



M68HC705E24PGMR/D
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M68HC705E24PGMR PROGRAMMER USER'S MANUAL

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CHAPTER1.

INTRODUCTION

This manual describes the technique used to program and verify the MC68HC705E24 microcontroller (MCU) internal OTPROM/EPROM. All that is required to program the MC68HC705E24 OTPROM/EPROM MCU is the PGMR and a +5 volt and V_{pp} dc power supply.

The PGMR supports 64 pin Quad Flat Pack (QFP) MCU, 44 Quad Flat Pack (QFP) and 68 pin Plastic Leaded Chip Carrier (PLCC) MCU device programming.

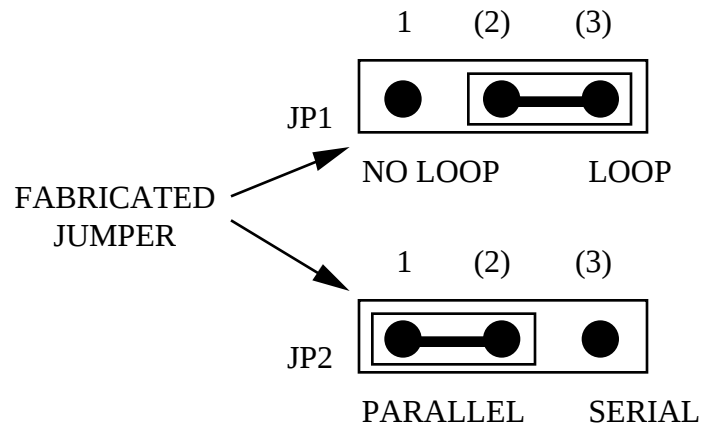
NOTE: 68pin PLCC MCU is inserted in a dead bug fashion (i.e. upside down).

CHAPTER 2.

PROGRAMMING TECHNIQUE

2.1 PARALLEL MODE

The parallel PGMR programming technique allows the user program, contained in an external EPROM, to be copied into the internal PROM (OTPROM/EPROM) of the MC68HC705E24 MCU device. This mode is selected by setting JP1 to the LOOP position and JP2 to the PARALLEL position.



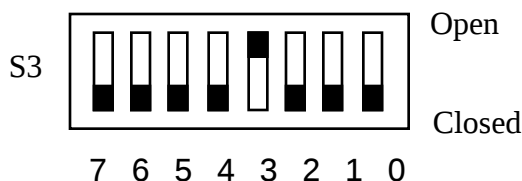
The MC68HC705E24 MCU device is inserted the appropriate socket on the PGMR . The applicable program/verify routine is selected via the switch pack S3 , and power is applied to the PGMR via switch S1. The MCU is taken out of reset and placed in the run mode via switch S2, and MCU control is transferred to the bootstrap ROM. The selected programming routine is then executed.

NOTE

Only a single E24 MCU may be installed in the PGMR board at any time.

2.1.1 Programming the MCU PROM (PARALLEL)

To select the program mode the switch pack S3 should both be set to 08 hex (PD7-PD0) (open switches correspond to a high PD bit).



In the program MCU PROM routine, the contents of an external 32K EPROM are copied into the MCU PROM areas of the applicable device. There is a direct correlation of addresses between the two devices. Non-MCU PROM addresses are ignored so data contained in those areas are not accessed. Unprogrammed external EPROM address locations should contain \$00 to speed up the programming operation. During the programming routine, the PROGRAM LED D2 is illuminated. At the end of the programming routine, D2 is turned off, and the verification routine is entered. If the contents of the MCU PROM and external EPROM exactly match, then the VERIFY LED D3 is illuminated.

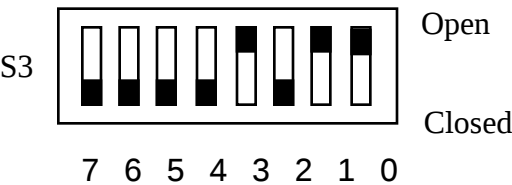
During the verification routine, all locations are compared to the data residing in external EPROM. The verification routine will stop if a discrepancy has been detected and the error address location will be placed on the external memory address bus.

2.1.2 Verify MCU PROM (PARALLEL)

To select the verify mode switch pack S3 should be set to 09 hex (PD7-PD0) (open switches correspond to a high PD bit). The verify MCU PROM contents routine is normally entered automatically after the MCU PROM is programmed. Direct entry of this mode will cause the MCU PROM contents to be compared to external EPROM contents residing at the same address locations. Both D2 and D3 LEDs are turned off at this time until verification is completed. Upon completion of the verification routine (every location verified) the VERIFIED LED D3 is illuminated. If D3 does not illuminate, a discrepancy has been detected and the error address location will be placed on the external memory address bus.

2.1.3 Blank Verify MCU PROM (PARALLEL)

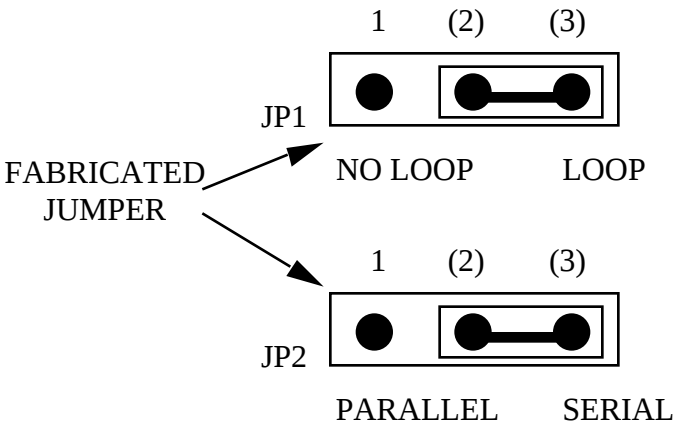
To select the blank verify mode switch pack S3 should be set to 0B hex (PD7-PD0) (open switches correspond to a high PD bit).



The blank verify mode will cause the MCU PROM to be checked against the erased state. Both D2 and D3 LEDs are turned off at this time until verification is completed. Upon completion of the verification routine (every location verified erased) the VERIFIED LED D3 is illuminated. If D3 does not illuminate, a discrepancy has been detected and the error address location will be placed on the external memory address bus.

2.2 SERIAL MODE

This mode is selected by setting jumper JP1 to the SERIAL position.



The serial mode allows communication with the device using the Load RAM and Execute software. The PGMR kit comes with a software program that allows programming of the E24 MCU via a serial link. To use the serial software connect the PGMR board to your computer and execute the E24EVS2 program. Follow the on-screen instructions to program the MCU.

CHAPTER 3.

PROGRAMMER PREPARATION

The PGMR must be prepared/configured prior to any program/verify operations. Board preparation consists of the external power source (+5V and V_{pp}), EPROM installation, QFP or PLCC PGMR configuration.

3.1 EXTERNAL POWER SOURCE

Power connector P1 is used to connect an external power supply to the PGMR. A +5 Vdc @ 100 mA power source is connected to connector P1 pins labeled +5V and GND. The programming voltage power source is connected to pins labeled V_{pp} and GND. Refer to the specific device data sheet for programming voltage (V_{pp}) specifications.

NOTE

The programming voltage (V_{pp}) must be measured at C5 +ve terminal during programming cycle (D2) PROGRAM LED illuminated.

3.2 EPROM INSTALLATION

The basic EPROM device used on the PGMR (at location SKT1) is a 27256 or 27C256, 32K EPROM, 28-pin device. This EPROM device contains the user code to be programmed into the applicable PROM MCU device.

3.3 PROGRAMMING OPERATION (PARALLEL METHOD)

To program the MC68HC705E24 MCU PROM, perform the following steps:

1. Place switch S1 to POWER-OFF (left) position.
2. Install MCU and EPROM devices into PGMR.

NOTE: 68 pin PLCC MCU is inserted in a dead bug fashion (i.e. upside down)

3. Place switch S2 to RESET-IN (left) position.
4. Check that the following are set :

JP1 - LOOP position

JP2 - PARALLEL position

S3 - PD0 closed PD1 closed PD2 closed PD3 open

PD4 closed PD5 closed PD6 closed PD7 closed

5. Place switch S1 to POWER-ON (right) position.
6. Place switch S2 to RESET-OUT (right) position.

RED LED illuminates signifying programming sequence being performed.

GREEN LED illuminates signifying verification is completed.

7. Place switch S2 to RESET-IN (left) position.
8. Remove power (via S1), or select and run new routine.

3.4 VERIFY OPERATION (PARALLEL METHOD)

To verify the MC68HC705E24 MCU PROM, perform the following steps:

1. Place switch S1 to POWER-OFF (left) position.
2. Install MCU and EPROM devices into PGMR.

NOTE: 68 pin PLCC MCU is inserted in a dead bug fashion (i.e. upside down)

3. Place switch S2 to RESET-IN (left) position.
4. Check that the following are set :

JP1 - LOOP position

JP2 - PARALLEL position

S3 - PD0 open PD1 closed PD2 closed PD3 open

PD4 closed PD5 closed PD6 closed PD7 closed

5. Place switch S1 to POWER-ON (right) position.
6. Place switch S2 to RESET-OUT (right) position.

VERIFY LED illuminates signifying verification is completed.

7. Place switch S2 to RESET-IN (left) position.
8. Remove power (via S1), or select and run new routine.

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