



KONGSBERG

# **MP7900**

## ***Maintenance Manual***

MP7900 Base model:	327059
MP7900 with LAN/CAN connection model:	327063
MP7900 NAV model:	327906
MP7900 with 4-Screen model:	327908
MP7900 with 8 channel BlueStorm model:	327910
MP7900 with LAN/CAN connection and COM2 port model:	327924
MP7900 HS/DP Recorder 500 model:	329693
MP7900 with Matrox Extio interface model:	330507
MP7900 with mirrored system discs model:	343811
MP7900 with LAN/CAN Windows 7 model:	347744



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## Document history

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Rev. B	April 2009	New photos and rectified text accordingly.
Rev. C	May 2009	Spare part (memory) 328802 replaced by 333337.
Rev. D	September 2009	Part number for the BlueStorm serial interface card corrected. Also added the XP-image as a new consumable.
Rev. E	December 2009	Corrected figure 3 and figures and text in sections 1.4.2.1 and 1.4.2.3.
Rev. F	March 2010	Corrected heading text of section 1.4.2.1 and added text in front page.
Rev. G	September 2010	Added MP7900 with LAN/CAN Windows 7 model.
Rev. H	March 2011	Added new LAN kit and corrected some of the spare parts.

### Note

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*Kongsberg Maritime AS endeavours to ensure that all information in this document is correct and fairly stated, but does not accept liability for any errors or omissions.*

### Comments

To assist us in making improvements to the product and to this manual, we welcome comments and constructive criticism.

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# Hardware Description

This section describes the MP7900 hardware configuration.

## General description

The MP7900 maritime computer is used in a wide range of Operator Stations (OSs) produced by Kongsberg Maritime.

The computer can be installed inside OS consoles by using specific mounting brackets (see relevant operator station maintenance manual for details on mounting).

The OS and process station application software is stored on the MP7900 flash disk.

The MP7900 is built around a high-performance CPU (central processing unit) running the Microsoft® Windows XP™.

The computer can be easily dismantled for replacing module purposes.

The MP7900 accepts both 115 and 230 VAC mains input voltage.

Part numbers for the different models are shown on the front page of this document. The models differ mainly on the combination of interface cards installed.

## MP7900 computer cabinet

### Cabinet front panel

The DVD-RW drive is located to the left. In the middle there is a microphone input, headphones output, two USB ports, LEDs for power and internal hard-disk drive, and the On/Off button.

Figure 1 Cabinet front panel



## Cabinet rear panel

Connectors for power, user interfaces and external equipment are located on the rear panel. See *MP7900 external connections* on page 11.

Six different types of MP7900 computers are available using different interface cards. See *Interface cards and connections* on page 13.

Figure 2 Cabinet rear panel (example)



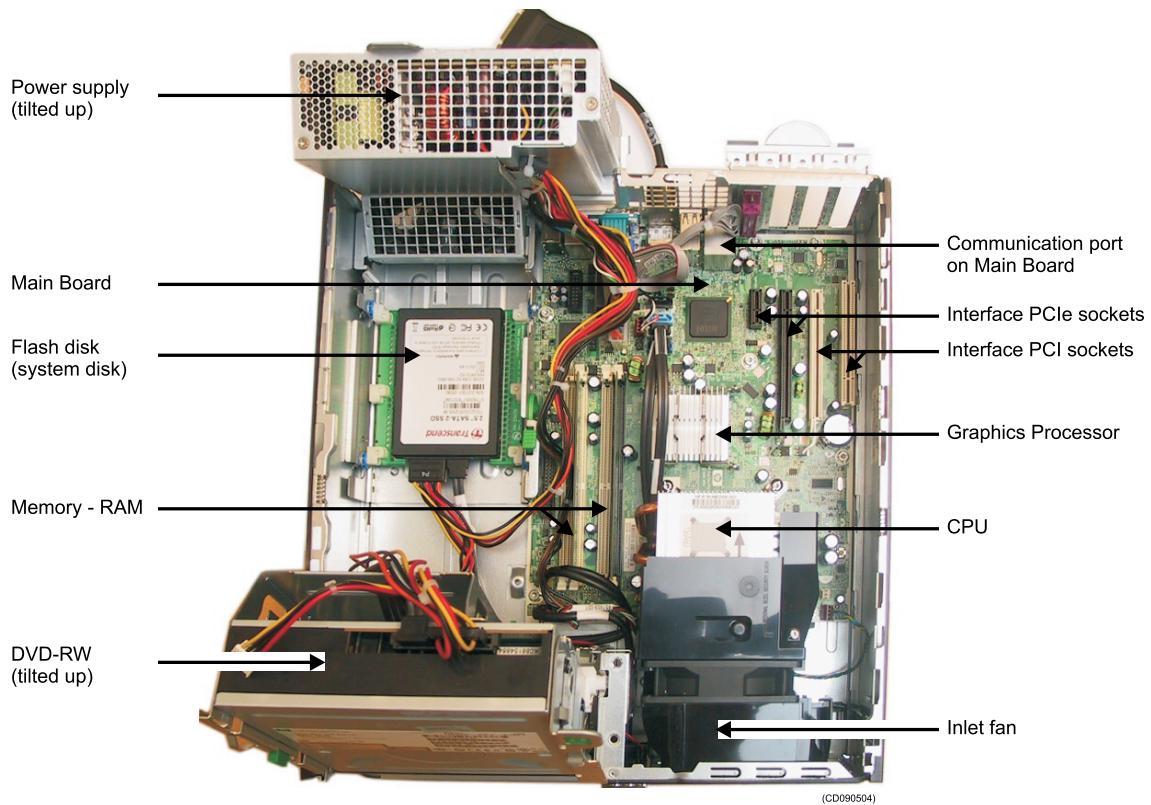
## Cabinet interior

Location of the main components inside the cabinet is shown in the figure below. The computer is shown from above with the front wall pointing towards you.

The power supply with its cooling fan is tilted up and located back to the left.

The DVD-RW drive assembly is also tilted up and located in front to the left.

*Figure 3 Cabinet interior*



The interface card assembly modules (removed in figure above) are located in the upper right hand corner. They can easily be pulled out for changing of interface cards. No screws are to be unscrewed, only lift the lever at the green coloured handle, which secures the interface cards to the main board and release the interface card lock. See also *Removing a PCI card* on page 36.

## MP7900 configuration

The following cards and components are available for the different models of the MP7900:

- Main board (Motherboard)
- CPU
- Memory (RAM, 2 x 1GB)
- Power supply 115/230 VAC
- Network card (Net B and Net C)
- Graphics card (2–screen / 4–screen)
- Serial line connector (COM2)

- BlueStorm card (8 channel serial card)
- LAN card for LAN/CAN connections
- Radar Interface card
- Flash disk (system disk)
- Hard-disk drive (recorder disk)
- DVD-RW drive
- Miniature speaker
- Reset button (On/Off)

Each of the computer and interface cards, drives and power supplies listed above are shortly described in sections below. The replaceable modules are described more detailed in separate documents (*Hardware Module Descriptions*).

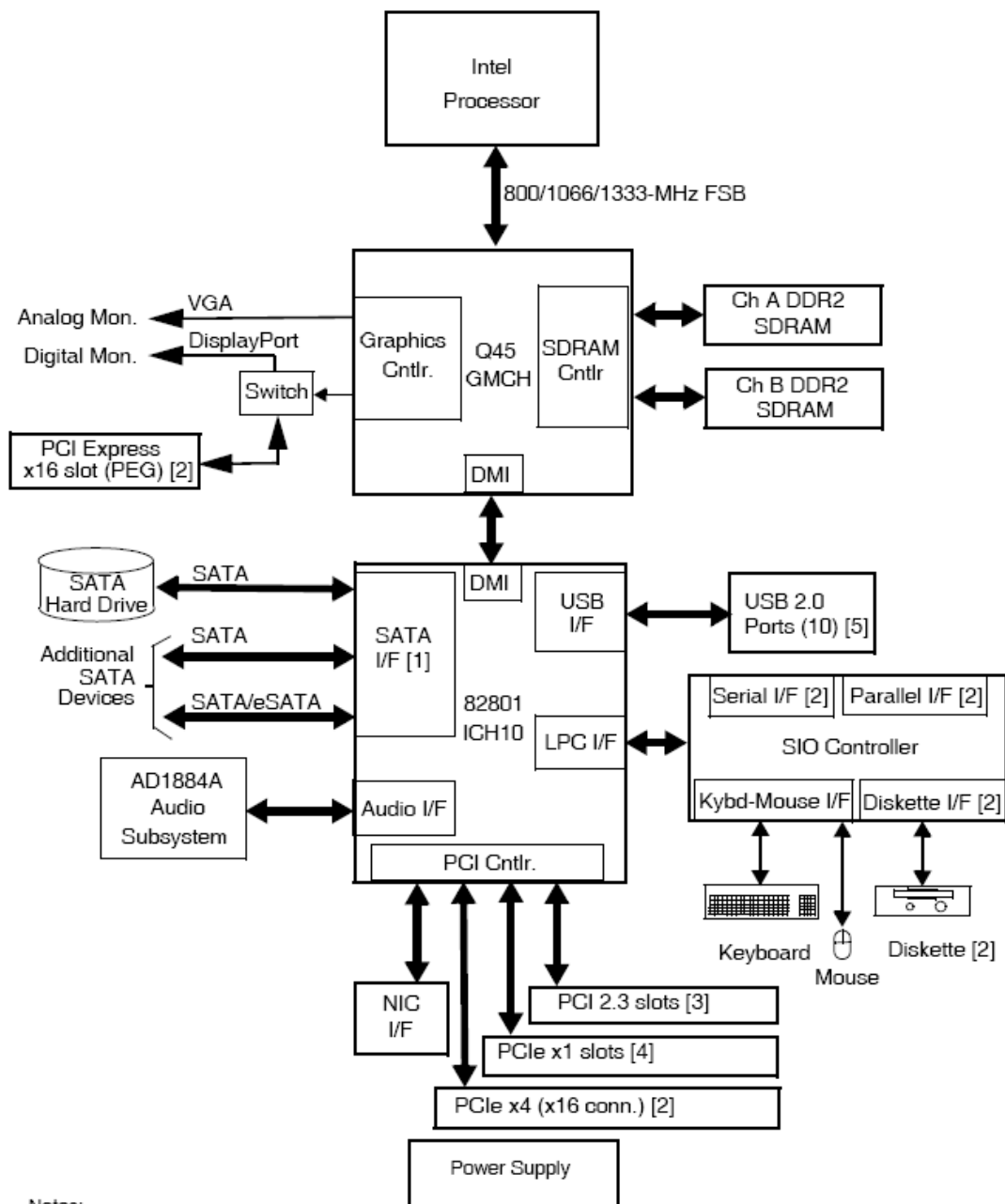
The following figure shows a block diagram of the MP7900.

Note

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*The figure does not show an actual MP7900 configuration, but the available interface cards, drives and power supplies.*

---



## Notes:

- [1] 2 SATA ports in USDT, 3 SATA ports in SFF, 4 SATA ports in CMT, and 1 eSATA port in SFF and CMT.
- [2] SFF and CMT only
- [3] 0 slots in USDT, 1 or 2 slots in SFF, 3 slots in CMT
- [4] 1 MiniCard slot in USDT, 1 slot in SFF and CMT
- [5] 8 ports accessible externally, 2 ports accessible internally

## Main board

The main board is equipped with a 2.4 GHz Intel dual core CPU and 2 x 1 GB RAM.

The main board is not considered a replaceable module because the computer has to be rebuilt from scratch and thoroughly tested if the board is changed.

## Power Supply

One power module is used. It has 115 VAC or 230 VAC as input voltage, and is of type Autosense.

### Note

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*See Replaceable Parts and Consumables on page 51 for module names and part numbers, and see the corresponding Hardware Module Description for more technical information.*

---

## Interface cards

The following interface cards are available with MP7900 computer:

Dual network card, Single network card, 2-screen graphic card, 4-screen graphic card, Radar interface card 2 (RIC2), BlueStorm serial interface card, and COM2 connector.

For details about the interface cards see the appropriate *Hardware Module Descriptions*, and refer to *Interface cards and connections* on page 13.

### Note

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*See Replaceable Parts and Consumables on page 51 for module names and part numbers.*

---

## Storage drives

Standard DVD-RW drive, flash disk and hard-disk drive for HS/DP Recorder data is used in the computer.

For details about the storage drive see the appropriate *Hardware Module Description*.

### Note

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*See Replaceable Parts and Consumables on page 51 for module names and part numbers.*

---

## Miniature speaker

The speaker is located inside the cabinet on the front wall.

## Cooling fans

Two CPU fans are located in the centre, behind the CPU. It provides cooling to the CPU and graphics processor.

The power supply module contains a fan located inside the power supply cabinet.

## Power ON/OFF button

A black ON/OFF button is located in the centre of the cabinet front.



Pressing the button once, the computer is turned On or Off, depending on the prerequisite.

## MP7900 external connections

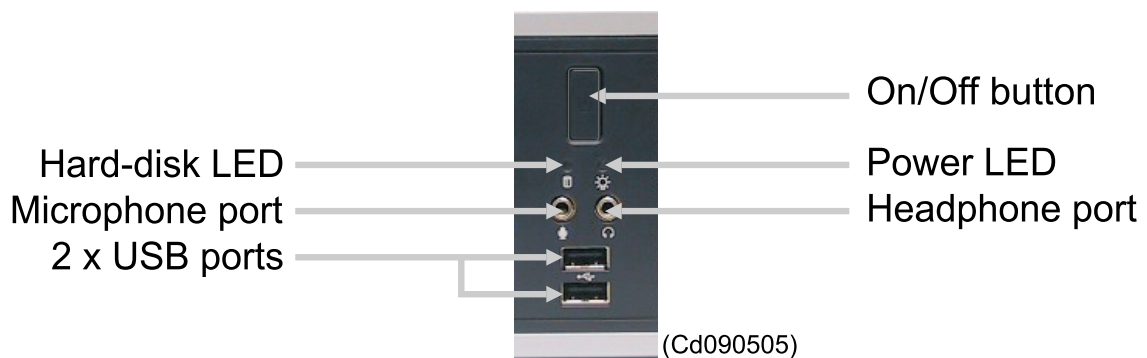
The MP7900 provides (including options) the necessary set of standard PC connectors for user interfaces and the necessary set of application-required connectors for system interfacing.

### Main board connections

This section lists the connectors available from the main board. For more details refer to the *Hardware Module Description* for the main board.

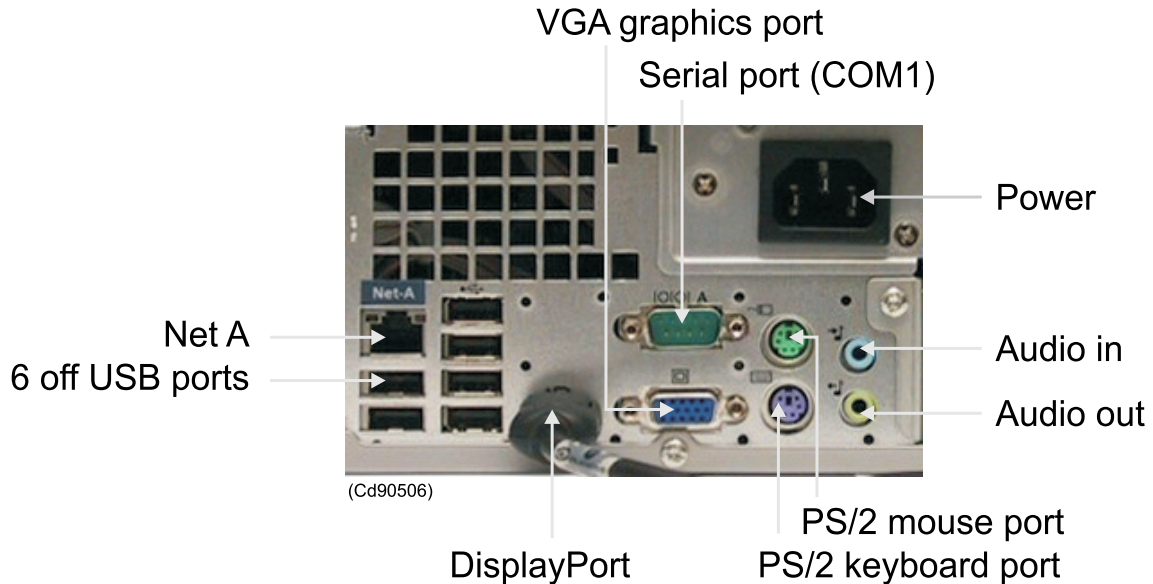
The following figure shows front connectors for external connections:

*Figure 4 Front – external connections*



The following figure shows rear wall connectors for external connections:

Figure 5 Rear – external connections



### Mouse

This is a standard PS/2 serial mouse connector.

### Keyboard

This is a standard PS/2 keyboard connector.

### Parallel port (not shown in the picture)

The Parallel port complies with the standard for PC parallel ports.

With appropriate driver software and configuration a local printer can be connected to this port.

Note \_\_\_\_\_

*The Parallel port is not included in the NAV model.*

---

### COM1 and COM2 (not shown in the picture)

These are standard PC serial line COM ports.

### Network

This is a standard ethernet network connection based on the RJ45 connector. It is assigned to the network A in the redundant process network.

### **Audio In**

This is a audio line input connection based on the mini jack connector.

### **Audio Out**

This is a audio line output connection based on the mini jack connector.

### **Microphone**

This is a microphone connection based on the mini jack connector. A contact is located on the front and on the rear wall.

### **Headphones**

This is a headphones connection based on the mini jack connector and is located on the front.

### **USB**

The main board provides eight USB (Universal Serial Bus) roots (ports) for attaching USB devices. Two ports are available on the front and six on the rear panel.

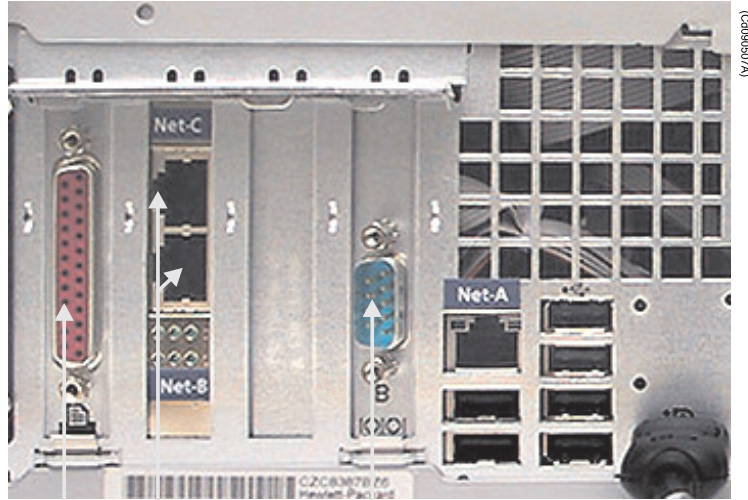
## **Interface cards and connections**

The illustrations below shows the different types of MP7900 computers.

Eight different types of MP7900 computers are available: (see front page for part numbers). Common for all rear panels are: Net A, 6 off USB ports, VGA graphics port, Display port, PS/2 mouse port, Keyboard port, Audio -in and -out, and Main power plug as shown in *Rear – external connections* on page 12.

The rear panel layout for each type is shown in figures below. It is focused on slot 1 through 4 where the differences are.

**MP7900 Base model, HS/DP Recorder 500 model and mirrored system discs model**

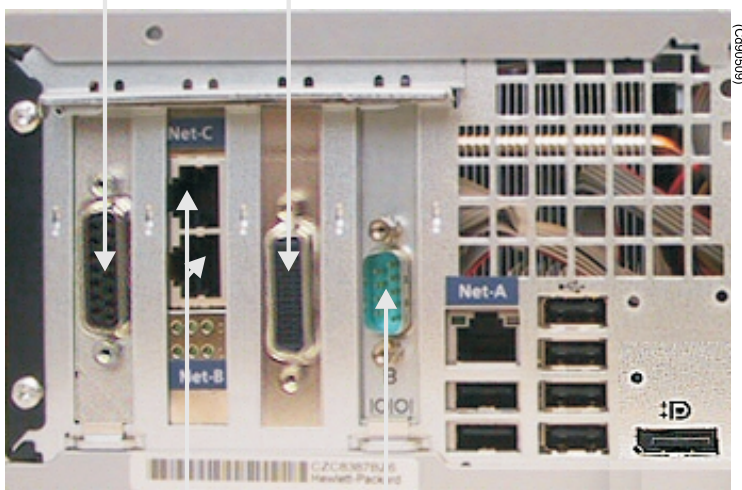


Parallel port    Network card  
NET C (above)  
NET B (below)    Serial port  
(COM2)

The different card slots are as follows (seen from left to right – slot 1 through 4): Parallel port, Dual network card (Net B and C), empty slot and COM2 connector.

**MP7900 NAV model**

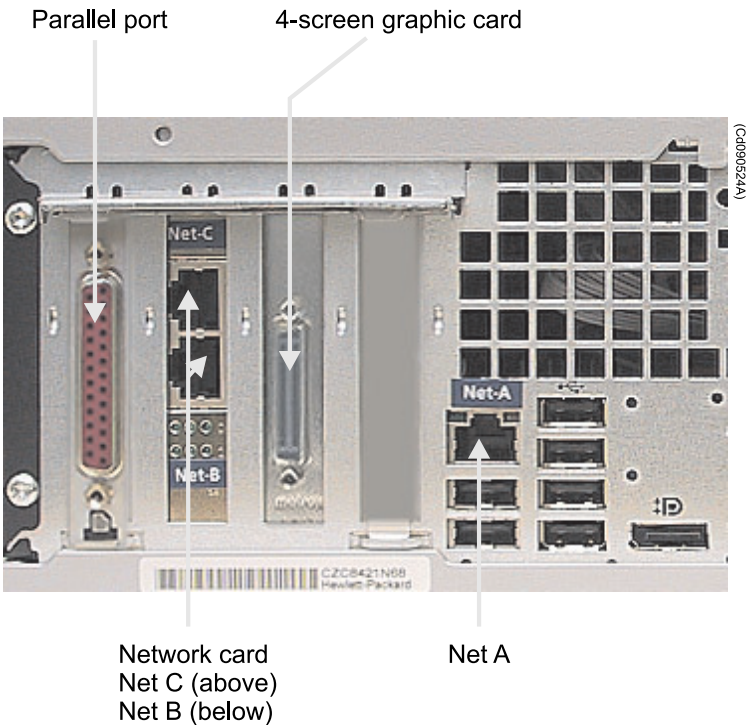
RIC2 port    2-screen graphic card



Network card  
Net C (above)  
Net B (below)    COM2 port

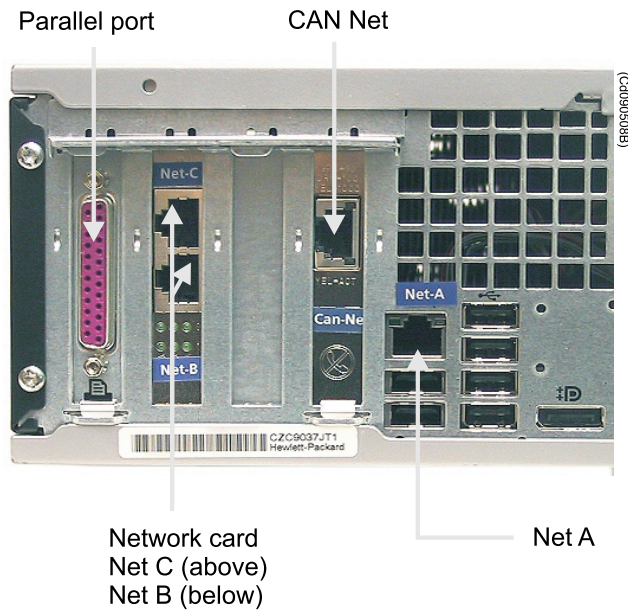
The different card slots are as follows (seen from left to right – slot 1 through 4): RIC2, Dual network card (Net B and C), 2-screen graphic card, COM2 connector.

**MP7900 with 4-screen model**



The different card slots are as follows (seen from left to right – slot 1 through 4): Parallel port, Dual network card (Net B and C) and 4-screen graphic card.

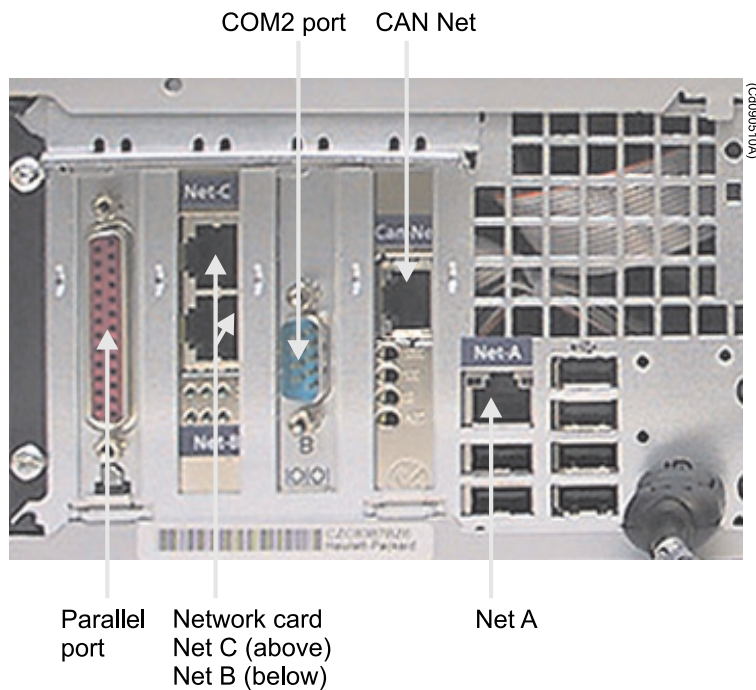
**MP7900 with LAN/CAN model**



The different card slots are as follows (seen from left to right – slot 1 through 4): Parallel port, Dual network card (Net B and C), empty slot and Single network card (CAN net).

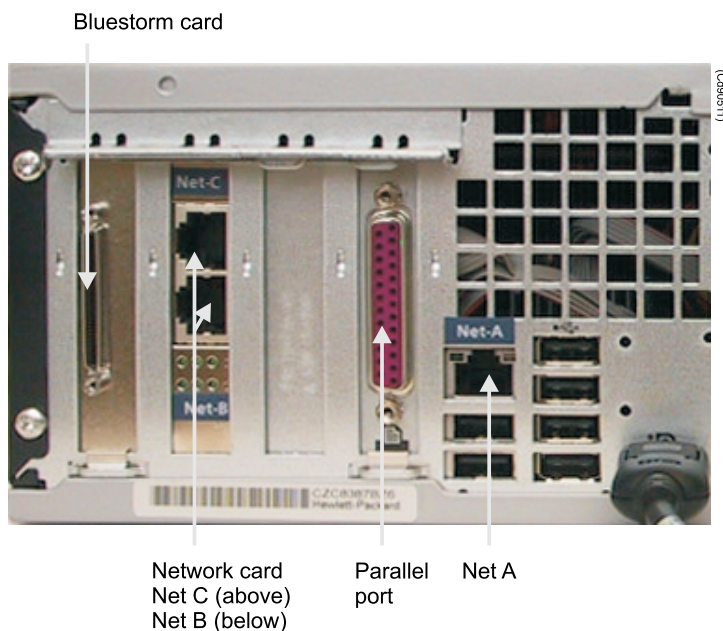


### MP7900 with LAN/CAN + 2 COM ports model



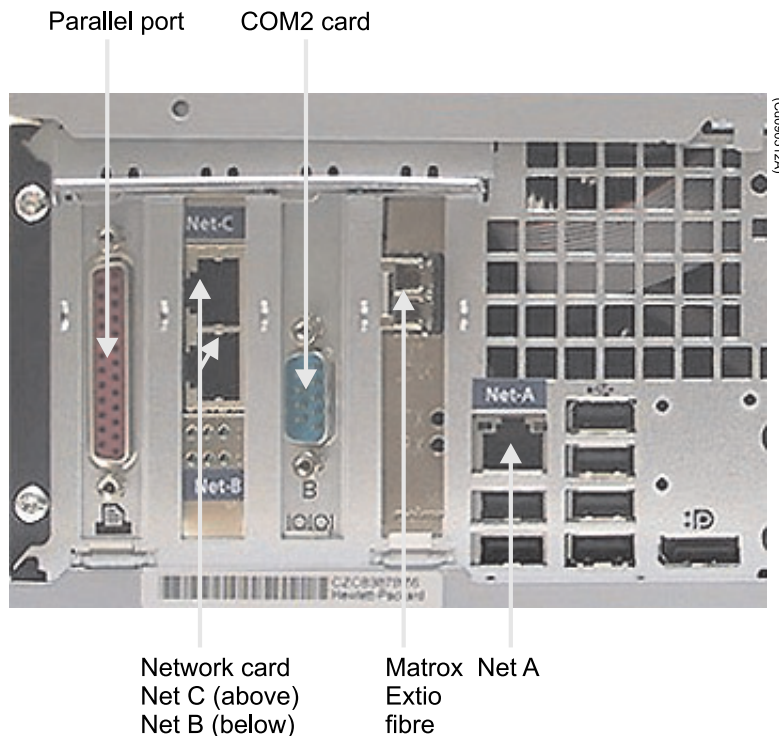
The different card slots are as follows (seen from left to right – slot 1 to 4): Parallel port, Dual network card (Net B and C), COM2 connector and Single network card (CAN net).

### MP7900 with BlueStorm model (8 channel serial card)



The different card slots are as follows (seen from left to right – slot 1 to 4): BlueStorm card, Dual network card (Net B and C), empty slot and Parallel port.

### MP7900 with Matrox Extio fibre model



The different card slots are as follows (seen from left to right – slot 1 to 4): Parallel port, Dual network card (Net B and C), COM2 connector and Matrox Extio fibre card (Graphic Card).

### Interface cards

#### Dual network card (standard)

The dual network card is a PCIe 4x type card and provides two network ports. The lower port is normally connected to Network B, and the upper port, if required by the system, is connected to Network C. The connectors are of the RJ45 type. For details refer to the *Hardware Module Description* for the network card.

#### Single network card (optional)

The single network card is used as interface to the external LAN/CAN converter. It is a PCIe 16x type card. The connector on the single LAN interface card is a RJ45 type.

For details refer to the *Hardware Module Description* for the single LAN network card.

#### RIC2 (optional)

The Radar Interface Card2 (RIC2) is a PCI type card, is normally located in slot 1 and is used for connection to radar scanners. For details refer to the *Hardware Module Description* for the appropriate card.

### BlueStorm interface card

The BlueStorm card is an 8 channel serial interface card. This card is a PCI type card and provides four RS422/485 ports and four RS232 ports serial channels by the use of a special interface split cable. The connector types used on the cable are eight 9-pin male D-sub.

#### Note

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*Read the numbering on the cable connectors for which is which serial line.*

---

For details refer to the *Hardware Module Description* for the BlueStorm interface card.

### Graphics cards

The 2-screen Matrox Millennium P690LP graphics card is a PCIe 16x slot card. Split cables that come with the graphics card are used for connecting to the colour monitors.

The 4-screen Matrox M9140 Plus graphics card is a PCIe 16x slot card. Split cables that come with the graphics card are used for connecting to the colour monitors.

The fibre-optic interface card Matrox Extio PCIe1x converts outgoing bus data to an optical signal and converts incoming bus data back to an electrical signal. The card transmits and receives this optical data to and from the remote graphic unit via a fibre-optic cable. Extio has integrated graphics, audio and USB hardware which process the bus data as if it was part of an add-in card directly installed in a computer expansion slot.

#### Note

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*Read the numbering on the cable connectors for which monitor they connect.*

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### Power connection

The computer is provided with a standard three-pin apparatus socket and fits a standard female three-hole apparatus plug, as shown in *Rear – external connections* on page 12.

#### Note

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*The power supply is of the Autosense type, and thereby automatically senses correct input voltage (either 115 VAC or 230 VAC).*

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### Chassis ground connection

The computer is provided with a ground terminal screw located at the right lower corner when the computer is seen from the rear side, as shown in *Rear – external connections* on page 12. This terminal must be bonded to PE (Protection Earth) with a short ground wire having large cross section.



## MP7900 Technical specifications

### POWER SUPPLY REQUIREMENTS

Voltage:	115/230 VAC (autosense)
Power consumption from power supply:	240 W

### CONFIGURATION, PERFORMANCE AND CAPACITY

CPU type and speed:	Intel Core Duo E8400
Hard-disk drive for DP/HS Recorder disk:	Hard Disc Drive 2.5" SATA
Flash disk:	Transcend 32 GB SSD drive
DVD-RW drive:	SATA 16X super multi light scribe drive, (see item no. 5 in Spare Parts list)
Memory:	2 x 1GB
Power Supply 115/230 VAC:	Power Supply, (see item no. 1 in Spare Parts list)
VGA:	On main board — Intel processor
DVI:	Display port
Dual network interface card: (Network interface, one port on main board)	Broadcom Dual 10/100/1000 LPnic PWLA8492MTBLK5 (see item no. 10 in Spare Parts list)
Single network interface card:	Broadcom NetXtreme Gigabit PCIe NIC, (optional) - (see item no. 11 in Spare Parts list)
Graphics card (2-screen):	Matrox Millenium P690LP, PCI x 16, (see item no. 13 in Spare Parts list)
Graphics card (4-screen):	Matrox M9140 Plus, (see item no. 14 in Spare Parts list)
RIC:	RIC card (optional) - (see item no. 16 in Spare Parts list)
Serial interface:	- BlueStorm 8 ports RS422/485 FH surge DB09M cable

### MECHANICAL SPECIFICATION

Size: width x depth x height:	337 x 379 x 103 mm
Weight:	8.5 kg (Base model)
IP degree:	IP22

### ENVIRONMENTAL REQUIREMENTS

Refer to KM Environmental Specification, document number 161011.

### LIFE CYCLE SPECIFICATION

MTBF calculated:	108 206 hours
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# Fault Finding

This section presents the fault finding principles for the MP7900 computer.

## Fault location/identification

If a fault situation has occurred, the fault is normally identified from the symptoms observed. It is therefore important to record all these observations to help the maintenance person or service engineer. All error messages shown on the screen should be logged for this purpose.

### Note

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*If you are not able to correct the error situation yourself, you should contact your nearest Kongsberg Maritime service office for advice or to request service.*

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The fault-finding table below assumes that the problem is caused by the MP7900 computer itself and no external factors are involved.

*Table 1 Fault-finding tips*

<b>ID</b>	<b>Symptoms</b>	<b>Probable Error Source</b>	<b>Corrective Action</b>
1	No visible or audible sign of power present at MP7900. Fans are not blowing.	External supply voltage is turned off or circuit-breaker fuse has tripped.	Check the 115/230 VAC power supply.
		Internal power supply defect.	Replace power supply. See procedure <i>How to replace the Power Supply model</i> on page 38.
2	Applications are not loading when booting the MP7900. Only blue screen displayed.	Defective file system.	Reinstall the software by using the system backup CD.
3	Applications are not loading when booting after the entire operating system software has been installed on MP7900. Only blue screen displayed.	Defective flash disk	Replace flash disk. See procedure <i>How to replace the flash disk</i> on page 30.
4	MP7900 does not respond over network on either channel.	Network task not running.	Reboot MP7900.

*Table 1 Fault-finding tips (cont'd.)*

<b>ID</b>	<b>Symptoms</b>	<b>Probable Error Source</b>	<b>Corrective Action</b>
5	MP7900 responds over network on only one of three channels.	Defective network card or network part of main board.	Replace network card. See procedure <i>How to replace a socket-mounted PCI and PCIe card</i> on page 35.
6	MP7900 crashes or hangs unexpectedly.	Possible defective RAM memory card.	Replace RAM memory card. See procedure <i>How to replace a RAM memory card</i> on page 37.

# Preventive Maintenance

This section presents the preventive maintenance procedures for the MP7900.

Replacement procedures relating to preventive maintenance, are described only in the Corrective maintenance section.

## How to clean the MP7900 cabinet surface

Use a lint-free, non-abrasive cloth and a neutral or mild soap solution for best result. Do not use a dripping wet cloth when cleaning. Use only a moistened cloth.

## Preventive maintenance intervals

Note

*These procedures should be performed on each MP7900 in the system. Local evaluations should be made to determine site-specific maintenance intervals.*

*Table 2 Recommended preventive maintenance intervals*

<b>ACTION</b>	<b>INTERVAL RECOMMENDED</b>
Clean all operator panels.	Every week.
Clean all filters for units equipped with fans.	
Clean cabinet surface.	Each month.
Check for loose connectors and wires.	Every six month.

# Corrective Maintenance

This section presents the corrective maintenance procedures for the MP7900.

Corrective maintenance procedures not described in this section are to be found in the appropriate *Hardware Module Description* for the part numbers referred to in the replaceable parts and recommended spare parts list. Corrective maintenance of parts not provided by any of the above should be performed by Kongsberg Maritime service personnel only.

## Replacement procedures

### Caution

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*Electrostatic charges can damage components on the cards. Notice the following precautions: Always wear a properly connected earthing strap when handling unpacked cards. Place unpacked cards only on a properly connected earthing mat or a shielding bag. Keep cards in their shielding bags when not installed. Never store cards near electromagnetic or electrostatic devices.*

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### Note

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*Replacement procedures that require power to be turned off must be preceded by shutting down the MP7900 in a controlled manner. Refer to the system operator manual for the appropriate procedure.*

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### **WARNING**

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***To avoid the risks accompanying high voltages, always turn off the power circuit supplying the computer before you open the cabinet lid.***

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## How to remove MP7900 computer from Damper kit

Two Damper kits are available: One for horizontal mounting and one for vertical e.g. door mounting, see figures below.

- 1 Disconnect all cables connected to the computer.
- 2 Standing in front of the computer locate the damper kit.

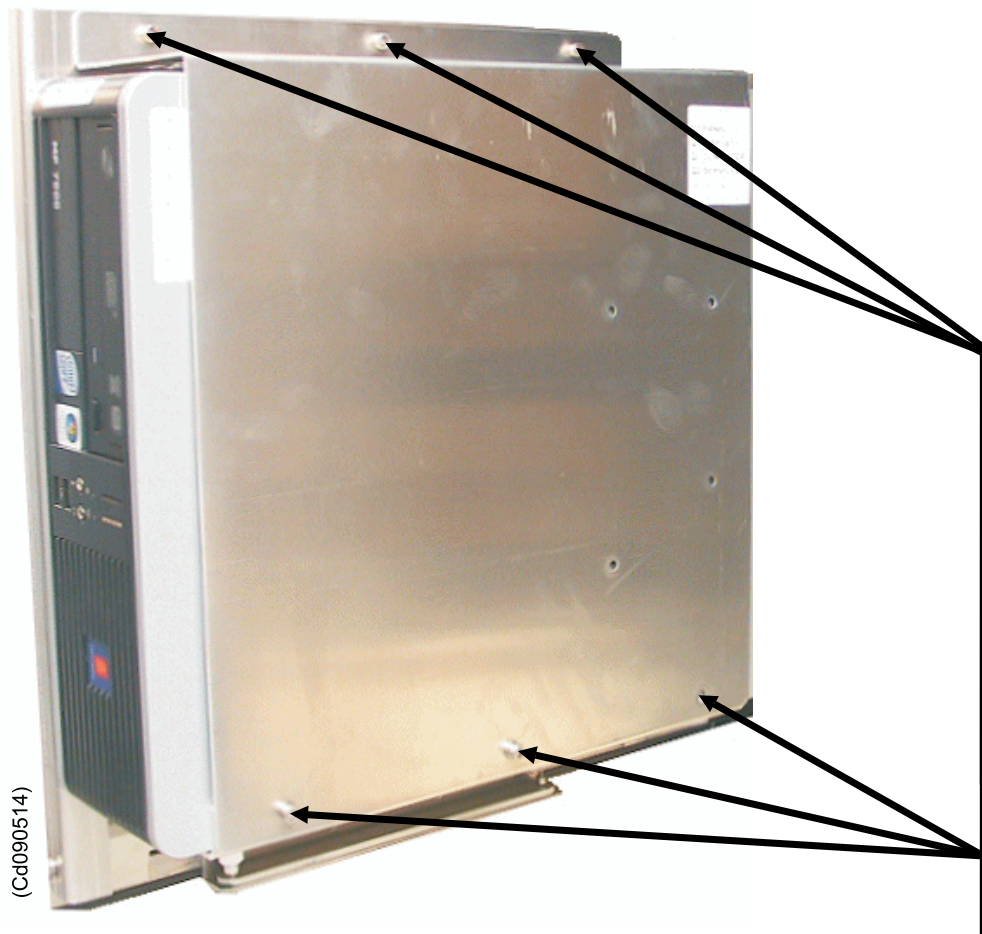
- 3 Unscrew 4 off screws (horizontal mounting, see Figure 6) or 6 off screws (vertical mounted, see Figure 7 and ) on the damper kit securing the computer.

*Figure 6 Horizontal mounted Damper kit*



Unscrew four off screws  
(two on each side)

Figure 7 Vertical mounted Damper kit



Unscrew six off screws  
- three off, top  
- three off, bottom

- 4 Carefully remove the computer and place aside.

## How to remove cabinet lid

- 1 Disconnect all cables connected to the computer.
- 2 Place the computer on a firm surface.
- 3 Standing with the front of the computer towards you, push the two release levers in, one on each side of computer, slide the lid forward and lift the lid (see figure below for location of the lid release lever).

*Figure 8 Release lever of the cabinet lid*



- 4 If you need to remove the front cover, press the lockers on each side of the front cover.



## How to replace the DVD-RW drive

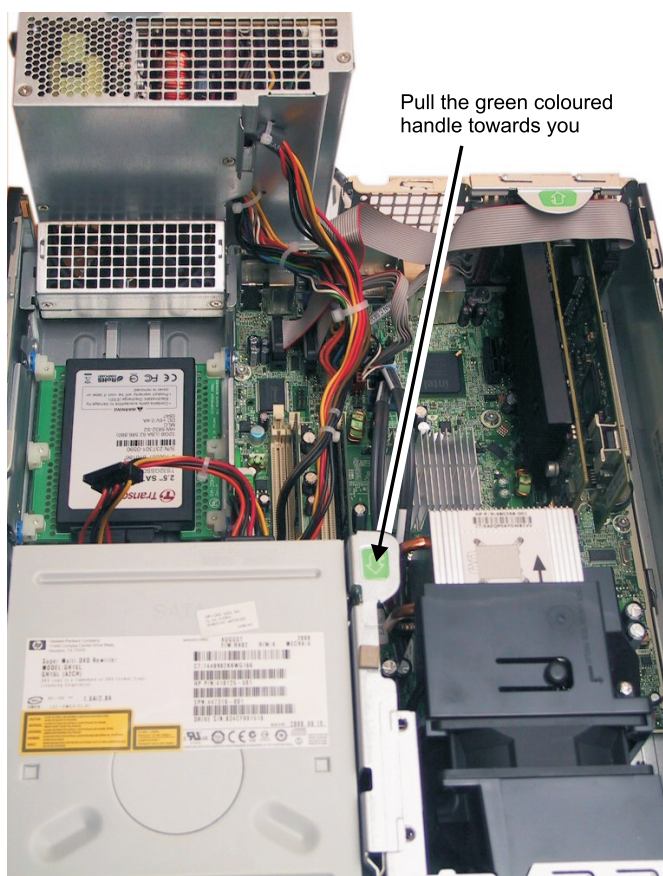
The following steps must be done before performing this procedure:

- The power to the MP7900 computer must have been turned off.
- Ensure that the new drive is equal to the one listed in recommended consumable spare part list.
- The damper kit must have been removed from the computer, as described in *How to remove MP7900 computer from Damper kit* on page 23.
- The cabinet lid must have been removed from the computer, as described in *How to remove cabinet lid* on page 26.

### Disassembly

- 1 Tilt the DVD-RW drive assembly in upwards direction, by pulling the green coloured handle towards you.

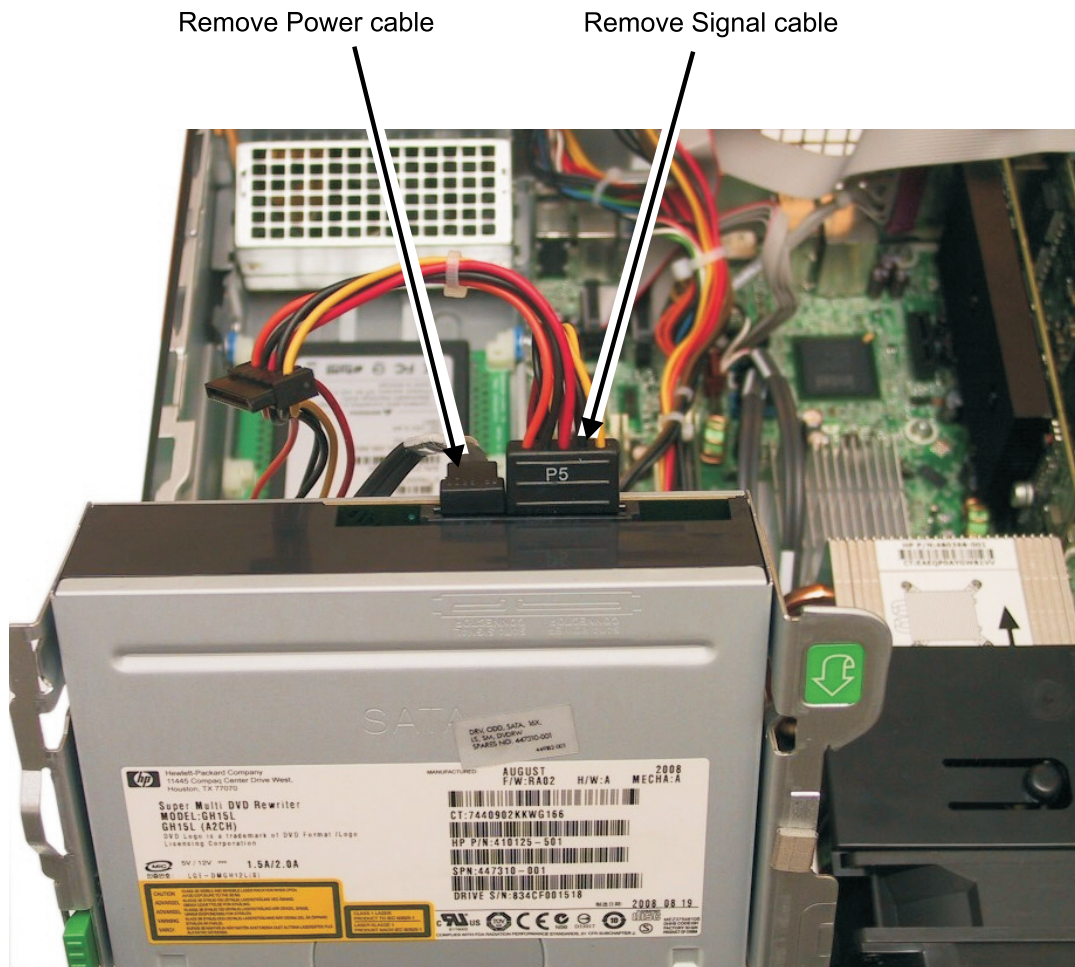
*Figure 9 Lifting the DVD chassis*



(Cd090517a)

- 2 Disconnect and remove the flat signal cable and power cable from the DVD-RW drive, as identified in figure below:

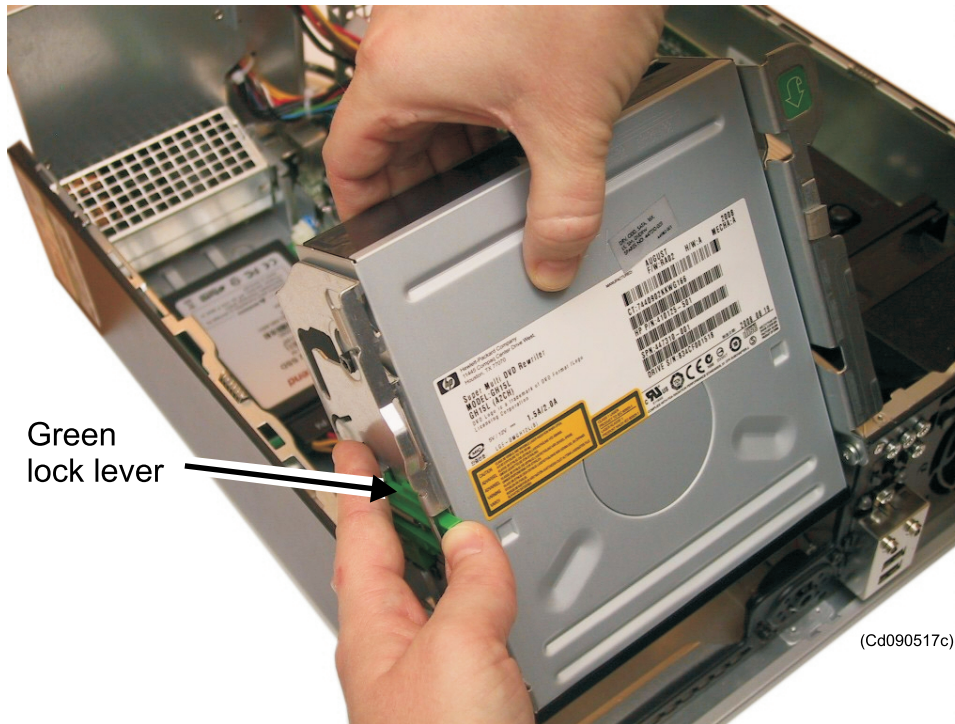
Figure 10 Disconnecting cables



(Cd090517b)

- 3 Release the lock for DVD-RW drive by pushing the lever in, identified in figure below.

Figure 11 Releasing the lock lever



- 4 Carefully slide the drive out from its bracket.
- 5 Mark the DVD-RW with a label describing the symptoms observed, carefully pack in a shielding bag and place on a secure place.

### Reassembly

- 1 Set any mode jumpers of the new drive to the same positions as for the replaced drive.
- 2 Reassemble by performing steps 1 to 4 of the *Disassembly* procedure above, in reverse order.
- 3 Verify proper drive operation.



## How to replace the flash disk

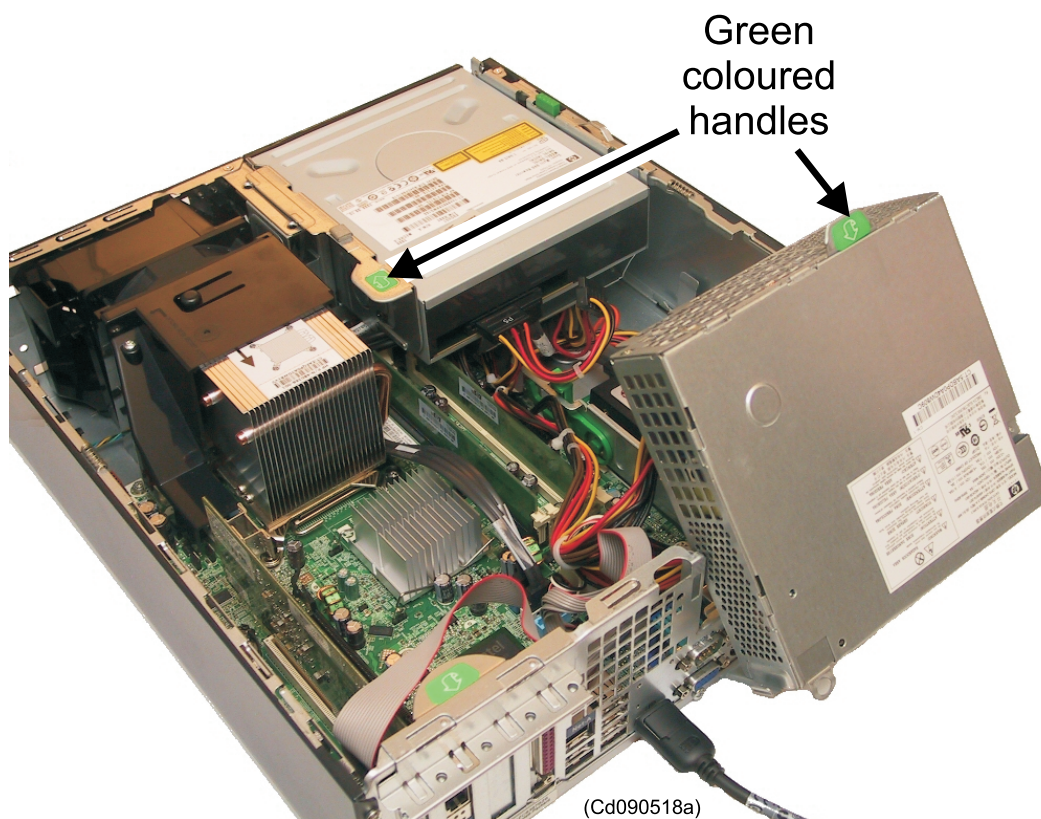
The following steps must have been done before performing this procedure:

- The power to the MP7900 computer must have been turned off.
- Ensure that the new system flash disk drive is equal to the one listed in recommended consumable spare part list.
- The damper kit must have been removed from the computer, as described in *How to remove MP7900 computer from Damper kit* on page 23.
- The cabinet lid must have been removed from the computer, as described in *How to remove cabinet lid* on page 26.

### Disassembly

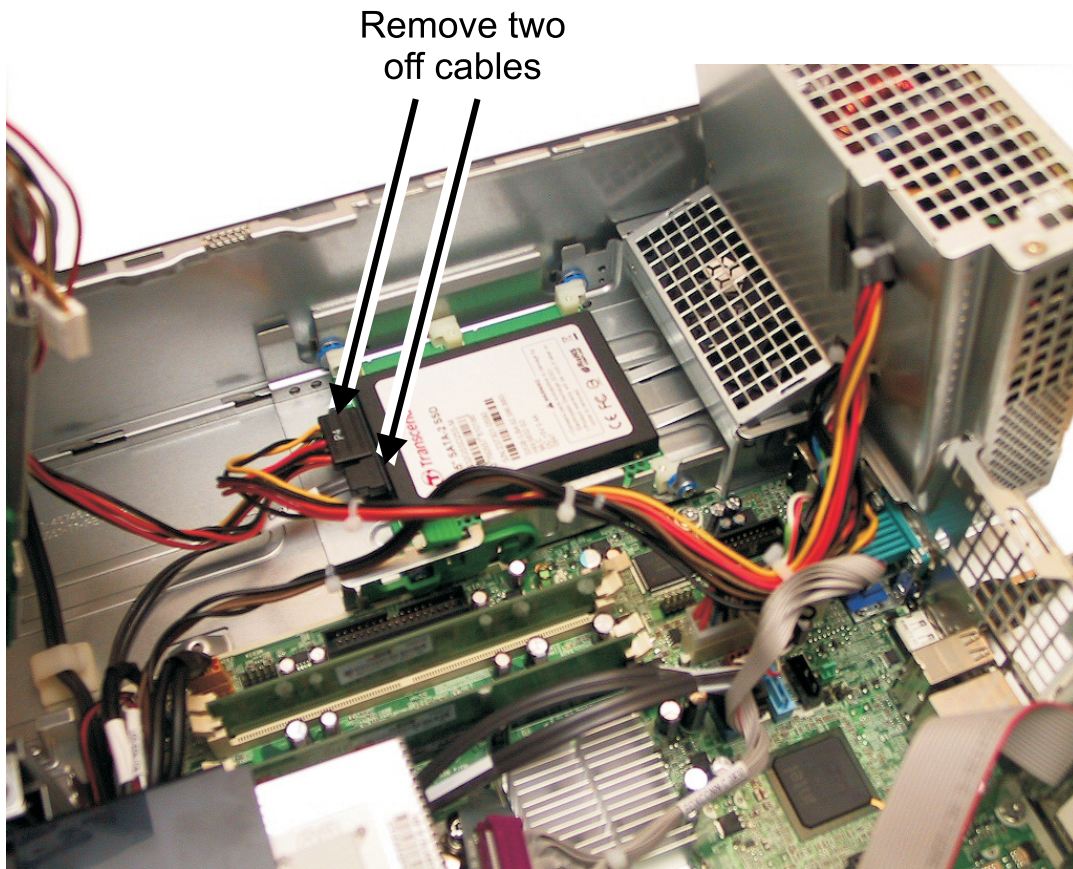
- 1 Place the computer on a flat surface with the interface cards towards you.
- 2 Tilt the power supply assembly and the chassis for the DVD-RW drive in upwards direction, by pulling the green coloured handles.

*Figure 12 Lifting the power supply*



- 3 Disconnect and remove the 2 off flat cables from the disk, as identified in figure below:

Figure 13 Disconnecting cables

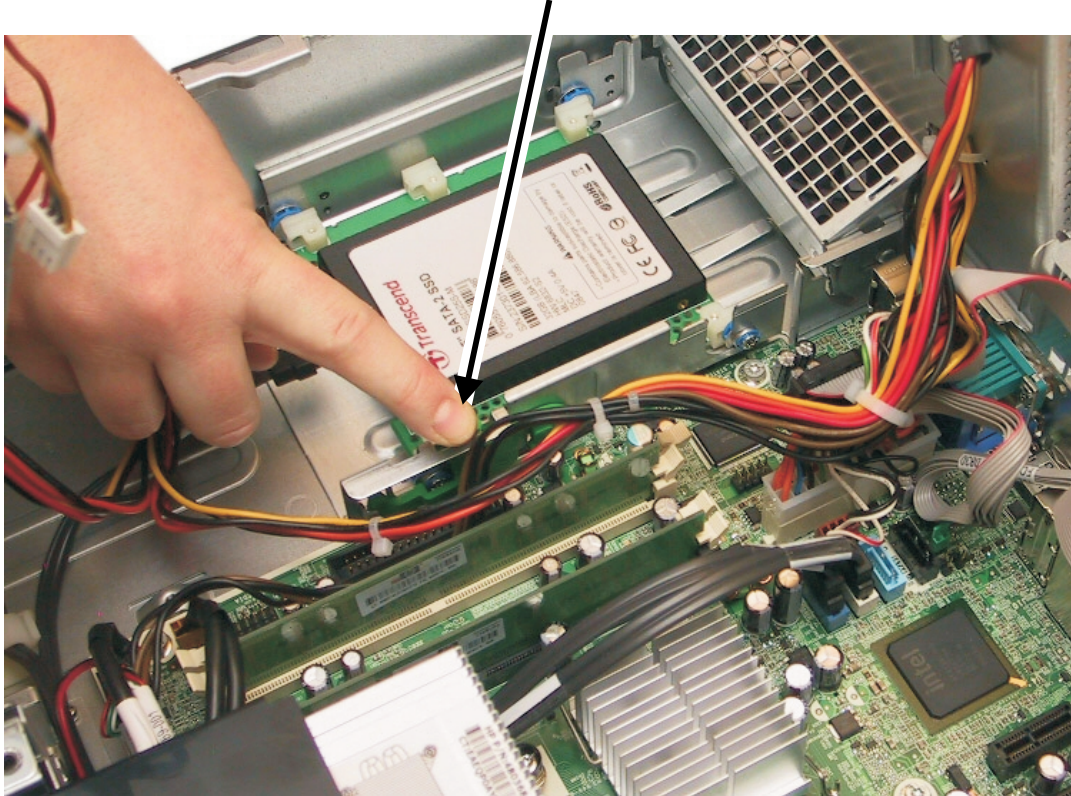


(Cd090518b)

- 4 Release the lock for the flash disk by pulling out, as identified in figure below:

*Figure 14 Releasing the lock*

Push the green lock

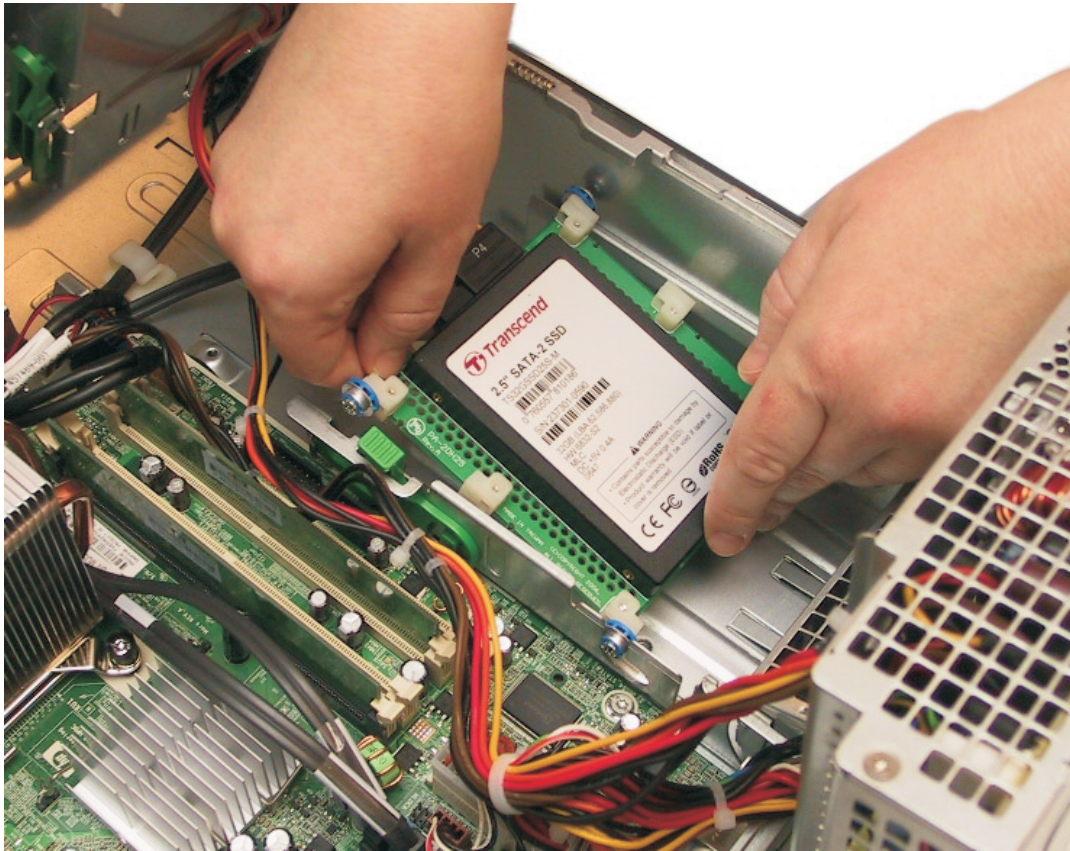


(Cd090518c)

- 5 Carefully slide the disk from its frame.



Figure 15 Releasing the flash disk



(Cd090518d)

- 6 Mark the old disk with a label describing the symptoms observed, carefully pack in a shielding bag and place on a secure place.

### Reassembly

- 1 Reassemble by performing steps 1 to 5, of the *Disassembly* procedure, in reverse order.
- 2 Verify proper operation. The flash disk must then be reloaded with backup data (see separate procedure).

## How to replace the hard-disk drive for HS/DP Recorder

The HS/DP Recorder consists of one 32 Gb Flash disk, containing system application, and two mirrored hard-disks (320 Gb each) for recorded data.

### Note

*For each hard-disk there is an indication LED in front. If the disk is defect the LED will be lit red.*

---

### Disassembly

Release the hard-disk by opening the disk's front cover.

*Figure 16 Hard-disks*





## How to replace a socket-mounted PCI and PCIe card

### Note

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*The PCI sockets are the two white sockets, and the PCIe socket is the black socket, refer to Cabinet interior on page 7.*

---

### Note

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*No screws are to be unscrewed to replace an interface card, only lifting the lever at the green coloured handle, which secures the interface card to the main board.*

---

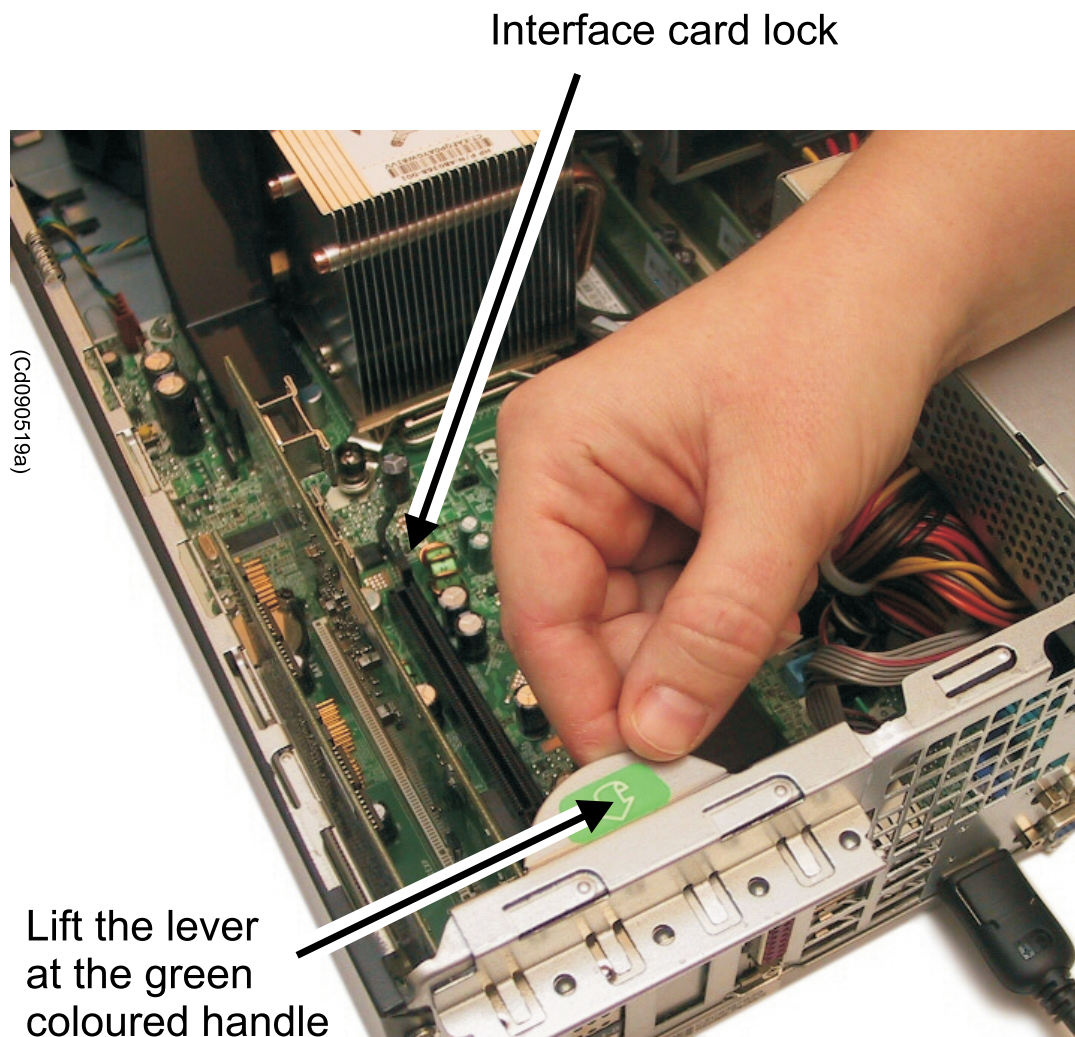
The following steps must have been done before performing this procedure:

- The power to the MP7900 computer must have been turned off.
- The cable must be removed from the interface card to be replaced.
- Ensure that the new card is equal to the one listed in recommended consumable spare part list.
- The kit must have been removed from the computer, as described in *How to remove MP7900 computer from Damper kit* on page 23.
- The cabinet lid must have been removed from the computer, as described in *How to remove cabinet lid* on page 26.

### Disassembly

- 1 At the rear end of the computer, loosen the locking lever for the PCI cards by lifting the lever at the green coloured handle, as identified by figure below:

Figure 17 Removing a PCI card



- 2 Release the interface card lock and carefully pull the PCI (PCIe) card assembly to be replaced upwards from the socket card and remove the card assembly.
- 3 Mark the card with a label describing the symptoms observed, carefully pack in a shielding bag and place on a secure place.

### Reassembly

- 1 Check that all jumper and DIP settings of the new card are set correctly before starting to reassemble.
- 2 Reassemble by performing steps 1 to 2, of the *Disassembly* procedure, in reverse order.
- 3 If the card is a network card, you should perform the Checking Network Cards procedure, else verify proper operation of MP7900.

## How to replace a RAM memory card

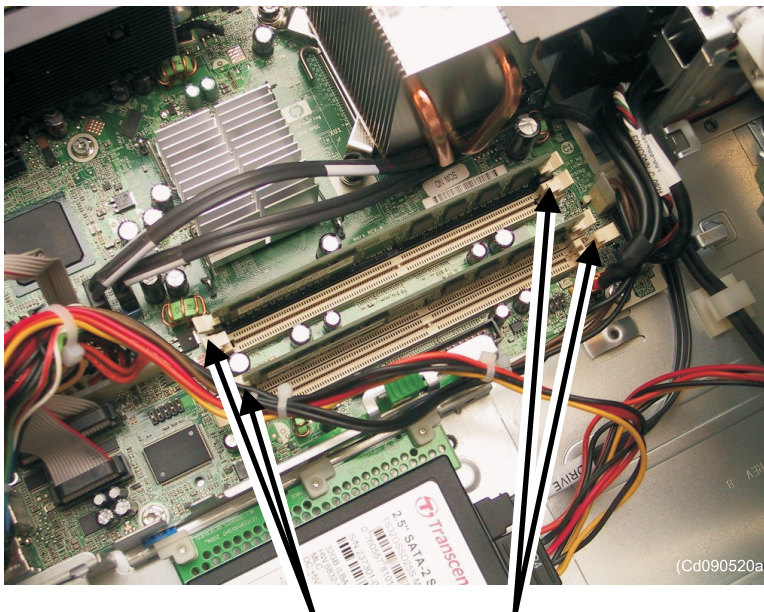
The following steps must have been performed before performing this procedure:

- The power to the MP7900 computer must have been turned off.
- Ensure that the RAM memory card is equal to the one listed in recommended consumable spare part list.
- The kit must have been removed from the computer, as described in *How to remove MP7900 computer from Damper kit* on page 23.
- The cabinet lid must have been removed from the computer, as described in *How to remove cabinet lid* on page 26.

### Disassembly

- 1 Lift the power supply assembly and the DVD-RW assembly, as described in on page .
- 2 Locate the RAM memory card inside the computer.
- 3 Lift assemblies according to on page .
- 4 Remove the RAM memory card by pressing the ejectors at both ends of the memory card to release it from the socket, see figure below:

*Figure 18 Memory card sockets with ejectors*



Memory card ejectors

- 5 Mark the memory module with a label describing the symptoms observed, carefully pack in a shielding bag and place on a secure place.

### Reassembly

- 1 Reassemble by performing step 1 to 3 of the *Disassembly* procedure, in reverse order.
- 2 Verify proper operation of MP7900.



## How to replace the Power Supply model

The following steps must have been performed before performing this procedure:

- The power to the MP7900 computer must have been turned off.
- Ensure that the new power supply module is equal to the one listed in recommended consumable spare part list.
- The kit must have been removed from the computer, as described in *How to remove MP7900 computer from Damper kit* on page 23.
- The cabinet lid must have been removed from the computer, as described in *How to remove cabinet lid* on page 26.

### Note

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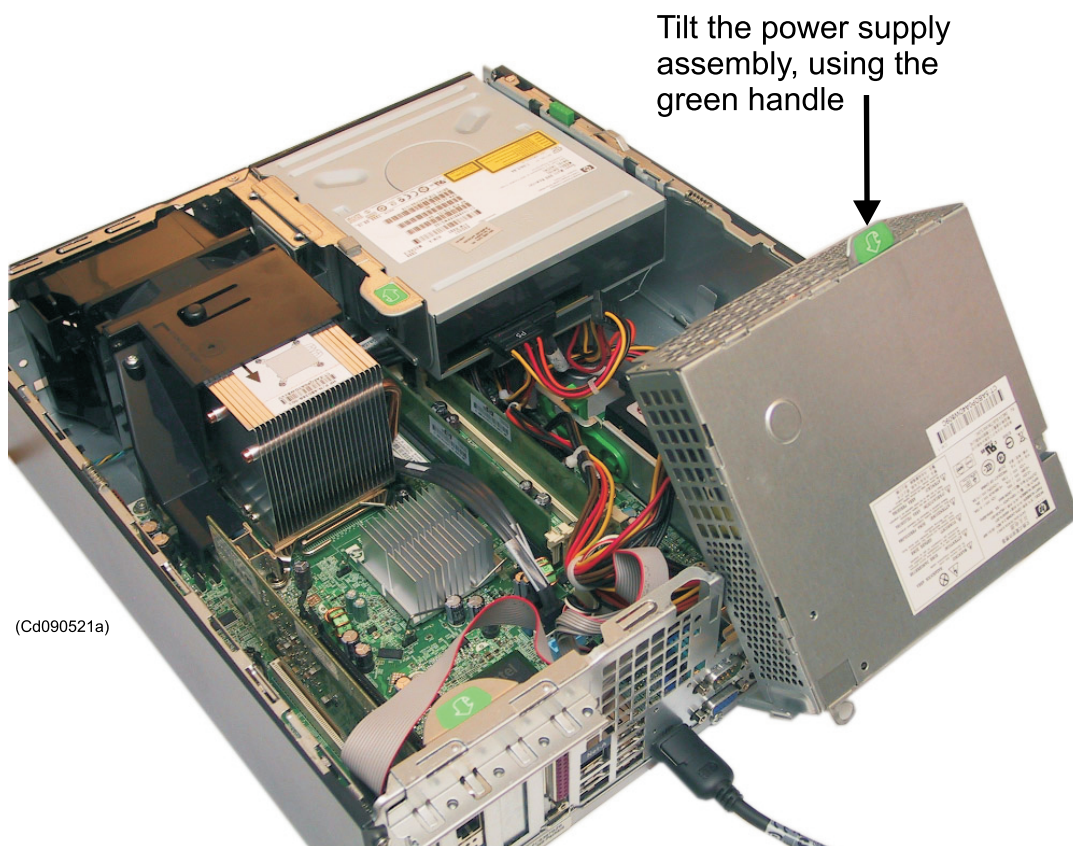
*An error with the power supply module should be handled by Kongsberg Maritime Service Department only.*

---

## Disassembly

- 1 Tilt the power supply assembly and the DVD-RW assembly, as described in on page .

*Figure 19 Lifting the power supply assembly*

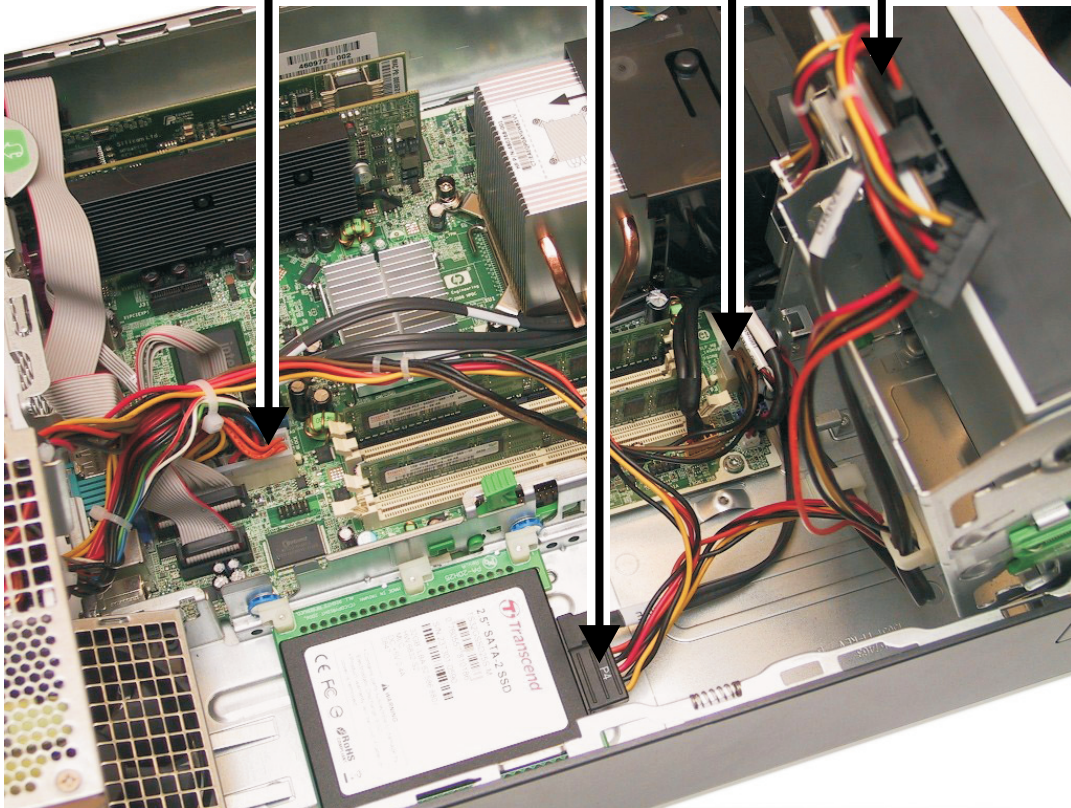


- 2 Disconnect 4 off power cables, refer to figure below:

Figure 20 Power cables

Remove 4 off cables:

- Power to DVD-RW
- Power to main board
- Power to flash disk
- Power to main board



(Cd090521b)

- 3 When cables are removed, slide the power supply module towards the flash disk and out of the computer chassis by lifting upwards.
- 4 If necessary, use a cutter to remove the strips that keep the cable bundles together.
- 5 Mark the power supply module with a label describing the symptoms observed, carefully pack in a shielding bag and place on a secure place.

### Reassembly

- 1 Reassemble by performing step 1 to 4 of the *Disassembly* procedure, in reverse order.
- 2 Verify proper operation of MP7900.

## How to replace the Filter

### Note

---

*This procedure applies only to the MP7900 with LAN/CAN model.*

---

The following steps must have been performed before performing this procedure:

- The power to the MP7900 computer must have been turned off.
- Check that the new filter is equal to the one listed in recommended consumable spare part list.
- The kit must have been removed from the computer, as described in *How to remove MP7900 computer from Damper kit* on page 23.
- The cabinet lid must have been removed from the computer, as described in *How to remove cabinet lid* on page 26.

### Disassembly

- 1 For cabinets with filter, there is a screw in front. Unscrew this.

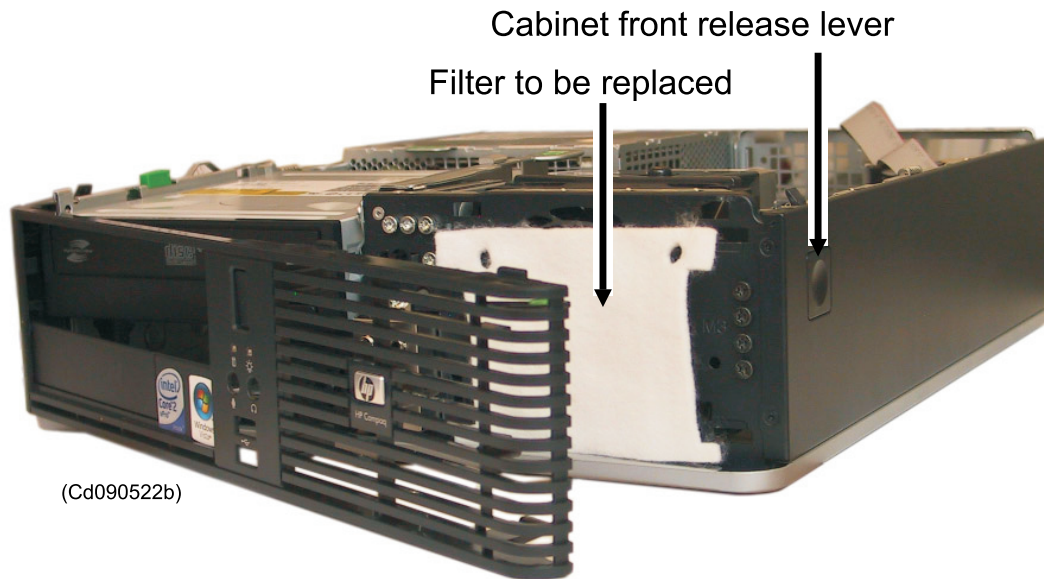
*Figure 21 Filter screw*



- 2 Take off the front cover and locate the filter, refer to figure below:



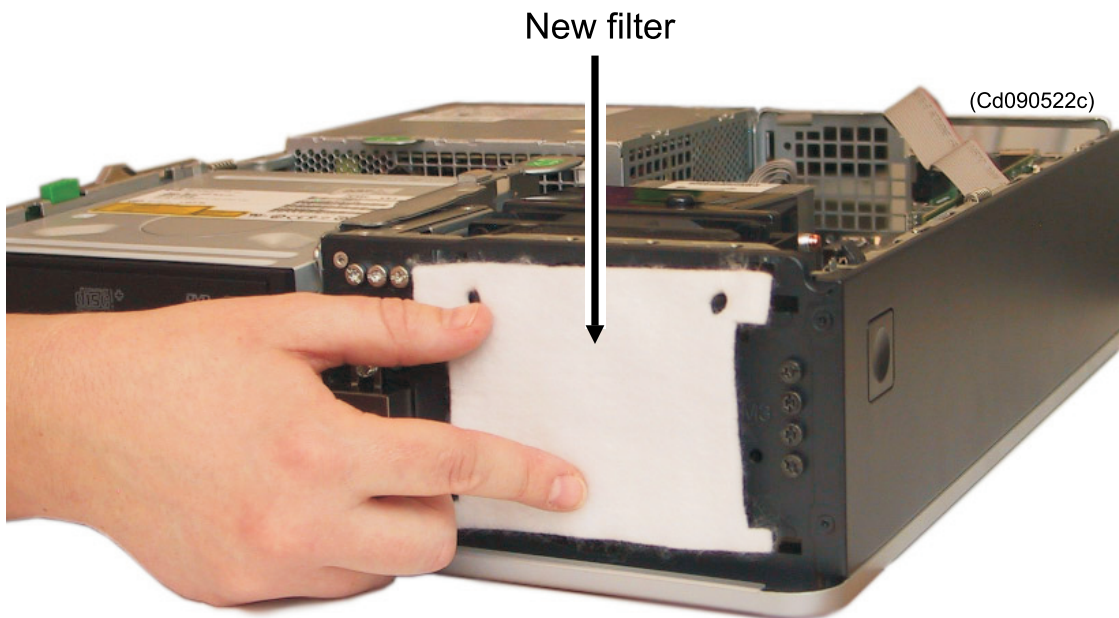
Figure 22 Filter location



- 3 Carefully remove the filter inside the lid by snapping it off the lid.

### Reassembly

Figure 23 New filter



- 1 Reassemble by inserting a new filter onto the lid.
- 2 Verify proper installation and fastening of the filter.

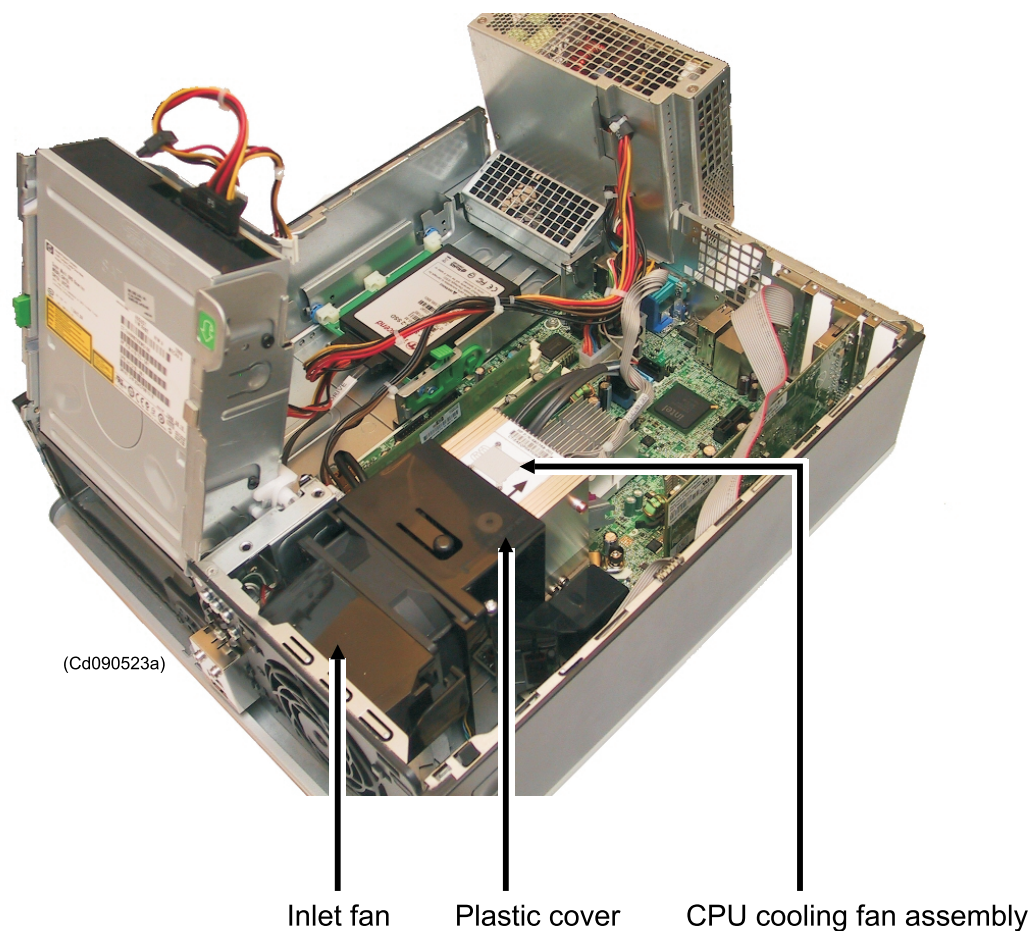


## How to replace the CPU cooling fan

The following steps must have been performed before performing this procedure:

- The power to the MP7900 computer must have been turned off.
- Check that the new fan is equal to the one listed in recommended consumable spare part list.
- The kit must have been removed from the computer, as described in *How to remove MP7900 computer from Damper kit* on page 23.
- The cabinet lid must have been removed from the computer, as described in *How to remove cabinet lid* on page 26.
- The Plastic cover, covering the inlet fan must have been removed from inside the computer, see Figure 24.

*Figure 24 Inside view of the computer*

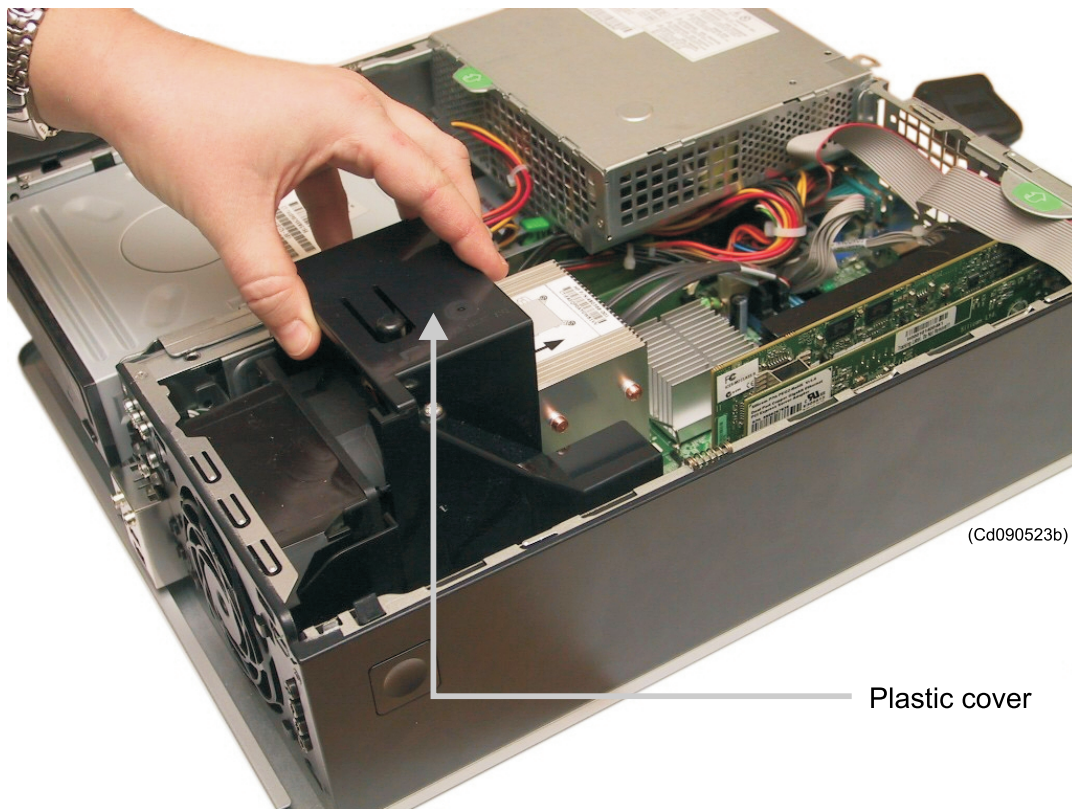


### **CPU fan**

#### **Disassembly**

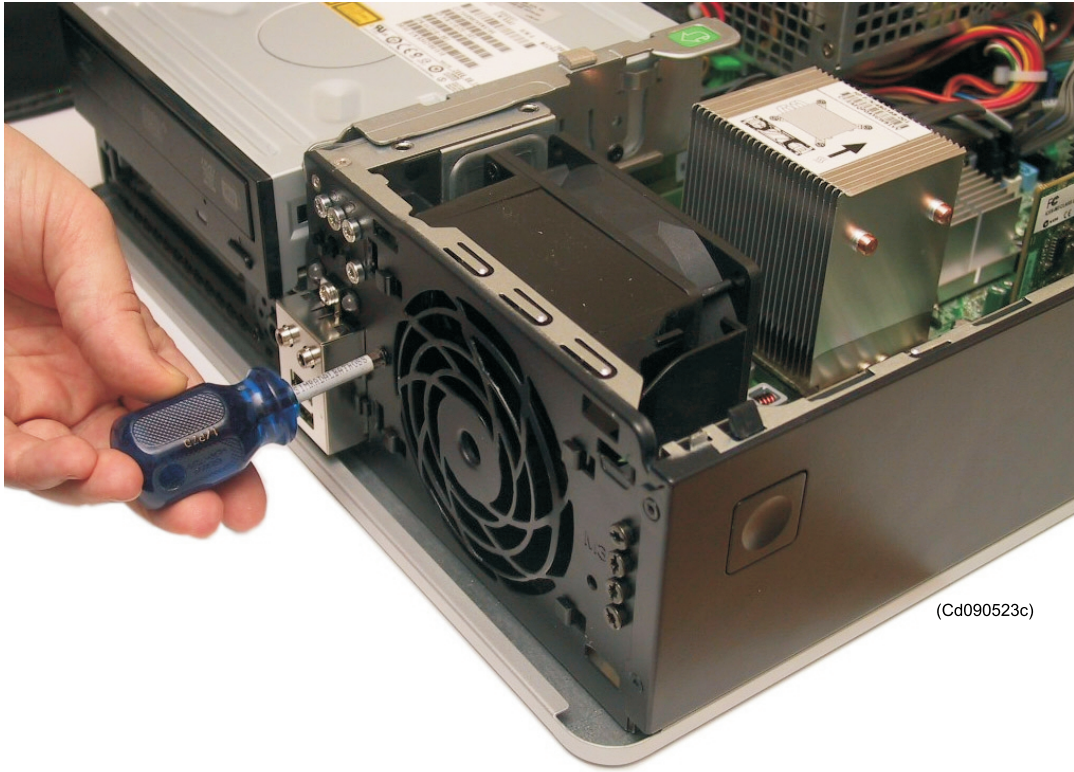
- 1 Locate the CPU fan inside the computer and remove the plastic cover, see Figure 24 and Figure 25.

Figure 25 Remove the plastic cover



- 2 From outside of the computer, unscrew 4 off screws, one in each corner of the fan assembly. See Figure 26.

*Figure 26 Location of off screws*

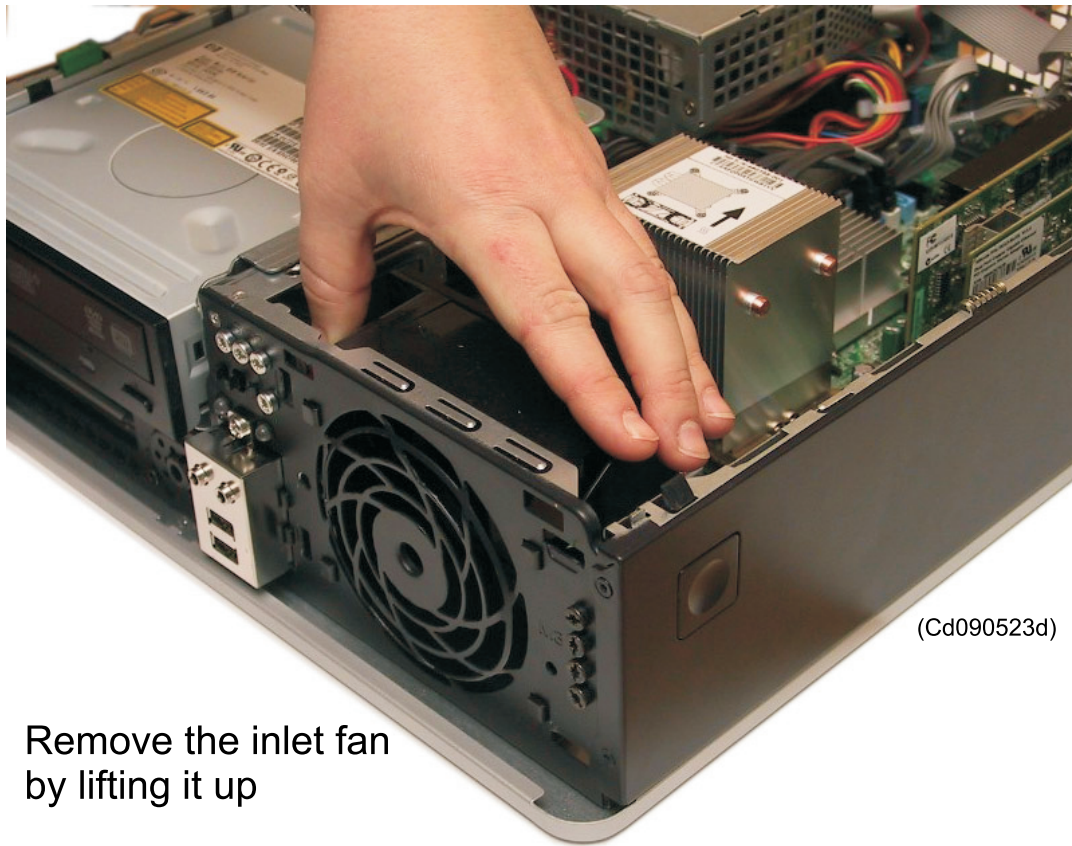


(Cd090523c)

- 3** Lift the fan assembly carefully out of the computer. See Figure 27.



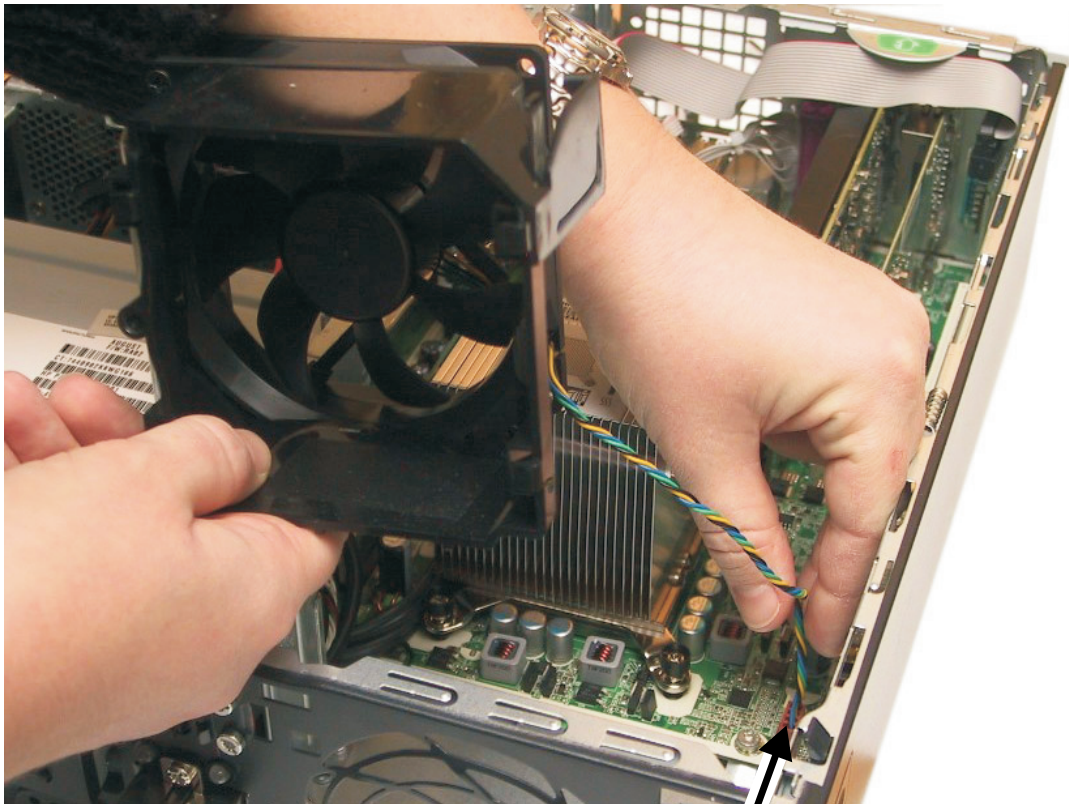
*Figure 27 Remove the inlet fan*



Remove the inlet fan  
by lifting it up

- 4 Disconnect the power cable for the CPU fan from the connector located on the motherboard of the computer, see Figure 28.

*Figure 28 Disconnect the power cable*



(Cd090523e)

Power cable

- 5 Mark the CPU fan with a label describing the symptoms observed, carefully pack in a shielding bag and place on a secure place.

### **Reassembly**

- 1 Connect the power cable to the connector located on the motherboard of the computer, see Figure 25.
- 2 From the outside of the computer, screw the inlet fan to the computer by using the 4 off screws, one in each corner of the fan, see Figure 25.
- 3 Insert the plastic cover inside the computer, covering the inlet fan.



## How to replace the CPU

### Note

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*An fault with the CPU should be handled by Kongsberg Maritime Service Department.*

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## How to replace the Main Board

### Note

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*An fault with the main board should be handled by Kongsberg Maritime Service Department.*

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## How to replace the Built-in Speaker

### Note

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*An fault with the built-in speaker should be handled by Kongsberg Maritime Service Department.*

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## How to replace a MP7600 computer w/4 channel Blue Heat card with a new MP7900 computer w/8 channel BlueStorm card

The two computer types with Blue Heat cards are as follows:

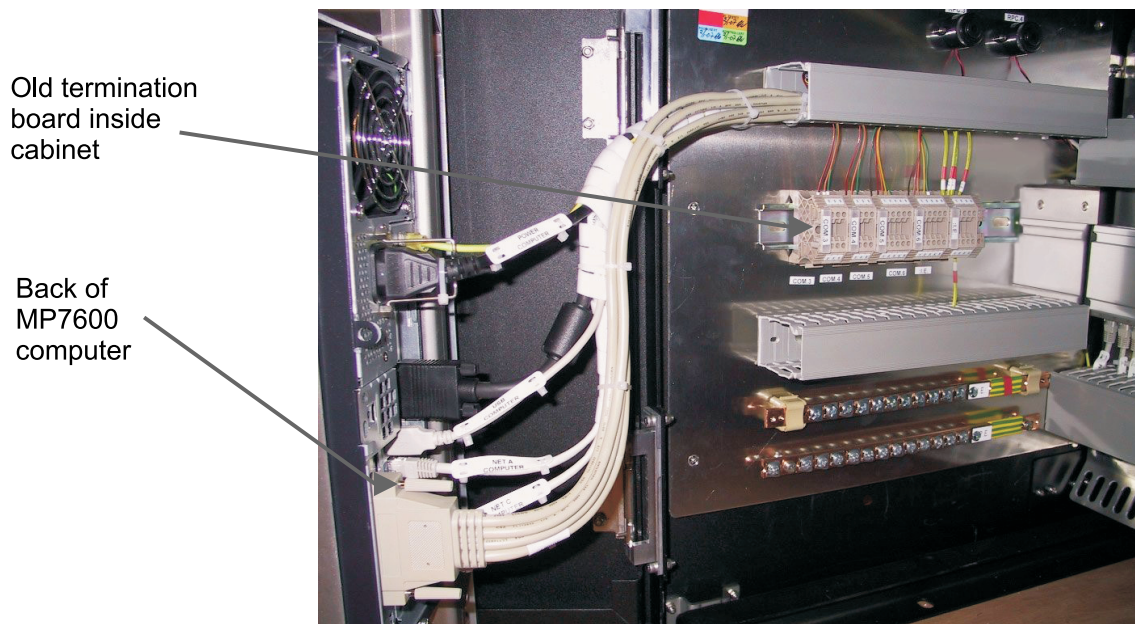
- MP7600 computer with 4 channel Blue Heat card (MP7600 w/4 ch.)
- MP7600 computer with 8 channel Blue Heat card (MP7600 w/8 ch.)

The following steps must have been done before performing this procedure:

- Ensure that the new termination board (green) is the correct type, and the correct number termination boards are available.
- The power to the MP7600 computer must have been turned off.

This is how a typical MP7600 w/4 ch. looks like inside the cabinet, where channel 1 and 2 are for RS232 and channel 3 and 4 are for RS422/485 on the old grey termination board:

Figure 29 Typical MP7600 w/4 channel system (old termination board)



- 1 Unscrew and disconnect all the cables from the back of the MP7600 computer.
- 2 Perform the procedure *How to remove MP7900 computer from Damper kit* on page 23.
- 3 Then attach the new MP7900 computer with 8 channel BlueStorm card, by reversing the steps in procedure referred in step above.
- 4 Attach the cables to the back of the new computer.
- 5 Unscrew and disconnect the leads including the ground leads from the 4 channels on the computer side of the termination board.

Note \_\_\_\_\_

*Channel 1 and 2 (RS232) uses 3 leads, and channel 3 and 4 (RS422/485) uses 5 leads.*

---

- 6 Remove the disconnected cables from the cable tray.
- 7 Unscrew and disconnect leads including the ground leads from the 4 channels on the field side of the termination board.

Note \_\_\_\_\_

*It is advisable to screw the leads including the ground leads from the field side directly onto the new loose termination boards (green termination boards) before removing the old termination boards from the metal bar.*

---

- 8 Remove the 4 off old termination boards by snapping them off the metal bar, using a screwdriver at top of the termination board, see figure below:

Figure 30 Disconnecting old termination board

Snapp-off the old termination boards using a screw driver



- 9 Connect the BlueStorm cable to the Blue Heat connector (78-pin) on back of the MP7900 computer, see .
- 10 Snap-on the new termination boards, onto the metal bar.

Figure 31 Terminal board – new type

New termination board attached to the metal bar (one shown)

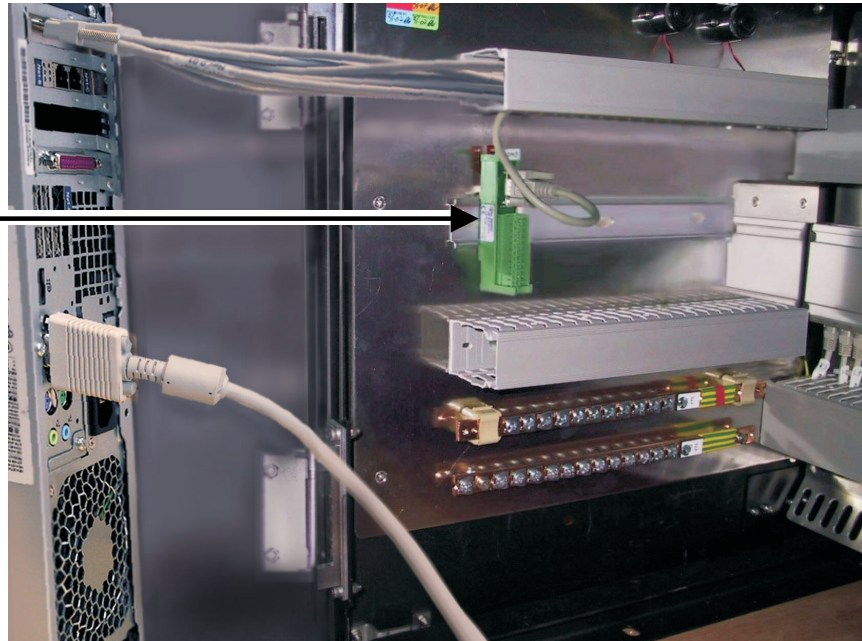


- 11 The figure below is how a typical MP7900 w/8 ch. looks like inside the cabinet (only channel 1 shown and connected).



*Figure 32 Typical MP7900 w/8 channel BlueStorm card (new terminal board)*

Attach cables to the new termination boards (one termination board shown)



(Cd090528a)

- 12 If more termination boards are to be connected, perform steps 10 and forward.
- 13 Lay the split cables inside the cable tray and snap-on the cover.
- 14 If applicable, turn on power to the MP7600 computer and close the cabinet door.

Note \_\_\_\_\_

*See the document 329611, MP7900 Setup Procedure, for how to configure the serial line ports.*

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# Replaceable Parts and Consumables

This section contains lists of replaceable parts, recommended spare parts and consumables used in MP7900. Replacement procedures for the listed parts are mainly described in the Corrective maintenance chapter. No replacement procedures are normally supplied for the consumables.

## Replaceable basic parts and recommended spare parts

The table shows replaceable basic parts and recommended spare parts for the computer.

List Ident.	Part Name	Recommended as Spare Part	Part Number
1	Power Supply, 437798-001	X	328791
2	Mainboard, 437793-001		
3	Hard-disk drive 320GB Western Digital, WD3200BJKT used as data storage in HS/DP Recorder 500 model.	X	328797
4	System disk, Flashdisk, 32GB, Transcend SSD drive, TS32GSSD25S-M	X	328796
5	16X DVD-RW drive, 447310-001		328798
6	Memory AH058AA, 1GB DRAM	X	333337
7	Heat sink 480368-001		357589
8	CPU, Intel core duo E8400 processor, 466169-001		328804
9	HP Parallel Port Adapter, KP716AV		328805
10	Dual LAN card, Silicom Dual nic, ZV789AA		328807
11	Serial Port 2ND DC7100/ DC7600/DC7900SFF, PA716A		328815
12	2-screen graphic card; Matrox Millenium P690 LP PCI x16, P69-MDDE128LPF (for NAV model)		328825
13	4-screen graphic card; Matrox M9140 Plus 512MB DDR2 Quad Head (for 4-screen model)		328828



<b>List Ident.</b>	<b>Part Name</b>	<b>Recommended as Spare Part</b>	<b>Part Number</b>
14	Matrox Extio card, PCI-Express 1x Fiber-Optic, XTOA-FESLPAF		328829
15	RIC2 card, low profile (optional for MP7900 NAV)		6200455
16	Drive Module for two 2.5" sata HDD, ST-2221SATA		328831
17	Display port adapter: HP DisplayPort To DVI-D Adapter, KV902AV		328832
18	Serial interface; BlueStorm /LP Universal PCI serial card; 8 ports switchable RS232/422/485. BLG041-01		337533
19	Front fan 435452-001		357591
20	System disk, SSD 2.5", 128GB CORSAIR P128. For use in LAN/CAN Windows 7 model		346458
21	LAN kit MP7900 LAN/CAN model		357584

## Consumables

<b>List Ident.</b>	<b>Part Name</b>	<b>Recommended as Spare Part</b>	<b>Part Number</b>
1	System Backup DVD	X	329905
2	Filter for MP7900 computer, for LAN/CAN model	X	329906
3	XP-image		337873



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