

M68MP16PABUM/D

Rev. 2

**MCU** *Scribe*<sup>™</sup>

**MP16  
Programming  
Adapter Board  
User's Manual**



**MOTOROLA**

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# 1

## Getting Started

### What does this manual cover?

This manual is a quick introduction to:

- The **MP16** programming adapter boards (PABs): the M68PA08MP16FU64 PAB and the M68PA08MP16B56 PAB, and
- The M68HC908MR24 (**MR24**) microcontroller unit (MCU) and the M68HC708MP16 (**MP16**) MCU—the MCUs the MP16 PABs support

This chapter explains how to install the MCUscribe software, MP16 PABs, MP16 MCU, and MR24 MCU. Other chapters have notes about using MR24 and MP16 MCUs with the MCUscribe application, and tell you how to get additional information and technical support.

### 1.1 Installing the MCUscribe Application and Personality Files

The MP16 programming adapter board comes with the latest version of the MCUscribe application (for Windows NT and Windows 95). First, install the software:

Insert the first MCUscribe diskette into your floppy drive, and enter **a:\setup.exe** in the Windows **Run** dialog box. The installation setup program opens.

Follow the instructions to install the software in a folder of your choice. The installation program places all the MCUscribe files in one folder. (Using a single folder expedites selection of the MCU and S-record files, so that you can start programming more quickly.)

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### 1.1.1 Files Included with MCUscribe Software

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The MCUscribe setup program installs these files on your system:

- **MCUscribe.exe** — Windows executable file for the MCUscribe application, which is the interface you use to communicate with the SPGMR08, and to program MCU memory.
- **.mmp** files — The personality files that supply the SPGMR08 with MCU configuration and memory map information. The personality file for the MR24 MCU is *908mr24.mmp*. The personality file for the MP16 MCU is *708MP16.mmp*.
- **MCUscribe.hlp** and **MCUscribe.cnt** — Online help for the MCUscribe application.
- **MCUscribe.pdf** — *Serial Programmer for HC08 User's Manual*. Instructions for using the MCUscribe application (help information presented in an Adobe Acrobat PDF user's manual).
- **QStart08.pdf** — *SPGMR08 QuickStart Guide*. A streamlined PDF guide to setting up SPGMR08 hardware and software.
- **PABMP16.pdf** — *MP16 Programming Adapter Board User's Manual*, an Acrobat PDF version of specific instructions for setting up and using the MP16 PAB. The software may also include user's manuals for other programming adapter boards.
- **readme.txt** — Release notes in ASCII format (text from *QStart08.pdf*)

For tips on opening online support documents, see page 17.

## 1.2 Disconnecting Power Before Handling Components

If power is disconnected, you can insert or remove MCUs and programming adapter boards freely. However, if you are in an MCUscribe session, make sure the yellow Socket Power light is off before you handle the MCU or switch out the programming adapter board. MCUs can be damaged by power surges during installation.

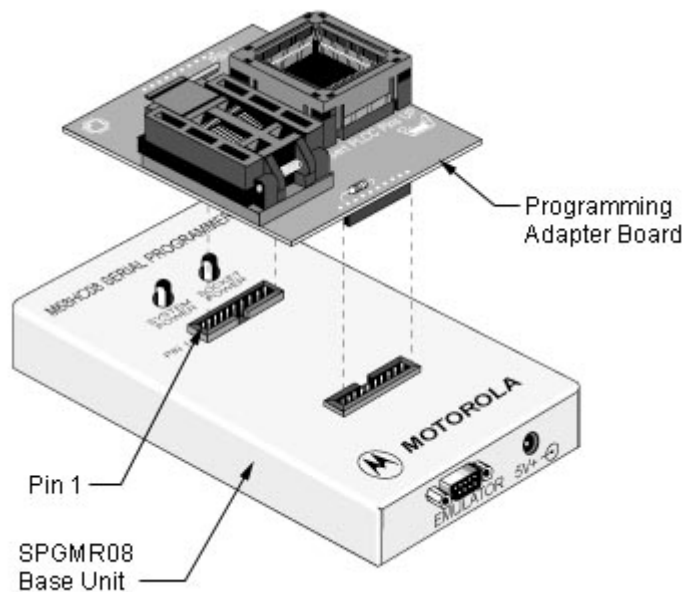
If the Socket Power light is on, click the **Power Off** button in the MCUscribe Control Panel. Socket power is disconnected, and the yellow Socket Power light goes off.

## 1.3 Inserting a Programming Adapter Board

To use the MP16 PAB, plug it onto the SPGMR08 base unit. The PAB works when installed in either direction on the base unit. That is, the Pin 1 base unit connector can accept either connector of the adapter board. The illustration below shows a programming adapter board about to be plugged onto the base unit.

**Note:**

*The programming adapter board shown here is not an MP16 PAB. (All PABs are installed in a similar way.)*



## 1.4 Inserting a QFP MCU Device

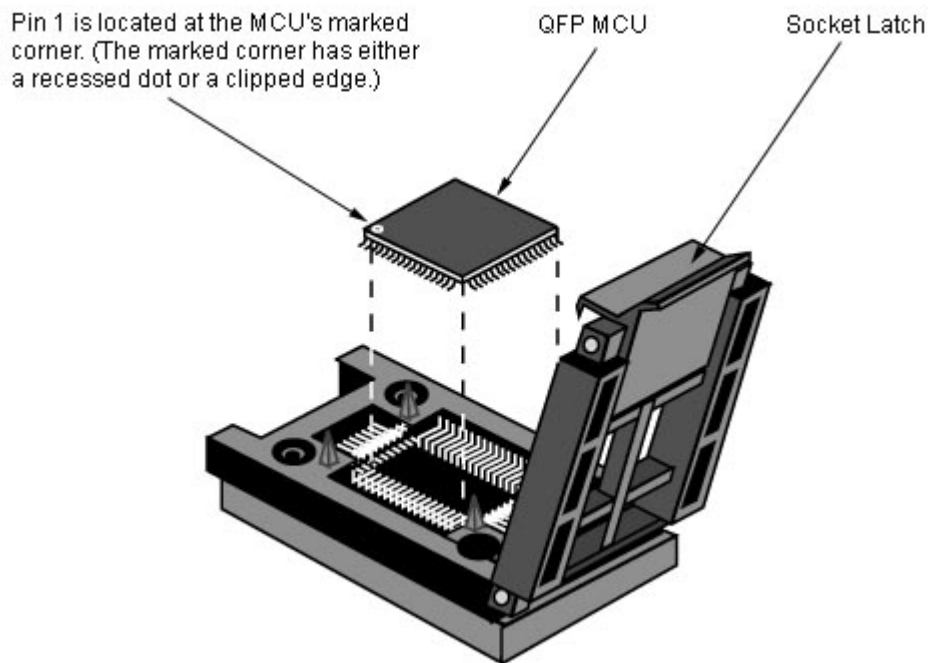
The illustration at the bottom of the page shows a Quad Flat Pack (QFP) socket with an MCU ready to be inserted. To insert a QFP MCU:



1. Open the socket case by lifting the latch.
2. Insert the MCU, matching the MCU's Pin 1 with the socket's Pin 1. The MCU's marked corner identifies Pin 1's location. An orientation key printed on the board (shown at left) shows the MCU and socket Pin 1 alignment.

**Note:** Be careful to avoid bending the pins. Motorola recommends that you use a vacuum pen or other appropriate tool to handle MCUs.

3. Push the socket lid down gently until it snaps shut.



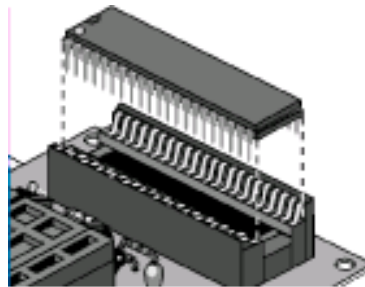


## 1.5 Inserting an SDIP MCU Device

The illustration below shows a shrink dual in-line (SDIP) socket with an MCU ready to be inserted. To insert an SDIP MCU:

Insert the MCU, matching the MCU's Pin 1 with the socket's Pin 1. The MCU's marked corner identifies Pin 1's location. A **1** printed on the board identifies the socket's Pin 1.

**Note:** Be careful to avoid bending the pins. Motorola recommends that you use a vacuum pen or other appropriate tool to handle MCUs.





# 2

## Using the MP16 Programming Adapter Board

This chapter has specific information about using the M68PA08MP16B56 and M68PA08MP16FU64 MP16 programming adapter boards (PABs). These PABs enable the SPGMR to program:

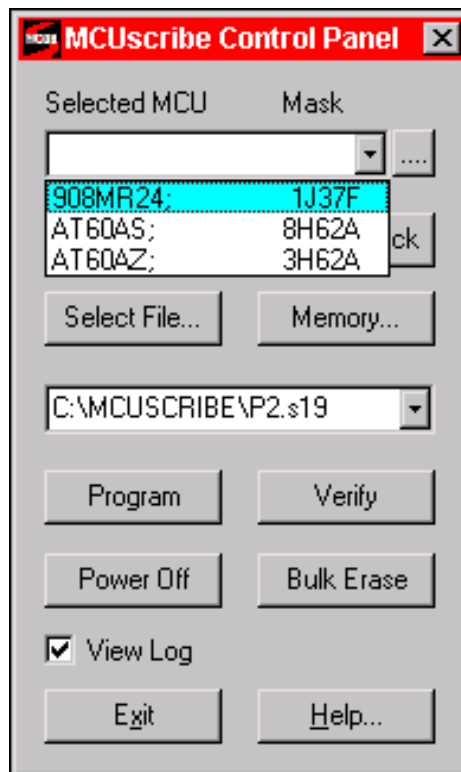
- EPROM memory ranges of MC68HC708MP16 (MP16) MCUs in 64-pin QFP and 56-pin SDIP package configurations.
- Flash EEPROM memory ranges of MC68HC908MR24 (MR24) MCUs in 64-pin QFP and 56-pin SDIP package configurations.

## 2.1 Device and Mask Set Information

Device	Mask set	Personality file	Selected MCU / Mask choice
MC68HC708MP16	1H87J	708mp16.mmp	708MP16;1H87J
MC68HC908MR24	1J37F	908mr24.mmp	908MR24;1J37F

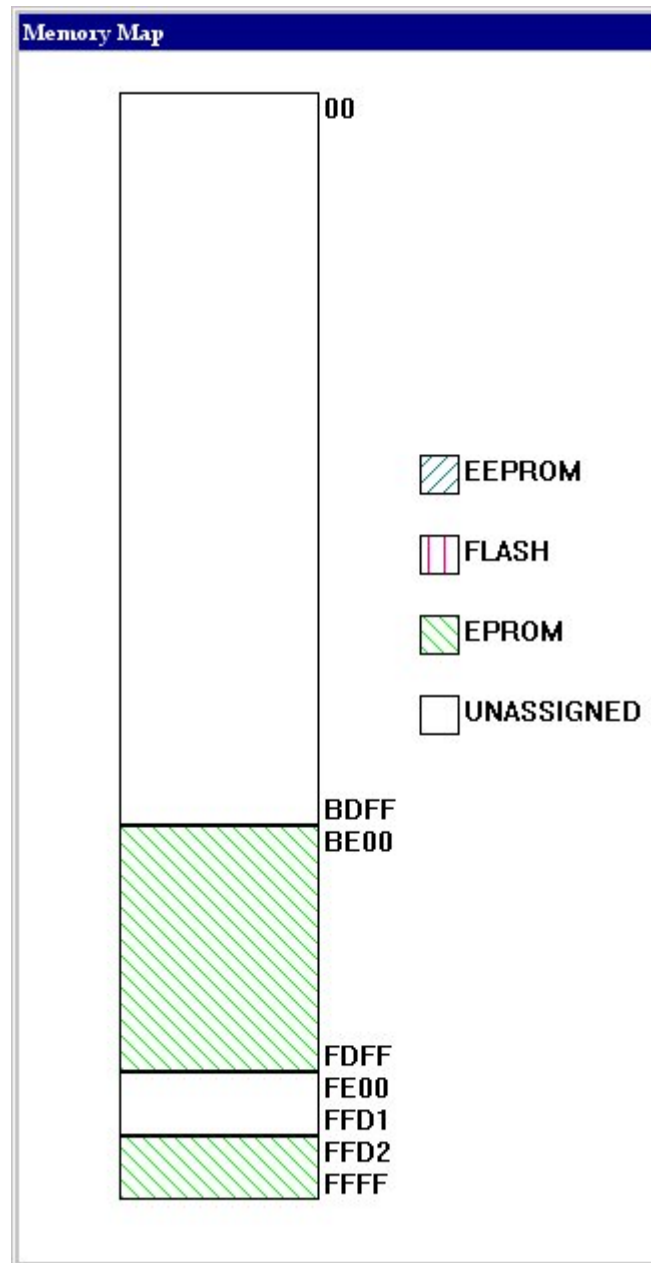
The table above shows the device and mask set supported by the MP16 PAB, with these types of corresponding information:

- **Personality file** — The file that supplies configuration and memory map data for programming the MCU and mask set. To program a particular mask set, the corresponding personality file must be installed on the host system.
- **Selected MCU/Mask choice** — The choice you make to begin working with the MR24 MCU in an MCUscribe session. You must select an MCU in the MCUscribe Control Panel before you can begin programming. (The Control Panel and selection list is shown in the illustration below.)



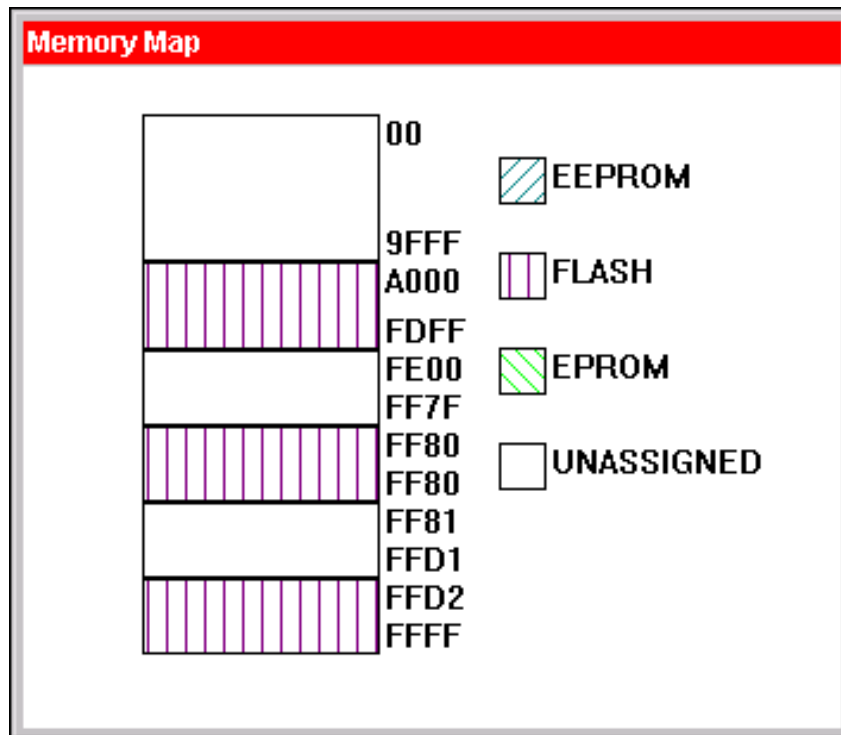
## 2.2 MP16 MCU Memory Configuration

The MP16 MCU has 16 KB of programmable Flash EPROM memory, 46 bytes of user-definable vector addresses, and a block protect register. The MCUscribe MP16 Memory Map status box (shown below) displays the location of the Flash EPROM memory arrays.



## 2.3 MR24 MCU Memory Configuration

The MR24 MCU has 24 KB of programmable Flash EEPROM memory, 46 bytes of user-definable vector addresses, and a block protect register. The MCUscribe MR24 Memory Map status box (shown below) displays the location of the Flash EEPROM memory arrays.



## 2.4 Special Warnings

The following special warnings apply to the MP16 programming adapter board:

- **Inadvertent Flash EEPROM erasure:** If you program Flash EEPROM memory with a sequence of S-record files, you may find that each new programming command erases already-programmed Flash EEPROM arrays.

**Recommendation:** To avoid force-erasing Flash EEPROM memory arrays, clear the Flash EEPROM force-erase option:

Click the **Setup** button in the Control Panel. The Setup dialog opens. Select the **MCU Programming** tab. If the **Erase flash before write** check box is checked, click it to clear the check mark. With the option cleared, a programming command does not erase already-programmed Flash EEPROM arrays.

- **Device orientation:** You can damage any MCU by inserting it with an incorrect pin orientation, then attempting to program the MCU.

**Recommendation:** As with all MCUs, make sure you insert the MCU so that its pin 1 matches the socket's pin 1.

- **Electrostatic discharge:** Electrostatic discharge can damage the programming adapter board and MCUs.

**Recommendation:** Observe standard grounding precautions to avoid electrostatic buildup when you handle the programming adapter board and MCUs.





# 3

## Support

This chapter explains how to open information resources online, and how to contact customer support.

### 3.1 Opening Additional Online Documentation

#### Acrobat-format documents

The MCUscribe application comes with a user's manual and other documents in Acrobat PDF format. If you have the Acrobat Reader, you can open PDF-format documents by double-clicking the file name in Windows Explorer. To open the *Serial Programmer for HC08 User's Manual*, you can also double-click the manual icon in the MCUscribe program group.

#### Online help

Open MCUscribe help directly from the desktop, or from within the application. (Make sure you have installed the **MCUscribe.hlp** file and the **MCUscribe.cnt** files in the same folder.) You can use any of these methods to open MCUscribe help:

- Double-click the help icon in the MCUscribe program group.
- Double-click the **MCUscribe.hlp** file in Windows Explorer, if *.hlp* files are associated with *Winhlp32.exe*.
- Click the **Help** button in the MCUscribe application, or press **F1**.

## 3.2 Contacting Customer Support

For technical support, contact the Motorola Customer Focus Center by telephone or fax at the numbers below.

**Telephone: 1-800-521-6274**

Telephone support hours are Monday through Friday, 9:00 a.m. to 5:00 p.m. (CST).

**FAX:(602) 302-8157**