This program is used with the Memsic 2125 accelerometers to make a basic seismograph that teachers can use to demonstrate seismic measurement principles. The Basic Stamp measures the pulse width modulation produced by the accelerometers and sends the data to either a computer with EXCEL spreadsheet software via StampDAQ, or by a data link transmitter. The math needed to translate the pulse width modulation into g force is accomplished within the spreadsheet to take advantage of the computer's computational power (and to avoid the BStamp integer math limitations). The X-Y accelerometer is mounted flush so the main circuit board. The Z-X/Y accelerometer is mounted perpendicular to the main board and at a 45 degree angle to the X-Y axis. Though not used in this program, the X/Y axis accelerometer can be measured and indicates the vector sum of the individual X-Y axis.

The program will take and send 500 data points, then clear the graphs, and finally starts collection over again to provide a continuos output. The program could be easily changed to await accelerations above a certain threshold before collecting data.

The program could be modified to store acceleration data for later retrieval and display with StampDAQ. This would allow the device to be used in other ways to explore accelerations, for instance, amusement ride physics activities, vehicular accelerations, or dropped object and trajectory activities.

set up variables
xraw VAR Word
yraw VAR Word
zraw VAR Word
xin CON 15 'x axis line
yin CON 14 'y axis line
zin CON 13 'z axis line
xyin CON 12 'xy axis line
txPin CON 8 'tx data line on data link transmitter
HiPulse CON 1
x VAR Word 'Variable for collection count
sPin CON 16 'Serial Pin - P16, Programming port
Baud CON 84 'Baud mode for a rate of 9600, 8-N-1
'BS2P, BS2SX use 240 for 9600, 8-N-1

initialize communications with computer
PAUSE 1000 'Allow data communications to stabilize
SEROUT sPin,Baud,[CR] 'Send a lone CR to ensure StampDAQ buffer is ready
'use following line if using a data link transmitter
'SEROUT txPin,Baud,[CR]

*****************************************************************************
Configure:
'set up data tables on the computer
with TIME, X, and SIN X

SEROUT sPin,Baud,"CLEARDATA",CR]   'Clear all data columns (A-J) in
Excel
'use following lines if using a data link transmitter
'SEROUT txPin,Baud,"CLEARDATA",CR]

Main:

FOR x=0 TO 499                       '500 data points sent to StampDaq
    'then graph is cleared and more
    'data sent.
    PULSIN xin,HiPulse, xraw             'reading the PWM of the
accelerometers
    PULSIN yin,HiPulse, yraw
    PULSIN zin,HiPulse, zraw

    SEROUT sPin,Baud,"DATA,TIME"," DEC xraw, ",", DEC yraw","", DEC
zraw,CR]   'use following line if using a data link transmitter
    'SEROUT txPin,Baud,"DATA,TIME"," DEC xraw, ",", DEC yraw","", DEC
zraw,CR]
    NEXT 'next x

SEROUT sPin,Baud,"CLEARDATA",CR]   'Clear graphs and start collection
again
'use following line if using a data link transmitter
'SEROUT txPin,Baud,"CLEARDATA",CR
GOTO Main

END