

HitMon11 v0.24 Manual

COLLABORATORS

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Contents

1	HitMon11 v0.24 Manual	1
1.1	Main Screen	1
1.2	1.0 Copyright notice	1
1.3	1.1 Disclaimer	1
1.4	1.2 Author	1
1.5	1.3 Copyright & Trademarks	2
1.6	1.4 Special thanks	2
1.7	2.0 Contents	2
1.8	3.0 General information	3
1.9	3.1 Known Bugs and Weaknesses	3
1.10	3.2 DOS Command line format and options	4
1.11	3.3 Internal Command Line Format And Options	5
1.12	4.0 Command Summary	5
1.13	Command BF (Block Fill)	6
1.14	Command CALL	6
1.15	Command CLRM (Call Macro)	6
1.16	Command DASM (Disassemble)	7
1.17	Command DEFM (Define Macro)	7
1.18	Command DELM (Delete Macro)	7
1.19	Command DOS	8
1.20	Command DR (Display Registers)	8
1.21	Command EEPROM	8
1.22	Command EEPROM CLR	9
1.23	Command EEPROM BULK	9
1.24	Command EEPROM ROW	9
1.25	Command EEPROM ERASE	10
1.26	Command FIND	10
1.27	Command G (Go)	11
1.28	Command LOADM (Load Macros)	11
1.29	Command LOADS (Load S19-Record)	12

1.30	Command LSTM (List Macros)	12
1.31	Command MD (Memory Dump)	12
1.32	Command MM (Memory Modify)	13
1.33	Command MS (Memory Set)	13
1.34	Command QUIT	14
1.35	Command RESTART	14
1.36	Command SAVEM (Save Macros)	14
1.37	Command VERF (Verify)	14

Chapter 1

HitMon11 v0.24 Manual

1.1 Main Screen

```
HitMon11 v0.24 Manual.
```

```
$VER: HitMon11_Manual_Guide 0.24 (15-Feb-94)
```

```
See Contents
```

1.2 1.0 Copyright notice

```
1.0 Copyright notice
```

```
This program is freeware. There should be no charge when copying
this program. You are not allowed to make any money by distributing
this program. You are allowed to take a nominal fee to cover
copying and disk costs but nothing more. If you distribute this
program see to that all files (listed in the file "OnTheDisk.txt")
are kept together. You are not allowed to change any of the files.
```

1.3 1.1 Disclamer

```
1.1 Disclamer
```

```
I believe this program workes as stated in this manual, but I don't
guarantee anything. Neither do I take any responsibility for any
damage made directly or indierctly by this program.
```

1.4 1.2 Author

```
1.2 Author
```

```
All code by: Richard Karlsson
```

If you want to send in a bug report, have any questions or for some other reason want to contact me, do so at:

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E-mail: No certain e-mail. You can always try my
"winter" e-mail address. But most certainly you
will have to send snail mail.

1.5 1.3 Copyright & Trademarks

1.3 Copyrights & Trademarks

Motorola is a registered trademark of Motorola Inc.
Amiga is a registered trademark of Commodore-Amiga, Inc.
Commodore and CBM are registered trademarks of Commodore
Electronics Limited.

1.6 1.4 Special thanks

1.4 Special thanks

Special thanks to Fredrick Karlsson for writing the expression
evaluator for the assembler included in this package, to Motorola
for their great processors, and to Commodore for the greatest
Computer, the Amiga.

1.7 2.0 Contents

2.0 Contents

1.0 Copyright

1.1 Disclaimer

1.2 Author

1.3 Copyrights & Trademarks

1.4 Special thanks

2.0 Contents

3.0 General information

3.1 Known Bugs and Weaknesses

3.2 DOS Command Line Format and Options

3.3 Internal Command Line Format and Options

4.0 Command Summary

1.8 3.0 General information

3.0 General information

The HitMon11 is a monitor intended to be used to upload Motorola S-Records to the Hc11 line of processors from Motorola. And also for faciliating debugging of programs. It should run on any Commodore Amiga computer. I believe it's the most powerful Hc11 monitor of it's kind that can be run on an Amiga.

1.9 3.1 Known Bugs and Weaknesses

3.1 Known Bugs and Weaknesses

This program is still in it's early stage and many functions is still to be added to the program, I hope. The program is based on a S-Record uploader I wrote a long time ago in pure hardware code, and that version was not intended to reach the public and thus was not very user friendly (i.e. if you did anything wrong the program would crash). Some of these weeknesses are still in the program so I would advice you to restart the program (Write restart at the prompt) if anything goes wrong. If for example you loose contact with the Hc11 the program has no possability to retain contact. You'll have to Restart. As soon as you see an error message regarding the contact with the Hc11 no more contact will be possable after that point. But some commands will still give you output. For example if you MD (Memory Dump) after contact has been lost, you will first get an error message but then MD will still output a Memory Dump. The contents of this memory dump is most certainly wrong. Restart HitMon11 to start over.

- If you DefM (Define Macro) a macro that already exists no error will be reported. You will then have two macros with the same name, but only the first one defined will ever be called. Advice: DelM

the first macro before redefining it.

- The DOS command executed with the "DOS" command can't ask for inputs from the keyboard. I.e. 'Dir Df1:' works fine, but 'Dir ?' doesn't work. But it will return control to the monitor. So no tilts or hangs, as far as I can see.

- No other known bugs...

Features I would like to add to the program in the future:

- Step by step debugging.
- Breakpoints.
- Symbols.
- The possibility to import a symboltable from the assembler.
- Better error control.
- I'm not very satisfied with the way the program handles numbers overall, it considers every value greater than 255 and less than -256 as 16 bit and the rest of the numbers as 8 bit. This is a weakness that will be removed.
- Other numeric formats than HEX will be allowed.
- Expressions will be allowed.

1.10 3.2 DOS Command line format and options

3.2 DOS Command line format and options

Usage:

```
HitMon11 <Talker> <Crystal> [-m <Macro file>] [-d <Device>] [-u
<Device Unit>]
```

<Talker>	The filepath to the Talker file to be used.
<Crystal>	The processors crystal frequency, in kilo herz.
<Macro file>	The file path to a macro file to load at startup. If no macro file is specified none is loaded. If this macrofile contains a macro called AutoStart, then that macro will be ran as soon as the Talker has been uploaded to the Hc11.
<Device>	The device to use when recieving/sending data from/to the Hc11. If this is not specified it defaults to "serial.device"
<Device unit>	Which unit number of the device to use. If this is not specified it defaults to 0.

The first thing the program will do is load the talker and macro files. Then it will try to make contact with the Hc11, and upload the talker. The talker is a little but powerful program written by Motorola that resides inside the Hc11 RAM. There are different talkers written for all Hc11 models. Remember that the talker is in RAM and thus you can't change the RAM during the operation of the monitor. This shouldn't be a problem since the RAM will be cleared anyway when the Hc11 loses its power and thus you will never have any data there that is needed when your program starts. If it is not possible to upload the talker to the Hc11 HitMon11 will tell you to reset you Hc11 in BootStrap mode (ModA = 0, ModB = 0). When the processor is reset the program starts uploading the talker

again. If it fails to do so you will be instructed to reset your Hc11 again. This is repeated until it works without any problems. Sometimes you will have to reset your processor many times and only after a while does it work. I don't know why this is the case and I will try to fix the problem till the next release. Sometimes it helps to adjust the crystal frequency given to HitMon11. I don't think there is any idea to change it by more than plus or minus 200 kilohertz. If the program tells you over and over again to reset your Hc11, but the upload fails every time, you probably have set the wrong crystal frequency, or picked the wrong talker file. If nothing happens when you reset you Hc11, you have maybe reset it in the wrong mode (Should be BootStrap), or else the connection between the Amiga and the Hc11 is faulty. Remember that you have to convert the voltages from the Amiga to the Hc11 to TTL levels and the voltages from the Hc11 to the Amiga to RS232 levels. When the talker has uploaded properly the processor state is written to the screen. Also if a macro file was specified at the command line and that macro file contains a macro called AutoStart, then that macro is run.

1.11 3.3 Internal Command Line Format And Options

3.3 Internal Command Line Format And Options.

When the monitor is ready to accept commands from you it writes a prompt to the left of the screen. It looks like this:

>

At the prompt you can write any of the supported commands. No white spaces are allowed in front of the command (not including the one after the '>').

If the command takes any options they should be separated by spaces, any number of spaces works fine. All commands accepted are listed and explained in chapter 4.

1.12 4.0 Command Summary

4.0 Command Summary

This is a list of all supported commands right now:

BF Addr1 [Addr2] Byte Word	Set MCU Memory byte(s) (Block
CALL Addr	Calls a subroutine in MCU memory.
CLRM	Clear Macros
DASM [Addr1] [Addr2]	Disassemble MCU memory.
DEFM MacroName	Defines a macro
DELM MacroName	- Deletes a macro.
DOS Command [Arg1] [Arg2] [...]	Executes a DOS command.
DR	Display Registers
EEPROM [Addr1] [Addr2]	Define EEPROM range
EEPROM CLR	Clear all EEPROM ranges.

EEPROM BULK Addr	Bulk erase EEPROM
EEPROM ROW Addr	Row erase EEPROM space.
EEPROM ERASE [Enable Disable]	EEPROM erase before write enable or disable.
FIND <Addr1> <Addr2> <8 16 32>	Finds a sequence of bytes in MCU
G Addr	Starts a MCU program.
LOADM <MacroFile>	Load Macros
LOADS <File>	Load motorola S19-record
LSTM	List Macros.
MD [Addr1] [Addr2]	Memory Dump
MM Addr	Memory Modify
MS Addr Value	Memory Set
QUIT	Ends the HitMon11 program.
RESTART	Restarts HitMon11.
SAVEM FileName	Saves macros to file.
VERF <S-Record>	Verifys MCU content to a S-Record

1.13 Command BF (Block Fill)

BF Addr1 [Addr2] Byte|Word Set MCU Memory byte(s) (Block Fill).

This command programmes one or more MCU memory locations, staring at Adr1 ending at one location less than Adr2. If no Adr2 is specified only one byte|word is written.

-- **** --

1.14 Command CALL

CALL Addr Calls a soubroutine in MCU memory.

This command calls a soubroutine in the MCUs memory at address <Addr>. Control is turned back to the monitor as soon as the subroutine has ended.

Example:

Call \$ee00 Calls the subroutine at address \$ee00

-- **** --

1.15 Command CLRM (Call Macro)

CLRM Clear Macros

Clears all macro definitions. Macros not saved will be lost.

Example:

Clrm All macros cleard.

-- **** --

1.16 Command DASM (Disassemble)

DASM [Addr1] [Addr2] Disassemble MCU memory.

Disassembles MCU memory starting from address <Addr1> ending at <Addr2> or as soon as the opcode at <Addr2> ends. If Addr2 is not specified HEX 100 (256) bytes of memory will be assembled, starting from <Addr1>. If no address is specified disassembly will start at the current address, and continue for 256 more bytes. The current address will be updated, so that disassembly can be continued by writing only 'Dasm'.

Example:

Dasm \$ee00 \$f000 Will disassemble MCU memory from
address HEX ee00 to address HEX
\$f000.

-- **** --

1.17 Command DEFM (Define Macro)

DEFM MacroName Defines a macro

Defines a macro with the name <MacroName>. You can now write the macro contents separated by returns (Enter). When you're finished press return twice.

If you want your macro to contain commandline arguments specify them as \n. Where n is the number of the argument starting from 0. When the macro is run these will be replaced by the command line arguments, or with nothing if there are no arguments.

Example:

DefM LD <Enter> Defines the macro LD
EEPROM Bulk \0 <Enter>
LoadS S19:Current.S19 <Enter>
EEPROM Erase Enable <Enter>
<Enter>

Here you're returned to the prompt. When the macro is run \0 will be replaced by the first argument.

-- **** --

1.18 Command DELM (Delete Macro)

DELM MacroName - Deletes a macro.

The macro with the name <MacroName> will be deleted from memory. If the macro has been saved to disk it will be safe there.

Example:

DelM AutoStart The macro called AutoStart will be deleted.

-- **** --

1.19 Command DOS

DOS Command [Arg1] [Arg2] [...] Executes a DOS command.

Executes the DOS command <Command> with the specified arguments. Control is returned to the monitor as soon as the DOS command is finished. No Ctrl-C's can be sent to the DOS command.

Example:

DOS Dir Sou: Dirs the volume or assign Sou:. But only if dir is found in the current path and if that is what the dir command found does...

-- **** --

1.20 Command DR (Display Registers)

DR Display Registers

Display the current values in the MCU register, stackpointer, CCR and PC. The CCR is displayed both in HEX and BIN form. DR takes no arguments.

Example:

DR Displays the current MCU registers.

-- **** --

1.21 Command EEPROM

EEPROM [Addr1] [Addr2] Define EEPROM range

Defines the address space between <Addr1> and <Addr2> (Excluding <Addr2>) as EEPROM space. If only <Addr1> is specified only the byte at <Addr1> is defined as EEPROM space.

Anytime a value is written to an address that is included in an

EEPROM range a special EEPROM algorithm will be used to program that address. This is completely transparent to the user.

If no address is specified a list will be displayed with all the current EEPROM ranges.

Examples:

EEPROM \$103f Defines address HEX 103f as EEPROM space.

EEPROM \$b600 \$b800 Defines addresses between \$b600 and \$b800 as EEPROM memory. (Including \$b600, excluding \$b800)

EEPROM Displays all current EEPROM ranges.

-- **** --

1.22 Command EEPROM CLR

EEPROM CLR Clear all EEPROM ranges.

Any EEPROM ranges specified by the EEPROM command are turned back to normal memory. The actual memory of the MCU isn't changed only the list that specifies what memory that should be treated as EEPROM is cleared.

-- **** --

1.23 Command EEPROM BULK

EEPROM BULK Addr Bulk erase EEPROM

Bulk erases the EEPROM area in which <Addr> is included. The whole area will be erased. An erased EEPROM byte reads HEX FF.

See the manual to your Hc11 to see how the EEPROM areas are defined in your Hc11 and how they can be moved around.

Example:

EEPROM Bulk \$b600 Clears the EEPROM area at \$b600.

-- **** --

1.24 Command EEPROM ROW

EEPROM ROW Addr Row erase EEPROM space.

Row erases the EEPROM Row in which <Addr> is included. All bytes in

the row will be erased. An erased EEPROM byte reads HEX FF.

See your Hc11 manual how the ROWs are defined in your Hc11, and how they can be moved.

Example:

EEPROM Row \$b600	Erases the EEPROM Row in which address HEX \$b600 is included.
-------------------	--

-- **** --

1.25 Command EEPROM ERASE

EEPROM ERASE [Enable Disable]	EEPROM erase before write enable or disable.
-------------------------------	--

Enables or disables the 'EEPROM erase before write' feature. If it's enabled any EEPROM byte that is written to will be byte erased before it is written to. If it's disabled it will not be erased before it's written to.

If this feature is enabled programming time will take about twice as long. And if it's not enabled and the EEPROM byte to be programmed is not previously erased the write may fail. Good practice is to normally have this feature enabled, but if you are going to program a large amount of EEPROM addresses and the area in which these are contained can be erased without loss of data, then you should BULK erase the whole area, disable the EEPROM erase before write feature, then program the desired addresses, possibly by loading a S-Record, when this is finished enable the EEPROM erase before write feature again.

Actually its only the first character after ERASE that is checked for. So, E for enable and D for disable.

If neither Enable or Disable are specified the current state of the EEPROM erase before write feature will be listed.

Examples:

EEPROM Erase	Lists the current state of the EEPROM erase before write feature.
EEPROM Erase Enable	Enables the EEPROM erase before write feature.
EEPROM Erase Disable	Disables the EEPROM erase before write feature.

-- **** --

1.26 Command FIND

FIND <Addr1> <Addr2> <8|16|32> Finds a sequence of bytes in MCU memory.

Searches from <Addr1> to <Addr2> for the occurrence of the byte sequence in the last operand. If it's a byte (8 bit), that byte will be searched for. If it's a 16 bit word, that 16 bit word will be searched for. And if it's a 32 bit word, that 32 bit word will be searched for. Even if a 16 or 32 bit word is specified the search will be performed at every byte boundary.

Examples:

FIND \$8000 \$9000 \$12 Searches for the occurrence of HEX 12 from address \$8000 to \$8fff

FIND \$8000 \$9000 \$123 Searched for the occurrence of HEX 0123 in the same address space as above.

FIND \$8000 \$9000 \$12345 Searched for the occurrence of HEX 00012345 in the same address space as above.

-- **** --

1.27 Command G (Go)

G Addr Starts a MCU program.

Starts MCU program at address <Addr>. Control will not return to the monitor.

Example:

G \$ee00 Starts code execution at address HEX ee00.

-- **** --

1.28 Command LOADM (Load Macros)

LOADM <MacroFile> Load Macros

Loads macros from the file <MacroFile> and adds them to the current macros in memory. This file may either be produced by the SaveM command or edited by a standard text editor as for example Ed on the Workbench disk. The file should look like this:

```
DefM <MacroName>
Begin
<Command1> [Arg1] [Arg2] [...]
[<Command2>] [Arg...]
[...]
```

```
End
DefM <Macro2>
Begin
[<Command...>]
[...]
End
```

... I hope you get the idea. '`\n`' will as usual with macros be replaced by the command line arguments (n is the number of the argument starting from 0).

-- **** --

1.29 Command LOADS (Load S19-Record)

```
LOADS <File>                                Load motorola S19-record
```

Loads the file <File>, checks if it's a valid Motorola S19 record and if it is uploads it to the Hc11. While uploading the remaining bytes to upload are displayed on screen. The value is updated every 256 bytes or less. If data is uploaded to EEPROM, 256 bytes takes quite long so don't get impatient. If you have an LED on the TxD and/or on the RxD line(s) you can see that something indeed is happening, else you'll just have to wait for it to finish.

-- **** --

1.30 Command LSTM (List Macros)

```
LSTM                                           List Macros.
```

Lists the macros currently in memory. Here you can see which macros are currently available.

Examples:

```
LstM                                           Lists current macros.
```

-- **** --

1.31 Command MD (Memory Dump)

```
MD [Addr1] [Addr2]                           Memory Dump
```

MD displays memory using the standard HEX dump format. I.e at the very left end of the line the address is displayed in HEX. Following the address is the current content (byte) of that address, followed by the contents of the following 15 addresses (totaling 16) separated by spaces. After the HEX values the same 16 bytes are listed again but in ASCII format enclosed by quotes. An example shows how it all can look:

-- **** --

1.34 Command QUIT

QUIT Ends the HitMon11 program.

Quit will quit the program without confirmation. It wont check if you have saved changed macros. If anything is written but the quit command the program will not quit. This ensures you will not quit the program by mistake.

Usage:

Quit Quits the program.

-- **** --

1.35 Command RESTART

RESTART Restarts HitMon11.

If contact has been lost with the MCU, the MCU has to be reset (in bootstrap mode) and the HitMon11 will have to be restarted. The Restart command acts exactly like quitting the program and restarting it with the same arguments.

Example:

Restart Restart HitMon11, and wait for new contact with the MCU.

-- **** --

1.36 Command SAVEM (Save Macros)

SAVEM FileName Saves macros to file.

Saves macros currently in memory to the file specified by <FileName>. To see what macros are beeing saved use the 'LstM' command. Macros that have been changed must be saved before the program is exited, or they will be lost.

Example:

SaveM S:Setup.Mcr Saves macros to file 'S:Setup.Mcr'.

-- **** --

1.37 Command VERF (Verify)

VERF <S-Record> Verifys MCU content to a S-Record

Loads the S-Record <S-Record> (May include path) and verifys MCR memory content to the information in the S-Record. If there is differences they are reported to the screen. Addresses not found in the S-Record are not verified.

Example:

VERF T:Current.S19 Checks if MCU memory is the same as the S-Record says it should be.

-- **** --