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Contents

Introduction	2
Anti-static precautions	3
Power down procedure	4
Power up procedure	4
Preparing the system unit	5
Removing the side panel	6
Removing the drive cradle	7
Adapter cards	9
Upgrading memory	11
Processor upgrades	18
Supplier upgrades	25

Introduction

This guide contains instructions on installing expansion cards, extra memory and processor upgrades in your computer. This document should be your only source of information when installing any of these.

You should read this document before purchasing extra memory or a processor upgrade. If, having read the relevant instructions, you are not confident about installing the upgrade, you may wish to have your supplier or service organization install it for you.

Before you start installing an upgrade you should be thoroughly familiar with all the relevant instructions in this guide.

Warning

Never carry out any work on the equipment with power applied. Always switch off at the mains, isolate the batteries and remove the power lead from the equipment before starting work.

At the rear of this guide is some information about CPU module and drive upgrades. These options are not user installable items, only competent service personnel may install them.

Anti-static precautions

All electronic components and equipments are sensitive to static electricity. Even small electrostatic discharges can render components useless or severely shorten their working life, therefore you should always take preventive measures.

No work should be carried out on any item unless it is in a Special Handling Area (SHA) as defined in BS CECC 00015:Part 1. In general this involves:

- * a common earth point
- * an earthed bench or bench mat
- * an earthed wrist strap

Further information on anti-static precautions is given in your Owner's Handbook, if required.

Note

An anti-static earthing point is provided on the rear panel.

Power down procedure

If LOC Technology is in use, a user of appropriate authority must be logged on before the system can be powered down.

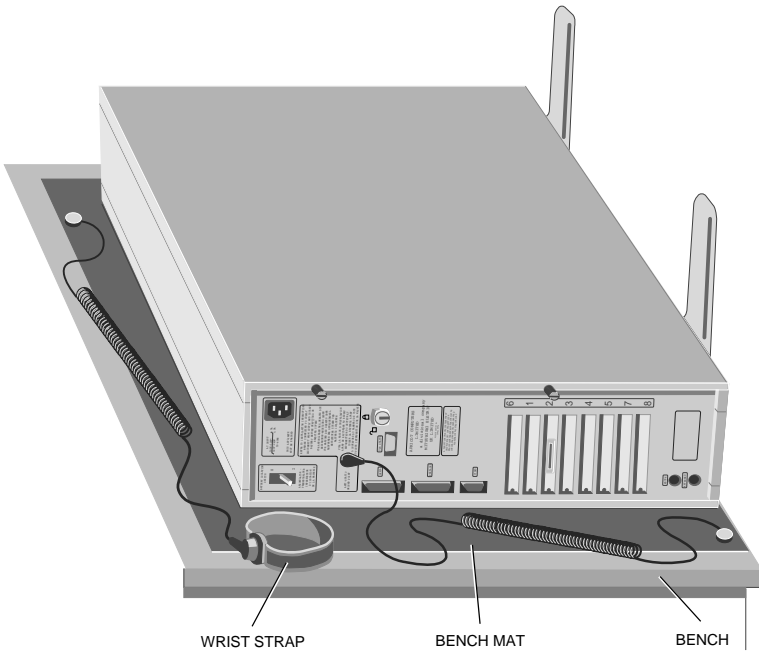
1. Push the **POWER** button and hold it until the system powers down.
2. Isolate the UPS batteries by setting the Battery Power switch to the “0” position.
3. Unplug the mains power supply.

Power up procedure

1. Ensure that the Battery Power switch is in the “0” position.
2. Plug in the mains power supply.
4. Set the Battery Power switch to the “1” position.
5. Push the **POWER** button.
6. Perform any required power-on security procedure.

Preparing the system unit

Before any add-ons can be installed, the system unit must be powered down and disconnected from the power supply, as described earlier. It must also be resting flat on the right side panel on a suitable work surface with the appropriate antistatic measures taken. As shown below:

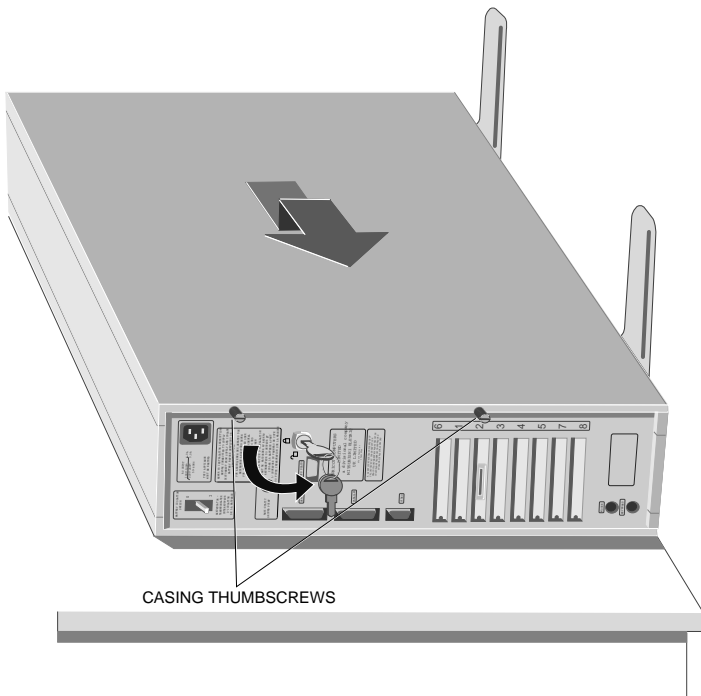


In the instructions that follow, it is assumed that the system unit is resting on its side panel and that the reader is viewing the system unit from the front, with the drive cradle door to the right, as shown above.

Removing the side panel

To install any of the add-ons described here it is necessary to obtain access to the motherboard. This requires the removal of the left side panel as described below:

1. Prepare the system unit as described above.
2. Unlock the security lock on the rear panel.
3. Unscrew the two thumbscrews.

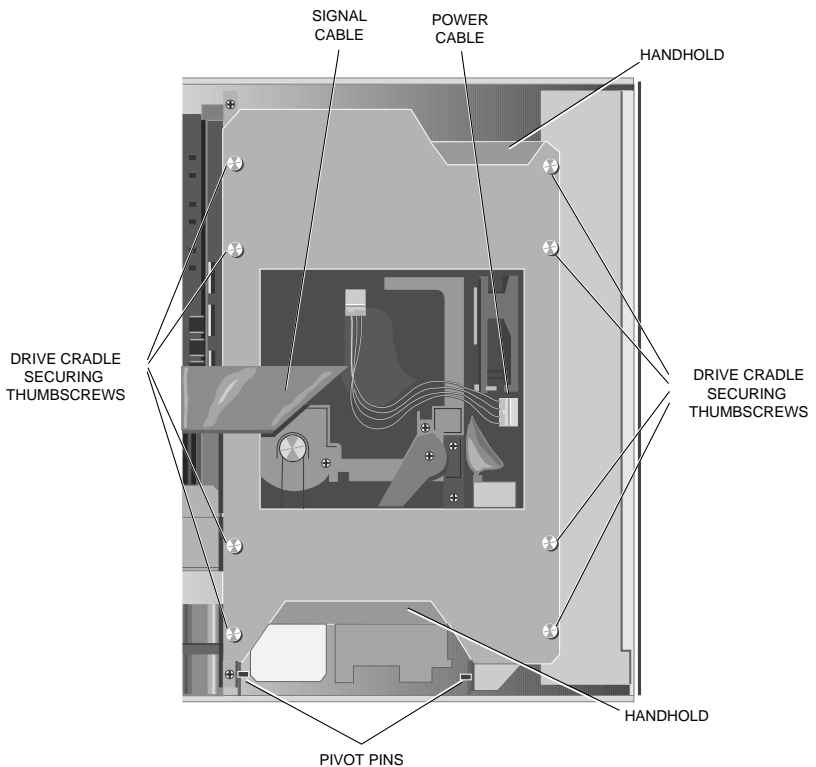


4. Slide the panel back about 15mm to free it from the lugs.
5. Lift the panel off.

Removing the drive cradle

In order to access one pair of SIMMs, or to install an upgrade processor it is necessary to remove the drive cradle. With the side panel removed as described in *Removing the side panel* the drive cradle can be removed as described below:

1. Undo the eight thumbscrews that secure the drive cradle.



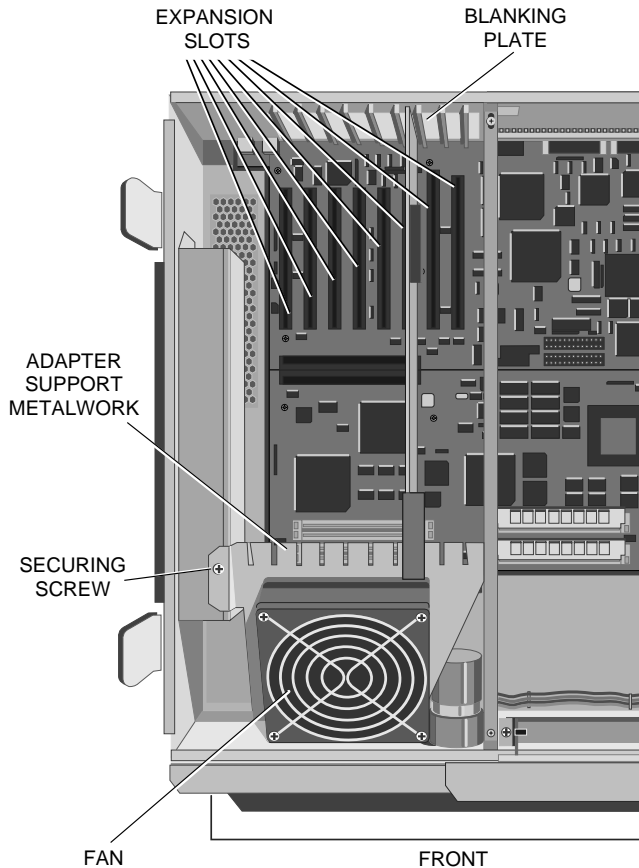
2. Disconnect the power cable(s) from the power supply, and the signal cable(s) from the connectors on the drive cradle.
3. Using the handholds provided at the front and rear of the drive cradle, lift the rear of cradle, swivelling it about the two pegs at the front.
4. With the cradle at approximately 30° move it backwards to free it from the pegs and lift it clear.
5. Put the drive cradle down on a flat surface with the handholds uppermost.

Warnings

1. *Ensure that the drive cradle is stable.*
2. *The surface the drive cradle rests on must be flat, any irregularity may come into contact with the drives in the cradle and damage them.*

Adapter cards

Eight 32-bit Micro Channel slots are available on the motherboard for adapter cards. Each slot has a blanking plate in the rear panel, and a notch in the adapter support metalwork at the front of the system unit.



The two slots nearest the drive cradle (labelled 6 and 1) are both video slots. Slot 6 is a secondary, or auxiliary, video slot suitable for use with a slave video card. Slot 1 is a primary, or base video slot. If a suitable video card is installed in this socket the motherboard video adapter is automatically disabled.

Drive controllers must occupy slots 2 and 3. The primary controller always occupies slot 2 and the secondary (if fitted) slot 3.

It is recommended that slots 6 and 1 are left unoccupied (except for video cards), and slot 3 is left unoccupied (except for a secondary drive controller). Any other adapter cards should be fitted in slots 4, 5, 7 and 8 working down the system unit. Only after all these slots are full should cards other than video adapters or drive controllers be fitted in slots 6, 1 or 3.

To install an adapter card:

1. Remove the side panel as described in *Removing the side panel*.
2. Loosen the thumbscrew at the bottom of the blanking plate for the slot that the adapter is to occupy, and remove the blanking plate.

Note

If the thumbscrew is tight it may be necessary to use a screwdriver to release it.

3. Holding the adapter card only by the plastic fixings, position it above the required connector. Make sure that the front edge of the card locates in the appropriate notch in the adapter support metalwork.
4. Using the plastic fixings, push the card firmly into the connector. Do not use excessive force.
5. Secure the card by tightening the thumbscrew at the bottom of the rear panel of the card.
6. Replace the side panel.
7. Power the system up and reconfigure for the new adapter.

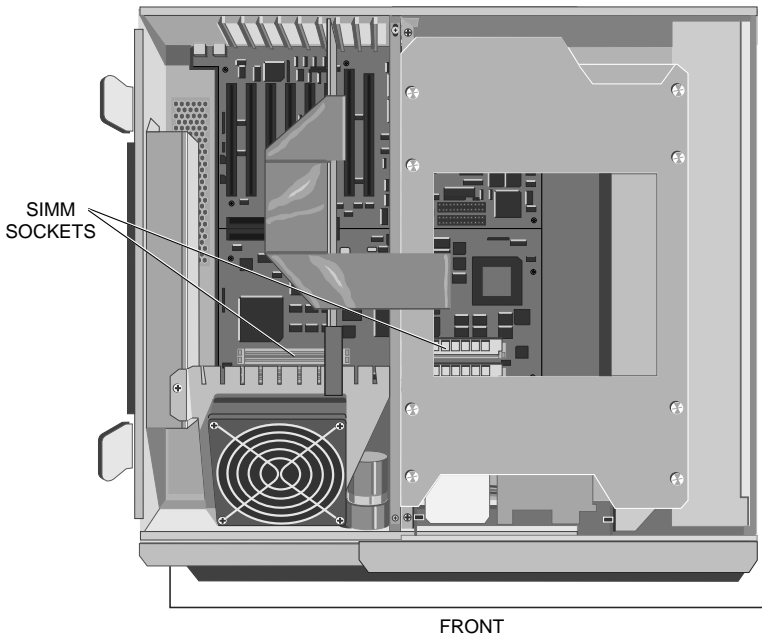
Warning

Always ensure that the system unit is fully reassembled before powering it up.

Upgrading memory

Introduction

The FT//e motherboard is fitted with six SIMM sockets, these allow system RAM to be expanded to up to 192Mbytes using standard gold plated 70 nS SIMMs. The SIMM sockets are on the processor section of the motherboard. Two sockets are hidden by the drive cradle, the other four are in front of the adapter cards.



SIMMs must be installed in pairs. The pairings are: the pair hidden by the drive cradle, the front pair of the four by the adapter cards, and the rear pair of the four by the adapter cards.

Apricot supplies 8 Mbyte (2Mx36), 16 Mbyte (4Mx36) and 32 Mbyte (8Mx36) SIMMs, giving upgrade capacities of 16, 32 and 64 Mbytes. Any combination of these three capacities is possible, using any capacity in any of the three pairs. Thus any 16 Mbyte increment between 16 and 160 Mbytes is possible, as well as the 192 Mbyte maximum.

The pair of sockets hidden by the drive cradle are always filled during manufacture. There should be no reason to access these SIMMs unless all three pairs are already occupied and you wish to replace the SIMMs with higher capacity SIMMs.

Purely for convenience during the following instructions, the sockets by the drive cradle will be referred to as the base sockets, those by the adapter cards will be referred to as expansion sockets.

Obtaining access

To obtain access to the SIMM sockets you must remove the side panel as described in *Removing the side panel*.

With the system unit resting on its right side and the left side panel removed you will be able to see the expansion sockets, in front of the adapter cards. Depending on the number of adapters fitted it may be possible to install the memory upgrade without removing any of the adapters.

If you can get one hand between the batteries and the leftmost adapter card, and the other hand between the drive cradle and the rightmost card you will be able to install SIMMs in these sockets without removing any cards. If you cannot get both hands to the SIMMs you will have to remove enough cards to allow access.

Adapter cards are secured by thumbscrews on the rear panel of the system unit. If you remove any cards, first make a note of any cables connected to them, and which slot each card is in. Only then should you disconnect any cables, loosen the thumbscrews and remove the cards.

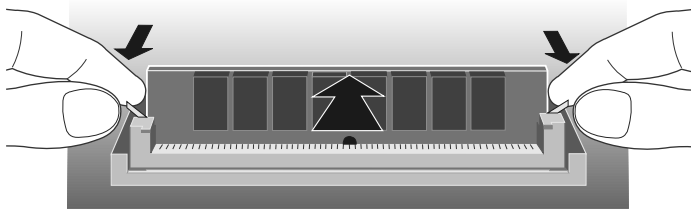
In order to change SIMMs in the base sockets you must remove the drive cradle. Instructions are given in *Removing the drive cradle* earlier.

Installing SIMMs in expansion sockets

Removing SIMMs

If you wish to install an upgrade in a pair of SIMM sockets which are already occupied you must first remove the existing SIMMs. Starting with the SIMM nearest the rear of the system unit and working towards the front:

1. Lever the metal clips on each side of the socket gently away from the SIMM using your forefingers. When the clips are far enough apart the top edge of the SIMM will move backwards about 15°.



Note

During removal the top edge of the rearmost SIMM may come into contact with the front edge fitting of any adapters in the system. This is normal and will have no adverse affect on the SIMM or the cards.

2. Taking care to avoid touching any of the components on the SIMM grip the top corners of the SIMM between thumb and first finger and carefully pull the SIMM out of the socket.
3. Repeat steps 1 and 2 for the other SIMM(s) affected.

Inserting SIMMs

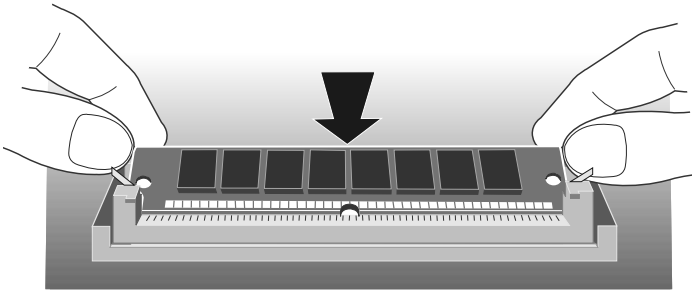
Working from the socket nearest the front of the system unit towards the rear, install the SIMMs.

To fit a SIMM:

1. The SIMM will only install in one orientation. There is a cutout at one end of the SIMM next to the connector strip.

Hold the SIMM with the cutout on the left and the metal connector strip nearest the motherboard.

2. Position the SIMM above the socket with the SIMM at an angle of about 15° to the vertical towards the rear of the system unit.



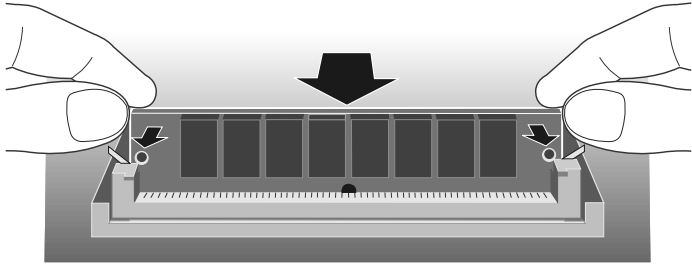
Note

Installation of the rearmost SIMM with adapters in the system is possible. In order for the SIMM to be seated properly in the socket it may be necessary for the top edge of the SIMM to touch the front edge fittings of the cards. This is normal and will have no adverse affect on the SIMM or the cards.

3. Lower the SIMM into the socket, and ensure that the SIMM is properly located in the connector.

4. Pushing gently on the top corners rotate the SIMM towards the vertical until it clips into place. Do not use excessive force.

If the SIMM will not rotate easily remove it and start again.



5. If the SIMM is properly located the SIMM should remain in position held by the securing clips, and with a small plastic lug through the holes on either side of the SIMM.

Repeat this process for the remaining SIMMs and reassemble the system. Reboot your computer with the Reference diskette and reconfigure your system for the extra memory.

Warning

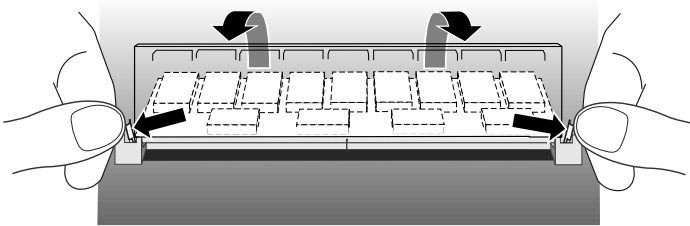
Always ensure that the system unit is fully reassembled before powering it up.

Installing SIMMs in the base sockets

Removing a SIMM

If you wish to install an upgrade in a SIMM socket which is already occupied you must first remove the existing SIMM.

1. Lever the metal clips on each side of the socket gently away from the SIMM using your thumbs.
2. Move the top edge of the SIMM gently towards the vertical.



3. When the SIMM has rotated through 20°, taking care to avoid touching any of the components on the SIMM, grip the top corners of the SIMM between thumb and first finger and carefully pull the SIMM out of the socket.

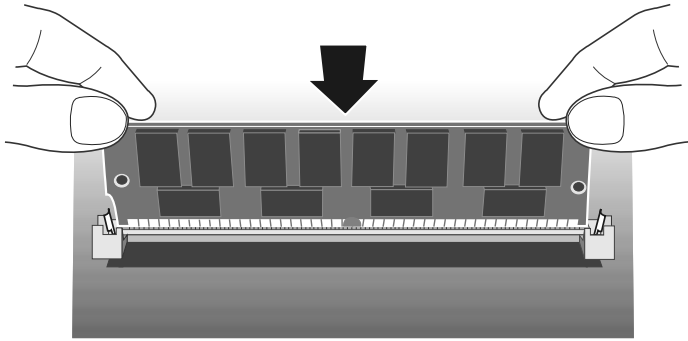
Inserting a SIMM

To fit a SIMM:

1. The SIMM will only install in one orientation. There is a cutout at one end of the SIMM next to the connector strip.

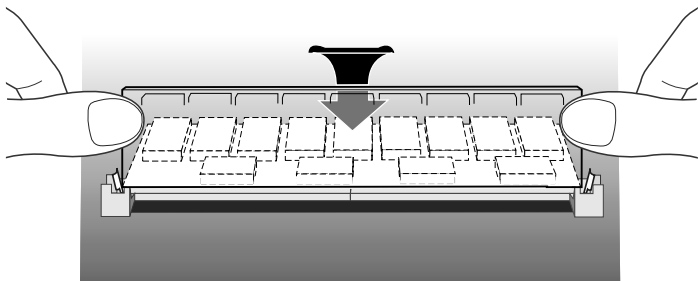
Hold the SIMM with the cutout on the left and the metal connector strip nearest the motherboard.

2. Position the SIMM above the socket with the SIMM tilted slightly towards the rear of the system unit.



3. Lower the SIMM into the socket, and ensure that the SIMM is properly located in the connector.
4. Pushing gently on the top corners rotate the SIMM towards the horizontal until it clips into place. Do not use excessive force.

If the SIMM will not rotate easily remove it and start again.



5. If the SIMM is properly located the SIMM should remain in position held by the securing clips, and with a small plastic lug through the holes on either side of the SIMM.

Processor upgrades

The FT//e motherboard is fitted with a processor socket that supports all variants of the Intel i486 processor family with an external clock speed of 33MHz, including OverDrive 486 processors.

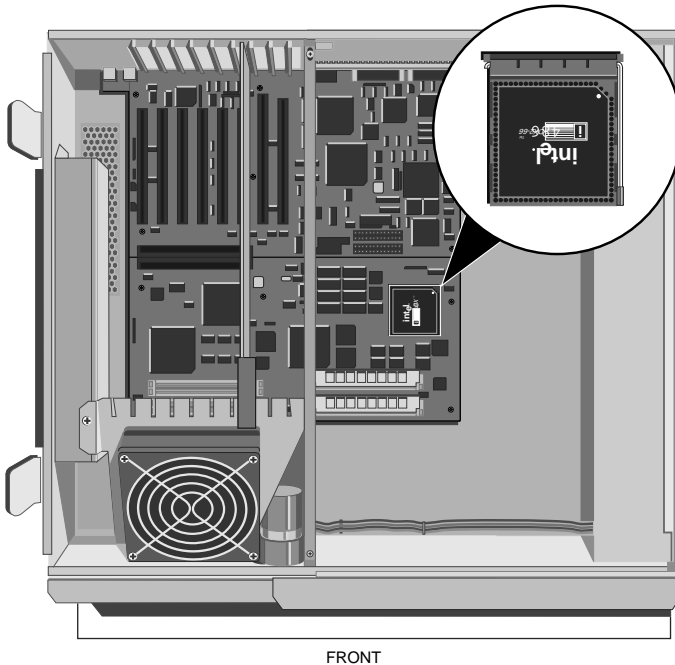
At the time of writing the FT//e 486 is available with a choice of two i486 processors, the i486DX-33 and the i486DX2-66. As the DX2-66 is the highest performance i486 processor currently available, the only feasible upgrade to an FT//e 486 is to replace an i486DX-33 with an Intel OverDrive processor.

However future developments by Intel may result in yet higher performance i486 variants. If this is the case, the FT//e motherboard is ready to accept any i486 processor with an external clock speed of 33MHz.

Removing the processor

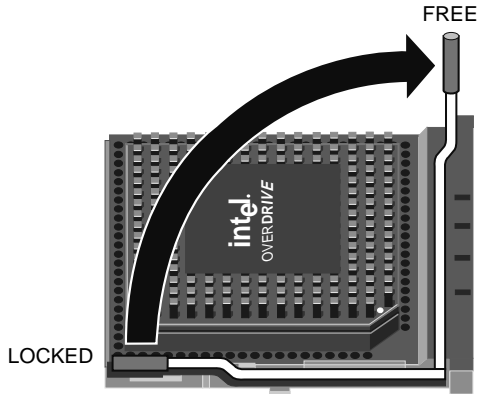
Before installing the upgrade processor you must first remove the existing processor. Instructions on locating the socket and removing a processor are given below.

1. Remove the side panel as described in *Removing the side panel*.
2. Remove the drive cradle as described in *Removing the drive cradle*.
3. Identify the processor.



The processor is installed in a zero-insertion-force (ZIF) socket. A lever attached to the socket clamps the processor securely in the socket when it is parallel to the motherboard.

- Carefully rotate the lever from the secure position until it is perpendicular to the motherboard.



The first and last 15° of movement may require considerable effort, apply just enough pressure to overcome the resistance offered by the lever.

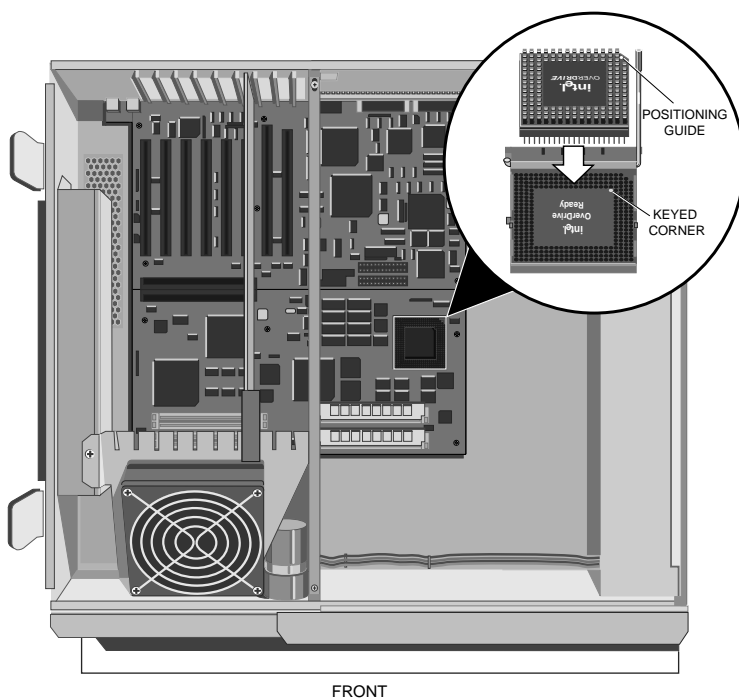
- Lift the processor out of its socket and place it on the anti-static foam provided with the upgrade processor.

Installation

You are ready to install your new upgrade processor.

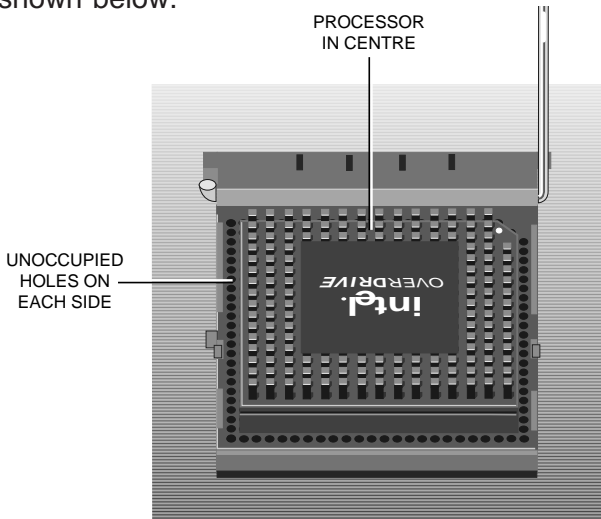
1. The upgrade processor and socket are keyed to ensure that the processor can only be installed in one orientation.

The inside of one corner of the socket has a key hole, the outside of the same corner is missing three holes. The processor has a positioning guide in the form of a small dot of paint. Use the following illustration to help identify these features.



2. Carefully position the upgrade processor above the socket with the positioning guide on the processor over the keyed corner of the socket and the securing lever in the perpendicular position.

If the upgrade processor does not occupy all four rows of holes it should be positioned centrally as shown below.



Warning

If the processor is misaligned it will not go into the socket, and any attempt to force it will damage the processor, or the socket, or both.

3. Gently insert the upgrade processor making sure that it is correctly aligned with the socket and that you do not bend or otherwise damage the pins.
4. Once you are certain that all the pins on the processor are in the holes in the socket carefully move the securing lever to the locked position.

The lever may require a considerable amount of force in order to lock the processor in place. Take care to exert no more force than is necessary.

5. With the upgrade processor installed you must now ensure that the upgrade socket, and motherboard clock speed are correctly configured for your new processor.

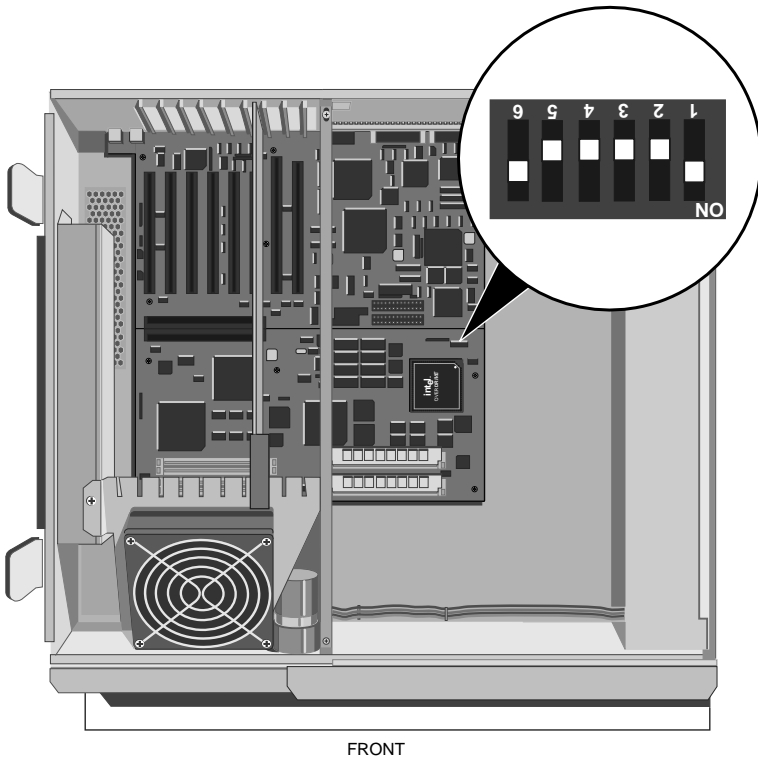
Configuring the motherboard below describes how to ensure that when you reassemble your system the new processor will work.

Configuring the motherboard

The FT//e processor socket supports a range of processor types. The socket is configured using a set of switches by the socket.

It is vital that the upgrade socket configuration is set correctly. Follow the instructions below to check the settings and adjust them as necessary.

1. Use the following illustration to identify the switches.



The switches numbered 4, 5 and 6 are used to configure the upgrade socket.

2. From the table below, and the label on your upgrade processor or its packaging, decide which processor type you have installed.

Switch			Processor
4	5	6	
on	off	off	Intel486SX
off	on	off	Intel487SX/OverDrive
off	off	on	Intel486DX/Intel486DX2

Notes

1. *All other combinations of these switches are invalid.*
2. *Switches 1, 2 and 3 should not be altered when a processor upgrade is installed. They should always be: switch 1 on, switches 2 and 3 off.*
3. You should by now have: removed the existing processor, installed the new processor and configured the socket. If you are uncertain about having completed any of these steps, go back to the beginning and check the steps you carried out against the installation instructions.
4. Once you are satisfied that you have installed the upgrade and configured the system correctly, reassemble the system.

Supplier upgrades

The add-ons described earlier may be installed by a confident and competent user. The installation of a CPU module upgrade, and additional (or replacement) drives is more complex, and should only be carried out by competent service personnel.

CPU module upgrade

The motherboard in your Apricot FT//e uses a modular design. This enables the system to be economically upgraded by replacing the CPU section with a higher performance CPU section as and when they become available.

Contact your Apricot supplier for information about the availability of such modules.

Installing additional drives

The Apricot FT//e provides a drive cradle that contains two bays with space for a maximum of five drives. These are:

- * Two 1/2 height drives at the front of the system unit.
- * Up to three SCSI hard disk drives at the rear of the system unit.

Notes

1. *The first 3.5" floppy drive is not installed in the drive cradle. It is attached, via a mounting plate, to the power supply.*
2. *Drives available for the front bay include: 3.5" SCSI hard disk drives, 5.25" floppy drive, 5.25" SCSI tape drives and a 5.25" CD-ROM drive.*

Expansion options

The following table lists the possible upgrade routes for each possible combination of drives in each bay:

Drive bay	Current configuration	Possible expansion
Rear drives	One 1" high drive	One 1/2 height drive or One or two 1" inch high
	Two 1" high drives	One 1" inch high drive
	One 1/2 height drive	One 1/2 height drive or One 1" inch high drive
Front	One 1/2 height drive	One 1/2 height drive or One 1" inch high drive
	One 1" high drive	One 1/2 height drive or One 1" inch high drive


Note

The drive on the left of the front drive bay must be a removable media drive

Contact your Apricot supplier for further information about drive upgrades.

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APRICOT COMPUTERS LIMITED
3500 PARKSIDE
BIRMINGHAM BUSINESS PARK
BIRMINGHAM B37 7YS.

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