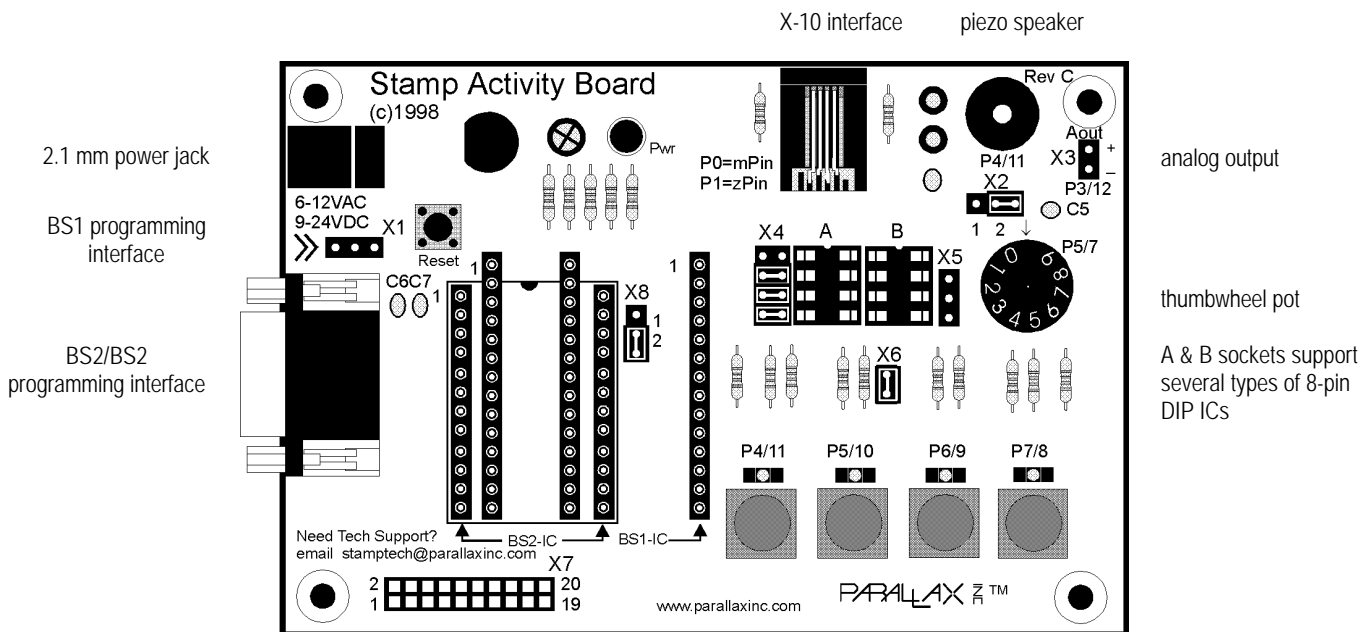


# BASIC Stamp® Activity Board:

## Features and Specifications

The BASIC Stamp Activity Board (BSAC) is a demonstration board for Parallax BASIC Stamp computers (BS1-IC, BS2-IC, and the BS2SX-IC modules). The BSAC board, coupled with the sample programs, provide many working examples of the higher Stamp functions and depict intermediate stamp programming techniques. This documentation explains BSAC features and provides sample source code for the BASIC Stamp I, II, and the IISX. Sample source code is included on the enclosed diskette.



I/O pins brought out to standard 2x10 IDC header for easy access. Four pushbuttons and LEDs for operator interface.  
(Actual size = 4.00" x 3.00")

### Features

- Four pushbuttons let you stimulate inputs
- Four LEDs indicate the status of the outputs
- 32 Ohm Speaker outputs frequencies: 500-8K Hz
- Potentiometer gives you an analog input
- RC network changes PWM into a smooth analog output
- A/B sockets support many 8 pin DIP ICs including: eeproms, ADCs, digital thermometers, etc.
- X-10 interface via RJ-11 connection
- Standard 25mil post, 100mil center, dual row header provides an interface to other modules
- Current limit resistors make the board forgiving of 'engineering mistakes'
- Reset pushbutton allows you to easily reset the Basic Stamp
- Large holes in the corners allow easy mounting
- Supports the BS1-IC, BS2-IC, and the BS2SX-IC

PARALLAX Z™

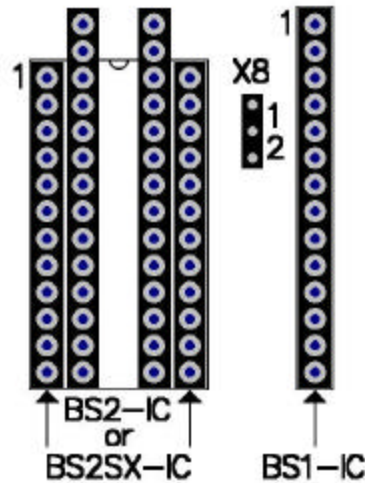
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## Power Supply

The power required is 6-12 VAC or 9-24 VDC @ 100mA. The voltages noted on the printed circuit board are lower to accommodate certain regulators used on early models of BASIC Stamps. If your BASIC Stamp regulator has the letters, "KD", printed on it, or if you are using the BS2SX-IC, use the lower voltages specified on the printed circuit board. BS2-ICs bearing regulators printed with the number, "LM293", can use the higher input voltages specified above. The green LED should light when power is applied. We have included a 9VDC wall-pack power supply that is suitable.

## BASIC Stamp Modules

The BSAC board supports the BS1-IC, BS2-IC, or the BS2SX-IC modules. You may use the BS1-IC with either the BS2-IC or the BS2SX-IC. Since all modules have on-board 5VDC regulators, you must choose which stamp will supply the 5 Vdc for the rest of the Stamp Activity Board. This is done by positioning X8. In the "1" position, X8 connects the BS1-IC's 5V supply to the Stamp Activity Board circuitry. In the "2" position, X8 connects the BS2-IC (or the BS2SX) 5V supply to the Stamp Activity Board circuitry. This drawing shows how and where to plug your Stamp into the Stamp Activity Board and the relative position of the X8 jumper.

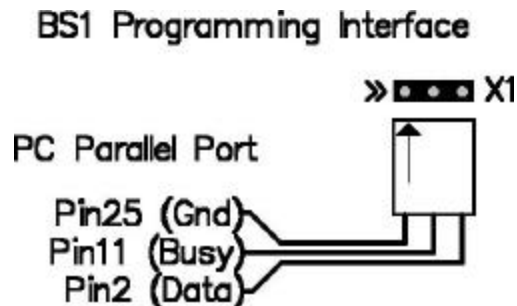


## Reset Switch

The reset pushbutton is connected to both Stamp sockets. Each BASIC Stamp has its own brown-out-reset circuit that pulls the reset line high. Pushing the reset pushbutton pulls the RST pin of the BASIC Stamp to ground, thereby resetting the stamp.

## BS1-IC Programming Interface

The BS1-IC programming interface is a three-pin, in-line connection (X1). When connecting the BS1 Programming Cable, (provided in the BS1-Starter Kit), line up the arrow found on the side of the cable with the hash marks found on the Stamp Activity Board. If you wish to make your own cable, follow the diagram to the right.



## BS2-IC Programming Interface

The BS2-IC and the BS2SX-IC programming interface is DB9 (RS-232) serial connection. Simply connect the Serial Programming Cable, (provide in either the BS2 Starter Kit, or the BS2SX Starter Kit), to the DB9 serial connector provided on the Stamp Activity Board. If you do not have this cable, any DB9-DB9 'straight-through' modem cable will do.

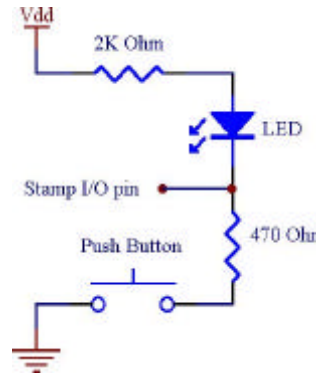
## I/O Pins

Most of the I/O Pins are 'pre-wired' to dedicated peripherals on the board. All I/O Pins connect directly to the AppMod socket (X7: a female IDC socket located near the bottom of the board) that allow I/O pin access as well as providing a means to connect AppMods to the BSAC board.

**Use caution** when connecting peripherals directly to the AppMod socket as there are no 'safety resistors' used. Short circuits and I/O Pin conflicts can result in damage to the Stamp and/or the Stamp Activity Board.

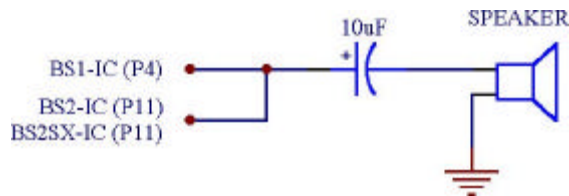
## Pushbuttons & LEDs

Four push buttons are provided to stimulate the input pins of the Stamp. Four LEDs indicate the status of the I/O pins and connect to the same I/O pins as the four pushbuttons. Above each LED/Pushbutton combination there is a legend that shows which I/O pin it is connected to. There are two pin numbers for each LED/Pushbutton. The first number is the BS1-IC pin number and the second is for the BS2-IC/BS2SX-IC pin number. The diagram below shows how the pushbuttons and LEDs are typically connected.\* Note: the jumper, X6, must be shorted to allow proper operation of the P5/P10 LED.



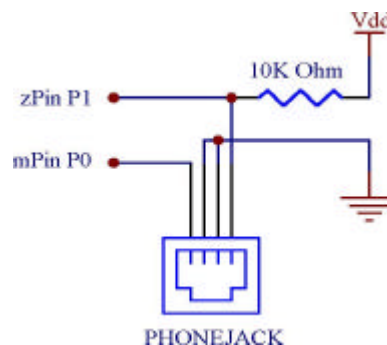
## The Speaker

A 32 Ohm speaker is coupled through a 10uF capacitor so that it may be used by the BS1-IC (P4), the BS2-IC (P11), or the BS2SX-IC (P11). This drawing shows the connections.



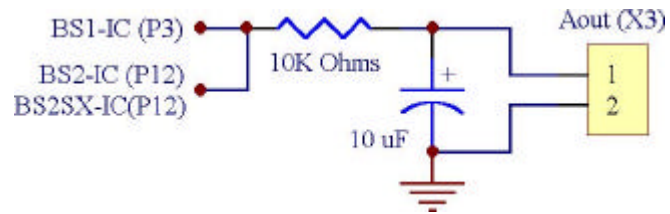
## X-10 Interface

The RJ-11 connector is pre-wired to interface directly to a Powerhouse TW-523 Powerline interface. Since only the BS2-IC and the BS2SX-IC offers the XOUT function, this peripheral is wired only to the BS2-IC and BS2SX-IC pins. The diagram to the right shows the connections.



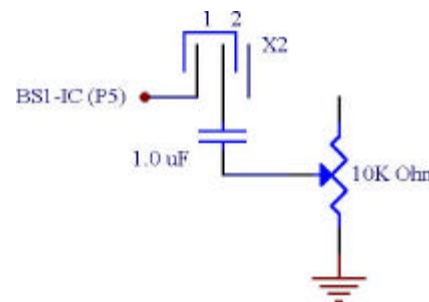
### Analog Output

Though none of the BASIC Stamp offers an analog output function, all of them offer the PWM function (pulse width modulation) . If an RC network filters the PWM output, a smooth analog output 0-5Vdc) results. The diagram to the right shows the connections.



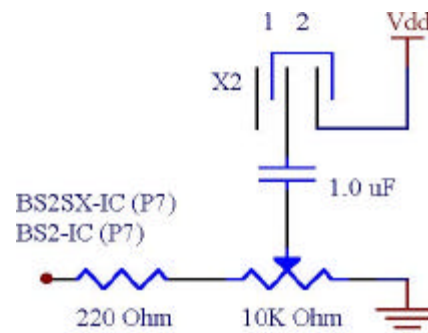
### The Potentiometer (BS1-IC)

The POT command allows the BS1-IC to read a variable resistance in series with a known capacitance. Position the X2 jumper to the "1" position. Remove the X6 jumper when reading the potentiometer. The diagram to the right shows the connections.



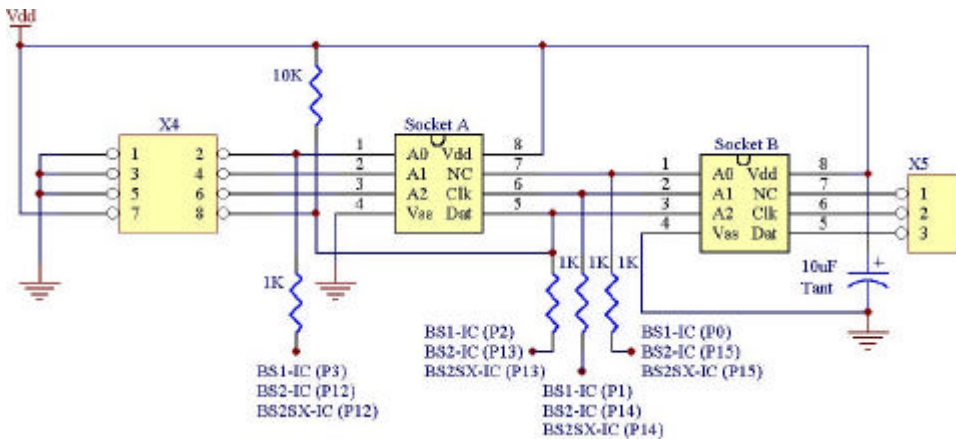
### The Potentiometer (BS2-IC)

The RCTIME command allows the BS2-IC or the BS2SX-IC to read a variable resistance in series with a known capacitance. Position the X2 jumper to the "2" position. The diagram to the right shows the connections.



### IC Sockets

The BSAC board provides two 8-pin DIP sockets designed to accommodate a variety of different ICs. Several ICs have been selected and made examples of herein. Please note that socket 'A' and socket 'B' are wired slightly differently, this is to widen the range of parts supported. To use any of the examples below, you need only insert the specified IC into the socket directed, configure the jumpers as specified, and program the stamp with the correlating example code provided on the included diskette.



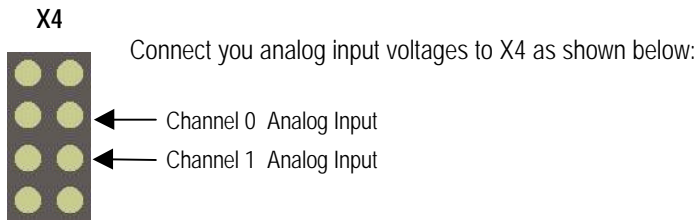
#### 24C65 Serial Eeprom

Socket 'A' supports the 24C65 eeprom from Microchip. Plug the 24C65 into socket 'A'. Align the notch on the chip with the notch on the socket. Configure the jumpers as shown in the drawing on the right. After installing your stamp onto the BSAC board, power up the BSAC board and download the program called 24C65 (the extension corresponds to the type of stamp you have) located on the enclosed diskette.



#### LTC1298 A/D Converter

Socket 'A' supports the LTC-1298 A/D Converter from Linear Technologies. Plug the LTC-1298 into socket 'A'. Align the notch on the chip with the notch on the socket. Configure the jumpers as shown in the drawing on the right. After installing your stamp onto the BSAC board, power up the BSAC board and download the program called LTC1298 (the extension corresponds to the type of stamp you have) located on the enclosed diskette.



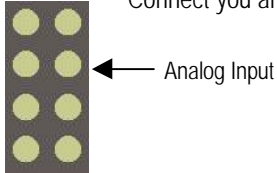
**ADC0831 A/D Converter**

Socket 'A' supports the ADC-0831 A/D Converter from Analog Devices. Plug the ADC-0831 into socket 'A'. Align the notch on the chip with the notch on the socket. Configure the jumpers as shown in the drawing on the right. After installing your stamp onto the BSAC board, power up the BSAC board and download the program called ADC0831 (the extension corresponds to the type of stamp you have) located on the enclosed diskette.



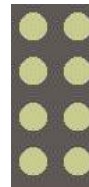
**X4**

Connect you analog input voltages to X4 as shown below:

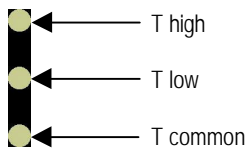


**DS1620 Digital Thermometer**

Socket 'B' supports the DS-1620 Digital Thermometer/Thermostat. Plug the DS1620 into socket 'B'. Align the notch on the chip with the notch on the socket. Configure the jmpers on X4 as shown (all jumpers removed) in the drawing on the right. After installing your stamp onto the BSAC board, power up the BSAC board and download the program called DS1620 (the extension corresponds to the type of stamp you have) located on the enclosed diskette. Please note the outputs available on strip header X5.



**X5**



## Legend of Stamp I/O Pin Connections

BS2-IC Pin BS2SX-IC Pin	BS1-IC Pin	Connected To:
P15	P0	Socket A, pin 7 Socket B, pin 1 Note: Connected via a 1K Ohm isolation resistor
P14	P1	Socket A, pin 6 Socket B, pin 2 Note: Connected via a 1K Ohm isolation resistor
P13	P2	Socket A, pin 5 Socket B, pin 3 Note: Connected via a 1K Ohm isolation resistor 10 K Ohm pull up resistor (to +5 Vdc) X4 (can be hard jumpered to +5 Vdc)
P12	P3	Socket A, pin 1 via a 1K Ohm isolation resistor Note: Socket A, pin 1 can be grounded via the X4 jumper. RC filter for Analog Output (X3)
P11	P4	P4/P11 Pushbutton/LED circuit The speaker The potentiometer RC network (for BS1-IC) Note: The jumper on X6 must be removed for proper operation of the 'Pot' function
P10	P5	P5/P10 Pushbutton/LED circuit
P9	P6	P6/P9 Pushbutton/LED circuit
P8	P7	P7/P8 Pushbutton /LED circuit
P7		The potentiomer RC network for BS2-IC and BS2SX-IC
P6 through P2		No connections
P1		Pin 1 of the RJ-11 connector (for X-10) Note: This line is pulled to +5 Vdc via a 10 KOhm resistor
P0		Pin 4 of the RJ-11 connector (for X-10)