TCS Replacement

In case of a hardware failure, several spare parts are available for replacement. Most of the spare parts can be found in a box in Michel's office (see Fig. 1). It contains a small box with a new PCB PCI Card and a new PCB A32/D32 VME PCI bridge board. Two new connector cables for these boards are also included.

Figure 1: This box within Michel's office contains two new boards that comprise the VME–PCI bridge, which are still in its original package in the small box. Two new connector cables for these boards are also included.

Regardless of which part you are going to replace, take the following precaution actions before doing so.

- Park the telescope.
- Turn the brakes.
- If the TCS display is running on VELA, move the pointer to that window and end it by hitting Ctrl+c to get the shell prompt.
- Otherwise click on the $\boxed{\text{TCS}}$ button and login as **tcs**.
- Type `StopTCS`
- Go to the pedestal.

- Turn the key to **local**.
- Turn off PYXIS by turning the key on the front side.

Replacement of ANTLIA

Replacing ANTLIA is mainly a switching from black to white, meaning that a almost fully equipped backup PC (white tower) is standing next to ANTLIA (see Fig. 2).

Figure 2: An almost fully equipped spare PC is standing next to ANTLIA, which can be used as a backup.

In order to prevent any confusion, all peripherals like keyboard and screen (see Fig. 3) are also held in white colour.
Shutdown the PCs first before replacing them:

- Log in as root.
- Type `halt`

  or
- Type `shutdown -t now`
- Turn off the PCs.

Then take a closer look at rear side of the TCS rack (see Fig. 4). You will notice the PCI Board with a 62 pin connector assembled to ANTLIA. Be sure to remove this connector first. Either

Figure 3: Both the screens for ANTLIA and its backup PC are located on top of the TCS rack. Note that the error messages on the white screen are because of an intentionally lacking ethernet connection while the spare PC is not in use.

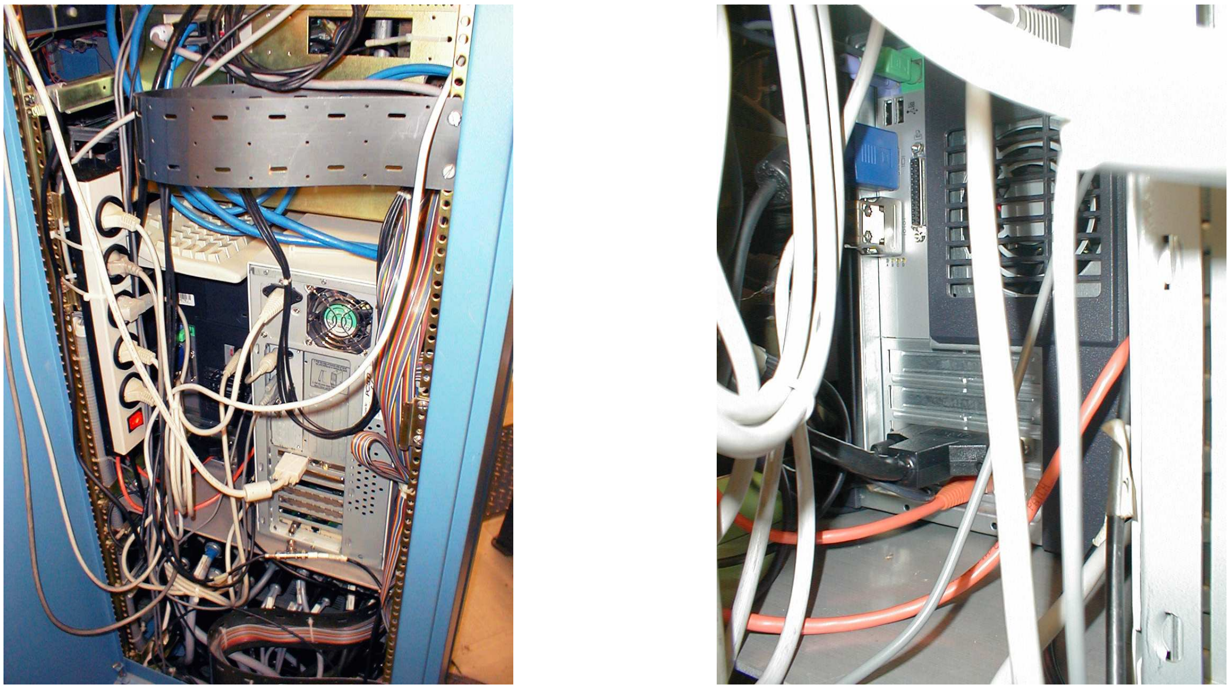

Figure 4: Rear view of the TCS rack. The left image shows backside of both the PCs, while the right image displays a close-up of ANTLIA with the PCI board connected to PYXIS.

you take ANTLIA's board and install it into the spare PC or you take the spare board (see Sect.) from Michel's office. Any slot of the replacement PC should be fine. Reconnect the 62 pin plug.

Furthermore you will see that the spare PC, is disconnected from the control network. Connect it with the dangling BNC cable. The ethernet card should already be configured to be recognised as ANTLIA. But do not forget to disconnect the original ANTLIA. Here you will find an RJ45 connector. Carry out the following steps afterwards:

- Switch on ANTLIA (Linux PC) and wait for the BIOS boot messages.
- Switch on PYXIS (VME).
- Put the key back to **remote**.
- Go back to the control room.
- Open a terminal window to PYXIS. You may have to open a local shell and telnet to PYXIS and login as **michel** with the password **haaa**.
- Type `startTCS` and wait 15 seconds.
- Close the PYXIS terminal.
- Click on the [TCS] button.
- Login as **tcs**.
- Type the following commands:

```
StartTCS
display
```

- Re-initialise the encoders.

Replacement of the PCI Board on ANTLIA

This section describes the installation of a new PCI board, which on the PC side is responsible for the command and data transfer between the VME system PYXIS and the PC ANTLIA. You might use the spare board either if the original board is damaged or you want to switch to the backup PC without removing the PCI board from the original ANTLIA. The new PCI board is stored within the small white box (see Fig. 1) together with the PCI–VME bridge board. However, the PCI board can be easily recognised, since it is the smaller one with a 62 pin socket (see Fig. 5).

Just like any other computer board, it can be assembled or replaced easily. Disconnect the 62 pin plug from the original PCI board, replace it by the new board and reconnect the 62 pin plug. The choice of the slot is not important. Carry out the following steps afterwards:

- Switch on ANTLIA (Linux PC) and wait for the BIOS boot messages.
- Switch on PYXIS (VME).

Figure 5: This is the spare PCI board, which replaces the original part installed on ANTLIA.

- Put the key back to **remote**.
- Go back to the control room.
- Open a terminal window to PYXIS. You may have to open a local shell and telnet to PYXIS and login as **michel** with the password **haaa**.
- Type `startTCS` and wait 15 seconds.
- Close the PYXIS terminal.
- Click on the TCS button.
- Login as **tcs**.
- Type the following commands:

```
StartTCS
display
```

- Re-initialise the encoders.

Replacement of the PCI–VME Bridge Board on PYXIS

The PCI–VME bridge board (middle board in Fig. 6) is responsible for the data and command transfer between the VME system PYXIS and the Linux PC ANTLIA. It is connected to the PCI

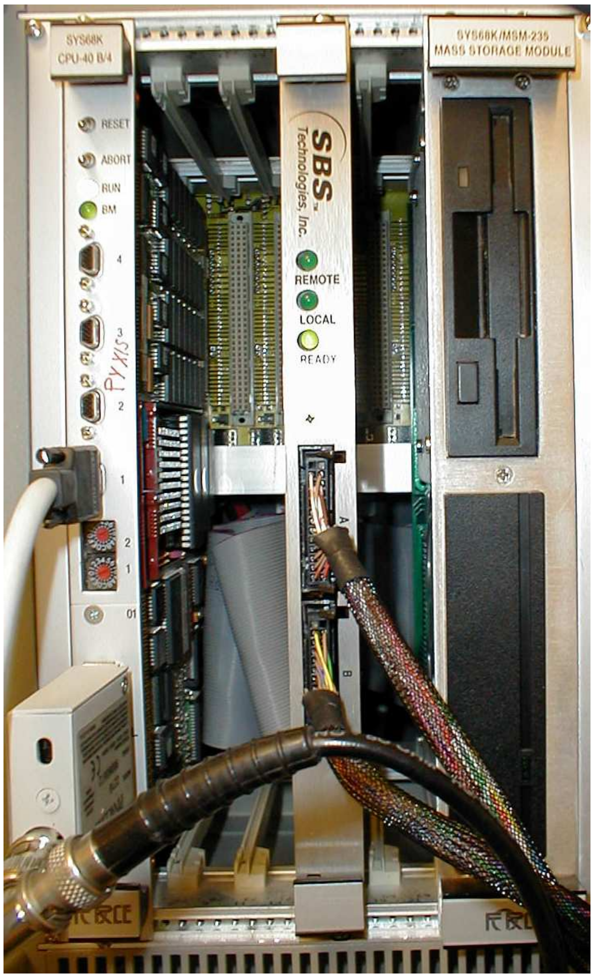

Figure 6: Close up view on the PYXIS main boards comprising from left to right the CPU board, the PCI–VME bridge board and the data storage assembly including the hard-disk drive.

board installed to ANTLIA via two 26 pin plugs, which merge into a 62 pin connector at the other end of the cable. A spare board is stored in the small white box (see Fig. 1) in Michel's office.
After switching off the VME system PYXIS, replace the present board following these steps:

- Slide aside the fixation clamps from the two 26 pin connectors.
- Carefully remove the connectors. Memorise their correct position.
- Loosen the two fixation screws at the top and the bottom of the board.
- Carefully pull out the board by flipping the top and bottom handles.
- Vigilantly compare both boards for the jumper settings and modify them on the spare board if needed.

Figure 7: This is the spare PCI–VME bridge board, which replaces the original part installed on PYXIS.

- Insert the board into the crate and slide it back.
- Fasten the fixation screws.
- Reinstall the 26 pin connectors.
- Switch on ANTLIA (Linux PC) and wait for the BIOS boot messages.
- Switch on PYXIS (VME).
- Put the key back to **remote**.
- Go back to the control room.
- Open a terminal window to PYXIS. You may have to open a local shell and telnet to PYXIS and login as **michel** with the password **haaa**.
- Type `startTCS` and wait 15 seconds.
- Close the PYXIS terminal.
- Click on the $\boxed{\text{TCS}}$ button.
- Login as **tcs**.
- Type the following commands:

```
StartTCS
display
```

- Re-initialise the encoders.

Replacement of the CPU Board on PYXIS

Two reasons may apply for replacing the CPU board on the VME system. Firstly, the old TCS is going to be re-installed (see Sect.), or, secondly, the board is damaged. The CPU board is the on the left in Fig. 6. A prepared replacement board is installed on FORNAX in the lab (see Fig. 8).

Figure 8: A spare CPU board for PYXIS has been installed on FORNAX in the lab.

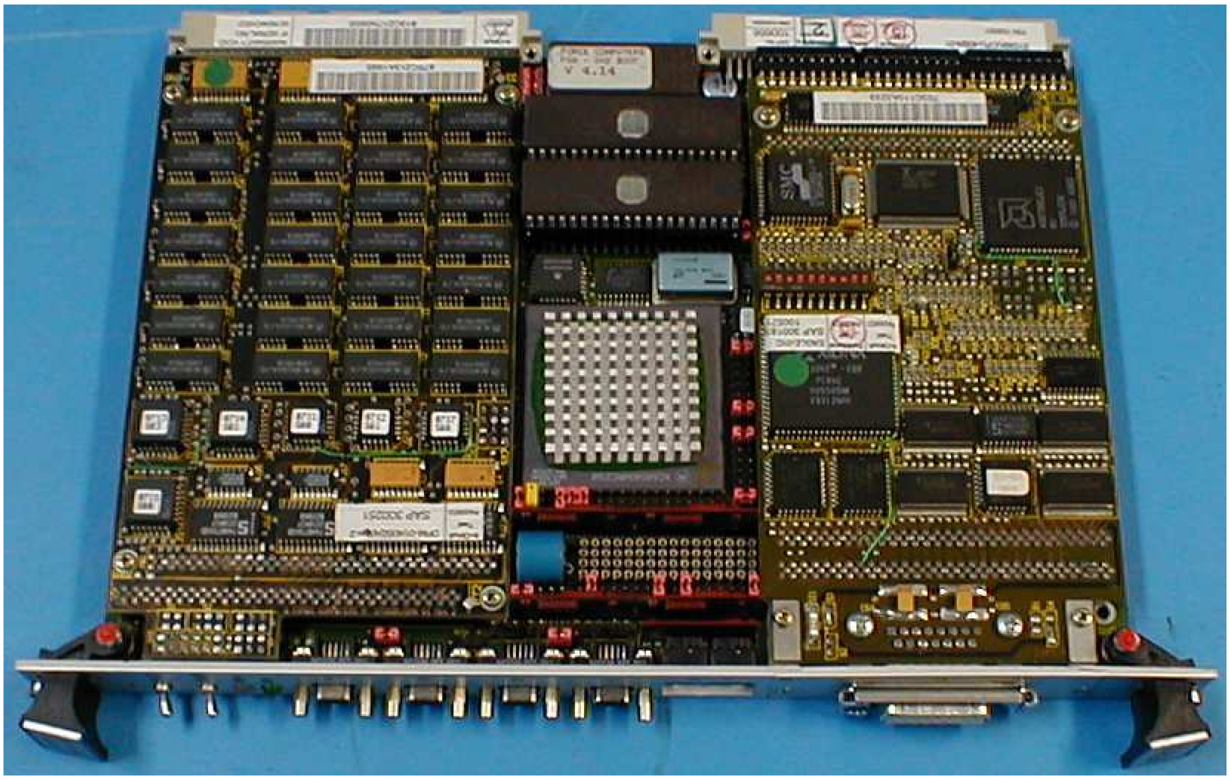

Figure 9: This is the spare CPU board after disassembling it from FORNAX. It is configured to act as a fully functional replacement of the original CPU board on PYXIS. The operating system resides on the two EPROMS in the upper central part of the board above the CPU.

In order to exchange the CPU boards carry out the following steps:

- Remove the small black serial port connector. Memorise the socket.
- Dismount the ethernet transceiver. There is a metal catch.
- Loosen the two fixation screws.
- Carefully pull out the CPU board by flipping the top and bottom handles. **CAUTION! There is a grey ribbon cable attached to the lower rear connector at the back of the board.**
- Gently pull out the plug with the grey ribbon cable.
- Take the new CPU board and connect the grey ribbon cable to it.
- Insert the board into the crate and slide it back.
- Fasten the fixation screws.
- Connect the small black serial port plug to the socket as before.

- Attach the ethernet transceiver. Remember the catch.
- Switch on ANTLIA (Linux PC) and wait for the BIOS boot messages.
- Switch on PYXIS (VME).
- Put the key back to **remote**.
- Go back to the control room.
- Open a terminal window to PYXIS. You may have to open a local shell and telnet to PYXIS and login as **michel** with the password **haaa**.
- Type `startTCS` and wait 15 seconds.
- Close the PYXIS terminal.
- Click on the $\boxed{\text{TCS}}$ button.
- Login as **tcs**.
- Type the following commands:

```
StartTCS
display
```

- Re-initialise the encoders.

Installation of the Old TCS

If for some reason the TCS behaves strangely, it may be desired to re-install the old TCS, which is running only on the VME without the Linux PC. The old system is burnt onto two EPROMS, which are held in a small box in Michel's office (see Fig. 10).

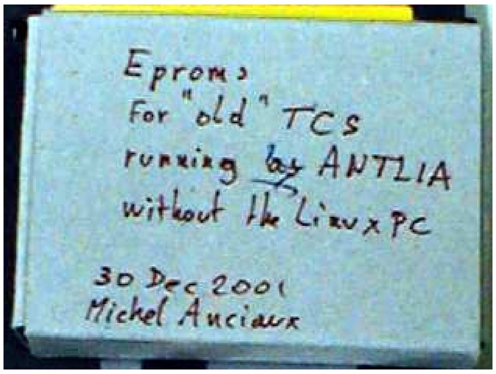

Figure 10: The old TCS is located on two EPROMS, which are stored in this small box.

The two EPROMS on the spare board (see Fig. 9) have to be replaced by these. This must be done with utmost care, preventing the damage of one of the legs of the microchips. The re-installation of the old TCS is then almost similar to the replacement of the CPU board as described in Sect. .

- Remove the small black serial port connector on the CPU board. Memorise the socket.
- Dismount the ethernet transceiver. There is a metal catch.
- Loosen the two fixation screws.
- Carefully pull out the CPU board by flipping the top and bottom handles. **CAUTION! There is a grey ribbon cable attached to the lower rear connector at the back of the board.**
- Gently pull out the plug with the grey ribbon cable.
- Take the CPU board with the old TCS and connect the grey ribbon cable to it.
- Insert the board into the crate and slide it back.
- Fasten the fixation screws.
- Connect the small black serial port plug to the socket as before.
- Attach the ethernet transceiver. Remember the catch.
- Switch on the VME system, which now is ANTLIA. PYXIS does not exist with the old TCS.
- Put the key back to **remote**.
- Go back to the control room.
- Click on the $\boxed{\text{TCS}}$ button.
- Login as **michel** with the password **haaa**.
- Type `startTCS.old` and wait 15 seconds.
- Type `display`
- Re-initialise the encoders.