Introduction

The Delptronics Trigger Man is a unique trigger sequencer. There are 8 trigger/gate outputs and each pattern consists of 8 steps per output. It has 8 pattern memories, which can be played back in any order and chained into a pattern of patters up to 100 patterns long. The revolutionary pattern editing interface enables you to create any pattern with just two knobs.

Features

- 8 HP wide, 30mm deep.
- 8 trigger/gate outputs.
- 8 patterns, each consisting of 8 steps for each of the 8 outputs.
- Each output has a separately configurable length: 10ms, clock, or full.
  - When set to clock, output is on when clock signal is on, and off when clock signal is off.
  - When set to full, output is on for the full length of the step, consecutive "on" steps produce no "off" time between the steps.
- Three modes of operation
  - ○ Algorithmic Edit: A revolutionary pattern editing interface wherein one knob controls the complexity of the steps (number of "on" steps and rests between the steps), and another knob shifts the steps right and left.
  - ••• Step Edit: A traditional mode in which each step is turned on or off individually. The shift knob still functions in Step Edit mode.
  - ∞ Pattern Play: Select which pattern is currently playing, or create a chain of patterns up to 100 patterns long. The shift knob shifts the patterns in the chain.
- Internal clock with tempo knob (40 - 295 BPM).
- Run/Stop button controls the internal clock, or resets to the first step if using an external clock.
- External clock input jack can be configured as ticks or voltage controlled tempo.
  - When set to ticks, on/off voltages advance the step counter, and the tempo knob acts as a clock divider. External clock can be divided by 1/2/3/4/6/8/12/16/32.
  - When set to VC, a control voltage at the clock input jack determines the tempo.
- Multi-function control voltage jack.
  - In pattern play mode, the control voltage determines the currently playing pattern.
  - In the edit modes, the control voltage determines the shift and/or complexity of the steps. Each output can be individually configured as to how it responds to the control voltage, if at all.
- Non-volatile pattern and configuration memory. Data is saved even when powered off.

Terminology

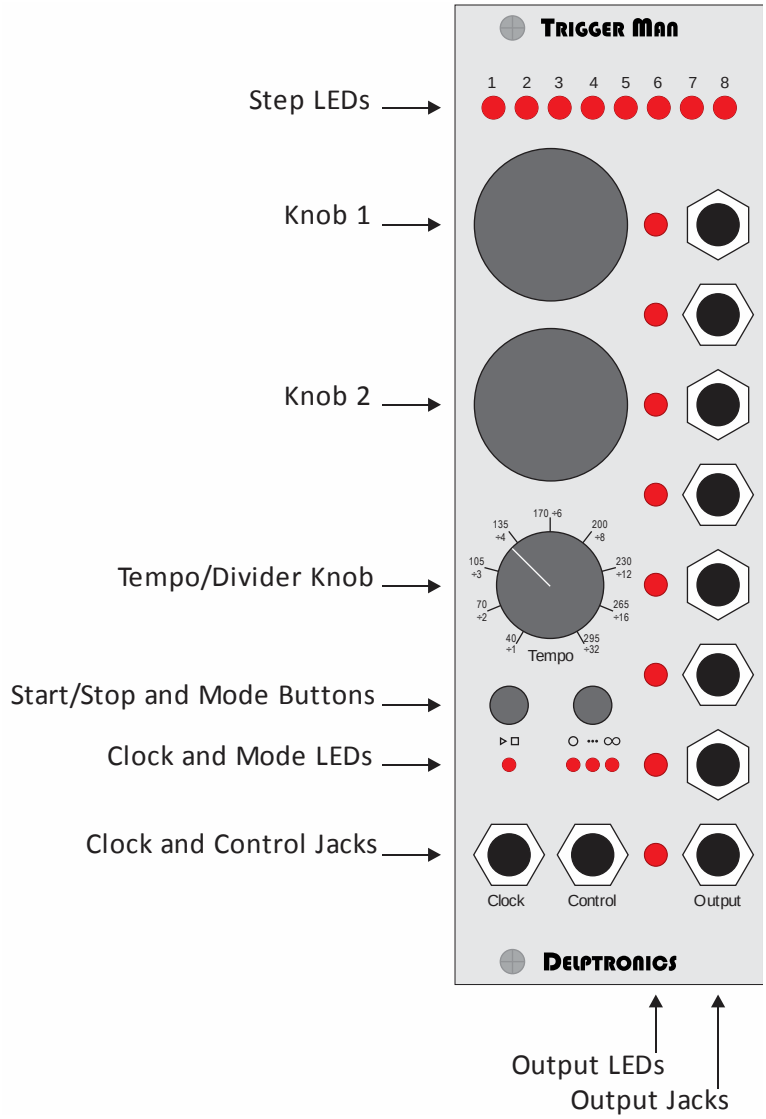
Sequences and Patterns

A sequence is a set of 8 steps. Each output jack has its own sequence. You can think of it as an 8X8 grid, with steps in the X axis and the outputs in the Y axis – just like the step and output LEDs on the panel.

A pattern is a set of 8 sequences. There are 8 pattern memories.

Controls, Jacks, and LEDs

This manual refers to the controls, jacks and LEDs by the names shown below.



Quick Reference

To cram a zillion functions into 8 HP, many of the controls and LEDs perform different functions depending on the mode of operation. The control scheme is quite intuitive and easy to master. The chart below summarizes the functions of the controls and LEDs for each mode.

Controls and LEDs

"O / ••• +Mode" means, while in Algorithmic or Step Edit mode, hold down the Mode button while turning or pressing one of the top two knobs.

Mode / Control	O Algorithmic	··· Step Edit	O / ··· +Mode	∞ Pattern Play	Configuration
Step LEDs	Steps	Steps	Output Length	Patterns	Config Bits
Output LEDs	Output Being Edited	Output Being Edited	Pattern Number	n/a	Output Being Configured
Knob 1 Turn	Complexity	Move Cursor	Set Output Length	Move Cursor	Move Cursor
Knob 1 Press	Select Previous Output	Toggle Step On/Off	Clear Steps	Add Pattern to Chain	Toggle Config Bit on/off
Knob 2 Turn	Shift Steps	Shift Steps	Select Pattern	Shift Pattern/Chain	Select Output to Configure
Knob 2 Press	Select Next Output	Select Next Output	Clear Pattern	Select Single Pattern	Select Next Output

Configuration Mode

Enter Configuration mode by holding down the Mode button, then pressing the Start/Stop button. The mode indicator LED will blink indicating that you are in Configuration mode. Press and release the Mode button to exit Configuration mode.

Clock Jack		Control Jack		Control Jack (per output)					
1	Jack Function	2	VC Pattern Change	3	VC Shift/Cx Change	4	VC Shift	5	VC Complexity
○	Ticks	○	On First Step	○	On First Step	○	Off	○	Off
✹	VC Tempo	✹	Immediate	✹	Immediate	✹	On	✹	On

○ Algorithmic Mode

In Algorithmic Mode, the Step LEDs at the top of the module show the sequence of on and off steps for one output jack at a time. An illuminated LED corresponds to a positive 12 volts on the output jack for that step. An off LED represents a rest where the output jack is zero volts (grounded). One of the Output LEDs on the right side of the module is illuminated to indicate which output is currently being edited.

Turn Knob 1 to increase or decrease the complexity of the sequence. Complexity is the term we use to describe the number of on steps and the rests between them. There are 36 levels of complexity, including all steps off and all steps on. Most of the possible step sequences are simply shifted versions of other sequences.

Less Complex	Less Complex	Example Steps	More Complex	More Complex
○○○○○○○○	○○✹○○○○○	○○○✹✹○○○	○○○✹○✹○○	○○○✹○○✹○

Turn Knob 2 to shift the steps to the right or left. For example:

Shifted Left Twice	Shifted Left Once	Example Steps	Shifted Right Once	Shifted Right Twice
○✹✹○○○○○	○○✹✹○○○○	○○○✹✹○○○	○○○○✹✹○○	○○○○○✹✹○

Press Knob 1 or Knob 2 to change the output currently being edited. The knobs are also pushbutton switches, and so can be pressed like a button. Press Knob 1 to move the Output LED indicator up, and press Knob 2 to move the indicator down. The Output LED that is illuminated indicates which output is currently being edited.

Copy

You can copy any pattern to any other pattern. To access the copy function, press both knobs at the same time. That is, press and hold Knob 1 then press Knob 2, or press and hold Knob 2 then press Knob 1. The Mode LEDs will flash in a distinctive way to indicate that the copy function is active.

While the copy function is active, the Step LEDs will show pattern A and the Output LEDs will show pattern B. Either A or B can be the source or destination for the copy.

Turn Knob 1 to select pattern A.

Turn Knob 2 to select pattern B.

Press Knob 1 to copy pattern B to pattern A. Pattern A then becomes the current pattern, and the module returns to the mode you were in when you initiated the copy function.

Press Knob 2 to copy pattern A to pattern B. Pattern B then becomes the current pattern, and the module returns to the mode you were in when you initiated the copy function.

Pres the Mode Button to cancel the copy function without copying anything.

••• Step Edit Mode

Step Edit Mode offers a more traditional editing method in which each step is turned on or off individually. The controls in Step Edit Mode are nearly identical to Algorithmic mode. All of the controls work exactly the same, with the exception of Knob 1.

Turn Knob 1 to move the blinking cursor to the left or right.

Press Knob 1 to toggle the step indicated by the cursor. That is, if the step was on, pressing the knob turns the step off, and if it was off, pressing the knob turns it on.

∞ Pattern Play Mode

In the Algorithmic and Step Edit modes, only the current pattern can be played.

In Pattern Play mode you can select which pattern is currently playing, or create a chain of patterns. A chain is a sequence of patterns. Chains can be as complex as you want up to 100 patterns long. For example, if the chain consisted of patterns 1 and 2, then those two patterns would play, one after another repeatedly. Patterns can also appear more than once or be repeated in the chain. For example a chain consisting of three different patterns could be 1, 1, 2, 2, 3. In that example, after pattern 3 finishes, the chain will restart and play pattern 1 twice, and so on.

The Step LEDs show which pattern(s) are playing. It also shows a blinking cursor. The Output LEDs are not used in this mode.

Turn Knob 1 to move the blinking cursor to the left or right.

Turn Knob 2 to shift the pattern or chain to the right or left. For example, if pattern 1 is playing, and Knob 2 is turned one click to the right, then pattern two will play. Or, if a chain consisting of pattern 1 and pattern 2 is playing, and Knob 2 is turned one click to the right, then the chain will now consist of pattern 2 and pattern 3.

Press Knob 1 to add a pattern to the chain. For example, if only pattern 1 is playing, and the cursor is on pattern 2, then pressing Knob 1 will add pattern 2 to the chain. Pressing Knob 1 again will add a second instance of pattern 2 to the chain, which will now play pattern 1 once, and pattern 2 twice before re-peating.

Press Knob 2 to select a single pattern to play. If a chain of patterns was previously programmed, then the chain is gone and only the newly selected pattern will play repeatedly.

Start/Stop Button

Pressing the Start/Stop Button starts or stops the internal clock. The clock stops immediately on whatever step was playing. When the clock restarts, it starts on step one. The Clock LED under the Start/Stop Button blinks in time with the clock.

Note that the Start/Stop Button acts differently if you are using an external clock signal plugged into the Clock Jack. See the Configuration section for details.

Mode Button

Press the Mode Button to change the current mode. Repeatedly pressing and releasing the Mode Button cycles through the three modes (Algorithmic, Step Edit, and Pattern Play). One of the Mode LEDs is illuminated to indicate the current mode.

Hold the Mode Button down while pressing or turning Knob 1 or Knob 2 when in the Algorithmic or Step Edit mode to access additional functions described below.

Clear

Hold Mode + Press Knob 1 to clear all the steps for the output that is currently being edited.

Hold Mode + Press Knob 2 to clear the entire pattern, that is, clear all of the steps for all eight outputs.

Output Length

Hold Mode + Turn Knob 1 to set the output length of the output currently being edited. Output length is the length of time that the output jack is on (12V). The Step LEDs will indicate the length of the current output by displaying one of the patterns shown below.

✹○○○○○○○ **10 milliseconds:** the output is on for 10ms regardless of the clock speed or pulse width. This is a typical trigger output.

✹✹✹✹○○○○ **Clock:** the output is on when clock signal is on, and off when clock signal is off. If using an external clock divided by 1, then the output will have the same pulse width as the external clock. Dividing by another number has the effect of squaring the external pulses (equal on/off time).

✹✹✹✹✹✹✹✹ **Full:** the output is on for the full length of the step, and consecutive on steps produce no off time between the steps.

Pattern Select

Hold Mode + Turn Knob 2 to select the pattern to edit. This changes the whole pattern (set of eight outputs) being edited, not just the current output within a pattern. The current pattern is indicated by a blinking Output LED which moves as you turn the knob. The current output is indicated by a steadily illuminated Output LED, as it always is in Algorithmic and Step Edit mode.

Clock and Control Jacks

The behavior of the Clock and Control Jacks is set in Configuration mode. The specifics of each jack's behavior in each different mode are described on the next page.

Configuration Mode

Configuration mode is used to set the behavior of the Clock and Control Jacks. The Step LEDs display the state of the configurable options. The chart below shows the meanings of each of the LEDs. An empty circle means the LED is off, and a filled in circle means the LED is illuminated.

Clock Jack		Control Jack		Control Jack (per output)					
1	Jack Function	2	VC Pattern Change	3	VC Shift/Cx Change	4	VC Shift	5	VC Complexity
○	Ticks	○	On First Step	○	On First Step	○	Off	○	Off
✹	VC Tempo	✹	Immediate	✹	Immediate	✹	On	✹	On

Entering Configuration Mode

Enter Configuration mode by holding down the Mode button, then pressing the Start/Stop button. The mode indicator LED will blink, indicating that you are in Configuration mode. Press and release the Mode button to exit Configuration mode. The configuration is saved even when the power is off.

Changing the Configuration

The Step LEDs show the state of the configurable options. LEDs 1 and 2 are global. LEDs 3, 4, and 5 relate to options set individually for each output. LEDs 6, 7, and 8 have no configuration option associated with them.

One of the Output LEDs is illuminated indicate the output currently being configured.

Turn Knob 1 to move a blinking cursor left and right across the Step LEDs.

Press Knob 1 to toggle the configuration option indicated by the cursor. That is, if the LED (and the corresponding option) was on, pressing the knob turns that option off, and if it was off, pressing the knob turns it on.

Turn Knob 2 to change the output currently being configured.

Press Knob 2 to select the next output to configure.

Clock Jack Function

- **Ticks:** The Clock Jack is expecting a standard clock signal. Hysteresis occurs at 2.5 volts. That is, when the voltage on the jack rises above 2.5 volts, it is considered on, and when it drops below 2.5 volts, it is considered off. Any waveform of any pulse width can be used to clock the Trigger Man, including, but not limited to square, triangle, and saw tooth waves. More complex waveforms may give unpredictable and interesting results as they pass through the 2.5 volt hysteresis point. As soon as a tick is detected, the Trigger Man switches over internally to expect an external clock signal.

  When receiving external clock signals, the Tempo Knob acts as a clock divider. The external clock is divided by 1, 2, 3, 4, 6, 8, 12, 16, or 32 as indicated on the panel. If you want the Trigger Man to be clocked at the same rate as the incoming clock signal, just turn the Tempo Knob all the way to the left to divide by 1.

  When receiving external clock signals, pressing the Start/Stop button works differently. After an external tick is received the Trigger Man is "running." At that point, pressing Start/Stop resets the Trigger Man to the first step, and it is not considered to be running. Pressing Start/Stop will then restart the internal clock, which will continue to run until Start/Stop is pressed again, or an external tick is received.

- **Voltage Controlled Tempo:** The Clock Jack is expecting zero to 5 volts, which will produce a clock rate of 40 to 295 BPM, just like the Tempo knob does. A voltage over 5 volts is interpreted as 295 BPM. If the Clock Jack function is set to VC Tempo, and nothing is plugged into the jack, the Tempo will always be 40 BPM. When the Clock Jack Function is set to VC Tempo, the Tempo has no effect. VC Tempo is not the same as an external clock; it merely sets the speed of the internal clock. The Start/Stop button functions normally.

Control Jack Voltage Controlled Pattern Change

When in Pattern Play mode, a voltage on the control jack sets the currently playing pattern. The control jack is expecting zero to 5 volts. The 5 volt range is divided into 9 equal divisions of approximately 0.55 volts. A voltage under 0.55 volts has no effect on the currently playing pattern, just as if nothing was plugged into the control jack.

- **On First Step:** The currently playing pattern, as determined by the voltage on the Control Jack, changes on the first step. Voltage changes during the playing of the sequence are ignored.

- **Immediate:** The currently playing pattern changes immediately in response to the voltage on the Control Jack. The current step does not reset to the first step when that happens, the pattern changes right away. Immediate changes to the currently playing pattern can produce chaotic results, which may or may not be desirable.

Control Jack (per output)

When in Algorithmic or Step Edit mode, the voltage on the control jack affects the shift and/or complexity of the outputs. Each output can be individually configured as to how it responds to the control voltage, if at all.

Voltage Controlled Shift/Complexity Change

- ○ **On First Step:** The shift and/or complexity, as determined by the voltage on the Control Jack, changes on the first step. Voltage changes during the playing of the sequence are ignored.
- ✹ **Immediate:** The shift and/or complexity changes immediately in response to the voltage on the Control Jack. The current step does not reset to the first step when that happens, the sequence changes right away.

Voltage Controlled Shift

- ○ **Off:** The voltage on the Control Jack has no effect on the shifting of the steps. Knob 2 still controls the shift.
- ✹ **On:** The shift changes with the voltage on the control jack. The 5 volt range is divided into 9 equal divisions of approximately 0.55 volts. A voltage under 0.55 volts has no effect on the shift, just as if nothing was plugged into the control jack, or this option was turned off.

Voltage Controlled Complexity

- ○ **Off:** The voltage on the Control Jack has no effect on the complexity of the sequence. Knob 1 still controls the complexity, or edits the steps (in Algorithmic or Step Edit mode respectively).
- ✹ **On:** The complexity changes with the voltage on the control jack. A voltage under 0.55 volts has no effect on the complexity, just as if nothing was plugged into the control jack, or this option was turned off. The voltages above 0.55 volts are divided into 36 equal divisions of approximately 0.12 volts, corresponding to the 36 different complexity levels.

Both Voltage Controlled Shift and Complexity

If both VC Shift and VC Complexity are turned on for an output, then the zero to 5 volt range is divided into 256 equal divisions of approximately 0.02 volts, corresponding to all of the possible sequences of eight steps. Mathematically inclined users should note that the steps are not set to the binary equivalent of the voltage, but rather are sorted in ascending complexity and shift order.

If both VC Shift and VC Complexity are turned on for an output, and nothing is plugged into the Control Jack, then the all steps will remain off for that output.

Saving Data

Changes to the configuration are saved when you exit configuration mode.

Changes to the steps are only saved when you press the Start/Stop or Mode buttons. Saving constantly whenever the steps changed would introduce delays and would wear out the nonvolatile memory.