MOTOROLA
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# MPL COMPILER

## Advance Information

M6800
SOFTWARE

### M6800 SOFTWARE . . . MPL COMPILER

MPL is a high-level, user-oriented programming language for the Motorola M6800 Microprocessor. The language is a subset of PL/I with features chosen for applicability to the microprocessor environment.

MPL was designed to simplify the translation from functional requirements for a microprocessor application to operating M6800 programs. The MPL language and its associated compiler provide a powerful software tool which can significantly reduce the time and costs associated with microprocessor software development and maintenance.

- Based on PL/I, a Powerful, High-Level Programming Language Which Is Widely Known and Used
- Supports Free Format, Block Structured Input
- Machine Independent
- Allows Embedded Assembly Language

### AVAILABILITY

MPL is available worldwide through timesharing. A "portable" version written in ANSI-standard FORTRAN is available for installation on in-house computer systems. Details concerning prices and introduction schedules are available from Motorola Sales Offices.

### MPL ADVANTAGES

- **Easy to Learn**
  The user-orientation of MPL results in reduced training requirements and shorter project start-up times.
- **Easy to Read**
  The self-documenting nature of MPL simplifies software maintenance and product enhancement.
- **Easy to Write**
  User-oriented statement forms and free-format input simplify program writing. The MPL block structure encourages software modularity and structured programming.
- **Easy to Debug**
  A high-level language permits an emphasis on debugging algorithms and design flaws rather than on the details of an assembly language implementation.
- **Easy to Optimize**
  Assembly language output and the use of embedded assembly language allow the optimization of certain program segments for execution speed or memory space, without writing an entire program in assembly language. Calls to assembly language subroutines involve very little overhead.
- **Easy to Upgrade**
  Programs written in MPL for the M6800 will be transferable to future Motorola microprocessor products by recompiling, not rewriting.
- **Easy to Use**
  - Higher productivity for software development
  - Lower software costs
  - Shorter design cycles
  - Easier product modification

### LANGUAGE FEATURES

**Standard PL/I Statements**
- PROCEDURE
- DECLARE statement with INITIAL, DEFINED attributes
- IF, THEN, ELSE statement
- DO statement with TO, BY, WHILE clauses
- Assignment statement
- GOTO and GOTO with label arrays
- Subroutine CALL
- RETURN
- END

**Data Types**
- Bit string
- Binary (1 or 2 bytes)
- Decimal (signed or unsigned)
- Character
- Labeled arrays

**Data Classes (Static or BASED)**
- Multidimensional arrays
- Structures
- Scalers
- Pointers

**Arithmetic or Logical Operators**
- Multiplication
- Division
- Subtraction
- Addition
- Shift
- Relational operators
- AND, OR, Exclusive OR

**Extensions**
- Address constants
- Computed GOTO
- Embedded assembly language statements
- ORIGIN
- Optional subroutine CALL with register arguments

## HOST COMPUTER REQUIREMENTS

- Software
  - ANSI FORTRAN IV
  - Any operating system that supports ANSI FORTRAN IV.
- Memory
  - 32-bit minimum word length
  - Memory size requirements vary due to computer and compiler differences. Estimates for machines for which the compiler is currently available are given in Table 1.
- Peripherals
  - MPL uses three or five logical units
    - Source Input
    - MPL Subroutine Library Input
    - Compiler Output
    - Terminal Input and Output on a Time-Sharing System
  - In general the peripherals needed for FORTRAN are sufficient for MPL.

## SOURCE MEDIA

MPL consists of approximately 5500 source statements including comments. The source program is available in two forms:

- Cards – 80 Column Punched Cards in 029 Punch Code
- Magnetic Tape – Unlabeled 9-track 800 BPI, Odd Parity, ASCII Character Set, Card-Image Records (80 character/record).

## INSTALLATION

The MPL Compiler has been designed to be as machine-independent as possible. However, some program functions must be changed to adapt it to a particular host computer. For computers listed in Table 1, machine dependent modifications already have been incorporated into the program. For these machines, installing MPL consists of supplying the job control statements required to run a FORTRAN program.

Installation of MPL on other machines is straightforward. Computer dependencies have been isolated and identified as separate program modules. Features which may require minor modification include:

- Input/Output including the assignment of logic devices
- Intrinsic Function (Logical AND, OR; Right and Left Shift)
- Character Set Translation

The starting point for such an installation should be the Motorola-converted version of MPL for the computer closest to the target system. Using the list in Table 1, match the computer characteristics first by the internal character set and then by word size.

TABLE 1 – ORDERING INFORMATION

| Part Number | Media | Computer | HOST COMPUTER ATTRIBUTES | | | |
|---|---|---|---|---|---|---|
| | | | Character Set | Word Size | Negative Number | Memory Used |
| M68MPL0210E<br>M68MPL0210F | Cards<br>Magnetic Tape | Xerox Sigma 9 | 8-Bit EBCDIC | 32 Bits | 2's Complement | 24K Words |
| M68MPL0710E*<br>M68MPL0710F* | Cards<br>Magnetic Tape | IBM360/370 | 8-Bit EBCDIC | 32 Bits | 2's Complement | 120K Bytes** |
| M68MPL0910E<br>M68MPL0910F | Cards<br>Magnetic Tape | Honeywell 6000 | 9-Bit ASCII | 36 Bits | 2's Complement | 26K Words |
| M68MPL1010E*<br>M68MPL1010F* | Cards<br>Magnetic Tape | CDC6000 | 6/12-Bit Display Code | 60 Bits | 1's Complement | 30K Words** |

*Scheduled for availability May 1976.

**Estimate

MOTOROLA Semiconductor Products Inc.
BOX 20912 • PHOENIX, ARIZONA 85036 • A SUBSIDIARY OF MOTOROLA INC
1G169-2 PRINTED IN USA 7-76 IMPERIAL LITHO 05827G 10M
AD1-345-R1