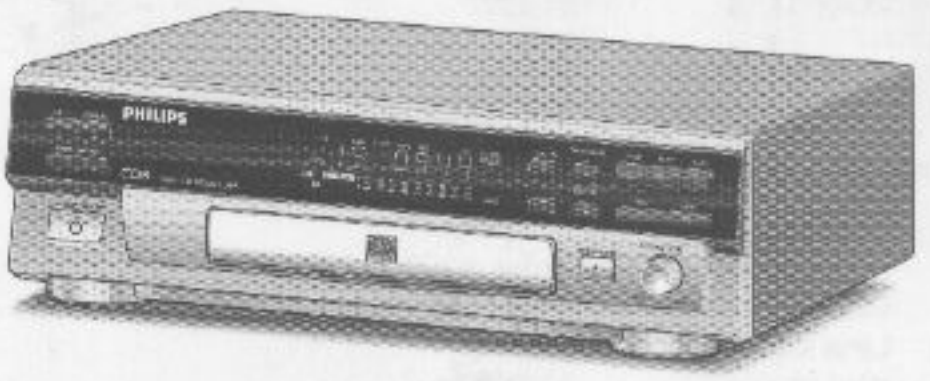
Compact disc recorder

CDR538/CDR560

CDR538/00S
CDR560/00S/11S/13S

Service
Service
Service



Service Manual

COMPACT disc DIGITAL AUDIO Recordable ReWritable

COMPACT disc DIGITAL AUDIO Recordable

COMPACT disc DIGITAL AUDIO ReWritable

SERVICING

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

1. The Display board, the Connector interface board and the Level / Headphone board have to be repaired on component level. The power supply is available as a spare part but can also be repaired on component level.
2. The loader (containing CD mechanism and CDM-board) and the Main board will be exchanged completely in case of failure. Both are available as sparepart. For easy diagnostics, the set has been equipped with a selfdiagnose program. Defective loaders and main boards have to be returned for central repair.

Also available: Circuit description:"The basics of Compact Disc Recordable / Rewritable.
Service codenumber 4822 725 25242.

CONTENTS PAGE

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PCS 98 801

PHILIPS

TECHNICAL SPECIFICATIONS

General

1. Mains voltage
   /00/06/11/13 84-250V
   /17 117V
2. Mains frequency 50-60Hz
3. Power consumption 15W

Input/Output

1. **Line output.**
   Output level: 2Vrms at 0dB.
   Output resistance: 200Ω.
2. **Line input.**
   input sensitivity: 500mVrms.
   Input impedance: 50kΩ.
   Maximum input voltage: 5Vrms.
3. **Digital output.**
   Format: AES/EBU format according IEC958 (consumer format).
   Sampling frequency: 44.1kHz.
   output resistance: 75Ω.
4. **Digital input.**
   Format: AES/EBU format according IEC958 (consumer format).
   Sampling frequency: 44.1kHz.
   Input resistance: 75Ω.
5. **Optical input.**
   Format: AES/EBU format according IEC958 (consumer format).
   Sampling frequency: 44.1kHz.

Audio performance

Cinch analog output (playback path).

Output voltage: 2Vrms ± 2dB. (0dB digital).
Frequency range F.R.: 20Hz < F.R. < 20kHz.
Amplitude linearity: ± 0.3dB.
typical.: ± 0.1dB.
Channel unbalance: <0.3dB at 1kHz.
typical: ±0.2dB.
Output resistance: 200Ω.
Phase non-linearity: <0.2° at 1kHz.
Outband attenuation: 50dB above 30kHz.
Channel separation: >90dB at 1kHz.
typical: 110dB.
>85dB from 20Hz. until 20kHz.
typical: >93dB.
S/N-ratio A-weighted: >98dB.
typical: 105dB.
S/N-ratio unweighted: >95dB.
typical: 100dB.
Dynamic range: >92dB. at 1kHz.
typical: 96dB.
>90dB from 20Hz. until 20kHz.
typical: 96dB.
THD+N: >82dB from 20Hz. until 20kHz.
typical: 85dB.

Cinch analog input/output (monitor path).

Measured with Audio precision system one.
Input voltage is 500mVrms.

Output voltage: 2Vrms ± 2dB. (0dB digital).
Frequency range F.R.: 20Hz < F.R. < 20kHz.
Amplitude linearity: ± 0.3dB.
typical.: ± 0.1dB.
Channel unbalance: <0.3dB at 1kHz.
typical: ±0.2dB.
Output resistance: 200Ω.
Phase non-linearity: <0.2° at 1kHz.
Outband attenuation: 50dB above 30kHz.
Channel separation: >90dB at 1kHz.
typical: 98dB.
>85dB from 20Hz. until 20kHz.
typical: >92dB.
S/N-ratio unweighted: >84dB.
typical: 88dB.
Dynamic range: >85dB. at 1kHz.
typical: 90dB.
THD+N: >80dB from 20Hz. until 20kHz.
typical: 85dB.
Intermodulation THD: >80dB.

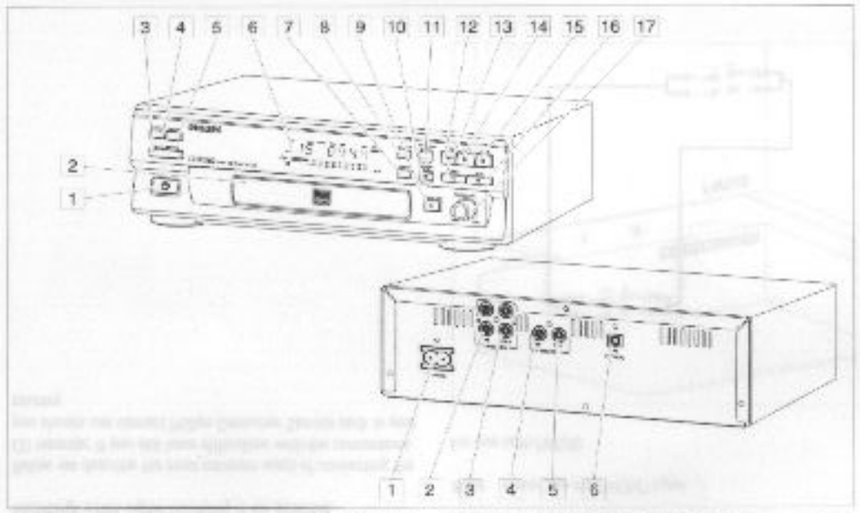
Dimensions and weight

1. Apparatus tray closed: WxDxH 265 x 305 x 75
2. Weight without packaging: 2,6 kg
3. Weight in packaging: 3,6 kg

Laser Device Unit

1. Material: GaAlAs
2. Wave length: 775→795 nm(at 25°C)
3. Laser output
   read: 0,7→0,9 mW
   write: 13→18 mW
4. Class: 3B

CONTROLS AND CONNECTIONS



Controls on the front

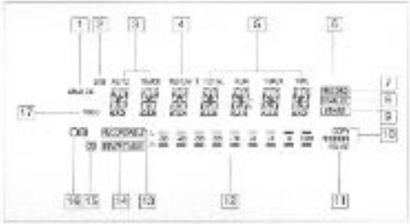
1 **ON/OFF** ..... turns the CD recorder ON and OFF
2 Disc tray
3 **AUTO/MANUAL** .. selects track increase method
4 **SOURCE** ..... selects digital or analog input
5 **DISPLAY** ..... selects display information
6 DISPLAY (information screen)
7 **ERASE** ..... erases recording
8 **FINALIZE** ..... finalizes recording
9 **OPEN/CLOSE** ..... opens/closes disc tray
10 **RECORD** ..... records
11 **CD-SYNC** ..... synchronized recording (automatic start when recording)
12 **STOP ■** ..... stops
13 ⏮ ..... previous track/searches back
14 **PLAY ▶** ..... starts play or record
15 **PAUSE II** ..... interrupts play
16 ⏭ ..... next track/searches forward
17 **REC LEVEL** ..... adjusts the recording level (analog)

Connections at the back

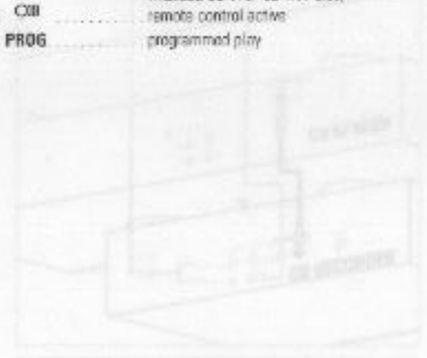
1 Connection to mains
2 **ANALOG IN** ..... connects to the line output of an amplifier (left and right)
3 **ANALOG OUT** ..... connects to the line input of an amplifier (left and right)
4 **DIGITAL IN** ..... connects to the digital coaxial output of a CD player
5 **DIGITAL OUT** ..... connects to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

DISPLAY

DISPLAY explanation



1 **ANALOG** ..... analog input is selected
2 **DIG** ..... lights when digital input is selected and flashes when digital input is incorrect
3 **AUTO TRACK** ..... automatically increasing track numbers
4 **REPEAT (1)** ..... repeat function activated during play
5 Track number and time
6 **CD-SYNC** ..... synchronized recording is active
7 **RECORD** ..... lights during recording and flashes in record standby
8 **FINALIZE** ..... lights during finalizing and flashes in finalize standby
9 **ERASE** ..... lights during erase recording and flashes in erase standby
10 **COPY PROHIBIT** ..... Lights when trying to record digital protected audio.
11 **PAUSE** ..... pause function is active
12 Record/play level bar (analog)
13 **RECORDABLE** ..... Unfinalized CD-R disc inserted
14 **REWRITABLE** ..... CD-RW disc inserted
15 **CD** ..... CD inserted (a pre-recorded CD or finalized CD-R or CD-RW disc)
16 **CDII** ..... remote control active
17 **PROG** ..... programmed play



DISPLAY messages

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

READING ...reading disc information
OPC .....during OPC procedure
OPEN .....during tray opening
CLOSE .....during tray closing
NO DISC ...no disc inserted, or disc unreadable
UPDATE .....updating disc contents
ERROR .....write error during recording
RECOVER ..during recovery procedure
WRITE ...../recording stop (4 seconds) in progress
SYNC .....during synchronized recording standby
TRACK .....during erase-track standby
DISC .....during erase-disc standby
SERVICE ..selftest failed
OPCERR1L ...laser power calibration failed. Further recording not possible
FULL .....program full
CD FULL ...no more recording possible
EMPTY .....no recordings on disc, finalizing not possible
NO AUDIO (flashing) no audio disc loaded or failure to read data
FINAL .....laser power calibration performed 99 times, finalize disc
COAXIAL ..digital coaxial input selected
OPTICAL ..digital optical input selected
SHUFFLE ..during shuffle
RC-DISC ..recovered disc. Finalizing not possible
TOC .....flashes during unfinalize disc standby, lights during unfinalize disc
INPUT .....during input selection (CD-SYNC)
ANALOG ....analog input selected

English

Connections general

For recording the CD recorder has the following inputs:
- Digital optical input
- Digital coaxial input
- Analog input

For play back the CD recorder has the following outputs:
- Digital coaxial output
- Analog output

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.

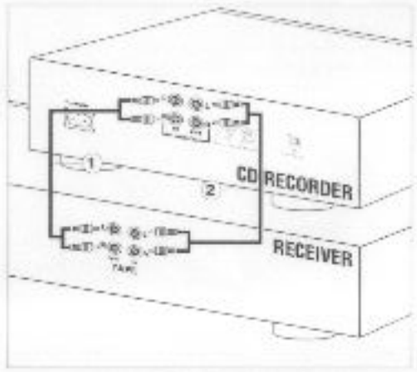
Recordings made from a digital source (CD player) via the digital optical or digital coaxial connection will give the best performance in audio and usability (e.g. auto-track).
(The digital optical connection is less sensitive to external disturbances).
If your equipment does not offer digital connections, 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 always to establish both digital and analog connections. In this way you can always make analog recordings when digital recording is not possible.

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

Analog connections



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

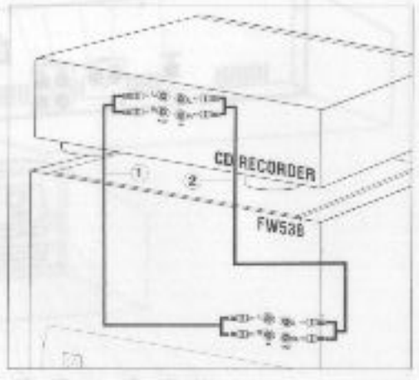
1 For recording, connect cable ① between the ANALOG IN sockets on the CD recorder and the LINE- or TAPE OUT-sockets of an amplifier (FW538).

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

2 For playback, connect cable ② between the ANALOG OUT-sockets on the CD recorder and the input sockets of an amplifier e.g. TAPE IN, CD-R or AUX (FW538).

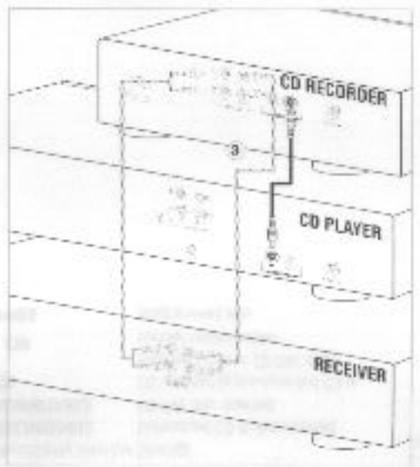
Note: Never use the PHONO input.

For use with FW538:



English

Digital coaxial connections

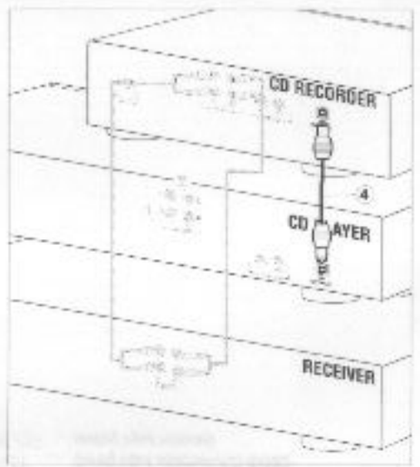


Use the supplied cable with the black plugs.

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

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

Digital optical connections

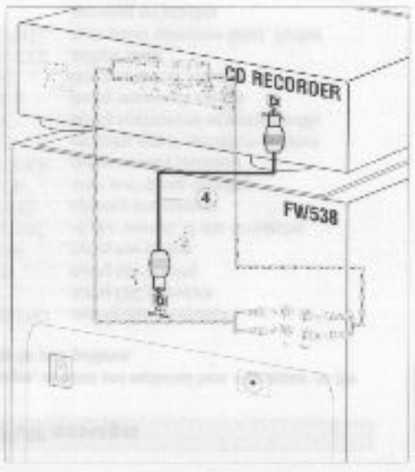


1 Remove the dust caps from the digital optical connections. (We recommend you to save the caps).

2 For recording, connect a fibre-optic cable ④ between the digital optical input of the CD recorder and the digital optical output of a CD player (FW538).

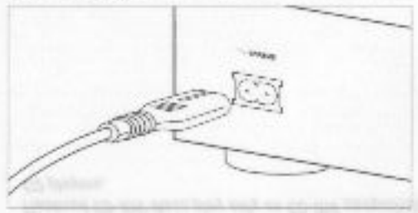
Note: For playback the digital coaxial output or analog output should be connected to an amplifier.

For use with FW538:



INSTALLATION

Power supply



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

2 Press ON/OFF to turn the CD recorder on.

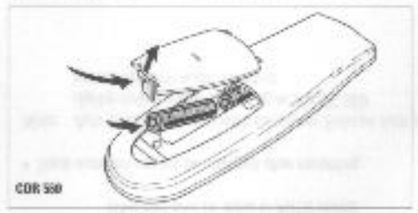
Note:

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

Setup recommendations

- Place the CD recorder on a solid, vibration free surface.
- Do not place the CD recorder near a source of heat or in direct sunlight.
- Do not use the CD recorder under extremely damp conditions.
- If the CD recorder is placed in a cabinet, make sure that a 2,5 cm space remains free on all sides of the recorder for proper ventilation.

Inserting batteries in the remote control



Note: For CDR538 and Remote Control RW538.

1 Open the battery compartment cover.

2 Insert 2 batteries (AAA, R03 or UM-4; as supplied) as shown.

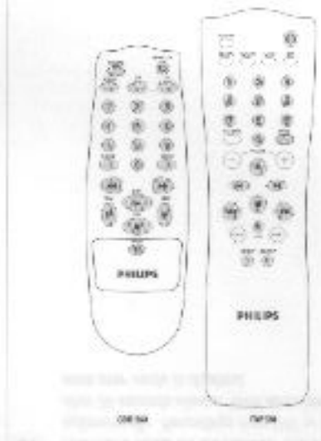
3 Replace the cover.

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

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

REMOTE CONTROL & INSERTING DISCS

Remote control commands

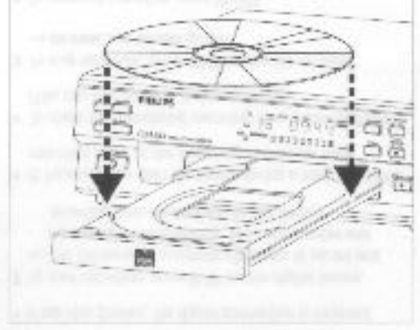


PROGRAM	programs track numbers
DISPLAY	selects display information
Number keys 0 - 9	Selects a track by number
SHUFFLE	plays CD(RW) or program in random order
◄◄	Searches backward
PREVIOUS ◄	selects the beginning of a previous track
STOP ■	stops CD(RW) and clears a program
PAUSE II	interrupts CD(RW) play
NEXT ►►I	selects the beginning of subsequent track
PLAY ►	starts CD(RW) play
►►	Searches forward
REPEAT	repeat play
CD	CDR 765 only
CD-R	CDR 765 only
OPEN/CLOSE	Opens or closes the disc tray

While you press a button on the remote control, the indicator on the display lights up.

Note: Unless otherwise stated, all controls are on the front of the CD recorder. When provided on the remote control, you can also use the corresponding buttons.

Inserting discs



1 Press OPEN/CLOSE (⏏) to open the disc tray.

2 Insert a CD, CD-R or CD-RW in the appropriate recess in the tray, label side up.

IMPORTANT:
For recording it is important that the blank disc is completely free from dust particles or scratches. (see Disc Maintenance, p.5).

3 Gently push the front of the tray or press OPEN/CLOSE to close the tray (see also Playing a CD).

⇒ The display will show the type of disc you inserted.

- If a CD-R is finalized it will show **CD** on the display.
- If a CD-RW is finalized it remains a CD-ReWritable and will show **CD REWRITABLE** on your display.

If you insert a blank or partly recorded CD-R or CD-RW, the CD recorder will calibrate the disc for optimum recording. During this process the display will first show OPC and then the number of audio tracks. Calibration can take up to 25 seconds.

Note: Only Audio CDs will be accepted. If a non-audio disc is inserted, the display shows NO AUDIO.

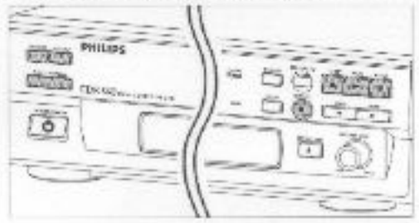
Remarks about recording

You will soon discover how easy it is to make your own CDs. Nevertheless, it is advisable to use a CD-RW disc for your first try. We will describe the 3 ways to make recordings:
- Digital unsynchronized
- Digital synchronized
- Analog

- The recording procedure is the same for CD-Rs or CD-RWs.
- If the disc is a CD-RW and is already finalized you must unfinalize it first *(p.14)*
- If the disc already contains recordings, the CD recorder will automatically search for the end of the last track, so that recording can start from there.
- There must be at least 7 seconds of recording time left on the disc, otherwise you will not be able to enter record standby mode.
- If the display indicates **COPY PROHIBIT**, no digital recording can be made of the source material. Recording will not start or stops after 4 seconds.
- The **Serial Copy Management System** (SCMS) only allows digital recording under specific conditions:
  - This means that it is not possible to make a digital copy from a digital copy.
  - Analog recording is always possible !
  The number of recordings from the original is unlimited.
- A maximum of 99 tracks can be recorded on a disc. Minimum allowable track length is 4 seconds.
- Digital recordings can be made from CDs (or other sources with an output Sample Frequency of 44.1 kHz +/- 100 ppm) via the digital input.

Important:
If you want to play the recorded CD-R disc on a regular CD player, it must first be finalized. See finalizing discs (p.15).
Finalized CD-RW discs play only on CD-RW compatible CD players.

Digital recording - unsynchronized



Preparing for digital recording

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

2 Press SOURCE repeatedly until (depending on the digital connection used):

⇒ **DIG** COAXIAL or **DIG** OPTICAL appears on the display.

3 Press AUTO/MANUAL to switch between auto and manual track numbering.
⇒ If AUTO is selected (preferred), **AUTO TRACK** appears on the display.

- AUTO: The track increments are automatically taken over from the digital source material.
- MANUAL: Track numbers can be incremented manually by pressing ⏭. (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.

Start digital recording

1 With the recorder stopped, press RECORD to enter the Record standby mode.
⇒ **RECORD** flashes.

- If **DIG** also flashes, the digital connection is incorrect.

2 To start recording, press PLAY and immediately start the source (from stop-mode).
⇒ **RECORD** lights continuously. The track number and recording time used appear on the display.

- To record a 3-second silence at the start of a track, press PAUSE.
- To check the (remaining) recording time, press DISPLAY. (This can also be done during the recording).

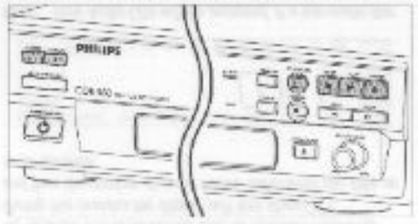
3 To stop recording, press STOP on the CD recorder.
⇒ **RECORD** goes out.

- To interrupt recording, press PAUSE.
⇒ **RECORD** starts to flash. Resume at step 2.

After recording the display will show UPDATE for several seconds.

*Note: With **AUTO TRACK** on, the recorder will stop automatically. Recordings from DAT or DCC will stop after 20 seconds silence. With **AUTO TRACK** off, the **AUTO STOP** mode is disabled.*

Synchronized digital recording - CD-SYNC



Preparing for synchronized digital recording

The CD-SYNC feature enables you to make fast and easy digital recording of a CD. Track increments are automatically detected from the digital source material. Track increments cannot be added manually.

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

2 Press SOURCE repeatedly until (depending on the connection used):

⇒ **DIG** COAXIAL or **DIG** OPTICAL appears on the display.

Start synchronized digital recording

1 With the CD recorder stopped, press CD SYNC.
⇒ On the display, **CD-SYNC** & SYNC appears. After a time, **RECORD** starts to flash.

- If **DIG** also flashes, the digital connection is incorrect.

2 To start recording, press PLAY on the digital source.
⇒ The CD recorder automatically starts to record and **RECORD** lights continuously. The track number and recording time used appear on the display.

- If, however, you start the source during a track, CD-SYNC recording starts at the beginning of the next track.
- To check the (remaining) recording time, press DISPLAY. (This can also be done during recording).

3 To stop recording, press STOP on the CD recorder.
⇒ **CD-SYNC** and **RECORD** go out.

- To interrupt recording, press PAUSE.
⇒ **RECORD** starts to flash. To resume, press PLAY on the CD recorder.

After recording the display will show UPDATE for several seconds.

English

Note:
- *The CD recorder will not start until it recognizes a digital signal. Although the reaction time is less than 200 milliseconds, the very beginning of the music may sometimes not be recorded. If this happens, you can start the recording manually (see digital recording - unsynchronized).*
- *Recordings from DAT or DCC will only stop after 20 seconds silence.*

Analog recording

Only make analog recordings if digital recording is not possible.

Preparing for analog recording

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

2 Press SOURCE repeatedly until:
⇒ **ANALOG** appears on the display.

3 Press AUTO/MANUAL to switch between auto and manual track numbering.
⇒ If **Auto** is selected (preferred), **AUTO TRACK** appears on the display.

- AUTO: The track number is automatically incremented after a silence on the original of minimum 3 seconds.
- MANUAL: Track numbers can be incremented manually by pressing ⏭ (minimum track length is 4 sec). (This can also be done in AUTO mode)
- Track numbers cannot be changed after recording.

4 With the recorder stopped, press RECORD to enter Record standby mode.
⇒ **RECORD** flashes.

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

6 Turn the REC LEVEL control so that, on the Record/Play Level bar, all the blue segments are alight, but the red segments do not light continuously during the loudest passages.

7 Stop the source.

English

Start analog recording

1 To start recording, press PLAY on the CD recorder and immediately start the source.
⇒ **RECORD** lights continuously. The track number and recording time used appear on the display.

- To record a 3-second silence at the start of a track, press PAUSE.
- To check the (remaining) recording time, press DISPLAY. (This can also be done during the recording)

2 To stop recording, press STOP on the CD recorder.
⇒ **RECORD** goes out.

- To interrupt recording, press PAUSE.
⇒ **RECORD** starts to flash. Resume at step 1.

After recording the display will show UPDATE for several seconds.

*Note: With **AUTO TRACK** on, the recorder will stop automatically after 20 seconds silence. With **AUTO TRACK** off, the **AUTO STOP** mode is disabled.*

Finalizing CD-R & CD-RW discs

Finalizing is a simple procedure that is necessary in order to play the discs on a regular (non recording) CD player.

Note: Finalizing prevents any further recording on a CD-R. A finalized CD-RW must be unfinalized to allow further recording or erasure of tracks.

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

2 With the recorder stopped press FINALIZE and then within 3 seconds press RECORD.

⇒ The approximate finalisation time appears in the display. Record & finalize lights up. The display counts down through the finalisation.
On completion, the total number of tracks and the total time recorded appears on the display.
For CD-R **CD RECORDABLE** becomes **CD** on display.
For CD-RW no change on display.

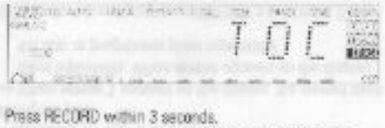
Finalizing will last at least 2 minutes.

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

Unfinalizing CD-RW discs

For CD-RW 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 Press ERASE twice.
⇒ On the display, TOC and **ERASE** flash.



2 Press RECORD within 3 seconds.
⇒ TOC and **ERASE** light continuously during erasure.

Note: This will take approximately 1 minute.

English

Erasing CD-RW discs

For CD-RW discs only.

You can erase:
- track by track from the end.
- the entire disc.

To erase the last track :

1 Make sure the disc is not finalized (Showing :OPC on display during start up). Otherwise unfinalize first (p.15)

2 Press ERASE.
⇒ On the display, TRACK and **ERASE** flash.

3 Press RECORD within 3 seconds.
⇒ TRACK and **ERASE** light continuously during erasure.

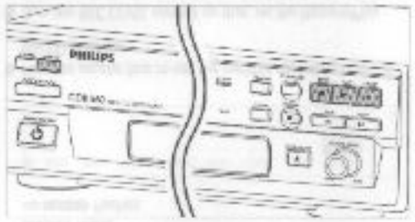
To erase the entire disc:

1 Press ERASE once (for finalized CD-RW) and twice (for unfinalized CD-RW).
⇒ On the display, DISC and **ERASE** flash.

2 Press RECORD within 3 seconds.
⇒ DISC and **ERASE** light continuously during erasure.

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

Playing a CD



1 Press PLAY to start CD play.
⇒ The track number and track time apear on the display, together with the record/play level indicator.

2 Press DISPLAY once, twice, or three times to see:
⇒ Remaining track time; Total remaining time; Track time with the record/play level bar off.

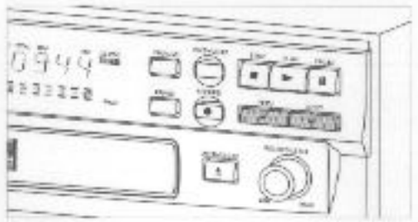
3 To interrupt play temporarily, press PAUSE.
⇒ **PAUSE** lights on the display.

4 To continue play, press PAUSE again or press PLAY.

5 To stop play, press STOP.
⇒ The number of tracks and the total playing time appear on the display.

English

Selecting a track or searching



Selecting a track during play

1 Briefly press ⏮ or ⏭ one or more times.
⇒ Play skips to the beginning of the present, previous or subsequent tracks.

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.

Selecting a track when CD play is stopped

1 Briefly press ⏮ or ⏭ one or more times.

2 Press PLAY.
⇒ Play starts at 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 starts at the selected track.

Searching during CD play

1 Hold down ⏮ or ⏭ (or ◀◀ or ▶▶ on the remote control).
⇒ The player first searches backwards or forwards at 10 times normal speed with sound at low volume, then goes to fast reverse or fast forward with sound muted.

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

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

Shuffle play

1 Press SHUFFLE (or PLAY) on the remote control before or during CD play to start shuffle play.
⇒ The tracks on the CD (or program if set) play in random order. SHUFFLE appears on the display between tracks.

2 Press SHUFFLE again to return to normal CD play.

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

Repeat CD, track or program

1 Press **REPEAT** on the remote control one or more times during CD play.
⇒ When **REPEAT 1** appears on the display, the current track plays repeatedly. When **REPEAT** appears on the display, the disc or programme plays repeatedly.

2 To return to normal play, press REPEAT one or more times until:
⇒ the repeat message disappears from the display.

Note:
- *You can use shuffle in combination with repeat CD or programme play.*
- *Repeat is also cleared if you open the disc tray.*

Programming

You can program up to 30 tracks to play in any desired sequence. Tracks can be programmed more than once, but each time counts as a track.

1 On the remote control press PROGRAM to start programming.
⇒ **PROG** flashes on the display.

2 Key in a track number with the number keys. For 2 digit numbers, press the keys in rapid succession.
⇒ On the display, the track number appears briefly, followed by the total programmed tracks and total programme time.

3 Repeat step 2 for all tracks to be programmed.

4 Press STOP or PROGRAM to end programming.
⇒ **PROG** lights continuously.

Note:
- *To review the program, press ⏮ or ⏭ in stop mode.*
- *To add more tracks to the programme, repeat steps 1 to 4.*
- *If you try to store more than 30 tracks, FULL appears on the display.*

5 Press PLAY to start programmed play.

Clearing a program

1 Press STOP if necessary to stop programmed play.

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

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

FIXING PROBLEMS

Troubleshooting

If you think your CD recorder is defective, it is wise to check this list first and run the diagnostic program. Maybe you 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: • SOLUTION

No power
- ensure that the ON/OFF button is on
- 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 3 seconds silence in between the tracks (analog recording only)
- check if the source is a consumer source with the digital output according the IEC audio standard.

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 right source first

Will not record
- clean the disc.
- check if CD-RW is not finalized.
- check that the disc is recordable and replace if necessary
- the disc is not an AUDIO disc
- wrong input source chosen

Analog recording is distorted
- make sure the recording level is correct

29 second pause between recordings
- see synchronized digital recording (CD SYNC) *(p. 13)*

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

SERVICE ***on display after switching on***
- try switching off and on again

RECOVER ***on display***
- a power failure has occured during recording, the CD recorder is attempting to repair the disc.
- if RC-DISC then appears on the display, the disc cannot be recorded further, and cannot be finalized. But can be played on a CD recorder.
- on a CD-RW disc, the track being recorded is lost, but further recording and finalization can still be done.
- if DPC FAIL appears, no further recording is possible.
  You can still use the disc as a CD on this recorder.

Diagnostic program

If the malfunction continues, perform the Diagnostic Program:

1 Switch the recorder off using ON/OFF.

2 Simultaneously press PLAY and STOP and switch the recorder back on using ON/OFF.
→ The display will now indicate BUSY and after a few minutes, the message will change to ERROR or PASSED.

- If the ERROR message appears, your recorder is defective and needs to be repaired. Consult your supplier or call the Philips Consumer Line to find the nearest service centre. The number of the Consumer Line can be found in the guarantee booklet.
- If the PASSED message appears, you may be misinterpreting the user instructions or using an inappropriate disc, or there may be a mechanical defect or an incorrect connection. Carefully read the user instructions once again; and if necessary contact your supplier.
- If you cannot solve the problem, contact to the nearest service centre.

3 Switch off the recorder using ON/OFF to exit from the Diagnostic Program.

GENERAL INFORMATION

Discs for recording

For recording use, special audio discs must be used (for music only). These Discs bear the logos as shown below. The text 'DIGITAL AUDIO' is present. ! Copyright fees have been paid on these discs in some countries.

Your recorder uses two types of discs for recording purposes:

- **CD-Audio Recordable** (CD-R) discs:
  Fully recorded and finalized, these discs play on all CD players and recorders.

COMPACT disc DIGITAL AUDIO Recordable

- **CD-Audio ReWritable** (CD-RW) discs:
  Can be recorded, erased and re-recorded hundreds of times. When finalized, they play on CD-RW compatible CD players and recorders.
  In the course of 1999 most Philips CD players and recorders will be CD-RW compatible.

COMPACT disc DIGITAL AUDIO ReWritable

Discs for playback

Your CD recorder is able to play:

- All prerecorded audio CDs, and combined CDs such as CD Extra
  All Audio CD-R and Audio CD-RW.

Note: CD-R discs recorded with a computer can only be used when they are correctly treated according the audio standard (IEC958: Consumer part).
Single session only!

Maintenance

For recording it is very important to use dust and scratch free discs.

To clean a CD, wipe it in a straight line from the center toward the edge using a soft, lint-free cloth. A cleaning agent may damage the disc! Write only on the printed side of a CD-R or CD-RW, and only with a soft felt tipped pen.

Clean the CD recorder with a soft, slightly dampened lint-free cloth. Do not use any cleaning agents as they may have a corrosive effect.

Do not expose the CD recorder, batteries or CDs to humidity, rain, sand or excessive heat (caused by heating equipment or direct sunlight).

If the CD recorder cannot read CDs correctly use a commonly available cleaning CD to clean the lens before taking the CD player to repair. Other cleaning methods may destroy the lens. Always keep the tray closed to avoid dust on the lens.

The lenses may cloud over when the CD recorder is suddenly moved from cold to warm surroundings. Playing a CD is not possible then. Leave the CD recorder in a warm environment until the moisture evaporates.

Accessories

- 2 Analog audio cables (with red and white plugs)
- 1 Digital coaxial cable (with black plugs)
- Power cord
- 2 Batteries
- Remote control
- Guarantee
- Optical cable (CDR538 only)

TECHNICIAN NOTES

(GB) WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD).
Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

ESD

(NL) WAARSCHUWING

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

(F) ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise a leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller a ce que les composants ainsi que les outils que l'on utilise soient également a ce potentiel.

(D) WARNUNG

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

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevita potrebbe essere fortemente ridatta in caso di non osservazione della piu grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

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

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

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

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

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

CAUTION
VARO!
VARNING
ADVERSEL
DANGER
VORSICHT

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

SHOCK, FIRE HAZARD SERVICE TEST:

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

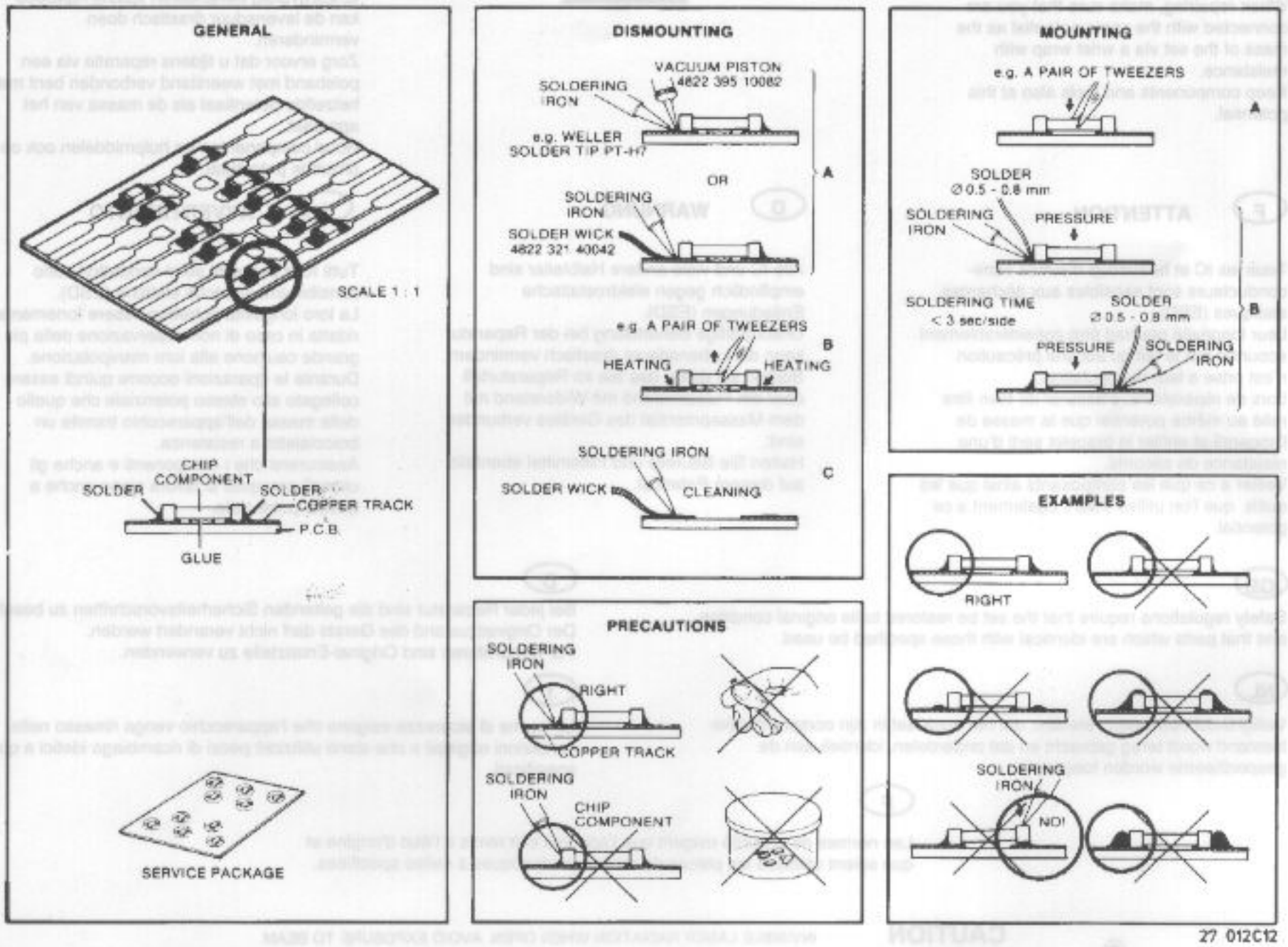
NOTE ON SAFETY:

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

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

SERVICING HINTS

In the set chip components have been applied. For disassembly and assembly of chip components see the figure below.



27 012C12

SERVICE TOOLS

Audio signals disc	4822 397 30184
Disc without errors(SBC444) and disc with DO errors, black spots and fingerprints(SBC444A)	4822 397 30245
Disc(65 min , 1 kHz) without no pause	4822 397 30155
Maximum diameter disc(58.0 mm)	4822 397 60141
Torx screwdrivers	
Set (straight)	4822 395 50145
Set (square)	4822 395 50132

SAFETY GUIDELINES FOR THE PROFESSIONAL SERVICE TECHNICIAN

Important

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

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

Safety Checks

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

Fire and Shock Hazard

1. Be sure all components are positioned in such a way as to avoid the possibility of adjacent component shorts. This is especially important on those units which are transported to and from the service shop.
2. Never release a repaired unit unless all protective devices such as insulators, barriers, covers, strain reliefs, and other hardware have been installed according to the original design.
3. Soldering and wiring must be inspected to locate possible cold solder joints, solder splashes, sharp solder points, frayed leads, pinched leads, or damaged insulation (including the ac cord). Be certain to remove loose solder balls and all other loose foreign particles.
4. Check across-the-line components and other components for physical evidence of damage or deterioration and replace if necessary. Follow original layout, lead length, and dress.
5. No lead or component should touch a resistor rated at 1 watt or more. Lead tension around protruding metal surfaces or edges must be avoided.
6. Critical components having special safety characteristics are identified with a ⚠ by the Ref. No. in the parts list and enclosed within a broken line* (where several critical components are grouped in one area) along with the safety symbol ⚠ on the schematic diagrams and/or exploded views. Replacement parts without the same safety characteristics may create shock, fire, or other hazards.
7. When servicing any unit, always use a separate isolation transformer for the chassis. Failure to use a separate isolation transformer may expose you to possible shock hazard, and may cause damage to servicing instruments.
8. Many electronic products use a polarized ac line cord (one wide pin on the plug). Defeating this safety feature may create a potential hazard to the servicer and the user. Extension cords which do not incorporate the polarizing feature should never be used.

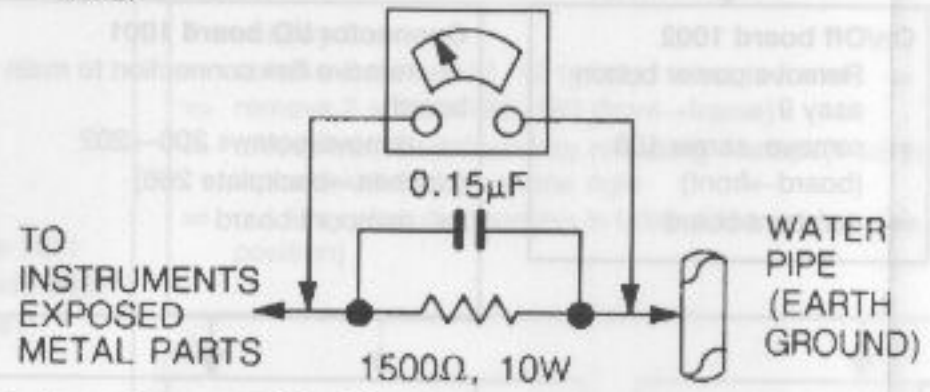
Fire and Shock Hazard (Continued)

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

* Broken line: ▬▪▬▪▬▪▬▪▬▪

Leakage Current Cold Check

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



Leakage Current Hot Check

1. Do not use an isolation transformer for this test. Plug the completely reassembled unit directly into the ac outlet.
2. Connect a 1.5k, 10W resistor paralleled by a 0.15uF. capacitor between each exposed metallic cabinet part and a good earth ground such as a water pipe, as shown above.
3. Use an ac voltmeter with at least 5000 ohms/volt sensitivity to measure the potential across the resistor.
4. The potential at any point should not exceed 0.75 volts. A leakage current tester may be used to make this test; leakage current must not exceed 0.5 millamps. 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

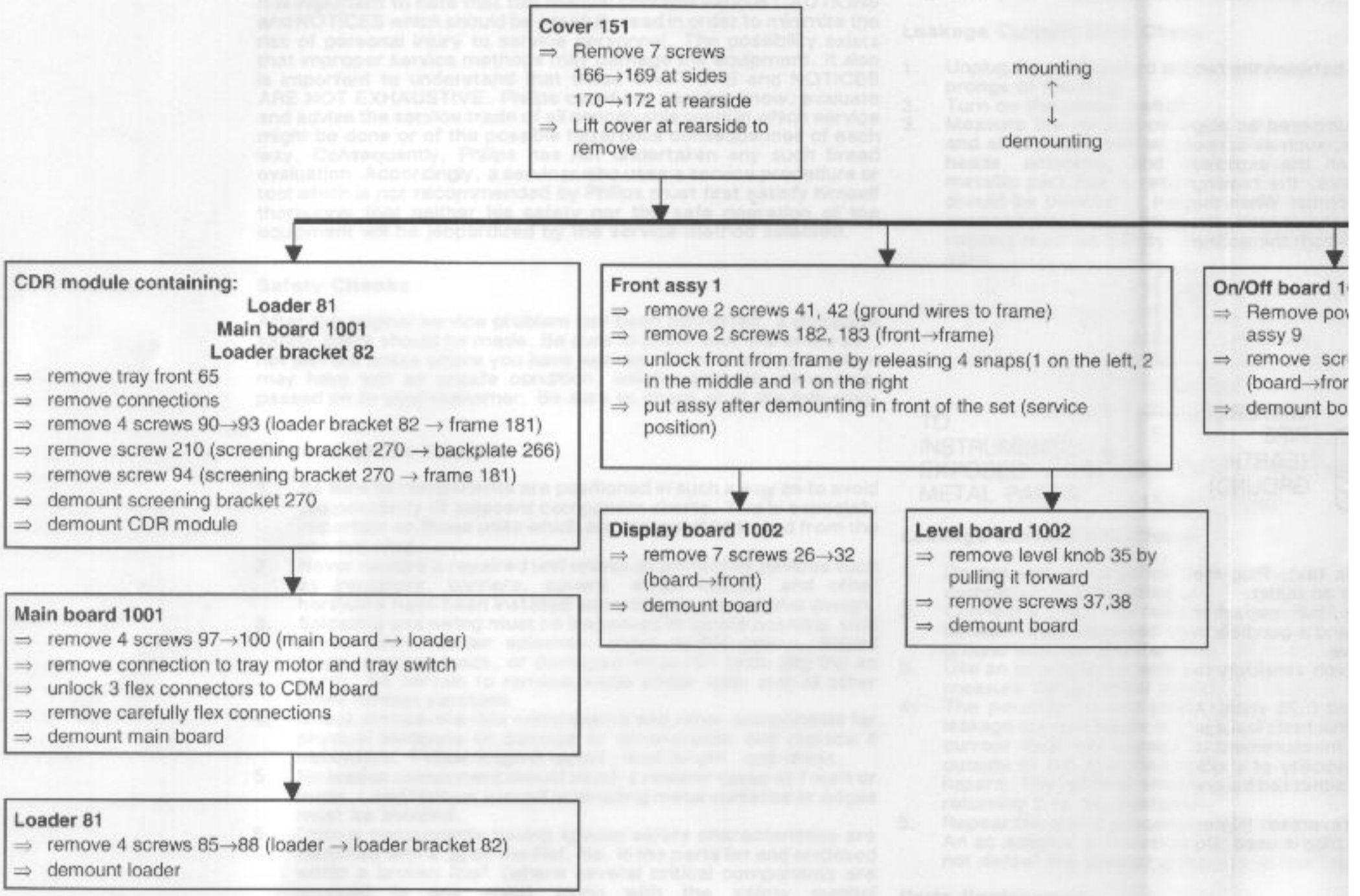
1. Many electrical and mechanical parts in Philips equipment have special safety related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, 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.

DISMANTLING INSTRUCTIONS

See exploded view for item numbers



MECHANICAL PARTSLIST

1	4822 459 05124	FRONT ASSY CDR538
1	4822 459 05126	FRONT ASSY CDR560
9	4822 410 12066	POWER BUTTON ASSY
15	4822 454 13339	CDRW - LOGO
35	4822 410 12067	REC. LEVEL KNOB ASSY
65	4822 459 05125	TRAY FRONT ASSY
81	4822 691 10737	CDR LOADER CDL3610/01
271-274	4822 462 40683	FOOT
301⚠	4822 321 10249	SBC1201 MAINS CABLE
312-313	4822 321 11357	AUDIO CORD SET
316	4822 324 00007	OPTICAL CORD SET
317	4822 321 61452	DIG OUT CABLE
318	4822 219 10559	REMOTE CONTROL RC07110/01
1001	4822 214 12845	MAIN BOARD CDR538/560
1003⚠	4822 218 11938	POWER SUPPLY 20PS314/00

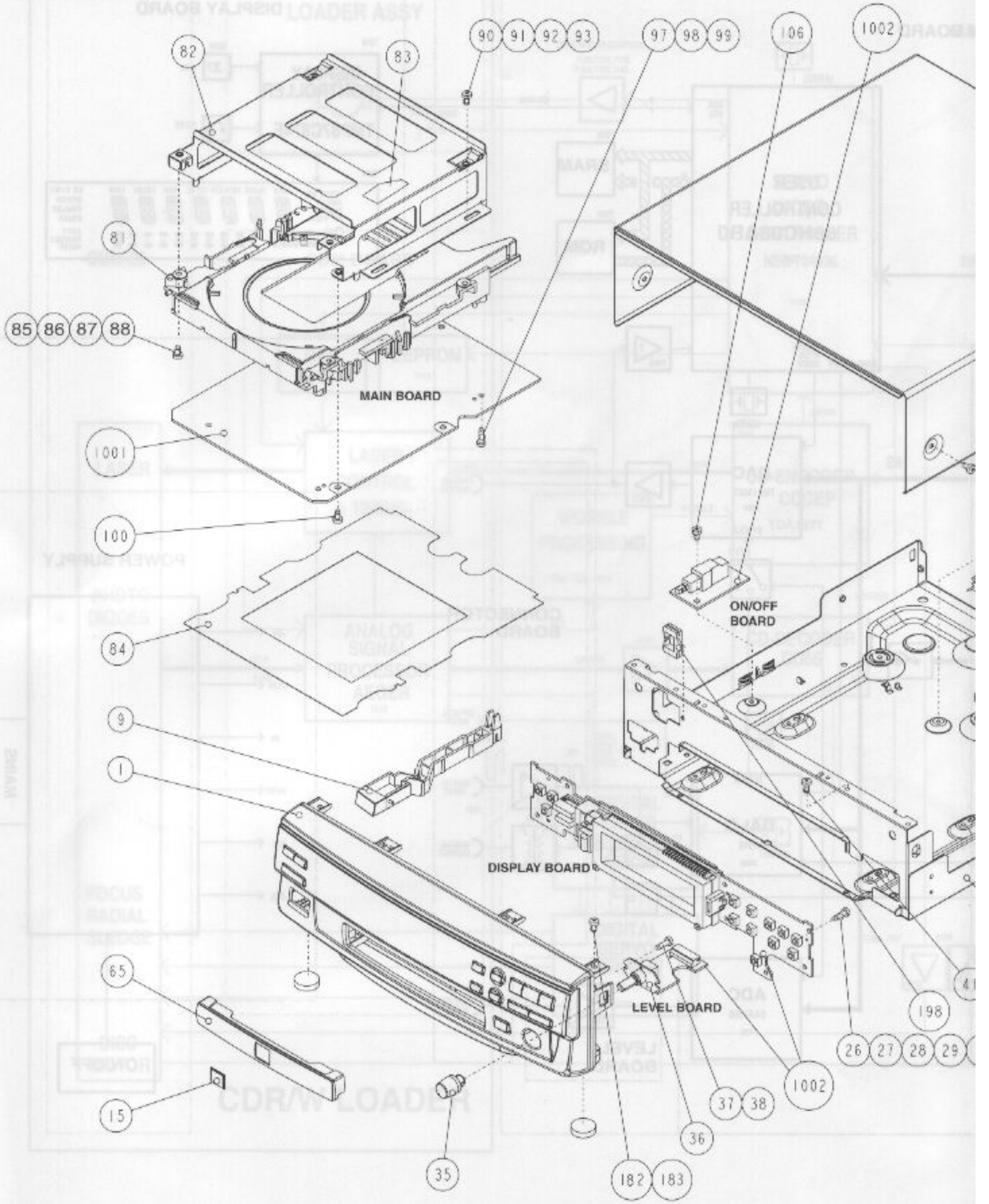
n/Off board 1002
- Remove power button assy 9
- remove screw 106 (board→front)
- demount board

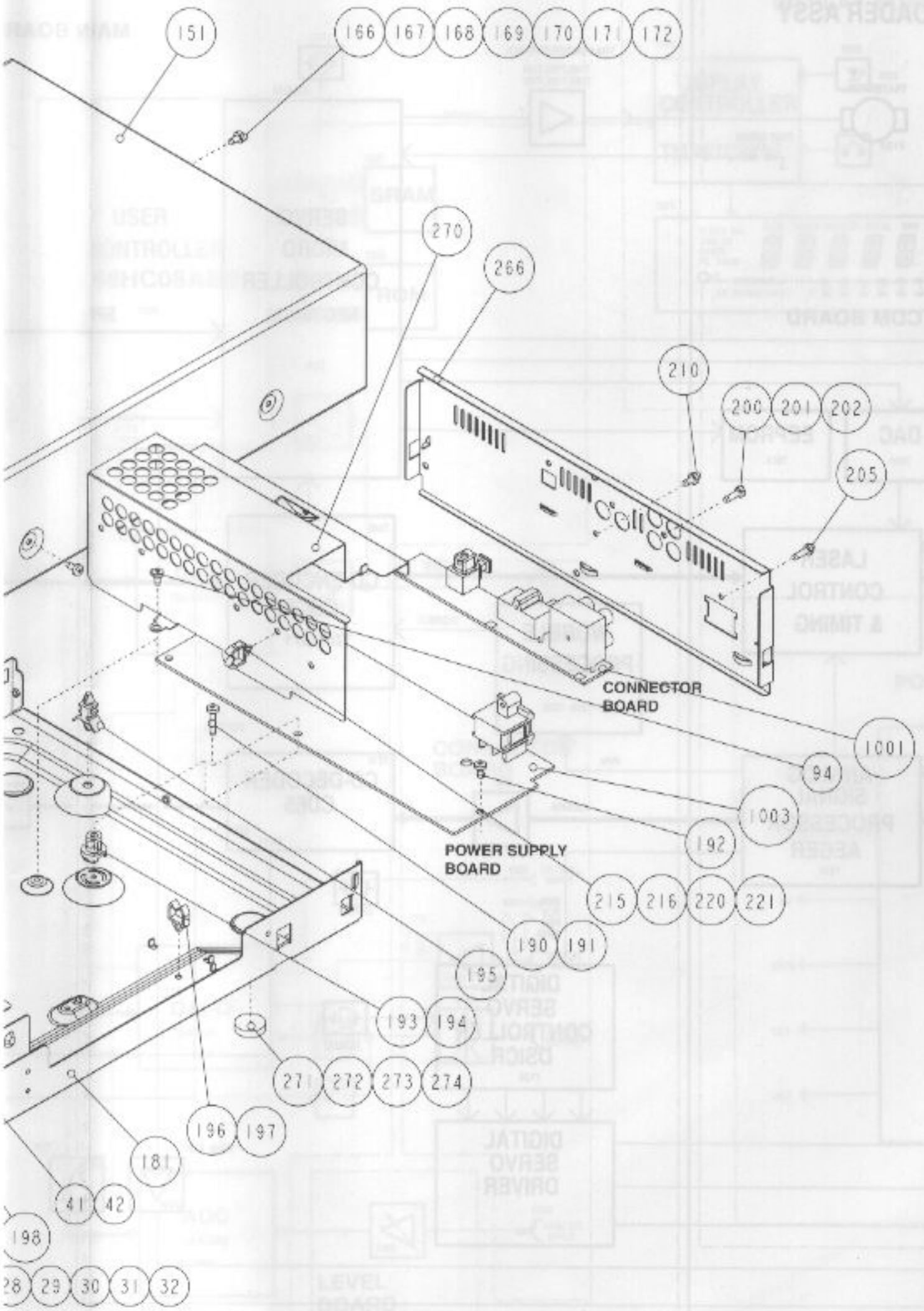
Connector I/O board 1001
⇒ remove flex connection to main board
⇒ remove screws 200→202 (cinches→backplate 266)
⇒ demount board

Power supply board 1003
⇒ remove screw 210 (screening bracket 270 → backplate 266)
⇒ remove screw 94 (screening bracket 270 → frame 181)
⇒ demount screening bracket 270
⇒ remove connections
⇒ remove 3 screws 190,191,192 (board→frame 181)
⇒ remove screw 205 (mains inlet→backplate 266)
⇒ unlock snap of spacer 195.
⇒ demount board

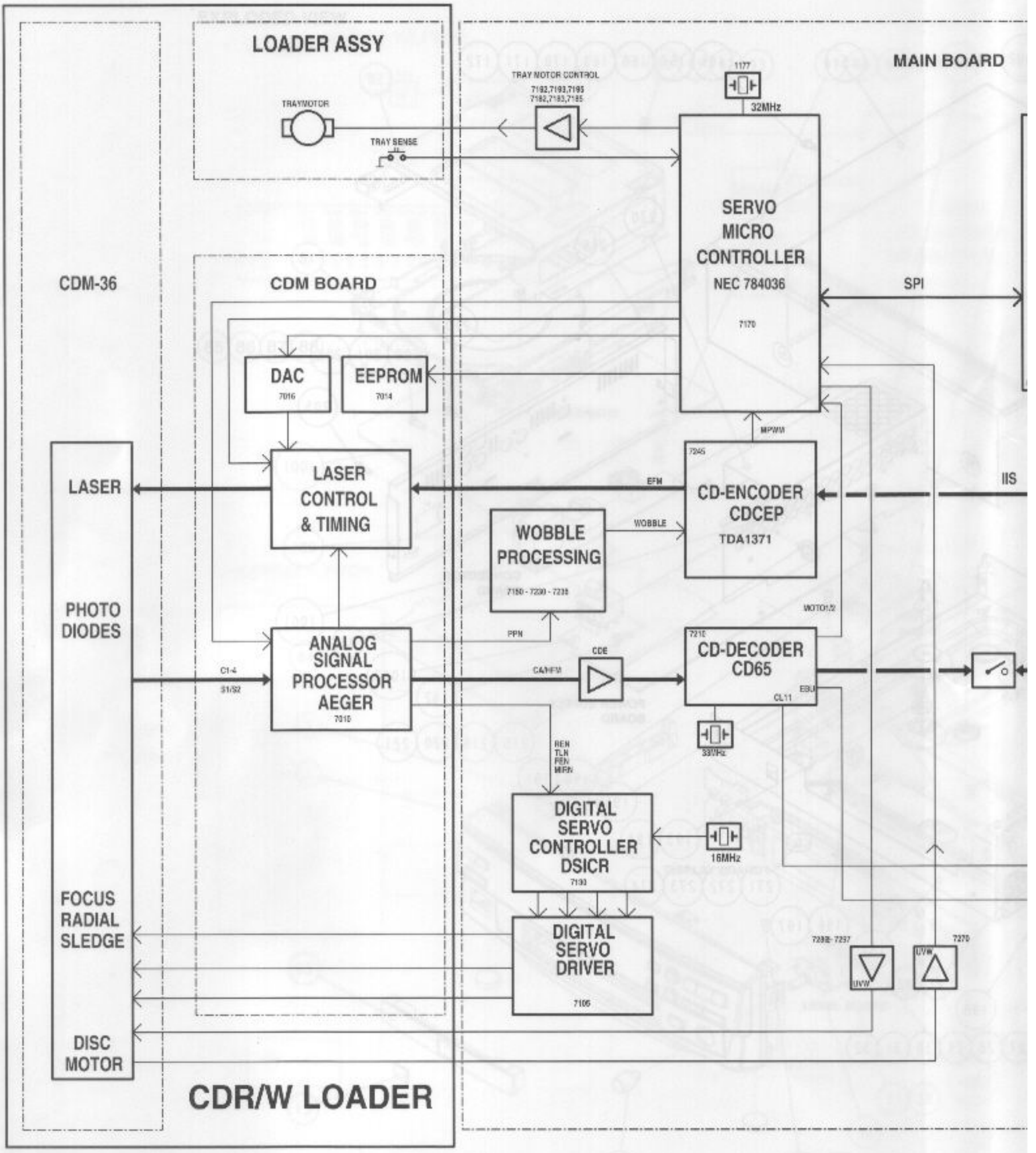
WARNING: POSSIBILITY OF HIGH VOLTAGE (300V) ON HEAT SINK, EVEN AFTER DEMOUNTING OF PCB. DISCHARGE ELCAP 2121.

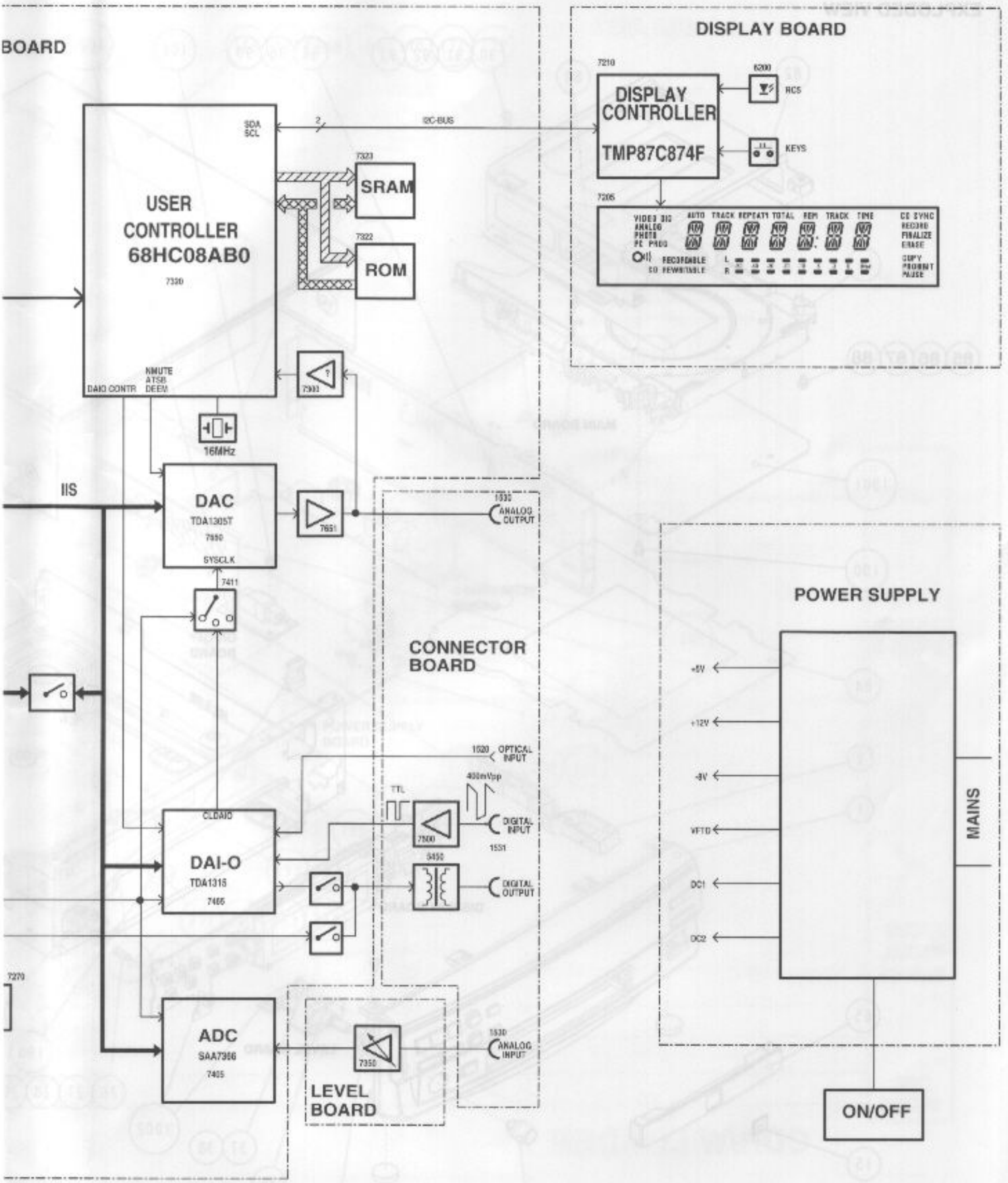
EXPLODED VIEW




151
166
167
168
169
170
171
172
270
266
210
200
201
202
205
CONNECTOR BOARD
1001
94
1003
192
POWER SUPPLY BOARD
215
216
220
221
190
191
195
193
194
271
272
273
274
196
197
181
41
42
198
28
29
30
31
32

OVERALL BLOCKDIAGRAM




BOARD
USER
CONTROLLER
68HC08AB0
7320
SDA
SCL
2
I2C-BUS
7323
SRAM
7322
ROM
NMUTE
ATSB
DAIO CONTR
DEEM
7303
16MHz
IIS
DAC
TDA1305T
7350
SYSCLK
7651
1530
ANALOG
OUTPUT
7411
CONNECTOR
BOARD
1520
OPTICAL
INPUT
400mVpp
TTL
7500
DIGITAL
INPUT
1531
CLDAIO
DAI-O
TDA1315
7455
5450
DIGITAL
OUTPUT
7270
ADC
SAA7356
7405
7350
1530
ANALOG
INPUT
LEVEL
BOARD
DISPLAY BOARD
7210
DISPLAY
CONTROLLER
TMP87C874F
6200
RCS
KEYS
7205
VIDEO 312
ANALOG
PHOTO
PC PROG
AUTO
TRACK
REPEAT1
TOTAL
REM
TRACK
TIME
CD SYNC
RECORD
FINALIZE
ERASE
RECORDABLE
CD REWRITABLE
COPY
PROHIBIT
PAUSE
POWER SUPPLY
+5V
+12V
-8V
VFTD
DC1
DC2
MAINS
ON/OFF

SIGNALS AND ABBREVIATIONS

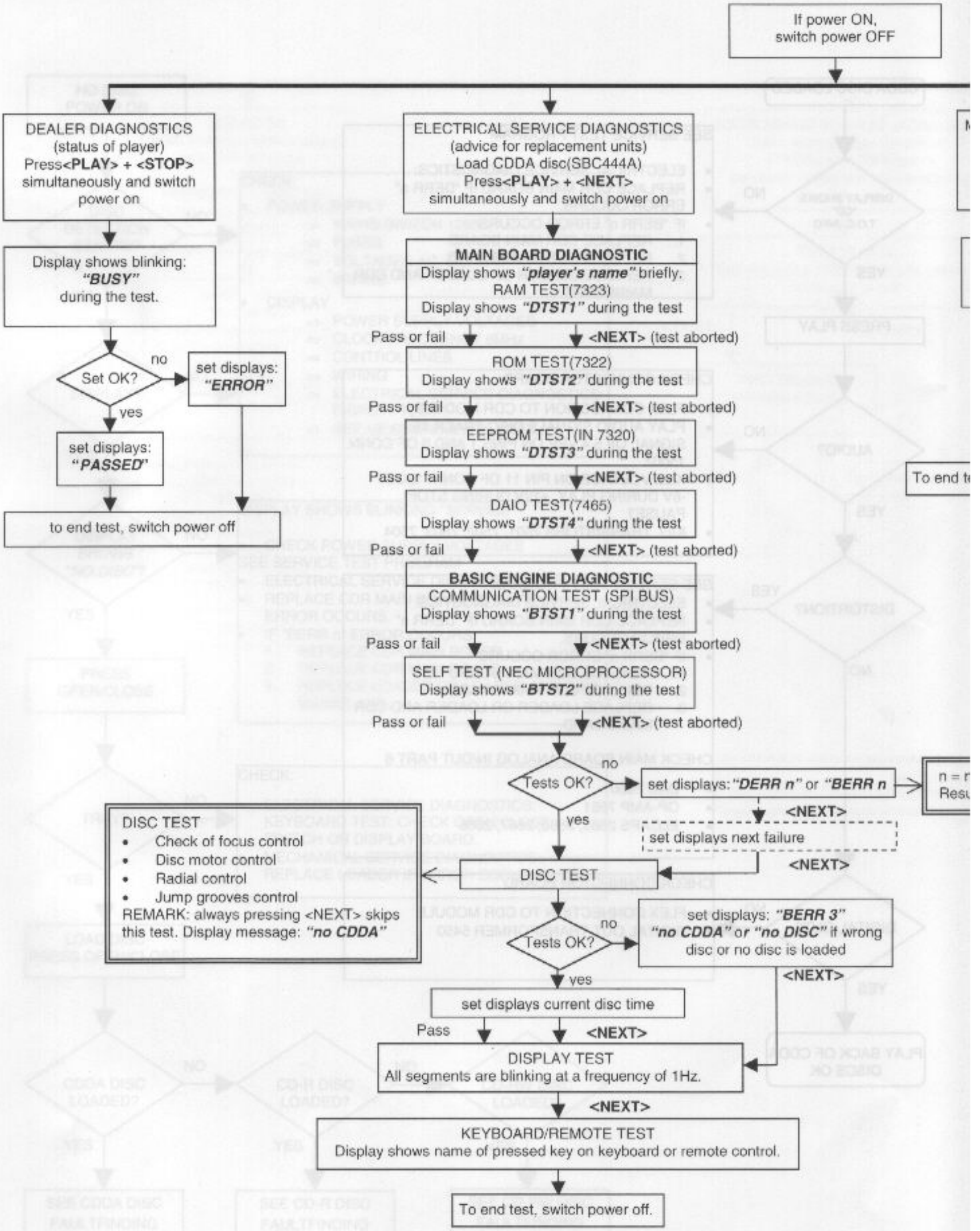
SIGNAL NAME	SIGNAL FLOW	FUNCTION AND DESCRIPTION
+12Va	Supply voltage	Single power supply +12V for op-amps 7150, 7235
+12Vb	Supply voltage	Power supply +12V for op-amps
+4V	Supply from CDR loader	Power supply +4V for servo microcontroller
+5Va	Supply voltage	Analog power supply +5V
+5Vb	Supply voltage	Digital power supply +5V
+5VDS	Supply voltage	Power supply +5V for Connector Part
+5VM	Supply voltage	Power supply turntable motor control circuit
-8Va	Supply voltage	Power supply -8V
A1A	IC7170→CONN.1101	Calculation β and HF0 Positive peak detector between CA and CALF
A2A	IC7170→CONN.1101	Beta = (A1-A2)/(A1+A2) Negative peak detector between CA and CALF
ACK	IC7320↔R3904(IC7170)	Acknowledge serial communication user microprocessor
AD[0:18]	IC7320→IC7322 IC7320→IC7323	External address bus of user processor
ADC		Analog/Digital Converter
ANACD	IC7320→IC7605	Control signal dubbing analog for protected tracks
ANAIN1	IC7320→IC7601	Control signal level setting analog input
ANAIN2	IC7320→IC7601	Control signal level setting analog input
ATSB	IC7320→IC7650	Attenuation 12 dB of DAC(active low) during search
BS	IC7320→IC7440	Block synchronisation
CA	CONN.1101→R3299	Central Aperture(C1+C2+C3+C4)DC →for Mod. calculation
CALF	IC7170→CONN.1101	CA low frequency
CD60		Decoder
CD60CLK	IC7210→IC7403	I2S clock from CD60
CD60WS	IC7210→IC7403	I2S word select from CD60
CDAICL	IC7320→IC7465	DAI-O interface clock
CDAIDA	IC7320↔IC7465	DAI-O interface data
CDAILD	IC7320→IC7465	DAI-O interface mode
CDCEP		CD-Circ Efm Encoder Plus
CDE	IC7170→R3255	CD erase
CDTRAYO	IC7320→CONN1380	CD loader tray open (CDR765) (not used)
CDTRAYC	IC7320→CONN1380	CD loader tray closed (CDR765) (not used)
CE_INT	IC7170←IC7245	CDCEP interrupt
CFLG	IC7210→CONN.1250	Correction flag output(CD60)
CL11	IC7210→IC7411	11.2896 MHz systemclock for ADC/DAC
CL16	IC7210→IC7241	164344 MHz systemclock (not used)
CLCE	IC7170→IC7245	µP clock output encoder(CD60)
CLDAIO	IC7465→IC7411	Clock output DAIO
CLDE	IC7170→IC7210	µP clock output decoder(CD60)
CLDS	IC7170→IC7130	µP clock output DSICR
CLKC0	IC7241→CONN1360	System clock for CD player (CDR765)
CLKCDCEP	IC7260→IC7245	I2S clock to CDCEP
CLKN2	CONN1360→IC7260	I2S clock from CD player (CDR765)
CLKQ	IC7245→IC7240 IC7245→IC7241	PLL clock output from encoder
CLKQD	IC7241→IC7240	CLKQ divided by 2
CLO3	IC7440→IC7411	GDIN clock3 out: system clock for DAC (option)
CLWP	IC7170→IC7245	µP clock Atip information CDCEP
COMCLK	IC7320↔R3165(IC7170)	Communication clock for data transfer from user microprocessor
COMSYNC	IC7320↔IC7170	Communication synchronisation from user microprocessor
CRIN	IC7440→IC7210	GDIN clock1 out: system clock for decoder CD60 (option)
CSRAM	IC7320→IC7323	Chip Select RAM

CSROM	IC7320→IC7322	Chip Select ROM
D[0:7]	IC7320↔IC7322 IC7320↔IC7323 IC7320↔IC7324	Data bus
DAC		Digital/Analog Converter
DACDCEP	IC7260↔IC7245	I2S data to CDCEP
DACE	IC7170→IC7245	µP data I/O CDCEP
DACL	IC7170→CONN.1102	DAC clock
DADE	IC7170→IC7210	uP data CDLIP
DADI	IC7170→CONN.1102	DAC data in (CDM)
DADS	IC7170→IC7130	µP data I/O DSICR
DAIN	IC7465↔IC7245	Data signal(CDCEP)
DAI-O		Digital Audio Input/Output
DAIO_REC	IC7325→IC7403	high during recording from digital in source, low to prevent conflict in IIS bus during playback and analog recording(option)
DALD	IC7170→CONN.1102	DAC load(CDM)
DAN2	CONN1360↔IC7260	I2S data from CD player (CDR765)
DAOUT	R3217(IC7210)→IC7403	I2S data output(CD60)
DATADIR	IC7320→IC7403	Data direction: control signal, HIGH during playback
DAWP	IC7170→IC7245	µP data Atip information(CDCEP)
DEEM1	IC7320→IC7650	Deemphasis active(44.1 kHz sample rate)
DIGIN	IC7410→IC7465 IC7410→IC7440	Digital input signal to DAIO and GDIN
DIGINEXT	CONN1400→IC7410	Digital input
DIGOUT	IC7465→CONN.1400	Digital output
DIGSW1	IC7320→IC7410	Control signal for digital input/output selection
DIGSW2	IC7320→IC7410	Control signal for digital input/output selection
DSA_ACK	IC7320→CONN1360	Data/strobe/acknowledge serial communication from USER uP to CD player (CDR765)
DSA_DATA	IC7320→CONN1360	Data/strobe/acknowledge serial communication from USER uP to CD player (CDR765)
DSA_STROBE	IC7320→CONN1360	Data/strobe/acknowledge serial communication from USER uP to CD player (CDR765)
DSICR		Digital Servo IC Recordable
EBUCD60	IC7210→IC7410	Digital out signal from CD60
EBUDAIO	IC7465→IC7410	Digital out signal from DAIO
EBUININT	CONN1360→IC7410	Digital input from CD player (CDR765)
EECL	IC7170→CONN.1102	EEPROM clock
EEDA	IC7170↔CONN.1102	EEPROM data
EFM	IC7245→IC7205	Eight to Fourtheen Modulation CDCEP output for monitoring (reduced voltage from CD60 to MONON)
EFMCLK	IC7245→CONN.1102	EFM clock 4.3218 or 8.6436 MHz
EFMM	IC7245→CONN.1102	EFM N-1
FEN	CONN.1101→IC7130	Focus Error Normalized = (C1 + C3 - C2 - C4)/(C1 + C2 + C3 + C4)
FEOFS	IC7170→R3133	Focus Error OFF Switch
FOC-	IC7105→CONN.1101	Focus actuator negative connection
FOC+	IC7105→CONN.1101	Focus actuator positive connection
FS	CONN.1102→R3152	FS = FS0 - DALFA(write power to laser control)
FSM	CONN.1102→D6155	Focused sense monitor
GDIN		General Digital Input (option)
GDINCL	IC7320→IC7440	GDIN interface clock
GDINDA	IC7320↔IC7440	GDIN interface data
GDINLD	IC7320→IC7440	GDIN interface mode
HALL_U, V, W	IC7170→IC7270 IC7170→IC7280	Hall element U, V, W of motor

HMSW	CONN.1101→IC7170	Home Switch
IISCLK	IC7603→IC7465 IC7603→IC7245 IC7403→IC7650	I2S-BUS clock
IISWS	R3219(IC7210)→IC7403	I2S-BUS word select
INTSLAVE	CONN1330→IC7320	Slave processor interrupt
KILL	T7446→R3671,3672	Kill signal to mute analog output signal
KILL_OUT	IC7320→R3473	Control signal to activate Kill signal
LDCE	IC7170←IC7245	µP load input(from CDCEP)
LDDE	IC7170→IC7210	µP load output decoder
LDDS	IC7170→IC7130	µP load output DSICR
LDON	IC7130→CONN.1102 IC7105→CONN.1102	Laser Diode ON(on read)
LEFTOUT	C2497→CONN.1400 C2497→CONN.1420 C2497→C2300	Analog left output
LWRT	IC7245→CONN.1102	Laser at writing power
MIRN	CONN.1101→IC7130	Mirror normalized
MISO	IC7320↔R3168(IC7170) IC7320↔CONN.1300	Master in, Slave out: data from Basic Engine to USER.
MONON	IC7170→IC7205	Monitoring EFM from CDCEP to CD60
MOSI	IC7320↔R3903(IC7170) IC7320↔CONN.1300	Master out, Slave in : data from USER to Basic Engine
MOTO1	IC7210→IC7170	Control signal for motor
MPWM	IC7170→IC7245	Motor Pulse Width Modulation
N=2	IC7320→IC7260	Control signal to close switch when dubbing (n = 2 !)
N2	IC7170→IC7240 IC7170→IC7205	N = high(double speed)
N4	IC7170→IC7205	N = high(fourfold speed)
NCLOSE	IC7170→R3196	Tray close (CDR loader)
NIRQ	IC7170→IC7245	Interrrupt request wobble processing(CDCEP)
NMUTE	IC7320→IC7650	Mute signal (active low)
NOPEN	IC7170→R3181	Tray open (CDR loader)
NRSMP	IC7245→CONN.1102	None read sample
OPTIN	CONN.1400→IC7440 CONN.1400→IC7465	Optical input
OTD	IC7130→IC7170	Off track dectection DISCR
OVLD	IC7603→IC7320	Overload flag input
PP	CONN.1101→C2231	XB or PPN(read or write)
PWM	IC7170→R3268	Pulse width modulation
R/W	IC7320→IC7324	µP read/write signal
RAD-	IC7105→CONN.1101	Radial actuator negative connection
RAD+	IC7105→CONN.1101	Radial actuator positive connection
RADINT	IC7170→R3111	Radial actuator integrator voltage.
REN	CONN.1101	Radial Error Normalized
RENSW	IC7170→R3124	Radial Error Normalized switch
RESEN	IC7170→IC7245 IC7170→IC7130	Reset encoder(CDCEP) and digital servo(DSICR)
RESET	IC7170→IC7210	Reset decoder CD60
RIGHTOUT	C2498→CONN.1400 C2498→CONN.1420 C2498→C2303	Analog right output
RSTHA	IC7325→IC7465	Reset high active, reset for DAIO

RSTIN	IC7320→IC7325	Reset microcontroller(from user µP)
RSTLA	IC7325→IC7440 IC7325→IC7170 IC7325→D6130 IC7325→CONN.1330	Reset low active, reset for GDIN, servo uP, DSD3, DSICR and display.
RXD	IC7320↔IC7325	Receive data of serial interface
SCL	IC7320↔L5300	I2C-bus clock for communication
SCLI	IC7320→T7326	I2C-bus clock Input to check "busy" of slave
SDA	IC7320↔L5300	I2C-bus data to display driver
SDAUX	IC7603→IC7440	Analog to digital converted data from ADC to DAI-O
SL-	IC7105→CONN.1101	Sledge motor negative connection
SL+	IC7105→CONN.1101	Sledge motor positive connection
STROBE	IC7320→IC7465 IC7320→CONN.1302	Control signal for DAI-O : data strobe
SWRT	IC7245→CONN.1102	Start Write 9ms(one shot at start up LWRT)
SYSCKLSW2	IC7320→IC7411	Control signal for system clock selection
SYSCLKSW1	IC7320→IC7411	Control signal for system clock selection
SYSSYNC	IC7170→CONN.1135	System synchronization
TLN	CONN.1101→IC7130	Track Loss Normalized
TRAYSW	CONN1380→IC7320	Control signal from CD loader (CDR765)
TRS1N	IC7170→CONN.1103	Tray sense
TXD	IC7320↔IC7325	Transmit data serial interface
UDAVAIL	IC7320→IC7465	User-data available
UNLOCK	IC7465→IC7320	Not locked on incoming EBU-signal
UNLOCK_GDIN	IC7323→R3435	Unlock signal to GDIN
V4	IC7210→CONN.1250	Versatile pin 4
VDC1	Supply voltage	Filament voltage for display
VDC2	Supply voltage	Filament voltage for display
VFTD	Supply voltage	Power supply for display
WCLK	IC7210→IC7245	Word clock
WSCDCEP	IC7260→IC7245	I2S word select to CDCEP
WSN2	CONN1360→ IC7260	I2S word select from CD player (CDR765)

SERVICE TEST PROGRAM



F

MECHANICAL SERVICE DIAGNOSTICS
(advice for replacement units)
Press<**PREV**> + <**NEXT**>
simultaneously and switch power on

FOCUS TEST
Display shows *"**BUSY**"* during the test
Visual inspection

<**OPEN**>

<**CLOSE**>

TRAY TEST
Visual inspection
Display shows *"**OPENED**"*
even if tray is blocked

<**PREV**>

<**NEXT**>

SLEDGE TEST
Visual inspection

To end test, switch power off.

DC ERASE
(erasement of complete disc)
Load CD-RW disc
Press
<**ERASE**> + <**RECORD**>
simultaneously and switch
power on

Display shows:
"***ER mm:ss***"
during the erase function.
mm :remaining minutes
ss :remaining seconds
TOTAL and ***REM*** are also
illuminated

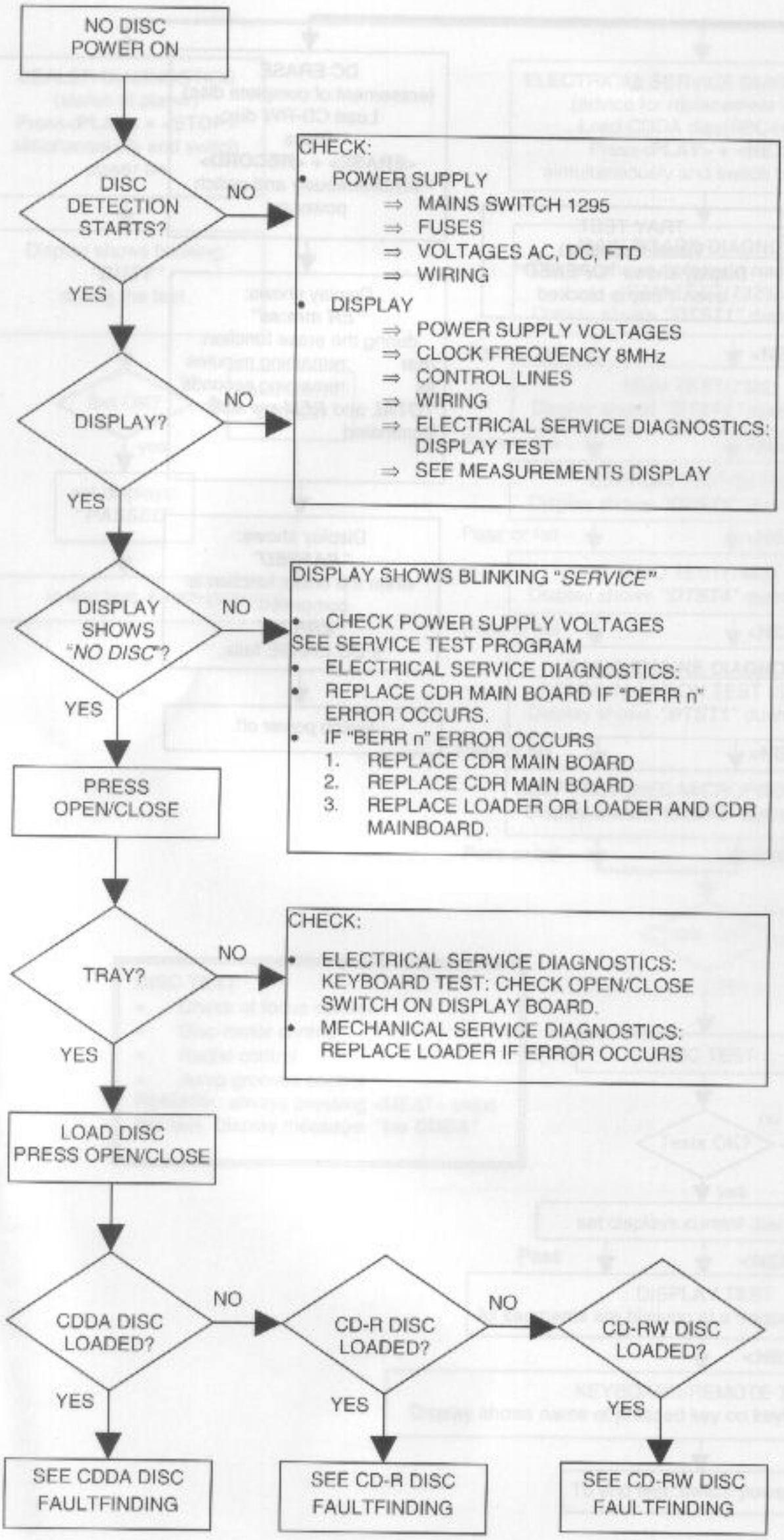
Display shows:
"***PASSED***"
when the erase function is
completed.
"***ERROR***"
if DC ERASE fails.

switch power off.

n = number of test
Result of aborted test will not be displayed

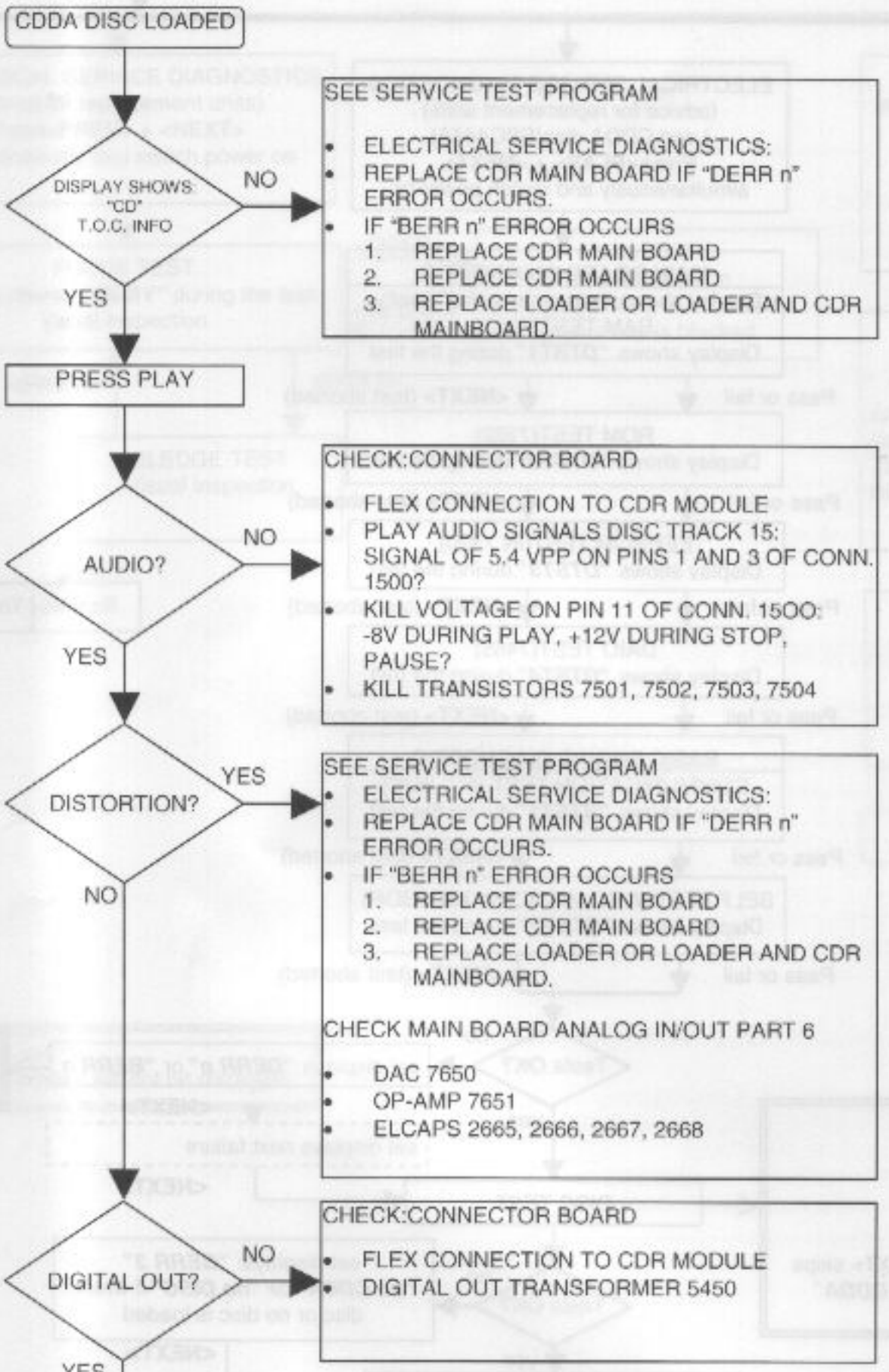
PCS 84 071

FAULTFINDING GUIDE

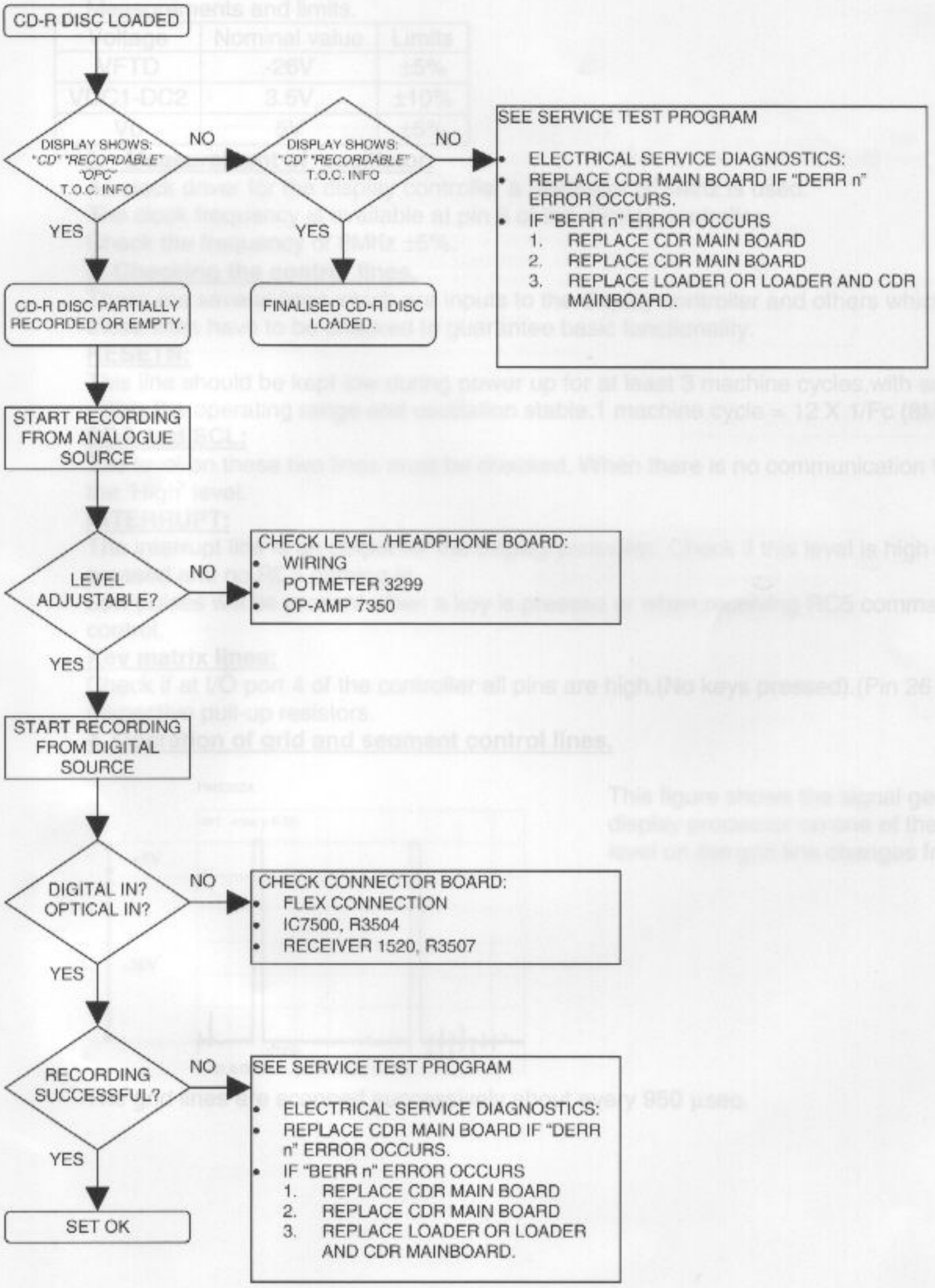


PCS 98 821

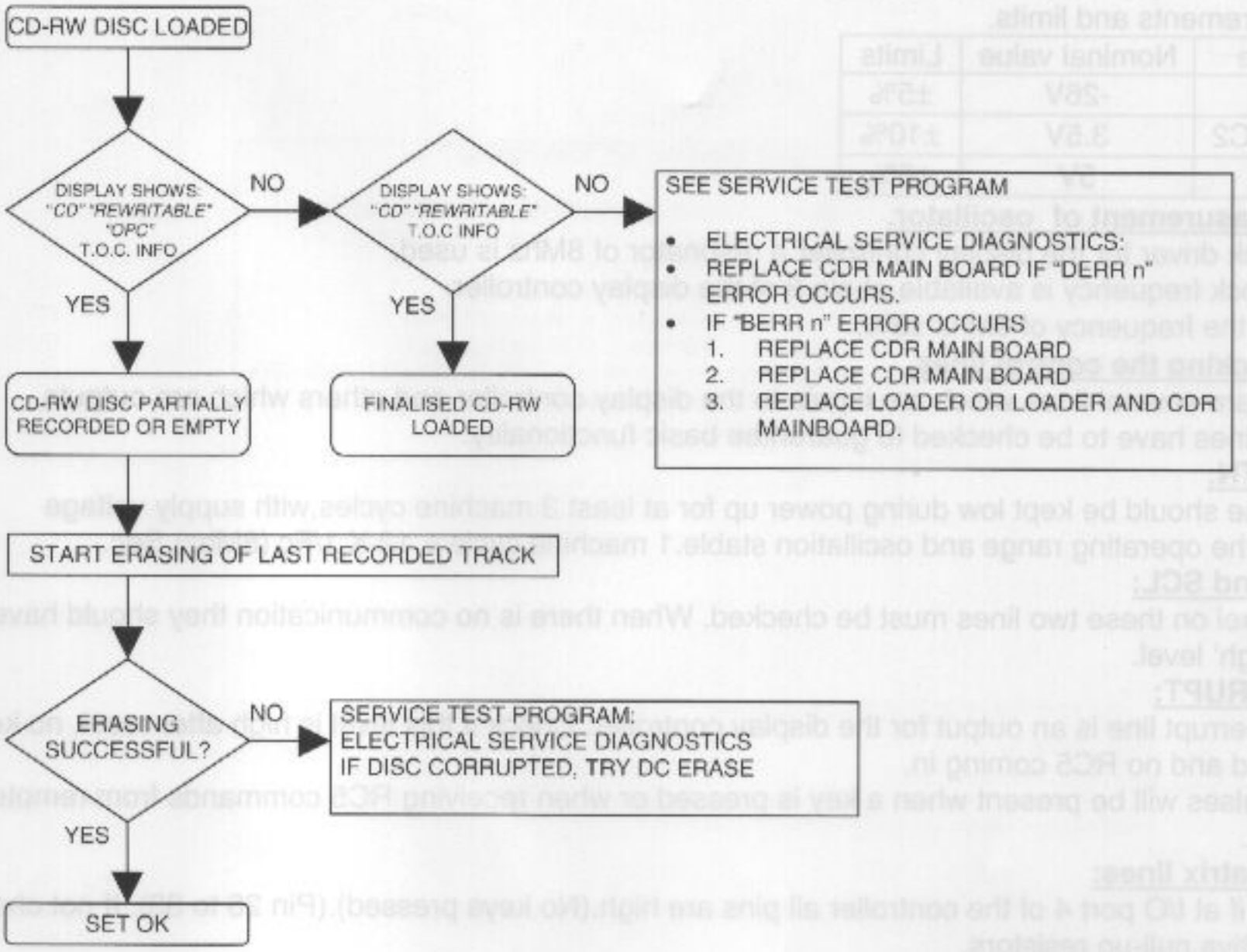
CDDA DISC FAULTFINDING GUIDE



CD-R DISC FAULTFINDING



CD-RW DISC FAULTFINDING



MEASUREMENTS DISPLAY PANEL

1. Measurement of voltage supplies.

Several voltages arrive at the display PCB.
Measurements and limits.

Voltage	Nominal value	Limits
VFTD	-26V	±5%
VDC1-DC2	3.5V	±10%
Vb	5V	±5%

2. Measurement of oscillator.

As clock driver for the display controller a resonator of 8Mhz is used.
The clock frequency is available at pin 8 of the display controller.
Check the frequency of 8Mhz ±5%.

3. Checking the control lines.

There are several lines which are inputs to the display controller and others which are outputs, these lines have to be checked to guarantee basic functionality.

RESETN:

This line should be kept low during power up for at least 3 machine cycles,with supply voltage within the operating range and oscillation stable.1 machine cycle = 12 X 1/Fc (8Mhz) Sec.

SDA and SCL:

The level on these two lines must be checked. When there is no communication they should have the 'High' level.

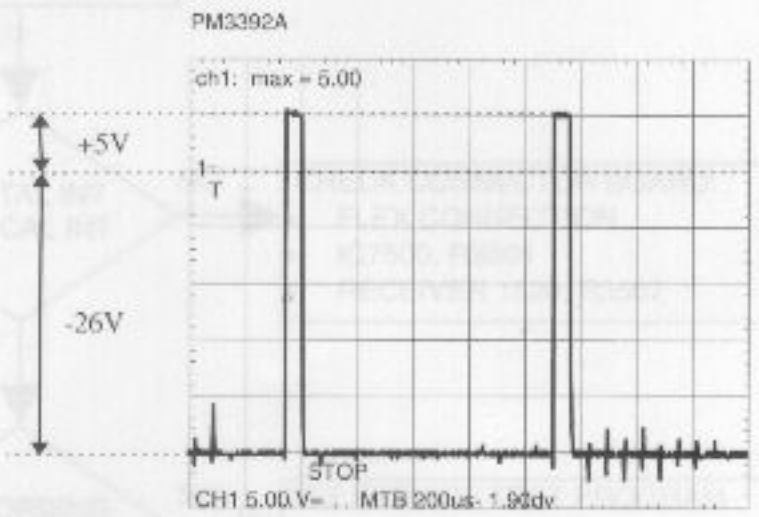
INTERRUPT:

The interrupt line is an output for the display controller. Check if this level is high after reset, no key pressed and no RC5 coming in.
Low pulses will be present when a key is pressed or when receiving RC5 commands from remote control.

Key matrix lines:

Check if at I/O port 4 of the controller all pins are high.(No keys pressed).(Pin 26 to 33). If not check respective pull-up resistors.

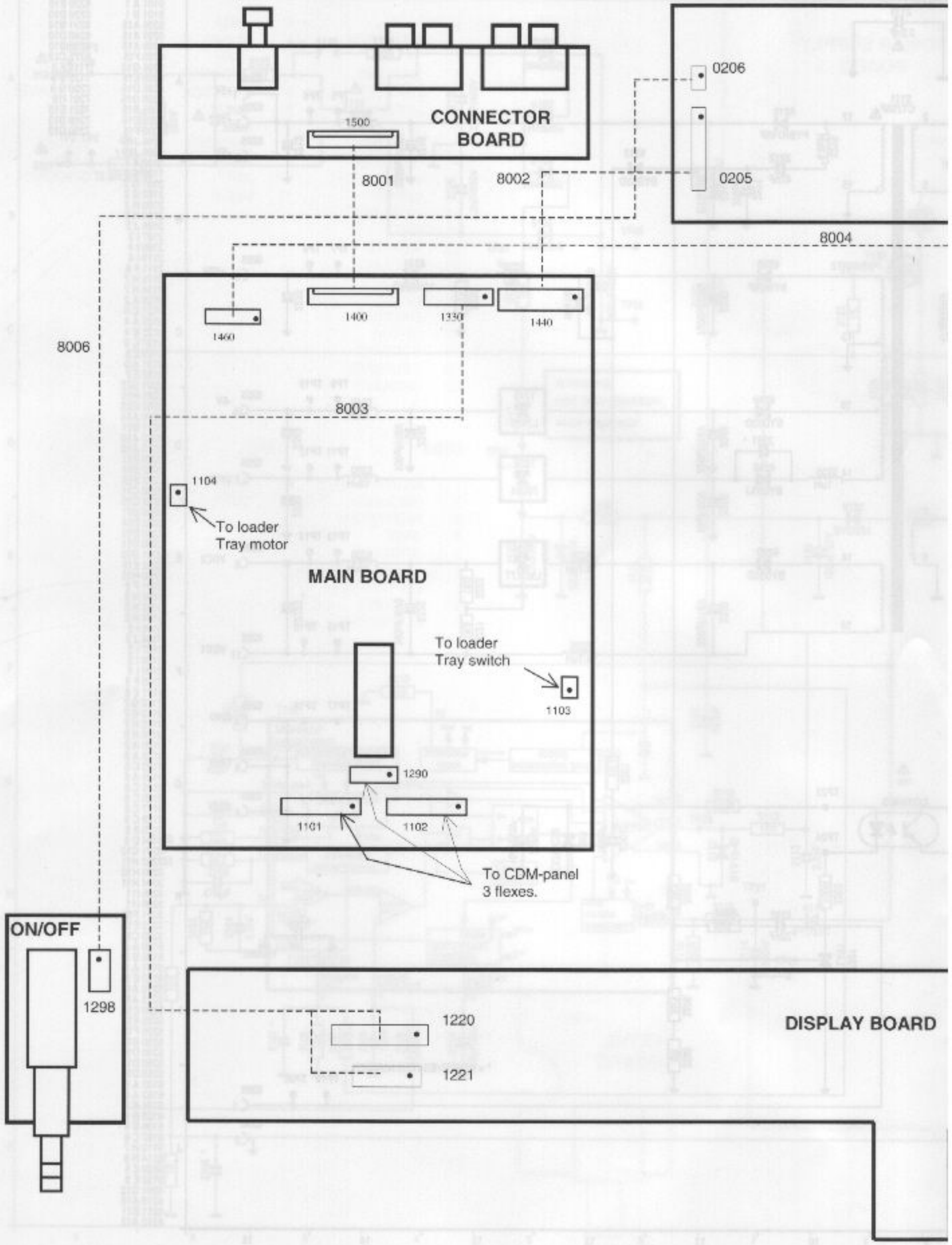
4. Operation of grid and segment control lines.



This figure shows the signal generated by the display processor on one of the grid lines. The level on the grid line changes from -26V to +5V.

The grid lines are scanned successively about every 950 µsec.

WIRING DIAGRAM CDR560/538



Pin 1 indicated by • All Wires are 1/1.

8001

1	
	RIGHTOUT
!	
2	GROUND
3	LEFTOUT!
4	LEFTIN!
5	GROUND
6	RIGHTIN!
7	GROUND
8	+5Vb!
9	LEFT2!
10	GROUND
11	KILL!
12	RIGHT2!
13	GROUND
14	DIGOUT!
15	DIGINEXT!
16	GROUND
17	OPTIN!
18	GROUND
19	EBUININT!
20	GROUND

8002

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

8003

1	SDA!
2	SCL!
3	RSTLA!
4	GROUND
5	INTSLAVE!
6	VDC1!
7	VFTD!
8	VDC2!
9	+5Vb!
10	GROUND

8004

1	RIGHTTLEV!
2	GROUND
3	RIGHTFLEV!
4	-8Vb!
5	GROUND
6	+12Vb!
7	LEFTFLEV!
8	GROUND
9	LEFTTLEV!

8006

1	ON!
2	OFF!

POWER SUPPLY BOARD

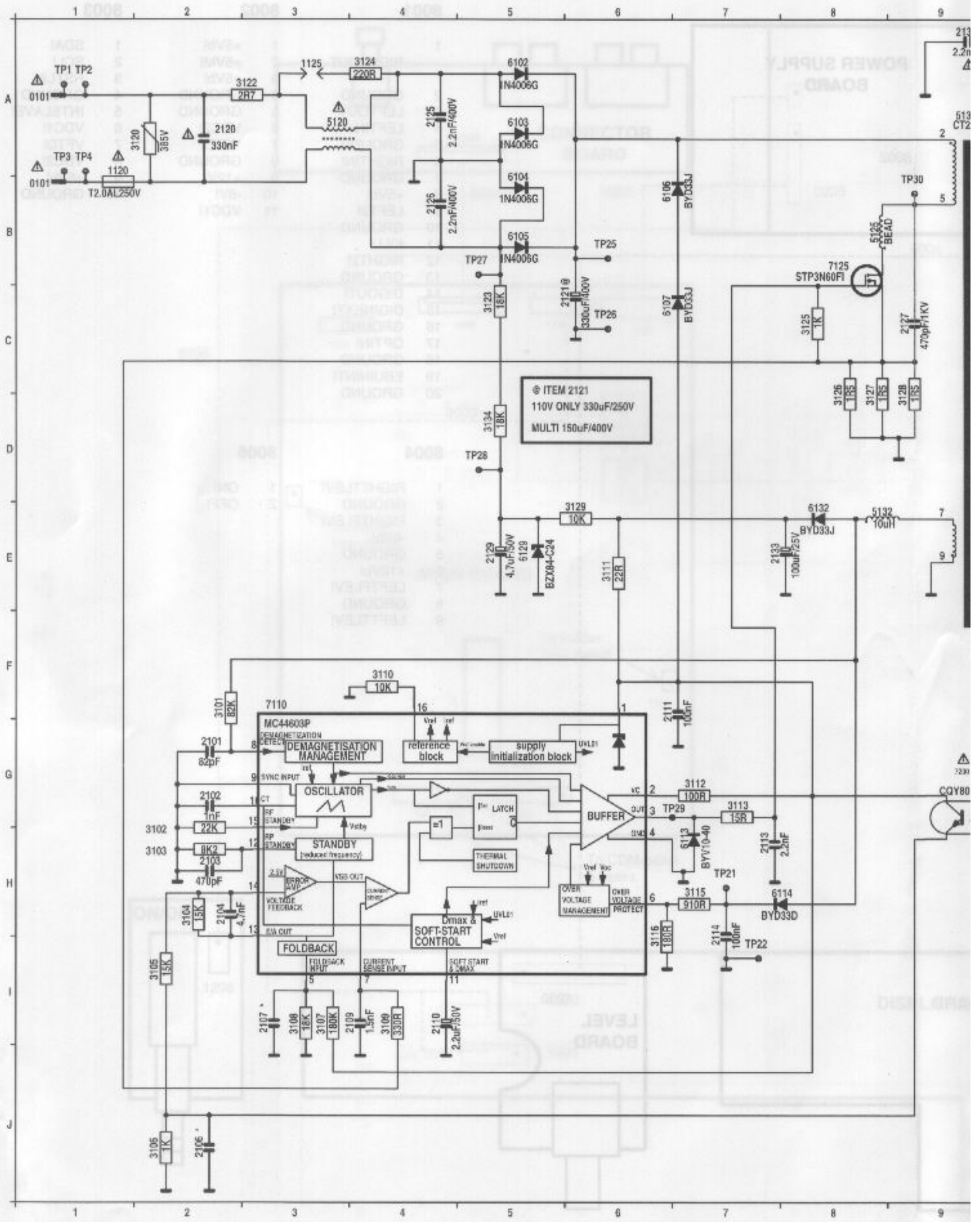
8002

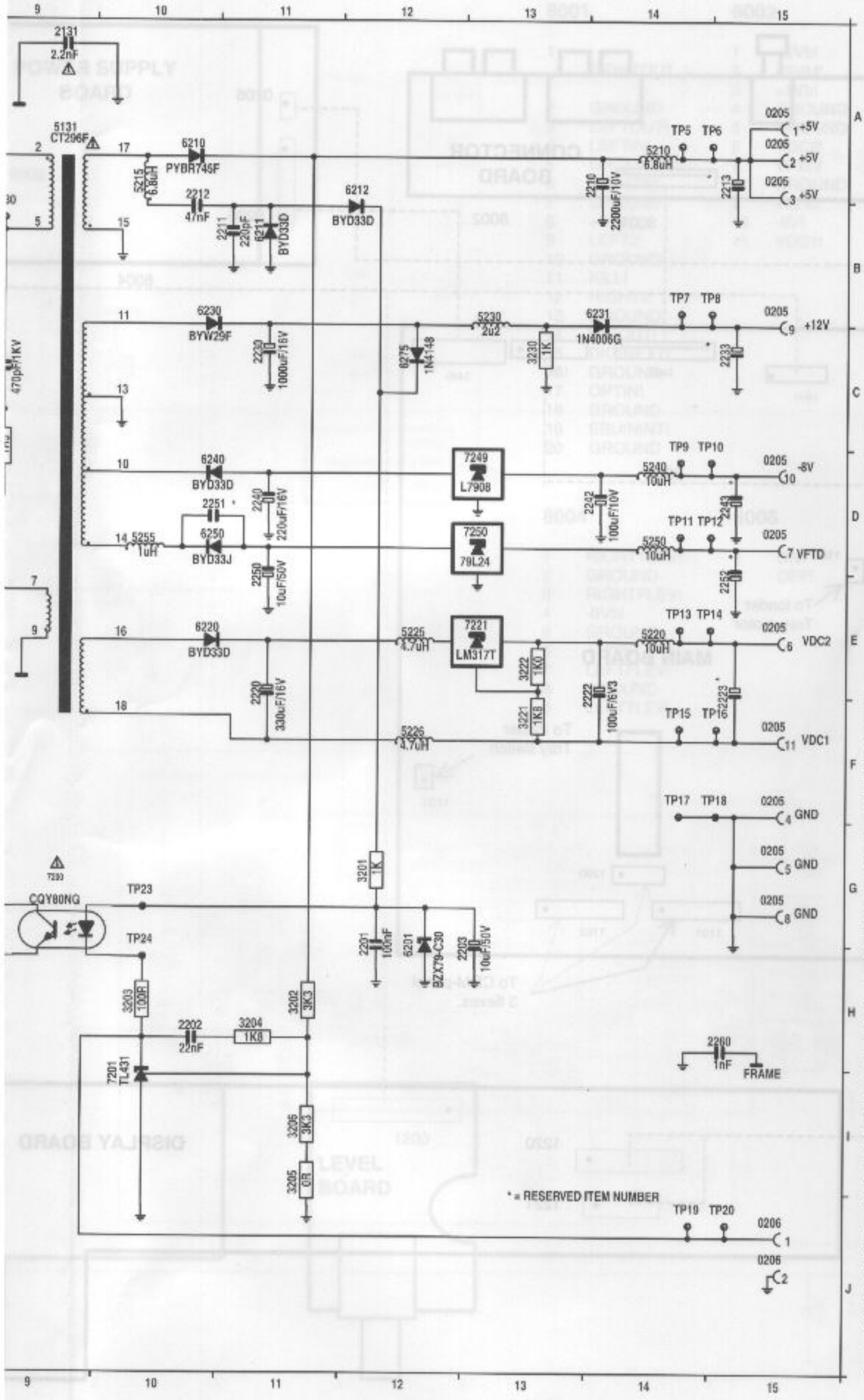
)ARD

1200

LEVEL BOARD

POWER SUPPLY UNIT CIRCUIT DIAGRAM

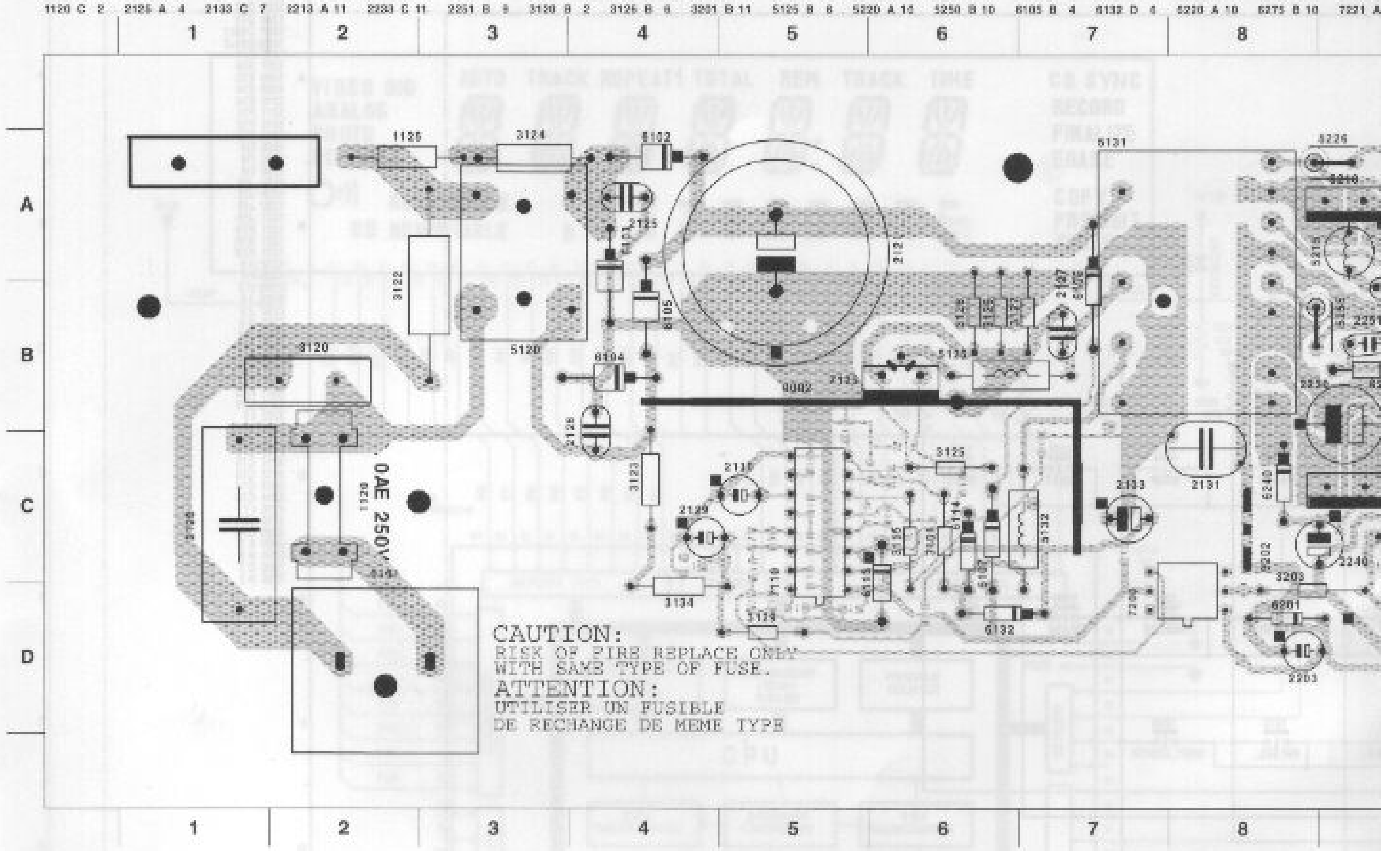




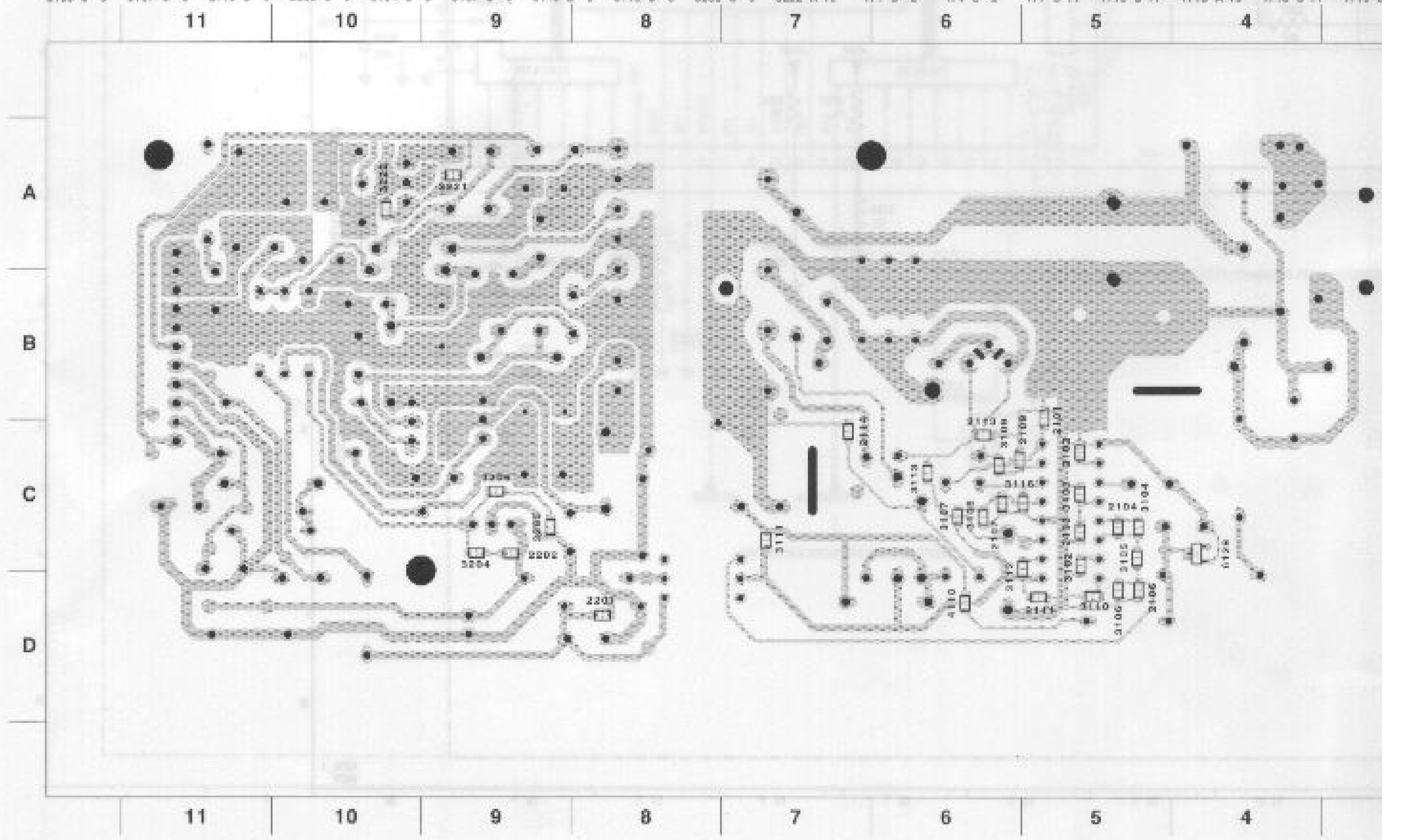
0101 A 1
0101 B 1
0205 A15
0205 A15
0205 A15
0205 F15
0205 G15
0205 E15
0205 D15
0205 G15
0205 B15
0205 D15
0205 F15
0206 J15
0206 J15
1120 A 1
1125 A 3
2101 G 2
2102 G 2
2103 H 2
2104 H 2
2106 J 2
2107 I 3
2109 I 4
2110 I 4
2111 F 6
2113 H 7
2114 H 7
2120 A 2
2121 C 6
2125 A 4
2126 B 4
2127 C 9
2129 E 5
2131 A 9
2133 E 7
2201 G12
2202 H10
2203 G13
2210 A14
2211 B11
2212 A10
2213 A15
2220 E11
2222 E14
2223 E15
2230 C11
2233 C15
2240 D11
2242 D14
2243 D15
2250 D11
2251 D10
2252 E15
2260 H15
3101 F 2
3102 H 2
3103 H 2
3104 H 2
3105 I 2
3106 J 2
3107 I 3
3108 I 3
3109 I 4
3110 F 4
3111 E 6
3112 G 7
3113 G 7
3115 H 7
3116 H 6
3120 A 2
3122 A 3
3123 C 5
3124 A 4
3125 C 8
3126 C 8
3127 C 8
3128 C 9
3129 E 6
3134 D 5
3201 G12
3202 H11
3203 H10
3204 H11
3205 I11
3206 I11
3221 F13
3222 E13
3230 C13
5120 A 3
5125 B 8
5131 A 9
5132 E 8
5210 A14
5215 A10
5220 E14
5225 E12
5226 F12
5230 B13
5240 D14
5250 D14
5255 D10
6102 A 5
6103 A 5
6104 B 5
6105 B 5
6106 B 6
6107 C 6
6113 H 7
6114 H 8
6129 E 5
6132 E 8
6201 G12
6210 A10
6211 B11
6212 A12
6220 E10
6230 B10
6231 B14
6240 D10
6250 D10
6275 C12
7110 F 3
7125 B 8
7200 G 9
7201 I10
7221 E13
7249 D13
7250 D13

POWER SUPPLY UNIT BOARD

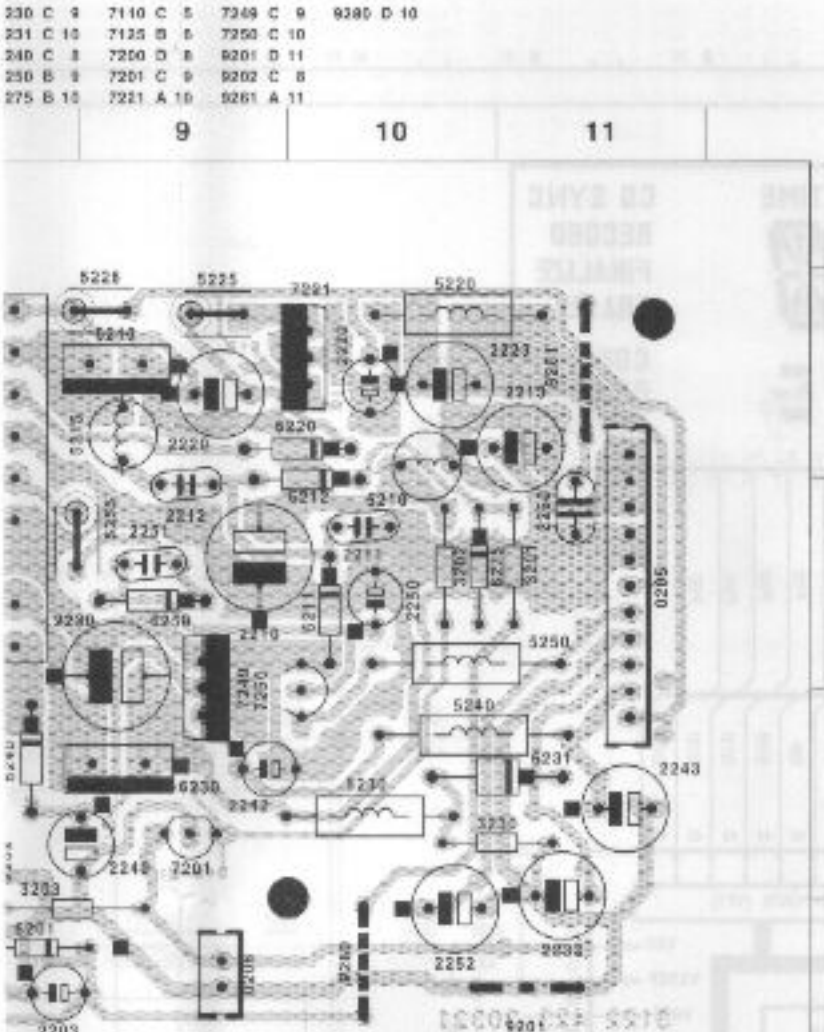
0002 B 6	1125 A 2	2126 B 4	2203 D 8	2220 A 9	2240 C 9	2252 D 10	3122 B 3	3127 B 7	3202 B 10	5131 B 8	5225 A 9	6265 B 8	6106 B 7	6201 D 8	6230 C 9	7110 C
0101 D 2	2110 C 6	2127 B 7	2210 B 9	2222 A 10	2242 C 9	2260 B 11	3123 C 4	3128 B 5	3203 D 8	5132 C 7	5226 A 9	6102 A 4	6107 C 4	6210 A 9	6231 C 10	7125 B
0205 B 11	2120 C 1	2129 C 4	2211 B 10	2223 A 10	2243 C 11	3101 C 6	3124 A 3	3129 D 5	3230 C 10	5210 A 10	5230 C 10	6103 A 4	6113 D 4	6211 B 10	6240 C 8	7200 D
0206 D 11	2121 A 5	2131 C 8	2212 B 9	2230 B 9	2250 B 10	3115 C 6	3125 C 6	3134 D 4	5120 A 3	5215 A 8	5240 C 10	6104 B 4	6114 C 4	6212 B 10	6250 B 9	7201 C
1120 C 2	2125 A 4	2133 C 7	2213 A 11	2233 C 11	2251 B 9	3120 B 2	3126 B 6	3201 B 11	5125 B 6	5220 A 10	5250 B 10	6105 B 4	6132 D 4	6220 A 10	6275 B 10	7221 A



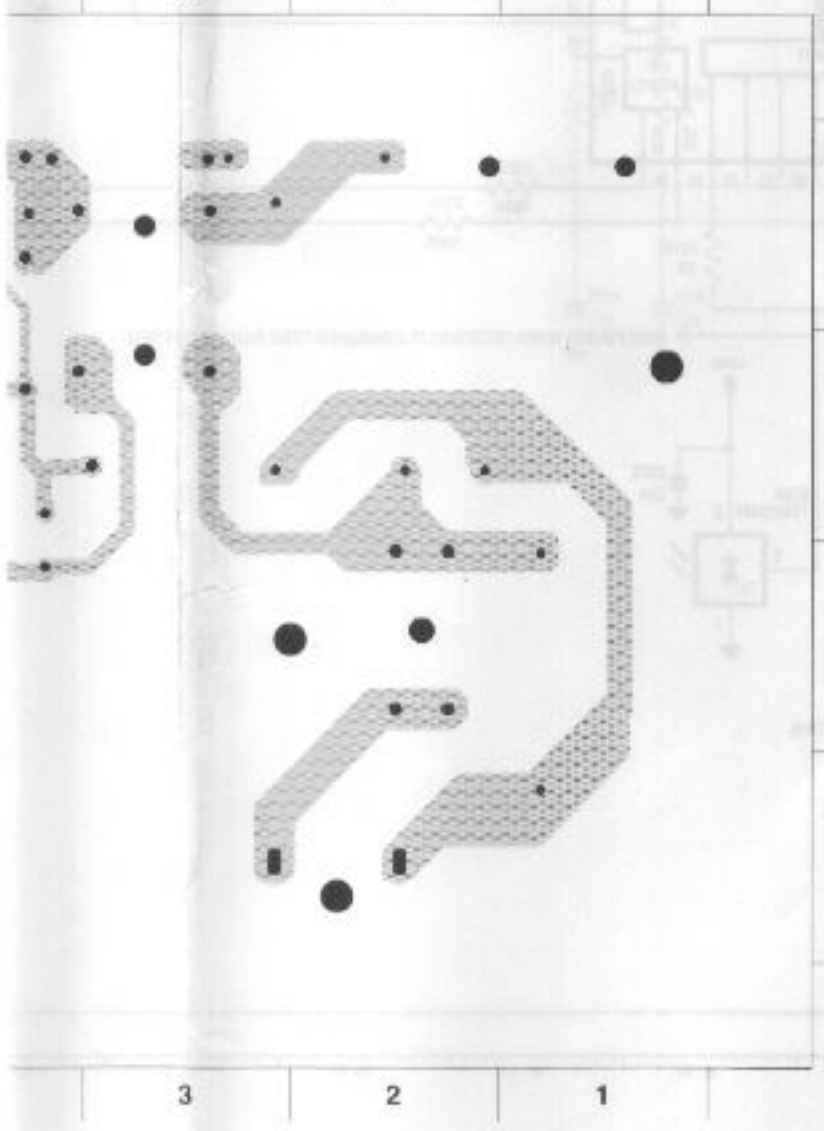
2101 B 5	2104 C 5	2109 C 6	2114 C 7	3102 C 5	3105 C 5	3108 C 6	3111 C 7	3116 C 6	3206 C 9	4110 D 6	TP2 D 2	TP5 B 11	TP8 C 11	TP11 C 10	TP14 A 11	TP17 E
2102 C 5	2106 D 5	2111 D 5	2201 D 8	3103 C 5	3106 D 5	3109 C 6	3112 C 5	3204 C 9	3221 A 9	6129 C 4	TP3 D 3	TP6 A 11	TP9 C 11	TP12 B 11	TP15 B 11	TP18 E
2103 C 5	2107 C 6	2113 C 6	2202 C 9	3104 C 5	3107 C 6	3110 D 5	3113 C 6	3205 C 9	3222 A 10	TP1 D 2	TP4 C 2	TP7 C 11	TP10 C 11	TP13 A 10	TP16 C 11	TP19 D



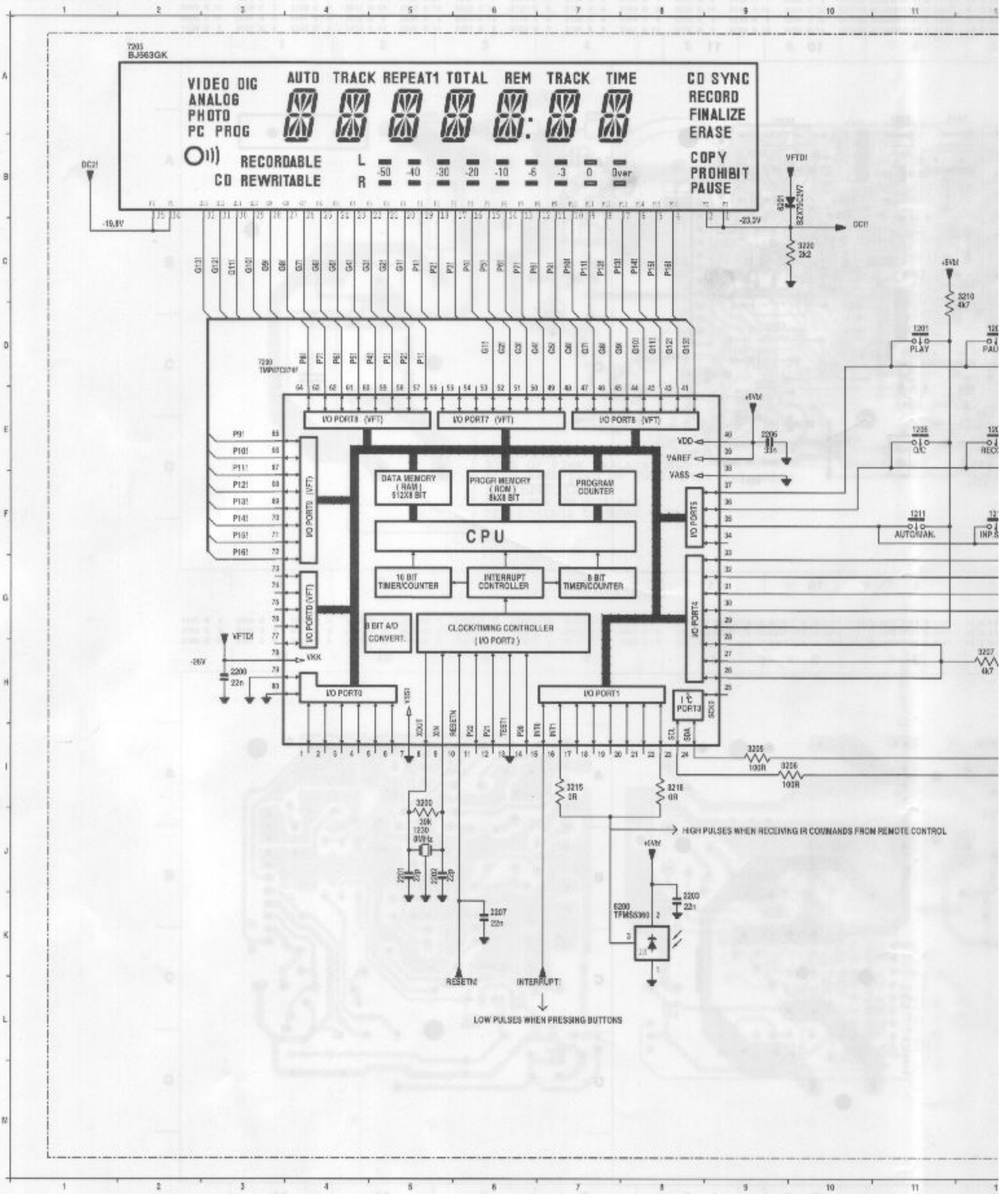
230	C 9	7110	C 5	7249	C 9	9380	D 10
231	C 10	7125	B 5	7250	C 10		
240	C 8	7200	D 8	9201	D 11		
250	B 9	7201	C 9	9202	C 8		
275	B 10	7221	A 10	9261	A 11		

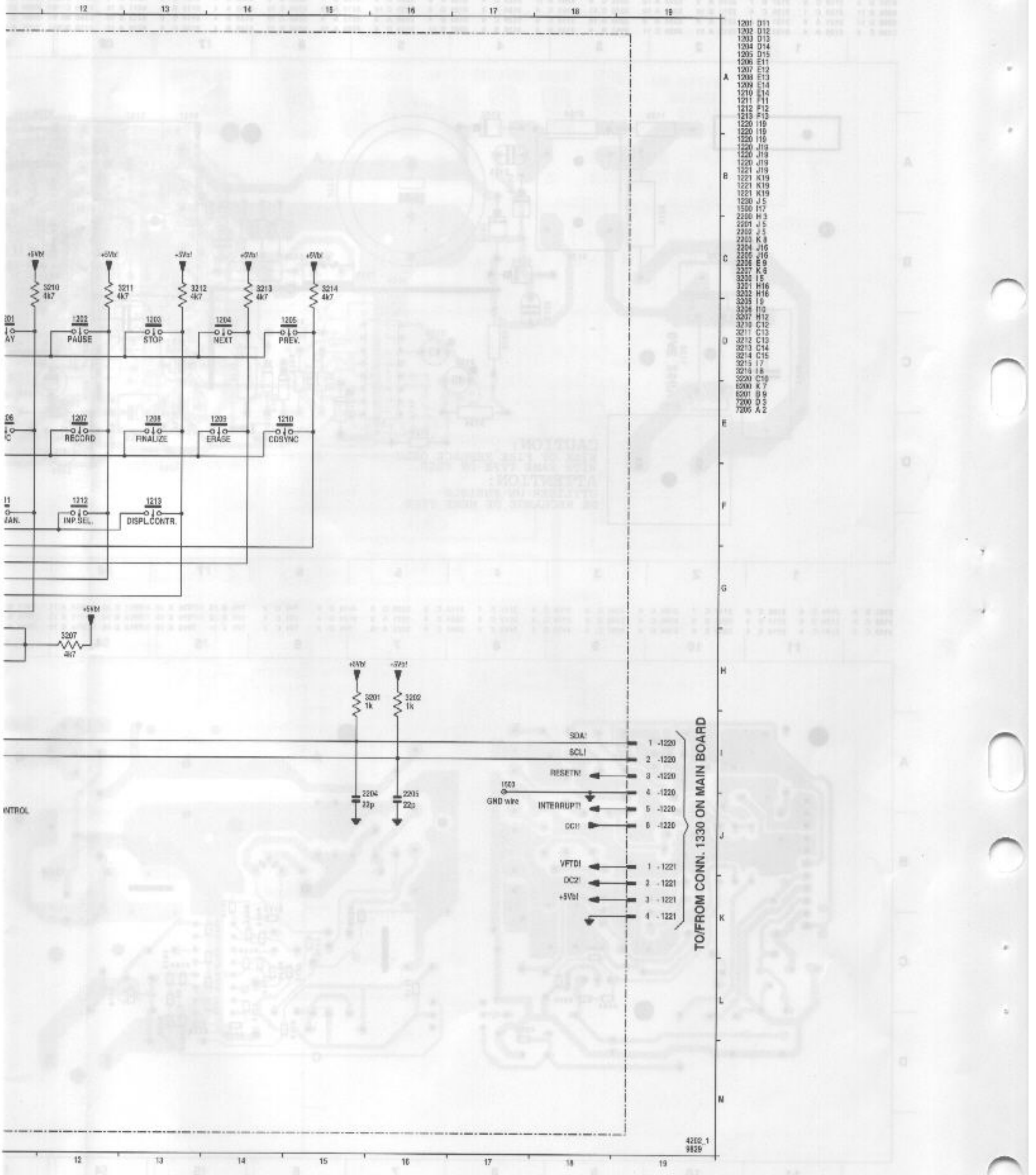


P14	A 11	TP17	B 11	TP20	D 11	TP23	D 8	TP26	B 5	TP29	C 5
P15	B 11	TP18	B 11	TP21	C 7	TP24	D 8	TP27	C 4	TP30	B 7
P16	C 11	TP19	D 11	TP22	B 7	TP25	A 5	TP28	C 5		

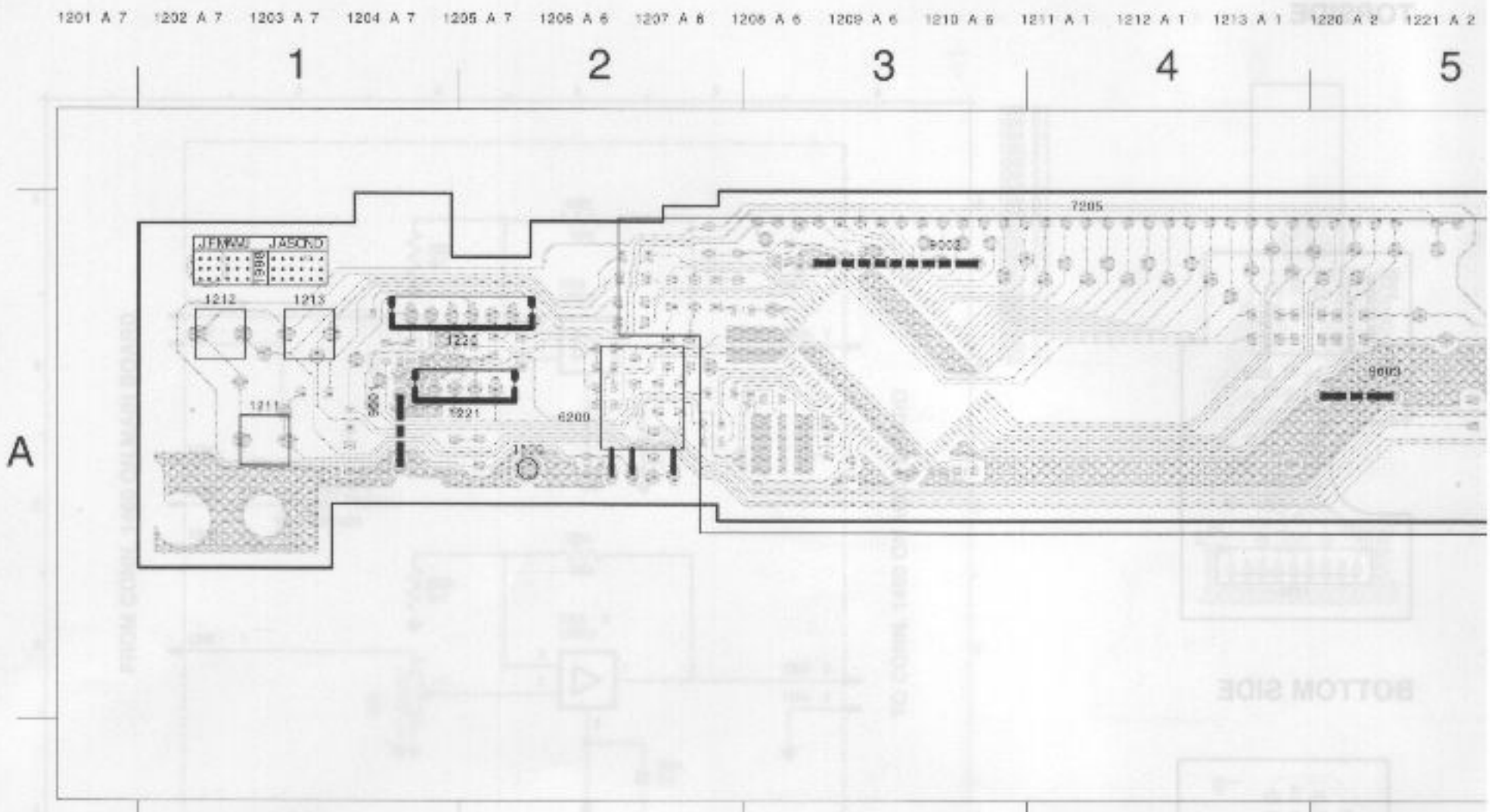


DISPLAY CIRCUIT DIAGRAM



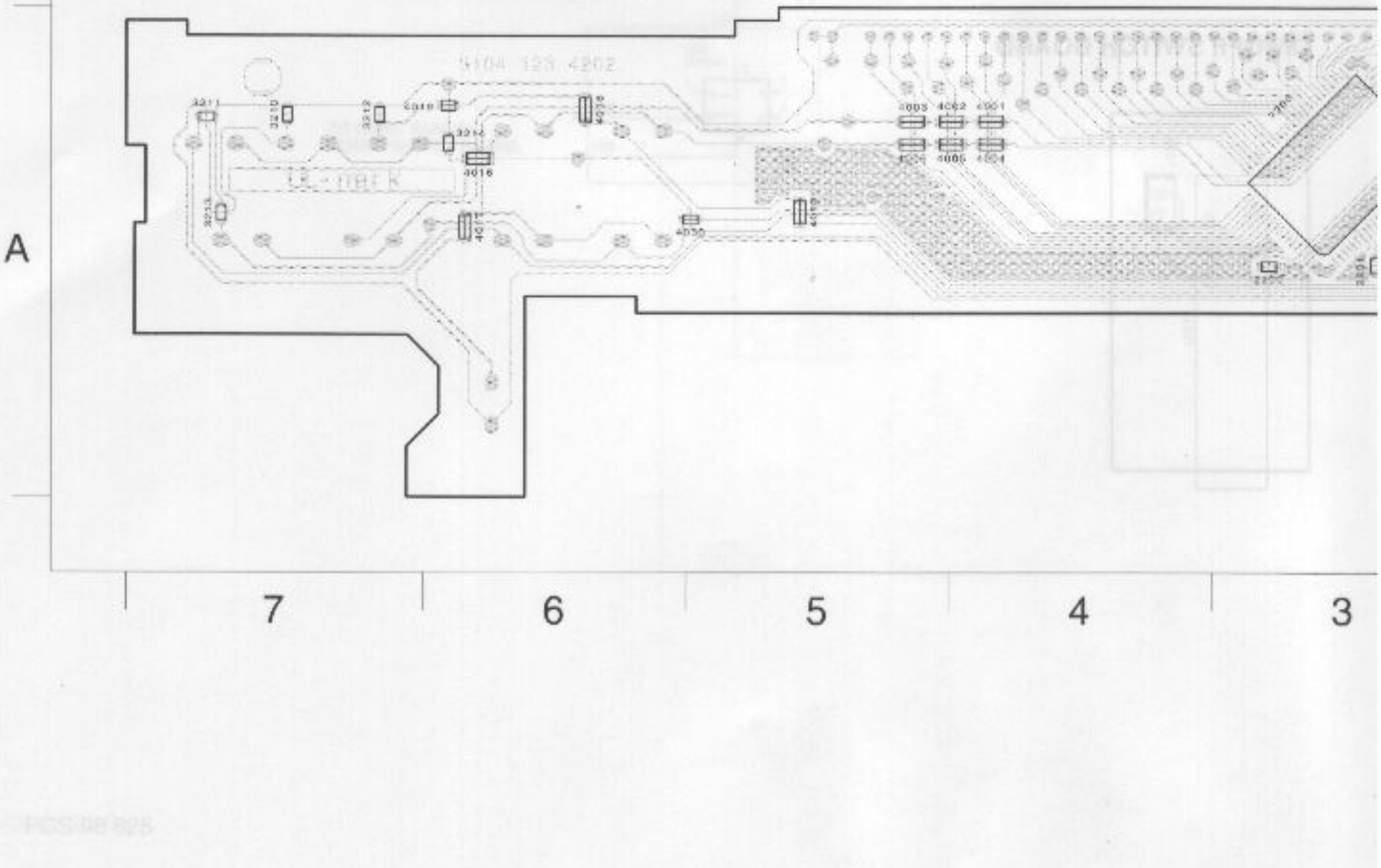

12 13 14 15 16 17 18 19
+5Vbl
3210 4k7
3211 4k7
3212 4k7
3213 4k7
3214 4k7
1202 PAUSE
1203 STOP
1204 NEXT
1205 PREV.
1207 RECORD
1208 FINALIZE
1209 ERASE
1210 CDSYNC
1212 IMP.SEL.
1213 DISPL.CONTR.
3207 4k7
3201 1k
3202 1k
2204 33p
2205 22p
SDA1
SCL1
RESETN1
INTERRUPT1
DC1I
VFTDI
DC2I
+5Vbl
1 -1220
2 -1220
3 -1220
4 -1220
5 -1220
6 -1220
1 -1221
2 -1221
3 -1221
4 -1221
GND wire
TO/FROM CONN. 1330 ON MAIN BOARD
A B C D E F G H I J K L N
4202_1
9829

DISPLAY BOARD TOP SIDE



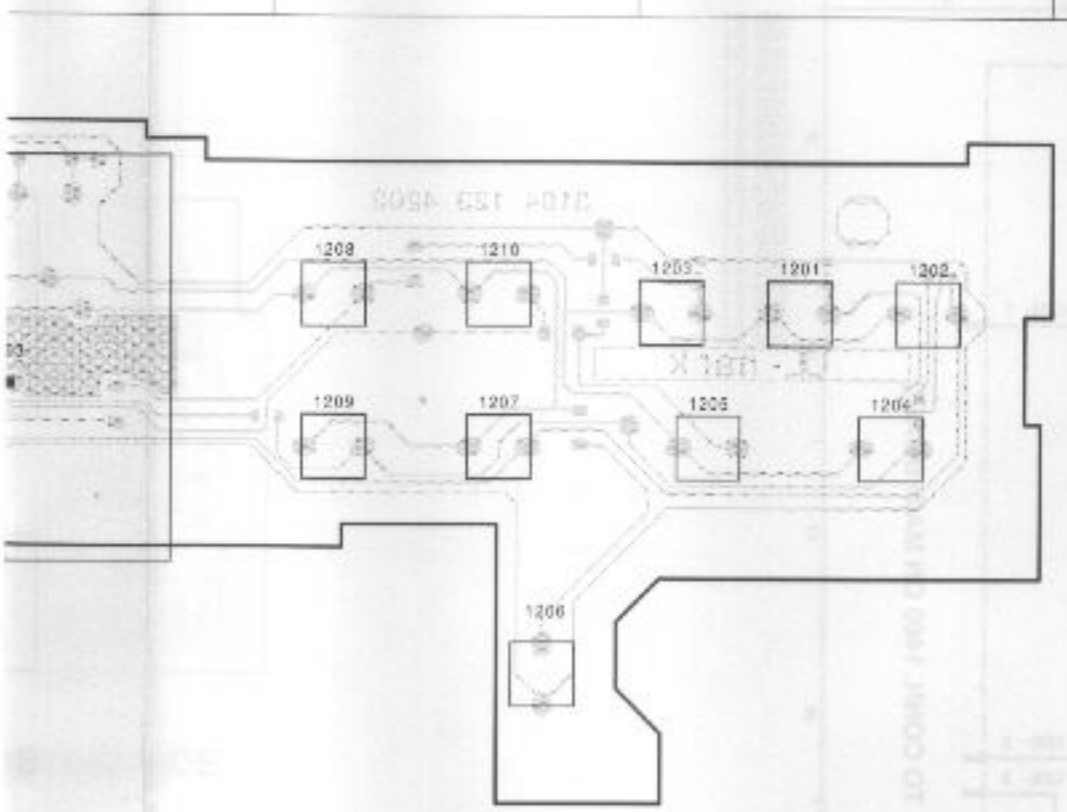
DISPLAY BOARD BOTTOM SIDE

1230 A 3	2202 A 3	2205 A 2	3200 A 3	3205 A 2	3210 A 7	3213 A 7	3216 A 2	4002 A 4	4005 A 4	4008 A 2	4011 A 2	4014 A 2	4017 A 6	4020 A 2
2200 A 3	2203 A 2	2206 A 3	3201 A 2	3206 A 2	3211 A 7	3214 A 6	3220 A 1	4003 A 5	4006 A 5	4009 A 2	4012 A 2	4015 A 2	4018 A 6	4021 A 2
2201 A 3	2204 A 2	2207 A 1	3202 A 2	3207 A 2	3212 A 7	3215 A 2	4001 A 4	4004 A 4	4007 A 2	4010 A 5	4013 A 1	4016 A 5	4019 A 6	4022 A 2



1221 A 2 1500 A 2 6200 A 2 7205 A 4 9001 A 1 9002 A 3 9003 A 5

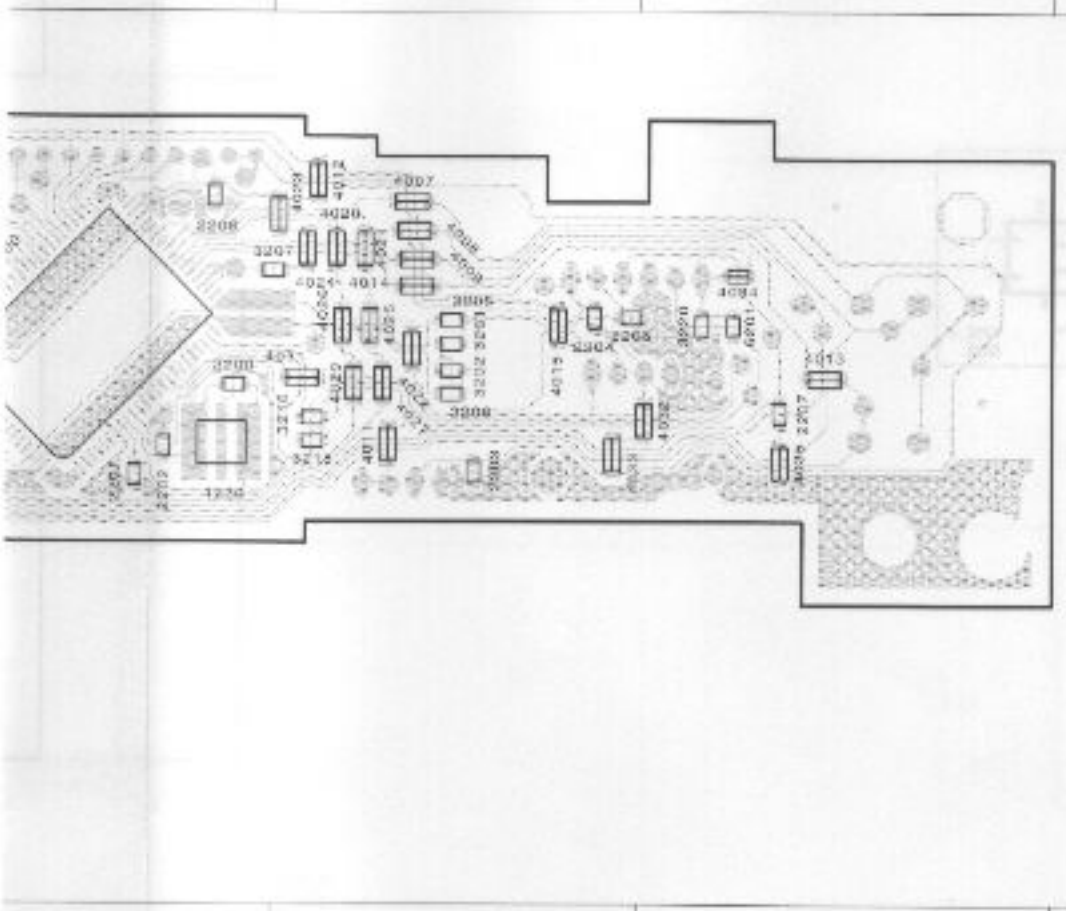
5 6 7



5 6 7

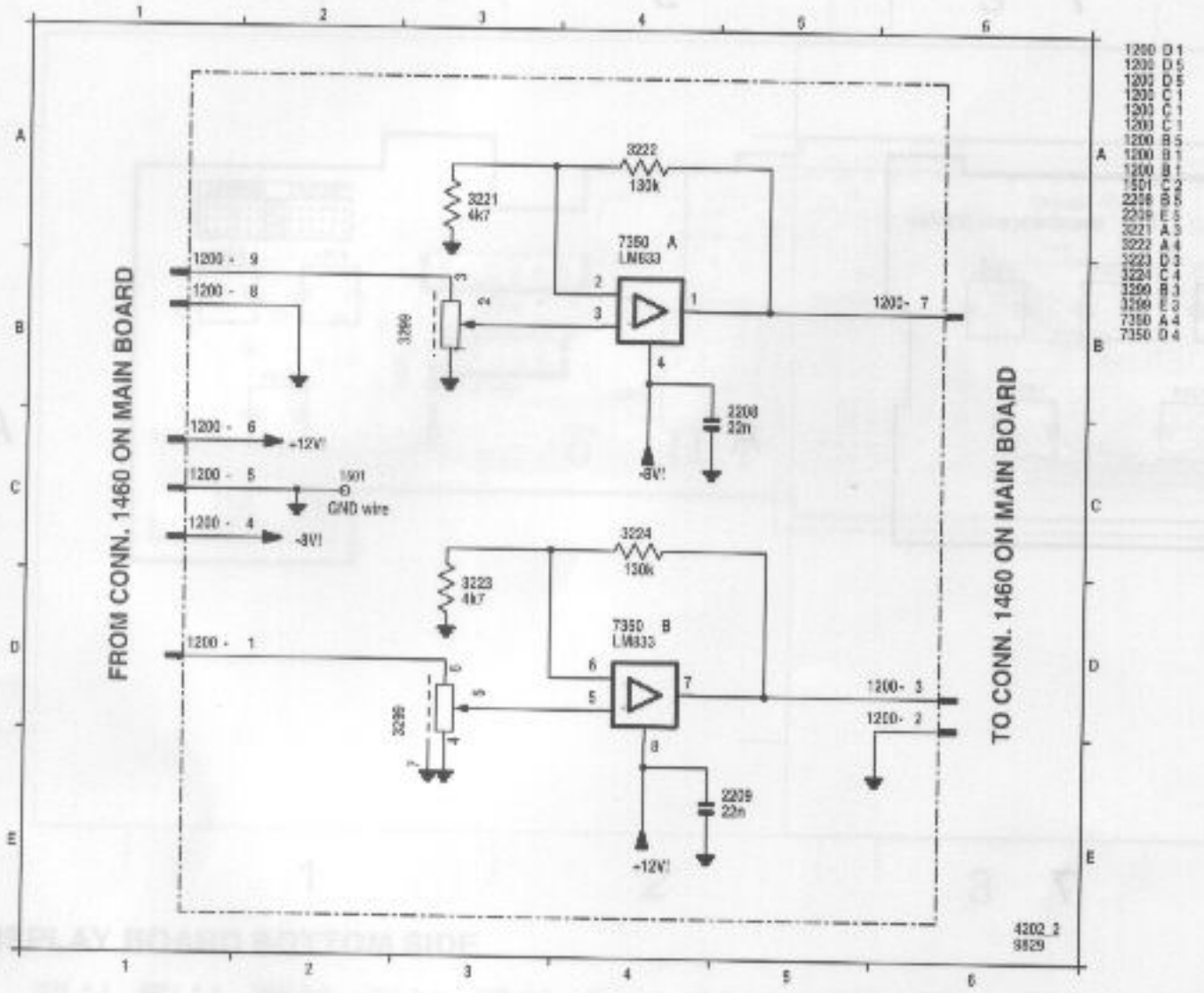
4028 A 2 4023 A 2 4026 A 2 4030 A 5 4033 A 2 5201 A 1
4021 A 2 4024 A 2 4027 A 2 4031 A 2 4034 A 1 7200 A 3
4022 A 2 4025 A 2 4029 A 2 4032 A 1 4035 A 1

3 2 1

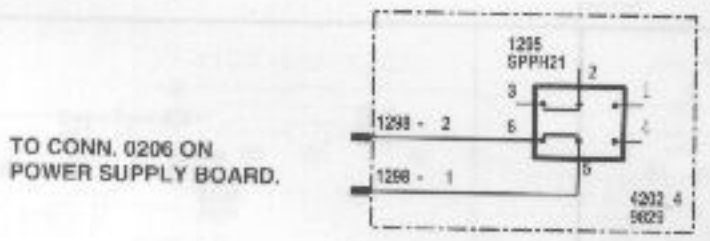


3 2 1

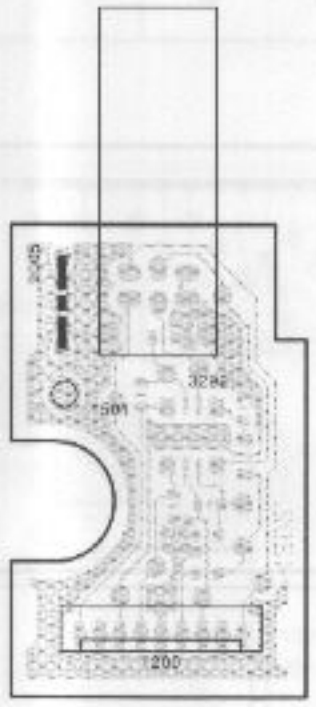
LEVEL CIRCUIT DIAGRAM



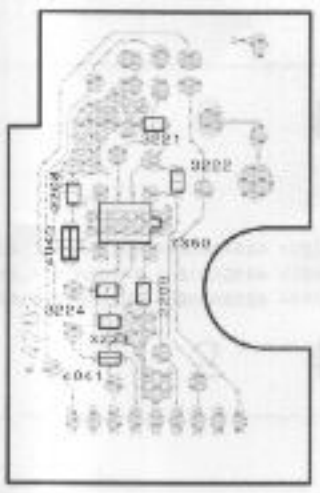
ON/OFF SWITCH BOARD



LEVEL BOARD TOPSIDE



BOTTOM SIDE



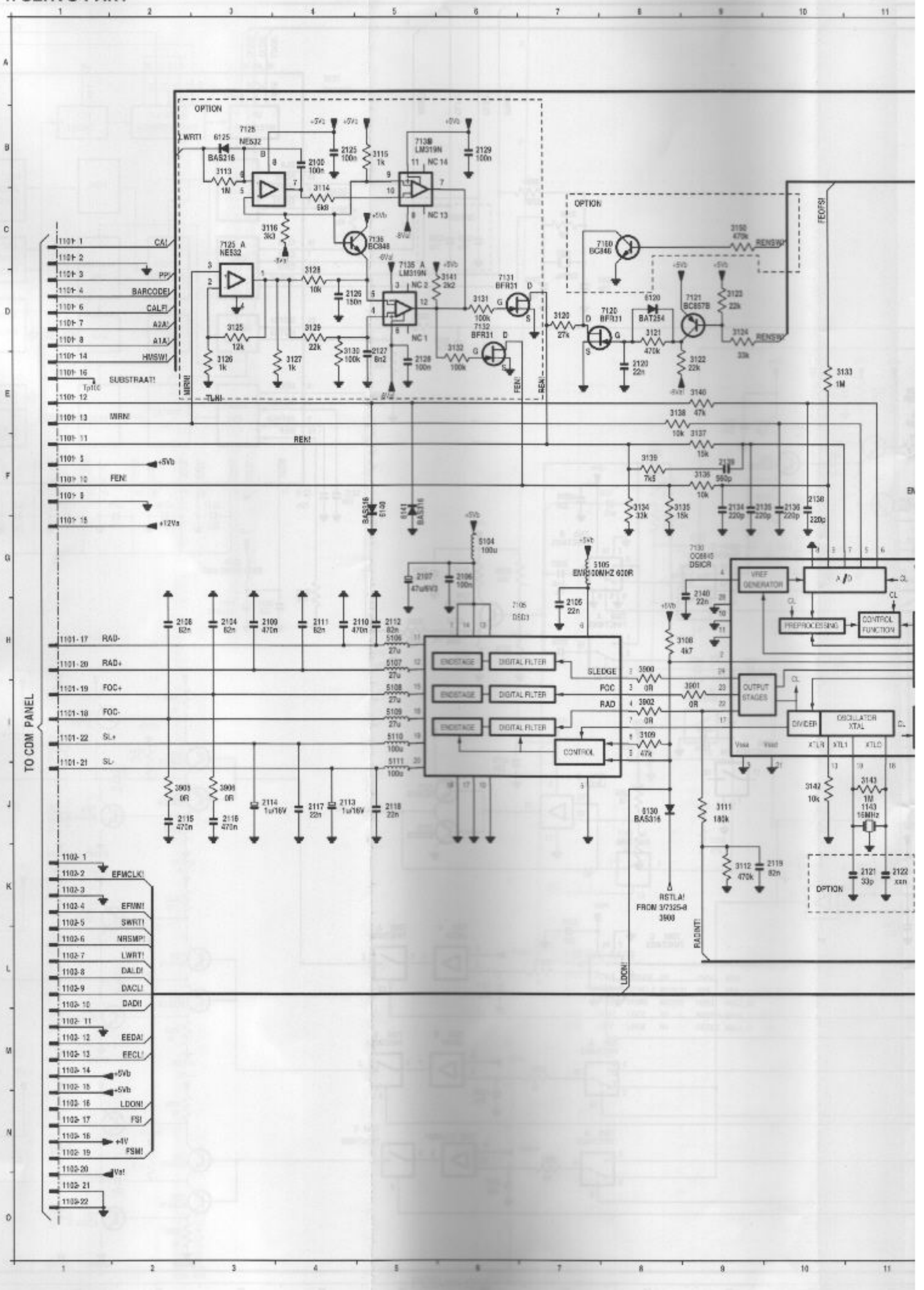
ON/OFF SWITCH BOARD

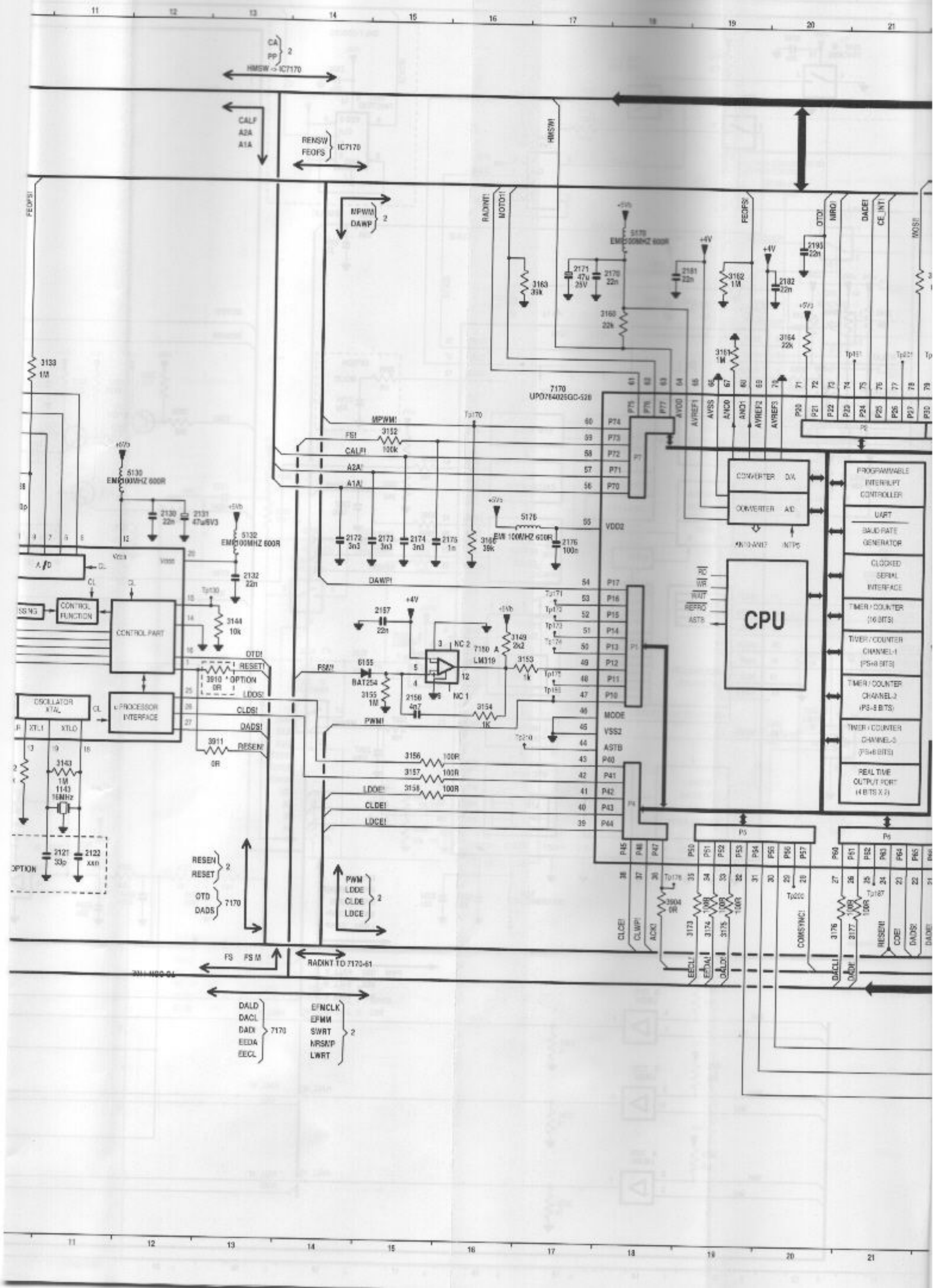
CDR MAIN BOARD

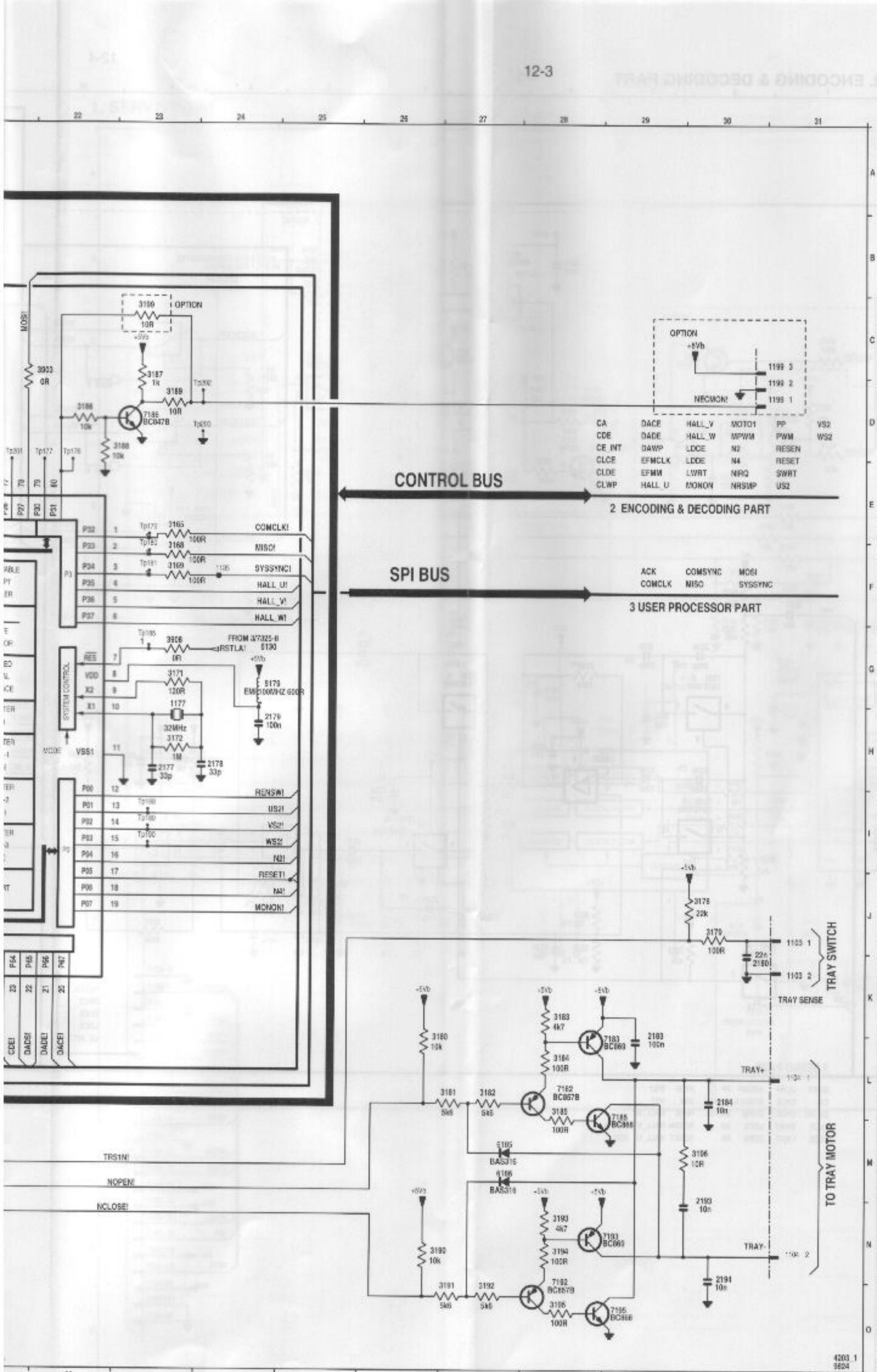
CONTENTS

TECHNICIAN NOTES

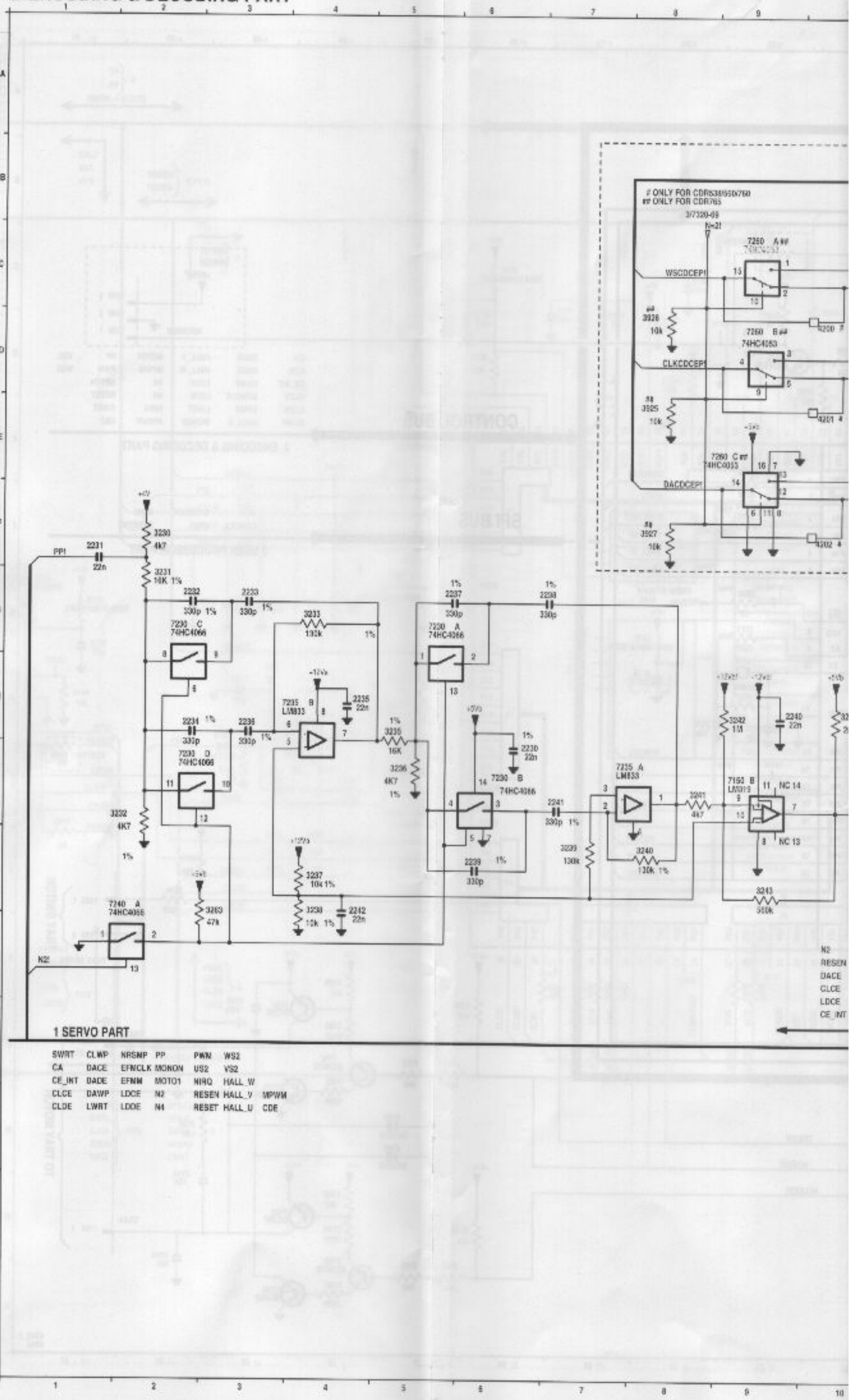
1. SERVO PART


OPTION
LWRT!
6125
BAS216
7126
NE532
2125 100n
3115 1k
7138 LM319N
2129 100n
3113 1N
2130 100n
3114 5k8
3116 3k3
7135 BC848
7125 A NE532
7135 A LM319N
3128 10k
2126 150n
3141 2k2
3125 12k
3129 22k
3126 1k
3127 1k
3130 100k
2127 8n2
2128 100n
3131 100k
7131 BFR31
3132 100k
7132 BFR31
FEN!
REN!
MRN!
TLN!
OPTION
7120 BC846
3150 470k
RENSW!
FEOFS!
3120 27k
7120 BFR31
6120 BAT254
7121 BC857B
3123 22k
3121 470k
3124 33k
2120 22n
3122 22k
3140
3133 1M
3138 47k
3137 15k
3139 7k5
2139 560p
3136 10k
3134 33k
3135 15k
2134 220p
2135 220p
2136 220p
2138 220p
6130 BAS316
6140 BAS316
6141 BAS316
5104 100u
5105 EMI 30MHZ 600R
2107 47u/6V3
2106 100n
2105 22n
7105 DSD3
7130 OC6845 DSICR
VREF GENERATOR
A/D
PREPROCESSING
CONTROL FUNCTION
3108 4k7
2140 22n
ENDSTAGE
DIGITAL FILTER
CONTROL
SLEDGE
FOC
RAD
3900 0R
3901 0R
3902 0R
3109 47k
OUTPUT STAGES
DIVIDER
OSCILLATOR XTAL
2108 82n
2104 82n
2109 470n
2111 82n
2110 470n
2112 82n
5106 27u
5107 27u
5108 27u
5109 27u
5110 100u
5111 100u
3903 0R
3904 0R
2115 470n
2116 470n
2114 1u/16V
2117 22n
2113 1u/16V
2118 22n
3111 180k
3112 470k
2119 82n
3142 10k
3143 1M 1143 16MHz
OPTION
2121 33p
2122 xxn
RSTLA!
FROM 3/7325-8 3500
LDON!
RADINT!
TO CDM PANEL
1101-1 CAI
1101-2
1101-3 PP!
1101-4 BARCODE!
1101-6 CALFI
1101-7 A2A!
1101-8 A1A!
1101-14 HMSWI
1101-16 SUBSTRAAT!
Tp11C
1101-12
1101-13 MRN!
1101-11 REK!
1101-5 +5Vb
1101-10 FEN!
1101-9
1101-15 +12Va
1101-17 RAD-
1101-20 RAD+
1101-19 FOC+
1101-18 FOC-
1101-22 SL+
1101-21 SL-
1102-1
1102-2 EFMCLK!
1102-3
1102-4 EFMN!
1102-5 SWRT!
1102-6 NRSMP!
1102-7 LWRT!
1102-8 DALD!
1102-9 DACL!
1102-10 DAD!
1102-11
1102-12 EEDA!
1102-13 EECL!
1102-14 +5Vb
1102-15 +5Vb
1102-16 LDON!
1102-17 FSI
1102-18 +1V
1102-19 FSM!
1102-20 Va!
1102-21
1102-22


11 12 13 14 15 16 17 18 19 20 21
CA
PP
2
HMSW -> IC7170
CALF
A2A
A1A
RENSW
FEOPS
IC7170
MPWM
DAWP
2
HMSW!
RADINT!
MOTOI!
FEOPS!
OTOI!
NIROI!
DACEI
CE_INT!
WOSI!
FEOPS!
3133
1M
5130
EMI 100MHZ 600R
2130
22n
2131
47u/6V3
5132
EMI 100MHZ 600R
2132
22n
A/D
CONTROL FUNCTION
CONTROL PART
3144
10k
OTD!
RESET!
3910
0R
OPTION
LDDS!
CLDS!
DADS!
RESEN!
3911
0R
OSCILLATOR
XTAL
XT1
XT0
PROCESSOR
INTERFACE
3143
1M
1143
16MHz
2121
33p
2122
X6R
OPTION
RESEN
RESET
2
OTD
DADS
7170
PWM
LDDE
CLDE
LDCE
2
3163
39k
2171
47u
25V
2170
22n
3160
22k
2157
22n
2181
22n
3162
1M
2193
22n
2182
22n
3164
22k
3161
1M
5170
EMI 100MHZ 600R
7170
UPD784025GC-528
MPWM!
FS!
CALF!
A2A!
A1A!
3152
100k
2172
3n3
2173
3n3
2174
3n3
2175
1n
3165
39k
5175
EMI 100MHZ 600R
2176
100n
DAWP!
7180 A
LM319
NC 2
NC 1
3149
2k2
3153
1k
6155
BAT254
3155
1M
2156
4n7
3154
1K
FS!
PWM!
3156
100R
3157
100R
3158
100R
LDDE!
CLDE!
LDCE!
P74
P73
P72
P71
P70
VDD2
P17
P16
P15
P14
P13
P12
P11
P10
MODE
VSS2
ASTB
P40
P41
P42
P43
P44
P45
P46
P47
P50
P51
P52
P53
P54
P55
P56
P57
P60
P61
P62
P63
P64
P65
CONVERTER D/A
CONVERTER A/D
PROGRAMMABLE INTERRUPT CONTROLLER
UART
BAUD RATE GENERATOR
CLOCKED SERIAL INTERFACE
TIMER / COUNTER (16 BITS)
TIMER / COUNTER CHANNEL-1 (PS+8 BITS)
TIMER / COUNTER CHANNEL-2 (PS+8 BITS)
TIMER / COUNTER CHANNEL-3 (PS+8 BITS)
REAL TIME OUTPUT PORT (4 BITS X 2)
CPU
RD
WR
WAIT
REFRQ
ASTB
3904
0R
3173
3174
100R
3175
100R
3176
3177
100R
COMSYNC!
RESEN!
CDE!
DADS2!
DALDE!
CLCE!
CLWR!
ACK!
EECL!
EEDA!
DALD!
DACL!
DADI!
Tp170
Tp171
Tp172
Tp173
Tp174
Tp175
Tp176
Tp177
Tp178
Tp179
Tp180
Tp200
Tp187
FS
FS M
RADINT TO 7170-61
DALD
DACL
DADI
EEDA
EECL
7170
EFNCLK
EFMW
SWRT
NRSMP
LWRT
2


OPTION
3189 10R
+5Vb
3187 1k
3188 10k
7186 BC847B
3186 10k
3188 10k
3903 0R
MOSI
Tp202
Tp200
Tp201
Tp177
Tp178
P32 COMCLK!
P33 MISO!
P34 SYSSYNC!
P35 HALL_U!
P36 HALL_V!
P37 HALL_W!
3165 100R
3168 100R
3169 100R
1105
SYSTEM CONTROL
RES
VDD
X2
X1
VSS1
MODE
3171 120R
1177 32MHz
3172 1M
2177 33p
2178 33p
2179 100n
5179 EMI 100MHz 600R
FROM 37325-B 5130
RSTLA!
3906 0R
P00 RENSW!
P01 US2!
P02 VS2!
P03 WS2!
P04 N2!
P05 RESET!
P06 N4!
P07 MONON!
CDE!
DADS!
DADE!
DACE!
CONTROL BUS
2 ENCODING & DECODING PART
SPI BUS
ACK
COMSYNC
MOSI
COMCLK
MISO
SYSSYNC
3 USER PROCESSOR PART
OPTION
+5Vb
1199 3
1199 2
1199 1
NRCMON!
CA DACE HALL_V MOTO1 PP VS2
CDE DADE HALL_W MPWM PWM WS2
CE_INT DAWP LDCE N2 RESEN
CLCE EFMCLK LDDE N4 RESET
CLDE EFMM LWRT NIRQ SWRT
CLWP HALL_U MONON NRSMP US2
-5Vb
3176 22k
3179 100R
2180 22n
1103 1
1103 2
TRAY SENSE
TRAY SWITCH
3180 10k
3183 4k7
7183 BC860
2183 100n
3184 100R
TRAY+
7182 BC857B
3181 5k6
3182 5k6
3185 100R
7185 BC860
2184 10n
5185 BAS316
5186 BAS316
TRS1N!
NOPEN!
NCLOSE!
3196 10R
2193 10n
3190 10k
3193 4k7
7193 BC860
3194 100R
TRAY-
7192 BC857B
3191 5k6
3192 5k6
3195 100R
7195 BC860
2194 10n
TO TRAY MOTOR
4203_1
9624

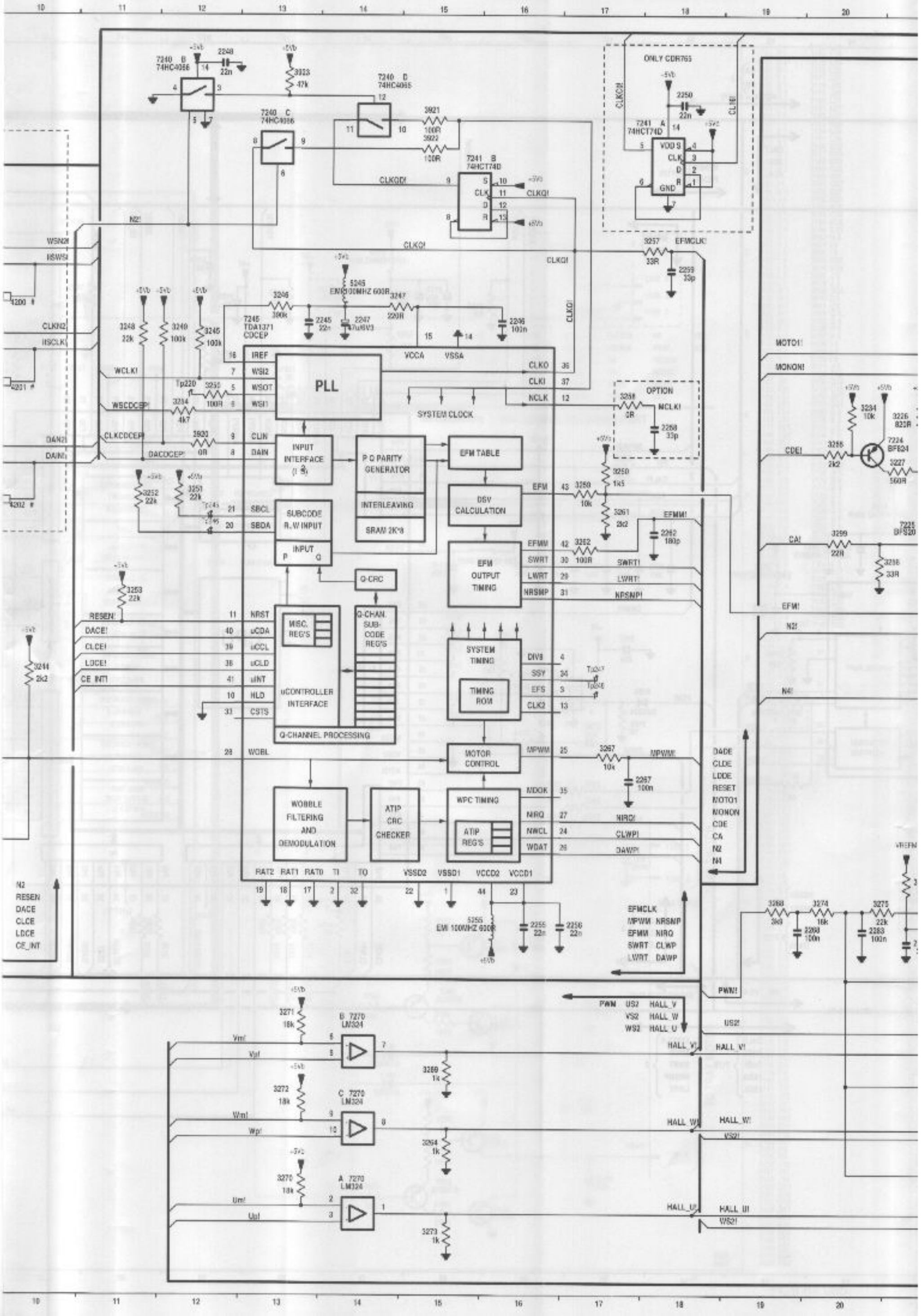
2. ENCODING & DECODING PART

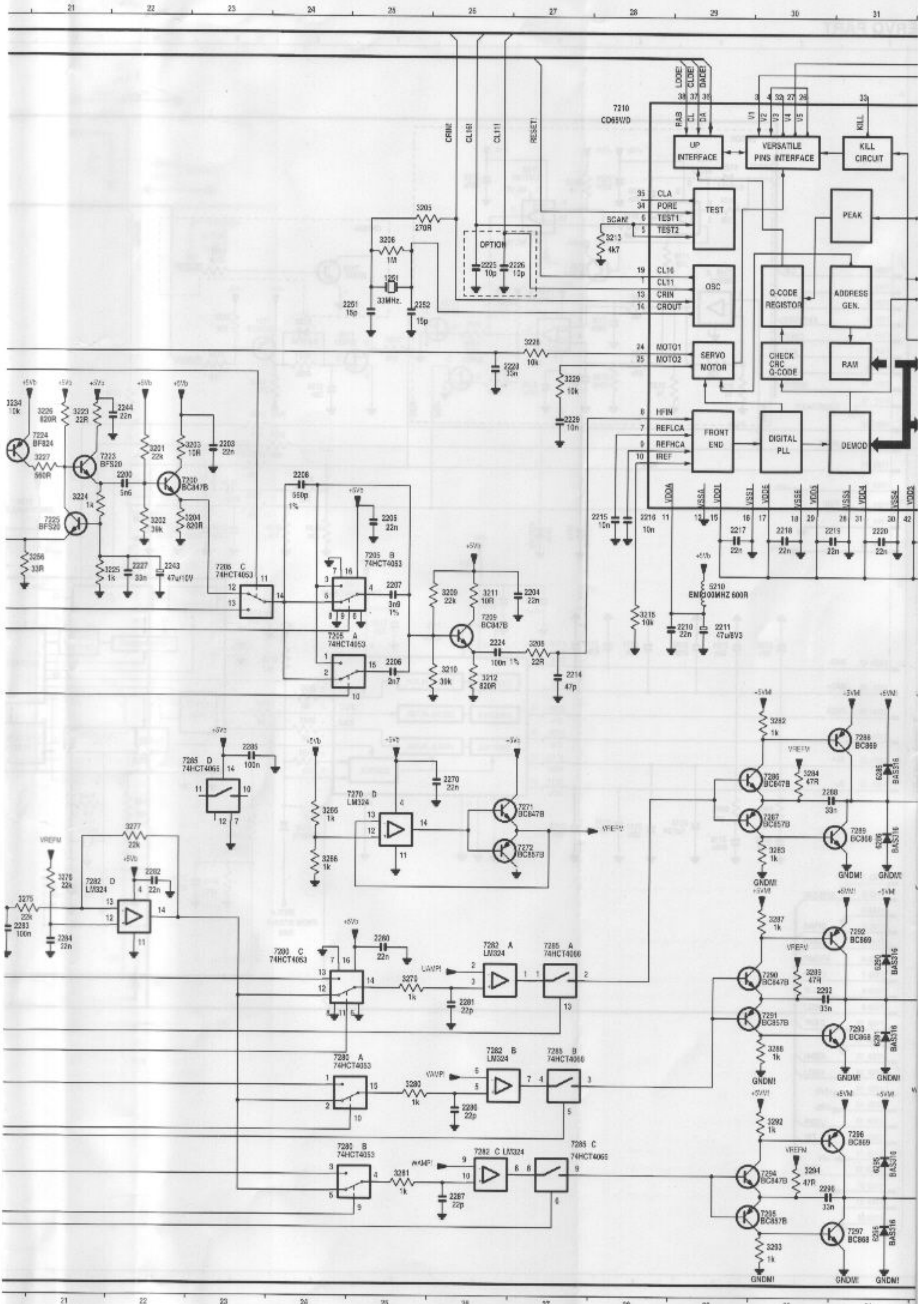


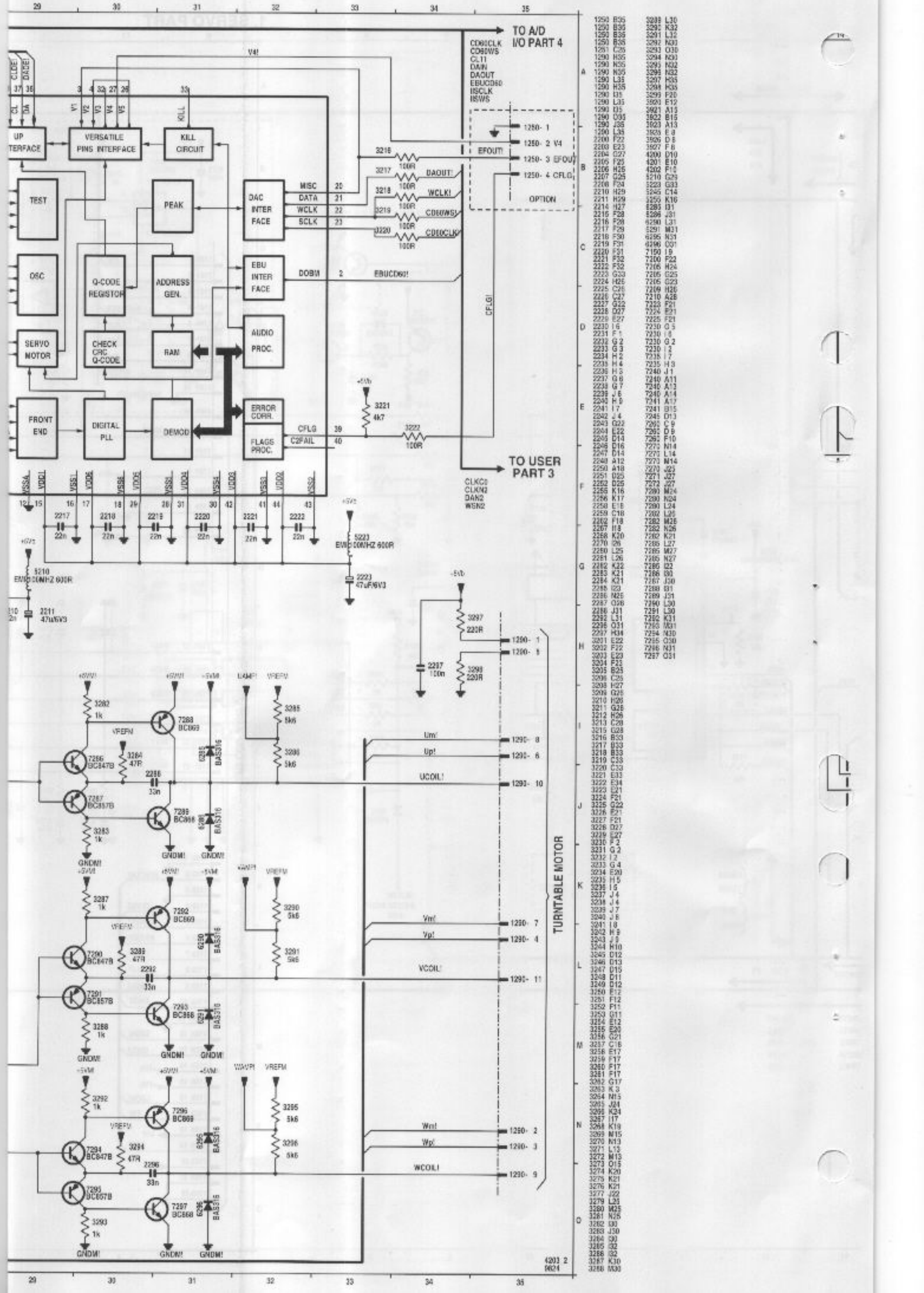
1 SERVO PART

SWRT	CLWP	NRSNP	PP	PWN	WS2
CA	DACE	EFNCLK	MONON	US2	VS2
CE_INT	DADE	EFNM	MOTO1	NIRQ	HALL_W
CLCE	DAWP	LDCE	N2	RESEN	HALL_V MPWM
CLDE	LWRT	LDDE	N4	RESET	HALL_U CDE

12-4

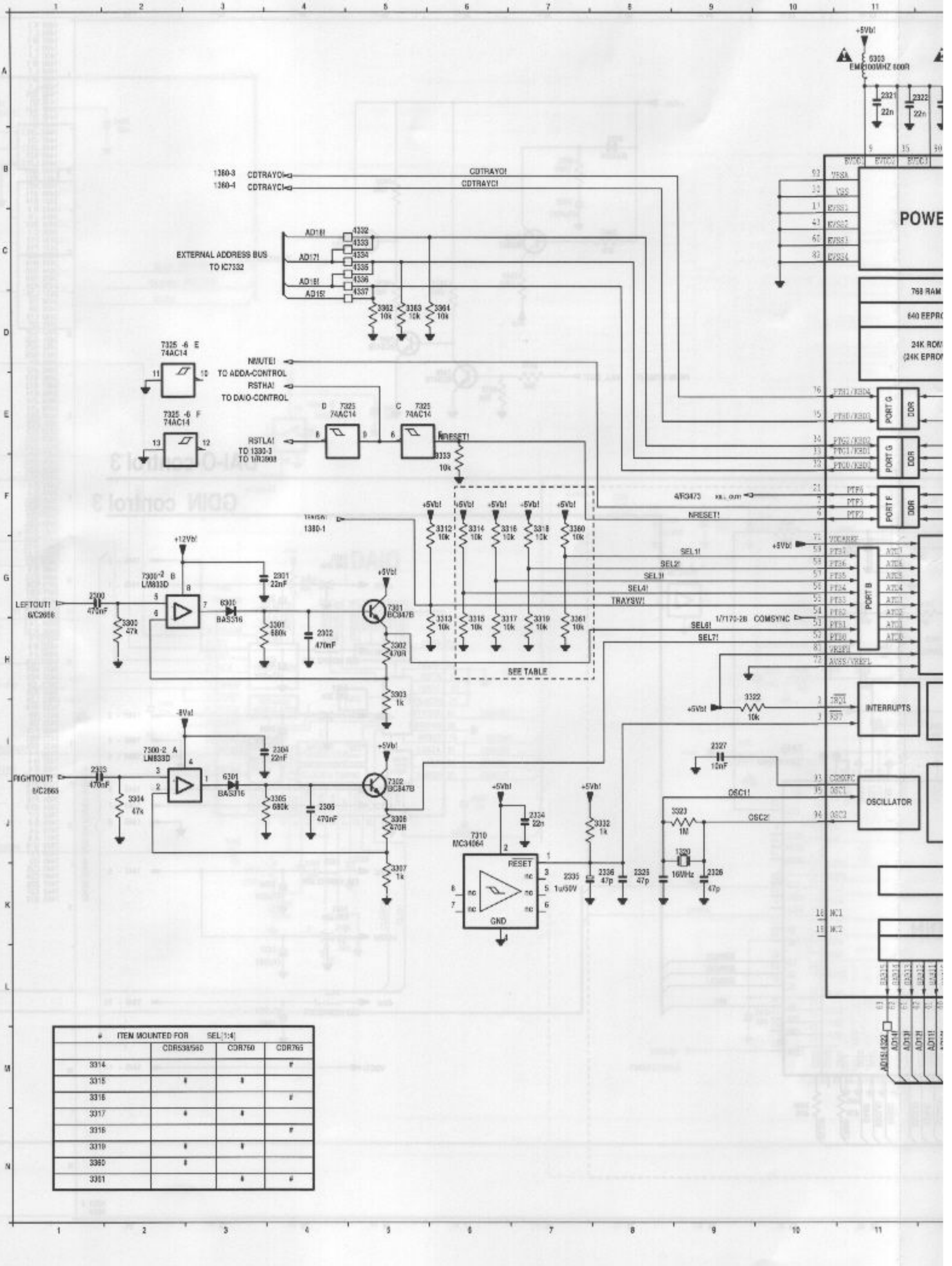

PLL
INPUT INTERFACE
P Q PARITY GENERATOR
INTERLEAVING
SRAM 2K*8
EFM TABLE
DSV CALCULATION
EFM OUTPUT TIMING
SUBCODE R..W INPUT
INPUT
Q-CRC
MISC. REG'S
Q-CHAN. SUB-CODE REG'S
uCONTROLLER INTERFACE
Q-CHANNEL PROCESSING
SYSTEM TIMING
TIMING ROM
MOTOR CONTROL
WPC TIMING
ATIP REG'S
WOBBLE FILTERING AND DEMODULATION
ATIP CRC CHECKER
SYSTEM CLOCK
OPTION
ONLY CDR765
7240 B 74HC4066
7240 C 74HC4066
7240 D 74HC4066
7241 A 74HCT74D
7241 B 74HCT74D
7245 TDA1371 CDCEP
B 7270 LM324
C 7270 LM324
A 7270 LM324
7224 BF824
7225 BFS20
WSN2I
WSWSI
CLKN2
WCLK!
WSCDCEP!
CLKCDCEP!
DACDCEP!
DAN2I
DAN1I
RESEN!
DACE!
CLCE!
LDCE!
CE_INT!
WOBL
CLKOI
CLKCDI
EFMCLK
EFMI
EFMMI
SWRT!
LWRT!
NRSMPI
MOTO1!
MONON!
CDE!
CA!
N2!
N4!
DADE
CLDE
LDDE
RESET
MOTO1
MONON
CDE
CA
N2
N4
MPWM
NIRQ
CLWP!
DAWP!
PWM!
US2!
VS2!
WS2!
HALL_V!
HALL_W!
HALL_U!


7210
CD65WD
UP INTERFACE
VERSATILE PINS INTERFACE
KILL CIRCUIT
TEST
OSC
PEAK
Q-CODE REGISTOR
ADDRESS GEN.
CHECK CRC Q-CODE
RAM
SERVO MOTOR
FRONT END
DIGITAL PLL
DEMOD
CRINI
CL16I
CL11I
RESETI
LOOEI
CLOEI
DAOEI
OPTION
7205 A 74HCT4053
7205 B 74HCT4053
7205 C 74HCT4053
7205 D 74HCT4066
7280 A 74HCT4053
7280 B 74HCT4053
7280 C 74HCT4053
7285 A 74HCT4066
7285 B 74HCT4066
7285 C 74HCT4066
7282 D LM324
7270 D LM324
7282 A LM324
7282 B LM324
7282 C LM324
VREFM
VREFN
GNDMI
GNDNI



	1250 B35	3208 L30					
	1250 B36	3209 K32					
	1250 B36	3291 L32					
	1250 B35	3292 K30					
	1251 C26	3293 O30					
	1290 H35	3294 N30					
	1290 N35	3295 N32					
	1290 N35	3296 N32					
	1290 L35	3297 H35					
	1290 H35	3298 K35					
	1290 I35	3299 F20					
	1290 L35	3920 E12					
	1290 I35	3921 A13					
	1290 O35	3922 B15					
	1290 J35	3923 A13					
	1290 L35	3925 E 8					
	2200 F22	3926 D 8					
	2203 E23	3927 F 8					
	2204 G27	4200 D10					
	2205 F25	4201 E10					
	2206 H25	4202 F10					
	2207 G25	5210 G29					
	2208 F24	5223 G33					
	2210 H29	5245 C14					
	2211 H29	5250 K16					
	2214 H27	6285 I31					
	2215 F28	6286 J31					
	2216 F28	6290 L31					
	2217 F29	6291 M31					
	2218 F30	6295 N31					
	2219 F31	6296 O31					
	2220 F31	7150 I 9					
	2221 F32	7200 F22					
	2222 F32	7205 H24					
	2223 G33	7205 G25					
	2224 H25	7205 G23					
	2225 C26	7209 H26					
	2226 C27	7210 A28					
	2227 G22	7223 F21					
	2228 O27	7224 E21					
	2229 E27	7225 F21					
D	2230 I 6	7230 G 5					
	2231 F 1	7230 I 8					
	2232 G 2	7230 G 2					
	2233 G 3	7230 I 3					
	2234 H 2	7235 I 7					
	2235 H 4	7235 H 3					
	2236 H 3	7240 J 1					
	2237 G 6	7240 A11					
	2238 G 7	7240 A13					
	2239 J 6	7240 A14					
	2240 H 9	7241 A12					
E	2241 I 7	7245 B15					
	2242 J 4	7245 D13					
	2243 G23	7260 C 9					
	2244 E22	7260 D 9					
	2245 D14	7262 F10					
	2246 D16	7270 N14					
	2247 D14	7270 L14					
	2248 A12	7270 M14					
	2250 A18	7270 J25					
	2251 D25	7271 J27					
	2252 D25	7272 J27					
F	2255 K16	7280 M24					
	2256 K17	7280 N24					
	2258 E18	7280 L24					
	2259 C18	7282 L26					
	2262 F18	7282 M26					
	2267 I18	7282 N26					
	2268 K20	7282 K21					
	2270 I26	7285 L27					
	2280 L25	7285 M27					
	2281 L26	7285 N27					
G	2282 K22	7285 I22					
	2283 K21	7286 I30					
	2284 K21	7287 J30					
	2285 I23	7288 I31					
	2286 N26	7289 J31					
	2287 O26	7290 L30					
	2288 J31	7291 L30					
	2292 L31	7292 K31					
	2296 O31	7293 M31					
	2297 H34	7294 M30					
	3201 E22	7295 O30					
H	3202 F22	7296 N31					
	3203 E23	7297 O31					
	3204 F23						
	3205 B25						
	3206 C25						
	3208 H27						
	3209 G28						
	3210 H28						
	3211 G28						
	3212 H26						
	3213 C28						
I	3215 G28						
	3216 B33						
	3217 B33						
	3218 B33						
	3219 C33						
	3220 C33						
	3221 E33						
	3222 E34						
	3223 E21						
	3224 F21						
J	3225 G22						
	3226 E21						
	3227 F21						
	3228 D27						
	3229 E27						
	3230 F 2						
	3231 G 2						
	3232 I 2						
	3233 G 4						
	3234 E20						
K	3235 H 5						
	3236 I 5						
	3237 J 4						
	3238 J 4						
	3239 J 7						
	3240 J 8						
	3241 I 8						
	3242 H 9						
	3243 J 9						
	3244 H10						
L	3245 D12						
	3246 D13						
	3247 D15						
	3248 D11						
	3249 D12						
	3250 E12						
	3251 F12						
	3252 F11						
	3253 G11						
	3254 E12						
	3255 E20						
	3256 G21						
M	3257 C16						
	3258 E17						
	3259 F17						
	3260 F17						
	3261 F17						
	3262 G17						
	3263 K 3						
	3264 N15						
	3265 J24						
	3266 K24						
	3267 I17						
N	3268 K19						
	3269 N15						
	3270 N19						
	3271 L13						
	3272 M13						
	3273 O15						
	3274 K20						
	3275 K21						
	3276 K21						
	3277 J22						
	3279 L25						
	3280 M25						
	3281 N25						
O	3282 I30						
	3283 J30						
	3284 I30						
	3285 I32						
	3286 I32						
	3287 K30						
	3288 M30						

3. USER PROCESSOR PART

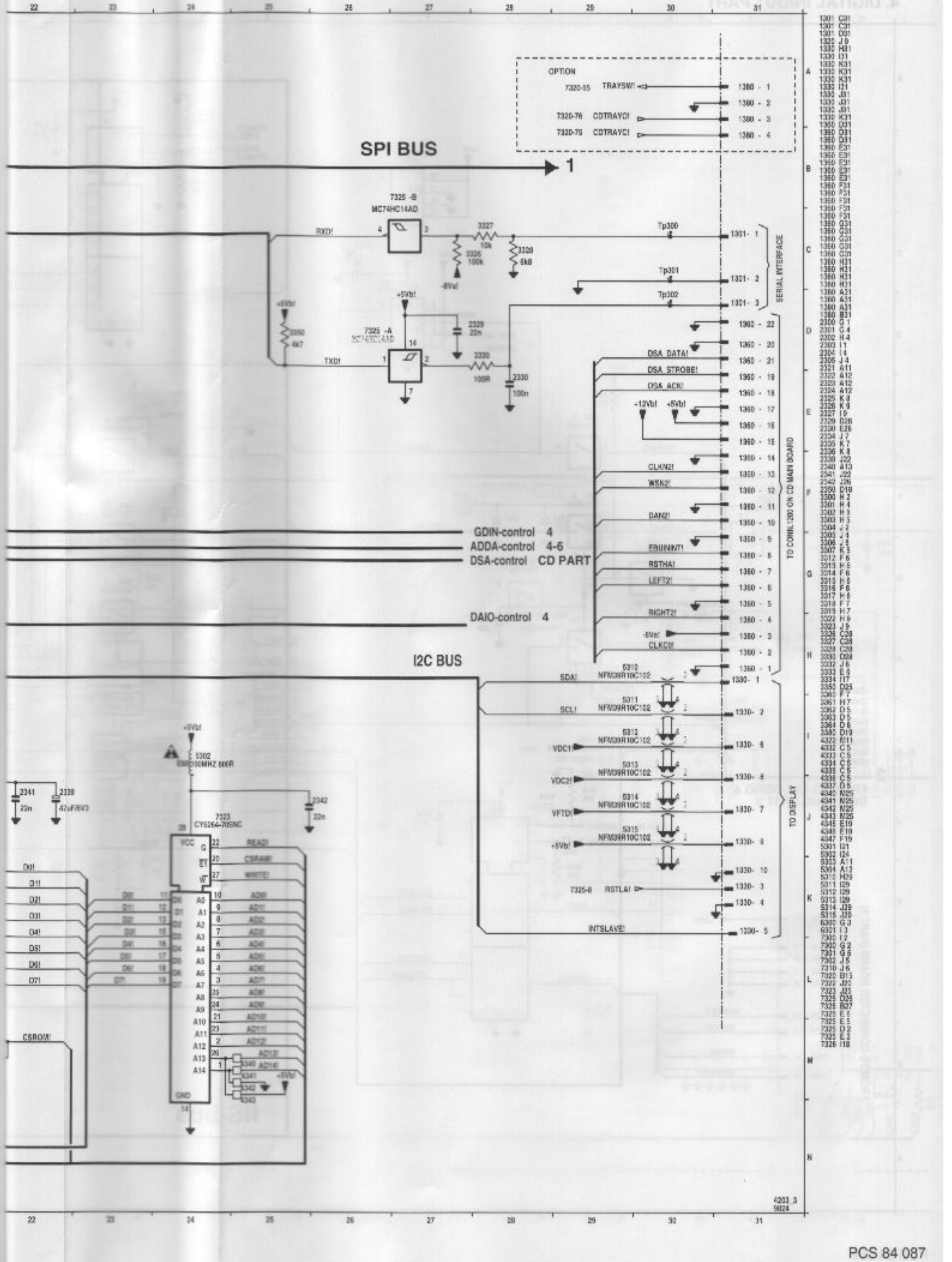


# ITEM MOUNTED FOR SEL[1:4]			
	CDR530/560	CDR760	CDR765
3314			#
3315	#	#	
3316			#
3317	#	#	
3318			#
3319	#	#	
3360	#		
3361		#	#

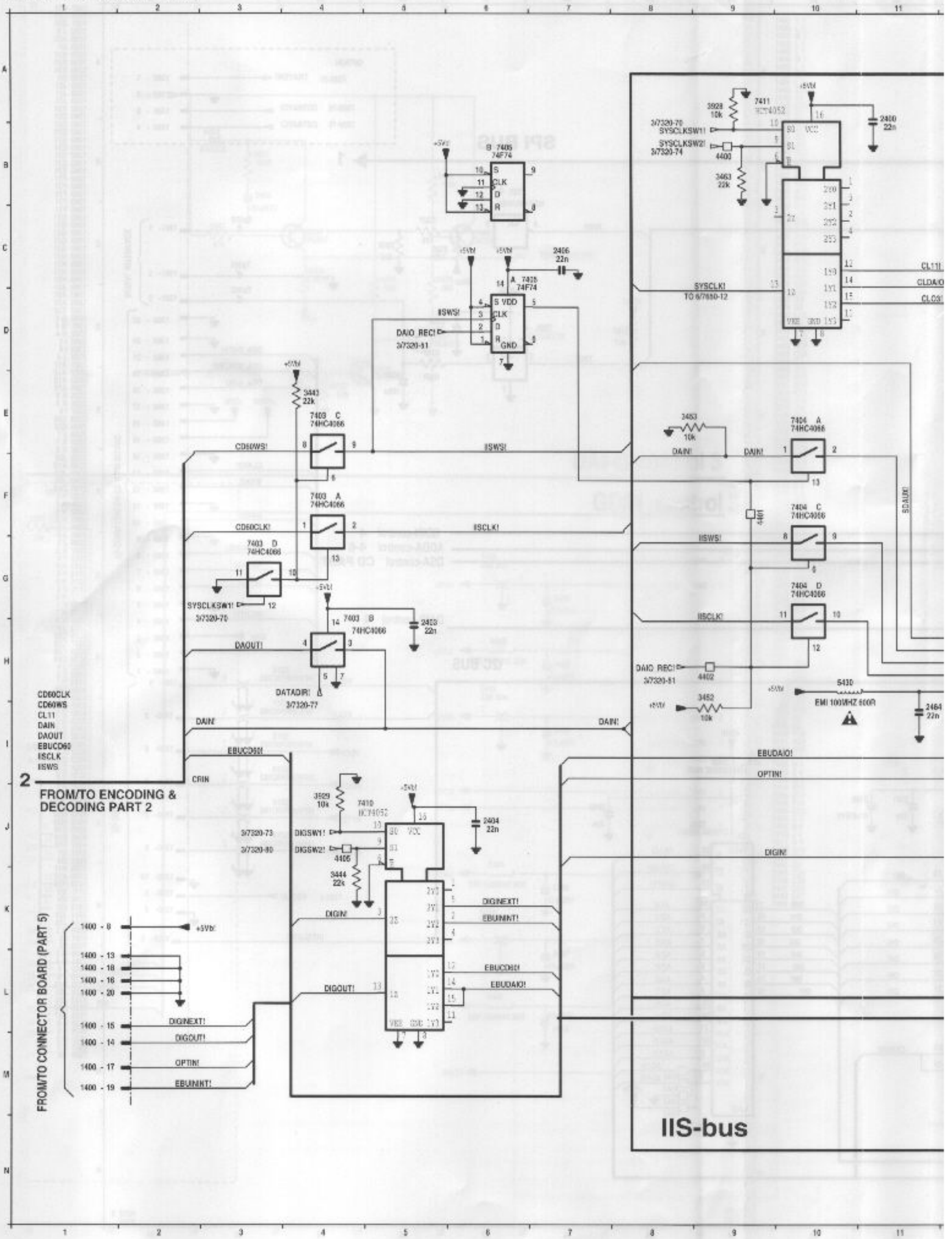
12 13 14 15 16 17 18 19 20 21 22 23

+5Vb!
5304
EMI 100MHZ 600R
2322 22n
2323 22n
2324 22n
2340 22n
7320
MC68HC08AB0
VSSA1 VDD VDDA
POWER
768 RAM
640 EEPROM
24K ROM
(24K EPROM)
SPI
SCK
MOSI
MISO
SS
SCI
PULSE ACCUMULATOR
TIMER A/B
PERIODIC INTERRUPT
COP WATCHDOG
DDR
PORT D
PORT E/F
PORT C
PORT A
PTD7 50 DIGSW2!
PTD6 49 ANAIN2!
PTD5 48 ANAIN1!
PTD4 47 DATADIR!
PTD3 44 SYSCLKSW2!
PTD2 43 DIGSW1!
PTD1 40 SYSCLKSW1!
PTD0 39 N=2! 2/7200
PTC5 201 ANACD!
PTC4 1 ATSB!
PTC3 59 DEEM1!
PTC2 58 DSA_ACK!
PTC1 57 DSA_STROBE!
PTC0 56 DSA_DATA!
PTA7 51 DMO_REC!
PTA6 50 STROBE!
PTA5 49 CDAILD!
PTA4 48 CDAICL!
PTA3 47 CDAIDA!
PTA2 46
PTA1 45 SCL8!
PTA0 44
PTE5/TBCH1 20 BS!
PTE4/TBCH0 8 DSA_DATA!
PTE3/TACH1 5
PTE2/TACH0 4 INTSLAVE!
PTE1/TACH1 25 ACK!
PTE0/TACH2 24 SYSSYNC!
DSA_DATA! 3380 10k +5Vb!
UDAVAIL!
2350 33n
DSA_ACK! 4345 GDINLD!
DSA_STROBE! 4346 GDINCL!
DSA_DATA! 4347 GDINDA!
OPTION
INTSLAVE!
SCL! 3334 10k SCL!
7325 BC847B
SDA!
A/D
CPU
MEMORY EXPANSION
Non-Multiplexed Address/Data Bus
DDR
External address bus
DDR
External data bus
NSCLK 53
RDE 55 READ!
WDE 57 WRITE!
CS1 54 CSRAM!
CS0 52 CSROM!
+5Vb!
5301
EMI 100MHZ 600R
7332
USER (EP)ROM
2341 22n
2339 47uF/6V3
AD2! 12 A0
AD1! 11 A1
AD0! 10 A2
AD3! 9 A3
AD4! 8 A4
AD5! 7 A5
AD6! 6 A6
AD7! 5 A7
AD8! 27 A8
AD9! 26 A9
AD10! 23 A10
AD11! 25 A11
AD12! 4 A12
AD13! 28 A13
AD14! 29 A14
AD15! 3 A15
AD16! 2 A16
AD17! 30 A17
AD18! 31 A18
Vcc 32
NC 1
GND 16
O0 13 D0!
O1 14 D1!
O2 15 D2!
O3 17 D3!
O4 18 D4!
O5 19 D5!
O6 20 D6!
O7 21 D7!
CE 22 CSROM!
OE 24
D0! D1! D2! D3! D4! D5! D6! D7!

12 13 14 15 16 17 18 19 20 21 22 23


SPI BUS
OPTION
7320-55 TRAYSW!
7320-76 CDTRAYC!
7320-76 CDTRAYC!
1360 - 1
1360 - 2
1360 - 3
1360 - 4
7325 -B
MC74HC14AD
RXD!
3327 10k
3326 100k
3328 6k8
-8Va!
Tp300
Tp301
Tp302
1301- 1
1301- 2
1301- 3
SERIAL INTERFACE
+5Vb!
3350 4k7
7325 -A
2329 22n
TXD!
3330 100R
2330 100n
1360 - 22
1360 - 20
1360 - 21
1360 - 19
1360 - 18
1360 - 17
1360 - 16
1360 - 15
1360 - 14
1360 - 13
1360 - 12
1360 - 11
1360 - 10
1360 - 9
1360 - 8
1360 - 7
1360 - 6
1360 - 5
1360 - 4
1360 - 3
1360 - 2
1360 - 1
DSA_DATA!
DSA_STROBE!
DSA_ACK!
-12Vb!
+5Vb!
CLKIN2!
WSK2!
DAN2!
FRUNINT!
RSTHA!
LEFT2!
RIGHT2!
-8Va!
CLKC0!
TO CONN.1200 ON CD MAIN BOARD
GDIN-control 4
ADDA-control 4-6
DSA-control CD PART
DAIO-control 4
I2C BUS
5310 NFM39R10C102
5311 NFM39R10C102
5312 NFM39R10C102
5313 NFM39R10C102
5314 NFM39R10C102
5315 NFM39R10C102
SDA!
SCL!
VDC1!
VDC2!
VFTD!
+8Vb!
1330- 1
1330- 2
1330- 6
1330- 8
1330- 7
1330- 9
1330- 10
1330- 3
1330- 4
1330- 5
7325-8 RSTLA!
INTSLAVE!
TO DISPLAY
+8Vb!
5302 600R
2341 22n
2339 47uF/6V3
2342 22n
7323 CY5264-70SNC
VCC
GND
READ!
CSRAM!
WRITE!
D0!
D1!
D2!
D3!
D4!
D5!
D6!
D7!
CSROM!
5340
5341
5342
5343
+5Vb!
4203_3
5824

4. DIGITAL IN/OUT PART



PCS 84 088

11 12 13 14 15 16 17 18 19 20 21 22

DAIO

GDIN

CL11! (PLAYBACK)
CLDAIO! (RECORD)
CLC3!

2400 22n

+5V1
14 7404 B 74HC4066
4 3
5 7
2401 22n
DAIO_REC
3/7323-51

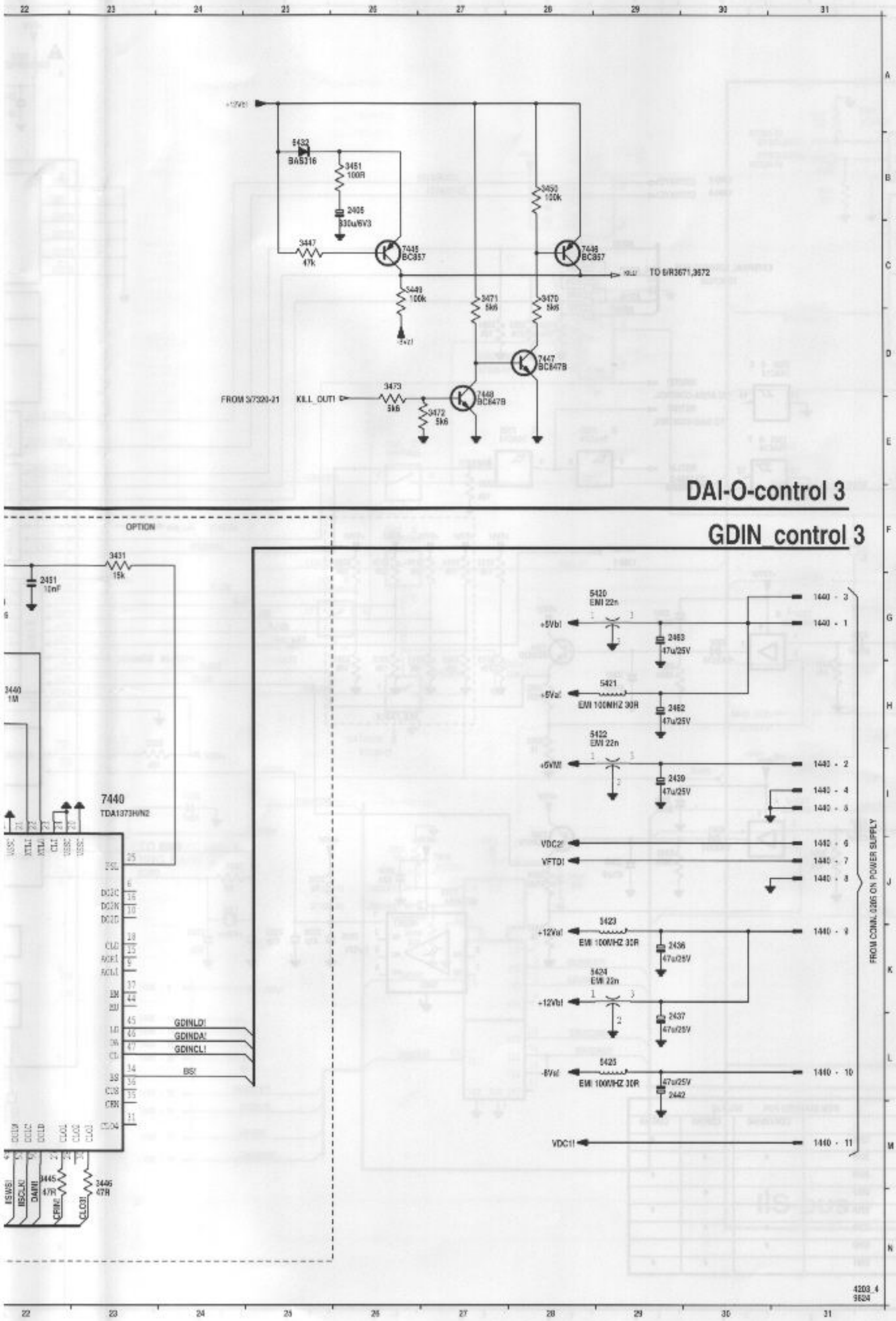
SDAUX!

+5V1
3462 22k
7465 TDA1315
34 SDAUX
35 SD
36 WS
37 SCK
17 VddD2
42 VddD1
41 VssD1
18 VssD2
9 IECOUTEN
8 IECOUT
6 IECIN0
I2S TRANCEVER
BIPHASE MODULATOR
IEC-OUT
IEC-IN
2464 22n
FIFO
CONTROL
LED-DRIVERS
COPY 29
TESTA 28
TESTB 10
TESTC 11
FRLMODE 21
STROBE 26 STROBE!
WRDWN 20
RESET 19 RSTHA!
LDATA 25 CDAIDA!
LCLK 24 CDAICL!
LMODE 23 CDAILD!
BIPHASE DEMODULATOR
CLOCK & TIMING
2470 1n
UDAVAIL!
2465 1n
3464 270R
2467 33n
2466 100n
2468 22n
+5V1
CLDAIC!
CL11!

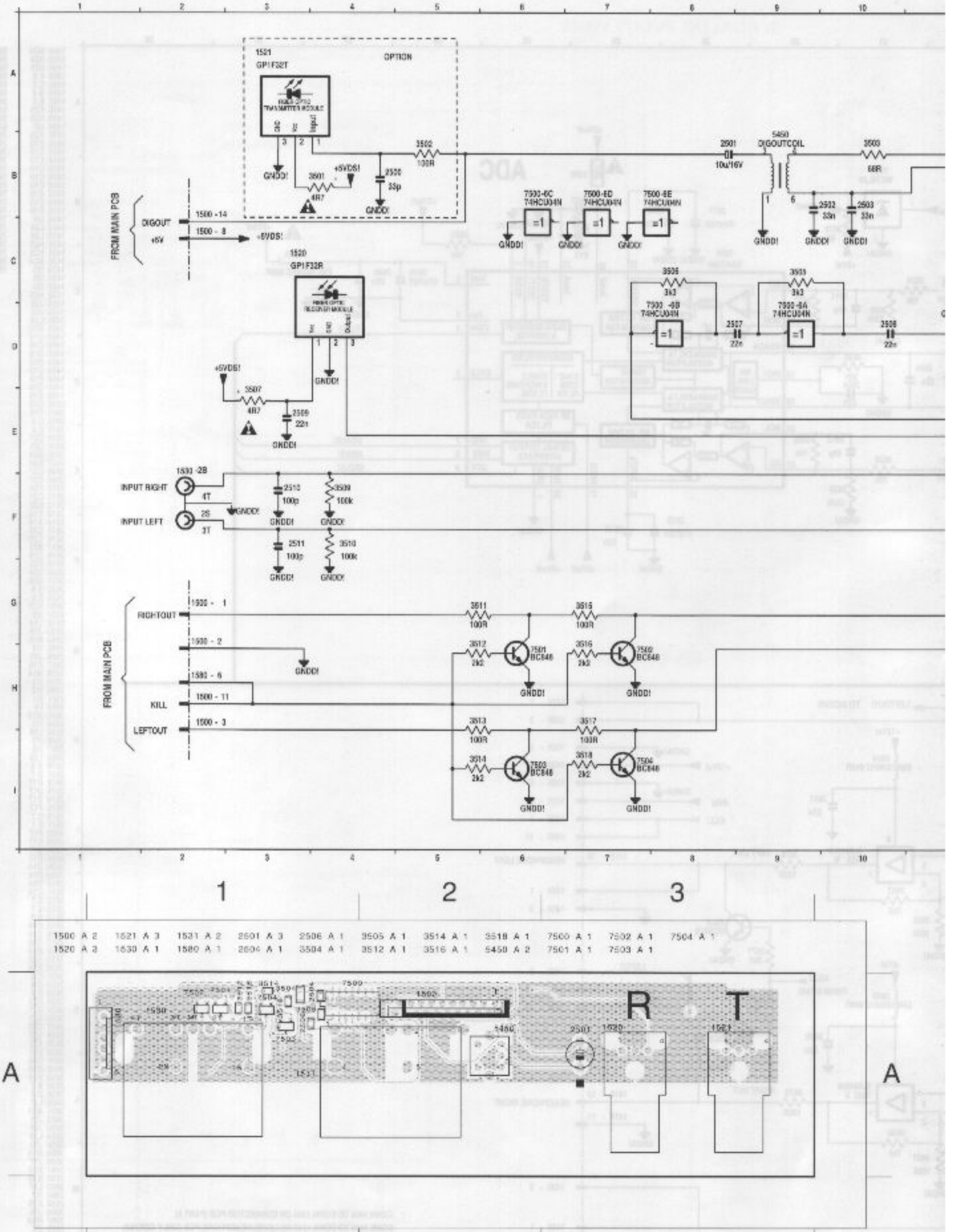
+12V1M
3430 300R
2430 47u/25V
2431 10n
6430 BZX284-6V1
7430 -2 B MC34072
3432 10k
2432 33n
3433 5k6
3434 5k6
2431 10nF
7430 -2 A MC34072
3437 270k
2434 180p
3439 0R
5431 BB212
1451 33.0MHz
1455 33MHz
3440 1N
2433 180p
3438 1k5
2435 180p
5432 EMI 100MHZ 600R
2441 22n
5431 EMI 100MHZ 600R
2436 22n

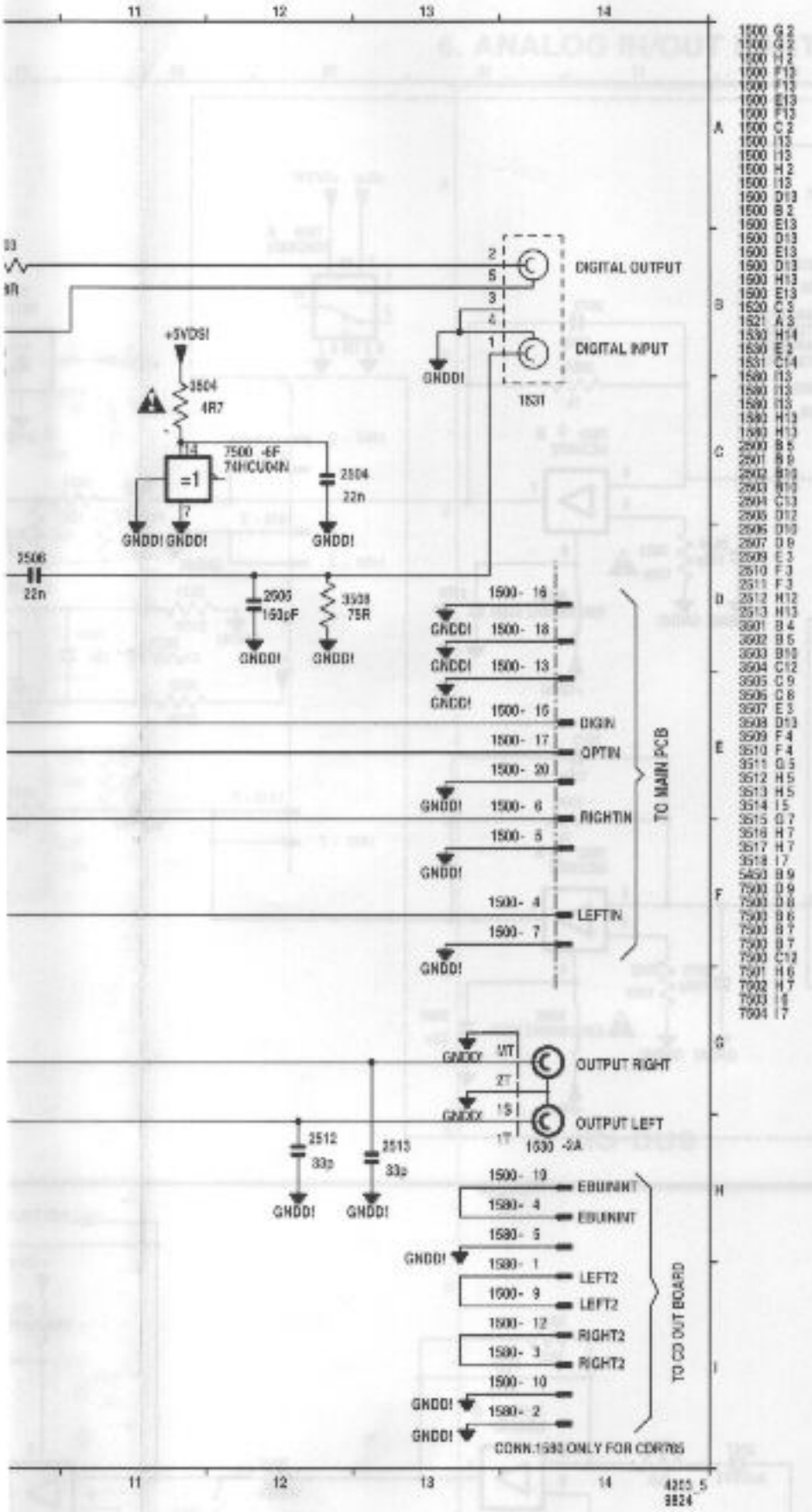
DIGIN!
OPTIN!
2440 22n
RSTLA!
FROM 3/7323-8

SDAUX! IISWS! IISCLK! IISWS! IISCLK! DAIN! 3445 47R CRIN! CLO3!


DAI-O-control 3
GDIN_control 3
OPTION
BAS316
3451 100R
2405 330u/6V3
3447 47k
7445 BC857
7446 BC857
3450 100k
TO 6/R3671,3672
3449 100k
3471 5k6
3470 5k6
7447 BC847B
7448 BC847B
3473 5k6
3472 5k6
FROM 3/7320-21
KILL_OUT!
3431 15k
2451 10nF
3440 1M
7440
TDA1373H/N2
GDINLD!
GDINDA!
GDINCL!
BS!
3445 47R
3446 47R
5420 EMI 22n
5421 EMI 100MHZ 30R
5422 EMI 22n
5423 EMI 100MHZ 30R
5424 EMI 22n
+5Vb!
+5Va!
+5VM!
+12Vs!
+12Vb!
-8Vs!
VDC2!
VFTD!
VDC1!
2463 47u/25V
2462 47u/25V
2439 47u/25V
2436 47u/25V
2437 47u/25V
2442 47u/25V
1440 - 1
1440 - 2
1440 - 3
1440 - 4
1440 - 5
1440 - 6
1440 - 7
1440 - 8
1440 - 9
1440 - 10
1440 - 11
FROM COMM. 0306 ON POWER SUPPLY
4203_4
9624

5 CONNECTOR PART





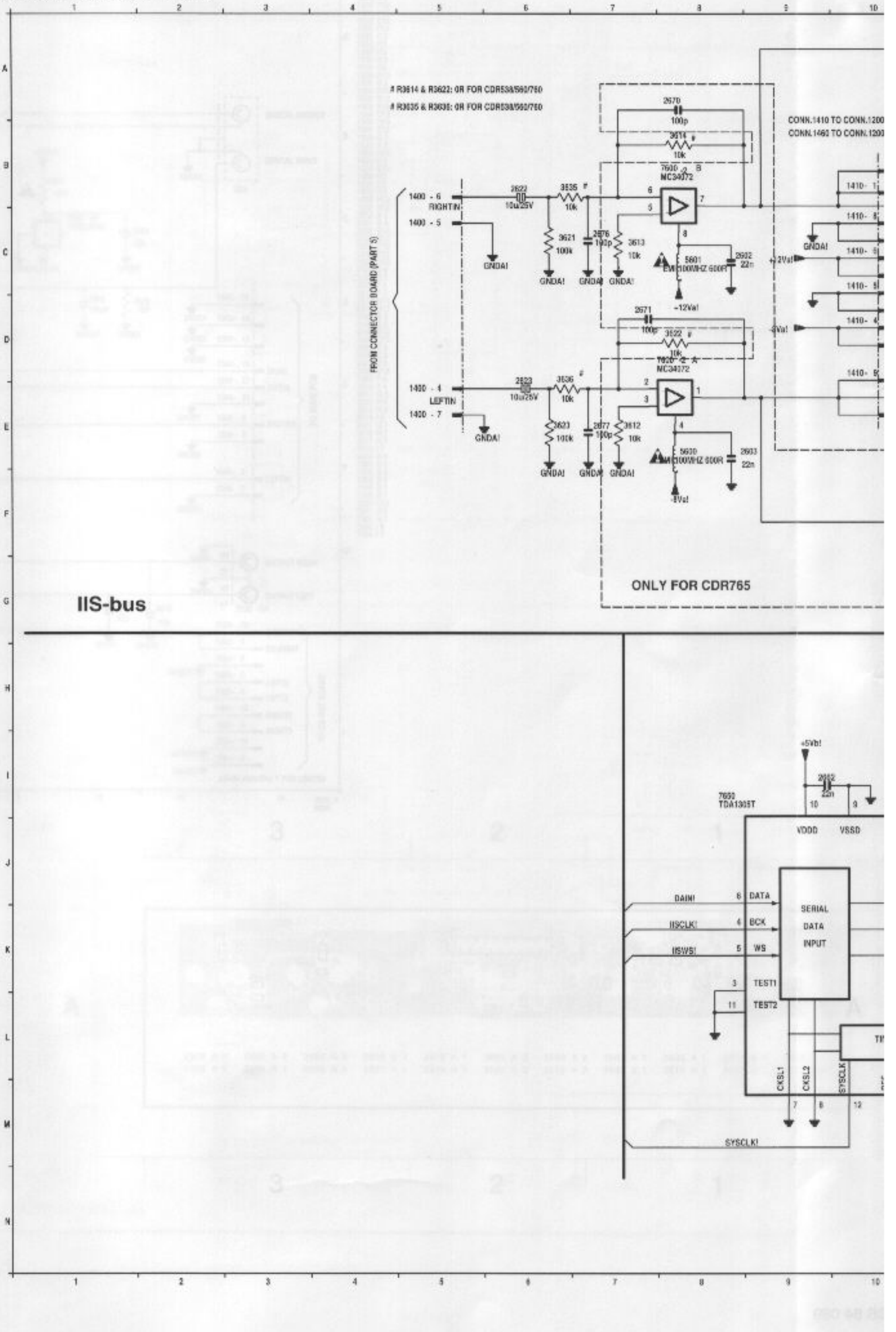
3 2 1

A A A

3 2 1

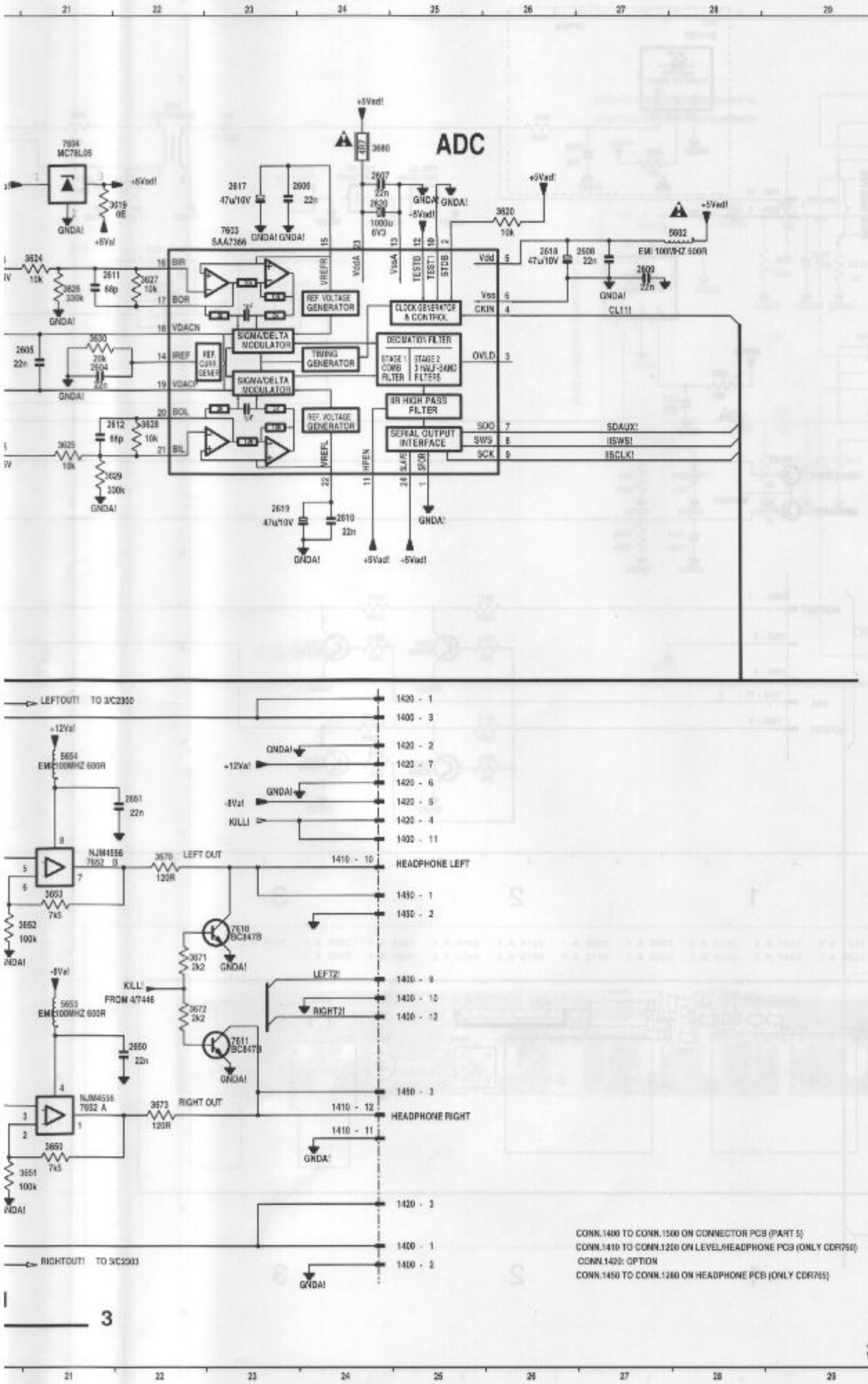
PCS 84 089

6. ANALOG IN/OUT PART



ADDA-control

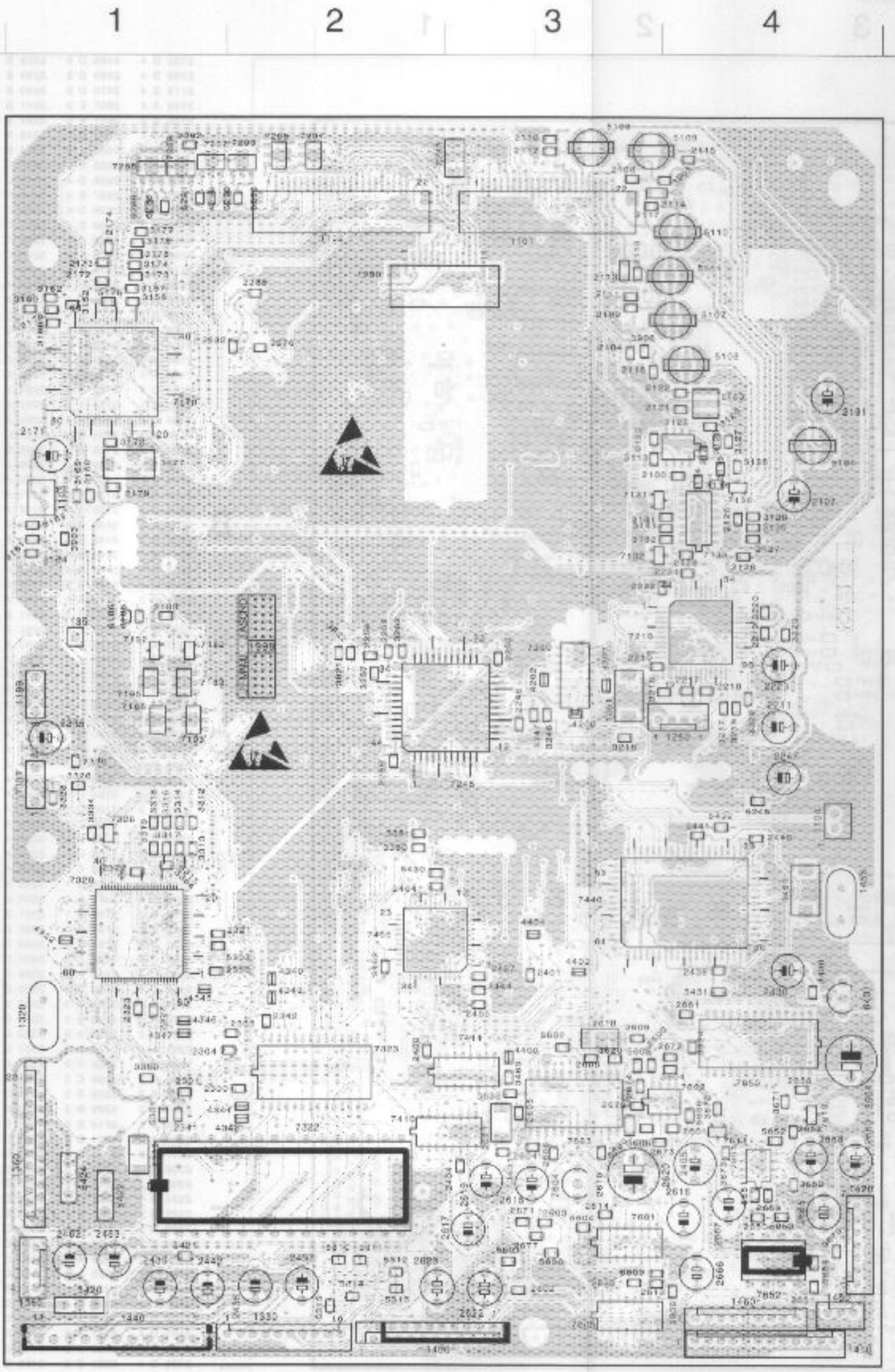
ADC



CONN.1400 TO CONN.1500 ON CONNECTOR PCB (PART 5)
CONN.1410 TO CONN.1200 ON LEVEL/HEADPHONE PCB (ONLY CDR750)
CONN.1420: OPTION
CONN.1450 TO CONN.1280 ON HEADPHONE PCB (ONLY CDR765)

4223_6
9824

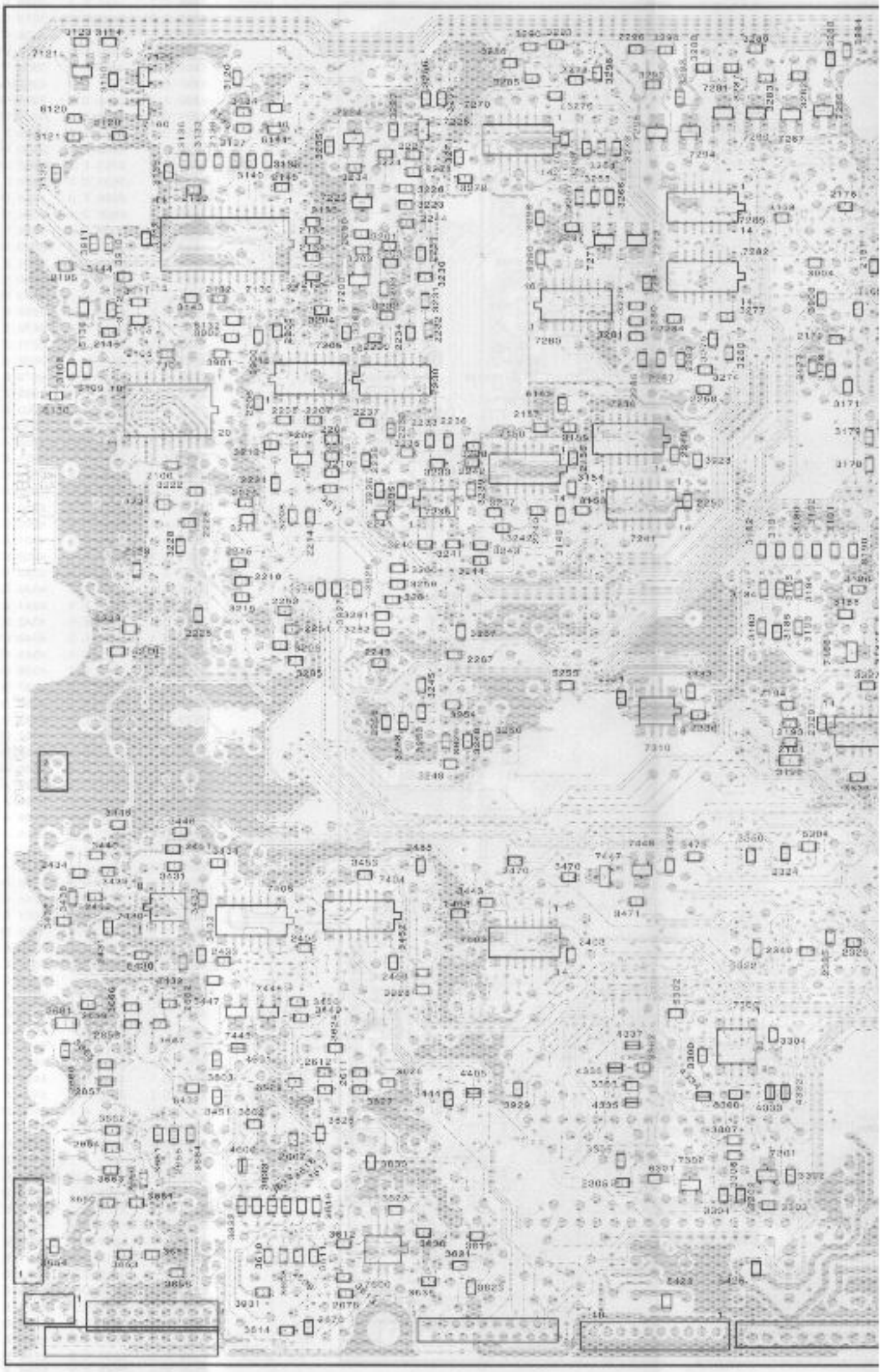
12-9



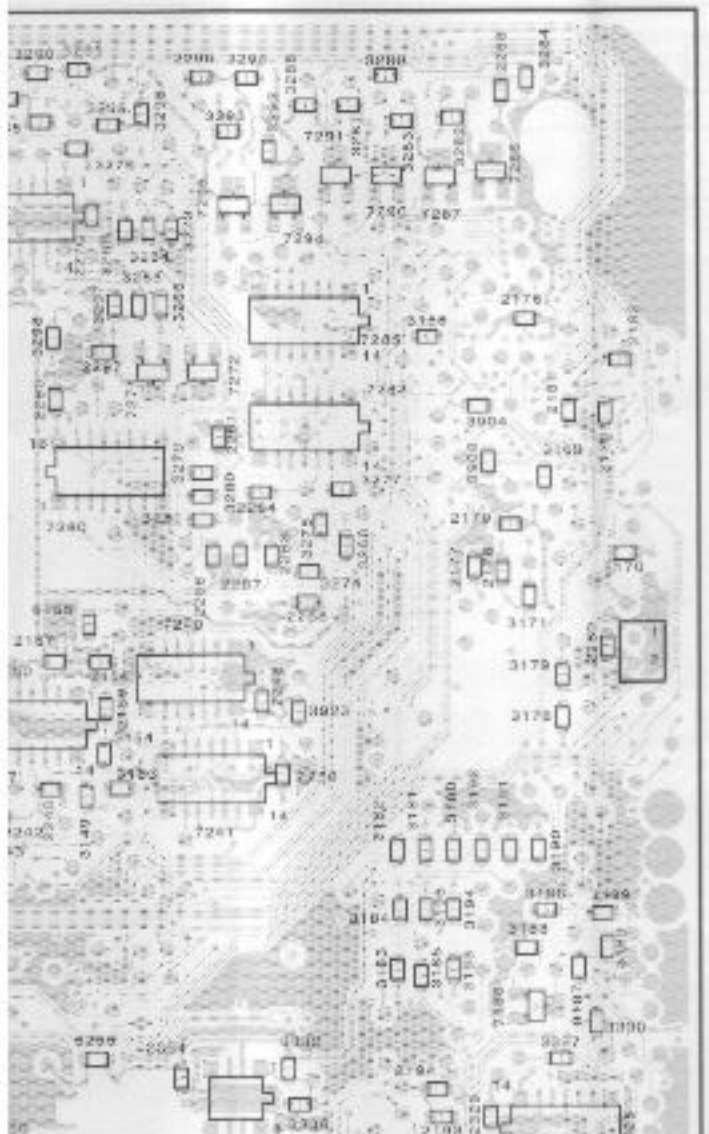
his assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective partslist.

1101 A 3	2438 D 4	3314 C 1	6286 A 2
1102 A 2	2439 E 1	3315 C 1	6296 A 2
1103 B 1	2440 C 4	3316 C 1	6431 D 4
1104 C 4	2441 C 4	3317 C 1	6600 E 2
1135 C 1	2442 E 1	3318 C 1	7125 B 4
1143 A 4	2462 E 1	3319 C 1	7131 B 3
1177 B 1	2463 E 1	3325 C 1	7132 B 3
1199 C 1	2464 D 2	3328 C 1	7136 B 4
1250 C 4	2466 D 3	3334 C 1	7136 B 4
1251 C 3	2467 D 3	3360 C 2	7170 A 1
1299 A 2	2600 D 3	3361 C 2	7182 C 1
1301 C 1	2601 E 4	3364 D 1	7183 C 1
1329 D 1	2602 E 3	3380 E 1	7185 C 1
1330 E 2	2603 E 3	3430 D 4	7192 C 1
1340 E 1	2604 E 3	3462 D 2	7193 C 1
1350 E 1	2605 E 3	3463 E 3	7196 C 1
1400 E 2	2606 E 3	3464 D 3	7210 D 4
1413 E 4	2608 D 3	3604 E 4	7245 C 3
1420 E 4	2609 D 3	3606 E 3	7260 C 3
1440 E 1	2610 E 3	3620 D 3	7288 A 1
1450 E 4	2613 E 3	3631 E 3	7289 A 1
1451 D 4	2614 E 3	3632 E 3	7292 A 1
1455 D 4	2615 E 3	3633 E 3	7293 A 2
1460 E 4	2616 E 4	3659 E 4	7296 A 2
2100 B 4	2617 E 3	3670 E 4	7297 A 2
2104 A 3	2618 D 3	3671 E 4	7320 D 1
2107 B 4	2619 E 3	3672 E 4	7322 E 2
2108 A 3	2620 E 3	3673 E 4	7323 E 2
2109 A 3	2621 E 3	3680 E 3	7326 C 1
2110 A 3	2622 E 3	3903 B 1	7410 E 3
2111 A 3	2623 E 2	3905 A 4	7411 E 3
2112 A 3	2650 E 4	3905 A 3	7440 D 4
2113 A 3	2651 E 4	3921 C 2	7485 D 2
2114 A 3	2652 E 4	3922 C 2	7501 E 3
2115 A 4	2653 E 4	3924 D 4	7502 E 4
2116 A 3	2658 E 4	3930 E 4	7503 E 3
2117 A 3	2661 D 4	4200 C 3	7804 E 3
2118 A 3	2663 E 4	4201 C 3	7805 E 3
2121 A 4	2664 D 4	4202 C 3	7810 E 4
2122 A 4	2665 E 4	4322 D 1	7811 E 4
2125 B 4	2666 E 4	4340 D 2	7850 D 4
2126 B 4	2667 E 4	4341 E 2	7851 E 4
2127 B 4	2668 E 4	4342 E 2	7852 E 4
2128 B 4	2671 E 3	4343 D 2	
2129 B 4	2672 D 4	4345 D 1	
2131 A 4	2673 E 3	4346 D 1	
2171 B 1	2674 E 3	4347 D 1	
2172 A 1	2675 E 3	4400 D 3	
2173 A 1	2677 E 3	4401 D 3	
2174 A 1	3113 B 3	4402 D 3	
2175 A 1	3114 B 4	5104 B 4	
2183 B 1	3115 B 4	5106 A 3	
2210 C 3	3116 B 4	5107 A 4	
2211 C 4	3125 B 4	5108 A 4	
2217 C 4	3126 B 4	5109 A 3	
2218 C 4	3127 B 4	5110 A 4	
2219 C 4	3128 B 4	5111 A 4	
2220 B 4	3129 B 4	5176 A 1	
2221 B 4	3130 B 4	5179 B 1	
2222 B 4	3131 B 4	5245 C 4	
2223 C 4	3132 B 4	5301 E 1	
2243 A 3	3141 B 4	5303 D 1	
2246 C 3	3152 A 1	5310 E 2	
2247 C 4	3156 A 1	5311 E 2	
2268 C 3	3157 A 1	5312 E 2	
2256 C 2	3160 A 1	5313 E 2	
2259 C 2	3161 B 1	5314 E 2	
2262 C 2	3162 A 1	5315 E 2	
2282 A 2	3163 B 1	5420 E 1	
2285 A 2	3164 B 1	5421 E 1	
2282 A 1	3165 B 1	5422 E 1	
2300 E 2	3166 A 1	5424 E 1	
2301 E 1	3168 B 1	5430 D 2	
2303 D 2	3172 B 1	5431 D 4	
2304 D 2	3173 A 1	5432 C 4	
2321 D 1	3174 A 1	5600 E 3	
2322 D 1	3175 A 1	5601 E 3	
2323 D 1	3176 A 1	5602 D 3	
2327 D 1	3177 A 1	5604 E 3	
2330 C 1	3216 C 4	5605 D 3	
2335 C 1	3217 C 4	5606 E 4	
2338 E 1	3218 C 3	5651 E 4	
2341 E 1	3219 C 4	5652 E 4	
2342 D 2	3220 C 4	5653 E 4	
2350 D 1	3229 C 4	5654 E 4	
2400 D 2	3246 C 3	6125 B 3	
2401 D 3	3247 C 3	6195 B 1	
2404 E 3	3257 C 2	6198 B 1	
2405 E 4	3262 C 2	6285 A 1	
2430 D 4	3276 A 2	6286 A 1	
2436 E 2	3312 C 1	6290 A 1	
2437 E 2	3313 C 1	6291 A 1	

R MAINBOARD BOTTOM SIDE



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



2105 B 4	2468 D 3	3238 B 3	3471 D 2	7121 A 4
2106 B 4	2469 D 3	3239 B 3	3472 D 2	7130 A 4
2119 B 4	2470 D 2	3240 B 3	3473 D 2	7150 B 2
2120 A 4	2607 E 3	3241 B 3	3602 E 3	7160 A 4
2130 A 4	2611 E 3	3242 B 2	3603 E 4	7180 C 1
2132 A 4	2612 E 3	3243 B 3	3608 E 3	7200 A 3
2134 A 3	2654 E 4	3244 B 3	3609 E 3	7205 B 3
2135 A 3	2655 E 4	3245 C 3	3610 E 3	7209 B 3
2136 A 3	2656 D 4	3246 C 3	3611 E 3	7223 A 3
2138 A 3	2657 E 4	3249 C 3	3612 E 3	7224 A 3
2139 A 4	2658 D 4	3250 C 2	3613 E 3	7225 A 3
2140 A 3	2660 E 4	3251 C 3	3614 E 3	7230 B 3
2156 B 2	2662 D 4	3252 C 3	3615 E 3	7235 B 3
2157 B 2	2670 E 3	3253 C 3	3616 E 3	7240 B 2
2170 A 1	2676 E 3	3254 C 3	3617 E 3	7241 B 2
2176 A 1	3108 B 4	3255 A 3	3618 E 3	7270 A 2
2177 B 1	3109 B 4	3256 A 3	3619 E 3	7271 A 2
2178 B 1	3111 A 4	3258 C 3	3621 E 3	7272 A 2
2179 B 1	3112 A 4	3259 C 3	3622 E 3	7280 A 2
2180 B 1	3120 A 4	3260 C 3	3623 E 3	7282 A 2
2181 A 1	3121 A 4	3261 C 3	3624 E 3	7285 A 2
2182 A 1	3122 A 4	3263 B 3	3625 E 3	7286 A 1
2184 C 1	3123 A 4	3264 A 2	3626 E 3	7287 A 1
2193 C 1	3124 A 4	3265 A 2	3627 E 3	7290 A 1
2194 C 1	3133 A 4	3266 A 2	3628 E 3	7291 A 1
2195 A 4	3134 A 4	3267 C 3	3629 E 3	7294 A 2
2200 A 3	3135 A 4	3268 B 1	3630 E 3	7295 A 2
2203 A 3	3136 A 4	3269 A 2	3635 E 3	7300 E 1
2204 B 3	3137 A 4	3270 A 2	3636 E 3	7301 E 1
2205 B 3	3138 A 3	3271 A 3	3650 E 4	7302 E 2
2206 B 3	3139 A 4	3272 A 3	3651 E 4	7310 C 2
2207 B 3	3140 A 3	3273 A 2	3652 E 4	7325 C 1
2208 B 3	3142 A 4	3274 B 2	3653 E 4	7403 D 2
2214 B 3	3143 A 4	3275 B 2	3654 E 4	7404 D 3
2215 B 4	3144 A 4	3277 A 1	3658 E 4	7405 D 3
2216 C 4	3145 B 2	3279 A 2	3660 E 4	7430 D 4
2224 B 3	3150 A 4	3280 A 2	3661 E 4	7445 D 4
2225 C 4	3153 B 2	3281 B 2	3662 E 4	7446 D 3
2226 B 4	3154 B 2	3282 A 1	3663 E 4	7447 D 2
2227 A 3	3155 B 2	3283 A 1	3664 E 4	7448 D 2
2228 B 4	3156 A 1	3284 A 1	3665 E 4	7600 E 3
2229 C 4	3169 A 1	3285 A 2	3666 D 4	
2230 B 3	3171 B 1	3286 A 2	3667 D 4	
2231 A 3	3175 B 1	3287 A 1	3681 D 4	
2232 B 3	3179 B 1	3288 A 2	3900 B 3	
2233 B 3	3180 B 1	3289 A 1	3901 B 4	
2234 B 3	3181 B 1	3290 A 2	3902 B 4	
2235 B 3	3182 B 1	3291 A 2	3904 A 1	
2236 B 3	3183 C 1	3292 A 2	3908 A 1	
2237 B 3	3184 C 1	3293 A 2	3910 A 4	
2238 B 3	3185 C 1	3294 A 2	3911 A 4	
2239 B 3	3186 C 1	3295 A 2	3920 C 3	
2240 B 2	3187 C 1	3296 A 2	3923 B 2	
2241 B 3	3188 C 1	3297 A 2	3925 C 3	
2242 B 3	3189 C 1	3298 A 2	3926 C 3	
2244 A 3	3190 B 1	3299 A 3	3927 C 3	
2245 C 3	3191 B 1	3300 E 2	3928 D 3	
2248 B 2	3192 B 1	3301 E 1	3929 E 2	
2260 B 2	3193 C 1	3302 E 1	3931 E 3	
2251 C 3	3194 C 1	3303 E 1	3932 E 4	
2252 C 3	3195 C 1	3304 D 1	3933 E 3	
2258 C 3	3196 C 1	3305 E 2	4332 E 1	
2267 C 3	3198 C 1	3306 E 1	4333 E 1	
2268 B 2	3201 A 3	3307 E 1	4334 E 2	
2270 A 2	3202 A 3	3322 D 1	4335 E 2	
2280 A 2	3203 A 3	3323 D 1	4336 E 2	
2281 A 2	3204 A 3	3327 C 1	4337 E 2	
2283 B 2	3205 C 3	3330 C 1	4405 E 3	
2284 A 2	3206 C 3	3332 C 2	4600 E 4	
2286 B 2	3208 B 3	3333 C 1	4601 E 4	
2287 B 2	3209 B 3	3350 D 1	5105 A 4	
2288 A 1	3210 B 3	3362 E 2	5130 A 4	
2296 A 2	3211 B 3	3363 E 2	5132 A 4	
2297 A 2	3212 B 3	3431 D 4	5170 B 1	
2302 E 1	3213 B 3	3432 D 4	5210 C 4	
2305 E 2	3215 C 4	3433 D 4	5223 C 4	
2324 D 1	3221 B 4	3434 D 4	5255 C 2	
2325 D 1	3222 B 4	3437 D 4	5302 D 2	
2326 D 1	3223 A 3	3438 D 4	5304 D 1	
2329 C 1	3224 A 3	3439 D 4	5423 E 2	
2334 C 2	3225 A 3	3440 D 4	5425 E 1	
2336 C 2	3226 A 3	3443 D 2	6120 A 4	
2340 D 1	3227 A 3	3444 E 3	6130 B 4	
2403 D 2	3228 B 4	3445 D 4	6140 A 3	
2406 D 3	3230 A 3	3446 D 4	6141 A 3	
2431 D 4	3231 A 3	3447 D 4	6155 B 2	
2432 D 4	3232 A 3	3449 D 3	6300 E 1	
2433 D 4	3233 B 3	3450 D 3	6301 E 2	
2434 D 4	3234 A 3	3451 E 4	6430 D 4	
2435 D 4	3235 B 3	3452 D 3	6432 E 4	
2461 D 4	3236 B 3	3453 D 3	7105 B 4	
2465 D 3	3237 B 2	3470 D 2	7120 A 4	

used in a specific version see schematic diagram and respective partslist.

ELECTRICAL PARTSLIST

MAINBOARD

MISCELLANEOUS

1001	4822 214 12845	MAINBOARD ASSY CDR560
1101	4822 267 60409	CONN 22P FEMALE
1102	4822 267 60409	CONN 22P FEMALE
1143	4822 242 82075	CRYSTAL 16 MHz
1177	4822 242 10557	XTL.RESONATOR 32 MHz
1251	4822 242 10757	CRYSTAL 33.868 000MHz
1290	4822 267 51454	CONN. 11P FEMALE
1320	4822 242 10236	LN-G102-139 (16MHZ)
1400	4822 267 10939	FLEX CONN. 20P. FEM. V
1500	4822 267 10939	FLEX CONN. 20P. FEM. V
1520	4822 218 11487	OPTICAL INPUT GP1F32R
1530	4822 265 11151	ANALOG INPUT/OUTPUT CINCH
1531	4822 267 31448	DIGITAL INPUT/OUTPUT CINCH

CAPACITORS

2104	4822 126 14104	82nF 10% 0805 X7R 16V
2105	5322 122 32654	22nF10%X7R 63V
2106	4822 126 13296	100nF10% X7R 16V
2107	4822 124 80483	47µF20% 6,3V
2108	4822 126 14104	82nF 10% 0805 X7R 16V
2109	4822 126 13482	470nF80/20% 16V
2110	4822 126 13482	470nF80/20% 16V
2111	4822 126 14104	82nF 10% 0805 X7R 16V
2112	4822 126 14104	82nF 10% 0805 X7R 16V
2113	4822 124 11353	1µF20% 16V
2114	4822 124 11353	1µF20% 16V
2115	4822 126 13482	470nF80/20% 16V
2116	4822 126 13482	470nF80/20% 16V
2117	5322 122 32654	22nF10%X7R 63V
2118	5322 122 32654	22nF10%X7R 63V
2119	4822 126 14104	82nF 10% 0805 X7R 16V
2120	5322 122 32654	22nF10%X7R 63V
2130	5322 122 32654	22nF10%X7R 63V
2131	4822 124 80483	47µF20% 6,3V
2132	5322 122 32654	22nF10%X7R 63V
2134	4822 122 33575	220pF 5%NPO 50V
2135	4822 122 33575	220pF 5%NPO 50V
2136	4822 122 33575	220pF 5%NPO 50V
2138	4822 122 33575	220pF 5%NPO 50V
2139	5322 116 80853	560pF 5%NP0 63V
2140	5322 122 32654	22nF10%X7R 63V
2156	5322 126 10223	4,7nF10%X7R 63V
2157	5322 122 32654	22nF10%X7R 63V
2170	5322 122 32654	22nF10%X7R 63V
2171	4822 124 40433	47µF20% 25V
2172	4822 122 33891	3,3nF10%X7R 63V
2173	4822 122 33891	3,3nF10%X7R 63V
2174	4822 122 33891	3,3nF10%X7R 63V
2175	5322 122 34123	1nF10%X7R 50V
2176	4822 126 13296	100nF10% X7R 16V
2177	5322 122 32659	33pF 5% 50V
2178	5322 122 32659	33pF 5% 50V
2179	4822 126 13296	100nF10% X7R 16V
2180	5322 122 32654	22nF10%X7R 63V
2181	5322 122 32654	22nF10%X7R 63V
2182	5322 122 32654	22nF10%X7R 63V
2183	4822 126 13296	100nF10% X7R 16V
2184	4822 122 33177	10nF 20% X7R 50V
2193	4822 122 33177	10nF 20% X7R 50V
2194	4822 122 33177	10nF 20% X7R 50V
2195	5322 122 32654	22nF10%X7R 63V
2200	4822 122 32646	5,6nF10%X7R 50V
2203	5322 122 32654	22nF10%X7R 63V
2204	5322 122 32654	22nF10%X7R 63V
2205	5322 122 32654	22nF10%X7R 63V
2206	4822 122 32627	2.7nF10%X7R 50V
2207	5322 126 10465	3,9nF 10% X7R 50V 0805 CER2
2208	5322 116 80853	560pF 5%NP0 63V
2210	5322 122 32654	22nF10%X7R 63V
2211	4822 124 80483	47µF20% 6,3V
2214	4822 126 13692	47pF 1% NP0 63V
2215	4822 122 33177	10nF 20% X7R 50V
2216	4822 122 33177	10nF 20% X7R 50V
2217	5322 122 32654	22nF10%X7R 63V
2218	5322 122 32654	22nF10%X7R 63V
2219	5322 122 32654	22nF10%X7R 63V
2220	5322 122 32654	22nF10%X7R 63V
2221	5322 122 32654	22nF10%X7R 63V
2222	5322 122 32654	22nF10%X7R 63V
2223	4822 124 80483	47µF20% 6,3V
2224	4822 126 13296	100nF10% X7R 16V
2225	5322 122 32448	10pF 5% 50V
2226	5322 122 32448	10pF 5% 50V
2227	4822 126 12105	33nF 5%X7R 63V
2228	4822 126 12105	33nF 5%X7R 63V
2229	4822 122 33177	10nF 20% X7R 50V
2230	5322 122 32654	22nF10%X7R 63V
2231	5322 122 32654	22nF10%X7R 63V
2232	4822 126 13618	330pF 1%NPO 63V
2233	4822 126 13618	330pF 1%NPO 63V
2234	4822 126 13618	330pF 1%NPO 63V
2235	5322 122 32654	22nF10%X7R 63V
2236	4822 126 13618	330pF 1%NPO 63V
2237	4822 126 13618	330pF 1%NPO 63V
2238	4822 126 13618	330pF 1%NPO 63V
2239	4822 126 13618	330pF 1%NPO 63V
2240	5322 122 32654	22nF10%X7R 63V
2241	4822 126 13618	330pF 1%NPO 63V
2242	5322 122 32654	22nF10%X7R 63V
2243	4822 124 11445	47µF20% 10V
2244	5322 122 32654	22nF10%X7R 63V
2245	5322 122 32654	22nF10%X7R 63V
2246	4822 126 13296	100nF10% X7R 16V
2247	4822 124 80483	47µF20% 6,3V
2248	5322 122 32654	22nF10%X7R 63V
2250	5322 122 32654	22nF10%X7R 63V
2251	4822 126 13486	15pF 2% NP0 63V
2252	4822 126 13486	15pF 2% NP0 63V
2255	5322 122 32654	22nF10%X7R 63V
2256	5322 122 32654	22nF10%X7R 63V
2259	5322 122 32659	33pF 5% 50V
2262	4822 126 10326	180pF 5%NP0 63V
2267	4822 126 13296	100nF10% X7R 16V
2268	4822 126 13296	100nF10% X7R 16V
2270	5322 122 32654	22nF10%X7R 63V
2280	5322 122 32654	22nF10%X7R 63V
2281	5322 122 32658	22pF 5% 50V
2282	5322 122 32654	22nF10%X7R 63V
2283	4822 126 13296	100nF10% X7R 16V
2284	5322 122 32654	22nF10%X7R 63V
2285	4822 126 13296	100nF10% X7R 16V
2286	5322 122 32658	22pF 5% 50V
2287	5322 122 32658	22pF 5% 50V
2288	4822 126 12105	33nF 5%X7R 63V
2292	4822 126 12105	33nF 5%X7R 63V
2296	4822 126 12105	33nF 5%X7R 63V

2297	4822 126 13296	100nF10% X7R 16V
2300	4822 126 13482	470nF80/20% 16V
2301	5322 122 32654	22nF10%X7R 63V
2302	4822 126 13482	470nF80/20% 16V
2303	4822 126 13482	470nF80/20% 16V
2304	5322 122 32654	22nF10%X7R 63V
2305	4822 126 13482	470nF80/20% 16V
2321	5322 122 32654	22nF10%X7R 63V
2322	5322 122 32654	22nF10%X7R 63V
2323	5322 122 32654	22nF10%X7R 63V
2324	5322 122 32654	22nF10%X7R 63V
2325	4822 126 13692	47pF 1% NP0 63V
2326	4822 126 13692	47pF 1% NP0 63V
2327	4822 122 33177	10nF 20% X7R 50V
2329	5322 122 32654	22nF10%X7R 63V
2330	4822 126 13296	100nF10% X7R 16V
2334	5322 122 32654	22nF10%X7R 63V
2336	4822 126 13692	47pF 1% NP0 63V
2339	4822 124 11445	47µF20% 10V
2340	5322 122 32654	22nF10%X7R 63V
2341	5322 122 32654	22nF10%X7R 63V
2342	5322 122 32654	22nF10%X7R 63V
2350	4822 126 12105	33nF 5%X7R 63V
2400	5322 122 32654	22nF10%X7R 63V
2401	5322 122 32654	22nF10%X7R 63V
2403	5322 122 32654	22nF10%X7R 63V
2404	5322 122 32654	22nF10%X7R 63V
2405	4822 124 42242	330µF20% 6,3V
2406	5322 122 32654	22nF10%X7R 63V
2436	4822 124 80483	47µF20% 6,3V
2437	4822 124 80483	47µF20% 6,3V
2439	4822 124 80483	47µF20% 6,3V
2442	4822 124 80483	47µF20% 6,3V
2462	4822 124 80483	47µF20% 6,3V
2463	4822 124 80483	47µF20% 6,3V
2464	5322 122 32654	22nF10%X7R 63V
2465	5322 122 34123	1nF10%X7R 50V
2466	4822 126 12102	330 nF 10% X7R 16V 0603
2467	4822 126 12105	33nF 5%X7R 63V
2468	5322 122 32654	22nF10%X7R 63V
2469	4822 126 13296	100nF10% X7R 16V
2501	4822 124 41579	10µF 20% 50V
2502	4822 126 12105	33nF 5%X7R 63V
2503	4822 126 12105	33nF 5%X7R 63V
2504	5322 122 32654	22nF10%X7R 63V
2505	5322 122 33538	150pF 2%NP0 63V
2506	5322 122 32654	22nF10%X7R 63V
2507	5322 122 32654	22nF10%X7R 63V
2509	5322 122 32654	22nF10%X7R 63V
2510	5322 122 32531	100pF 5%NP0 50V
2511	5322 122 32531	100pF 5%NP0 50V
2512	5322 122 32659	33pF 5% 50V
2513	5322 122 32659	33pF 5% 50V
2604	5322 122 32654	22nF10%X7R 63V
2605	5322 122 32654	22nF10%X7R 63V
2606	5322 122 32654	22nF10%X7R 63V
2607	5322 122 32654	22nF10%X7R 63V
2608	5322 122 32654	22nF10%X7R 63V
2609	5322 122 32654	22nF10%X7R 63V
2610	5322 122 32654	22nF10%X7R 63V
2611	4822 126 13694	68pF 1% NP0 63V
2612	4822 126 13694	68pF 1% NP0 63V
2615	4822 124 40246	4,7µF 20% 63V DXH=5X11
2616	4822 124 40246	4,7µF 20% 63V DXH=5X11
2617	4822 124 40433	47µF20% 25V
2618	4822 124 11445	47µF20% 10V
2619	4822 124 40433	47µF20% 25V
2620	4822 124 41829	1000µF20% 6,3V
2621	4822 124 11445	47µF20% 10V
2622	4822 124 80865	10µF20% 25V
2623	4822 124 80865	10µF20% 25V
2652	5322 122 32654	22nF10%X7R 63V
2653	5322 122 32654	22nF10%X7R 63V
2654	5322 122 32531	100pF 5%NP0 50V
2655	5322 122 32531	100pF 5%NP0 50V
2656	5322 126 10184	680P 5% NPO 50V.
2657	5322 126 10184	680pF 5% NPO 50V.
2658	5322 122 32654	22nF10%X7R 63V
2659	5322 122 32654	22nF10%X7R 63V
2660	5322 122 32654	22nF10%X7R 63V
2661	5322 122 32654	22nF10%X7R 63V
2662	5322 122 32654	22nF10%X7R 63V
2663	4822 124 41579	10µF 20% 50V
2664	4822 124 41829	1000µF20% 6,3V
2665	4822 124 80865	10µF20% 25V
2666	4822 124 80865	10µF20% 25V
2667	4822 124 40246	4,7µF 20% 63V DXH=5X11
2668	4822 124 40246	4,7µF 20% 63V DXH=5X11

RESISTORS

3108	4822 051 20472	4k7 5% 0,1W
3109	4822 117 10834	47k 1% 0,1W
3111	4822 051 20184	180k 5% 0,1W
3112	4822 051 20474	470k 5% 0,1W
3120	4822 051 20273	27k 5% 0,1W
3121	4822 051 20474	470k 5% 0,1W
3122	4822 051 20223	22k 5% 0,1W
3123	4822 051 20223	22k 5% 0,1W
3124	4822 051 20333	33k 5% 0,1W
3133	4822 051 20105	1M 5% 0,1W
3134	4822 051 20333	33k 5% 0,1W
3135	4822 051 20153	15k 5% 0,1W
3136	4822 117 10833	10k 1% 0,1W
3137	4822 051 20153	15k 5% 0,1W
3138	4822 117 10833	10k 1% 0,1W
3139	4822 051 20752	7k5 5% 0,1W
3140	4822 117 10834	47k 1% 0,1W
3142	4822 117 10833	10k 1% 0,1W
3143	4822 051 20105	1M 5% 0,1W
3144	4822 117 10833	10k 1% 0,1W
3149	4822 117 11449	2k2 1% 0,1W
3152	4822 051 20104	100k 5% 0,1W
3153	4822 051 10102	1k 2% 0,25W
3154	4822 051 10102	1k 2% 0,25W
3155	4822 051 20105	1M 5% 0,1W
3156	4822 051 20101	100Ω 5% 0,1W
3157	4822 051 20101	100Ω 5% 0,1W
3158	4822 051 20101	100Ω 5% 0,1W
3160	4822 051 20223	22k 5% 0,1W
3161	4822 051 20105	1M 5% 0,1W
3162	4822 051 20105	1M 5% 0,1W
3163	4822 051 20393	39k 5% 0,1W
3164	4822 051 20223	22k 5% 0,1W
3165	4822 051 20101	100Ω 5% 0,1W
3166	4822 051 20393	39k 5% 0,1W
3168	4822 051 20101	100Ω 5% 0,1W
3169	4822 051 20101	100Ω 5% 0,1W
3171	4822 051 20121	120Ω 5% 0,1W
3172	4822 051 20105	1M 5% 0,1W
3173	4822 051 20101	100Ω 5% 0,1W
3174	4822 051 20101	100Ω 5% 0,1W
3175	4822 051 20101	100Ω 5% 0,1W
3176	4822 051 20101	100Ω 5% 0,1W
3177	4822 051 20101	100Ω 5% 0,1W
3178	4822 051 20223	22k 5% 0,1W
3179	4822 051 20101	100Ω 5% 0,1W
3180	4822 117 10833	10k 1% 0,1W

3181	4822 051 20562	5k6 5% 0,1W 0805
3182	4822 051 20562	5k6 5% 0,1W 0805
3183	4822 051 20472	4k7 5% 0,1W
3184	4822 051 20101	100Ω 5% 0,1W
3185	4822 051 20101	100Ω 5% 0,1W
3186	4822 117 10833	10k 1% 0,1W
3187	4822 051 10102	1k 2% 0,25W
3188	4822 117 10833	10k 1% 0,1W
3189	4822 051 20109	10Ω 5% 0,1W
3190	4822 117 10833	10k 1% 0,1W
3191	4822 051 20562	5k6 5% 0,1W 0805
3192	4822 051 20562	5k6 5% 0,1W 0805
3193	4822 051 20472	4k7 5% 0,1W
3194	4822 051 20101	100Ω 5% 0,1W
3195	4822 051 20101	100Ω 5% 0,1W
3196	5322 117 11726	10Ω 5%
3201	4822 051 20223	22k 5% 0,1W
3202	4822 051 20393	39k 5% 0,1W
3203	4822 051 20109	10Ω 5% 0,1W
3204	4822 117 11454	820Ω 1% 0,1W
3205	4822 117 11504	270Ω 1% 0.1W
3206	4822 051 20105	1M 5% 0,1W
3208	4822 051 20229	22Ω 5% 0,1W
3209	4822 051 20223	22k 5% 0,1W
3210	4822 051 20393	39k 5% 0,1W
3211	4822 051 20109	10Ω 5% 0,1W
3212	4822 117 11454	820Ω 1% 0,1W
3213	4822 051 20472	4k7 5% 0,1W
3215	4822 117 10833	10k 1% 0,1W
3216	4822 051 20101	100Ω 5% 0,1W
3217	4822 051 20101	100Ω 5% 0,1W
3218	4822 051 20101	100Ω 5% 0,1W
3219	4822 051 20101	100Ω 5% 0,1W
3220	4822 051 20101	100Ω 5% 0,1W
3221	4822 051 20472	4k7 5% 0,1W
3222	4822 051 20101	100Ω 5% 0,1W
3223	4822 051 20229	22Ω 5% 0,1W
3224	4822 051 10102	1k 2% 0,25W
3225	4822 051 10102	1k 2% 0,25W
3226	4822 117 11454	820Ω 1% 0,1W
3227	4822 051 20561	560Ω 5% 0,1W
3228	4822 117 10833	10k 1% 0,1W
3229	4822 117 10833	10k 1% 0,1W
3230	4822 051 20472	4k7 5% 0,1W
3231	4822 117 11751	16k RC12H 1% 0805
3232	4822 117 11145	4k7 1% 0,1W
3233	4822 117 10839	130k 1% 0.1W
3234	4822 117 10833	10k 1% 0,1W
3235	4822 117 11751	16k RC12H 1% 0805
3236	4822 117 11145	4k7 1% 0,1W
3237	4822 117 10833	10k 1% 0,1W
3238	4822 117 10833	10k 1% 0,1W
3239	4822 117 10839	130k 1% 0.1W
3240	4822 117 10839	130k 1% 0.1W
3241	4822 051 20472	4k7 5% 0,1W
3242	4822 051 20105	1M 5% 0,1W
3243	4822 051 20564	560k 5% 0,1W
3244	4822 117 11449	2k2 1% 0,1W
3245	4822 051 20104	100k 5% 0,1W
3246	4822 051 20394	390k 5% 0,1W
3247	4822 117 11503	220Ω 1% 0.1W
3248	4822 051 20223	22k 5% 0,1W
3249	4822 051 20104	100k 5% 0,1W
3250	4822 051 20101	100Ω 5% 0,1W
3251	4822 051 20223	22k 5% 0,1W
3252	4822 051 20223	22k 5% 0,1W
3253	4822 051 20223	22k 5% 0,1W
3254	4822 051 20472	4k7 5% 0,1W
3255	4822 117 11449	2k2 1% 0,1W
3256	4822 051 20339	33Ω 5% 0,1W
3257	4822 051 20339	33Ω 5% 0,1W
3259	4822 117 10833	10k 1% 0,1W
3260	4822 117 11139	1k5 1% 0,1W
3261	4822 117 11449	2k2 1% 0,1W
3262	4822 051 20101	100Ω 5% 0,1W
3263	4822 117 10834	47k 1% 0,1W
3264	4822 051 10102	1k 2% 0,25W
3265	4822 051 10102	1k 2% 0,25W
3266	4822 051 10102	1k 2% 0,25W
3267	4822 117 10833	10k 1% 0,1W
3268	4822 051 20392	3k9 5% 0,1W
3269	4822 051 10102	1k 2% 0,25W
3270	4822 117 10965	18k 1% 0,1W
3271	4822 117 10965	18k 1% 0,1W
3272	4822 117 10965	18k 1% 0,1W
3273	4822 051 10102	1k 2% 0,25W
3274	4822 117 10965	18k 1% 0,1W
3275	4822 051 20223	22k 5% 0,1W
3276	4822 051 20223	22k 5% 0,1W
3277	4822 051 20223	22k 5% 0,1W
3279	4822 051 10102	1k 2% 0,25W
3280	4822 051 10102	1k 2% 0,25W
3281	4822 051 10102	1k 2% 0,25W
3282	4822 051 10102	1k 2% 0,25W
3283	4822 051 10102	1k 2% 0,25W
3284	4822 051 20479	47Ω 5% 0,1W
3285	4822 051 20562	5k6 5% 0,1W 0805
3286	4822 051 20562	5k6 5% 0,1W 0805
3287	4822 051 10102	1k 2% 0,25W
3288	4822 051 10102	1k 2% 0,25W
3289	4822 051 20479	47Ω 5% 0,1W
3290	4822 051 20562	5k6 5% 0,1W 0805
3291	4822 051 20562	5k6 5% 0,1W 0805
3292	4822 051 10102	1k 2% 0,25W
3293	4822 051 10102	1k 2% 0,25W
3294	4822 051 20479	47Ω 5% 0,1W
3295	4822 051 20562	5k6 5% 0,1W 0805
3296	4822 051 20562	5k6 5% 0,1W 0805
3297	4822 117 11503	220Ω 1% 0.1W
3298	4822 117 11503	220Ω 1% 0.1W
3299	4822 051 20229	22Ω 5% 0,1W
3300	4822 117 10834	47k 1% 0,1W
3301	4822 051 20684	680k 5% 0,1W
3302	4822 051 20471	470Ω 5% 0,1W
3303	4822 051 10102	1k 2% 0,25W
3304	4822 117 10834	47k 1% 0,1W
3305	4822 051 20684	680k 5% 0,1W
3306	4822 051 20471	470Ω 5% 0,1W
3307	4822 051 10102	1k 2% 0,25W
3312	4822 117 10833	10k 1% 0,1W
3313	4822 117 10833	10k 1% 0,1W
3315	4822 117 10833	10k 1% 0,1W
3317	4822 117 10833	10k 1% 0,1W
3319	4822 117 10833	10k 1% 0,1W
3322	4822 117 10833	10k 1% 0,1W
3323	4822 051 20105	1M 5% 0,1W
3326	4822 051 20104	100k 5% 0,1W
3327	4822 117 10833	10k 1% 0,1W
3328	4822 117 11507	6k8 1% 0,1W
3330	4822 051 20101	100Ω 5% 0,1W
3332	4822 051 10102	1k 2% 0,25W
3333	4822 117 10833	10k 1% 0,1W
3334	4822 117 10833	10k 1% 0,1W
3350	4822 051 20472	4k7 5% 0,1W
3360	4822 117 10833	10k 1% 0,1W
3362	4822 117 10833	10k 1% 0,1W

3363	4822 117 10833	10k 1% 0,1W
3364	4822 117 10833	10k 1% 0,1W
3380	4822 117 10833	10k 1% 0,1W
3443	4822 051 20223	22k 5% 0,1W
3444	4822 051 20223	22k 5% 0,1W
3447	4822 117 10834	47k 1% 0,1W
3449	4822 051 20104	100k 5% 0,1W
3450	4822 051 20104	100k 5% 0,1W
3451	4822 051 20101	100Ω 5% 0,1W
3452	4822 117 10833	10k 1% 0,1W
3453	4822 117 10833	10k 1% 0,1W
3462	4822 051 20223	22k 5% 0,1W
3463	4822 051 20223	22k 5% 0,1W
3464	4822 117 11504	270Ω 1% 0,1W
3470	4822 051 20562	5k6 5% 0,1W 0805
3471	4822 051 20562	5k6 5% 0,1W 0805
3472	4822 051 20562	5k6 5% 0,1W 0805
3473	4822 051 20562	5k6 5% 0,1W 0805
3503	4822 051 20689	68Ω 5% 0,1W
3504⚠	4822 117 11152	4Ω7 5%
3505	4822 051 20332	3k3 5% 0,1W
3506	4822 051 20332	3k3 5% 0,1W
3507⚠	4822 117 11152	4Ω7 5%
3508	4822 051 20759	75Ω 5% 0,1W
3509	4822 051 20104	100k 5% 0,1W
3510	4822 051 20104	100k 5% 0,1W
3511	4822 117 11373	100Ω 1% RC12H 0805
3512	4822 117 11449	2k2 1% 0,1W
3513	4822 117 11373	100Ω 1% RC12H 0805
3514	4822 117 11449	2k2 1% 0,1W
3515	4822 117 11373	100Ω 1% RC12H 0805
3516	4822 117 11449	2k2 1% 0,1W
3517	4822 117 11373	100Ω 1% RC12H 0805
3518	4822 117 11449	2k2 1% 0,1W
3614	4822 051 20008	0Ω JUMP. (0805)
3620	4822 117 10833	10k 1% 0,1W
3621	4822 051 20104	100k 5% 0,1W
3622	4822 051 20008	0Ω JUMP. (0805)
3623	4822 051 20104	100k 5% 0,1W
3624	4822 117 10833	10k 1% 0,1W
3625	4822 117 10833	10k 1% 0,1W
3626	4822 051 20334	330k 5% 0,1W
3627	4822 117 10833	10k 1% 0,1W
3628	4822 117 10833	10k 1% 0,1W
3629	4822 051 20334	330k 5% 0,1W
3630	4822 117 11188	20k 1% 0,1W
3631	4822 117 11504	270Ω 1% 0,1W
3632	4822 117 11504	270Ω 1% 0,1W
3635	4822 051 20008	0Ω JUMP. (0805)
3636	4822 051 20008	0Ω JUMP. (0805)
3654	4822 051 20104	100k 5% 0,1W
3658	4822 051 20104	100k 5% 0,1W
3659	4822 117 10833	10k 1% 0,1W
3660	4822 117 10833	10k 1% 0,1W
3661	4822 117 11437	8k2 1% 0,1W
3662	4822 117 11437	8k2 1% 0,1W
3663	4822 117 13085	5k6 1% RC12H 0,1W 0805
3664	4822 117 13085	5k6 1% RC12H 0,1W 0805
3665	4822 051 20223	22k 5% 0,1W
3666	4822 051 20223	22k 5% 0,1W
3667	4822 117 10834	47k 1% 0,1W
3680⚠	4822 117 11152	4Ω7 5%
3681⚠	4822 117 11152	4Ω7 5%
3900	4822 051 20008	0Ω JUMP. (0805)
3901	4822 051 20008	0Ω JUMP. (0805)
3902	4822 051 20008	0Ω JUMP. (0805)
3903	4822 051 20008	0Ω JUMP. (0805)
3904	4822 051 20008	0Ω JUMP. (0805)
3905	4822 051 20008	0Ω JUMP. (0805)
3906	4822 051 20008	0Ω JUMP. (0805)
3908	4822 051 20008	0Ω JUMP. (0805)
3911	4822 051 20008	0Ω JUMP. (0805)
3920	4822 051 20008	0Ω JUMP. (0805)
3921	4822 051 20101	100Ω 5% 0,1W
3922	4822 051 20101	100Ω 5% 0,1W
3923	4822 117 10834	47k 1% 0,1W
3924	4822 051 20472	4k7 5% 0,1W
4xxx	4822 051 20008	0□ JUMP. (0805)

COILS

5104	4822 157 71659	100µH 15% 7A06L
5105⚠	4822 157 71206	BLM21A601SPT
5106	4822 157 71658	27µH 15% 7A06L
5107	4822 157 71658	27µH 15% 7A06L
5108	4822 157 71658	27µH 15% 7A06L
5109	4822 157 71658	27µH 15% 7A06L
5110	4822 157 71659	100µH 15% 7A06L
5111	4822 157 71659	100µH 15% 7A06L
5130⚠	4822 157 71206	BLM21A601SPT
5132⚠	4822 157 71206	BLM21A601SPT
5170⚠	4822 157 71206	BLM21A601SPT
5176⚠	4822 157 71206	BLM21A601SPT
5179⚠	4822 157 71206	BLM21A601SPT
5210⚠	4822 157 71206	BLM21A601SPT
5223⚠	4822 157 71206	BLM21A601SPT
5245⚠	4822 157 71206	BLM21A601SPT
5255⚠	4822 157 71206	BLM21A601SPT
5301⚠	4822 157 71206	BLM21A601SPT
5302⚠	4822 157 71206	BLM21A601SPT
5303⚠	4822 157 71206	BLM21A601SPT
5304⚠	4822 157 71206	BLM21A601SPT
5310	4822 242 10958	NFM39R12C102T1
5311	4822 242 10958	NFM39R12C102T1
5312	4822 242 10958	NFM39R12C102T1
5313	4822 242 10958	NFM39R12C102T1
5314	4822 242 10958	NFM39R12C102T1
5315	4822 242 10958	NFM39R12C102T1
5420	4822 242 82201	DSS306-92F223Z16
5421	4822 157 11716	BLM21P300SPT
5422	4822 242 82201	DSS306-92F223Z16
5423	4822 157 11716	BLM21P300SPT
5424	4822 242 82201	DSS306-92F223Z16
5425	4822 157 11716	BLM21P300SPT
5430⚠	4822 157 71206	BLM21A601SPT
5450	4822 157 70601	100µH (920927085A)
5602⚠	4822 157 71206	BLM21A601SPT
5651⚠	4822 157 71206	BLM21A601SPT
5652⚠	4822 157 71206	BLM21A601SPT

DIODES

6120	4822 130 10654	BAT254
6130	4822 130 11397	BAS316
6140	4822 130 11397	BAS316
6141	4822 130 11397	BAS316
6155	4822 130 10654	BAT254
6185	4822 130 11397	BAS316
6186	4822 130 11397	BAS316
6285	4822 130 11397	BAS316
6286	4822 130 11397	BAS316
6290	4822 130 11397	BAS316
6291	4822 130 11397	BAS316
6295	4822 130 11397	BAS316
6296	4822 130 11397	BAS316
6300	4822 130 11397	BAS316
6301	4822 130 11397	BAS316
6432	4822 130 11397	BAS316

TRANSISTORS AND INTEGRATED CIRCUITS

7105	4822 209 15602	SZA1010T/k1
7120	5322 130 44787	BFR31
7121	5322 130 60508	BC857B
7130	4822 209 33421	OQ8845
7150	4822 209 30732	LM319D
7170	4822 209 14785	SERVO CONTROLLER V 2.1
7182	5322 130 60508	BC857B
7183	4822 130 60142	BC869
7185	5322 130 61569	BC868
7186	4822 130 60511	BC847B
7192	5322 130 60508	BC857B
7193	4822 130 60142	BC869
7195	5322 130 61569	BC868
7200	4822 130 60511	BC847B
7205	4822 209 60792	74HC4053D
7209	4822 130 60511	BC847B
7210	4822 209 16438	CD65WD
7223	5322 130 42718	BFS20
7224	4822 130 60383	BF824
7225	5322 130 42718	BFS20
7230	5322 209 61482	PC74HC4066T
7235	4822 209 30095	LM833D
7240	5322 209 61482	PC74HC4066T
7241	5322 209 73179	74HCT74D
7245	4822 209 33417	TDA1371H/N1
7270	4822 209 31615	LM324AD
7271	4822 130 60511	BC847B
7272	5322 130 60508	BC857B
7280	4822 209 60792	74HC4053D
7282	4822 209 31615	LM324AD
7285	5322 209 61482	PC74HC4066T
7286	4822 130 60511	BC847B
7287	5322 130 60508	BC857B
7288	4822 130 60142	BC869
7289	5322 130 61569	BC868
7290	4822 130 60511	BC847B
7291	5322 130 60508	BC857B
7292	4822 130 60142	BC869
7293	5322 130 61569	BC868
7294	4822 130 60511	BC847B
7295	5322 130 60508	BC857B
7296	4822 130 60142	BC869
7297	5322 130 61569	BC868
7300	4822 209 30095	LM833D
7301	4822 130 60511	BC847B
7302	4822 130 60511	BC847B
7310	4822 209 31275	MC34064D5
7320	4822 209 16834	MC68HC08AB0
7322	4822 209 16934	IC USER CDR560
7323	4822 209 16439	CY6264-70SNC
7325	5322 209 11548	74HC14D
7326	4822 130 60511	BC847B
7403	5322 209 61482	PC74HC4066T
7404	5322 209 61482	PC74HC4066T
7405	5322 209 73179	74HCT74D
7410	5322 209 61132	PC74HCT4052T
7411	5322 209 61132	PC74HCT4052T
7445	5322 130 60508	BC857B
7446	5322 130 60508	BC857B
7447	4822 130 60511	BC847B
7448	4822 130 60511	BC847B
7465	4822 209 33395	TDA1315H/N2
7500	5322 209 11517	PC74HCU04T
7501	4822 130 60511	BC847B
7502	4822 130 60511	BC847B
7503	4822 130 60511	BC847B
7504	4822 130 60511	BC847B
7603	4822 209 33397	SAA7366T
7604	4822 209 72042	L78L05ACZ
7650	4822 209 33403	TDA1305T/N2
7651	4822 209 30095	LM833D

DISPLAY BOARD

MISCELLANEOUS

1002/3	4822 256 10522	FTD HOLDER
1201	4822 276 13114	TACT SWITCH
1202	4822 276 13114	TACT SWITCH
1203	4822 276 13114	TACT SWITCH
1204	4822 276 13114	TACT SWITCH
1205	4822 276 13114	TACT SWITCH
1206	4822 276 13114	TACT SWITCH
1207	4822 276 13114	TACT SWITCH
1208	4822 276 13114	TACT SWITCH
1209	4822 276 13114	TACT SWITCH
1210	4822 276 13114	TACT SWITCH
1211	4822 276 13114	TACT SWITCH
1212	4822 276 13114	TACT SWITCH
1213	4822 276 13114	TACT SWITCH
1230	4822 242 10753	CSTCS8,00MT-TC
1295	4822 276 13489	ON/OFF SWITCH

CAPACITORS

2200	5322 122 32654	22nF10%X7R 63V
2201	5322 122 32658	22pF 5% 50V
2202	5322 122 32658	22pF 5% 50V
2203	5322 122 32654	22nF10%X7R 63V
2204	5322 122 32658	22pF 5% 50V
2205	5322 122 32658	22pF 5% 50V
2206	4822 126 12105	33nF 5%X7R 63V
2207	5322 122 32654	22nF10%X7R 63V
2208	5322 122 32654	22nF10%X7R 63V
2209	5322 122 32654	22nF10%X7R 63V

RESISTORS

3200	4822 051 20393	39k 5% 0,1W
3201	4822 051 10102	1k 2% 0,25W
3202	4822 051 10102	1k 2% 0,25W
3205	4822 051 20101	100Ω 5% 0,1W
3206	4822 051 20101	100Ω 5% 0,1W
3207	4822 051 20472	4k7 5% 0,1W
3210	4822 051 20472	4k7 5% 0,1W
3211	4822 051 20472	4k7 5% 0,1W
3212	4822 051 20472	4k7 5% 0,1W
3213	4822 051 20472	4k7 5% 0,1W
3214	4822 051 20472	4k7 5% 0,1W
3215	4822 051 20008	0Ω JUMP. (0805)
3216	4822 051 20008	0Ω JUMP. (0805)
3220	4822 117 11449	2k2 1% 0,1W
3221	4822 117 10833	10k 1% 0,1W
3222	4822 117 10833	10k 1% 0,1W
3223	4822 117 10833	10k 1% 0,1W
3224	4822 117 10833	10k 1% 0,1W
3299	4822 100 90108	20k
4xxx	4822 051 10008	0Ω 5% 0,25W
4019	4822 051 20008	0Ω JUMP. (0805)
4030	4822 051 20008	0Ω JUMP. (0805)
4034	4822 051 20008	0Ω JUMP. (0805)
4041	4822 051 20008	0Ω JUMP. (0805)

INTEGRATED CIRCUITS

6200	4822 212 30842	TSOP1736SB1
6201	4822 130 11088	BZX284-C2V4
7200	4822 209 16055	TMP87PM74ZF
7205	4822 135 00251	BJ363Gk
7350	4822 209 30095	LM833D

CONNECTIONS

8001	4822 320 12499	CWAS FLEX CDR 20P

POWER SUPPLY BOARD

MISCELLANEOUS

1003	4822 218 11938	PSU ASSY 20PS314/00
4⚠	4822 265 31015	MAINS INLET /00
9⚠	4822 256 92053	FUSE HOLDER CLICK (PROM)
1120⚠	4822 070 32002	FUSE 218002.(2A)
1125	4822 252 60151	SURGE PROTECT DSP-501N-A21F A

CAPACITORS

2101	4822 126 13695	82pF 1% NP0 63V
2102	5322 126 10511	1nF 5%NP0 50V
2103	5322 122 32268	470pF 10% 50V
2104	5322 126 10223	4,7nF10%X7R 63V
2109	5322 122 31865	1,5nF10%X7R 63V
2110	4822 124 41576	2,2µF 20% 50V
2111	4822 126 13196	100nF 10% 0805 X7R 25V
2113	4822 122 33127	2,2nF10%X7R 63V
2114	4822 126 13196	100nF 10% 0805 X7R 25V
2120	4822 121 10799	330nF 20% MPP 250V
2121	4822 124 12281	150µF 20% 400V
2125	4822 121 51598	2,2nF 5% 400V
2126	4822 121 51598	2,2nF 5% 400V
2127	4822 126 14496	470pF 10% 1KV
2129	4822 124 81024	4,7µF20% 50V
2131⚠	4822 126 14497	2,2nF 20% 250V
2133	4822 124 12062	100uF 20% 25V
2201	4822 126 13196	100nF 10% 0805 X7R 25V
2202	5322 122 32654	22nF10%X7R 63V
2203	4822 124 40248	10µF20% 63V
2210	4822 124 12282	2200µF 20% YK 10V
2211	4822 122 31173	220pF 10% 500V
2212	4822 121 43526	47nF 5% 250V
2220	4822 124 40849	330µF 20% 16V
2222	4822 124 12283	100µF 20% MS7 6.3V
2230	4822 124 81144	1000µF 16V
2240	4822 124 41545	220µF20% 16V
2242	4822 124 41584	100µF 20% 10V
2250	4822 124 40248	10µF20% 63V
2260	4822 122 31175	1nF 10% 500V

RESISTORS

3101	4822 116 52304	82k 5% 0,5W
3102	4822 051 20223	22k 5% 0,1W
3103	4822 051 20822	8k2 5% 0,1W
3104	4822 051 20153	15k 5% 0,1W
3105	4822 051 20153	15k 5% 0,1W
3106	4822 051 20102	1k 5% 0,1W
3107	4822 051 20184	180k 5% 0,1W
3108	4822 117 10965	18k 1% 0,1W
3109	4822 051 20331	330Ω 5% 0,1W
3110	4822 117 10833	10k 1% 0,1W
3111	4822 051 20229	22Ω 5% 0,1W
3112	4822 051 20101	100Ω 5% 0,1W
3113	4822 051 20159	15Ω 5% 0,1W
3115	4822 116 52232	910Ω 5% 0,5W
3116	4822 117 11448	180Ω 1% 0,1W
3120	4822 116 21217	1MA/423V 800V
3122	4822 117 13515	2Ω7 3W AC03 WW
3123	4822 050 21803	18k 1% 0,6W
3124	4822 116 83872	220Ω 5% 0,5W
3125	4822 050 21002	1k 1% 0,6W
3126	4822 116 80676	1Ω5 5% 0,5W
3127	4822 116 80676	1Ω5 5% 0,5W
3128	4822 116 80676	1Ω5 5% 0,5W
3129	4822 116 83864	10k 5% 0,5W
3134	4822 050 21803	18k 1% 0,6W
3201	4822 050 21002	1k 1% 0,6W
3202	4822 050 13302	3k3 1% 0,4W
3203	4822 116 52175	100Ω 5% 0,5W
3204	4822 051 20182	1k8 5% 0,1W
3205	4822 051 20008	0Ω JUMP. (0805)
3206	4822 051 20332	3k3 5% 0,1W
3221	4822 051 20182	1k8 5% 0,1W
3222	4822 051 20102	1k 5% 0,1W
3230	4822 050 21002	1k 1% 0,6W
4110	4822 051 20008	0Ω JUMP. (0805)

COILS

5120⚠	4822 157 53348	FILTER CHOKE ASSY CU15D3
5125	4822 157 11411	100MHz
5131⚠	4822 146 11062	TRANSFORMER CT296F CDR765
5132	4822 157 51462	10µH
5210	4822 157 11722	6,8µH 20% 7,7X9,5
5215	4822 157 11722	6,8µH 20% 7,7X9,5
5220	4822 157 51462	10µH
5225	4822 157 53139	4,7µH
5226	4822 157 53139	4,7µH
5230	4822 157 50963	2,2µH
5240	4822 157 51462	10µH
5250	4822 157 51462	10µH
5255	4822 157 51195	1µH 20% 4X9,8MM AXIAL

DIODES

6102	4822 130 31603	1N4006
6103	4822 130 31603	1N4006
6104	4822 130 31603	1N4006
6105	4822 130 31603	1N4006
6106	4822 130 42606	BYD33J
6107	4822 130 42606	BYD33J
6113	4822 130 32245	BYV10-40
6114	4822 130 42488	BYD33D
6129	5322 130 80122	BZX84-C24
6132	4822 130 42488	BYD33D
6201	4822 130 34328	BZX79-B30
6210	4822 130 83801	PBYR745F
6211	4822 130 42488	BYD33D
6212	4822 130 42488	BYD33D
6220	4822 130 42488	BYD33D
6230	4822 130 80983	BYW29F-150
6231	4822 130 31603	1N4006
6240	4822 130 42488	BYD33D
6250	4822 130 42606	BYD33J
6275	4822 130 30621	1N4148

IC's

7110	4822 209 90025	MC44603P
7125	4822 130 63689	STP3N60FI
7200⚠	4822 130 91451	CQY80NG
7201	4822 209 16944	KA431AZ
7221	4822 209 80591	LM317T
7249	4822 209 82112	MC7908CT
7250	4822 209 31257	MC79L24ACP