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MITSUBISHI ELECTRIC

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Contents

Introduction

This guide contains instructions on installing extra memory in Qi 486 and 486SX, and an 80487SX coprocessor in a Qi 486SX. This document should be your only source of information when installing extra memory or a coprocessor.

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

Warning

Never carry out any work on the computer with power applied. Always switch off at the mains and remove the power lead from the system unit before starting work.

Before you start installing the upgrade you should be thoroughly familiar with all the relevant instructions in this guide and the appropriate sections of your *Owners Handbook*.

CPU module upgrade

The system boards in Qi 486SX and Qi 486 have removable CPU modules. These modules can be removed and replaced without replacing the entire system board.

80486SX CPU modules can be removed and replaced with a CPU module fitted with an 80486DX. This upgrade is not user installable. Contact your supplier or service organization for details.

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 preventative measures.

No work should be carried 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

Installing extra memory

The system board in your computer has eight sockets for Single Inline Memory Modules (SIMMs). The system board treats these sockets as two sets of four. Each set of four sockets must either be all occupied, or all empty. SIMMs are supplied in sets of four.

How much memory

Three different capacities of SIMM are available: 256kbyte, 1Mbyte and 2Mbyte, giving upgrade kit capacities of 1, 4 and 8 Mbytes. The system board does not support all possible combinations of these three capacities. The following table shows the RAM capacities supported:

Memory Fitted	SIMM Capacity	
	Set 0	Set 1
1 Mbyte	256k	-
2 Mbyte	256k	256k
4 Mbyte	1M	-
5 Mbyte	256k	1M
8 Mbyte	1M	1M
12 Mbyte	2M	1M
16 Mbyte	2M	2M

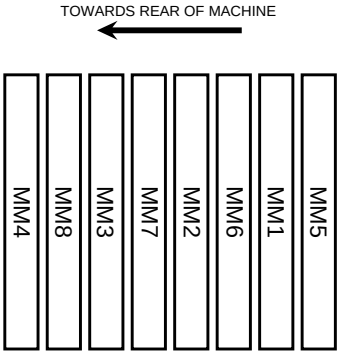
If you do not know how much memory is fitted to your system, you can find out when you switch your computer on. During the power up sequence on-board memory is tested and the capacity is displayed on the screen.

On the start up screen two memory capacities will be shown: base and extended. By adding the base and extended memory capacities together and dividing by 1024 you will arrive at the amount of RAM (in Mbytes) fitted to your system board. The result should always be an integer.

If the result of the calculation is not an integer you probably have ROM BIOS shadowing enabled and you should add 384kbytes to the total you arrived at before dividing by 1024.

The following diagrams show which type of SIMM should be fitted in each slot for each possible memory capacity. The memory sockets are labelled ‘MM1’ to ‘MM8’, note that the sockets are not numbered in sequence.

Orientation



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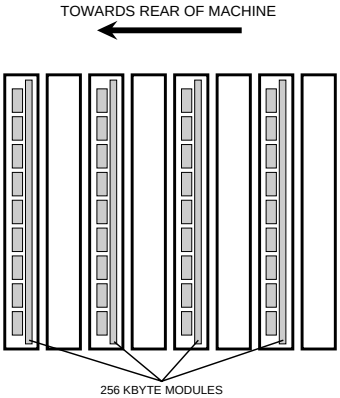

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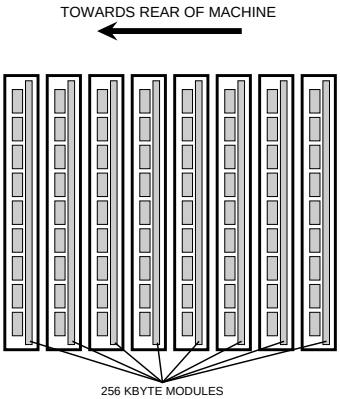

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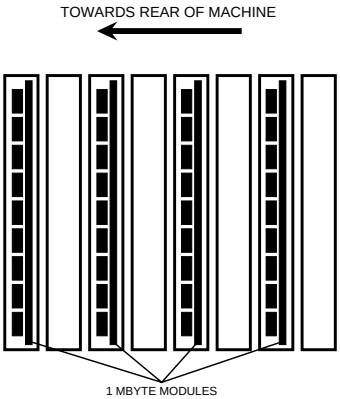

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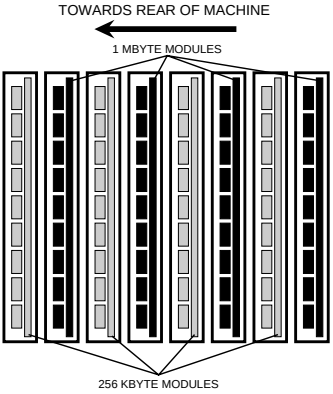

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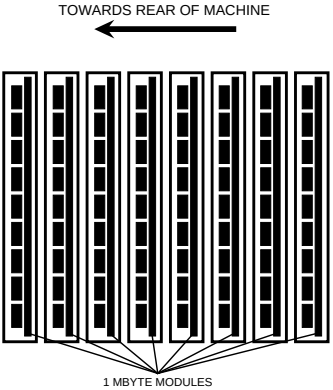

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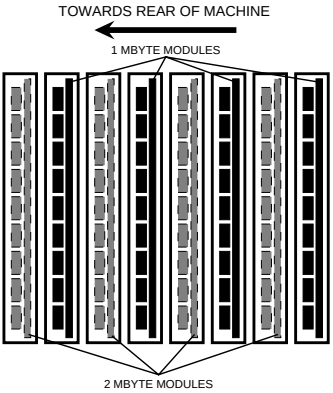

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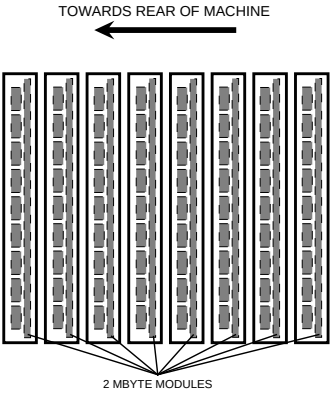
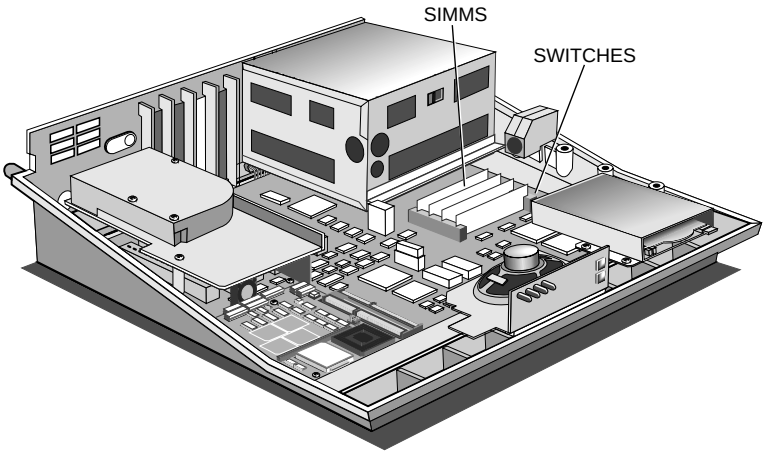


Obtaining access

The SIMM sockets are accessible with the system unit cover removed. To obtain access:

1. Take suitable anti-static precautions.
2. Remove the system unit cover as described in your *Owner's Handbook*.
3. Identify the SIMM sockets from the illustration below.



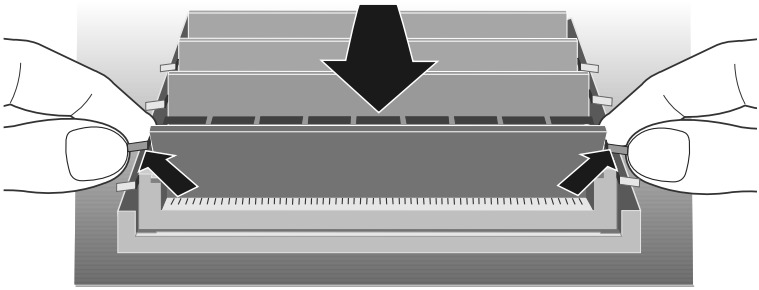
Removing and replacing SIMMs

If you are fitting additional SIMMs remove those already installed.

Removing SIMMs

Starting with the SIMM nearest the front of the system unit and working towards the rear:

1. Note which socket the SIMM is in.
2. Lever the metal clips on each side of the socket gently away from the SIMM using your thumbnails. When the clips are far enough apart the top edge of the SIMM will move forward until the SIMM is at an angle of about 15°.



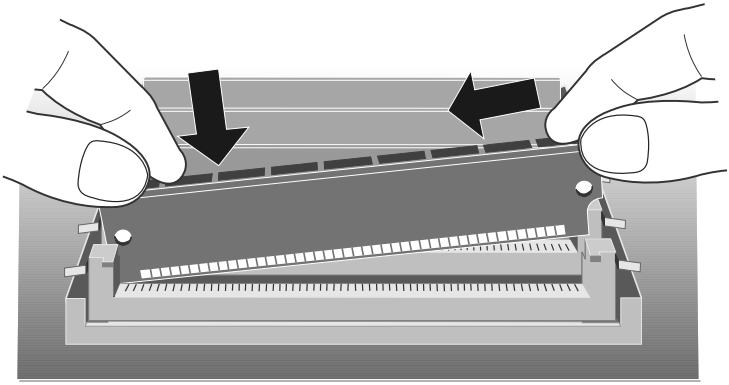
3. Taking care to avoid touching any of the components on the SIMM grip the top corners of the SIMM between thumb and first finger and carefully pull the SIMM out of the socket.
4. Repeat steps 1 to 3 for all the other SIMMs.

Inserting SIMMs

From the illustrations showing the possible SIMM combinations decide which SIMM capacity will be installed in each slot. Then, working from the socket nearest the rear of the system unit towards the front, install the SIMMs.

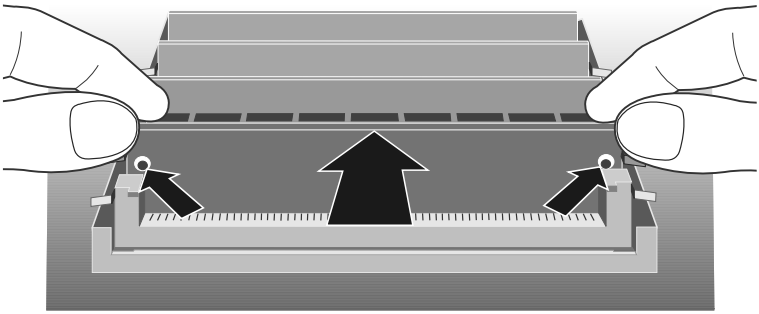
To fit a SIMM:

1. Hold the SIMM so that the memory chips are facing the rear of the system unit with the metal connector strip nearest the system board.
2. Position the SIMM above the socket at an angle of about 15°.



3. Lower the SIMM towards the socket. The right edge of the SIMM will be prevented from reaching the connector by the securing clip.
4. Allow the left edge of the SIMM to drop into the connector.
5. Push the SIMM gently to the right and lower the right edge into the connector.
6. Ensure that the SIMM is properly located in the connector.

7. Rotate the SIMM into the vertical position by pushing gently on the top corners.



8. 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.

Installing an 80487SX in Qi 486SX

The 80486SX CPU module provides a co-processor socket for an 80487SX. The socket can be configured to accept either an 80486SX or an 80487SX. Normally, the socket will be free, the 80486SX will be soldered directly to the CPU module, and the socket will be configured for an 80487SX.

It is possible however, that the 80486SX may be installed in the socket. If so, the 80486SX will have to be removed and the socket reconfigured before the 80487SX can be installed.

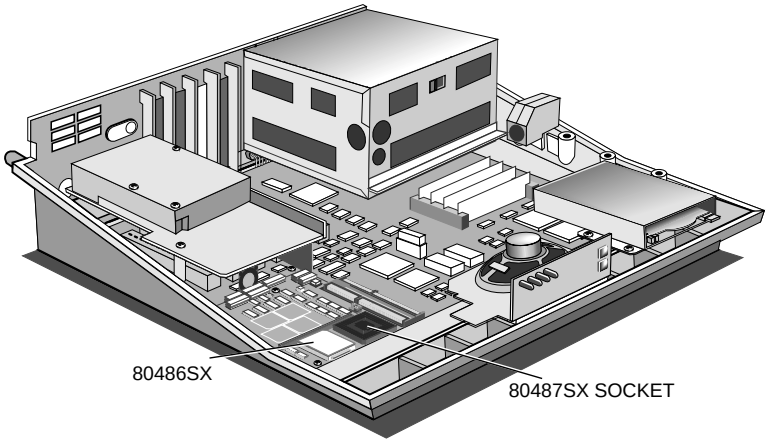
Identifying the 80487SX socket

1. Take suitable anti-static precautions as described in your *Owner's Handbook*.
2. Obtain access to the system board as described in your *Owner's Handbook*.
3. Identify the tape drive mounting plate at the front left of the system unit.
4. Remove the four screws that secure the plate and lift it clear of the system unit.

   Notes

   1. *If there is an adapter card fitted in slot 3 you may find the removal of the mounting plate easier if you first remove the adapter card.*
   2. *If a tape drive is fitted it must be removed with the mounting plate. See the instructions on page 17.*

5. Identify the 80487SX socket.



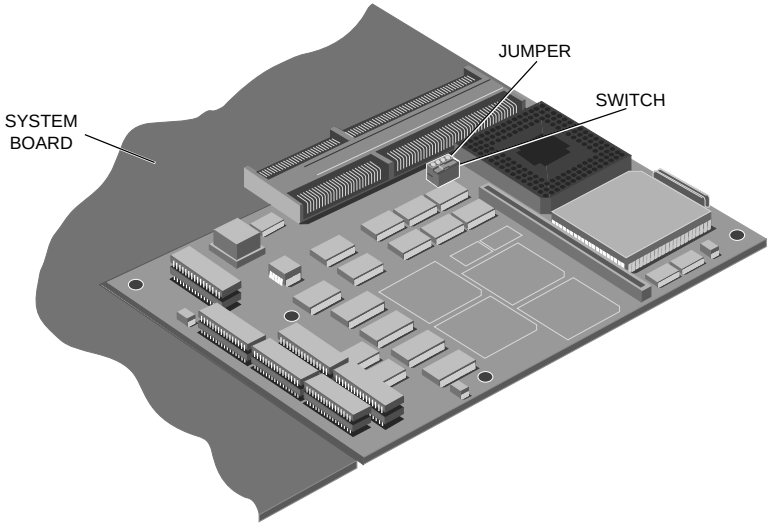
From the illustration above, you will be able to identify the 80487SX socket. If the socket is unoccupied, and an 80486SX is soldered to the CPU module as shown, you can install the 80487SX as described in *Installing the 80487SX*.

If the socket is occupied by an 80486SX before you install the 80487SX you will have to remove the 80486SX, using a suitable extraction tool, and reconfigure the socket.

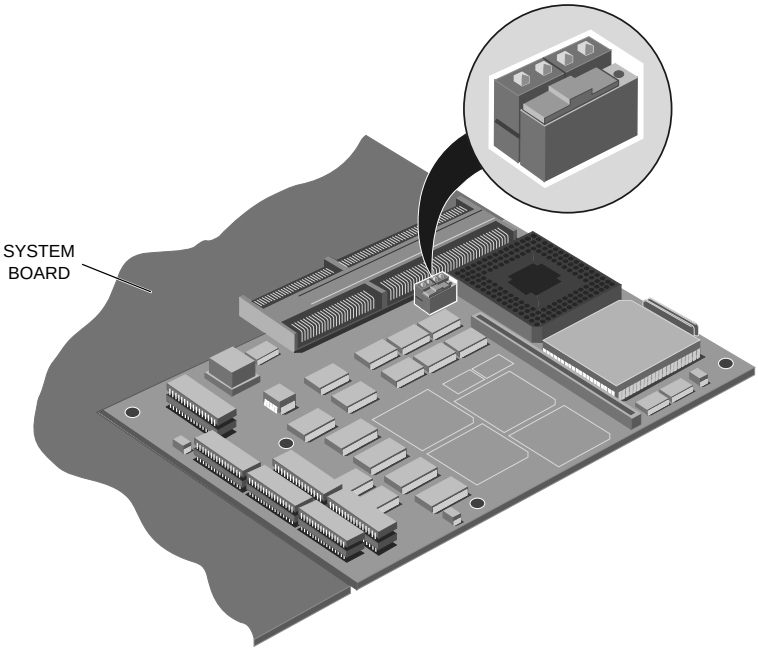
Configuring the 80487SX socket

If the 80486SX is soldered directly to the CPU module the socket will already be configured for an 80487SX.

If an 80486SX is installed in the socket it must be removed and the socket reconfigured, before the 80487SX can be installed. The socket is configured by a four pin jumper block and two position switch alongside the socket.



If the socket is configured for an 80487SX two jumpers will be fitted and the switch will be away from the socket, as shown in the following illustration.



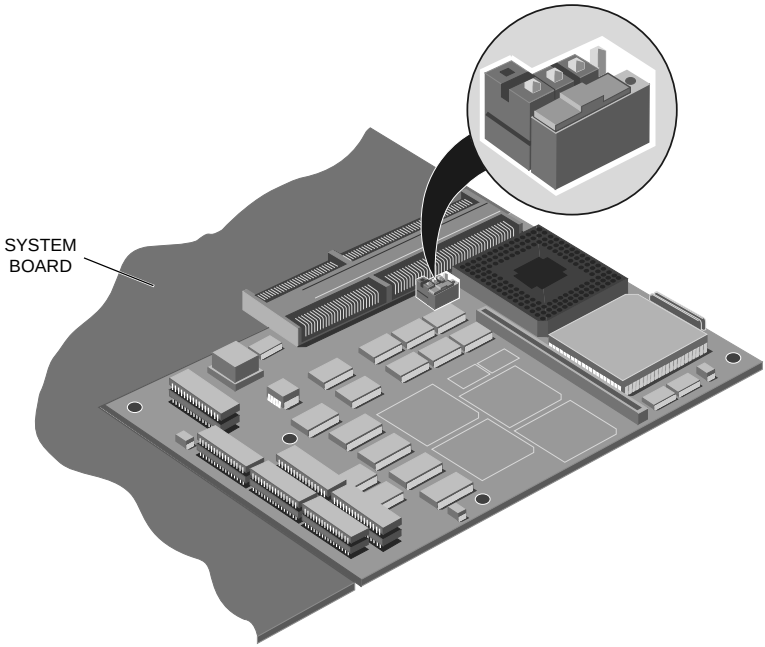
If the jumpers and switch are not as shown above, reconfigure the socket by moving the jumpers and switch to the correct positions.

Note

If the socket is configured for an 80486SX a second jumper should be fitted to one of the unused posts on the jumper block. This allows the socket to be reconfigured for an 80487SX.

80486SX configuration

If the socket is configured for an 80486SX one jumper will be fitted and the switch may be in either position. The switch will normally be away from the socket, as shown in the following illustration.



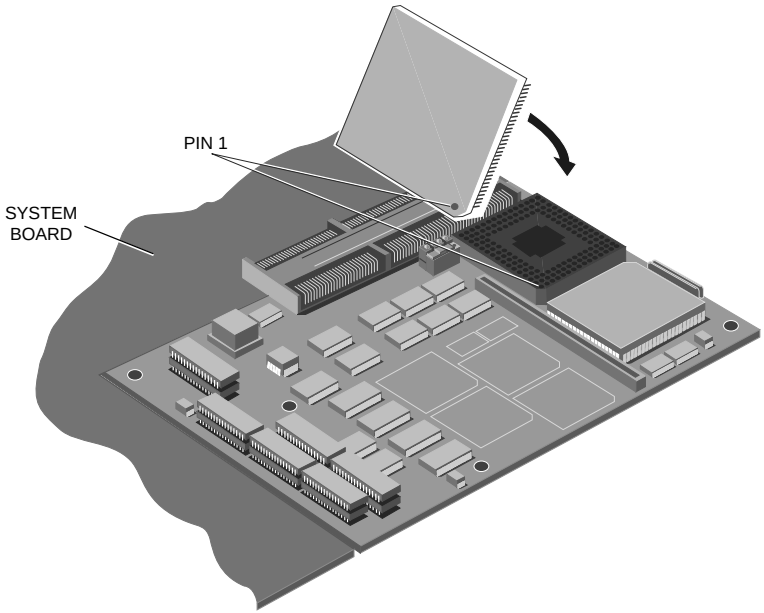
Note

A second jumper should be fitted to one of the unused posts on the jumper block. This allows the socket to be reconfigured for an 80487SX.

Installing the 80487SX

With the co-processor socket empty and correctly configured you can install the 80487SX as follows:

1. Identify the 80487SX socket.



2. The 80487SX has a positioning guide in the form of a small dot of paint. Carefully position the 80487SX above the socket with the positioning guide at pin 1.
3. Gently insert the 80487SX making sure that it is correctly aligned with the socket and that you do not bend or otherwise damage the pins.
4. Reassemble the computer.
5. Reboot the computer with the Reference/SETUP diskette and reconfigure it for the co-processor.

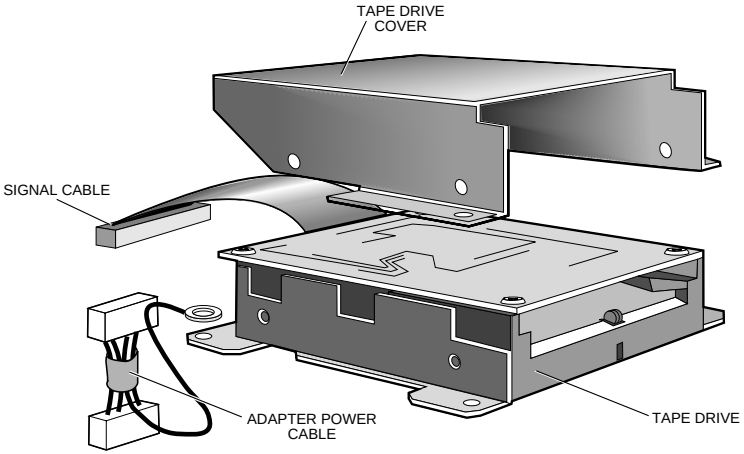
Warning

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

Removing a tape drive

If your computer has a tape drive fitted this must be removed to allow access to the CPU module. To remove the drive follow the procedure below.

1. Remove the four screws that secure the drive cover, drive and earth tag.



2. Lift the drive cover clear.
3. Lift the drive far enough to allow access to the power and signal cables at the rear of the drive and disconnect them.
4. Lift the drive clear.
5. Once the 80487SX has been installed the drive may be replaced by reversing the removal procedure.

   Note

   Ensure that the earth tag is secured by the screw at the left rear of the drive.

CPU module upgrades

If your computer is fitted with an 80486SX CPU module it can be upgraded by fitting an 80486 CPU module. depnding the the processor clock speed it may also be possible to upgrade an 80486DX based system to a faster processor.

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

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