www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl

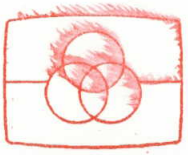
# Portable compact disc interactive player CDI 360/00/05/11/17

Service
Service
Service

Interactive
Media
Systems

CD-I





Free service manuals
Gratis schema's
Digitized by
www.freeservicemanuals.info



# ServiceManual

COMPACT disc Interactive

Photo CD™

**The Philips Portable CD-I system**

- Combination CD-I player, 6" color LCD screen, and pointing device for home, institutional or professional purposes.
- Ideal stand-alone system for individual, person-to-person and small-groups applications.
- Connectable to any PAL or NTSC TV set or Monitor to form a high-performance CD-I system, ideal for presentations.
- Comprehensive interfaces to remote controller, pointing devices and HiFi stereo systems.
- Plays all CD-I discs, CD-digital audio, Photo CD and CD-Bridge discs.
- Easy operation using on-screen program display.
- Runs on the AC-power adapter 22ER9150.

The optical pick-up assy,Code Number 4822 693 91593, contains the CDM-9.
Optional Remote Control 22ER9051/11 Code Number 4822 218 10438

**CONTENTS**

1. Caution.
2. Product Information.
3. Service Information.
4. Demounting and Service positions.
5. Service Software.
6. Electrical Drawings.
7. Diagnostics.
8. Mechanical drawing.
9. Partslist.

(SF)

Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen.

(S)

Osynlig laserstrålning när denna del är öppnad och spärren ar urkopplad. Betakta ej strålen.

(GB)

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

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

CLASS 1
LASER PRODUCT
3122 110 03420

Published by MW october 1992 Service & Support Interactive Media Systems Printed in The Netherlands ©Copyright reserved Subject to modification 4822 725 24112

PHILIPS

PHILIPS

PCS 67 285

World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



CHAP. CONTENTS


**1 CAUTION**

**2 PRODUCT INFORMATION**
2.1 Technical specification
2.2 Connections and controls

**3 SERVICE INFORMATION**
3.1 Safety instructions
3.2 Servicing of SMDs (Surface Mounted Devices)
3.2.1 General cautions on handling and storage
3.2.2 Removal of SMDs
3.2.2.1 Caution on removal
3.2.3 Attachment of SMDs
3.2.3.1 Caution on attachment
3.3 Handling ESD sensetive components
3.3.1 Personal safety
3.3.2 Storage and transport
3.3.3 Testing or handling
3.3.4 Mounting ESD sensetive components
3.3.5 Soldering
3.3.6 Electrostatic charges
3.3.7 Transients (switch-on phenomena)
3.3.8 Working environment
3.3.9 Replacement of the Flat Pack ICs
3.4 Service tools
3.4.1 Service PCB
3.4.1.1 Circuit diagram
3.4.1.2 Layout
3.4.1.3 Parts list
3.4.2 Test discs
3.4.3 Extention connectors
3.4.4 Measurement equipment
3.4.5 Pointing device
3.4.6 (de)Mounting tool
3.5 Circuit Description
3.6 THE CENTRAL REPAIR PROCEDURE

**4 Demounting and Service positions**
4.1 Servicing the MAIN board PM06
4.2 Servicing the CD-Lid
4.3 Servicing the LCD screen unit

**5 SERVICE SOFTWARE**
5.1 The low level MMC test
5.1.1 Tools
5.1.2 Test sequence
5.1.3 Low level test implementation
5.1.4 How to start up the low level test
5.1.5 PCB low level test
5.1.6 Terminal low level test
5.1.7 Error codes
5.1.8 Release number, position and checksum storage
5.1.9 How is the checksum calculated ?
5.2 The service shell
5.2.1 Starting the service shell
5.2.2 Layout info
5.2.3 Subject dependent information

**6 ELECTRICAL DRAWINGS**
6.1 Wiring diagram
6.2 Alphabetical signal listing
6.3 Block diagram
6.4 MAIN Panel
6.4.1 PCB Layout ( Top side )
6.4.2 Servo Schematic Diagram
6.4.3 Audio Schematic Diagram ( Part 1 )
6.4.4 Power/Audio Schematic Diagram ( Part 2 )
6.4.5 Video Schematic Diagram ( Part 1 )
6.4.6 Video Schematic Diagram ( Part 2 )
6.4.7 MMC Schematic Diagram ( Part 1 )
6.4.8 MMC Schematic Diagram ( Part 2 )
6.4.9 MMC Schematic Diagram ( Part 3 )
6.4.10 PCB Layout ( Bottom side )
6.5 Other Panel (PS06,PP06,PI06,CD Lid )
6.6 Power Supply Unit
6.6.1 PCB Layout
6.6.2 Schematic Diagram

**7 DIAGNOSTICS**
7.1 Power Supply unit
7.2 Mainboard
7.2.1 Power voltage
7.2.2 Measurements Servo circuit
7.2.2.1 Laser current
7.2.2.2 Focus signal
7.2.2.3 Starting signal
7.2.2.4 Motor control signals
7.2.2.5 Radial error circuit signals
7.2.2.6 Clock signal IC88
7.2.2.7 Decoder signals
7.2.2.8 Video signals
7.2.3 Measurements Audio circuit
7.2.3.1 Slave processor data
7.2.3.2 I2S signals
7.2.3.3 Xin clock signal
7.2.3.4 DEEMP signal
7.2.3.5 FILTERN signal
7.2.3.6 KIII signal
7.2.3.7 Performance check
7.2.4 Measurements & adjustment Video2 circuit
7.2.4.1 Check of NTSC subcarrier
7.2.4.2 Check of PAL subcarrier ( & adjustment)
7.2.4.3 Check of Phase Locked Loop
7.2.4.4 Check of XT4 clocksignal
7.2.4.5 Check of standard control signal SW
7.2.4.6 Check of KILLM signal
7.2.4.7 Check of HSYNC signal
7.2.4.8 Check of RGB input signals
7.2.5 Measurements MMC circuit
7.2.5.1 Clock signals
7.2.5.2 Reset circuitry
7.2.5.3 Check of microprocessor 68070
7.2.5.4 Low level test

**8 MECHANICAL DRAWING**
8.1 Exploded view

**9 Parts List**
9.1 Exploded view parts list
9.2 Electrical parts list




World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



## 1 CAUTION

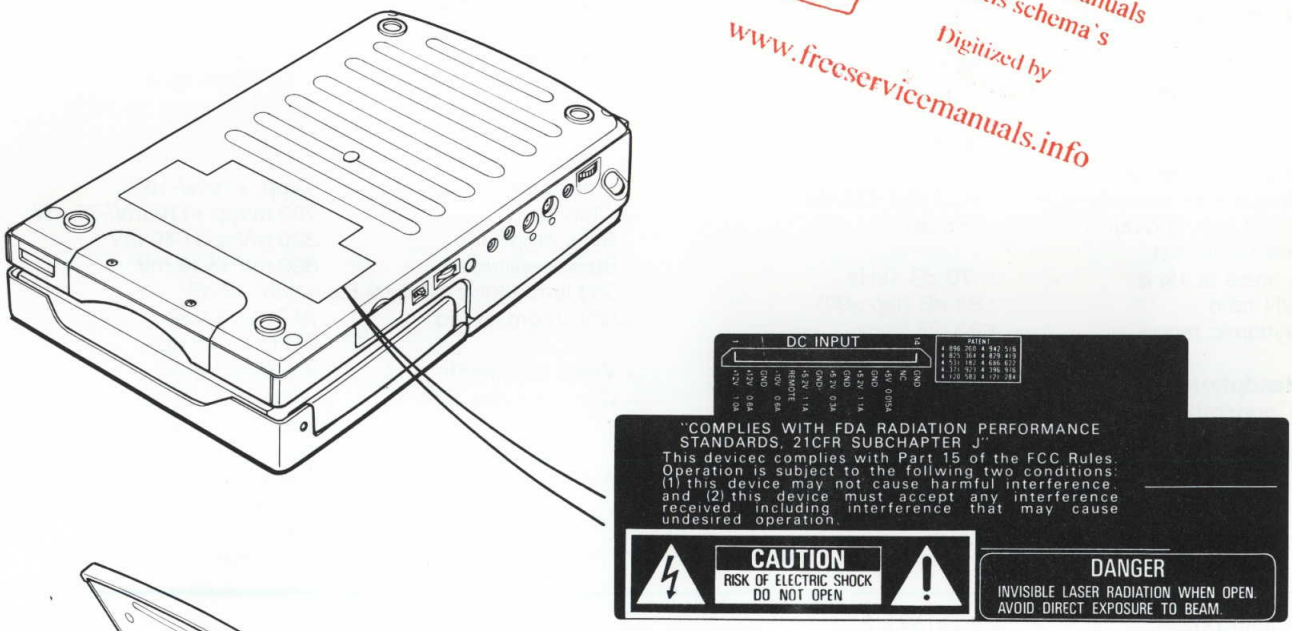
LASER NOTE:
DANGER - Invisible laser radiation when open. AVOID DIRECT EXPOSURE TO BEAM.
CAUTION - Use of controls or adjustments or performance of procedures other than those specified herein may in result hazardous radiation exposure.
CAUTION - The use of optical instruments with this product will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

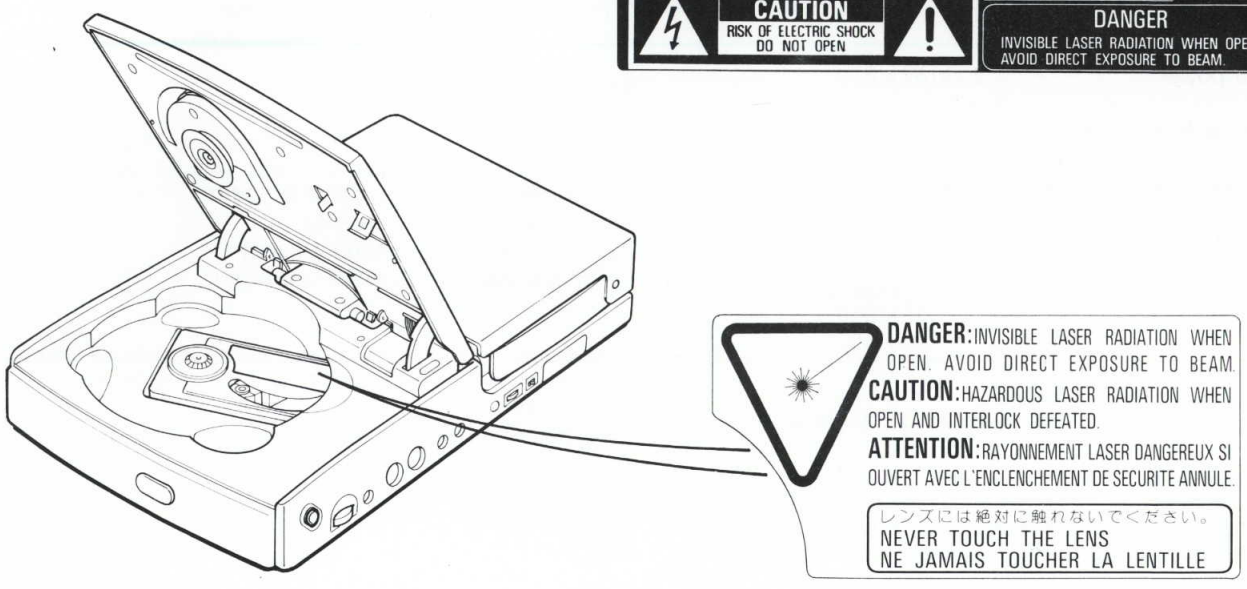
THE CD-I PLAYER SHOULD NOT BE ADJUSTED OR REPAIRED BY ANYONE EXCEPT PROPERLY QUALIFIED SERVICE PERSONNEL.

**LASER BEAM RADIATION SPOT**
Laser Diode Properties
Material: Ga-Al-As
Wavelength: 760 - 800nm (30°C)
Laser Output: Continuous Wave Tpy. 0.4mW Max. 0.6mW

**WARNING !!**
When servicing, do not approach the laser exit with the eye too closely.
In case it is necessary to confirm laser beam emission, be sure to observe from a distance of more than 30cm from the surface of the objective lens on the light pen assembly.

Free service manuals
Gratis schema's
Digitized by
www.freeservicemanuals.info






World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



## 2 PRODUCT INFORMATION

### 2.1 TECHNICAL SPECIFICATION

**Physical**
- Dimensions (w x d x h)
292 x 190 x 46 mm
( 11.5 x 7.5 x 1.9 inch)

**- Weight** (approx.)
1.9 kg
( 4.2 lbs)

**Power supply**
/11 /17 Model ... Japan / USA
100/120V (90V to 132V ) 50/60Hz
/00 Model ... Europe
220/240V ( 198V to 264V ) 50/60Hz

**Power consumption**
Approx. 20.6 W (without extensions)

**Approvals**
FCC, UL
Conforms with VDE, FTZ, CSA, Nordic, US and german laser safety regulations

**Audio L+R:**

| | |
|---|---|
| -Connector | |
| Type | : Mini Phone socket |
| - Output quality in case of CD-DA | |
| Output level | : 2V +/- 3 dB |
| Channel unbalance | : 80 dB 1kHz |
| Frequency range | : 20 HZ to 20 kHz |
| Phase non- linearity | : +0.2 dB/ -0.2 dB |
| Cross talk (1kHz) | : - 86 dB |
| Harmonic dist. | |
| + noise at 1kHz | : -70 dB 1kHz |
| S/N ratio | : 84 dB (typ >90) |
| Dynamic range | : 80 dB 1kHz |

**Headphone output:**

| | |
|---|---|
| -Connector | |
| Type | : Mini Phone socket |
| -Output quality in case of CD-DA | |
| Load impedance range | : 8 Ohm - 2 kOhm |
| Output power | : 10 mW at 1kHz, 32 Ohm |
| Distortion | : 50dB 1kHz 32 ohm |

**Speaker output**
Output power : 200mW x 2

**Video specifications**
625 lines : RGB (PAL, SECAM)
525 lines : RGB, Y/C, CVBS (NTSC)

**Video interface**

| General information | PAL | NTSC |
|---|---|---|
| Resolution normal | Enviroment | Enviroment |
| H*V | 384*280 | 384*240 |
| | 384*560 | 384*480 |
| Line period | 64.00 us | 63.555 us |
| Active line period | 51.20 us | 58.84 us |
| VSC clock | 30.0000 MHz | 30.2098 MHz |
| | | |
| Display format | | |
| non-interlace | 312 lines | 262 lines |
| interlace | 625 lines | 525 lines |
| (2 different frames) | | |
| interleaved | 625 lines | 525 lines |
| (2 identical frames) | | |

**RGB output:**

A/ NTSC

| | |
|---|---|
| - Amplitude | : 714mVpp +/- 10% (max. white level) |
| - Line time | : 63.555 uS |
| - CVBS. output | : 1Vpp +15%/- 10% |
| - S/N on RGB output | : > 50 dB (40 Hz - 5 MHz) |
| - S/N on RGB output | : > 45 dB (40 Hz - 10 MHz) |
| - Bandwidth on RGB out | : - 3 dB at 7.5 MHz |

B/ PAL

| | |
|---|---|
| - Amplitude | : 700mVpp +/- 10% (max. white level) |
| - Line time | : 64. uS |
| - CVBS. output | : 1Vpp +15%/-10% |
| - S/N on RGB output | : > 50 dB (40 Hz - 5 MHz) |
| - S/N on RGB output | : > 45 dB (40 Hz - 10 MHz) |
| - Bandwidth on RGB out | : - 3 dB at 7.5 MHz |

**CVBS output:**

A/ NTSC

| | |
|---|---|
| - Amplitude | : 1Vpp +15% / -10% |
| - White bar | : 714 mVpp +110 mV / -70 mV |
| - Sync amplitude | : 286 mVpp +/- 40 mV |
| - Burst amplitude | : 290 mV +/- 30 mV |
| - S/N lum. (40Hz-10MHz) | fsc notch >45dB |
| - S/N chrom. in red | : AM (*) > 37 dB<br>PM (**) > 48 dB |
| - Video bandwidth | : 4.5 MHz (-6dB) |
| - Chroma subc. freq. | : = 3.579545 MHz locked to sync. +/-70Hz |

B/ PAL

| | |
|---|---|
| - Amplitude | : 1Vpp +15%/-10% |
| - White bar | : 700 mVpp +110 mV/-70 mV |
| - Sync amplitude | : 300 mVpp +/-40 mV |
| - Burs amplitude | : 300 mV +/-30 mV |
| - S/N lum. (40Hz-10MHz) | fsc notch >45dB |
| - S/N chrom. in red | : AM (*) > 37 dB<br>PM (**) > 43 dB |
| - Video bandwidth | : 4.5 MHz (-6dB) |
| - Chroma subc. freq. | : = 4.433661 MHz X-tal locked +/-50Hz |

* AM noise: output of measured value in dB referred to the average amplitude of the colour subcarrier burst applied

** PM noise: output of measured value in dB referred to the constant phase of a reference oscillator

**Y/C ouput:**

A/ NTSC

| | |
|---|---|
| - amplitude | : Y= 1Vpp +/-10% into 75 Ohm |
| - amplitude | : C= 286 mVpp +/- 10% (burst) |
| - bandwidth Y | : = 4.5 MHz (-3dB) |
| - bandwidth C | : = 1 MHz |
| - S/N on Y output | : 45dB (unweight) |
| - S/N on C output | : 42dB (unweight) |

B/ PAL

| | |
|---|---|
| - amplitude | : Y= 1Vpp +15%/-10% into 75 Ohm |
| - amplitude | : C= 300 mVpp +/- 10% (burst) |
| - bandwidth Y | : = 5 MHz (-3dB) |
| - bandwidth C | : = 1.6 MHz |
| - S/N on Y output | : 45dB (unweight) |
| - S/N on C output | : 42dB (unweight) |



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



**Laser Detector Grating Unit (LDGU)**

| | |
|---|---|
| Laser type | : semi conductor AlGaAs |
| Wave length | : 780 nm |
| Output power | : 3.3 mW typical |

**RS232-2 (port 2) communication: ( INPUT )**

| | |
|---|---|
| Connector type | : 8 pins miniDIN (female) |
| Internal device | : on chip UART (SCC68070) |
| Baudrates | : 75, 150, 300, 1200, 2400, 4800, 9600 and 19200 |
| Dataformat | : character length: 7 or 8 bits |
| stopbit length | : 1 or 2 bits |
| parity | : odd, even or no |
| Handshake | : hardware: 2 control lines; RTS and CTS. |
| software | : XON/XOFF. |

All signal levels and current ratings, except +5V and DTR are according EIA RS-232-C standard.

| | |
|---|---|
| RATINGS | : +5V +/-10% max. 200mA |
| DTR | : +12V +/-10% max. 10mA (Ri = 1k ohm) |

**IR interface:**

The IR (infra red) receiver for use with the CD-I remote control.
Specification according UAW-0422

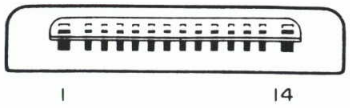
- characteristics

| | |
|---|---|
| Data format | : RC-5 extended format and RC-6 format |

-infrared transmission data.

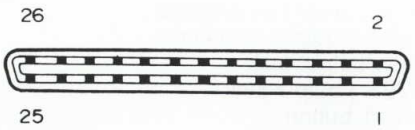
| | |
|---|---|
| Distance | : 20 - 800 cm. |
| Sampling time | : =< 50 ms |
| Receive angle | : 45 degree out of the centre line |

**DC Power Input**




| Pin | Signal | Pin | Signal |
|---|---|---|---|
| 1 | +12v | 2 | +8v |
| 3 | GND | 4 | -8V |
| 5 | Power ON/OFF | 6 | +5V |
| 7 | GND | 8 | +5V |
| 9 | GND | 10 | +5V |
| 11 | GND | 12 | +5V Standby |
| 13 | Voltage detect | 14 | GND |

**Video ( RGB ) IN/OUT**




| Pin | Signal | Pin | Signal |
|---|---|---|---|
| 1 | Blue GND | 2 | Blue |
| 3 | Green GND | 4 | Green |
| 5 | Red GND | 6 | Red |
| 7 | SW ( RGB/CVBS ) | 8 | CVBS/RGB sync |
| 9 | SW | 10 | n.c |
| 11 | GND | 12 | n.c |
| 13 | External SW | 14 | +12V out ( 300mA max. ) |
| 15 | Audio in | 16 | GND |
| 17 | V.sync out | 18 | H.sync out |
| 19 | LCD SW | 20 | Sync in |
| 21 | Red in GND | 22 | Red in |
| 23 | Green in GND | 24 | Green in |
| 25 | Blue in GND | 26 | Blue in |

**S-Video (Y/C) connector**

| Pin | Signal |
|---|---|
| 1 | GND Y |
| 2 | GND C |
| 3 | Y |
| 4 | C |



**RS232C (INPUT) connector**

| Pin | Signal |
|---|---|
| 1 | n.c |
| 2 | Txd |
| 3 | Rxd |
| 4 | DTR |
| 5 | GND |
| 6 | CTS |
| 7 | RTS |
| 8 | +5V (160mA max. ) |



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl

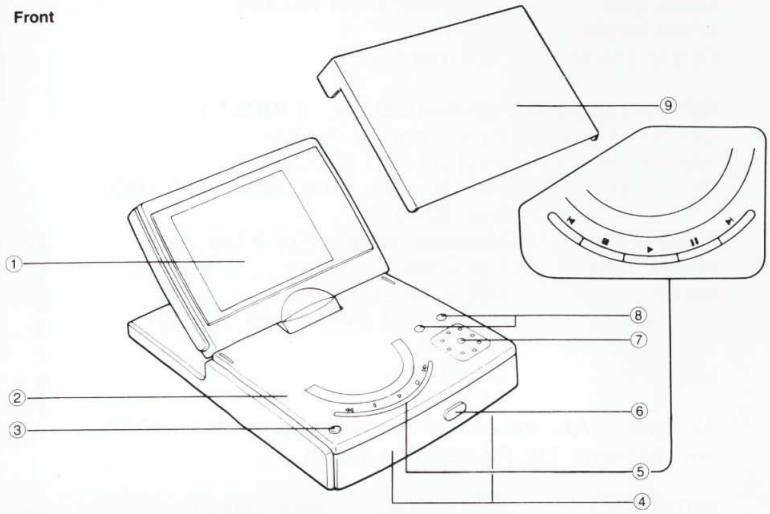


## 2.2 Connections and Controls

### Front view

1 LCD screen
2 Disc inspection window
3 Power button and indicator
4 Stereo speakers
5 Basic audio CD control
6 Sensor for remote control
7 Touchpad controller
8 Action buttons
9 Compartment cover

Front

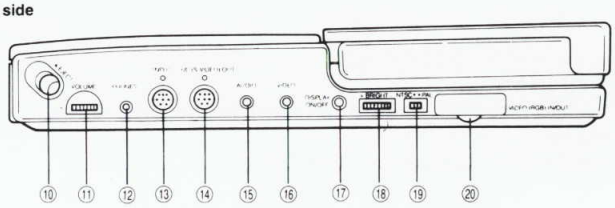


### Right hand side view

10 Disc compartment eject button
11 Volume control (Headphone & Speakers)
12 Headphone socket
13 Input connector
- note that connecting an external pointing device disables the touchpad controller/ remote control, expect in certain programs for two persons.

14 Y/C ( S-Video ) output connector
15 Stereo audio output jack
16 Video ( CVBS ) output jack
17 Display on/off button
18 Screen brightness control
19 PAL/NTSC selector
20 Video ( RGB ) IN/OUT

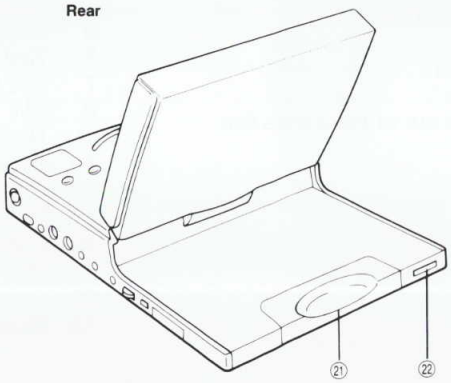
Right hand side



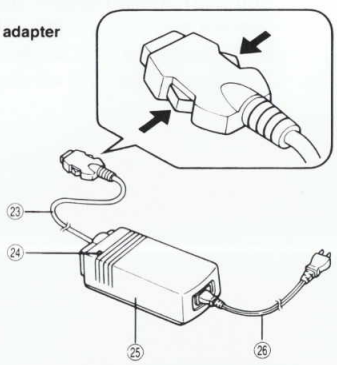
### Rear view

21 Cover protecting extension socket
22 Power supply connector (low voltage DC)

Rear



AC adapter



**AC adapter**
- 22ER9150/00 220/240V
- 22ER9150/11, /17 100/120V

23 DC output cable
Squeeze sides to disconnect.
24 Power indicator
25 Adapter
26 AC power cord

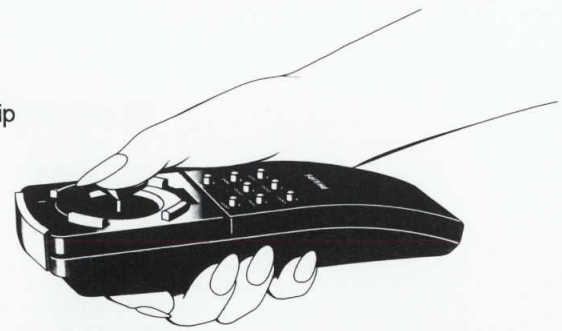
**Note** The rating plate is affixed to the bottom of the unit.

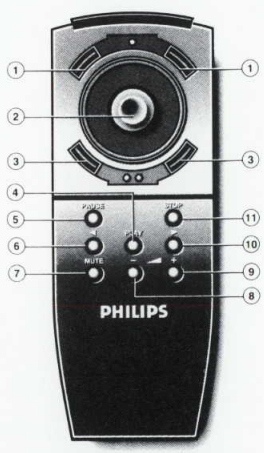
Free service manuals
Gratis schema's
Digitized by
www.freeservicemanuals.info

**Remote controler** ( Option )
- 22ER9051

001/3 Action keys
2 Thumbstick
4 "Play" key
5 "Pause" key
6 "Previous" key for instant track skip
7 Mute or TV/CDI selector key*
8 Volume control down key
9 Volume control up key
10 "Next" key for instant track skip
11 "stop" key
*depending on version

The control sits conviniently in the hand, and the thumbstick and action keys, which are by far most-used controls, are easily operated one-handed.






*22ER9051 Infra red remote control*

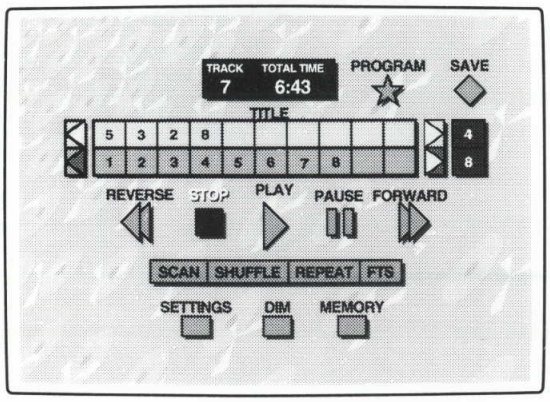


World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



**The user shell**
With just the one "point and click" operation, player functions can be controlled so easily that the actions become intuitive. This is because of the player's specially designed "user shell" program, which presents a series of screen displays that not only allow you a complete choice of play functions, but also guide you in selecting them.




When the player is switched on, the first "user shell" screen invites you to load a disc. Playing a CD-I disc is a simple matter of loading the disc and selecting "Start" on the "CD-I start" screen which then automatically appears. The CD-I program starts to run, and you select options from the screen according to choice.

For CD-Digital Audio discs, the "user shell" presents a play control screen. This offers more than just the functions fitted as standard on CD players ( and also provided on the front panel and remote control). It offers all the features found only on top-of-the-range players. These include Program, Favorite Track Selection, Title, Shuffle, Repeat, Play and Scan.

Another "user shell" screen offers "Personal Preference" settings. These include data and time display, Scan time, Auto Shuffle, and Repeat. When "Personal Preference" settings have been made, the player automatically adopts them when starting up.

Further "user shell" screens provide information, CD-DA programming (FTS) facilities, a list of stored programs and other information, and control for CD-Graphics.

**User Shell Functions**
**General screens:**
> "Personal preference " seting screen:
Auto Shuffle, Auto FTS, Display Time/Date, Scan Time, Repeat (Disc or Track).
> Memory screen ( manages CD-I stored data, as well as FTS programs and titles).
> Dim Screen (LCD display ON/OFF and adjust screen brightness for external TV.)

**CD-I start-up screen:**
> Start CD-I ( stats CD-I or Phote-CD applications).

**CD-Digital Audio screen:**
> While Playing: Play, Stop and Pause.
> Play Modes: Scan, Shuffle, Repeat and FTS.
> Control: Fast Forward, Fast Rewind, Next Track (directly selectable), Previous Track ( directly selectable), Program (programming of selected tracks in any order), Save ( stores your favorite track program and allows manual input of titles related to discs or FTS programs).



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



# 3 SERVICE INFORMATION

## 3.1 SAFETY INSTRUCTIONS

- Safety regulations demand that the set be restored to its original condition and that components identical with the original types be used.
  Safety components are marked by the symbol ⚠.
- **ESD**

  All IC's 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.
  For detailed information see "Handling ESD-sensitive components".
- A set to be repaired should always be connected to the mains via a suitable isolating transformer.
- never replace any modules or any other parts while the set is switched on.
- Use plastic instead of metal alignment tools. This in order to prelude short-circuit or to prevent a specific circuit form being rendered unstable.

## 3.2 SERVICING OF SMDs (Surface Mounted Devices)

### 3.2.1 General cautions on handling and storage

a. Oxidation on the SMDs terminals results in poor soldering. Do not handle SMDs with bare hand.
b. Avoid for storage places that are sensitive to oxidation such as places with sulfur or chlorine gas, direct sunlight, high temperatures or a high degree of humidity.
   As a result the capacitance or resistance value of the SMDs may be affected.
c. Rough handling of circuit boards containing SMDs may cause damage to the components as well as the circuit boards. Circuit boards containing SMDs should never be bent or flexed. Different circuit board materials expand and contract at different rates when heated or cooled and the components and/or solder connections may be damaged due to the stress.
   Never rub or scrape chip components as this may cause the value of the component to change. Similary, do not slide the circuit board across any surface.

### 3.2.2 Removal of SMDs

a. Heat the solder (for 2-3 seconds) at each terminal of the chip. Small components can, by means of litz wire and a limited horizontal force, be removed with the soldering iron. They can also be removed with a solder sucker (see Fig. 1a) or
b. While holding the SMD with a pair of tweezers take it off gently using th soldering iron's heat applied to each terminal (see Fig. 1b).
c. Remove the excess solder on the solder lands by means of litz wire or a solder sucker (see Fig. 1c).

#### 3.2.2.1 Caution on removal:

a. When handling the soldering iron, use suitable pressure and be careful.
b. When removing the chip, do not use undue force with the pair of tweezers.
c. The soldering iron to be used (approx. 30 W), must preferably be provided with a thermal control (soldering temperature about 225 to 250°C).
d The chip, once removed, must **never** be used again.

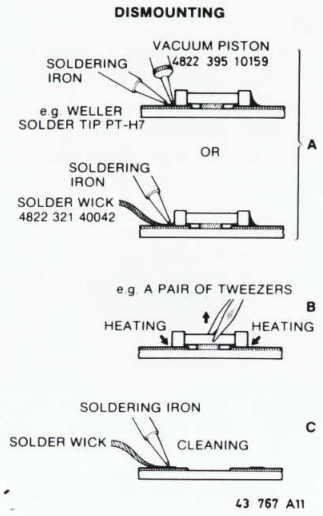



Fig. 1

### 3.2.3 Attachment of SMDs

a. Locate the SMD on the solder lands by means of tweezers and solder the component at one side. Ensure that the component is positioned well on the solder lands (see Fig. 2a).
b. Next complete te soldering of the terminals of the component (see Fig. 2b).

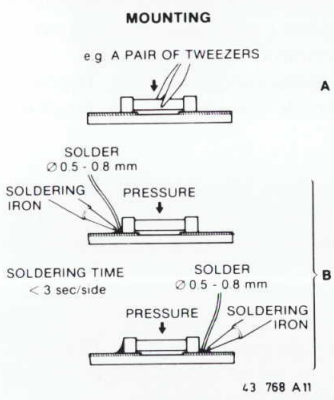



Fig. 2

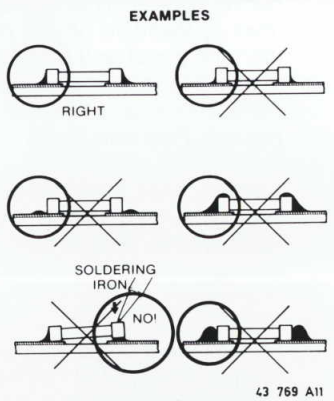



Fig. 3

#### 3.2.3.1 Caution on attachment:

a. When soldering the SMD terminals, do not touch them directly with the soldering iron. The soldering must be as quick as possible; care must be taken to avoid damage to the terminals and the body itself.
b. Keep the SMD's body in contact with the printed board when soldering.
c. The soldering iron to be used (approx. 30 W) must preferably be provided with a thermal control (soldering temperature about 225 to 250°C).
d. Soldering should not be done outside the solder land.
e. Soldering flux (of rosin) may be used but should not be acidic.
f. After soldering, let the SMD cool down gradually at room temperature.
g. The quantity of solder must be proportional with the size of the solder land. If the quantity is too great, the SMD might crack or the solder lands might be torn loose from the printed board (see Fig. 3).



World of free manuals

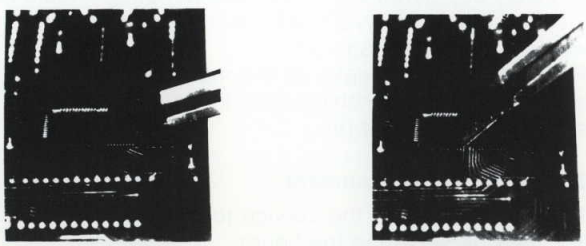
www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



## TOOLS TO BE USED




## DISMOUNTING



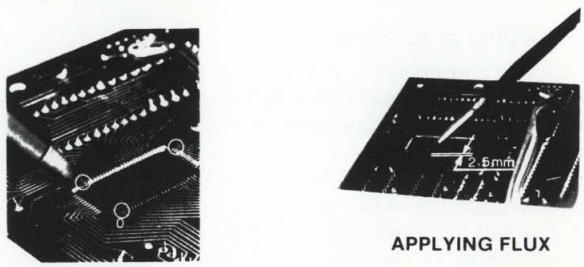
CUTTING THE LEADS

WRONG TRACKS WILL BE DAMAGED



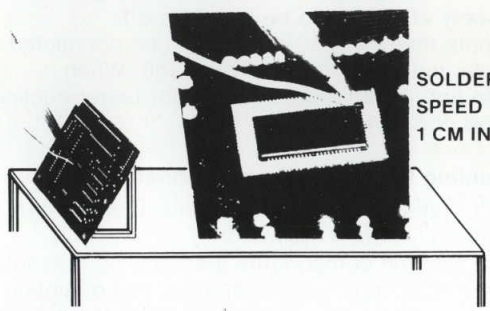
CLEANING THE TRACKS

## MOUNTING

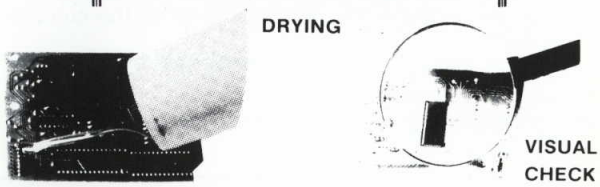



FIXING IC AT THE CORNERS

APPLYING FLUX



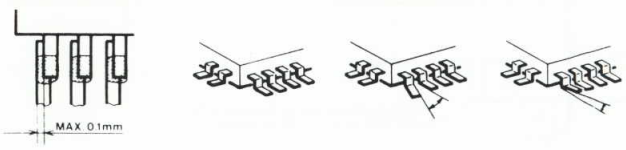
SOLDERING: SPEED 1 CM IN 5 SEC.



DRYING

VISUAL CHECK

## ALIGNING THE LEADS




RIGHT WRONG WRONG

## SOLDERING



RIGHT WRONG WRONG



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



## 3.3 HANDLING ESD-SENSITIVE COMPONENTS

### 3.3.1 Personal safety

The testing, handling and replacing of ESD-sensitve components requires special attention for personal safety. A person dealing with ESD-sensitive components should, normally speaking, be connected via a resistance to the same potential as the chassis of the set to protect him against direct contact with the supply voltage.
This resistance is often applied in the connection lead of wrist wraps. If necessary, make use of an isolating transformer.

### 3.3.2 Storage and transport

Transport and store the circuits and PCBs in their original packages.
As an alternative to the original package one may use a conductive material or special IC package which short-circuits all the pins of the component with one another.
Always discharge the package before opening it.

### 3.3.3 Testing or handling

Work on a conductive surface when testing loose circuits and components or when transferring components and circuits from one package to another.
Use a conductive wrist wrap with lead to make an electrical connection between the conductive surface and yourself via a resistance in the connection lead of the wrist wrap.
Connect equipment and tools also with this conductive surface.
Do not connect any signals to inputs as long as the power supply of the set to be tested is off.
All the inputs that are not used should be connected either to ground or to the supply voltage. When testing, do not use any freon sprays for under-cooling of sensitive components.

### 3.3.4 Mounting ESD-sensitive components

Mount ESD-sensitive components only after all other components have been mounted.
Make sure that the components themselves, the metal parts of the PCB, mounting equipment and mounting operator are at the same potential level as the chassis of the set.
If it is impossible to ground the PCB, the mounting operator should pick the PCB up before bringing it into contact with the components to be replaced.

### 3.3.5 Soldering

Soldering iron tips, also those of low-voltage soldering stations, should be kept at the same potential as the components and the PCB.
It is better to use solder-removing braid than solder suckers.

### 3.3.6 Electrostatic charges

One should stick to the precautionary measures also after the ESD-sensitive components have been mounted on the PCB. Until the sub-PCBs have been incorporated into a complete system on which the correct supply voltages are connected, the PCB is nothing more than an extension of the conductors of the components on this PCB. To prevent electrostatic discharges from passing to the components via the terminals, we recommend that you apply conductive clips or conductive tape on the terminals of the PCB.

### 3.3.7 Transients (switch-on phenomena)

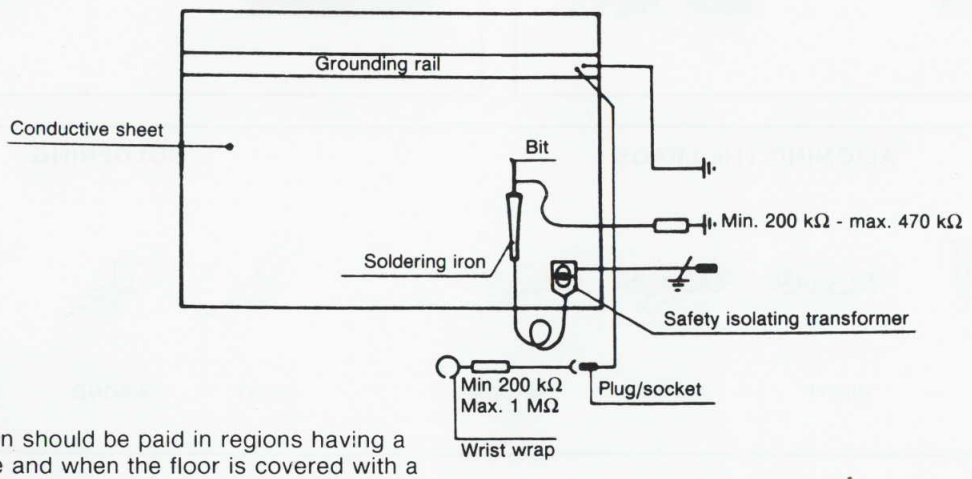
To prevent permanent damages as a result of switch-on phenomena, no ESD-sensitive components, or PCBs populated with these components, should be inserted in or removed from test-sockets or systems with the supply voltage on.
Prevent switching peeks on the mains as a consequence of switching electric equipment, relay and DC lines on and off.

### 3.3.8 Working environment

The work bench for the service technician should look like the one shown in the figure.

### 3.3.9 Replacement of the Flat Pack IC's

For replacing a component see Fig. 6 Dismounting and Mounting. Also a number of precautions and examples is given.
When replacing a flat pack, rosin flux applied to the device leads will ensure a good soldered joint.
Since rosin flux, when not properly heated by the soldering process, is sticky, it will attract dust which will result in component degeneration over a period of time.
The removal of excess flux with a cleaner will not solve this problem because the flux is then even spread over a greater area by the cleaner. Drying of the flux can be accomplished by blowing the area with a common hair dryer for 1 or 2 minutes at a distance of approx. 10 centimeters.




Special attention should be paid in regions having a dry atmosphere and when the floor is covered with a nylon carpet or such.



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl

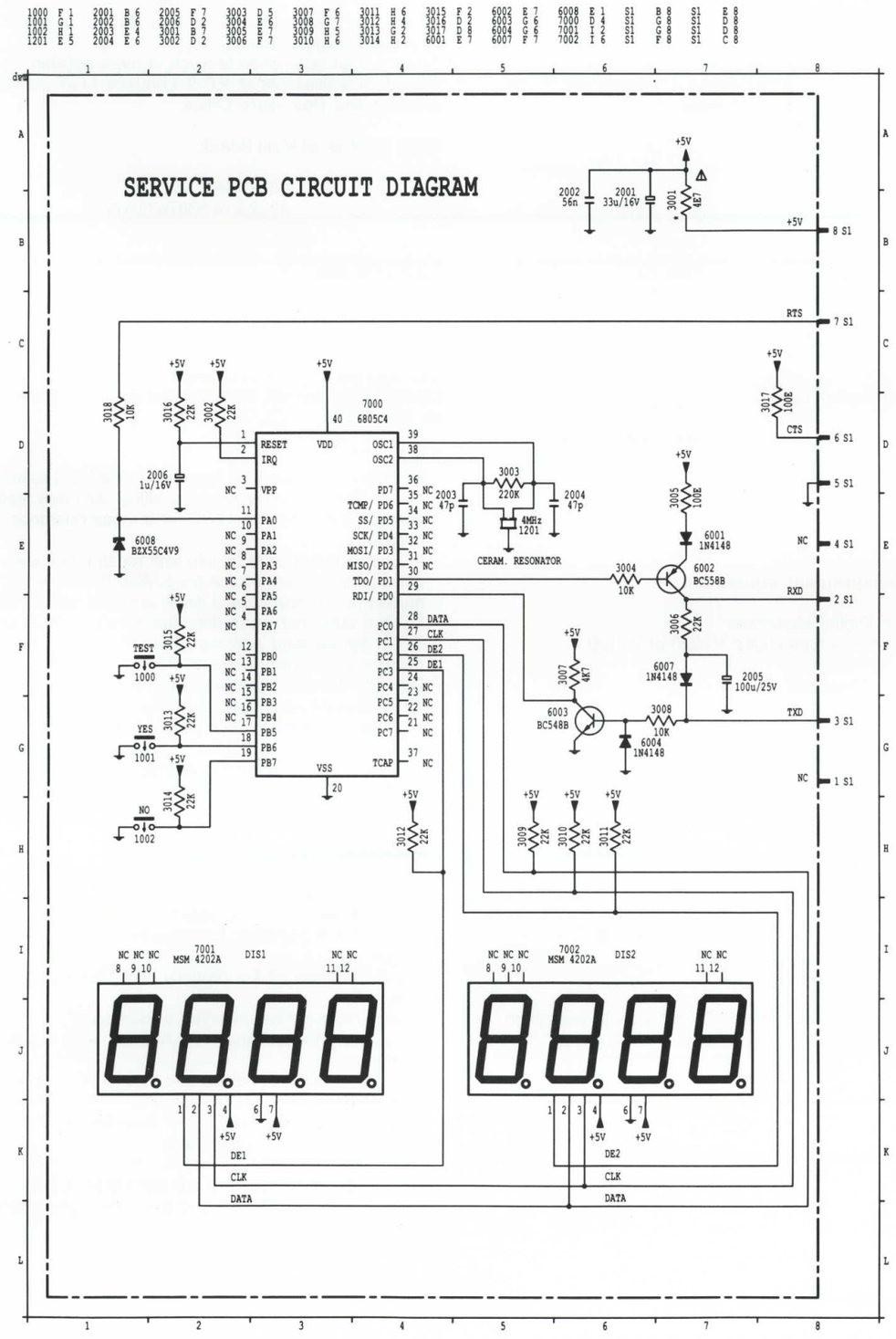


## 3.4 SERVICE TOOLS

### 3.4.1 Service PCB ( Low Level Test )

| Code number | Name/Description | Application |
|---|---|---|
| 4822 214 52007 | Service PCB | Low Level Test |
| 4822 321 61677 | Cable | Connect Low Level PCB to Mainboard |

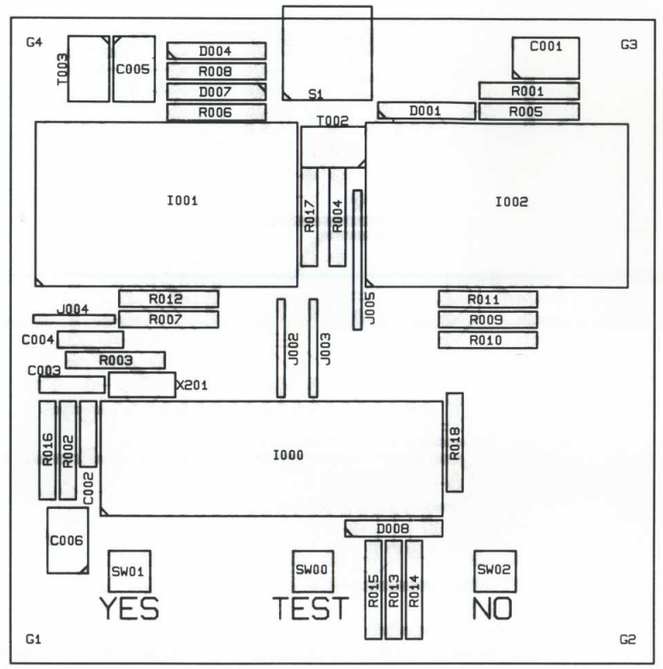
### 3.4.1.1 Circuit diagram






Free service manuals
Gratis schema's
Digitized by
www.freeservicemanuals.info

### 3.4.1.2 Layout




### 3.4.1.3 Parts list

| ITEM | DESCRIPTION | | CODENUMBER |
|---|---|---|---|
| 1000 | Tact switch | | 4822 276 10974 |
| 1001 | Tact switch | | 4822 276 10974 |
| 1002 | Tact switch | | 4822 276 10974 |
| 1201 | Ceram.resonator | | 4822 242 72527 |
| 2001 | 33 | µF/16V | 4822 124 20688 |
| 2002 | 56 | nF | 4822 121 41154 |
| 2003 | 47 | pF | 4822 122 31072 |
| 2004 | 47 | pF | 4822 122 31072 |
| 2005 | 100 | µF/25V | 4822 124 20701 |
| 2006 | 1 | µF/63V | 4822 124 20722 |
| 3001 | 4,7 | Ω | See standardized list |
| 3002 | 22 | KΩ | |
| 3003 | 220 | KΩ | |
| 3004 | 10 | KΩ | |
| 3005 | 100 | Ω | |
| 3006 | 22 | KΩ | |
| 3007 | 4,7 | KΩ | |
| 3008 | 10 | KΩ | |
| 3009 | 22 | KΩ | |
| 3010 | 22 | KΩ | |
| 3011 | 22 | KΩ | |
| 3012 | 22 | KΩ | |
| 3013 | 22 | KΩ | |
| 3014 | 22 | KΩ | |
| 3015 | 22 | KΩ | |
| 3016 | 22 | KΩ | |
| 3017 | 100 | Ω | |
| 6001 | 1N4148 | | 4822 130 30621 |
| 6002 | BC558B | | 4822 130 44197 |
| 6003 | BC548B | | 4822 130 30621 |
| 6005 | BZX55 C4V7 | | 4822 130 34174 |
| 6006 | BAT85 | | 4822 130 31983 |
| 6007 | 1N1448 | | 4822 130 30621 |
| 7000 | MC68HC705C4 | | 4822 900 10272 |
| 7001 | MSM 4202A | | 4822 130 90474 |
| 7002 | MSM 4202A | | 4822 130 90474 |
| S1 | miniDIN 8pins | | 4822 267 31289 |



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



### 3.4.2 Test discs

| Codenumber | Name/description | Application |
|---|---|---|
| 4822 397 30096 | Testdisc 5 (music) Testdisc 5A (music + dropouts and fingerprints) | Reference disc for playability and adjustments of CDM |
| 4822 397 30155 | test disc with 1 KHz continous signal, 70 minutes. | life test in case of intermittent faults |
| 4822 397 30184 | Audio signals | Measure specs. |
| 4822 701 11922 | Skew disc 0,6 | Reference disc for playability |
| 4822 701 11923 | Excentricity disc 150 | Reference disc for playability |
| Launch disc | CD-I demo disc | |

### 3.4.3 Extension cable

| Codenumber | Name/description | Application |
|---|---|---|
| 4822 322 40066 | FLEX Cable | For CDM 9 |
| 4822 267 50676 | FLEX Cable connector | extention |

### 3.4.4 Measurement equipment

Electronic Digital Multimeter
Display terminal type Digital VT220 or VT100
Digital oscilloscope
Analog oscilloscope
Timer/counter

### 3.4.5 Pointing devices

| | | |
|---|---|---|
| 4822 218 10401 | Remote Control | 22ER9051 |
| 4822 691 30297 | Mouse ( Black ) | 22ER9011 |
| 4822 691 30298 | Trackball | 22ER9013 |
| 4822 691 30293 | Roller Controler | 22ER9012 |

### 3.4.6 (de)Mounting tool

Torx screw drivers 4822 395 50145

### 3.5 Circuit Description

For circuit description, See CDI 205 circuit description.
This is available under code number 4822 725 24107.

## 3.6 THE CENTRAL REPAIR PROCEDURE

### 3.6.1 Mainboard

The mainboard contains functions like MMC as well as peripheral functions, like Servo, Audio and Video processing. In case of a defect of the MMC function the complete board must be sent for repair to PCS. In case of a defect in the peripheral functions this must be repaired locally. The different functions are indicated on the PCB by means of marked lines.
Below a brief description is given, a more detailed procedure is available at P.C.S Logistics Management, systems and Procedure Office.

Code Number of Main Board:

4822 214 52033/17
4822 214 33876/00/05/11

### 3.6.2 LCD unit

Code number : 4822 130 91193
In case of a defect LCD unit the complete unit must be sent back for repair to PCS.
The LCD unt may not be opened.
Opened units are not accepted and the return pricewill not be credited.

### 3.6.3

- NSO or Customer: send telex or on-line MSH system info to PCS customer relations officer with indicated number(s) and service 12NC for a repair reference number.
- PCS: send telex or MSH info with repair reference number and return invoice price. Also the same number(s) of new/repaied items are sent with invoice.
- NSO or customer: send defective item(s) to PCS at SDM1 by standard address label with repair reference number and return invoice to PCS -price center.
- Remark: the difference between the invoice price and return invoice price gives the 'repair price' for the NSO.
- PCS: send defective item tofactory and stock.
- Experience has learned that the status of the particular products and packaging needs your local attention. Products wil be returned in case of unacceptable conditions.

### 3.6.4 Repair Procedure Conditions:

- HANDLE WITH CARE IN AN ESD PROTECTED ENVIROMENT.
- Defective items must be sent back to PHILiPS CONSUMER SERVICE for repair forwarded by Address sticker.
- Put the address sticker properly on a free area of the box.
- Boards must not be reworked or damaged.
- Re-use original package order new package in case of damages.
- Remove additional stickers and labeling if re-using the original box.
  Service codenumber on sticker must be equal to codenumber on repairable item.

**!!! If the above conditions are not fulfilled, hen boards are not accepted and the return price will not be credited !!!**



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



## 4 DEMOUNTING AND SERVICE POSITIONS

### 4.1 Servicing the MAIN board PM06

**4.1.1**

Remove the FMV connector cover 055B/056B. Remove the 5 screws on the bottom-side of the player then remove 2 screws on the right hand side of the player.
Screw 3 is a Longer type.

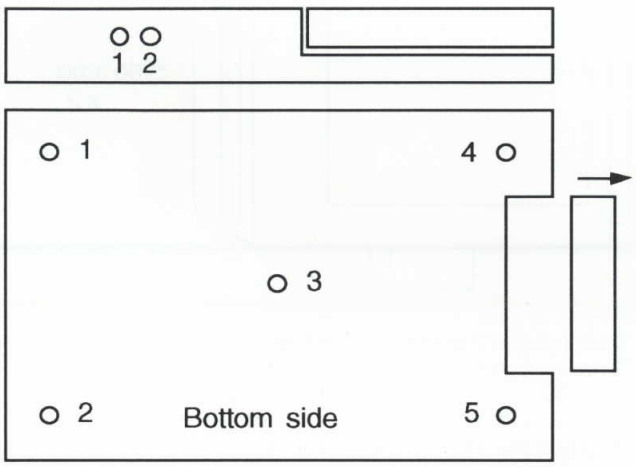



Fig 4.1

Lift the top cover from the bottom-side. Then place the top cover on the right hand side and dismount the flex wire from connector J402 and connector JF01.
Also disconnect the connector J502 then the top cover can be taken off.

**4.1.2 Remove CDM**

Remove 4 screws of the CDM.
Disconnect flex wire J801 and disconnect J802.
Remove sheet 036B, then remove 2 screws on the mainboard and 2screws on the power plug PP06.
Then the main board PM06 can be removed.

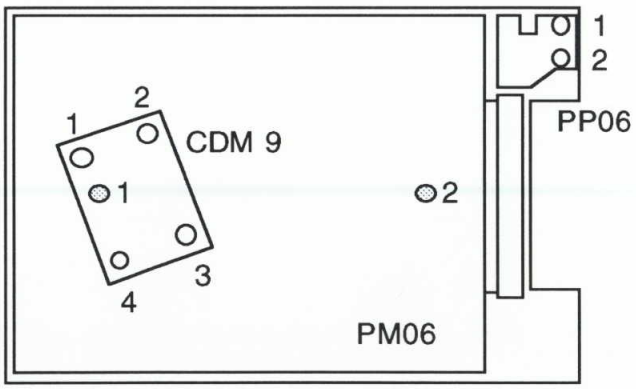



Fig 4.2

**Caution** : Demounting of Flex Foil CDM 9
- Remove the "flex foil" from the connector(s) on the PCB by lifting the upper part of the connector and taking the flex foil out. ( see Fig 4.4 )
- After disconnection of the "flex foil" short-circuit the by means of a paperclip or conductive clip.

**Note**:
Since laser, monitor diode and photodiodes are very sensitive to electrostatic discharges, careless handling during servicing may reduce life expectancy drastically.For this reason care should be taken that during servicing the potentials of the aids and yourself are equal to that of the screening of the set.

**4.1.3 Connect the CDM with an extention frex wire.**
This extention wire can be made yourself by soldering a frex connector J801 on the extention flex wire. This wire can be ordered with service code number 4822 322 40066.

Connect the motor wire to J802 and position the CDM next to the front side of the mainboard.

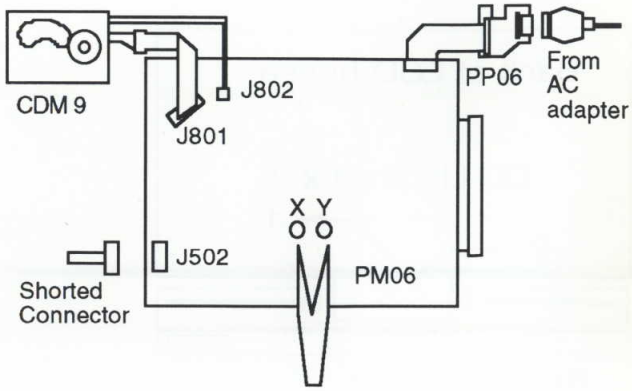



Fig 4.3

Both side of the mainboard can be reached by turn over the mainboard.
Mounting must be done in the reversed way.

**4.1.4 Operate without top cover**

When the CD Lid is removed the player can still be operated with the remote control.
First interconnect pin 5 and pin 6 of connector J502. This can be done by connecting a female onnector to J502 with pin 5 and pin 6 short circuited. Connect the AC adapter to the PP06 PCB. Second interconnect point X and Y on the mainboard for switching on the player. ( near the JF01 )

**4.1.5 Playing**

For player a disc in this service position place a disc on the turntable and place a magnetic clamper pos.058B on the disc.

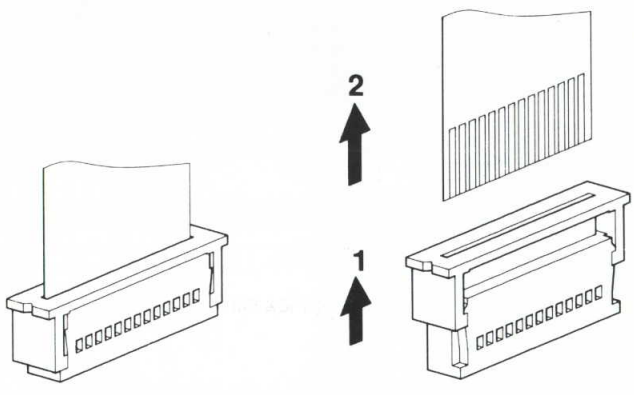



Fig 4.4



World of free manuals

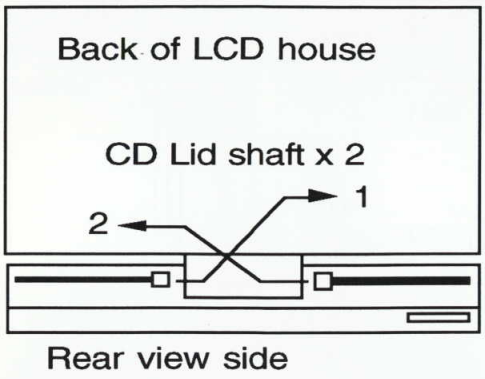
www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



### 4.2 Servicing the CD-Lid

First Remove top cover 4.1.1

**4.2.1 Remove the CD-Lid**
Put the LCD unit in the vertical position.
Now the shafts can be reached from behind.
Remove the shafts by means of a pair of tweezers.




Then the CD-Lid can be removed carefully.

Be **Careful** with Flex wire of CD Lid when inserting the CD Lid shaft 1.

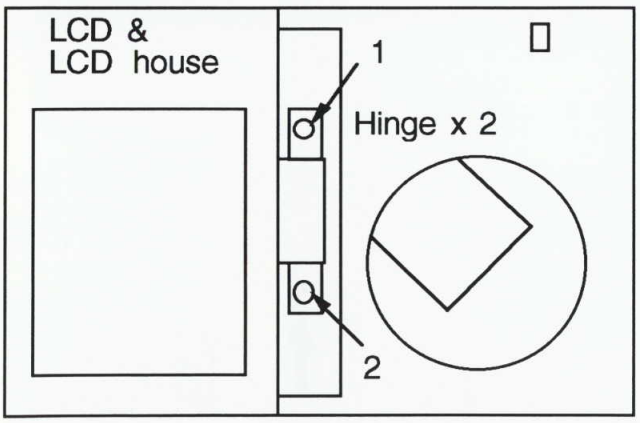
**4.2.2**
The CD-Lid is a complete service part only the clamper pos.058B and the clamper bracket pos. 002B are also service parts.

### 4.3 Servicing the LCD screen unit

**4.3.1**
The LCD unit cannot be repaired locally but must be sent for repair. See: Repair procedure

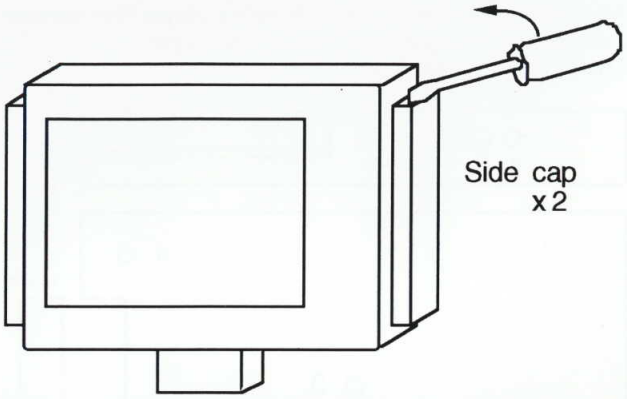
**WARNING !!!**
1. The LCD Screen Unit may Not Be Opened.
2. Do Not Touch the Surface of the LCD Glass.

**4.3.2 Remove the LCD house.**
Remove two screws from the two Hinges.




Then remove the LCD house cafully. ( Flex wire )

**4.3.3**
Remove the LCD-screen unit from the LCD housing.
Remove side caps pos.046B(R) and pos.047B(L) by means of a screw-driver.




Then remove 2 screws on each side of the LCD house.
Then remove two screws holding the Hinges from behind.
The LCD house can be opened now and the LCD-screen unit can be taken out.
Mounting the LCD-screen unit must be done in the opposite way.


World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



## 5 SERVICE SOFTWARE

### 5.1 THE LOW LEVEL MMC TEST

**Scope**
This test is standard implemented in the boot software of CD-RTOS. It doesn't need a lot of hardware to run. When debugging or servicing an MMC panel this test is very useful.

**General**
This test is developed for service and low level hardware debugging purposes only. It is meant to be used with the service pcb as described in TOOLS (please refer to section 3.5 SERVICE TOOLS). The test executed with the service pcb is called the **"pcb low level test"**.
The test executed with the VT100 terminal is called the **"terminal low level test"**. Since this service pcb display has just 8 digits, only the most important information will be displayed to the user. For the VT100 terminal this is never a problem.
This test consists out of the following items:

a. Display header and release number.
b. VSC
c. ROM
d. NVRAM
e. DRAM
f. CDIC
g. SLAVE processor (68HC05)

**5.1.1 Tools**
In this test the service pcb acts as some kind of a 'micro terminal'. This means that the service pcb is able to display some alphabetical and numerical characters. Some characters because it uses 7-segment displays

The three keys available are:
TEST ; test all display leds.
Yes ; Send an ASCII 'Y'.
No ; Send an ASCII 'N'.

The communication parameters are fixed at: 9600 baud
8 data bits
1 stopbit
no parity

The microcontroller is programmed with software available at IMS CDI software group.
The circuit diagram is on section 3.5.1.1

**5.1.2 Testsquence**
Table 1 below shows all the steps of the testprogram and what kind of tests are performed.

| STEP | ACTION/TEST PERFORMED |
|---|---|
| 00 | VSC master/slave init |
| 01 | ROM |
| 05 | NVRAM |
| 06 | DRAM BANK0 & BANK1 |
| 07 | DRAM BANK0 |
| 08 | DRAM BANK1 |
| 09 | CDIC |
| 10 | SLAVE |
| 11 | CLOCK CALIBRATION |

Table 1: teststeps low level test

**5.1.3 Low level test implementation**
The low level test (short: lltest) is implemented in the boot part of the CD-RTOS software. The whole test occupies about 10k of ROM memory and is written in assembler.
The test runs without the use of any external RAM. It only uses internal CPU registers. As communication channel the 68070's UART is used. Before starting the normal player boot the following sequence is executed:
1. Initialize the 68070's UART : 9600 baud
   1 startbit
   8 databits
   1 stopbit
   no parity
   no handshake !
2. Clear the RXD buffer.
3. Wait 5 ms.
4. Read the RXD buffer.
5. If the character received was an ACK ($06) the start the pcb lltest

The UART is connected to I/O port 2

**5.1.4 How to start up the low level test**

**With service pcb**
To startup **the pcb low level testsoftware** the next sequence should be followed:
- Switch off the player.
- Connect service pcb to INPUT at the right hand side.
- Switch on the player.
- The service pcb display should now show 'CDI RLxx'. (with xx the release number)
- The pcb lltest is now ready to go.

**With VT100 terminal**
To startup **the terminal low level testsoftware** one should follow the next sequence:
- Switch off the player.
- Connect the terminal to the 68070's UART of the player.
- Switch on the player while pressing the SPACE-bar of the terminal.
- The terminal should now show the title of the terminal lltest.

**5.1.5 PCB low level test**
If the service pcb is connected to port 2 the pcb low level test is executed after power on. In table 1 a survey is given for all tests executed.

**Display lltest release number:**
When this lltest is entered, first the release number of the pcb lltest will be displayed.

Example: CDI RLxx

(RL stands for RELEASE, xx stands for release x.x).
The lltest is now waiting for an action from the user. The user should now press either the'Y' or 'N' button to continue the test.

**STEP 0: VSC**

STEP 0A: VSC MASTER

display: 0A

In this step some registers of the VSC MASTER are initialized. These registers are :

DCR2 register(set to independant
DCR register (disable display)
CSR register (set DTACK delay and DRAM type)

STEP 0B: VSC SLAVE

display: 0B

In this step some registers of the VSC SLAVE are initialized. These registers are:

DCR2 register(set to independant DCA)
DCR register (disable display)
CSR register (set DTACK delay and DRAM type)



**STEP 1: ROM**

In this step the contents of the ROM is checked.
Following tests are done on the ROM:
1. Display release number of this ROM. (test A)
3. Check if the parity of the ROM is OK. (test C)

Address range:
- The ROM chips used for this memory map are : 1 X 4Mbit.
  On the MINI MMC the clock and calendar chip used is the SGS-Thomson MK48T08B. It is visible in the memory map.

| Nr.of Bytes Words | UPPER — — — LOWER | MAPPED ADDRESS SPACE | UNMAPPED ADDRESS SPACE | FUNCTION |
|---|---|---|---|---|
| 512kB | UP&LO | 00 0000 - 07 FFFF | 00 0000 - 07 FFFF | DRAM BANK1 |
| 512kB | UP&LO | 08 0000 - 0F FFFF | 08 0000 - 0F FFFF | DRAM BANK2 |
| 512kB | UNDEF | 10 0000 - 17 FFFF | 10 0000 - 17 FFFF | RESERVED |
| 512kB | UP&LO | 18 0000 - 1F FBFF | 18 0000 - 1F FBFF | SYSTEM ROM |
| 16B | LO | 1F FC00 - 1F FFBF | 1F FC01 - 1F FC1F | DUART (4) |
| 16B* | UP&LO | 1F FFC0 - 1F FFDF | 1F FFC0 - 1F FFDF | VCS REGS SLAVE |
| 16B* | UP&LO | 1F FFE0 - 1F FFFF | 1F FFE0 - 1F FFFF | VSC REGS MASTER |
| 4B | LO | 20 0000 - 20 7FFF | 20 0001 - 20 0007 | SLAVE |
| 500kB | UNDEF | 20 8000 - 27 FFFF | 20 8000 - 27 FFFF | FREE SPACE |
| 64kB | LO | 28 0000 - 28 FFFF | 28 0001 - 28 FFFF | FLOPPY (4) |
| 460kB | UNDEF | 28 0000 - 2F FFFF | 28 0000 - 2F FFFF | FREE SPACE |
| 8kW | UP&LO | 30 0000 - 30 7FFF | 30 0000 - 30 3FFE | CDI |
| 910kB | UNDEF | 31 0000 - 3E FFFF | 31 0000 - 3E FFFF | FREE SPACE |
| 2B | LO | 3F 0000 - 3F 7FFF | 3F 0001 - 3F 0003 | KILLME/DMAMEM |
| 8kB-8 | UP | 3F 8000 - 3F FBFF | 3F 8000 - 3F BFEE | NVRAM (2) |
| 8B | UP | 3F BFF0 - 3F FBFF | 3F BFF0 - 3F BFFE | CLOCK&CAL REGS |
| 1kB | UNDEF | 3F FC00 - 3F FFFF | 3F FC00 - 3F FFFF | DO NOT ACCESS(3) |
| 13MB | UNDEF | 40 0000 - FF FFFF | 40 0000 - FF FFFF | EXTENSION SPACE |

Table of the memory map

(1) The effective memory space for SYSTEM ROM is 512kB-1k.
(2) The maximum available NVRAM space in this configuration is 31 kByte.
(3) This part of the memory map should not be accessed. The VSC registers are mapped here.
(4) When used.

**I.. Explanation of items in tables**
Nbr. of Bytes/Words :
The total available bytes or words. Words in this case means the part of the memory map is only accessable as a word.
kB = kilobytes
B = bytes
B* = bytes, but some addresses are only accessible as words.
kW = kilowords, only accessible as a word!



UPPER - LOWER:
This column gives an indication of how the device is accessible.
UP = only accessible as byte via the UPPER byte of the databus. (DATA8-DATA15)
LO = only accessible as byte via the LOWER byte of the databus. (DATA0-DATA7)
UP&LO = accessible via LOWER as well as UPPER byte of the databus. (the device uses the complete databus.
UNDEF = not defined.

MAPPED ADDRESS SPACE:
This column gives the total address range where the device described in FUNCTION is accessible. In this range the device can occur several times.

UNMAPPED ADDRESS SPACE:
Analogous as mapped address space, only the device can occur only ONE time.

FUNCTION: This column describes the device or register

**STEP 1: ROM 10**

STEP 1A: ID AND RELEASE NUMBER DISPLAY

display: 1A
IDxxRLyy

In this step the release number of this ROM is displayed for a moment.
(ID stands for IDentification, xx is the id number.
RL stands for RELEASE, yy stands for y.y)

STEP 1C: CHECKSUM

display: 1C

In this step the checksum of this ROM is calculated as described in " how is the checksum calculated ". If the checksum is not ok an error will be displayed.

display: 1C Er05

**STEP 5: NVRAM**
The nvram test is a non destructive test. This means that the original nvram contents is restored again.
Address range: Full nvram address range (see product spec)

display: 5

The following actions take place in the nvram test:
1. read byte from nvram and save it in a register
2. write a pattern (from ROM) to nvram
3. read byte from nvram and compare with pattern
4. if byte read is ok then continue with action 5 else give error message and stop testing

If error,

display: 5 Er09

5. write inverted pattern to nvram
6. read byte from nvram and compare with pattern
7. if byte read is ok then restore original byte else give error message and stop testing

If error,

display: 5 Er10

8. repeat this for every possible nvram address

**STEP 6-8 :DRAM**
The dram test is always a destructive test. The test is performed for both ram bank0 and bank1 as one large memory followed by a test for each bank separately. On the displays following, the 'x' is a memory counter. The counter is incremented every 128k. So for the full range it counts from 1 to 8.

Address range: full address range (see table)
Bank0 = lower RAM bank
Bank1 = upper RAM bank

STEP 6A : TEST THE FULL DRAM MEMORY
The following actions take place in this test:
1. fill the memory with the long word address as data.

   display: 6Afx

2. read the memory contents and compare with the address.

   display: 6Arx

3. if the long word read is ok then continue else give error message and stop testing.
   If error,

   display: 6ArxEr11

STEP 6B : TEST THE FULL DRAM MEMORY WITH INVERTED DATA
The following actions take place in this test:
1. fill the memory with the inverted long word address as data.

   display: 6Bfx

2. read the memory contents and compare with the inverted address.

   display: 6Brx

3. if the long word read is ok then continue else give error message and stop testing.
   If error,

   display: 6BrxEr12

STEP 7A : TEST DRAM BANK0
The following actions take place in this test:
1. fill the memory with the long word address as data.

   display: 7Afx

2. read the memory contents and compare with the address.

   display: 7Arx

3. if the long word read is ok then continue else give error message and stop testing.
   If error,

   display: 7ArxEr13



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



STEP 10D : READ AND DISPLAY CD RELEASE NUMBER

display: 10D

In this step the following actions take place:
1. read the next byte from the slave
2. if the byte < > $00 then continue with step 3 else give an error and stop testing
   If error,

   display: 10D Er22

3. wait until a key is pressed.
4. read the next byte: this is a dummy read.

Free service manuals
Gratis schema's
Digitized by
www.freeservicemanuals.info

| STEP | DESCRIPTION |
|---|---|
| 0a | VSC master initialization |
| 0b | VSC slave initialization |
| 1a | ROM10 release number |
| 1c | ROM10 checksum check |
| 5 | NVRAM test with rom data as data |
| 6af | DRAM fill bank0&bank1 with address as data |
| 6ar | DRAM read and compare data |
| 6bf | DRAM fill bank0&bank1 with inverted add. as data |
| 6br | DRAM read and compare data |
| 7af | DRAM fill bank0 with address as data |
| 7ar | DRAM read and compare |
| 7bf | DRAM fill bank0 with inverted address as data |
| 7br | DRAM read and compare data |
| 8af | DRAM fill bank1 with address as data |
| 8ar | DRAM read and compare |
| 8bf | DRAM fill bank1 with inverted address as data |
| 8br | DRAM read and compare data |
| 9a | CDIC RAM test with address as data |
| 9b | CDIC RAM test with inverted address as data |
| 9c | CDIC register test |
| 10a | SLAVE test: write request to slave |
| 10b | SLAVE test: read echo from slave |
| 10c | SLAVE test: read SLAVE release number from slave |
| 10d | SLAVE test: read CD release number from slave |

Table 1: PCB LLTEST steps overview

### 5.1.6 Terminal low level test

If a VT100 or compatible terminal is connected to the 68070's UART of the CDI player one is able to execute the terminal low level test. Due to the fact that almost every test is self explanatory only the major steps are described below. In this test it is possible to skip every major step.

**Display lltest header and release number**

STEP 0: VSC
Both master and slave vsc are low level initialized sequentially. This is done the same as in the pcb low level test.

STEP 0: Writing to a user definable ram address
This test writes the powers of 2 to a ( word ) address. The result is read again and will be displayed. The address can be selected by the user ( only word adresses ). Pressing 'ESC' stops the test.
If one trys to write to unused space in the memory map, the program will NOT generate an error message.

STEP 01: ROM
For the ROM the following information is displayed and checked:
- Display the identification code for this ROM (ROM ID)
- Display the release number of this ROM
- Display the checksum of this ROM. The upper word of the checksum displayed is always '0000'.

If the checksum is not ok then a specific error will be displayed. This error is the same as in the pcb low level test.

STEP 05: NVRAM
For the NVRAM test three different tests can be selected:
- The first is a non destructive nvram test as in the pcb low level test.
- The second test is a destructive nvram test with ROM data as test data.
- The third test is also a destructive test with the address as data.
- The third test has also some hidden functions. Pressing:
  w: writes continu the address as data to the nvram.
  r: reads continu the complete nvram ( no display ).
  d: displays the contents of 421 succeeding ram locations. The start address is given by the user.
  ESC stops these functions.

Remark: The error message is different from the pcb lltest.

See error table for more information.

Address range: Full nvram address range (see table of memory map)

STEP 06-08: DRAM
The dram test is always a destructive test. The test is performed for both ram bank0 and bank1 as one large memory followed by a test for each bank separately.
The following actions take place in the dram test:
1. fill the memory with the long word address as data.
2. read the memory contents and compare with the address.
3. if the long word read is ok then continue else give error message and stop testing.
4. write the inverted long word address as data to memory.
5. read the memory contents and compare with the inverted address.
6. if the long word read is ok then continue else give error message and stop testing.

This test has also some hidden functions. Pressing:
w: writes continu the long address as data to the dram.
r: reads continu the dram ( no display ).
d: displays the contents of 421 succeeding ram locations.
The start address is given by the user.
ESC stops these functions.

Remark: the error message is different from the pcb lltest.

See error table for more information.

Address range: full address range (see product spec)
Bank0 = lower RAM bank
Bank1 = upper RAM bank

STEP 09: CDIC
cdic register2:
CDIC base address + $3FFA ; register2 contents after reset: $D7FE

See table of memory map for base address.

The cdic test consists out of three main parts:
1 test cdic ram with long word address as pattern
2 test cdic ram with inverted long word address as pattern
3 display cdic register and compare



STEP 7B : TEST DRAM BANK0 WITH INVERTED DATA
The following actions take place in this test:
1. fill the memory with the inverted long word address as data.

   display: 7Bfx

2. read the memory contents and compare with the inverted address.

   display: 7Brx

3. if the long word read is ok then continue else give error message and stop testing.
   If error,

   display: 7BrxEr14

STEP 8A : TEST DRAM BANK1
The following actions take place in this test:
1. fill the memory with the long word address as data.

   display: 8Afx

2. read the memory contents and compare with the address.

   display: 8Arx

3. if the long word read is ok then continue else give error message and stop testing.
   If error,

   display: 8ArxEr15

STEP 8B : TEST DRAM BANK1 WITH INVERTED DATA
The following actions take place in this test:
1. fill the memory with the inverted long word address as data.

   display: 8Bfx

2. read the memory contents and compare with the inverted address.

   display: 8Brx

3. if the long word read is ok then continue else give error message and stop testing.
   If error,

   display: 8BrxEr16

**STEP 9: CDIC**
This test only checks part of the CDIC ram, mainly because it is possible that during the test the CDIC destroys part of the ram contents.
address range: CDIC base address + $1400 to CDIC base address + $3C7F.
cdic register2: CDIC base address + $3FFA
register2 contents after reset: $C7FE

See table for base address.

STEP 9A :CDIC RAM TEST WITH ADDRESS AS DATA

display: 9A

The following actions take place in the CDIC RAM test:
1. Fill the memory with long word address as data.
2. Read and compare the data with the address.
3. If the long word read is ok then continue else give an error and stop testing.
   If error,

   display: 9A Er17

STEP 9B :CDIC RAM TEST WITH INVERTED ADDRESS AS DATA

display: 9B

The following actions take place in the CDIC RAM test:
1. Fill the memory with inverted long word address as data.
2. Read and compare the data with the inverted address.
3. If the long word read is ok then continue else give an error and stop testing.
   If error,

   display: 9A Er18

STEP 9C :CDIC REGISTER 2 TEST

display: 9C

The following actions take place in the CDIC REGISTER test:
1. Read register 2 and compare with fixed pattern. (Register 2 has a defined pattern after reset.)
2. If the register is ok then continue with next step else give an error and stop testing.
   If error,

   display: 9C Er19

**STEP 10 SLAVE processor (68HC05)**
This test checks the communication with the slave processor.
Additionally it displays the slave and cd processor release numbers. If the communication with the cd processor via SPI does not function, the cd release number will give a 0.0.

Address range: Slave base address + 6 (See table).

STEP 10A : WRITE REQUEST BYTE TO THE SLAVE

display: 10A

In this step a $F0 (request) is written to the slave.

STEP 10B : READ ACKNOWLEDGE FROM THE SLAVE

display: 10B

In this step the following actions take place:
1. wait about 2 sec to give the slave the time to acknowledge.
2. read the acknowledge.
3. if the acknowledge is $F0 then continue else give an error and stop testing.
   If error, `

   display: 10B Er20

STEP 10C : READ AND DISPLAY SLAVE RELEASE NUMBER

display: 10C

In this step the following actions take place:
1. read the next byte from the slave
2. if the byte «gd› $00 then continue with step 3 else give an error and stop testing.
   If error,

   display: 10C Er21

3. wait until a key is pressed.
4. continue with next step



If in one of these tests an error occurs the test will be stopped and the error displayed.

This test has also some hidden functions. Pressing:
w: writes continu the long address as data to the cdic.
r: reads continu the complete cdic ( no display ).
d: displays the contents of 421 succeeding ram locations.
The start address is given by the user.
ESC stops these functions.

Address range:
CDIC base address + $1400 to CDIC base address + $3C80.

STEP 10: SLAVE processor (68HC05)
This lltest for the slave performs following actions:
1 Write $F0 to the slave processor.
2 Read byte from same address, the slave should respond with $F0.
3 If data is not $F0 then stop testing and display error code else continue with next action.
4 Read the next byte: this byte is the release number of the slave processor firmware. Display the release number. If the release number is $00 then an error will be displayed.
5 Read the next byte: this byte is the release number of the CD processor firmware. Display the release number. If the release number is $00 then an error will be displayed.
6 Read the next byte: this is a dummy read.

Address range: Slave base address + what is read in 6.

See table of memory map for base address.

STEP 11: CLOCK CALIBRATION
This step is not really a test. it is a software tool that can be used to trim the clock&calendar chip so that it runs within 1 minute acc. per month. If calibration is not needed, this step should be executed since a frequency counter is needed to complete this test successfully. If this test is entered accidently, just switch off the power and restart the lltest.
The clock calibration should be performed with an external frequency counter.

- Connect the probe of the counter to pin21 of IC7205 the signalis called CSCDICN.
- Start the test with the gate time of the frequency counter set to minimum 5 sec.
- The counter display should now show a frequency near to 512 Hz.
  If not, the chek if everything is set and connected properly.
  (range : 511,96724 to 512,03276)
- Press a key on the terminal to stop the measurement.
- Now fill in the measured value of the frequency. The lltest software will now calculate the proper value to be filled into the calibration register of the clock&calendar IC.
  The value of the frequency at pin21 of IC7205 will not be changed or influenced.
- The calibration is done now.

### 5.1.7 Error codes

When during a test an error occurs the user should be aware of following conventions:
- For the pcb low level test the error is displayed on the outermost righthand side of the display.

  Example: 1 Er11

  An survey for all error codes is given in table 2.

- For the terminal low level test the error is displayed on the outermost lefthand side of the terminal. In some cases (memory tests) the error code is replaced by a more meaningful error output.

  Example: ADDRESS DATA READ EXPECTED
  ERROR:00080000 F0080000 00080000 RETURN to continue,ESC to STOP

  Meaning: (assuming long word data is used); On address
  $80000 the data was $F0080000 and not $80000 as it should be. If the RETURN button is pressed, the next address will be read and checked. With this output it will be easier to debug the MMC board

- When an error has occurred the program will wait for a user intervention with following question:
  RESTART the test Yes or No?
  If the answer was 'Y' then the lltest software is executed again from the beginning.
  If the answer was 'N' then the next test is executed as if nothing happened.

| ERROR | DESCRIPTION | DISPLAY |
|---|---|---|
| 05 | ROM checksum error | Er05 |
| 09 | NVRAM error | Er09 |
| 10 | NVRAM error (for inverted data) | Er10 |
| 11 | DRAM error (bank0 & bank1) | Er11 |
| 12 | DRAM error (bank0 & bank1, inverted data) | Er12 |
| 13 | DRAM bank0 error | Er13 |
| 14 | DRAM bank0 error (inverted data) | Er14 |
| 15 | DRAM bank1 error | Er15 |
| 16 | DRAM bank1 error (inverted data) | Er16 |
| 17 | CDIC RAM error | Er17 |
| 18 | CDIC RAM error (inverted data) | Er18 |
| 19 | CDIC register error | Er19 |
| 20 | SLAVE error (wrong echo from slave) | Er20 |
| 21 | Invalid release number from slave | Er21 |
| 22 | Invalid release number from cd proc | Er22 |

Table 2. Error codes overview

### 5.1.8 Release number, position and checksum storage

The release number,ID and checksum are always stored in the CDI ROM. Step 1 of the pcb lltest as well as the terminal lltest uses all this information to check if the ROM is ok.

Where are these bytes stored in the ROM's, where in the memory?
(ROM address range for the 4Mb: $00000-$7FBFF)
(MMC address range for the 1Mb: $180000-$1FFBFF)



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



ROM address $7FBFF = LSByte of the checksum
$7FBFE = MSByte of the checksum
$7FBFD = Release number of this ROM (BCD coded)
$7FBFC = Player ID (BCD coded)
MMC address $1FFBFF = LSByte of the checksum of the ROM
$1FFBFE = MSByte of the checksum of the ROM
$1FFBFD = Release number of the ROM (BCD coded)
$1FFBFC = Player ID (BCD coded)

Remark: The total ROM space is 512k minus 1k. This 1k can never be accessed in the MMC address space. It is used for the VSC's registers and chip selects.

**5.1.9 How is the checksum calculated?**
The checksum is calculated for every ROM separately. The checksum is the algebraic sum of all bytes in that ROM except the 2 bytes where the checksum is written. Only the LSWord of the sum is used. To calculate the real checksum of the ROM just add these 2 bytes to the LSWord of the sum.
The last 1024 bytes are always assumed to be all $FF.

ROM checksum = sum of all bytes of the address range $180000 to $1FFBFD + $FC00
ROM checksum displayed in STEP 1=
ROM checksum + (LSB + MSB) of this checksum.
This is also equal to the checksum of the complete ROM.

**5.2 THE SERVICE SHELL**

**Introduction.**
For service purposes the CD-I set has built-in software modules. These modules can be activated via the service shell by menu.
The modules are for the testing of :
- Video circuitry, by means of a colorbar testpatern
- CDM and servo circuitry
- Input / Output ports
- Audio circuitry

Testing the CDM, servo and audio cicuitry in the service shell is only possible with a CD-DA disc.

**5.2.1 Starting the service shell**
(1) Power OFF (2) Press two switches: ' Display ON/OFF ' and ' Action button 2 (Right side) ' (3) Power ON and release two switch if after Power ON

**5.2.2 Layout info**

SELECTABLE/NON SELECTABLE ITEMS
Each menu of the service shell consist of a number of boxes and text strings. Some of these boxes can be selected by moving the screen cursor above the box and clicking on one of the joystick buttons. Only the colored boxes can be selected. Clicking on one of the other boxes will have no effect.

(ERROR) MESSAGES ON THE SCREEN
The service shell will provide information and errors in a box at the top of the screen. To remove such a message and continue with the test a button must be clicked on the remote control joystick.

MENU STRUCTURE
When the service shell is started, the main menu appears with a number of boxes on it. Selecting some boxes will result in a submenu being displayed, other boxes may result in immediate action. Selecting the EXIT box will stop the service shell and restart the player. Selecting EXIT in a submenu will return you to the previous menu.

**5.2.3 Subject dependent information**

MAIN MENU
The main menu contains four test item boxes and the EXIT box. Selecting TEST IMAGE will give immediate action, the other three test items will display a submenu.

CD TEST
This menu has two information boxes at the top of the screen. Below it are three test items for the CD player and below these are three buttons that can be selected only during the CD drive test. When the menu is first entered only the three test item boxes can be selected. Subjects of the CD test are the cd drive itself, the X bus and a test on Digital Out.
When this menu is selected in the main menu, the communication channel with the CD processor will be checked first. A message will be displayed giving the result of this check (either O.K. or No response). After pressing one of the buttons (to remove the message) the cd menu will be displayed.

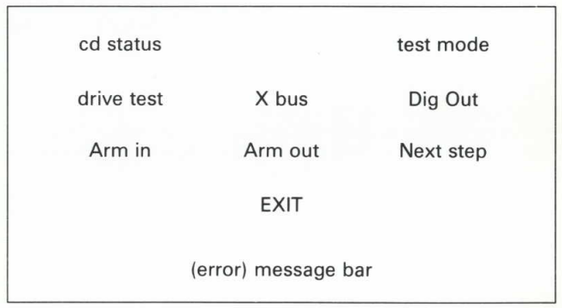



fig 3.2 CD test menu

The X bus test will result in immediate action. It checks the communication channel between the CDIC and CD processor that is normally used to send commands (seek, read etc) to the CD processor. The result is either O.K or No response.
The Dig. Out test will also give immediate action. It's purpose is to check wether the CDIC receives a Digital Out signal or not. The result of this test is O.K. or No Digital Out.
The CD drive test uses a different menu and will therefore be described in a separate paragraph.

CD DRIVE TEST
The CD drive test will perform the service loop as implemented in the Philips CD audio players. A disc is needed for this test. Results of this test will be displayed on the screen instead of a display. When the cd drive test is selected, the same screen will appear, but with other buttons highlighted. You cannot select the X bus and Dig Out test anymore. Selecting the EXIT button will return you to the cd menu. (X bus and Dig Out button highlighted again). The drive test consist of the following steps:

Mode 0
Software release number of the CD micro processor is displayed in the button at the left top of the screen (cd status button).Mode 0 is displayed in the button at the right top of the screen (mode button). During the cd drive test this button will display the current mode.
In mode 0, the ARM IN and ARM OUT buttons can be selected to move the cd lense inwards and outwards.
Selecting NEXT STEP will bring the player in mode 1.



Mode 1
In mode 1 the cd driveprocessor will try to focus. If it manages to do so (a disc must be present!), the message IN FOCUS will appear in the status button. Otherwise, the message NO FOCUS will appear in the status button after the cd driveprocessor has tried to focus 16 times (this may take a while). In that case (no focus found) the test will return to mode 0.
Selecting NEXT STEP will bring the player in mode 2.

Mode 2
The turntablemotor is rotating and controlled by the rough HF, moving the cd lense outside (by hand) will slow the disc down.
If an error occurs, the test will return to mode 0.
Selecting NEXT STEP in mode 2 will bring the player in mode 3.

Mode 3
You can select ARM IN and ARM OUT to make the cd lense jump inside or outside (small jumps). The laser will keep jumping while a button is pressed on the remote control.
If an error occurs, the test will return to mode 0.
NEXT STEP in mode 3 will bring the player in normal playing mode.

Normal playing mode
The player shell will be started and errors sent by the cd processor will be displayed in a box on the screen. You cannot return to the service shell otherwise than by resetting the player.

ERROR MESSAGES

display: A5 xx0000

xx = 2 : focus error
xx = 3 : radial error
xx = 5 : off error (TL stays low for 50 msec.)
xx = 6 : jump error
xx = 7 : subcode error, no valid subcode in 3 sec.
xx = 8 : TOC error: out of lead-in area while reading the TOC
xx = 30 : to many grooves to jump
xx = 31 : search time out
xx = 32 : bin. search error
xx = 33 : search index error
xx = 34 : search time error
xx = 37 : selection error

DUART TEST
This test is not relevant

APU/KEY TEST
This is a combined menu, the attenuation can be changed via this menu and the keys on remote control and player can be tested with it. There are three buttons for every attenuation path on the screen. Two of them can be selected (to increment/decrement) and one is used to display the current attenuation value for the path. There is also a MONO/STEREO button on the screen. In STEREO, two attenuation paths are disabled (left to right and right to left), in MONO all attenuation paths are enabled. Maximum attenuation is reached at the value 47 (no sound). A CD audio disc is needed for the attenuation test. The test routine will start playing the disc at initializiation.
When a key is pressed, a text will appear on the key button on the right side of the screen describing the button pressed. The text will disappear when the key is released.

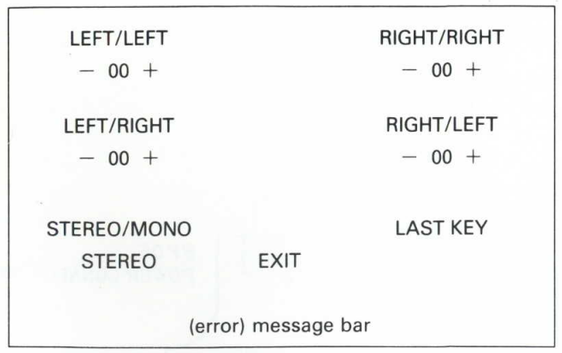



fig 3.4 APU test menu

VIDEO TEST IMAGE
A colorbar will be displayed on the screen. Pressing a button after the screen has been filled completely will return you to the main menu. There are no error messages for this test.

**What could be wrong if...**
This paragraph will describe the meaning of the error messages given by the service shell and contains suggestions about possible errors. This paragraph must be updated with new information from testing and debugging players.

Service shell cannot be started with the testplug. Connections between port 1 and slave may be bad. Testplug could be wrong. Maybe the slave processor is defect. If the playershell cannot be started either, try the low level test first.

The key test will display the text ERROR if an unknown key code is received.

Disconnecting the clock from MMC to CD processor will make the CD player turn as fast as it can.



World of free manuals

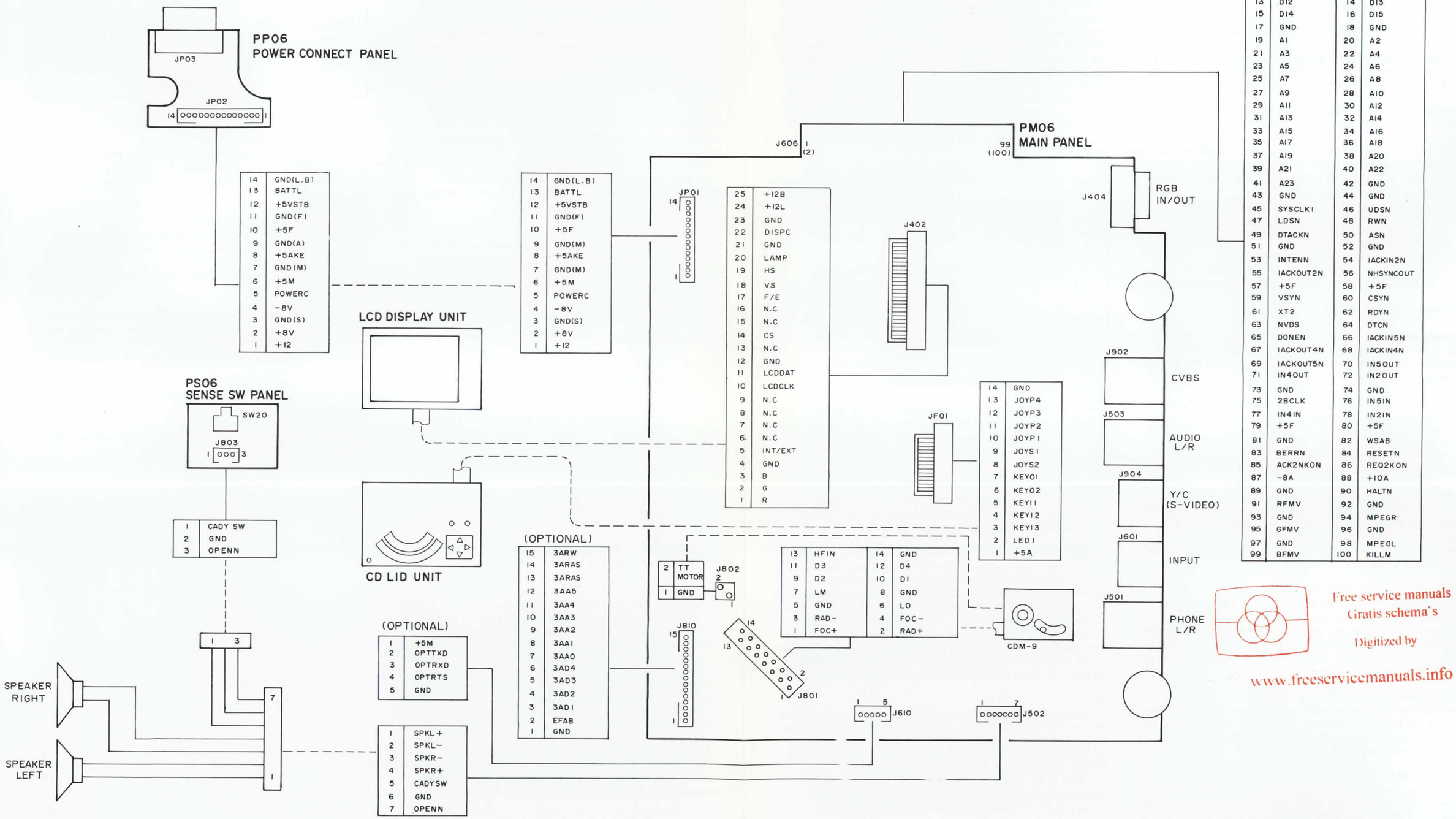
www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl





# 6 ELECTRICAL DRAWINGS

## 6.1 Wiring diagram




Free service manuals
Gratis schema's
Digitized by
www.freeservicemanuals.info



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



## 6.2 Alphabetical signal listing

ACK2N : DMA REQUEST ACKNOWLEDGE (active low) (of channel 2)
ADEN : (=ADENA) ADDRESS ENABLE NOT. When low,the address ADENA coming from the bus (68070) will be put through to CDIC
AM : ADDITIONAL MUTE
ASN : ADDRESS STROBE (active low,tristate) indicates when an address is valid on the bus for the system
AVN : AUTOVECTORED INTERRUPTS (active low),can be used by an extension
B0..3 : input control bits for off-,catch-,play status and DAC output current for radial motor
BATTL : Battery detect signal from Power in
BCDI : Video signal from VSD (GCDI,RCDI)
BENC : >> to encoder
BFMV : >> from J606 (GENC,RENC)
BERRN : >> BUS ERROR (active low,open drain)
BERR : >>
BLANI : (=BLAN1M) BLANKING OUTPUT (active low,tristate)of the VSC
BTU : Video signal from J404 (GTU,RTU)
CBA,CBAA : 68070 bus transiever latch (rising edge)
CDICDACKN : (=ACK1N) DMA REQUEST ACKNOWLEDGE (active low)
CDICREQN : (=REQ1N) DMA REQUEST (active low)
CDIEXT : Interna(CDI)l/Extanal exchange signal of Audio/Video(Low=intanal)
CLAB : (=CLAB2) bitclock for the SAA 7220 chip
CLK : CLOCK (11,2896 Mc)
CLKDAC : CLOCK DAC,the clock used to send seria data to the volume adjustment
CLK1 : the clock on which the DSP operates (7,5264 Mc)
CRI : COUNTER RESET INHIBIT (low during a real trackloss or during excention of a jump command
COC : COMMAND COMPLETED signal
COXN : serial output clock for the X-bus
CPUASN : the address strobe of the 68070 microprocessor
CPULDSN : the lower data strobe of the 68070 microprocessor
CPUUDSN : the upper data strobe of the 68070 microprocessor
CS : CHIP SELECT
CSCDICN : CHIP SELECT CDIC (active low) bus information is intended for or coming from CDIC
CSDAC1N : (=CSDAC2N) (if selected,low) it means that data will be adjusted on that channel
CSNVRAMN : CHIP SELECT NVRAM (active low) bus information is intended for or coming from the NVRAM
CSROMN : Chip delect ROM ( active low )
CSSLAVEN : CHIP SELECT SLAVES (active low)
CSON : (=CSONA) CHIP SELECT (active low) for the 8Kx8 SRAM'S
CSVSCMSN : CHIP SELECT VSC MASTER AND SLAVE. When low the coming information is intended for the VSC'S
CSYN : COMPOSITE SYNCHRONIZATION input from the VSC's (active low)
CSYENC : >> to encoder
CTS2,M : CLEAR TO SEND (active low) it indicates that the remote recieving device is ready
DAAB : (DAAB2) serial data output of the X-bus I2S standard
DATA 0..15 : DATA LINES
DATADAC : Data which will be send to the DAC('S) for volume adjustment
DDTACK : DATA TRANSFER ACKNOWLEDGE to the 68070 bus
DEEMP : DEEMPHASIS
DIRN : DIRECTION CONTROL. Indecates the direction of data transfer through the transcievers
DISCLK : DISPLAY CLOCK>>
DISDAT : DISPLAY DATA >>only for CDI 2XX
DISPC : LCD screen ON/OFF (ON=high)
DIV4 : DIVIDE BY 4 signal
DO : DIGITAL OUT
DODS : DROP-OUT DETECTOR SUPPRESSION
DONEN : DONE (active low,open drain),operates in the DMA-mode
DOXN : serial data output of the X-bus
DSPRWN : Read (high) or write (low) from or to the Digital Signal Processor
DSN2N : DATA STROBE (active low) of the DSP
DTACKN : DATA TRANSFER ACKNOWLEDGE asserted by a peripheral
DTACKSLAVEN : DATA TRANSFER ACKNOWLEDGE of the SLAVE processor (68HC05)
DTCN : DATA TRANSFER COMPLETE (active low,open drain) operates in the DMA-mode
EFAB : ERROR FLAG
FILTERN : filter select when high:level C,when low:level A
FOC- : >> focus out to CDM 9
FOC+ : >>
GN : >>
GNA : >> When low:the outputs and inputs of the trancievers (646) are enabled
GNB : >>
HALTN : active low,open drain,biderectional. If low together whith the resetn it couses the 68070 to enter the reset state.
HSLCD : Hsync from LCD screen for external video
HSYN : (active low) horizontal synchronisation input from the VSC
HVID 0 IN ....HVID 7 IN : >> 8 bit pixel bus for channel 1
HVID 0 OUT ...HVID 7 OUT : >> (VSC-master)
IACKIN2N : >>
IACKIN4N : >> Decoded interupt acknowledge (active low).
IACKIN5N : >> Asserted during an interupt acknowledge
IACKOUT2N : >> sequence to indicate to a peripheral that
IACKOUT4N : >> this interupt request is bein serviced
IACKOUT5N : >>
IACKOUT2 : >>
IACKOUT4 : >>
IACKOUT5 : >>
IDAC : 1/2 bit DAC
IDTACKN : data transfer acknowledge from 68070
IFDN2 : main channel word-flag to the DSP
INTENN : >> when low,no extensions use the interupts,when high interrupt devices are daisy chained
INTENN2 : >>
INTENN3 : >>
INTENN4 : >>
IN2IN : (=IN2OUT) >>
IN4IN : (=IN4UT) >> Decoder interrupt priority inputs



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



IN5IN : (=IN5OUT) >> (active low) IN2IN has the lower
IN2OUT : >> and IN5IN has the higher priority
IN4OUT : >> IN2IN = SLAVEPROCESSOR (6805),IN4IN =
IN5OUT : >> CDIC (IMS66490),IN5IN = DUART (68681)
JOYP1..4 : Controler ( Joy Pad ) input
JOYS1,2 : Action sw input
KEYI1..3 : Key scan for Front switch
KEYO..3 :>>
LCDCLK : LCD screen control by I2C
LCDDAT :>>
LED1 : Power LED (red)
KILLM : to mute audio outputs by power on and off
LADD1..23 : ADDRESS-BUS (active high,tristate) for direct addressing of 16 Mbyte of memory
LDSN : LOWER DATA STROBE of the bus
LM : LASER MONITOR diode input
LO : LASER amplifier current OUTPUT
LRDN : when low select,the ROM'S or NVRAM read the lower data byte
LVID0IN : >> 8 bit pixel-bus for channel 2
....LVID7IN (VSCSLAVE)
LVID0OUT : >>
...LVID7OUT
MC : MOTOR CONTROL signal
MISO : MASTER IN SLAVE OUT
MOSI : MASTER OUT SLAVE IN
MPEGL,R : Audio signal from J606
MSMA0..8 : ADDRESS BUS between the DRAM'S of the VSC' MASTER and the VSC MASTER
MSMD0..15 : DATA BUS between the DRAM'S of the VSC' MASTER and the VSC MASTER
NRESET : when low the video synthesizer (VSR) is in reset
NVDS : digital output to control an external switch for TV overlays (active low)
PCLK1IN : >> PIXEL CLOCK for channel 1
PCLK1OUT : >>
PCLK2IN : >> PIXEL CLOCK for channel 2
PCLK2OUT : >>
PLOIN1 : input clock for CDIC (22,5792 Mc)
PLOIN2 : input clock for CDIC (19,3536 Mc)
POWERC : Power ON/OFF control from ICF1(ON=high)
QCL : Q-channel CLOCK
QDA : Q-channel DATA
QRA : Q-channel REQUEST INPUT/ACKNOWLEDGE OUTPUT
Q22 : output to PLL (22,5792 Mc) devided by 14
Q21 : output to PLL (19,3536 Mc) devided by 12
RAD+ : >> RADIAL OUT to CDM 9
RAD- : >>
RD : READY signal,starting up procedure finished
RDYN : READY (active low) of the DMA channel
REDIG : RADIAL ERROR DIGITAL
RESETCD : when low resetsequence starts
RESETINN : when low VSC is in reset
RESETN : this is the reset for all other ic's
REQ2N : DMA-request of the second channel
RSTOUT : RESET OUT of the slave processor when high resetsequence starts
RTSUART : REQUEST TO SEND from the slave processor to the UART of the 68070 processor
RTS2,M : >> REQUEST TO SEND (active low)
RWN : READ - WRITE (low is write) signal
RWN2 : READ - WRITE (low is write) signal from CDIC to the DSP
RWRAM : READ - WRITE signal from the CDIC to the S-RAM'S
RXD2,M : >> RECIEVE DATA RXD is data input
SI : on - off control for laser supply and focus circuit
SLMA0..8 : VSC-slave memory address bus to the DRAM'S
SLMD0..15 : VSC-slave memory data bus to the DRAM'S SOXENN: SERIAL OUTPUT ENABLE FOR THE X-BUS (enabled when low)
SOXRQN : SERIAL OUTPUT REQUEST FOR THE X-BUS (when low)
SOYENN2 : SERIAL OUTPUT ENABLE FOR THE Y-BUS (when low)
SPICLK : SERIAL PERIPHERAL INTERFACE CLOCK
SPISS : SERIAL PERIPHERAL INTERFACE SLAVE SELECT
STANDARD : software choise between PAL and NTSC
STANDARDSW : handware choise between PAL and NTSC
SOUND : Audio signal (mono) of external
SWAB : SUBCODING WORD CLOCK INPUT
SYSCLK : >> SYSTEM CLOCK
SYSCLK1,2,A : >>
TCAP : input capture feature for the on-chip timer
TCMP : output for the output compare feature of the on chip timer
TMOUT : TRAY MOTOR OUT
TXD2,M : >> TRANSMIT DATA TXD is data output
UDSN : UPPER DATA STROBE (active when low)
URDN : READ UPPER DATA BYTE (active when low)
UWRMN : READ - WRITE (write when low) UPPER MEMORY DATA FROM DRAM'S FROM VSC-MASTER
UWRN : WRITE UPPER DATA BYTE (active when low)
UWRSN : READ - WRITE (write when low) UPPER MEMORY DATA FROM DRAM'S FROM VSC-SLAVE
VC : output DC-motor (VOLTAGE CONTROL)
V-FLAG : output to the DSP
VSCM-INTN : when low,interrupt from VSC master to 68070 processor
VSCS-INTN : when low,interrupt from VSC slave to 68070 processor
VSYN : (active when low) VERTICAL SYNCHRONISATION INPUT from the VSC
WRPN1IN..2 : >> control input for channel 1 or 2 (active low)
WRPN1OUT.2 : >>
WSAB : >> WORD SELECT FOR AB CHIP
WSAB2 : >>
XIN : >> 11,2896/9,6768/4,8384 symmetrical clock
XIN2 : >>
X-TAL2 : the same as the system clock,coming out of the VSC'S
XT2 : the system clock devided by two
XT4 : >> the system clock devided by four
XT4IN : >>
0AD..12AD : >> ADDRESS BUS,between CDIC-SRAM'S and SYSTEM ADDRESS BUS BUFFERS
10ADA : >>
....12ADA
0D..15D : DATA BUS between CDIC and DSP



World of free manuals

www.freeservicemanuals.info
10/1/2013
www.nostatatech.nl

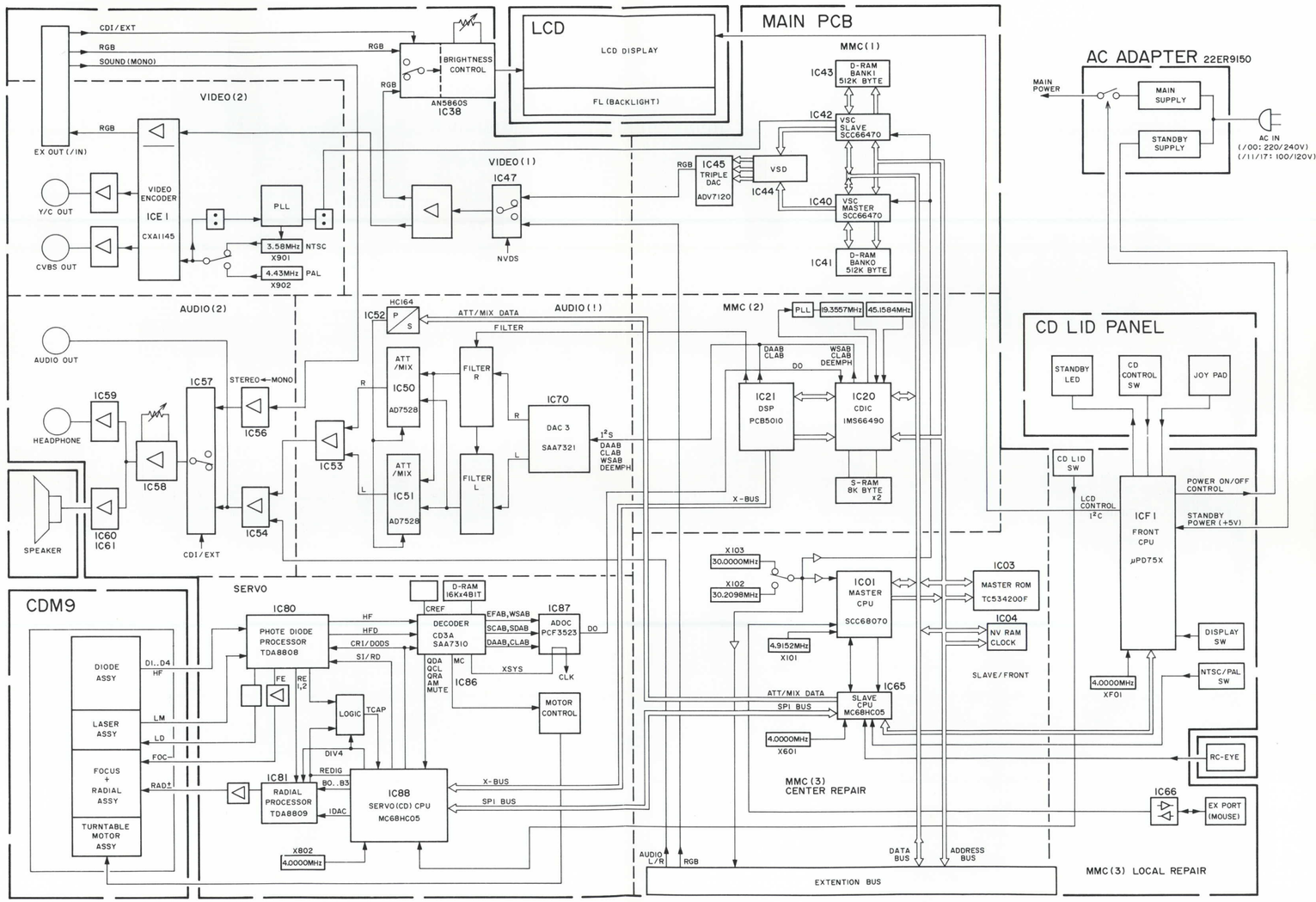


0DA..15DA : DATA BUS between CDIC-SRAM'S and SYSTEM DATA BUS TRANCIEVERS
2BCLK : CLOCK for the 2B-chip
12A..15A : ADDRESS BUS between CDIC and DSP





### 6.3 Block diagram






World of free manuals

www.freeservicemanuals.info

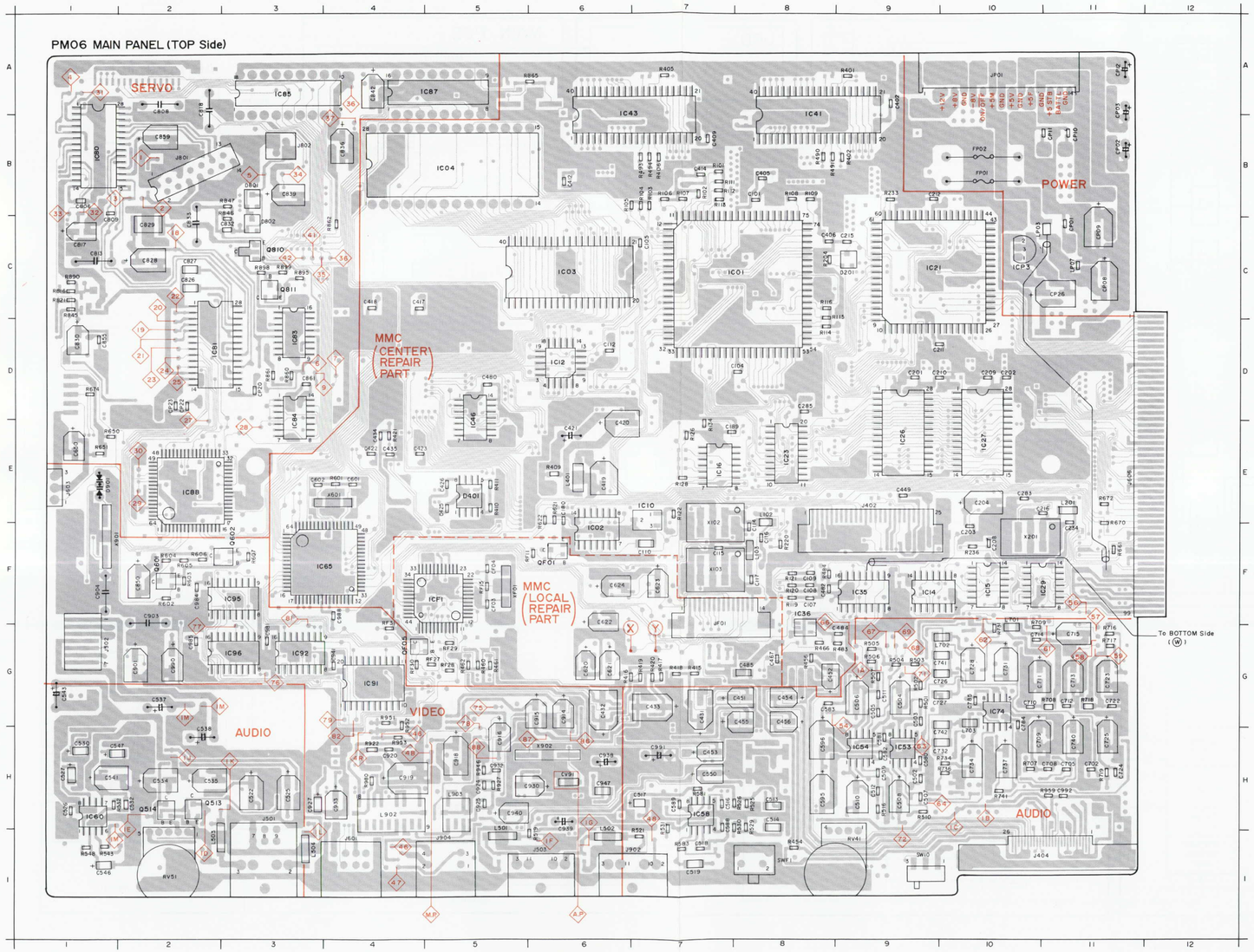
www.nostatatech.nl



## 6.4 MAIN Panel

### 6.4.1 PCB Layout ( Top side )

PM06 MAIN PANEL (TOP Side)






| | | | | | | | |
|---|---|---|---|---|---|---|---|
| C101 B8 | C530 H1 | C859 B2 | J603 E1 | R494 B7 | | | |
| C104 D8 | C532 H2 | C861 D3 | J606 E11 | R501 G9 | | | |
| C105 F8 | C534 H2 | C901 G2 | J801 B2 | R502 G9 | | | |
| C107 F8 | C535 H2 | C903 F2 | J802 B3 | R503 G9 | | | |
| C108 F8 | C537 G2 | C904 F1 | J902 I5 | R504 G9 | | | |
| C109 F8 | C538 H2 | C914 G6 | J904 I5 | R505 G9 | | | |
| C110 F7 | C541 H1 | C915 G6 | JP01 A10 | R506 G9 | | | |
| C112 D6 | C543 G1 | C916 H5 | L102 E8 | R507 G9 | | | |
| C114 F8 | C546 I1 | C918 H5 | L103 F8 | R510 H9 | | | |
| C115 F7 | C547 H1 | C919 H4 | L201 E11 | R516 H9 | | | |
| C116 F8 | C550 H7 | C920 H4 | L401 E6 | R519 I6 | | | |
| C117 F8 | C580 H9 | C924 H5 | L501 I5 | R521 I7 | | | |
| C180 E6 | C581 H9 | C925 H5 | L502 I6 | R525 H8 | | | |
| C189 E7 | C582 H9 | C927 H3 | L503 I2 | R526 H8 | | | |
| C201 D9 | C583 G8 | C930 H6 | L504 I3 | R529 H8 | | | |
| C202 D10 | C588 H7 | C932 H5 | L701 G10 | R530 H8 | | | |
| C203 F10 | C589 H7 | C933 H4 | L702 G10 | R531 H7 | | | |
| C204 E10 | C595 H8 | C938 H6 | L703 H10 | R532 H1 | | | |
| C208 D10 | C596 H8 | C939 H6 | L902 H4 | R543 I1 | | | |
| C209 D10 | C601 E4 | C940 H5 | L903 H5 | R548 I1 | | | |
| C210 D10 | C602 E3 | C941 G4 | LP03 C11 | R581 H7 | | | |
| C211 D10 | C620 G6 | C981 G3 | LP07 C11 | R583 I7 | | | |
| C212 B9 | C621 G6 | C984 E2 | Q505 G4 | R601 E4 | | | |
| C215 C9 | C622 F6 | C985 G2 | Q513 H2 | R602 F2 | | | |
| C216 E11 | C623 F7 | C988 F4 | Q514 H2 | R603 F2 | | | |
| C234 E11 | C624 F6 | C990 G2 | Q601 F2 | R604 F2 | | | |
| C283 E10 | C650 E1 | C991 H7 | Q602 F3 | R605 F2 | | | |
| C285 D8 | C702 H12 | C992 H11 | Q810 C3 | R606 F3 | | | |
| C402 A9 | C705 H12 | CF03 F5 | Q811 C3 | R607 F3 | | | |
| C405 B8 | C708 H12 | CF04 F5 | QF01 E6 | R621 E6 | | | |
| C406 C8 | C709 H10 | CP01 C11 | R101 B7 | R716 G11 | | | |
| C409 B7 | C710 G10 | CP02 B11 | R102 B7 | R717 G11 | | | |
| C412 B6 | C711 G10 | CP03 A11 | R103 B7 | R718 G11 | | | |
| C414 B7 | C712 G11 | CP08 C11 | R104 B7 | R719 H11 | | | |
| C417 C4 | C713 G11 | CP09 C11 | R105 B6 | R731 G10 | | | |
| C418 C4 | C714 G10 | CP10 B11 | R106 B7 | R734 H10 | | | |
| C419 E6 | C715 G1 | CP11 B11 | R107 B7 | R736 H10 | | | |
| C420 E6 | C722 G11 | CP12 A11 | R108 B8 | R741 H10 | | | |
| C421 E6 | C723 G11 | CP20 D3 | R109 B8 | R816 C1 | | | |
| C422 E4 | C724 H11 | CP22 D2 | R111 B7 | R821 C1 | | | |
| C423 E4 | C725 H11 | CP23 D2 | R112 B7 | R845 C1 | | | |
| C425 E5 | C726 G10 | CP26 C11 | R113 B7 | R846 B3 | | | |
| C426 E5 | C727 G10 | CV91 H6 | R114 D8 | R847 B3 | | | |
| C431 G7 | C728 G10 | D201 C9 | R115 C8 | R860 D3 | | | |
| C432 G6 | C731 G10 | D401 E5 | R116 C8 | R861 D3 | | | |
| C433 G7 | C732 H10 | D801 B3 | R119 F8 | R862 C4 | | | |
| C434 E4 | C734 H10 | D802 C3 | R120 F8 | R865 A6 | | | |
| C435 E4 | C737 H10 | D901 E1 | R121 F8 | R895 C1 | | | |
| C449 E9 | C740 H11 | FP01 B10 | R122 E7 | R895 C3 | | | |
| C451 G8 | C741 G10 | FP02 B10 | R126 E7 | R898 C3 | | | |
| C452 G8 | C742 G10 | IC01 C8 | R128 E7 | R899 C3 | | | |
| C453 H7 | C784 G10 | IC02 F6 | R134 E7 | R922 H4 | | | |
| C454 G8 | C785 G10 | IC03 C6 | R204 C8 | R927 H5 | | | |
| C455 G8 | C806 B1 | IC04 B5 | R220 F8 | R946 H5 | | | |
| C456 G8 | C808 A2 | IC10 E7 | R233 B9 | R951 G4 | | | |
| C467 G8 | C809 B1 | IC12 D6 | R401 A9 | R952 G4 | | | |
| C480 D5 | C813 C1 | IC14 F9 | R402 B9 | R953 H4 | | | |
| C482 F8 | C817 C1 | IC15 F10 | R405 A7 | R959 H11 | | | |
| C484 G9 | C818 A2 | IC16 E7 | R236 F10 | R986 H4 | | | |
| C485 F8 | C826 C2 | IC21 C9 | R406 B7 | RF11 F6 | | | |
| C502 H9 | C827 C2 | IC23 E8 | R409 E6 | RF15 F5 | | | |
| C503 G9 | C828 C2 | IC26 E9 | R410 E5 | RF27 G5 | | | |
| C504 G9 | C829 C2 | IC27 E10 | R411 E5 | RF28 G5 | | | |
| C505 G9 | C830 D1 | IC29 F11 | R415 G7 | RF29 G5 | | | |
| C506 G9 | C832 C3 | IC35 F9 | R416 G6 | RF30 G4 | | | |
| C507 H9 | C835 C2 | IC36 F8 | R417 G7 | RV41 H9 | | | |
| C508 H9 | C836 B4 | IC41 A8 | R418 G7 | RV51 I2 | | | |
| C510 H9 | C839 B3 | IC43 A6 | R419 G7 | SW10 I9 | | | |
| C511 G9 | C842 A4 | IC46 E5 | R420 G7 | SWF1 I8 | | | |
| C512 H9 | C850 F2 | IC53 H9 | R421 E4 | | | | |
| C513 H8 | C855 D1 | IC54 H9 | R454 I8 | R622 E6 | | | |
| C514 H8 | IC60 H1 | IC58 H7 | R456 G8 | R650 E1 | | | |
| C516 H7 | IC65 F4 | IC92 G3 | R460 G5 | R651 E1 | | | |
| C517 H7 | IC80 B1 | IC95 F3 | R461 G5 | R661 F11 | | | |
| C518 I7 | IC81 D2 | IC96 G3 | R462 G5 | R670 E11 | | | |
| C519 I7 | IC83 D3 | ICF1 F5 | R466 G8 | R672 E11 | | | |
| C522 H3 | IC84 D3 | ICP3 C10 | R483 G9 | R674 D1 | | | |
| C525 H3 | IC85 A3 | J402 E9 | R484 F8 | R707 H10 | | | |
| C526 H1 | IC87 A5 | J404 I11 | R490 B8 | R708 G11 | | | |
| C527 H1 | IC88 E2 | J502 G1 | R491 B8 | R709 G10 | | | |
| | IC91 G4 | J503 I6 | R493 B7 | | | | |
| | | J601 I3 | | | | | |





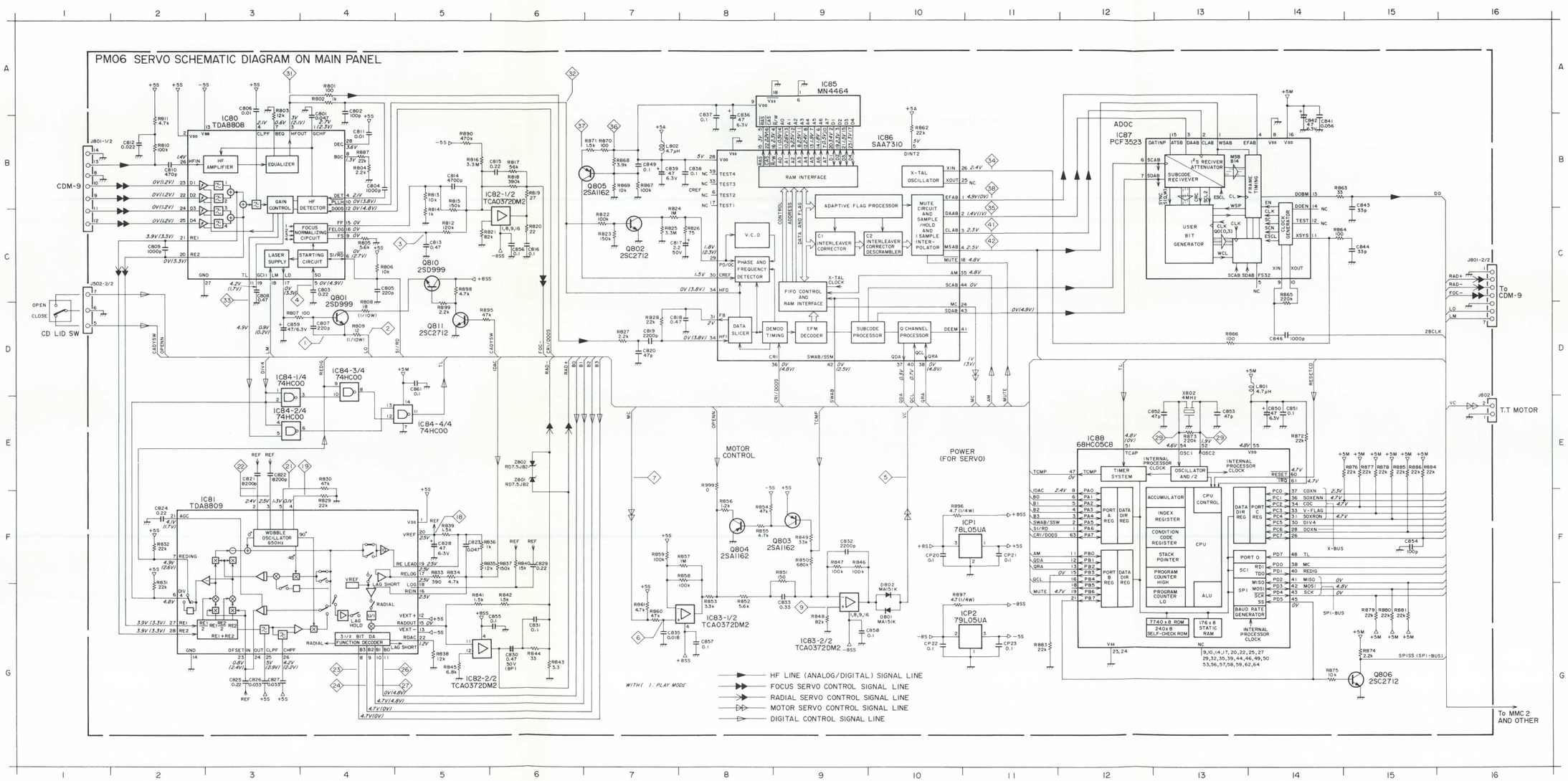
World of free manuals

www.freeservicemanuals.info

www.nostatatech.nl



## 6.4.2 Servo Schematic Diagram




( ): BOTTOM SIDE PARTS

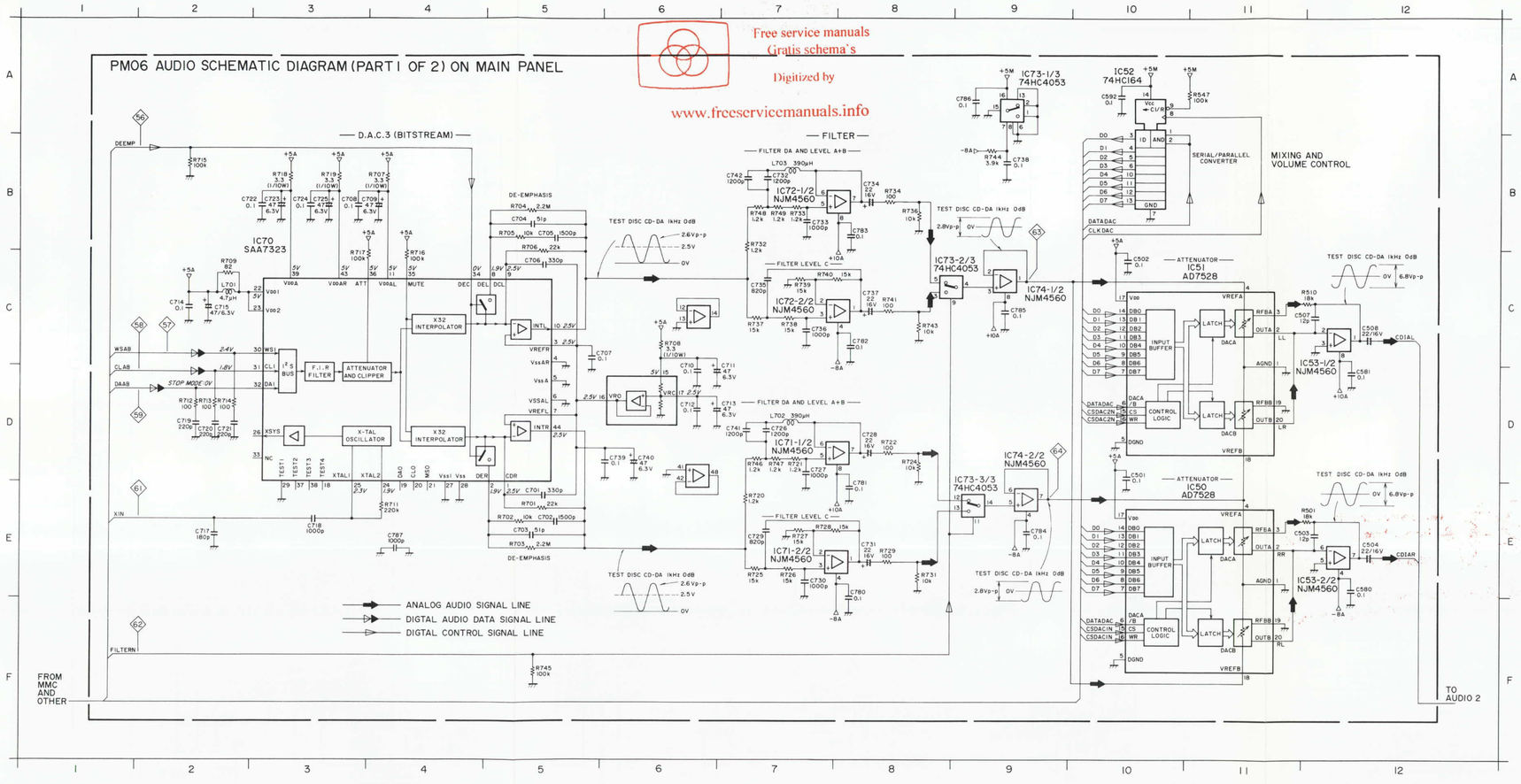
World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



### 6.4.3 Audio Schematic Diagram ( Part 1 )

( ): BOTTOM SIDE PARTS




(C501) D9
C502 C10
C503 E12
C504 E12
C507 C12
C508 C12
C580 E12
C581 D12
(C592) A10
(C701) E5

C702 E5
(C703) E5
(C704) B5
C705 B5
(C706) C5
(C707) C5
C708 B3
C709 B4
C710 D6
C711 D7

C712 D6
C713 D7
C714 C2
C715 C2
(C717) E2
(C718) E3
(C819) D2
(C720) D2
(C721) D2
C722 B3

C723 B3
C724 B3
C725 B3
C726 D7
C727 D7
C728 D8
(C729) E7
(C730) E7
C731 E8
C732 B7

(C733) B7
C734 B8
(C735) C7
(C736) C7
C737 C8
(C738) B9
(C739) D6
C740 D6
C741 D7
C742 B7

(C780) E8
(C781) E8
(C782) C8
(C783) B8
C784 E9
C785 C9
(C786) A9
(C787) E4
IC50 E11
IC51 C11

(IC52) A10
IC53 C12
IC53 E12
(IC70) C3
(IC71) D7
(IC71) E7
(IC72) B7
(IC72) C7
(IC73) A9
(IC73) C8

(IC73) E9
IC74 C9
IC74 D9
L701 C2
L702 D7
L703 B7
R501 E12
R510 C12
(R547) A11
(R701) E5

(R702) E5
(R703) E5
(R704) B5
(R705) B5
(R706) B5
R707 B4
R708 C6
R709 C2
(R711) E4
(R712) D2

(R713) D2
(R714) D2
(R715) B2
R716 C4
R717 C3
R718 B3
R719 B3
(R720) E7
(R721) D7
(R722) D8

(R724) D8
(R725) E7
(R726) E7
(R727) E7
(R728) E7
(R729) E8
R731 E8
(R732) B7
(R733) B7
R734 B8

R736 B8
(R737) C7
(R738) C7
(R739) C7
(R740) C7
R741 C8
(R743) C8
(R744) B9
(R745) F5
(R746) D7

(R747) D7
(R748) B7
(R749) B7



World of free manuals

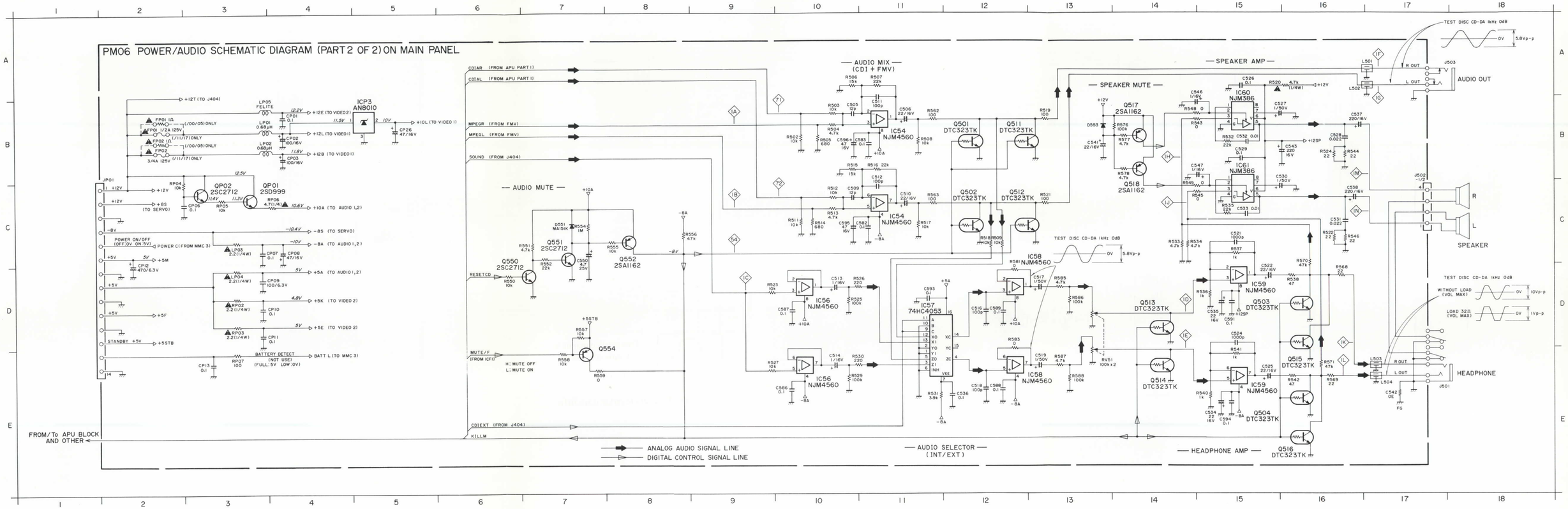
www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



## 6.4.4 Power/Audio Schematic Diagram ( Part 2 )

( ): BOTTOM SIDE PARTS

CP01 B4 (CP13)E3 C516 D12 C528 B16 C543 B16 (C591)D15 IC54 B11 IC61 B15 L502 A16 (Q512)C12 (Q554)E7 R503 B10 (R514)C10 (R524)B16 (R535)C15 (R546)C16 (R558)E7 (R578)B14
CP02 B4 CP26 B5 C517 D13 (C529)B15 C546 B14 (C593)D11 IC54 C11 JP01 B2 L503 E17 Q513 D14 RP01 B3 R504 B10 (R515)B10 R525 D10 (R536)D15 R548 B14 (R559)E7 R581 D12
CP03 B4 C505 B10 C518 E12 C530 C15 C547 B15 (C594)E15 (IC56)D10 J501 E17 L504 E17 Q514 E14 (RP02)D3 R505 B10 R516 B11 R526 D10 (R537)C15 (R549)C14 (R562)B11 R583 D12
(CP06)C3 C506 B11 C519 E13 (C531)C16 C550 C7 C595 C10 (IC56)E10 J502 C17 (QP01)C3 (Q515)E16 (RP03)D3 R506 A10 (R517)B11 (R527)E9 (R538)D16 (R550)D6 (R563)C11 (R585)D13
CP07 C3 C509 C10 (C521)C15 C534 E15 C582 C11 C596 B10 IC57 D11 J503 A18 (QP02)C3 (Q516)E16 (RP04)C2 R507 A11 (R518)C12 R529 E10 (R540)E15 (R551)C7 (R568)D16 (R586)D13
CP08 C4 C510 C11 C522 D15 C535 D15 C583 B11 (D551)C7 IC58 D13 (LP01)B3 (Q501)B12 (Q517)B14 (RP05)C3 (R508)B11 R519 B13 R530 E10 (R541)E15 (R552)C7 (R569)E16 (R587)E13
CP09 D3 C511 B11 (C524)D15 (C536)E12 (C586)E10 (D553)B13 IC58 E13 (LP02)B3 (Q502)C12 (Q518)C14 (RP06)C4 (R509)C12 (R520)A15 R531 E11 (R542)E16 (R554)C7 (R570)C16 (R588)E13
CP10 D3 C512 C11 C525 E15 C537 B16 (C587)D10 FP01 B2 (IC59)D15 LP03 C3 (Q503)D15 (Q550)C6 (RP07)E3 (R511)C10 R521 C13 R532 B15 R543 B14 (R555)C8 (R571)E16
CP11 D3 C513 D10 C526 A15 C538 C16 C588 E12 FP02 B2 (IC59)E15 (LP04)D3 (Q504)E15 (Q551)C7 RV51 E13 (R512)C10 (R522)C16 (R533)C14 (R544)B16 (R556)C8 (R576)B14
CP12 C2 C514 E10 C527 A15 C541 B13 C589 D12 ICP3 B5 IC60 B15 LP05 B3 (Q511)B12 (Q552)C8 R502 B10 (R513)C10 (R523)D9 (R534)C14 (R545)C14 (R557)D7 (R577)B14
L501 B3




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



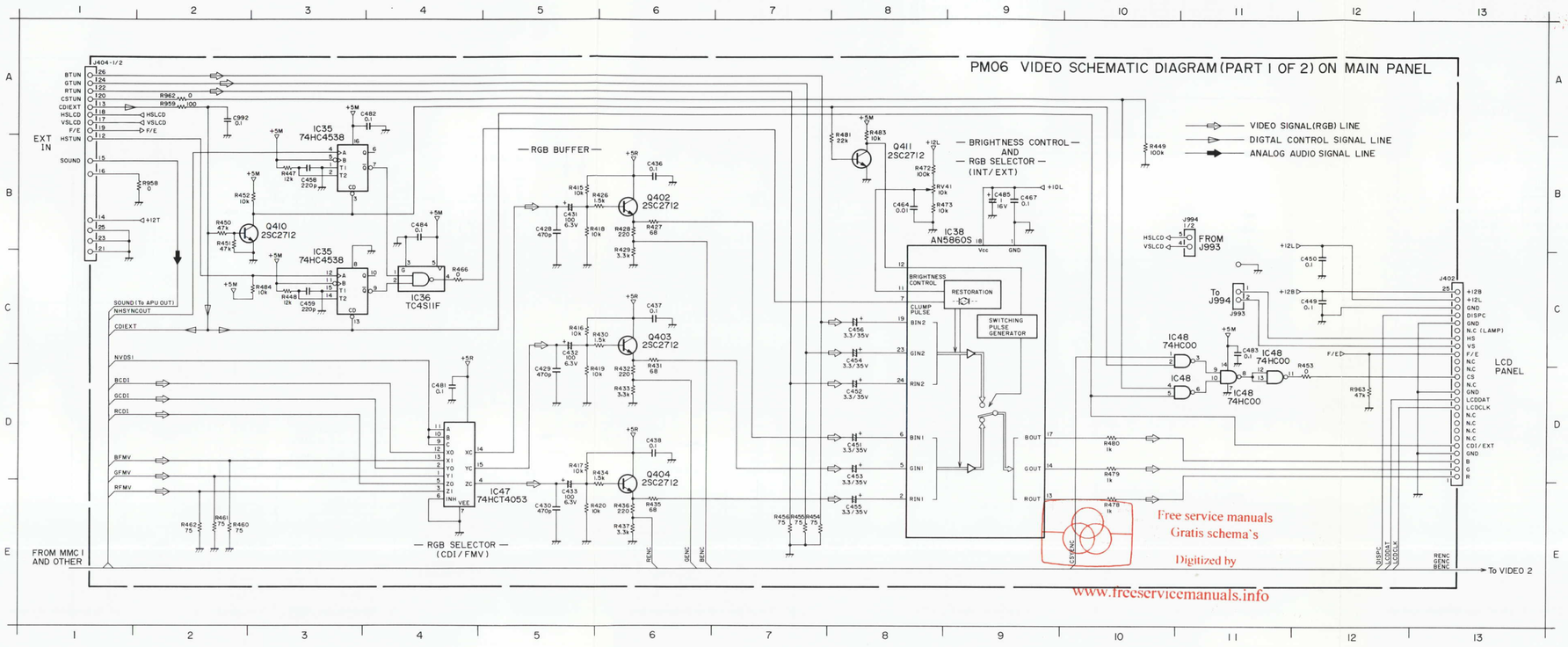
World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



### 6.4.5 Video Schematic Diagram ( Part 1 )

( ): BOTTOM SIDE PARTS




(C428)B5
(C429)D5
(C430)E5
C431 B5
C432 C5
C433 E5
(C436)B6
(C437)C6
(C438)D6
C449 C12

(C450)C12
C451 D8
C452 D8
C453 D8
C454 C8
C455 E8
C456 C8
(C458)B3
(C459)C3
(C464)B8

C467 B9
(C481)D4
C482 A4
(C483)C11
C484 B4
C485 B9
C992 A2
IC35 B3
IC35 C3
IC36 C4

IC38 B9
(IC47)E5
(IC48)C11
J402 C13
J404 A1
(J993)C11
(J994)B11
(Q402)B6
(Q403)C6
(Q404)D6

(Q410)B3
(Q411)B8
RV41 B8
R415 B5
R416 C5
R417 D5
R418 B5
R419 D5
R420 E5
(R426)B5

(R427)B6
(R428)B6
(R429)B6
(R430)C6
(R431)C6
(R432)D6
(R433)D6
(R434)D6
(R435)E6
(R436)E6

(R437)E6
(R447)B3
(R448)C3
(R449)B10
(R450)B2
(R451)B2
(R452)B2
(R453)C12
R454 E7
(R455)E7

R456 E7
R460 E2
R461 E2
R462 E2
R466 C4
(R472)B8
(R473)B8
(R478)E10
(R479)D10
(R480)D10

(R481)B8
R483 A3
R484 C3
(R958)B2
R959 A2
R962 A2
R963 D12



World of free manuals

www.freeservicemanuals.info

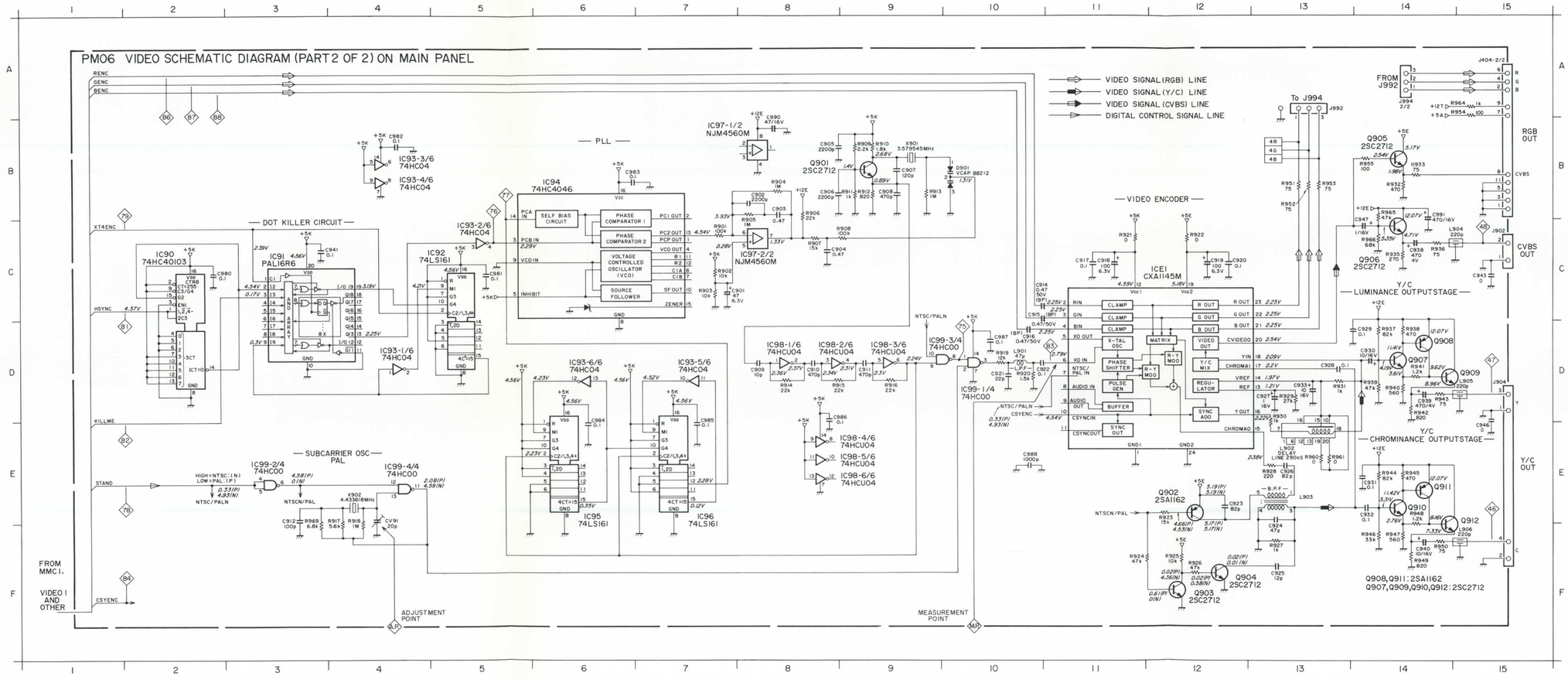
www.nostatatech.nl



### 6.4.6 Video Schematic Diagram ( Part 2 )

( ): BOTTOM SIDE PARTS

CV91 E4 (C910)D8 (C921)D10 (C931)E14 C947 C14 C991 B14 (IC93)D7 (IC99)E3 (L905)C15 (Q908)D14 (R906)B8 (R916)D9 (R926)F12 (R937)D14 (R947)F14 (R961)E13
C901 C7 (C911)D9 (C922)D10 (C932 E14 (C980)C2 D901 B10 (IC94)B6 (IC99)E4 (L905)D15 (Q909)D15 (R907)C8 (R917)E4 R927 F13 (R938)D14 (R948)E14 (R964)A15
(C902)B8 (C912)E3 (C923)E12 C933 D13 (ICE1)C12 IC95 E6 J404 A15 (L906)F15 (Q910)E14 (R908)C9 (R918)E4 (R928)E13 (R939)D14 (R949)F14 (R965)B14
C903 B8 C914 C10 C924 E13 C936 C14 (C982)B4 (IC90)C2 IC96 E7 J902 C15 (Q901)B8 (Q911)E14 (R909)B9 (R919)D10 (R929)D13 (R940)D14 (R950)F14 (R966)C14
C904 C8 C915 C10 C925 F13 C938 C14 (C983)B6 IC91 C3 (IC97)B7 J904 D15 (Q902)E12 (Q912)E15 (R910)B9 (R920)D10 (R930)D13 (R941)D14 R951 B13 (R969)E3
(C905)B8 C916 D10 (C926)E13 C939 D14 C984 D6 IC92 C5 (IC97)C8 J992 A13 (Q903)F12 (R901)C7 (R911)B9 (R921)C11 (R931)D13 (R942)D14 R952 B13 X901 B9
(C906)B8 (C917)C11 C927 D13 C940 F14 C985 D7 (IC93)B4 (IC98)D8 J994 A14 (Q904)F12 (R902)C7 (R912)B9 R922 C12 (R932)B14 (R943)D14 R953 B13 X902 E4
(C907)B9 C918 C11 (C928)D13 C941 C3 (C987)D10 (IC93)C5 (IC98)D9 (L901)D10 (Q905)B14 (R903)C7 (R913)B9 (R923)E12 (R933)B14 (R944)E14 (R954)A15
(C908)B9 C919 C12 (C929)D14 (C943)C15 C986 E10 (IC93)D4 (IC98)E9 L902 E13 (Q906)C14 (R904)B8 (R914)D8 (R924)F11 (R934)C14 (R945)E14 R955 B14
(C909)D8 C920 C12 C930 D14 (C946)E15 C990 B8 (IC93)D6 (IC99)C10 L903 E13 (Q907)D14 (R905)B8 (R915)D8 (R925)F12 (R936)C14 R946 F14 R960 E13




World of free manuals

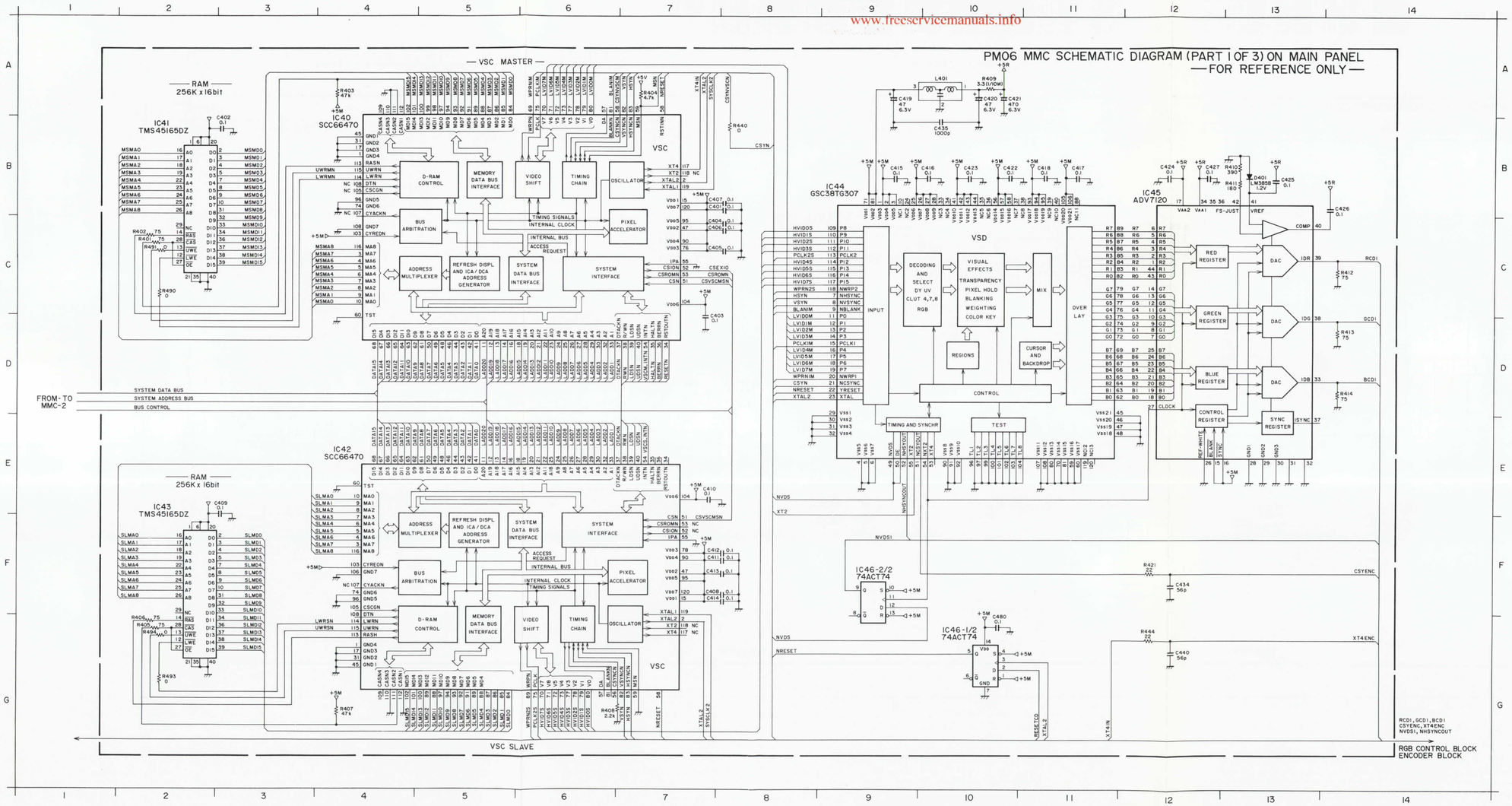
www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



Free service manuals
Gratis schema's
Digitized by
www.freeservicemanuals.info

## 6.4.7 MMC Schematic Diagram ( Part 1 )

( ): BOTTOM SIDE PARTS




(C401) B8
C402 B8
(C403) C7
C404 C6
C405 C8
C406 C8
(C407) B8
(C408) F8
C409 E5
(C410) E7

(C411) F8
C412 F8
(C413) F8
C414 F8
(C415) B9
(C416) B10
C417 B11
C418 B11
C419 A9
C420 A10

C421 A10
C422 B10
C423 B10
(C424) B12
C425 B12
C426 B14
(C427) B12
C434 F12
C435 B10
(C440) G12

C480 G10
D401 B13
(C40) B4
C41 B2
(C42) E4
C43 F2
(C44) B9
((C45) B12
IC46 F9
IC46 G10

L401 A10
R401 C2
R402 C2
(R403) A4
(R404) A7
R405 G2
R406 G2
(R407) G4
(R408) G6
R409 A10

R410 B13
R411 B13
(R412) C14
(R413) D14
(R414) D14
R421 F12
(R440) B8
(R444) G12
R490 C2
R491 C2

R493 G2
R494 G2



World of free manuals

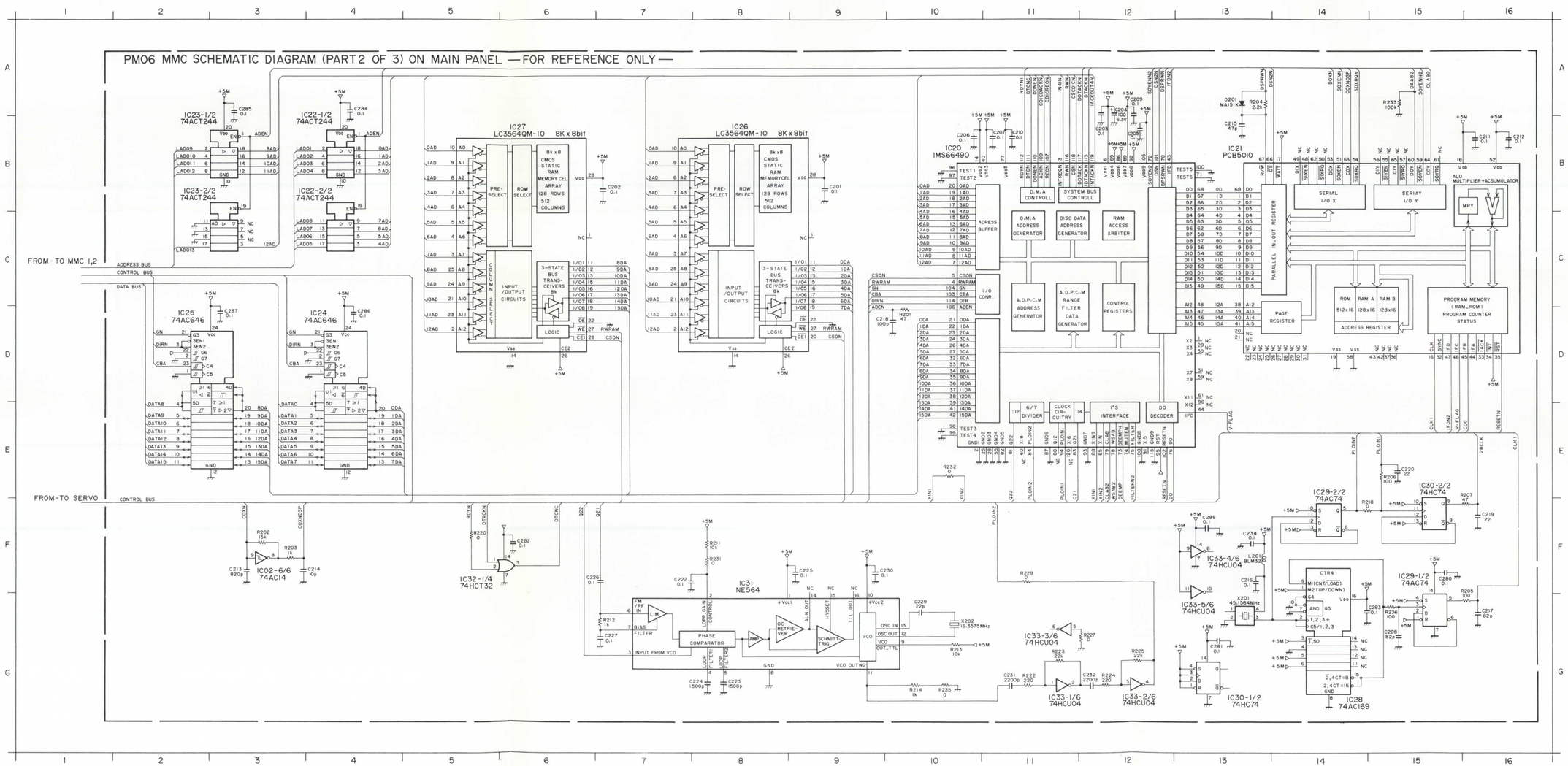
www.freeservicemanuals.info

www.nostatatech.nl



### 6.4.8 MMC Schematic Diagram ( Part 2 )

( ): BOTTOM SIDE PARTS




C201 B9
C202 B7
C203 A12
C204 A12
(C205)B12
(C206)B10
(C207)B11
C208 G15
C209 A12
C210 B11

C211 B16
C212 B16
(C213)F3
(C214)F4
C215 B13
C216 F13
(C217)D16
(C218)D10
(C219)F16
(C220)E15

(C222)F7
(C223)G8
(C224)G8
(C225)F9
(C226)F7
(C227)G7
(C229)G10
(C230)F9
(C231)G11
(C232)G12

C234 F13
(C280)F15
(C281)G13
(C282)F6
C283 G14
C284 A4
C285 A3
(C286)D4
(C287)D3
(C288)F13

D201 A13
IC02 F5
(IC20)B10
IC21 B13
(IC22)A4
(IC22)B4
IC23 A2
IC23 B2
(IC24)D4
(IC25)D2

IC26 B8
IC27 B6
(IC28)G14
IC29 F14
IC29 F15
(IC30)G13
(IC30)F15
(IC31)F8
(IC32)F5
(IC33)G13

(IC33)G12
(IC33)G13
(IC33)F13
L201 F13
(R201)D10
(R202)F3
(R203)F3
R204 A13
(R205)G16
(R206)E15

(R207)F16
(R211)F8
(R212)G7
(R213)G10
(R214)G10
(R218)F14
R220 F5
(R222)G11
(R223)G11
(R224)G12

(R225)G12
(R227)G12
(R229)F11
(R231)F8
(R232)E10
R233 A15
(R235)G10
R236 G15
X201 G13
(X202)G10



World of free manuals

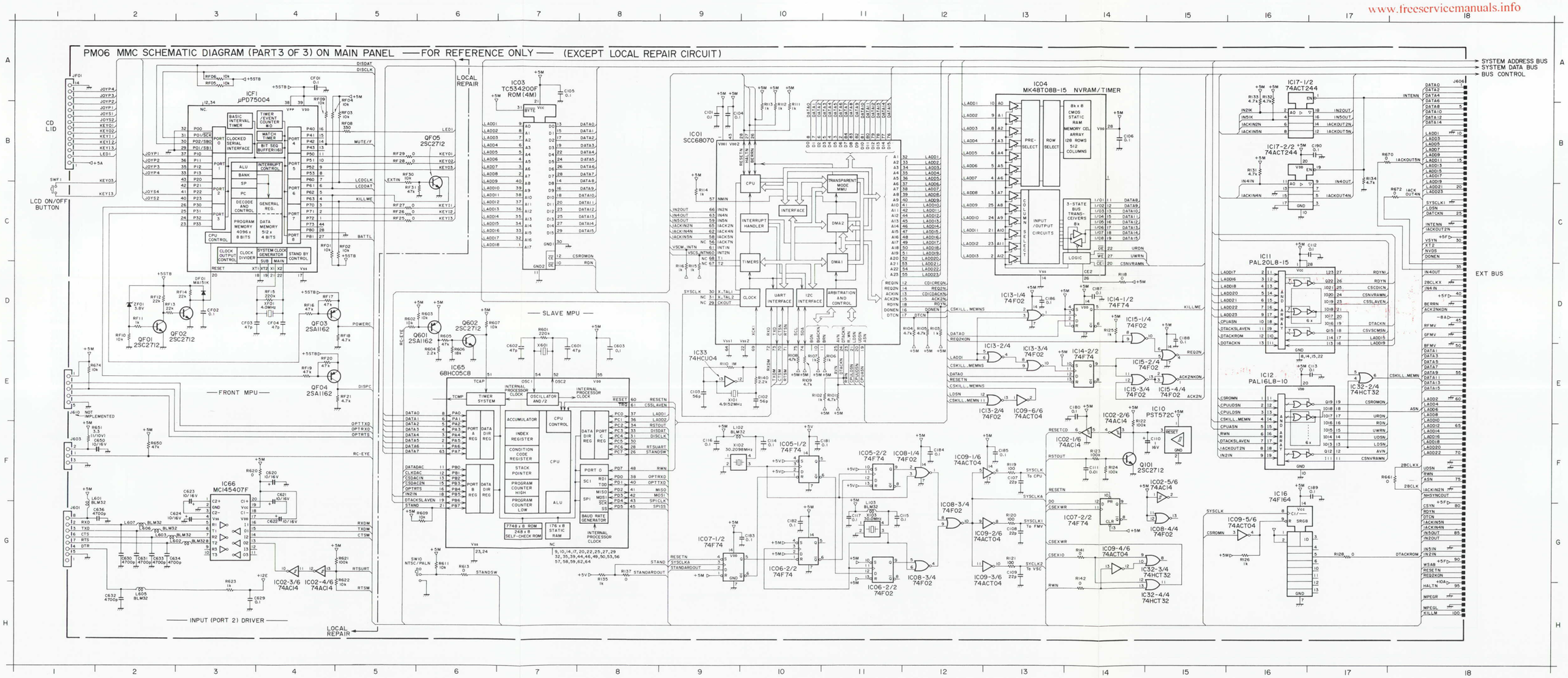
www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



### 6.4.9 MMC Schematic Diagram ( Part 3 )

( ): BOTTOM SIDE PARTS

Free service manuals
Gratis schema's
Digitized by
www.freeservicemanuals.info






World of free manuals

www.freeservicemanuals.info

www.nostatatech.nl



C102 D4
C103 C4
C106 B9
C111 F7
C113 D7
C181 E6
C182 F6
C183 E5
C184 F5
C185 F4

C186 F3
C188 F3
C190 D5
C205 E2
C206 F5
C207 F4
C213 F6
C214 E6
C217 F3
C218 E2

C219 F3
C220 F3
C222 D6
C223 D6
C224 D5
C225 D5
C226 D6
C227 D6

C229 D5
C230 D6
C231 D4
C232 D5
C280 F2
C281 F2
C282 E4
C284 D5
C286 C4
C287 C3

C288 C4
C401 A4
C403 A4
C407 B3
C408 A6
C410 A6
C411 A7
C413 D6
C415 D7
C416 E7

C424 F7
C427 E8
C428 G5
C429 G6
C430 G6
C436 G6
C437 G7
C438 G6
C440 A4

C450 F3
C458 F4
C459 F4
C464 I4
C481 G7
C483 F4
C501 G3
C519 I8
C521 H10

C524 H11
C528 G11
C529 H12
C531 H11
C533 H11
C536 H6
C542 I10

C586 H5
C587 H5
C591 H10
C592 G4
C593 H5
C594 H11
C603 E9
C629 H9

C630 I9
C631 I9
C632 I9
C633 I9
C634 I9
C636 I9
C701 H2
C703 H2
C704 H2
C706 H2

C707 H2
C717 G2
C718 G2
C719 G2
C720 G2
C721 G2
C729 G3
C730 G2
C733 H3

C735 H3
C736 H3
C739 H2
C780 G3
C781 G3
C782 H3
C783 H3

C787 G2
C801 A12
C802 B12
C803 B11
C804 B12
C805 B12
C807 B11
C810 B11
C811 A11
C812 A11

C814 C11
C815 C12
C816 B11
C819 B10
C820 B11
C821 C10
C822 C10
C823 C10
C824 D10
C825 C11

C831 D12
C835 D10
C837 B9
C838 B9
C841 A8
C843 A8
C844 A8
C846 A7
C849 A9
C851 E11

C852 E11
C853 E11
C854 E10
C856 D11
C857 C10
C858 D9
C902 G11
C905 F12
C906 F12
C907 F12

C908 E12
C909 G8
C910 G9
C911 G9
C912 H7
C917 H8
C921 H8
C922 H8
C923 H8
C926 H8

C928 H8
C929 H7
C931 H7
C943 I7
C946 I9
C980 G9
C982 F10
C983 G10

D551 H5
D553 H12
DF01 F8

IC05 F6
IC06 F6
IC07 F5
IC08 F5
IC09 F5
IC13 F5
IC17 E5
IC20 E5
IC22 E5
IC24 D3
IC25 D3

IC28 E2
IC30 F2
IC31 D5
IC32 F5
IC33 C5
IC38 G5
IC40 B4
IC47 G8
IC48 F4
IC50 G4
IC51 H4

IC51 H4
IC52 F4
IC56 H5
IC57 H6
IC59 H11
IC61 H11
IC66 G6
IC70 G2
IC73 G3

IC82 D12
IC86 B9
IC90 G9
IC93 F10
IC94 G10
IC97 G11
IC98 G9
IC99 G8
ICE1 H8
ICP1 D10
ICP2 D11

J992 G9
J993 D4
J994 F3
L601 H9
L602 H9
L603 H9
L605 H9
L606 H9
L607 H9

L801 F11
L802 B9
L901 H8
L904 I6
L905 I8
L906 I8
LP01 B2
LP02 B2
LP04 C2

LP05 C2
Q101 F6
Q402 G5
Q403 G6
Q404 G6
Q410 G4
Q411 G4
Q501 G4
Q502 H4
Q503 H10

Q504 H10
Q511 H4
Q512 H4
Q515 H10
Q516 H10
Q517 I12
Q518 H12
Q550 H5
Q551 H5
Q552 H5

Q554 H5
Q801 B11
Q802 B11
Q803 C10
Q804 B10
Q805 A9
Q806 F10
Q901 E12
Q902 H8
Q903 H8

Q904 H8
Q905 H6
Q906 H6
Q907 H7
Q908 H7
Q909 I7
Q910 H8
Q911 H7
Q912 I7
QF02 F8

QF03 F8
QF04 F8
QP01 C2
QP02 C2
R110 G4
R118 B8
R123 F7
R124 F7
R125 F3
R131 F6

R132 E6
R133 E6
R135 F9
R137 F9
R140 D4
R141 E5
R142 F4
R201 E2
R202 F6
R203 E6

R205 F3
R206 F3
R207 F3
R211 D5
R212 D6
R213 D5
R214 D5
R218 F2
R222 D4
R223 D5

R224 D5
R225 D5
R227 D5
R229 D5
R231 D5
R232 D3
R235 D5
R403 A4
R404 C5
R407 A6

R408 C7
R412 E8
R413 E8
R414 E8
R426 G6
R427 G5
R428 G6
R429 G6
R430 G6
R431 G6

R432 G7
R433 H7
R434 G6
R435 G6
R436 G6
R437 H6
R440 D7
R444 A4
R447 F4
R448 F4

R449 F4
R450 F4
R451 G5
R452 F4
R453 F4
R455 I4
R472 I4
R473 I4
R478 G5
R479 G5

R480 G5
R481 G4
R508 G4
R509 G4
R511 H3
R513 I4
R514 I3
R515 I4
R517 H4

R518 H4
R520 G12
R522 G10
R523 H5
R524 G10
R527 I5
R533 I11
R534 H11
R535 H11
R536 H10

R537 H11
R538 H10
R540 H11
R541 H11
R542 H9
R544 G10
R545 H11
R546 H10
R547 G3
R549 H12

R550 H5
R551 H5
R552 H5
R554 H5
R555 H5
R556 H4
R557 H5
R228 H5
R559 H4
R562 G4

R563 H4
R568 H10
R569 H9
R570 H10
R571 H9
R576 H12
R577 H12
R578 H12
R585 I11
R586 I11

R587 I11
R588 I11
R609 F9
R611 I4
R613 F9
R620 G7
R623 H9
R701 H2
R702 H2
R703 H2

R704 H2
R705 H2
R706 H2
R711 G2
R712 G2
R713 G2
R714 G2
R715 G2
R720 G3
R721 G3

R722 G3
R724 G3
R725 G2
R726 G3
R727 G3
R728 G3
R732 H3
R733 H3
R737 H3

R738 H3
R739 H3
R740 H3
R743 H2
R744 G3
R745 F3
R746 G3
R747 G3
R748 H3
R749 H3

R801 A12
R802 A12
R803 B12
R804 B12
R805 B12
R806 B12
R807 B11
R808 B11
R809 B11
R810 B11

R811 A11
R812 C11
R813 C12
R814 C12
R815 C11
R817 C11
R818 C11
R819 C11
R820 C11
R822 B12

R823 B12
R824 B12
R825 C11
R826 B12
R827 A10
R828 A10
R829 C10
R830 D10
R831 D11
R832 D11

R833 D10
R834 D10
R835 C10
R836 C10
R837 D10
R838 D10
R839 C11
R840 C11
R841 D12
R842 D12

R843 D11
R844 D11
R848 D9
R849 D9
R850 D9
R851 B10
R852 C10
R853 C10
R854 C9
R855 C9

R856 B10
R857 D9
R858 D10
R859 D10
R863 A8
R864 A8
R866 A8
R867 A9
R868 A9
R869 A9

R876 A9
R871 A9
R872 E11
R873 E11
R874 F10
R875 F10
R876 E10
R877 E10
R878 E10
R879 E11

R880 E11
R881 E11
R883 E10
R884 E10
R885 E10
R886 E10
R887 E12
R896 E10
R897 D9
R899 C10

R901 G11
R902 G11
R903 G11
R904 G11
R905 F11
R906 F11
R907 F11
R908 F12
R909 F12
R910 F11

R911 F12
R913 B12
R914 G9
R915 G9
R917 G7
R918 G7
R919 H7
R920 H8
R921 H8
R923 H8

R925 H8
R926 H8
R928 H8
R929 H9
R930 H8
R931 H9
R932 H6
R933 I6
R936 I6
R937 H7

RF01 F8
RF02 F9
RF03 F8
RF04 G8

RF05 F9
RF06 F9
RF08 F8
RF09 F8
RF10 F7
RF12 F7
RF13 F7
RF14 F8
RF16 F8
RF17 F9

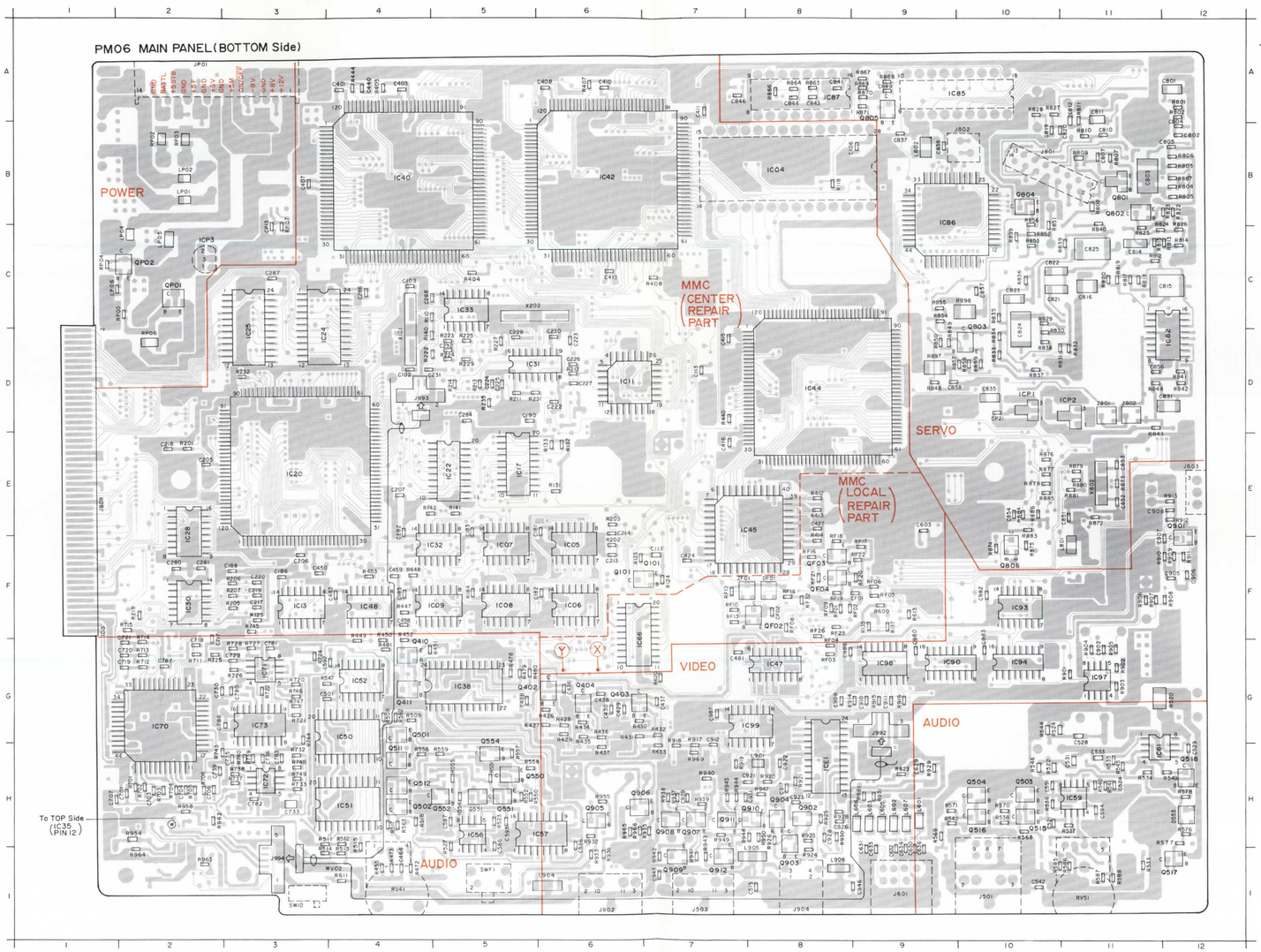
RF18 E9
RF19 F8
RF20 F9
RF22 F9
RF25 F8
RF26 F8
RP02 B2
RP03 B2
RP04 C1
RP05 C2

RP06 D2
RP07 C3
Z801 D11
Z802 D11
ZF01 F7
X101 D4
X202 C5
X802 E11



### 6.4.10 PCB Layout ( Bottom side )

PM06 MAIN PANEL(BOTTOM Side)








World of free manuals

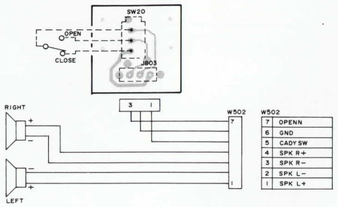
www.freeservicemanuals.info

www.nostatatech.nl



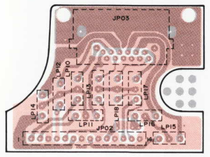
## 6.5 Other Panel (PS06,PP06,PI06,CD Lid )

CD LID SW PANEL(PS06)



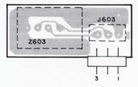

| W502 | |
|---|---|
| 7 | OPENN |
| 6 | GND |
| 5 | CADY SW |
| 4 | SPK R+ |
| 3 | SPK R− |
| 2 | SPK L− |
| 1 | SPK L+ |

POWER CONNECT PANEL(PP06)



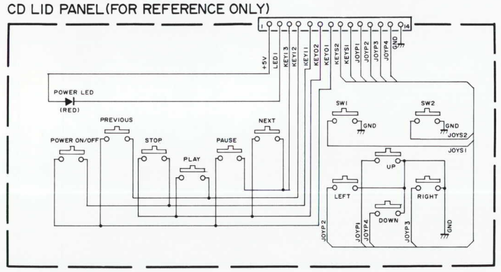

| JP02 | |
|---|---|
| 14 | GND |
| 13 | BATTL |
| 12 | +5STB |
| 11 | GND |
| 10 | +5F |
| 9 | GND |
| 8 | +5AKE |
| 7 | GND |
| 6 | +5M |
| 5 | POWERC |
| 4 | −8V |
| 3 | GND |
| 2 | +8V |
| 1 | +12V |

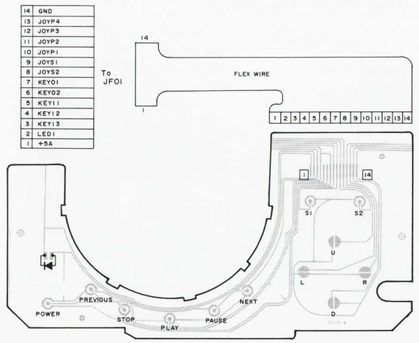
REMOTE IR PANEL(PI06)




| J603 | |
|---|---|
| 1 | GND |
| 2 | +5V |
| 3 | IR IN |

CD LID PANEL(FOR REFERENCE ONLY)




| | |
|---|---|
| 14 | GND |
| 13 | JOYP4 |
| 12 | JOYP3 |
| 11 | JOYP2 |
| 10 | JOYP1 |
| 9 | JOYS1 |
| 8 | JOYS2 |
| 7 | KEY01 |
| 6 | KEY02 |
| 5 | KEY11 |
| 4 | KEY12 |
| 3 | KEY13 |
| 2 | LED1 |
| 1 | +5A |



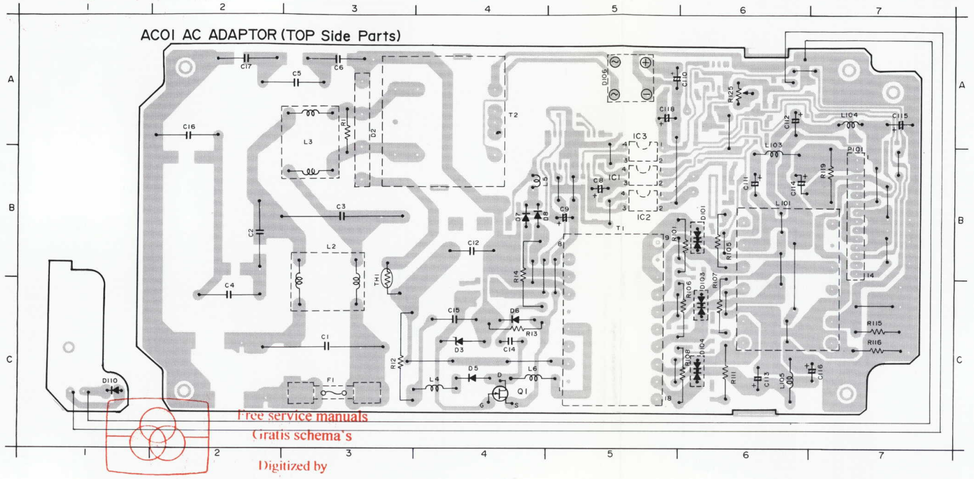




## 6.6 Power Supply Unit

### 6.6.1 PCB Layout

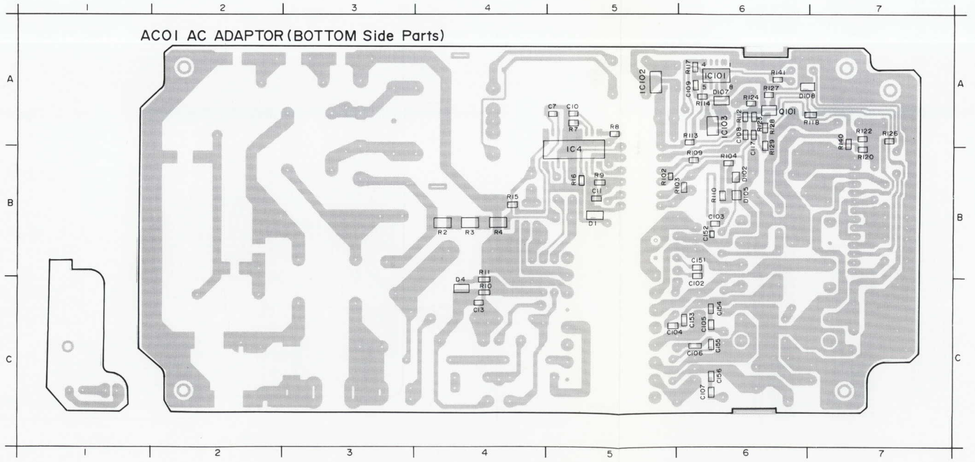
ACO1 AC ADAPTOR(TOP Side Parts)



| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C1 | C3 | C15 | C4 | C118 | A5 | D106 | A5 | L6 | C4 | R101 | B6 |
| C2 | B2 | C16 | A2 | D2 | A3 | D111 | C1 | L101 | B6 | R105 | B6 |
| C3 | B3 | C17 | A2 | D3 | C4 | F1 | C3 | L103 | B6 | R106 | C6 |
| C4 | C2 | C110 | A6 | D5 | C4 | IC1 | B5 | L104 | A7 | R107 | C6 |
| C5 | A3 | C111 | B6 | D6 | C4 | IC2 | B5 | L105 | C6 | R108 | C6 |
| C6 | A3 | C112 | A6 | D7 | B4 | IC3 | A5 | P101 | B7 | R111 | C6 |
| C8 | B5 | C113 | C6 | D8 | B4 | L2 | B3 | Q1 | C4 | R115 | C7 |
| C9 | B5 | C114 | B6 | D101 | B6 | L3 | A3 | R1 | A3 | R116 | C7 |
| C12 | B4 | C115 | A7 | D103 | C6 | L4 | C4 | R12 | C3 | R119 | B7 |
| C14 | C4 | C116 | C7 | D104 | C6 | L5 | B4 | R13 | C4 | R125 | A6 |
| | | | | | | | | R14 | B4 | T1 | B5 |
| | | | | | | | | | | T2 | A4 |
| | | | | | | | | | | THI | C3 |

Free service manuals
Gratis schema's
Digitized by
www.freeservicemanuals.info

ACO1 AC ADAPTOR(BOTTOM Side Parts)



| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C7 | A5 | C108 | A6 | D4 | C4 | R2 | B4 | R104 | B6 | R123 | A6 |
| C10 | A5 | C109 | A6 | D102 | B6 | R3 | B4 | R109 | B6 | R124 | A6 |
| C11 | B5 | C117 | A6 | D105 | B6 | R4 | B4 | R110 | B6 | R126 | A7 |
| C13 | C4 | C151 | B6 | D107 | A6 | R7 | A5 | R112 | A6 | R127 | A6 |
| C102 | C6 | C152 | C6 | D108 | A6 | R8 | A5 | R113 | A6 | R128 | A6 |
| C103 | B6 | C153 | C6 | IC4 | B5 | R9 | B5 | R114 | A6 | R129 | B6 |
| C104 | C5 | C154 | C6 | IC101 | A6 | R10 | C4 | R117 | A6 | R140 | A7 |
| C105 | C6 | C155 | C6 | IC102 | A5 | R11 | B4 | R118 | A7 | R141 | A6 |
| C106 | C6 | C156 | C6 | IC103 | A6 | R15 | B4 | R120 | B7 | | |
| C107 | C6 | D1 | B5 | Q101 | A6 | R16 | B5 | R122 | A7 | | |
| | | | | | | R102 | B5 | | | | |
| | | | | | | R103 | B6 | | | | |

World of free manuals

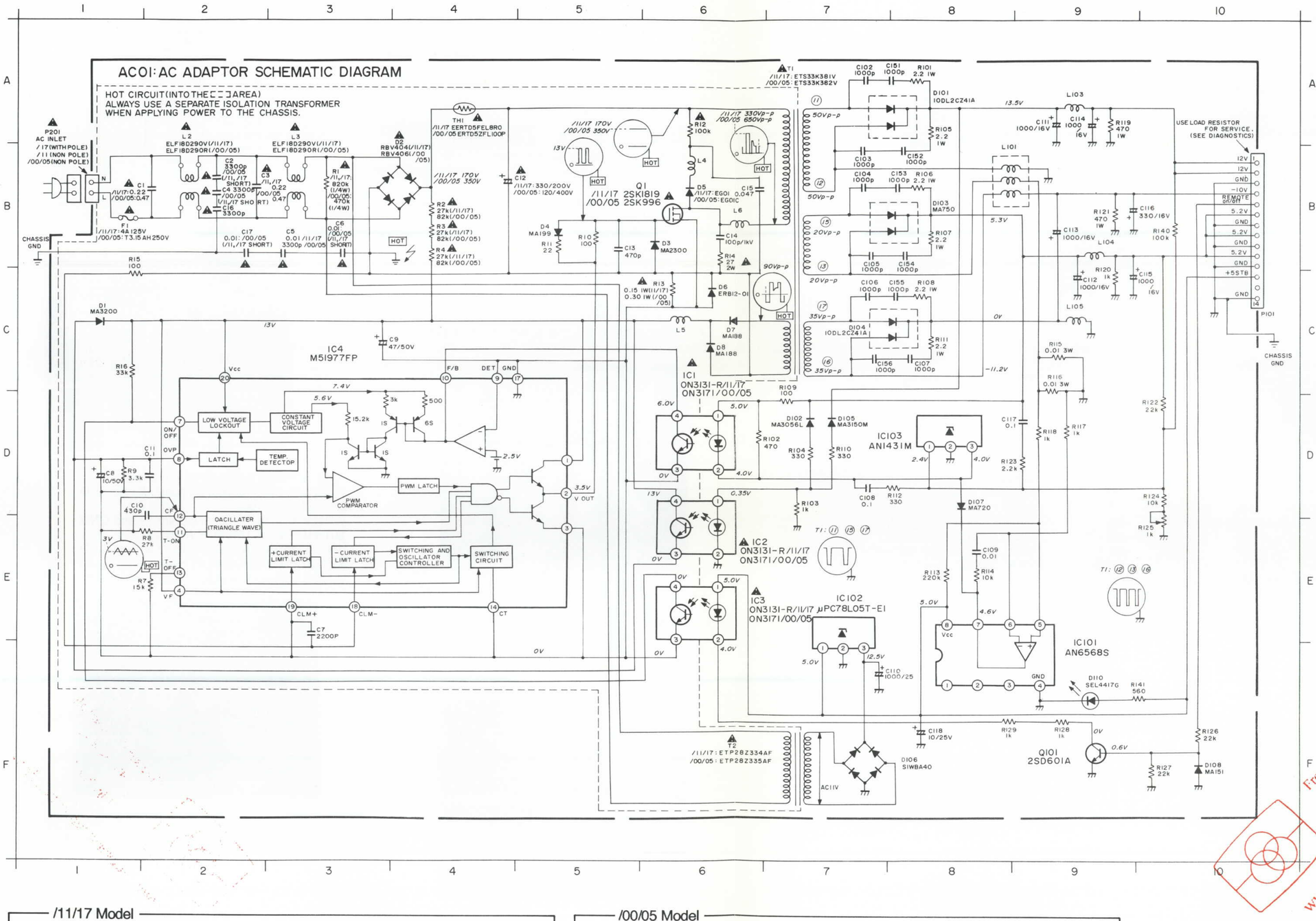
www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl





### 6.6.2 Schematic Diagram

( ): BOTTOM SIDE PARTS




| | | | |
|---|---|---|---|
| C1 | B2 | R119 | A9 |
| C2 | B2 | (R120) | C9 |
| C3 | B2 | R121 | B9 |
| C4 | B2 | (R122) | D10 |
| C5 | B3 | (R123) | D9 |
| C6 | B3 | (R124) | D10 |
| (C7) | E3 | R125 | E10 |
| C8 | D1 | (R126) | F10 |
| C9 | C3 | (R127) | F10 |
| (C10) | E2 | (R128) | F9 |
| (C11) | D2 | (R129) | F8 |
| C12 | B4 | (R140) | B10 |
| (C13) | B5 | (R141) | F10 |
| C14 | B6 | T1 | A7 |
| C15 | B6 | T2 | F7 |
| C16 | B2 | TH1 | A4 |
| C17 | B2 | | |
| (C102) | A7 | | |
| (C103) | B7 | | |
| (C104) | B7 | | |
| (C105) | B7 | | |
| (C106) | C7 | | |
| (C107) | C8 | | |
| (C108) | D7 | | |
| (C109) | E8 | | |
| C110 | F7 | | |
| C111 | A9 | | |
| C112 | C9 | | |
| C113 | B9 | | |
| C114 | A9 | | |
| C115 | C9 | | |
| C116 | B9 | | |
| (C117) | D9 | | |
| C118 | F8 | | |
| (C151) | A8 | | |
| C152 | B8 | | |
| C153 | B8 | | |
| C154 | B8 | | |
| (C155) | C8 | | |
| (C156) | C7 | | |
| (D1) | C1 | | |
| D2 | B4 | | |
| D3 | B6 | | |
| (D4) | B5 | | |
| D5 | B6 | | |
| D6 | C6 | | |
| D7 | C6 | | |
| D8 | C6 | | |
| D101 | A8 | | |
| (D102) | D7 | | |
| D103 | B8 | | |
| D104 | C8 | | |
| (D105) | D7 | | |
| D106 | F7 | | |
| (D107) | D8 | | |
| (D108) | F10 | | |
| D110 | F9 | | |
| F1 | B1 | | |
| IC1 | C6 | | |
| IC2 | E6 | | |
| IC3 | E6 | | |
| (IC4) | C3 | | |
| (IC101) | F9 | | |
| (IC102) | E7 | | |
| IC103 | D8 | | |
| L2 | B2 | | |
| L3 | B3 | | |
| L4 | B6 | | |
| L5 | C6 | | |
| L6 | B6 | | |
| L101 | B8 | | |
| L103 | A9 | | |
| L104 | B9 | | |
| L105 | C9 | | |
| P101 | C10 | | |
| P201 | A1 | | |
| Q1 | B6 | | |
| (Q101) | F9 | | |
| R1 | B3 | | |
| (R2) | B4 | | |
| (R3) | B4 | | |
| (R4) | B4 | | |
| (R7) | E2 | | |
| (R8) | E2 | | |
| (R9) | D1 | | |
| (R10) | B5 | | |
| (R11) | B5 | | |
| R12 | A6 | | |
| R13 | C6 | | |
| R14 | B6 | | |
| (R15) | C1 | | |
| (R16) | C1 | | |
| (R101) | A8 | | |
| (R102) | D6 | | |
| R103 | B7 | | |
| (R104) | D7 | | |
| R105 | A8 | | |
| R106 | B8 | | |
| R107 | B8 | | |
| R108 | C8 | | |
| (R109) | D7 | | |
| (R110) | D7 | | |
| R111 | C8 | | |
| (R112) | D8 | | |
| (R113) | E8 | | |
| (R114) | E8 | | |
| R115 | C9 | | |
| R116 | C9 | | |
| (R117) | D9 | | |
| (R118) | D9 | | |

**/11/17 Model**

**CAUTION**: FOR CONTIUED PROTECTION AGAINST FIRE HAZARD. REPLACE ONLY WITH THE SAME TYPE 4A 125V FUSE.
**ATTENTION**: POUR UNE PROTECTION CONTINUE LES AISQUES D'INCEIE N'UTILJSER QUE DES FUSIBLE DE MÉME TYPE 4A 125V

4A 125V

**/00/05 Model**

**CAUTION**: FOR CONTIUED PROTECTION AGAINST FIRE HAZARD. REPLACE ONLY WITH THE SAME TYPE T3.15AH 250VFUSE.
**ATTENTION**: POUR UNE PROTECTION CONTINUE LES AISQUES D'INCEIE N'UTILJSER QUE DES FUSIBLE DE MÉME TYPE T3.15AH 250V

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

Free service manuals Circuit Schema's provided by www.freeservicemanuals.info

World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



# 7 DIAGNOSTICS

## 7.1 Troubleshooting and repair

General Sequence:

1. Power ON/OFF ( controled by Front CPU, ICF1 )
   (1) ICF1 power voltage (+5STB; standby power)
   (2) ICF1 clock signal
   (3) ICF1 keyscan signal ( during pressed switch )
   (4) ICF1 Power control signal (POWERC)
   (5) +5M voltage

2. Power Voltage
   (1) ICF1 Power control signal (POWERC)
   (2) +5M (for MMC)
   (3) other voltage

3. Low Level Test ( Operating is same as CDI205)

4. Service Shell (Operating is same as CDI205)
   How to activated of Service Shell for CDI360
   (1) Power OFF
   (2) Press two switches: Display ON/OFF and Action button 2
   (3) Power ON
   and release two switch if after Power ON

5. Measurement Each Circuit

### 7.1.1 Power supply unit

**Preparation**

**- Load Resistor and Power ON/OFF switch**
Switching power supply is needed load resistor when servicing. And this power supply is needed Power ON/OFF switch for standby circuit.

1. Load Resistor
For service purposes you only have to connect the two load resistance to the +5M and +5F (+5V).
Use two 5.1 ohm, 10W resistor, code number 4822 053 34518.

2. Power ON/OFF switch
For service purposes you only have to connect a switch between +5STB and Power ON/OFF.

**CAUTION.**
- Never turn on the power supply if no load resistor has been connected.
- Safety regulations require that the set under repair should be restored to its original state and that components identical to the ones specified should used.
- For reasons of safety, components. For code number refer to the parts list of electrical components.

## 7.2 Mainboard

### 7.2.1 Power voltage

JP01 ( after Power ON )

| Pin | Name | Voltage | Power lines of separated |
|---|---|---|---|
| 1 | +12V | +12V | +12E,+12L,+12B,+10L +10A,+12V(SP) |
| 2 | +8S | +12V | +8S |
| 3 | GND | 0V | |
| 4 | -8V | -10.4V | -8S,-8A |
| 5 | Power ON/OFF | 5V | |
| 6 | +5M | +5V | +5M |
| 7 | GND | 0V | |
| 8 | +5V | +5V | +5A,+5K,+5E |
| 9 | GND | 0V | |
| 10 | +5F | +5V | +5F |
| 11 | GND | 0V | |
| 12 | +5STB | +5V | +5STB |
| 13 | BATTL | +5V | |
| 14 | GND | 0V | |

Power lines

| | |
|---|---|
| +12E | Video 2 |
| +12L | Video 1 (for LCD panel) |
| +12B | Video 1 (for LCD backlight) |
| +10L | Video 1 (for LCD brightness control) |
| +10A | Audio 1 and 2 |
| +12V(SP) | Audio 2 (for speaker amp) |
| +8S (+5S) | Servo |
| -8S (-5S) | Servo |
| +5M | MMC,etc. ( for digital circuit) |
| +5A | Audio |
| +5K | Video 2 (for digital circuit) |
| +5E | Video 2 (for Analog circuit) |
| +5F | MMC (for Extention socket) |
| +5STB | MMC (for ICF1,Front uCOM) |



### 7.2.2 Measurements Servo circuit

In the circuit diagrams and on the drawings of the panels measuring points are marked with : .
Some times signals to be measured are pointed as for example : IC80 pin1.
All DC signals are measured with an universal electronic voltmeter.
All AC signals are measured with an oscilloscoop

#### 7.2.2.1 Lasercurrent.

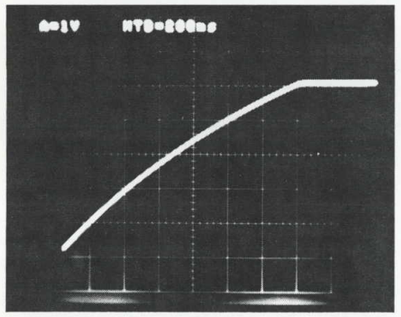
The lasercurrent is adjusted in the CDM9 and is a factory adjustment. After replacing a defective CDM the laser current does not need to be adjusted.
Play track 1 of testdisc 5, the voltage accross measuring point 1 and point 2
should be : 0.7 V / DC +/-10 %.

#### 7.2.2.2 Focus signal.

Play track 1 of testdisc 5, the voltage accross measuring point 3 and GND
should be : + 400 mV / DC +/-10%.

#### 7.2.2.3 Starting signal.

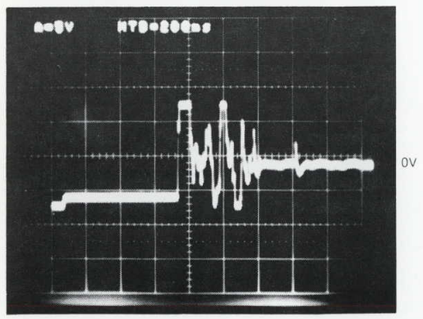
Insert a disc and measure accross measuring point 4 and GND. After pushing the play button the next picture appears on the oscilloscoop :



The signal is triggered by the Si/RD signal on IC80 pin6.

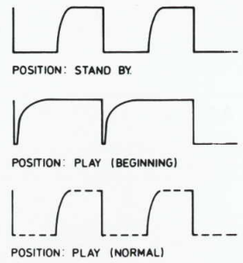
#### 7.2.2.4 Motorcontrol signals.

Insert testdisc 5.
Measure accross IC83 pin3 and GND, after pushing the play button the next picture should appear on the oscilloscope.




After a while, when playing track 1, the voltage should be:
- 1.7 V DC +/-10%
Play track 1 of testdisc 5, the voltage across measuring point 6 and ground should be: 3.2V DC +/-10%

Signal accross measuring point 7 and GND should be :

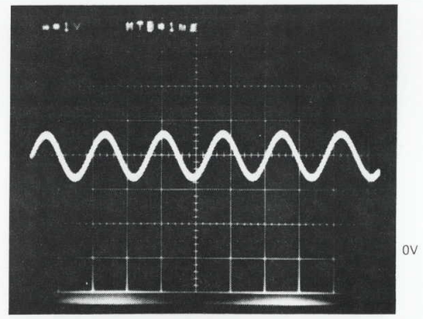



Insert test disc 5. Accross measuring point 8 and GND the next picture should appear on the oscilloscope after pushing the play button




#### 7.2.2.5 Radial error circuit signals.

Voltage accross measuring point 18 and GND :
2,6 V / DC +/- 10%.
Voltage accross measuring point 19 and GND :
110 mV / DC +/- 10% in PLAY mode.
Voltage accross measuring point 21 and GND :
1,2 V / DC +/- 10% in PLAY mode.
Voltage accross measuring point 22 and GND :




Voltage accross measuring points 23,24,26 and 27 denpending on playing mode, 0 V if LOW or 5V if HIGH

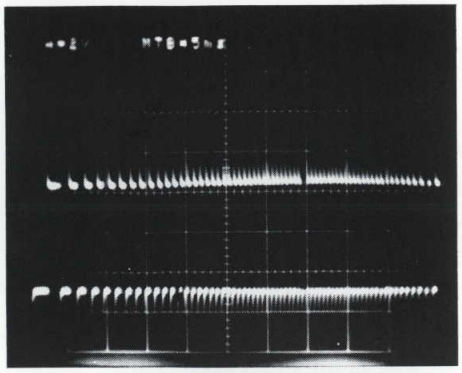


World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



For measuring point 28 and 33 put the player in the service shell on CD drive test mode 2. The voltage accross point 28 and GND should be :

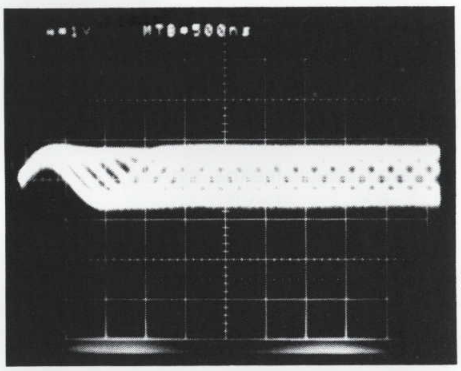



### 7.2.2.6 Clock signal IC88

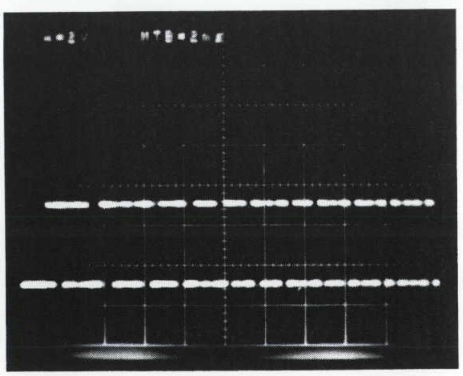
Measuring point 29 : clock signal f = 4MHz.

### 7.2.2.7 Decoder signals

Play track 1 of testdisc 5.
The signal accross measuring point 31 and GND should be:



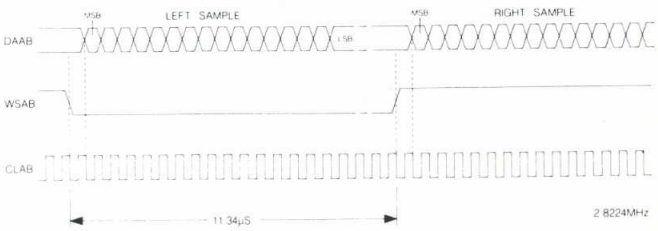

Insert testdisc 5 and put the player in the service shell on CD drive test mode 2.
The signal accross measuring point 32 should be :




Measuring point 34 : clock signal f = 11.289.600 Hz.
Voltage accross measuring point 37 and 37 :
775 mV /DC +/- 10%

Measuring points 38 : LOW. If the blackdot track of testdisc 5A is played then pulses activity should be measured on this point.

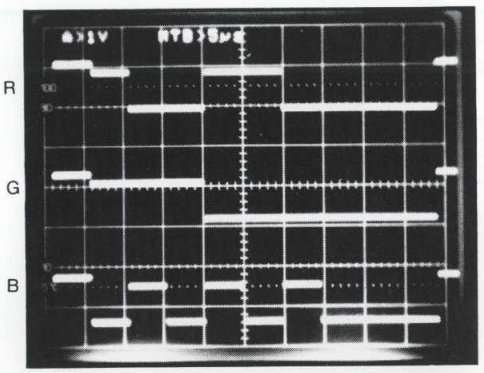
Measuring point 39,41 and 42 :



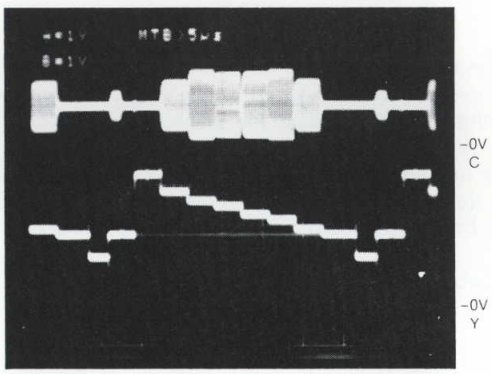

### 7.2.2.8 Video signals

Put the player in the service shell on testimage (colorbar).

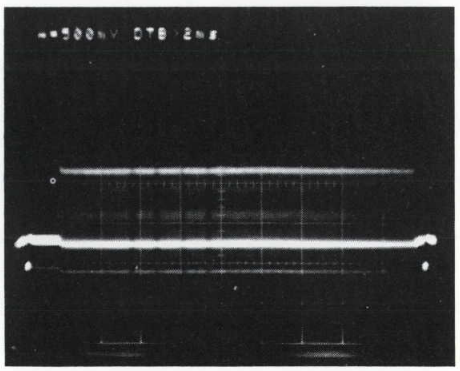
Measuring point 43 and 44 :




Measuring point 46 :




Measuring point 47 :





World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



### 7.2.3 Measurments Audio circuit

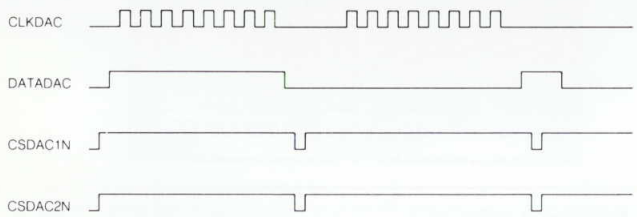
Select the submenu "MMC slave" of the Service Shell, see section 5.2. With this menu we can check besides the remote control functions also the audio functions L-R and mono/streo. This audio function can only be checked when an audio-disc is inserted. When any disturbances occur, the following checks/measuerments can be performed (2 % 8).

Required test discs:
Use an arbitrary Digital Audio disc in the service shell, submenu MMC slave.
Test disc no.5-5A (4822 397 30096 - SBC 426)
Use launch disc or arbitrary CD-I disc which contains audio levels A-B-C and/or CD-DA
Audio signals disc (4822 397 30184 - SBC 429 )

#### 7.2.3.1 Slave processor data

Check whether the signals appear on test/measurments points 66 % 69 from the slave processor.

66 - CLKDAC
67 - DATADAC
68 - CSDAC1N
69 - CSDAC2N

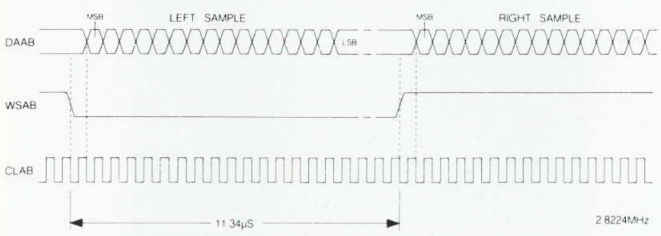



There signals are very hard to recognize on an oscilloscope during the normal application. Only in the service shell and controlling the attenuators you can observe activity.
If there is any activity on one of the lines 66 % 69 one can suppose that the information of this signals are oke. This is also to be considered for the data lines D0 % D7.

If no disturbances, check the data outputs D0 % D7 of IC52.

#### 7.2.3.2 I2S signals

Ckeck whether the signals, given below, appear on the testpoints 57 - 58 - 59.
Time base related only to CD-DA.




#### 7.2.3.3 Xin clock signal

(testpoint 61)

Play a CD-DA track.
The frequency of the Xin signal must be :
11.2896 MHz (CD-DA)

Play CD-I audio.
9.767 MHz for CD-I level A and CD-I level B.
4.838 MHz for CD-I level C.

#### 7.2.3.4 DEEMP signal

(testpoint 56)
Insert test disc 5 or 5A and during track 14 (recorderd without pre-emphasis) the signal DEEMP should be low. (0V)
During track 15 (recorded with pre-emphasis) this signal DEEMP should be high (+5V).

#### 7.2.3.5 FILTERN signal

(testpoint 62)
Insert CD-I disc which contains audio levels A-B-C and/or Digital audio.
This signal FILTERN should be high (+5V). In case a track is played back with audio level C (speech).
The signal FILTERN should be low (0V), in case of level A or B or DA.

#### 7.2.3.6 KILL signal

(test point 54)
This KILL signal must be +5V during reset. In normal/play position this signal is -8V.

#### 7.2.3.7 Performance check APU

Position digital audio
- Insert Audio signals test disc 1, SBC 429.
- Play track no.1. ( 1kHz sinus signal L + R 0dB )
- The level on testpoint 63 and 64 should be:
  0.9Vrms +/- 2dB

If this level deviates check firstthe signals

| | | |
|---|---|---|
| FILTERN | 62 | step 6 |
| KILL | 54 | step 7 |
| Xin | 61 | step 4 |

- The level on testpoint 71 and 72 should be:
  2 Vrms +/- 3dB.

Position audio level C
- Insert CD-I disc
- Play track with audio .level C, 1kHz L + R, 0dB.
- The level on testpoint 63 and 64 should be:
  0.9V rms +/- 3dB

If this level deviates check first the signals

| | | |
|---|---|---|
| FILTERN | 62 | step 6 |
| KILLM | 54 | step 7 |

- The level on test point 71 and 72 should be:
  2Vrms +/-3dB.



World of free manuals

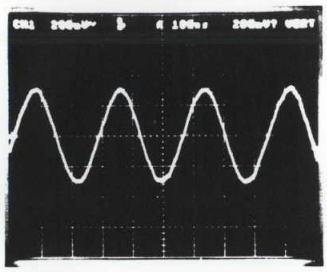
www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



### 7.2.4 Measurements & adjustments Video 2 circuit ( Video Encoder )

**Required test equipment.**
- Electronic voltmeter
- Oscilloscope
- Frequency counter

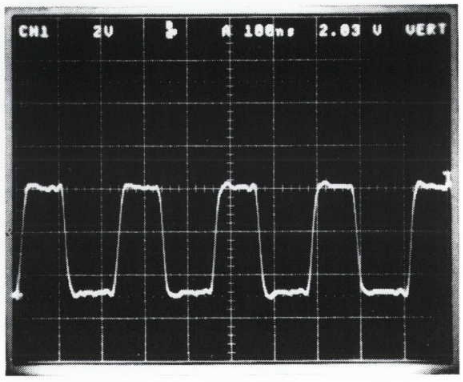
**7.2.4.1 Check of NTSC subcarrier .**
- Player switched off.
- Standard switch NTSC/PAL (SW10 ) in position 525, NTSC.
- Connect frequency counter to testpoint 83 , (Pin 6 ICE1) and turn on the player.
- The frequency on testpoint 83 should be; 3 579 545 Hz. +/- 50 Hz.
- The amplitude on testpoint 83 should be in between; 400 mV and 1000 mVpp



- Now check if the lock signal on testpoint 76, (pin 3 of IC94) meets 39335 Hz +/- 8 Hz. and the divided VCO output signal on testpoint 77 , ( pin 14 of IC 94 ) meets also meets 39335 Hz +/- 8 Hz.

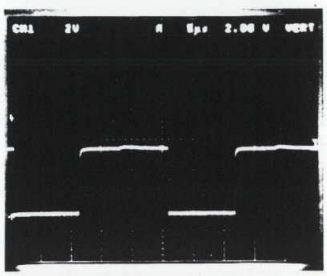
**7.2.4.2 Check of PAL subcarrier .**
- Player switched off.
- Standard switch NTSC/PAL (SW10 ) in position 625, PAL.
- Connect frequency counter to testpoint 83 ,( Pin 6 IC ICE1 ) and turn on the player.
- The frequency on testpoint 83 should be; 4 433 618 Hz. +/- 50 Hz.
- The amplitude on testpoint 83 should be in between; 400 mV and 1000 mVpp
- If the frequency of this signal deviates, perform alignment of trimmer CV91.

**Adjustment PAL sub carrier oscillator.**
- Player switched off.
- Standard switch NTSC/PAL (SW10) in position 625, PAL .
- Connect frequency counter to testpoint 83 and turn on the player.
- Adjust with trimmer CV91, the frequency on testpoint 83 at 4 433 618 Hz. +/- 50 Hz.




**7.2.4.3 Check of Phase Locked Loop. ( NTSC Only )**
- Check if the lock signal for NTSC on testpoint 76 , ( pin 3 of IC94 ) meets 39335 Hz +/- 8 Hz.
  If this frequency deviates check: XT4, HSYNC, and KILLM.

- Check if the divided VCO outputsignal on testpoint 77 , ( pin 14 of IC94 ) meets 39335 Hz +/- 8 Hz.



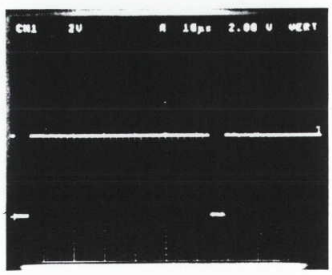
**7.2.4.4 Check of XT4, System clock divided by 4 ( NTSC Only )**
The divided by 4 system clock frequency on testpoint 79 , should be: 7 552 450 Hz .
If this clocksignal deviates check the IC40 pin117.



**7.2.4.5 Check of standard control signal SW**
In case of NTSC ( 525 ) the control signal SW on testpoint 78, should be high ( + 5 V ).
In case of PAL ( 625 ) this signal sould be low ( 0 V )
If this signal deviates check the IC65 26pin

**7.2.4.6 Check of KILLM signal. ( NTSC Only )**
This KILLM signal ( active Low ) on testpoint 82, ( pin 3 of IC91 ) should be low ( 0 V) incase of Non interlaced video.

**7.2.4.7 Check of HSYNC signal. ( NTSC Only )**
The horizontal synchronisation signal for NTSC standard is given on the photograph below. Testpoint 81, ( pin 1 IC90 )





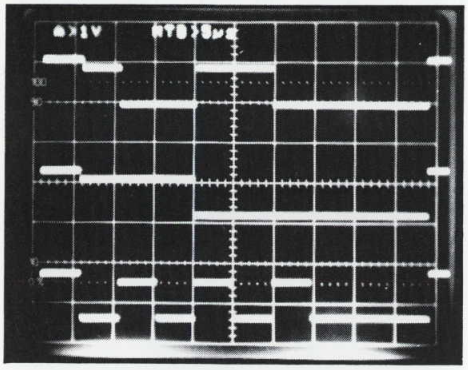
World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl

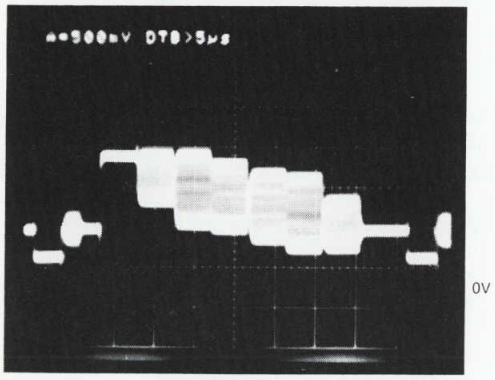


### 7.2.4.8 Check of RGB input signals

On the given photo below the signals are given for R - G - B in case of NTSC. On Testpoints 86 87 88.

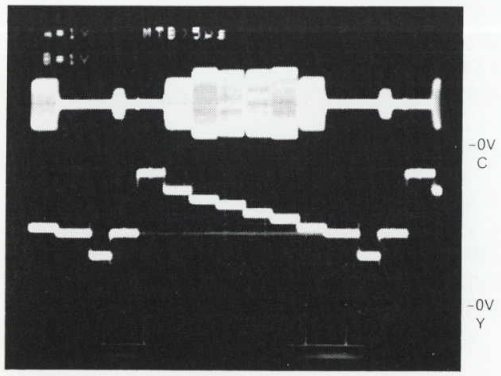



Check of Output signals for CVBS - Y / C.




CVBS signals
Testpoint 89

| | PAL-CVBS | NTSC-CVBS |
|---|---|---|
| - Video signal | 1000 mVpp | 1000 mVpp |
| - White level | 710 mVpp | 710 mVpp |
| - sync | 290 mVpp | 290 mVpp |
| - Burst | 290 mVpp | 290 mVpp |




Y/C signals
Testpoint 91/92

| | NTSC- Y/C Sign. Testpoint 91/92 | |
|---|---|---|
| - Video signal | 1000 mVppl | 1000 mVpp |
| - White level | 710 mVpp | 710 mVpp |
| - sync | 290 mVpp | 290 mVpp |
| - Chroma | 300 mVpp | 300 mVpp |



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



### 7.2.5 Measurements MMC circuit

**Required equipment:**
Multimeter
Display terminal type Digital VT220 or VT100
Digital oscilloscope
Analog oscilloscope
Timer/counter

**7.2.5.1 Clock signals:**
Carry out measurements just after hardware reset.
This is dine each time after pressing Power ON/OFF switch, or interconnect point X and Y without CD Lid.
( see the section 4.1.4 )

System clock = 30.2098 MHz +/- 600 Hz (NTSC)
30.0000 MHz +/- 1500 Hz (PAL)

- Changed by PAL/NTSC switch

This system clock must be present at the following points:
IC01 pin 30
IC40 pin 119
IC42 pin 119

At IC01pin 29 Clock divided by two must be present for
NTSC 15.1049 MHz (=30.2098 : 2)
PAL 15.000 MHz (=30.000 : 2).

At IC01 pin 69 the UART clock of 68070 must be present.
Frequency 4.9152 MHz +/- 250 Hz

At IC65 pin 54 clock of '68HC05' must be present.
Frequency 4.000 MHz +/- 100 Hz

At IC20 pin94 the clock of the CDIC must me present.
Frequency 22.5792 MHz +/- 1100 Hz.
At IC21 pin16 the DSP clock must be present.
Frequency 7.5264MHz +/- 380 Hz

At IC87 pin9 the '2B-clock' must be present.
Frequency 11.2896 MHz +/- 560 Hz

Carry out measurements at IC40 pin117. Clock of 'XT4' must be present. For
Frequency 7.55245 +/- 150 Hz for NTSC
7.5000 +/- 380 Hz for PAL

The frequency at IC88 pin37 'COXN' must be 75kHz +/- 25kHz.

**7.2.5.2 Reset circuitry:**
Power ON and measure the 'RESETCD' time
This 'low' time must be 140ms +/- 20 ms

Also measure the RESETCD time (low!) if the button is released. The signal
RESETCD must be low for 140ms +/- 20ms.

IC7201 pin 28 RESETN; low time = 250 ms +/- 20 ms

**7.2.5.3 Check of microprocessor 68070.**
Check after power on:
IC01, pin 27 (= HALTN) = high (+5V)
IC01, pin 28 (= RESETN) = high (+5V)
IC01, pin 24 (=DTACKN) = changing high/low
IC01, pin 26 (=BERRN) = high (+5V)

**7.2.5.4 Low level test**
Purpose is to test the hardware with software.
Connect a terminal,or test PCB to the UART of microprocessor 68070 via connector at INPUT ( port2 ).

Settings of the terminal:
Baudrate : 9600
start bit : 1
data bists : 8
stop bits : 0
no parity
no handshake

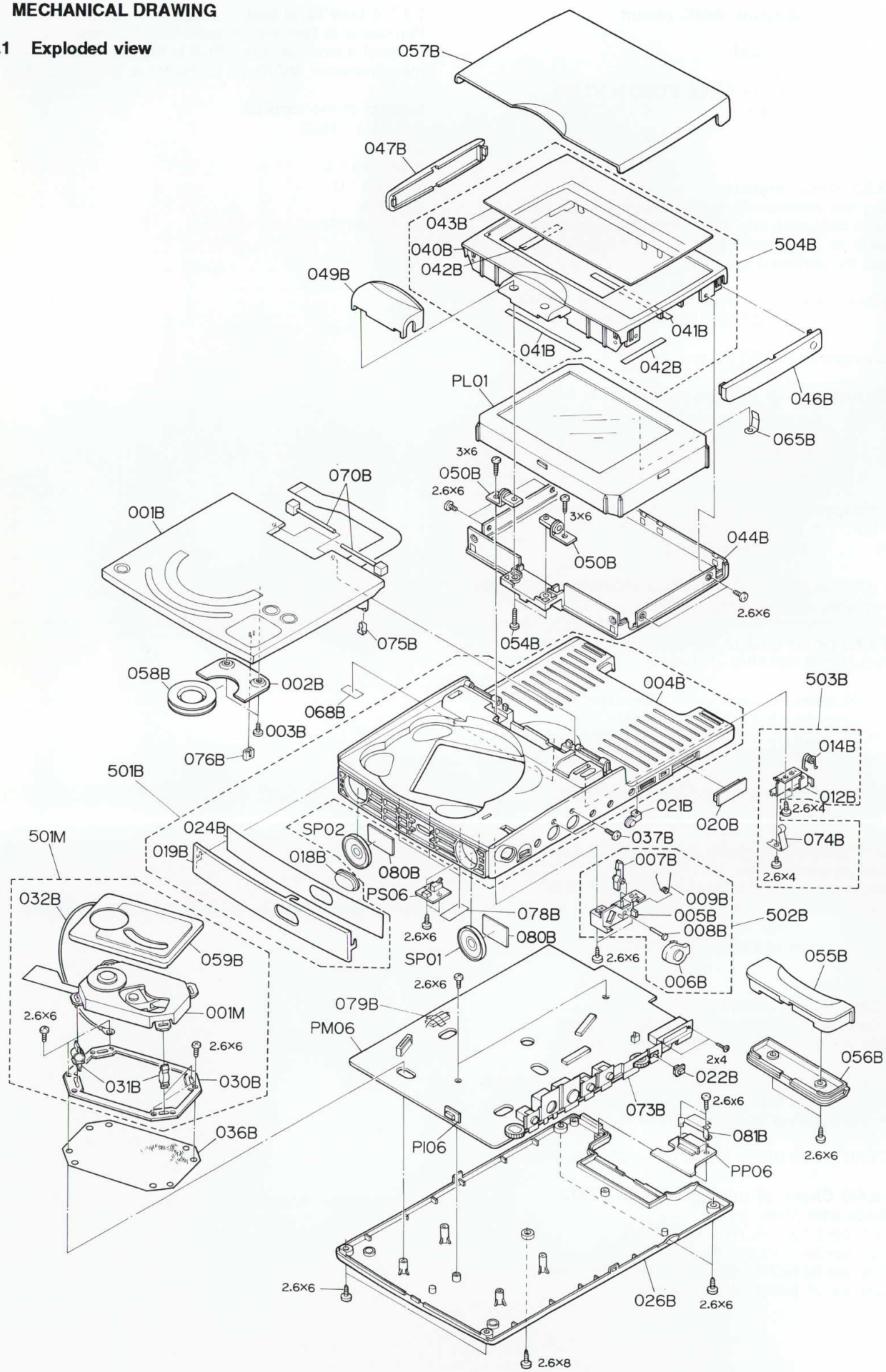
World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



## 8 MECHANICAL DRAWING

### 8.1 Exploded view






World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



# 9 PARTS LIST

## 9.1 Exploded view parts list

| Positionnbr | Servicecode | Description |
|---|---|---|
| 001B | 4822 444 30461 | CD COVER WITH KEYS |
| 002B | 4822 402 61464 | CLAMPER BRACKET |
| 003B | 4822 502 13203 | SCREW CLAMP BRACKET |
| 020B | 4822 444 60883 | RGB CONN. COVER |
| 021B | 4822 410 62344 | LCD ON/OFF BUTTON |
| 022B | 4822 410 62343 | PAL/NTSC BUTTON |
| 026B | 4822 444 50694 | BOTTOM CASE ASSY |
| 036B | 4822 444 60884 | COSMETIC CDM COVER |
| 037B | 4822 502 21292 | F.H.M. SCREW 2.6x5 |
| 044B | 4822 444 50693 | LCD BOTTOM CASE |
| 046B | 4822 444 40611 | R SIDECAP LCD CASE |
| 047B | 4822 444 40612 | L SIDECAP LCD CASE |
| 049B | 4822 444 60879 | LCD HINGE COVER |
| 050B | 4822 417 11179 | LCD HINGE |
| 054B | 4822 502 30701 | SCREW HINGE COVER |
| 055B | 4822 444 60881 | FMV TOP COVER |
| 056B | 4822 444 50692 | FMV BOTTOM COVER |
| 057B | 4822 444 60882 | COVER HOOD |
| 058B | 4822 532 21464 | CLAMPER |
| 070B | 4822 535 93367 | HOLDER ASSY |
| 076B | 4822 462 71896 | LID CAP |
| 501B | 4822 444 60886 | MAIN CASE ASSY |
| 502B | 4822 256 92004 | EJECT HOLDER ASSY |
| 503B | 4822 402 61467 | OPEN BRACKET ASSY |
| 504B | 4822 444 30462 | LCD TOP CASE ASSY |
| 501M | 4822 693 91593 | CDM 9 ASSY |
| PL01 | 4822 130 91193 | LCD UNIT |
| PP06 | 4822 214 52034 | POWER CONNECT PCB |
| SP01 | 4822 240 30598 | SPEAKER |
| SP02 | 4822 240 30598 | SPEAKER |



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



## 9.2 Electrical parts list

### AUDIO

| | | |
|---|---|---|
| C501 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C502 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C503 | 4822 126 11663 | 12pF 50V |
| C504 | 4822 124 11075 | 22µF/ 16V |
| C505 | 4822 126 11663 | 12 pF 50V CHIP |
| C506 | 4822 124 11075 | 22µF/ 16V |
| C507 | 4822 126 11663 | 12 pF 50V |
| C508 | 4822 124 11075 | 22µF/ 16V |
| C509 | 4822 126 11663 | 12 pF 50V |
| C510 | 4822 124 11075 | 22µF/ 16V |
| C511 | 4822 122 33744 | 100pF (GR39) 50V |
| C512 | 4822 122 33744 | 100pF (GR39) 50V |
| C513 | 4822 122 32672 | 1µF/16V TANTAL |
| C514 | 4822 122 32672 | 1µF/16V TANTAL |
| C515 | 4822 116 82487 | 0Ω ±5% 1/16W |
| C516 | 4822 122 33744 | 100pF (GR39) 50V |
| C517 | 4822 122 32672 | 1µF/16V TANTAL |
| C518 | 4822 122 33744 | 100pF (GR39) 50V |
| C519 | 4822 122 32672 | 1µF/16V TANTAL |
| C521 | 4822 126 11681 | 1000pF (GR39) 50V |
| C522 | 4822 124 11075 | 22µF/ 16V |
| C524 | 4822 126 11681 | 1000pF (GR39) 50V |
| C525 | 4822 124 11075 | 22µF/ 16V |
| C526 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C527 | 4822 122 32672 | 1µF/16V TANTAL |
| C528 | 4822 122 32701 | 0.022µF 50V |
| C529 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C530 | 4822 122 32672 | 1µF/16V |
| C531 | 4822 122 32701 | 0.022µF 50V |
| C532 | 4822 122 32667 | 0.01µF Z 50V |
| C533 | 4822 122 32667 | 0.01µF Z 50V |
| C534 | 4822 124 11075 | 22µF/ 16V |
| C535 | 4822 124 11075 | 22µF/ 16V |
| C536 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C537 | 4822 124 80412 | 220µF/16V |
| C538 | 4822 124 80412 | 220µF/16V |
| C541 | 4822 124 11075 | 22µF/16V |
| C542 | 4822 116 82487 | 0Ω ±5% 1/16W |
| C543 | 4822 124 80412 | 220µF/16V |
| C546 | 4822 122 32672 | 1µF/16V |
| C547 | 4822 122 32672 | 1µF/16V |
| C550 | 4822 124 10773 | 4.7µF/ 25V |
| C580 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C581 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C582 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C583 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C586 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C587 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C588 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C589 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C591 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C595 | 4822 124 41842 | 47µF/16V |
| C596 | 4822 124 41842 | 47µF/16V |

| | | |
|---|---|---|
| C704 | 4822 126 12494 | GR39 51pF CH 50V |
| C705 | 4822 126 12495 | 1500pF (GR39) 50V |
| C706 | 4822 126 12493 | 330pF ±5% J CG |
| C707 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C708 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C709 | 4822 124 11131 | 47µF/6.3V |
| C710 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C711 | 4822 124 11131 | 47µF/6.3V |
| C712 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C713 | 4822 124 11131 | 47µF/6.3V |
| C714 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C715 | 4822 124 11131 | 47µF/6.3V |
| C718 | 4822 126 11681 | 1000pF (GR39) 50V |
| C719 | 4822 126 11682 | 220pF (GR39) 50V |
| C720 | 4822 126 11682 | 220pF (GR39) 50V |
| C721 | 4822 126 11682 | 220pF (GR39) 50V |
| C722 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C723 | 4822 124 11131 | 47µF/6.3V |
| C724 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C725 | 4822 124 11131 | 47µF/6.3V |
| C726 | 4822 123 30365 | 1200pF J 16V ECWU1C |
| C727 | 4822 123 30364 | 1000pF J 16V ECWU1C |
| C728 | 4822 124 11075 | 22µF/ 16V |
| C729 | 4822 126 12502 | 820pF ±10% 50V |
| C730 | 4822 126 11681 | 1000pF (GR39) 50V |
| C731 | 4822 124 11075 | 22µF/ 16V |
| C732 | 4822 123 30365 | 1200pF J 16V |
| C733 | 4822 123 30364 | 1000pF J 16V |
| C734 | 4822 124 11075 | 22µF/ 16V |
| C735 | 4822 126 12502 | 820pF ±10% 50V |
| C736 | 4822 126 11681 | 1000pF (GR39) 50V C |
| C737 | 4822 124 11075 | 22µF/ 16V 50V C |
| C738 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C739 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C740 | 4822 124 11131 | 47µF/6.3V |
| C741 | 4822 123 30365 | 1200pF J 16V ECWU1C |
| C742 | 4822 123 30365 | 1200pF J 16V ECWU1C |
| C780 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C781 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C782 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C783 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C784 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C785 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C786 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C787 | 4822 126 11681 | 1000pF (GR39) 50V CH |



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



| | | |
|---|---|---|
| R502 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R503 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R504 | 4822 051 30472 | 4.7kΩ ± 5% 1/16W |
| R505 | 4822 051 30684 | 680Ω ± 5% 1/16W |
| R506 | 4822 051 30153 | 15kΩ ± 5% 1/16W |
| R507 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R508 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R509 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R511 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R512 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R513 | 4822 051 30472 | 4.7kΩ ± 5% 1/16W |
| R514 | 4822 051 30684 | 680Ω ± 5% 1/16W |
| R515 | 4822 051 30153 | 15kΩ ± 5% 1/16W |
| R516 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R517 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R518 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R519 | 4822 051 30101 | 100Ω ± 5% 1/16W |
| R520 | 4822 117 10146 | # 4.7Ω J 1/4W RF |
| R521 | 4822 051 30101 | 100Ω ± 5% 1/16W |
| R522 | 4822 111 91459 | 22Ω ±5% 1/10W |
| R523 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R524 | 4822 111 91459 | 22Ω ± 5% 1/10W |
| R525 | 4822 051 30104 | 100kΩ ± 5% 1/16W |
| R526 | 4822 051 30221 | 220Ω ± 5% 1/16W |
| R527 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R529 | 4822 051 30104 | 100kΩ ± 5% 1/16W |
| R530 | 4822 051 30221 | 220Ω ± 5% 1/16W |
| R531 | 4822 051 30392 | 3.9kΩ ± 5% 1/16W |
| R532 | 4822 051 30223 | 22kΩ ±5% 1/16WW |
| R533 | 4822 051 30472 | 4.7kΩ ±5% 1/16WW |
| R534 | 4822 051 30472 | 4.7kΩ ±5% 1/16W |
| R535 | 4822 051 30223 | 22kΩ ±5% 1/16W |
| R536 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R537 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R538 | 4822 051 30479 | 47Ω ± 5% 1/16W |
| R540 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R541 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R542 | 4822 051 30479 | 47Ω ±5% 1/16W |
| R543 | 4822 116 82487 | 0Ω 1/16W |
| R544 | 4822 111 91459 | 22Ω ± 5% 1/10W |
| R545 | 4822 116 82487 | 0Ω 1/16W |
| R546 | 4822 111 91459 | 22Ω ±5% 1/10W |
| R547 | 4822 051 30104 | 100kΩ ± 5% 1/16W |
| R548 | 4822 116 82487 | 0Ω 1/16W |
| R549 | 4822 116 82487 | 0Ω 1/16W |
| R550 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R551 | 4822 051 30472 | 4.7kΩ ± 5% 1/16W |
| R552 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R554 | 4822 051 30105 | 1MΩ ± 5% 1/16W |
| R555 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R556 | 4822 051 30473 | 47kΩ ±5% 1/16W |
| R557 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R558 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R559 | 4822 116 82487 | 0Ω ±5% 1/16W |
| R562 | 4822 051 30101 | 100Ω ±5% 1/16W |

| | | |
|---|---|---|
| R563 | 4822 051 30101 | 100Ω ± 5% 1/16W |
| R568 | 4822 051 30229 | 22Ω ± 5% 1/16W |
| R569 | 4822 051 30229 | 22Ω ± 5% 1/16W |
| R570 | 4822 051 30473 | 47kΩ ±5% 1/16W |
| R571 | 4822 051 30473 | 47kΩ ±5% 1/16W |
| R576 | 4822 051 30104 | 100kΩ ±5% 1/16W |
| R577 | 4822 051 30472 | 4.7kΩ ± 5% 1/16W |
| R578 | 4822 051 30472 | 4.7kΩ ± 5% 1/16W |
| R581 | 4822 116 82487 | 0Ω ± 5% 1/16W |
| R583 | 4822 116 82487 | 0Ω ± 5% 1/16W |
| R585 | 4822 051 30472 | 4.7kΩ ± 5% 1/16W |
| R586 | 4822 051 30104 | 100kΩ ± 5% 1/16W |
| R587 | 4822 051 30472 | 4.7kΩ ± 5% 1/16W |
| R588 | 4822 051 30104 | 100kΩ ± 5% 1/16W |
| R701 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R702 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R703 | 4822 051 30225 | 2.2MΩ ± 5% 1/20W |
| R704 | 4822 051 30225 | 2.2MΩ ± 5% 1/20W |
| R705 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R706 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R707 | 4822 117 10145 | # 3.3Ω ±5% 1/10W |
| R708 | 4822 117 10145 | # 3.3Ω ±5% 1/10W |
| R709 | 4822 051 30829 | 82Ω ± 5% 1/16W |
| R711 | 4822 051 30224 | 220kΩ ± 5% 1/16W |
| R712 | 4822 051 30101 | 100Ω ± 5% 1/16W |
| R713 | 4822 051 30101 | 100Ω ± 5% 1/16W |
| R714 | 4822 051 30101 | 100Ω ± 5% 1/16W |
| R715 | 4822 051 30104 | 100kΩ ± 5% 1/16W |
| R716 | 4822 051 30104 | 100kΩ ± 5% 1/16W |
| R717 | 4822 051 30104 | 100kΩ ± 5% 1/16W |
| R718 | 4822 117 10145 | # 3.3Ω ±5% 1/10W |
| R719 | 4822 117 10145 | # 3.3Ω ±5% 1/10W |
| R720 | 4822 116 83207 | 1.2kΩ ± 5% 1/16W |
| R721 | 4822 116 83207 | 1.2kΩ ± 5% 1/16W |
| R722 | 4822 051 30101 | 100Ω ± 5% 1/16W |
| R724 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R725 | 4822 051 30153 | 15kΩ ± 5% 1/16W |
| R726 | 4822 051 30153 | 15kΩ ± 5% 1/16W |
| R727 | 4822 051 30153 | 15kΩ ± 5% 1/16W |
| R728 | 4822 051 30153 | 15kΩ ± 5% 1/16W |
| R729 | 4822 051 30101 | 100Ω ± 5% 1/16W |
| R731 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R732 | 4822 116 83207 | 1.2kΩ ± 5% 1/16W |
| R733 | 4822 116 83207 | 1.2kΩ ± 5% 1/16W |
| R734 | 4822 051 30101 | 100Ω ± 5% 1/16W |
| R736 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R737 | 4822 051 30153 | 15kΩ ± 5% 1/16W |
| R738 | 4822 051 30153 | 15kΩ ± 5% 1/16W |
| R739 | 4822 051 30153 | 15kΩ ± 5% 1/16W |
| R740 | 4822 051 30153 | 15kΩ ± 5% 1/16W |
| R741 | 4822 051 30101 | 100Ω ± 5% 1/16W |
| R743 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R744 | 4822 051 30392 | 3.9kΩ ± 5% 1/16W |
| R745 | 4822 051 30104 | 100kΩ ± 5% 1/16W |
| R746 | 4822 116 83207 | 1.2kΩ ± 5% 1/16W |

Free service manuals
Circuits schematics
Datasheets
www.freeservicemanuals.info



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



| | | |
|---|---|---|
| R747 | 4822 116 83207 | 1.2kΩ ± 5% 1/16W |
| R748 | 4822 116 83207 | 1.2kΩ ± 5% 1/16W |
| R749 | 4822 116 83207 | 1.2kΩ ± 5% 1/16W |
| RV51 | 4822 100 11944 | RK10J12T T6 K2 M3 1O |

| | | |
|---|---|---|
| L701 | 4822 157 63234 | 4.7µH |
| L702 | 4822 157 70271 | 390µH J |
| L703 | 4822 157 70271 | 390µH J |

| | | |
|---|---|---|
| D551 | 4822 130 32635 | MA-151K TAPEING |
| D553 | 4822 130 32635 | MA-151K TAPEING |

| | | |
|---|---|---|
| Q501 | 4822 130 63187 | DTC323TK |
| Q502 | 4822 130 63187 | DTC323TK |
| Q503 | 4822 130 63187 | DTC323TK |
| Q504 | 4822 130 63187 | DTC323TK |
| Q511 | 4822 130 63187 | DTC323TK |
| Q512 | 4822 130 63187 | DTC323TK |
| Q513 | 4822 130 63187 | DTC323TK |
| Q514 | 4822 130 63187 | DTC323TK |
| Q515 | 4822 130 63187 | DTC323TK |
| Q516 | 4822 130 63187 | DTC323TK |
| Q517 | 4822 130 42733 | 2SA1162 GR |
| Q518 | 4822 130 42733 | 2SA1162 GR |
| Q550 | 4822 130 43398 | 2SC2712 GR |
| Q551 | 4822 130 43398 | 2SC2712 GR |
| Q552 | 4822 130 42733 | 2SA1162 GR |
| Q554 | 4822 130 42733 | 2SA1162 GR |

| | | |
|---|---|---|
| IC50 | 4822 209 31905 | AD7528 MIX/ATTN |
| IC51 | 4822 209 31905 | AD7528 MIX/ATTN |
| IC52 | 4822 209 62764 | 74HC164F TAPING |
| IC53 | 4822 209 83357 | NJM4560M |
| IC54 | 4822 209 83357 | NJM4560M |
| IC56 | 4822 209 83357 | NJM4560M |
| IC57 | 4822 209 62503 | 74HC4053 |
| IC58 | 4822 209 83357 | NJM4560M |
| IC59 | 4822 209 83357 | NJM4560M |
| IC60 | 4822 209 61666 | NJM386M FLAT PACK |
| IC61 | 4822 209 61666 | NJM386M FLAT PACK |
| IC70 | 4822 209 63997 | SAA7323GP DAC3 |
| IC71 | 4822 209 83357 | NJM4560M |
| IC72 | 4822 209 83357 | NJM4560M |
| IC73 | 4822 209 62503 | 74HC4053 |
| IC74 | 4822 209 83357 | NJM4560M |

## VIDEO

| | | |
|---|---|---|
| C428 | 4822 126 11568 | 470pF (GR39) 50V |
| C429 | 4822 126 11568 | 470pF (GR39) 50V |
| C430 | 4822 126 11568 | 470pF (GR39) 50V |
| C431 | 4822 124 10772 | 100µF/6.3V |
| C432 | 4822 124 10772 | 100µF/6.3V |
| C433 | 4822 124 10772 | 100µF/6.3V |
| C435 | 4822 126 12516 | 1000pF 50V |
| C436 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C437 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C438 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C449 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C450 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C451 | 4822 124 11336 | 3.3µF/35V |
| C452 | 4822 124 11336 | 3.3µF/35V |
| C453 | 4822 124 11336 | 3.3µF/35V |
| C454 | 4822 124 11336 | 3.3µF/35V |
| C455 | 4822 124 11336 | 3.3µF/35V |
| C456 | 4822 124 11336 | 3.3µF/35V |
| C458 | 4822 126 11668 | 220 pF (GR39) 50V |
| C459 | 4822 126 11668 | 220 pF (GR39) 50V |
| C464 | 5322 122 34098 | 0.01µF 50V |
| C467 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C481 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C482 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C483 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C484 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C485 | 4822 122 32672 | 1µF/16V |
| C901 | 4822 124 11131 | 47µF/6.3V |
| C902 | 4822 126 11566 | 2200pF (GR39) 50V |
| C903 | 4822 121 42668 | 0.47µF,J,50V |
| C904 | 4822 121 42668 | 0.47µF,J,50V |
| C905 | 4822 126 11566 | 2200pF (GR39) 50V |
| C906 | 4822 126 11566 | 2200pF (GR39) 50V |
| C907 | 4822 122 33751 | 120pF (GR39) 50V |
| C908 | 4822 126 11568 | 470pF (GR39) 50V |
| C909 | 4822 122 33741 | 10pF (GR39) 50V |
| C910 | 4822 126 11568 | 470pF (GR39) 50V |
| C911 | 4822 126 11568 | 470pF (GR39) 50V |
| C912 | 4822 122 33744 | 100pF (GR39) 50V |
| C914 | 4822 124 11333 | B.P 0.47µF 50V (MV) |
| C915 | 4822 124 11333 | B.P 0.47µF 50V (MV) |
| C916 | 4822 124 11333 | B.P 0.47µF 50V (MV) |
| C917 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C918 | 4822 124 10772 | 100µF/6.3V |
| C919 | 4822 124 10772 | 100µF/6.3V |
| C920 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C921 | 4822 122 33761 | 22pF (GR39) 50V |
| C922 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C923 | 4822 122 33788 | 82pF (GR39) 50V |
| C924 | 4822 122 33777 | 47pF (GR39) 50V |
| C925 | 4822 126 11663 | 12 pF 50V |
| C926 | 4822 122 33788 | 82pF (GR39) 50V |
| C927 | 4822 122 32672 | 1µF/16V |
| C928 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C929 | 4822 126 11687 | GRM39F104Z16 0.1µF |



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl





| | | |
|---|---|---|
| C930 | 4822 124 11074 | 10µF/ 16V |
| C931 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C932 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C933 | 4822 124 11074 | 10µF/ 16V |
| C938 | 4822 124 23561 | 470µF/4V |
| C939 | 4822 124 23561 | 470µF/4V O=8 H=7 |
| C940 | 4822 124 11074 | 10µF/16V |
| C941 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C943 | 4822 116 82487 | 0Ω ±5% 1/16W |
| C946 | 4822 116 82487 | 0Ω ±5% 1/16W |
| C947 | 4822 122 32672 | 1µF/16V TANTAL |
| C980 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C981 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C982 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C983 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C984 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C985 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C986 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C987 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C988 | 4822 126 11681 | 1000pF 50V GR39 |
| C990 | 4822 124 41842 | 47µF/ 16V |
| C991 | 4822 124 21852 | 470µF/ 16V |
| C992 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| CV91 | 4822 125 60188 | TZC03P200A110 20pF |



| | | |
|---|---|---|
| R415 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R416 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R417 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R418 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R419 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R420 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R426 | 4822 051 30152 | 1.5kΩ ± 5% 1/16W |
| R427 | 4822 116 83218 | 68Ω ± 5% 1/16W |
| R428 | 4822 051 30221 | 220Ω ± 5% 1/16W |
| R429 | 4822 051 30332 | 3.3kΩ ±5% 1/16W |
| R430 | 4822 051 30152 | 1.5kΩ ± 5% 1/16W |
| R431 | 4822 116 83218 | 68Ω ± 5% 1/16W |
| R432 | 4822 051 30221 | 220Ω ± 5% 1/16W |
| R433 | 4822 051 30332 | 3.3kΩ ±5% 1/16W |
| R434 | 4822 051 30152 | 1.5kΩ ± 5% 1/16W |
| R435 | 4822 116 83218 | 68Ω ± 5% 1/16W |
| R436 | 4822 051 30221 | 220Ω ± 5% 1/16W |
| R437 | 4822 051 30332 | 3.3kΩ ±5% 1/16W |
| R447 | 4822 116 83208 | 12kΩ ±5% 1/16W |
| R448 | 4822 116 83208 | 12kΩ ± 5% 1/16W |
| R449 | 4822 051 30104 | 100kΩ ± 5% 1/16W |
| R450 | 4822 051 30473 | 47kΩ ± 5% 1/16W |
| R451 | 4822 051 30473 | 47kΩ ± 5% 1/16W |
| R452 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R453 | 4822 116 82487 | 0Ω ±5% 1/16W |
| R454 | 4822 051 30759 | 75Ω ± 5% 1/16W |
| R455 | 4822 051 30759 | 75Ω ± 5% 1/16W |
| R456 | 4822 051 30759 | 75Ω ± 5% 1/16W |
| R460 | 4822 051 30759 | 75Ω ± 5% 1/16W |



| | | |
|---|---|---|
| R461 | 4822 051 30759 | 75Ω ± 5% 1/16W |
| R462 | 4822 051 30759 | 75Ω ± 5% 1/16W |
| R466 | 4822 116 82487 | 0Ω ± 5% 1/16W |
| R472 | 4822 051 30104 | 100kΩ ±5% 1/16W |
| R473 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R478 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R479 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R480 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R481 | 4822 051 30223 | 22 kΩ ±5% 1/16W |
| R483 | 4822 051 30103 | 10kΩ ±5% 1/16W |
| R484 | 4822 051 30103 | 10kΩ ±5% 1/16W |
| R901 | 4822 051 30104 | 100kΩ ± 5% 1/16W |
| R902 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R903 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R904 | 4822 051 30105 | 1MΩ ± 5% 1/16W |
| R905 | 4822 051 30105 | 1MΩ ± 5% 1/16W |
| R906 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R907 | 4822 051 30153 | 15kΩ ± 5% 1/16W |
| R908 | 4822 051 30104 | 100kΩ ± 5% 1/16W |
| R909 | 4822 051 30222 | 2.2kΩ ± 5% 1/16W |
| R910 | 4822 116 83211 | 1.8kΩ ± 5% 1/16W |
| R911 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R912 | 4822 116 83219 | 820Ω ± 5% 1/16W |
| R913 | 4822 051 30105 | 1MΩ ± 5% 1/16W |
| R914 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R915 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R916 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R917 | 4822 116 83215 | 5.6kΩ ± 5% 1/16W |
| R918 | 4822 051 30105 | 1MΩ ± 5% 1/16W |
| R919 | 4822 116 83208 | 12kΩ ± 5% 1/16W |
| R920 | 4822 051 30152 | 1.5kΩ ± 5% 1/16W |
| R921 | 4822 116 82487 | 0Ω ±5% 1/16W |
| R922 | 4822 116 82487 | 0Ω ±5% 1/16W |
| R923 | 4822 051 30153 | 15kΩ ± 5% 1/16W |
| R924 | 4822 051 30473 | 47kΩ ± 5% 1/16W |
| R925 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R926 | 4822 051 30473 | 47kΩ ± 5% 1/16W |
| R927 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R928 | 4822 051 30221 | 220Ω ± 5% 1/16W |
| R929 | 4822 051 30273 | 27kΩ ± 5% 1/16W |
| R930 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R931 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R932 | 4822 051 30471 | 470Ω ± 5% 1/16W |
| R933 | 4822 051 30759 | 75Ω ± 5% 1/16W |
| R935 | 4822 116 83213 | 270Ω ±5% 1/16W |
| R936 | 4822 051 30759 | 75Ω ± 5% 1/16W |
| R937 | 4822 116 83222 | 82kΩ ± 5% 1/16W |
| R938 | 4822 051 30471 | 470Ω ± 5% 1/16W |
| R939 | 4822 051 30473 | 47kΩ ±5% 1/16W |
| R940 | 4822 051 30561 | 560Ω ±5% 1/16W |
| R941 | 4822 116 83207 | 1.2kΩ ± 5% 1/16W |
| R942 | 4822 116 83219 | 820Ω ±5% 1/16W |
| R943 | 4822 051 30759 | 75Ω ± 5% 1/16W |
| R944 | 4822 116 83222 | 82kΩ ± 5% 1/16W |
| R945 | 4822 051 30471 | 470Ω ± 5% 1/16W |



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl





| | | |
|---|---|---|
| R946 | 4822 051 30333 | 33kΩ ±5% 1/16W |
| R947 | 4822 051 30561 | 560Ω ±5% 1/16W |
| R948 | 4822 116 83207 | 1.2kΩ ± 5% 1/16W |
| R949 | 4822 116 83219 | 820Ω ±5% 1/16W |
| R950 | 4822 051 30759 | 75Ω ± 5% 1/16W |
| R951 | 4822 051 30759 | 75Ω ± 5% 1/16W |
| R952 | 4822 051 30759 | 75Ω ± 5% 1/16W |
| R953 | 4822 051 30759 | 75Ω ± 5% 1/16W |
| R954 | 4822 111 90893 | 100Ω ±5% 1/10W |
| R955 | 4822 051 30101 | 100Ω ± 5% 1/16W |
| R958 | 4822 116 82487 | 0Ω ± 5% 1/16W |
| R959 | 4822 051 30101 | 100Ω ±5% 1/16W |
| R960 | 4822 116 82487 | 0Ω ± 5% 1/16W |
| R961 | 4822 116 82487 | 0Ω ± 5% 1/16W |
| R962 | 4822 116 82487 | 0Ω ± 5% 1/16W |
| R963 | 4822 051 30473 | 47kΩ ± 5% 1/16W |
| R964 | 4822 051 30102 | 1kΩ ±5% 1/16W |
| R965 | 4822 051 30473 | 47kΩ ±5% 1/16W |
| R966 | 4822 051 30683 | 68 kΩ ±5% 1/16W |
| R969 | 4822 051 30682 | 6.8kΩ ±5% 1/16W |



| | | |
|---|---|---|
| L901 | 4822 157 70272 | 47µH 10% CHIP INDUCT |
| L902 | 4822 320 40294 | 4FT 290nS DELAY LINE |
| L903 | 4822 153 70057 | 4FUS FOR MULTI STAND |



| | | |
|---|---|---|
| D901 | 4822 130 31129 | BB212 V-CAP DOUBLE D |



| | | |
|---|---|---|
| Q402 | 4822 130 43398 | 2SC2712 GR |
| Q403 | 4822 130 43398 | 2SC2712 GR |
| Q404 | 4822 130 43398 | 2SC2712 GR |
| Q410 | 4822 130 43398 | 2SC2712 GR |
| Q411 | 4822 130 43398 | 2SC2712 GR |
| Q901 | 4822 130 43398 | 2SC2712 GR |
| Q902 | 4822 130 42733 | 2SA1162 GR |
| Q903 | 4822 130 43398 | 2SC2712 GR |
| Q904 | 4822 130 43398 | 2SC2712 GR |
| Q905 | 4822 130 43398 | 2SC2712 GR |
| Q906 | 4822 130 43398 | 2SC2712 GR |
| Q907 | 4822 130 43398 | 2SC2712 GR |
| Q908 | 4822 130 42733 | 2SA1162 GR |
| Q909 | 4822 130 43398 | 2SC2712 GR |
| Q910 | 4822 130 43398 | 2SC2712 GR |
| Q911 | 4822 130 42733 | 2SA1162 GR |
| Q912 | 4822 130 43398 | 2SC2712 GR |



| | | |
|---|---|---|
| IC35 | 4822 209 31902 | 74HC4538 FLAT PACK |
| IC36 | 4822 209 31901 | CHIP LOGIC TC4S11F |
| IC90 | 4822 209 30142 | PC74HC40103T JEDEC F |
| IC91 | 4822 209 31911 | TIBPAL16R6-25CDW SOP |
| IC92 | 4822 209 60898 | 74LS161 EIAJ FLAT |
| IC93 | 5322 209 73187 | 74HC04 EIAJ FLAT |
| IC94 | 4822 209 31931 | 74HC4046 JEDEC FLAT |
| IC95 | 4822 209 60898 | 74LS161 EIAJ FLAT |
| IC96 | 4822 209 60898 | 74LS161 EIAJ FLAT |
| IC97 | 4822 209 83357 | NJM4560M |
| IC98 | 4822 209 61534 | 74HCU04 EIAJ FLAT |
| IC99 | 4822 209 31928 | 74HC00 EIAJ FLAT |
| ICE1 | 4822 209 31908 | CXA1145M RGB ENCODER |



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



**MMC**

Miscellaneous

| | | |
|---|---|---|
| DF01 | 4822 130 32635 | MA-151K TAPEING |
| SW10 | 4822 277 21656 | SSSS2-12-12 SMT NTSC |
| XF01 | 5322 242 73734 | CSAC4.00MGC CERAMIC |
| X101 | 4822 242 81347 | 4.9152MHZ SMD-49 CH |
| X102 | 4822 242 81351 | 30.2098MHZ DSO49SJ C |
| X103 | 4822 242 81349 | 30.0000MHZ DSO49SJ C |
| X201 | 4822 242 81352 | 45.1584MHZ DSO49SJ C |
| X202 | 4822 242 81348 | 19.3575MHZ SMD-49 CH |
| X601 | 5322 242 73734 | CSAC4.00MGC CERAMIC |
| X901 | 4822 242 81378 | 3.579545 MHZ XTAL SM |
| X902 | 4822 242 81379 | 4.433618 MHZ XTAL SM |
| Z603 | 4822 130 83197 | GP1U58XP PHILIPS VER |
| ZF01 | 4822 130 83229 | 02CZ3.9X (TOSHIBA) |

⊣⊢

| | | |
|---|---|---|
| C101 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C102 | 4822 122 33782 | 56pF (GR39) 50V |
| C103 | 4822 122 33782 | 56pF (GR39) 50V |
| C104 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C105 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C106 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C107 | 4822 122 33761 | 22pF (GR39) 50V |
| C108 | 4822 122 33761 | 22pF (GR39) 50V |
| C109 | 4822 122 33761 | 22pF (GR39) 50V |
| C110 | 4822 122 32672 | 1µF/16V |
| C111 | 5322 122 34098 | 0.01µF 50V |
| C112 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C113 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C114 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C115 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C116 | 4822 126 11687 | 0.1µF 25V |
| C117 | 4822 126 11687 | 0.1µF 25V |
| C180 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C181 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C182 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C183 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C184 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C185 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C186 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C187 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C188 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C189 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C190 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C201 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C202 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C203 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C204 | 4822 124 10772 | 100µF/6.3V |
| C205 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C206 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C207 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C208 | 4822 122 33788 | 82pF (GR39) 50V |
| C209 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C210 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C211 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C213 | 4822 126 12502 | 820pF ± 10% |

⊣⊢

| | | |
|---|---|---|
| C212 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C214 | 4822 122 33741 | 10pF (GR39) |
| C215 | 4822 122 33777 | 47pF (GR39) |
| C216 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C217 | 4822 122 33788 | 82pF (GR39) |
| C218 | 4822 122 33744 | 100pF (GR39) |
| C219 | 4822 122 33761 | 22pF (GR39) |
| C220 | 4822 122 33761 | 22pF (GR39) |
| C222 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C223 | 4822 126 12495 | 1500pF (GR39) |
| C224 | 4822 126 12495 | 1500pF (GR39) |
| C225 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C226 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C227 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C229 | 4822 122 33761 | 22pF (GR39) |
| C230 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C231 | 4822 126 11566 | 2200pF (GR39) |
| C232 | 4822 126 11566 | 2200pF (GR39) |
| C234 | 4822 126 11687 | 0.1µF 25V |
| C280 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C281 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C282 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C283 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C284 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C285 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C286 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C287 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C288 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C401 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C402 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C403 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C404 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C405 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C406 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C407 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C408 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C409 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C410 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C411 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C412 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C413 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C414 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C415 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C416 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C417 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C418 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C419 | 4822 124 11131 | 47µF/6.3V |
| C420 | 4822 124 11131 | 47µF/6.3V |
| C421 | 5322 124 21349 | 470µF/6.3V |
| C422 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C423 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C424 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C425 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C426 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C427 | 4822 126 11687 | GRM39F104Z16 0.1µF |



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl





| | | |
|---|---|---|
| C434 | 4822 122 33782 | 56pF (GR39) |
| C440 | 4822 122 33782 | 56pF (GR39) |
| C480 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C601 | 4822 122 33777 | 47pF (GR39) |
| C602 | 4822 122 33777 | 47pF (GR39) |
| C603 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C620 | 4822 124 11074 | 10µF/ 16V |
| C621 | 4822 124 11074 | 10µF/ 16V |
| C622 | 4822 124 11074 | 10µF/ 16V |
| C623 | 4822 124 11074 | 10µF/ 16V |
| C624 | 4822 124 11074 | 10µF/ 16V |
| C629 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C630 | 4822 126 11685 | 4700pF (GR39) |
| C631 | 4822 126 11685 | 4700pF (GR39) |
| C632 | 4822 126 11685 | 4700pF (GR39) |
| C633 | 4822 126 11685 | 4700pF (GR39) |
| C634 | 4822 126 11685 | 4700pF (GR39) |
| C636 | 4822 126 11685 | 4700pF (GR39) |
| C650 | 4822 124 11074 | 10µF/ 16V |
| CF01 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| CF02 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| CF03 | 4822 122 33777 | 47pF (GR39) 50V |
| CF04 | 4822 122 33777 | 47pF (GR39) 50V |



| | | |
|---|---|---|
| R101 | 4822 051 30472 | 4.7kΩ ± 5% 1/16W |
| R102 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R103 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R104 | 4822 051 30472 | 4.7kΩ ± 5% 1/16W |
| R105 | 4822 051 30472 | 4.7kΩ ± 5% 1/16W |
| R106 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R107 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R108 | 4822 051 30472 | 4.7kΩ ± 5% 1/16W |
| R109 | 4822 051 30472 | 4.7kΩ ± 5% 1/16W |
| R110 | 4822 051 30105 | 1MΩ ± 5% 1/16W |
| R111 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R112 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R113 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R114 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R115 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R116 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R118 | 4822 116 82487 | 0Ω ± 5% 1/16W |
| R119 | 4822 051 30101 | 100Ω ±5% 1/16W |
| R120 | 4822 051 30101 | 100Ω ±5% 1/16W |
| R121 | 4822 051 30101 | 100Ω ±5% 1/16W |
| R122 | 4822 051 30104 | 100kΩ ± 5% 1/16W |
| R123 | 4822 051 30104 | 100kΩ ± 5% 1/16W |
| R124 | 4822 051 30104 | 100kΩ ± 5% 1/16W |
| R125 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R126 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R128 | 4822 116 82487 | 0Ω ± 5% 1/16W |
| R131 | 4822 051 30472 | 4.7kΩ ± 5% 1/16W |
| R132 | 4822 051 30472 | 4.7kΩ ± 5% 1/16W |
| R133 | 4822 051 30472 | 4.7kΩ ± 5% 1/16W |
| R134 | 4822 051 30472 | 4.7kΩ ± 5% 1/16W |



| | | |
|---|---|---|
| R135 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R137 | 4822 116 82487 | 0Ω ± 5% 1/16W |
| R140 | 4822 051 30222 | 2.2kΩ ± 5% 1/16W |
| R141 | 4822 116 82487 | 0Ω ±5% 1/16W |
| R142 | 4822 116 82487 | 0Ω ±5% 1/16W |
| R201 | 4822 051 30479 | 47Ω ± 5% 1/16W |
| R202 | 4822 051 30153 | 15kΩ ± 5% 1/16W |
| R203 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R204 | 4822 051 30222 | 2.2kΩ ± 5% 1/16W |
| R205 | 4822 051 30101 | 100Ω ± 5% 1/16W |
| R206 | 4822 051 30101 | 100Ω ±5% 1/16W |
| R207 | 4822 051 30479 | 47Ω+/-5% 1/16W |
| R211 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R212 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R213 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R214 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R218 | 4822 116 82487 | 0Ω ± 5% 1/16W |
| R220 | 4822 116 82487 | 0Ω ± 5% 1/16W |
| R222 | 4822 051 30221 | 220Ω ± 5% 1/16W |
| R223 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R224 | 4822 051 30221 | 220Ω ± 5% 1/16W |
| R225 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R227 | 4822 116 82487 | 0Ω ± 5% 1/16W |
| R229 | 4822 116 82487 | 0Ω ± 5% 1/16W |
| R231 | 4822 116 82487 | 0Ω ± 5% 1/16W |
| R232 | 4822 116 82487 | 0Ω ± 5% 1/16W |
| R233 | 4822 051 30104 | 100kΩ ± 5% 1/16W |
| R235 | 4822 116 82487 | 0Ω ± 5% 1/16W |
| R236 | 4822 051 30101 | 100Ω ±5% 1/16W |
| R401 | 4822 051 30759 | 75Ω ± 5% 1/16W |
| R402 | 4822 051 30759 | 75Ω ± 5% 1/16W |
| R403 | 4822 051 30473 | 47kΩ ± 5% 1/16W |
| R404 | 4822 051 30472 | 4.7kΩ ± 5% 1/16W |
| R405 | 4822 051 30759 | 75Ω ± 5% 1/16W |
| R406 | 4822 051 30759 | 75Ω ± 5% 1/16W |
| R407 | 4822 051 30473 | 47kΩ ± 5% 1/16W |
| R408 | 4822 051 30222 | 2.2kΩ ± 5% 1/16W |
| R409 | 4822 117 10145 | # 3.3Ω ±5% 1/10W |
| R410 | 4822 051 30391 | 390Ω ± 5% 1/16W |
| R411 | 4822 051 30181 | 180Ω ± 5% 1/16W |
| R412 | 4822 051 30759 | 75Ω ± 5% 1/16W |
| R413 | 4822 051 30759 | 75Ω ± 5% 1/16W |
| R414 | 4822 051 30759 | 75Ω ± 5% 1/16W |
| R421 | 4822 051 30229 | 22Ω ± 5% 1/16W |
| R440 | 4822 116 82487 | 0Ω ± 5% 1/16W |
| R444 | 4822 051 30229 | 22Ω ± 5% 1/16W |
| R490 | 4822 116 82487 | 0Ω ±5% 1/16W |
| R491 | 4822 116 82487 | 0Ω ±5% 1/16W |
| R493 | 4822 116 82487 | 0Ω ±5% 1/16W |
| R494 | 4822 116 82487 | 0Ω ±5% 1/16W |
| R601 | 4822 051 30224 | 220kΩ ± 5% 1/16W |
| R602 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R603 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R604 | 4822 051 30222 | 2.2kΩ ± 5% 1/16W |
| R605 | 4822 051 30473 | 47kΩ ± 5% 1/16W |



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl





| | | |
|---|---|---|
| R606 | 4822 116 83212 | 18kΩ ± 5% 1/16W |
| R607 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R609 | 4822 051 30103 | 10kΩ ±5% 1/16W |
| R611 | 4822 051 30103 | 10kΩ ±5% 1/16W |
| R613 | 4822 116 82487 | 0Ω ± 5% 1/16W |
| R620 | 4822 116 82487 | 0Ω ± 5% 1/16W |
| R621 | 4822 051 30104 | 100kΩ ± 5% 1/16W |
| R622 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R623 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R650 | 4822 051 30473 | 47kΩ ± 5% 1/16W |
| R651 | 4822 117 10145 | # 3.3Ω ±5% 1/10W |
| R661 | 4822 116 82487 | 0Ω ± 5% 1/16W |
| R670 | 4822 116 82487 | 0Ω ± 5% 1/16W |
| R672 | 4822 116 82487 | 0Ω ± 5% 1/16W |
| R674 | 4822 051 30103 | 10kΩ ±5% 1/16W |
| RF01 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| RF02 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| RF03 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| RF04 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| RF05 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| RF06 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| RF08 | 4822 051 30331 | 330Ω ± 5% 1/16W |
| RF09 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| RF10 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| RF11 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| RF12 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| RF13 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| RF14 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| RF15 | 4822 051 30224 | 220kΩ ± 5% 1/16W |
| RF16 | 4822 051 30473 | 47kΩ ± 5% 1/16W |
| RF17 | 4822 051 30473 | 47kΩ ± 5% 1/16W |
| RF18 | 4822 051 30472 | 4.7kΩ ± 5% 1/16W |
| RF19 | 4822 051 30473 | 47kΩ ± 5% 1/16W |
| RF20 | 4822 051 30473 | 47kΩ ± 5% 1/16W |
| RF21 | 4822 051 30472 | 4.7kΩ ± 5% 1/16W |
| RF22 | 4822 051 30103 | 10kΩ ±5% 1/16W |
| RF25 | 4822 116 82487 | 0Ω ±5% 1/16W |
| RF26 | 4822 116 82487 | 0Ω ±5% 1/16W |
| RF27 | 4822 116 82487 | 0Ω ±5% 1/16W |
| RF28 | 4822 116 82487 | 0Ω ±5% 1/16W |
| RF29 | 4822 116 82487 | 0Ω ±5% 1/16W |
| RF30 | 4822 051 30103 | 10kΩ ±5% 1/16W |
| RF31 | 4822 051 30473 | 47kΩ ±5% 1/16W |
| RF32 | 4822 051 30103 | 10kΩ ±5% 1/16W |



| | | |
|---|---|---|
| L102 | 4822 158 60636 | BLM32A07 FER BEADS C |
| L103 | 4822 158 60636 | BLM32A07 FER BEADS C |
| L201 | 4822 158 60636 | BLM32A07 FER BEADS C |
| L401 | 4822 157 70322 | NFM61R10T102 COIL C |
| L601 | 4822 158 60636 | BLM32A07 FER BEADS C |
| L602 | 4822 158 60636 | BLM32A07 FER BEADS C |
| L603 | 4822 158 60636 | BLM32A07 FER BEADS C |
| L604 | 4822 158 60636 | BLM32A07 FER BEADS C |
| L605 | 4822 158 60636 | BLM32A07 FER BEADS C |
| L606 | 4822 158 60636 | BLM32A07 FER BEADS C |
| L607 | 4822 158 60636 | BLM32A07 FER BEADS C |



| | | |
|---|---|---|
| D201 | 4822 130 32635 | MA151K |
| D401 | 4822 209 31965 | LM385B-1.2 REF.-D 1. |



| | | |
|---|---|---|
| Q101 | 4822 130 43398 | 2SC2712 GR |
| Q601 | 4822 130 42733 | 2SA1162 GR |
| Q602 | 4822 130 43398 | 2SC2712 GR |
| QF01 | 4822 130 43398 | 2SC2712 GR |
| QF02 | 4822 130 43398 | 2SC2712 GR |
| QF03 | 4822 130 42733 | 2SA1162 GR |
| QF04 | 4822 130 42733 | 2SA1162 GR |
| QF05 | 4822 130 43398 | 2SC2712 GR |



| | | |
|---|---|---|
| IC01 | | SCC68070 16/32 BIT C |
| IC02 | 4822 209 31941 | 74AC14 EIAJ FLAT TAP |
| IC03 | 4822 209 12533 | TC534200F 4MBIT CMOS |
| IC04 | 4822 209 30554 | MK48T08B-15 TIMEKEEP |
| IC05 | 4822 209 31938 | 74F74 EIAJ FLAT IC |
| IC06 | 4822 209 31938 | 74F74 EIAJ FLAT IC |
| IC07 | 4822 209 31938 | 74F74 EIAJ FLAT IC |
| IC08 | 4822 209 31948 | 74F02 EIAJ FLAT IC |
| IC09 | 4822 209 31945 | 74ACT04 EIAJ FLAT IC |
| IC10 | 4822 209 31951 | PST572C 4.5V RESET I |
| IC11 | 4822 209 31956 | TIBPAL20L8-15CFN PLC |
| IC12 | 4822 209 31955 | TIBPAL16L8-10CFN PLC |
| IC13 | 4822 209 31948 | 74F02 EIAJ FLAT IC |
| IC14 | 4822 209 31938 | 74F74 EIAJ FLAT IC |
| IC15 | 4822 209 31948 | 74F02 EIAJ FLAT IC |
| IC16 | 4822 209 31939 | 74F164 EIAJ FLAT IC |
| IC17 | 4822 209 31947 | 74ACT244 EIAJ FLAT IC |
| IC20 | | IMS66490 CDIC |
| IC21 | | PCB5010 IMS1088-3 DS |
| IC22 | 4822 209 31947 | 74ACT244 EIAJ FLAT IC |
| IC23 | 4822 209 31947 | 74ACT244 EIAJ FLAT IC |
| IC24 | 4822 209 31944 | 74AC646 JEDEC FLAT IC |
| IC25 | 4822 209 31944 | 74AC646 JEDEC FLAT IC |
| IC26 | 4822 209 31972 | LC3564QM-10 64K SRAM |
| IC27 | 4822 209 31972 | LC3564QM-10 64K SRAM |
| IC28 | 4822 209 31943 | 74AC169 EIAJ FLAT IC |
| IC29 | 4822 209 31942 | 74AC74 EIAJ FLAT IC |
| IC30 | 4822 209 61494 | 74HC74 EIAJ FLAT IC |



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl





| | | |
|---|---|---|
| IC31 | 4822 209 31963 | NE564D PHASE-LOCKED |
| IC32 | 4822 209 31966 | 74HCT32 EIAJ FLAT |
| IC33 | 4822 209 61534 | 74HCU04 EIAJ FLAT |
| IC38 | 4822 209 31964 | AN5860S ANALOG SW FO |
| IC40 | | SCC66470 VSC |
| IC41 | 4822 209 31957 | TMS4516S-80 256X16 B |
| IC42 | | SCC66470 VSC |
| IC43 | 4822 209 31957 | TMS4516S-80 256X16 B |
| IC44 | | GSC38TG307CF31 MC444 |
| IC45 | 4822 209 31949 | ADV7120KP30 3-DAC PL |
| IC46 | 4822 209 31946 | 74ACT74 EIAJ FLAT |
| IC47 | 4822 209 31967 | 74HCT4053 JEDEC FLAT |
| IC48 | 4822 209 31928 | CMOS 74HC00 FLAT TAP |
| IC65 | 4822 209 31968 | MC68HC05C8 268K SERV |
| IC66 | 4822 209 31954 | MC145407F 5V DRIVER/ |
| ICF1 | 4822 209 31971 | UPD75004GB-3B4 268K |

## POWER

Miscellaneous

Only for version /00/11/05

| | | |
|---|---|---|
| FP01 | 4822 117 10196 | FUS.RES.1Ω10%1/16W |
| FP02 | 4822 117 10196 | FUS.RES.1Ω10%1/16W |

Only for version /17

| | | |
|---|---|---|
| FP01 | 4822 253 30423 | FUSE 1/2A 125V |
| FP02 | 4822 253 30424 | FUSE 3/4A 125V |



| | | |
|---|---|---|
| CP01 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| CP02 | 4822 126 12341 | 100µF/16V L=7 D=6.3 |
| CP03 | 4822 126 12341 | 100µF/16V L=7 D=6.3 |
| CP06 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| CP07 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| CP08 | 4822 124 41842 | 47µF/ 16V |
| CP09 | 4822 124 10772 | 100µF/6.3V |
| CP10 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| CP11 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| CP12 | 4822 124 22048 | 220µF/6.3V L=7 D=6.3 |
| CP13 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| CP20 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| CP21 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| CP22 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| CP23 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| CP26 | 4822 124 41842 | 47µF 16V |



| | | |
|---|---|---|
| RP02 | 4822 117 10153 | # 2.2Ω ±5% 1/4W |
| RP03 | 4822 117 10153 | # 2.2Ω ±5% 1/4W |
| RP04 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| RP05 | 4822 051 30102 | 1kΩ ±5% 1/16W |
| RP06 | 4822 117 10146 | # 4.7Ω J 1/4W |
| RP07 | 4822 051 30101 | 100Ω ±5% 1/16W |



| | | |
|---|---|---|
| L501 | 4822 157 70322 | NFM61R10T102CHIPCOIL |
| L502 | 4822 157 70322 | NFM61R10T102CHIPCOIL |
| L503 | 4822 157 70322 | NFM61R10T102CHIPCOIL |
| L504 | 4822 157 70322 | NFM61R10T102CHIPCOIL |
| L904 | 4822 157 70332 | NFM41R00C221CHIPCOIL |
| L905 | 4822 157 70332 | NFM41R00C221CHIPCOIL |
| LP01 | 4822 157 70267 | NL322522 0.68UH C |
| LP02 | 4822 157 70267 | NL322522 0.68UH C |
| LP03 | 4822 117 10153 | # 2.2Ω ±5% 1/4W |
| LP04 | 4822 117 10153 | 2.2Ω ±5% 1/16W C |
| LP05 | 4822 158 60636 | BLM32A07 FER BEADS C |
| LP10 | 4822 242 73843 | DSS306-91-F-223Z NOI |
| LP11 | 4822 242 73843 | DSS306-91-F-223Z NOI |
| LP12 | 4822 242 73843 | DSS306-91-F-223Z NOI |
| LP13 | 4822 242 73843 | DSS306-91-F-223Z NOI |
| LP14 | 4822 242 73843 | DSS306-91-F-223Z NOI |
| LP15 | 4822 242 73843 | DSS306-91-F-223Z NOI |
| LP16 | 4822 242 73843 | DSS306-91-F-223Z NOI |
| LP17 | 4822 242 73843 | DSS306-91-F-223Z NOI |
| LP18 | 4822 242 73843 | DSS306-91-F-223Z NOI |



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl





| | | |
|---|---|---|
| L906 | 4822 157 70332 | NFM41R00C221 |



| | | |
|---|---|---|
| ICP1 | 4822 209 63385 | NJM78L05UA CHIP REG |
| ICP2 | 4822 209 31903 | NJM79L05UA -5V/0.1A |
| ICP3 | 4822 209 32034 | AN8010 REG IC LEAD |

## SERVO

### Miscellaneous

| | | |
|---|---|---|
| Z801 | 4822 130 32874 | MA-3075-M |
| Z802 | 4822 130 32874 | MA-3075-M |



| | | |
|---|---|---|
| C801 | 4822 123 30373 | 0.047µF J 16V ECWU1C |
| C803 | 4822 123 30369 | 0.22µF |
| C811 | 4822 123 30366 | 0.01µF J 16V ECWU1C |
| C814 | 4822 123 30372 | 4700pF J 16V ECWU1C |
| C815 | 4822 123 30369 | 0.22µF 16V |
| C816 | 4822 123 30367 | 0.1µF J 16V ECWU1C |
| C821 | 4822 123 30374 | 8200pF J 16V ECWU1C |
| C822 | 4822 123 30374 | 8200pF J 16V ECWU1C |
| C823 | 4822 123 30373 | 0.047µF J 16V ECWU1C |
| C824 | 4822 123 30369 | 0.22µF 16V |
| C825 | 4822 123 30369 | 0.22µF 16 |
| C826 | 4822 123 30371 | 0.033µF J 16V ECWU1C |
| C827 | 4822 123 30371 | 0.033µF J 16V ECWU1C |
| C829 | 4822 123 30369 | 0.22µF 16V |
| C830 | 4822 124 11333 | B.P. 0.47µF 50V (MV) |
| C831 | 4822 123 30367 | 0.1µF J 16V ECWU1C |
| C835 | 4822 123 30368 | 0.018µF J 16V ECWU1C |
| C802 | 4822 122 33744 | 100pF (GR39) |
| C804 | 4822 126 11681 | 1000pF (GR39) |
| C805 | 4822 126 11668 | 220pF (GR39) |
| C806 | 5322 122 34098 | 0.01µF |
| C807 | 4822 126 11668 | 220pF (GR39) 50V |
| C808 | 4822 121 42668 | 0.47µF ±5% 50V |
| C809 | 4822 126 11681 | 1000pF (GR39) 50V |
| C810 | 4822 126 11568 | 470pF (GR39) 50V |
| C812 | 4822 122 32701 | 0.022µF 50V |
| C813 | 4822 121 42668 | 0.47µF ±5% 50V |
| C817 | 4822 124 11331 | 2.2µF/ 50V |
| C818 | 4822 121 42668 | 0.47µF ±5% 50V |
| C819 | 4822 126 11566 | 2200pF (GR39) 50V |
| C820 | 4822 122 33777 | 47pF (GR39) 50V |
| C828 | 4822 124 11131 | 47µF/6.3V |
| C832 | 4822 122 33127 | 2200pF 50V |
| C833 | 5322 121 42661 | 0.33µF ±5% 50V |
| C836 | 4822 124 11131 | 47µF/6.3V |
| C837 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C838 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C839 | 4822 124 11131 | 47UF/6.3V |
| C841 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C842 | 4822 124 11131 | 47µF/6.3V |
| C843 | 4822 126 11671 | 33pF (GR39) |
| C844 | 4822 126 11671 | 33pF (GR39) |
| C846 | 4822 126 11681 | 1000pF (GR39) |
| C849 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C850 | 4822 124 11131 | 47µF/6.3V |
| C851 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C852 | 4822 122 33777 | 47pF (GR39) |
| C853 | 4822 122 33777 | 47pF (GR39) |
| C854 | 4822 122 33744 | 100pF (GR39) |
| C855 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C856 | 4822 126 11687 | GRM39F104Z16 0.1µF |



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



| | | |
|---|---|---|
| C857 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C858 | 4822 126 11687 | GRM39F104Z16 0.1µF |
| C859 | 4822 124 11131 | 47µF/6.3V |
| C861 | 4822 126 11687 | GRM39F104Z16 0.1µF |

| | | |
|---|---|---|
| R801 | 4822 051 30101 | 100Ω ± 5% 1/16W |
| R802 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R803 | 4822 116 83208 | 12kΩ ± 5% 1/16W |
| R804 | 4822 051 30222 | 2.2kΩ ± 5% 1/16W |
| R805 | 4822 116 83215 | 5.6kΩ ± 5% 1/16W |
| R806 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R807 | 4822 051 30101 | 100Ω ± 5% 1/16W |
| R808 | 4822 117 10152 | # 18Ω ±5% 1/10W |
| R809 | 4822 117 10151 | # 12Ω ±5% 1/10W |
| R810 | 4822 051 30104 | 100kΩ ± 5% 1/16W |
| R811 | 4822 051 30472 | 4.7kΩ ± 5% 1/16W |
| R812 | 4822 116 83209 | 120kΩ ± 5% 1/16W |
| R813 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R814 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R815 | 4822 051 30154 | 150kΩ ± 5% 1/16W |
| R816 | 4822 051 30335 | 3.3MΩ ± 5% 1/16W |
| R817 | 4822 116 83216 | 56kΩ ± 5% 1/16W |
| R818 | 4822 051 30394 | 390kΩ ± 5% 1/16W |
| R819 | 4822 051 30279 | 27Ω ± 5% 1/16W |
| R820 | 4822 051 30229 | 22Ω ± 5% 1/16W |
| R821 | 4822 116 83222 | 82kΩ ± 5% 1/16W |
| R822 | 4822 051 30104 | 100kΩ ± 5% 1/16W |
| R823 | 4822 051 30154 | 150kΩ ± 5% 1/16W |
| R824 | 4822 051 30105 | 1MΩ ± 5% 1/16W |
| R825 | 4822 051 30335 | 3.3MΩ ± 5% 1/16W |
| R826 | 4822 051 30759 | 75Ω J 1/16W |
| R827 | 4822 051 30222 | 2.2kΩ ± 5% 1/16W |
| R828 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R829 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R830 | 4822 051 30473 | 47kΩ ± 5% 1/16W |
| R831 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R832 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R833 | 4822 051 30391 | 390Ω ± 5% 1/16W |
| R834 | 4822 051 30472 | 4.7kΩ ± 5% 1/16W |
| R835 | 4822 116 83208 | 12kΩ ± 5% 1/16W |
| R836 | 4822 051 30102 | 1kΩ ± 5% 1/16W |
| R837 | 4822 051 30154 | 150kΩ ± 5% 1/16W |
| R838 | 4822 116 83208 | 12kΩ ± 5% 1/16W |
| R839 | 4822 051 30152 | 1.5kΩ ± 5% 1/16W |
| R840 | 4822 051 30153 | 15kΩ ± 5% 1/16W |
| R841 | 4822 051 30152 | 1.5kΩ ± 5% 1/16W |
| R842 | 4822 051 30152 | 1.5kΩ ± 5% 1/16W |
| R843 | 4822 051 30338 | 3.3Ω ± 5% 1/16W |
| R844 | 4822 051 30339 | 33Ω ± 5% 1/16W |
| R845 | 4822 051 30682 | 6.8kΩ ± 5% 1/16W |
| R846 | 4822 051 30104 | 100kΩ ± 5% 1/16W |
| R847 | 4822 051 30104 | 100kΩ ± 5% 1/16W |
| R848 | 4822 116 83222 | 82kΩ ± 5% 1/16W |
| R849 | 4822 051 30333 | 33kΩ ± 5% 1/16W |

| | | |
|---|---|---|
| R850 | 4822 051 30684 | 680kΩ ± 5% 1/16W |
| R851 | 4822 051 30154 | 150kΩ ± 5% 1/16W |
| R852 | 4822 116 83215 | 5.6kΩ ± 5% 1/16W |
| R853 | 4822 051 30332 | 3.3kΩ ± 5% 1/16W |
| R854 | 4822 051 30473 | 47kΩ ± 5% 1/16W |
| R855 | 4822 051 30472 | 4.7kΩ ± 5% 1/16W |
| R856 | 4822 116 83207 | 1.2kΩ ± 5% 1/16W |
| R857 | 4822 051 30105 | 1MΩ ± 5% 1/16W |
| R858 | 4822 051 30104 | 100kΩ ± 5% 1/16W |
| R859 | 4822 051 30104 | 100kΩ ± 5% 1/16W |
| R860 | 4822 051 30473 | 47kΩ ± 5% 1/16W |
| R861 | 4822 051 30472 | 4.7kΩ ± 5% 1/16W |
| R862 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R863 | 4822 051 30339 | 33Ω ± 5% 1/16W |
| R864 | 4822 051 30101 | 100Ω ± 5% 1/16W |
| R865 | 4822 051 30224 | 220kΩ ± 5% 1/16W |
| R866 | 4822 051 30101 | 100Ω ± 5% 1/16W |
| R867 | 4822 051 30104 | 100kΩ ± 5% 1/16W |
| R868 | 4822 051 30392 | 3.9kΩ ± 5% 1/16W |
| R869 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R870 | 4822 051 30101 | 100Ω ± 5% 1/16W |
| R871 | 4822 051 30152 | 1.5kΩ ± 5% 1/16W |
| R872 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R873 | 4822 051 30224 | 220kΩ ± 5% 1/16W |
| R874 | 4822 051 30222 | 2.2kΩ ± 5% 1/16W |
| R875 | 4822 051 30103 | 10kΩ ± 5% 1/16W |
| R876 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R877 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R878 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R879 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R880 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R881 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R883 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R884 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R885 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R886 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R887 | 4822 051 30223 | 22kΩ ± 5% 1/16W |
| R895 | 4822 051 30473 | 47kΩ ± 5% 1/16W |
| R896 | 4822 117 10146 | # 4.7Ω J 1/4W RF |
| R897 | 4822 117 10146 | # 4.7Ω J 1/4W RF |
| R898 | 4822 051 30472 | 4.7kΩ ± 5% 1/16W |
| R899 | 4822 051 30222 | 2.2kΩ ±5% 1/16W |
| R890 | 4822 051 30474 | 470 kΩ ±5%1/16W |
| R999 | 4822 116 82487 | 0Ω ± 5% 1/16 |
| RV80 | 4822 100 11789 | 20kΩ EVM1S,TMC3K |

| | | |
|---|---|---|
| L801 | 4822 157 63234 | NL322522-4R7M 4.7µH |
| L802 | 4822 157 63234 | NL322522-4R7M 4.7µH |

| | | |
|---|---|---|
| D801 | 4822 130 32635 | MA-151K TAPEING |
| D802 | 4822 130 32635 | MA-151K TAPEING |



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



| | | |
|---|---|---|
| Q801 | 4822 130 43954 | 2SD999 |
| Q802 | 4822 130 43398 | 2SC2712 GR |
| Q803 | 4822 130 42733 | 2SA1162 GR |
| Q804 | 4822 130 42733 | 2SA1162 GR |
| Q805 | 4822 130 42733 | 2SA1162 GR |
| Q806 | 4822 130 43398 | 2SC2712 GR |
| Q810 | 4822 130 43954 | 2SD999 |
| Q811 | 4822 130 43398 | 2SC2712 GR |
| QP01 | 4822 130 43954 | 2SD999 |
| QP02 | 4822 130 43398 | 2SC2712 GR |

| | | |
|---|---|---|
| IC80 | 4822 209 30436 | TDA8808 HF AMP FLAT- |
| IC81 | 4822 209 30437 | TDA8809 RADIAL SERVO |
| IC82 | 4822 209 31953 | TCA0372DM2 SOP |
| IC83 | 4822 209 31953 | TCA0372DM2 SOP |
| IC84 | 4822 209 31928 | CMOS 74HC00 FLAT TAP |
| IC85 | 4822 209 73952 | UPD41416C,MB81416. |
| IC86 | 4822 209 63453 | SAA7310 DEMODULATOR |
| IC87 | 4822 209 30439 | PCF3523P ADOC |
| IC88 | 4822 209 31969 | MC68HC05C8 268K SERV |

## AC ADAPTER

**Miscellaneous**

| | | |
|---|---|---|
| AC01 | 4822 272 10326 | 180-265V 22ER9150/00 |
| AC01 | 4822 272 10329 | 85-135V 22ER9150/17 |
| AC01 | 4822 272 10329 | AC ADAPTER 85-135V |
| AC02 | 4822 321 10914 | # 14P DC CORD TPX13 |
| AC03 | 4822 321 10915 | AC MAINS CORD /11/17 |
| AC03 | 4822 321 10939 | AC MAINSCORD /17 |
| AC03 | 4822 321 10932 | AC MAINSCORD /00 |

Free service manuals
Gratis schema's
Digitized by
www.freeservicemanuals.info



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



**Miscellaneous**

| | | |
|---|---|---|
| 003B | 4822 502 13203 | SCREW:CLAMPER BRACKE |
| 010B | 4822 502 13877 | SCREW:EJECT HOLDER |
| 011B | 4822 502 13877 | SCREW:O/C PCB |
| 016B | 4822 502 13314 | SCREW:OPEN BRACKET |
| 017B | 4822 502 13314 | SCREW:LEAF SPRING |
| 030B | 4822 402 61465 | CDM BRACKET |
| 031B | 4822 402 61466 | SUSPENTION:CDM-9 |
| 033B | 4822 502 13877 | SCREW:CDM BRACKET |
| 034B | 4822 502 13314 | SCREW:DC PCB |
| 035B | 4822 502 13877 | SCREW:MMC PCB |
| 037B | 4822 502 13877 | I/O&S OUT |
| 045B | 4822 502 13877 | SCREW:LCD CASE |
| 048B | 4822 502 13877 | SCREW:CASE DOWN&UP |
| 051B | 4822 502 13103 | SCREW:CASE DOWN&UP |
| 053B | 4822 502 30699 | HINGE UNIT |
| 059B | 4822 462 71882 | ORNAMENTAL COVER |
| 065B | 4822 281 50174 | LCD CONTACTOR |
| 066B | 4822 466 62294 | SPEAKER SHEET |
| 067B | 4822 281 50175 | LID CONTACTOR |
| 068B | 4822 502 13877 | FOR FMV CASE |
| 075B | 4822 281 50175 | LID CONTACTSPRING |
| 078B | 4822 462 71897 | SPEAK WIRE BUFFER |
| 079B | 4822 462 71897 | CDM WIRE BUFFER |
| 080B | 4822 466 62294 | SPEAKER SHEET |
| J402 | 4822 265 31052 | 006200-257-032800 FF |
| J404 | 4822 265 31047 | TX20A-26RD2G1-A1L 26 |
| J501 | 4822 265 31046 | HSJ0924-01-1110 FOR |
| J502 | 4822 265 31049 | CGP4707-0101 EP 7P L |
| J503 | 4822 267 31581 | HSJ0922-01-1140 FOR |
| J601 | 4822 265 31054 | TCS7184-01-201 EMI-P |
| J603 | 4822 267 31585 | 2.5MM PIN IMSA-6035B |
| J606 | 4822 265 31053 | FCN-228J100-G/0-01 ( |
| J801 | 4822 267 50676 | 14P JACK MOLEX 5597- |
| J802 | 4822 267 31584 | MKS8082-6-0-202 STOC |
| J902 | 4822 267 31581 | HSJ0922-01-1140 FOR |
| J904 | 4822 265 31055 | TCS7144-01-201 EMI-P |
| J992 | 4822 265 31065 | JACK1.25MM 3PIN CHIP |
| J993 | 4822 265 31064 | JACK1.25MM 2PIN CHIP |
| JF01 | 4822 265 31051 | 006200-147-032800 14 |
| JP01 | 4822 265 31048 | S14B-PH-K-S |
| PI06 | 4822 214 52039 | IR-JOINT-PCB |
| PM06 | 4822 214 33876 | MAIN PCB /00/05 |
| PM06 | 4822 214 52033 | MAIN PCB/17 |
| PS06 | 4822 214 52035 | LID SWITCH PCB |
| S801 | 4822 271 30787 | SIF-012H R66 4759 1- |
| W401 | 4822 321 61813 | 25PIN 330MM FLAT CAB |
| W502 | 4822 321 61812 | CGP1207(7P)-EHR(3P) |
| WP01 | 4822 321 61808 | PHR14-SAN14 80MM |
| WV02 | 4822 321 61845 | 5P TO 3P SHIELD WIRE |
| X802 | 5322 242 73734 | CSAC4.00MGC CERAMIC |

**Service tools**

| | | |
|---|---|---|
| J502 | 4822 267 31618 | FEMALE CONNECTOR |
| TOOL | 4822 395 50365 | CHIP REPLACE JIG BIG |
| TOOL | 4822 395 50366 | CHIP REPLACEJIG SMAL |
| TOOL | 4822 395 90612 | CHIP IC REPLACE JIG |
| TOOL | 4822 267 50676 | CDM FLEX CONNECTOR |
| TOOL | 4822 214 52007 | LL TEST PCB |
| TOOL | 4822 321 61677 | LL TEST CABLE |



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl



**22ER9150 :**

**Miscellaneous**

| | | |
|---|---|---|
| JA31 | 4822 265 41293 | LSJP0038 CONN.14P |

| | | |
|---|---|---|
| CA02 | 4822 125 60192 | ECKDNS332ME 3300pF |
| CA04 | 4822 125 60192 | ECKDNS332ME 3300pF |
| CA06 | 4822 121 70275 | ECQU2A103MY 0.01µF |
| CA07 | 4822 122 33127 | ECUV1H222KBN 2200pF |
| CA08 | 4822 124 80448 | ECEA1HGE100 10µF/50V |
| CA09 | 4822 124 80449 | ECEA1HGE470 47µF/50V |
| CA10 | 4822 125 60193 | ECUV1H431JCN 430pF |
| CA11 | 4822 126 12061 | ECUV1E104KBN 0.1µF |
| CA13 | 5322 122 34099 | ECUV1H471KBN 470pF/50 |
| CA14 | 4822 125 60191 | ECKD3A101KBN 100pF/1K |
| CA15 | 4822 121 70274 | ECQE6473KFWN 0.047µF |
| CA17 | 4822 121 70275 | ECQU2A103MY 0.01µF |
| CA32 | 4822 125 60194 | MCUV2D102KRN 1000pF |
| CA33 | 4822 125 60194 | MCUV2D102KRN 1000pF |
| CA34 | 4822 125 60194 | MCUV2D102KRN 1000pF |
| CA35 | 4822 125 60194 | MCUV2D102KRN 1000pF |
| CA36 | 4822 125 60194 | MCUV2D102KRN 1000pF |
| CA37 | 4822 125 60194 | MCUV2D102KRN 1000pF |
| CA38 | 4822 126 12061 | ECUV1E104KBN 0.1µF |
| CA39 | 5322 122 34098 | ECUV1H103KBN 0.01µF |
| CA40 | 4822 124 80447 | ECEA1EGE102 1000µF |
| CA41 | 4822 124 80444 | ECEA1CGE102 1000µF |
| CA42 | 4822 124 80444 | ECEA1CGE102 1000µF |
| CA43 | 4822 124 80444 | ECEA1CGE102 1000µF |
| CA44 | 4822 124 80444 | ECEA1CGE102 1000µF |
| CA45 | 4822 124 80444 | ECEA1CGE102 1000µF |
| CA46 | 4822 124 80445 | ECEA1CGE331 330µF/16V |
| CA47 | 4822 126 12061 | ECUV1E104KBN 0.1µF/25V |
| CA48 | 4822 124 80446 | ECEA1EGE100 10µF/25V |
| CA81 | 4822 125 60194 | MCUV2D102KRN 1000pF |
| CA82 | 4822 125 60194 | MCUV2D102KRN 1000pF |
| CA83 | 4822 125 60194 | MCUV2D102KRN 1000pF |
| CA84 | 4822 125 60194 | MCUV2D102KRN 1000pF |
| CA85 | 4822 125 60194 | MCUV2D102KRN 1000pF |
| CA86 | 4822 125 60194 | MCUV2D102KRN 1000pF |

| | | |
|---|---|---|
| RA07 | 4822 117 10207 | ERJ6ENF1502V 15kΩ |
| RA08 | 4822 117 10209 | ERJ6ENF2702V 27kΩ |
| RA09 | 4822 111 91076 | ERJ6GEYJ332V 3.3kΩ |
| RA10 | 4822 117 10218 | ERJ14YJ01H 100Ω |
| RA11 | 4822 117 10219 | ERJ14YJ220H 22Ω |
| RA12 | 4822 117 10214 | ERG3SJ104H 100kΩ |
| RA14 | 4822 117 10213 | ERG2SJ270P 27Ω 2W |
| RA15 | 4822 111 90893 | ER6GEYJ101V 100Ω |
| RA16 | 4822 111 90913 | ERJ6GEYJ333V 33kΩ |
| RA31 | 4822 117 10215 | ERX1SJ2R2P 2.2Ω |
| RA32 | 4822 111 91192 | ERJ6GEYJ471V 470Ω |
| RA33 | 4822 111 90894 | ERJ6GEYJ102V 1kΩ |
| RA34 | 4822 111 91191 | ERJ6GEYJ331V 330Ω |
| RA35 | 4822 117 10215 | ERX1SJ2R2P 2.2Ω |
| RA36 | 4822 117 10215 | ERX1SJ2R2P 2.2Ω |
| RA37 | 4822 117 10215 | ERX1SJ2R2P 2.2Ω |
| RA38 | 4822 117 10215 | ERX1SJ2R2P 2.2Ω |
| RA39 | 4822 111 90893 | ERJ6GEYJ101V 100Ω |
| RA40 | 4822 111 91191 | ERJ6GEYJ331V 330Ω |
| RA41 | 4822 117 10215 | ERX1SJ2R2P 2.2Ω |
| RA42 | 4822 111 91191 | ERJ6GEYJ331V 330Ω |
| RA43 | 4822 117 10208 | ERJ6ENF2203V 220kΩ SV |
| RA44 | 4822 117 10206 | ERJ6ENF1002V 10kΩ SV |
| RA45 | 4822 111 92141 | BPR3F 0.01 0.01Ω |
| RA46 | 4822 111 92141 | BPR3F 0.01 0.01Ω |
| RA47 | 4822 117 10205 | ERJ6ENF1001V 1kΩ |
| RA48 | 4822 117 10205 | ERJ6ENF1001V 1kΩ |
| RA49 | 4822 117 10212 | ERG1SJ471P 470Ω |
| RA50 | 4822 111 90894 | ERJ6GEYJ102V 1kΩ |
| RA51 | 4822 117 10212 | ERG1SJ471P 470Ω 1W |
| RA52 | 4822 111 90907 | ERJ6GEYJ223V 22kΩ |
| RA53 | 4822 111 90906 | ERJ6GEYJ222V 2.2kΩ |
| RA54 | 4822 111 90895 | ERJ6GEYJ103V 10kΩ |
| RA55 | 4822 100 11983 | EVN39C00YB13 1kΩ |
| RA56 | 4822 111 90907 | ERJ6GEYJ223V 22kΩ |
| RA57 | 4822 111 90907 | ERJ6GEYJ223V 22kΩ |
| RA58 | 4822 111 90894 | ERJ6GEYJ102V |
| RA59 | 4822 111 90894 | ERJ6GEYJ102V |
| RA70 | 4822 111 90896 | ERJ6GEYJ104V 100kΩ |
| RA71 | 4822 116 83352 | ERJ6GEYJ561V 560Ω |

| | | |
|---|---|---|
| LA04 | 4822 157 70393 | VLPS0005A/B/C COIL |
| LA05 | 4822 157 70394 | VLQS7H392J COIL |
| LA06 | 4822 157 70393 | VLPS0005A/B/C COIL |
| LA31 | 4822 157 70392 | ETS29K484V COIL |
| LA033 | 4822 157 70393 | VLPS0005A/B/C COIL |
| LA034 | 4822 157 70395 | VLQS9A9ROM COIL |
| LA35 | 4822 157 70393 | VLPS0005A/B/C COIL |

| | | |
|---|---|---|
| DA01 | 4822 130 42657 | MA3200 0.1A/20V |
| DA03 | 4822 130 83318 | MA2300 0.4A/30V |
| DA04 | 4822 130 83321 | MA199 0.2A/200V |
| DA06 | 4822 130 33617 | ERB12-01 1A/100V |
| DA07 | 4822 130 83317 | MA188 0.2A/200V |
| DA08 | 4822 130 83317 | MA188 0.2A/200V |
| DA31 | 4822 130 83323 | 10DL2CZ41A 10A/200V |
| DA32 | 4822 130 83327 | MA3056 0.1A/5.6V |
| DA33 | 4822 130 83324 | MA750 10A/40V |
| DA34 | 4822 130 83323 | 10DL2CZ41A 10A/200V |
| DA35 | 4822 130 83328 | MA3150 0.1A/15V |
| DA36 | 4822 130 83325 | SIWBA40 1A/400V |
| DA37 | 4822 130 82452 | MA720 0.5A/40V |
| DA38 | 4822 130 32635 | MA151K 0.1A/40V |
| DA40 | 4822 130 83326 | SEL4417G LED |

| | | |
|---|---|---|
| QA31 | 4822 130 42671 | 2SD601A 0.1A/50V |



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl





| | | |
|---|---|---|
| ICA4 | 4822 209 62279 | M51977FP SUPPLY IC |
| ICA5 | 4822 209 32136 | AN6588S OP-AMP |
| ICA6 | 4822 209 32137 | UPC78L05T POWER IC |
| ICA7 | 4822 209 32135 | AN143M POWER REG IC |

**Only for 22ER9150/00 :**

**Miscellaneous**

| | | |
|---|---|---|
| 001V | 4822 444 40646 | LSKM0067+0068 CASE |
| FA01 | 4822 253 30426 | FUSE 3.15A/250V |
| JA32 | 4822 265 20624 | LSJP0037 AC INLET |
| THA1 | 4822 111 92137 | ERT5ZFL100P 10Ω |
| TA01 | 4822 146 21717 | ETS33K382V TRANS. |
| TA02 | 4822 146 21716 | ETP28Z335AF TRANS. |



| | | |
|---|---|---|
| CA01 | 4822 121 70276 | ECQU2A47MV 0.47µF/250V |
| CA03 | 4822 121 70276 | ECQU2A47MV 0.47µF/250V |
| CA05 | 4822 121 70275 | ECQU2A103MY 0.01µF |
| CA12 | 4822 124 80451 | MCES2DG121Q 120µF/400 |
| CA16 | 4822 125 60192 | ECKDNS332ME 3300pF |



| | | |
|---|---|---|
| RA01 | 4822 117 10211 | ERD25FJ474 470kΩ |
| RA02 | 4822 117 10217 | ERJ12YJ823H 82kΩ |
| RA03 | 4822 117 10217 | ERJ12YJ823H 82kΩ |
| RA04 | 4822 117 10217 | ERJ12YJ823H 82kΩ |
| RA13 | 4822 117 10216 | ERX1SJR30P 0.30Ω |



| | | |
|---|---|---|
| LA02 | 4822 157 70391 | ELF18D290R COIL |
| LA03 | 4822 157 70391 | ELF18D290R COIL |



| | | |
|---|---|---|
| DA02 | 4822 130 83319 | RBV-406 4A/600V |
| DA05 | 4822 130 83316 | EG01C |



| | | |
|---|---|---|
| QA01 | 4822 130 63241 | 2SK996 |



| | | |
|---|---|---|
| ICA1 | 4822 209 32138 | ON3731 PHOTO COUPLER |
| ICA2 | 4822 209 32138 | ON3171 PHOTO COUPLER |
| ICA3 | 4822 209 32138 | ON3171 PHOTO COUPLER |

**Only for 22ER9150/17 :**

**Miscellaneous**

| | | |
|---|---|---|
| FA01 | 4822 253 30427 | LSSF0015A40 4A/125V |
| THA1 | 4822 111 92142 | ERTD5ZFL8ROP 80Ω |
| TA02 | 4822 146 21718 | ETP28Z334AF TRANS. |
| JA32 | 4822 265 20625 | LSJP0036 AC INLET |
| 001V | 4822 444 40647 | LSKM00063+0062 CASE |



| | | |
|---|---|---|
| CA01 | 4822 121 70278 | EQU2A224MN 0.22µF |
| CA03 | 4822 121 70278 | EQU2A224MN 0.22µF |
| CA05 | 4822 125 60195 | VCKS0009 3300pF |
| CA16 | 4822 125 60195 | VCKS0009 3300pF |



| | | |
|---|---|---|
| RA01 | 4822 117 10226 | ERD25FJ474 407kΩ |
| RA02 | 4822 117 10227 | ERJ12YJ273H 27kΩ |
| RA03 | 4822 117 10227 | ERJ12YJ273H 27kΩ |
| RA04 | 4822 117 10227 | ERJ12YJ273H 27kΩ |



| | | |
|---|---|---|
| LA02 | 4822 157 70401 | ELF18D290V COIL |
| LA03 | 4822 157 70401 | ELF18D290V COIL |



| | | |
|---|---|---|
| DA02 | 4822 130 83319 | RBV-406 4A/400V |
| DA05 | 4822 130 83329 | EGO1 0.7A/400V |



| | | |
|---|---|---|
| QA01 | 4822 130 63245 | 2SK1819 5A/450V |



| | | |
|---|---|---|
| ICA1 | 4822 209 32156 | ON3131 PHOTO COUPLER |
| ICA2 | 4822 209 32156 | ON3131 PHOTO COUPLER |
| ICA3 | 4822 209 32156 | ON3131 PHOTO COUPLER |



World of free manuals

www.freeservicemanuals.info 10/1/2013 www.nostatatech.nl
Free service manuals
Gratis schema's
Digitized by

# PHILIPS SAFETY GUIDELINES FOR THE PROFESSIONAL SERVICE TECHNICIAN

www.freeservicemanuals.info

## Important

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

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

## Safety Checks

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

## Fire and Shock Hazard

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

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

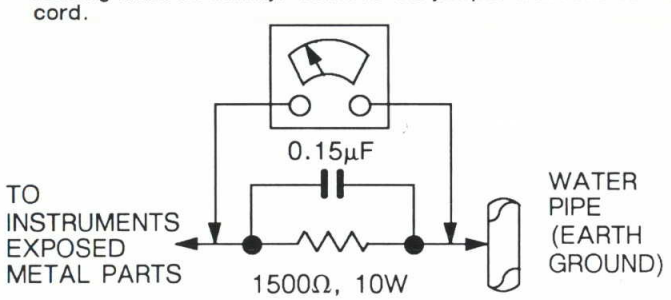
## Fire and Shock Hazard (Continued)

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

* Broken line: ▬ ▪ ▬ ▪ ▬ ▪ ▬ ▪ ▬ ▪

## Leakage Current Cold Check

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




## Leakage Current Hot Check

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

## Parts Replacement

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

**LASER NOTE:**

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



World of free manuals