

Service Service Service



CL 96532121_000.eps
141099

Service Manual



SERVICING

For servicing CDR950/951, the set can be divided into two parts.

1. The display and standby LED board 1002, the I/O board 1004, the headphone & mic board 1005 and the power supply unit 1003 have to be repaired at component level.
2. The CDR module (containing the CDR loader 80, 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.

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

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PHILIPS

1. Technical Specifications

1.1 General

Mains voltage: European 230V +/-10% (/00), USA version 117V/60Hz (/17)
all range version 100/110/230/240 +/-10% (/11), Japanese version 100/60Hz (/06)
Mains frequency: 50-60 Hz
Power consumption: 15W

1.2 Input/Output

1.2.1 Line output

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

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

1.2.4 Digital input 2x

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

1.2.6 Optical output

Format: AES/EBU format according IEC958 (consumer format)
Sampling frequency: 44.1kHz

1.3 Audio Performance

1.3.1 Cinch analog output (play-back path)

Output voltage: 2Vrms ±2dB (0dB signal)
Frequency range F.R.: 20Hz < F.R. < 20kHz
Amplitude linearity: ±0.15dB (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: > 100dB at 1kHz (typical 110dB), > 95dB between 20Hz and 20kHz (typical > 93dB)
S/N-ratio A-weighted: > 105dB (typical 110dB)
S/N-ratio unweighted: > 100dB (typical 105dB)
Dynamic range: > 94dB at 1kHz (typical 96dB), > 93dB between 20Hz and 20kHz (typical 96dB)
THD+N: > 90dB between 20Hz and 20kHz (typical 92dB)

1.3.2 Cinch analog input (monitor path)

Measured with Audio precision system one.
Input voltage is 2Vrms.
Output voltage: 2Vrms ±2dB (0dB signal)
Frequency range F.R.: 20Hz < F.R. < 20kHz
Amplitude linearity: ±0.2dB (typical ±0.1dB)
Channel unbalance: < 0.2dB at 1kHz (typical ±0.15dB)
Output resistance: 50Ω
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: > 100dB (typical 105dB)
S/N-ratio unweighted: > 95dB (typical 100dB)
Dynamic range: > 95dB at 1kHz (typical 100dB), > 93dB between 20Hz and 20kHz (typical 98dB)

1.3.3 Headphone output (all functions)

Output voltage: 0-5Vrms (0dB)/8-2000Ω
S/N: > 80dB
THD+N: > 78dB
Channel separation: > 60dB between 20Hz and 20kHz

1.3.4 Microphone input (all functions).

Input voltage: 2mV to 20mVrms
Frequency range F.R.: 200Hz < F.R. < 16kHz
S/N-ratio A-weighted: > 80dB (typical 82dB)
S/N-ratio unweighted: > 70dB (typical 80dB)
THD+N: > 70dB between 200Hz and 16kHz (typical 75dB)

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: 4 x 11mm foiled
Apparatus tray closed (WxDxH): 435x305x75mm (without feet)
Weight without packaging: 3.2 kg
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 dit zelfde 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 à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

D WARNUNG

Alle IC und viele andere Halbleiter sind empfindlich gegen elektrostatische Entladungen (ESD).
Unvorsichtige 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.

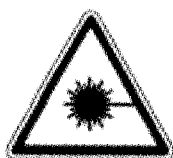
GB
Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

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

D
Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Gerats darf nicht verändert werden. Für 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 ricambio identici a quelli specificati.

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



**CAUTION
VAROI
VARNING
ADVERSEL
DANGER
VORSICHT**

INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM.
AVATTAESSA OLET ALTIINA NÄKYMÄTTÖMÄLLÄ LASER SÄTEILYLLE ÄLÄ KATSO SÄTEESIEN.
OSYNLIG LASERSTRÅLNING NÄR ÖPPNAD. BETRÄKTA EJ STRÅLEN.
USYNLIG LASERSTRÅLNING VED ÖPPNING. UNDGA ONSÄTTELSE FÖR STRÅLNING.
INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM.
UNSIICHTBARE LASERSTRÄHLUNG WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN.

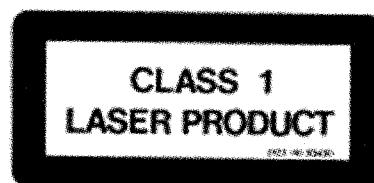
SHOCK, FIRE HAZARD SERVICE TEST:

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.

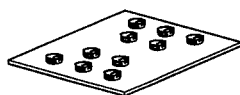
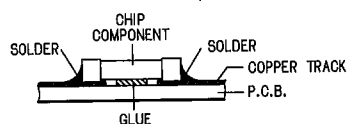
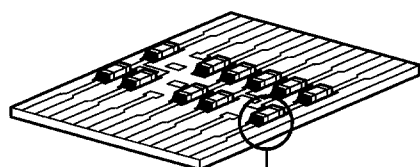
Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne.



SERVICING HINTS

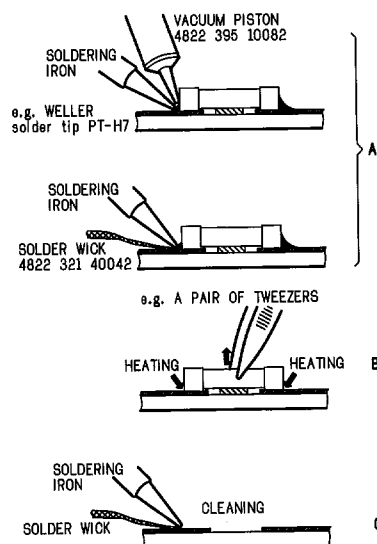
In the set, chip components have been applied. For disassembly and assembly check the figure below.

GENERAL

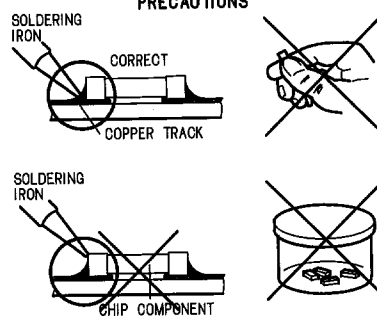


SERVICE PACKAGE

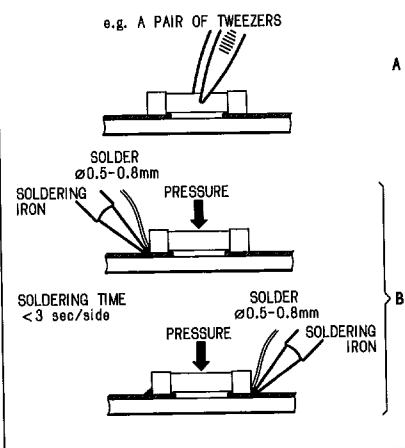
DISMOUNTING



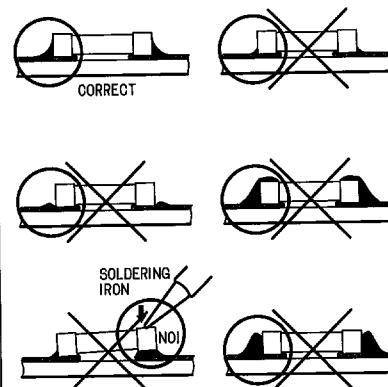
PRECAUTIONS



MOUNTING



EXAMPLES



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 Δ 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 Δ 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.

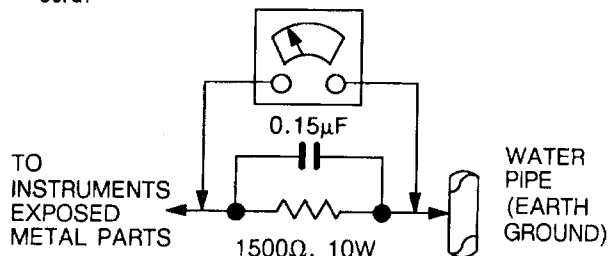
Fire and Shock Hazard (Continued)

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 0.15µF. 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 milliamperes. 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.

DISPLAY

DISPLAY messages

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

General

RCR7TNF5.....reading disc information

general	reading disc information
OPEN	during tray opening
CLOSE	during tray closing
NO DISC	no disc inserted; disc unreadable or disc inserted upside down
PROGS FULL	program full
INSERT DISC	insert disc or insert disc in correct way
NO AUDIO CD	inserted disc is no audio CD
UNF. FILE TYPE	uninitialized CDROM disc
MEMORY ERROR	indicates the amount of text memory used for uninitialized discs

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

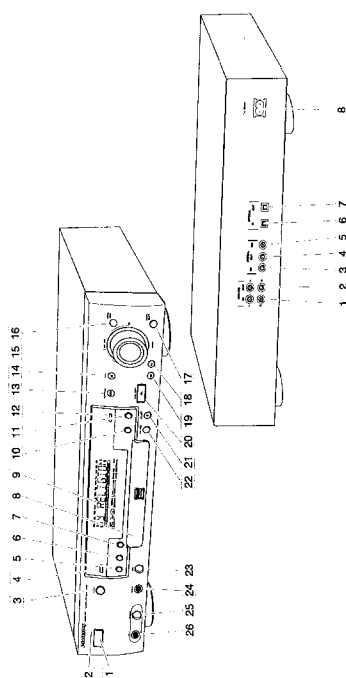
UPDATE	updating disc contents
DISC FULL	no more recording possible
35517AL 1	digital coaxial input 1 selected
35517AL 2	digital coaxial input 2 selected
OPTICAL	digital optical input selected
ANALOG	analog input selected
MICROPHONE	microphone input selected
[COPY PROTECT]	no digital recording can be made of the connected source
NOT UNINITIALIZED	when opening the tray with an uninitialized disc inserted
MARK CB	start of synchronized recording of a complete disc and Auto Finalize function selected
RECORD	start of synchronized recording of a complete disc

RECORD#	TRACK	start of synchronized recording of a single track
REC	MANUAL	manual start of recording selected
--X JB		level is being adjusted
ERASE	TRACK	when erasing one or more tracks
ERASE	TRFSE	when erasing a disc
FINALIZE		when finalising a disc
FINALIZED		when trying to finalise an already finalized disc
CHECK	INPUT	when RECORD is pressed while no digital source is detected
--X ERASE		time countdown when erasing a track or a disc
--X FINAL		time countdown when finalising a disc
MINI-TAP	MOJIE	sample rate converter active
PRESS	RECORD	to start manual recording, finalising or erasing

[illegible]

- | | | |
|------------------|---|---|
| 1 | REMAINING TIME | remaining recording time / recording time |
| 2 | TRACK | track number |
| 3 |  | balance (lights during balance adjustment) |
| TOTAL REM | | |
| 4 | TRACK TIME | total or remaining time of disc or track |
| 5 | FADE | fade action |
| 6 | COI | remote control active |
| 7 | STEP | indicates the number of tracks in a program |
| 8 | Track bar | indicates:
- tracks on a disc or in a program
- track in play
- disc or program contains more than 20 tracks |
| 9 | + 20 | |
| 10 | SCAN | lights up when the first 10 seconds of each track are played |
| 11 | REPEAT TRACK/ALL | lights up when a track's complete disc (or program) is repeated |
| 12 | SYNC | synchronized recording active |
| 13 | SHUFFLE ALL | plays tracks in random order |
| 14 | MANUAL | manual recording active |
| 15 | LR II | Record/play level bar, indicates the audio signal level |
| 16 | PROGRAM | flashes during programming / lights in program mode |
| 17 |  | pause function active |
| 18 |  | lights during play |
| 19 |  | lights during recording |
| 20 | RW | uninitialized (CDRW) disc inserted |
| 21 | CD | CD inserted (a pre-recorded CD or finalized CDR or CDRW disc) |
| 22 |  | lights during recording |
| 23 |  | microphone connected |
| 24 | ANALOG | analog input selected |
| 25 | OPTICAL | optical input selected for external recording |
| 26 | DIGITAL | digital input selected for external recording |
| 27 | DIGITAL II | digital input II selected for external recording |

English



[19] **◀◀** - searches backward
 - cursor control in Menu/Prog.
 review mode

- | | | |
|-----------|-------------------|---|
| 1 | ON/OFF | turns the CD recorder ON and OFF |
| 2 | Standby indicator | |
| 3 | DISPLAY | selects display / information/text |
| 4 | SCROLL | activates scrolling of text over the display (once) |
| 5 | PROGRAM | opens/closes program memory |
| 6 | REPEAT | repeats play (all, program or track) |
| 7 | SHUFFLE | plays CD (RM) or program in random order |
| 8 | Disc tray | |
| 9 | DISPLAY | information screen |
| 10 | ERASE | selects erasing mode |
| 11 | FINALIZE | selects finalize mode |
| 12 | SOURCE | selects input source |
| 13 | PLAY/PAUSE | starts play/interrupts play or recording |

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

DISPLAY

START SOURCE to start synchronised recording from a source
 FINALIZED CD when trying to record on a finalized CD or a pre-recorded CD
 UNFINALIZE/ when trying to record on a pressed ENTER finalized CDRW
 PROF SOURCE when a professional source is connected

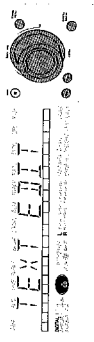
Play

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 REC'D during disc recovering after power failure
 OPC ERROR OPC failure during OPC procedure
 RECORD ERROR OPC = Optimum Power Calibration
 DISC ERROR recording error in menu mode
 MEMORY FULL/ when trying to record on or finalize a recovered disc
 FINALIZE CD when text memory is full. To add a CD to the list, first finalize or erase another disc from the list.

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 or FADE on
 OFF Auto Track increment or FADE off
 SET BALANCE when selecting BALANCE
 SET FADE when selecting FADE adjustment
 FADE ON OFF when switching FADE on or off
 SET FADE IN when setting the FADE IN time
 SET FADE OUT when setting the FADE OUT time
 NO TEXT no text stored for disc
 NAME SOURCE when renaming input sources

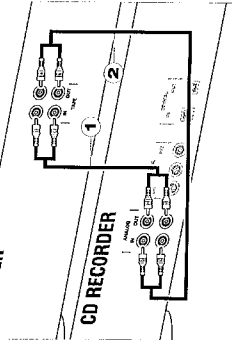
INSTALLATION

English

Analog connections

Analog connection is required for playback of CDs (use cable ②) and for recording from external analog sources (use cable ①).

RECEIVER



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 IN sockets 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.

Connections general

For recording the following inputs are present:

- Digital optical input
- Digital coaxial input 1.
- Digital coaxial input 2.
- Analog input.

For playback the following outputs are present:

- Digital coaxial output
- Digital optical output
- Analog output

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 Converter 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 Converter of the CD recorder ensures a very good sound quality via the analog output.

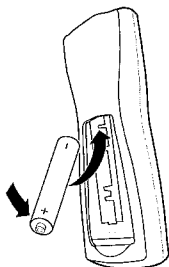
We advise you to always establish both digital and analog connections. In this way you can always make analog recordings when digital recording is not possible.

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.

INSTALLATION

English

Inserting batteries in the remote control

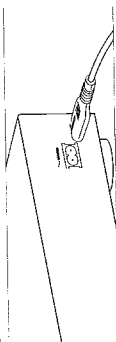


- 1 Open the battery compartment cover.
- 2 Insert 2 batteries ("AA", LR6 or UM-3; as supplied) as shown.
- 3 Replace the cover.

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

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

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:

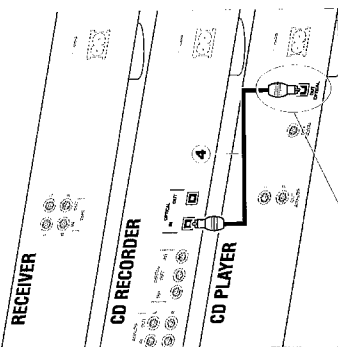
- The CD recorder will automatically adjust to the local mains voltage.
- When the CD recorder is in the Standby mode, it is still consuming some power. If you wish to disconnect your recorder completely from the mains, press ON/OFF on the recorder front.

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.

Digital optical connections

Digital optical connection is only required in case you wish to record from a CD player with a digital optical output.



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

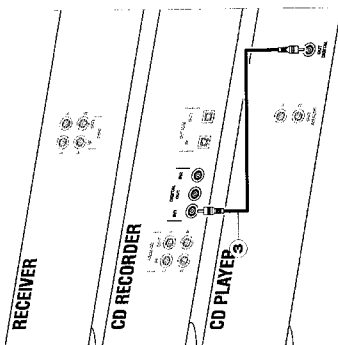
- 1 Remove the dust caps from the digital optical connection. (We recommend you save the cap).

- 2 For recording, connect a fibre-optic cable (4) between the digital OPTICAL IN socket of the CD recorder and the digital optical output of a CD player.

Note: Your CD recorder is equipped with a digital OPTICAL output. This output can be used for digital playback.

Digital coaxial connections

Digital coaxial connection is only required in case you wish to record from a CD player with a digital coaxial output.



Use the digital coaxial cable supplied.

- 1 For recording, connect the cable (3) between the DIGITAL IN-1 socket on the CD recorder and the DIGITAL OUT-socket of a CD player.

- If required you can connect an extra digital device (e.g. a DAT or DCC recorder) to the DIGITAL IN 2 socket of the recorder.

Note: Your CD recorder is equipped with a digital coaxial output (DIGITAL OUT). This output can be used for digital playback.

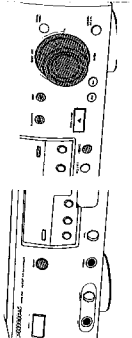
INSTALLATION

English

RECORDING

English

Autostart recording



This 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.

Important:
- Recording from CD-changers should always be started in the RECORD DISC, RECORD TRACK or MAKE CD mode.

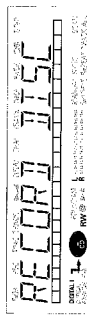
Preparing for autostart recording

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

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



3 With the CD recorder stopped, press REC TYPE once to select RECORD, TRACK, or
twice to select RECORD, TRACK, or
four times to select MAKE CD.
→ 1 and SYNC start to flash and the display shows the selection.



• 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 1 lights continuously.
- If, however, you start the source during a track, 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.
→ 1 lights up and SYNC and 1 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.
→ 1 starts to flash. To resume, press RECORD on the CD recorder.

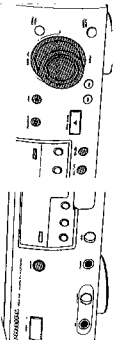
After recording the display will show LPBITE for several seconds.

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 finalising discs.

Finalized CDRW discs play only on CDRW compatible CD players.

Manual recording



Important:
- Recording from CD-changers should always be started in the RECORD DISC, RECORD TRACK or MAKE CD 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 SOURCE repeatedly until (depending on the connection used):
→ DIGITAL 1, DIGITAL 1, OPTICAL 1 or
→ ANALOG 1 lights up and DIGITAL 1, DIGITAL 2, OPTICAL 1 or ANALOG 1 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 INCREMENT 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.

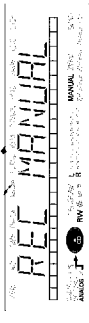
OFF (MANUAL): Track numbers can be incremented manually by pressing TRACK INCREMENT on the remote control. (Minimum track length is 4 sec.) (This can also be done in Auto mode.)

- 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

RECORDING

English

3 With the recorder stopped, press REC TYPE three times to enter the Manual Record standby mode.
→ MANUAL starts to flash and the display shows REC.



- 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 -H- B.

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).
→ 1 lights continuously. The track number and recording time appear on the display.

- To record a 9-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.
→ 1 lights up and 1 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.
1 starts to flash. Resume at step 1.

After recording the display will show LPBITE for several seconds.

Note: With REMOTE 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 REMOTE TRACK OFF, the auto stop mode is disabled.

RECORDING

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.

English

Microphone recording

Karaoke recording

- 1 Connect a (stereo) microphone to the MIC socket. → lights up. The previously active source will be selected automatically.

You can now mix your voice with the sound from the selected source (DIGITAL 1, DIGITAL 11, OPTICAL 1 → or ANALOG 1).

- 2 Use the REC TYPE key to select the required recording mode: RECORD, DISC, RECORD, TRACK, REC, MONITOR, or MAKE C.

- 3 To start recording press PLAY on the selected source (RECORD, DISC, RECORD, TRACK or MAKE C) selected.

Press RECORD on the recorder and PLAY on the selected source (REC, MONITOR selected).

- Use the LEVEL (MIC) key to mix your voice with the sound from the source.

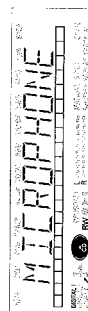
- Use the EASY JOG key to set the recording level.

For details about recording see the instructions in the previous chapters.

Microphone recording

- 1 Connect a (stereo) microphone to the MIC socket. → lights up. The previously active source will be selected automatically.

- 2 Press SOURCE repeatedly until MICROPHONE is displayed.



- 3 Use the REC TYPE key to select REC, MONITOR.

- 4 Press RECORD to start recording.

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RECORDING

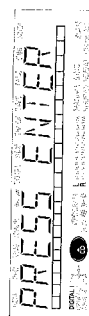
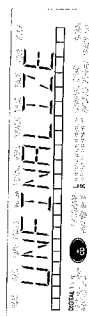
Unfinalizing CDRW discs

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.

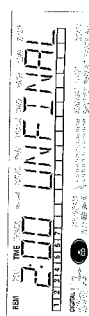
To unfinalize:

- 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/FULL FILL C will be displayed. You will now have to erase text, stored for other discs, or finalize another disc in order to obtain memory space.

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

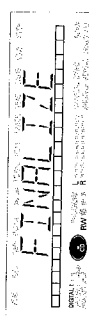
Auto finalizing is possible when using the MAKE CD recording function.

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.

→ The display shows 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 CDRW, CDRW changes to CD on display.

Finalizing will take at least 2 - 4 minutes.

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

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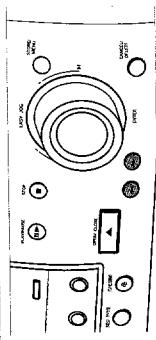
PLAYING

English

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 ► to start playing.
- or
- 1 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. Play starts.
- or
- 1 Briefly press ◀ or ▶ one or more times.
- 2 Start playback by pressing PLAY/PAUSE ► or 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.

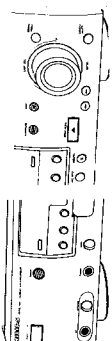
Note: During Shuffle, Repeat, Track or Programmed play, search is restricted to within the track being played at the time.

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.

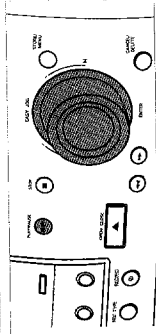
Note: Shuffle is also cleared if you open the disc tray.

Playing a CD



- 1 Press PLAY/PAUSE ► to start CD play.
→ ► lights up and the track number and track time of the track in play appear on the display.
- 2 Press DISPLAY once, twice or three times to see:
→ Remaining track time, total remaining time, text information (see Menu Mode).
- 3 To interrupt play temporarily, press PLAY/PAUSE ► again.
→ ► lights on the display
- 4 To continue play, press PLAY/PAUSE ► again.
- 5 To stop play, press STOP ■
→ The number of tracks and the total playing time appear on the display.

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
- 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.
→ 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.

To erase the entire disc:

- 1 Press ERASE twice.
→ The display shows the number of tracks and their total playing time. ERASE 11:50 and PRESS RECORD light up.
- If the disc is finalized, an appears on the display after inserting a CDRW in the recorder. The recorder will ask you to confirm finalizing first. Confirm by pressing the EASY JOG/ENTER key or ENTER on the remote control.



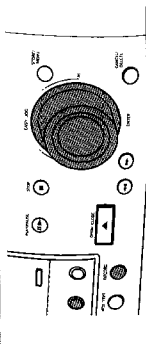
- 2 Press RECORD
→ The display shows the total countdown time and ERASE. The complete disc will be erased.



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

RECORDING

Erasing CDRW discs

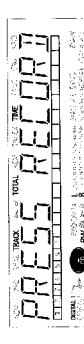
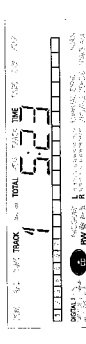


For unfinalized CDRW discs only.
You can erase:
- one or more tracks from the end,
- the entire disc.

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, an appears on the display after inserting a CDRW in the recorder. The recorder will ask you to confirm finalizing 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).

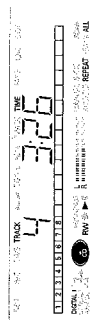


- 3 Press RECORD.
→ The display shows the total countdown time and ERASE.
→ After the selected track(s) have erased, the display shows the remaining tracks and their total playing time.

PLAYING PROGRAMMING

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.

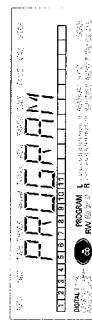
Note:
- You can use **shuffle** in combination with **REPEAT ALL** or **programmed play**.
- **REPEAT** is also cleared if you open the disc tray.

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).

Programming

- 1 In Stop mode press PROGRAM to enter Program mode.
→ PROGRAM flashes and **PROGRAM** appears on the display.



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



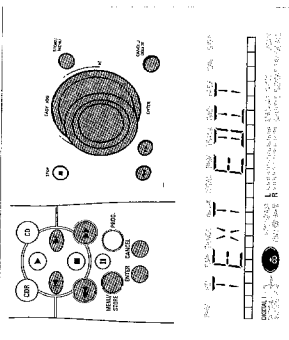
or:

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.

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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, tracks and input sources. The disc and track names will be displayed during playback. The input source names will be displayed when the source is selected.

- In the **RECORDING** submenu you can set Auto Track, Balance and Fade.

- 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

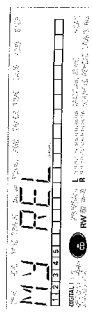
- In Stop mode, select CDR.
- Press STORE/MENU on the deck or the remote control to enter Menu mode.
→ **TEXT EDIT** appears on the display.
- Rotate EASY JOG/ENTER to select the required submenu.
- Press EASY JOG/ENTER or ENTER on the remote control to confirm selections.
- Rotate EASY JOG/ENTER to select options in the submenu.
- Press EASY JOG/ENTER or ENTER on the remote control to confirm selections.
- Press STORE/MENU to store settings and return to the submenu.
- Press STOP to store settings and exit Menu mode.

Note: text can only be edited for uninitialized discs. (finalized CDRW discs must be uninitialized first)

Text settings

Storing names

- Select the **TEXT EDIT** submenu.
→ **TEXT EDIT** appears on the display.
- Press EASY JOG/ENTER or ENTER on the remote control to confirm.
- Rotate EASY JOG/ENTER to select the required option in the submenu: CD Title, Track 1 Artist, Track 1 Title, etc.
- Press EASY JOG/ENTER or ENTER on the remote control to confirm.
- Select the characters by rotating the EASY JOG/ENTER key or by pressing the corresponding numeric/alphabet key on the remote control.



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

- 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 **DELETE/CANCEL** key 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

- Select the **TEXT ERASE** submenu.
→ **TEXT ERASE** appears on the display.
- Press EASY JOG/ENTER or ENTER on the remote control to confirm.
- 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.

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MENU MODE

English

Fade

- 1 Select the SET FADE sub menu.
→ SET FADE appears on the display.



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

- 3 Select FRJBE ON or OFF.

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

→ CH or OFF appears for 2 seconds on the display.

- 5 Rotate EASY JOG/ENTER to select SET FRJBE IN or SET FRJBE OUT.

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

→ 2000 H5 appears on the display.

- 7 By turning the EASY JOG key you can set the FADE IN or FADE OUT time.

- FADE IN automatically starts when you press RECORD to start recording. Your recording will automatically be faded out when you press the STOP ■ or PLAY/PAUSE ► key.

- 8 Press STORE/MENU to store settings and return to the sub-menu or STOP ■ to exit.

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.

→ CH or OFF appears for 2 seconds on the display.

- When CH 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 sub-menu or STOP ■ to exit.

Balance (Only active in Record/Standby mode)

- 1 Select the SET BALANCE sub menu.

→ 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 recording balance by turning the EASY JOG/ENTER key.

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

- Turn right: the figure right (R-) 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.

MENU MODE

English

Rename input source

- 1 Select the NAME SOURCE sub menu.
→ NAME SOURCE appears on the display.

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

- 3 Select the input source you wish to rename.

- 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.

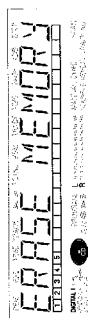
- 6 Press EASY JOG/ENTER or ENTER on the remote control to store the characters and move to the next cursor position.

- 7 Press STORE/MENU to store a name you have entered and move to the next item in the sub menu.



- 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 sub menu or STOP ■ to exit.

Note:

- If there are no discs in the memory, the message MEMORY FULL appears on the display.
- When the text memory of your CDRRecorder is full, the message MEMORY FULL will appear, followed by FULL. 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 will also appear when finalizing 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.

Personal notes:

FIXING PROBLEMS

TROUBLESHOOTING

English

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 CD recorder 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 unformatted disc
- check that the disc is recordable and replace if necessary
- the disc is not an AUDIO disc (ARCHIVE / JISC)
- wrong input source chosen. Input label flashing (CHECK INPUT)
- text memory full (MEMORY FULL / FULL / FULL / SIZE CD). When a CDR(W) has to be unformatted 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

Player does not react

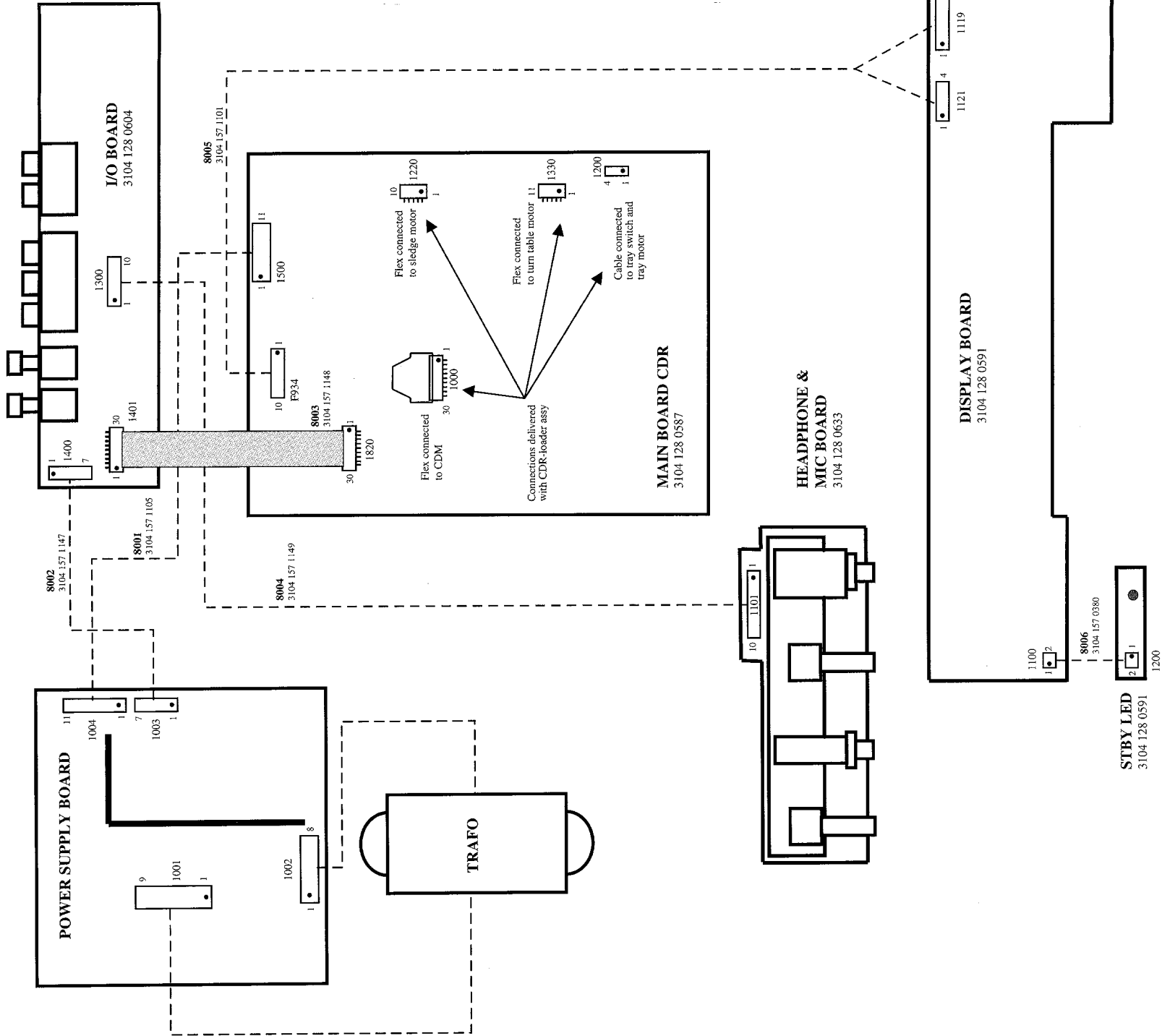
- switch the ON/OFF button on the front of the player off and back on

JISC RECOVER on display

- a power failure has occurred during recording, the CD recorder is attempting to repair the disc
- if JISC 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 CDR(W) disc, the track being recorded is lost, but further recording and finalisation can still be done

4. Mechanical Instructions

WIRING DIAGRAM CDR950/951



Pin 1 indicated by • All Wires are 1/1, except flex 8003

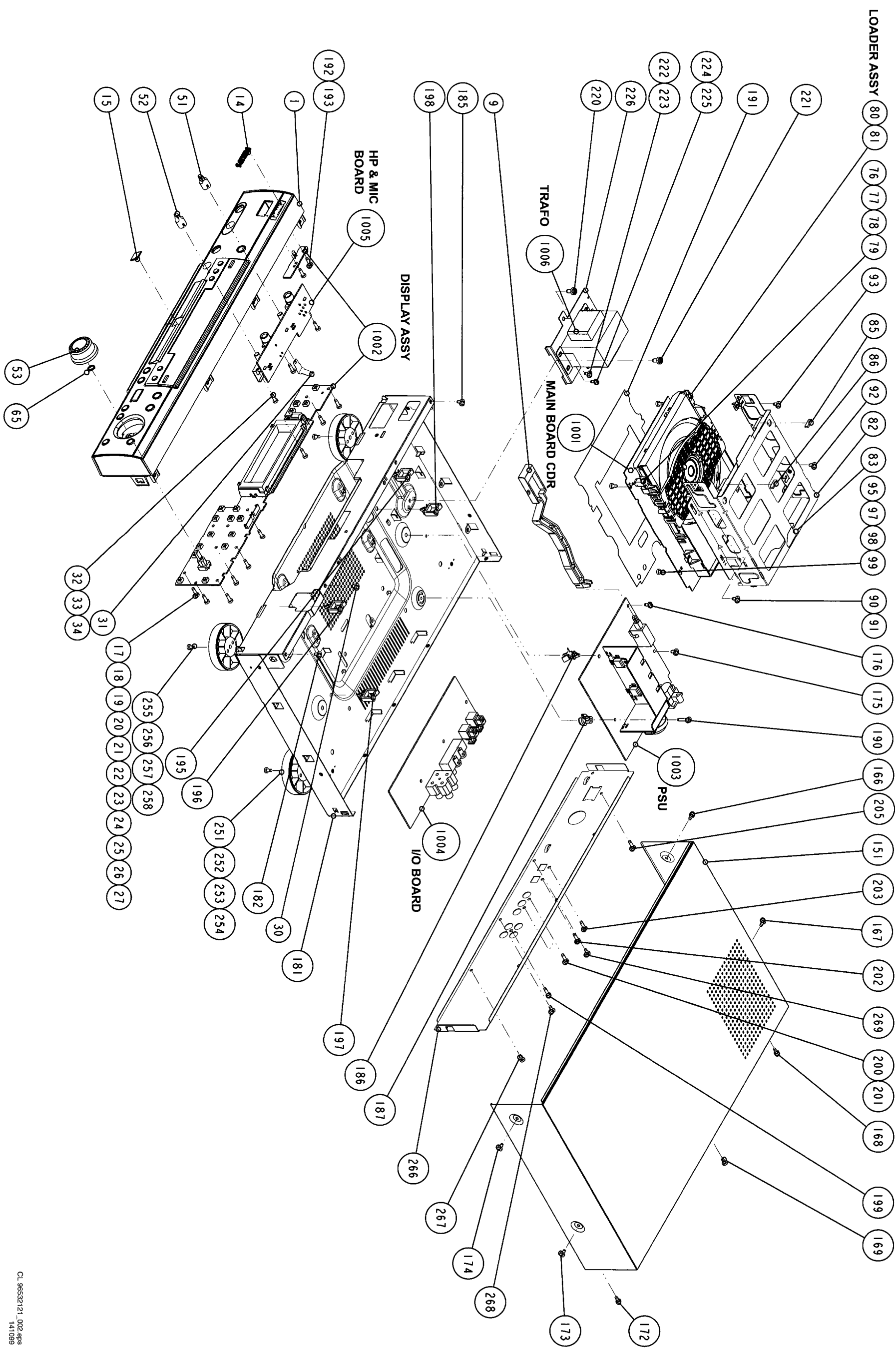
8001	8002	8003 (at conn. 1401 of I/O board)
1 VDC2	1 GND	1 GND
2 VFTD	2 +12V	2 OPT-IN
3 VDC1	3 GND	3 DIG-OUT
4 GROUND	4 +5V	4 GND
5 +5V	5 GND	5 DIG-IN2
6 +5V	6 -12V	6 DIG-IN1
7 GROUND	7 KILL	7 GND
8 GROUND		8 NOTUSED
9 GROUND		9 KILL-MAIN
10 +12V		10 DEEMP
11 -12V		11 MUTE
		12 MICPRES-INTCOPY
		13 LEVEL-A2
		14 LEVEL-A1
		15 LEVEL-A0
		16 GND
		17 PST3
		18 +5V
		19 IIS-DATA-ADC
		20 IIS-BCLK-ADC (MIC)
		21 GND
		22 IIS-WS-ADC (MIC)
		23 IIS-DATA-DAC
		24 GND
		25 IIS-BCLK-DAC
		26 IIS-WS-DAC
		27 GND
		28 MIC-HPSEL (DATA)
		29 CL11
		30 GND

8004	8005
1 HP-LEFTOUT	1 VDC2
2 KILL	2 VFTD
3 HP-RIGHTOUT	3 VDC1
4 -12V	4 SYS-RESET
5 GND	5 IIC-DATA
6 +12V	6 GND
7 MIC-RIGHTIN	7 IIC-CLK
8 GND	8 DISPL-INT
9 MIC-LEFTIN	9 GND
10 MICPRES-INTCOPY	10 D5V

8006
1 STBY
2 GND

Texture indicates text on flex.

EXPLODED VIEW CDR950/951



DISMANTLING INSTRUCTIONS CDR950/951

See exploded view for item numbers

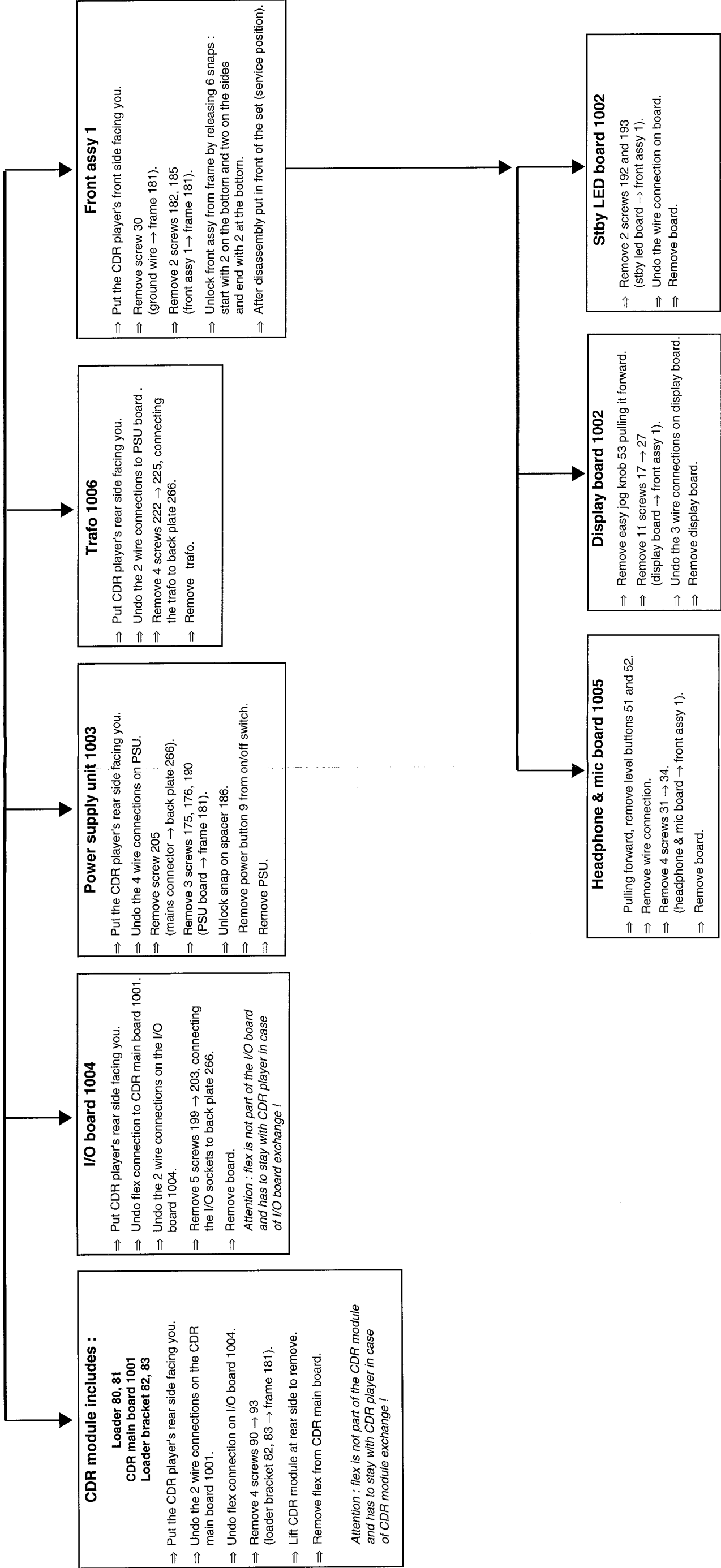
Cover 151

⇒ Remove 7 screws 166 → 169, 172 → 174
2 at each side and 3 at rear side.

⇒ Lift cover at rear side to remove.

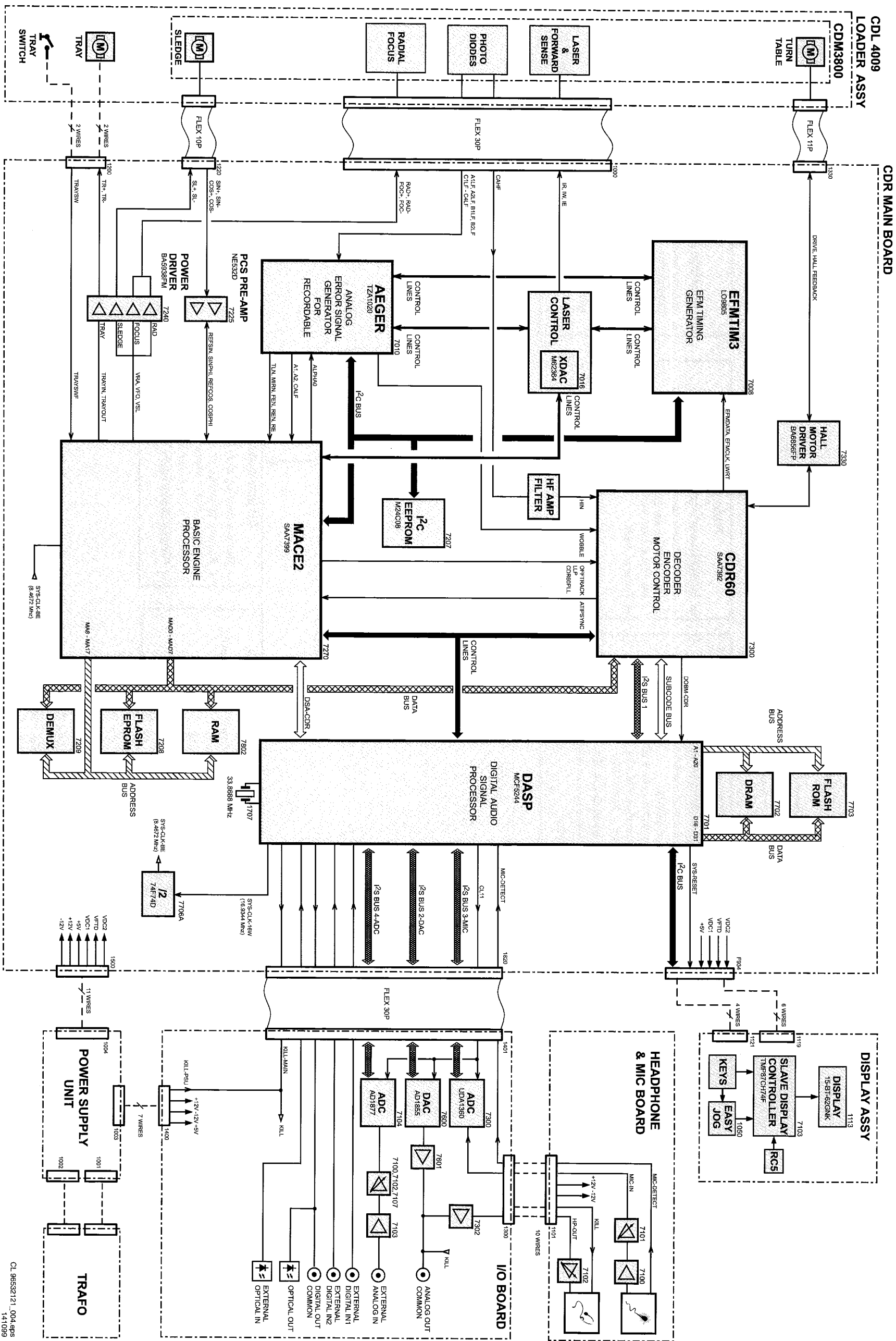
↑
assembling

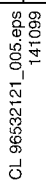
↓
disassembling



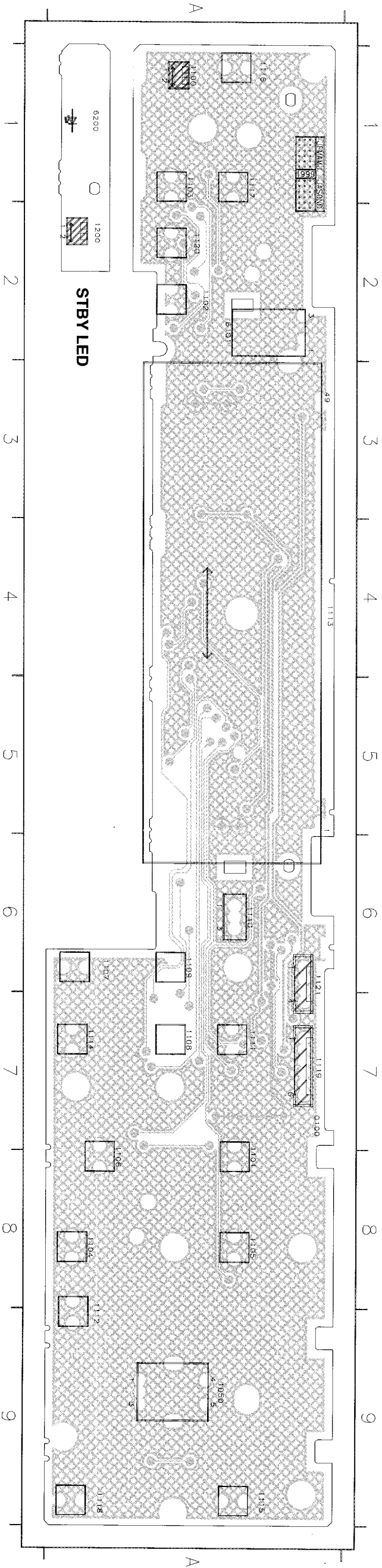
5. Electrical and Circuit Diagrams

OVERALL BLOCK DIAGRAM CDR950/951

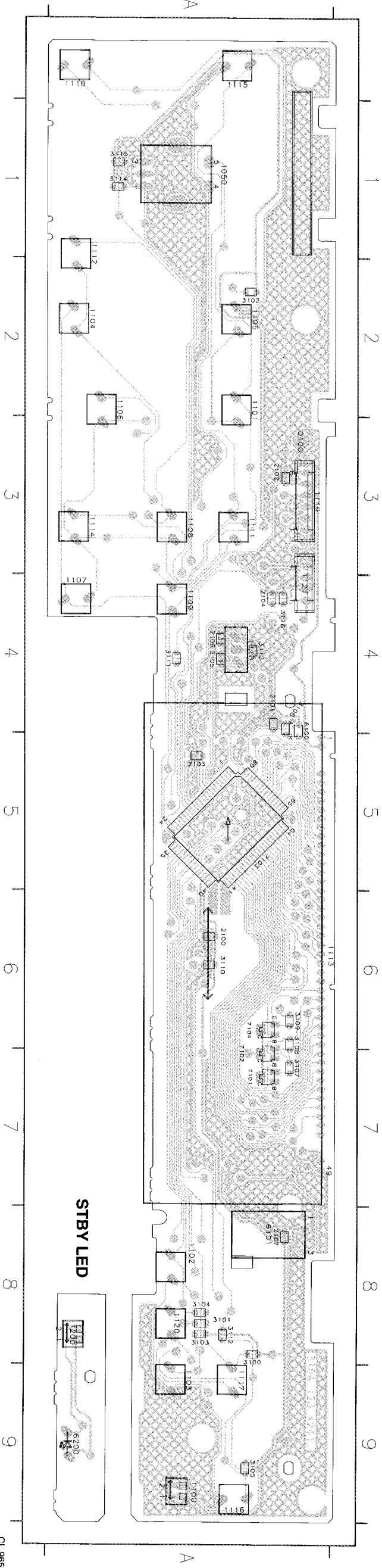




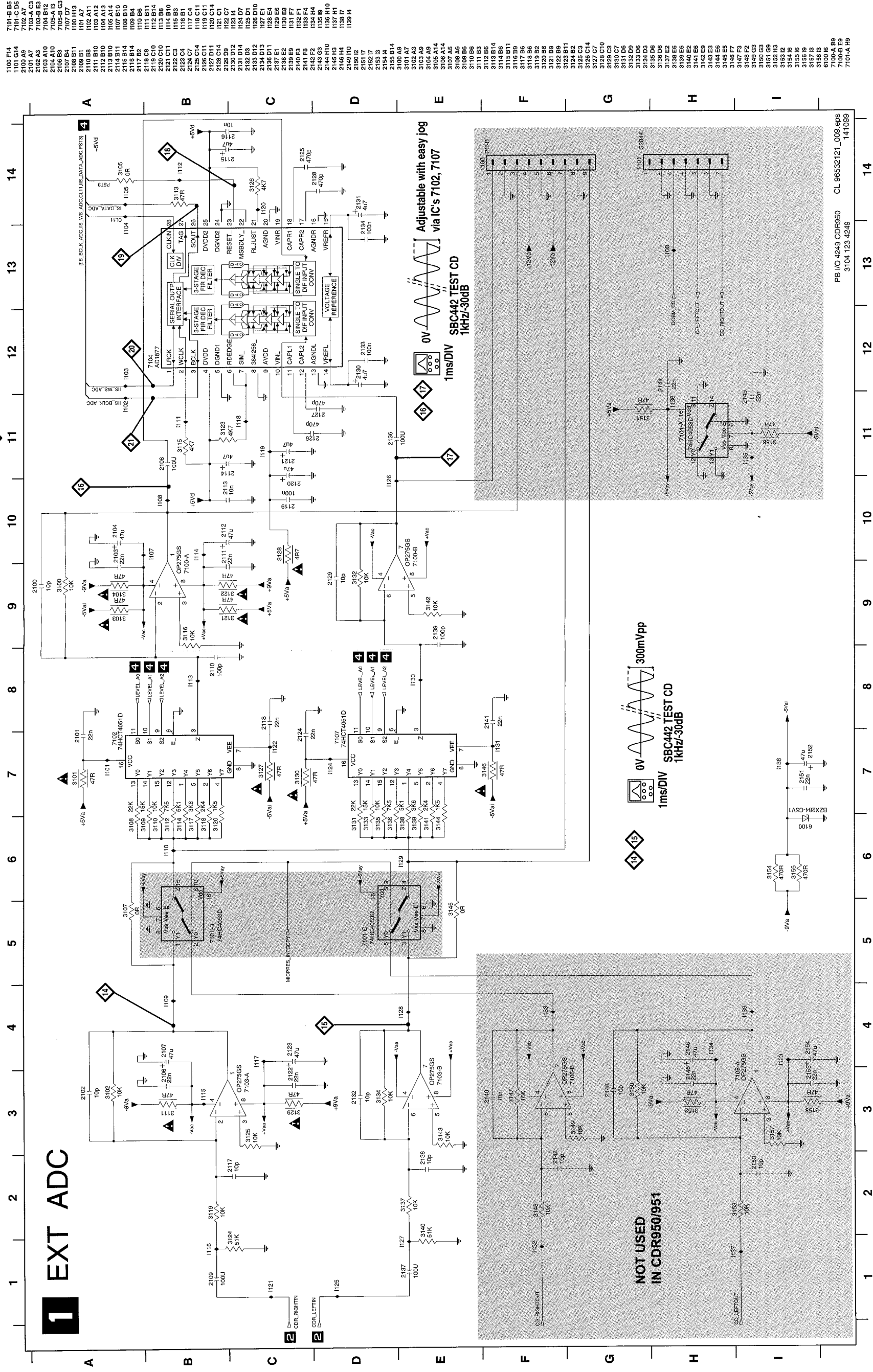
DISPLAY BOARD & STBY LED CDR950/951 - FRONT VIEW



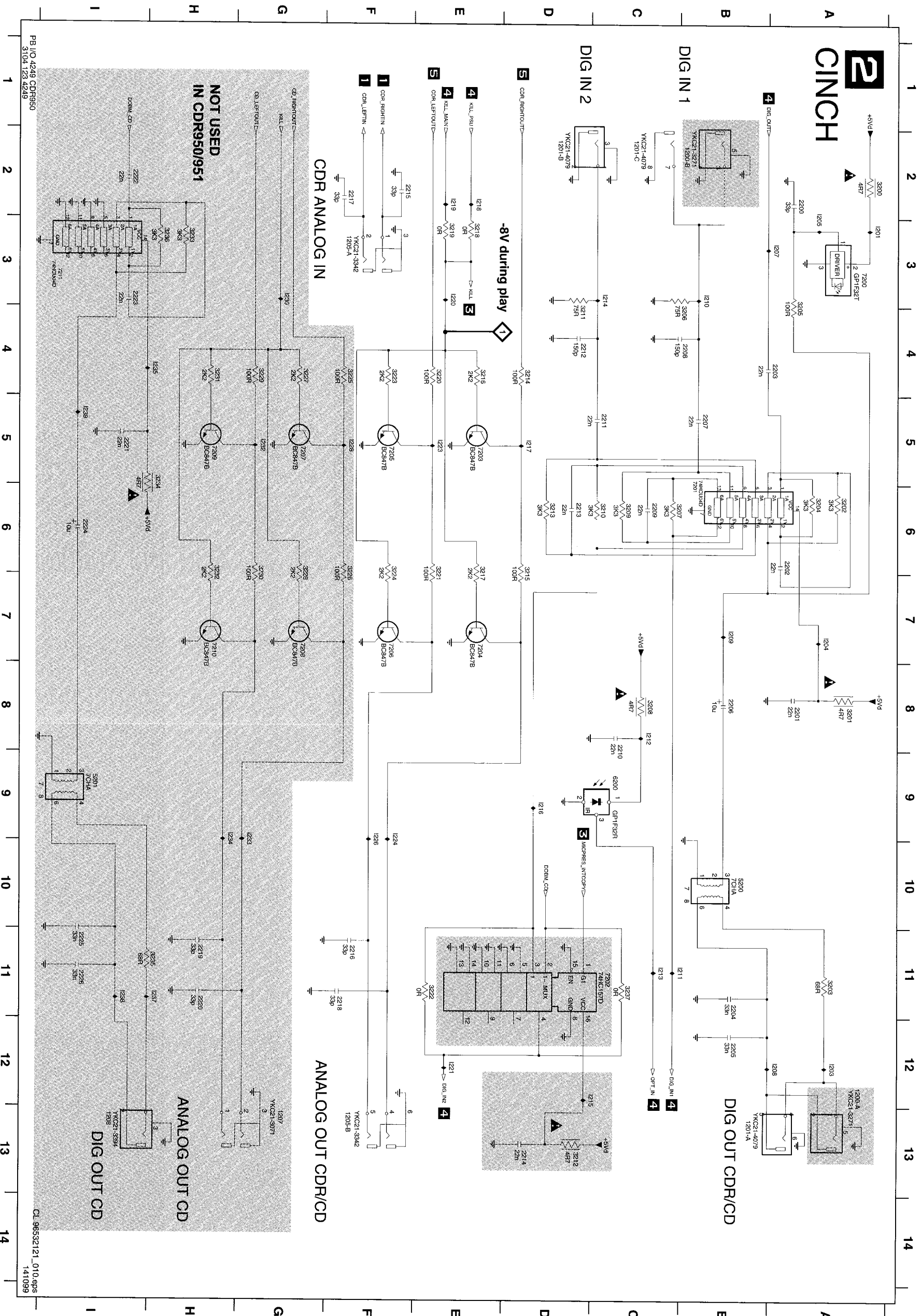
DISPLAY BOARD & STBY LED CDR950/951 - BACK VIEW



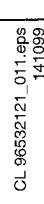
EXT ADC



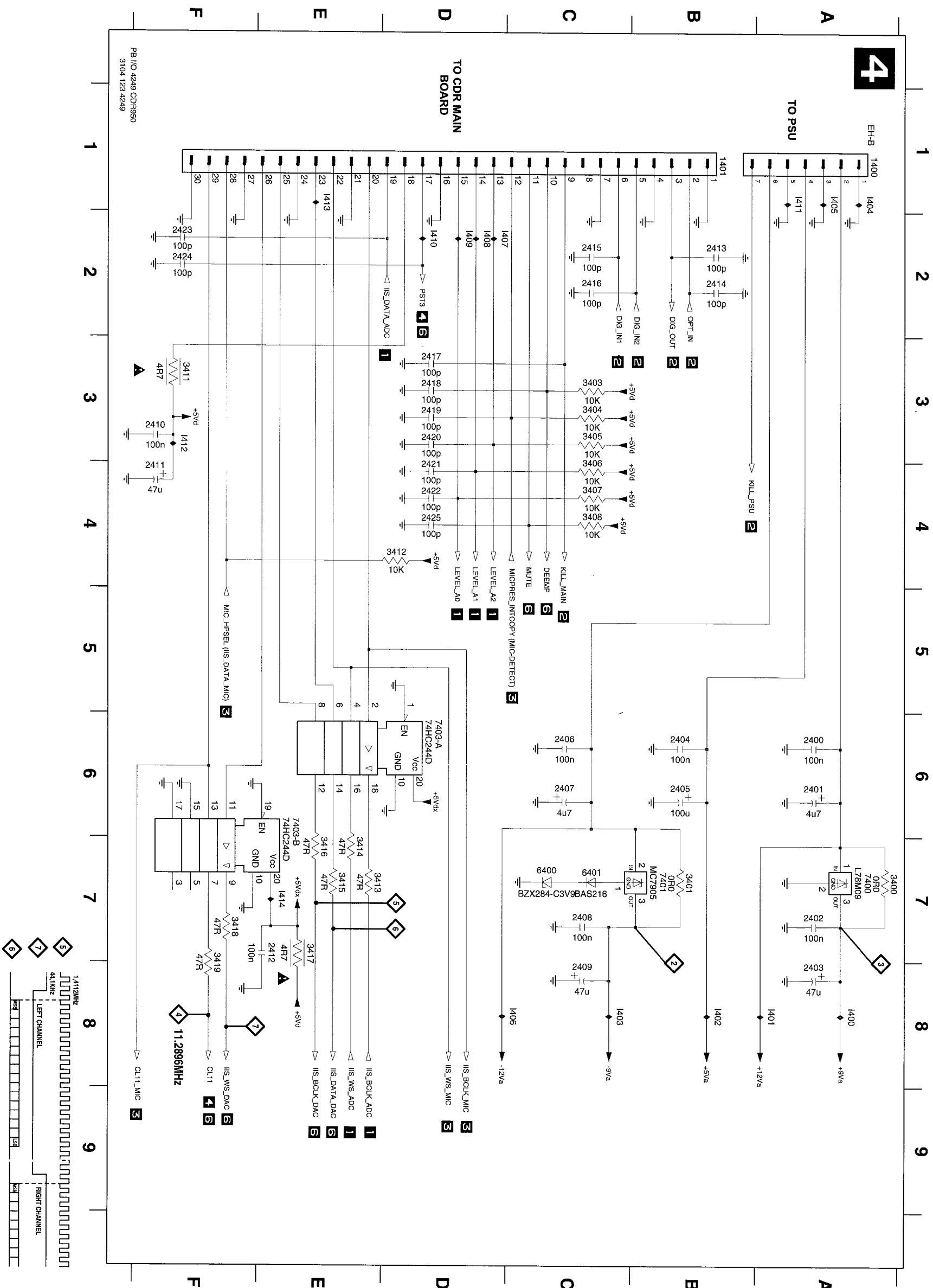
I/O BOARD CDR950/951 - CIRCUIT DIAGRAM 2



1230 A-12	1230 A-13	1230 A-14	1230 A-15	1230 A-16	1230 A-17	1230 A-18	1230 A-19	1230 A-20	1230 A-21	1230 A-22	1230 A-23	1230 A-24	1230 A-25	1230 A-26	1230 A-27	1230 A-28	1230 A-29	1230 A-30	1230 A-31	1230 A-32	1230 A-33	1230 A-34	1230 A-35	1230 A-36	1230 A-37	1230 A-38	1230 A-39	1230 A-40	1230 A-41	1230 A-42	1230 A-43	1230 A-44	1230 A-45	1230 A-46	1230 A-47	1230 A-48	1230 A-49	1230 A-50	1230 A-51	1230 A-52	1230 A-53	1230 A-54	1230 A-55	1230 A-56	1230 A-57	1230 A-58	1230 A-59	1230 A-60	1230 A-61	1230 A-62	1230 A-63	1230 A-64	1230 A-65	1230 A-66	1230 A-67	1230 A-68	1230 A-69	1230 A-70	1230 A-71	1230 A-72	1230 A-73	1230 A-74	1230 A-75	1230 A-76	1230 A-77	1230 A-78	1230 A-79	1230 A-80	1230 A-81	1230 A-82	1230 A-83	1230 A-84	1230 A-85	1230 A-86	1230 A-87	1230 A-88	1230 A-89	1230 A-90	1230 A-91	1230 A-92	1230 A-93	1230 A-94	1230 A-95	1230 A-96	1230 A-97	1230 A-98	1230 A-99	1230 A-100	1230 A-101	1230 A-102	1230 A-103	1230 A-104	1230 A-105	1230 A-106	1230 A-107	1230 A-108	1230 A-109	1230 A-110	1230 A-111	1230 A-112	1230 A-113	1230 A-114	1230 A-115	1230 A-116	1230 A-117	1230 A-118	1230 A-119	1230 A-120	1230 A-121	1230 A-122	1230 A-123	1230 A-124	1230 A-125	1230 A-126	1230 A-127	1230 A-128	1230 A-129	1230 A-130	1230 A-131	1230 A-132	1230 A-133	1230 A-134	1230 A-135	1230 A-136	1230 A-137	1230 A-138	1230 A-139	1230 A-140	1230 A-141	1230 A-142	1230 A-143	1230 A-144	1230 A-145	1230 A-146	1230 A-147	1230 A-148	1230 A-149	1230 A-150	1230 A-151	1230 A-152	1230 A-153	1230 A-154	1230 A-155	1230 A-156	1230 A-157	1230 A-158	1230 A-159	1230 A-160	1230 A-161	1230 A-162	1230 A-163	1230 A-164	1230 A-165	1230 A-166	1230 A-167	1230 A-168	1230 A-169	1230 A-170	1230 A-171	1230 A-172	1230 A-173	1230 A-174	1230 A-175	1230 A-176	1230 A-177	1230 A-178	1230 A-179	1230 A-180	1230 A-181	1230 A-182	1230 A-183	1230 A-184	1230 A-185	1230 A-186	1230 A-187	1230 A-188	1230 A-189	1230 A-190	1230 A-191	1230 A-192	1230 A-193	1230 A-194	1230 A-195	1230 A-196	1230 A-197	1230 A-198	1230 A-199	1230 A-200	1230 A-201	1230 A-202	1230 A-203	1230 A-204	1230 A-205	1230 A-206	1230 A-207	1230 A-208	1230 A-209	1230 A-210	1230 A-211	1230 A-212	1230 A-213	1230 A-214	1230 A-215	1230 A-216	1230 A-217	1230 A-218	1230 A-219	1230 A-220	1230 A-221	1230 A-222	1230 A-223	1230 A-224	1230 A-225	1230 A-226	1230 A-227	1230 A-228	1230 A-229	1230 A-230	1230 A-231	1230 A-232	1230 A-233	1230 A-234	1230 A-235	1230 A-236	1230 A-237	1230 A-238	1230 A-239	1230 A-240	1230 A-241	1230 A-242	1230 A-243	1230 A-244	1230 A-245	1230 A-246	1230 A-247	1230 A-248	1230 A-249	1230 A-250	1230 A-251	1230 A-252	1230 A-253	1230 A-254	1230 A-255	1230 A-256	1230 A-257	1230 A-258	1230 A-259	1230 A-260	1230 A-261	1230 A-262	1230 A-263	1230 A-264	1230 A-265	1230 A-266	1230 A-267	1230 A-268	1230 A-269	1230 A-270	1230 A-271	1230 A-272	1230 A-273	1230 A-274	1230 A-275	1230 A-276	1230 A-277	1230 A-278	1230 A-279	1230 A-280	1230 A-281	1230 A-282	1230 A-283	1230 A-284	1230 A-285	1230 A-286	1230 A-287	1230 A-288	1230 A-289	1230 A-290	1230 A-291	1230 A-292	1230 A-293	1230 A-294	1230 A-295	1230 A-296	1230 A-297	1230 A-298	1230 A-299	1230 A-300	1230 A-301	1230 A-302	1230 A-303	1230 A-304	1230 A-305	1230 A-306	1230 A-307	1230 A-308	1230 A-309	1230 A-
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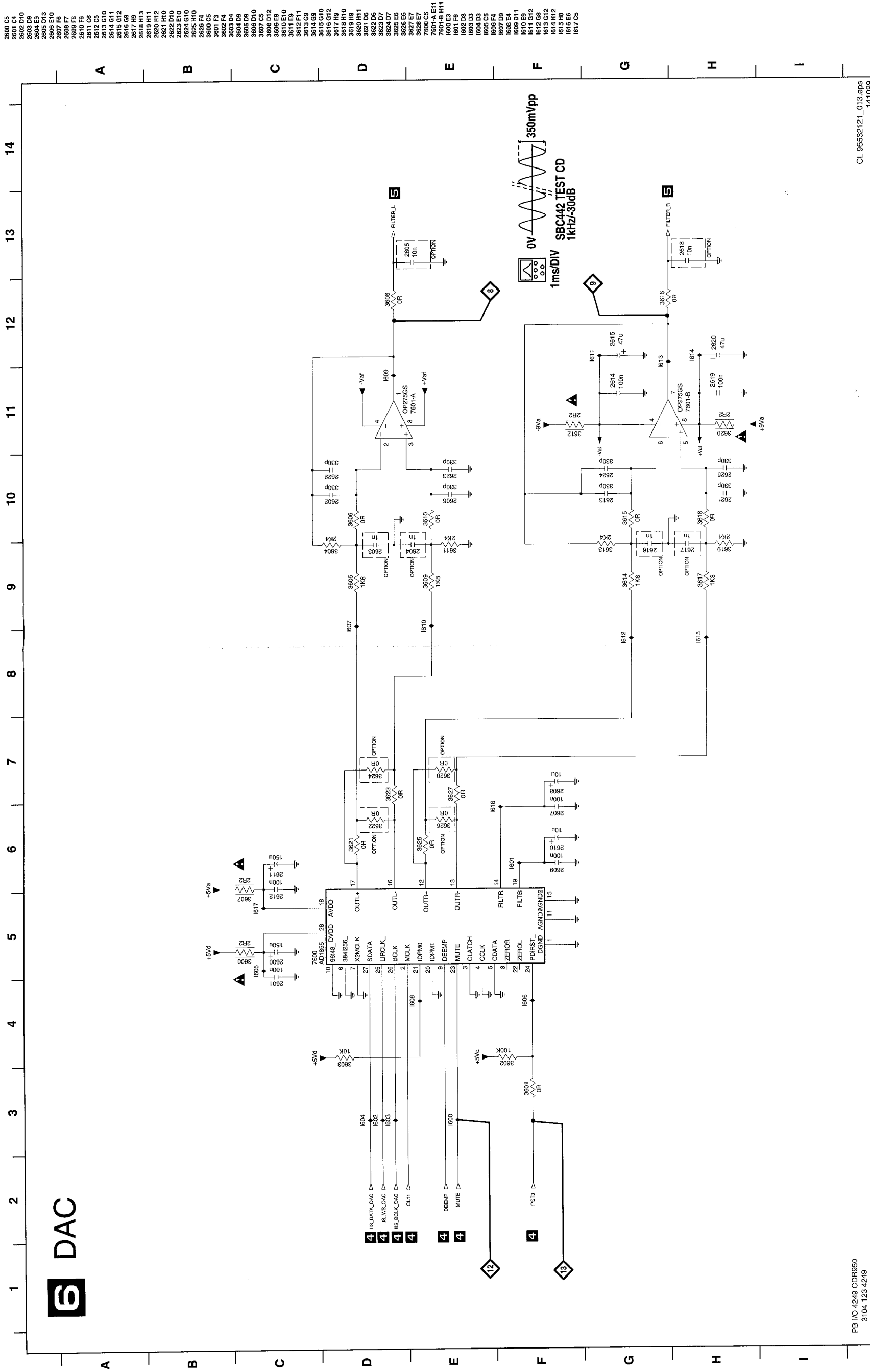
PB I/O 4249 CDR950
3104 123 4249

I/O BOARD CDR950/951 - CIRCUIT DIAGRAM 4

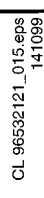


1400 A1
1401 B1
2401 A6
2402 A7
2403 A8
2404 B6
2405 B6
2406 C6
2407 C6
2408 C7
2409 C8
2410 F3
2411 F4
2412 E7
2413 B2
2414 B2
2415 C2
2416 C2
2417 D3
2418 D3
2419 D3
2420 D3
2421 D3
2422 D4
2423 F2
2424 F2
2425 D4
3400 A7
3401 B7
3402 C3
3403 C3
3404 C3
3405 C3
3406 C4
3407 C4
3408 C4
3411 F3
3412 D4
3413 E7
3414 E7
3415 E7
3416 E7
3417 E7
3418 F7
3419 F8
6400 C7
6401 C7
7400 A7
7401 B7
7403-A D6
7403-B E6
1400 A8
1401 A8
1402 B8
1403 C8
1404 A1
1405 A1
1406 C8
1407 D2
1408 D2
1409 D2
1410 D2
1411 A1
1412 F3
1413 F3
1414 E7

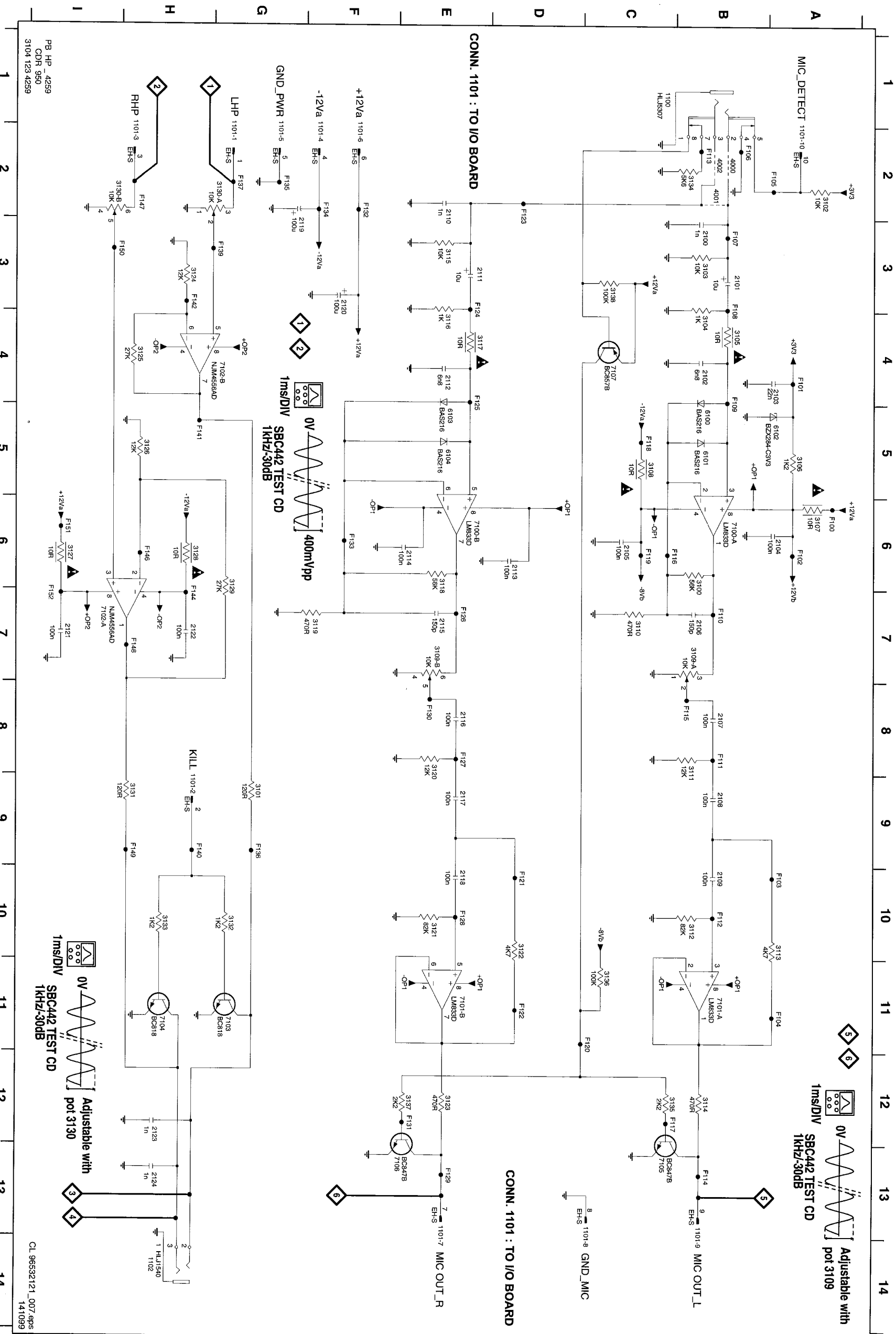
I/O BOARD CDR950/951 - CIRCUIT DIAGRAM 6



△

[illegible]

HEADPHONE & MIC BOARD CDR950/951 - CIRCUIT DIAGRAM

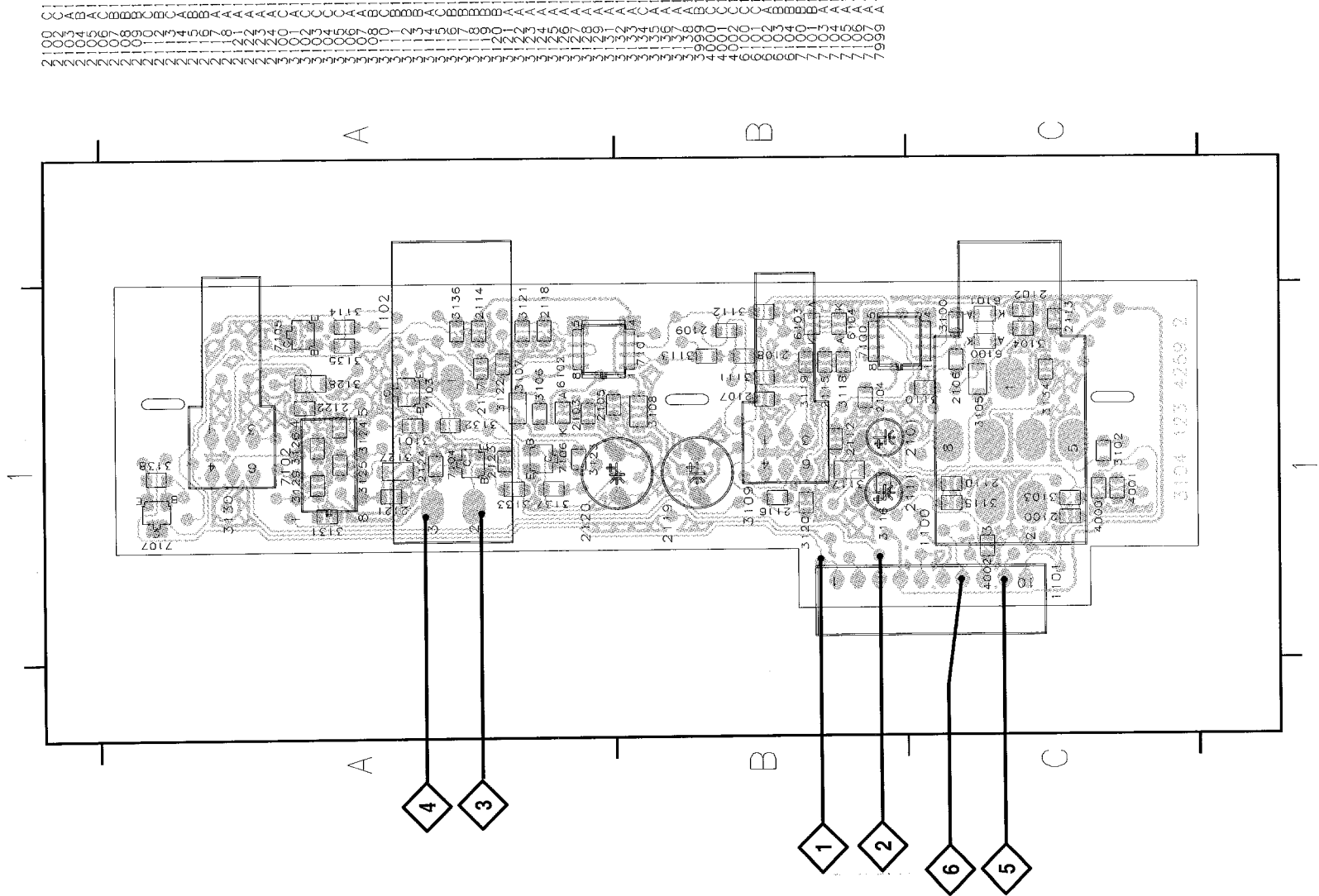


- F114 B13
- F115 B13
- F116 B13
- F117 C12
- F118 C12
- F119 C12
- F120 C11
- F121 D10
- F122 D11
- F123 D2
- F124 E3
- F125 E4
- F126 E4
- F127 E5
- F128 E10
- F129 E10
- F130 E10
- F131 E12
- F132 F2
- F133 F2
- F134 F2
- F135 G2
- F136 G2
- F137 G2
- F138 G2
- F139 G2
- F140 H3
- F141 H3
- F142 H3
- F143 H3
- F144 H7
- F145 H7
- F146 H6
- F147 H2
- F148 H2
- F149 H9
- F150 H9
- F151 I6
- F152 I7
- F110 C1
- F111 G1
- F112 G1
- F113 G1
- F114 G1
- F115 G1
- F116 G1
- F117 G1
- F118 G1
- F119 G1
- F120 G1
- F121 G1
- F122 G1
- F123 G1
- F124 G1
- F125 G1
- F126 G1
- F127 G1
- F128 G1
- F129 G1
- F130 G1
- F131 G1
- F132 G1
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- F142 G1
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- F148 G1
- F149 G1
- F150 G1
- F151 G1
- F152 G1

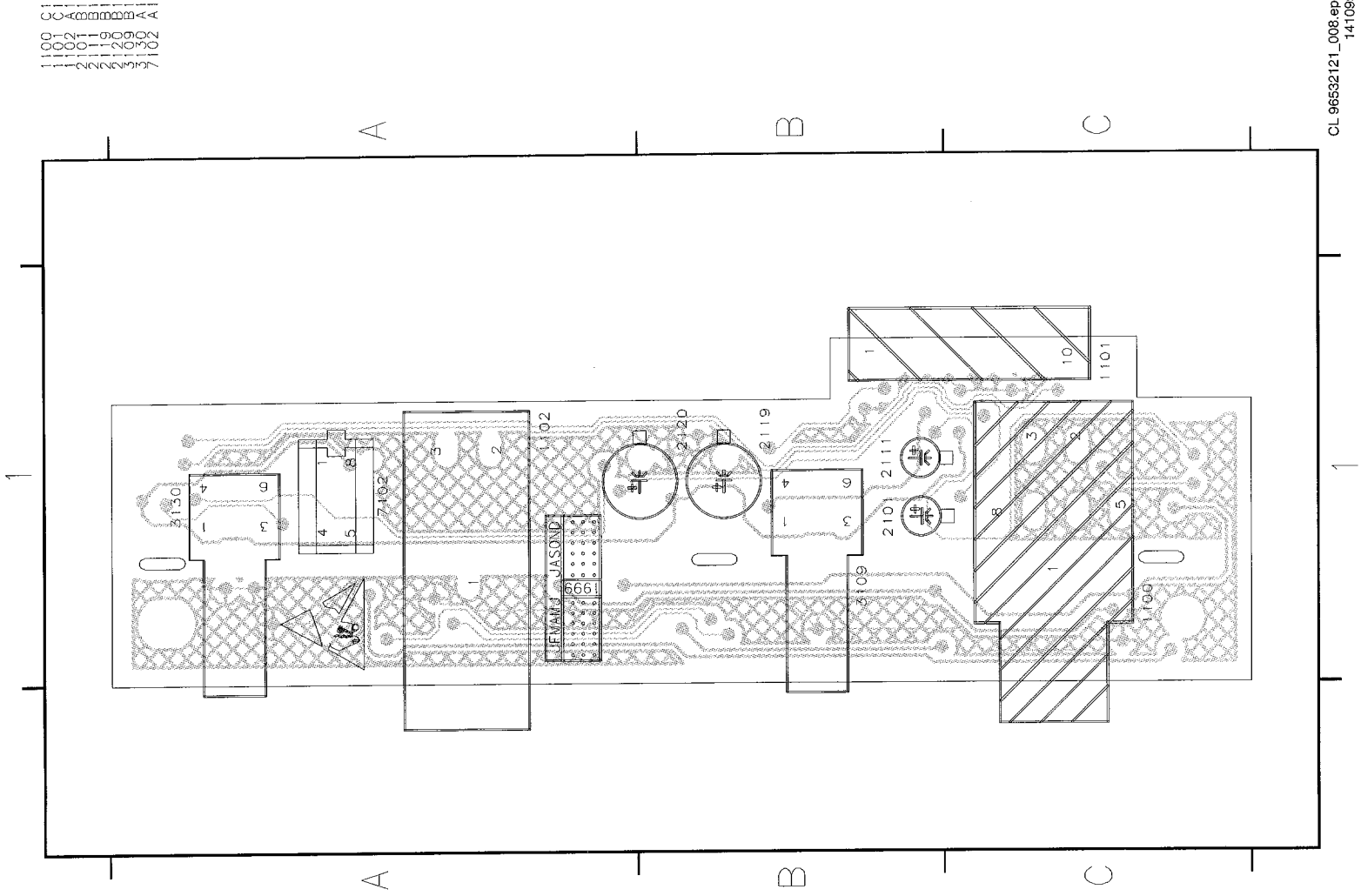
PB HP - 4259
CDR 950
3104 123 4259

CL 96532121_007.eps
141099

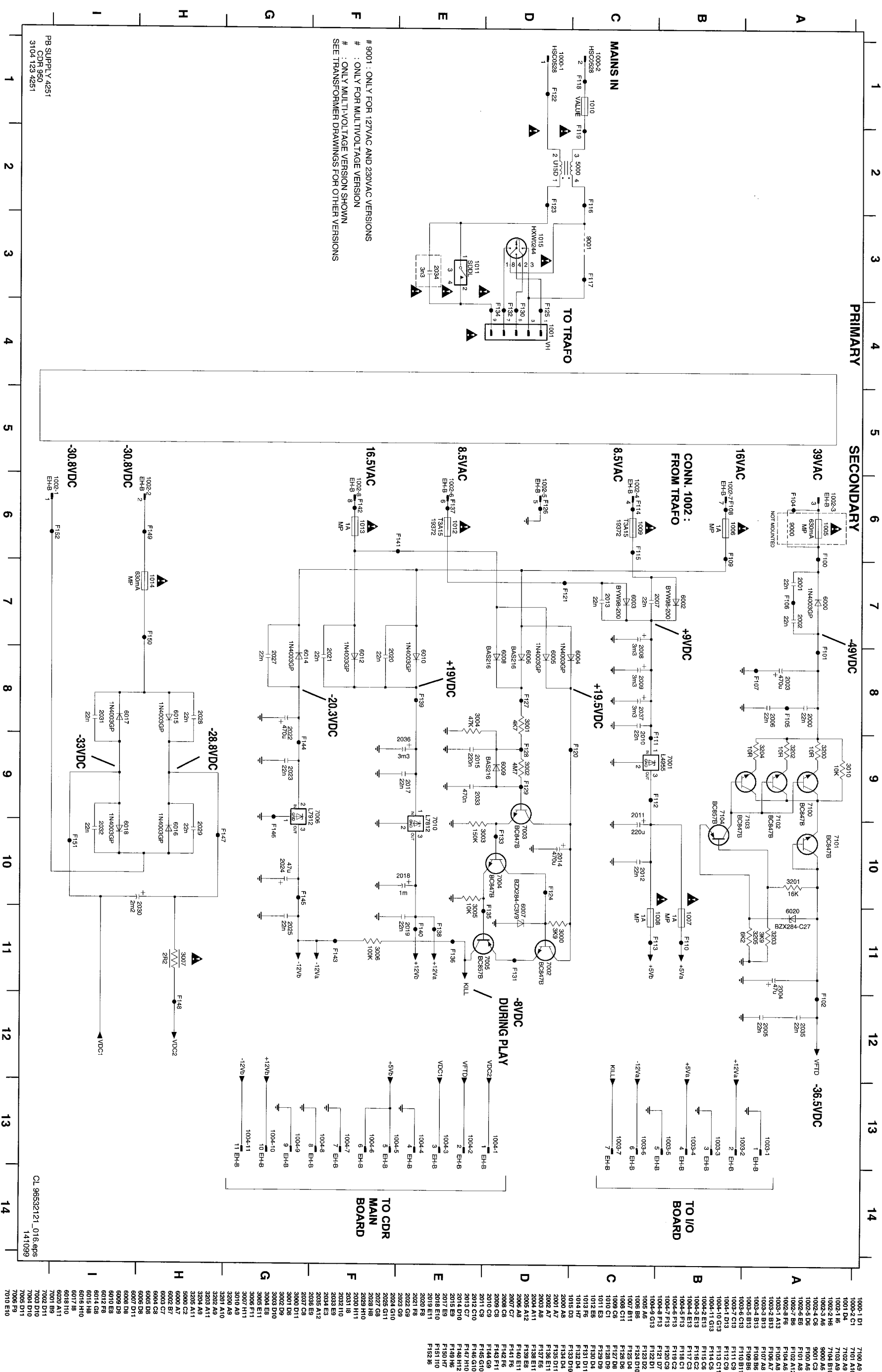
HEADPHONE & MIC BOARD CDR950/951 - TOP VIEW



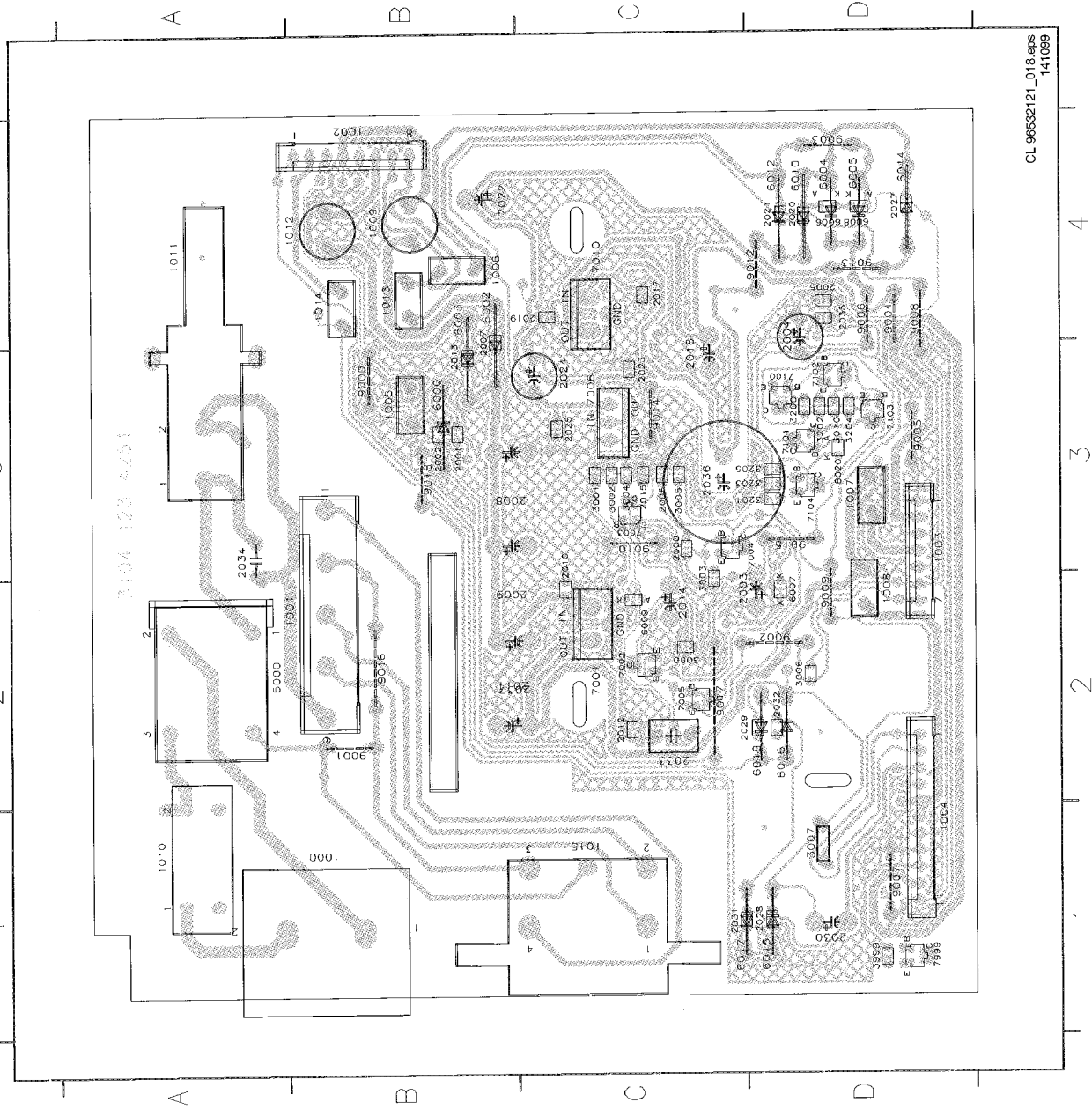
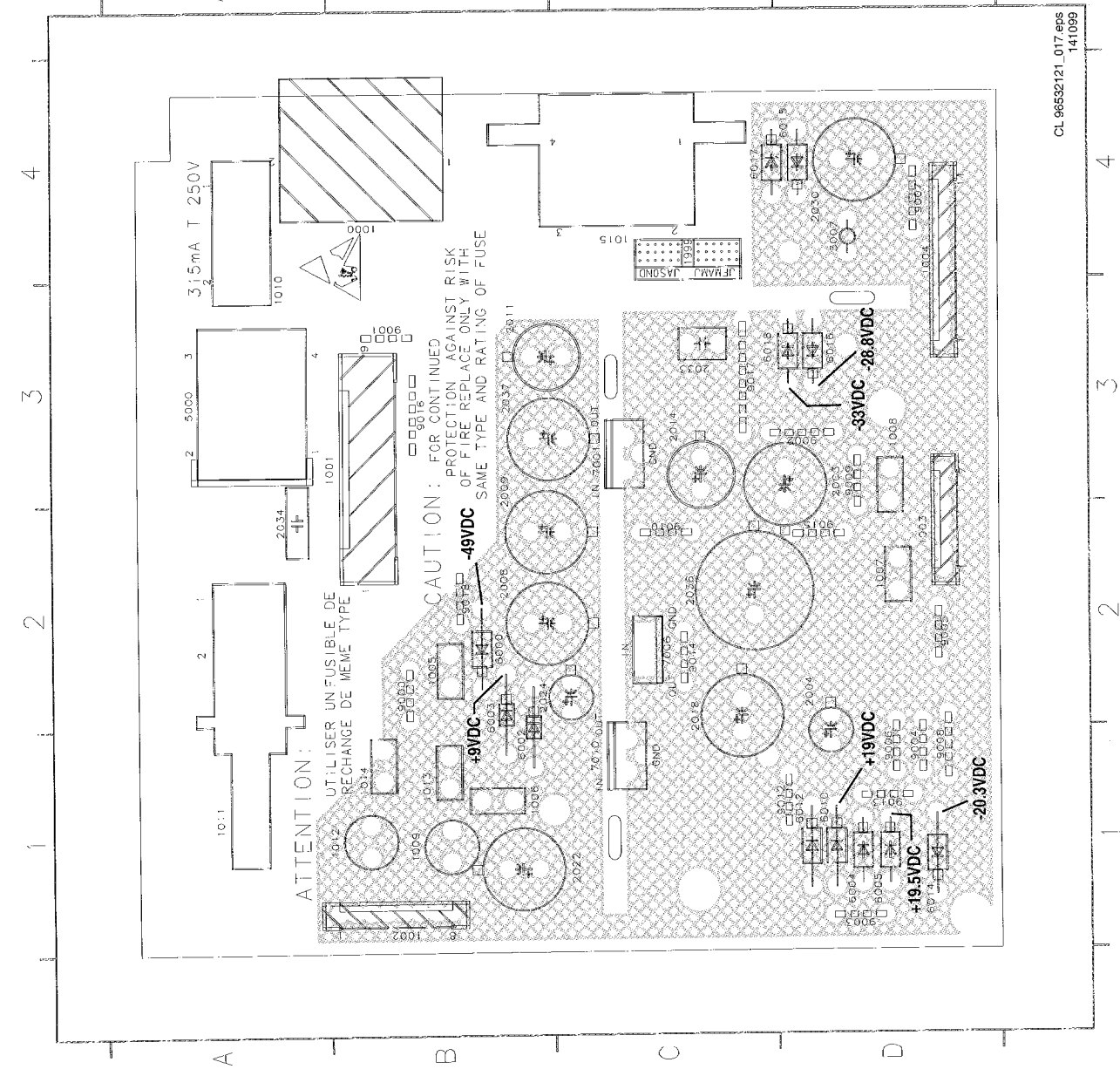
HEADPHONE & MIC BOARD CDR950/951 - BOTTOM VIEW



PSU BOARD CDR950/951 - CIRCUIT DIAGRAM



PSU BOARD CDR950/951 - BOTTOM VIEW



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

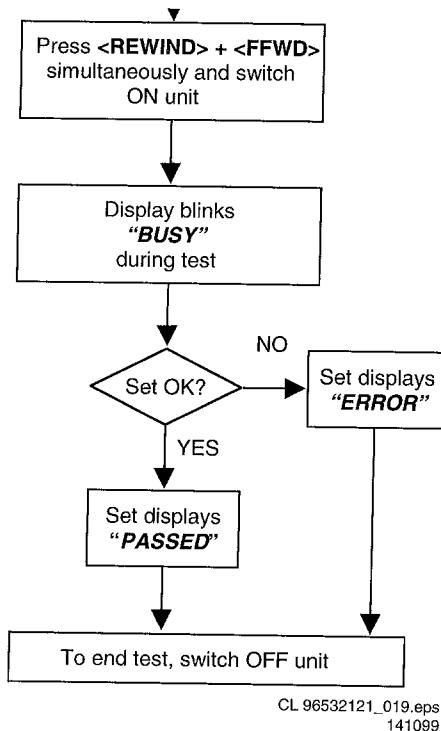


Figure 6-1

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)

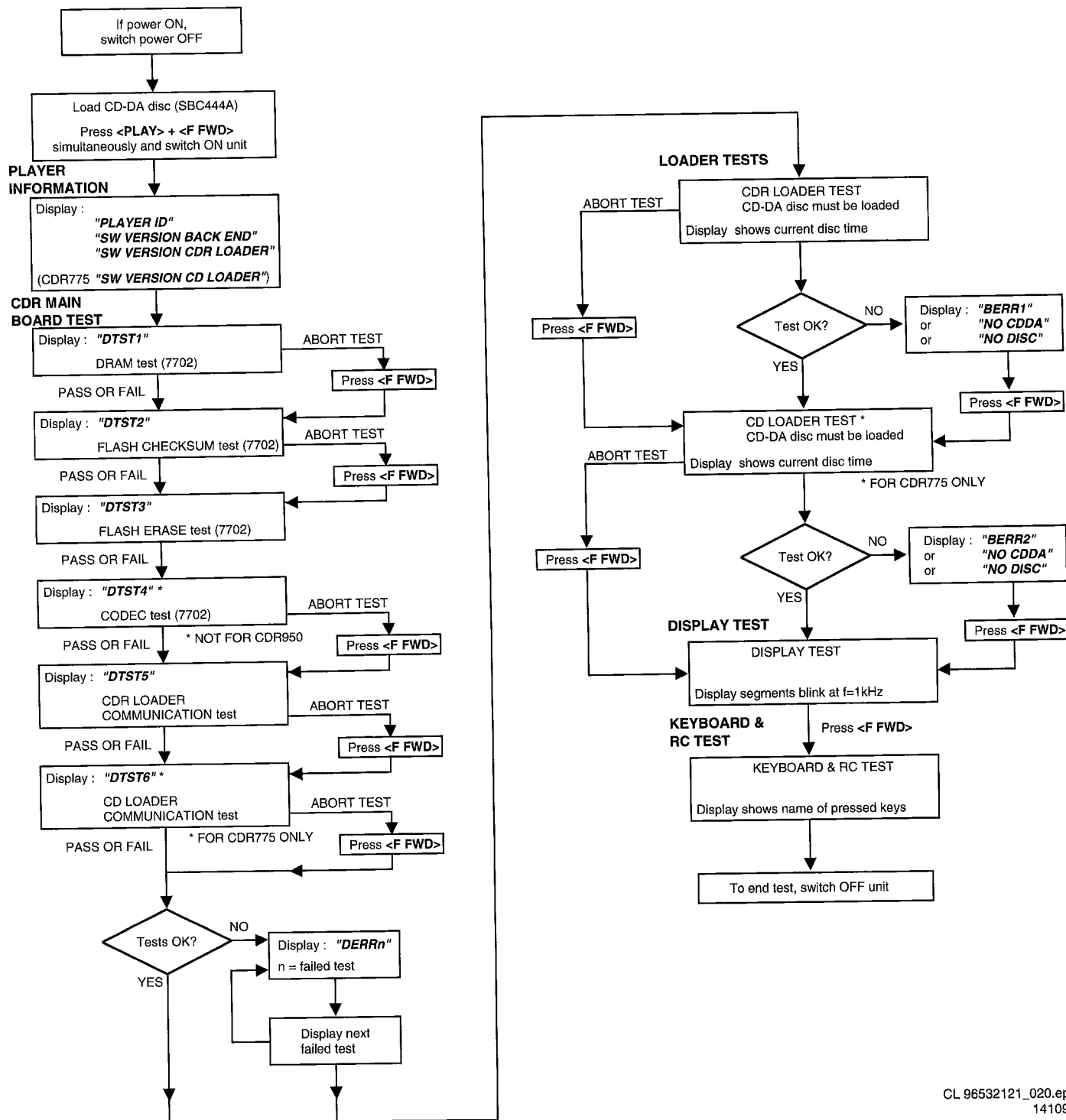


Figure 6-2

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

As soon as the CDR main board tests are finished, all failure messages (if any) will be displayed sequentially by pressing the [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

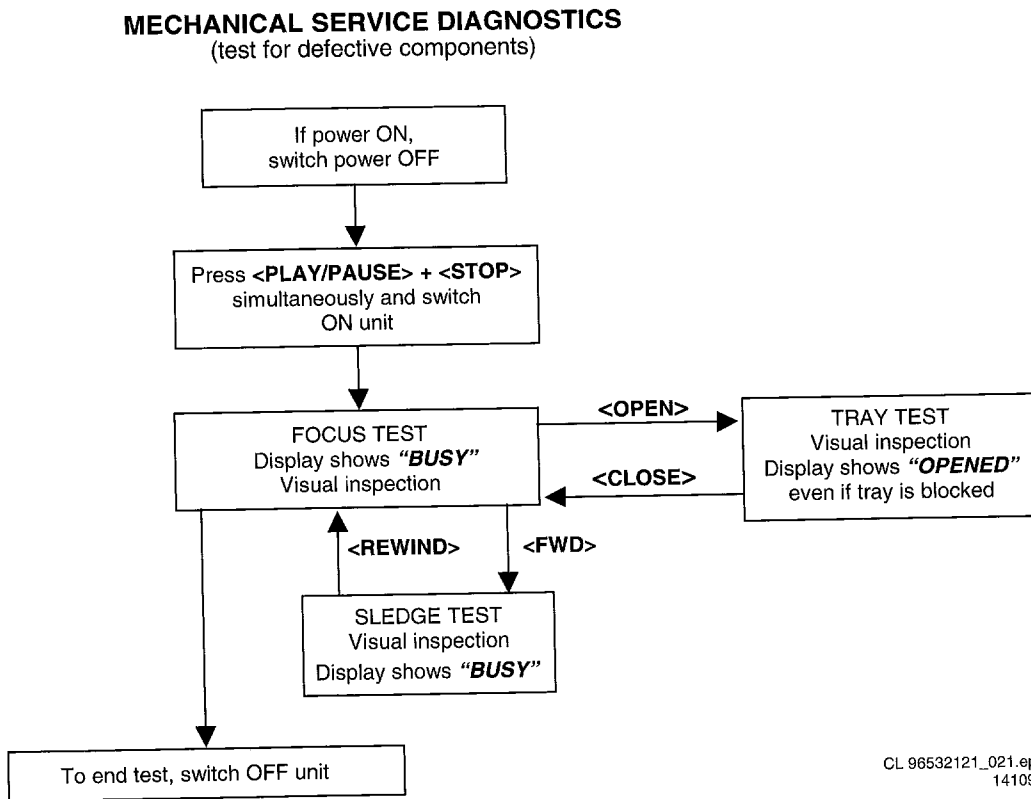


Figure 6-3

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.

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".

6.4.2 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

6.5 DC-erase service mode

DC ERASE SERVICE MODE (erasure of complete CD-RW)

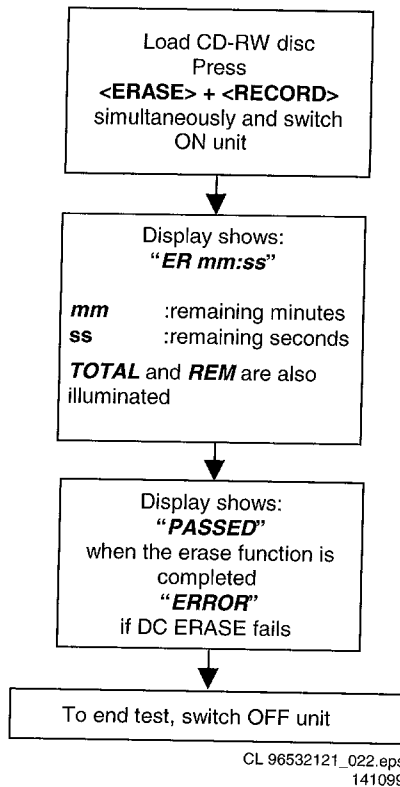


Figure 6-4

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.

7. Faultfinding Trees

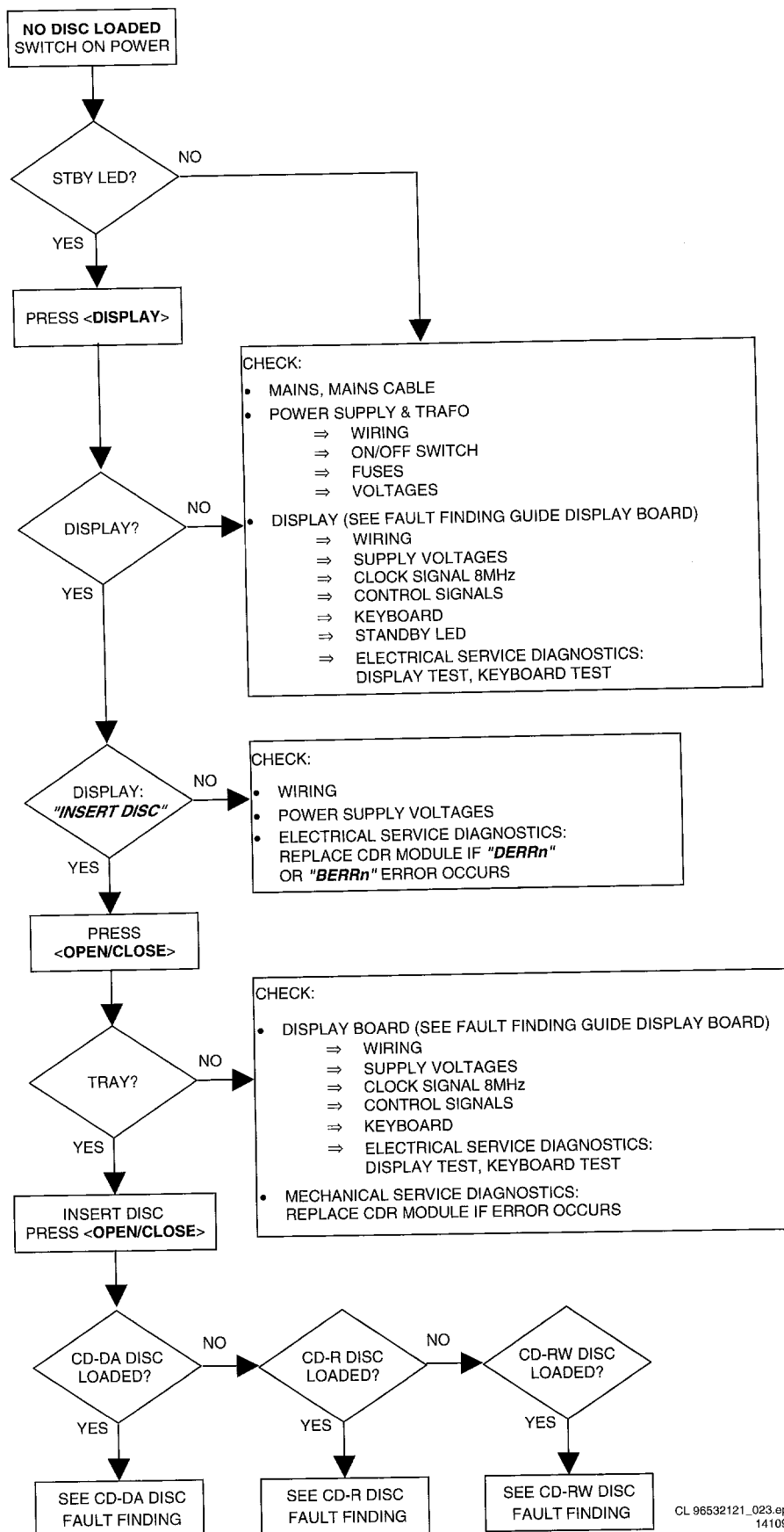


Figure 7-1

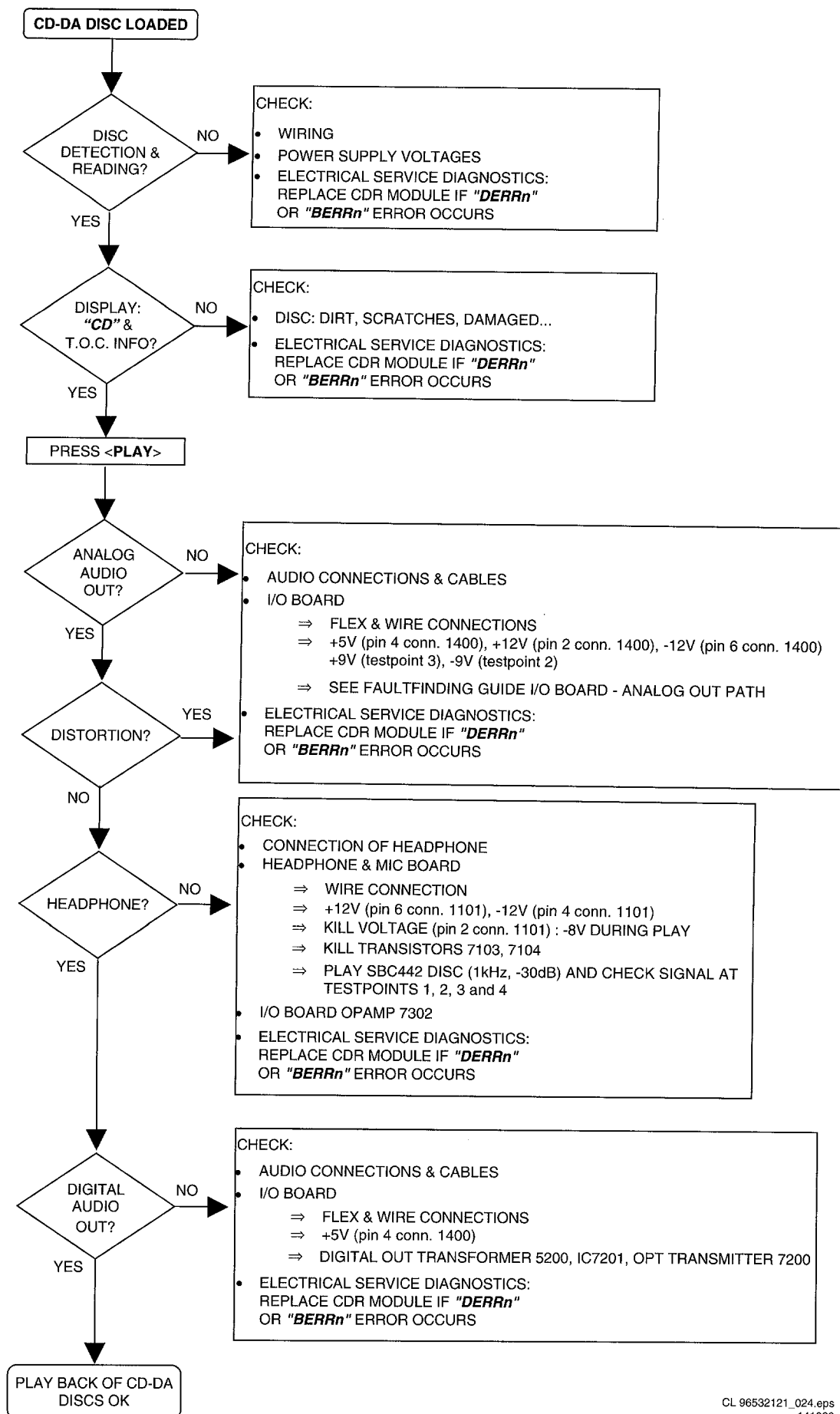


Figure 7-2

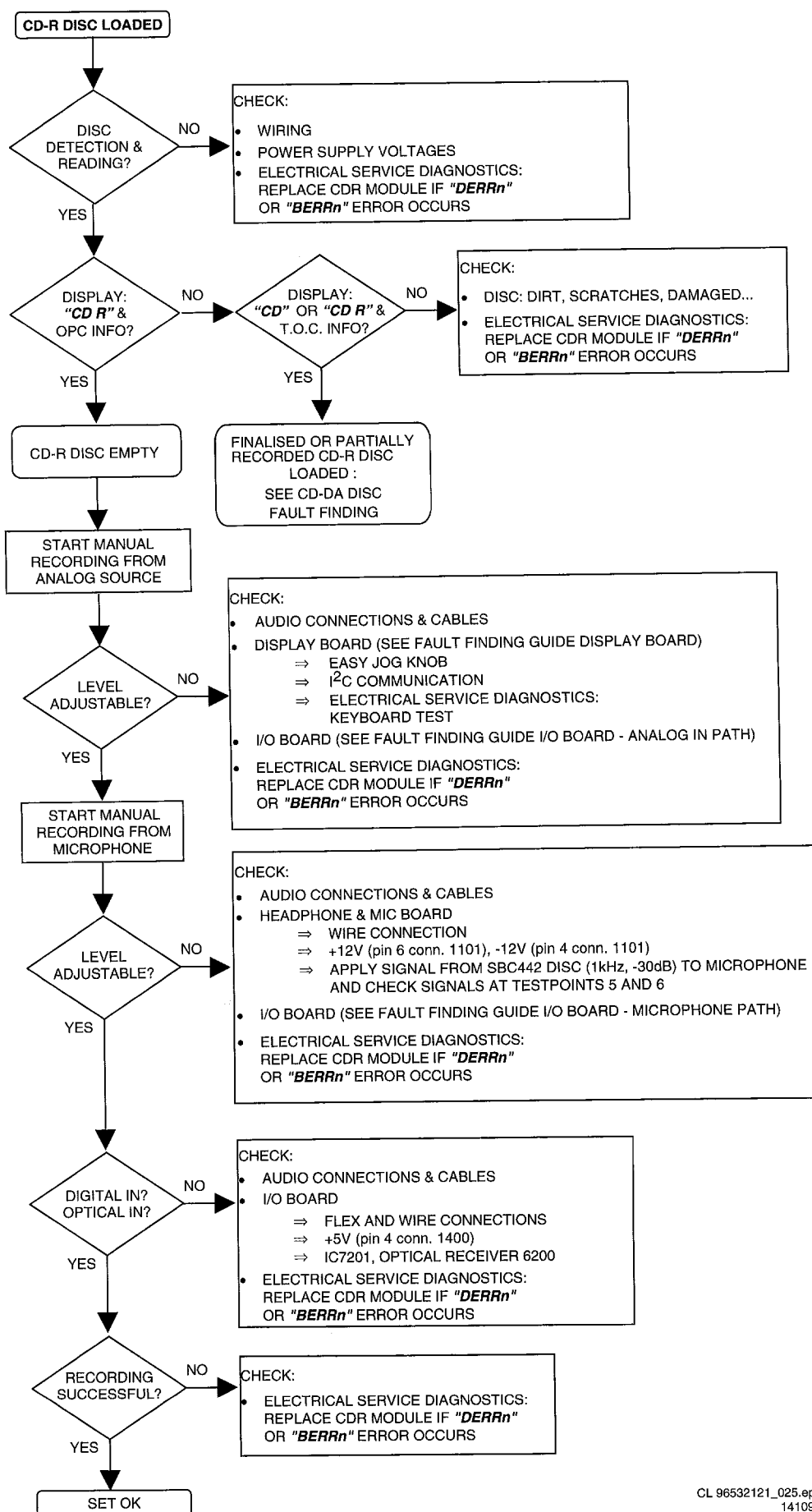
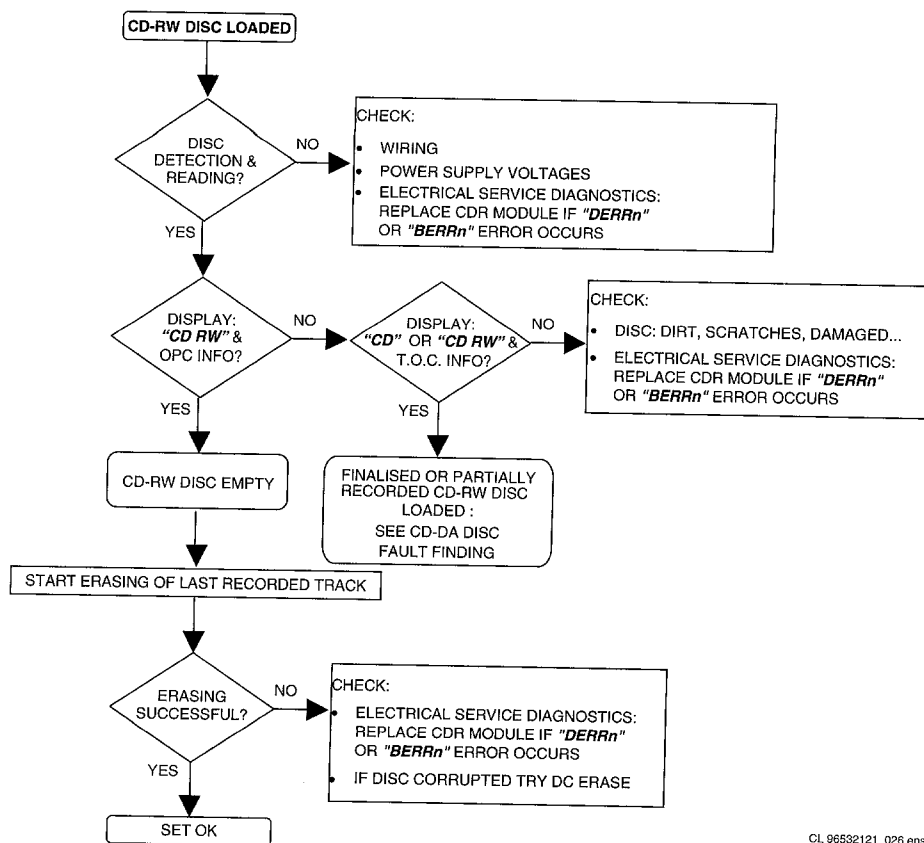


Figure 7-3



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Figure 7-4

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 TMP87CH74F 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 TMP87CH74F

TMP87CH74F (IC7103) 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.

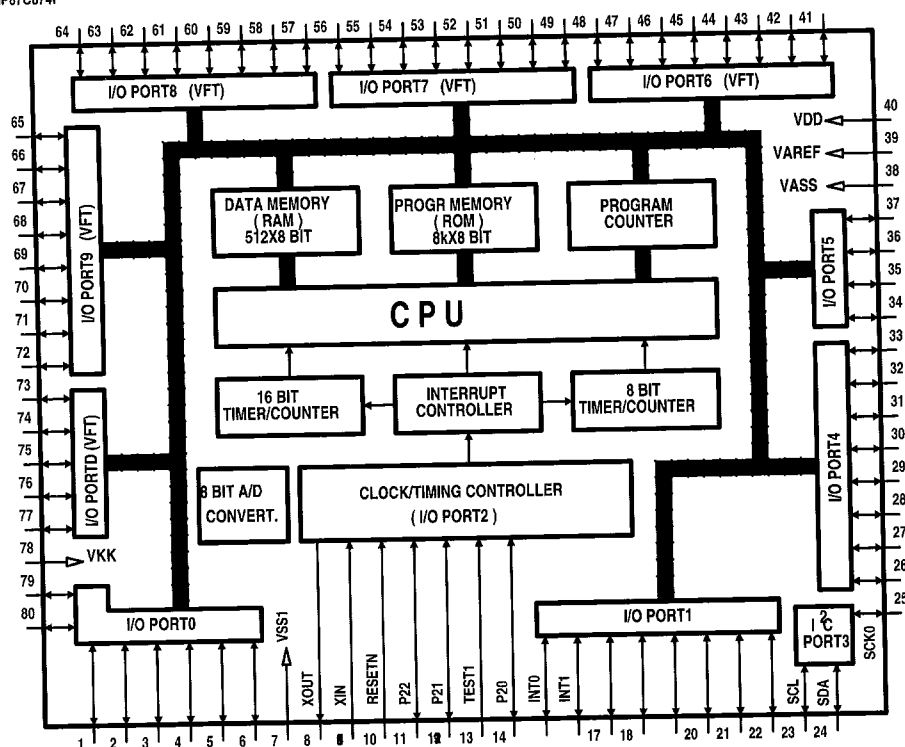
In this application, its functions are :

- 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

TMP87C874F



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

Figure 8-1

8.1.2 Test instructions

Supply voltages

The display board receives several voltages via connector 1119 (and connector 1121 for CDR570/930/950).

- VFTD : $-38V \pm 5\%$ measured at pin 2 of conn. 1119.
- VDC1-VDC2 : $3V8 \pm 10\%$ measured between pin 1 and 3 of conn. 1119.
- +5V : $+5V \pm 5\%$ measured at pin 10 of conn. 1119 (pin 4 of conn. 1121 for CDR570/930/950).

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 $\pm 5\%$.

Control signals**RESETN**

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 = $12 \times 1/F_c$ (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 CDR570/930/950). 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.

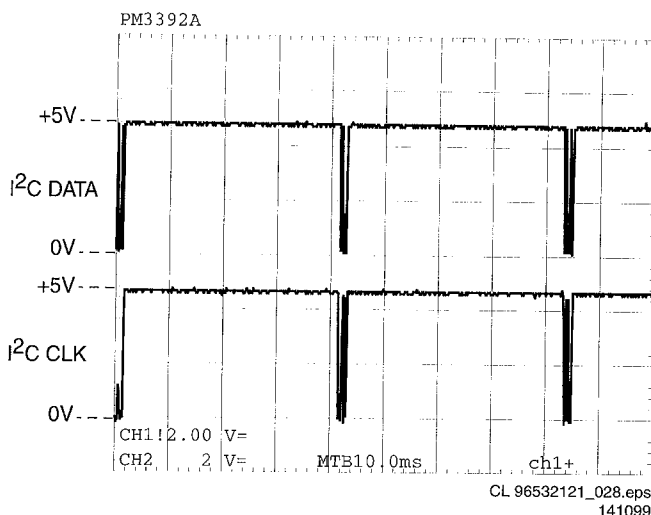


Figure 8-2 "I2C SIGNALS"

FTD drive lines**Filament voltage**

Should measure $3.8V \pm 10\%$ (=VDC1-VDC2) between pins 1-2-3 and pins 45-46-47 (pins 1-2 and pins 48-49 for CDR570/930/950) 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 : T7101 for G13, T7102 for G14 and T7104 for G15. A typical grid line signal shows in the oscillogram below.

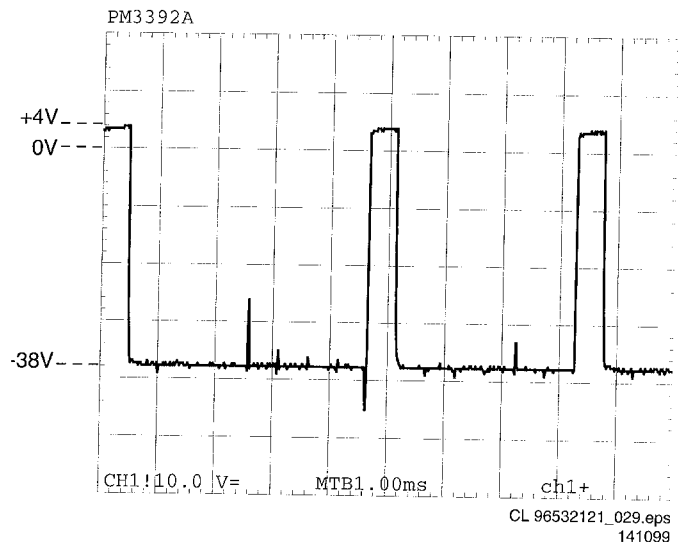


Figure 8-3 "GRID LINE"

Segment lines

Level and timing of all segment lines, P-->P21 (P-->P20 for CDR570/930/950), 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.

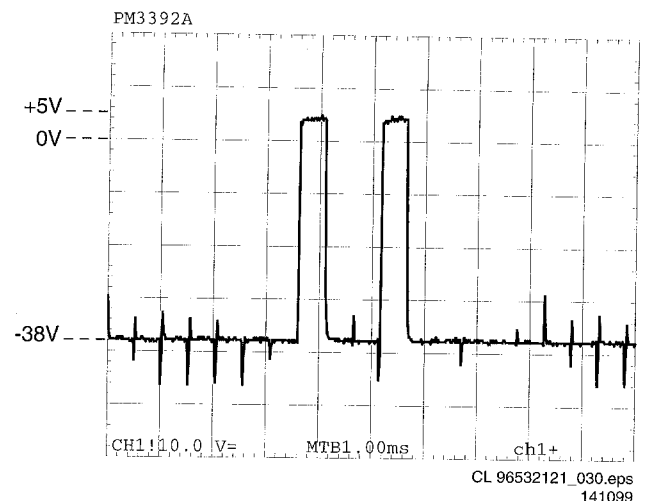


Figure 8-4 "SEGMENT LINE"

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).

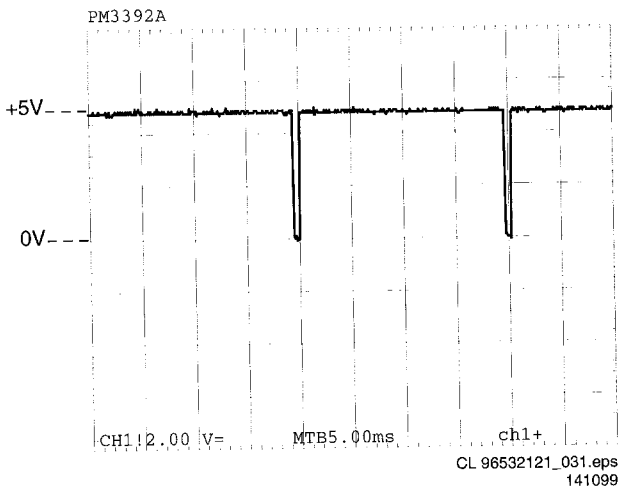


Figure 8-5 "KEY MATRIX SCAN LINE"

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.

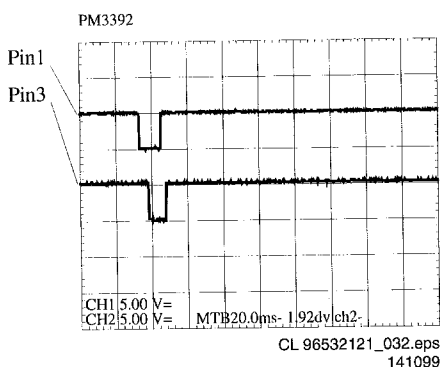


Figure 8-6 "TURN CLOCKWISE"

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

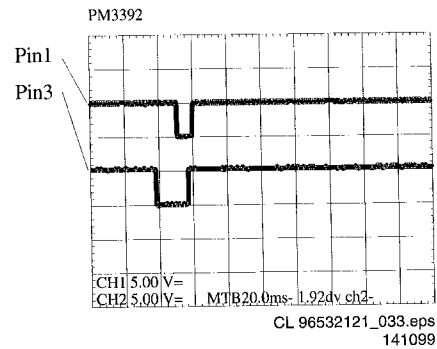


Figure 8-7 "TURN ANTI-CLOCKWISE"

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 CDR570/930/950 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.

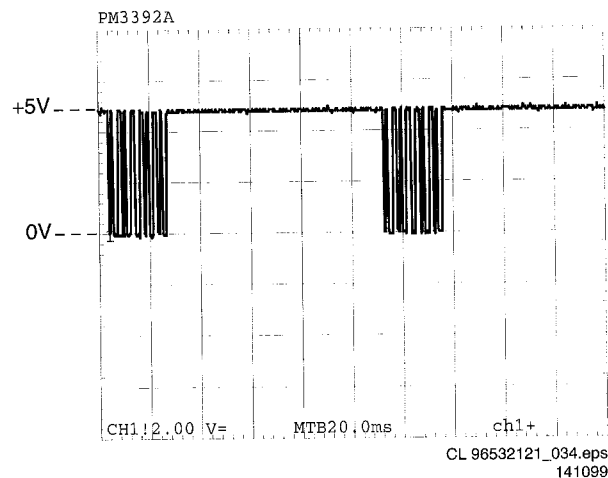


Figure 8-8 "IR RECEIVER SIGNAL"

8.1.3 Display board troubleshooting guide

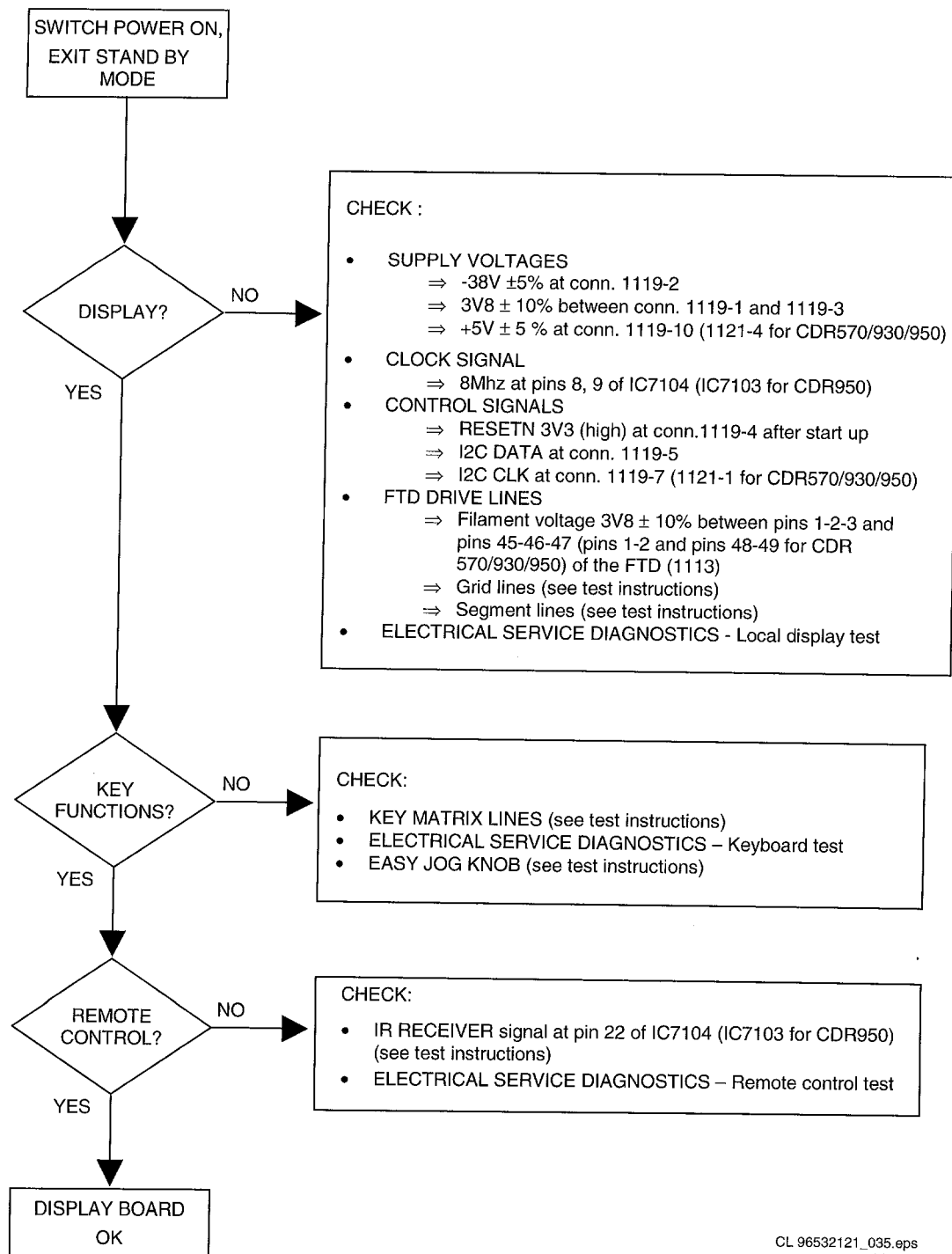
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Figure 8-9

8.2 I/O Board

The I/O board for the CDR950/951 is a full high performance AD/DA panel, acting as an interface to the outside world. Key components are ADC UDA1360, ADC AD1877 and DAC AD1855, being "stand-alone" ADDA converters with a limited need for software to control.

8.2.1 Analog-in path

Description

The via cinch connected analog-in L and R signals are pre-amplified by opamp 7103 after which they are presented to an adjustable amplifier made out of mux/demux 74HCT4051 (7102, 7107) and opamp 7100. The level of the incoming analog signal is adjusted by means of control lines "level_A0, level_A1, level_A2" coming from the DASP on the CDR main board and switching the mux/demux. The analog signal is then presented to the A/D converter AD1877 (7104) where they are converted from analog to I2S-bus data format. The I2S-bus is connected via connector 1401 and flex to the DASP on the CDR main board. The ADC uses the CL11-clock (11.2896 MHz), coming from the DASP on the CDR main board.

ADC AD1877**Description**

The AD1877 is a stereo, 16-bit oversampling ADC based on Sigma Delta technology intended primarily for digital audio bandwidth applications. It supports the I2S-bus data format. The device can be used in either slave or master mode. In this application it is used in slave mode receiving its clock from the DASP on the CDR main board.

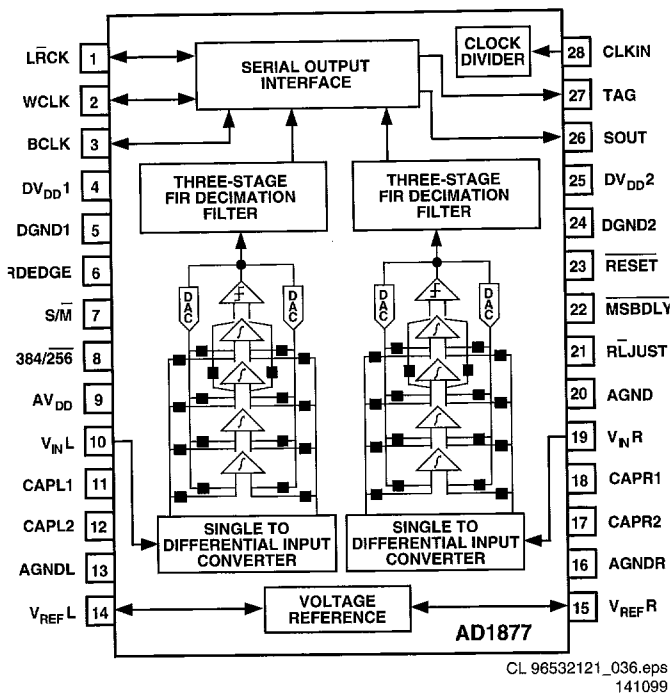
Block diagram

Figure 8-10

Pin description

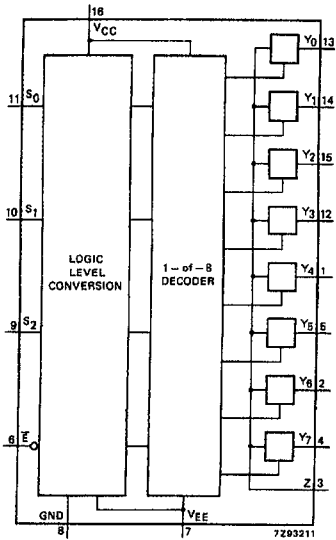
Pin	Input/Output	Pin Name	Description
1	I/O	L $\overline{\text{RCK}}$	Left/ Right Clock
2	I/O	WCLK	Word Clock
3	I/O	BCLK	Bit Clock
4	I	DV _{DD} 1	+5 V Digital Supply
5	I	DGND1	Digital Ground
6	I	RDEDGE	Read Edge Polarity Select
7	I	S/ $\overline{\text{M}}$	Slave/Master Select
8	I	384/256	Clock Mode
9	I	AV _{DD}	+5 V Analog Supply
10	I	V _{IN} L	Left Channel Input
11	O	CAPL1	Left External Filter Capacitor 1
12	O	CAPL2	Left External Filter Capacitor 2
13	I	AGNDL	Left Analog Ground
14	O	V _{REF} L	Left Reference Voltage Output
15	O	V _{REF} R	Right Reference Voltage Output
16	I	AGNDR	Right Analog Ground
17	O	CAPR2	Right External Filter Capacitor 2
18	O	CAPR1	Right External Filter Capacitor 1
19	I	V _{IN} R	Right Channel Input
20	I	AGND	Analog Ground
21	I	RLJUST	Right/Left Justify
22	I	MSBDLY	Delay MSB One BCLK Period
23	I	RESET	Reset
24	I	DGND2	Digital Ground
25	I	DV _{DD} 2	+5 V Digital Supply
26	O	SOUT	Serial Data Output
27	O	TAG	Serial Overrange Output
28	I	CLKIN	Master Clock

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Figure 8-11

Mux/demux 74HCT4051

Function Table



FUNCTION TABLE

INPUTS				channel ON
$\bar{E}$	S_2	S_1	S_0	
L	L	L	L	$Y_0 - Z$
L	L	L	H	$Y_1 - Z$
L	L	H	L	$Y_2 - Z$
L	L	H	H	$Y_3 - Z$
L	H	L	L	$Y_4 - Z$
L	H	L	H	$Y_5 - Z$
L	H	H	L	$Y_6 - Z$
L	H	H	H	$Y_7 - Z$
H	X	X	X	none

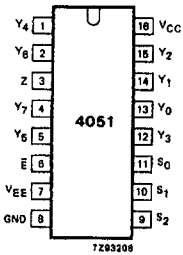
Notes

- 1. H = HIGH voltage level
- L = LOW voltage level
- X = don't care

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Figure 8-12

Pin configuration and description



PIN NO.	SYMBOL	NAME AND FUNCTION
3	Z	common input/output
6	$\bar{E}$	enable input (active LOW)
7	V_{EE}	negative supply voltage
8	GND	ground (0 V)
11, 10, 9	S_0 to S_2	select inputs
13, 14, 15, 12, 1, 5, 2, 4	Y_0 to Y_7	independent inputs/outputs
16	V_{CC}	positive supply voltage

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Figure 8-13

Troubleshooting analog-in path

LOAD SBC442 TEST CD (1kHz, -30dB) 4822 397 30155
AS SOURCE DISC

CHECK:

- Flex and wire connections
- +5V (pin 4 conn. 1400), +12V (pin 2 conn. 1400), -12V (pin 6 conn. 1400)
- +9V (testpoint 3), -9V (testpoint 2)
- $CL11 = 11.2896\text{MHz}$ at testpoint 4

START RECORDING FROM SOURCE DISC

CHECK:

- Signals at testpoints 14, 15, 16 and 17
- $PST3$ voltage testpoint 18 = reset : high during normal operation
- I^2S signals at testpoints 19, 20 and 21

ANALOG IN PATH OK

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Figure 8-14

8.2.2 Analog-out path

Description

The I2S-bus data format being the digital output signal, goes from the DASP on the CDR main board via flex and connector 1401 to the I/O board. Here it is presented to the D/A converter AD1855. The DAC's analog outputs pass an amplification circuit (opamp 7601). After amplification the analog-out L and R signals pass the filtering circuit and are sent to both the headphone connector on the headphone & mic board and the analog out cinch connectors on the I/O board. The DAC uses the CL11-clock (11.2896 MHz), coming from the DASP on the CDR main board.

DAC AD1855

Description

The AD1855 is a high performance, single-chip stereo, audio DAC delivering 113 dB dynamic range and SNR at 48kHz sample rate.

Block diagram

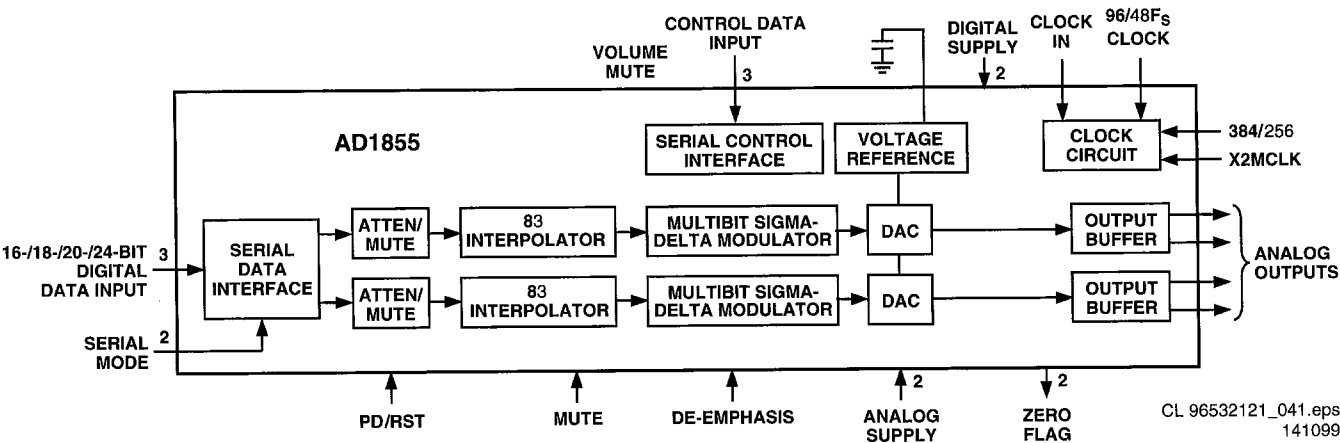
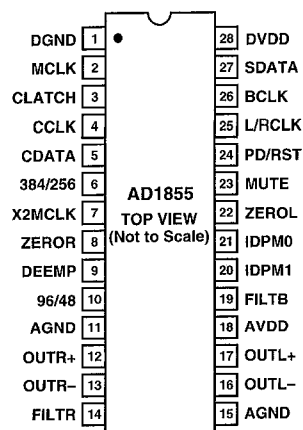


Figure 8-15

Pin configuration and description



Pin	Input/Output	Pin Name	Description
1	I	DGND	Digital Ground.
2	I	MCLK	Master Clock Input. Connect to an external clock source at either 256, 384 or 512 F _s .
3	I	CLATCH	Latch input for control data. This input is rising-edge sensitive.
4	I	CCLK	Control clock input for control data. Control input data must be valid on the rising edge of CCLK. CCLK may be continuous or gated.
5	I	CDATA	Serial control input, MSB first, containing 16 bits of unsigned data per channel. Used for specifying channel specific attenuation and mute.
6	I	384/256	Selects the master clock mode as either 384 times the intended sample frequency (HI) or 256 times the intended sample frequency (LO). The state of this input should be hardwired to logic HI or logic LO, or may be changed while the AD1855 is in power-down/reset. It must not be changed while the AD1855 is operational.
7	I	X2MCLK	Selects internal clock doubler (LO) or internal clock = MCLK (HI).
8	O	ZEROR	Right Channel Zero Flag Output. This pin goes HI when Right Channel has no signal input for more than 1024 LR Clock Cycles.
9	I	DEEMP	De-Emphasis. Digital de-emphasis is enabled when this input signal is HI. This is used to impose a 50 µs/15 µs response characteristic on the output audio spectrum at an assumed 44.1 kHz sample rate.
10	I	96/48	Selects 48 kHz (LO) or 96 kHz Sample Frequency Control.
11, 15	I	AGND	Analog Ground.
12	O	OUTR+	Right Channel Positive line level analog output.
13	O	OUTR-	Right Channel Negative line level analog output.
14	O	FILTR	Voltage Reference Filter Capacitor Connection. Bypass and decouple the voltage reference with parallel 10 µF and 0.1 µF capacitors to the AGND.
16	O	OUTL-	Left Channel Negative line level analog output.
17	O	OUTL+	Left Channel Positive line level analog output.
18	I	AVDD	Analog Power Supply. Connect to analog +5 V supply.
19	O	FILTB	Filter Capacitor connection, connect 10 µF capacitor to AGND.
20	I	IDPM1	Input serial data port mode control one. With IDPM0, defines one of four serial modes.
21	I	IDPM0	Input serial data port mode control zero. With IDPM1, defines one of four serial modes.
22	O	ZEROL	Left Channel Zero Flag output. This pin goes HI when Left Channel has no signal input for more than 1024 LR Clock Cycles.
23	I	MUTE	Mute. Assert HI to mute both stereo analog outputs. Deassert LO for normal operation.
24	I	PD/RST	Power-Down/Reset. The AD1855 is placed in a low power consumption mode when this pin is held LO. The AD1855 is reset on the rising edge of this signal. The serial control port registers are reset to the default values. Connect HI for normal operation.
25	I	L/RCLK	Left/Right clock input for input data. Must run continuously.
26	I	BCLK	Bit clock input for input data. Need not run continuously; may be gated or used in a burst fashion.
27	I	SDATA	Serial input, MSB first, containing two channels of 16, 18, 20, and 24 bits of twos complement data per channel.
28	I	DVDD	Digital Power Supply Connect to digital +5 V supply.

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141099

Figure 8-16

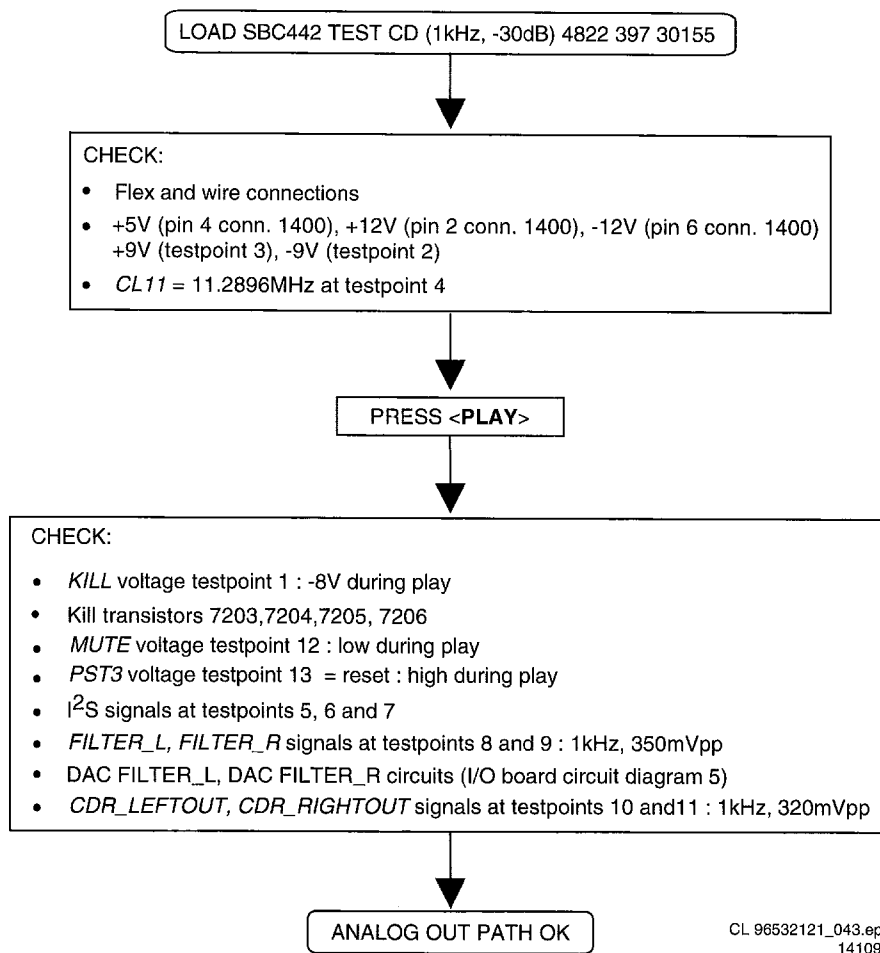
Troubleshooting analog-out path

Figure 8-17

8.2.3 Microphone path

The CDR950/951 allows for a microphone to be connected. The microphone input can be used for recording, even mixed with other sources, or for mixing with the play back signals when in play back.

Description

The analog L and R microphone signals arrive from the headphone & mic board via connector 1300. In the A/D converter UDA1360 (7300) they are converted from analog to I2S-bus data format. The I2S-bus is connected via connector 1401 and flex to the DASP on the CDR main board. The ADC uses the CL11-clock (11.2896 MHz), coming from the DASP on the CDR main board. Control line "micpres_intcopy (mic_detect)" signals to the DASP on the CDR main board when a microphone is plugged in.

ADC UDA1360**Description**

The UDA1360 is a single chip stereo A/D converter employing bitstream conversion techniques. It supports the I2S-bus data format and is suitable for use in digital audio equipment which incorporates recording functions. The device accommodates slave mode only. This means that the system clock needs to be provided by the system devices (here the DASP on the CDR main board).

Block diagram

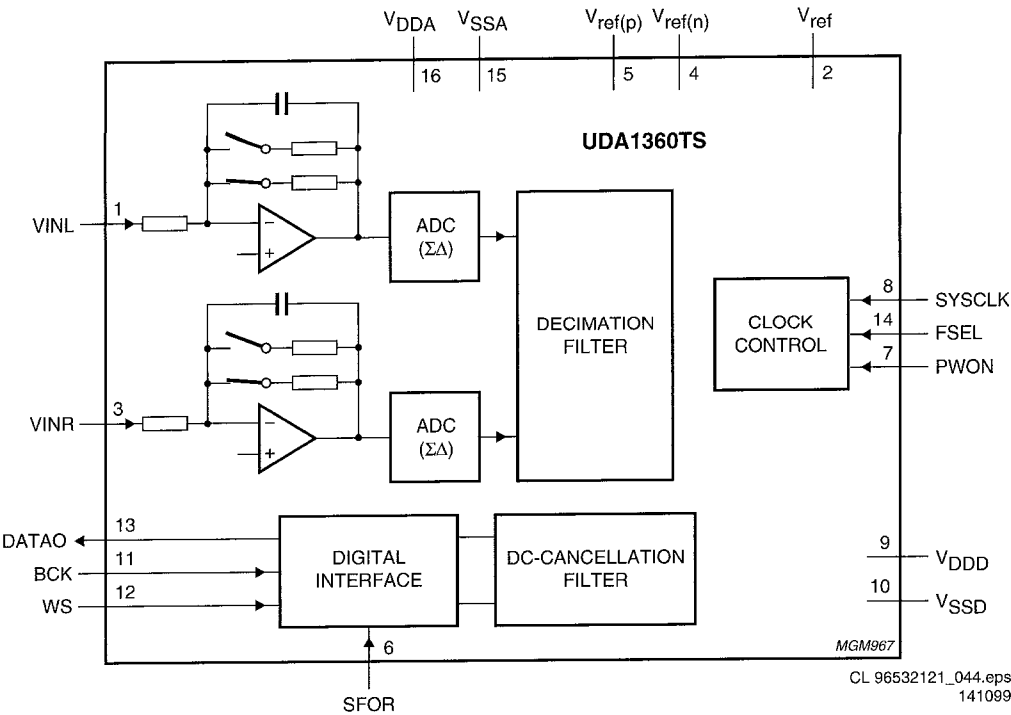


Figure 8-18

Pin configuration and description

SYMBOL	PIN	DESCRIPTION
VINL	1	left channel input
V _{ref}	2	reference voltage
VINR	3	right channel input
V _{ref(n)}	4	ADC negative reference voltage
V _{ref(p)}	5	ADC positive reference voltage
SFOR	6	data format selection input
PWON	7	power control input
SYSCLK	8	system clock input 256 or 384f _s
V _{DDD}	9	digital supply voltage
V _{SSD}	10	digital ground
BCK	11	bit clock input
WS	12	word selection input
DATAO	13	data output
FSEL	14	system clock frequency select
V _{SSA}	15	analog ground
V _{DDA}	16	analog supply voltage

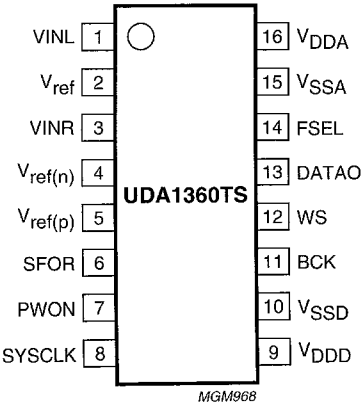


Figure 8-19

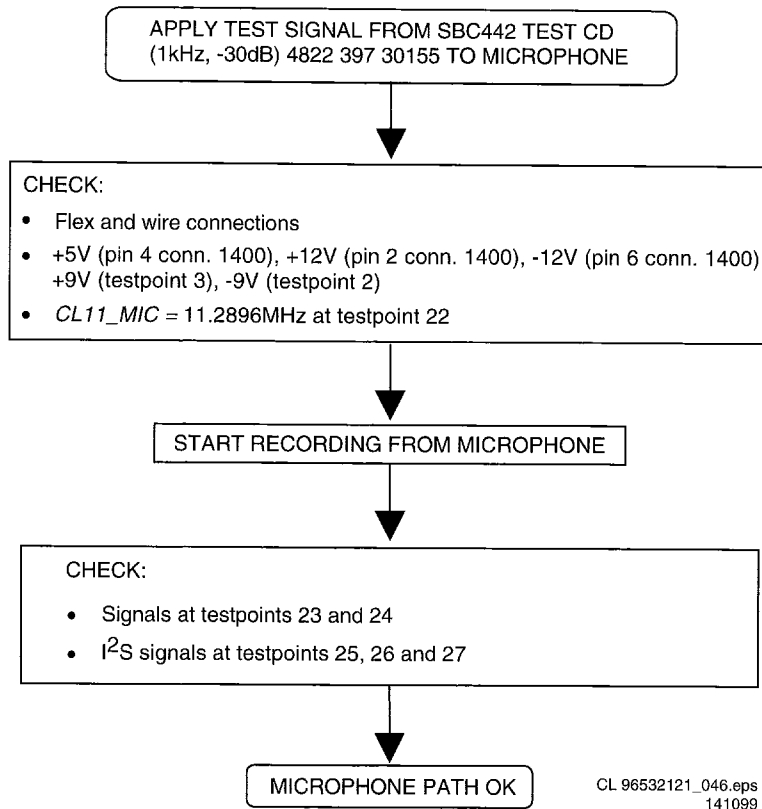
Troubleshooting microphone path

Figure 8-20

8.2.4 Digital in/out paths

There are 2 cinch digital-in paths and an optical path taking the digital signals pretty much straight to the DASP on the CDR main board. The optical-out and the digital-out path take the signal from the DASP on the CDR main board to their respective output connectors on the I/O board.

8.3 Headphone & mic board**8.3.1 Headphone path**

The L and R analog signals coming from the analog output on the I/O board pass an adjustable amplifier (opamp 7102) after which they are passed on to the headphone connector. The amplification is adjusted by means of a potentiometer positioned at the front of the CDR player.

8.3.2 Microphone path

The L and R input signals from the microphone are pre-amplified (opamp 7100) and pass an adjustable amplifier (opamp 7101) after which they are passed on to the I/O board. The level of the signals is adjusted by means of a potentiometer positioned at the front of the CDR player. A switch inside the microphone connector tells the DASP on the CDR main board when a microphone is plugged in : signal high = no microphone, signal low = microphone connected.

8.4 Mains Transformers

/00 version(230V)

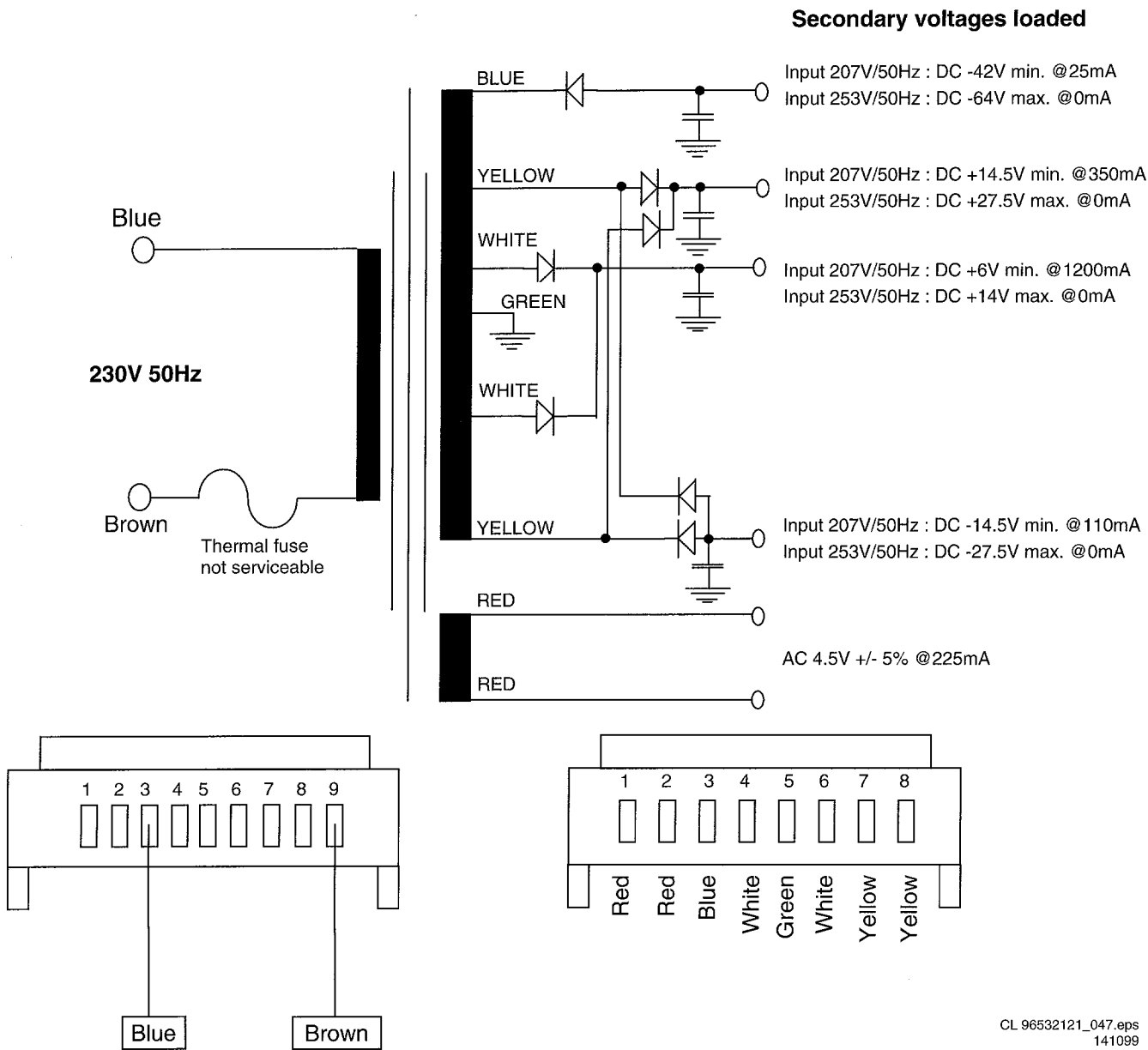


Figure 8-21

Secondary voltages loaded



/17 version(117V)

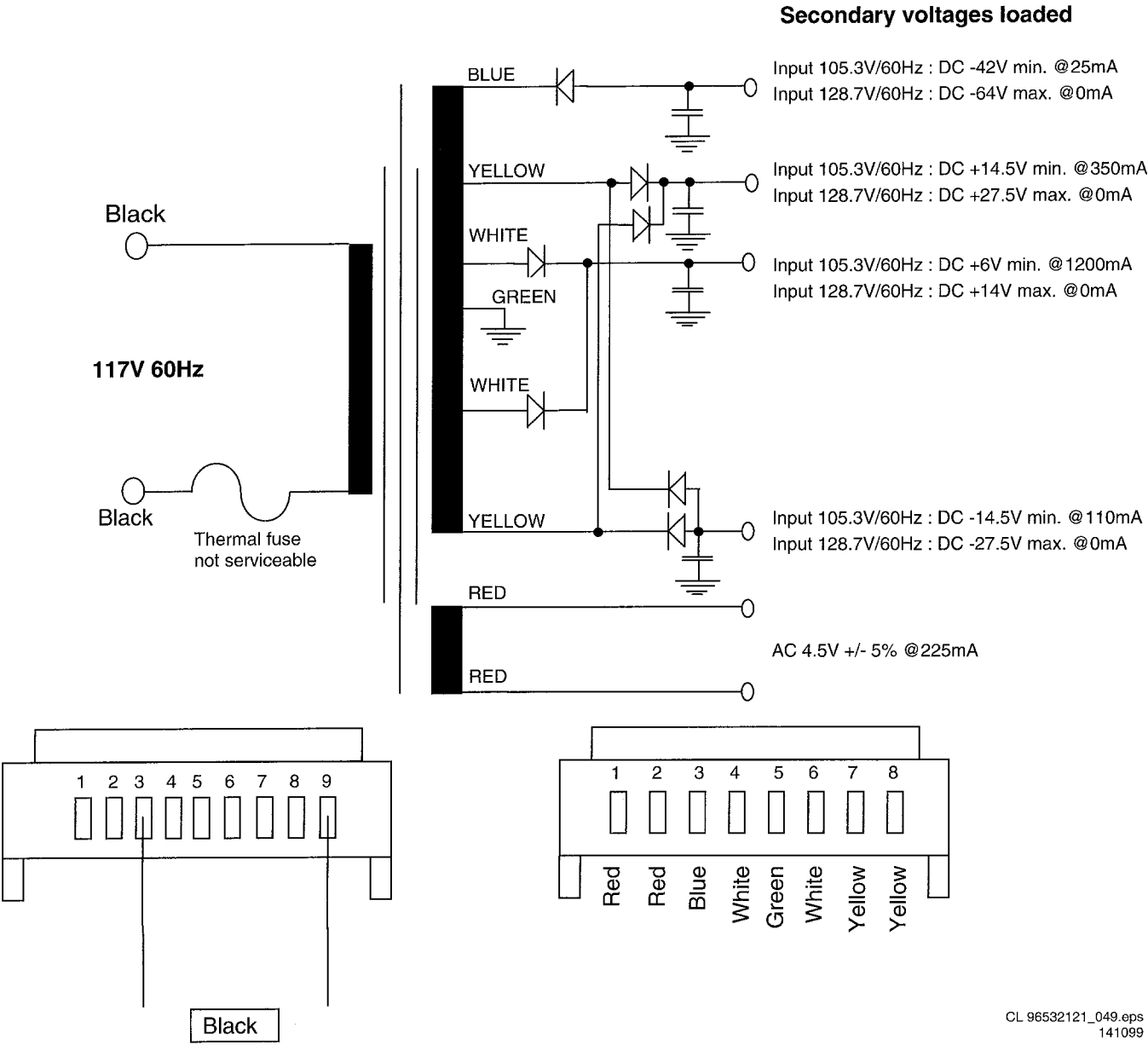


Figure 8-23

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, IC7300	Address Latch Enable; external address latch strobe line, freeze address when low
	IC7270 --> R3230	
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, R3722	ATTenuation request from MACE2 to audio DAC, active low; means that the output can be attenuated in case of search activities
	IC7270 --> IC7701	
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 --> IC7270	Basic Engine RESET, active high
	IC7701 --> R3716	
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

SIGNAL NAME	SIGNAL FLOW	FUNCTION AND DESCRIPTION
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 --> IC7355C	inverted CDR-strategy-detected signal
	IC7355D --> CONN1000	
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, R3724	DE-EMphasis control for audio DAC from MACE2, active high; means that de-emphasis is needed in digital filter
	IC7270 --> IC7701	
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 <---> CONN1708	Data/Strobe/Acknowledge serial communication between DASP and CD-player in CDR775
	IC7701 <---> R3830 <---> C2735	
DSA_ACK_CDR	IC7701 --> R3729 --> IC7270, CONN1830	Data/Strobe/Acknowledge serial communication between MACE2 and DASP for CDR; acknowledge input for MACE2 is strobe output for DASP
	IC7701 --> R3729 --> R3769	
DSA_DATA_CD	IC7701 <---> R3828 <---> R3829 <---> CONN1708	Data/Strobe/Acknowledge serial communication between DASP and CD-player in CDR775
	IC7701 <---> R3828 <---> C2733	
DSA_DATA_CDR	IC7270<--->R3246<---> R3813 <---><---> IC7701, CONN1830	Data/Strobe/Acknowledge serial communication between MACE2 and DASP for CDR
	IC7270<--->R3246<---> R3767	
DSA_STR_CD	IC7701 <---> R3835 <---> R3832 <---> CONN1708	Data/Strobe/Acknowledge serial communication between DASP and CD-player in CDR775
	IC7701 <---> R3835 <---> C2734	

SIGNAL NAME	SIGNAL FLOW	FUNCTION AND DESCRIPTION
DSA_STR_CDR	IC7270 --> R3245 --> IC7701, CONN1830	Data/Strobe/Acknowledge serial communication between MACE2 and DASP for CDR (strobe output for MACE2 is acknowledge input for DASP)
	IC7270 --> R3245 --> R3768	
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 --> R3010 IC7008 --> 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 --> IC7701	Flash READY detection, this line is forced low as long as the flash is busy with erase or program algorithm
	CONN1701 --> IC7701	
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 --> F934	I2C CLoCK line used for display slave processor and digital potmeter
	IC7701, R3711 --> IC7801	
I2C_DATA	IC7701, R3712 <---> R3713 <---> C2708, R3714 <---> F934	I2C DATA line used for display slave processor and digital potmeter
	IC7701, R3712 <---> IC7801	
I2CL	R3248B --> IC7207, R3247C	I2C CLoCK line
I2CSCL	IC7207 --> IC7008	I2C Serial CLoCK line
	IC7207 --> IC7010	
	IC7207 --> R3248B	

SIGNAL NAME	SIGNAL FLOW	FUNCTION AND DESCRIPTION
I2CSDA	IC7207 <---> IC7008	I2C Serial Data line
	IC7207 <---> IC7010	
	IC7207 <---> R3248A	
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_ANA	IC7701 --> R3721 --> IC7401	select INTernal COPY ANAlog (in case of copy protected disc or track on CD drive) (CDR775 only)
	IC7701 --> R3721 --> R3410	
IR	T7135 --> CONN1000	laser Read drive current signal
	T7135 --> R3056	
	T7135 --> IC7008	
IW	T7122 --> CONN1000	laser Write drive current signal
	T7122 --> D6003	
KEY_PRESSED	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 <---> R3212	LoaD line DAC LASer control

SIGNAL NAME	SIGNAL FLOW	FUNCTION AND DESCRIPTION
	IC7270 <---> R3232	
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, R3723	MUTE control from MACE2 to DASP, active low
	IC7270 --> IC7701	
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; overrides 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)
PSEn	IC7270 --> R3260 --> IC7208	Program Store ENable; external ROM output enable line, active low
	IC7270 --> R3231	
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 --> IC7002B	drive signal from XDAC for write and erase current sources
	IC7016 --> IC7002C	
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

SIGNAL NAME	SIGNAL FLOW	FUNCTION AND DESCRIPTION
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 --> IC7010	RECORDING output (active high)
	IC7008 --> CONN1000	
	IC7008 --> IC7355C	
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	Reference 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 --> CONNF934	SYSTEM RESET to display assy (and CD player for CDR775)
	IC7701 --> R3770 --> T7707 --> CONN1708	
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 --> R3747	TRAY SWitch signal from loader assy
	CONN1200 --> R3748	
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

SIGNAL NAME	SIGNAL FLOW	FUNCTION AND DESCRIPTION
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 --> R3009	Write Power ON
	IC7008 --> C2009	
WPONO	IC7008 --> R3106	Write Power ON Open drain output
WPONRC	R3003 --> CONN1000	Write Power ON (after RC circuit)
XDAC		multiplied DAC

10. Spare parts list

MECHANICAL PARTS LIST

Cabinet parts

	3104 129 52540	COMPLETE CDR950 MODULE
0001	3104 127 09050	FRONT ASSY COMPL. CDR950/00/17 BLACK
0001	3104 127 09770	FRONT ASSY COMPL. CDR950/01C CHAMPAGNE
0001	3104 127 09510	FRONT ASSY COMPL. CDR951/00C CHAMPAGNE
0009	3104 124 05940	POWER ROD CDR950
0009	3104 124 06160	POWER ROD CDR951
0014	4822 459 10887	PLATE INDICATION PLASTIC
0015	4822 454 13339	PLATE NAME
0051	3104 124 05370	VOLUME KNOB CDR950
0051	3104 127 09550	VOLUME KNOB CDR951
0052	3104 124 05370	VOLUME KNOB CDR950
0052	3104 127 09550	VOLUME KNOB CDR951
0053	3104 124 05930	EASY JOG KNOB BLACK CDR950
0053	3104 127 09120	EASY JOG KNOB CHAMPAGNE CDR951
0065	4822 492 51374	RING
0076	3104 144 05730	SUSPENSION
0077	3104 144 05730	SUSPENSION
0078	3104 144 05730	SUSPENSION
0079	3104 144 05730	SUSPENSION
0151	4822 442 01095	COVER BLACK CDR950/00/ 17
0151	3104 127 09560	COVER CHAMPAGNECDR950/01C CDR951/00C
0251	4822 462 42159	FOOT SILVER CDR950/00/ 17
0251	3104 124 06310	FOOT CHAMPAGNE CDR950/01C CDR951/00C
0252	4822 462 42159	FOOT SILVER CDR950/00/ 17
0252	3104 124 06310	FOOT CHAMPAGNE CDR950/01C CDR951/00C
0253	4822 462 42159	FOOT SILVER CDR950/00/ 17
0253	3104 124 06310	FOOT CHAMPAGNE CDR950/01C CDR951/00C
0254	4822 462 42159	FOOT SILVER CDR950/00/ 17
0254	3104 124 06310	FOOT CHAMPAGNE CDR950/01C CDR951/00C
0301	4822 321 10249	SBC1201 MAINS CABLE/00/ 00C/01C
0301	4822 321 11466	MAINS CABLE USA /17
0309	3104 125 22930	USER MANUAL CDR950/00/ 01C WEU
0309	3104 125 22980	USER MANUAL CDR950/17 USA
0309	3104 125 22930	USER MANUAL CDR951/ 00C WEU
0312	4822 321 22611	CABLE CINCH
0313	4822 321 22611	CABLE CINCH
0317	4822 321 61452	DIG OUT CABLE
0318	3139 228 82010	REMOTE CONTROL BLACK RC282921/01
0318	3139 228 83260	REMOTE CONTROL CHAMPAGNE RC282922/01
1006	3104 128 70150	TRAFO CDR950/00 CDR951/00C
1006	3104 128 70170	TRAFO CDR950/01C
1006	3104 128 70160	TRAFO CDR950/17
8003	3104 157 11480	CWAS FLEX 0,5MM 30 130

ELECTRICAL PARTS LIST

displayboard

Miscellaneous

0003	3104 124 05730	FTD HOLDER
1050	8204 056 04810	EVQB2CFC620B

1101	4822 276 13114	
1102	4822 276 13114	
1103	4822 276 13114	
1104	4822 276 13114	
1105	4822 276 13114	
1106	4822 276 13114	
1107	4822 276 13114	
1108	4822 276 13114	
1109	4822 276 13114	
1110	4822 242 72066	CST8,00MT
1111	4822 276 13114	
1112	4822 276 13114	
1113	2722 171 07175	VFD 15-BT-61GNK
1114	4822 276 13114	
1115	4822 276 13114	
1116	4822 276 13114	
1117	4822 276 13114	
1118	4822 276 13114	
1120	4822 276 13114	

-II-

2100	4822 126 14585	100nF 10% 50V
2101	4822 126 14585	100nF 10% 50V
2102	5322 122 32658	22pF 5% 50V
2103	5322 122 32654	22nF 10% 63V
2104	5322 122 32658	22pF 5% 50V
2105	5322 122 32658	22pF 5% 50V
2106	5322 122 32658	22pF 5% 50V
2107	4822 126 14585	100nF 10% 50V

-□-

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 051 20332	3k3 5% 0.1W
3107	4822 117 11149	82k 1% 0.1W
3108	4822 117 11149	82k 1% 0.1W
3109	4822 117 11149	82k 1% 0.1W
3110	4822 051 20472	4k7 5% 0.1W
3111	4822 051 20101	100Ω 5% 0.1W
3112	4822 051 20561	560Ω 5% 0.1W
3113	4822 051 20393	39k 5% 0.1W
3114	4822 117 10833	10k 1% 0.1W
3115	4822 117 10833	10k 1% 0.1W
3116	4822 051 20101	100Ω 5% 0.1W

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6100	4822 130 11411	BZX284-C3V3
6101	4822 212 30842	TSOP1736SB1
6200	4822 130 82978	LTL-16KPE-P

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7101	4822 130 60511	BC847B
7102	4822 130 60511	BC847B
7103	3104 123 94761	ROM TMP87CH74
7104	4822 130 60511	BC847B

power supply

Miscellaneous

0061	4822 492 63076	SPRING
0062	4822 492 63076	SPRING
1000	4822 265 31015	MAINS CONNECTOR /00/ 00C/01C
1000A	4822 265 31016	MAINS CONNECTOR /17
1001A	3104 150 20050	CONNECTOR 5P TOP ENTRY B
1005A	4822 252 51185	FUSE 19398E1(630mA)
1006A	4822 252 51173	FUSE 19398E1(1A)
1007A	4822 252 51173	FUSE 19398E1(1A)
1008A	4822 252 51173	FUSE 19398E1(1A)
1009A	4822 071 53152	FUSE 19372(3.15A)
1010A	4822 265 11253	FUSE HOLDER 2P
1011A	4822 276 13224	SWITCH SDDL1B(G7440986M)

1012A	4822 071 53152	FUSE 19372(3.15A)
1013A	4822 252 51173	FUSE 19398E1(1,000A)
1014A	4822 252 51185	FUSE 19398E1(0,630A)
1015A	4822 277 11483	SWITCH ROT V4POS2A5
1110A	4822 070 33151	FUSE 218.315(315mA)

-II-

2000	5322 122 32654	22nF 10% 63V
2001	5322 122 32654	22nF 10% 63V
2002	5322 122 32654	22nF 10% 63V
2003	4822 124 42391	470μF 20% 63V
2004	4822 124 41751	47μF 20% 50V
2005	5322 122 32654	22nF 10% 63V
2006	5322 122 32654	22nF 10% 63V
2007	5322 122 32654	22nF 10% 63V
2008	4822 124 40784	3300μF 20% 16V
2009	4822 124 40784	3300μF 20% 16V
2010	5322 122 32654	22nF 10% 63V
2011	4822 124 11769	220μF 20% 50V
2012	5322 122 32654	22nF 10% 63V
2013	5322 122 32654	22nF 10% 63V
2014	4822 124 23172	470μF 20% 50V
2015	4822 126 13473	220nF 80-20% 50V
2017	5322 122 32654	22nF 10% 63V
2018	4822 124 12056	1000μF 20% 35V 85C 12.5X20MM
2019	5322 122 32654	22nF 10% 63V
2020	5322 122 32654	22nF 10% 63V
2021	5322 122 32654	22nF 10% 63V
2022	4822 124 23172	470μF 20% 50V
2023	5322 122 32654	22nF 10% 63V
2024	4822 124 41751	47μF 20% 50V
2025	5322 122 32654	22nF 10% 63V
2027	5322 122 32654	22nF 10% 63V
2028	5322 122 32654	22nF 10% 63V
2029	5322 122 32654	22nF 10% 63V
2030	2020 012 93057	EL VR 16V S 2200μF PM20 B
2031	5322 122 32654	22nF 10% 63V
2032	5322 122 32654	22nF 10% 63V
2033	4822 121 51252	470nF 5% 63V
2034A	4822 126 13599	3.3nF 10% 500V
2035	5322 122 32654	22nF 10% 63V
2036	4822 124 42367	3300μF 20% 35V
2037	4822 124 40784	3300μF 20% 16V

-□-

3000	4822 051 20392	3k9 5% 0.1W
3001	4822 051 20472	4k7 5% 0.1W
3002	4822 051 20475	4M7 5% 0.1W
3003	4822 051 20154	150k 5% 0.1W
3004	4822 117 10834	47k 1% 0.1W
3005	4822 117 10833	10k 1% 0.1W
3006	4822 117 10837	100k 1% 0.1W
3007	4822 052 10228	222 5% 0.33W
3010	4822 117 10833	10k 1% 0.1W
3200	4822 051 20109	10Ω 5% 0.1W
3201	4822 116 83933	15k 1% 0.1W
3202	4822 051 20109	10Ω 5% 0.1W
3203	4822 051 20392	3k9 5% 0.1W
3204	4822 051 20109	10Ω 5% 0.1W
3205	4822 051 20622	6k2 5% 0.1W
3999	4822 051 20472	4k7 5% 0.1W

5000A	4822 214 51841	
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6000	4822 130 31878	1N4003G
6002	5322 130 31938	BYV27-200
6003	5322 130 31938	BYV27-200
6004	4822 130 31878	1N4003G
6005	4822 130 31878	1N4003G
6006	4822 130 83757	BAS216
6007	4822 130 11366	BZX284-C3V9
6008	4822 130 83757	BAS216
6009	4822 130 83757	BAS216
6010	4822 130 31878	1N4003G
6012	4822 130 31878	1N4003G
6014	4822 130 31878	1N4003G

3138	4822 117 13472	5k1 1% 0805 RC12H R3
3139	4822 117 13592	3k6 1% 0.1W RC12H 0805
3140	4822 117 13623	51k 1% 0.1W RC12H 0805
3141	4822 117 11142	2k4 1% 0.1W
3142	4822 117 10833	10k 1% 0.1W
3143	4822 117 10833	10k 1% 0.1W
3144	4822 117 11139	1k5 1% 0.1W
3145	4822 051 20008	0Ω jumper . (0805)
3146▲	2322 750 64709	RST SM FUSE 1206 47Ω PM5 R
3154	4822 051 20471	470Ω 5% 0.1W
3155	4822 051 20471	470Ω 5% 0.1W
3200▲	4822 117 11152	4Ω7 5%
3201▲	4822 117 11152	4Ω7 5%
3202	4822 051 20332	3k3 5% 0.1W
3203	4822 117 12521	68Ω 1% 0.1W
3204	4822 051 20332	3k3 5% 0.1W
3205	4822 051 20101	100Ω 5% 0.1W
3206	4822 117 11927	75Ω 1% 0.1W
3207	4822 051 20332	3k3 5% 0.1W
3208▲	4822 117 11152	4Ω7 5%
3209	4822 051 20332	3k3 5% 0.1W
3210	4822 051 20332	3k3 5% 0.1W
3211	4822 117 11927	75Ω 1% 0.1W
3213	4822 051 20332	3k3 5% 0.1W
3214	4822 051 20101	100Ω 5% 0.1W
3215	4822 051 20101	100Ω 5% 0.1W
3216	4822 117 11449	2k2 1% 0.1W
3217	4822 117 11449	2k2 1% 0.1W
3218	4822 051 20008	0Ω jumper . (0805)
3220	4822 051 20101	100Ω 5% 0.1W
3221	4822 051 20101	100Ω 5% 0.1W
3222	4822 051 20008	0Ω jumper . (0805)
3223	4822 117 11449	2k2 1% 0.1W
3224	4822 117 11449	2k2 1% 0.1W
3233	4822 051 20332	3k3 5% 0.1W
3234	4822 117 11152	4Ω7 5%
3235	4822 117 12521	68Ω 1% 0.1W
3236	4822 051 20332	3k3 5% 0.1W
3237	4822 051 20008	0Ω jumper . (0805)
3300	4822 117 10834	47k 1% 0.1W
3301	4822 117 10834	47k 1% 0.1W
3302	4822 051 20829	82Ω 5% 0.1W
3304▲	2322 750 64709	RST SM FUSE 1206 47Ω PM5 R
3305	4822 117 11383	12k 1% 0.1W
3307	4822 117 11383	12k 1% 0.1W
3310	4822 051 20479	47Ω 5% 0.1W
3311	4822 051 20108	1Ω 5% 0.1W
3314	4822 051 20101	100Ω 5% 0.1W
3318	4822 051 20008	0Ω jumper . (0805)
3320▲	2322 750 64709	RST SM FUSE 1206 47Ω PM5 R
3321	4822 051 20008	0Ω jumper . (0805)
3322▲	2322 750 64709	RST SM FUSE 1206 47Ω PM5 R
3323	5322 117 12487	1k RC12G 1% 0.125W
3324	5322 117 12487	1k RC12G 1% 0.125W
3403	4822 117 10833	10k 1% 0.1W
3405	4822 117 10833	10k 1% 0.1W
3406	4822 117 10833	10k 1% 0.1W
3407	4822 117 10833	10k 1% 0.1W
3408	4822 117 10833	10k 1% 0.1W
3411▲	4822 117 11152	4Ω7 5%
3412	4822 117 10833	10k 1% 0.1W
3413	4822 051 20479	47Ω 5% 0.1W
3414	4822 051 20479	47Ω 5% 0.1W
3415	4822 051 20479	47Ω 5% 0.1W
3416	4822 051 20479	47Ω 5% 0.1W
3417▲	4822 117 11152	4Ω7 5%
3418	4822 051 20479	47Ω 5% 0.1W
3419	4822 051 20479	47Ω 5% 0.1W
3500▲	4822 117 11748	2Ω2 1206 5% FUSE
3501	4822 051 20122	1k2 5% 0.1W
3502	4822 117 11449	2k2 1% 0.1W
3503	4822 117 10353	150Ω 1% 0.1W
3504	4822 117 13577	330Ω 1% RC12H 0805 1.25W
3505	4822 051 20392	3k9 5% 0.1W
3506	4822 117 11383	12k 1% 0.1W
3507	4822 117 12521	68Ω 1% 0.1W
3508	4822 117 11951	2k 1% 0.1W
3511	4822 051 20392	3k9 5% 0.1W
3512	4822 117 10833	10k 1% 0.1W
3513	4822 117 12521	68Ω 1% 0.1W
3516	4822 117 13577	330Ω 1% RC12H 0805 1.25W
3517	4822 117 11449	2k2 1% 0.1W
3518	4822 051 20122	1k2 5% 0.1W
3519	4822 117 10353	150Ω 1% 0.1W
3520▲	4822 117 11748	2Ω2 1206 5% FUSE

3521	4822 117 11141	1k8 1% 0.1W
3522▲	4822 117 11748	2Ω2 1206 5% FUSE
3523	4822 051 20122	1k2 5% 0.1W
3524	4822 117 11449	2k2 1% 0.1W
3525	4822 117 10353	150Ω 1% 0.1W
3526	4822 117 13577	330Ω 1% RC12H 0805 1.25W
3527	4822 051 20392	3k9 5% 0.1W
3528	4822 117 11383	12k 1% 0.1W
3529	4822 117 12521	68Ω 1% 0.1W
3530	4822 117 11951	2k 1% 0.1W
3533	4822 051 20392	3k9 5% 0.1W
3534	4822 117 10833	10k 1% 0.1W
3535	4822 117 12521	68Ω 1% 0.1W
3538	4822 117 13577	330Ω 1% RC12H 0805 1.25W
3539	4822 117 11449	2k2 1% 0.1W
3540	4822 051 20122	1k2 5% 0.1W
3541	4822 117 10353	150Ω 1% 0.1W
3542▲	4822 117 11748	2Ω2 1206 5% FUSE
3543	4822 117 11141	1k8 1% 0.1W
3545	5322 117 12487	1k RC12G 1% 0.125W
3546	5322 117 12487	1k RC12G 1% 0.125W
3547	5322 117 12487	1k RC12G 1% 0.125W
3548	5322 117 12487	1k RC12G 1% 0.125W
3549	4822 117 10353	150Ω 1% 0.1W
3550	4822 117 10353	150Ω 1% 0.1W
3600▲	4822 117 11748	2Ω2 1206 5% FUSE
3601	4822 051 20008	0Ω jumper . (0805)
3602	4822 117 10837	100k 1% 0.1W
3603	4822 117 10833	10k 1% 0.1W
3604	4822 117 11142	2k4 1% 0.1W
3605	4822 051 20182	1k8 5% 0.1W
3606	4822 051 20008	0Ω jumper . (0805)
3607▲	4822 117 11748	2Ω2 1206 5% FUSE
3608	4822 051 20008	0Ω jumper . (0805)
3609	4822 051 20182	1k8 5% 0.1W
3610	4822 051 20008	0Ω jumper . (0805)
3611	4822 117 11142	2k4 1% 0.1W
3612▲	4822 117 11748	2Ω2 1206 5% FUSE
3613	4822 117 11142	2k4 1% 0.1W
3614	4822 051 20182	1k8 5% 0.1W
3615	4822 051 20008	0Ω jumper . (0805)
3616	4822 051 20008	0Ω jumper . (0805)
3617	4822 051 20182	1k8 5% 0.1W
3618	4822 051 20008	0Ω jumper . (0805)
3619	4822 117 11142	2k4 1% 0.1W
3620▲	4822 117 11748	2Ω2 1206 5% FUSE
3621	4822 051 20008	0Ω jumper . (0805)
3623	4822 051 20008	0Ω jumper . (0805)
3625	4822 051 20008	0Ω jumper . (0805)
3627	4822 051 20008	0Ω jumper . (0805)

5200 4822 157 70601 100μH (920927085A)



6100	4822 130 11383	BZX284-C5V1
6200	4822 218 11487	GP1F32R
6300	4822 130 10838	UDZ3.3B
6301	4822 130 10838	UDZ3.3B
6400	4822 130 11366	BZX284-C3V9
6401	4822 130 83757	BAS216
6500	4822 130 83757	BAS216
6501	4822 130 83757	BAS216
6502	4822 130 83757	BAS216
6503	4822 130 83757	BAS216
6504	4822 130 83757	BAS216
6505	4822 130 83757	BAS216
6506	4822 130 83757	BAS216
6507	4822 130 83757	BAS216
6508	4822 130 83757	BAS216
6509	4822 130 83757	BAS216
6510	4822 130 83757	BAS216
6511	4822 130 83757	BAS216
6512	4822 130 83757	BAS216
6513	4822 130 83757	BAS216
6514	4822 130 83757	BAS216
6515	4822 130 83757	BAS216
6516	4822 130 83757	BAS216
6517	4822 130 83757	BAS216
6518	4822 130 83757	BAS216
6519	4822 130 83757	BAS216
6520	4822 130 83757	BAS216
6521	4822 130 83757	BAS216
6522	4822 130 83757	BAS216
6523	4822 130 83757	BAS216
6524	4822 130 83757	BAS216

6525 4822 130 83757 BAS216



7100	9322 067 00668	IC SM OP275GS (ANA0) R
7102	9337 153 00118	IC SM 74HCT4051D (PHSE) R
7103	9322 067 00668	IC SM OP275GS (ANA0) R
7104	4822 209 90531	AD1877
7107	9337 153 00118	IC SM 74HCT4051D (PHSE) R
7200	4822 130 10845	GP1F32T
7201	5322 209 11517	PC74HCU04T
7203	4822 130 60511	BC847B
7204	4822 130 60511	BC847B
7205	4822 130 60511	BC847B
7206	4822 130 60511	BC847B
7211	5322 209 11517	PC74HCU04T
7300	9352 615 37118	IC SM UDA1360TS/N1 (PHSE) R
7302	9322 067 00668	IC SM OP275GS (ANA0) R
7400	4822 209 15083	AN78M09
7403	4822 209 15375	74HC244D
7500	4822 130 60373	BC856B
7501	5322 130 60159	BC846B
7502	4822 130 60373	BC856B
7503	5322 130 60159	BC846B
7505	4822 130 60373	BC856B
7507	5322 130 60159	BC846B
7508	4822 130 60373	BC856B
7509	5322 130 60159	BC846B
7510	4822 130 60373	BC856B
7511	5322 130 60159	BC846B
7512	4822 130 60373	BC856B
7513	5322 130 60159	BC846B
7515	4822 130 60373	BC856B
7517	5322 130 60159	BC846B
7518	4822 130 60373	BC856B
7519	5322 130 60159	BC846B
7520	4822 130 60373	BC856B
7521	5322 130 60159	BC846B
7522	4822 130 60373	BC856B
7523	5322 130 60159	BC846B
7600	4822 209 17016	AD1855JRS
7601	9322 067 00668	IC SM OP275GS (ANA0) R

headphone

Miscellaneous

1100	4822 267 31479
1102	4822 267 31453



2100	5322 122 31647	1nF 10% 63V
2101	4822 124 11947	10μF 20% 16V
2102	5322 122 31866	6.8nF 10% 63V
2103	5322 122 32654	22nF 10% 63V
2104	4822 126 14585	100nF 10% 50V
2105	4822 126 14585	100nF 10% 50V
2106	5322 122 33538	150pF 2% 63V
2107	4822 126 14585	100nF 10% 50V
2108	4822 126 14585	100nF 10% 50V
2109	4822 126 14585	100nF 10% 50V
2110	5322 122 31647	1nF 10% 63V
2111	4822 124 11947	10μF 20% 16V
2112	5322 122 31866	6.8nF 10% 63V
2113	4822 126 14585	100nF 10% 50V
2114	4822 126 14585	100nF 10% 50V
2115	5322 122 33538	150pF 2% 63V
2116	4822 126 14585	100nF 10% 50V
2117	4822 126 14585	100nF 10% 50V
2118	4822 126 14585	100nF 10% 50V
2119	4822 124 41643	100μF 20% 16V DIM:6.3X11MM
2120	4822 124 41643	100μF 20% 16V DIM:6.3X11MM
2121	4822 126 14585	100nF 10% 50V
2122	4822 126 14585	100nF 10% 50V
2123	5322 122 31647	1nF 10% 63V
2124	5322 122 31647	1nF 10% 63V



3100	4822 117 11148	56k 1% 0.1W
3101	4822 051 20121	120Ω 5% 0.1W

3102	4822 051 20472	4k7 5% 0.1W
3103	4822 117 10833	10k 1% 0.1W
3104	4822 051 10102	1k 2% 0.25W
3105▲	5322 117 11726	10Ω 5%
3106	4822 051 20122	1k2 5% 0.1W
3107▲	5322 117 11726	10Ω 5%
3108▲	5322 117 11726	10Ω 5%
3109	4822 101 21199	10kX2 20% 0.025W
3110	4822 051 20471	470Ω 5% 0.1W
3111	4822 117 11383	12k 1% 0.1W
3112	4822 117 11149	82k 1% 0.1W
3113	4822 051 20472	4k7 5% 0.1W
3114	4822 051 20471	470Ω 5% 0.1W
3115	4822 117 10833	10k 1% 0.1W
3116	4822 051 10102	1k 2% 0.25W
3117▲	5322 117 11726	10Ω 5%
3118	4822 117 11148	56k 1% 0.1W
3119	4822 051 20471	470Ω 5% 0.1W
3120	4822 117 11383	12k 1% 0.1W
3121	4822 117 11149	82k 1% 0.1W
3122	4822 051 20472	4k7 5% 0.1W
3123	4822 051 20471	470Ω 5% 0.1W
3124	4822 117 11383	12k 1% 0.1W
3125	4822 051 20273	27k 5% 0.1W
3126	4822 117 11383	12k 1% 0.1W
3127▲	5322 117 11726	10Ω 5%
3128▲	5322 117 11726	10Ω 5%
3129	4822 051 20273	27k 5% 0.1W
3130	4822 101 21199	10kX2 20% 0.025W
3131	4822 051 20121	120Ω 5% 0.1W
3132	4822 051 20122	1k2 5% 0.1W
3133	4822 051 20122	1k2 5% 0.1W
3134	4822 051 20562	5k6 5% 0.1W 0805
3135	4822 117 11449	2k2 1% 0.1W
3136	4822 117 10837	100k 1% 0.1W
3137	4822 117 11449	2k2 1% 0.1W
3138	4822 117 10837	100k 1% 0.1W
4000	4822 051 20008	0Ω jump (0805)
4002	4822 051 20008	0Ω jump (0805)



6100	4822 130 83757	BAS216
6101	4822 130 83757	BAS216
6102	4822 130 11411	BZX284-C3V3
6103	4822 130 83757	BAS216
6104	4822 130 83757	BAS216



7100	4822 209 30095	LM833D
7101	4822 209 30095	LM833D
7102	4822 209 82362	NJM4556D
7103	4822 130 42133	BC817
7104	4822 130 42133	BC817
7105	4822 130 60511	BC847B
7106	4822 130 60511	BC847B
7107	4822 130 60373	BC856B
7999	4822 130 60511	BC847B

6015 4822 130 31878 1N4003G
6016 4822 130 31878 1N4003G
6017 4822 130 31878 1N4003G
6018 4822 130 31878 1N4003G
6020 4822 130 34379 BZX79-B27



7001 9322 138 13687 IC L4955V5.1 (ST00) L
7002 4822 130 60511 BC847B
7003 4822 130 60511 BC847B
7004 4822 130 60511 BC847B
7005 4822 130 60373 BC856B
7006 4822 209 73492 L7912CV
7010 4822 209 81726 MC7812CT
7100 4822 130 60511 BC847B
7101 4822 130 60511 BC847B
7102 4822 130 60511 BC847B
7103 4822 130 60511 BC847B
7104 4822 130 60373 BC856B

i/o board

Miscellaneous

1201 2422 026 05072 CON BM CINCH H 3P F
BKBKKB B
1205 4822 265 11287 4P
1401 4822 267 10666 30 P. FEM.

-II-

2100 5322 122 32448 10pF 5% 63V CASE
2101 5322 122 32654 22nF 10% 63V
2102 5322 122 32448 10pF 5% 63V CASE
2103 5322 122 32654 22nF 10% 63V
2104 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2106 5322 122 32654 22nF 10% 63V
2107 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2108 4822 124 22339 100UE 16V
2109 4822 124 22339 100UE 16V
2110 5322 122 32531 100pF 5% 50V
2111 5322 122 32654 22nF 10% 63V
2112 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2113 4822 122 33177 10nF 20% 50V
2114 2022 029 00359 TAnF SM TAJ 10V 4U7
PM10 R
2115 2022 029 00359 TAnF SM TAJ 10V 4U7
PM10 R
2116 4822 122 33177 10nF 20% 50V
2117 5322 122 32448 10pF 5% 63V CASE
2118 5322 122 32654 22nF 10% 63V
2119 4822 126 14585 100nF 10% 50V
2120 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2121 2022 029 00359 TAnF SM TAJ 10V 4U7
PM10 R
2122 5322 122 32654 22nF 10% 63V
2123 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2124 5322 122 32654 22nF 10% 63V
2125 5322 122 32268 470pF 10% 50V
2126 5322 122 32268 470pF 10% 50V
2127 5322 122 32268 470pF 10% 50V
2128 5322 122 32268 470pF 10% 50V
2129 5322 122 32448 10pF 5% 63V CASE
2130 2022 029 00359 TAnF SM TAJ 10V 4U7
PM10 R
2131 2022 029 00359 TAnF SM TAJ 10V 4U7
PM10 R
2132 5322 122 32448 10pF 5% 63V CASE
2133 4822 126 14585 100nF 10% 50V
2134 4822 126 14585 100nF 10% 50V
2136 4822 124 22339 100UE 16V
2137 4822 124 22339 100UE 16V
2138 5322 122 32448 10pF 5% 63V CASE
2139 5322 122 32531 100pF 5% 50V
2141 5322 122 32654 22nF 10% 63V
2151 5322 122 32654 22nF 10% 63V
2152 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2200 5322 122 32659 33pF 5% 50V
2201 5322 122 32654 22nF 10% 63V
2202 5322 122 32654 22nF 10% 63V
2203 5322 122 32654 22nF 10% 63V

2204 4822 126 12105 50V 33nF PM5
2205 4822 126 12105 50V 33nF PM5
2206 5322 124 41979 10μF 10% 16V
2207 5322 122 32654 22nF 10% 63V
2208 5322 122 33538 150pF 2% 63V
2209 5322 122 32654 22nF 10% 63V
2210 5322 122 32654 22nF 10% 63V
2211 5322 122 32654 22nF 10% 63V
2212 5322 122 32659 33pF 5% 50V
2213 5322 122 32654 22nF 10% 63V
2215 5322 122 32659 33pF 5% 50V
2216 5322 122 32659 33pF 5% 50V
2217 5322 122 32659 33pF 5% 50V
2218 5322 122 32659 33pF 5% 50V
2224 5322 124 41979 10μF 10% 16V
2300 5322 122 32531 100pF 5% 50V
2301 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2302 4822 126 14585 100nF 10% 50V
2304 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2305 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2306 4822 126 14585 100nF 10% 50V
2307 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2308 5322 122 32448 10pF 5% 63V CASE
2309 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2310 4822 126 14585 100nF 10% 50V
2311 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2312 4822 126 14585 100nF 10% 50V
2317 5322 122 32654 22nF 10% 63V
2318 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2319 5322 122 32654 22nF 10% 63V
2320 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2321 5322 122 32448 10pF 5% 63V CASE
2322 5322 122 32448 10pF 5% 63V CASE
2325 5322 122 32448 10pF 5% 63V CASE
2400 4822 126 14585 100nF 10% 50V
2401 3198 030 74780 EL SM 35V 4U7 PM20 COL
R
2402 4822 126 14585 100nF 10% 50V
2403 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2404 4822 126 14585 100nF 10% 50V
2405 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2406 4822 126 14585 100nF 10% 50V
2407 3198 030 74780 EL SM 35V 4U7 PM20 COL
R
2408 4822 126 14585 100nF 10% 50V
2409 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2410 4822 126 14585 100nF 10% 50V
2411 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2412 4822 126 14585 100nF 10% 50V
2413 5322 122 32531 100pF 5% 50V
2414 5322 122 32531 100pF 5% 50V
2415 5322 122 32531 100pF 5% 50V
2416 5322 122 32531 100pF 5% 50V
2417 5322 122 32531 100pF 5% 50V
2418 5322 122 32531 100pF 5% 50V
2419 5322 122 32531 100pF 5% 50V
2420 5322 122 32531 100pF 5% 50V
2421 5322 122 32531 100pF 5% 50V
2422 5322 122 32531 100pF 5% 50V
2423 5322 122 32531 100pF 5% 50V
2424 5322 122 32531 100pF 5% 50V
2425 5322 122 32531 100pF 5% 50V
2500 5322 122 32654 22nF 10% 63V
2501 4822 124 12095 100μF 20% 16V
2502 5322 122 32654 22nF 10% 63V
2503 4822 122 33216 270pF 5% 50V
2504 4822 124 22339 100UE 16V
2506 4822 122 33216 270pF 5% 50V
2507 4822 124 12095 100μF 20% 16V
2508 5322 122 32654 22nF 10% 63V
2509 5322 122 32654 22nF 10% 63V
2510 5322 122 32654 22nF 10% 63V
2511 4822 124 12095 100μF 20% 16V
2512 5322 122 32654 22nF 10% 63V
2513 4822 122 33216 270pF 5% 50V
2514 4822 124 22339 100UE 16V
2516 4822 122 33216 270pF 5% 50V
2517 4822 124 12095 100μF 20% 16V
2518 5322 122 32654 22nF 10% 63V

2519 5322 122 32654 22nF 10% 63V
2520 4822 121 51379 82nF 5% 63V
2521 4822 121 51379 82nF 5% 63V
2526 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2527 4822 126 14585 100nF 10% 50V
2528 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2529 4822 126 14585 100nF 10% 50V
2530 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2531 4822 126 14585 100nF 10% 50V
2532 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2533 4822 126 14585 100nF 10% 50V
2534 4822 126 14585 100nF 10% 50V
2535 4822 126 14585 100nF 10% 50V
2536 4822 126 14585 100nF 10% 50V
2537 4822 126 14585 100nF 10% 50V
2600 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2601 4822 126 14585 100nF 10% 50V
2602 5322 122 31863 63V 330pF PM5
2605 5322 122 34098 10nF 10% 63V
2606 5322 122 31863 63V 330pF PM5
2607 4822 126 14585 100nF 10% 50V
2608 4822 124 23002 10mF 16V
2609 4822 126 14585 100nF 10% 50V
2610 4822 124 23002 10mF 16V
2611 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2612 4822 126 14585 100nF 10% 50V
2613 5322 122 31863 63V 330pF PM5
2614 4822 126 14585 100nF 10% 50V
2615 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2618 5322 122 34098 10nF 10% 63V
2619 4822 126 14585 100nF 10% 50V
2620 2020 004 90297 TAnF SM F93 16V 100μF
PM20 R
2621 5322 122 31863 63V 330pF PM5
2622 5322 122 31863 63V 330pF PM5
2623 5322 122 31863 63V 330pF PM5
2624 5322 122 31863 63V 330pF PM5
2625 5322 122 31863 63V 330pF PM5



3100 4822 117 10833 10k 1% 0.1W
3101▲ 2322 750 64709 RST SM FUSE 1206 47Ω
PM5 R
3102 4822 117 10833 10k 1% 0.1W
3104▲ 2322 750 64709 RST SM FUSE 1206 47Ω
PM5 R
3105 4822 051 20008 0Ω jumper . (0805)
3107 4822 051 20008 0Ω jumper . (0805)
3108 4822 117 10354 22k 1% 0.1W
3109 4822 116 83933 15k 1% 0.1W
3110 4822 117 10833 10k 1% 0.1W
3111▲ 2322 750 64709 RST SM FUSE 1206 47Ω
PM5 R
3112 4822 117 10362 7k5 1% 0.1W
3113 4822 117 12519 47Ω 1% 0.1W
3114 4822 117 13472 5k1 1% 0805 RC12H R3
3115 4822 117 11145 4k7 1% 0.1W
3116 4822 117 10833 10k 1% 0.1W
3117 4822 117 13592 3k6 1% 0.1W RC12H 0805
3118 4822 117 11142 2k4 1% 0.1W
3119 4822 117 10833 10k 1% 0.1W
3120 4822 117 11139 1k5 1% 0.1W
3122▲ 2322 750 64709 RST SM FUSE 1206 47Ω
PM5 R
3123 4822 117 11145 4k7 1% 0.1W
3124 4822 117 13623 51k 1% 0.1W RC12H 0805
3125 4822 117 10833 10k 1% 0.1W
3126 4822 117 11145 4k7 1% 0.1W
3127▲ 2322 750 64709 RST SM FUSE 1206 47Ω
PM5 R
3128▲ 4822 117 11152 4Ω7 5%
3129▲ 2322 750 64709 RST SM FUSE 1206 47Ω
PM5 R
3130▲ 2322 750 64709 RST SM FUSE 1206 47Ω
PM5 R
3131 4822 117 10354 22k 1% 0.1W
3132 4822 117 10833 10k 1% 0.1W
3133 4822 116 83933 15k 1% 0.1W
3134 4822 117 10833 10k 1% 0.1W
3135 4822 117 10833 10k 1% 0.1W
3136 4822 117 10362 7k5 1% 0.1W
3137 4822 117 10833 10k 1% 0.1W

3138	4822 117 13472	5k1 1% 0805 RC12H R3
3139	4822 117 13592	3k6 1% 0.1W RC12H 0805
3140	4822 117 13623	51k 1% 0.1W RC12H 0805
3141	4822 117 11142	2k4 1% 0.1W
3142	4822 117 10833	10k 1% 0.1W
3143	4822 117 10833	10k 1% 0.1W
3144	4822 117 11139	1k5 1% 0.1W
3145	4822 051 20008	0Ω jumper . (0805)
3146▲	2322 750 64709	RST SM FUSE 1206 47Ω PM5 R
3154	4822 051 20471	470Ω 5% 0.1W
3155	4822 051 20471	470Ω 5% 0.1W
3200▲	4822 117 11152	4Ω7 5%
3201▲	4822 117 11152	4Ω7 5%
3202	4822 051 20332	3k3 5% 0.1W
3203	4822 117 12521	68Ω 1% 0.1W
3204	4822 051 20332	3k3 5% 0.1W
3205	4822 051 20101	100Ω 5% 0.1W
3206	4822 117 11927	75Ω 1% 0.1W
3207	4822 051 20332	3k3 5% 0.1W
3208▲	4822 117 11152	4Ω7 5%
3209	4822 051 20332	3k3 5% 0.1W
3210	4822 051 20332	3k3 5% 0.1W
3211	4822 117 11927	75Ω 1% 0.1W
3213	4822 051 20332	3k3 5% 0.1W
3214	4822 051 20101	100Ω 5% 0.1W
3215	4822 051 20101	100Ω 5% 0.1W
3216	4822 117 11449	2k2 1% 0.1W
3217	4822 117 11449	2k2 1% 0.1W
3218	4822 051 20008	0Ω jumper . (0805)
3220	4822 051 20101	100Ω 5% 0.1W
3221	4822 051 20101	100Ω 5% 0.1W
3222	4822 051 20008	0Ω jumper . (0805)
3223	4822 117 11449	2k2 1% 0.1W
3224	4822 117 11449	2k2 1% 0.1W
3233	4822 051 20332	3k3 5% 0.1W
3234	4822 117 11152	4Ω7 5%
3235	4822 117 12521	68Ω 1% 0.1W
3236	4822 051 20332	3k3 5% 0.1W
3237	4822 051 20008	0Ω jumper . (0805)
3300	4822 117 10834	47k 1% 0.1W
3301	4822 117 10834	47k 1% 0.1W
3302	4822 051 20829	82Ω 5% 0.1W
3304▲	2322 750 64709	RST SM FUSE 1206 47Ω PM5 R
3305	4822 117 11383	12k 1% 0.1W
3307	4822 117 11383	12k 1% 0.1W
3310	4822 051 20479	47Ω 5% 0.1W
3311	4822 051 20108	1Ω 5% 0.1W
3314	4822 051 20101	100Ω 5% 0.1W
3318	4822 051 20008	0Ω jumper . (0805)
3320▲	2322 750 64709	RST SM FUSE 1206 47Ω PM5 R
3321	4822 051 20008	0Ω jumper . (0805)
3322▲	2322 750 64709	RST SM FUSE 1206 47Ω PM5 R
3323	5322 117 12487	1k RC12G 1% 0.125W
3324	5322 117 12487	1k RC12G 1% 0.125W
3403	4822 117 10833	10k 1% 0.1W
3405	4822 117 10833	10k 1% 0.1W
3406	4822 117 10833	10k 1% 0.1W
3407	4822 117 10833	10k 1% 0.1W
3408	4822 117 10833	10k 1% 0.1W
3411▲	4822 117 11152	4Ω7 5%
3412	4822 117 10833	10k 1% 0.1W
3413	4822 051 20479	47Ω 5% 0.1W
3414	4822 051 20479	47Ω 5% 0.1W
3415	4822 051 20479	47Ω 5% 0.1W
3416	4822 051 20479	47Ω 5% 0.1W
3417▲	4822 117 11152	4Ω7 5%
3418	4822 051 20479	47Ω 5% 0.1W
3419	4822 051 20479	47Ω 5% 0.1W
3500▲	4822 117 11748	2Ω2 1206 5% FUSE
3501	4822 051 20122	1k2 5% 0.1W
3502	4822 117 11449	2k2 1% 0.1W
3503	4822 117 10353	150Ω 1% 0.1W
3504	4822 117 13577	330Ω 1% RC12H 0805 1.25W
3505	4822 051 20392	3k9 5% 0.1W
3506	4822 117 11383	12k 1% 0.1W
3507	4822 117 12521	68Ω 1% 0.1W
3508	4822 117 11951	2k 1% 0.1W
3511	4822 051 20392	3k9 5% 0.1W
3512	4822 117 10833	10k 1% 0.1W
3513	4822 117 12521	68Ω 1% 0.1W
3516	4822 117 13577	330Ω 1% RC12H 0805 1.25W
3517	4822 117 11449	2k2 1% 0.1W
3518	4822 051 20122	1k2 5% 0.1W
3519	4822 117 10353	150Ω 1% 0.1W
3520▲	4822 117 11748	2Ω2 1206 5% FUSE

3521	4822 117 11141	1k8 1% 0.1W
3522▲	4822 117 11748	2Ω2 1206 5% FUSE
3523	4822 051 20122	1k2 5% 0.1W
3524	4822 117 11449	2k2 1% 0.1W
3525	4822 117 10353	150Ω 1% 0.1W
3526	4822 117 13577	330Ω 1% RC12H 0805 1.25W
3527	4822 051 20392	3k9 5% 0.1W
3528	4822 117 11383	12k 1% 0.1W
3529	4822 117 12521	68Ω 1% 0.1W
3530	4822 117 11951	2k 1% 0.1W
3533	4822 051 20392	3k9 5% 0.1W
3534	4822 117 10833	10k 1% 0.1W
3535	4822 117 12521	68Ω 1% 0.1W
3538	4822 117 13577	330Ω 1% RC12H 0805 1.25W
3539	4822 117 11449	2k2 1% 0.1W
3540	4822 051 20122	1k2 5% 0.1W
3541	4822 117 10353	150Ω 1% 0.1W
3542▲	4822 117 11748	2Ω2 1206 5% FUSE
3543	4822 117 11141	1k8 1% 0.1W
3545	5322 117 12487	1k RC12G 1% 0.125W
3546	5322 117 12487	1k RC12G 1% 0.125W
3547	5322 117 12487	1k RC12G 1% 0.125W
3548	5322 117 12487	1k RC12G 1% 0.125W
3549	4822 117 10353	150Ω 1% 0.1W
3550	4822 117 10353	150Ω 1% 0.1W
3600▲	4822 117 11748	2Ω2 1206 5% FUSE
3601	4822 051 20008	0Ω jumper . (0805)
3602	4822 117 10837	100k 1% 0.1W
3603	4822 117 10833	10k 1% 0.1W
3604	4822 117 11142	2k4 1% 0.1W
3605	4822 051 20182	1k8 5% 0.1W
3606	4822 051 20008	0Ω jumper . (0805)
3607▲	4822 117 11748	2Ω2 1206 5% FUSE
3608	4822 051 20008	0Ω jumper . (0805)
3609	4822 051 20182	1k8 5% 0.1W
3610	4822 051 20008	0Ω jumper . (0805)
3611	4822 117 11142	2k4 1% 0.1W
3612▲	4822 117 11748	2Ω2 1206 5% FUSE
3613	4822 117 11142	2k4 1% 0.1W
3614	4822 051 20182	1k8 5% 0.1W
3615	4822 051 20008	0Ω jumper . (0805)
3616	4822 051 20008	0Ω jumper . (0805)
3617	4822 051 20182	1k8 5% 0.1W
3618	4822 051 20008	0Ω jumper . (0805)
3619	4822 117 11142	2k4 1% 0.1W
3620▲	4822 117 11748	2Ω2 1206 5% FUSE
3621	4822 051 20008	0Ω jumper . (0805)
3623	4822 051 20008	0Ω jumper . (0805)
3625	4822 051 20008	0Ω jumper . (0805)
3627	4822 051 20008	0Ω jumper . (0805)

5200 4822 157 70601 100μH (920927085A)



6100	4822 130 11383	BZX284-C5V1
6200	4822 218 11487	GP1F32R
6300	4822 130 10838	UDZ3.3B
6301	4822 130 10838	UDZ3.3B
6400	4822 130 11366	BZX284-C3V9
6401	4822 130 83757	BAS216
6500	4822 130 83757	BAS216
6501	4822 130 83757	BAS216
6502	4822 130 83757	BAS216
6503	4822 130 83757	BAS216
6504	4822 130 83757	BAS216
6505	4822 130 83757	BAS216
6506	4822 130 83757	BAS216
6507	4822 130 83757	BAS216
6508	4822 130 83757	BAS216
6509	4822 130 83757	BAS216
6510	4822 130 83757	BAS216
6511	4822 130 83757	BAS216
6512	4822 130 83757	BAS216
6513	4822 130 83757	BAS216
6514	4822 130 83757	BAS216
6515	4822 130 83757	BAS216
6516	4822 130 83757	BAS216
6517	4822 130 83757	BAS216
6518	4822 130 83757	BAS216
6519	4822 130 83757	BAS216
6520	4822 130 83757	BAS216
6521	4822 130 83757	BAS216
6522	4822 130 83757	BAS216
6523	4822 130 83757	BAS216
6524	4822 130 83757	BAS216

6525 4822 130 83757 BAS216



7100	9322 067 00668	IC SM OP275GS (ANA0) R
7102	9337 153 00118	IC SM 74HCT4051D (PHSE) R
7103	9322 067 00668	IC SM OP275GS (ANA0) R
7104	4822 209 90531	AD1877
7107	9337 153 00118	IC SM 74HCT4051D (PHSE) R
7200	4822 130 10845	GP1F32T
7201	5322 209 11517	PC74HCU04T
7203	4822 130 60511	BC847B
7204	4822 130 60511	BC847B
7205	4822 130 60511	BC847B
7206	4822 130 60511	BC847B
7211	5322 209 11517	PC74HCU04T
7300	9352 615 37118	IC SM UDA1360TS/N1 (PHSE) R
7302	9322 067 00668	IC SM OP275GS (ANA0) R
7400	4822 209 15083	AN78M09
7403	4822 209 15375	74HC244D
7500	4822 130 60373	BC856B
7501	5322 130 60159	BC846B
7502	4822 130 60373	BC856B
7503	5322 130 60159	BC846B
7505	4822 130 60373	BC856B
7507	5322 130 60159	BC846B
7508	4822 130 60373	BC856B
7509	5322 130 60159	BC846B
7510	4822 130 60373	BC856B
7511	5322 130 60159	BC846B
7512	4822 130 60373	BC856B
7513	5322 130 60159	BC846B
7515	4822 130 60373	BC856B
7517	5322 130 60159	BC846B
7518	4822 130 60373	BC856B
7519	5322 130 60159	BC846B
7520	4822 130 60373	BC856B
7521	5322 130 60159	BC846B
7522	4822 130 60373	BC856B
7523	5322 130 60159	BC846B
7600	4822 209 17016	AD1855JRS
7601	9322 067 00668	IC SM OP275GS (ANA0) R

headphone

Miscellaneous

1100	4822 267 31479
1102	4822 267 31453



2100	5322 122 31647	1nF 10% 63V
2101	4822 124 11947	10μF 20% 16V
2102	5322 122 31866	6.8nF 10% 63V
2103	5322 122 32654	22nF 10% 63V
2104	4822 126 14585	100nF 10% 50V
2105	4822 126 14585	100nF 10% 50V
2106	5322 122 33538	150pF 2% 63V
2107	4822 126 14585	100nF 10% 50V
2108	4822 126 14585	100nF 10% 50V
2109	4822 126 14585	100nF 10% 50V
2110	5322 122 31647	1nF 10% 63V
2111	4822 124 11947	10μF 20% 16V
2112	5322 122 31866	6.8nF 10% 63V
2113	4822 126 14585	100nF 10% 50V
2114	4822 126 14585	100nF 10% 50V
2115	5322 122 33538	150pF 2% 63V
2116	4822 126 14585	100nF 10% 50V
2117	4822 126 14585	100nF 10% 50V
2118	4822 126 14585	100nF 10% 50V
2119	4822 124 41643	100μF 20% 16V DIM:6.3X11MM
2120	4822 124 41643	100μF 20% 16V DIM:6.3X11MM
2121	4822 126 14585	100nF 10% 50V
2122	4822 126 14585	100nF 10% 50V
2123	5322 122 31647	1nF 10% 63V
2124	5322 122 31647	1nF 10% 63V



3100	4822 117 11148	56k 1% 0.1W
3101	4822 051 20121	120Ω 5% 0.1W

3102	4822 051 20472	4k7 5% 0.1W
3103	4822 117 10833	10k 1% 0.1W
3104	4822 051 10102	1k 2% 0.25W
3105▲	5322 117 11726	10Ω 5%
3106	4822 051 20122	1k2 5% 0.1W
3107▲	5322 117 11726	10Ω 5%
3108▲	5322 117 11726	10Ω 5%
3109	4822 101 21199	10kX2 20% 0.025W
3110	4822 051 20471	470Ω 5% 0.1W
3111	4822 117 11383	12k 1% 0.1W
3112	4822 117 11149	82k 1% 0.1W
3113	4822 051 20472	4k7 5% 0.1W
3114	4822 051 20471	470Ω 5% 0.1W
3115	4822 117 10833	10k 1% 0.1W
3116	4822 051 10102	1k 2% 0.25W
3117▲	5322 117 11726	10Ω 5%
3118	4822 117 11148	56k 1% 0.1W
3119	4822 051 20471	470Ω 5% 0.1W
3120	4822 117 11383	12k 1% 0.1W
3121	4822 117 11149	82k 1% 0.1W
3122	4822 051 20472	4k7 5% 0.1W
3123	4822 051 20471	470Ω 5% 0.1W
3124	4822 117 11383	12k 1% 0.1W
3125	4822 051 20273	27k 5% 0.1W
3126	4822 117 11383	12k 1% 0.1W
3127▲	5322 117 11726	10Ω 5%
3128▲	5322 117 11726	10Ω 5%
3129	4822 051 20273	27k 5% 0.1W
3130	4822 101 21199	10kX2 20% 0.025W
3131	4822 051 20121	120Ω 5% 0.1W
3132	4822 051 20122	1k2 5% 0.1W
3133	4822 051 20122	1k2 5% 0.1W
3134	4822 051 20562	5k6 5% 0.1W 0805
3135	4822 117 11449	2k2 1% 0.1W
3136	4822 117 10837	100k 1% 0.1W
3137	4822 117 11449	2k2 1% 0.1W
3138	4822 117 10837	100k 1% 0.1W
4000	4822 051 20008	0Ω jump (0805)
4002	4822 051 20008	0Ω jump (0805)



6100	4822 130 83757	BAS216
6101	4822 130 83757	BAS216
6102	4822 130 11411	BZX284-C3V3
6103	4822 130 83757	BAS216
6104	4822 130 83757	BAS216



7100	4822 209 30095	LM833D
7101	4822 209 30095	LM833D
7102	4822 209 82362	NJM4556D
7103	4822 130 42133	BC817
7104	4822 130 42133	BC817
7105	4822 130 60511	BC847B
7106	4822 130 60511	BC847B
7107	4822 130 60373	BC856B
7999	4822 130 60511	BC847B