M68HC705L1PGMR
PROGRAMMER
USER'S MANUAL

Second Edition

MOTOROLA

CONTENTS

FIGURE

1 INTRODUCTION

This document contains information on the operation of the M68HC705L1PGMR which is a programmer board for programming MC68HC705L1 MCU device.

The on-chip EPROM feature of the MC68HC705L1 MCU enables user to emulate the MC68HC05L1 device. This document describes the M68HC705L1PGMR used to program the MC68HC705L1 MCU internal EPROM for emulating the MC68HC05L1. EPROM programming is facilitated though the program contained in the on-chip bootstrap ROM of the MC68HC705L1, and the bootstrap program is invoked by using the programmer board described herein. Besides programming, verification between the contents of the MCU EPROM can also performed with this board.

2 PROGRAMMING BOARD OPERATION

This section will give a description of the operations available to the user through the programmer board. The following is the standard procedure for using the programmer board.

The MC68HC705L1 device and the EPROM with the appropriate user program is inserted into the programming socket and the EPROM socket on the programmer board respectively (note: at most one MCU should be inserted onto the board at any time). One of the routines in the bootstrap ROM of the MC68HC705L1 is selected via mode switch SW1, and +5 V D.C. and Vpp power (refer to Technical Data Book) is applied to the programming circuitry. The MCU enters the bootstrap mode by placing SW2 from OFF to ON position.

The procedure for invoking the bootstrap routine is as follows:

1. Connect Vpp, +5V and GND to power connectors.

2. Place switch SW2 to OFF position.

3. Place the MC68HC705L1 in sockets, either U1 or U2.
   (note: ONLY one MCU should be placed on the board at any time)

4. Place the EPROM in socket U5.
   The EPROM is 27C256.

5. Select the desired bootstrap routine via switch SW1.

6. Place switch SW2 to ON position.

7. Bootstrap routine will be executed to completion.

8. Place switch SW2 to OFF position.

9. Remove the MC68HC705L1 from the programming socket.

10. Repeat from step 3 for next MCU.

Once the bootstrap mode is entered, mode switch settings are scanned to establish the routine to be executed. The routine executed and the corresponding settings are tabulated as follows:

SW1	1	2	3	4	Mode
	0	0	x	x	Program & Verify EPROM
	0	1	x	x	Verify EPROM Contents

The details of the routines will be described in the following sections.

2.1 Program and Verify EPROM

In the program and verify EPROM routine, the contents of an external 32K EPROM are copied into the EPROM areas of the MC68HC705L1 device. The is direct correspondence of addresses between the two devices. Non-EPROM addresses are ignored so data contained in those areas are not accessed. Unprogrammed EPROM address locations should contain $FF to speed up programming operation. During the programming routine the PROGRAMMING LED DS1 is illuminated, and the EPROM will be programmed twice for better data retention. At the end of the programming routine, the verification routine is entered. IF the contents of the EPROM and external EPROM exactly match, then the VERIFIED LED DS2 is illuminated and the DS1 is turned off. This program and verify procedure should take no more than 1 minute. If the verified LED DS2 does not illuminate within 1 minute, a discrepancy between the on-chip EPROM and external memory device has been detected.

2.2 Verify EPROM Contents

The verify EPROM contents routine is normally entered automatically after the EPROM is programmed. Direct entry of this mode will cause the EPROM contents to be compared with external memory contents residing at the same address locations. Both DS1 and DS2 LEDs are turned off at this time until verification is completed. Upon completion of the verification routine (every location verified) the VERIFIED LED DS2 is illuminated. Since the verification procedure should not take more than 5 seconds, so if DS2 does not illuminate after 5 seconds, a discrepancy has been detected.

NOTE: An external EPROM with all locations programmed to $FF can be used to blank check the EPROM/OTP MCU device by using this mode.