XOR

INTRODUCTION

6 voice polyphonic sound module to be played by MIDI. Each voice has its own bit modulator (xor,or,and) and envelope. Than there is global LFO and arpeggiator.
Pressing BIG_BUTTONs flips the switches indicated by the leds and shows combination under which the sound settings are stored. Knobs edit the settings of this sound. By pressing PAGE_BUTTON you go through 3 different PAGES of settings. The page is indicated by the color of the RGB led. Red page is oscillator and arpeggiator settings, green is for LFO and blue is for ADSR.

MIDI IMPLEMENTATION

You need to send MIDI notes to ^[XOR] in order to hear any sound. For this you need MIDI Bastl module for having the MIDI jack connector on it. The settings of MIDI input channel on ^[XOR] has to match the output channel on your midi device. All voices are responsive to MIDI Note, velocity, sustain pedal, pitch bend. Mod wheel adjusts LFO AMT. Arpeggio synchronizes automatically to MIDI clock messages if there are any.

FREEZING

Changing to different sound or page always deactivates = freezes the knobs to avoid overwriting the original values. To unfreeze the knob you have to hit the original value with the knob. This is indicated by short flash of white on the RGB led. With the knobs you are always editing the last triggered sound.

OSCILLATOR

There is one oscillator for each voice. When on the RED page you can adjust the OSC+XOR CHAR (RIGHT_KNOB) to browse between possible combinations one of 3 wavetables (sine, saw, triangle) and bit modulations. The wavetables can be modulated by one of the 4 bit operators - ^[XOR], |[OR], &[AND]. As extra there is ultra XOR mode which modulates the voices between each other by bit operator instead of simple sum up. Adjust the XOR AMT (LEFT_KNOB) to set the amount of modulation applied.

LFO

On LFO page (green) you adjust rate - the speed of LFO (TOP_KNOB), amount of modulation (LEFT_KNOB) and resolution of the modulation / smoothness (RIGHT_KNOB). By pressing the LFO_SHAPE button on the green page you browse the 8 possible LFO shapes. The LFO is applied to the final volume.

ADSR

On the ADSR (blue) page you can adjust the attack (TOP_KNOB), sustain (LEFT_KNOB), release (RIGHT_KNOB) and decay by pressing the DECAY BUTTON to browse 8 different values.

ARPEGGIATOR

^[XOR] is equipped by powerful arpeggiator which is adjusted on the red page. To turn ON or OFF the arpeggiator simply press the ARP ON/OFF button. To adjust the speed of the arpeggio turn the TOP_KNOB. To browse through the possible arpeggio types hold down the ARP ON/OFF button and keep pressing the PAGE button. The arpeggio types (as ordered in the synth) are: gate Arp straight, gate Arp triplet, gate Arp rave, note Arp up, note Arp down, note Arp up down inclusive, note Arp up down exclusive, note Arp causal (in the order of pressed keys) and note Arp random.

Trinity is hackable digital synthesizer compatible to Arduino IDE and Mozzi Library for Arduino. To hack your instruments connect FTDi USB connector breakout to the "hack-port".

NOTE: the words written in big letters and underscore such as SHIFT_BUTTON refer to their names in the source code.

POWER UP

There are $$$ options of powering TRINITY

$) Battery: plug the 9V battery to the battery clip and put the slide switch to BATT position

$$) Adapter: plug in the power adapter 9V DC positive polarity (+ in the centre of the connector) and put the slide switch to PLUG position

$$$) Via another instrument: side pins are used to share power, audio and communication among several instruments with the same pinout (Bastl Instruments, NovaDrone). Connect two or more devices, power one of the instruments form an adaptor and put the slide switch to PLUG position.

Note: to avoid charging 9V batteries inside the instrument the instruments are not able to share the power from built-in battery connector to the chain connectors. To pass this limitation you can your 9V battery to the power jack connector adaptor cable and connect via the power plug.
However the chips can take a bit of energy from the communication line so as far as there is no MIDI data on the data line some non-powered instruments might appear turned ON but are not fully functional.

MIDI

Input MIDI channel can be set up manually by holding down one of the BIG BUTTONS while turning the device ON. This sets the input channel to 1,2 or 3 (being indicated by blinking one of the LEDs 3 times after intro animation). By holding down the SHIFT BUTTON and one of the BIG BUTTONS the input channels sets to 10,11 or 12 (being indicated by blinking one of the LEDs 3 times while the other 2 LEDs are ON).

For more information about your instrument and about hacking it visit www.bastl-insruments.com