Compact disc recorder CDR775 /00

Service
Service
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Service Manual

COMPACT disc DIGITAL AUDIO ReWritable
COMPACT disc DIGITAL AUDIO Recordable ReWritable
COMPACT disc DIGITAL AUDIO Recordable
COMPACT disc DIGITAL AUDIO

SERVICING

For servicing CDR775, the set can divided into three parts.

1. The display board (partly) 1 002, the I/O board 1004, the headphone board (partly) 1002, the IR board (partly) 1002, the ON/ OFF & Standby LED board (partly) 1002 and the CD-out board (partly) 1002 have to be repaired at component level. The power supply unit 1003 is available as spare part, but can also be repaired at component level.
2. The CDR module (containing the CDR loader 81, CDR main board 1001 and loader bracket 82, 83) will be exchanged completely in case of failure. This complete CDR module is available as spare part. Defective modules have to be returned for central repair.
3. The CD module (containing the CD loader 131, CD main board 1005 and loader bracket 132) is a new module with VAL1250 loader assy but also a separate CDM and separate loader parts will be available via service stock. The CD main board can be repaired at component level.

Also available: Circuit Description " The Basics of Compact Disc Recordable/Rewriteable". Service code number 4822 725 25242.

Contents

CLASS 1
LASER PRODUCT

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PHILIPS

1. Technical Specifications CDR775

1.1 General

Mains voltage	:	all range version 84-230V (/00, /01C, /06, /13, /14)
	:	USA version 117V/60Hz (/17)
Mains frequency	:	50-60 Hz
Power consumption	:	12W
DC output	:	+5V ± 10%, 50mA max.

1.2 Input/output

1.2.1 Line output (CDR & CD)

Output level\	:	2Vrms at 0dB
Output resistance	:	200Ω

1.2.2 Line input

Input sensitivity	:	500mVrms
Input impedance	:	50kΩ
Max. input voltage	:	2.5Vrms

1.2.3 Digital output (CDR & CD)

Format	:	AES/EBU format according IEC958 (consumer format)
Sampling frequency	:	44.1kHz
Output resistance	:	75Ω

1.2.4 Digital input

Format	:	AES/EBU format according IEC958 (consumer format)
Sampling frequency	:	32 to 48kHz
Input resistance	:	75Ω

1.2.5 Optical input

Format	:	AES/EBU format according IEC958 (consumer format)
Sampling frequency	:	32 to 48kHz

1.3 Audio performance

1.3.1 Cinch analog output (CDR play-back)

Output voltage	:	2Vrms ± 2dB (0dB signal)
Frequency range F.R.	:	20Hz < F.R.< 20kHz
Amplitude linearity	:	± 0.3dB (typical ± 0.1dB)
Channel unbalance	:	< 0.3dB at 1kHz (typical ± 0.2dB)
Output resistance	:	200Ω
Phase non-linearity	:	< 0.2 deg at 1kHz
Outband attenuation	:	50dB above 30kHz
Channel separation	:	> 90dB at 1kHz (typical 110dB), >85dB between 20Hz and 20kHz (typical >93dB)
S/N-ratio A-weighted	:	> 98dB (typical 100dB)
S/N-ratio unweighted	:	> 95dB (typical 98dB)
Dynamic range	:	> 92dB at 1kHz (typical 96dB), > 90dB between 20Hz and 20kHz (typical 96dB)
THD+N	:	>85dB between 20Hz and 20kHz (typical 91dB)

1.3.2 Cinch analog input/output (monitor path CDR)

Measured with Audio precision system one.
Input voltage is 1Vrms.

Output voltage	:	2Vrms ± 2dB (0dB signal)
Frequency range F.R.	:	20Hz < F.R.< 20kHz
Amplitude linearity	:	± 0.3dB (typical ± 0.1dB)
Channel unbalance	:	< 0.3dB at 1kHz (typical ± 0.2dB)
Output resistance	:	200Ω
Phase non-linearity	:	< 0.2 deg at 1kHz
Outband attenuation	:	50dB above 30kHz
Channel separation	:	> 90dB at 1kHz (typical 98dB), > 85dB between 20Hz and 20kHz (typical >92dB)
S/N-ratio A-weighted	:	> 90dB (typical 88dB)
Dynamic range	:	> 85dB at 1kHz (typical 90dB)
THD+N	:	> 80dB between 20Hz and 20kHz (typical 82dB)
Intermodulation THD	:	> 80dB

1.3.3 Cinch analog output (CD play-back)

Output voltage	:	2Vrms ± 2dB (0dB signal)
Frequency range F.R.	:	20Hz < F.R.< 20kHz
Amplitude linearity	:	± 0.3dB (typical ± 0.1dB)
Channel unbalance	:	< 0.3dB at 1kHz (typical ± 0.2dB)
Output resistance	:	200Ω
Phase non-linearity	:	< 0.2 deg at 1kHz
Outband attenuation	:	50dB above 30kHz
Channel separation	:	> 90dB at 1kHz (typical 100dB), >85dB between 20Hz and 20kHz (typical >93dB)
S/N-ratio A-weighted	:	> 98dB (typical 100dB)
S/N-ratio unweighted	:	> 94dB (typical 98dB)
Dynamic range	:	> 92dB at 1kHz (typical 96dB), > 90dB between 20Hz and 20kHz (typical 96dB)
THD+N	:	> 82dB between 20Hz and 20kHz (typical 85dB)

1.3.4 Headphone output (all functions)

Output voltage	:	3Vrms (0dB)/8-2000Ω
S/N	:	> 80dB
THD+N	:	> 78dB
Channel separation	:	> 60dB between 20Hz and 20kHz

1.4 Laser device

Material	:	GaAlAs
Wave length	:	between 780 and 800nm (at 25°C)
Laser output	:	1mW max. during reading, 20mW max. during writing
Class	:	3B

1.5 Dimensions and weight

Number and height of feet	:	4x11mm foiled
Apparatus tray closed (WxDxH)	:	435x305x75mm (without feet)
Weight without packaging	:	3.2kg
Weight with packaging	:	4.2kg

2. Warnings and Servicing Hints

(GB) WARNING

All ICs and many other semi-conductors 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 wrist wrap with resistance.
Keep components and tools also at this potential.

ESD

(NL) WAARSCHUWING

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

(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 a 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 a ce que les composants ainsi que les outils que l'on utilise soient également a ce potentiel.

(D) WARNUNG

Alle IC und viele andere Halbleiter sind empfindlich gegen elektrostatische Entladungen (ESD).
Unsorgfältige Behandlung bei der Reparatur kann die Lebensdauer drastisch vermindern.
Sorgen sie dafür, das Sie im Reparaturfall über ein Pulsarmband mit Widerstand mit dem Massepotential des Gerätes verbunden sind.
Halten Sie Bauteile und Hilfsmittel ebenfalls auf diesem Potential.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevita potrebbe essere fortemente ridatta in caso di non osservazione della piu 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)

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

(NL)

Veiligheidsbepalingen vereisen, dat het apparaat in zijn oorspronkelijke toestand wordt terug gebracht en dat onderdelen, identiek aan de gespecifieerde worden toegepast.

(D)

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten.
Der Originalzustand des Gerats darf nicht verandert werden.
Fur Reparaturen sind Original-Ersatzteile zu verwenden.

(I)

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati pezzi di ricambiago idetici a quelli specificati.

(F)

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

CAUTION
VARO!
VARNING
ADVERSEL
DANGER
VORSICHT

INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM.
AVATTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASER SÄTTEILYLLE ÄLÄ KATSO SÄTEESEN.
OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD BETRAKTA EJ STRÅLEN.
USYNLIG LASERSTRÅLING VED ÅBNING. UNDGÅ UNSAETTELSE FOR STRÅLING.
INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM.
UNSICHTBARE LASERSTRAHLUNG WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN.

SHOCK, FIRE HAZARD SERVICE TEST:

CAUTION: After servicing this appliance and prior to returning to customer, measure the resistance between either primary AC cord connector pins (with unit NOT connected to AC mains and its Power switch ON), and the face or Front Panel of product and controls and chassis bottom,
Any resistance measurement less than 1 Megohms should cause unit to be repaired or corrected before AC power is applied, and verified before return to user/customer.
Ref.UL Standard NO.1492.

NOTE ON SAFETY:

Symbol ⚠ : Fire or electrical shock hazard. Only original parts should be used to replace any part with symbol ⚠
Any other component substitution(other than original type), may increase risk or fire or electrical shock hazard.

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

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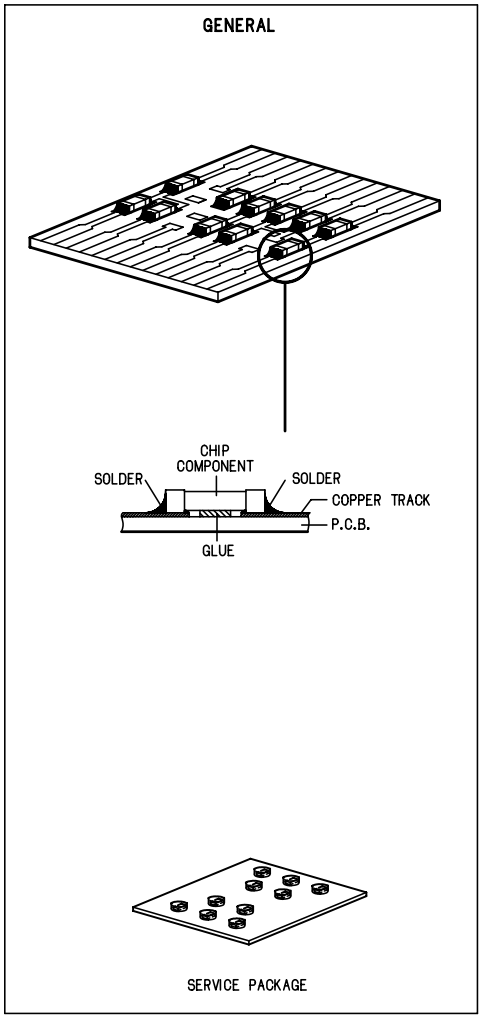
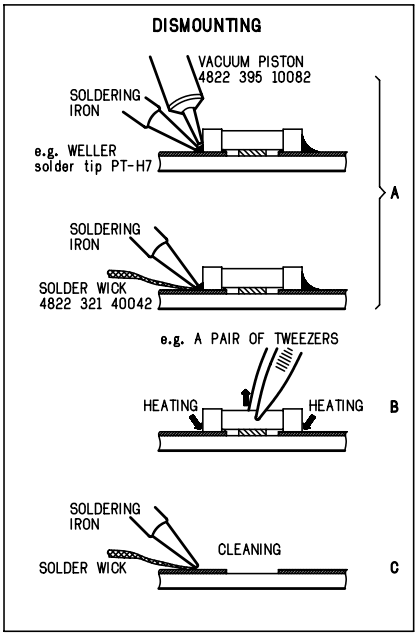
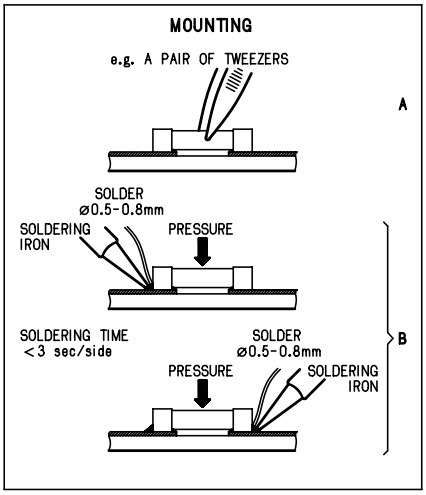
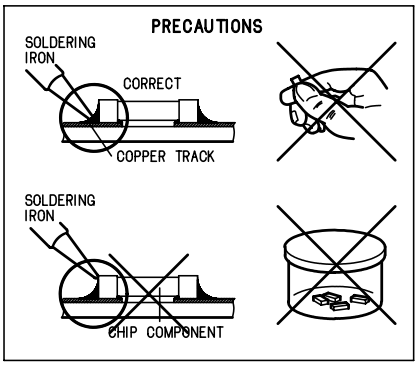
SERVICING HINTS

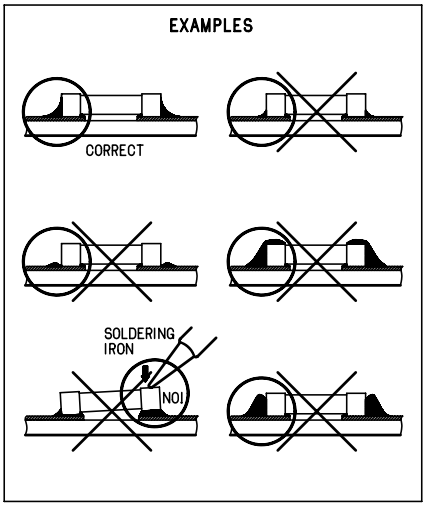
In the set, chip components have been applied. For disassembly and assembly check the figure below.











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SAFETY GUIDELINES FOR THE PROFESSIONAL SERVICE TECHNICIAN

Important

Proper service and repair is important to the safe, reliable operation of all Philips equipment. The service procedures recommended by Philips and described in this service manual are effective methods of performing service operations. Some of these service operations require the use of tools specially designed for the purpose. The special tools should be used when and as recommended.

It is important to note that this manual contains various CAUTIONS and NOTICES which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It also is important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. Philips could not possibly know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Philips has not undertaken any such broad evaluation. Accordingly, a servicer who uses a service procedure or tool which is not recommended by Philips must first satisfy himself thoroughly that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.

Safety Checks

After the original service problem has been corrected, a complete safety check should be made. Be sure to check over the entire set, not just the areas where you have worked. Some previous servicer may have left an unsafe condition, which could be unknowingly passed on to your customer. Be sure to check all of the following:

Fire and Shock Hazard

1. Be sure all components are positioned in such a way as to avoid the possibility of adjacent component shorts. This is especially important on those units which are transported to and from the service shop.
2. Never release a repaired unit unless all protective devices such as insulators, barriers, covers, strain reliefs, and other hardware have been installed according to the original design.
3. Soldering and wiring must be inspected to locate possible cold solder joints, solder splashes, sharp solder points, frayed leads, pinched leads, or damaged insulation (including the ac cord). Be certain to remove loose solder balls and all other loose foreign particles.
4. Check across-the-line components and other components for physical evidence of damage or deterioration and replace if necessary. Follow original layout, lead length, and dress.
5. No lead or component should touch a resistor rated at 1 watt or more. Lead tension around protruding metal surfaces or edges must be avoided.
6. Critical components having special safety characteristics are identified with a ⚠ by the Ref. No. in the parts list and enclosed within a broken line* (where several critical components are grouped in one area) along with the safety symbol ⚠ on the schematic diagrams and/or exploded views.

   Replacement parts without the same safety characteristics may create shock, fire, or other hazards.
7. When servicing any unit, always use a separate isolation transformer for the chassis. Failure to use a separate isolation transformer may expose you to possible shock hazard, and may cause damage to servicing instruments.
8. Many electronic products use a polarized ac line cord (one wide pin on the plug). Defeating this safety feature may create a potential hazard to the servicer and the user. Extension cords which do not incorporate the polarizing feature should never be used.

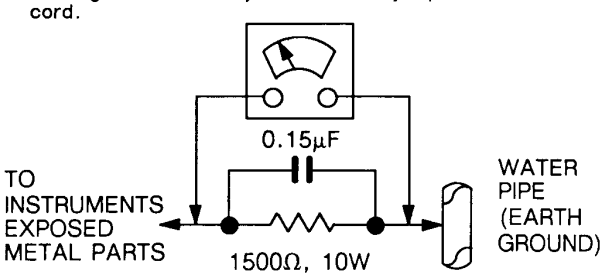
Fire and Shock Hazard (Continued)

9. After reassembly of the unit, always perform an ac leakage test or resistance test from the line cord to all exposed metal parts of the cabinet. Also, check all metal control shafts (with knobs removed), antenna terminals, handles, screws, etc. to be sure the unit is safe to operate without danger of electrical shock.

* Broken line: ▬ ▪ ▬ ▪ ▬ ▪ ▬ ▪ ▬ ▪

Leakage Current Cold Check

1. Unplug the ac line cord and connect a jumper between the two prongs of the plug.
2. Turn on the power switch.
3. Measure the resistance value between the jumpered ac plug and all exposed cabinet parts of the receiver, such as screw heads, antennas, and control shafts. When the exposed metallic part has a return path to the chassis, the reading should be between 1 megohm and 5.2 megohms. When the exposed metal does not have a return path to the chassis, the reading must be infinity. Remove the jumper from the ac line cord.



Leakage Current Hot Check

1. Do not use an isolation transformer for this test. Plug the completely reassembled unit directly into the ac outlet.
2. Connect a 1.5k, 10W resistor paralleled by a 0.15uF. capacitor between each exposed metallic cabinet part and a good earth ground such as a water pipe, as shown above.
3. Use an ac voltmeter with at least 5000 ohms/volt sensitivity to measure the potential across the resistor.
4. The potential at any point should not exceed 0.75 volts. A leakage current tester may be used to make this test; leakage current must not exceed 0.5 milliamps. If a measurement is outside of the specified limits, there is a possibility of shock hazard. The receiver should be repaired and rechecked before returning it to the customer.
5. Repeat the above procedure with the ac plug reversed. (Note: An ac adapter is necessary when a polarized plug is used. Do not defeat the polarizing feature of the plug.)

Parts Replacement

1. Many electrical and mechanical parts in Philips equipment have special safety related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. The use of a substitute part which does not have the same safety characteristics as the Philips recommended replacement part shown in this service manual may create shock, fire, or other hazards. Under no circumstances should the original design be modified or altered without written permission from Philips. Philips assumes no liability, express or implied, arising out of any unauthorized modification of design. Servicer assumes all liability.
2. All ICs and many other semiconductor parts are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce the life of the part drastically.

LASER NOTE:

DANGER - Invisible laser radiation when open. AVOID DIRECT EXPOSURE TO BEAM.
CAUTION - Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
CAUTION - The use of optical instruments with this product will increase eye hazard.

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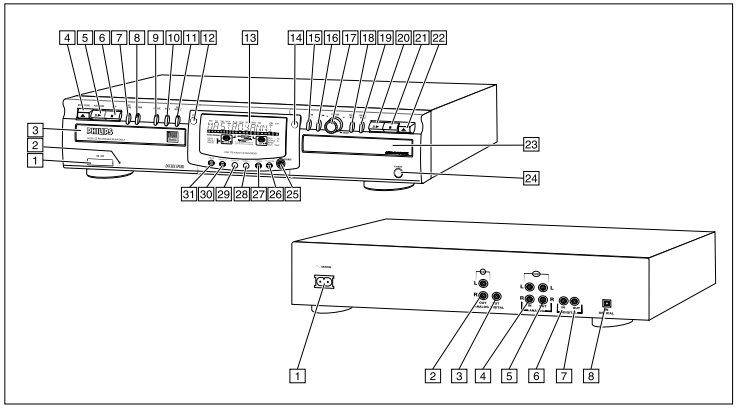


Controls on the front

CD recorder

1 **ON/OFF**.....turns the CD recorder ON and OFF
2 Standby indicator
3 Disc tray
4 **OPEN/CLOSE ▲**.....opens/closes disc tray
5 **PLAY/PAUSE ▶ II**.....starts play/interrupts play or recording
6 **STOP ■**.....stops/clears a program
7 **REC**(ord) **TYPE**.....selects recording modes
8 **RECORD**.....starts recording, finalizing, erasing
9 **FINALIZE**.....selects finalize mode
10 **ERASE**.....selects erasing mode
11 **SOURCE**.....selects external input source
12 **CDR**.....selects CDR display/keys

CD player

14 **CD**.....selects CD display/keys
20 **PLAY/PAUSE ▶ II**.....starts play/interrupts play
21 **STOP ■**.....stops/clears a program
22 **OPEN/CLOSE ▲**.....opens/closes disc tray
23 Disc tray

General

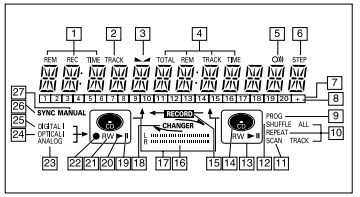
13 Display.....information screen
15 **◀◀**.....- searches backward
- cursor control in Menu/Prog. review mode
16 **▶▶**.....- searches forward
- cursor control in Menu/Prog. review mode
17 **I◀ EASY JOG ▶I**.....- previous/next track (Play and Program mode)
(rotate) - recording level control (recording)
- selects settings (menu on)
ENTER.....- plays selected tracks
(push) - selects settings in Menu mode
- programs track numbers
18 **STORE/MENU**.....- enters Menu mode
- stores Menu settings
19 **CANCEL/DELETE**.....- deletes tracks from a program
- deletes text in Menu mode
- returns to a higher level in the menu
24 **IR sensor**.....receives signals from the remote control
25 **PHONES**.....socket for headphones
26 **DJ MODE**.....separate play of CD recorder and CD player
27 **REPEAT**.....repeats play (All, program or track)
28 **SCROLL**.....activates scrolling of text over the display (once)
29 **DISPLAY**.....selects display information/text
30 **SHUFFLE**.....plays CD(RW) or program in random order
31 **PROG**(ram).....opens/closes program memory

Note: Unless stated otherwise, all controls are on the front of the CD recorder. When provided on the remote control, you can also use the corresponding buttons, after selecting the CD recorder or CD Player by pressing CDR or CD.

Connections at the back

1 Connection to mains
4 **ANALOG IN**.....connects to the line output of an amplifier (left and right)
5 **ANALOG OUT CDR & CD**.....connects to the line input of an amplifier (left and right)
6 **DIGITAL IN**.....connects to the digital coaxial output of an external CD player
7 **DIGITAL OUT CDR & CD**.....connects to the digital coaxial input of e.g. amplifier or recording device
8 **OPTICAL IN**.....connects to the digital optical output of an external CD player
3 **DIGITAL OUT CD**.....connects CD player deck to the digital coaxial input of e.g. amplifier or recording device
2 **ANALOG OUT**.....connects CD player deck to the line input of an amplifier (left and right)

DISPLAY indications



1 **REM/REC TIME**.....remaining recording time / recording time
2 **TRACK**.....track number
3 ◣◢.....balance (lights during balance adjustement)
4 **TOTAL REM TRACK TIME**.....total or remaining time of disc or track
5 **O))**.....remote control active
6 **STEP**.....indicates the number of tracks in a program
7 **Track bar**.....indicates:
- tracks on a disc or in a program
- track in play
8 **+ 20**.....disc or program contains more than 20 tracks
9 **PROG**(ram).....flashes during programming/lights in program mode
10 **REPEAT TRACK/ALL**..lights up when a track/ complete disc (or program) is repeated.
11 **SCAN**.....lights up when the first 10 seconds of each track are played.
12 **SHUFFLE ALL**.....plays tracks in random order
13 ▢.....CD player selected
14 **CD**.....CD inserted (a pre-recorded CD or finalized CDR or CDRW disc)
15 **← RECORD –**.....lights during recording from the internal CD
16 **L/R II II**.....record/play level bar. Indicates the audio signal level.
17 ⌟ ⌞.....DJ mode selected
18 **CHANGER**.....changer mode selected
19 **II**.....pause function active
20 **▶**.....lights during play
21 **R(W)**.....unfinalized CDR(W) disc inserted
22 **●**.....lights during recording
23 **ANALOG** ⌟→.....analog input selected for external recording
ANALOG.....analog recording
24 **OPTICAL I →**.....optical input I selected for external recording
25 **DIGITAL I** ⌞.....digital input I selected for external recording
26 **MANUAL**.....manual start of external recording
27 **SYNC**.....automatic or synchronised start of external recording

English

DISPLAY messages

Messages, as listed and explained here, may appear on the display for your guidance.

General

READING ..... reading disc information
OPEN ..... during tray opening
CLOSE ..... during tray closing
NO DISC ..... no disc inserted, disc unreadable or disc inserted upside down
PROG FULL ..... program full
INSERT DISC ..... insert disc or insert disc in correct way
WRONG DISC ..... inserted disc is no audio CD
UNFINALIZED ..... unfinalized CDR(W) disc
MEMORY xx% ..... indicates the amount of text memory used for unfinalized discs

Recording

WAIT ..... - when STOP ■ is pressed during recording
- when STOP ■ is pressed during recording the first 4 seconds of a track

UPDATE ..... updating disc contents
DISC FULL ..... no more recording possible
DIGITAL 1 ..... digital coaxial input 1 selected
OPTICAL ..... digital optical input selected
ANALOG ..... analog input selected
COPY PROTECT ..... no digital recording can be made of the external source
NOTFINALIZED ..... when opening the tray with an unfinalized disc inserted (CD recorder)
RECORD FAST ..... High Speed recording selected
REC LISTEN ..... Listen Speed recording selected
MAKE CD ..... High Speed Recording and Auto Finalize function selected
REC EXT DISC ..... Synchronised start of recording from external source selected
REC EXT MAN ..... Manual start of recording from external source selected
-xx DB ..... level is being adjusted
DOES NOT FIT ..... time left on CDR(W) disc is not enough for proposed recording
ANALOG REC ..... copy prohibited track found during recording. Track will be copied analog (Copy Protection Regulations).
ERASE TRACK ..... when erasing one or more tracks
ERASE DISC ..... when erasing a disc
FINALIZE ..... when finalizing a disc
FINALIZED ..... when trying to finalize an already finalized disc
CHECK INPUT ..... when RECORD is pressed while no digital source is detected
xx xx ERASE ..... time countdown when erasing a track or a disc
xx xx FINAL ..... time countdown when finalizing a disc
PRESS RECORD ..... to start manual recording, finalizing or erasing
START SOURCE ..... to start synchronised recording from a source
FINALIZED CD ..... when trying to record on a finalized CDR or a prerecorded CD
UNFINALIZE/ ..... when trying to record on a
PRESS ENTER ..... finalized CDRW
PROF SOURCE ..... when a professional source is connected

Play

CHANGER ..... CD changer-mode selected
DJ-MODE ..... DJ- mode selected when recording keys are pressed in DJ-mode
PROGRAM ..... program mode selected
ALBUM TITLE ..... will be followed by album title
TRACK TITLE ..... will be followed by track title
ALBUM ARTIST ..... will be followed by artist name
TRACK ARTIST ..... will be followed by track artist name

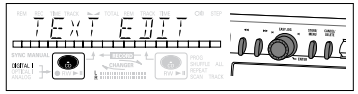
Others

NO AUDIO TR ..... when the recorder enters a data track during recording
FINALIZE CD ..... laser power calibration performed 96 times, finalize disc
INITIALIZING ..... during laser power calibration for unfinalized discs
DISC RECOVER ..... during disc recovering after power failure
OPC ERROR ..... OPC failure during OPC procedure (OPC = Optimum Power Calibration)
RECORD ERROR ..... recording error in menu mode
DISC ERROR ..... when trying to record on or finalize a recovered disc
MEMORY FULL/ ..... when text memory is full. To add a
FINALIZE CD ..... CD to the list, first finalize or erase another disc from the list.

English

GB 8
3.
CDR775
User instructions

MENU messages - See Menu mode



Menu messages

NO TRACKS ..... when attempting to edit text for a disc which has no tracks
TEXT EDIT ..... when entering Text Edit mode
CD ARTIST ..... when editing or erasing an artist name
CD TITLE ..... when editing or erasing a title
TR N ARTIST ..... when editing or erasing an artist name per track
TR N TITLE ..... when editing or erasing a title per track
TEXT ERASE ..... when entering Text Erase mode
ALL TEXT ..... when entering All Text mode
ERASE OK ..... when confirmation for erasing has to be given with ENTER key
ERASE ALL OK ..... when confirmation for erasing has to be given with ENTER key
ERASE MEMORY ..... when waiting for confirmation when erasing a disc
MEMORY VIEW ..... when selecting text review per unfinalized disc in memory
MEMORY EMPTY ..... when REVIEW is selected while no text is in memory
AUTO TRACK ..... when selecting auto track increment ON or OFF
ON ..... Auto Track increment on
OFF ..... Auto Track increment off
SET BALANCE ..... when selecting BALANCE
NO TEXT ..... no text stored for disc

Connections general

For playback on the CD recorder (and/or CD player deck) the following outputs are present:
- Digital coaxial output (CD & CDR);
- Analog output (CD & CDR).

We advise you to connect these to the TAPE or CDR input on your amplifier.

For external recording the following inputs are present:
- Digital optical input;
- Digital coaxial input;
- Analog input.

For playback of CD player deck separately (DJ mode) from the CD recorder the following outputs are present:
- Digital coaxial output (CD);
- Analog output (CD).

We advise you to connect these to the CD input on your amplifier.

The connections you make will depend upon the possibilities your audio equipment offers. Please refer to the user manuals for your other audio equipment first.

Digital recordings (optical or coaxial) give the best performance in audio and usability (e.g. auto-track).
(The digital optical connection is less sensitive to external disturbances).
If your equipment does not offer digital connections, the high quality Analog-Digital-Convertor of your CD recorder will ensure very good audio performance when recordings are made from the analog input.

Playback via the digital coaxial output of the CD recorder gives the best audio performance.
If your equipment does not offer digital connections, the high quality Digital-Analog-Convertor of the CD recorder ensures a very good sound quality via the analog output.

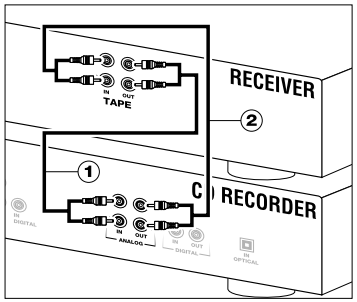
We advise you to always establish both digital and analog connections. In this way you can always make analog recordings when digital recording is not possible.

We have described the most common ways of connecting the CD recorder. If you still have difficulties with the connections you can always contact the Philips Consumer Service desk in your country.

English

Analog connections CD recorder & CD player

This connection must be made for playback on the CD recorder deck as well as the CD player deck (cable ②). Cable ① is only required if you want to make recordings from an external analog source.



Use the audio cables supplied. Connect the red plugs to the R sockets, and the white plugs to the L sockets.

1 For recording, connect cable ① between the ANALOG IN-sockets on the CD recorder and the CDR LINE- or TAPE OUT-sockets of an amplifier.

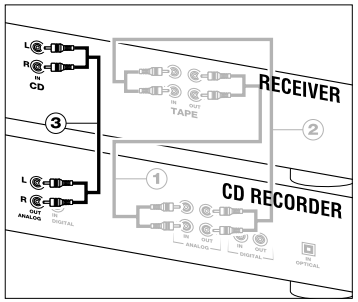
Note: For recording directly from a CD player, the analog input of the CD recorder should be connected to the analog output of the CD player.

2 For playback, connect cable ② between the ANALOG OUT-sockets on the CD recorder and the input sockets of an amplifier e.g. TAPE IN, CDR or AUX.

Note: Never use the PHONO input.

Analog connections CD player deck

This connection is only required if you want to playback on the CD player deck seperately from the CD recorder deck. This will be the case in DJ-mode.



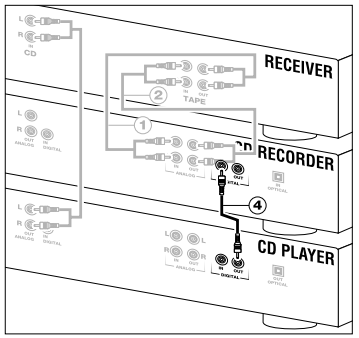
1 For separate playback on the CD player deck, connect a third cable ③ (not supplied) between the ANALOG OUT sockets of the CD recorder and the input sockets of an amplifier e.g. CD, or AUX.
(Connect the red plugs to the R sockets, and the white plugs to the L socket.)

Note:
- Never use the PHONO input.
- Your CD recorder/player is equipped with a digital coaxial output for the CD player deck. This output can be used for digital playback.

English

Digital coaxial connections CD recorder

This connection is only required if you want to make recordings from an external CD player with a digital coaxial output.



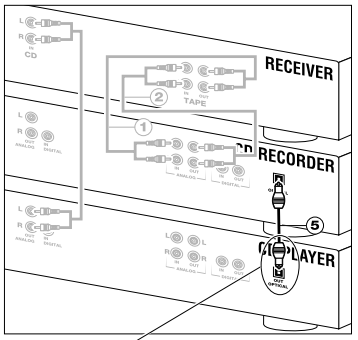
Use the digital coaxial cable supplied.

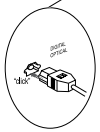
1 For external recording, connect the cable ④ between the DIGITAL IN-socket on the CD recorder and the DIGITAL OUT-socket of an external CD player.

Note: Your CD recorder is equipped with a digital coaxial output (common output for CD recorder & CD player deck). This output can be used for digital playback.

Digital optical connections CD recorder

This connection is only required if you want to make recordings from an external CD player with a digital optical output.





When connecting the Digital Optical cable, make sure it is fully inserted until there is a click.

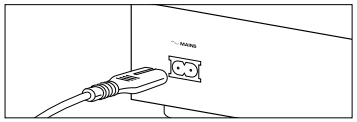
1 Remove the dust caps from the digital optical connection. (We recommend you save the cap.)

2 For external recording, connect a fibre-optic cable ⑤ between the digital optical input of the CD recorder and the digital-optical output of an external CD player.

Note: For playback, the digital coaxial outputs or analog outputs of the CD Player and CD recorder should be connected to an amplifier

INSTALLATION

Power supply



1 Plug the power cord supplied into the MAINS connector on the CD recorder, then into a mains socket.

2 Press ON/OFF.
➜ The recorder is now in Standby mode.

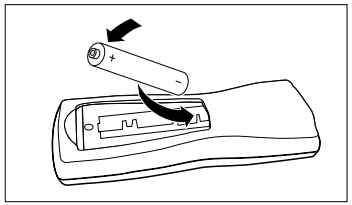
3 Press any key to activate the recorder.

Note:
- *The CD recorder will automatically adjust to the local mains voltage.*
- *When the CD recorder is in the 'OFF' position, it is still consuming some power. If you wish to disconnect your player completely from the mains, withdraw the plug from the AC outlet.*

Setup recommendations

- Place the CD recorder on a solid, vibration free surface.
- Do not place the CD recorder near a source of heat or in direct sunlight.
- Do not use the CD recorder under extremely damp conditions.
- If the CD recorder is placed in a cabinet, make sure that a 2.5 cm space remains free on all sides of the CD recorder/player for proper ventilation.

Inserting batteries in the remote control



1 Open the battery compartment cover.

2 Insert 2 batteries ("AA", LR-6 or UM-3; as supplied) as shown.

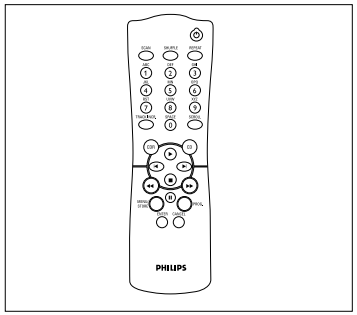
3 Replace the cover.

Note: We recommend you use 2 batteries of the same type and condition.

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

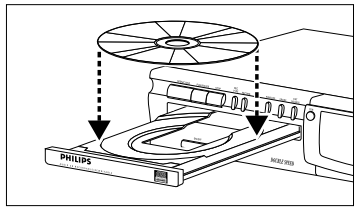
REMOTE CONTROL

Remote control commands



STANDBY ..... switches to Standby/On/Off
SCAN ..... plays the first 10 seconds of each track
SHUFFLE ..... plays CD(RW) or program in random order
REPEAT ..... repeat play
Number/alphabet keys 0 - 9
..... - selects a track by number
- selects character for text input
TRACK INCR(ement) ..... increases track numbers during recording
SCROLL ..... activates scrolling of text over the display
CDR ..... selects CD recorder
CD ..... selects CD player
▶ ..... starts CD(RW) play
|◀◀ ..... previous track (Play and Program mode)
▶▶| ..... next track (Play and Program mode)
■ ..... stops CD(RW) and clears a program
◀◀ ..... - searches backward
- cursor control in Menu/Prog. review mode
▶▶ ..... - searches forward
- cursor control in Menu/Prog. review mode
II ..... interrupts CD(RW) play/recording
MENU/STORE ..... - enters Menu mode
- stores Menu settings
PROG.(ram) ..... opens/closes program memory
ENTER ..... - selects settings in Menu mode
- programs track numbers
- starts playback of selected track
CANCEL ..... - deletes tracks from a program
- deletes text in Menu mode
- returns to a higher level in the menu

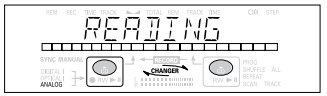
Inserting discs



1 Press OPEN/CLOSE to open the disc tray.
➜ OPEN lights up.

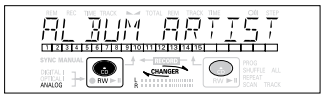
2 Insert a CD, CDR or CDRW in the appropriate recess in the tray, label side up.

3 Press OPEN/CLOSE to close the tray (see also Playing a CD).
➜ CLOSE lights up, followed by READING and the display will show the type of disc you inserted.



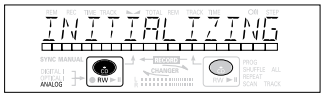
- If a CDR(W) is finalized it will show **CD** on the display.

- If CD-text is available the TITLE/ARTIST will scroll by.



Note:
- *Only Audio CDs will be accepted. If a non-audio disc is inserted, the display shows WRONG DISC.*

CD recorder deck only
- *For recording it is important that the blank disc is completely free from dust particles or scratches. (see Disc maintenance).*
- *If you insert a blank or partly-recorded CDR or unfinalized CDRW, the CD recorder will calibrate the disc for optimum recording. During this process the display will first show INITIALIZING and then the number of audio tracks. Calibration can take up to 25 seconds.*



English

Remarks about recording

You will soon discover how easy it is to make your own CDs. Nevertheless, it is advisable to use a CDRW disc for your first try. We will describe:
- Digital recording (fast or normal recording).
- Recording from external CD player:
  - Digital
  - Digital (synchronized start with external CD player)
  - Analog

• If the disc is a CDRW and is already finalized you must unfinalize it first.

• The recording procedure is the same for CDRs and CDRWs.

• If the disc already contains recordings, the CD recorder will automatically search for the end of the last track, so that recording can start from there.

• There must be at least 7 seconds of recording time left on the disc, otherwise you will not be able to enter record standby mode. DOES NOT FIT then lights up.

• If the display indicates COPY PROTECT, no digital recording can be made of the source material. Recording will not start.

• The **Serial Copy Management System** (SCMS) only allows digital recording under specific conditions:
  - This means that it is not possible to make a digital copy from a digital copy.
  - Analog recording is always possible !
  - The number of recordings from the original is unlimited.

• A maximum of 99 tracks can be recorded on a disc. Minimum allowable track length is 4 seconds.

• Recordings from DAT or DCC players will not always stop automatically.

Important:
If you want to play the recorded CDR disc on any regular CD player, it must first be finalized. See finalizing discs.

Finalized CDRW discs play only on CDRW compatible CD players.

For recording from CD changers always use *REC EXT DISC*.

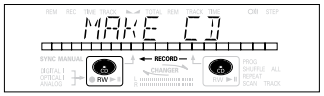
Recording modes

Your recorder offers several recording modes.

For recording from internal CD-deck:

- *RECORD FAST* (high speed recording) - fast recording of a disc or programmed tracks.
- *REC LISTEN* (normal speed recording) - listening to a recording while making it.
- *MAKE CD* (high speed recording and auto-finalize) - fast recording of a disc or programmed tracks. Recording will be finalized automatically.

Warning: *No more recording possible after finalizing CDR disc!*



For recording from external sources:

- *REC EXT DISC* (automatic start of recording) - to make an automatic recording of an external source simply by starting the source.
- *REC EXT MAN* (manual start of recording) - to start a manual recording from an external source.

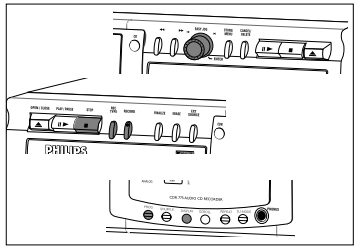
Some remarks on recording:

- During high speed recording, the original recording quality will be maintained.
- When Auto track is on (default setting), track numbers will automatically be increased during recording.
- By programming tracks first, a compilation can be recorded.
- If a finalized CD recordable disc is inserted in the CD recorder, FINALIZED CD will be displayed. Recording is not possible.
- If a finalized CD rewritable disc is inserted in the CD recorder, UNFINALIZE and PRESS ENTER will be displayed when the REC TYPE is pressed. If ENTER is pressed, the disc will be unfinalized.

Note: If during recording ANALOG REC *appears, the track will be recorded as analog, at normal speed. All other tracks will be copied normally (at double speed).*

English

High speed recording from internal CD player

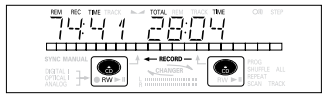


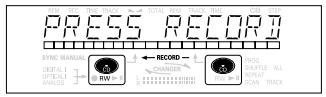
Preparing for high speed recording

Make sure that the recording disc is absolutely free of scratches and dust particles.
During high speed recording the sound is not audible.

Start high speed recording

1 To choose the type of recording, press REC TYPE:
once: to select '*RECORD FAST*' if you wish to make a fast recording of a disc or programmed tracks;
three times: to select '*MAKE CD*' if you wish to make a fast recording of a disc or programmed tracks and to automatically finalize the recording. Also see 'Finalizing CDR & CDRW discs.'
➜ The display first shows the selection:
The ← **RECORD –** label starts blinking. After 3 seconds the display shows the remaining CDR(W) recording time on the left and total time of source on the right. (every 2 seconds PRESS RECORD is displayed.)
Both selection indicators are lit.





• Press PROG to select one or more tracks for recording (see programming):
  - rotate the EASY JOG/ENTER key to the required track number, then press the key (or ENTER on the remote control)

or
  - directly select the track number via the 10-keypad on the remote control

2 To start recording press RECORD.
➜ The display shows the real remaining time for the selected recording. High speed recording starts.
← **RECORD –** lights continuously.

• To check the elapsed recording time, press DISPLAY. This can be done during recording.

• Recording will stop automatically.

Note: Copy prohibited tracks will be copied analog. ANALOG REC *is displayed.*

3 To stop recording manually, press STOP.
➜ WAIT lights up, ← **RECORD –** goes out and recording stops. (Minimal track length must be 4 seconds otherwise silence will be added to the track.)

• If STOP was pressed within 3 seconds after RECORD, no recording will take place.

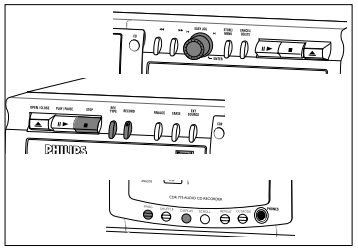
After recording, the display shows UPDATE for several seconds. The Total time indications can differ slightly. However, no music information is lost.

Note: In this Recording mode, the Pause function is not operative.

Important:
If you want to play the recorded CDR disc on any regular CD player, it must first be finalized. See finalizing discs.

Finalized CDRW discs play only on CDRW compatible CD players.

Listen mode recording from internal CD player

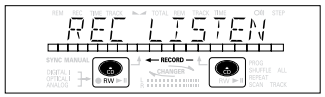


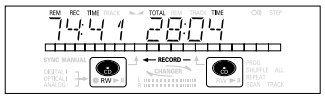
Preparing for Listen mode recording

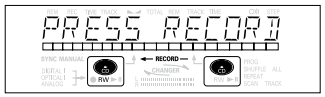
Make sure that the recording disc is absolutely free of scratches and dust particles.
During Listen mode recording you listen to the recording while you are making it.

Start Listen mode recording

1 For recording, press REC TYPE twice:
➜ the display first shows the selection:
the ← **RECORD –** label starts blinking. After 3 seconds the display shows the remaining CDR(W) recording time on the left and total time of source on the right. (every 2 seconds PRESS RECORD is displayed)
Both selection indicators are lit.







- Press PROG to select one or more tracks for recording (see programming):
  - rotate the EASY JOG/ENTER key to the required track number, then press the key

or:

  - directly select the track number via the 10-keypad on the remote control

2 To start recording, press RECORD.
➜ ← **RECORD –** lights continuously and the selected track or program is copied at normal speed. The recording time left will appear.

- To check the elapsed recording time, press DISPLAY. This can be done during recording.

- Recording will stop automatically.

Note: Copy prohibited tracks will be copied analog. ANALOG REC is displayed.

3 To stop recording, press STOP.
➜ WAIT lights up, ← **RECORD –** goes out and recording stops. (Minimal track length must be 4 seconds otherwise silence will be added to the track.)

- If STOP was pressed within 3 seconds after RECORD, no recording will take place.

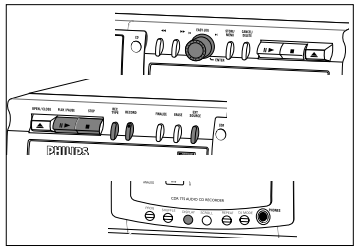
After recording, the display shows UPDATE for several seconds. The Total time indications can differ slightly. However, no music information is lost.

Note: In this recording mode, the Pause function is not operative.

Important:
If you want to play the recorded CDR disc on any regular CD player, it must first be finalized. See finalizing discs.

Finalized CDRW discs play only on CDRW compatible CD players.

Manual recording from external CD player

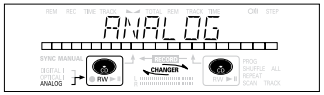


Important:
- Recording from CD-changers should always be started in the Auto-Start mode.
- Only make analog recordings when digital recording is not possible.

Preparing for manual recording

1 Make sure the disc is absolutely free of scratches and dust particles.

2 Press EXT(ernal) SOURCE repeatedly until (depending on the connection used):
➜ DIGITAL I ⌐, OPTICAL I → or ANALOG ⌐→ lights up and DIGITAL 1, OPTICAL or ANALOG appears on the display.



- When Auto Track is On (default setting), track numbers will automatically be increased during recording.

- To switch off the Auto Track function you have to enter Menu mode.
If you wish to increase track numbers manually, press TRACK INCR(ement) on the remote control. For further instructions see Menu mode.

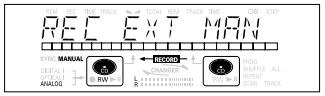
ON (AUTO): The track increments are automatically taken over from the digital source material or after 2.7 seconds silence during analog recording.

OFF (MANUAL): Track numbers can be incremented manually by pressing TRACK INCR(ement) on the remote control. (Minimum track length is 4 sec.) (This can also be done in Auto mode.)

- Track numbers cannot be changed after recording.

Note: Auto track works only with Consumer Sources with a digital output signal according to the IEC 958 (consumer part) audio standard.

3 With the recorder stopped, press REC TYPE four times to enter the Manual Record standby mode.
➜ **MANUAL** starts to flash and the display shows REC EXT MAN.



- If CHECK INPUT message also flashes, the digital connection is incorrect.

4 Play the source first to set the optimal recording level on the CD recorder.

5 Rotate the EASY JOG/ENTER key until, on the Record/Play Level bar, all the blue segments are alight, but the red segments do not light continuously during the loudest passages.
➜ Display shows -xx DB.

6 Stop the source.

Start manual recording

1 To start recording, press RECORD on the CD recorder and immediately start the source (from Stop-mode).
➜ ← **RECORD –** lights continuously. The track number and recording time left appear on the display.

- To record a 3-second silence at the start of a track, press PAUSE on the CD recorder before starting the source.

- To check the elapsed recording time, press DISPLAY on the CD recorder. (This can also be done during the recording.)

2 To stop recording, press STOP on the CD recorder.
➜ WAIT lights up and ← **RECORD –** goes out.

- If STOP was pressed within 3 seconds after RECORD, no recording will take place.

- To interrupt recording, press PAUSE on the CD recorder.
← **RECORD –** starts to flash. Resume at step 1.

After recording the display will show UPDATE for several seconds.

English

Note: With AUTO TRACK ON, the recorder will stop and go to REC STANDBY for 1 minute and then goes to Stop mode automatically. Recordings from DAT, DCC or recordings made analogously will stop after 20 seconds silence. With AUTO TRACK OFF, the auto stop mode is disabled.

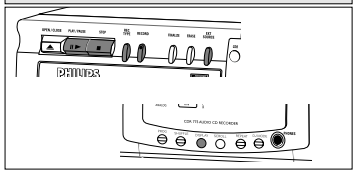
Important:

If you want to play the recorded CDR disc on any regular CD player, it must first be finalized. See finalizing discs.

Finalized CDRW discs play only on CDRW compatible CD players.

***For recording from CD changers always use** REC EXT DISC.*

Autostart recording from external CD player CD-SYNC

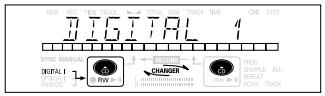


Preparing for autostart recording

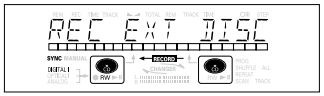
The CD-SYNC feature enables you to make fast and easy recordings of a CD. Track increments are automatically detected from the source material. Track increments cannot be added manually. In analog source material a silence of 2.7 seconds or more is automatically detected as a track increment.

1 Make sure the disc is absolutely free of scratches and dust particles.

2 Press EXT(ernal) SOURCE repeatedly until (depending on the digital connection used):
➜ DIGITAL I ⌐, OPTICAL I ⟶ or ANALOG ⌐ lights up and DIGITAL 1, OPTICAL or ANALOG appears on the display.



3 With the CD recorder stopped, press REC TYPE *five times:* if you wish to record a complete disc or program.
➜ ← **RECORD** – and **SYNC** start to flash and the display shows REC EXT DISC.



- If CHECK INPUT message also flashes, the digital connection is incorrect.

Start autostart recording

1 To start recording, press PLAY on the selected source.
➜ The CD recorder automatically starts to record and ← **RECORD** – lights continuously. The recording time left appears on the display.

- If, however, you start the source during a track, CD-SYNC recording starts at the beginning of the next track or after 2.7 seconds of silence in analog recordings.

- To check the elapsed recording time, press DISPLAY. (This can also be done during recording)

- The recorder stops automatically.

2 To stop recording manually, press STOP on the CD recorder.
➜ WAIT lights up and **SYNC** and ← **RECORD** – go out.

- If STOP ■ was pressed within 3 seconds after pressing PLAY, no recording will take place.

- To interrupt recording, press PAUSE on the CD recorder.
➜ ← **RECORD** – starts to flash. To resume, press RECORD on the CD recorder.

After recording the display will show UPDATE for several seconds.

Note: Recordings from DAT, DCC or analog sources will only stop after 20 seconds silence.

Important:

If you want to play the recorded CDR disc on any regular CD player, it must first be finalized. See finalizing discs.

Finalized CDRW discs play only on CDRW compatible CD players.

***For recording from CD changers always use** REC EXT DISC.*

English

User instructions

Finalizing CDR & CDRW discs

Finalizing is a simple procedure, necessary to:
- be able to play recordings on a CD PLAYER,
- avoid further unwanted recordings on a disc,
- avoid erasure of tracks on a CDRW.

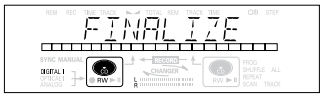
Auto finalizing

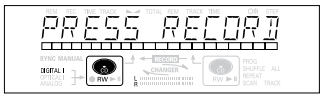
Auto finalizing is possible when using the MAKE CD recording function.

Manual finalizing

1 Make sure the disc (in the CD recorder) is absolutely free of scratches and dust particles.

2 With the recorder stopped press FINALIZE.
➜ The display shows FINALIZE and PRESS RECORD.





3 Press RECORD.
➜ xx xx FINAL and the approximate finalisation time appears on the display.
The display counts down through the finalisation.
On completion, the total number of tracks and the total time recorded appears on the display.
For CDR(W), **CDR(W)** changes to **CD** on display.

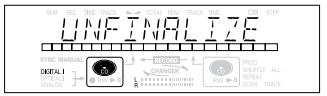
Finalizing will take at least 2 - 4 minutes.

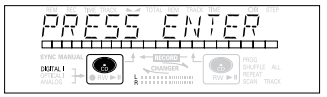
Note: During finalisation, the CD recorder accepts no operating commands.

Unfinalizing CDRW discs

For CDRW discs only.
If you want to make more recordings (or erasures of tracks) on a finalized disc you must unfinalize it first. The Table of Contents (TOC) will be removed.
To unfinalize:

1 With the CD recorder stopped, press REC TYPE or ERASE.
➜ UNFINALIZE and PRESS ENTER will appear on the display.

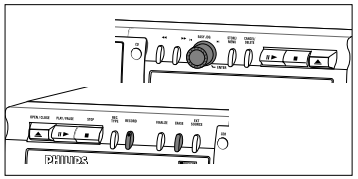




2 Press ENTER.
➜ The disc will now be unfinalized and can be recorded on again.

Note:
- Unfinalizing will take approximately 2 minutes.
- When unfinalizing a CDRW disc with text on it available, this text will be transferred to the CD recorder memory. It may occur that the text memory is full. The message MEMORY FULL/FINALIZE CD will be displayed. You will now have to erase text, stored for other discs, or finalize another disc in order to obtain memory space.

Erasing CDRW discs



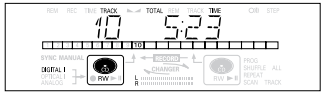
For unfinalized CDRW discs only.
You can erase:
- one or more tracks from the end,
- the entire disc.

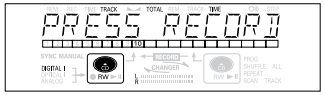
To erase one or more tracks from the end:

1 Press ERASE once.
➜ The display shows the number of tracks and their total playing time. ERASE TRACK and PRESS RECORD lights up.

• If the disc is finalized, CD appears on the display after inserting a CDRW in the recorder. The recorder will ask you to confirm unfinalizing first. Confirm by pressing the EASY JOG/ENTER key or ENTER on the remote control.

2 Select the track(s) you wish to erase by turning the EASY JOG/ENTER key to the left and confirm by pressing this key.
➜ The selected track numbers start blinking on the track bar.
➜ The display shows the remaining number of tracks and the remaining playing time after erasing the selected track(s).



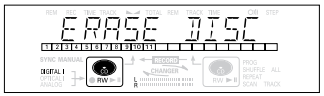


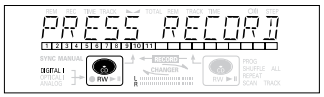
3 Press RECORD.
➜ The display shows the total countdown time and ERASE.
➜ After the selected track(s) have erased, the display shows the remaining tracks and their total playing time.

To erase the entire disc:

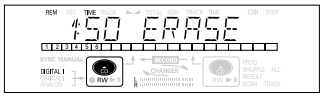
1 Press ERASE twice.
➜ The display shows the number of tracks and their total playing time. ERASE DISC and PRESS RECORD light up.

• If the disc is finalized, CD appears on the display after inserting a CDRW in the recorder. The recorder will ask you to confirm unfinalizing first. Confirm by pressing the EASY JOG/ENTER key or ENTER on the remote control.





2 Press RECORD.
➜ The display shows the total countdown time and ERASE. The complete disc will be erased.

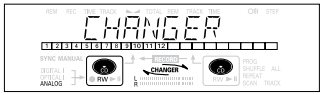


Erasure of a complete disc may take up to 1.5 minutes.

Play a 2-disc changer (Changer mode)

Your CD recorder is able to play the two decks sequentially (CHANGER mode). This is the default setting.

1 Select Changer mode using the DJ MODE key.
➜ CHANGER appears on the display and CHANGER lights up.



2 On the deck you want to play, press PLAY/PAUSE ▶ II to start CD play.
➜ The track number and track time of the track in play appear on the display.
➜ After playing the first disc the second disc will be played.

• Press DISPLAY once, twice or three times to see:
➜ remaining track time, total remaining time, text information (see Menu mode).

• To interrupt play temporarily, press PLAY/PAUSE ▶ II again.
➜ II lights on the display.

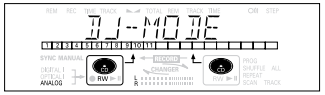
• To continue play, press PLAY/PAUSE ▶ II again.

3 To stop play, press STOP ■.
➜ The number of tracks and the total playing time appear on the display.

Playing CDs on Deck 1 and/or Deck 2 (DJ mode)

With this double deck it is possible to play the CD recorder deck and/or the CD player deck individually (at the same time). In this case the extra CD output must also be connected to an amplifier.

1 Select DJ mode using the DJ MODE key.
➜ DJ MODE appears on the display and ⌟ ⌞ lights up.



2 On the deck you want to play, press PLAY/PAUSE ▶ II to start CD play.
➜ ▶ lights up and the track number and track time of the track in play appear on the display.

• Press DISPLAY once, twice or three times to see:
➜ remaining track time, total remaining time, text information (see Menu mode).

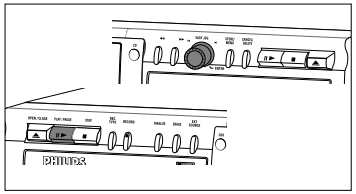
• To interrupt play temporarily, press PLAY/PAUSE ▶ II again.
➜ II lights on the display.

• To continue play, press PLAY/PAUSE ▶ II again.

3 To stop play, press STOP ■.
➜ The number of tracks and the total playing time appear on the display. If you want to see this information about the other deck, press CDR or CD.

PLAYING

Selecting a track



Selecting a track during play

1 Turn the EASY JOG/ENTER key until the required track number appears on the display.
➜ Play skips to the beginning of the selected track.
or
Select CDR or CD on the remote control and key in the required track number using the numerical keys on the remote control. For 2-digit track numbers, press the keys in rapid succession. For tracks on the other disc, first press CD or CDR as applicable.
➜ Play skips to the beginning of the selected track.
or
Press ⏮ or ⏭ on the remote control one or more times.
➜ Play skips to the beginning of the present, previous or subsequent tracks, including tracks on other disc. (Changer mode only.)

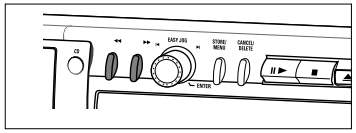
Selecting a track when CD play is stopped

1 Turn the EASY JOG/ENTER key until the required track number appears on the display.

2 Press EASY JOG/ENTER or ENTER on the remote control to confirm or press PLAY/PAUSE ▶ II to start playing.
or
1 Select CDR or CD on the remote control and key in the required track number using the numerical keys. For 2-digit track numbers, press the keys in rapid succession. Play starts.
or
1 Briefly press ⏮ or ⏭ one or more times.

2 Start playback by pressing PLAY/PAUSE ▶ II, EASY JOG/ENTER or ENTER on the remote control.

Search



1 Hold down ◀◀ or ▶▶.
➜ The player first searches backwards or forwards at 10 times normal speed with sound at low volume, then goes to 50 times normal speed with sound muted.

2 Release the button at the desired passage.
➜ Play starts at the desired passage.

Note: During Shuffle, Repeat Track or Programmed play, search is restricted to within the track being played at the time.

Shuffle (random order) play

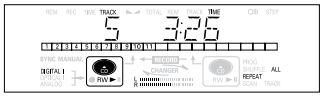
1 Press SHUFFLE before or during CD play to start shuffle play.
➜ The tracks on the CD (or program if set) play in random order.

2 Press SHUFFLE again to return to normal CD play.

Note: Shuffle is also cleared if you open the disc tray.

Repeat CD, track or program

1 Press REPEAT one or more times during CD play.
➜ When **REPEAT TRACK** lights up, the current track plays repeatedly. When **REPEAT ALL** lights up, the disc or program plays repeatedly.



2 To return to normal play, press REPEAT one or more times until:
➜ the **REPEAT** label disappears from the display.

Note:
*- You can use shuffle in combination with **REPEAT ALL** or programmed play of the 2-disc changer.*
*- **REPEAT** is also cleared if you open the disc tray.*

Remarks about programming

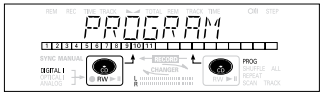
- You can program up to 99 tracks to play in any desired sequence.
- Tracks can be programmed more than once, but each time counts as a track.(**STEP**)
- A program for playback can be made from both the disc in the recorder and the disc in the player. A program for recording can only be made from the disc in the player (CD deck).

Programming for playback

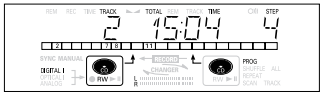
1 Select Changer mode or DJ mode using the DJ MODE key.
➜ CHANGER or DJ MODE appears on the display.

2 Press CDR or CD to select the required deck.
➜ Selected key lights up.

3 Press PROG(ram) to enter Program mode.
➜ **PROG** flashes and PROGRAM appears on the display.



4 Select the required track numbers by turning the EASY JOG/ENTER key left or right and store by pressing ENTER.



or:
Key in a track number with the number keys. For 2-digit numbers, press the keys in rapid succession.
➜ The track will be stored in the program.

➜ The track number, total program time and the number of programmed tracks (**STEPS**) are displayed.

5 Repeat step **3** to **4** for all tracks to be programmed.

6 Press STOP or PROG(ram) to end programming.
➜ **PROG** lights continuously.

7 Press PLAY/PAUSE ▶ II to start programmed play.

Programming for recording

1 Press RECORD TYPE to select the required recording mode (see 'Recording').

2 Compile your programme as described in "programming for playback".

- Only tracks from the disc in the CD player can be stored.

3 Press RECORD to start recording.

Note:
- To review the program, press PROG(ram), followed by ◀◀ or ▶▶ with the CD player or CD recorder in stop mode.
*- To add more tracks to the program, repeat steps **1** to **7**.*
- If you try to store more than 99 tracks, PROG FULL appears on the display.

Clearing a program

1 Press STOP ■ if necessary to stop programmed play.

2 Press STOP ■ again to clear the program.
➜ **PROG** disappears from the display.

- The program is also cleared if you open the disc tray.

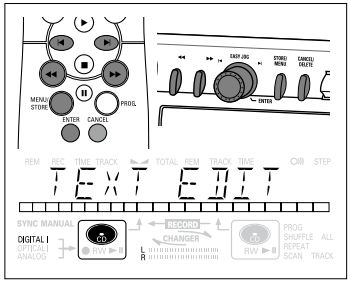
Erasing a track from a program

1 In Stop mode press PROG(ram) to enter Program mode.

2 Use ◀◀ or ▶▶ to select the track from which to delete.
➜ The track number and program step will be shown on the display.

3 Press DELETE/CANCEL to erase the track from the program.
➜ The remaining program steps and the remaining playing time of the program will be displayed.

Remarks about Menu mode



- In Menu mode you will have access to a number of features which are not available via the regular keys (on the deck's front and the remote control).
- The TEXT submenus allow you to give names to discs and tracks. The disc and track names will be displayed during playback.
- In the RECORDING submenus you can set Auto Track and Balance.
- All settings (except Balance) made in Menu mode will be stored in the deck's memory and can be called up and changed at any time.

General Operation

1 In Stop mode, select CDR.

2 Press STORE/MENU on the deck or the remote control to enter Menu mode.
➜ TEXT EDIT appears on the display.

3 Rotate EASY JOG/ENTER to select the required submenus.

4 Press EASY JOG/ENTER or ENTER on the remote control to confirm selections.

5 Rotate EASY JOG/ENTER to select options in the submenus.

6 Press EASY JOG/ENTER or ENTER on the remote control to confirm selections.

7 Press STORE/MENU to store settings and return to the submenu.

8 Press STOP ■ to store settings and exit Menu mode.

Note: Text can only be edited for unfinalized discs. (finalized CDRW discs must be unfinalized first)

Text settings

Storing names

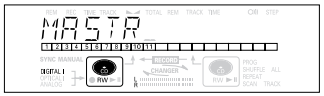
1 Select the TEXT EDIT submenu.
➜ TEXT EDIT appears on the display.

2 Press EASY JOG/ENTER or ENTER on the remote control to confirm.

3 Rotate EASY JOG/ENTER to select the required option in the submenu: CD Artist, CD Title,Track 1 Artist, Track 1 Title, etc.

4 Press EASY JOG/ENTER or ENTER on the remote control to confirm.

5 Select the characters by rotating the EASY JOG/ENTER key or by pressing the corresponding numeric/alphabet key on the remote control.



6 Press EASY JOG/ENTER or ENTER on the remote control to store the characters and move to the next cursor position.

7 Press STORE/MENU to store a name you have entered and return to the submenu or STOP ■ to exit.

Note:
- A maximum of 60 characters can be stored per item.
- By pressing the EASY JOG/ENTER key or ENTER on the remote control without selecting a character first, you can insert a space between characters.
- With the ◂◂ ▸▸ keys you can move to a required cursor position.
- With the DELETE/CANCEL key you can delete a character.
- When an artist's name has been stored for a certain track, the name will automatically be copied for the next track. The name can be confirmed by pressing STORE/MENU or a new name can be entered as described above.

Erasing names

1 Select the TEXT ERASE submenu.
➜ TEXT ERASE appears on the display.

2 Press EASY JOG/ENTER or ENTER on the remote control to confirm.

3 Rotate EASY JOG/ENTER to select the required option in the submenu: All Text, CD Title, CD Artist, Track 1 Title, Track 1 Artist, etc.

4 Press EASY JOG/ENTER or ENTER on the remote control to confirm.
➜ The display will ask you to reconfirm your selection.

5 Press EASY JOG/ENTER or ENTER on the remote control to reconfirm.

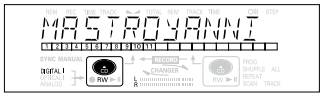
6 Press STORE/MENU to return to the submenu or STOP ■ to exit.

Text Memory Review/Erase Text Memory

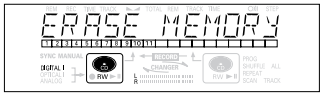
1 Select the MEMORY VIEW submenu.
➜ MEMORY VIEW appears on the display.

2 Press EASY JOG/ENTER or ENTER on the remote control to confirm.

3 Select the disc you wish to erase.



4 Press EASY JOG/ENTER or ENTER on the remote control to confirm.
➜ ERASE MEMORY appears on the display.



5 Press EASY JOG/ENTER or ENTER on the remote control to reconfirm.

6 Press the EASY JOG/ENTER key or ENTER on the remote control to confirm the erasure of the text for that particular disc.

7 Press STORE/MENU to return to the submenu or STOP ■ to exit.

Note:
- If there are no discs in the memory, the message MEMORY EMPTY appears on the display.
- When the text memory of your CDRecorder is full, the message MEMORY FULL will appear, followed by FINALIZE CD. If you want to add a CD to the list of discs for which text is stored, you have to erase a disc from this list or finalize another disc. ("for which text is stored")
- MEMORY FULL/FINALIZE CD may also appear when unfinalizing a CDRW disc for which text was stored (see 'Unfinalizing CDRW discs'). The same action(s) should be taken in order to obtain memory space.

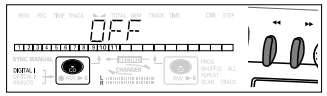
Recording settings

Auto track increment

1 Select the AUTO TRACKING sub menu.
➜ AUTO TRACK appears on the display.

2 Press EASY JOG/ENTER or ENTER on the remote control to confirm.

3 Select Auto track ON or OFF.



4 Press EASY JOG/ENTER or ENTER on the remote control to confirm.
➜ ON or OFF appears for 2 seconds on the display.

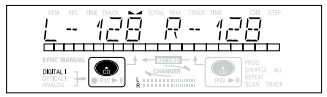
- When ON is selected, track numbers will be automatically incremented during recording.
- When OFF is selected, you can number the recorded tracks yourself.

5 Press STORE/MENU to store settings and return to the submenu or STOP ■ to exit.

Balance (Only active in Record/Standby mode)

1 Select the SET BALANCE submenu.
➜ SET BALANCE appears on the display.

2 Press EASY JOG/ENTER or ENTER on the remote control to confirm.
➜ ◣◢ and L- 12B R- 12B appear on the display.



3 Adjust the internal and external recording balance by turning the EASY JOG/ENTER key.

- Turn left: the figure left (◣) counts up, right counts down.
- Turn right: the figure right (◢) counts up, left counts down.

4 Press EASY JOG/ENTER or ENTER on the remote control to confirm.

5 Press STORE/MENU to store settings.

Note: The balance setting will not be stored.

FIXING PROBLEMS

TROUBLESHOOTING

If your CD recorder is defective, it is wise to check this list first. You may have forgotten a simple step.

Warning!

Under no circumstances should you attempt to repair the CD recorder yourself as this will invalidate the guarantee.

SYMPTOM • possible solution:

No power
- ensure that the ON/OFF button is on: the CDRecorder is in standby mode, press any key to activate it
- ensure that the mains cable is plugged in correctly
- switch the recorder OFF and then immediately back ON

Auto track does not work
- check if auto track is selected
- check if there are 2.7 seconds silence in between the tracks (analog recording only)
- check if the source is a consumer source with the digital output according to the IEC audio standard
- source is DVD player (no track information)

No sound
- check the audio connections
- if using an amplifier, try using a different source

Amplifier sound is distorted
- check that the CD recorder analog output is not connected to the amplifier Phono input

Play will not start
- ensure that the label of the CD is facing up
- clean the disc
- check that the disc is not defective by trying another disc

Remote control does not work
- point the remote control directly at the CD recorder
- check the batteries and replace if necessary
- select the right source first

Will not record
- clean the disc
- check if CDR(W) is an unfinalized disc
- check that the disc is recordable and replace if necessary
- the disc is not an AUDIO disc (WRONG DISC)
- wrong input source chosen. Input label flashing (CHECK INPUT)
- text memory full (MEMORY FULL / FINALIZE CD). When a CDRW has to be unfinalized for recording. Erase text for other disc(s) or finalize other disc(s) to obtain memory space.

Recording is distorted
- make sure the recording level is correct

20 second pause between recordings
- see Autostart recording from external CD player (CD-SYNC).

Player does not react
- switch the ON/OFF button on the front of the player off and back on

DISC RECOVER **on display**
- a power failure has occurred during recording, the CD recorder is attempting to repair the disc
- if DISC ERROR then appears on the display, the disc cannot be recorded further, and cannot be finalized. But it can still be played on the CD recorder or another CD recorder.
- on a CDRW disc, the track being recorded is lost, but further recording and finalisation can still be done

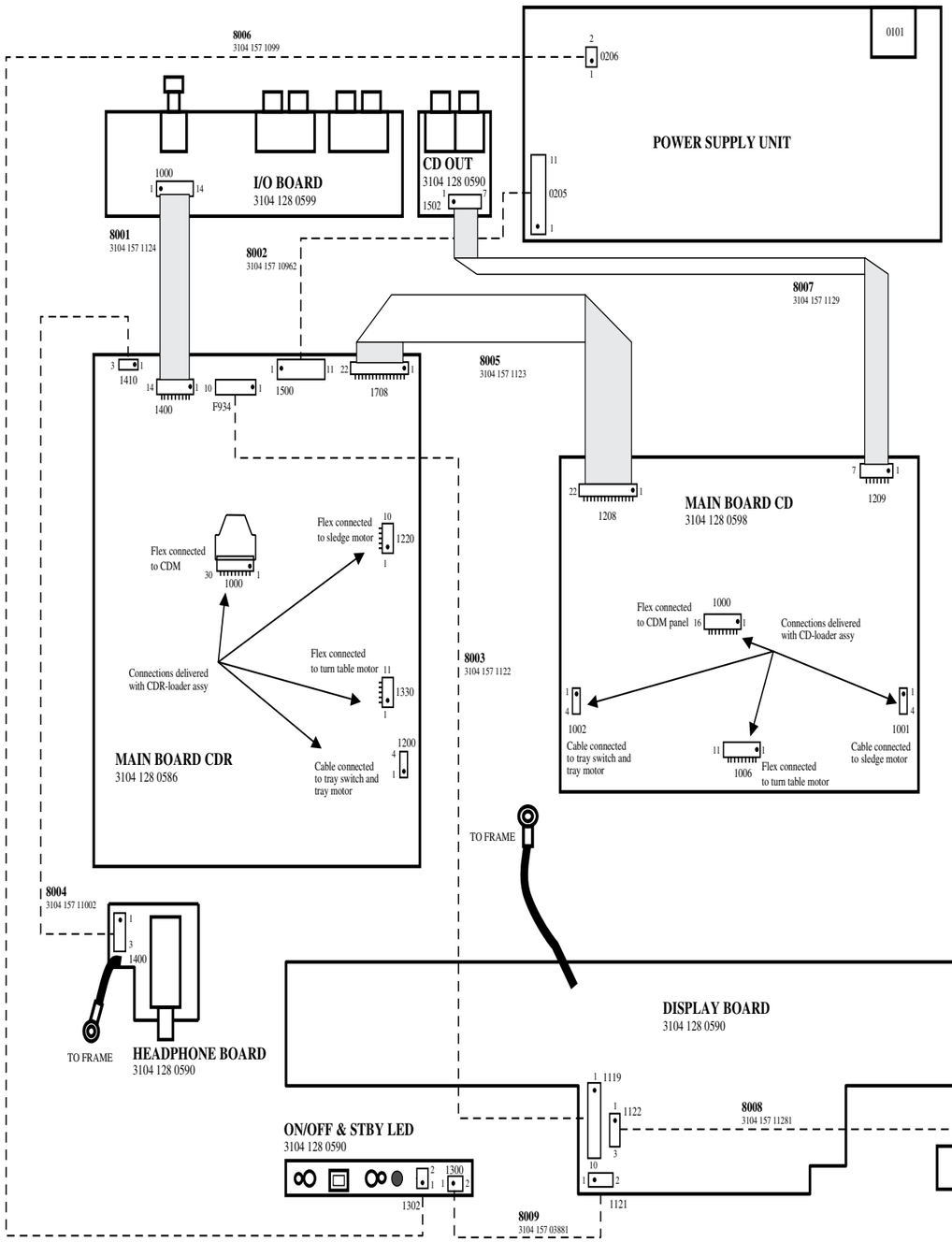
Personal notes:

Personal notes:

4. Mechanical instructions

Wiring diagram

WIRING DIAGRAM CDR775



Pin 1 indicated by • All Wires are 1/1, except flex 8001, 8005 and 8007

8001 (at conn. 1400 of CDR main board)

1	GROUND
2	DIG_OUT_C
3	GROUND
4	EXT_DIG_IN
5	EXT_OPT_IN
6	GROUND
7	D5V
8	KILL
9	LEFT_IN
10	GROUND
11	RIGHT_IN
12	RIGHT_OUT
13	GROUND
14	LEFT_OUT

8002

1	VDC2
2	VFTD
3	VDC1
4	GROUND
5	+5V
6	+5V
7	GROUND
8	GROUND
9	GROUND
10	+12V
11	-8V

8003 (at conn. F934 of CDR main board)

1	VDC2
2	VFTD
3	VDC1
4	SYS_RESET
5	IIC_DATA
6	GROUND
7	IIC_CLK
8	DISPL_INT
9	GROUND
10	D5V

8004

1	LEFT_HP_OUT
2	GROUND
3	RIGHT_HP_OUT

8006

1	ON!
2	OFF!

8009

1	LED_ON
2	GROUND

8008

1	+5V
2	IR_IN
3	GROUND

8007 (at conn. 1209 of CD main board)

1	RIGHT_CD
2	GND
3	LEFT_CD
4	GND
5	DOBM_CD
6	GROUND
7	KILL

8005 (at conn. 1708 of CDR main board)

1	GROUND
2	DSA_DATA_CD
3	GROUND
4	DSA_STR_CD
5	DSA_ACK_CD
6	GROUND
7	D5V
8	12V_CD
9	GROUND
10	IIS_DATA_CD
11	IIS_WS_CD
12	GROUND
13	IIS_BCLK_CD
14	GROUND
15	DOBM_CD
16	SYS-RESET
17	LEFT_IN_CD
18	GROUND
19	RIGHT_IN_CD
20	KILL
21	SYS_CLK_8W
22	GROUND

Texture indicates text on flex.

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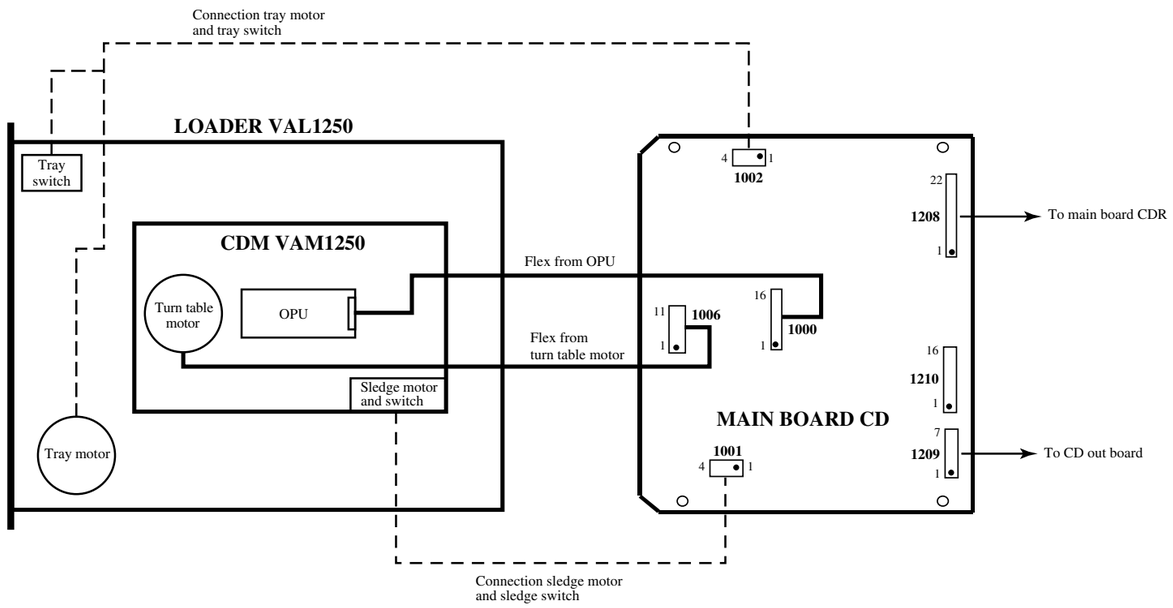
Wiring CD

WIRING DIAGRAM CD LOADER VAL1250



CONNECTOR 1006

1 HALL +
2 W-
3 W+
4 V+
5 HALL-
6 U+
7 V-
8 U-
9 UCOIL
10 VCOIL
11 WCOIL

CONNECTOR 1000

1 VSUB
2 HFGND
3 VDD
4 RF
5 LDON
6 R2
7 R1
8 D4/D3
9 D2
10 D1
11 FTC
12 RW
13 FOC+
14 FOC-
15 RAD+
16 RAD-

CONNECTOR 1002

1 HOMESW
2 SGND
3 TRAY+
4 TRAY-

CONNECTOR 1001

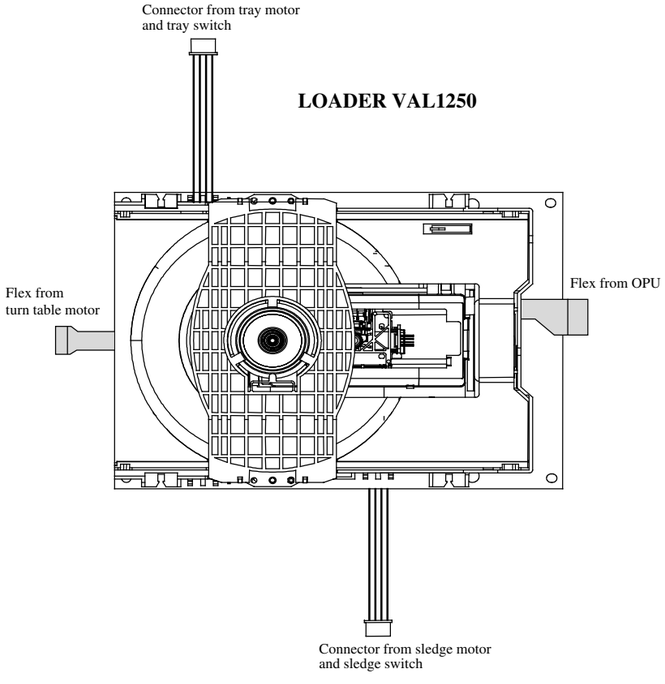
1 HOMESW
2 SGND
3 SL-
4 SL+

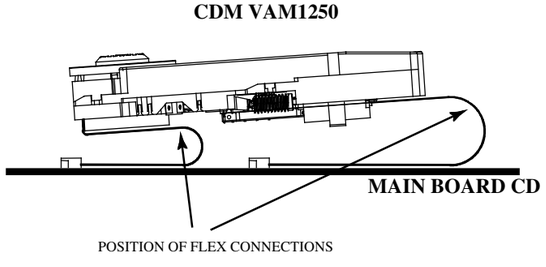
CONNECTOR 1209

1 AUDIO R (RIGHT_CD)
2 GND
3 AUDIO L (LEFT_CD)
4 GND
5 DOBM5_CD (DOBM_CD)
6 GND
7 KILL

CONNECTOR 1208

1 GND
2 CRIN (SYS_CLK_8W)
3 KILL
4 AUDIO R (RIGHT_IN_CD)
5 GND
6 AUDIO L (LEFT_IN_CD)
7 DSA_RST (SYS_RESET)
8 DOBM (DOBM_CD)
9 GND
10 SCLK (I^2S_BCLK_CD)
11 GND
12 WCLK (I^2S_WS_CD)
13 DATA (I^2S_DATA_CD)
14 GND
15 +12V
16 +5V
17 GND
18 DSA_ACK (DSA_ACK_CD)
19 DSA_STROBE (DSA_STR_CD)
20 GND
21 DSA_DATA (DSA_DATA_CD)
22 GND





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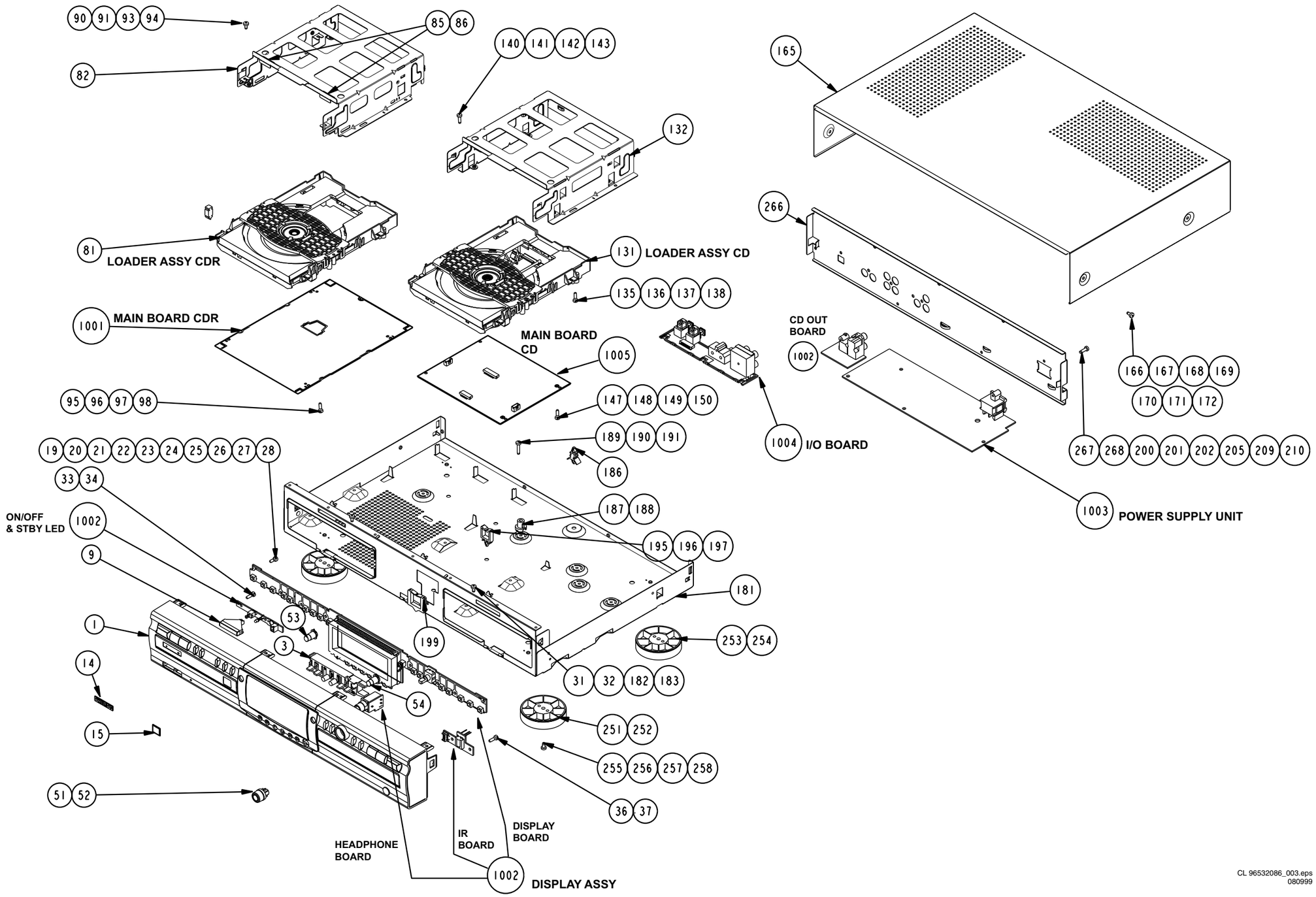
Exploded view CDR775

EXPLODED VIEW CDR775



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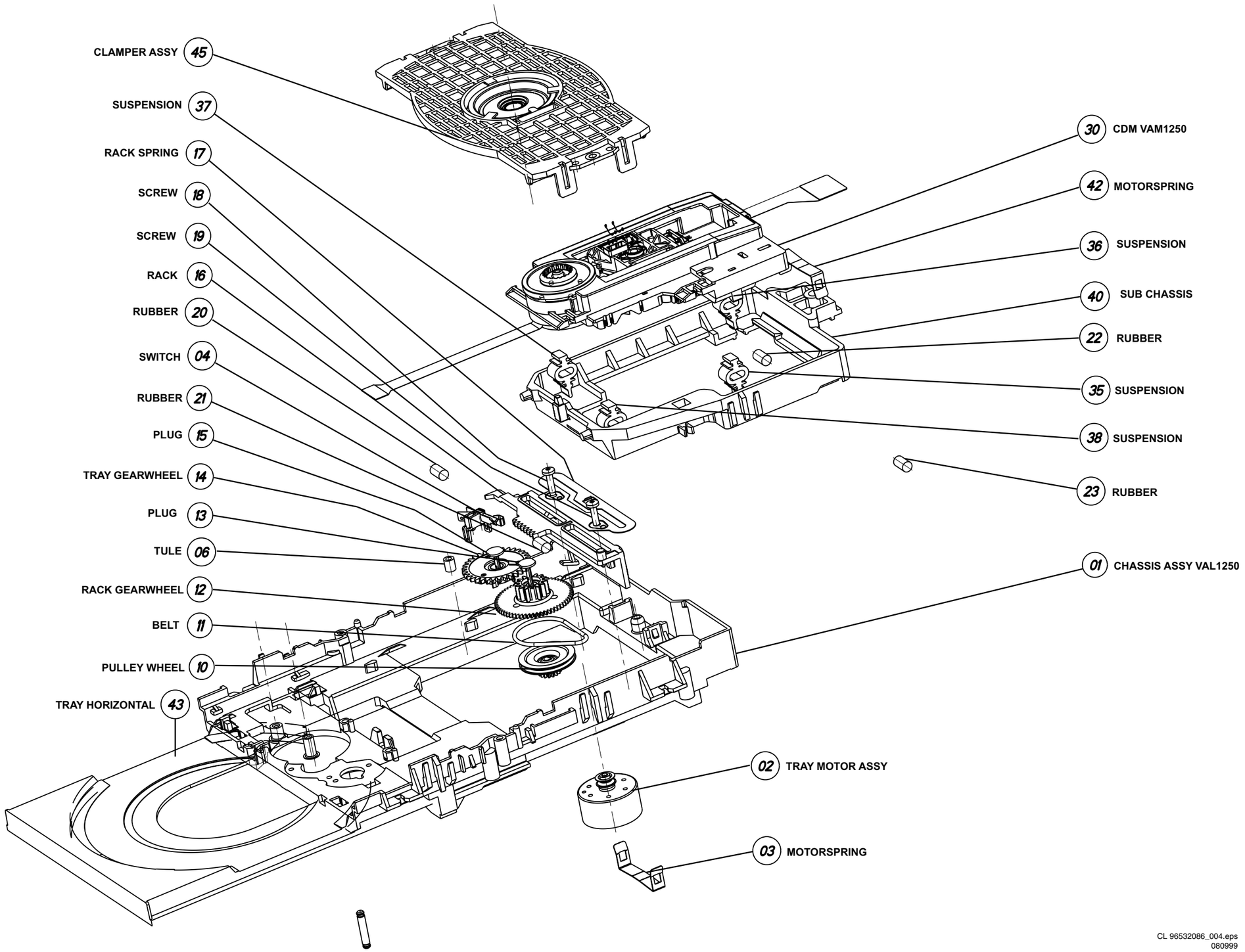
Exploded view CD

EXPLODED VIEW CD LOADER VAL1250



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Dismantling 775

DISMANTLING INSTRUCTIONS CDR775

See exploded views for item numbers

assembling ↑ ↓ disassembling

Cover 165
- ⇒ Remove 7 screws 166 → 172, 2 at each side and 3 at rear side.
- ⇒ Lift cover at rear side to remove.

CDR module includes :

Loader 81
CDR main board 1001
Loader bracket 82

- ⇒ Put the CDR player's rear side facing you.
- ⇒ Undo the 3 wire connections on the CDR main board 1001.
- ⇒ Undo the 2 flex connections on CDR main board.
- ⇒ Remove 4 screws 90,91,93,94 (loader bracket 82 → frame 181).
- ⇒ Lift CDR module at rear side to remove.

Attention : flexes are not part of the CDR module and have to stay with CDR player in case of CDR module exchange !

CD module includes :

Loader 131
CD main board 1005
Loader bracket 132

- ⇒ Put the CDR player's rear side facing you.
- ⇒ Remove 4 screws 140 → 143 (loader bracket 132 → frame 181).
- ⇒ Lift CD module at rear side to remove.
- ⇒ Undo the 2 flex connections on CD main board.

Attention : flexes are not part of the CD module and have to stay with CDR player in case of CD module exchange !

CD main board 1005
- ⇒ Remove 4 screws 147 → 150 (CD main board → loader bracket 132).
- ⇒ Undo 2 flex and 2 wire connections on CD main board.
- ⇒ Remove board.

CD loader assy 131
- ⇒ Remove 4 screws 135 → 138 (CD loader → loader bracket 132).
- ⇒ Remove loader.

CDM VAM1250
- ⇒ Remove clamper assy 45 by releasing 4 snaps (2 on left 2 on right side) on chassis assy 1.
- ⇒ Open tray 43 by unlocking rack 16.
- ⇒ Undo wires of CDM VAM1250 from wire retainers on sub chassis 40.
- ⇒ Unlock suspensions 35 → 38 from sub chassis 40.
- ⇒ Remove CDM VAM1250.

CD out board 1002
- ⇒ Put CDR player's rear side facing you.
- ⇒ Undo flex connection to CD main board 1005.
- ⇒ Remove 2 screws 209, 210 connecting the 2 I/O sockets to back plate 266.
- ⇒ Remove board.

Attention : flex is not part of the CD out board and has to stay with CDR player in case of CD out board exchange !

I/O board 1004
- ⇒ Put CDR player's rear side facing you.
- ⇒ Undo flex connection to CDR main board 1001.
- ⇒ Remove 3 screws 200 → 202, connecting the 3 I/O sockets to back plate 266.
- ⇒ Remove board.

Attention : flex is not part of the I/O board and has to stay with CDR player in case of I/O board exchange !

Power supply unit 1003
- ⇒ Put the CDR player's rear side facing you.
- ⇒ Undo the 2 wire connections on PSU.
- ⇒ Remove screw 205 (mains connector → back plate 266).
- ⇒ Remove 3 screws 189 → 191 (PSU board → frame 181).
- ⇒ Unlock snap on spacer 186.
- ⇒ Remove PSU.

WARNING: POSSIBILITY OF HIGH VOLTAGE (300V) ON HEAT SINK, EVEN AFTER REMOUNTING OF PCB. DISCHARGE ELCAP 2121.

Front assy 1
- ⇒ Put the CDR player's front side facing you.
- ⇒ Remove 2 screws 31, 32 (ground wires → frame 181).
- ⇒ Remove 2 screws 182, 183 (front assy 1→ frame 181).
- ⇒ Unlock front assy from frame by releasing 7 snaps : start with 2 on the top and two on the sides and end with 3 at the bottom.
- ⇒ After disassembly put in front of the set (service position).

IR board 1002
- ⇒ Remove 2 screws 36 and 37 (IR board → front assy 1).
- ⇒ Undo wire connection on board.
- ⇒ Remove board.

Display board 1002
- ⇒ Remove easy jog knob 51 pulling it forward.
- ⇒ Remove 11 screws 19 → 29 (display board → front assy 1).
- ⇒ Release 2 snaps (1 on left and 1 on right side)
- ⇒ Undo the 3 wire connections on display board.
- ⇒ Remove display board.

Attention : when reassembling make sure the wiring from display board to IR board is positioned between FTD display and middle key assy 3 !

Headphone board 1002
- ⇒ Pull board out of front assy 1.
- ⇒ Slide board out of middle key assy 3.
- ⇒ Undo wire connection on board.
- ⇒ Remove board.

On/Off & Stby LED board 1002
- ⇒ Remove 2 screws 33 and 34 (on/off switch → front assy 1).
- ⇒ Undo the 2 wire connections on board.
- ⇒ Remove power button 9 from on/off switch.
- ⇒ Remove board.

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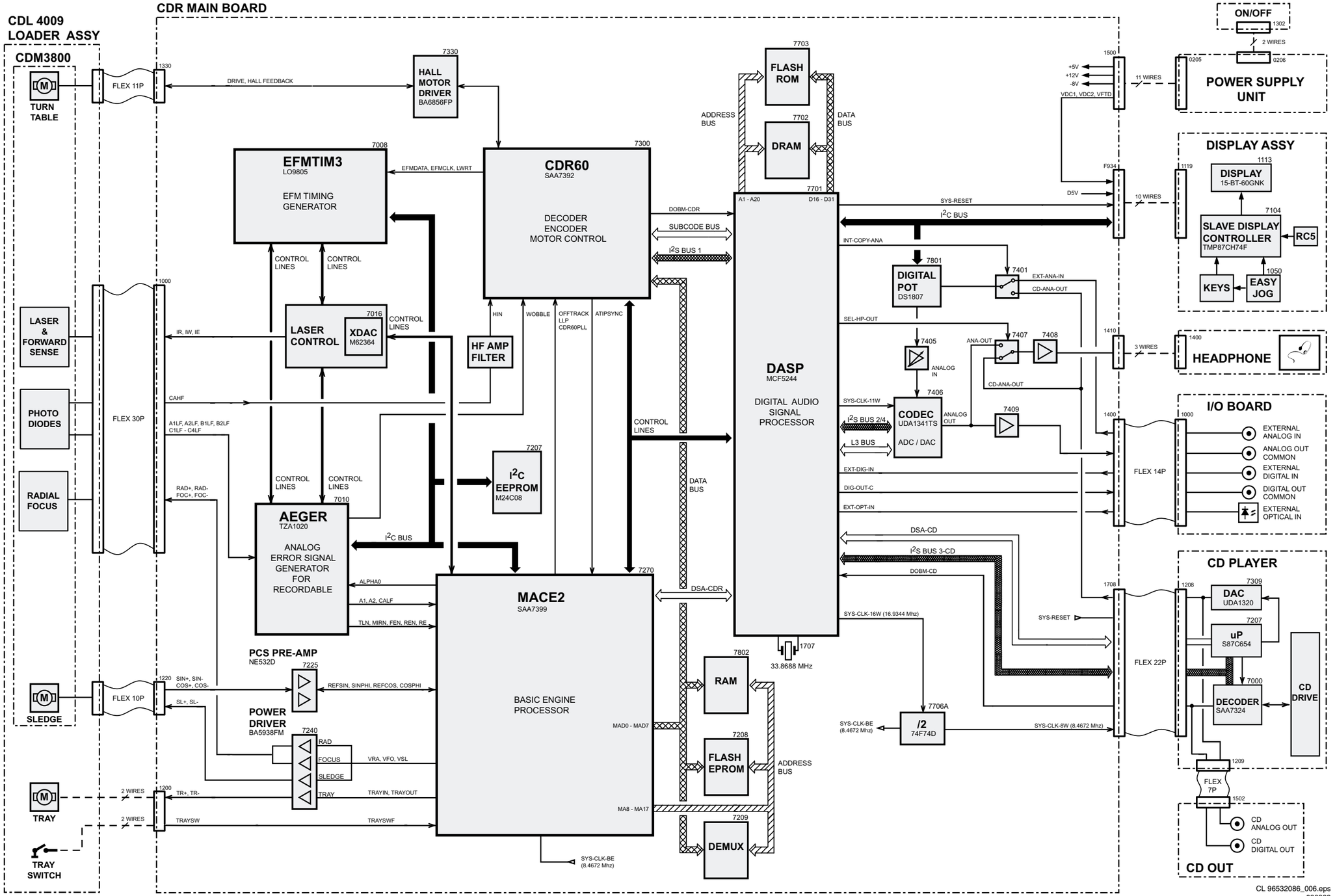
5. Electrical and circuit diagrams

Blockdiagram 775

OVERALL BLOCK DIAGRAM CDR775



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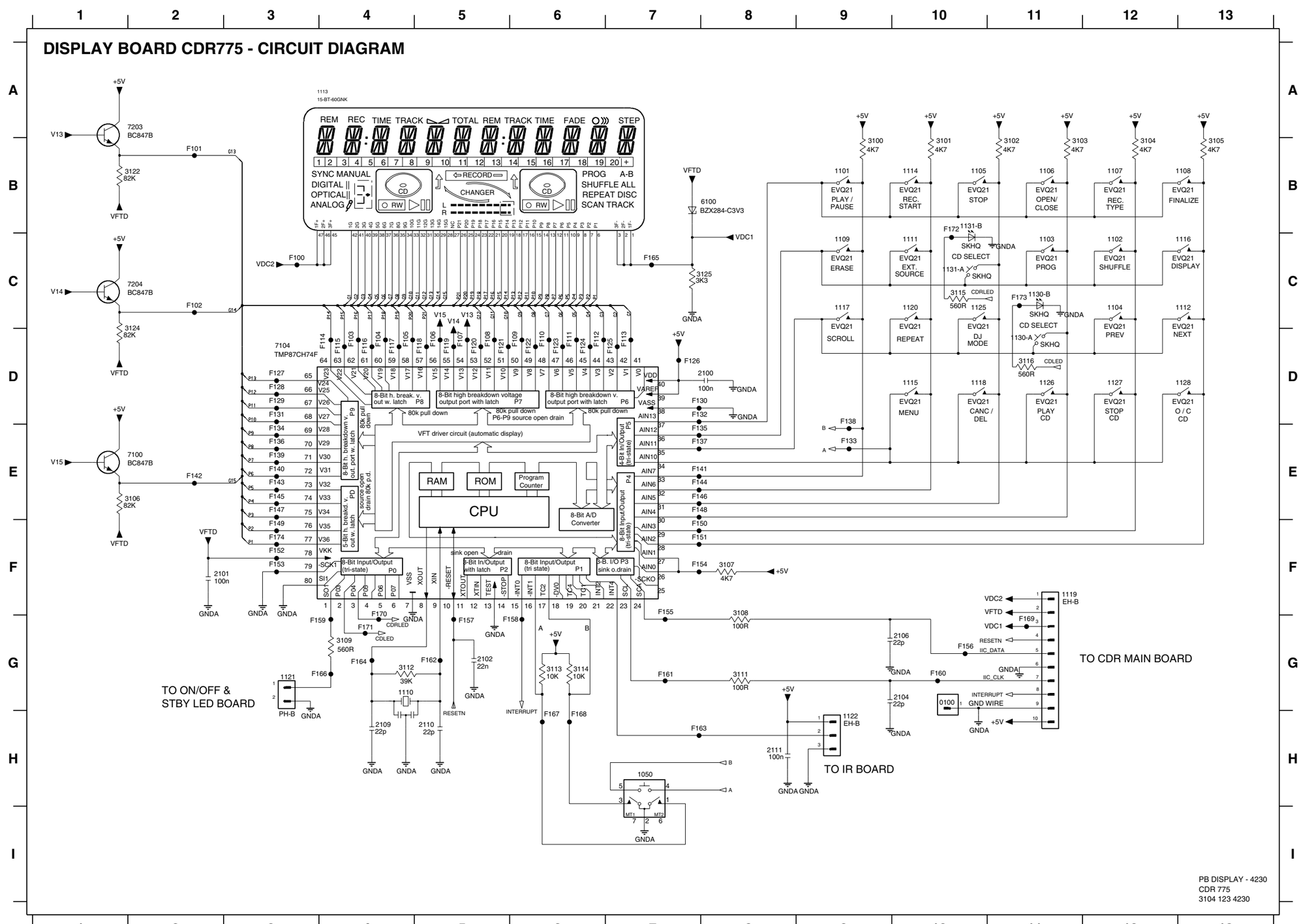
Display 775

DISPLAY BOARD CDR775 - CIRCUIT DIAGRAM



PB DISPLAY - 4230
CDR 775
3104 123 4230

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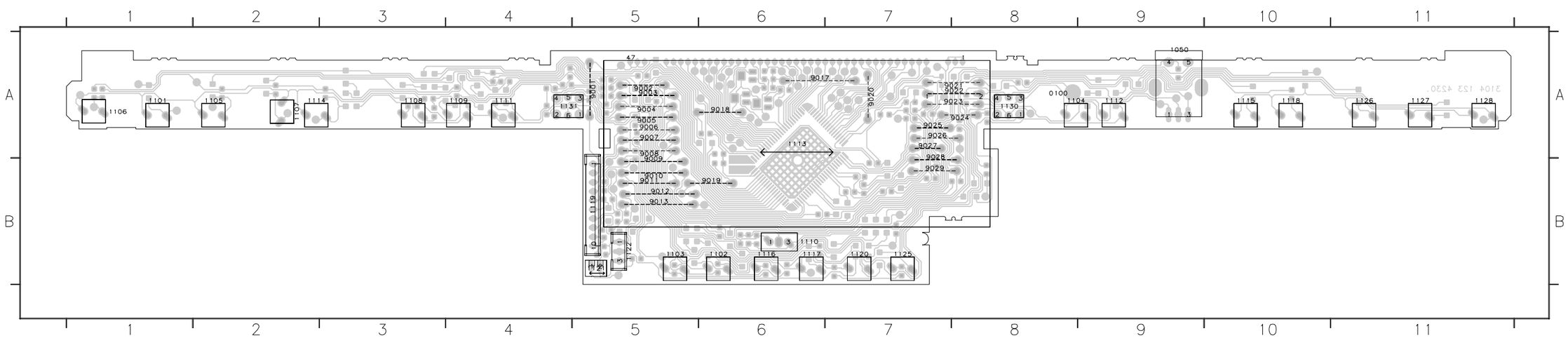
0100 G10
1050 H7
1101 B9
1102 C12
1103 C11
1104 C12
1105 B10
1106 B11
1107 B12
1108 B13
1109 C9
1110 G4
1111 C10
1112 C13
1113 A3
1114 B10
1115 D10
1116 C13
1117 C9
1118 D10
1119 F11
1120 C10
1121 G3
1122 H9
1125 C10
1126 D11
1127 D12
1128 D13
1130-A D11
1130-B C11
1131-A C10
1131-B B10
2100 D8
2101 F2
2102 G5
2104 G10
2106 G10
2109 H4
2110 H5
2111 H8
3100 B9
3101 B10
3102 B11
3103 B11
3104 B12
3105 B13
3106 E2
3107 F8
3108 F8
3109 G4
3111 G8
3112 G4
3113 G6
3114 G6
3115 C10
3116 D11
3122 B2
3124 C2
3125 C8
6100 B8
7100 E1
7104 D3
7203 A1
7204 C1
F100 C3
F101 B2
F102 C2
F103 D4
F104 D4
F105 D4
F106 D5
F107 D5
F108 D5
F109 D6
F110 D6
F111 D6
F112 D6
F113 D7
F114 D4
F115 D4
F116 D4
F117 D4
F118 D5
F119 D5
F120 D5
F121 D5
F122 D6
F123 D6
F124 D6
F125 D7
F126 D7
F127 D3
F128 D3
F129 D3
F130 D7
F131 D3
F132 D7
F133 E9
F134 E3
F135 E7
F136 E3
F137 E7
F138 D9
F139 E3
F140 E3
F141 E7
F142 E2
F143 E3
F144 E7
F145 E3
F146 E7
F147 E3
F148 E7
F149 F3
F150 F7
F151 F7
F152 F3
F153 F3
F154 F7
F155 F7
F156 G10
F157 G5
F158 G6
F159 G3
F160 G10
F161 G7
F162 G5
F163 H7
F164 G4
F165 C7
F166 G4
F167 H6
F168 H6
F169 G11
F170 G4
F171 G4
F172 B10
F173 C11
F174 F3

Display 775

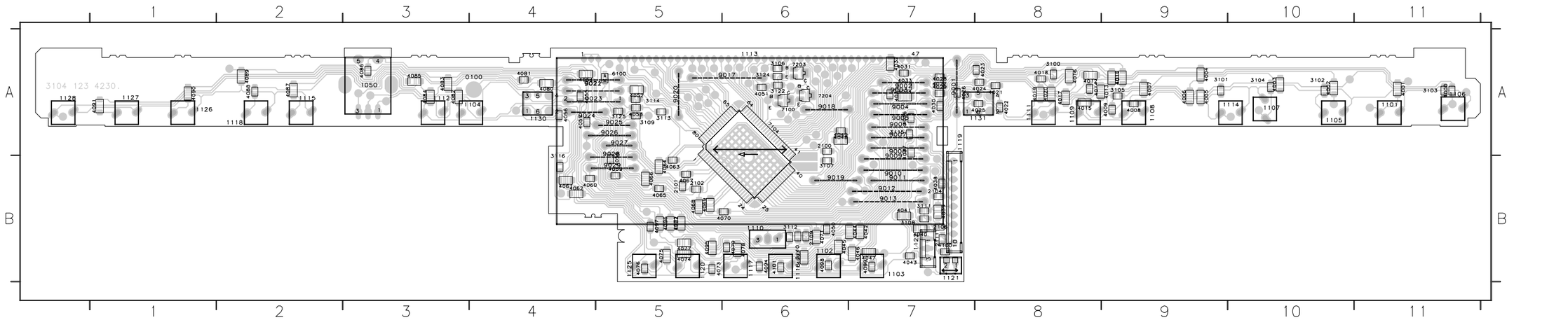
DISPLAY BOARD CDR775 - FRONT VIEW

0100 A8 1101 A1 1104 A8 1107 A2 1110 B6 1113 A6 1116 B6 1119 A5 1122 B5 1127 A1 1131 A4 1301 B10 1401 B3 1502 B2 6200 B9 9002 A5 9005 A5 9008 A5 9011 B5 9017 A6 9020 A7 9023 A8 9026 A7 9029 B7
0400 B3 1102 B6 1105 A2 1108 A3 1111 A4 1114 A2 1117 B6 1120 B7 1125 B7 1128 A1 1200 B10 1302 B10 1500 B2 2500 A2 6300 B10 9003 A5 9006 A5 9009 A5 9012 B5 9018 A6 9021 A8 9024 A8 9027 A7 9030 B2
1050 A9 1103 B5 1106 A1 1109 A4 1112 A9 1115 A10 1118 A10 1121 B5 1126 A1 1130 A8 1300 B11 1400 B3 1501 B1 5500 B2 9001 A5 9004 A5 9007 A5 9010 B5 9013 B5 9019 B6 9022 A8 9025 A7 9028 A7



DISPLAY BOARD CDR775 - BACK VIEW

2100 A6 2109 B6 2501 B10 3101 A9 3106 A6 3112 B6 3122 A6 3502 B11 4001 A1 4006 A9 4011 A9 4016 A8 4021 A8 4026 A7 4031 A7 4036 A7 4041 B7 4046 B7 4051 A6 4056 A4 4061 B4 4066 B5 4071 B6 4076 B5 4081 A4 4086 A3 4091 A1 4096 B5 4101 B6 7203 A6
2101 B5 2110 B6 2502 B10 3102 A10 3107 B6 3113 A5 3124 A6 3503 B10 4002 A10 4007 A9 4012 A8 4017 A8 4022 A8 4027 A7 4032 A7 4037 A7 4042 B7 4047 B7 4052 A5 4057 A4 4062 B4 4067 B5 4072 B5 4077 B5 4082 A3 4087 A2 4092 B9 4097 B5 4102 B5 7204 A6
2102 B5 2111 B7 2503 B11 3103 A11 3108 B7 3114 A5 3125 A5 3504 B10 4003 A10 4008 A9 4013 A9 4018 A8 4023 A8 4028 A7 4033 A7 4038 B7 4043 B7 4048 A6 4053 A5 4058 B5 4063 B5 4068 B5 4073 B5 4078 B6 4083 A3 4088 A2 4093 B6 4098 B6 6100 A5 7500 B11
2104 B7 2400 B9 2504 B11 3104 A10 3109 A5 3115 A7 3500 B10 3999 B8 4004 A9 4009 A9 4014 A8 4019 A8 4024 A8 4029 A7 4034 A7 4039 B7 4044 B7 4049 A6 4054 A4 4059 B5 4064 B5 4069 B5 4074 B5 4079 B6 4084 A3 4089 A2 4094 B6 4099 B7 7100 A6 7501 B10
2106 B7 2401 A9 3100 A8 3105 A9 3111 B7 3116 B4 3501 B11 4000 A9 4010 A9 4015 A8 4020 A8 4025 A8 4030 A7 4035 A7 4040 B7 4045 B6 4050 B6 4055 A4 4060 B4 4065 B5 4070 B6 4075 B5 4080 A4 4085 A3 4090 A1 4095 B5 4100 B7 7104 A6 7999 A8



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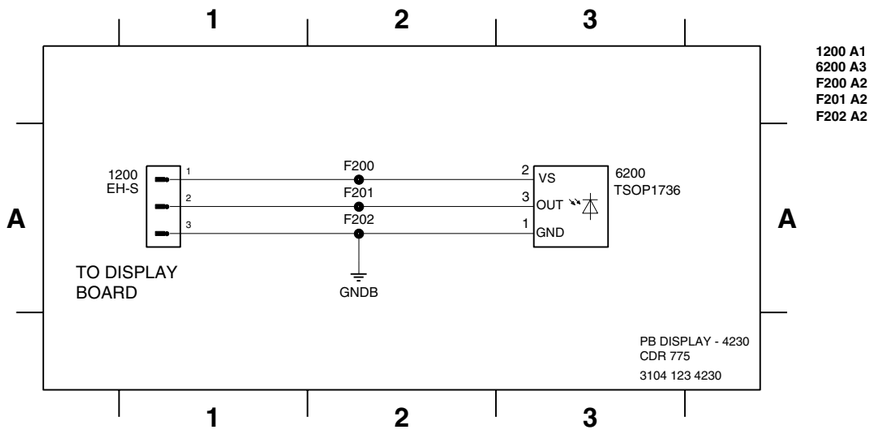
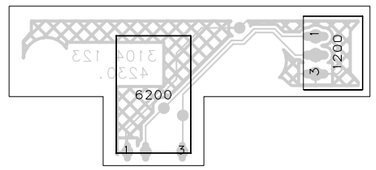
R on/off

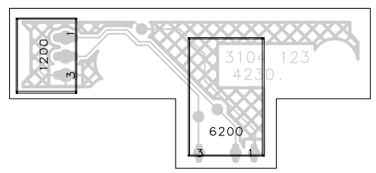
IR BOARD CDR775 - CIRCUIT DIAGRAM



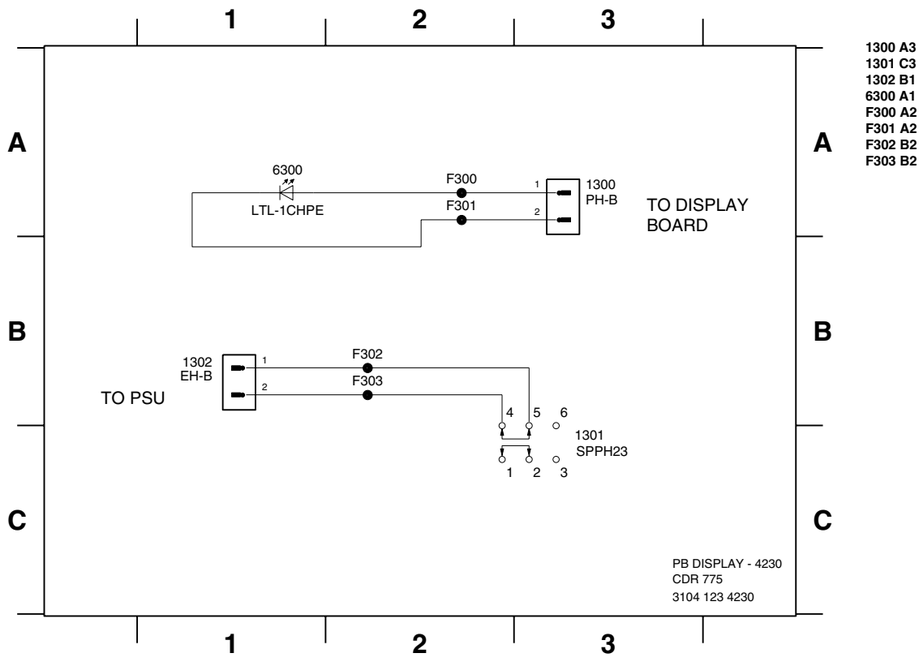
IR BOARD - FRONT VIEW



IR BOARD - BACK VIEW



ON/OFF & STBY LED BOARD CDR775 - CIRCUIT DIAGRAM



ON/OFF & STBY LED BOARD - FRONT VIEW

ON/OFF & STBY LED BOARD - BACK VIEW

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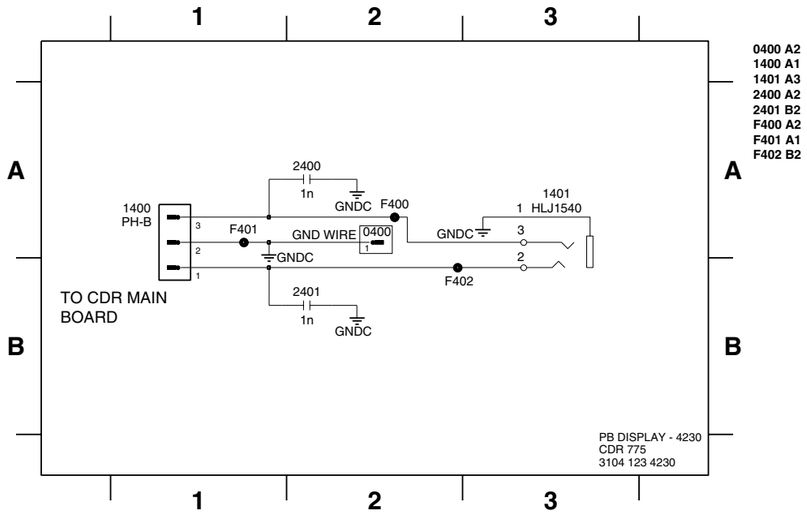
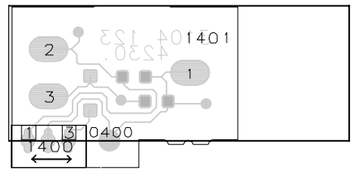
HPCD out

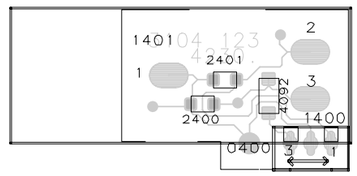
HEADPHONE BOARD CDR775 - CIRCUIT DIAGRAM



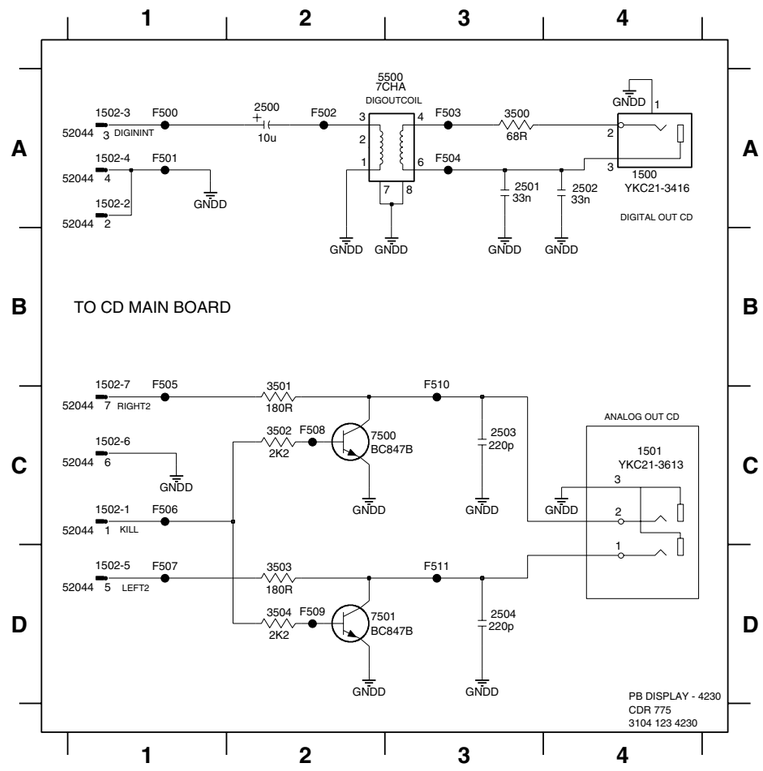
HEADPHONE BOARD - TOP VIEW



HEADPHONE BOARD - BOTTOM VIEW

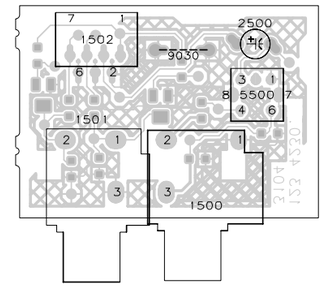


CD OUT BOARD CDR775 - CIRCUIT DIAGRAM

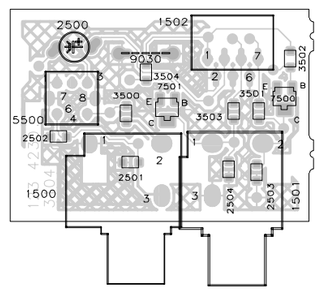


1500 A4	3504 D2
1501 C4	5500 A2
1502 A1	7500 C2
1502 A1	7501 D2
1502 A1	F500 A1
1502 C1	F501 A1
1502 C1	F502 A2
1502 C1	F503 A3
1502 D1	F504 A3
2500 A2	F505 C1
2501 A3	F506 C1
2502 A4	F507 D1
2503 C3	F508 C2
2504 D3	F509 D2
3500 A3	F510 C3
3501 C2	F511 D3
3502 C2	
3503 D2	

CD OUT BOARD - TOP VIEW



CD OUT BOARD - BOTTOM VIEW



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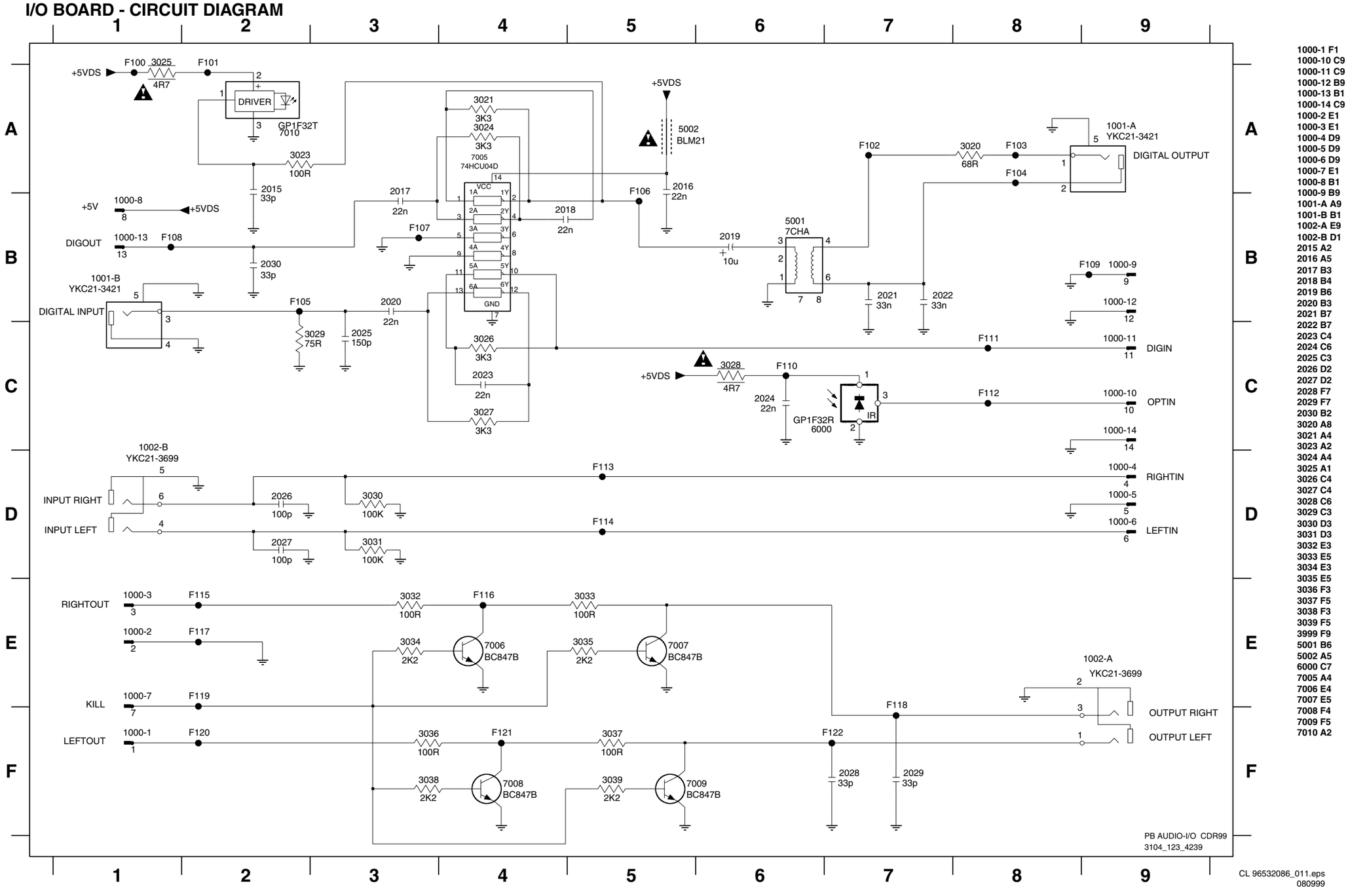
I/O board

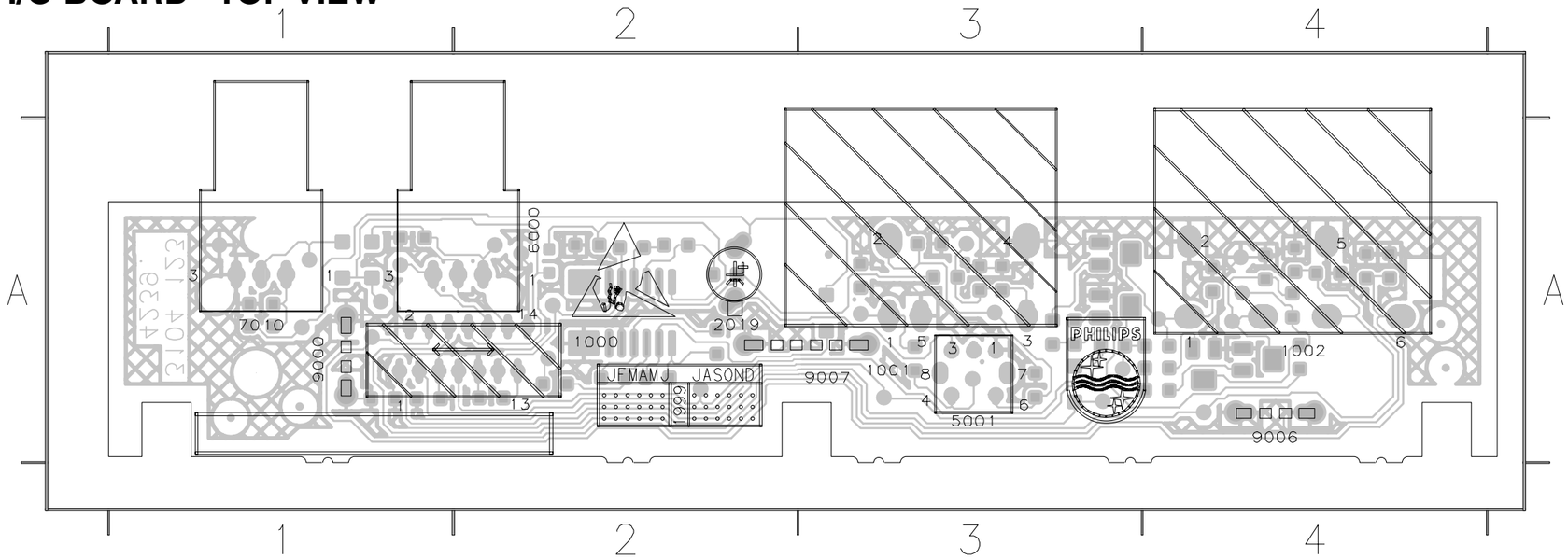
I/O BOARD - CIRCUIT DIAGRAM



1000-1 F1
1000-10 C9
1000-11 C9
1000-12 B9
1000-13 B1
1000-14 C9
1000-2 E1
1000-3 E1
1000-4 D9
1000-5 D9
1000-6 D9
1000-7 E1
1000-8 B1
1000-9 B9
1001-A A9
1001-B B1
1002-A E9
1002-B D1
2015 A2
2016 A5
2017 B3
2018 B4
2019 B6
2020 B3
2021 B7
2022 B7
2023 C4
2024 C6
2025 C3
2026 D2
2027 D2
2028 F7
2029 F7
2030 B2
3020 A8
3021 A4
3023 A2
3024 A4
3025 A1
3026 C4
3027 C4
3028 C6
3029 C3
3030 D3
3031 D3
3032 E3
3033 E5
3034 E3
3035 E5
3036 F3
3037 F5
3038 F3
3039 F5
3999 F9
5001 B6
5002 A5
6000 C7
7005 A4
7006 E4
7007 E5
7008 F4
7009 F5
7010 A2

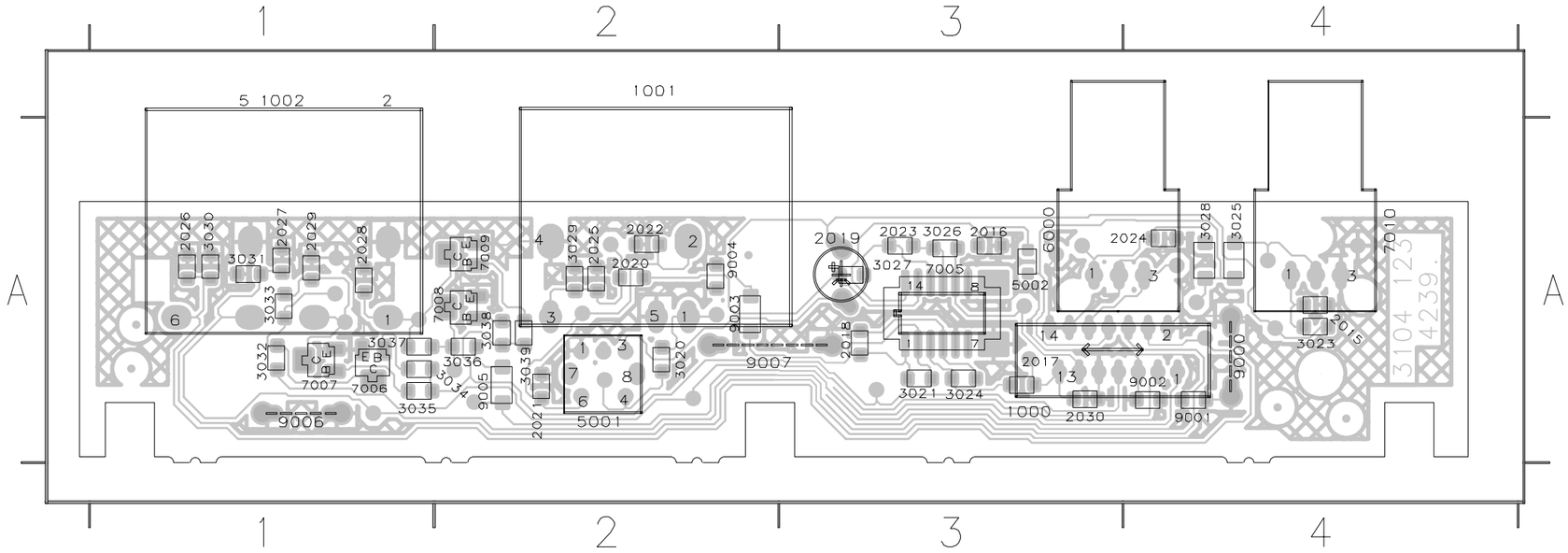
I/O board

I/O BOARD - TOP VIEW



1000 A2
1001 A3
1002 A4
2019 A2
5001 A3
6000 A2
7010 A1
9000 A1
9006 A4
9007 A3

I/O BOARD - BOTTOM VIEW



2015 A4
2016 A3
2017 A3
2018 A3
2020 A2
2021 A2
2022 A2
2023 A3
2024 A4
2025 A2
2026 A1
2027 A1
2028 A1
2029 A1
2030 A3
3020 A2
3021 A3
3023 A4
3024 A3
3025 A4
3026 A3
3027 A3
3028 A4
3029 A2
3030 A1
3031 A1
3032 A1
3033 A1
3034 A2
3035 A1
3036 A2
3037 A1
3038 A2
3039 A2
3999 A4
5002 A3
7005 A3
7006 A1
7007 A1
7008 A2
7009 A2
9001 A4
9002 A4
9003 A2
9004 A2
9005 A2

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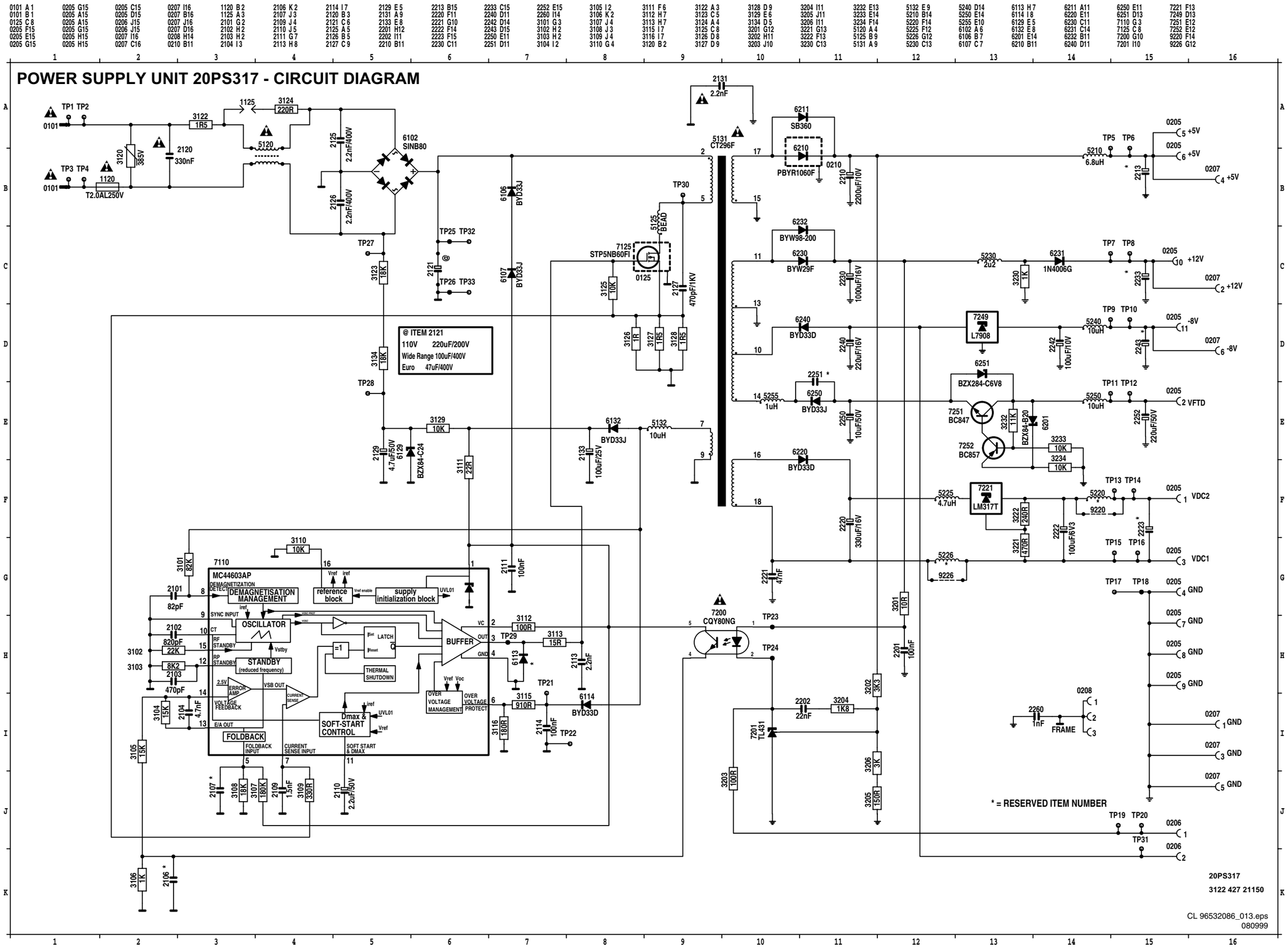
PSU 99


POWER SUPPLY UNIT 20PS317 - CIRCUIT DIAGRAM
MC44603AP
DEMAGNETISATION MANAGEMENT
OSCILLATOR
STANDBY (reduced frequency)
FOLDBACK
reference block
supply initialization block
BUFFER
LATCH
THERMAL SHUTDOWN
OVER VOLTAGE MANAGEMENT
OVER VOLTAGE PROTECT
Dmax & SOFT-START CONTROL
ERROR AMP
VOLTAGE FEEDBACK
CURRENT SENSE
@ ITEM 2121
110V 220uF/200V
Wide Range 100uF/400V
Euro 47uF/400V
* = RESERVED ITEM NUMBER
20PS317
3122 427 21150
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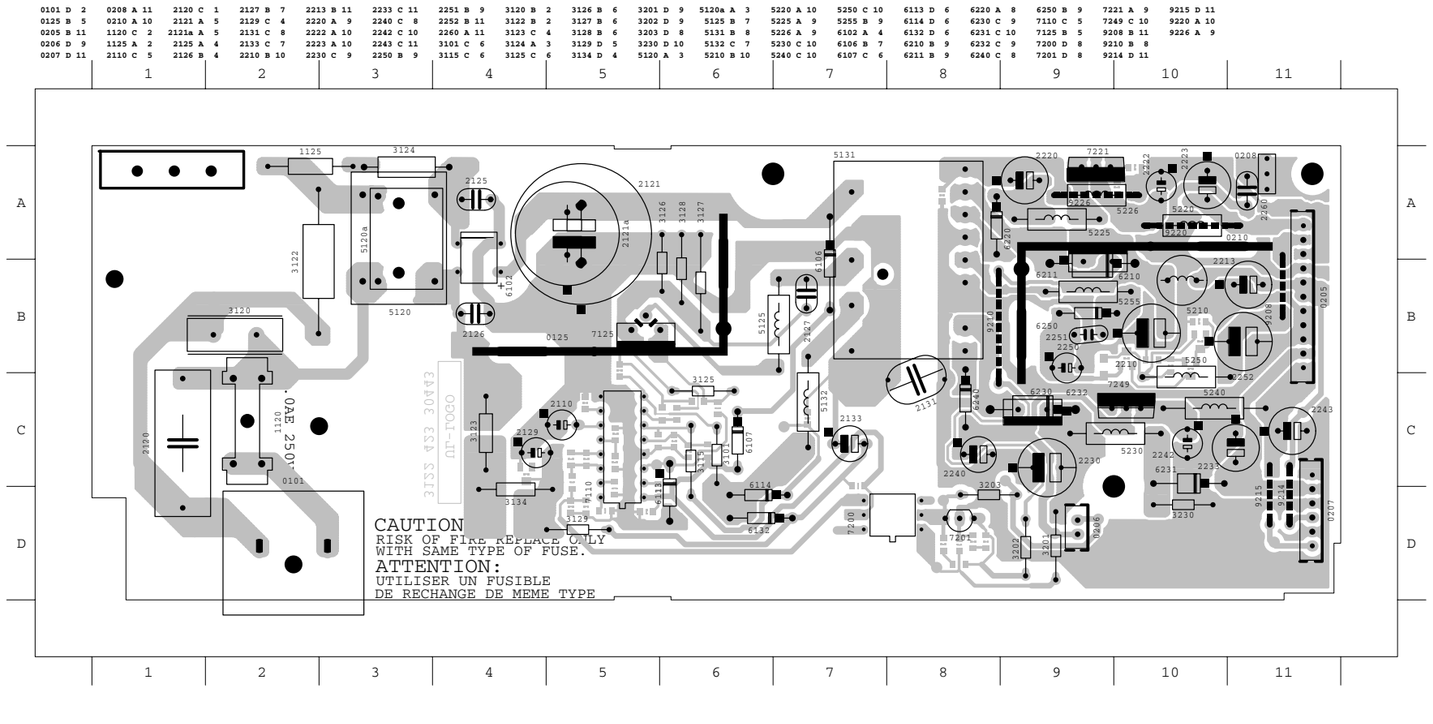
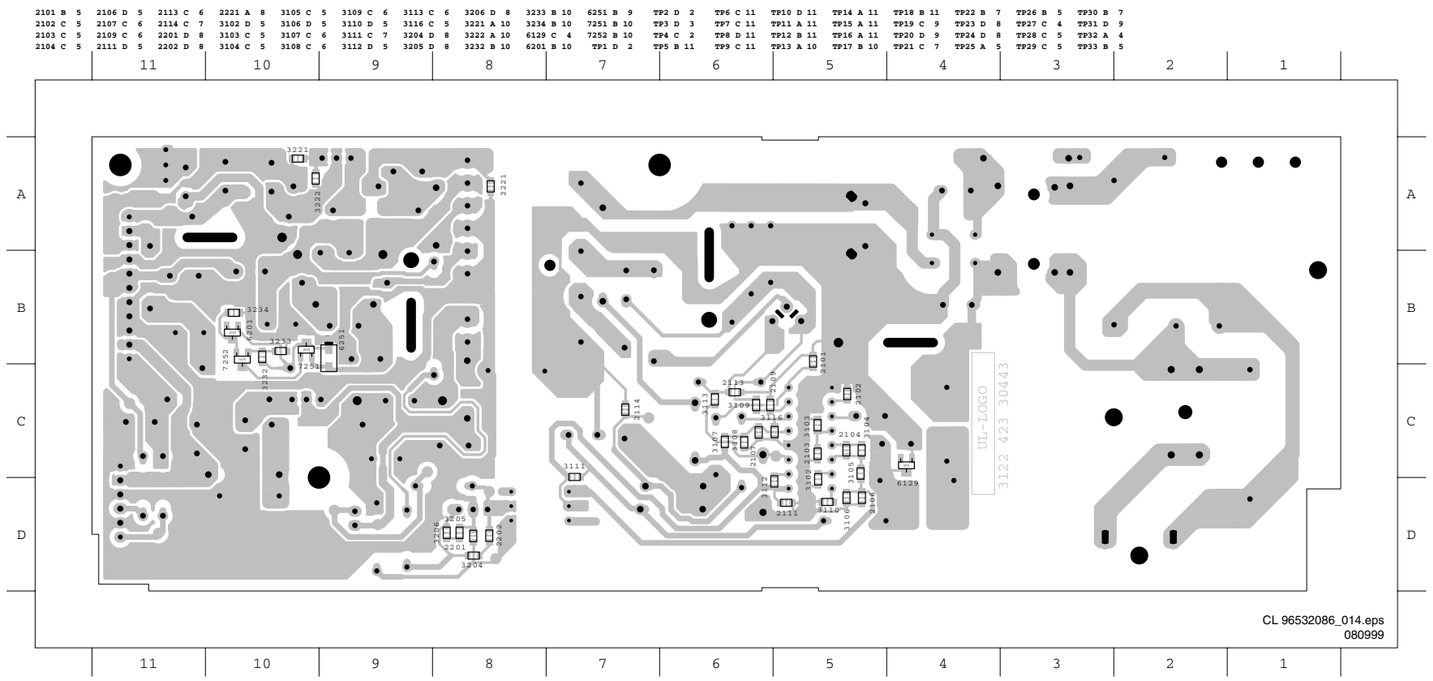
PSU 99

POWER SUPPLY UNIT 20PS317 - COMPONENT SIDE



POWER SUPPLY UNIT 20PS317 - SOLDERING SIDE



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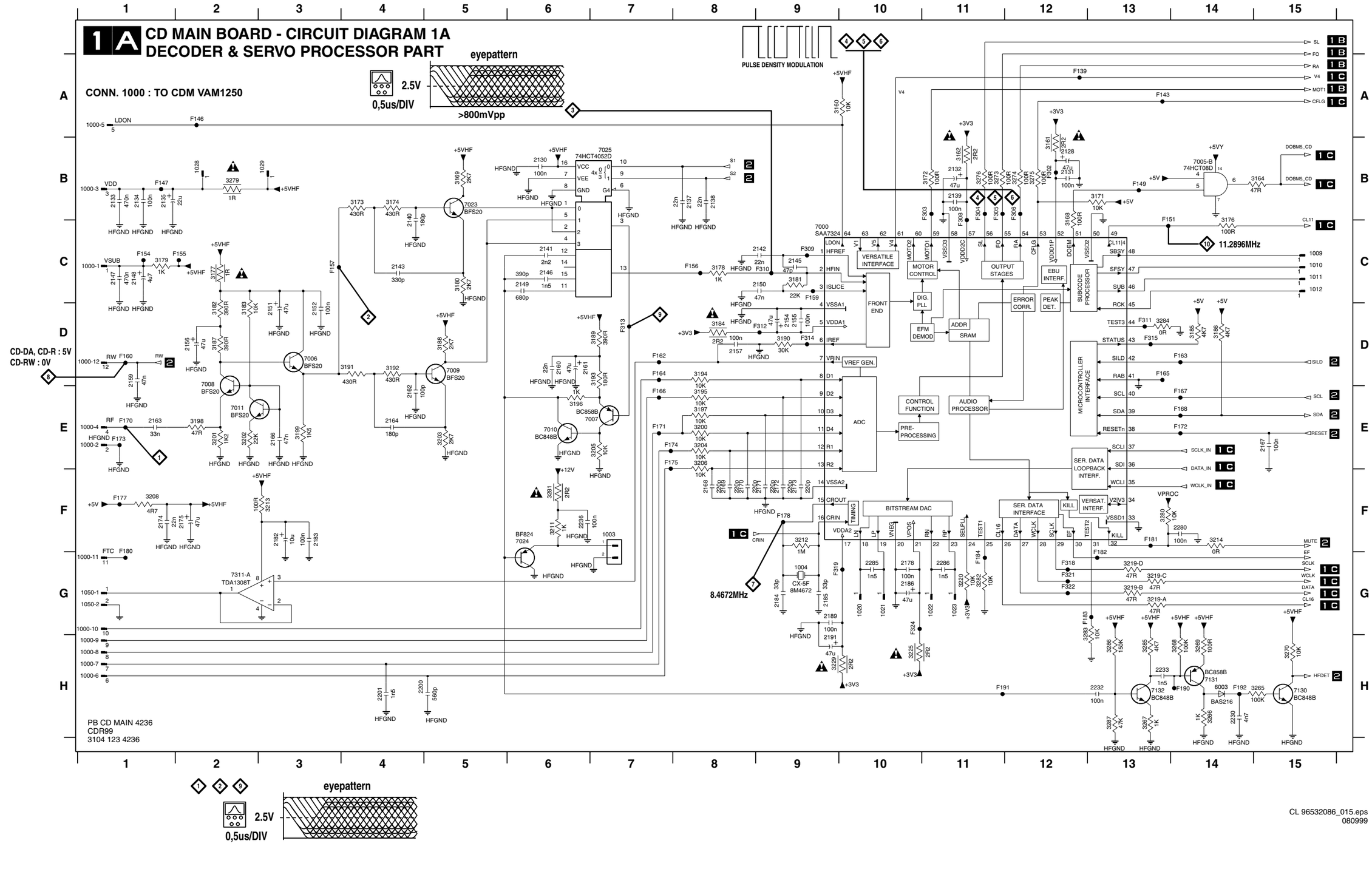
CD Diagram 1A

1000-1 C1 1000-10 G1 1000-11 G1 1000-12 D1 1000-2 E1 1000-3 B1 1000-4 E1 1000-5 A1 1000-6 H1
1000-7 H1 1000-8 H1 1000-9 H1 1003 F7 1004 G9 1009 C15 1010 C15 1011 C15 1012 C15
1020 G10 1021 G10 1022 G11 1023 G11 1028 B2 1029 B3 1050-1 G1 1050-2 G1 2128 B12
2130 B6 2131 B12 2132 B11 2133 B1 2134 B1 2135 B1 2137 B8 2138 B8
2139 B11 2140 C4 2141 C6 2142 C9 2143 C4 2145 C9 2146 C6 2147 C1
2148 C1 2149 C6 2150 C9 2151 D3 2152 D3 2154 D9 2155 D9 2156 D2 2157 D8
2159 D1 2160 D6 2161 D6 2162 E4 2163 E1 2164 E4 2166 E3 2167 E14 2168 F8
2169 F8 2170 F8 2171 F9 2172 F9 2173 F9 2174 F1 2175 F2 2178 G10 2182 F3
2183 F3 2184 G9 2185 G9 2186 G10 2189 G9 2191 H9 2200 H4 2201 H4 2230 H14
2232 H13 2233 H13 2236 F6 2280 F14 2285 G10 2286 G11 3160 A9 3161 B12 3162 B11
3164 B15 3168 B12 3169 B5 3171 B13 3172 B11 3173 B4 3174 B4 3176 C14 3177 C2
3178 C8 3179 C1 3180 C5 3181 C9 3182 D2 3183 D2 3184 D8 3185 D14 3186 D14
3187 D2 3188 D5 3189 D7 3190 D9 3191 D4 3192 D4 3193 D7 3194 D8 3195 E8
3196 E6 3197 E8 3198 E2 3199 E3 3200 E8 3201 E2 3202 E2 3203 E5 3204 E8
3205 E7 3206 E8 3208 F1 3211 F6 3212 F9 3213 F3 3214 F14 3219-A G13 3219-B G13
3219-C G13 3219-D G13 3220 G11 3225 H10 3273 B11 3274 B12 3275 B12 3276 B11 3280 F13 3281 F6
3269 H14 3270 H15 3282 G11 3283 G12 3284 D13 3285 H13 3286 H13 3287 H13 7000 C9 7005-B B14
7006 D3 7007 E7 7008 E2 7009 D5 7010 E6 7011 E2 7023 B5 7024 F6 7025 B7
7130 H15 7131 H14 7132 H13 7311-A G2 7311-A A12 F139 A12 F143 A13 F146 A2 F147 B1 F149 B13
F151 C13 F154 C1 F155 C2 F156 C8 F157 C8 F159 D8 F162 D7 F163 D14 F164 E7 F165 D13 F166 E7 F167 E14 F168 E14 F170 E1 F171 E7 F172 E14 F173 E1 F174 E7 F175 E7 F177 F1 F178 F9 F180 G1 F181 F13 F182 G13 F183 G12 F184 G11
F190 H14 F191 H11 F192 H14 F303 B11 F304 B11 F305 B11 F306 B11 F308 B11
F309 C9 F310 C9 F311 D13 F312 D9 F313 D7 F314 D9 F315 D13 F318 G12 F319 G9 F321 G12 F322 G12 F324 G10



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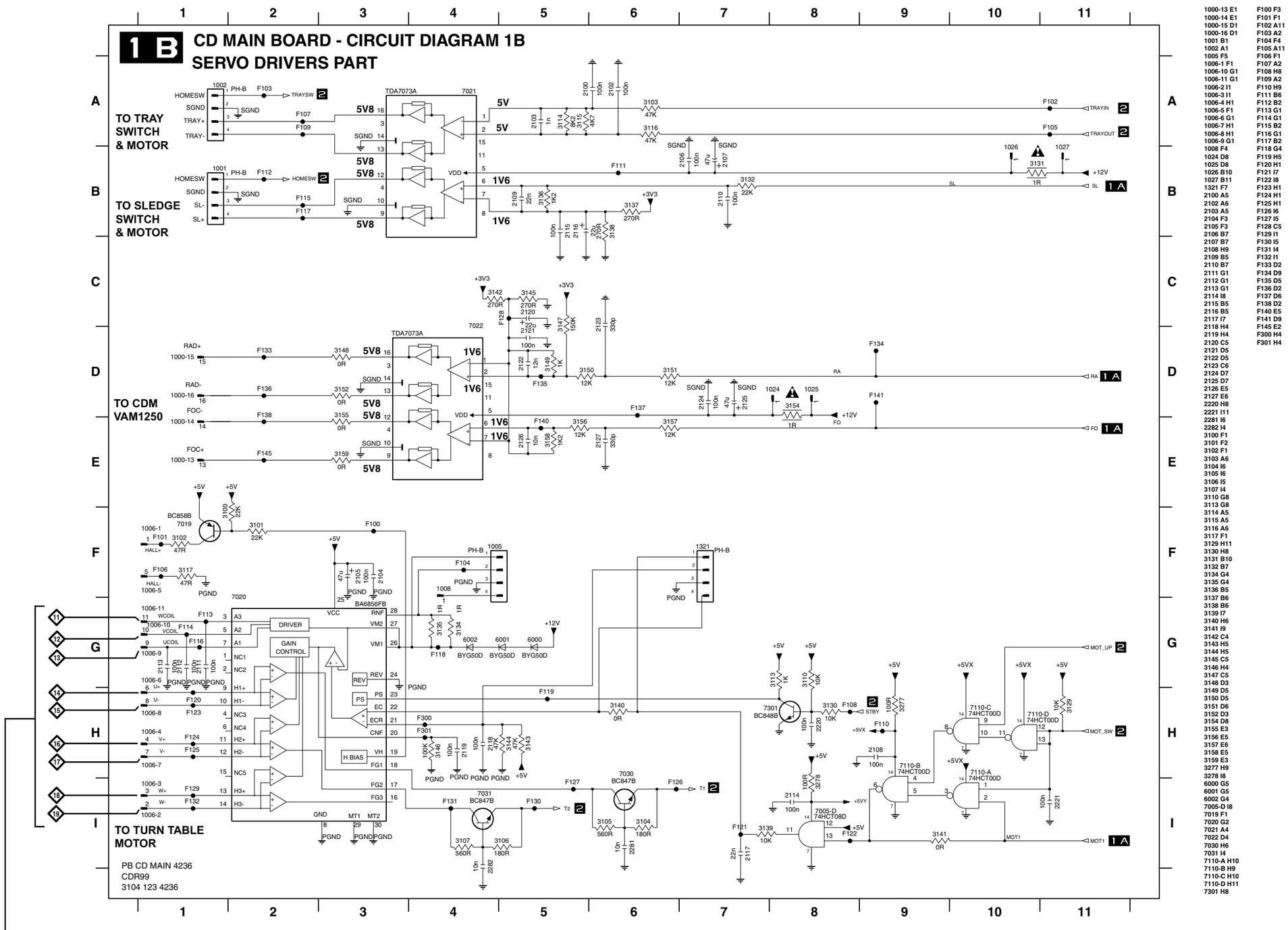
CD diagram 1B



Input conditions conn 1006 pin						Outputs conn 1006			Test points on driver		
6	8	4	7	3	2	9	10	11	18	17	16
U+	U-	V+	V-	W+	W-	UCOIL	VCOIL	WCOIL	HALL_U	HALL_V	HALL_W
L	M	H	M	M	M	6V	0V	0V	0V	5V	
H	M	L	M	M	M	0V	6V	6V	5V	0V	
M	M	L	M	H	M	0V	6V	0V		0V	5V
M	M	H	M	L	M	6V	0V	6V		5V	0V
H	M	M	M	L	M	0V	0V	6V	5V		0V
L	M	M	M	H	M	6V	6V	0V	0V		5V

Input voltage	Level	Tolerance	Unit
H	2.8	0.1	V
M	2.5	0.1	V
L	2.2	0.1	V

1000-13 E1
1000-14 E1
1000-15 D1
1000-16 D1
1001 B1
1002 A1
1005 F5
1006-1 F1
1006-10 G1
1006-11 G1
1006-2 I1
1006-3 I1
1006-4 H1
1006-5 F1
1006-6 G1
1006-7 H1
1006-8 H1
1006-9 G1
1008 F4
1024 D8
1025 D8
1026 B10
1027 B11
1321 F7
2100 A5
2102 A6
2103 A5
2104 F3
2105 F3
2106 B7
2107 B7
2108 H9
2109 B5
2110 B7
2111 G1
2112 G1
2113 G1
2114 I8
2115 B5
2116 B5
2117 I7
2118 H4
2119 H4
2120 C5
2121 D5
2122 D5
2123 C6
2124 D7
2125 D7
2126 E5
2127 E6
2220 H8
2221 I11
2281 I6
2282 I4
3100 F1
3101 F2
3102 F1
3103 A6
3104 I6
3105 I6
3106 I5
3107 I4
3110 G8
3113 G8
3114 A5
3115 A5
3116 A6
3117 F1
3129 H11
3130 H8
3131 B10
3132 B7
3134 G4
3135 G4
3136 B5
3137 B6
3138 B6
3139 I7
3140 H6
3141 I9
3142 C4
3143 H5
3144 H5
3145 C5
3146 H4
3147 C5
3148 D3
3149 D5
3150 D5
3151 D6
3152 D3
3154 D8
3155 E3
3156 E5
3157 E6
3158 E5
3159 E3
3277 H9
3278 I8
6000 G5
6001 G5
6002 G4
7005-D I8
7019 F1
7020 G2
7021 A4
7022 D4
7030 H6
7031 I4
7110-A H10
7110-B H9
7110-C H10
7110-D H11
7301 H8

F100 F3
F101 F1
F102 A11
F103 A2
F104 F4
F105 A11
F106 F1
F107 A2
F108 H8
F109 A2
F110 H9
F111 B6
F112 B2
F113 G1
F114 G1
F115 B2
F116 G1
F117 B2
F118 G4
F119 H5
F120 H1
F121 I7
F122 I8
F123 H1
F124 H1
F125 H1
F126 I6
F127 I5
F128 C5
F129 I1
F130 I5
F131 I4
F132 I1
F133 D2
F134 D9
F135 D5
F136 D2
F137 D6
F138 D2
F140 E5
F141 D9
F145 E2
F300 H4
F301 H4

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CD diagram 1C

1 C CD MAIN BOARD - CIRCUIT DIAGRAM 1C AUDIO PART

CONN. 1208 : TO CDR MAIN BOARD
CONN. 1209 : TO CD OUT BOARD

1208-10 C11
1208-11 C11
1208-12 D11
1208-13 D11
1208-14 A11
1208-2 B11
1208-22 D11
1208-3 G11
1208-4 H11
1208-5 H11
1208-6 I11
1208-8 B11
1208-9 C11
1209-1 H11
1209-2 H11
1209-3 H11
1209-4 I11
1209-5 I11
1209-6 I11
1209-7 G11
1210-10 A11
1210-11 F11
1210-12 F11
1210-13 F11
1210-14 F11
1210-15 F11
1210-16 G11
1210-3 A11
1210-4 A11
1210-5 E11
1210-6 E11
1210-7 C11
1210-8 B11
1210-9 D11
2153 C9
2158 D9
2165 D9
2176 E9
2180 F5
2181 F6
2187 F5
2188 F6
2190 F8
2197 H9
2199 H9
2202 H8
2203 H6
2204 H6
2208 H9
2211 I9
2214 I8
2216 G8
2217 G9
2218 B8
2219 B10
2234 G7
2235 I7
2252 I9
3153 A9
3175 B9
3215 F5
3216 F6
3217 E7
3218 E7
3226 F8
3227 F7
3233 G8
3235 G7
3236 G7
3237 G7
3241 H7
3242 H9
3243 H8
3245 H8
3248 I7
3254 I7
3256 I9
3258 I7
3260 I8
3263 G8
3271 G8
3361 H7
7120-A G8
7120-B I8
7309 F5
7310 F7
F142 A9
F148 B9
F150 B9
F152 C9
F158 C9
F161 D9
F169 D9
F176 E9
F179 F7
F185 F6
F186 F5
F187 G8
F188 G9
F189 H6
F193 H9
F194 H5
F195 H7
F196 H7
F197 G8
F198 I8
F199 H8
F307 B10
F317 E7
F320 F10
F323 F10
F325 G10
F329 G10
F350 G7
F351 G7
F352 G7
F353 H10
F354 I9
F355 I10

0V 5Vpp
2ms/DIV
GENERAL PURPOSE TEST
TRACK 10 1KHz 0dB

2,1168MHz
44,1KHz
SCL
WCLK
DATA
LEFT CHANNEL
RIGHT CHANNEL
MSB
LSB
0.5uS/DIV

PB CD MAIN 4236
CDR99
3104 123 4236

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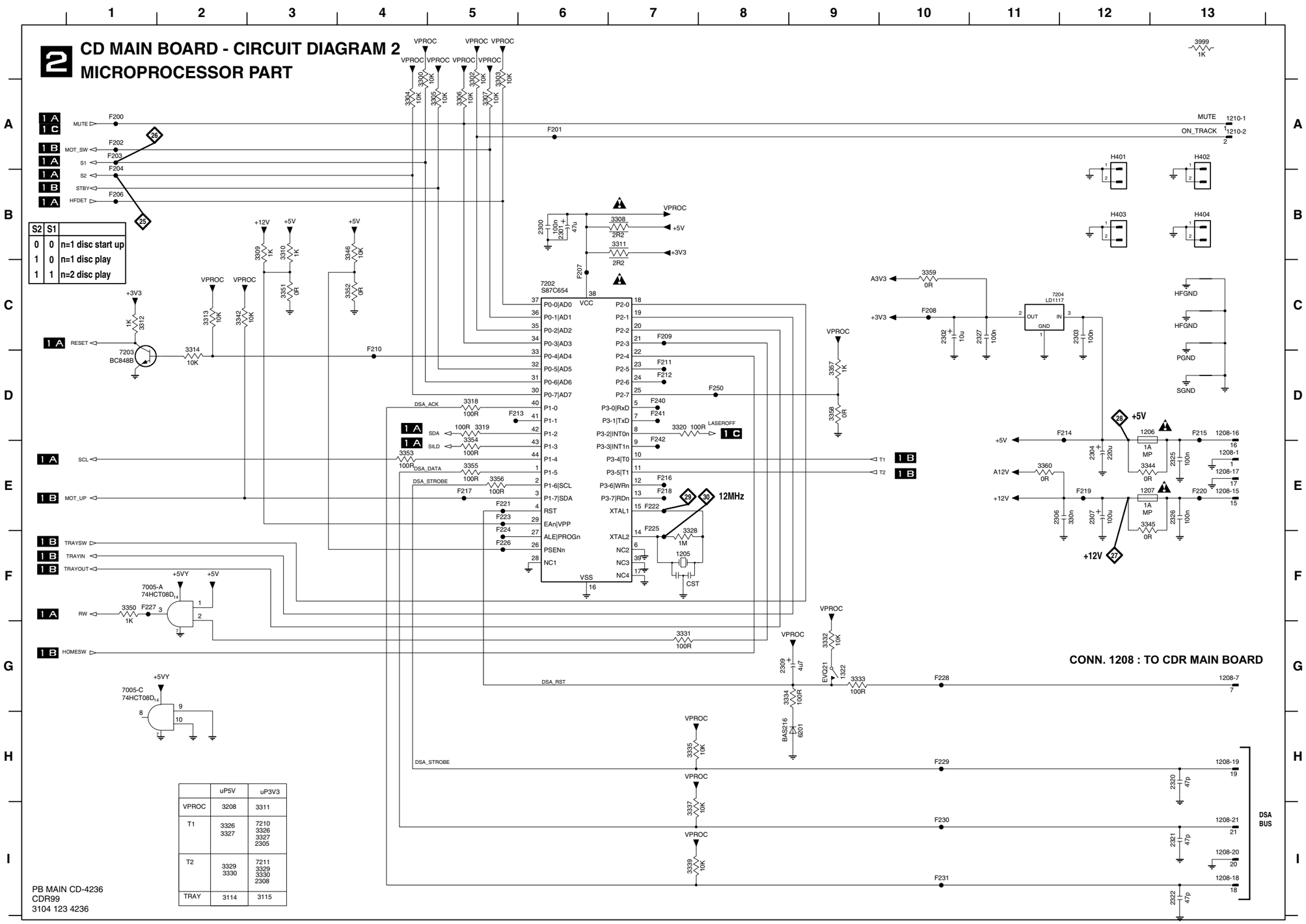
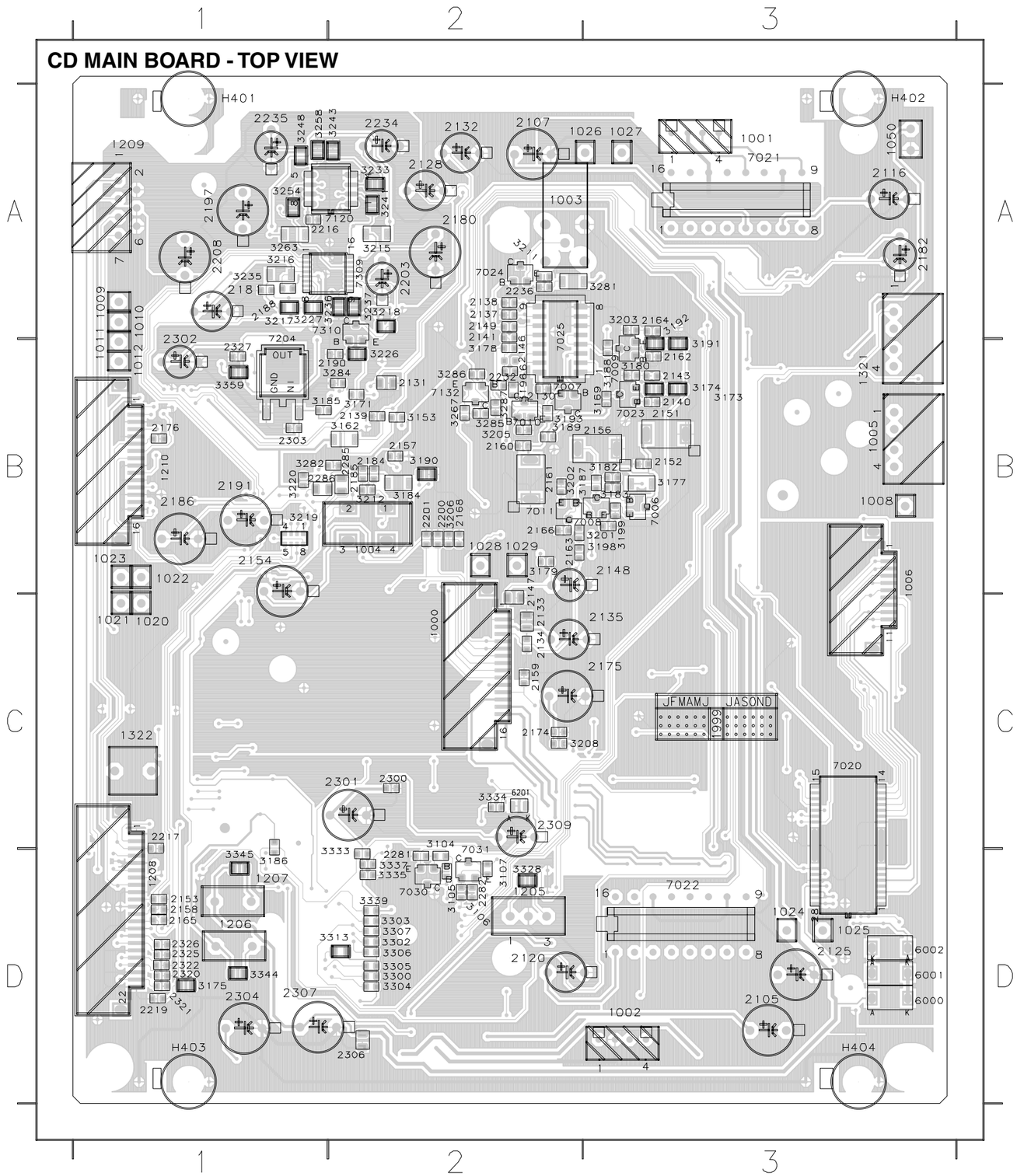
CD diagram 2



	uP5V	uP3V3
VPROC	3208	3311
T1	3326 3327	7210 3326 3327 2305
T2	3329 3330	7211 3329 3330 2308
TRAY	3114	3115

1205 F7
1206 D12
1207 E12
1208-1 E13
1208-15 E13
1208-16 D13
1208-17 E13
1208-18 I13
1208-19 H13
1208-20 I13
1208-21 I13
1208-7 G13
1210-1 A13
1210-2 A13
1322 G9
2300 B6
2301 B6
2302 C10
2303 C12
2304 E12
2306 E11
2307 E12
2309 G8
2320 H13
2321 I13
2322 I13
2325 E13
2326 E13
2327 C11
3300 A4
3302 A5
3303 A5
3304 A4
3305 A5
3306 A5
3307 A5
3308 B7
3309 B3
3310 B3
3311 B7
3312 C1
3313 C2
3314 D2
3318 D5
3319 D5
3320 D7
3328 F7
3331 G7
3332 G9
3333 G9
3334 G8
3335 H7
3337 I7
3339 I7
3342 C2
3344 E12
3345 E12
3346 B4
3350 F1
3351 C3
3352 C4
3353 E4
3354 E5
3355 E5
3356 E5
3357 D9
3358 D9
3359 C10
3360 E11
3999 A13
6201 H9
7005-A F1
7005-C G1
7202 C6
7203 D1
7204 C12
H401 A12
H402 A13
H403 B12
H404 B13

CD top



1000	C2	2208	A1	3285	B2
1001	A3	2216	A1	3286	B2
1002	D3	2217	C1	3287	B2
1003	A2	2219	D1	3300	D2
1004	B2	2232	B2	3302	D2
1005	B3	2234	A2	3303	D2
1006	B3	2235	A1	3304	D2
1008	B3	2236	A2	3305	D2
1009	A1	2281	D2	3306	D2
1010	A1	2282	D2	3307	D2
1011	B1	2285	B2	3313	D2
1012	B1	2286	B1	3328	D2
1020	C1	2300	C2	3333	D2
1021	C1	2301	C2	3334	C2
1022	B1	2302	B1	3335	D2
1023	B1	2303	B1	3337	D2
1024	D3	2304	D1	3339	D2
1025	D3	2306	D2	3344	D1
1026	A3	2307	D1	3345	D1
1027	A3	2309	C2	3359	B1
1028	B2	2320	D1	6000	D3
1029	B2	2321	D1	6001	D3
1050	A3	2322	D1	6002	D3
1205	D2	2325	D1	6201	C2
1206	D1	2326	D1	7006	B3
1207	D1	2327	B1	7007	B2
1208	D1	3104	C2	7008	B3
1209	A1	3105	D2	7009	B3
1210	B1	3106	D2	7010	B2
1321	B3	3107	D2	7011	B2
1322	C1	3153	B2	7020	C3
2105	D3	3162	B2	7021	A3
2107	A2	3169	B3	7022	D3
2116	A3	3171	B2	7023	B3
2120	D2	3173	B3	7024	A2
2125	D3	3174	B3	7025	A2
2128	A2	3175	D1	7030	D2
2130	B2	3177	B3	7031	D2
2131	B2	3178	B2	7120	A2
2132	A2	3179	B2	7132	B2
2133	C2	3180	B3	7204	A1
2134	C2	3182	B3	7309	A2
2135	C3	3183	B3	7310	A1
2137	A2	3184	B2		
2138	A2	3185	B1		
2139	B2	3186	D1		
2140	B3	3187	B2		
2141	A2	3188	B3		
2143	B3	3189	B2		
2144	B2	3190	B2		
2146	B2	3191	B3		
2147	B2	3192	A3		
2148	B3	3193	B2		
2149	A2	3196	B2		
2151	B3	3198	B3		
2152	B3	3199	B3		
2153	D1	3201	B3		
2154	B1	3202	B2		
2156	B3	3203	A3		
2157	B2	3205	B2		
2158	D1	3206	B2		
2159	C2	3208	C3		
2160	B2	3211	A2		
2161	B2	3212	B2		
2162	B3	3215	A2		
2163	B2	3216	A1		
2164	A3	3217	A1		
2165	D1	3218	A2		
2166	B2	3219	B1		
2168	B2	3220	B1		
2174	C2	3226	B2		
2175	C3	3227	A1		
2176	B1	3233	A2		
2180	A2	3235	A1		
2181	A1	3236	A2		
2182	A3	3237	A2		
2184	B2	3241	A2		
2185	B2	3243	A2		
2186	B1	3248	A1		
2188	A1	3254	A1		
2190	B2	3258	A1		
2191	B1	3263	A1		
2197	A1	3267	B2		
2200	B2	3281	A3		
2201	B2	3282	B1		
2203	A2	3284	B2		

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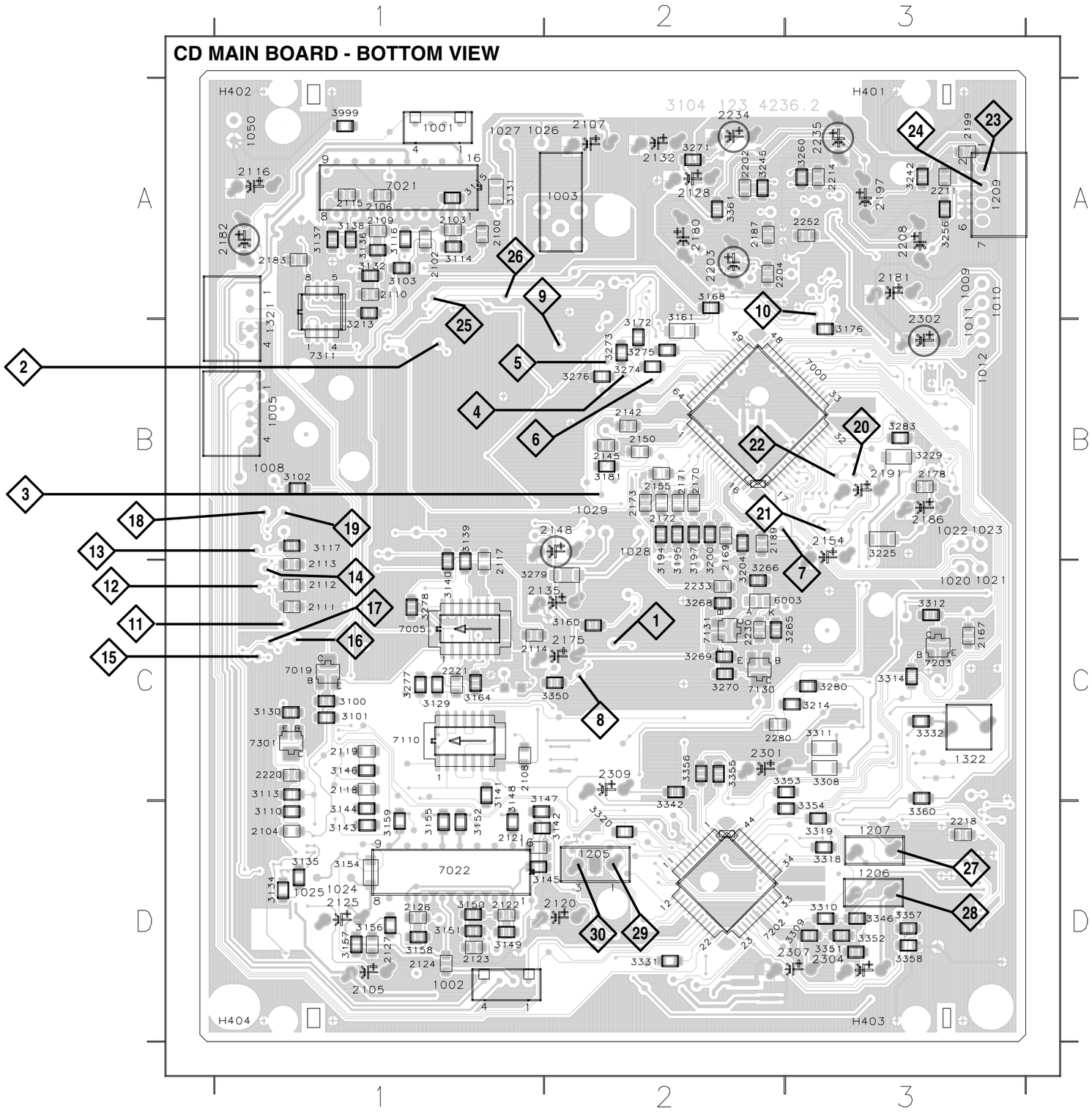
CD bottom



2100	A1	3158	D1	2100	A1	3158	D1
2102	A1	3159	D1	2102	A1	3159	D1
2103	A1	3160	C2	2103	A1	3160	C2
2104	D1	3161	A2	2104	D1	3161	A2
2106	A1	3164	C1	2106	A1	3164	C1
2108	C1	3168	A2	2108	C1	3168	A2
2109	A1	3172	B2	2109	A1	3172	B2
2110	A1	3176	B3	2110	A1	3176	B3
2111	C1	3181	B2	2111	C1	3181	B2
2112	C1	3194	C2	2112	C1	3194	C2
2113	C1	3195	C2	2113	C1	3195	C2
2114	C1	3197	C2	2114	C1	3197	C2
2115	A1	3200	C2	2115	A1	3200	C2
2117	C1	3204	C2	2117	C1	3204	C2
2118	C1	3213	B1	2118	C1	3213	B1
2119	C1	3214	C3	2119	C1	3214	C3
2121	D1	3225	B3	2121	D1	3225	B3
2122	D1	3229	B3	2122	D1	3229	B3
2123	D1	3242	A3	2123	D1	3242	A3
2124	D1	3245	A2	2124	D1	3245	A2
2126	D1	3256	A3	2126	D1	3256	A3
2127	D1	3260	A3	2127	D1	3260	A3
2136	C1	3265	C3	2136	C1	3265	C3
2142	B2	3266	C2	2142	B2	3266	C2
2145	B2	3268	C2	2145	B2	3268	C2
2150	B2	3269	C2	2150	B2	3269	C2
2155	B2	3270	C2	2155	B2	3270	C2
2167	C3	3271	A2	2167	C3	3271	A2
2169	B2	3273	B2	2169	B2	3273	B2
2170	B2	3274	B2	2170	B2	3274	B2
2171	B2	3275	B2	2171	B2	3275	B2
2172	B2	3276	B2	2172	B2	3276	B2
2173	B2	3277	C1	2173	B2	3277	C1
2178	B3	3278	C1	2178	B3	3278	C1
2183	A1	3279	C1	2183	A1	3279	C1
2187	A2	3280	C3	2187	A2	3280	C3
2189	B2	3283	B3	2189	B2	3283	B3
2199	A3	3308	C3	2199	A3	3308	C3
2202	A2	3309	D3	2202	A2	3309	D3
2204	A2	3310	D3	2204	A2	3310	D3
2211	A3	3311	C3	2211	A3	3311	C3
2214	A3	3312	C3	2214	A3	3312	C3
2218	D3	3314	C3	2218	D3	3314	C3
2220	C1	3318	D3	2220	C1	3318	D3
2221	C1	3319	D3	2221	C1	3319	D3
2230	C2	3320	D2	2230	C2	3320	D2
2233	C2	3331	D2	2233	C2	3331	D2
2252	A3	3332	C3	2252	A3	3332	C3
2280	C2	3342	D2	2280	C2	3342	D2
3100	C1	3346	D3	3100	C1	3346	D3
3101	C1	3350	C2	3101	C1	3350	C2
3102	B1	3351	D3	3102	B1	3351	D3
3103	A1	3352	D3	3103	A1	3352	D3
3110	D1	3353	C3	3110	D1	3353	C3
3113	C1	3354	D3	3113	C1	3354	D3
3114	A1	3355	C2	3114	A1	3355	C2
3115	A1	3356	C2	3115	A1	3356	C2
3116	A1	3357	D3	3116	A1	3357	D3
3117	B1	3358	D3	3117	B1	3358	D3
3129	C1	3360	D3	3129	C1	3360	D3
3130	C1	3361	A2	3130	C1	3361	A2
3131	A1	3999	A1	3131	A1	3999	A1
3132	A1	6003	C3	3132	A1	6003	C3
3134	D1	7000	B3	3134	D1	7000	B3
3135	D1	7005	C1	3135	D1	7005	C1
3136	A1	7019	C1	3136	A1	7019	C1
3137	A1	7110	C1	3137	A1	7110	C1
3138	A1	7130	C2	3138	A1	7130	C2
3139	B1	7131	C2	3139	B1	7131	C2
3140	C1	7202	D2	3140	C1	7202	D2
3141	C1	7203	C3	3141	C1	7203	C3
3142	D2	7301	C1	3142	D2	7301	C1
3143	D1	7311	B1	3143	D1	7311	B1
3144	D1			3144	D1		
3145	D2			3145	D2		
3146	C1			3146	C1		
3147	C2			3147	C2		
3148	C1			3148	C1		
3149	D1			3149	D1		
3150	D1			3150	D1		
3151	D1			3151	D1		
3152	D1			3152	D1		
3154	D1			3154	D1		
3155	D1			3155	D1		
3156	D1			3156	D1		
3157	D1			3157	D1		

CL 96532086_020.eps
080999

6. Diagnostic Software

6.1 Dealer mode

The purpose of the dealer mode is to prevent people taking out the CD inside the player at exhibitions, showrooms etc.. This mode disables the open/close function of the player.
The dealer mode can be switched on and off pressing keys [OPEN/CLOSE] and [STOP] of the CDR player simultaneously while switching on the unit. The dealer mode is stored in the flash memory and can only be changed by executing the above actions.

6.2 Dealer diagnostics

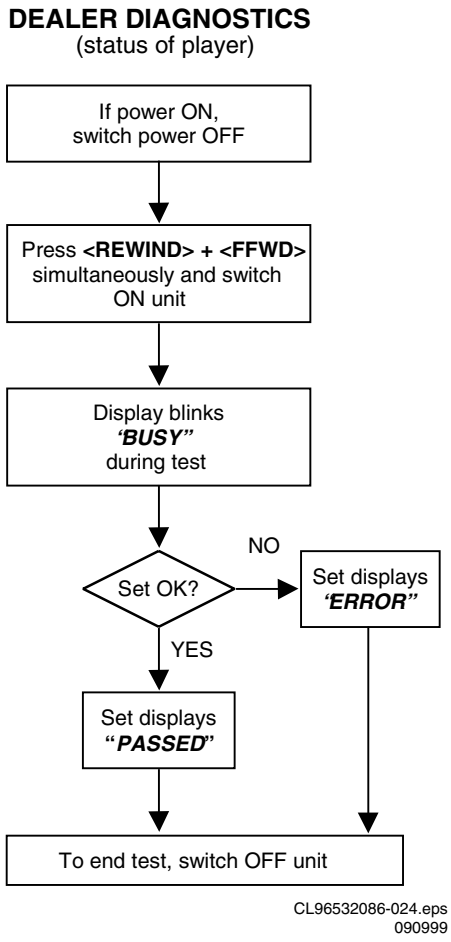


Figure 6-1

6.2.1 Description

The intention of the dealer diagnostics is to give an indication of the CDR player status. An inexperienced, even non-technical dealer will/can perform the test. Tests are executed automatically without need for external tools or disassembly of the unit. This test checks the CDR main board using the same tests as the electrical service diagnostics program. Only the result of the test, "PASSED" or "ERROR", will be shown on the display. Pressing keys [F FWD] and [REWIND] simultaneously while switching on the unit, starts the test. Switching off the unit ends the test.

6.2.2 Requirements to perform the test

- Working keyboard to start up the test.
- Working local display to check the output messages.

6.3 Electrical service diagnostics

ELECTRICAL SERVICE DIAGNOSTICS

(software versions, test for defective components)

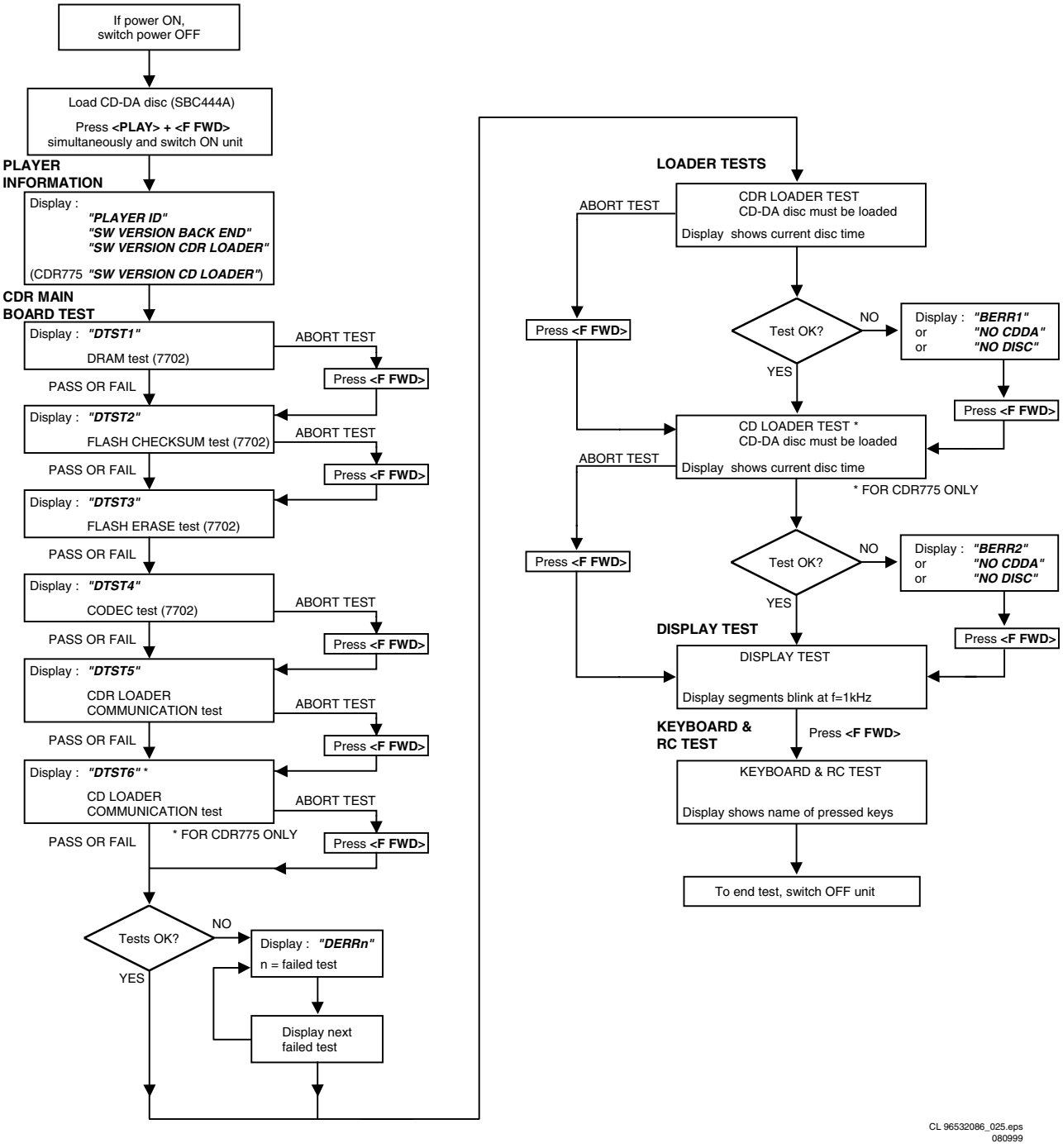


Figure 6-2

6.3.1 Description

The intention of the electrical service diagnostics is to show the software versions present in the player and to direct the dealer towards defective internal units. The units are : the CDR main board, the CDR loader, the CD loader in case of a CDR775 and the keyboard/display board. A sequence of tests is executed automatically. Some of the tests can be aborted or skipped without the result being taken into account. External tools or disassembly of the unit is not necessary to get the diagnostic information. Pressing keys [PLAY/PAUSE] and [F FWD] simultaneously while switching on the unit, starts the test. Switching off the unit ends the test.

6.3.2 Requirements to perform the test

- Working keyboard to start up the test.
- Working local display to check the output messages.
- A CD-DA disc with a minimum of 3 tracks in all trays to perform the disc test.

6.3.3 Description of the tests

Player information
In this part of the test the following important information can be checked without removing the cover :
- Recorder ID.
- SW-version back end of player.
- SW-version CDR loader.
- SW-version CD loader (only for CDR775).

CDR main board test
[F FWD] key. The message "DERRn" will be displayed with n indicating the faulty test number.
If one of the tests is aborted with the [F FWD] key, no error message will be displayed for this test. The flash data erase test ("DTST3") can not be aborted !
The CDR main board test consists out of :

DRAM test
Display : "DTST1". The DRAM used for buffer management is tested by writing, reading and verifying test patterns.

Flash checksum test
Display : "DTST2". This test checks the checksum of the player's SW stored in the flash.

Flash data erase
Display : "DTST3". During this test, all temporary information (CDtxt) in the flash is erased.

CODEC (ADC/DAC) test
Display : "DTST4". This test checks the CODEC IC by writing, reading and verifying test patterns. The test is not applicable for CDR950.

CDR communication test
Display : "DTST5". The communication between the host processor (DASP) and the CDR loader via the DSA-R-bus is tested.

CD communication test
Display : "DTST6"). The communication between the host processor (DASP) and the CD loader is tested. The test is only applicable for CDR775.

Loader tests
These tests determine if the CDR loader and the CD loader in case of a CDR775 work correctly. A CD-DA disc with a minimum of 3 tracks needs to be inserted in both loaders. A disc test is executed to check focus control, disc motor control, radial control and jump grooves control. The disc test is performed by audio play-back of 5 seconds at the beginning, middle and end of the disc.

CDR loader test
During the test, the current disc time is shown. In case of an error the message "BERR1" will be displayed and the [F FWD] key must be pressed to continue with the following test. Pressing the [F FWD] key also aborts this test.

CD loader test
For CDR775 only. During the test, the current disc time is shown. In case of an error the message "BERR2" will be displayed and the [F FWD] key must be pressed to continue with the following test. Pressing the [F FWD] key also aborts this test.

Display test
All segments will blink at a frequency of 1 Hz. Pressing the [F FWD] key will start the next test because the user has to check for himself if all segments work properly.

Keyboard and remote control tests
The test will give the user the ability to test every key without executing the function assigned to it. Therefore, the user needs to press every key on the keyboard and the remote control. The display will show the name of the key being pressed. Pressing more than one key at once will give an unpredictable result except for the service combinations : [PLAY/PAUSE] + [STOP], [PLAY/PAUSE] + [F FWD], [F FWD] + [REWIND], [ERASE] + [RECORD], [PLAY/PAUSE] + [RECORD], [OPEN/CLOSE] + [PROGRAM].

6.4 Mechanical service diagnostics

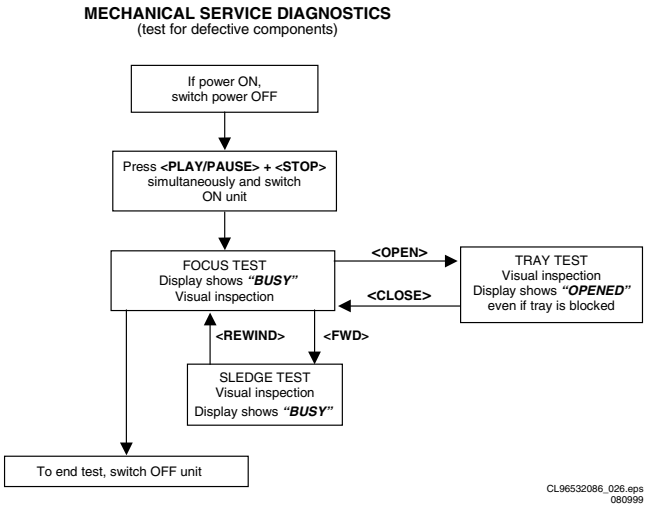


Figure 6-3

6.4.1 Description

No external tools are required to perform this test. The cover needs to be removed because the user has to check the movements of the tray, focus and sledge visually. Pressing keys [PLAY/PAUSE] and [STOP] simultaneously while switching on the unit, starts the test. Switching off the unit ends the test. In case of a CDR775, one can check the CD loader mechanics in the same way by pressing the above key combination on the CD player keys.

6.4.2 Requirements to perform the test

- Working keyboard to cycle through the tests and to start up the test.
- Working local display to check the output messages.

6.4.3 Description of the tests

Focus control test
The focussing lens is continuously moving up and down. The display reads "BUSY".

Sledge control test
After pressing [F FWD] the sledge continuously moves up and down. Pressing [REWIND] stops the sledge at the position it is in and the focus control test resumes. The display reads "BUSY".

Tray control test
This test starts from within the focus control test routine. Pressing [OPEN/CLOSE] moves the tray in or out. In the tray open position one can initiate focus and sledge tests by pressing [F FWD]. One has to stop these tests pressing [REWIND] before it is possible to close the tray again. Depending on the action the display reads "OPEN", "OPENED", "CLOSE" or "BUSY".

6.5 DC-erase service mode

6.5.1 Description

This test is initiated by pressing [ERASE] and [RECORD] simultaneously while switching on the unit. The player will erase a complete CD-RW disc (including PMA and ATIP lead out area) at speed N=2. The display shows the countdown of the remaining time required for the operation to complete. The format is "ER mm:ss", where "mm" are the remaining minutes and "ss" the remaining seconds. After completion the message "PASSED" is shown, and the player has to be switched off and on again to start up in normal operating mode. Switching off the unit before completion of the test, leaves the disc in an unpredictable state. In such case only a complete DC-erase procedure can recover the CD-RW disc.

6.5.2 Requirements to perform the test

- Functional CDR player.
- A CD-RW audio disc must be present in the tray.

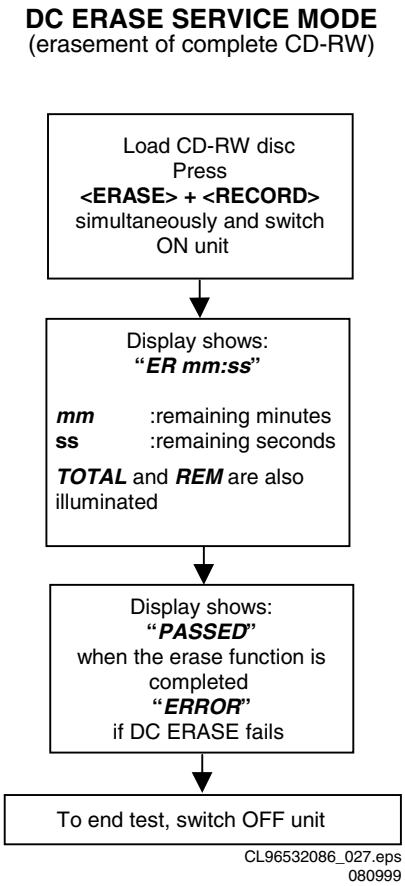


Figure 6-4

7. Faultfinding trees

7.1 CDR-Module

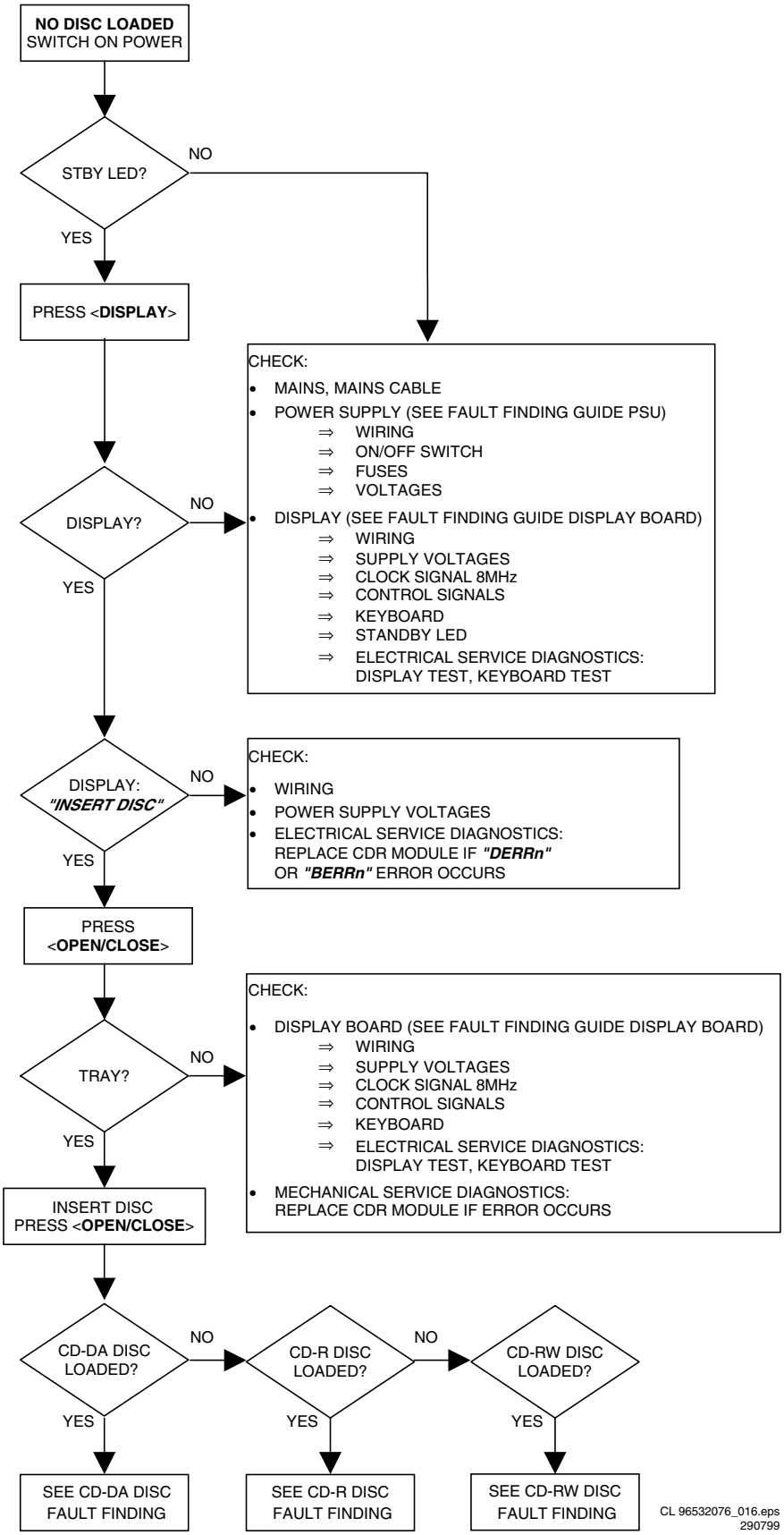


Figure 7-1

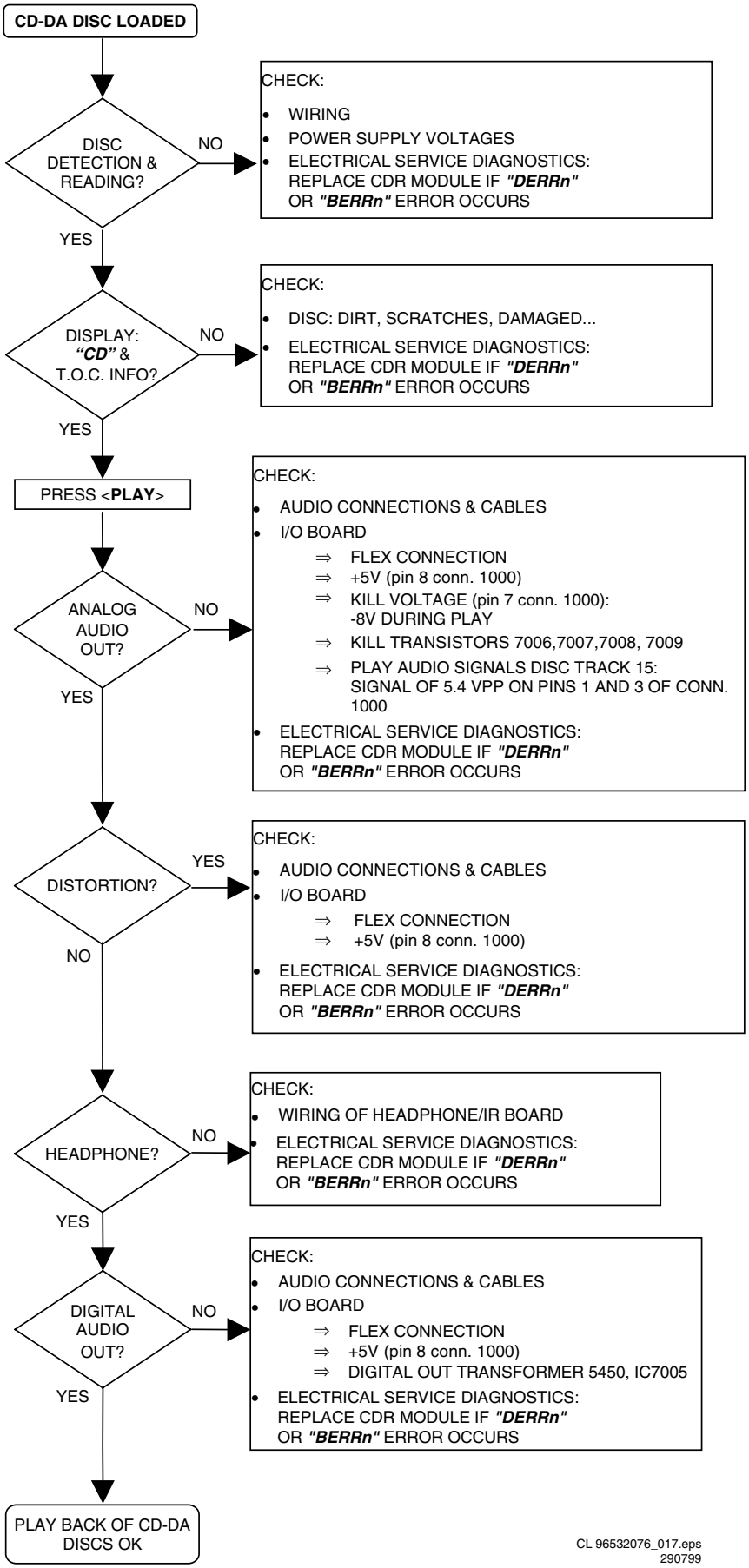

CD-DA DISC LOADED
DISC DETECTION & READING?
NO
CHECK:
• WIRING
• POWER SUPPLY VOLTAGES
• ELECTRICAL SERVICE DIAGNOSTICS: REPLACE CDR MODULE IF "DERRn" OR "BERRn" ERROR OCCURS
YES
DISPLAY: "CD" & T.O.C. INFO?
NO
CHECK:
• DISC: DIRT, SCRATCHES, DAMAGED...
• ELECTRICAL SERVICE DIAGNOSTICS: REPLACE CDR MODULE IF "DERRn" OR "BERRn" ERROR OCCURS
YES
PRESS <PLAY>
ANALOG AUDIO OUT?
NO
CHECK:
• AUDIO CONNECTIONS & CABLES
• I/O BOARD
⇒ FLEX CONNECTION
⇒ +5V (pin 8 conn. 1000)
⇒ KILL VOLTAGE (pin 7 conn. 1000): -8V DURING PLAY
⇒ KILL TRANSISTORS 7006,7007,7008, 7009
⇒ PLAY AUDIO SIGNALS DISC TRACK 15: SIGNAL OF 5.4 VPP ON PINS 1 AND 3 OF CONN. 1000
• ELECTRICAL SERVICE DIAGNOSTICS: REPLACE CDR MODULE IF "DERRn" OR "BERRn" ERROR OCCURS
YES
DISTORTION?
YES
CHECK:
• AUDIO CONNECTIONS & CABLES
• I/O BOARD
⇒ FLEX CONNECTION
⇒ +5V (pin 8 conn. 1000)
• ELECTRICAL SERVICE DIAGNOSTICS: REPLACE CDR MODULE IF "DERRn" OR "BERRn" ERROR OCCURS
NO
HEADPHONE?
NO
CHECK:
• WIRING OF HEADPHONE/IR BOARD
• ELECTRICAL SERVICE DIAGNOSTICS: REPLACE CDR MODULE IF "DERRn" OR "BERRn" ERROR OCCURS
YES
DIGITAL AUDIO OUT?
NO
CHECK:
• AUDIO CONNECTIONS & CABLES
• I/O BOARD
⇒ FLEX CONNECTION
⇒ +5V (pin 8 conn. 1000)
⇒ DIGITAL OUT TRANSFORMER 5450, IC7005
• ELECTRICAL SERVICE DIAGNOSTICS: REPLACE CDR MODULE IF "DERRn" OR "BERRn" ERROR OCCURS
YES
PLAY BACK OF CD-DA DISCS OK
CL 96532076_017.eps
290799

Figure 7-2

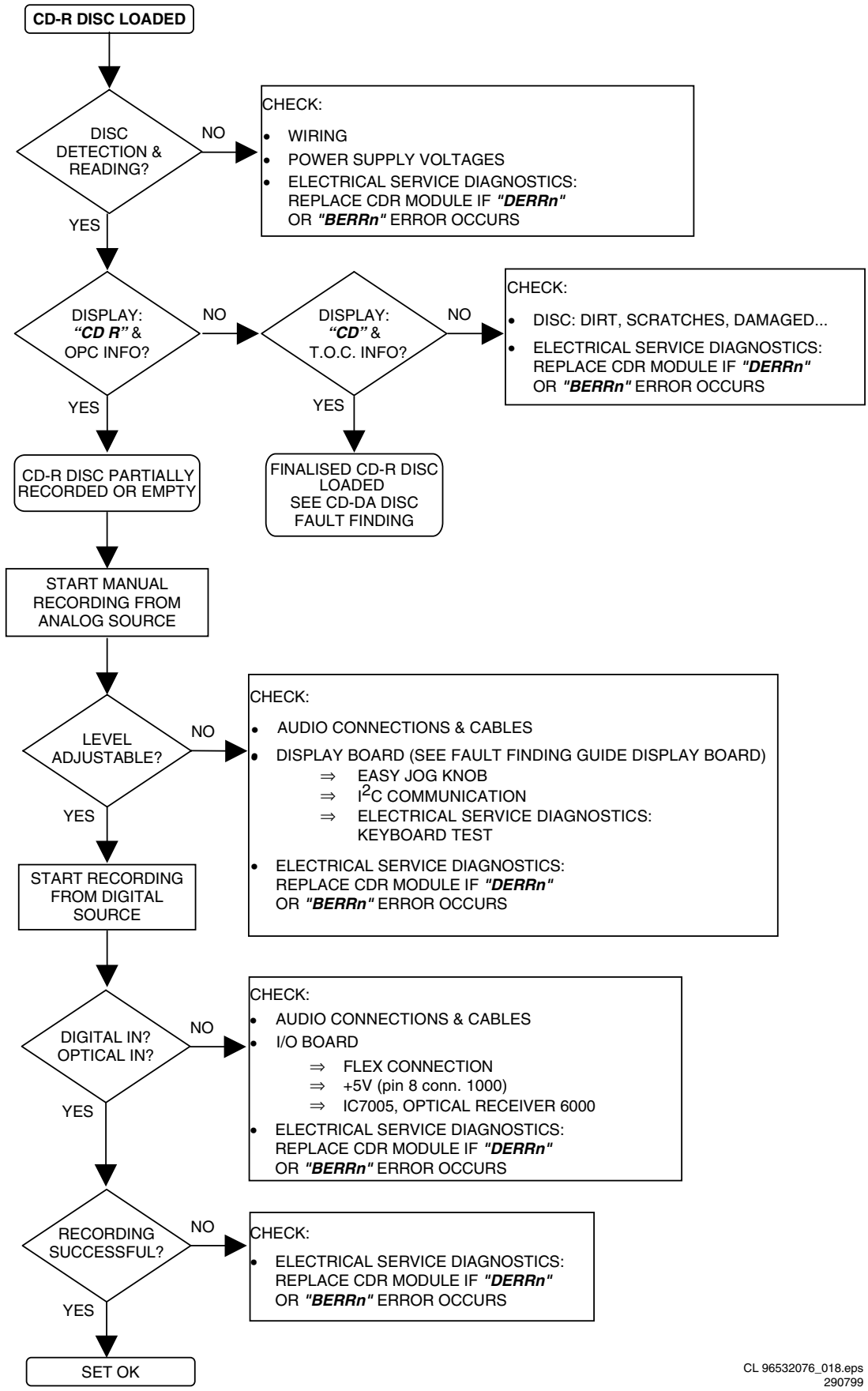

CD-R DISC LOADED
DISC DETECTION & READING?
NO
CHECK:
• WIRING
• POWER SUPPLY VOLTAGES
• ELECTRICAL SERVICE DIAGNOSTICS: REPLACE CDR MODULE IF "DERRn" OR "BERRn" ERROR OCCURS
YES
DISPLAY: "CD R" & OPC INFO?
NO
DISPLAY: "CD" & T.O.C. INFO?
NO
CHECK:
• DISC: DIRT, SCRATCHES, DAMAGED...
• ELECTRICAL SERVICE DIAGNOSTICS: REPLACE CDR MODULE IF "DERRn" OR "BERRn" ERROR OCCURS
YES
YES
CD-R DISC PARTIALLY RECORDED OR EMPTY
FINALISED CD-R DISC LOADED SEE CD-DA DISC FAULT FINDING
START MANUAL RECORDING FROM ANALOG SOURCE
LEVEL ADJUSTABLE?
NO
CHECK:
• AUDIO CONNECTIONS & CABLES
• DISPLAY BOARD (SEE FAULT FINDING GUIDE DISPLAY BOARD)
⇒ EASY JOG KNOB
⇒ I2C COMMUNICATION
⇒ ELECTRICAL SERVICE DIAGNOSTICS: KEYBOARD TEST
• ELECTRICAL SERVICE DIAGNOSTICS: REPLACE CDR MODULE IF "DERRn" OR "BERRn" ERROR OCCURS
YES
START RECORDING FROM DIGITAL SOURCE
DIGITAL IN? OPTICAL IN?
NO
CHECK:
• AUDIO CONNECTIONS & CABLES
• I/O BOARD
⇒ FLEX CONNECTION
⇒ +5V (pin 8 conn. 1000)
⇒ IC7005, OPTICAL RECEIVER 6000
• ELECTRICAL SERVICE DIAGNOSTICS: REPLACE CDR MODULE IF "DERRn" OR "BERRn" ERROR OCCURS
YES
RECORDING SUCCESSFUL?
NO
CHECK:
• ELECTRICAL SERVICE DIAGNOSTICS: REPLACE CDR MODULE IF "DERRn" OR "BERRn" ERROR OCCURS
YES
SET OK
CL 96532076_018.eps
290799

Figure 7-3

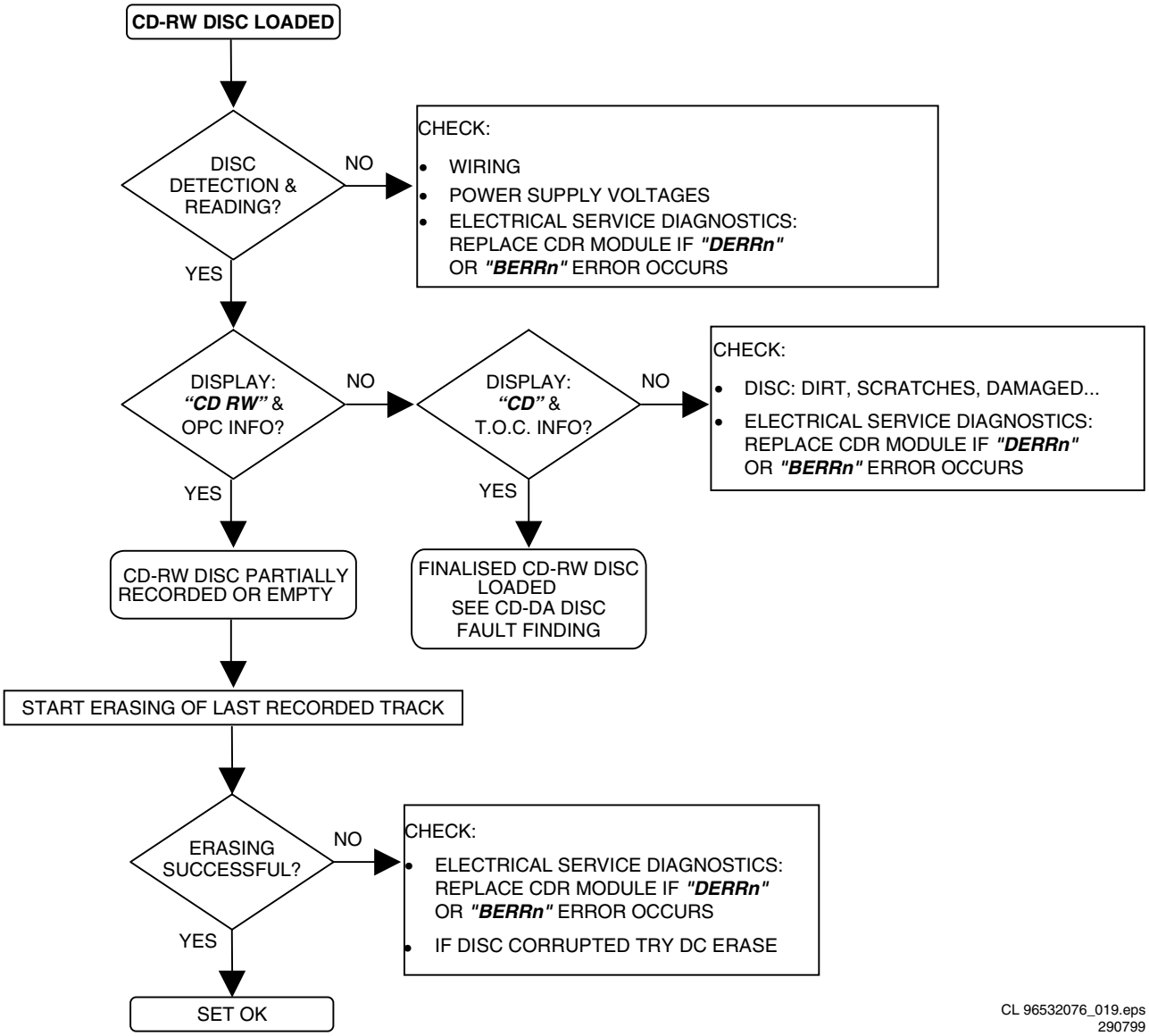
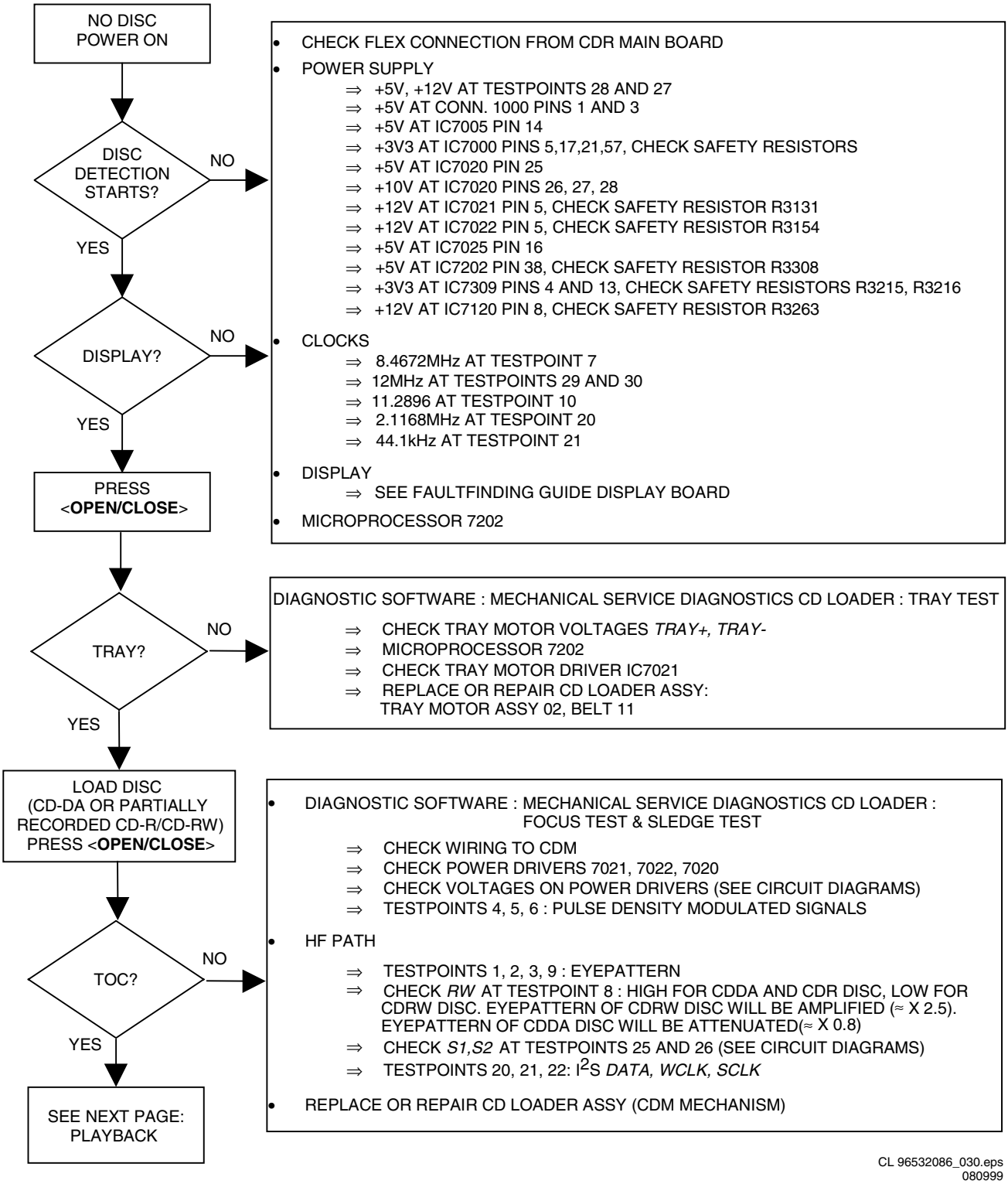

CD-RW DISC LOADED
DISC DETECTION & READING?
NO
CHECK:
• WIRING
• POWER SUPPLY VOLTAGES
• ELECTRICAL SERVICE DIAGNOSTICS: REPLACE CDR MODULE IF "DERRn" OR "BERRn" ERROR OCCURS
YES
DISPLAY: "CD RW" & OPC INFO?
NO
DISPLAY: "CD" & T.O.C. INFO?
NO
CHECK:
• DISC: DIRT, SCRATCHES, DAMAGED...
• ELECTRICAL SERVICE DIAGNOSTICS: REPLACE CDR MODULE IF "DERRn" OR "BERRn" ERROR OCCURS
YES
YES
CD-RW DISC PARTIALLY RECORDED OR EMPTY
FINALISED CD-RW DISC LOADED SEE CD-DA DISC FAULT FINDING
START ERASING OF LAST RECORDED TRACK
ERASING SUCCESSFUL?
NO
CHECK:
• ELECTRICAL SERVICE DIAGNOSTICS: REPLACE CDR MODULE IF "DERRn" OR "BERRn" ERROR OCCURS
• IF DISC CORRUPTED TRY DC ERASE
YES
SET OK
CL 96532076_019.eps
290799

Figure 7-4

7.2 CD Module

CD MODULE



CL 96532086_030.eps
080999

Figure 7-5

CD MODULE PLAYBACK

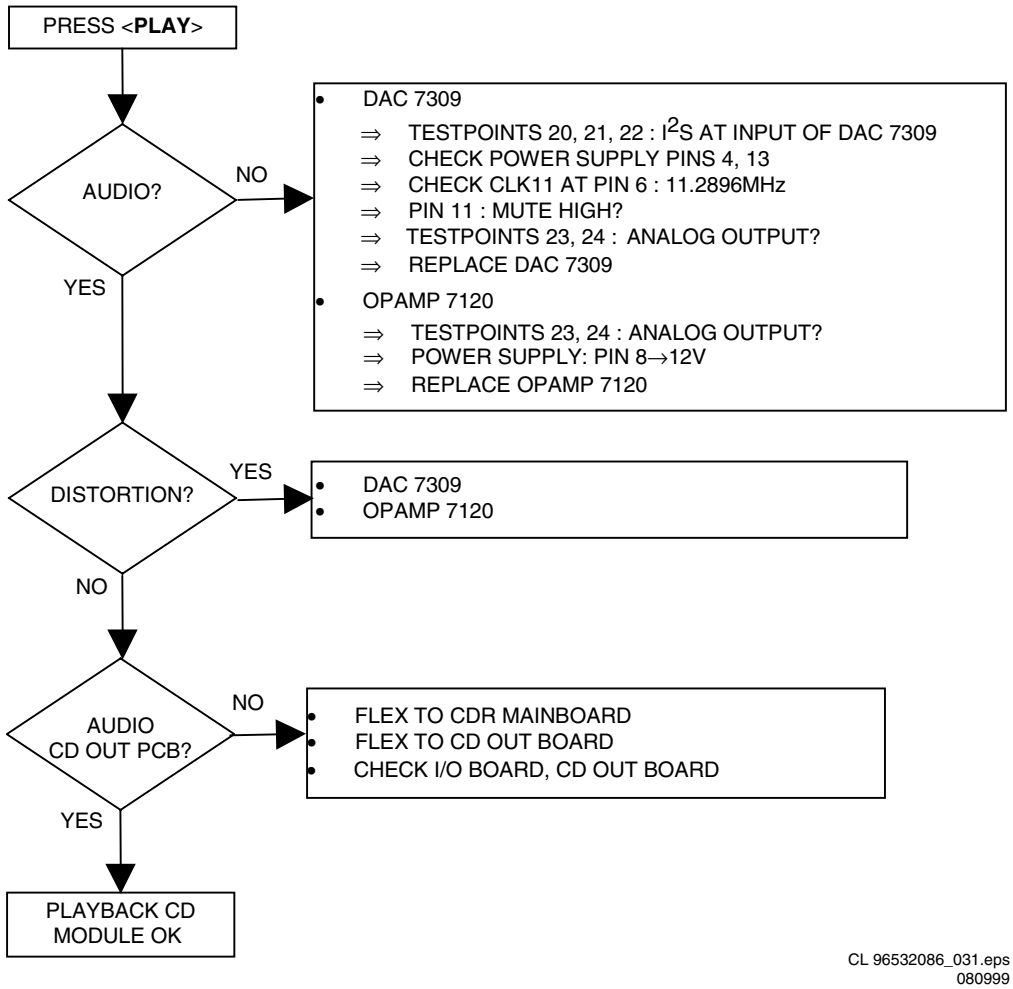


Figure 7-6

8. Faultfinding Guide

8.1 Display Board

8.1.1 Description of display board

General description

The display board has three major parts : the FTD (Fluorescent Tube Display), the display controller TMP87C874F and the keyboard. The display controller is controlled by the DASP master processor on the CDR main board. The communication protocol used is I2C. So all the information between DASP and display controller goes via the SDA or I2C DATA and SCL or I2C CLK lines. Communication is always initiated by the DASP on the CDR main board. Unlike the previous generations of CDR players, the interrupt generated by the display controller at key-press or reception of remote control is not used. Instead, the DASP polls the display controller for these events.

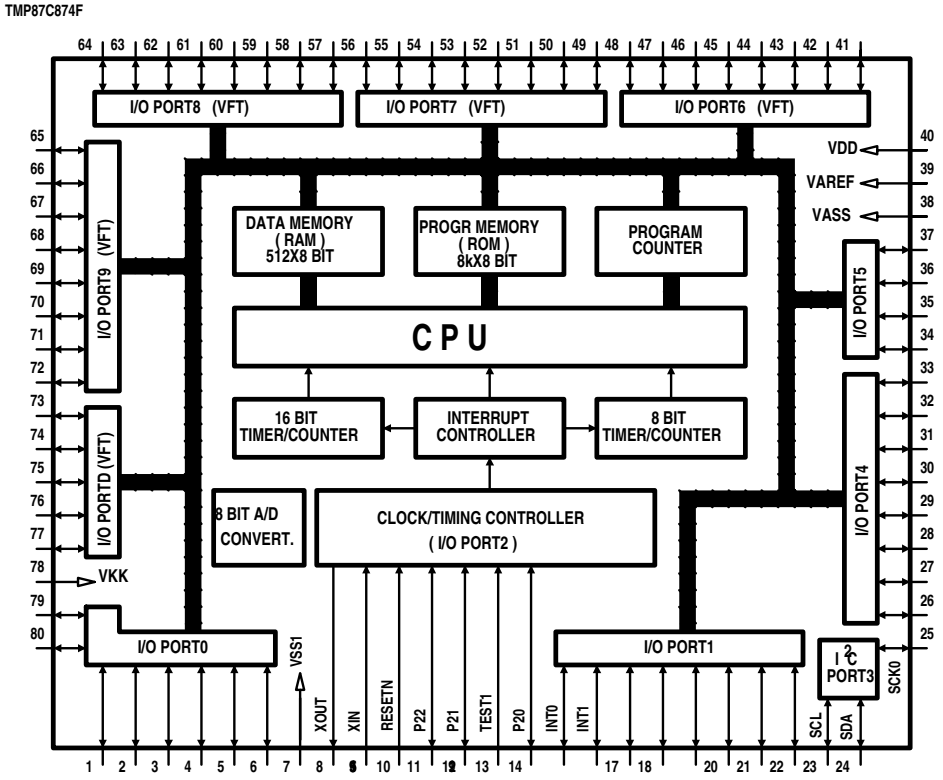
Display controller TMP87C874F

TMP87C874F (IC7104) is a high speed and high performance 8-bit single chip microprocessor, containing 8-bit A/D conversion inputs and a VFT (Vacuum Fluorescent Tube) driver. In this application, its functions are :

- slave microprocessor.
- FTD driver.
- generates the square wave for the filament voltage required for an AC FTD.
- generates the grid and segment scanning for the FTD.
- generates the scanning grid for the key matrix.
- input for remote control.

All the communication runs via the serial bus interface I2C. The display controller uses an 8MHz resonator as clock driver.

BLOCK DIAGRAM



PIN DESCRIPTIONS

INT0	external interrupt input 0
INT1	external interrupt input 1
RESETN	reset signal input, active low
SCL	I2C-bus serial clock input/output
SDA	I2C-bus serial data input/output
TEST	test pin, tied to low
VAREF	analog reference voltage input
VASS	analog reference ground
VDD	+5V
VKK	VFT driver power supply
VSS	ground
XIN, XOUT	resonator connecting pins for high-frequency clock

CL 96532076_028.eps
290799

Figure 8-1

8.1.2 Test instructions

Supply voltages

The display board receives several voltages via connector 1119 (and connector 1121 for CDR570/930).

- VFTD : -38V ±5% measured at pin 2 of conn. 1119.
- VDC1-VDC2 : 3V8 ±10% measured between pin 1 and 3 of conn. 1119.
- +5V : +5V ±5% measured at pin 10 of conn. 1119 (pin 4 of conn. 1121 for CDR770).

Voltages VFTD, VDC1 and VDC2 are produced in the power supply unit and sent to the display board via the CDR main board. The +5V voltage is produced on the CDR main board as D5V.

Clock signal

As clock driver for the display controller, a resonator of 8 MHz (1110) is used. The signal can be measured at pins 8 and 9 of the display controller : 8 MHz ±5%.

Control signals

RESET

The reset signal comes via pin 4 of conn. 1119 from the DASP master processor on the CDR main board (SYS_RESET). The reset is low active. It should be kept low during power up for at least 3 machine cycles with supply voltage in operating range and a stable clock signal (1 machine cycle = 12 x 1/Fc (8 MHz) sec.). During normal operation, the reset should be high (3V3). The high signal is 3V3 because the DASP operates on 3V3.

I2C DATA/I2C CLK

These lines connect to the DASP master processor via respectively pin 5 and pin 7 of conn. 1119 (pin 5 of conn. 1119 and pin 1 of conn. 1121 for CDR570/930). When there is no communication, they should have the high level (+5V). The oscillogram below gives an indication of how these signals should look like.

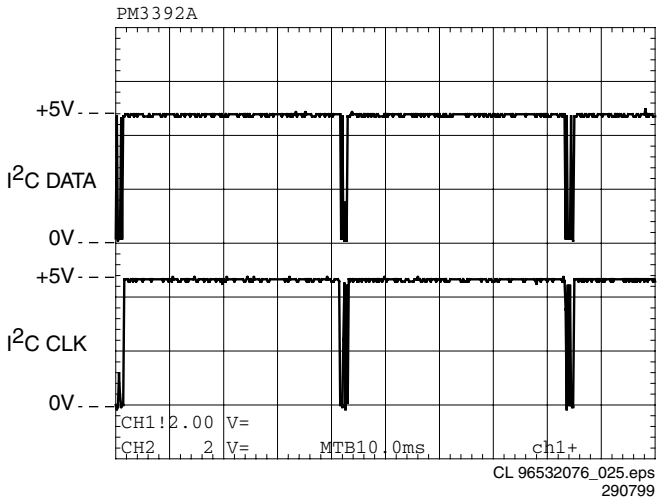


Figure 8-2 'I2C signals'

FTD drive lines

Filament voltage

Should measure 3.8V ±10% (=VDC1-VDC2) between pins 1-2-3 and pins 45-46-47 (pins 1-2 and pins 48-49 for CDR770) of the FTD (1113).

Grid lines

Level and timing of all grid lines, G1-->G15, can be checked either at the FTD itself or at the display controller. Grid lines G13, G14 and G15 each have an extra current amplifier in line : T7203 for G13, T7204 for G14 and T7100 for G15. A typical grid line signal shows in the oscillogram below.

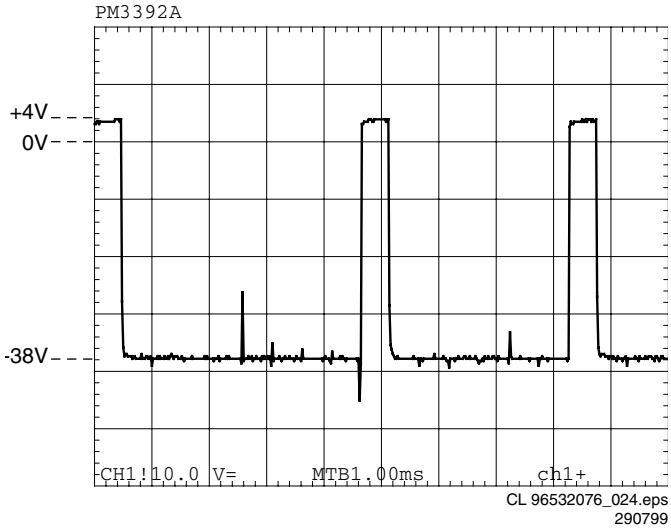


Figure 8-3 'Gridline'

Segment lines

Level and timing of all segment lines, P1-->P21 (P1-->P20 for CDR770), can be checked either at the FTD itself or at the display controller. The data on these segment lines however, depends on the characters displayed. The oscillogram below shows a segment line with data. A segment line without data maintains a -38V level.

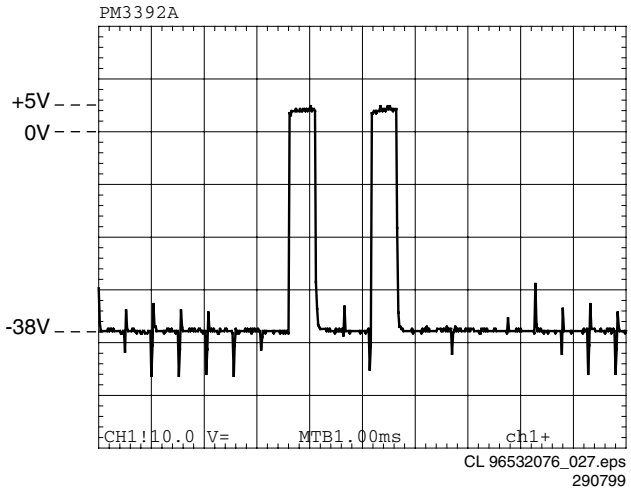


Figure 8-4 'Segment line'

Key matrix lines

The lines connected to pins 34, 35, 36 and 37 of the display controller act as matrix scanners. Without a key pressed, they maintain a low level. As soon as a key is pressed, the scanning line connected to that key puts out a scanning signal, which should look like the oscillogram below. This scanning signal goes via the pressed key to I/O port 4 of the display controller (pins 28 to 33). The display controller can now determine which key has been pressed. Without a key pressed, pins 28 to 33 of the display controller maintain a high level (+5V).

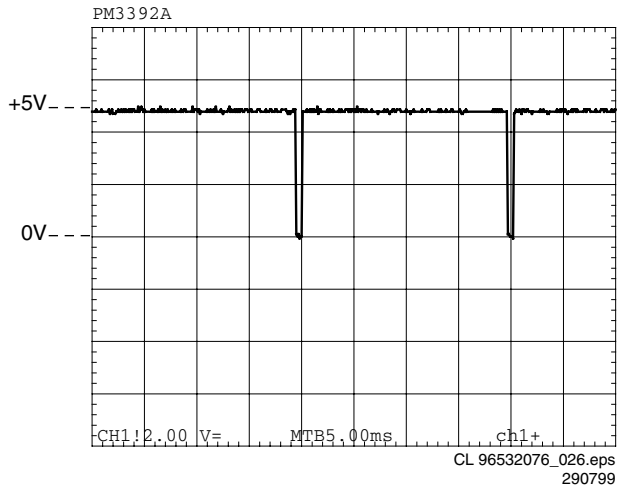


Figure 8-5 'Key matrix scan line'

Easy jog knob

Rotary operation
The easy jog knob (1050) incorporates a whole heap of user control possibilities in just one knob. Without the knob being operated, pin 1 and 3 of the knob (and thus pin 16 and 17 of the display controller), maintain the +5V level. Turning the knob clockwise briefly connects pin 1 to GND followed by pin 3.

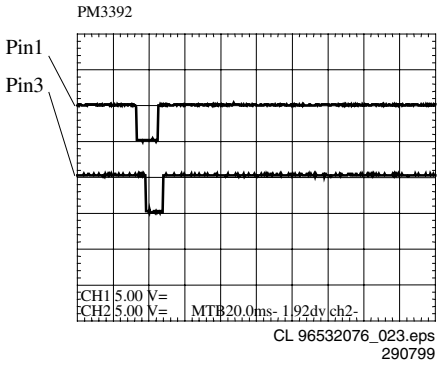


Figure 8-6 'Turn clockwise'

Turning the knob anti-clockwise briefly connects pin 3 to GND followed by pin 1.

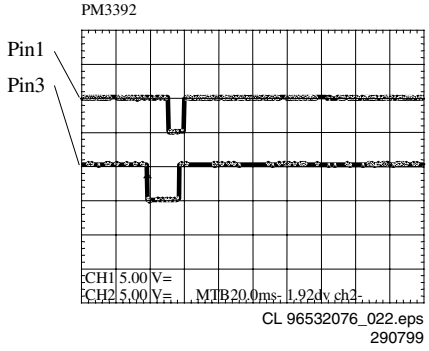


Figure 8-7 'Turn anti-clockwise'

The pulses created this way arrive at pin 16 and 17 of the display controller. The first pulse to arrive tells the controller the direction of the rotation. Counting the pulses reveals the amount of rotation. Combining and decoding this information, the display controller will execute the appropriate task.

Push button operation
This button connects to the key matrix lines and thus the operation is identical to the ordinary keys. Without being pressed, pin 4 of the easy jog maintains the low level, pin 5 the high level. When pressed the scanning signal goes through the closed contact of pins 4 and 5, and can be checked at both pins.

IR receiver - remote control
In the CDR570/930 the IR receiver TSOP1736 (6101) is mounted on the display board. In the CDR770 that same IR receiver (6200) is mounted on a small board together with the headphone socket. In the CDR775 the IR receiver (6200) is mounted on its own small board. In all versions the IR receiver connects to the display controller. The signal coming from the receiver can be checked at pin 22 of the display controller. This signal is normally high (+5V). When the remote control is being operated, pulses mixed in with the +5V can be measured. The oscillogram gives an indication of how the signal looks like with the RC being operated.

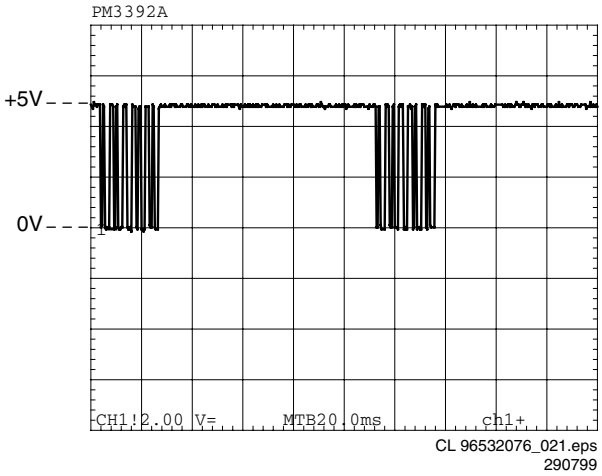


Figure 8-8 'IR receiver signal'

8.1.3 Display board troubleshooting guide

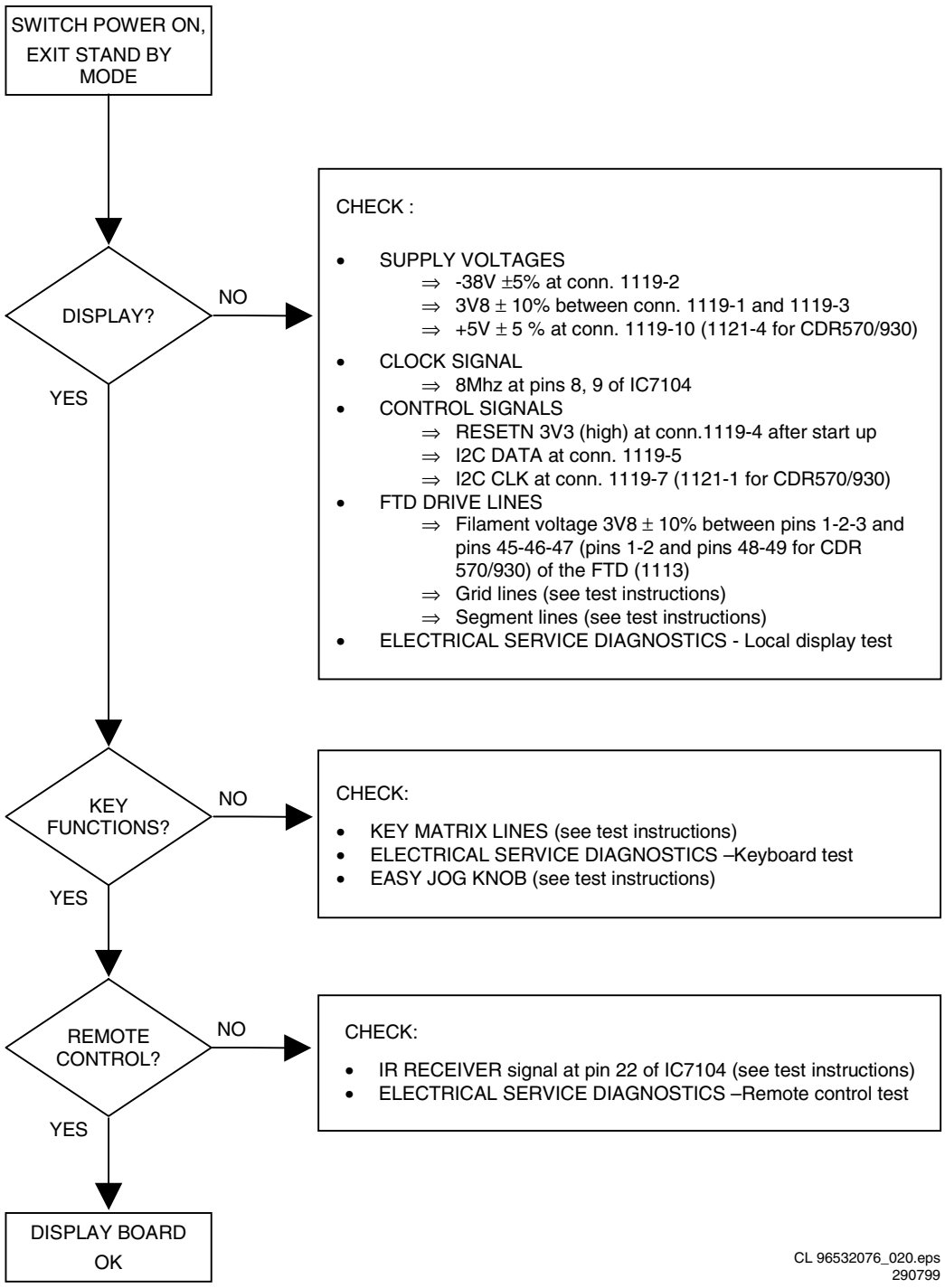


Figure 8-9 'Display board troubleshooting'

8.2 Power Supply Unit 20PS317

8.2.1 Description of PSU 20PS317

MOSFET 7125 is used as a power switch controlled by the controller IC7110. When the switch is closed, energy is transferred from mains to the transformer. This energy is supplied to the load when the switch is opened. Through control of the switch-on time, the energy transferred in each cycle is regulated so that the output voltages are independent of load or input voltage variations. The controlling device MC44603 is an integrated pulse width modulator. A clock signal initiates power pulses at a fixed frequency. The termination of each output pulse occurs when a feedback signal of the inductor current reaches a threshold set by the error signal. In this way the error signal actually controls the peak inductor current on cycle-by-cycle basis.

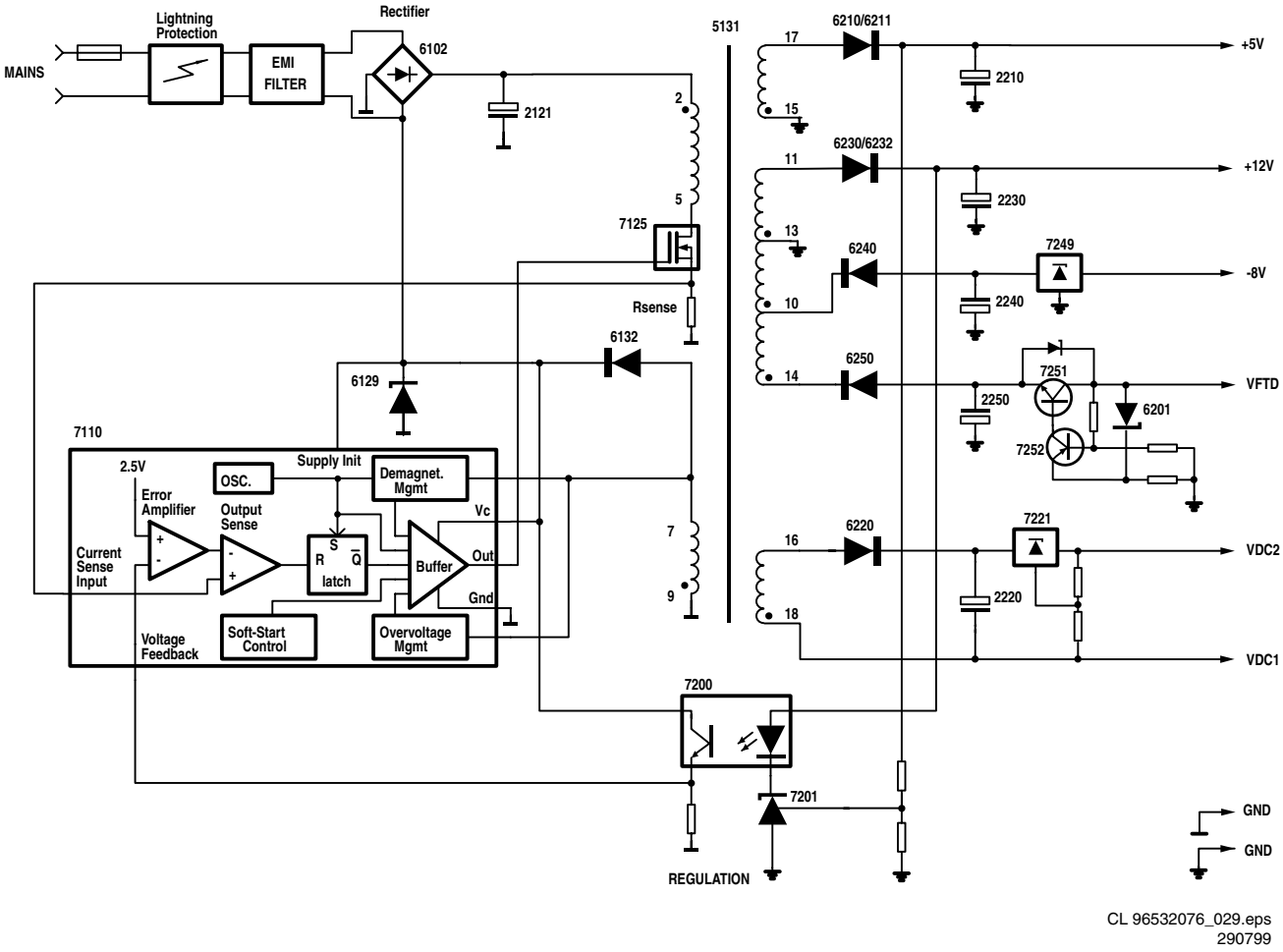


Figure 8-10 'Blockdiagram PSU 20PS317'

Description of controller MC44603

The MC44603 is an enhanced high performance controller that is specifically designed for off-line and DC-to-DC converter applications. This device has the unique ability of automatically changing operating modes if the converter output is overloaded, unloaded or shorted. The MC44603 has several distinguishing features when compared to conventional SMPS controllers. These features consist of a foldback facility for overload protection, a standby mode when the converter output is slightly loaded, a demagnetization detection for reduced switching stresses on transistor and diodes, and a high current totem pole output ideally suited for driving a power MOSFET. It can also be used for driving a bipolar transistor in low power converters. It is optimised to operate in discontinuous mode but can also operate in continuous mode. Its advanced design allows use in current mode or voltage mode control applications.

Pin connections

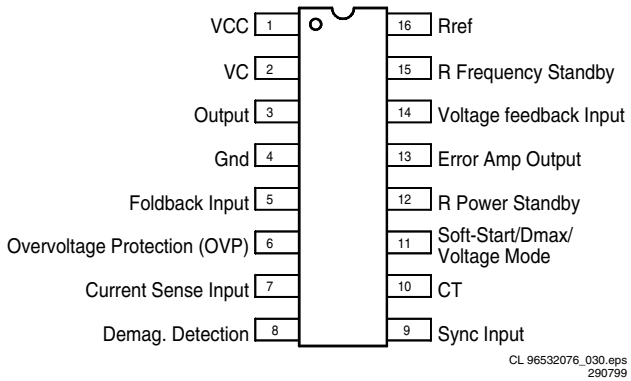


Figure 8-11

Pin function description

Pin	Name	Description
1	VCC	This pin is the positive supply of the IC. The operating voltage range after start-up is 9.0 to 14.5 V.
2	VC	The output high state (VOH) is set by the voltage applied to this pin.
3	Output	Peak currents up to 750 mA can be sourced or sunk, suitable for driving either MOSFET or bipolar transistors.
4	Gnd	The groundpin is a single return, typically connected back to the power source.
5	Foldback Input	The foldback function provides overload protection.
6	Overvoltage Protection	When the overvoltage protection pin receives a voltage greater than 2.5V, the device is disabled and requires a complete restart sequence.
7	Current Sense Input	A voltage proportional to the current flowing into the power switch is connected to this input.
8	Demagnetisation Detection	A voltage delivered by an auxiliary transformer winding provides to the demagnetisation pin an indication of the magnetisation state of the flyback transformer. A zero voltage detection corresponds to complete core saturation.
9	Synchronisation Input	The synchronisation input pin can be activated with either a negative pulse going from a level between 0.7V and 3.7V to Gnd or a positive pulse going from a level between 0.7V and 3.7V up to a level higher than 3.7V. The oscillator runs free when Pin 9 is connected to Gnd.
10	C_T	The normal mode oscillator frequency is programmed by the capacitor CT choice together with the Rref resistance value. CT, connected between Pin 10 and Gnd, generates the oscillator sawtooth.
11	Soft-Start/Dmax/Voltage-Mode	A capacitor, resistor or a voltage source connected to this pin limits the switching duty-cycle. This pin can be used as a voltage mode control input. By connecting Pin 11 to Ground, the MC44603 can be shut down.
12	RP Standby	A voltage level applied to the RP Standby pin determines the output power level at which the oscillator will turn into the reduced frequency mode of operation (i.e. standby mode). An internal hysteresis comparator allows to return in the normal mode at a higher output power level.
13	E/A Out	The error amplifier output is made available for loop compensation.
14	Voltage Feedback	This is the inverting input of the Error Amplifier. It can be connected to the switching power supply output through an optical (or other) feedback loop.
15	RF Standby	The reduced frequency or standby frequency programming is made by the RF Standby resistance choice.
16	Rref	Rref sets the internal reference current. The internal reference current ranges from 100μA to 500μA. This requires that 5.0kΩ ≤ Rref ≤ 25kΩ.

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Figure 8-12

Block diagram of MC44603

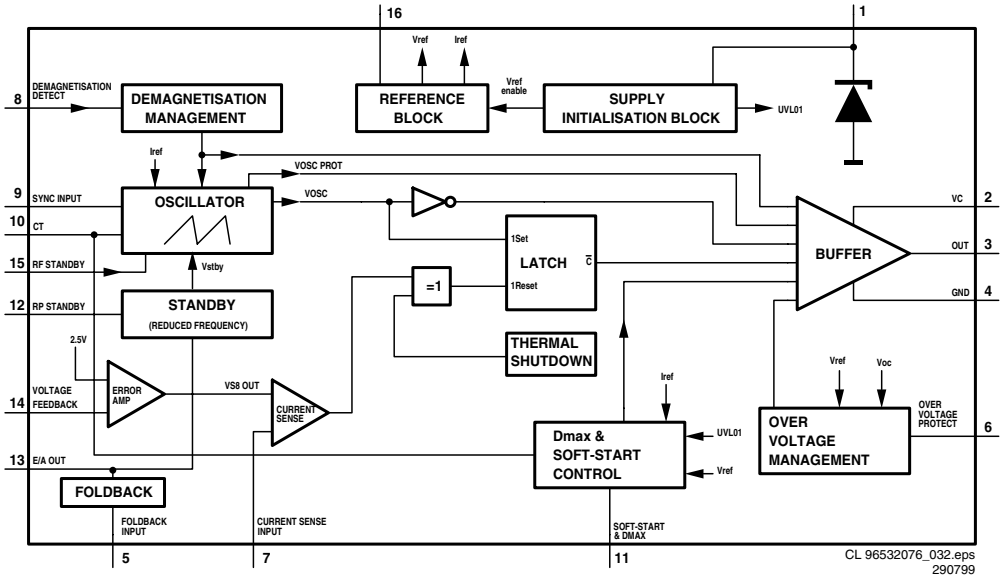


Figure 8-13

Operating description of MC44603

The input voltage Vcc (pin 1) is monitored by a comparator with hysteresis, enabling the circuit at 14.5V and disabling the circuit below 7.5V. The error amplifier compares a voltage Vfb (pin 14) related to the output voltage of the power supply, with an internal 2.5V reference. The current sense comparator compares the output of the error amplifier with the switch current Isense (pin 7) of the power supply. The output of the current sense comparator resets a latch, which is set every cycle by the oscillator. The output stage is a totem pole, capable of driving a MOSFET directly.

Start up sequence of PSU 20PS317

t1: Charging the capacitors at Vcc
C2129 will be charged via R3123 and R3134, C2133 and C2111 via R3129. The output is switched off during t1.
t2: Charging of output capacitors
When the input voltage of the IC exceeds 14.5V, the circuit is enabled and starts to produce output pulses. The current consumption of the circuit increases to about 17mA, depending on the external loads of the IC. At first, the capacitors at the Vcc pin will discharge because the primary auxiliary voltage, coming from winding 7-9 is below the Vcc voltage. At some moment during t2, the primary auxiliary voltage reaches the same level as Vcc. This primary auxiliary voltage now determines the Vcc voltage.
t3: Regulation
The output voltage of the power supply is in regulation.
t4: Overload
When the output is shorted, the supply voltage of the circuit will decrease and after some time drop below the lower threshold voltage. At that moment, the output will be disabled and the process of charging the Vcc capacitors starts again. If the output is still shorted at the next t2 phase, the complete start- and stop sequence will repeat. The power supply goes in a hiccup mode.

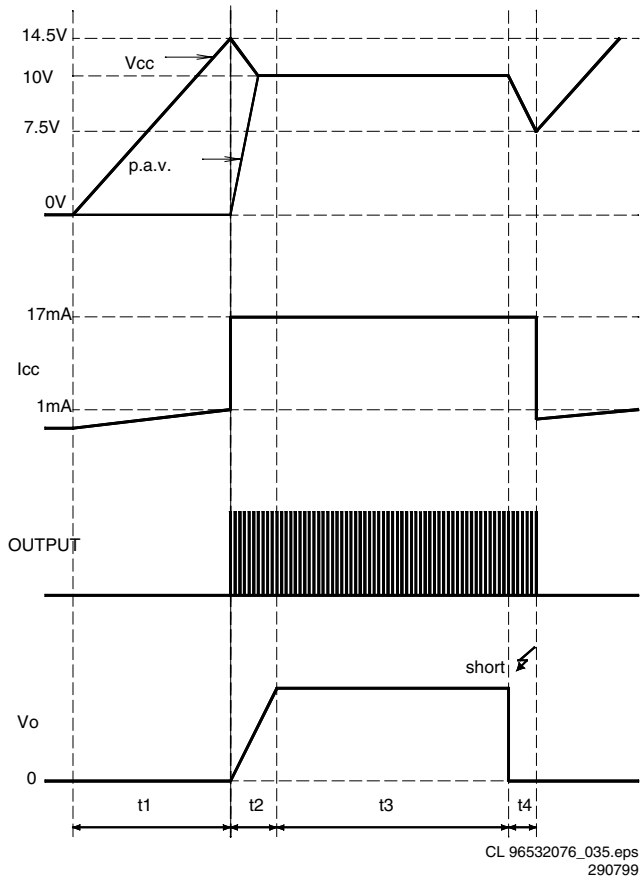


Figure 8-14 'Start-up sequence'

Regulation of PSU 20PS317

Figure 8-14 shows the most relevant signals during the regulation phase of the power supply.
The oscillator voltage ramps up and down between V1 and V2. The voltage at the current sense terminal is compared every cycle with the output of the error amplifier Vcomp. The output

is switched off when the current sense level exceeds the level at the output of the error amplifier.
TimeON phase : A drain current will flow from the positive supply at pin 2 of the transformer through the transformer's primary winding, the MOSFET and Rsense to ground. As the positive voltage at pin 2 of the transformer is constant, the current will increase linearly and create a ramp dependent on the mains voltage and the inductance of the primary winding. A certain amount of energy is stored in the transformer in the form of a magnetic field. The polarity of the voltages at the secondary windings is opposite to the primary winding so that the diodes are non-conducting in this phase.
TimeDIODE phase : When the MOSFET is switched off, energy is no longer supplied to the transformer. The inductance of the tranformer now tries to maintain the current which has been flowing through it at a constant level. The polarity of the voltage from the transformer therefore reverses. This results in a current flow through the transformer's secondary winding via the now conducting diodes, electrolytic capacitors and the load. This current is also ramp shaped but decreasing.
TimeDEAD phase : when the stored energy has been supplied to the load, the current in the secondary windings stops flowing. At this point, the drain voltage of the MOSFET will drop to the voltage of C2121 with a ringing caused by the drain-source capacitance with the primary inductance.
The oscillator will start a next cycle which consists of the above described three phases. The time of the different phases depends on the mains voltage and the load.
TimeDEAD is maximum with an input of 400VDC and a minimum load. It will be zero with an input of 100VDC and an overload.

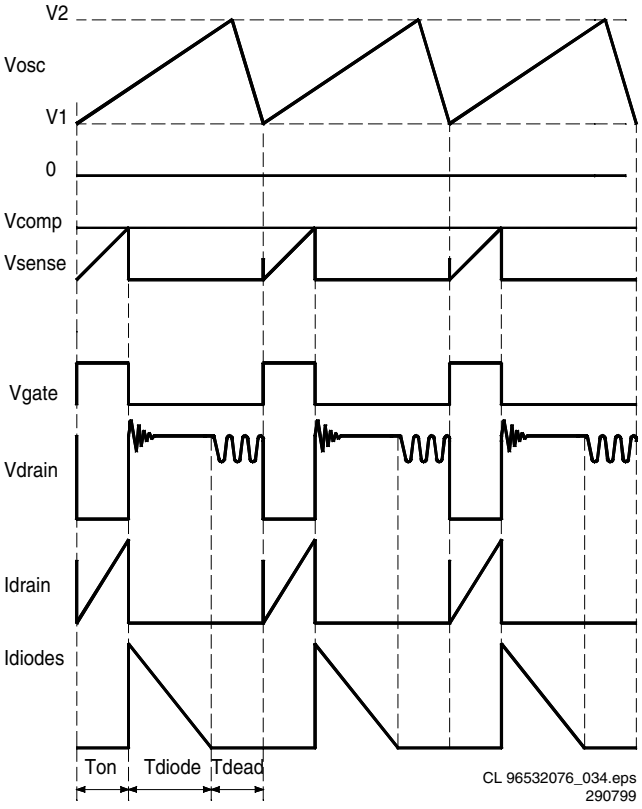
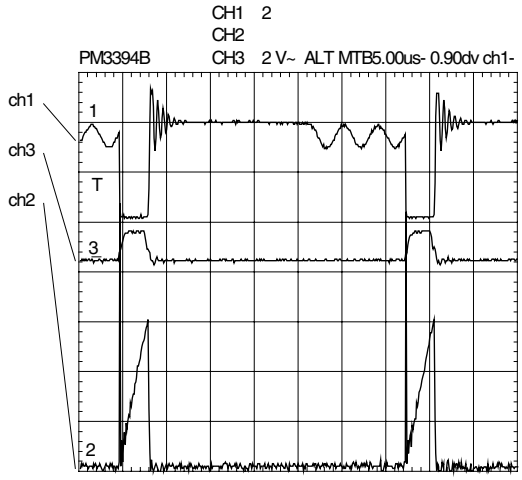
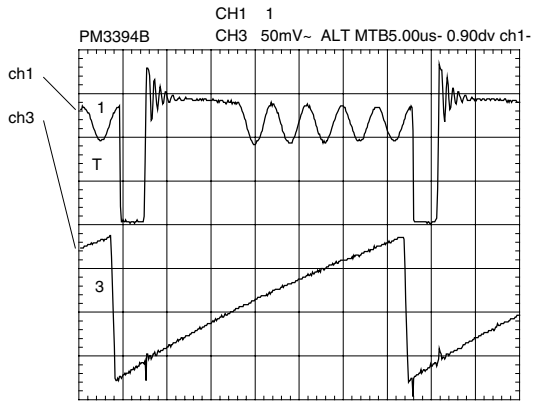


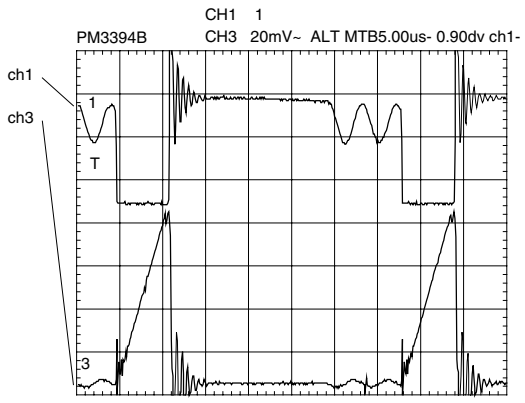
Figure 8-15 'Regulation'



ch1 : Drain voltage
ch2 : Drain current
ch3 : Gate voltage



ch1 : Drain voltage
ch2 : Oscillator voltage



ch1 : Drain voltage
ch3 : Sense voltage

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Figure 8-16 'Oscillograms'

Circuit description of PSU 20PS317

Input circuit
The input circuit consists of a lightning protection circuit and an EMI filter.
The lightning protection comprises R3120, gasarrestor 1125 and R3124. The EMI filter is formed by C2120, L5120, C2125 and C2126. It prevents inflow of noise into the mains.

Primary rectifier/smoothing
The AC input is rectified by rectifier bridge 6102 and smoothed into C2121. The voltage over C2121 is approximately 300V. It can vary from 100V to 390V.

Start up circuit and Vcc supply
This circuit is formed by R3123, R3134, C2129, D6129, R3129, R3111, C2133 and C2111.
When the power plug is connected to the mains voltage, the stabilised voltage over D6129 (24V) will charge C2133 via R3129. When the voltage reaches 14.5V across C2111, the control circuit of IC7110 is turned on and the regulation starts. During regulation, Vcc of IC7110 will be supplied by the rectified voltage from winding 7-9 via L5132, D6132 and C2133.

Control circuit
The control circuit exists of IC7110, C2102, C2104, C2107, C2109, C2110, R3102, R3103, R3104, R3107, R3108, R3109 and R3110. C2102 and R3110 define the frequency of the oscillator.

Power switch circuit
This circuit comprises MOSFET 7125, Rsense 3126, 3127 and 3128, R3125 , C2127, L5125, R3112 and R3113. R3125 is a pull-down resistor to remove static charges from the gate of the MOSFET.

Regulation circuit
The regulation circuit comprises opto-coupler 7200 which isolates the error signal from the control IC on the primary side and a reference component 7201. The TL431(7201) can be represented by two components:
a very stable and accurate reference diode
a high gain amplifier

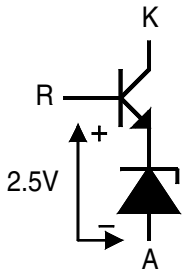

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Figure 8-17 'TL 431'

TL431 will conduct from cathode to anode when the reference is higher than the internal reference voltage of about 2.5V. If the reference voltage is lower, the cathode current is almost zero. The cathode current flows through the LED of the opto-coupler. The collector current of the opto-coupler flows through R3106, producing an error voltage, connected to voltage feedback pin 14 of IC7110.

Demagnetisation
The auxiliary winding (7-9) voltage is used to detect magnetic saturation of the transformer core and connected via R3101 to pin 8 of IC7110. During the demagnetisation phase, the output will be disabled.

Overvoltage protection circuit
This circuit consist of D6114, C2114, R3115 and R3116.
When the regulation circuit is interrupted due to an error in the control loop, the regulated output voltage will increase (overvoltage). This overvoltage is sensed at the auxiliary winding 7-9.
When an overvoltage longer than 2.0 (s is detected, the output is disabled until VCC is removed and then re-applied. The power supply will come in a hiccup mode as long as the error in the control loop is present.

Secondary rectifier/smoothing circuit
There are 5 rectifier/smoothing circuits on the secondary side. Each voltage depends on the number of windings of the transformer.
The -8V supply is regulated by voltage regulator 7249.

On/off circuit
In off mode pin 1 and pin 2 of connector 0206 are connected. The high voltage (-8V, +12V) over opto coupler 7200 forces this one to conduct. IC7110 is switched off and thus the output supply voltages.

8.2.2 Troubleshooting PSU 20PS317

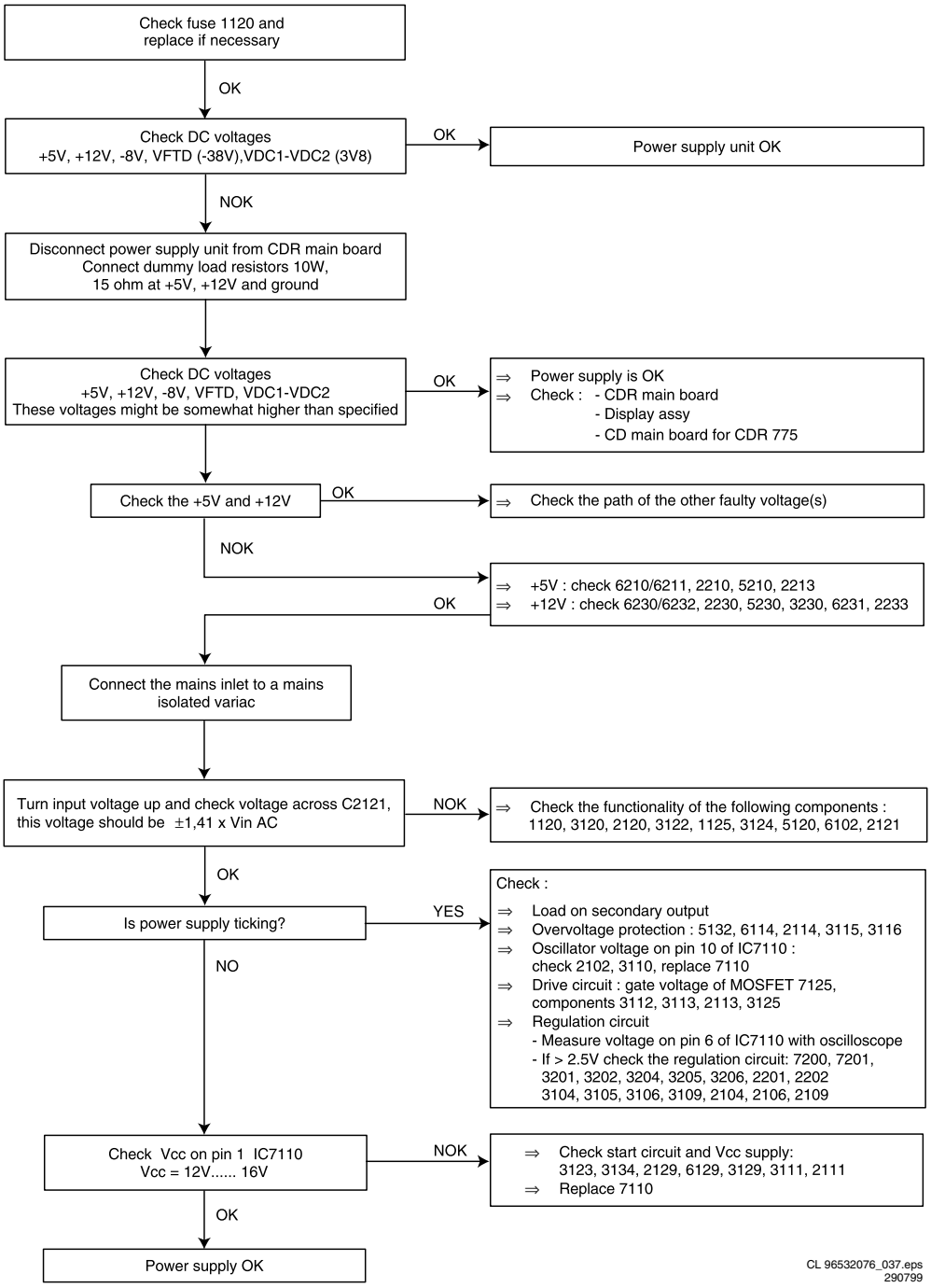

Figure 8-18

8.3 CD Main Board

The CD main board is built around the compact disc mechanism VAM1250 and a loader 1250. The CDM delivers diode signals and an unequalised high frequency signal. These signals are necessary inputs for the decoder CD10. Based on these signals the decoder will control the disc. The decoder is able to control the sledge, focus motor, radial motor and turn table. When everything is "locked", the decoder delivers a digital output according to IEC958 standard, subcode to the microprocessor and I2S for reproducing analog audio signals by means of a D/A converter.

The microprocessor controls the CD10 and is slave of the master processor on the CDR main board in the CDR775. Both processors communicate via a DSA connection (data, strobe and acknowledge).

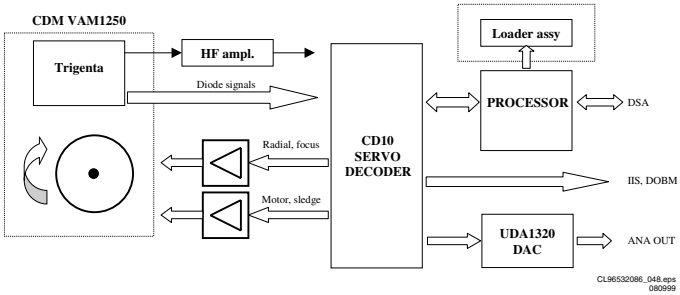

Figure 8-19

8.3.1 Supply Voltages

Description

The CD main board receives +5V and +12V from the CDR main board via respectively pin 16 and pin 15 of connector 1208. The +5V is split up into +5VHF and +5V. The +5VHF is used mainly for the diode currents and the HF-amplifier. The +5V is used for the digital part of the board. On the board a +3V3 is made from the +5V for the decoder CD10 and an A3V3 for the DAC UDA1320. The +12V is split up into A12V for the audio output stage and +12V for the power drivers of the CDM.

Measurements

Connect following supplies to next pins :

- +5V + 5% to pin 16 of connector 1208.
- +12V + 5% to pin 15 of connector 1208.
- Ground reference to pin 17 of connector 1208.

Keep microprocessor 7202 in reset by forcing pin 7 of connector 1208 to +5V. Check the following voltages :

Point	Voltage
Position 1000 pins 1,3	+5V ± 5%
Position 7000 pins 5,17,21,57	+3.3V ± 5%
Position 7005 pin 14	+5V ± 5%
Position 7020 pins 25	+5V ± 5%
Position 7020 pins 26,27,28	+10 ± 10%
Position 7021 pin 5	+12V ±10
Position 7022 pin 5	+12V ±10
Position 7025 pin 16	+5V ± 5%
Position 7202 pin 38	+5V ± 5% (other appl. 3V3 possible)
Position 7309 pins 4,13	+3V3 ± 5%
Position 7120 pin 8	+12V ± 10

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Figure 8-20

8.3.2 Clock Signals

Description

The microprocessor has its own Xtal or resonator of 12MHz. The CD10 needs a clock of 8.4672MHz + 100ppm. This speed also relates to the disc speed. To avoid locking problems between the two drives in the CDR775, both drives run on the same clock. Therefore the CD main board gets the clock for the decoder from the CDR main board via pin 2 of connector 1208. The DAC needs a system clock to drive its internal digital filters and to clock the I2S signals from the decoder. In our case this is 11.2896MHz (CL11) generated by the CD10.

Measurements

- Connect the power supply as described above in "1.1.1. Supply Voltages".
- Connect on pin 2 of position 1208 a clock signal of 8.4672 MHz (100ppm minimum rise time of 50ns and at TTL level (0V and +5V).
- Keep microprocessor 7202 in reset by forcing pin 7 at position 1208 to +5V.
- Release the reset. Now, the processor will reset the CD10 for at least 75µs.
- The output clock CL11 should be available now at pin 42 of the CD10.

Check the following frequencies :

Point	Frequency
Position 7000 pin 16	8.4672 MHz ± 100ppm
Position 7202 pins 14,15	12MHz ± 5%
Position 7309 pin 6	11.2896 MHz ± 100ppm
Position 7309 pin 1	2.1168 MHz ± 100ppm
Position 7309 pin2	44.1kHz ± 100ppm

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Figure 8-21

8.3.3 CD10 Decoder/Servo SAA7324 (7000)

Description

The CD10 is a single chip combining the functions of a CD decoder, digital servo and bitstream DAC. The decoder/servo part is based on the CD7. The decoding part supports a full audio specification and can operate at single speed (n=1) and double speed (n=2).

Block Diagram

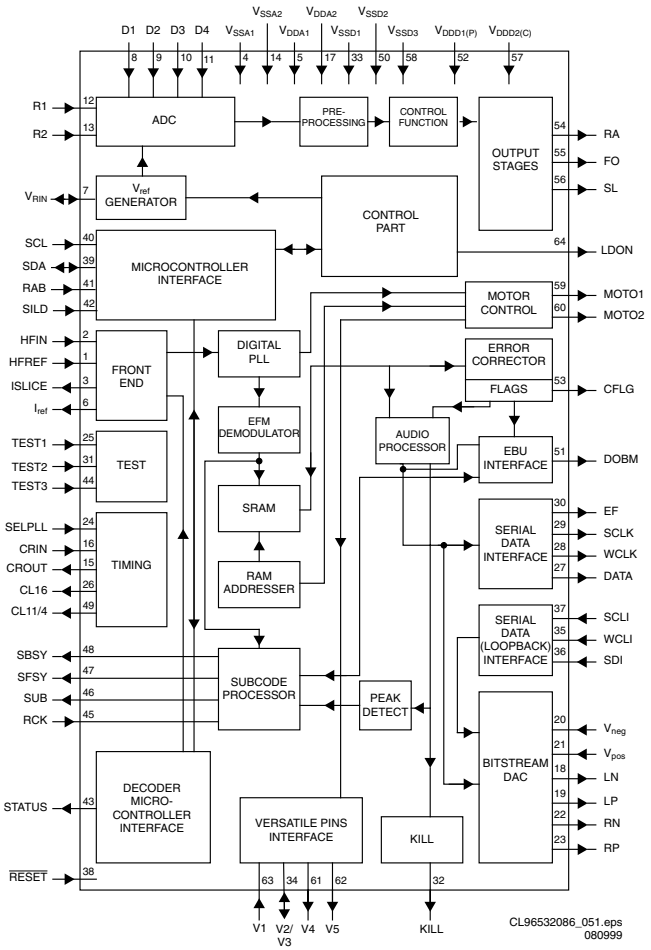

Figure 8-22

Pin Configuration

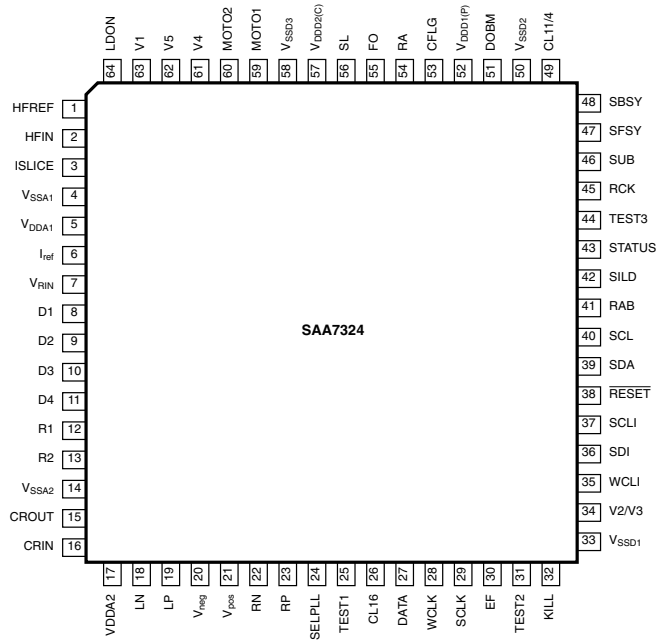

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Figure 8-23

8.3.4 TDA7073A Power Drivers (7021, 7022)

Description

The TDA7073A is a dual power driver circuit for servo systems with a single supply. In this configuration it is used to drive the sledge, tray, focus and radial.

Measurements

Keep microprocessor 7202 in reset by forcing pin 7 of connector 1208 to +5V. Connect the power supply as described above in "1.1.1. Supply Voltages". Check the following voltages :

Pin	Location	Value
5	7021	12V ± 10%
5	7022	12V ± 10%
1	7022	1.65V ± 10%
2	7022	1.65V ± 10%
6	7022	1.65V ± 10%
7	7022	1.65V ± 10%
1	7021	5.0 ± 10%
2	7021	5.0 ± 10%
6	7021	1.65V ± 10%
7	7021	1.65V ± 10%

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Figure 8-24

Pin	Location		Value DC
9	7022	FOC	5.8V ± 10%
12	7022	FOC	5.8V
13	7022	RAD	5.8V
16	7022	RAD	5.8V
9	7021	SLE	5.8V
12	7021	SLE	5.8V
13	7021	TRAY-	5.8V
16	7021	TRAY+	5.8V

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Figure 8-25

8.3.5 BA6856FP Turn Table Motor Driver (7020)

Description

This component is a 3 phase, full wave pseudo linear driving system with inbuilt Hall Bias circuit and 3 phase parallel output.

Measurements

Keep processor 7202 in reset by forcing pin 7 of connector 1208 to +5V. The outputs 9, 10, 11 of connector 1006 are 0V.
Pin 21 of the motor driver 7020 is 2.5V (10%.
Pin 22 of the motor driver 7020 is 2.5V (10%.
Pin 23 of the motor driver 7020 is 0V.
Pin 19 of the motor driver 7020 is 5V (10%.
Put the processor out of reset to continue the measurement.
Check MOT1 at pin 59 of CD10. The duty cycle of the output should be 50%. Check wave form at pin 11 of 7005-D : amplitude 5V + 5% duty cycle 50%.
The motor driver 7020 can be measured dynamically by connecting a hall motor to the application panel. Apply a pulse of 1V 10Hz and 15% duty cycle to pin 22 (Ec) as input value with reference to pin 21 (Ecr=2.5V). Measure the output signals on the driver. This will give as response a square wave on pin 17 and pin 18. When a positive voltage is applied, the square wave on pin 17 will go ahead of the square wave on pin 18. All signals will have a value as shown in the truth table. Check the following output signals :

Motor controller truth table

Input conditions conn 1006 pin						Outputs conn 1006			Test points on driver		
6	8	4	7	3	2	9	10	11	18	17	16
U+	U-	V+	V-	W+	W-	UCOIL	VCOIL	WCOIL	HALL_U	HALL_V	HALL_W
L	M	H	M	M	M	6V	0V	0V	0V	5V	
H	M	L	M	M	M	0V	6V	6V	5V	0V	
M	M	L	M	H	M	0V	6V	0V		0V	5V
M	M	H	M	L	M	6V	0V	6V		5V	0V
H	M	M	M	L	M	0V	0V	6V	5V		0V
L	M	M	M	H	M	6V	6V	0V	0V		5V

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Figure 8-26

Hall-elements input signal voltage levels

Input voltage	Level	Tolerance	Unit
H	2.8	0.1	V
M	2.5	0.1	V
L	2.2	0.1	V

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Figure 8-27

8.3.6 Tray Control

Description

The tray control consists of a TDA7073A power driver (7021) controlled by the processor 7202 via pin 19 TRAYIN and pin 20 TRAYOUT. If pin 20 is low and pin 19 high, the TRAY+ signal at pin 16 of 7021 is forced to +8V and the TRAY- signal at pin 13 of 7021 to GND : the tray will open. If pin 20 is high and pin 19 low, TRAY+ becomes GND and TRAY- becomes +8V : the tray will close. If pin 19 and 20 of the processor have the same value, TRAY+ and TRAY- will have the same value as well : the tray stops moving.

Measurements

Keep procesor 7202 in reset by forcing pin 7 of connector 1208 to +5V. Connect a load of 15Ω, 7W between pin 3 and 4 of connector 1002. Check the voltage over the load with TRAY+ (pin 3) as positive reference. Check also the levels of pins 19 and 20 of the processor.
U TRAY+,TRAY- = <100mV
Pin 20 = +5V
Pin 19 = +5V
Force pin 20 of the processor to ground, and check the voltages.
U TRAY+,TRAY- = -6.5V(10%
Pin 20 = +0V
Pin 19 = +5V
Force pin 19 of the processor to ground as well and check the levels again.
U TRAY+,TRAY- = <100mV
Pin 20 = +0V
Pin 19 = +0V
Release pin 20 of the processor and check the levels.
U TRAY+,TRAY- = 6.5V(10%
Pin 20 = +5V
Pin 19 = +0V
Release pin 19 of the processor and check the levels again:
U TRAY+,TRAY- = <100mV
Pin 20 = +5V
Pin 19 = +5V

8.3.7 HF Path

Description

The pre-amplified HF-signal is presented to both n=1 and n=2 amplifier circuits. The mux/demux switches via software and micro processor controlled S1 and S2 lines between either one of the amplified n=1 or n=2 signals. The signal will then follow another amplification and filtering circuit. The filtering again is controlled by the S1 and S2 lines, dependant on whether the disc starts up (speed n=1, S1 and S2 Low), disc plays at speed n=1 (S1 Low, S2 High) or disc plays at speed n=2 (S1 and S2 High).

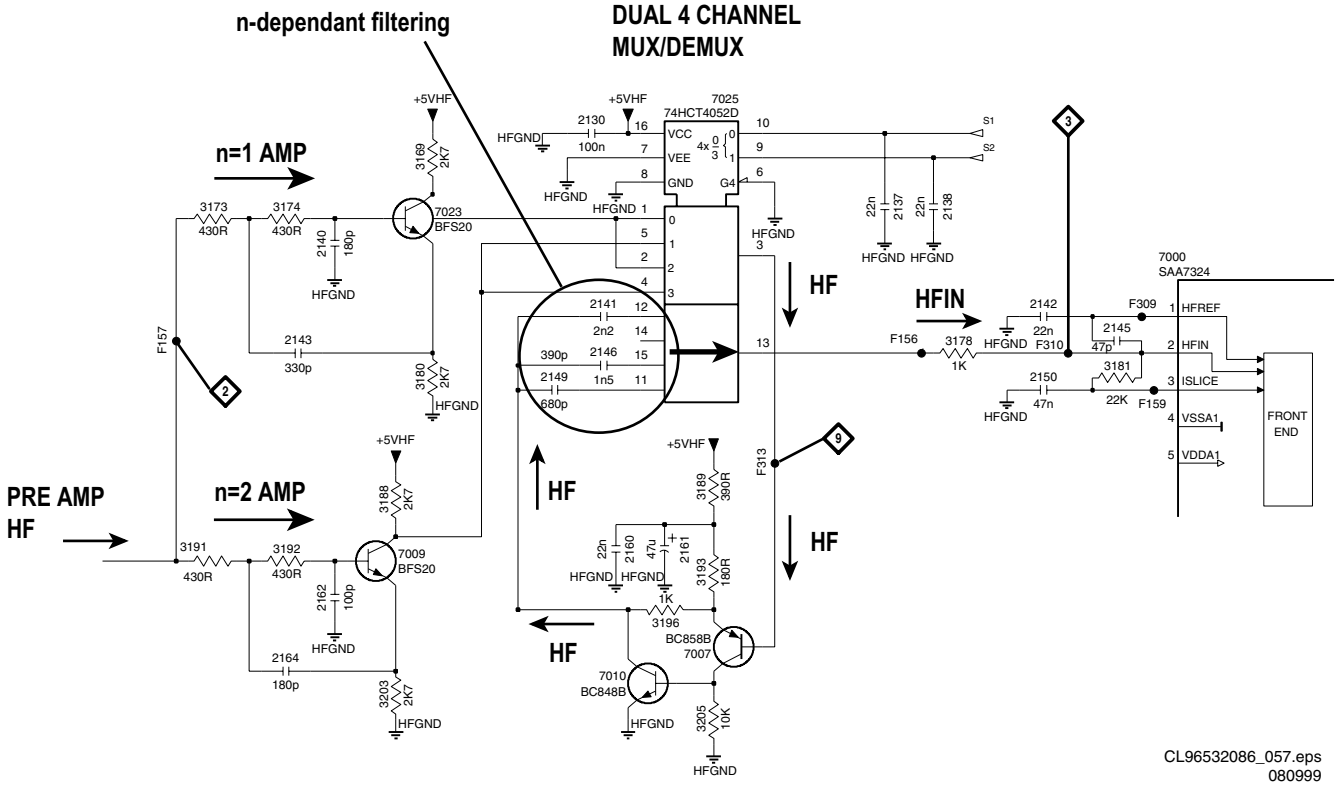

Figure 8-28

DC Settings

Set the power and reset connections as described above in "1.1.1. Supply Voltages". Check the following voltages :

Force	Pin	Location	Measure
	Emitter	7006	2.4 ± 10%
S1 and S2 “HIGH”	Collector	7010	1.9 ± 10%
S1 and S2 “LOW”	Collector	7010	1.9 ± 10%
S1 and S2 “HIGH”	13	7025	1.6 ± 10%
S1 and S2 “LOW”	13	7025	1.6 ± 10%
S1 and S2 “HIGH”	3	7025	3.2 ± 10%
S1 and S2 “LOW”	3	7025	3.2 ± 10%

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Figure 8-29

Transfer Characteristics
Set the power and reset connections as described above in "1.1.1. Supply Voltages". Connect a function generator via a serial resistor of 1k5 to pin 4 of connector 1000. Use the function generator as a sine wave generator with output level of 1Vtt. Check this AC value with an AC mV-meter connected to the input (pin 2) of the CD10 (7000) :

Frequencies	S1 and S2 "low"		S1 and S2 "high"	
	Input V_{AC}	Pin 2 at 7000	Input V_{AC}	Pin 2 at 7000
300 Hz	200mV	< 100mV ± 20%	200mV	< 100mV ± 20%
10 kHz	200mV	295mV ± 20%	200mV	330mV ± 20%
100 kHz	200mV	310 mV ± 20%	200mV	330 mV ± 20%
300 kHz	200mV	385 mV ± 20%	200mV	335 mV ± 20%
800 kHz	200mV	655 mV ± 20%	200mV	485 mV ± 20%
1.5 MHz	200mV	1.1V ± 20%	200mV	760 mV ± 20%
3MHz	200mV	1.1V ± 20%	200mV	1.1V ± 20%

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Figure 8-30

HFDET Setting
Set the power and reset connections as described above in "1.1.1. Supply Voltages". Connect a function generator via a serial resistor of 1k5 to pin 4 of connector 1000. Use the function generator as a sine wave generator with output level of 500 kHz, 1Vtt. Check this AC value with an AC mV-meter :

Location	Voltage DC		Voltage AC
	No HF	HF	
F190	4.8V± 20%	4.8V± 20%	175mV± 20%
F192	< 100mV	1.1V± 20%	-
F206	4.9V± 20%	150mV± 20%	-

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Figure 8-31

8.3.8 Audio Part - DAC

Description
The DAC used, is the UDA1320 bit stream, continuous calibration. I2S signals from various formats can be entered at pins 1,2 and 3. If these signals are in phase with the delivered system clock at pin 6, the DAC will reproduce analog output signals at pins 14 and 16. 0dB level is 0.85Vrms. These analog signals are at 1.65Vdc level.
The DAC has features which can be checked on the input pins. Mute will switch off the analog signals. De-emphasis is not used, since this is done in the decoder. Attenuation of -12dB is not used because this is also done in the decoder.

I2S
I2S is a kind of digital audio format, consisting out of 3 lines : CLOCK, WORDSELECT and DATA.

WORD-SELECT
Word select (WS) indicates whether the data-sample is from the left or the right audio-channel. It has the same frequency as the sample rate of the digital audio signal. This can be 32, 44.1 or 48kHz. Normal polarity is low for a left sample and high for a right sample. So within the low state of the WS-line the data bits for the left channel are transferred, and within the high state the data bits of the right channel are transferred.

CLOCK
The CLOCK signal (CLK) indicates when DataTips must be set, and when DataTips must be read. The frequency depends on the speed of the I2S-bus, but is always a factor of the frequency of the WS-signal. It can be 48x, 64x, 96, 128x... .In our case it is 48x the sample rate frequency = 2.1168MHz. The signal is in phase with the WS-signal. Transition of the WS always happens on a falling edge of the CLK.

DATA
DATA contains all data-bits. Data bits are set by the transmitting device, and read by the receiving device. The position of the DATA-bits within the WS-signal is very important. There are several formats for this. In our case we always use Philips I2S format, no Japanese or Sony format. The number of data-bits per channel depends on the used devices.

Timing of the I2S-bus, in case of Philips I2S is shown in the next figure :

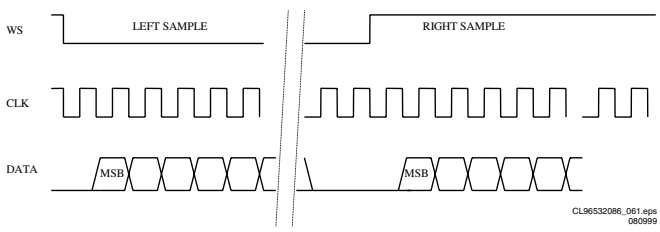

Figure 8-32

Measurements

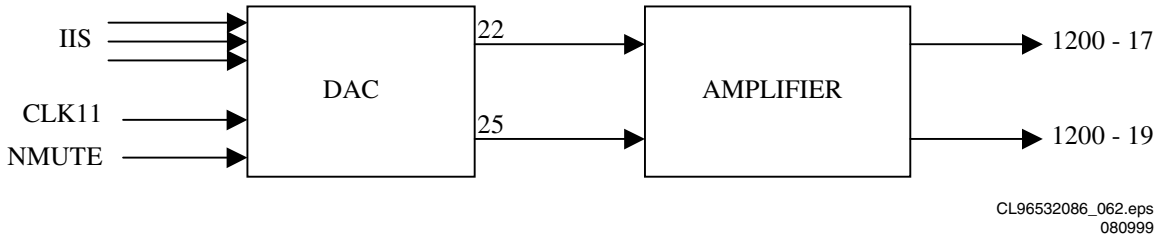

Figure 8-33

Keep processor 7202 in reset by forcing pin 7 of connector 1208 to +5V. This puts the processor outputs in tristate. Check the reset at pin 4 of processor 7202 to make sure that the processor is in reset.
Now, force port 0-4 pin 33 at 7202 to 0V to set the decoder outputs (SCLK, WCLK, DATA, and CL11).
Check the MUTE pin 11 at 7309 : this pin should be low.
Connect via an I2S generator I2S-signals to the DAC :
Pin 1 at 7309: SLCK.
Pin 2 at 7309: WCLK.
Pin 3 at 7309: DATA.
Connect also the SYSCLK pin 6 at position 7309 to a clock signal of 11.2896 MHz (100ppm.
Generate an I2S signal equivalent with a sine wave of 1kHz at 0dB for both left and right channels.
Check if 0.8 VRMS at pins 14 and 16 at location 7209 with a DC of 1.65VDC.
Check if 1.7 VRMS (2 dB at connector pins 1and 3 at location 1209.
Force MUTE Pin 11 at 7309 high.
Measure again at pins 1 and 3 at location 1209 : both signals should be at -90 dB.

9. List of Abbreviations

SIGNAL NAME	SIGNAL FLOW	FUNCTION AND DESCRIPTION
+12V	main supply voltage from PSU	+12V supply voltage from PSU
+12VA	supply voltage	+12V supply voltage for Audio part
+5V	main supply voltage from PSU	+5V supply voltage from PSU
+5VA	supply voltage	+5V supply voltage for Audio part
+9SRVPWR	IC7558 ->- IC7240	PoWeR supply for SeRVo driver IC
12VPWR	supply voltage	+12V supply voltage for servo part
-8V	main supply voltage from PSU	-8V supply voltage from PSU
-8VA	supply voltage	-8V supply voltage for Audio part
A(1:20)	IC7701 -> R3818,R3819, R3820, R3821, R3897 -> IC7703	Address lines 1 to 20 between DASP and flash ROM
A(10:20)	IC7701 -> R3819, R3820, R3821 -> IC7702	Address lines 10 to 20 between DASP and DRAM
A1	IC7010 -> IC7270	amplitude of the “land” reflection relative to the average EFM, voltage output, OPC input
A1LF, A2LF	CONN1000 -> IC7010	satellite photo diodes A1, A2 current output
A2	IC7010 -> IC7270	amplitude of the “pit” reflection relative to the average EFM, voltage output, OPC input
A-8V	supply voltage	-8V supply voltage for servo part
AEGER		Analog Error signal GEnerator for Recordable
AINTON	IC7008 -> IC7010	Alpha INTegrator ON (to AEGER)
ALE	IC7270 -> R3213 -> IC7209, IC7300IC7270 -> R3230	Address Latch Enable; external address latch strobe line, freeze address when low
ALPHA0	IC7270 -> IC7010	analog voltage mode output from OPC D/A converter
ALS	IC7008 -> IC7010	Alpha Loop Switch (to AEGER)
ASTROBE	IC7008 -> IC7010	Alpha STROBE (to AEGER)
ATIP		Absolute Time In Pre-groove (sync signal)
ATIPSYNC	IC7300 -> IC7270	ATIP SYNC signal
ATT	IC7270 -> R3717, R3722IC7270 -> IC7701	ATTenuation request from MACE2 to audio DAC, active low; means that the output can be attenuated in case of search activities
B1LF, B2LF	CONN1000 -> IC7010	satellite photo diodes B1, B2 current output
BCLK	IC7701 -> R3898A -> IC7300	I2S1 BitCLocK from DASP to CDR60 (playback and record)
BE_RESET	IC7701 -> R3261 -> IC7270IC7701 -> R3716	Basic Engine RESET, active high
BIASC	IC7008 -> R3056	BIAS Current switch CDRW output
BKPT	CONN1819, R3907 -> IC7701	JTAG mode select / debug mode BreaKPoinT
C1LF, .. , C4LF	CONN1000 -> IC7010	Central photo diodes C1, C2, C3, C4 current output
CAGAIN	R3016,R3115 -> IC7010	set-point laser power on disc, current input
CAHF	CONN1000 -> C2374	Central Aperture (central photo diodes) High Frequency current output (C1+C2+C3+C4)
CALF	IC7010 -> IC7270	Central Aperture (central photo diodes) Low-pass Filtered signal (DC coupled EFM signal), voltage output, OPC input
CAS0	IC7701 -> IC7702	Column Address Strobe DRAM for upper byte
CAS1	IC7701 -> IC7702	Column Address Strobe DRAM for lower byte
CDR	IC7008 -> IC7355	CDR strategy detected output (active high)
CDR60CFLG	IC7300 -> R3382B -> CONN1812	serial output of error corrector status information of the CDR60-decoder, to be measured at test connector
CDR60CL1	IC7300 -> R3382C -> CONN1812	output of CLock signal for testing system clock of IC CDR60 at test connector
CDR60CS	IC7270 -> R3235B -> R3702, IC7300	CDR60 Chip Select, active high
CDR60INT	IC7300 -> IC7270	CDR60 INTerrupt line, active low
CDR60LWRT	IC7300 -> R3048	CDR60 Laser WRiTe control output

CDR60MEAS1	IC7300 -> R3382A -> CONN1812	serial output of information about jitter, PLL frequency and asymmetry of bit recovery block in CDR60, to be measured at test connector
CDR60PLL	IC7270 -> R3305 -> IC7300	CDR60 clock multiplier enable, active high
CDRW	IC7355D -> IC7355CIC7355D -> CONN1000	inverted CDR-strategy-detected signal
CLK_OUT	IC7701 -> R3771 -> CONN1819	system CLocK OUT
CLK_SYS	IC7701 -> R3727, R3731	oscillator output
COS-	CONN1220 -> IC7225B	Hall feedback signal from sledge motor
COS+	CONN1220 -> IC7225B	Hall feedback signal from sledge motor
CSFLASH	IC7701 -> IC7703	Chip Select for FLASH or boot device
CSRAM	IC7270 -> R3235A -> R3703, IC7802	Chip Select SRAM, active low
D(16:31)	IC7701 <-> R3822, R3823, R3824, R3825 <-> IC7703, IC7702	Databus bit 16 to 31 between DASP, flash ROM and DRAM
D3V3	supply voltage	+3,3V supply voltage for Digital part
D5V	supply voltage	+5V supply voltage for Digital part
D5VS	supply voltage	+5V supply voltage for Servo part
DALPHA	IC7010 -> R3037	ALPHA error signal for laser power control
DASP		Digital Audio Signal Processor
DATAI	IC7701 -> R3898C -> IC7300	I2S1 DATA In from DASP to CDR60 (recording)
DATAO	IC7300 -> R3314 -> IC7701	I2S1 DATA Out from CDR60 to DASP (playback)
DEEMP	IC7270 -> R3719, R3724IC7270 -> IC7701	DE-EMphasis control for audio DAC from MACE2, active high; means that de-emphasis is needed in digital filter
DELTAP	IC7016 -> R3126	DELTA Power current source drive signal from XDAC
DIG_OUT_C	IC7701 -> R3706 -> C2707, CONN1400	Common DIGital OUTput (consumer)
DISPLAY_INT	F934 -> R3812, IC7701	DISPLAY INTerrupt
DMON	IC7270 -> R3324	power save at stop, active low
DOBM_CD	CONN1708, C2731 -> R3757 -> R3903 -> IC7701	Digital Output (EBU output) from CD player in CDR775 to DASP
DOBM_CDR	IC7300 -> R3382D -> C2379, IC7701	Digital Output (EBU output) from CDR60 to DASP
DRAM_RW	IC7701 -> IC7702	Read/Write strobe for DRAM
DSA_ACK_CD	IC7701 <-> R3830 <-> R3831 <-> CONN1708IC7701 <-> R3830 <-> C2735	Data/Strobe/Acknowledge serial communication between DASP and CD-player in CDR775
DSA_ACK_CDR	IC7701 -> R3729 -> IC7270, CONN1830IC7701 -> R3729 -> R3769	Data/Strobe/Acknowledge serial communication between MACE2 and DASP for CDR; acknowledge input for MACE2 is strobe output for DASP
DSA_DATA_CD	IC7701 <-> R3828 <-> R3829 <-> CONN1708IC7701 <-> R3828 <-> C2733	Data/Strobe/Acknowledge serial communication between DASP and CD-player in CDR775
DSA_DATA_CDR	IC7270<->R3246 <-> R3813 <-> IC7701, CONN1830IC7270<->R3246 <-> R3767	Data/Strobe/Acknowledge serial communication between MACE2 and DASP for CDR
DSA_STR_CD	IC7701 <-> R3835 <-> R3832 <-> CONN1708IC7701 <-> R3835 <->C2734	Data/Strobe/Acknowledge serial communication between DASP and CD-player in CDR775
DSA_STR_CDR	IC7270 -> R3245 -> IC7701, CONN1830IC7270 -> R3245 -> R3768	Data/Strobe/Acknowledge serial communication between MACE2 and DASP for CDR (strobe output for MACE2 is acknowledge input for DASP)
DSCLK	CONN1819, R3908 -> IC7701	reset in / Debug Serial CLocK in
DSI	CONN1819, R3909 -> IC7701	JTAG reset in / Debug Serial clock In
EFM		Eight to Fourteen Modulation = modulation method used for CD storage, also the actual raw CD signal as written or read on or from the CD disc
EFMCLK	IC7300 -> IC7008	EFM CLocK output
EFMDATA	IC7300 -> IC7008	EFM DATA output
EFMTIM3		EFM TIMing generator
EPON	IC7008 -> R3010IC7008 -> C2010	Erase Power ON
EPONO	IC7008 -> R3107	Erase Power ON Open drain output
EPONRC	R3004 -> CONN1000	Erase Power ON (after RC circuit)

ERASEC	IC7008 -> R3087	ERASE Current switch CDRW output
ERON	IC7008 -> IC 7010	ERror ON (to AEGER)
EXT_DIG_IN1	CONN1400 -> IC7701	EXTernal DIGital INput 1
EXT_DIG_IN2	CONN1702, C2767, C2721 -> R3701 ->IC7701	EXTernal DIGital INput 2 (CDR950 only)
EXT_OPT_IN	CONN1400, C2722 -> R3708 -> IC7701	EXTernal OPTical INput
F_READY	IC7703 -> R3817 -> IC7701CONN1701 -> IC7701	Flash READY detection, this line is forced low as long as the flash is busy with erase or program algorithm
F_RW	IC7701 -> IC7708B	Read/Write strobe for Flash ROM
FEN	IC7010 -> IC7270	Focus Error Normalized current output
FOC-	IC7240 -> CONN1000	FOCus actuator drive signal negative connection
FOC+	IC7240 -> CONN1000	FOCus actuator drive signal positive connection
FS30V	D6500 -> CONN1000	Forward Sense diode 30V power supply
FSA	CONN1000 -> T7119, T7120	Forward Sense photo diode current output
FSCLR	IC7008 -> IC7126	Forward Sense signals CLeaR switch
FSOF	IC7008 -> R3052	Forward Sense photo diode sampling OFf
FSON	IC7008 -> R3051	Forward Sense photo diode sampling ON
FSR	R3040 -> IC7270	Forward Sense signal while Reading for read control loop
FSRS	IC7008 -> IC7126D	Forward Sense photo diode Read Sampling
FSW	R3050 -> IC7270	Forward Sense signal while Writing for write control loop
FSWS	IC7008 -> IC7126C	Forward Sense photo diode Write Sampling
FWEN	IC7270 -> IC7208, R3806	Flash EPROM Write ENable
HALL_U, HALL_V, HALL_W	IC7330 -> IC7300, CONN1812	HALL feedback signals from turn table motor via hall motor driver
HFS0	IC7270 -> R3249 -> IC7360	select HF circuit
I2C		Inter IC
I2C_CLK	IC7701, R3711 -> R3715 -> C2709 -> F934IC7701, R3711 -> IC7801	I2C CLocK line used for display slave processor and digital potmeter
I2C_DATA	IC7701, R3712 <-> R3713 <-> C2708, R3714 <-> F934IC7701, R3712 <-> IC7801	I2C DATA line used for display slave processor and digital potmeter
I2CL	R3248B -> IC7207, R3247C	I2C CLock line
I2CSCL	IC7207 -> IC7008IC7207 -> IC7010IC7207 -> R3248B	I2C Serial CLock line
I2CSDA	IC7207 <-> IC7008IC7207 <-> IC7010IC7207 <-> R3248A	I2C Serial DAta line
I2DA	R3248A <-> IC7270,R3247D	I2C DAta line
I2S_BCLK_AI	IC7701 -> R3814 -> IC7406	I2S4 Bit CLocK for CODEC (ADC for CDR950) Analog Input (record from analog source)
I2S_BCLK_AO	IC7701 -> R3894A -> IC7406	I2S2 Bit CLocK for CODEC (DAC for CDR950) Analog Output
I2S_BCLK_CD	CONN1708, C2739 -> R3834 -> IC7701	I2S3 Bit CLocK from CD player (record n=2) (CDR775 only)
I2S_BCLK_MIC	CONN1708, C2739 -> R3834 -> IC7701	I2S3 Bit CLocK from MICrophone (CDR950 only)
I2S_DATA_AI	IC7406 -> IC7701	I2S4 DATA from CODEC (ADC for CDR950) Analog Input (record from analog source)
I2S_DATA_AO	IC7701 -> R3894C -> IC7406	I2S2 DATA for CODEC (DAC for CDR950) Analog Output
I2S_DATA_CD	CONN1708, C2738 -> R3836 -> IC7701	I2S3 DATA from CD player (record n=2) (CDR775 only)
I2S_DATA_MIC	CONN1708, C2738 -> R3836 -> IC7701	I2S3 DATA from MICrophone (CDR950 only)
I2S_WS_AI	IC7701 -> R3743 -> IC7406	I2S4 Word CLocK for CODEC (ADC for CDR950) Analog Input (record from analog source)
I2S_WS_AO	IC7701 -> R3894B -> IC7406	I2S2 Word CLocK for CODEC (DAC for CDR950) Analog Output
I2S_WS_CD	CONN1708, C2740 -> R3833 -> IC7701	I2S3 Word CLocK from CD player (record n=2) (CDR775 only)
I2S_WS_MIC	CONN1708, C2740 -> R3833 -> IC7701	I2S3 Word CLocK from MICrophone (CDR950 only)
I2S1_MS	IC7270 -> R3910, IC7701	I2S1 Master-Slave interrupt from MACE2
IE	T7121 -> CONN1000	laser Erase drive current signal

INT_COPY_AN A	IC7701 -> R3721 -> IC7401IC7701 -> R3721 -> R3410	select INTernal COPY ANAlog (in case of copy protected disc or track on CD drive) (CDR775 only)
IR	T7135 -> CONN1000T7135 -> R3056T7135 -> IC7008	laser Read drive current signal
IW	T7122 -> CONN1000T7122 -> D6003	laser Write drive current signal
KEY_PRESSE D	IC7706B -> R3816 -> IC7701	KEY PRESSED interrupt
KILL	T7560, T7561, R3560 -> CONN1400, R3424, R3428	KILL signal from power supply part to audio outputs
KILL_OUT	IC7701 -> R3532	disables the KILL activity from the PSU; 1 = no kill,0 = kill active
L12V	supply voltage	+12V supply voltage for servo/Laser part
L3_CLK	IC7701 -> R3725 -> IC7406	L3 interface CLocK line / control CODEC (not for CDR950)
L3_DATA	IC7701 <-> R3728 <-> IC7406	L3 interface DATA line with CODEC (not for CDR950)
L3_MODE	IC7701 -> R3735 -> IC7406	L3 interface MODE line selects data or address transfer mode for CODEC (not for CDR950)
L5V	supply voltage	+5V supply voltage for servo/Laser part
L-5V	supply voltage	-5V supply voltage for servo/Laser part
LASCK	IC7270 <-> R3248D	ClocK line DAC LASer control
LASDACCK	R3248D <-> IC7016	ClocK line DAC LASer control
LASDACDI	R3248C <-> IC7016	Data line DAC LASer control
LASDACLD	R3212 <-> IC7016	LoaD line DAC LASer control
LASDD	IC7270 <-> R3248C	Data line DAC LASer control
LASLD	IC7270 <-> R3238 <-> R3212IC7270 <-> R3232	LoaD line DAC LASer control
LEFT	CONN1708, C2743 -> IC7401C, IC7407C	audio output LEFT channel from CD-player in CDR775
LLP	IC7270 -> IC7300	Laser Low Power (active high), switches the laser from write to read power whenever the device tends to go offtrack
LWRT	R3048 -> IC7008	Laser WRiTe control input
MA(16:17)	IC7270 <-> IC7208	bank switch higher address lines
MA(8:15)	IC7270 <-> IC7802 <-> IC7208	address bus high byte
MACE2		Mini All Cd Engine (minus decoder + OPC + PCS + extra RAM)
MAD(0:7)	IC7270 <-> IC7209 <-> IC7802 <-> IC7208 <-> IC7300	bi-directional data bus / address bus low byte
MIRN	IC7010 -> IC7270	MIRror Normalized (disc reflection) current output
MOTO1	IC7300 -> IC7355A	turn table MOTOr control output
MRDN	IC7270 -> R3276 -> R3242A, IC7802, IC7300	Master ReaD, read strobe for external peripherals, active low
MUTE	IC7270 -> R3718, R3723IC7270 -> IC7701	MUTE control from MACE2 to DASP, active low
MWRN	IC7270 -> R3280 -> R3242B, IC7802, IC7300	Master WRite, write strobe for external peripherals, active low
NMUTE	IC7701 -> R3726, IC7406	MUTE output, low active
OFFTRACK	IC7270 -> IC7300	OFFTRACK detection flag
OPC		Optimum Power Calibration
P12VKILL	supply voltage	+12V supply voltage for KILL-circuit
PCS		Position Control Sledge
PCSCOS	IC7225B, C2229 -> IC7270, CONN1812	Position Control Sledge COS feedback signal
PCSSIN	IC7225A, C2227 -> IC7270, CONN1812	Position Control Sledge SIN feedback signal
PDAR		Photo Diode Amplifier Recordable
PERASE	R3036, R3031, R3030, R3029, R3028, R3027, R3020 -> IC7002C, R3043, T7113	laser Power switch for ERASE
POWER_UP	IC7270 -> R3243C,R3556, R3538	standby pin, high level activates essential powers necessary for full function; overrules HI_POWER setting
PPN	IC7010 -> IC7050C	Push-Pull signal, Normalized, balanced, voltage output

PRCOARSE	IC7016 -> R3057	drive signal from Power Read COARSE DAC for read current source
PRFINE	IC7016 -> R3058	drive signal from Power Read FINE DAC for read current source
PROF_EBU	IC7701 -> CONN1820	PROFessional digital output (CDR950 only)
PSENn	IC7270 -> R3260 -> IC7208IC7270 -> R3231	Program Store ENable; external ROM output enable line, active low
PW	R3081 -> IC7008	Write Power signal to OPC input of MACE2
PWB	IC7001C -> IC7016	drive signal to XDAC<->s for write and erase current sources and VCAGAIN
PWD	IC7016 -> IC7002BIC7016 -> IC7002C	drive signal from XDAC for write and erase current sources
PWMAX	IC7016 -> R3073	PW MAXimum signal from DAC used for determining set point for laser power during writing
PWMIN	IC7016 -> R3072	PW MINimum signal from DAC used for determining set point for laser power during writing
PWRITE	R3035, R3026, R3025, R3024, R3023, R3022, R3021 -> IC7002B, R3044, T7124	laser Power switch for WRITE
RAD-	IC7240 -> CONN1000	Radial actuator drive signal negative connection
RAD+	IC7240 -> CONN1000	Radial actuator drive signal positive connection
RAS0	IC7701 -> IC7702	Row Address Strobe DRAM
RCK	IC7300 -> R3319 -> IC7701	EIAJ subcode clock from CDR60 to DASP (CD text interface)
RDGAIN1	IC7008 -> R3054	forward sense ReaD GAIN switch 1
RDGAIN2	IC7008 -> C2027	forward sense ReaD GAIN switch 2
RDGAIN3	IC7008 -> C2060	forward sense ReaD GAIN switch 3
RE	IC7010 -> IC7215A	Radial Error signal for fast track counting, voltage output
RECORDING	IC7008 -> IC7010IC7008 -> CONN1000IC7008 -> IC7355C	RECORDING output (active high)
REN	IC7010 -> IC7270	Radial Error Normalized current output
RIGHT	CONN1708, C2742 -> IC7401A, IC7407A	audio output RIGHT channel from CD-player in CDR775
RXD_TOOL	CONN1818 -> IC7701	Receive of UART for test TOOL
S1V65	Referenve Voltage	1.65V delivered by IC7215B for Servo part
S2V9	Reference Voltage	2.9V delivered by IC7010 for Servo part
SEL_HP_OUT	IC7701 -> R3720 -> IC7407	SELect HeadPhone OUTput in DJ-mode (for CDR775 only)
SFSY	IC7701 -> R3756 -> IC7300	EIAJ subcode synchronisation from DASP to CDR60 (CD text interface)
SIN-	CONN1220 -> IC7225A	Hall feedback signal from sledge motor
SIN+	CONN1220 -> IC7225A	Hall feedback signal from sledge motor
SL-	IC7240 -> R3265 -> CONN1220	SLedge motor drive signal negative connection
SL+	IC7240 -> CONN1220	SLedge motor drive signal positive connection
SRSTN	IC7270 -> R3243B, IC7300	Slave ReSeT out (CDR60 reset), active low
STANDBY	IC7270 -> R3807 -> R3887 -> IC7701	STANDBY pin, high level activates essential powers necessary for full function; overrules HI_POWER setting
SUB	IC7701 -> R3710 -> IC7300	EIAJ subcode data from DASP to CDR60 (CD text interface)
SYS_CLK_11W	IC7701 -> R3732 -> IC7406	11.2896 MHz SYStem CLocK for AD/DA datapath
SYS_CLK_16W	IC7701 -> R3894D-> IC7706A	16.9344 MHz SYStem CLocK for producing SYS_CLK_BE
SYS_CLK_8W	IC7706A -> R3815 -> CONN1708	SYstem CLocK CD player (8.4672 MHz) (CDR775 only)
SYS_CLK_BE	IC7706A -> R3826 -> IC7270	SYstem CLocK Basic Engine (8.4672 MHz)
SYS_RESET	IC7701 -> R3758 -> CONNF934IC7701 -> R3770 -> T7707 -> CONN1708	SYStem RESET to display assy (and CD player for CDR775)
TCK	CONN1819 -> R3906, IC7701	JTAG ClocK signal
TDSO	IC7701 -> CONN1819	JTAG Serial Data Out / debug data out
TERMB	IC7270 <-> CONN1818	UART connection with MACE
TLN	IC7010 -> IC7270	Track Loss Normalized current output
TR-	IC7240 -> CONN1200	TRay motor drive signal negative connection
TR+	IC7240 -> CONN1200	TRay motor drive signal positive connection

TRACE99_RXD	CONN1818 -> R3838, IC7701	TRACE99 test tool receive data
TRACE99_TXD	IC7701 -> CONN1818	TRACE99 test tool transmit data
TRAYIN	IC7270 -> IC7240	move TRAY IN line, active low
TRAYOUT	IC7270 -> IC7240	move TRAY OUT line, active low

TRAYSW	CONN1200 -> R3747CONN1200 -> R3748	TRAY SWitch signal from loader assy
TRAYSWF	R3748, C2214 -> IC7270	Filtered TRAY SWitch signal, low is completely out or in
TXD_TOOL	IC7701 -> CONN1818	Transmit of UART for test TOOL
U+, U-, V+, V-, W+, W-	CONN1330 -> IC7330	hall feedback signals from turn table motor to hall motor driver
UCOIL, VCOIL, WCOIL	IC7330 -> CONN1330	drive signals for turn table motor
VCAGAIN	IC7016 -> IC7005A	set-point laser power on disc, voltage output
VDC1	CONN1500 -> CONNF934	supply voltage for display assy
VDC2	CONN1500 -> CONNF934	supply voltage for display assy
VFO	IC7270 -> R3295 -> R3244	FOcus actuator drive output
VFTD	CONN1500 -> CONNF934	Voltage Fluorescent Tube Display (display assy)
VRA	IC7270 -> R3297 -> R3254	RAdial actuator drive output
VSL	IC7270 -> R3299 -> IC7240	SLedge actuator drive output
WCLK	IC7701 -> R3898B -> IC7300	I2S1 WordCLocK from DASP to CDR60 (playback and record)
WOBBLE	IC7050C -> IC7300	analog WOBBLE signal of pre-groove detected by PPN-signal
WPON	IC7008 -> R3009IC7008 -> C2009	Write Power ON
WPONO	IC7008 -> R3106	Write Power ON Open drain output
WPONRC	R3003 -> CONN1000	Write Power ON (after RC circuit)
XDAC		multiplying DAC

10. Spare parts list

Mechanical Parts List 775

Cabinet Parts

	3104 129 52531	COMPLETE CDR775 MODULE
0001	3104 127 08720	FRONT ASSY COMPLETE CDR775
0003	3104 127 08710	KEY UNIT MIDDLE ASSY CDR775
0009	4822 410 11962	POWER BUTTON BLACK
0014	4822 459 10887	WORDMARK PLATE
0015	4822 454 13339	CDRW LOGO PLATE, NAME
0051	3104 124 05700	EASY JOG KNOB CDR775
0052	4822 492 51374	SPRING (RING)
0053	3104 124 05620	TRANSPARENT FRAME BUTTON
0054	3104 124 05620	TRANSPARENT FRAME BUTTON
0076	3104 144 05730	SUSPENSION
0077	3104 144 05730	SUSPENSION
0078	3104 144 05730	SUSPENSION
0079	3104 144 05730	SUSPENSION
0131	3104 147 13300	CD LOADER VAL 1250
0165	4822 442 01506	COVER
0251	4822 462 42159	FOOT SILVER
0252	4822 462 42159	FOOT SILVER
0253	4822 462 42158	FOOT BLACK
0254	4822 462 42158	FOOT BLACK
0301	4822 321 10249	SBC1201 MAINS CABLE
0309	3104 125 22870	USER MANUAL CDR775/ 776/00 WEU
0312	4822 321 62401	AUDIO CABLE
0313	4822 321 62401	AUDIO CABLE
0317	4822 321 61452	DIG OUT CABLE
0318	3139 228 82010	REMOTE CONTROL RC282921/01
1003	3122 427 21570	PSU CDR-3 SINGLE RANGE EURO
8001	3104 157 11240	CWAS FLEX 1MM 14 100 32S
8005	3104 157 11230	CWAS FLEX 1MM 22 320 32S
8007	3104 157 11320	CWAS FLEX 1.25MM 7 300 32S

CD Loader VAL1250

0001	3104 147 14100	CHASSIS ASSY LOADER VAL 1250
0002	4822 361 11131	TRAY MOTOR ASSY
0003	4822 492 11709	MOTOR SPRING
0004	4822 277 11838	SWITCH
0006	4822 532 13097	TULE
0010	4822 528 11295	PULLEY WHEEL
0011	4822 358 10266	BELT, DRIVING
0012	4822 522 10739	RACK GEAR WHEEL
0013	4822 535 10588	PIN, PLASTIC
0014	4822 522 10741	TRAY GEAR WHEEL
0015	4822 535 10588	PIN, PLASTIC
0016	4822 402 11221	RACK
0017	4822 492 11711	RACK SPRING
0020	4822 466 12131	CUSHION RUBBER
0021	4822 466 12131	CUSHION RUBBER
0022	4822 466 12131	CUSHION RUBBER
0023	4822 466 12131	CUSHION RUBBER
0030	9305 022 25001	CDM VAM 1250
0035	3104 144 02030	SUSPENSION
0036	3104 144 02030	SUSPENSION
0037	3104 144 02030	SUSPENSION
0038	3104 144 02030	SUSPENSION
0040	3104 144 05870	SUB-CHASIS
0042	4822 492 11709	MOTOR SPRING
0043	4822 418 10421	TRAY HORIZONTAL
0045	3104 147 13910	CLAMPER ASSY VAL 1250
8001	3104 148 01310	LED ASSY 4P

Display Board Assy 775

Miscellaneous

0003	3104 124 05710	FTD HOLDER
1050	2422 129 16314	ROT.ENCODER + SWITCH
1101	4822 276 13114	SWITCH, PUSH BUTTON
1102	4822 276 13114	SWITCH, PUSH BUTTON
1103	4822 276 13114	SWITCH, PUSH BUTTON
1104	4822 276 13114	SWITCH, PUSH BUTTON
1105	4822 276 13114	SWITCH, PUSH BUTTON
1106	4822 276 13114	SWITCH, PUSH BUTTON
1107	4822 276 13114	SWITCH, PUSH BUTTON
1108	4822 276 13114	SWITCH, PUSH BUTTON
1109	4822 276 13114	SWITCH, PUSH BUTTON
1110	2422 540 98423	RES CER 8MHz CSTS*MHz 03
1111	4822 276 13114	SWITCH, PUSH BUTTON
1112	4822 276 13114	SWITCH, PUSH BUTTON
1113	2722 171 07174	VFD 15-BT-60GNK 106*40 (FTB0)B
1114	4822 276 13114	SWITCH, PUSH BUTTON
1115	4822 276 13114	SWITCH, PUSH BUTTON
1116	4822 276 13114	SWITCH, PUSH BUTTON
1117	4822 276 13114	SWITCH, PUSH BUTTON
1118	4822 276 13114	SWITCH, PUSH BUTTON
1120	4822 276 13114	SWITCH, PUSH BUTTON
1125	4822 276 13114	SWITCH, PUSH BUTTON
1126	4822 276 13114	SWITCH, PUSH BUTTON
1127	4822 276 13114	SWITCH, PUSH BUTTON
1128	4822 276 13114	SWITCH, PUSH BUTTON
1130	4822 276 13441	SWITCH TACT LED
1131	4822 276 13441	SWITCH TACT LED
1301	4822 276 14007	SWI PUSH 2P 0.1A 12V
1401	4822 267 31453	SWITCH, PUSH BUTTON
1500	4822 267 31729	CON BM CINCH H 1P F
1501	4822 265 11406	CON BM CINCH V 2P F WHRD B
1502	4822 265 30987	BMT 7SR>CBL0,3-1,25

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2100	4822 126 14585	100nF 10% 50V
2101	4822 126 14585	100nF 10% 50V
2102	5322 122 32654	22nF 10% 63V
2104	5322 122 32658	22pF 5% 50V
2106	5322 122 32658	22pF 5% 50V
2111	4822 126 14585	100nF 10% 50V
2400	5322 122 31647	1nF 10% 63V
2401	5322 122 31647	1nF 10% 63V
2500	4822 124 11947	10µF 20% 16V
2501	4822 126 12105	50V 33nF PM5
2502	4822 126 12105	50V 33nF PM5
2503	4822 122 33575	220pF 5% 63V CASE
2504	4822 122 33575	220pF 5% 63V CASE

⊣□⊢

3100	4822 051 20472	4k7 5% 0.1W
3101	4822 051 20472	4k7 5% 0.1W
3102	4822 051 20472	4k7 5% 0.1W
3103	4822 051 20472	4k7 5% 0.1W
3104	4822 051 20472	4k7 5% 0.1W
3105	4822 051 20472	4k7 5% 0.1W
3106	4822 117 11149	82k 1% 0.1W
3107	4822 051 20472	4k7 5% 0.1W
3108	4822 051 20101	100Ω 5% 0.1W
3109	4822 051 20561	560Ω 5% 0.1W
3111	4822 051 20101	100Ω 5% 0.1W
3112	4822 051 20393	39k 5% 0.1W
3113	4822 117 10833	10k 1% 0.1W
3114	4822 117 10833	10k 1% 0.1W
3115	4822 051 20561	560Ω 5% 0.1W
3116	4822 051 20561	560Ω 5% 0.1W
3122	4822 117 11149	82k 1% 0.1W
3124	4822 117 11149	82k 1% 0.1W
3125	4822 051 20332	3k3 5% 0.1W
3500	4822 117 12521	68Ω 1% 0.1W
3501	4822 117 11448	180Ω 1% 0.1W
3502	4822 117 11449	2k2 1% 0.1W
3503	4822 117 11448	180Ω 1% 0.1W
3504	4822 117 11449	2k2 1% 0.1W
4xxx	4822 051 10008	0Ω 5% 0.25W (1206)
4xxx	4822 051 20008	0Ω 5% 0.25W (0805)

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5500	4822 157 70601	100µH (920927085A)

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6100	4822 130 11411	BZX284-C3V3
6200	4822 212 30842	TSOP1736SB1
6300	4822 130 82978	LTL-16KPE-P

7100	4822 130 60511	BC847B
7104	3104 123 94761	ROM TMP87CH74
7203	4822 130 60511	BC847B
7204	4822 130 60511	BC847B
7500	4822 130 60511	BC847B
7501	4822 130 60511	BC847B

CD Main Board

Miscellaneous

1000	2422 025 11704	CON BM H 16P F 1.00 FFC 0.3 R
1004	2422 543 00896	RES XTL SM 8M4672 30P CX-5F R
1006	4822 267 51454	CONN. 11P FEMALE
1205	5322 242 73686	CST12,00MTW-TF01
1206▲	4822 252 51173	19398E1(1,000A)
1207▲	4822 252 51173	19398E1(1,000A)
1208	4822 267 60409	CONN 22P FEMALE
1209	4822 265 30987	BMT 7SR>CBL0,3-1,25
1210	2422 025 11704	CON BM H 16P F 1.00 FFC 0.3 R

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2100	4822 126 14585	100nF 10% 50V
2102	4822 126 14585	100nF 10% 50V
2103	5322 122 31647	1nF 10% 63V
2104	4822 126 14585	100nF 10% 50V
2105	4822 124 81286	47µF 20% 16V
2106	4822 126 14585	100nF 10% 50V
2107	4822 124 81286	47µF 20% 16V
2109	5322 122 32654	22nF 10% 63V
2110	4822 126 14585	100nF 10% 50V
2111	4822 126 14585	100nF 10% 50V
2112	4822 126 14585	100nF 10% 50V
2113	4822 126 14585	100nF 10% 50V
2114	4822 126 14585	100nF 10% 50V
2115	4822 126 14585	100nF 10% 50V
2116	4822 124 41796	22µF 20% 16V
2117	5322 122 32654	22nF 10% 63V
2118	4822 126 14585	100nF 10% 50V
2119	4822 126 14585	100nF 10% 50V
2120	4822 124 41796	22µF 20% 16V
2121	4822 126 14585	100nF 10% 50V
2122	4822 126 12104	12nF 5% 50V
2123	5322 122 31863	63V 330pF PM5
2124	4822 126 14585	100nF 10% 50V
2125	4822 124 81286	47µF 20% 16V
2126	5322 122 34098	10nF 10% 63V
2127	5322 122 31863	63V 330pF PM5
2128	4822 124 80483	47µF 20% 6.3V
2130	4822 126 14305	100nF 10% 16V 0603
2131	4822 126 14585	100nF 10% 50V
2132	4822 124 80483	47µF 20% 6.3V
2133	4822 126 13482	470nF 80/20% 16V
2134	4822 126 14305	100nF 10% 16V 0603
2135	4822 124 41796	22µF 20% 16V
2137	4822 126 14494	22nF 10% 25V 0603
2138	4822 126 14494	22nF 10% 25V 0603
2139	4822 126 14305	100nF 10% 16V 0603
2140	4822 126 14508	180pF 5% 50V 0603
2141	4822 126 14238	0603 50V 2N2 COL R
2142	5322 122 32654	22nF 10% 63V
2143	4822 126 14241	0603 50V 330P COL R
2145	4822 126 13692	47pF 1% 63V
2146	4822 126 14247	0603 50V 1N5 COL R

2147	4822 126 13482	470nF 80/20% 16V
2148	4822 124 22726	4.7µF 35V
2149	3198 016 36810	0603 25V 680P COL R
2150	4822 126 12105	50V 33nF PM5
2151	5322 124 11919	47µF 20% 6.3V
2152	4822 126 14305	100nF 10% 16V 0603
2153	4822 122 33777	47pF 5% 63V
2154	4822 124 81286	47µF 20% 16V
2155	4822 126 14585	100nF 10% 50V
2156	5322 124 11919	47µF 20% 6.3V
2157	4822 126 14305	100nF 10% 16V 0603
2158	4822 122 33777	47pF 5% 63V
2159	3198 017 34730	0603 16V 47nF COL
2160	4822 126 14494	22nF 10% 25V 0603
2161	5322 124 11919	47µF 20% 6.3V
2162	4822 122 31765	100pF 2% 63V
2163	4822 126 14549	33nF 16V O6O3
2164	4822 126 14508	180pF 5% 50V 0603
2165	4822 122 33777	47pF 5% 63V
2166	3198 017 34730	0603 16V 47nF COL
2167	4822 126 14585	100nF 10% 50V
2168	4822 126 13883	220pF 5% 50V
2169	5322 126 10794	220pF 5% 63V
2170	5322 126 10794	220pF 5% 63V
2171	5322 126 10794	220pF 5% 63V
2172	5322 126 10794	220pF 5% 63V
2173	5322 126 10794	220pF 5% 63V
2174	4822 126 14494	22nF 10% 25V 0603
2175	4822 124 81286	47µF 20% 16V
2176	4822 122 33777	47pF 5% 63V
2178	4822 126 14585	100nF 10% 50V
2180	4822 124 41796	22µF 20% 16V
2181	4822 124 41796	22µF 20% 16V
2184	4822 126 14225	56pF 5% 50V 0603
2185	4822 126 14225	56pF 5% 50V 0603
2186	4822 124 81286	47µF 20% 16V
2187	4822 126 14585	100nF 10% 50V
2188	4822 126 14305	100nF 10% 16V 0603
2189	4822 126 14585	100nF 10% 50V
2191	4822 124 81286	47µF 20% 16V
2197	4822 124 81286	47µF 20% 16V
2199	4822 126 13692	47pF 1% 63V
2200	4822 126 14249	560pF 10% 50V CASE0603
2201	4822 126 14247	0603 50V 1N5 COL R
2202	5322 122 32531	100pF 5% 50V
2203	4822 124 22726	4.7µF 35V
2204	4822 126 14585	100nF 10% 50V
2208	4822 124 81286	47µF 20% 16V
2211	4822 126 13692	47pF 1% 63V
2214	5322 122 32531	100pF 5% 50V
2216	4822 126 14305	100nF 10% 16V 0603
2217	4822 122 33777	47pF 5% 63V
2218	4822 126 13692	47pF 1% 63V
2220	4822 126 14585	100nF 10% 50V
2230	5322 126 10223	4.7nF 10% 63V
2232	4822 126 14305	100nF 10% 16V 0603
2233	5322 122 31865	1.5nF 10% 63V
2234	4822 124 12362	47µF 4V 20%
2235	4822 124 12362	47µF 4V 20%
2252	5322 122 31647	1nF 10% 63V
2280	4822 126 14585	100nF 10% 50V
2285	5322 122 31865	1.5nF 10% 63V
2286	5322 122 31865	1.5nF 10% 63V
2300	4822 126 14305	100nF 10% 16V 0603
2301	4822 124 81286	47µF 20% 16V
2302	4822 124 11947	10µF 20% 16V
2303	4822 126 14305	100nF 10% 16V 0603
2304	4822 124 40196	220µF 20% 16V
2306	4822 126 12102	330nF 10% 16V
2307	4822 124 40207	100µF 20% 25V
2320	4822 122 33777	47pF 5% 63V
2321	4822 122 33777	47pF 5% 63V
2322	4822 122 33777	47pF 5% 63V
2325	4822 126 14305	100nF 10% 16V 0603
2326	4822 126 14305	100nF 10% 16V 0603
2327	4822 126 14305	100nF 10% 16V 0603

3100	4822 051 20223	22k 5% 0.1W
3101	4822 051 20223	22k 5% 0.1W
3102	4822 051 20479	47Ω 5% 0.1W
3103	4822 117 10834	47k 1% 0.1W
3104	3198 021 90031	0Ω JMP 0603
3105	3198 021 90031	0Ω JMP 0603
3106	3198 021 90031	0Ω JMP 0603
3107	3198 021 90031	0Ω JMP 0603
3113	4822 051 10102	1k 2% 0.25W
3114	4822 051 20822	8k2 5% 0.1W
3115	4822 051 20472	4k7 5% 0.1W
3116	4822 117 10834	47k 1% 0.1W
3117	4822 051 20479	47Ω 5% 0.1W
3130	4822 117 10833	10k 1% 0.1W
3131▲	4822 117 11151	1Ω 5%
3132	4822 051 20223	22k 5% 0.1W
3134	4822 051 20108	1Ω 5% 0.1W
3135	4822 051 20108	1Ω 5% 0.1W
3136	4822 051 20122	1k2 5% 0.1W
3137	4822 117 11504	270Ω 1% 0.1W
3138	4822 117 11504	270Ω 1% 0.1W
3139	4822 117 10833	10k 1% 0.1W
3140	4822 051 20008	0Ω jumper . (0805)
3141	4822 051 20008	0Ω jumper . (0805)
3142	4822 117 11504	270Ω 1% 0.1W
3143	4822 117 10834	47k 1% 0.1W
3144	4822 117 10834	47k 1% 0.1W
3145	4822 117 11504	270Ω 1% 0.1W
3146	4822 117 10837	100k 1% 0.1W
3148	4822 051 20008	0Ω jumper . (0805)
3149	4822 051 10102	1k 2% 0.25W
3150	4822 117 11383	12k 1% 0.1W
3151	4822 117 11383	12k 1% 0.1W
3152	4822 051 20008	0Ω jumper . (0805)
3153	4822 051 30101	100Ω 5% 0.062W
3154▲	4822 117 11151	1Ω 5%
3155	4822 051 20008	0Ω jumper . (0805)
3156	4822 117 11383	12k 1% 0.1W
3157	4822 117 11383	12k 1% 0.1W
3158	4822 051 20122	1k2 5% 0.1W
3159	4822 051 20008	0Ω jumper . (0805)
3160	4822 117 10833	10k 1% 0.1W
3161▲	4822 117 11748	2Ω2 1206 5% FUSE
3162▲	4822 117 11748	2Ω2 1206 5% FUSE
3164	4822 051 20479	47Ω 5% 0.1W
3168	4822 051 20101	100Ω 5% 0.1W
3169	4822 051 30272	2k7 5% 0.062W
3171	4822 051 30103	10k 5% 0.062W
3172	4822 051 20101	100Ω 5% 0.1W
3173	4822 117 11452	430Ω 1% 0.1W
3174	4822 117 11452	430Ω 1% 0.1W
3176	4822 051 20101	100Ω 5% 0.1W
3177▲	4822 117 11151	1Ω 5%
3178	4822 051 30102	1k 5% 0.062W
3179	4822 051 30102	1k 5% 0.062W
3180	4822 051 30272	2k7 5% 0.062W
3181	4822 051 20223	22k 5% 0.1W
3182	4822 051 30391	390Ω 5% 0.062W
3183	4822 051 30103	10k 5% 0.062W
3184▲	4822 117 11748	2Ω2 1206 5% FUSE
3185	4822 051 30472	4k7 5% 0.062W
3186	4822 051 30472	4k7 5% 0.062W
3187	4822 051 30391	390Ω 5% 0.062W
3188	4822 051 30272	2k7 5% 0.062W
3189	4822 051 30391	390Ω 5% 0.062W
3190	4822 117 11456	30k 1% 0.1W
3191	4822 117 11452	430Ω 1% 0.1W
3192	4822 117 11452	430Ω 1% 0.1W
3193	4822 051 30181	180Ω 5% 0.062W
3194	4822 051 20008	0Ω jumper . (0805)
3195	4822 051 20008	0Ω jumper . (0805)
3196	4822 051 30102	1k 5% 0.062W
3197	4822 117 10833	10k 1% 0.1W
3198	4822 051 30479	47Ω 5% 0.062W
3199	4822 051 30152	1k5 5% 0.062W
3200	4822 117 10833	10k 1% 0.1W
3201	4822 117 11817	1k2 1% 1/16W
3202	4822 051 30223	22k 5% 0.062W
3203	4822 051 30272	2k7 5% 0.062W
3204	4822 051 20008	0Ω jumper . (0805)
3205	4822 051 30103	10k 5% 0.062W
3206	4822 051 30008	0Ω jumper
3208	4822 117 13608	4.7Ω 5% 0603 0.0016W
3212	4822 051 30105	1M 5% 0.062W
3214	4822 051 20008	0Ω jumper . (0805)
3215▲	4822 117 11748	2Ω2 1206 5% FUSE
3216▲	4822 117 11152	4Ω7 5%
3217	4822 117 10833	10k 1% 0.1W
3218	4822 051 10102	1k 2% 0.25W
3219	4822 117 13509	4X47Ω 5% 1206 NETWORK
3220	4822 051 30103	10k 5% 0.062W
3225▲	4822 117 11748	2Ω2 1206 5% FUSE
3226	4822 117 10833	10k 1% 0.1W
3229▲	4822 117 11748	2Ω2 1206 5% FUSE
3233	4822 117 10354	22k 1% 0.1W
3235	4822 051 30008	0Ω jumper
3236	4822 051 20008	0Ω jumper . (0805)
3237	4822 051 20008	0Ω jumper . (0805)
3241	4822 117 10354	22k 1% 0.1W
3242	4822 117 10833	10k 1% 0.1W
3243	4822 117 10834	47k 1% 0.1W
3245	4822 117 10834	47k 1% 0.1W
3248	4822 117 10354	22k 1% 0.1W
3254	4822 117 10354	22k 1% 0.1W
3256	4822 117 10833	10k 1% 0.1W
3258	4822 117 10834	47k 1% 0.1W
3260	4822 117 10834	47k 1% 0.1W
3263▲	4822 117 11748	2Ω2 1206 5% FUSE
3265	4822 117 10837	100k 1% 0.1W
3266	4822 051 10102	1k 2% 0.25W
3267	4822 051 30102	1k 5% 0.062W
3268	4822 117 10837	100k 1% 0.1W
3269	4822 051 20101	100Ω 5% 0.1W
3270	4822 117 10833	10k 1% 0.1W
3271	4822 051 20101	100Ω 5% 0.1W
3273	4822 051 20101	100Ω 5% 0.1W
3274	4822 051 20101	100Ω 5% 0.1W
3275	4822 051 20101	100Ω 5% 0.1W
3276	4822 051 20101	100Ω 5% 0.1W
3277	4822 051 20101	100Ω 5% 0.1W
3278	4822 051 20008	0Ω jumper . (0805)
3279▲	4822 117 11151	1Ω 5%
3280	4822 117 10833	10k 1% 0.1W
3282	4822 051 30103	10k 5% 0.062W
3283	4822 117 10833	10k 1% 0.1W
3284	4822 051 30008	0Ω jumper
3285	4822 051 30472	4k7 5% 0.062W
3286	4822 051 30154	150k 5% 0.062W
3287	4822 117 12925	47k 1% 0.063W 0603
3300	4822 051 30103	10k 5% 0.062W
3302	4822 051 30103	10k 5% 0.062W
3303	4822 051 30103	10k 5% 0.062W
3304	4822 051 30103	10k 5% 0.062W
3305	4822 051 30103	10k 5% 0.062W
3306	4822 051 30103	10k 5% 0.062W
3307	4822 051 30103	10k 5% 0.062W
3308▲	4822 117 11748	2Ω2 1206 5% FUSE
3310	4822 051 10102	1k 2% 0.25W
3312	4822 051 10102	1k 2% 0.25W
3313	4822 117 10833	10k 1% 0.1W
3314	4822 117 10833	10k 1% 0.1W
3318	4822 051 20101	100Ω 5% 0.1W
3319	4822 051 20101	100Ω 5% 0.1W
3320	4822 051 20101	100Ω 5% 0.1W
3328	4822 051 20105	1M 5% 0.1W
3331	4822 051 20101	100Ω 5% 0.1W
3333	4822 051 30101	100Ω 5% 0.062W
3335	4822 051 30103	10k 5% 0.062W
3337	4822 051 30103	10k 5% 0.062W
3339	4822 051 30103	10k 5% 0.062W
3342	4822 117 10833	10k 1% 0.1W
3350	4822 051 10102	1k 2% 0.25W
3352	4822 051 20008	0Ω jumper . (0805)
3353	4822 051 20101	100Ω 5% 0.1W
3354	4822 051 20101	100Ω 5% 0.1W
3355	4822 051 20101	100Ω 5% 0.1W
3356	4822 051 20101	100Ω 5% 0.1W
3357	4822 051 20008	0Ω jumper . (0805)
3359	4822 051 20008	0Ω jumper . (0805)
3360	4822 051 20008	0Ω jumper . (0805)
3361	4822 051 20101	100Ω 5% 0.1W

6000	4822 130 11382	BYG50D
6001	4822 130 11382	BYG50D
6002	4822 130 11382	BYG50D
6003	4822 130 83757	BAS216

7000	4822 209 17285	SAA7324H
7005	9337 143 50653	74HCT08
7006	5322 130 42718	BFS20
7007	4822 130 60373	BC856B
7008	5322 130 42718	BFS20
7009	5322 130 42718	BFS20
7010	4822 130 60511	BC847B
7011	5322 130 42718	BFS20
7019	4822 130 60373	BC856B
7020	4822 209 16877	BA6856FP
7021	4822 209 32852	TDA7073A/N2
7022	4822 209 32852	TDA7073A/N2
7023	5322 130 42718	BFS20
7025	9337 153 10118	IC SM 74HCT4052D (PHSE) R
7120	4822 209 30095	LM833D
7130	4822 130 60511	BC847B
7131	4822 130 60373	BC856B
7132	4822 130 60511	BC847B
7203	4822 130 60511	BC847B
7204	4822 209 17398	LD1117DT33

7301	4822 130 60511	BC847B
7309	4822 209 17237	UDA1320ATS
7310	4822 130 60511	BC847B

I/O Board

Miscellaneous

1000	2422 025 16289	CON 14P PRINTCON.
1001	4822 267 31448	CINCH 2P
1002	4822 265 11151	CINCH 4P

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2016	5322 122 32654	22nF 10% 63V
2017	5322 122 32654	22nF 10% 63V
2018	5322 122 32654	22nF 10% 63V
2019	4822 124 40248	10µF 20% 63V
2020	5322 122 32654	22nF 10% 63V
2022	4822 126 12105	50V 33nF PM5
2023	5322 122 32654	22nF 10% 63V
2024	5322 122 32654	22nF 10% 63V
2025	5322 122 33538	150pF 2% 63V
2026	5322 122 32531	100pF 5% 50V
2027	5322 122 32531	100pF 5% 50V
2028	5322 122 32659	33pF 5% 50V
2029	5322 122 32659	33pF 5% 50V
2030	5322 122 32659	33pF 5% 50V

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3020	4822 117 12521	68Ω 1% 0.1W
3021	4822 051 20332	3k3 5% 0.1W
3022	4822 117 11152	4Ω7 5%
3024	4822 051 20332	3k3 5% 0.1W
3026	4822 051 20332	3k3 5% 0.1W
3027	4822 051 20332	3k3 5% 0.1W
3028▲	4822 117 11152	4Ω7 5%
3029	4822 117 11927	75Ω 1% 0.1W
3032	4822 117 11373	100Ω 1% RC12H 0805
3033	4822 117 11373	100Ω 1% RC12H 0805
3034	4822 117 11449	2k2 1% 0.1W
3035	4822 117 11449	2k2 1% 0.1W
3036	4822 117 11373	100Ω 1% RC12H 0805
3037	4822 117 11373	100Ω 1% RC12H 0805
3038	4822 117 11449	2k2 1% 0.1W
3039	4822 117 11449	2k2 1% 0.1W

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5001	4822 157 70601	100µH (920927085A)
5002▲	4822 157 71206	BLM21A601SPT

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6000	4822 218 11487	GP1F32R

7005	5322 209 11517	PC74HCU04T
7006	4822 130 60511	BC847B
7007	4822 130 60511	BC847B
7008	4822 130 60511	BC847B
7009	4822 130 60511	BC847B

Power Supply Unit 20PS317

Miscellaneous

0006	4822 492 63524	SPRING FIX. TRANSISTOR
0101▲	4822 265 31015	CONNECTOR, MAINS INLET
1120▲	4822 070 32002	FUSE 218002.(2A)
1121	3122 358 72141	FUSE HOLDER CLICK
1125	4822 252 60151	SURGE PROTECT DSP-501N-A21F

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2101	4822 126 13695	82pF 1% 63V
2102	5322 126 10184	820P 5% 50V 3
2103	5322 122 32268	470pF 10% 50V
2104	5322 126 10223	4.7nF 10% 63V
2109	5322 122 31865	1.5nF 10% 63V
2110	4822 124 22652	2.2µF 20% 50V
2111	4822 126 14585	100nF 10% 50V
2113	4822 122 33127	2.2nF 10% 63V
2114	4822 126 14585	100nF 10% 50V
2125	4822 121 51598	2.2nF 5% 400V
2126	4822 121 51598	2.2nF 5% 400V
2127	4822 126 14496	470pF 10% 1KV
2129	4822 124 23057	4.7µF 20% 50V
2131▲	4822 126 14497	2.2nF 20% 250V
2133	4822 124 12062	100µF 20% 25V
2201	4822 126 14585	100nF 10% 50V
2202	5322 122 32654	22nF 10% 63V
2210	4822 124 12282	2200µF 20% YK 10V
2220	4822 124 40849	330µF 20% 16V
2221	4822 126 13751	47nF 10% 63V
2222	4822 124 12283	100µF 20% MS7 6.3V
2230	4822 124 81144	1000µF 16V
2240	4822 124 81144	1000µF 16V
2242	4822 124 41584	100µF 20% 10V
2250	4822 124 40248	10µF 20% 63V
2252	4822 124 11769	220µF 20% 50V
2260	4822 122 31175	1nF 10% 500V

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3101	4822 116 52304	82k 5% 0.5W
3102	4822 051 20223	22k 5% 0.1W
3103	4822 051 20472	4k7 5% 0.1W
3104	4822 116 83933	15k 1% 0.1W
3105	4822 116 83933	15k 1% 0.1W
3106	4822 051 20102	1k 5% 0.1W
3107	4822 051 20184	180k 5% 0.1W
3108	4822 117 10965	18k 1% 0.1W
3109	4822 117 13577	330Ω 1% RC12H 0805 1.25W
3110	4822 117 10833	10k 1% 0.1W
3111	4822 051 20229	22Ω 5% 0.1W
3112	4822 051 20101	100Ω 5% 0.1W
3113	4822 051 20159	15Ω 5% 0.1W
3115	4822 116 52232	910Ω 5% 0.5W
3116	4822 117 11448	180Ω 1% 0.1W
3120▲	2122 550 00147	VDR DC 1mA/423V
3123	4822 050 21803	18k 1% 0.6W
3124	4822 116 83872	220Ω 5% 0.5W
3125	4822 050 21002	1k 1% 0.6W
3126	4822 116 80176	1Ω 5% 0.5W
3127	4822 116 80676	1Ω5 5% 0.5W
3128	4822 116 80676	1Ω5 5% 0.5W
3129	4822 050 21003	10k 1% 0.6W
3134	4822 050 21803	18k 1% 0.6W
3201	4822 116 52176	10Ω 5% 0.5W
3202	4822 050 13302	3k3 1% 0.4W
3203	4822 116 52175	100Ω 5% 0.5W
3204	4822 051 20182	1k8 5% 0.1W
3205	4822 117 10353	150Ω 1% 0.1W
3206	4822 117 11143	3k 1% 0.1W
3221	4822 051 20471	470Ω 5% 0.1W
3222	4822 051 20241	240Ω 5%
3230	4822 050 21002	1k 1% 0.6W
3231	4822 117 10833	10k 1% 0.1W
3232	4822 051 20113	11k 5% 0.1W
3233	4822 117 10833	10k 1% 0.1W
3234	4822 117 10833	10k 1% 0.1W

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5120▲	4822 157 11846	FILTER, MAINS
5125	4822 157 11411	100mH z
5132	4822 157 51462	10µH 10% 4X9.8MM LAL04T100K
5210	4822 157 11722	6.8µH 20% 7.7X9.5
5220	4822 157 51462	10µH 10% 4X9.8MM LAL04T100K
5225	4822 157 53139	4.7µH
5226	4822 157 53139	4.7µH
5230	4822 157 50963	2.2µH
5240	4822 157 51462	10µH 10% 4X9.8MM LAL04T100K
5250	4822 157 51462	10µH 10% 4X9.8MM LAL04T100K
5255	4822 157 51195	1 µH 20% 4X9.8MM AXIAL

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6102	4822 130 83707	SINB80
6106	4822 130 42606	BYD33J
6107	4822 130 42606	BYD33J
6114	4822 130 42488	BYD33D
6129	5322 130 80122	BZX84-C24
6132	4822 130 42488	BYD33D
6220	4822 130 42488	BYD33D
6231	4822 130 31603	1N4006
6232	4822 130 11584	BYW98-200-C1
6240	4822 130 42488	BYD33D
6250	4822 130 42606	BYD33J

7110	4822 209 15684	MC44603AP
7125	4822 130 63787	STP4NA60FI
7200▲	4822 130 91451	CQY80NG
7201	4822 209 16944	KA431AZ
7221	4822 209 80591	LM317T
7249	4822 209 82112	MC7908CT
7251	5322 130 60159	BC846B
7252	4822 130 60373	BC856B