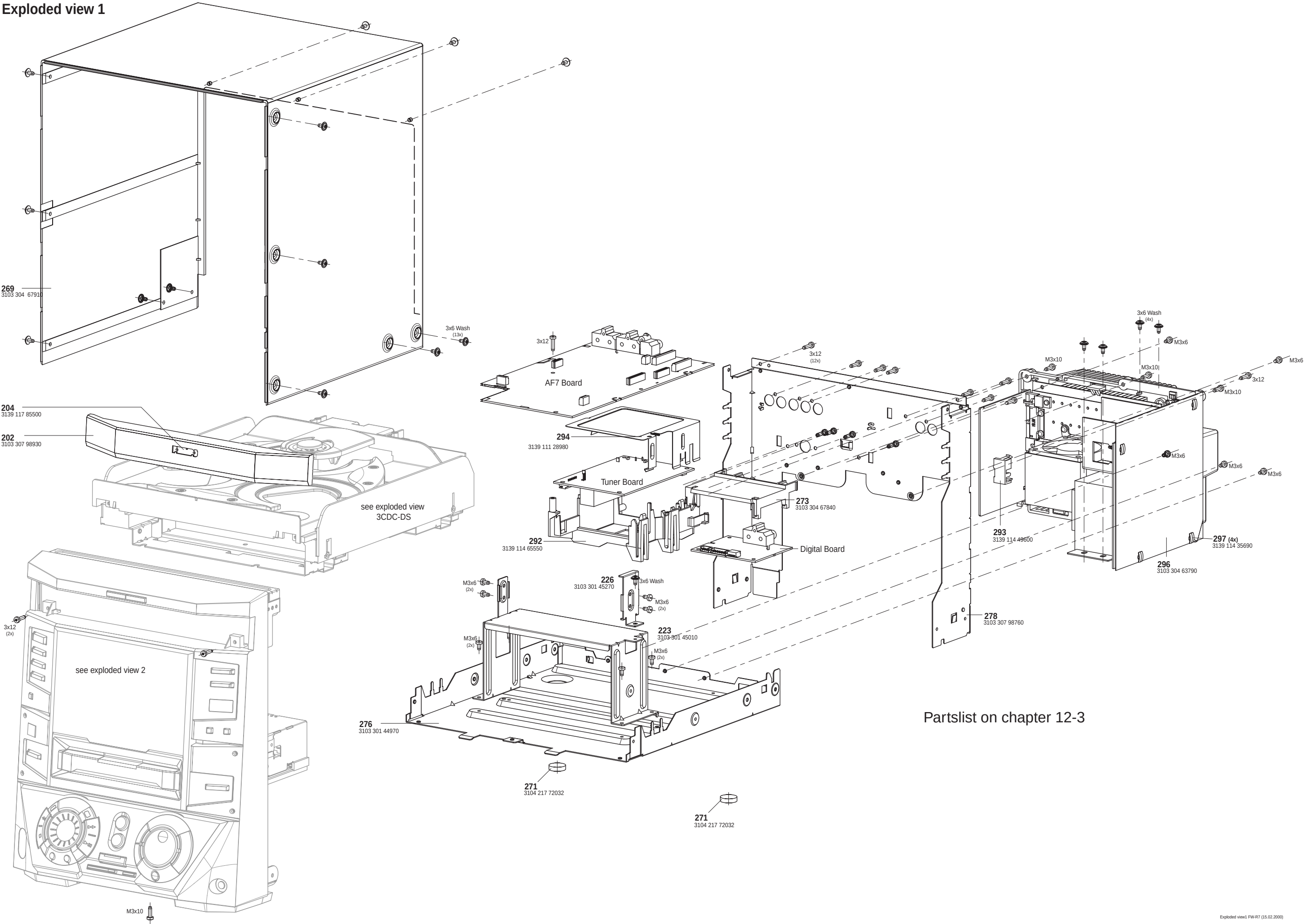
7801 ©	4822 209 17286	TZA1024T/N1 HF-AMPLIFIER
7806	9352 628 49112	IC TDA7073A/N4
7807	9352 628 49112	IC TDA7073A/N4
7810 ©	8203 303 11278	D/A CONVERTER PCM1716
7871	9352 628 49112	IC TDA7073A/N4
7873	5322 209 10421	HEF4094BP
7876 ©	4822 209 16143	LC89170M
7877 ©	9352 641 80557	SAA7324H/M2B CD10/M2B
7878	4822 209 72042	MC78L05ACP

Blockdiagram11-2

CDL 4009
LOADER ASSY

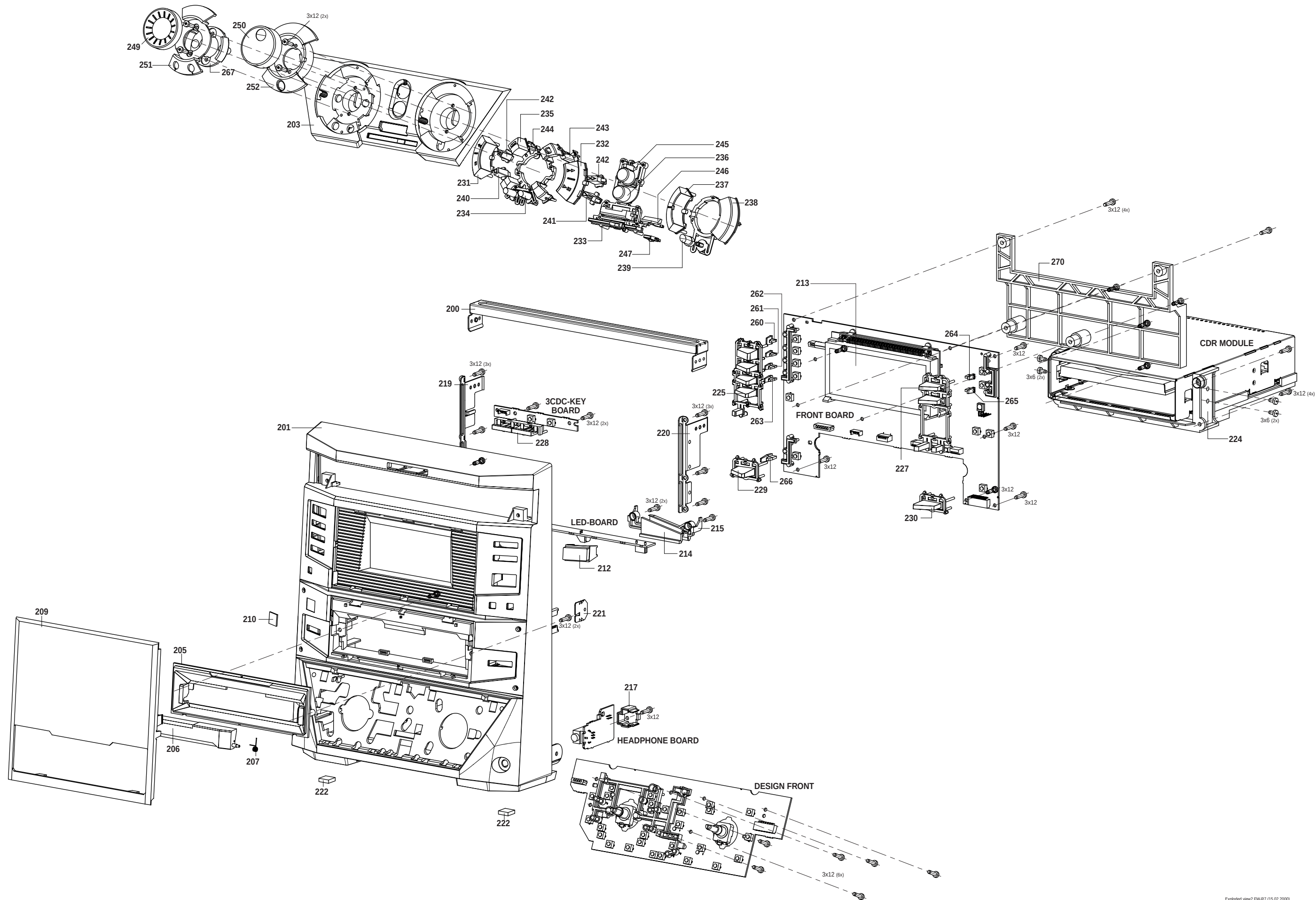


Exploded view 1



Partslist on chapter 12-3

Exploded view 2



MECHANICAL PARTS

201	3103 307 98591	CABINET FRONT
202	3103 307 98931	COVER 3CDC TRAY
203	3103 307 98581	CABINET INSERT
204	4822 454 13408	WORDMARK PHILIPS
205	3103 307 98921	FRAME ORNAMENTAL
206	3103 304 69271	DOOR CDRM99
207	3103 301 06490	SPRING DOOR CDR
209	3103 307 98602	WINDOW DISPLAY/CDR
210	4822 454 13339	ORNAMENTAL PLATE
212	3103 304 68130	LENS IR
213	3103 304 68990	CUTSHEET FTD
214	3103 304 67810	LIGHT GUIDE CDR
215	3103 304 68120	HOLDER LIGHT GUIDE
222	4822 462 40683	FOOT RUBBER
225	3103 307 98941	BUTTON-SET POWER
226	3103 301 45270	BRACKET CDR RIGHT
227	3103 307 99031	BUTTON-SET AUX/TUNER
228	3103 307 98951	BUTTON-SET 3CDC-OPEN
229	3103 307 98961	BUTTON-CDR SELECT
230	3103 307 98971	BUTTON-CDR OPEN
231	3103 307 98611	BUTTON-STOP PREV
232	3103 307 98621	BUTTON-PLAY NEXT
233	3103 307 98642	BUTTON-SET REC-TYPE
234	3103 307 98631	BUTTON-SET TRACK-MENUE
235	3103 304 68711	BUTTON-SET YES-NO-REC-PROG
236	3103 307 98652	BUTTON-SET CD-REC
237	3103 307 98662	BUTTON-PURE LOUDNESS
238	3103 307 98671	BUTTON-SET DSC-IS
239	3103 304 68970	CAP INCREDIBLE SURROUND
240	3103 304 68750	LIGHTGUIDE STOP
241	3103 304 68760	LIGHTGUIDE PLAY
242	3103 304 68770	LIGHTGUIDE PREV-NEXT
243	3103 307 98681	LIGHT GUIDE YES
244	3103 307 98691	LIGHT GUIDE NO
245	3103 304 68800	LIGHTGUIDE CD-REC
246	3103 304 68810	LIGHTGUIDE REC-TYPE
247	3103 304 68820	LIGHTGUIDE FINALIZE
249	3103 307 98701	ROTARY JOG
250	3103 307 98711	ROTARY VOLUME
251	3103 307 98721	COVER JOG
252	3103 307 98731	COVER VOLUME
260	3103 304 67360	LIGHT GUIDE POWER
261	3103 304 67370	LIGHT GUIDE CD1
262	3103 304 67380	LIGHT GUIDE CD2
263	3103 304 67390	LIGHT GUIDE CD3
264	3103 304 67870	LIGHT GUIDE AUX
265	3103 304 67880	LIGHT GUIDE TUNER
266	3103 304 67930	LIGHT GUIDE CDR
267	3103 304 68830	LIGHT GUIDE JOG-ROTARY
271	4822 462 40683	FOOT RUBBER
293	4822 402 10288	BRACKET MAINS SOCKET
297	4822 466 93148	SPACER

MISCELLANEOUS

3103 307 99140	SPEAKER-BOX LEFT
3103 307 99150	SPEAKER-BOX RIGHT
4822 303 50063	FM AERIAL
4822 320 11094	FW ANTENNA WIRE /37
4822 303 50082	AM FRAME AERIAL
3139 228 83630	REMOTE CONTROL RC2505/01
3104 128 92560	MAINS CORD, UL
4622 004 50290	CORDSET
1008 3103 308 30540	TRANSFORMER MAINS FOR /37
1008 3103 308 30550	TRANSFORMER MAINS FOR /22
1008 3103 308 30560	TRANSFORMER MAINS FOR /21
8002 4822 320 12335	FLEX FOIL CABLE,17P, 125mm
8004 3103 308 92310	FLEX FOIL CABLE 6P, 400mm
8006 3103 308 92320	FLEXFOIL CABLE, 7P, 280mm
8009 3103 308 92330	FLEX FOIL CABLE, 5P, 280mm
8013 3103 308 92340	FLEX FOIL CABLE, 5P, 280mm
8014 3103 308 92470	FLEX FOIL CABLE, 19p, 400mm
8015 3103 308 92460	FLEX FOIL CABLE 4P, 400mm

REPLACEMENTS

3104129 52590	CD-R/W MODULE
---------------	---------------