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Product Profile

MCUasm™ Assembly Language Toolset for Microcontrollers

MCUasm is an assembly language development toolset that supports the Motorola M68HC05, M68HC08, M68HC11, M68HC16, and M68300 families of microcontrollers. It replaces the MASM toolset. MCUasm tools provide a path to higher performance while maintaining compatibility with existing software and systems. The toolset can operate under either 32-bit Windows or protected-mode DOS. Various combinations of tools are available in the two operating environments. Refer to **Table 1** for information concerning toolset combinations.

MCUasm Features

- Fully compatible with MCUinit™, the graphical tool that automates MCU initialization
- Includes MCUdebug™ source-level debugger
- Relocatable or absolute object modules
- Switch selectable processor support
- Full instruction sets
- Instruction browser
- All available addressing modes
- Common syntax and extended instructions to ease upward migration
- Full macro capability with nesting
- Include file support that allows nested include files
- Linking of multiple source files
- Archiver
- Disassembler
- Optimization of long and short branches
- Generation of Motorola S-records
- 128 character symbol names
- Common Object File Format (COFF)
- User-controlled assembly listings
- Cross reference listings
- Symbol table listings
- User-selectable case sensitive labels
- Based on Motorola's assembly language input standard
- Works with existing MMDS systems and will be compatible with planned upgrades
- Works with existing CDS805 hardware and software
- User-selectable option to minimize the size of the symbol table to decrease download time
- Absolute listings available after relocation
- Creates map files for assembly debugging with M68ICD16 and M68ICD32 in-circuit debuggers

The Assembly Language Development Toolset comes in a single package that includes:

- User's Manual
- License Agreement
- Toolset software on 3.5-inch floppy disks.

The release guide provides technical support phone and fax numbers, as well as a technical support Internet address.

Table 1 Toolset Combinations

Development Tool	Integrated 32-bit Windows					Protected-Mode MSDOS				
	Microcontroller Family					Microcontroller Family				
	M68HC05	M68HC08	M68HC11	M68HC16	M68300	M68HC05	M68HC08	M68HC11	M68HC16	M68300
Relocatable Assembler	✔	✔	✔	✔		✔	✔	✔	✔	✔
Linker	✔	✔	✔	✔		✔	✔	✔	✔	✔
MCUdebug Source Level Debugger[1]	✔	✔								
S-Record Generator	✔	✔	✔	✔		✔	✔	✔	✔	✔
Archive Utility (Librarian)	✔	✔	✔	✔		✔	✔	✔	✔	✔
Instruction Browser	✔	✔	✔	✔						
Disassembler						✔	✔	✔	✔	
Name List Utility						✔	✔	✔	✔	✔
Symbol Strip Utility	✔	✔	✔	✔		✔	✔	✔	✔	✔
Absolute Listing Utility	✔	✔	✔	✔		✔	✔	✔	✔	✔
MASM to MCUasm Assembly Source Translator						✔	✔	✔	✔	
IASM to MASM Assembly Source Translator						✔	✔	✔	✔	
MCUasm to CDS805 Object File Translator	✔					✔				
Absolute Listing to P&E Microcomputer Mapfile Utility	✔	✔	✔	✔		✔	✔	✔	✔	
Terminal Emulator						✔ (real mode)				

NOTES:
1. For more information, see the *MCUdebug Product Profile* (M68SMCUDBGPP/D).

Host Requirements

MCUasm is intended for use with IBM PC™ or 100% PC-compatible systems that contain 80386 or later microprocessors, and runs under Microsoft Windows 3.1™, MSDOS 5.0™, or later versions of either. MCUasm requires a minimum of 6 Mbytes of RAM. At least 20 Mbytes of disk storage are needed to install the complete toolset.

Software

Many controller applications are limited by the cost of additional memory components or by timing constraints, and thus cannot take advantage of the benefits offered by high-level languages. In other applications, assembly language provides the best access to special hardware features. The MCUasm toolset provides solutions to these problems.

MCUasm provides capabilities not found in typical assembly-level toolsets. Some examples of the freedom allowed are: symbol names up to 128 characters, up to 32,000 symbols per source file, up to 256 sections, nested macros and nested include files up to 256 levels, and evaluation of all expressions using 32-bit arithmetic.

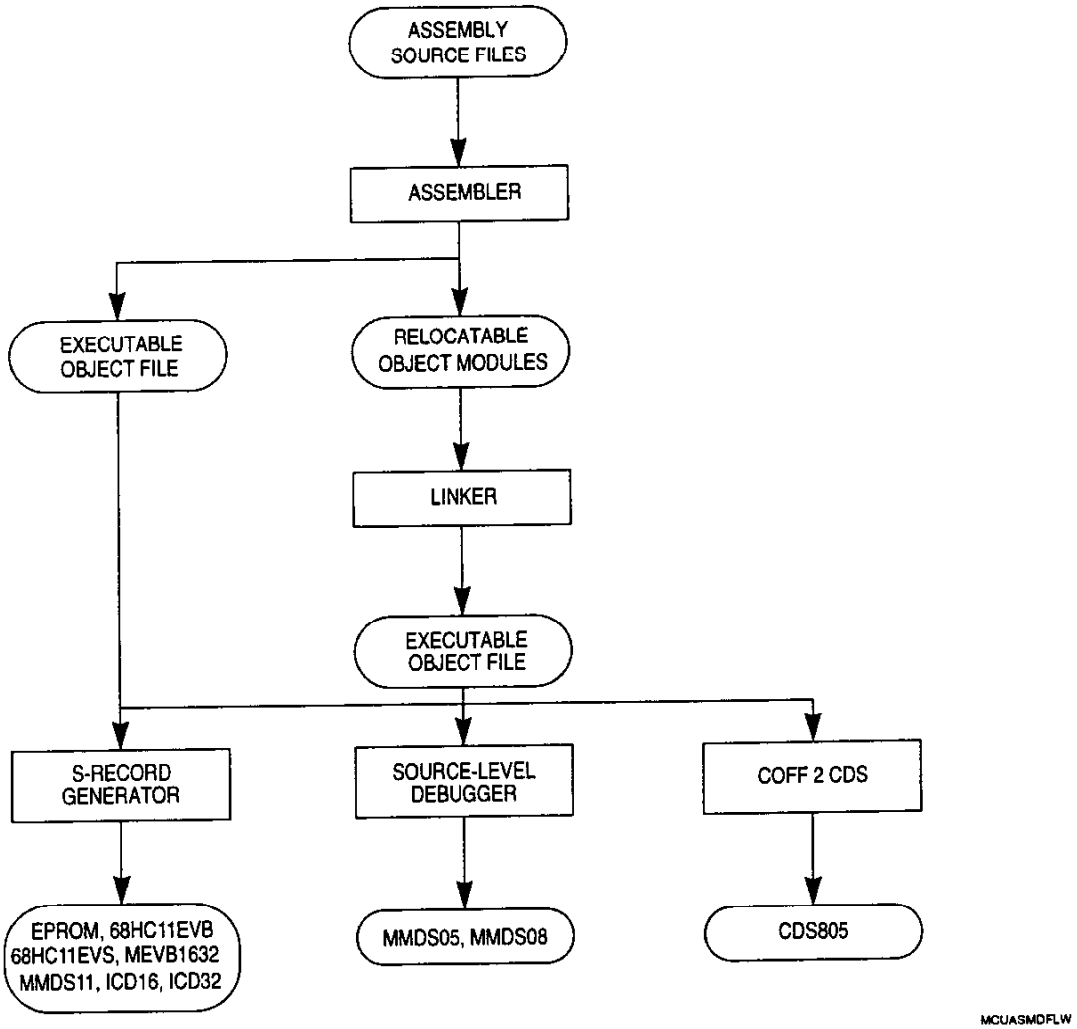

Figure 1 Development Flow

With the linker, a user arranges program sections to fit into physical memory. Sections can be contained in one or more files to facilitate rapid development and debugging. A user-defined directive file instructs the linker where to place these sections.

Particular Motorola microcontroller families have instruction sets and addressing modes that are optimized for high performance. MCUasm takes full advantage of these optimized instruction sets, and utilizes a common syntax to ease upward migration.

Table 2 Assembler Directives

Assembly Control
BASE — Sets default number base
END — End of source program
FAIL — User generated warning or error
INCLUDE — Include secondary file
ORG — Sets location counter

Data Definition/Storage Allocation
ALIGN — Aligns data or code in memory
DC — Allocates initialized storage
DCB — Allocates initialized memory block
DS — Reserves uninitialized memory
EVEN — Align to next word address
LONGEVEN — Align to next longword address

Listing Control and Options
CLIST — Controls conditional assembly listing
LIST — List the assembly
LLEN — Sets length of listing line
MLIST — Controls macro listing
NOLIST — Stop assembly listing
NOPAGE — Disables pagination in listing
PAGE — Advance to next page
PLEN — Sets page length
SPC — Insert blank lines in listing
TABS — Sets the tab length
TTL — Sets the title

Macros and Conditional Assembly
ELSEC — Assemble when IFcc is false
ENDC — End conditional assembly
ENDM — End macro definition
IFcc — Conditional assembly
MACRO — Macro definition
MEXIT — Exit macro

Symbol Definition
EQU — Equate symbol to a value
SECTION — Start section
SET — Set symbol to a value
XDEF — External symbol definition
XREF — External symbol reference
XREFB — External byte reference

Technical Support Information

- Telephone Support: 512-891-6276
- FAX Number: 512-891-2720
- Internet Address: masm@lemond.sps.mot.com

Ordering Information

Motorola's assembly language development toolset can be ordered through Motorola and participating authorized distributors. For information about a sales office or distributor near you, call (800) 765-7795, Extension 910.

Product	Host	Part Numbers
MCUasm	IBM-compatible PC	M68SMCUASMBB

RoHS-compliant and/or Pb- free versions of Freescale products have the functionality and electrical characteristics of their non-RoHS-compliant and/or non-Pb- free counterparts. For further information, see http://www.freescale.com or contact your Freescale sales representative.

For information on Freescale.s Environmental Products program, go to http://www.freescale.com/epp.