Activity Center

User's Guide
July 2, 2008 Revision 1.4
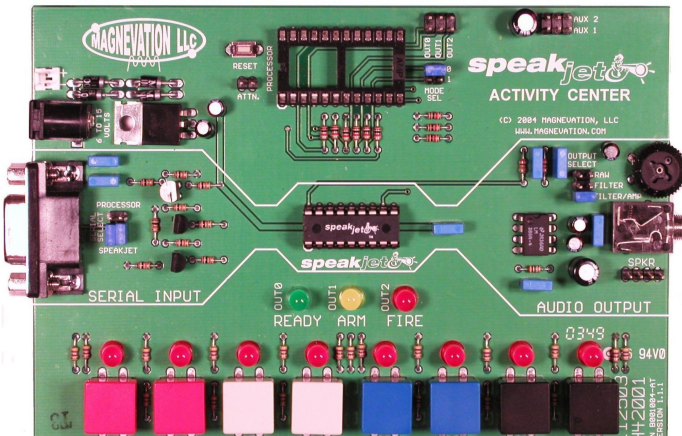
Core Features:

- Audio amplifier and filter
- Socket for optional Microcomputer.
- RS-232 interface for both SpeakJet and Microcomputer.
- Volume control.
- Color coded Key pad for data entry and Event triggers
- Bright LED's for visual feedback.
- Multiple power input options.
- Simple "Stand Alone" operation.
- Large, open and simple layout.
- Output header for the 3 programmable digital outputs.
- Durable FR4 construction for years of dependable use.

General Description

The SpeakJet Activity Center is a tool used to demonstrate all of SpeakJet's features. It can also be used as an educational aid for training in voice synthesis as well as a development tool for applications using SpeakJet.
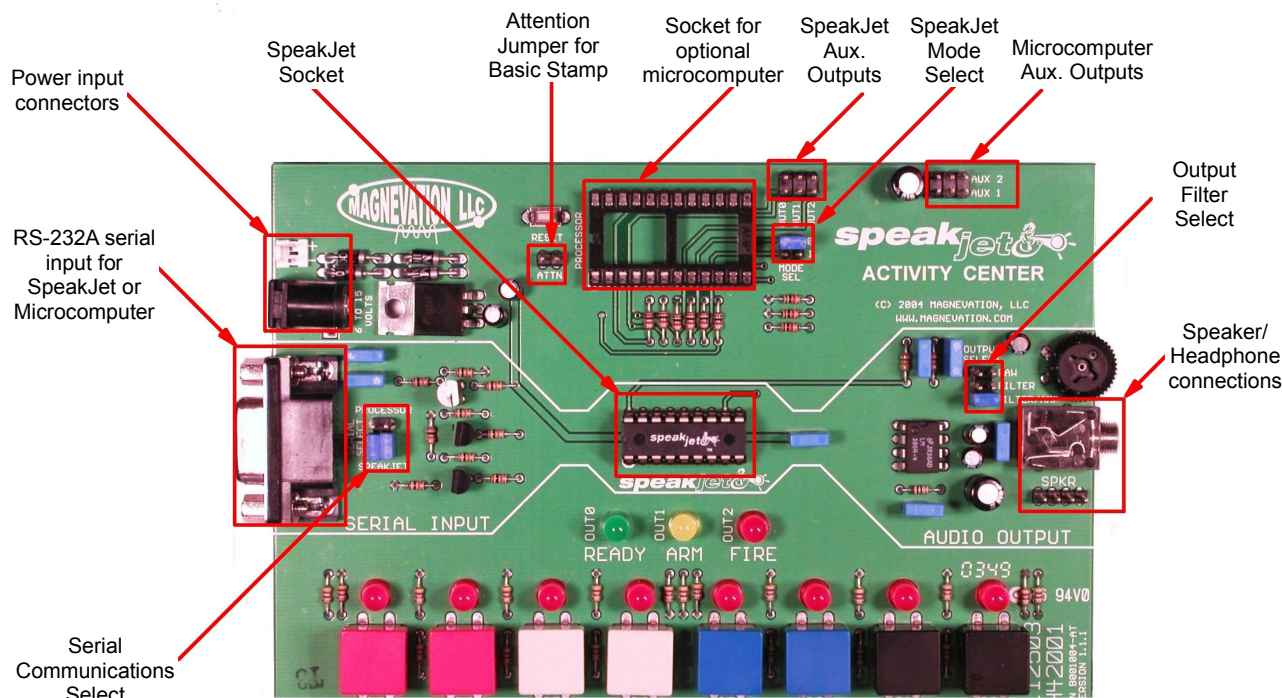
The SpeakJet Activity Center can be used in stand alone mode or controlled by an optional on-board microcomputer such as the OOPic C, Basic Stamp, or the the Basic X or by connecting to a Personal Computer.

The design of the Activity Center is an open layout to facilitate easy access to all connections and controls.
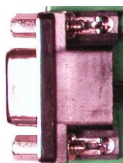
Other features include multiple methods of power input, easy connection to a personal computer through RS-232A interface. Color coded key pad for manual activation of Event Inputs, and data input to optional on-board Microcomputer. On board audio filter, and audio amplifier to allow use of amplified or non-amplified speakers or headphones.

Special Features

- Three multipurpose, programmable digital outputs allow the SpeakJet to control external devices based on timing of the sound output. Control of devices may include lights, motors, or even launch model rocket after a count down sequence.
- Socket for both SpeakJet and microcomputer to allow multiple configurations.
- Standard RS-232A connection for communicating with outside controlling hardware such as Personal computers, Laptops, PDA, industrial equipment, etc.
- Color coded Key pad with indicator lights for visual feedback of external input
- Use optional on-board microcomputer to develop applications, play games and record event sequences.
- User selectable for Raw data, Filtered Sound or Filtered and amplified data out.

Power input connectors

SpeakJet Socket

Attention Jumper for Basic Stamp

Socket for optional microcomputer

SpeakJet Aux. Outputs

SpeakJet Mode Select

Microcomputer Aux. Outputs

RS-232A serial input for SpeakJet or Microcomputer

Output Filter Select

Speaker/ Headphone connections

Serial Communications Select

MAGNEVATION LLC

RESET
ATTN
PROCESSOR

speak jet
ACTIVITY CENTER
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WWW.MAGNEVATION.COM

MODE SEL

OUTPUT SELECT
RAW
FILTER

PROCESSOR
SELECT
SPEAKJET

speakjet

SERIAL INPUT

OUT0 OUT1 OUT2
READY ARM FIRE

SPKR.

AUDIO OUTPUT

0349
94V0

AUX 2
AUX 1

Connections, Sockets and Jumper Settings

RS 232A Connector.
The RS-232A input connector is used for communications between a Personal Computer and SpeakJet or between the Personal Computer and the optional on-board microcomputer. This connector is to be connected to the PC through a straight 9 pin Male to Female cable of up to 2 meters long. The SpeakJet utilizes handshaking with the PC to control data flow to prevent buffer overflow. This is accomplished through the use of Pin 4 - DTR.

Power input connections.
There are two input connectors to choose from for power application to the SpeakJet Activity Center. The circular 2.5 mm barrel connector is a universal power input capable of utilizing a wide range of A.C. Adapters that everyone has in their spare parts box. The requirements for this is 6 to 15 volts DC of approximately 100 ma.. This can be either center positive or center negative type of connections. The other option is to us a battery connector on the two pin Molex connector just above coaxial. This input is diode protected so that if a battery is connected and an A.C. adapter, then the current will not flow in reverse back into the battery.

Serial Communications Select:
This Jumper selects which device is connected to the DB-9 connector on the end of the board. With the two jumpers in the upper position, the DB-9 connector is connected to the microcomputer socket for programming and communications with the outside world. With the jumpers are on the lower position, then the SpeakJet is connected to the DB-9 through the on-board level shifter translators to allow off-board devices to control SpeakJet through the RS-232 protocol. This lower jumper position is the factory default configuration.

You may connect one jumper in the upper position and the other in the lower position for special operation such as controlling the SpeakJet with and external device while reading data back from the on-board microcomputer. Since the SpeakJet is a listen only device and does not have a serial out, monitoring this will give a continuously low in the data stream.

Attention Jumper.
The Attention Jumper is used when programming the Basic Stamp from Parallax. The factory default for this is open. The OOPic C does not need this jumper for normal operation or programming.
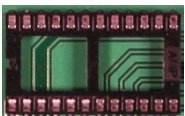
Microcomputer Socket:
This 24 pin socket if for an optional microcomputer such as the Basic Stamp, OOPic C, Basic X and many others that fit this pin layout. This also allows access to the event input pins on the SpeakJet as well. By placing 24 pin DIP header with ribbon cable you can connect the event input pins on the SpeakJet to external real world inputs.

SpeakJet Auxiliary Outputs:
These pins allow the SpeakJet to control external devices via logic levels. The maximum I/O levels are +5 volts and Ground. The maximum current sink or source is 20 ma. NOTE: Any voltage or current greater than the above limits can damage SpeakJet and not covered by any warranty. The upper pins are ground and the lower pins are the Out0, Out1 and Out2

SpeakJet Mode Select:

Jumper selection for Normal Operation, Test Mode or Baud Rate Calibration. The factory default setting is jumper mode zero with is normal operation. Both jumpers open is test mode and the SpeakJet will start with the first sound in the MSA and sequence through all sounds and repeat. The Baud Rate Calibrator is mode 1. The details of this mode is listed in further in the SpeakJet Users Manual.

Microcomputer Auxillary Outputs.
There are two outputs on this header. On this connector +5 volts, ground and Data I/O are available for use on each of the two I/O pins and arranged in a common RC model airplane servo configuration. This allows direct plug in for these servos to be controlled by the optional on-board microcomputer. The connectors are listed from left to right as I/O, +5 volts, Ground. Aux 2 is connected to pin 12 on the microcomputer socket and Aux 1 is connected to pin 11 on the microcomputer socket.

Output Filter Select:
This jumper selects the output mode to the 3.5mm Stereo output jack and the speaker header. In the upper most position, the TTL raw PWM data is present on both left and right outputs of the 3.5 mm stereo output jack, as well as the speaker output Header. In the middle position, the low-pass filter is in line with the 3.5mm Stereo output jack and the speaker header. In the lower position, the filter is directed to the amplifier and then to the 3.5mm Stereo output jack and the speaker header.

Output Jack and Header:
Standard 3.5 mm stereo headphone jack and speaker connector utilized for output of audio from SpeakJet and the amplifier. Tip and the ring of the Stereo connector are wired together for equal sound on both right and left audio channels. This allows connection with either headphones or amplified speakers such as those used with personal computer sound cards. The on-board audio amplified can provide approximately 500 mW. of audio power so none-amplified speakers may be used. There is also a 4 pin header for connecting a standard speaker and connector that is common inside of PC cases. The right most pin on the 4 pin header is ground while the left most pin is the audio output.

SpeakJet Socket:
The SpeakJet resides in the socket in the center of the SpeakJet Activity Center. The socket has pin one in the lower left corner. Pin connections and functions for the SpeakJet are listed in the SpeakJet Users manual.

SpeakJet Activity Center Usage:
The SpeakJet Activity Center is very easy to use. Simply connect a 6 to 15 volt supply to the power input connector, connect the RS-232A extension cable between the PC and the SpeakJet Activity Center, then finally connect the speaker system of your choice to the speaker output jack or speaker header. After power is applied and reset is applied the SpeakJet should say "ready". Adjustment of the volume control may be necessary to hear the audio.

After downloading and installing Phrase-A-Lator on a Windows XP based machine, the speech and sound generation can begin. To better understand the Phrase-A-Lator software package, you can also download the manual for the Phrase-A-Lator from the Magnevation web-site.

Example Program
This program example is a audio twist on the old classic Hello World samples. Tthis can be run from a Windows XP command prompt window by using GWBasic.

```
10 CLS
20 OPEN "COM1:9600,N,8,1" AS #1
40 PRINT#1,CHR$(183)
50 PRINT#1,CHR$(7)
60 PRINT#1,CHR$(159)
70 PRINT#1,CHR$(146)
80 PRINT#1,CHR$(164)
90 PRINT#1,CHR$(6)
100 PRINT#1,CHR$(1)
110 PRINT#1,CHR$(147)
120 PRINT#1,CHR$(153)
130 PRINT#1,CHR$(145)
140 PRINT#1,CHR$(177)
150 END
```

You may need to change the COM1 in line 10 to reflect the actual COM port you will be using.