AN_001

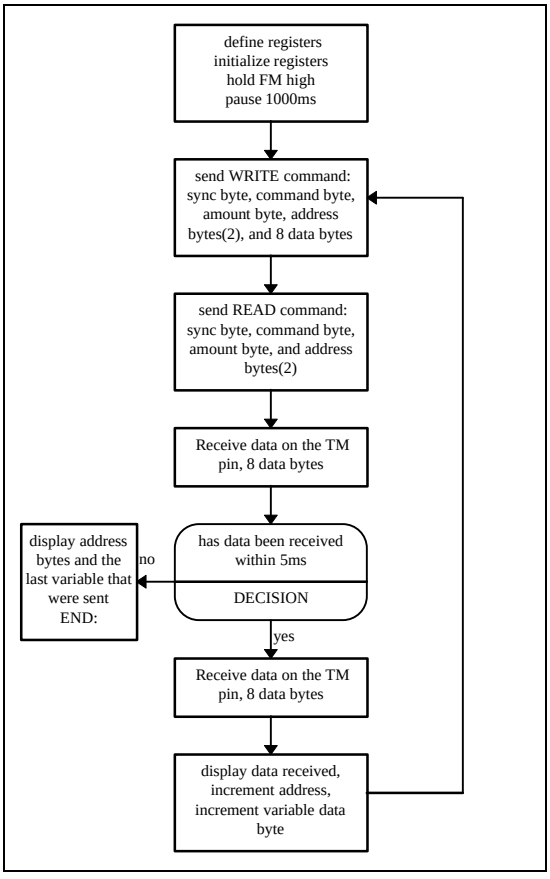
Using the RAMPack WRITE & READ commands with a Parallax Basic Stamp2

The following software listing depicts one way to utilize the RAMPack with a Basic Stamp 2. This software steps through each address location in the RAMPack. At each address the Basic Stamp writes eight data bytes at 9600 baud. The Basic Stamp then reads back the eight data bytes at 1200 baud, by means of the READ command.
If data is not received within 5ms the program jumps to a routine that displays the last address written to as well as a variable data byte.
If data is received it is stored in registers b15-b8. Then the address is incremented along with a variable data register.

This application note describes the methods to use the WRITE and READ commands. It also details a method for incrementing the address bytes and keeping them within the RAMPacks memory map. Also described is the process of adjusting a variable register and storing it in the RAMPacks memory space.

It is possible to WRITE commands at one baud rate and READ commands at another. The rate that data will be transferred on the TM pin will always be the same as the rate that the READ command was sent on the FM pin.

Software Flow Chart

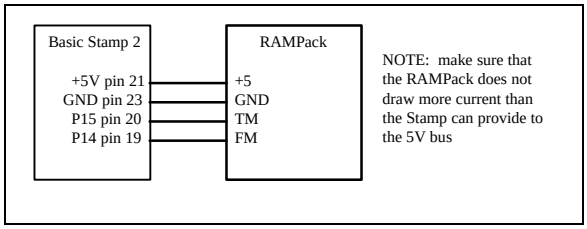


Software Listing

```
START:
input       15                      'P15 set as To Master: input
output      14                      'P14 set as From Master: output
ADDR_HI     var   byte              'Address high byte register
ADDR_LO     var   byte              'Address low byte register
VALUE       var   byte              'Variable data byte register
'
'Initial values of variable registers set to zero
'
VALUE                   = $00
ADDR_LO                 = $00
ADDR_HI                 = $00
HIGH        14                      'Set FM high to start program
PAUSE 1000                          'Wait a little bit
'
MORE_STUFF:
'
'WRITE 8 bytes of data at 9600 baud.  Start WRITE at ADDR_HI,ADDR_LO address
SEROUT  14,84,[$55,$00,$08,ADDR_HI,ADDR_LO,VALUE,$07,$06,$99,$88,$96,$55,$AA]
'
'Send READ command at 1200 baud, data will be received at 1200 baud
SEROUT  14,813,[$55,$01,$08,ADDR_HI,ADDR_LO]
'
'read in 8 data bytes, if data doesn't show up in 5ms go to PROBLEM
SERIN     15,813,5,PROBLEM,[b15,b14,b13,b12,b11,b10,b9,b8]

'display data received in two rows to the PC
DEBUG       ISHEX2 b15,TAB
DEBUG       ISHEX2 b14,TAB
DEBUG       ISHEX2 b13,TAB
DEBUG       ISHEX2 b12,CR
DEBUG       ISHEX2 b11,TAB
DEBUG       ISHEX2 b10,TAB
DEBUG       ISHEX2 b9,TAB
DEBUG       ISHEX2 b8,CR,CR
'
ADDR_LO = ADDR_LO + 1 'Increment address low byte
IF ADDR_LO =  0 THEN LOOP_OUT       'If address rolls over go to LOOP_OUT
VALUE = VALUE + 1                   'Increment variable data register
GOTO   MORE_STUFF                   'Send new data to new address
'
LOOP_OUT:                           'Low address has rolled over
IF ADDR_HI = $1F THEN ZERO_ADDR     'Have we reached the end of memory
ADDR_HI = ADDR_HI + 1               'Not end of memory increment address high byte
GOTO   MORE_STUFF                   'Send new data to new address
'
ZERO_ADDR:                          'Zero out upper address byte
ADDR_HI = $00
GOTO   MORE_STUFF
'
'READ command did not work, display address and value when failure occured
PROBLEM:
DEBUG       BELL
DEBUG       ISHEX2 ADDR_HI,TAB
DEBUG       ISHEX2 ADDR_LO,TAB
DEBUG       ISHEX2 VALUE,TAB
END:
```

Hook-up Diagram



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