User Guide for MOUSEMON Mobile Robot Program Monitor/Loader

(R)eg Dump

Format: xxR where xx is a hex-number between 00 and FF corresponding to one of the 256 internal registers of the microcontroller. The contents of the eight registers from xx are printed out. Note that for locations above 7F, you access plain memory, not the SFRs with the same addresses.

e.g.   `>10R`

       `10 = 6E 34 E8 76 A2 00 01 9D`

e(X)amine Register

Format: xxX where xx is a hex-number between 00 and FF corresponding to one of the 256 internal registers of the microcontroller. A routine similar to that of Single-Step is entered which prints out the contents of register xx after every user-program instruction has executed. Hence a register may be monitored continuously, albeit with a reduction in the speed of execution of the user-program.

e.g.   `>15X`

       `23`

Important Note: Examine mode uses External Interrupt 0. The interrupt vector in User RAM is changed when 'X' is keyed. There must be no hardware connection to the INT0 pin while using Examine.

(S)tore Reg

Format: xxyyS where xx is a hex-number between 00 and FF corresponding to one of the 256 internal registers of the microcontroller, and yy is the data to be stored in that register. Note that for locations above 7F, you access plain memory, not the SFRs with the same addresses.

e.g.   `>103FS`

The data 3F is stored in register 10.

If a sequence of numbers are to be entered in consecutive locations, then the address need not be entered for a second and subsequent time.

e.g.   `>103FS`

       `>20S`

       `>ABS`

would put 3F in register 10, 20 in register 11, and AB in register 12.

(M)em Dump

Format: xxxxM where xxxx is a 4-digit hex address corresponding to an <u>external</u> memory location. The contents of 16 locations are printed out both in hex and as ASCII equivalents. Typing M again will print out the next 16 and so on.

```
e.g.   >8000M
       8000 = 01 00 03 00 00 09 41 00 45 00 00 00 35 00 00 00  ......A.E...#...
```

(W)ipe Mem

Format: Typing W at the command prompt will result in 00 being stored in all external User RAM locations from 8000H to FFFFH.

```
e.g.   >W
```

(N)ext

Format: When first used, single-step mode is entered. Every time 'N' is keyed subsequently, one line of user program is executed and the program halted. The contents of important internal registers and Ports are displayed, including the Program Counter which contains the address of the <u>Next</u> user program instruction to be obeyed.

Note that other MOUSEMON commands may be used between single-steps. For instance, registers may be examined and modified using the 'R' and 'S' commands.

If any of the 'Useful Subroutines' held in the ROM are used, they will not be stepped, but will run without stopping until a Return (RET) instruction is executed.

To single-step a user program from the start: hit 'N' followed by 'G' or 'xxxxJ'.

```
e.g.   >N
       >G
       A   B   DPTR PSW P1 P3 SP Next
       00 8D 037E 00  FF FB 2F 8015
       >N
       A   B   DPTR PSW P1 P3 SP Next
       00 8D 037E 00  FF FB 2F 8017
       >
```

Important Note: Single-Step mode uses External Interrupt 0. The interrupt vector in User RAM is changed when 'N' is keyed for the first time. There must be no hardware connection to the INT0 pin while using Single-Step.

Disable other interrupts when using single-step mode. (Except Serial Port.)

(J)ump

Format: xxxxJ where xxxx is a 4-digit hex address corresponding to an <u>external</u> memory location. Execution is transferred to a user program at that address, <u>with monitor commands still available</u>.

e.g.   `>8030J`

(G)o User

Format: Typing **G** causes a user program to run at location 8012H in User RAM. It is functionally the same as typing: 8012J.

T(est)

Format: xxyyT where xx is a test number and yy is a motor speed factor. This provides access to three motor drive test programs described in the Modelling Notes.

e.g.   **>0180T**

(Q)uit

Format: Typing **Q** forces a reset of MOUSEMON: terminating user program execution and cancelling Single-Step mode (if activated).

e.g.   `>Q`

Loading User-Programs into the mobile robot memory

Use the **Send Text File** function in Windows Terminal or Hyperterminal to send assembled machine code files (.HEX format) to the robot via the RS-232 serial Com port link.

> 1. Interrupt vectors will become effective when your program enables them.
> 2. Reset and Serial Port interrupts are reserved by MOUSEMON.
> 3. External Interrupt 0 is used by the Single-Step/Examine mode (when activated).
> 4. Registers 79 to 7F are used by the Single-Step mode (when activated).
> 5. Register Bank 3 (18H to 1FH) is reserved by MOUSEMON.
> 6. Bit 20H is reserved by MOUSEMON.
> 7. The stack begins at register 30H and builds upwards.
> 8. Timer 1 is used by MOUSEMON as the serial port clock.

Manual34.doc WGM 6/2000