

# EISA Settings

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- ▶ **This Data Sheet covers the procedure for setting up the motherboard EISA system. For configuration details of specific plug-in EISA cards, please see the Data Sheets for those cards.**
- ▶ **For details of motherboard CMOS settings, please see the 'CMOS Settings' Data Sheet and the specific Data Sheet for your motherboard.**

## 1 Overview of the EISA Bus

EISA is an acronym for Extended Industry Standard Architecture. It is a development of the earlier ISA bus used to connect plug-in cards and other peripherals to 'AT-compatible' motherboards. The expansion slot connectors for EISA are twice the depth of the older, ISA edge connectors, with two sets of contacts, one above the other. The upper set connects to the original ISA bus (which exists as part of the EISA architecture) and both upper and lower sets together provide the connections to the EISA bus. This means that both EISA and the older ISA cards can be used in any EISA slot.

EISA provides a 32-bit wide data bus and allows up to 4Gb of RAM to be directly addressed via the bus address lines (ISA is 16-bit and can only directly address 16Mb, addressing beyond this being slower). It also has a high-speed burst mode for transfer allowing rates up to 33Mb/sec (ISA can only cope with speeds up to 8Mb/sec).

## 2 The EISA Configuration Utility

Because EISA is an extension of the original specification for IBM-compatible PC motherboards, additional configuration is required to set up the extended functions of the interface and control circuitry. This configuration is achieved by running a program called the EISA Configuration Utility (ECU). Using this utility, I/O ports, ROM addresses, memory control, IRQs and DMA lines can all be set up for the appropriate motherboard hardware. The ECU program is also used to configure any EISA card plugged into an expansion slot. Note that older, ISA cards do not require any EISA settings and are in fact 'invisible' to the EISA system and ECU program.

The ECU program is a DOS utility provided by the manufacturers of the motherboard. Configuration programs for different motherboards have slightly different menus and options but they are basically very similar in operation. Each type of EISA card which is to be used (including the motherboard itself) needs a config file which is usually in the ECU directory but may be on a floppy disk. At the end of this

data sheet is a list of all the EISA cards currently in use and their respective configuration files.

Once the EISA settings have been changed they are stored in non-volatile RAM on the motherboard. They are also stored in a special backup system configuration file in the ECU directory. This file is used by the system to detect any unexpected change in the motherboard settings.

The ECU program may also be run from floppy, which may be necessary if, for example, the settings for the SCSI card had become changed so that the card could no longer access any SCSI drives and therefore the machine couldn't boot from the C:drive (or run the ECU!).

### **3 Running the ECU Program**

The ECU program is normally run from the C:drive, from the ECU directory. If the machine will not boot from the C:drive, then it must be booted from a floppy disk. If, once booted from the floppy, the C:drive cannot be accessed, this is probably because the SCSI card has not been set up yet and the ECU program must be run from floppy.

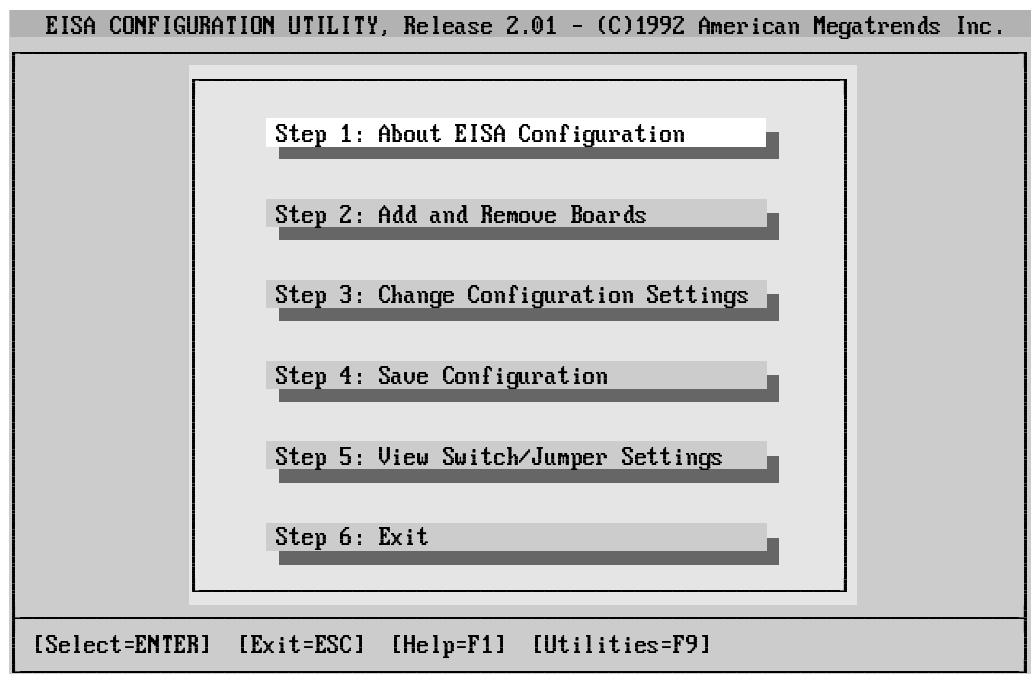
As mentioned above, different motherboards have different ECU programs. The following sections cover each of the different types of EISA motherboard currently in use.

## 4 AMI Enterprise III and IV motherboards

To run the ECU program from the C:drive, at the C:\LWORKS> prompt on the Data monitor type the following:

```
C:\LWORKS> CD\ECU <Enter>
C:\ECU> CFG <Enter>
```

You should now see a screen similar to that shown *in Fig. 1- AMI ECU Program Main Menu*, below. Press <F1> at any time to display a Help screen about the selected topic.



**Fig. 1- AMI ECU Program Main Menu**

Before any EISA settings are changed, the EISA system must first be told the amount and configuration of RAM installed in the motherboard. The amount of RAM will not normally change unless you have added (or removed) some. However, each time the ECU program is run the RAM setting should be checked as it will usually revert back to a default value when the configuration of EISA cards is changed.

### 4.1 Procedure

When you first switch on the machine, note the amount of memory checked (1Kb = 1024 bytes). Run the ECU program from the C:drive (see above).

1. Use the ↓ cursor key to move to 'Step 3: Change Configuration Settings' and press the <Enter> key. The display will usually automatically show the RAM configuration screen, shown in *Fig. 2*, below.

If a list of EISA slots appears instead (see *Fig. 3 List of EISA Slots*), select the top line, "System" (which is the motherboard) and press <Enter>. Then select "System Board (Extended) Memory" and again press <Enter>; the RAM Configuration screen should now be displayed.

System Board Memory

Select the amount of memory installed on the system board.

Total	Bank 0	Bank 1	Bank 2
( )16 MB or less memory installed			
( )18 MB	256Kx9	256Kx9	4Mx9
( )20 MB	1Mx9	4Mx9	Empty
( )24 MB	1Mx9	1Mx9	4Mx9
( *)32 MB	4Mx9	4Mx9	Empty
( )36 MB	1Mx9	4Mx9	4Mx9
( )40 MB	1Mx9	1Mx9	4Mx9
( )48 MB	4Mx9	4Mx9	4Mx9
( )64 MB	4Mx9	4Mx9	4Mx9
( )64 MB	16Mx9	Empty	Empty
( )128 MB	16Mx9	16Mx9	Empty
( )192 MB	16Mx9	16Mx9	16Mx9
( )256 MB	16Mx9	16Mx9	16Mx9

[Ok=ENTER]

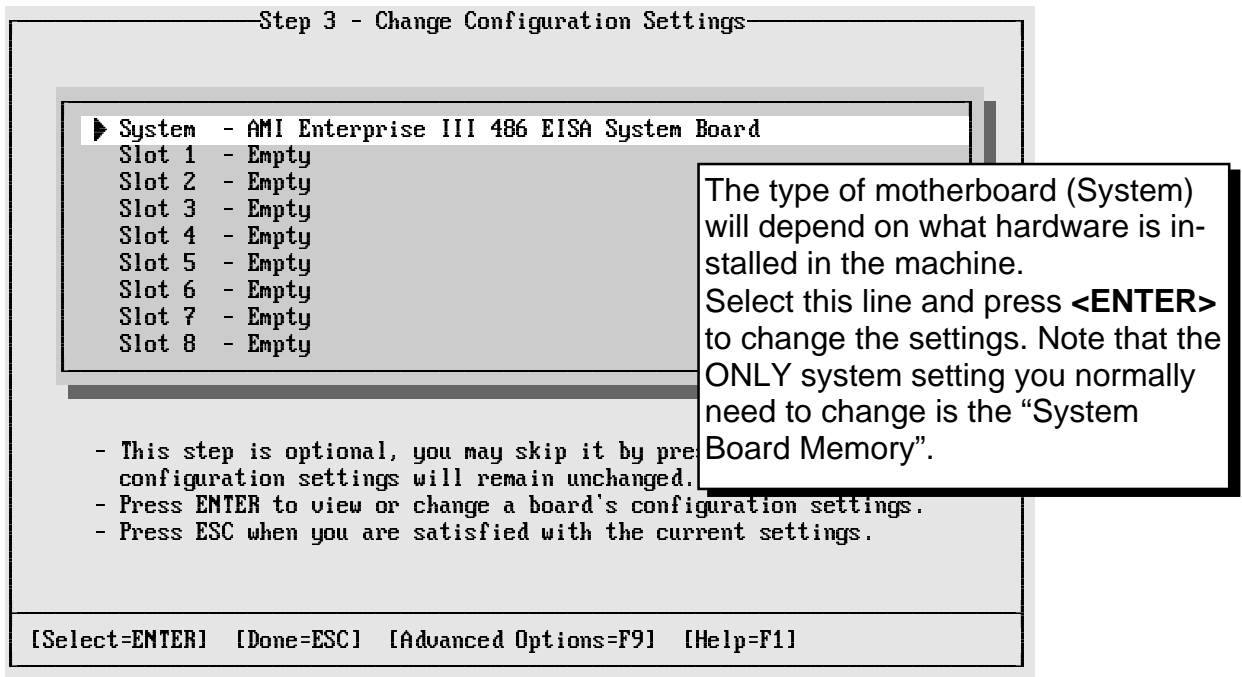
Select the correct RAM configuration for you machine. The total amount of memory is shown during the RAM test at bootup. For most configurations there is only one option in this list, however, you may also need to know the size of the SIMMs fitted (usually either 16Mb or 4Mb are used). This will depend on the type of motherboard.

**Fig. 2 RAM Configuration**

2. Move the cursor to the row showing the amount of RAM you have fitted (as noted during the self-test at switch on), for example, if you have 32768Kb then select "32M Total". Press <Enter> to select this option.

The adapter list screen showing all the EISA boards fitted will be displayed with the Motherboard highlighted, see *Fig. 3 List of EISA Slots*.

3. Press the <Esc> key to return to the opening menu.



**Fig. 3 List of EISA Slots**

- Use the ↓ cursor key to highlight "Step 4 : Save Configuration" and press <Enter>.

The EISA system is now set to access the correct amount of RAM.

- ▶ If you do not want to set up any plug-in EISA cards, select "Step 6" to exit from the utility. The machine should now be rebooted.

#### 4.2 Configuring a Plug-in EISA Card

It may be necessary to set up a plug in card if, for example, a new one has been installed or one taken out. Firstly, the EISA system must know what the card is and which slot it is in, and secondly the card itself must be configured. Both of these setups are achieved using the ECU program.

- ▶ Note that only EISA cards need to be configured with this utility. ISA cards must be set up using jumpers, switches and their own setup programs as appropriate.

#### 4.3 Procedure

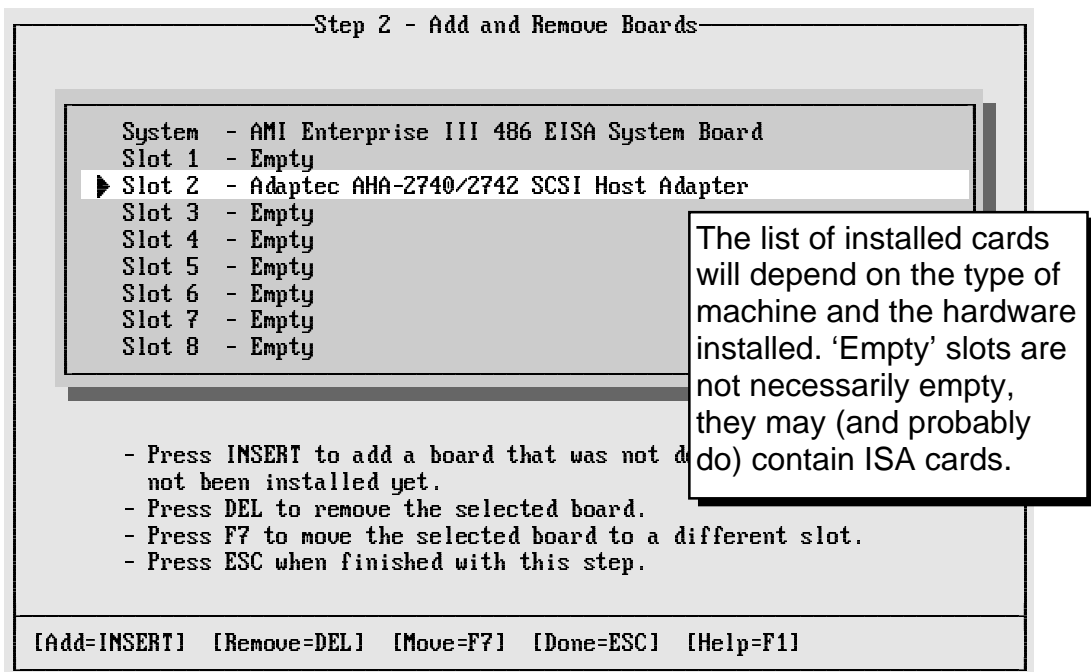
- Run the ECU program from the C:drive as described above.

If the machine will not boot from the C:drive because the primary SCSI adapter has not yet been configured (this is only likely if you have to replace this card), boot from a Lightworks Boot Floppy containing the ECU program.

- Update the RAM setting, as described above.

- ▶ If you are changing the settings on a card that is already installed, go to *step 12*, below. If you have installed or removed a card, or the position of cards has been changed, then you must ensure that the ECU program correctly reflects the configuration of EISA slots: Continue from *step 3*, below.
- 3. Once you are back at the main menu (see *Fig. 1*), use the ↓ cursor key to move to 'Step 2: Add and Remove Boards' and press <Enter>.
- 4. A list of all the EISA slots will be displayed, similar to that shown in *Fig. 4*, below. Check to make sure that it is correct (you will have to look inside the main crate to see what boards you've got).

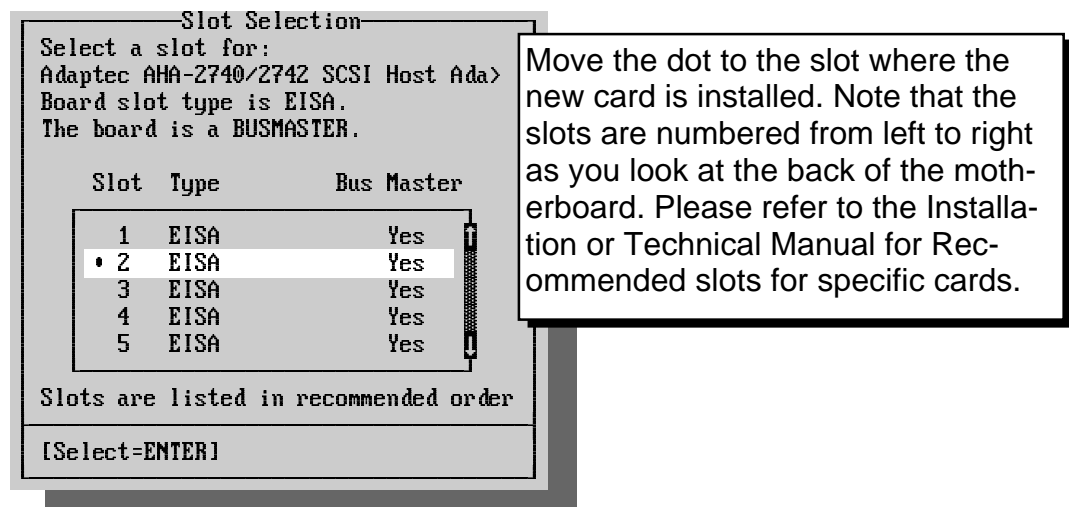
The list displayed is based on the default configuration file. Also, if any new cards have been installed since this file was last updated they should be automatically detected and added to the list, however, some cards are not detected and must be added manually.



**Fig. 4 List of Installed EISA Cards**

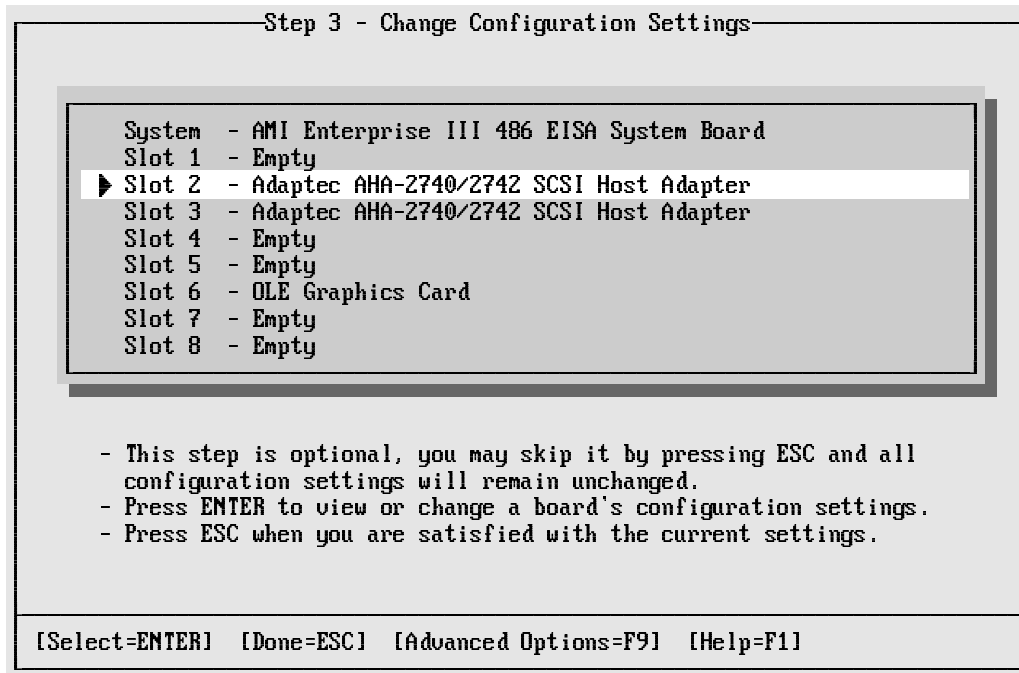
- 5. To add a card that was not detected press the <Insert> key. (It doesn't matter where the highlight is positioned in the list of slots).
- 6. A list of all the available configuration files (.CNF files in the ECU directory) will appear. Select the appropriate file and press <Enter>. See the *List of EISA Cards* and their configuration files at the end of this data sheet.
- ▶ Note that some of these configuration files support more than one type of card (the !ADP7771.CFG file, for example, is used to set up ANY of the AHA-2740 family of SCSI adapters) and a sub-menu box will appear with the different cards supported. Make sure that you select the correct type of card from this sub-menu.

7. Once the correct card's configuration file has been selected you will be asked which slot it is installed in (see *Fig. 5 EISA Slot Selection*, below). Select the slot, and the card should now appear in the list.
8. Repeat this process to add further cards if necessary.
9. If any cards appear in the list which are not actually installed in the motherboard, their entries can be removed by highlighting them and pressing the <Del> key.
10. Once the list correctly reflects the installed cards press the <Esc> key to return to the main ECU menu.



***Fig. 5 EISA Slot Selection***

12. The configuration settings can now be changed for any of the EISA cards.
13. Use the ↓ cursor key to move to 'Step 3: Change Configuration Settings' and press the <Enter> key.
14. The list of EISA cards will be displayed (see *Fig. 6*, below).
15. Move the highlight to the card you want to configure and press <Enter>.



**Fig. 6 A typical list of EISA Cards**

A list of all the settings for that card will be displayed. These settings should be set up according to the type of machine and the application.

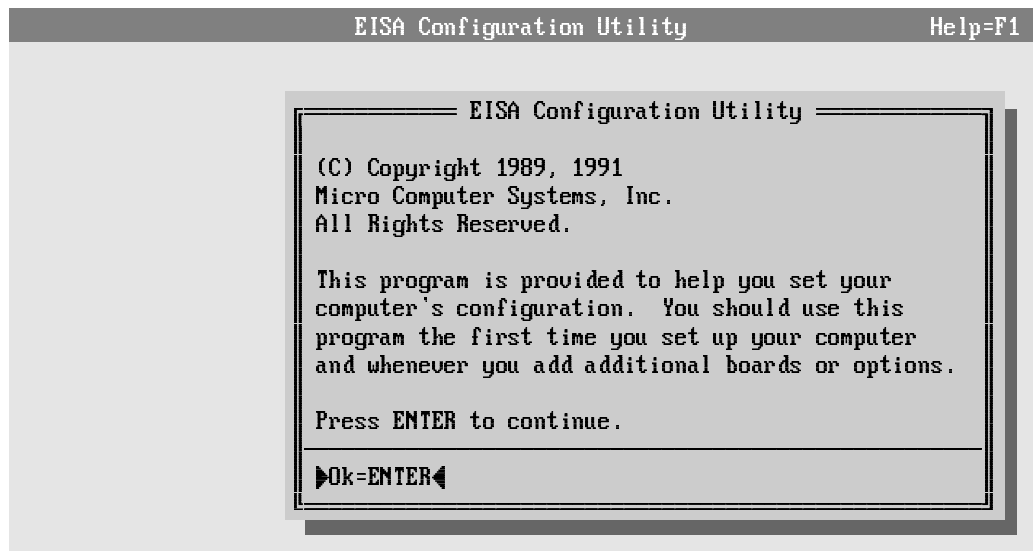
- ▶ Please see the separate Data Sheets for details of setting up specific plug-in EISA cards.
16. Once all the card settings have been altered, return to the Main ECU Menu by pressing <Esc>, as directed on the screen (*see Fig. 1- AMI ECU Program Main Menu*, above)
  17. Move the highlighted bar to 'Step 4' and save the settings.
  18. Once the settings have been saved to the motherboard EISA CMOS memory and also into a file in the ECU directory, select 'Step 6' and exit back to a DOS prompt.
- ▶ The machine must now be rebooted so that the new settings can take effect.

## 5 DTI ESP3520 Pentium Motherboards

To run the ECU program from the C:drive, at the C:\LWORKS> prompt on the Data monitor type the following:

```
C:\LWORKS> CD\ECU <Enter>
C:\ECU> CF <Enter>
```

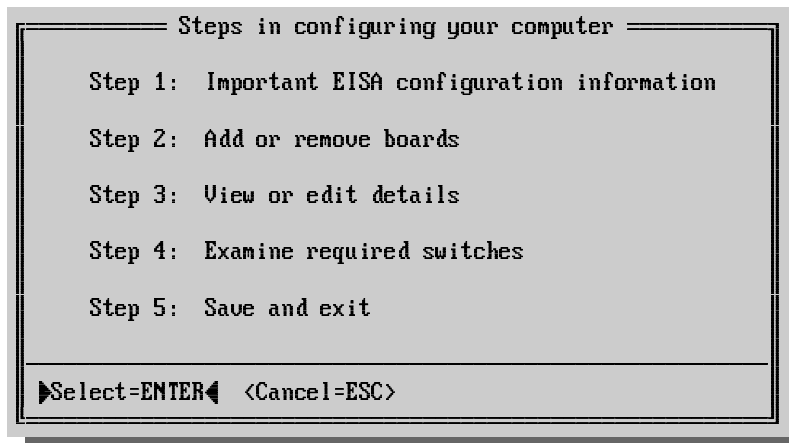
After an initial opening screen, you should see a screen similar to that shown below in *Fig. 7 - DTI ECU Startup Screen*



***Fig. 7 - DTI ECU Startup Screen***

When you press <Enter>, you get a warning that incorrect settings of the EISA system may prevent the machine from working properly and may even prevent it from booting. If this does happen, you may need a special boot floppy containing the ECU program in order to correct the EISA configuration.

You may be asked which configuration file you wish to use - select the 'ESP3520 SMP Pentium' and press <Enter>. You will then see the ECU Main Menu (*see Fig. 8, below*).



**Fig. 8 - ECU Main Menu (DTI Motherboards)**

## 5.1 Configuring the EISA System

From the Main Menu it is possible to set up the entire EISA system. The menu is arranged in 'Steps' in a logical order. 'Step 1' can be selected to give general information about EISA configuration.

To set up the EISA system, the first thing we must do is make sure that all the slots indicate the correct boards (including the motherboard). Once this list is accurate, we can set up each of the individual boards (in any order). Finally, the settings must be saved and the machine rebooted to install the new settings.

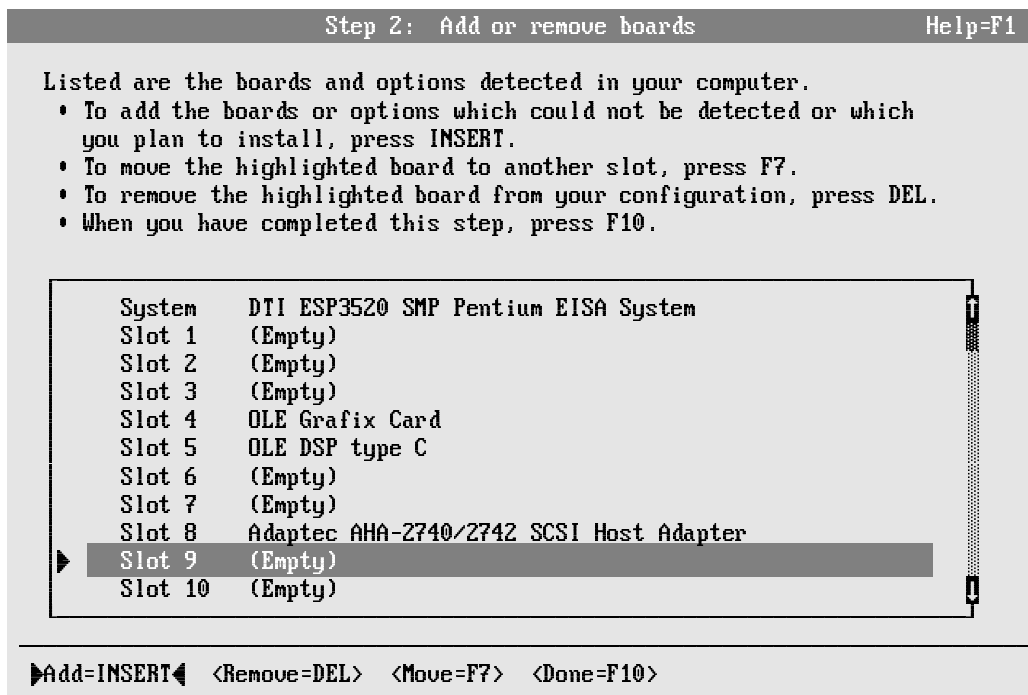
- ▶ Note that only EISA cards need to be configured with this utility. ISA cards must be set up using jumpers, switches and their own setup programs as appropriate.

## 5.2 Procedure

1. Run the ECU program from the C:drive as described above.

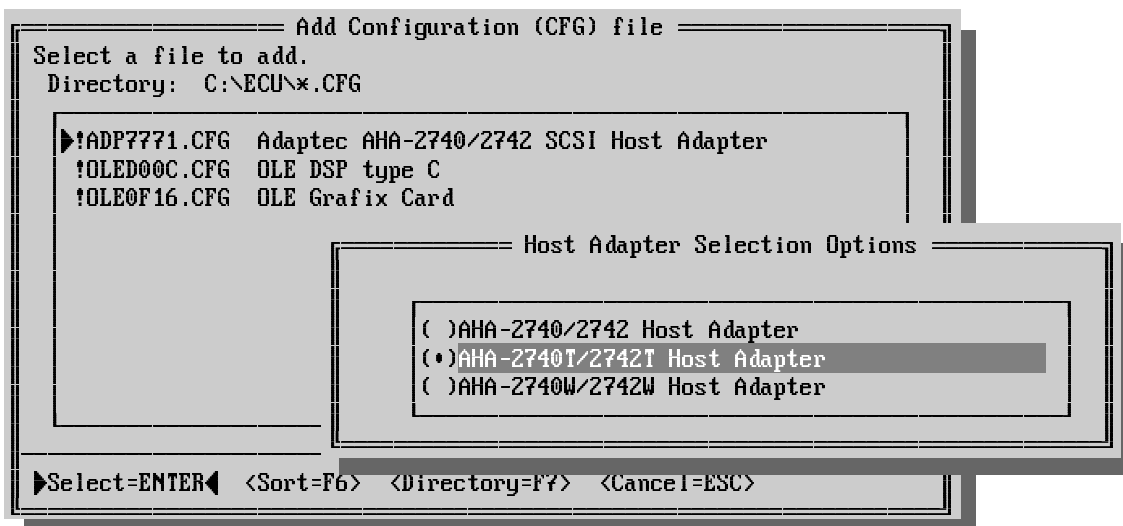
If the machine will not boot from the C:drive because the primary SCSI adapter has not yet been configured (this is only likely if you have to replace this card), boot from a Lightworks Boot Floppy containing the ECU program for this motherboard.

2. From the main menu (*see Fig. 8*), use the ↓ cursor key to move to 'Step 2: Add or remove Boards' and press <Enter>.
3. A list of all the EISA slots will be displayed, similar to that shown in *Fig. 9*, below. Some EISA cards are automatically detected by the system, others are not. Check to make sure that this list is correct (you will probably have to look inside the Main Crate to see what boards you've got).
  - ▶ Note that ISA cards will usually appear as '(Empty)' in the list as they are not controlled by the EISA system.
4. To add a card that was not detected press the <Insert> key. (It doesn't matter where the highlight is in the list of slots).

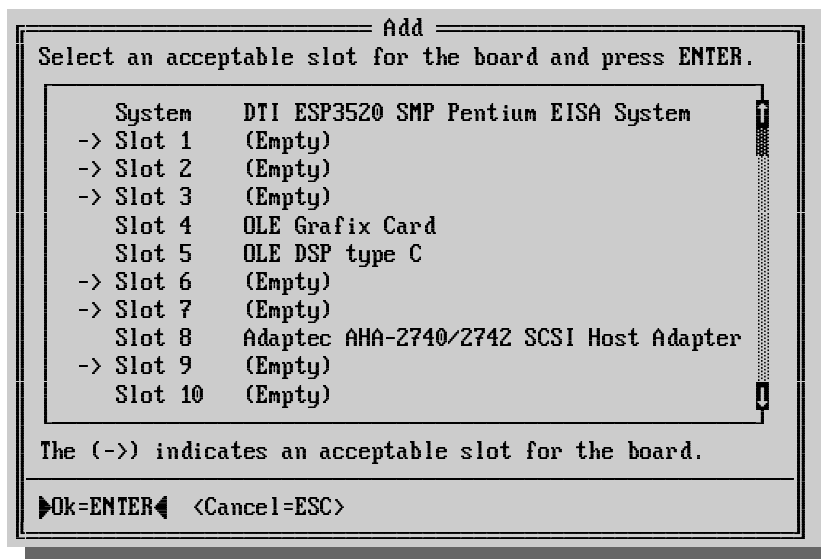


**Fig. 9 - List of EISA Slots**

5. You may now be asked the location of the configuration files. Normally they are in the ECU directory on the C:drive, so just press **<Enter>**.
- ▶ Note that some of these configuration files support more than one type of card (the !ADP7771.CFG file, for example, is used to set up ANY of the AHA-2740 family of SCSI adapters) and a sub-menu box will appear with the different cards supported. Make sure that you select the correct type of card from this sub-menu.



6. Once the correct card's configuration file has been selected you will be asked which slot it is installed in (see Fig. 10 - Slots Available for EISA Cards, below).



**Fig. 10 - Slots Available for EISA Cards**

7. The card should now appear in the list of Fig. 9
8. Repeat this process to add further cards if necessary.
9. If any cards appear in the list which are not actually installed in the motherboard, their entries can be removed by highlighting them and pressing the **<Del>** key.
10. Once the list is correct, press **<F10>** to return to the Main Menu.
- ▶ The Settings for the motherboard and each EISA card can now be checked and changed if necessary:
11. Select 'Step 3 - View or edit details' from the Main Menu (see Fig. 8, above) and press **<Enter>**. A complete list will be displayed of all the installed EISA components (including the motherboard itself), as shown in Fig. 11, below.
12. First check that the 'System' section is correct according to the Data Sheet for the motherboard and the machine it is used in.
- ▶ Note, the main memory size must match the amount of RAM in the machine. Press **<F6>** to set up the memory options.
13. Each of the plug-in EISA cards in the subsequent slots can now be set up correctly for the machine.
- ▶ Please see the appropriate Data Sheets for settings of different plug-in EISA cards.

```

Step 3: View or edit details Help=F1

Press ↑ and ↓ to see all information.
• To edit the functions of the highlighted item, press ENTER.
• To edit its resources (IRQs, DMAs, I/O ports, or memory), press F6.
• When you have finished this step, press F10.

System - DTI ESP3520 SMP Pentium EISA System Added
System Board Memory Functions
Base Memory..... 640k
System BIOS
Cacheability..... Non-Cacheable
Size..... 128K at E0000h - FFFFFh
Extended Memory from 1M-256M..... Press F6 to set memory size.
Memory Space Gap Enable
Memory Gap Start..... 1 Meg
Memory Gap Size..... Disabled

Slot 4 - OLE Grafix Card
Grafix Card Resources
DMA Channel Selection..... DMA Channel 6

Slot 5 - OLE DSP type C
DSP card resource
DMA Channel Selection..... DMA Channel 7

Slot 8 - Adaptec AHA-2740/2742 SCSI Host Adapter Added
Host Adapter Interface Definitions
Interrupt Level..... IRQ 11 LEVEL
Bus Release Time..... 60 BCLKS
Data FIFO Threshold..... 100%
Host Adapter BIOS Base Address..... D8000H

SCSI Channel A Configuration
Host Adapter SCSI ID..... 7
SCSI Bus Parity Check..... Enabled
SCSI Selection Timeout..... 256 milliseconds
SCSI Bus Reset at Power-on..... Enabled
SCSI Bus Termination..... Enabled

SCSI Channel B Configuration
Host Adapter SCSI ID..... 7
SCSI Bus Parity Check..... Enabled
SCSI Selection Timeout..... 256 milliseconds
SCSI Bus Reset at Power-on..... Enabled
SCSI Bus Termination..... Enabled
Primary Channel Selection..... A
BIOS and Device configuration..... Press <Enter> to configure
Utilities..... Press <Enter> to access

More: PgUp/PgDn
▶Edit=ENTER◀ <Edit Resources=F6> <Advanced=F7> <Done=F10>
    
```

This scrolling list contains the settings for all the installed EISA components. At the top of the list is the motherboard or 'System'. The actual settings shown will depend on the type of machine.

► Note that in Heavyworks and Newsworks machines, the Graphics Card and the DSP482 audio card (if fitted) only have fixed DMA Channel settings.

**Fig. 11 - All EISA Settings of DTI motherboard**

- Once all the settings are correct, they must be saved:
1. Return to the Main Menu by pressing <F10>.
  2. Select 'Step 5 - Save and exit' and press <Enter>.
  3. After a final confirmation message, the system will reboot to install the new settings for the EISA system.

## 6 Plug-in EISA Cards

Different Lightworks products will have different types of plug-in cards depending on the type and age of the system.

Below is a list of all the EISA cards currently in use in different machine with the current versions of their configuration files.

**Table 1 - List of all EISA Cards**

Card	Machine(s) Used In	Config File	Date
<b>AMI Enterprise III (motherboard)*</b>	Early Lightworks Turbo, Early Heavyworks, Some Newsworks	!AMI68B1.CFG	01/02/93
<b>AMI Enterprise IV (Motherboard)*</b>	Lightworks Turbo	!AMI87A1.CFG	21/05/93
<b>DTI ESP3520 (Motherboard)*</b>	Heavyworks, Newsworks	!DTI3520.CFG	02/04/96
<b>AHA-2742AT (SCSI Controller)</b>	Lightworks Turbo, Heavyworks, Newsworks	!ADP7771.CFG	30/11/93 or 17/08/94
<b>'Multicam' Graphics Card</b>	Heavyworks, Newsworks	!OLE0F16.CFG	02/11/93
<b>DSP482 (Audio DSP)</b>	Heavyworks, Newsworks	!OLED00C.CFG	05/04/95

\* The type of motherboard will determine the ECU program used