Beat Bot™
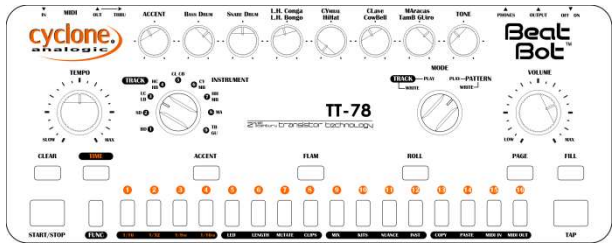
operation manual

English Version 0.9.9, 2016

Introduction

The TT-606 Drum Drone™ and TT-78 Beat Bot™ are analog drum machines with timeless electronic sounds and modern professional features. We've designed these instruments to provide musicians with inspiring percussive sounds while being a pleasure to use.

The Drum Drone™ features a classic set of analog drum and percussion sounds that work well with all styles of music, including a solid bass drum, a crispy snare drum, and expressive hi-hats.

The Beat Bot™ features a collection of distinctive instrument sounds that will enhance the rhythm of any track. These sounds include a deep bass drum, resonant bongos, and eclectic instruments like a guiro and clave.

These drum machines provide intuitive tools for creating and performing your own rhythms. By applying the techniques covered in this manual you will enjoy building beats that match your own personal style.

Read the first few lessons and you'll be making rhythms with your new drum machine within minutes. Then continue reading to learn about more advanced features that can enhance your rhythms and efficiency.

We hope you love your Drum Drone and Beat Bot as much as we loved bringing them to life.

Contents

Lesson 1 Overview

This lesson describes the Drum Drone's and Beat Bot's instruments and introduces some of the terms and notation used in this manual.

The Instruments

Each drum machine features a unique collection of drum instruments. The table below lists each drum machine's instruments as they appear on the **Track/Instrument** switch.

Position	Drum Drone Instrument	Beat Bot Instrument
1	Bass Drum (BD)	Bass Drum (BD)
2	Snare Drum (SD)	Snare Drum (SD)
3	Low Tom (LT)	* Low Bongo (LB) / Low Conga (LC)
4	High Tom (LT)	* High Bongo (HB) / High Conga (HC)
5	Cymbal (CY)	* Clave (CL) / Cowbell (CB)
6	Open Hi-hat (OH)	Cymbal (CY) plus Metal Beat (MB)
7	Closed Hi-hat (CH)	Hi-hat (HH) plus Metal Beat (MB)
8	Rimshot (RS)	Maracas (MA)
9	Hand Clap (CP)	* Guiro (GU) / Tambourine (TB)

* Refer to Lesson 6 for a description of **Track/Instrument** switch positions that include multiple instruments.

Button Notation

Throughout this manual, instructions for pressing buttons are presented with notation like "**[BUTTON]**," which refers to a specific button on the front panel of your drum machine. Certain commands require multiple buttons to be pressed in a specific order, which are shown like this:

[FIRST BUTTON]+[SECOND BUTTON]

This means press **[FIRST BUTTON]** and continue to hold it while then pressing **[SECOND BUTTON]** momentarily.

The term "**[#]** button" refers to one of the 16 numbered buttons on the front panel, depending on the context.

The expression **([X] - [Y]**) means press one button within the range of X to Y to make a selection.

The Sequencer

The "sequencer" is mentioned often in this manual. The sequencer is the software engine that triggers instruments based on the patterns you've created. It is responsible for playing the desired patterns at the correct tempo and time scale. The sequencer has two states: Running and Stopped.

Pattern

A Pattern is a programmed rhythm that is stored in memory. In this manual, patterns are referred to with a "P" prefix, like "P1" for Pattern 1.

Bar

In this manual, a "bar" refers to one complete playback cycle of a pattern regardless of its length.

Lesson 2   Orientation

This lesson will acquaint you with your drum machine's physical layout. The Drum Drone in shown below. The Beat Bot's layout is very similar.
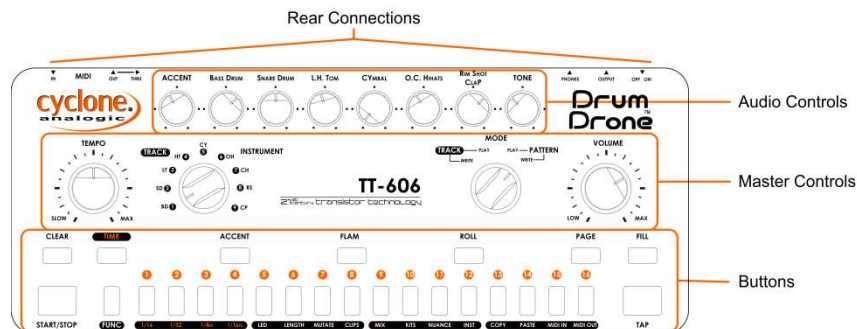
Rear Connections (left to right, top view)

MIDI In and **MIDI Out:** Accept standard 5-pin DIN type MIDI cables. Refer to Lesson 20 for details on the machines' MIDI implementations.

MIDI Out/Thru Switch: Select whether the **MIDI Out** jack operates as a MIDI output (left position) or as a MIDI Thru jack (right position).

Instrument Outputs: These 3.5mm mono jacks provide the output of one instrument or a submix of instruments so that you can isolate them for external processing or mixing. When a cable is inserted into an Instrument Output jack, that instrument will be removed from the main mix at the **Output** and **Phones** jacks.

Phones: An amplified stereo headphone jack for monitoring with headphones.

Output: This is the main mono audio output to an amplifier, effects, or mixer.

Power Input and Switch: The Drum Drone and Beat Bot accept 9V DC with negative polarity (barrel positive, center negative) at 300mA or greater. The power on/off switch is located here as well.

Tip!   *It is best to turn off the unit when not in use. Your patterns and tracks are stored permanently whether or not power is applied.*

Master Controls (left to right)

Tempo: This sets the tempo of the sequencer. This control is disabled when your drum machine is under the control of an external MIDI clock source (see Lesson 20). The center position corresponds to a tempo of approximately 120 beats per minute (BPM).

Track/Instrument Switch: Selects a drum instrument or a track, depending on the position of the **Mode** switch.

Mode Switch: Determines the operating mode for the drum machine. There are four unique operating modes which will be described in greater detail in later sections of this manual:

Pattern Write:	Create and modify patterns.
Pattern Play:	Play patterns safely without editing or saving functions.
Track Play:	Play tracks. "Tracks" are a sequence of patterns.
Track Write:	Create and modify tracks.

Volume: Sets the overall output volume for the **Phones** and **Output** jack audio signals.

Audio Controls (left to right)

Accent Amount: This controls the impact of the Accent modifier on accented drum steps. Accents are described in Lesson 5.

Level Controls: These set the volume of each instrument or submix within the mix and at the corresponding **instrument output** jack.

Tone: This adjusts the sound characteristics of the instrument that is selected on the **Track/Instrument** switch. Lesson 7 describes how the **Tone** control affects each instrument.

Buttons (left to right, top to bottom)

There are several buttons on the front panel. Their general purposes are described here but each may serve other additional functions.

[CLEAR]: Clears the content of a pattern or clears a feature's setting within a menu.

[START/STOP]: Toggles the sequencer between the Running state and the Stopped state.

[TIME]: Used to access feature and options related to timing, such as a pattern's Time Scale or the sequencer's Shuffle Amount setting, by holding **[TIME]** then pressing another button.

[FUNC]: Used to access various function and feature menus, or to exit those menus. Feature menus are accessed by pressing and holding **[FUNC]** then pressing another button.

[1] - [16]: Used to select patterns, enter step data when editing a pattern, or to access features when pressed with **[FUNC]** or **[TIME]**.

[ACCENT]: Assigns step accent effects when editing a pattern.

[FLAM]: Assigns step flam effects when editing a pattern.

[ROLL]: Assigns step roll effects when editing a pattern.

[PAGE]: Cycles through pages in views that display multiple pages of information.

[FILL]: Instructs the sequencer to play the fill variation of a pattern or to edit a pattern's fill variation.

[TAP]: Used to insert instrument steps while editing a pattern or to commit changes when editing a track. Used to tap the desired tempo while holding **[TIME]**.

Tip! *The Drum Drone and Beat Bot are intended to let you move seamlessly between Pattern Write and Pattern Play modes. The sequencer continues to play when switching between these modes so that you can modify patterns without interrupting your performance.*

Lesson 3   Pattern Storage and Selection

The Drum Drone is a pattern-based instrument, so it's important to understand how patterns are stored in memory. The Drum Drone can store up to 64 patterns. Each pattern consists of a normal pattern and an optional Fill variation of the pattern. Fills are described in Lesson 8.

Patterns are displayed in four "pages" with each page containing up to 16 patterns. Use [PAGE] to cycle through these pages of patterns. The color of the [PAGE] button indicates which page is being shown. The colors are:

Page 1	Page 2	Page 3	Page 4
Red	Yellow	Green	Blue

When viewing a page of patterns, buttons [1] through [16] will illuminate to show which pattern slots are filled and which are currently selected.

- The currently selected pattern (or patterns) is shown with a brightly blinking indicator.
- Pattern slots that are filled but not selected are shown with a dim indicator.
- Pattern slots that are empty are not illuminated.

Pattern Selection

You will often select one or more patterns in order to perform some kind of action on them.

To select a pattern, press the [#] button that corresponds to the desired pattern. You'll see that the selected pattern is brightly lit while the other pattern slots are dimly lit or off.

To select a range of patterns, press and hold the [#] button of the lowest pattern in the range then also press the [#] button of the highest pattern in the range. For example, to select patterns 5 through 8, you would press [5]+[8].

Lesson 13 further explains how to select and manipulate pages and patterns.

Lesson 4   Programming Your First Pattern

Patterns are programmed and edited in Pattern Write mode while the sequencer is running. Let's program a new pattern into pattern slot P1 in your red pattern page:

1. Be sure the sequencer is stopped then turn the Mode Switch to Pattern Write mode.

2. Set all the **instrument level controls** to the middle position.

3. If the **[PAGE]** button is not already a red color (Page 1), then press **[PAGE]** until its color changes to red.

4. Press **[1]** to select pattern slot P1.

5. If necessary, clear the pattern in slot #1 (this is covered later in Lesson 13) by pressing **[CLEAR]**+**[1]**. This initializes the pattern to an empty 16-step pattern with a 16th note time scale (see Lesson 9 to learn about time scales).

6. Press **[START/STOP]** to run the sequencer. You will see a cursor move across the keypad at the tempo that's currently set by the **Tempo** knob, but the pattern will be silent.

7. Program a simple beat for the Bass Drum. Set the **Track/Instrument** switch to the Bass Drum (BD) position. Now the display shows only the Bass Drum's part of the current pattern, which is currently empty.

8. Press **[1]**, then **[8]**, then **[11]**. These buttons will illuminate after being pressed to show that the Bass Drum will be played at those steps in the pattern. You should hear the bass drum when the playback cursor reaches steps 1, 8, and 11.
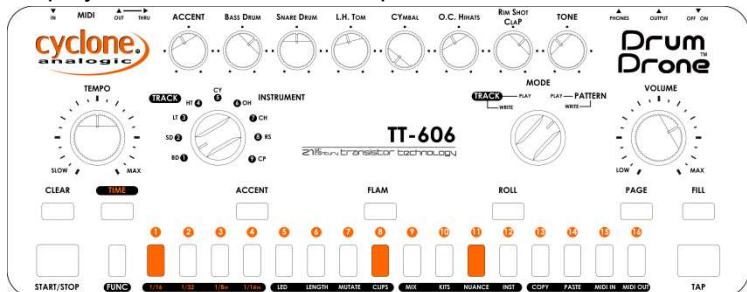
9. Switch the **Track/Instrument** switch to the Snare Drum (SD) position then press **[5]** then **[13]**.

10. Switch the **Track/Instrument** switch to the Closed Hi-hat (CH) position on your Drum Drone or Hi-hat on your Beat Bot then press **[3]**, **[7]**, **[11]**, **[15]**, then **[16]**.
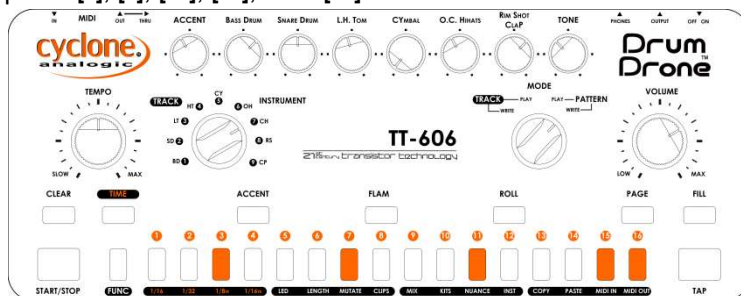
That's it! You've programmed your first rhythm pattern. But there is another practical way to set which steps are on or off for a particular instrument. Let's add another instrument to this pattern using a technique called Tap Entry:

1. With the sequencer still running, switch the **Track/Instrument** switch to the High Tom (HT) position on your Drum Drone or the High Conga/Bongo (HC/HB) position on your Beat Bot.

2. While the pattern plays, press **[TAP]** to record instrument strikes at certain steps. You will see that the sequencer illuminates the step numbers when you press **[TAP]**.

3. Repeat this process for other instruments if you'd like.

You can also clear steps for an instrument using a similar technique. Let's program a new rhythm for the Snare Drum.

1. Clear out the existing snare drum rhythm by pressing **[CLEAR]** and holding it through an entire repetition of the pattern. The display shows that none of the steps are active for the snare drum.

2. Now use **[TAP]** to enter a new snare drum rhythm.

3. If you're not happy with the result, you can manually adjust each step by pressing any of the **[#]** buttons as you did at the beginning of this lesson, or repeat steps 1 and 2 above to try again.

Tip! *If you hold* **[CLEAR]** *while pressing* **[TAP]** *to activate steps for the selected instrument, all existing steps will be turned off and the new steps entered with* **[TAP]** *will take their place.*

Lesson 5   Accents, Flams, and Rolls

In Lesson 4 you learned how to program a simple pattern. This lesson describes how to apply the Accent, Flam, and Roll modifiers to the steps of a pattern to make it more interesting. First, let's define these terms:

Accent:	The Accent modifier denotes steps which will be given extra emphasis, usually by accentuating the instrument's volume or length. The amount of additional emphasis is determined by the position of the **Accent** control.
Flam:	The Flam modifier adds a flam effect to the step, which simulates a drummer striking an instrument with both drum sticks but at slightly different times. The time gap between the first and second strikes is determined by the Flam Time setting, which can be adjusted to make the flam effect as subtle or obvious as you want. Adjusting the Flam Time is described in Lesson 9.
Roll:	The Roll modifier causes the instrument to be played twice for the programmed step, with the second strike taking place half way between the current step and the next step. For example, in a pattern with 16th note timing, a Roll step will play two 32nd notes.

The modifier buttons (**[ACCENT]**, **[FLAM]**, and **[ROLL]**) are used to edit these properties and are programmed in much the same way as how you programmed pattern steps in Lesson 4. They can be edited using either of the techniques below while in Pattern Write mode with the sequencer running.

Mode Editing	When a modifier button is pressed then released, the button illuminates to show that the modifier is currently ready to be edited. The steps for the selected instrument are displayed. Steps that are on but do not have the current modifier applied are shown in orange. Steps that have the current modifier applied are shown in the modifier's color. Pressing a **[#]** button will toggle the modifier for that step. If the step is off, pressing its **[#]** button will turn the step on and apply the modifier. Pressing **[TAP]** has the same effect. Press or hold **[CLEAR]** to remove the modifier from one or more steps as the sequencer plays. To completely clear a step in this mode, press and hold its **[#]** button for two seconds. Press the modifier button again to exit this mode.
Quick Editing	To quickly edit a modifier, press and hold the modifier button then press the **[#]** buttons you want to toggle. You can also hold the modifier button and press **[TAP]** to assign the modifier to new steps as they play. Quick Editing mode automatically exits when the modifier button is released.

We'll use a simple snare drum pattern to demonstrate the modifiers and the different ways you can edit them.

1. With the sequencer stopped, set the Mode switch to Pattern Write mode and choose an empty pattern slot. Make sure that the Accent and Snare Drum **Level Control** knobs are set to about 50%.

2. Press **[START/STOP]** to start the sequencer.

3. Set the **Track/Instrument** switch to Snare Drum (SD).

4. Press these buttons to program the basic rhythm: **[1]**, **[3]**, **[5]**, **[6]**, **[8]**, **[11]**, **[13]**, **[15]**, and **[16]**.
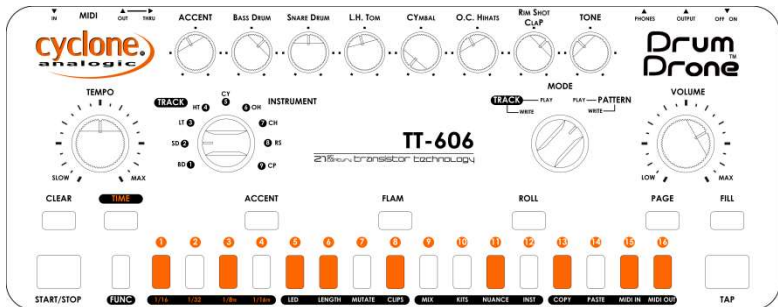
5. Press **[ACCENT]** to enter accent programming mode. Press **[1]**, **[5]**, **[13]**, and **[15]** to add accent to those steps. The buttons for these steps will show a red color. These steps will sound louder when the pattern plays.

6. Press **[FLAM]** to enter flam programming mode. Press **[TAP]** as the pattern plays to add the flam effect to some steps of the pattern or to add new flammed steps. Press **[FLAM]** again to exit.

7. Press and hold **[ROLL]**, then press **[16]**. Release both buttons. Listen for the roll effect on step 16.

Tip! *Steps can be accented <u>and</u> have flam or roll applied too. However, both flam and roll cannot be applied to the same step.*

Lesson 6 Instrument Selection

The TT-606 Drum Drone and TT-78 Beat Bot offer multiple instrument options for certain drum instruments, but the two drum machines are somewhat different in this respect.

TT-606 Instrument Timbre Selection

The TT-606 Drum Drone lets you choose from several timbres for the Cymbal and Hi-hat instruments. Each timbre has a distinctive sound that can change the personality of your patterns.

The Instrument Selection menu may be accessed in any mode by pressing **[FUNC]+[INST]**. The front panel will display the timbre options for the instrument that is currently selected by the **Track/Instrument** switch. The brightly lit button shows the current instrument timbre. Dimly lit buttons show the other available timbres.

Tip! *Instrument timbre selections are stored as part of TT-606 Kits, which are described in Lesson 16.*

TT-78 Instrument Selection

The TT-78 Beat Bot includes several positions on the **Track/Instrument** switch that include more than one available instrument. You can assign either of these instruments to any step of your pattern.

The two available instruments are referred to as Instrument A and Instrument B, where Instrument A is the first instrument listed for that position on the **Track/Instrument** switch.

In certain views on the Beat Bot, such as Pattern Write mode with the sequencer running, Instrument A steps are shown with an orange color and Instrument B steps are shown with a violet color. Refer to the table below.

Track/Instrument Position	Instrument A (ORANGE)	Instrument B (VIOLET)
LC / LB	Low Conga	Low Bongo
HC / HB	High Conga	High Bongo
CL / CB	Clave	Cowbell
TB / GU	Tambourine	Guiro

Some Beat Bot behaviors depend on which of the two available instruments is selected. The Instrument Selection menu may be accessed in any Mode by pressing **[FUNC]+[INST]**. Press **[1]** to select Instrument A or **[2]** to select Instrument B.

The instrument that was selected via the Instrument Selection menu will be used when any of the following is done:

- Tap Entry is used while pattern editing (Lesson 4);
- Drum strikes are triggered from the Mix menu (Lesson 11) or by pressing **[TAP]** in Pattern Play mode (Lesson 10);
- Nuance is applied (Lesson 12).

TT-78 Pattern Editing with Multiple Instruments

When in Pattern Write mode with the **Track/Instrument** switch set to one of these dual instrument positions (see the table on the previous page for a list), pressing the [#] button for a sequencer step will cause the step to cycle through three states:

- Off;
- Instrument A (orange);
- Instrument B (violet).

As an example, add some Clave and Cowbell steps to your pattern:

1. Set the **Mode** switch to Pattern Write and start the sequencer.

2. Set the **Instrument/Track** switch to CL/CB to edit the Clave and Cowbell instruments.

3. Press [1] once to set step #1 to play the Clave. Do the same for steps 4 and 7. The [#] buttons for these step should be orange.

4. Press [3] twice to set step #3 to play the Cowbell. Do the same for steps 9 and 12. The [#] buttons for these step should be violet.

5. Change step #7 to play the Cowbell sound by pressing [7] once. The [7] button will be violet.

6. Change step #3 to play the Clave sound by pressing [3] twice. The [3] button will be orange.

The example above demonstrates the behavior of the buttons when step programming these dual instruments.

Lesson 7   Tone Control

The Drum Drone's **Tone** knob controls some aspect of the sound of each instrument. Tone settings for the complete set of instruments can be saved and recalled as Drum Kits (see Lesson 16)

To adjust the tone of an instrument, select the instrument on the **Track/Instrument** switch then turn the **Tone** knob. The **Tone** knob's effect on each instrument's sound is described below.

Drum Drone Instrument	Tone Control Effect
Bass Drum (BD)	Tuning
Snare Drum (SD)	Snare snap
Low Tom (LT)	Tuning
High Tom (LT)	Tuning
Cymbal (CY)	Decay time Hold **[FUNC]** and turn **Tone** knob to adjust tuning.
Open Hi-hat (OH)	Decay time
Closed Hi-hat (CH)	Tone - alters the tuning of *both* the open (OH) and closed (CH) hi-hat sounds
Rimshot (RS)	Timbre
Hand Clap (CP)	Density

Beat Bot Instrument	Tone Control Effect
Bass Drum (BD)	Tuning
Snare Drum (SD)	Snare snap
Low Bongo (LB) / Low Conga (LC)	Tuning
High Bongo (HB) / High Conga (HC)	Tuning
Clave (CL)	Tuning
Cowbell (CB)	Tuning
Cymbal (CY)	Level of Metal Beat sound when Cymbal is played
Hi-hat (HH)	Level of Metal Beat sound when Hi-hat is played
Maracas (MA)	Decay Time
Guiro (GU)	Pitch
Tambourine (TB)	Decay Time

For positions on the Beat Bot's **Track/Instrument** switch with multiple instruments, the **Tone** knob controls the Tone property of Instrument A by default. Hold **[FUNC]** while adjusting the **Tone** knob to change the Tone property of Instrument B.

Tip! *The **Tone** knob serves other purposes within certain function menus. While in these function menus, changes to the **Tone** knob will not alter the instrument's tone but will instead adjust some setting for that function.*

Lesson 8 Fills

Each pattern has space for a Fill variation that may be used during performances or when building tracks. Fills can add variety to your rhythm tracks. A Fill can be scheduled or played in several ways.

A Fill shares the same basic properties of the pattern that contains it, such as the pattern length and time scale, but the Fill's rhythm pattern may be completely unique. Below is an illustration of each pattern's elements:
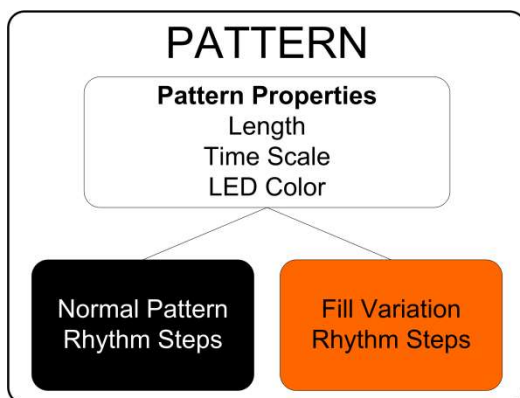
Editing Fills

Fills are programmed and edited using the same methods as the normal pattern. Follow these steps to program a Fill for one of your patterns.

1. With the sequencer stopped, set the **Mode** switch to Pattern Write.

2. Select a pattern slot that contains a pattern and press **[START/STOP]** to start the sequencer.

3. Press **[FILL]**. At the start of the next bar the Fill button will blink to show that you are editing the Fill variation.

4. Edit the Fill steps as desired.

5. Press **[FILL]** to stop editing the Fill and return to editing the normal pattern.

Creating a Fill Based on an Exiting Pattern

It is common to re-use the content of the normal pattern as a starting point when creating a Fill variation. To make this easier, a shortcut is available to copy the normal pattern into its own will Fill memory. To clone the pattern into the Fill slot, play the pattern in Pattern Write mode then press and hold **[FUNC]+[FILL]** for two seconds.

This is often the quickest way to begin programming a Fill.

Playing Fills

Fills can be triggered in several ways:

- While a pattern is playing in Pattern Play mode, press **[FILL]** to instruct the sequencer to schedule the Fill variation to be played next instead of the normal pattern. The Fill variation will play once then resume playing the normal pattern.

- Set the Auto-Fill feature to configure the sequencer to play Fills at a specified interval, as described in Lesson 9. For example, you can set Auto-Fill to automatically play a the fill variation every 4 bars.

- In Track mode, you can program specific bars to play the Fill variation instead of the normal pattern. This is described in Lesson 18.

Lesson 9   Time Functions

A set of Time functions controls many important properties of the Drum Drone and Beat Bot. The Time menu and other Time functions are described in this lesson. These functions are accessed using **[TIME]**, sometimes in combination with a second button.

Pattern Time Scale

Each of your patterns is associated with one of four available time scales. The time scale dictates the speed at which the pattern is played. The four available time scales are:

Time Scale	Description
[1] 16th note	Each pattern step represents one 16th note. This is the default time scale for new patterns.
[2] 32nd note	Each pattern step represents one 32nd note. This means the pattern is played back twice as fast as with the 16th note time scale.
[3] 8th note triplet	Each pattern step represents an 8th note triplet. This scale is intended for time signatures such as 3/4 and 6/8. With this time scale, a "bar" is 12 steps long instead of 16 steps. Because of this, each page of the pattern shows 12 steps and the maximum pattern length is 48 steps instead of 64.
[4] 16th note triplet	Each pattern step represents a 16th note triplet. This means the pattern is played back twice as fast as with the 8th note triplet time scale. A "bar" is 12 steps long and the maximum pattern length is 48 steps.

To set the Time Scale for a pattern, the Drum Drone must be in Pattern Write or Pattern Play mode and the sequencer must be stopped.* Press and hold **[TIME]**. The indicators of buttons **[1]** - **[4]** reflect the time scale options described above. The time scale assigned to the current pattern(s) is brightly lit while the other options are dimly lit. Press the **[#]** button to assign the corresponding time scale to the current pattern, then release **[TIME]** to exit the menu.

* You *can* change a pattern's Time Scale while the sequencer is running by pressing **[TIME]**+(**[1]** - **[4]**) and holding the buttons for two seconds. This special operation is required in order to prevent accidental Time Scale changes during live performances which could disrupt your drum machine's synchronization with other gear.

Shuffle Amount

The sequencer can add shuffle or 'swing' when playing patterns. The Shuffle Amount setting is applied to the playback of all patterns. The lowest Shuffle Amount setting corresponds to no shuffle.

To set the Shuffle Amount, press and hold **[TIME]**. The indicators of buttons **[9]** - **[16]** reflect the available range of shuffle amounts. The current Shuffle Setting is brightly lit. To choose a new setting, press a **[#]** button or turn the **Tone** knob, then release **[TIME]** to exit the menu.

Flam Time

The Flam Time, or the time between the two drum strikes of a flam step, is adjustable. This is a global setting that is applied by the sequencer to all instrument steps with the Flam modifier applied.

The Flam Time can be set to a value from 10 to 160 milliseconds. Press **[TIME]**+**[FLAM]** to enter the Flam Time menu. To choose a new setting, press a [#] button or turn the **Tone** knob, then release **[TIME]** to exit the menu.

Tip! *You can achieve higher resolution in setting values for Shuffle Amount and Flam Time by using the **Tone** knob to adjust those values while in their menus.*

Auto-Fill Interval

The Auto-Fill feature in Pattern Mode instructs the sequencer to automatically play the Fill variation of a pattern at a specified interval.

The Auto-Fill function is controlled by pressing **[TIME]+[FILL]**. The available Auto-Fill interval options are shown with dimly lit buttons, and these intervals are 1, 2, 4, 8, and 16 bars. Press the **[#]** button that corresponds to your desired interval.

For example, at a setting of *4* the normal pattern will play three times then the Fill variation will play once automatically. This sequence will repeat with the Fill playing every 4th bar.

Press **[FUNC]** to exit the Auto-Fill menu. When Auto-Fill is active the **[FILL]** LED will be flashing. Press **[CLEAR]** in the Auto-Fill menu to turn Auto-Fill off.

Fills are covered in Lesson 8.

Tap Tempo

Set the sequencer's tempo by holding **[TIME]** and pressing **[TAP]** along with the quarter notes of target tempo. At least three presses of **[TAP]** are required to accurately set the tempo. If **[TAP]** is pressed only once, the sequencer will do its best to shift the start of the pattern to the time when **[TAP]** was pressed. These tools make it possible to beat-match your drum machine to another instrument or song.

The **Tempo** knob will resume control of the tempo if the **Tempo** knob is moved.

Lesson 10 **Live Performance Features**

Once you've created some patterns or tracks, the Drum Drone and Beat Bot can be controlled in several interesting ways during a performance. You can adjust which instruments appear in the mix (similar to instrument muting), add or remove the Accent/Flam/Roll modifiers, or trigger additional instrument sounds.

The techniques in this lesson can be applied in Pattern Play or Track Play modes and they do not affect your stored patterns (i.e., they are non-destructive).

Also refer to the next lesson (Lesson 11) which covers the Mix Control function.

Accent/Flam/Roll Effects

Add a modifier effect to an instrument within a pattern or to all instruments.

Press or hold **[ACCENT]**, **[FLAM]**, and/or **[ROLL]** to add these effects to the currently selected instrument whenever that instrument is triggered by the sequencer.

Add or Subtract Drum Sounds

Add instrument strikes to a pattern while it's playing.

Press **[TAP]** to play the currently selected instrument. Hold **[TAP]** to continue to play that instrument for every step while **[TAP]** is pressed. Modifiers may also be applied by also holding **[ACCENT]**, **[FLAM]**, and/or **[ROLL]** when **[TAP]** is pressed. While holding **[TAP]**, you can adjust the repeat rate using the **Tone** knob (1/4, 1/8, 1/16, 1/32, or 1/64 note).

Press **[CLEAR]** to momentarily prevent the sequencer from playing the current instrument (i.e., momentarily mutes the instrument). While holding **[CLEAR]** you can press **[TAP]** to override the pattern's steps and instead insert different drum strikes.

Lesson 11 Mix Control

The Mix Control function determines which instruments are present in the mix. Use this function to selectively mute instruments to add variety to your performance, such as building a crescendo or adding a breakdown section. Mix Control is a global setting and also applies to all modes.

Press **[FUNC]+[MIX]** to access the Mix Control menu. Buttons **[1]** through **[9]** will be lit to indicate the mix status. The button numbers correspond to the instrument numbers on the **Track/Instrument** switch, with **[1]** indicating the bass drum and **[9]** indicating the Hand Clap (Drum Drone) or Tambourine/Guiro (Beat Bot). Instruments that are currently in the mix are brightly lit in orange while instruments that are muted are dimly lit. The LEDs blink in white when the corresponding instrument plays.

Press any of these **[#]** buttons to toggle its mix state. Press **[FUNC]** to exit the menu. On the TT-78 Beat Bot, the applicable **[#]** button affects both instruments where applicable (for example, the Low Conga and Low Bongo).

Trigger Instruments Manually

The **[16]** button is used to activate Instrument Trigger mode. While in the Mix menu, press **[16]** to switch from the standard Mix Control mode to Instrument Trigger mode, then press any button **[1]** through **[9]** to trigger the corresponding instrument.

For TT-78 Beat Bot **Track/Instrument** knob positions with multiple instruments, the instrument that is currently selected in the Instrument Selection menu (see Lesson 6) will be played.

Tip! *While in the Mix Control menu, press* **[CLEAR]** *to enable (unmute) all instruments. Press* **[CLEAR]** *again to revert to the previous Mix setting.*

Lesson 12 Nuance Auto-Variation

With the unique Nuance feature, the Drum Drone and Beat Bot can automatically make subtle (or not-so-subtle) adjustments to the Tone settings of each instrument while patterns play. Nuance can be used to give a more human touch, add a subtle groove, or even add wild effects to your patterns. You can adjust the shape, speed, and depth of the Nuance effect for each of the 9 instrument positions individually. It functions much like a synthesizer's LFO (low frequency oscillator). The waveforms are synchronized to the tempo, so if you are sequencing your drum machine externally, be sure to send it a MIDI clock signal.

The Nuance menu is accessed by pressing **[FUNC]+[NUANCE]** while in any mode. The Nuance feature will vary the currently selected instrument's Tone using one of several available waveforms with the instrument's current Tone setting as the baseline.

Each instrument position on the **Track/Instrument** switch has its own Nuance setting. When you enable Nuance for an instrument, it will continue automating the instrument's tone until you disable the nuance effect for the instrument (described below) or load a new Kit.

Nuance Shapes

Three different Nuance waveform shapes are available along with a Random option. These shapes are shown below.

| Sawtooth | Triangle | Square | Random |
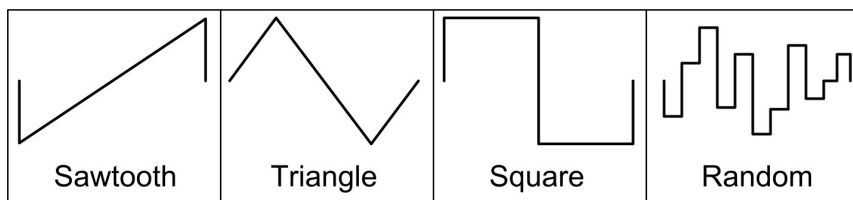
While in the Nuance menu, you will see buttons [1] through [16] illuminate to show the available Nuance shape settings.

Button	Color	Shape	Cycle Length
[1]	Cyan	Sawtooth	Two whole notes
[2]	Cyan	Sawtooth	One whole note
[3]	Cyan	Sawtooth	One half note
[4]	Cyan	Sawtooth	One quarter note
[5]	Cyan	Sawtooth	One eighth note
[6]	Green	Triangle	Two whole notes
[7]	Green	Triangle	One whole note
[8]	Green	Triangle	One half note
[9]	Green	Triangle	One quarter note
[10]	Green	Triangle	One eighth note
[11]	Purple	Square	Two whole notes
[12]	Purple	Square	One whole note
[13]	Purple	Square	One half note
[14]	Purple	Square	One quarter note
[15]	Purple	Square	One eighth note
[16]	White	Random	Each instrument trigger has a random tone value

Tip!   *There are actually nine Cycle Lengths available for each Nuance Shape. The additional four Cycle Lengths can be selected by pressing two adjacent [#] buttons of the same color. Additionally, the fastest Nuance speeds (5, 10, 15) sound best when applied to patterns that include roll steps or a triplet time scale.*

Nuance Depth

After selecting a shape, set the depth of the Nuance effect for the current instrument. The depth is set using the Tone knob while in the Nuance menu. The position of the Tone knob will dictate both the depth of the Nuance shape *and* its phase (that's whether the shape begins in the positive or negative direction). Setting the Tone knob to the middle (50%) position effectively yields a Nuance depth of zero.

This is illustrated below using the sawtooth shape as an example:
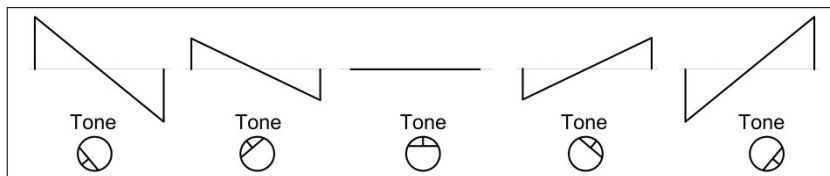
Nuance Example

As an example, follow these steps to add Nuance to an instrument:

1. Switch to Pattern Play mode. Select a pattern that has an active rhythm programmed for the Low Tom (Drum Drone) or Low Conga / Low Bongo (Beat Bot). Add this instrument to the pattern if necessary.

2. Press **[START/STOP]** to start the sequencer if it is not already running.

3. Select the Low Tom (LT) or Low Conga / Low Bongo (LC/LB) with the **Track/Instrument** switch.

4. Press **[FUNC]+[NUANCE]** to enter the Nuance menu.

5. Set the depth of the Nuance effect to the maximum value by setting the **Tone** knob to 100% (fully clockwise).

6. Press **[7]** to select a triangle wave pattern with a speed of one cycle per whole note.

Disable Nuance

To disable the Nuance effect for the selected instrument, press **[CLEAR]** while in the Nuance menu.

To disable the Nuance effect for all instruments, press and hold **[CLEAR]** for two seconds while in the Nuance menu for any instrument. You will see the **[CLEAR]** LED flash confirming that Nuance was disabled.

Lesson 13 Pattern Management

Patterns are managed and organized while in Pattern Play mode or in Pattern Write mode when the sequencer is stopped. Here you can assign colors to patterns, copy and paste patterns, or clear patterns.

Assign a Color to a Pattern

Assigning different colors to your patterns can help you keep them organized or highlight your favorites. Press **[FUNC]**+**[LED]** and the buttons **[1]** - **[13]** will light up with different color choices. Press the button for the color you want to assign for the currently selected pattern(s), or press **[CLEAR]** to set this pattern to always use the system color (see Lesson 17). Press **[FUNC]** to exit the color menu.

Copy and Paste a Pattern

Select the pattern that you want to copy by pressing its **[#]** button. Press **[FUNC]**+**[COPY]** to copy the pattern to the clipboard. Select the destination pattern number, then press **[FUNC]**+**[PASTE]**.

After performing a copy, the pattern will reside in the clipboard memory until a new copy command is issued, so you can perform several successive paste operations without repeating the copy operation.

Copy and Paste Multiple Patterns

Select a range of patterns to copy by performing a range selection. This is done by pressing and holding the **[#]** button of the first pattern then pressing the **[#]** button of the final pattern. For example, to select patterns P5, P6, P7, and P8, press **[5]**+**[8]**. Then copy these patterns to the clipboard by pressing **[FUNC]**+**[COPY]**.

Use a similar process to select the same number of destination pattern slots and press **[FUNC]**+**[PASTE]** to paste the patterns.

Clear One or More Patterns

Clearing a pattern will reset it to a silent 16-step pattern.

Clear a single pattern by pressing **[CLEAR]+[#]**, where "#" is the pattern number you want to clear.

Clear a range of patterns by pressing **[CLEAR]+[low #]+[high #]**, where "low #" and "high #" represent the first and last patterns in the range you want to clear.

Merge Multiple Patterns into a Single Pattern

Sometimes it is convenient to merge a number of patterns into a single longer pattern. For example, you may want to convert a group of four 16-step patterns into a single 64-step pattern. This can be done using the Merge Copy/Paste function.

Select the range of patterns you wish to merge, then press **[FUNC]+[COPY]** to copy them to the clipboard. Select a single destination pattern slot then press **[FUNC]+[PASTE]** to merge the source patterns into the destination pattern.

The destination pattern will be assigned with the color and Time Scale of the first pattern in the group of source patterns. The destination pattern contain a maximum of 64 steps (or 48 steps for patterns with either of the triplet Time Scales).

Tip! *When a pattern is copied to or pasted from the clipboard, both the normal and the fill variations of the pattern are included.*

Lesson 14 Advanced Pattern Editing

Lesson 4 showed you how to program basic patterns. This lesson introduces a number of other techniques for building and editing patterns.

The techniques in this lesson can be performed when in Pattern Write mode.

Instrument Copy/Paste

You can copy an instrument's rhythm within a pattern and paste it to a different instrument, to an instrument in another pattern, or to another page within the same pattern.

With the desired source pattern playing and the source instrument selected on the **Track/Instrument** switch, press **[FUNC]+[COPY]**. Then select the target pattern, instrument, and/or page and press **[FUNC]+[PASTE]** to paste it.

The source instrument's step settings and Accent/Flam/Roll modifiers will be applied to the destination.

Global Accents

The Drum Drone supports individually accented notes for each instrument (see Lesson 5), but some earlier drum machines used a dedicated Accent track which was used to program accents that applied to every instrument.

There is a dedicated Global Accent track in each pattern that is accessed while the sequencer is running in Pattern Write mode by pressing **[FUNC]+[ACCENT]**. When in the Global Accent view, you will see the **[ACCENT]** LED flashing.

After programming Global Accent steps in this view, any instruments that have triggers on those steps will play with accent applied.

You can exit the Global Accent view by pressing either **[FUNC]** or **[ACCENT]**.

Set a Pattern's Length

Patterns can have any length from 1 to 64 steps (or 1 to 48 steps for triplet time scales). To set a pattern's length, press **[FUNC]**+**[LENGTH]**. Buttons corresponding to all the existing steps in the pattern will be lit. Select the desired page using **[PAGE]** if necessary, then press the **[#]** button corresponding to the new last step in the pattern.

The following example demonstrates how to change a 16-step pattern into a 32-step pattern.

1. Select an existing 16-step pattern then press **[FUNC]**+**[LENGTH]**. Buttons **[1]** through **[16]** will be lit in blue.

2. Press **[PAGE]** once to advance to page 2 (yellow) of the pattern. Page 2 of this pattern will be empty.

3. Page 2 shows steps 17-32 of the pattern, so press **[16]** to set the new length to 32 steps.

4. Press **[FUNC]** to exit the menu.

Pattern Unroll

This function lengthens a pattern and clones its existing content into the newly added steps. For example, you can use this function to extend a 16-step pattern into a 32-step pattern without manually copying all of the new steps. This is done by performing a long press of the new length's **[#]** button when changing a pattern's length.

To try this, perform the same steps as in the "Set a Pattern's Length" example above (using a different 16-step pattern), except at step #3 press and hold **[16]** for two seconds. The content of the original 16 step pattern will then be copied into the newly added steps 17-32.

Instrument Mutate

The Mutate function automatically alters your pattern in a subtle way. It can be used to help you experiment with different rhythms.

While in Pattern Write mode, select an instrument using the **Track/Instrument** switch. Start the sequencer and be sure to activate several steps for the selected instrument. Mutate the current instrument by pressing **[FUNC]**+**[MUTATE]**.

Lesson 15 Working with Clips

A Clip is a stored rhythmic phrase for a single instrument that can be used to build patterns quickly. Clips are especially useful for adding commonly used building blocks into your patterns.

Your drum machine can store up to 16 Clips for each instrument and includes some sample clips. All Clip slots can be overwritten with your own Clips. The Clips menu can be accessed in Pattern Write mode while the sequencer is running.

Insert a Clip Into a Pattern

Inserting an instrument Clip will overwrite the pattern's contents for that instrument. Let's add a Clip into an existing pattern:

1. Switch to Pattern Write mode. Select a pattern to modify or choose a new empty pattern.

2. Press **[START/STOP]** to start the sequencer.

3. Set the **Track/Instrument** switch to the Bass Drum (BD).

4. Press **[FUNC]+[CLIPS]** to enter the Clips menu. The display will show the available Clips for the current instrument with dim yellow indicators. Empty Clip slots are shown with rim red indicators.

5. Press **[1]** to audition Bass Drum Clip #1. You will hear this Bass Drum rhythm played in your pattern. Try other Bass Drum Clips as well.

6. Once you've selected a Clip, press **[FUNC]** to apply the Clip to your pattern and exit the Clips menu, or press **[CLEAR]** to exit the menu without applying the Clip.

Tip! *While in the Clips menu, you can insert Clips into different instruments by turning the **Track/Instrument** switch and selecting a Clip for whichever instruments you choose.*

Saving a New Clip

If one of your patterns has an instrument rhythm that you want to save as a new Clip so you can use it later, follow these steps:

1. Switch to Pattern Write mode. Stop the sequencer then select a the pattern to use as the source of a Clip.

2. Press **[START/STOP]** to start the sequencer.

3. Set the **Track/Instrument** switch to the instrument you want to save to a Clip.

4. Press **[FUNC]+[CLIPS]** to enter the Clips menu.

5. Press and hold a slot's **[#]** button for two seconds to save the new Clip to that slot. The button will change to bright red to indicate that the new Clip was saved.

Notes about Clips

Here are some other things to know about working with Clips:

- Clips may be any length up to 64 steps, but the number of steps that are inserted into a pattern is determined by the destination pattern's length.
- If multiple patterns are currently selected, with the sequencer cycling through those patterns, then entering the Clips menu will cause the sequencer to stay at the current pattern until you exit the Clips menu.
- With the TT-78 Beat Bot, a Clip will include step information for both A and B instruments on the **Track/Instrument** switch where applicable (such as the CL/CB position).

Lesson 16 **Kits**

A Kit is a stored snapshot of all instrument parameters that can be saved and recalled later. Use Kits to store and load particular tunings or instrument types that you like. Up to 16 Kits can be stored. Kits are applied globally and are not associated with specific patterns.

Kits include several properties for each instrument:

- the Tone knob setting (see Lesson 7);

- the Instrument Timbre selection (see Lesson 6);

- the Nuance settings (see Lesson 12).

Kits are stored and recalled through the Kits menu, which can be accessed at any time by pressing **[FUNC]+[KITS]**. The display shows which slots contain saved Kits. You can do any of the following:

- To load a Kit, press a **[#]** button to first audition it. Then press **[FUNC]** to save your selection and exit the menu, or press **[CLEAR]** to exit the menu without loading a Kit.

- To store a new Kit, press and hold the target **[#]** button for two seconds. The button will change to a bright red color to indicate that the Kit was saved. Press **[FUNC]** to exit the menu.

- To erase a Kit, press and hold **[CLEAR]+[#]** for two seconds, where **[#]** corresponds to the Kit slot to be cleared.

Lesson 17 Overview of Track Modes

A track is a structured sequence of patterns. It can be a short sequence for making loops or the drum track for a complete song. There are two track modes available on the **Mode** switch. Track Write mode is where you compose and program tracks. Track Play mode is where you play and perform tracks.

Your drum machine can store up to 9 tracks which are selected using the **Track/Instrument** switch. Each track may be up to 240 bars in length, where a 'bar' refers to one complete cycle of a pattern regardless of the pattern's length.

Within the Track modes, the patterns that make up a track are displayed graphically through the **[#]** buttons. Up to 16 bars can be displayed at one time, and therefore a track may span multiple pages. Cycle through the pages using **[PAGE]**,or hold **[PAGE]** and select a page's corresponding **[#]** button to jump to that page. When the track is displayed, the indicator color of each bar corresponds to the color of that bar's pattern.

Many of the techniques learned in prior lessons can be applied in the Track modes, such as selecting and looping a range of bars, copying and pasting bars, and navigating pages using **[PAGE]**.

Set the System Color

You can customize the system color of your drum machine's LED indicators. While in either Track Play or Track Write mode, press **[FUNC]+[LED]** and the step buttons will light up to display an array of colors. Press the button for the color you want to use for the system color then press **[FUNC]** to exit the color menu. The default system color is red.

Lesson 18 **Writing a Track**

Writing a track involves programming a pattern to play for each bar of your track. In this lesson, you will compose a short track that will demonstrate the techniques of Track Write mode.

Each bar of the song can be programmed with the following information:

- the pattern that should be played, each of which can be any of your 64 stored patterns;
- whether or not the pattern's fill variation should be played;

Track Write mode has two "views" which are used in building a track:

Track View: This view shows each bar of the track and indicates the color of the pattern is assigned to each bar.

Pattern Selection View: This view is similar to that of Pattern Play mode and allows you to select a pattern to assign to one or more bars of the track.

To prepare for writing a short track, be sure to have patterns programmed in pattern mode, slots P1 and P2 in your first (red) page (see Lesson 3). Each pattern should also have a fill variation (see Lesson 8). The final track will have the structure shown below:

Bar	1	2	3	4	5	6	7	8
Pattern	P1	P1	P1	P1	P2	P2	P2	P2
Normal / Fill				FILL				FILL

Follow these steps to construct the track:

1. Set the **Track/Instrument** switch to Track 1 and set the **Mode** switch to Track Write mode.

2. The display shows Track View. Only bar #1 is present in the track, though no pattern has been assigned to it yet.

3. Assign the track's first four bars to play pattern #1 from your red page of patterns. To do this, first select the first four bars of the track by pressing **[1]**+**[4]**.

4. Press **[TAP]** to enter Pattern Selection view. Here you can choose a pattern to assign to the four bars that you selected in the previous step.

5. Press **[1]** to choose pattern P1 then press **[TAP]** to commit the selection and go back to Track View.

6. Track View now shows that bars #1 through #4 have been assigned with pattern #1 as shown by its color. By assigning patterns to bars 1 through 4 you have extended the length of the track to 4 bars.

7. Assign bar #4 to play the Fill variation of pattern P1. Press **[4]** to select bar #4, then press **[FILL]** to assign the Fill variation to this bar. The Fill LED will light up when you have selected one or more bars that have the Fill property assigned.

8. Now repeat steps 3 through 7 for bars #5 through #8, except assign pattern P2 to these bars.

Now you have a simple track with 8 bars. The next lesson will cover playing and performing a track.

Other Track Writing Tools

- You can copy and paste bars within a track. Copy and paste operations also include the Fill property of the bars being copied.
- You can audition patterns when in Pattern Selection view. Press **[START/STOP]** to run the sequencer. The sequencer will loop the selected pattern to help make sure you choose the one you want.
- You can clear bars within a track while in Track View, which will set those bars to be 16 steps of silence. Clearing bars is done the same way as clearing patterns in Pattern modes (see Lesson 13).

Clear a Track

To clear a track while in Track Write mode, first select the track to be cleared using the **Track/Instrument** switch. Set its length to one bar using the following steps:

1. Press **[FUNC]+[LENGTH]** to enter the track length setting menu.

2. Navigate to the first page of your track using **[PAGE]**.

3. Press **[1]** to set the track's new length to one.

This procedure deletes all bars in your track except bar #1.

Lesson 19 Playing and Performing Tracks

Track Play mode is the easiest way to play and perform your tracks without making accidental changes. In Track Play mode, you can also add non-destructive live performance elements to the track while it plays.

With the sequencer stopped, set the **Mode** switch to Track Play and set the **Track/Instrument** switch to track 1. Press **[START/STOP]** and your track will loop continuously.

You can perform any of the following while the track plays:

- Modify the instrument mix by pressing **[FUNC]+[MIX]** (refer to Lesson 11).

- Select a range of bars to instruct the sequencer to repeatedly loop them (refer to Lesson 3). This lets you set new loop points while the sequencer is running.

- Adjust the Tone of an instrument (refer to Lesson 7).

- Add live performance elements to the track or loop (refer to Lesson 10).

Note that changing the **Track/Instrument** switch while a track is playing will not change the track that is playing. This will instead change the instrument selection for live performance elements and Tone adjustments. The sequencer must be stopped in order to change to a different track.

Lesson 20 MIDI Functions

The Drum Drone and Beat Bot can send and receive many types of MIDI data. Their full MIDI Implementation Charts are included later in this manual. This lesson describes the MIDI capabilities of these drum machines.

Configuring the MIDI Out Port

Your drum machine's MIDI Out port may be configured as a MIDI Thru port. Set the **MIDI Out/Thru** switch on the rear of the drum machine to the desired mode.

MIDI Messages Sent by the Drum Drone

Your drum machine sends several types of MIDI messages through its MIDI OUT port, allowing you to control other instruments and record MIDI data using a computer. Connect the drum machine's MIDI OUT port to the MIDI IN port of your MIDI interface or another instrument. Set the **MIDI Out/Thru** switch on the rear panel to the OUT position.

- Your drum machine sends MIDI Note messages each time an instrument sound is generated by a pattern being played by the sequencer or any sounds added from the front panel controls during a performance. Accented steps are sent with a velocity value of 127.

- Your drum machine sends MIDI Continuous Control (CC) messages when the Tone knob is adjusted (except when using the Tone knob within a function menu, such as the Time Menu).

- Your drum machine sends out MIDI Clock transport messages for synchronizing other gear, except when the drum machine is already receiving MIDI Clock transport messages through its MIDI IN port.

External MIDI Control

Your drum machine can be controlled by an external MIDI controller or sequencer by connecting the MIDI OUT from another device to the MIDI IN jack on the back of the drum machine.

- Your drum machine responds to Note On messages for each of its drum instruments. Rhythms may be programmed through a DAW or another hardware sequencer. Your drum machine responds to Note On messages in all four of its modes. Note messages with a velocity value above 112 are considered to be accented drum strikes.

- Your drum machine responds to Continuous Controller (CC) messages for adjusting the Tone values of each of its instruments. There is at least one dedicated CC for each instrument.

- Your drum machine responds to other CC messages for controlling various other features. These are listed in the MIDI Implementation Chart later in this manual.

- Your drum machine always synchronizes its sequencer to incoming MIDI Clock transport messages. This is described below.

Synchronization to an External MIDI Clock

Your drum machine will automatically synchronize its sequencer to a MIDI clock received from an external MIDI source. It will respond to external start commands, stop commands, continue messages, and clock information.

Setting the MIDI Channels

If your drum machine is not responding to external MIDI messages as expected, you may need to adjust its MIDI channel settings. MIDI channels 1-16 are supported.

To set the MIDI IN channel, press **[FUNC]+[MIDI IN]**. MIDI channels are represented by buttons **[1]** to **[16]** on the front panel. The current MIDI channel will be brightly lit. Select a MIDI channel by pressing one of the buttons from **[1]** to **[16]** then press **[FUNC]** to exit the menu.

Set the MIDI OUT channel the same way, except initiate the selection using **[FUNC]+[MIDI OUT]**.

Note: *The default channel for both MIDI IN and MIDI OUT is Channel 1. Therefore the Drum Drone and Beat Bot will operate with many MIDI devices without any change to MIDI channel settings.*

Filtering Incoming or Outgoing MIDI Messages

To make your drum machine ignore all received MIDI note and CC data, press **[CLEAR]** when setting the MIDI IN channel instead of selecting a MIDI channel. All the channel LEDs will be dim when the MIDI input channel is cleared to show that no MIDI channel is selected.

Similarly, you can prevent your drum machine from sending MIDI note and CC data by pressing **[CLEAR]** when setting the MIDI OUT channel.

MIDI clock and sync data are not affected by these settings as your drum machine always receives MIDI Sync messages or sends them out if it is not receiving any.

Tip! *If you have the MIDI Output from one drum machine connected to the MIDI Input of a second drum machine, MIDI note and CC data from the first machine may cause extraneous drum triggers on the second. To prevent this, disable MIDI note output from the first machine by pressing* **[CLEAR]** *when setting its MIDI OUT channel as described above. The second machine will remain synchronized to the first but will not receive the unwanted drum triggers and MIDI CC messages.*

Pattern Cloning Between Two Drum Drones

You can copy patterns from one drum machine to another. You can do so by first connecting standard MIDI cables between the two units as shown in the image below. Connect the **MIDI In** jack from the first machine to the **MIDI Out** jack of the second, and the **MIDI Out** jack from the first machine to the **MIDI In** jack of the second. Basic copy and paste functions that are normally used for pattern manipulation will now apply between the machines.

To clone patterns select one or more pattern(s) P1 through P16 on the source drum machine and perform a copy operation using **[FUNC]+[COPY]** on the source drum machine. Then select one or more patterns on the destination drum machine and perform a paste operation **[FUNC]+[PASTE]** on the destination drum machine. Patterns will be copied from the source drum machine and sent to the destination drum machine. You can also copy/paste patterns between the Beat Bot and the Drum Drone.

Lesson 21 Firmware Updates and Pattern Backup & Restore

Updating OS Firmware via MIDI

The Drum Drone and Beat Bot operating system (OS) firmware can be updated via MIDI with system updates that will be made available from http://www.cyclone-analogic.com.

Use the Cyclone Studio app for PC or Mac to install this firmware using your drum machine's MIDI interface. The app will guide you through the firmware update procedure.

You can determine your current OS by noting the initial LED color when powering on your drum machine. The current release is RezOSDrum v1.0 which displays a red LEDs fade-in with white blinking LEDs.

Backing up and Restoring Patterns and Tracks via MIDI

It's recommended to periodically make a computer backup of your drum machine's memory. You can restore these backups later should you ever need to reload them.

Backup files contain Patterns, Tracks, Clips, Kits, and user system preferences (system color setting, MIDI in/out channel selections, etc.). Download the Cyclone Studio utility from the Cyclone Analogic website. It takes just seconds to backup work that may have taken hours to create!

Note that when restoring a backup using Cyclone Studio, all of your drum machine's Patterns, Tracks, Clips, Kits and user settings will be overwritten by the contents of the backup file.

Preparing to Update, Backup, or Restore

1. Check whether or not your drum machine requires a firmware according to the above revision history and information available on Cyclone Analogic's web site.

2. Use standard MIDI cables to connect your computer's MIDI interface to your drum machine. Connect the cables as shown below.
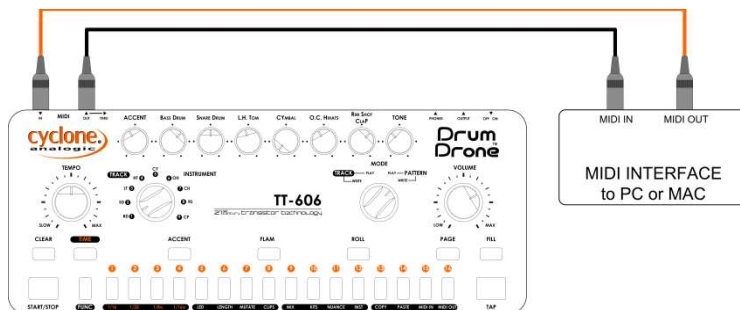
   Download and install the Cyclone Studio app for PC or Mac and get the most recent firmware update file from the Cyclone Analogic web site.

3. Run the Cyclone Studio app.

4. To perform a firmware update, click the "Firmware Update" button and follow the on-screen directions.

5. To perform a system backup, or to restore your drum machine from a previous backup file, click the "Backup" or "Restore" button and follow the on-screen instructions.

Hardware Maintenance

Preventative measures to avoid non-warrantied damage

When purchased, record the serial number and affix receipt to the inside back cover of this manual for indisputable record of ownership in case of theft or damage which is possible due to portability of the device.

Your serial number will be required for support by your distributor or Cyclone Analogic online.

Cleaning

Use a soft slightly water-dampened cloth with no chemicals such as window cleaner, alcohol or paint thinners. They may stain or remove casing paint. If liquids are spilled into the system immediately disconnect power to prevent a short circuit and allow to air dry. If a spill has contaminated the unit you should contact your retailer or Cyclone Analogic for service.

AC Adapter and Power

Only use the supplied power adapter. Using a lower quality adapter may result in buzzing sounds or other unwanted symptoms.

Use of an incorrect and excessive voltage from the use of an incorrect AC adapter may result in tripping internal safety fuses. This is evidenced by no power indication. If this should occur, your unit is not 'dead' but in protection mode. The drum machine may recover and work normally once you've corrected any problems with the power adapter or external equipment that is connected to the drum machine. However, some causes of such a failure will require servicing, requiring an authorized technician's full inspection and potentially repair to fix the problem.

Troubleshooting

Power: *No Power when switched on.*

- Confirm the supplied power adapter is being used. The power adapter supplied is specifically made for your drum machine. You may require a different type of adapter 'head' for your local area.
- Confirm that the **Power Switch** is on the ON position.

Unit is buzzing loudly.

- Unplug the power adapter and use the originally supplied 9VDC 300mA.
- Place the drum machine in a different area away from lamps or other high wattage devices.

Sound: *No sound.*

- If using headphones, make sure they are connected to the **Phones** jack and not the **Output** jack.
- Check that the main **Volume** and each instrument's **Level** control are turned up.

The sound is only in the left or right channel.

- Use the **Phones** jack for amplified stereo sound, though the mix is mono. The **Main Out** jack provides a mono output.

Pattern Editing: *Cannot edit pattern or use [functions].*

- Check that the **Mode** switch is set to Pattern Write and the sequencer is running.

MIDI: *MIDI IN or MIDI OUT not working.*

- Verify that your MIDI cables are connected properly (from IN to OUT and from OUT to IN).
- Check that correct channel numbers are selected for MIDI IN and MIDI OUT (refer to Lesson 20).

MIDI: *Cannot perform MIDI update from previous OS version.*

- Confirm that your PC or Mac has detected your MIDI/USB interface device.
- Try another cable or MIDI/USB device.

Command Shortcuts Summary

GLOBAL COMMANDS (For All Modes)

Edit the Drum Mix	**[FUNC]+[MIX]**
Save or Load Drum Kits	**[FUNC]+[KITS]**
Adjust "Nuance" Setting	**[FUNC]+[NUANCE]**
Select Instrument / Timbre	**[FUNC]+[INST]**
Set MIDI Input Channel	**[FUNC]+[MIDI IN]**
Set MIDI Output Channel	**[FUNC]+[MIDI OUT]**
Set Auto-Fill Interval	**[TIME]+[FILL]**
Set Shuffle Amount	**[TIME]**+(**[9]** − **[16]**)
Set Flam Time	**[TIME]+[FLAM]**
Tap Tempo	**[TIME]+[TAP]**

PATTERN WRITE MODE (Sequencer Running)

Edit Instrument Accent Steps	**[ACCENT]**
Edit Global Accent Steps	**[FUNC]+[ACCENT]**
Edit Instrument Flam Steps	**[FLAM]**
Edit Instrument Roll Steps	**[ROLL]**
Set Pattern Length	**[FUNC]+[LENGTH]**, then press **[#]** button for final step
Pattern Unroll	**[FUNC]+[LENGTH]**, then hold **[#]** button of last step for 2 sec. to unroll
Instrument Mutate	**[FUNC]+[MUTATE]**
Instrument Clips Menu	**[FUNC]+[CLIPS]**
Copy Instrument Steps	**[FUNC]+[COPY]**
Paste Instrument Steps	**[FUNC]+[PASTE]**
Toggle Regular / Fill Editing	**[FILL]**

PATTERN WRITE MODE (Sequencer Stopped) or PATTERN PLAY MODE

Mutate Pattern	**[FUNC]+[MUTATE]**
Copy Pattern(s)	**[FUNC]+[COPY]**
Paste Pattern(s)	**[FUNC]+[PASTE]**
Clear Pattern	**[CLEAR]+[#]**
Schedule Fill for Next Bar	**[FILL]**
Play Instrument	**[TAP]** (adjust rate using Tone knob)
Mute Instrument Steps	**[CLEAR]**
Perform Accent / Flam / Roll	**[ACCENT]** / **[FLAM]** / **[ROLL]**
Global Accent / Flam / Roll	**[FUNC]** + **[ACCENT]** / **[FLAM]** / **[ROLL]**
Set Pattern Time Scale	**[TIME]+([1] - [4])**

TRACK WRITE MODE

Toggle Bar/Pattern View	**[TAP]**
Copy Bar(s)	**[FUNC]+[COPY]**
Paste Bar(s)	**[FUNC]+[PASTE]**
Clear Bars at Selection	**[CLEAR]**
Set Track Length	**[FUNC]+[LENGTH]**
Set System Color	**[FUNC]+[LED]**

TRACK PLAY MODE

Play Instrument	**[TAP]**
Mute Instrument Steps	**[CLEAR]**
Instrument Accent / Flam / Roll	**[ACCENT]** / **[FLAM]** / **[ROLL]**
Global Accent / Flam / Roll	**[FUNC]** + **[ACCENT]** / **[FLAM]** / **[ROLL]**
Set System Color	**[FUNC]+[LED]**

RezOSDrum v1.0 MIDI Implementation Charts

Drum Drone TT-606

Function		Transmitted	Recognized	Remarks
Basic Channel		1-16	1-16	
Mode		4	4 Omni Off, Mono	
Note	36	O	O	Bass Drum (BD)
Number	38	O	O	Snare Drum (SD)
	43	O	O	Low Tom (LT)
	48	O	O	High Tom (HT)
	51	O	O	Cymbal (CY)
	46	O	O	Open Hi-hat (OH)
	42	O	O	Closed Hi-hat (CH)
	44	O	O	Closed+Open Hi-hat
	37	O	O	Rim Shot (RS)
	39	O	O	Hand Clap (CP)
Velocity	Note On	V = 64 Normal, 127 Accent	V = 0 Off, 1-111 Normal, 112-127 Accent	
	Note Off	V = 0	Any	
Aftertouch	Buttons	X	X	
	Channel	X	X	
Pitch Bend		X	X	
Control	16	X	O (0, 1, 2, 4, 8, 16)	Auto-Fill Interval
Change	17	X	O	Flam Time
	18	X	O	Shuffle Amount
	20	O	O	BD Tone
	22	X	O (0 - 31)	BD Nuance Shape

Function	Transmitted	Recognized	Remarks
23	X	O	BD Nuance Amount
25	X	O	BD Gate/Mute
28	O	O	SD Tone
30	X	O (0 - 31)	SD Nuance Shape
31	X	O	SD Nuance Amount
33	X	O	SD Gate/Mute
36	O	O	LT Tone
38	X	O (0 - 31)	LT Nuance Shape
39	X	O	LT Nuance Amount
41	X	O	LT Gate/Mute
44	O	O	LT Tone
46	X	O (0 - 31)	HT Nuance Shape
47	X	O	HT Nuance Amount
49	X	O	HT Gate/Mute
52	O	O	CY Tone (decay)
53	O	O	CY Tone (pitch)
54	X	O (0 - 31)	CY Nuance Shape
55	X	O	CY Nuance Amount
56	X	O	CY Inst Select
57	X	O	CY Gate/Mute
60	O	O	OH Tone
62	X	O (0 - 31)	OH Nuance Shape
63	X	O	OH Nuance Amount
64	X	O	OH Inst Select
65	X	O	OH Gate/Mute
68	O	O	CH Tone
70	X	O (0 - 31)	CH Nuance Shape
71	X	O	CH Nuance Amount
72	X	O	CH Inst Select
73	X	O	CH Gate/Mute
76	O	O	RS Tone

Function		Transmitted	Recognized	Remarks
	78	X	O (0 - 31)	RS Nuance Shape
	79	X	O	RS Nuance Amount
	81	X	O	RS Gate/Mute
	84	O	O	CP Tone
	86	X	O (0 - 31)	CP Nuance Shape
	87	X	O	CP Nuance Amount
	89	X	O	CP Gate/Mute
Program Change		X	X	
System Exclusive		O	O	Pattern backup, Firmware updates
System Common	Song Pos	X	X	
	Song Sel	X	X	
	Tune Req	X	X	
System Real-Time	Clock	O	O	
	Commands	Start/Stop	Start/Stop/Continue	
System Common		X	X	
Aux Messages		X	X	

Beat Bot TT-78

Function		Transmitted	Recognized	Remarks
Basic Channel		1-16	1-16	
Mode		4	4 Omni Off, Mono	
Note	36	O	O	Bass Drum (BD)
Number	38	O	O	Snare Drum (SD)
	64	O	O	Low Conga (LC)
	63	O	O	High Conga (HC)
	61	O	O	Low Bongo (LB)
	60	O	O	High Bongo (HB)
	42	O	O	Hi-hat (HH)
	51	O	O	Cymbal (CY)
	54	O	O	Tambourine (TB)
	56	O	O	Cowbell (CB)
	75	O	O	Clave (CL)
	70	O	O	Maracas (MA)
	73	O	O	Guiro (GU) short
	74	O	O	Guiro (GU) long
Velocity	Note On	V = 64 Normal, 127 Accent	V = 0 Off, 1-111 Normal, 112-127 Accent	
	Note Off	V = 0	Any	
Aftertouch	Buttons	X	X	
	Channel	X	X	
Pitch Bend		X	X	
Control Change	16	X	O (0, 1, 2, 4, 8, 16)	Auto-Fill Interval
	17	X	O	Flam Time
	18	X	O	Shuffle Amount
	20	O	O	BD Tone

Function	Transmitted	Recognized	Remarks
22	X	O (0 - 31)	BD Nuance Shape
23	X	O	BD Nuance Amount
24	X	O	BD Gate/Mute
28	O	O	SD Tone
30	X	O (0 - 31)	SD Nuance Shape
31	X	O	SD Nuance Amount
32	X	O	SD Gate/Mute
36	O	O	LC Tone
37	O	O	LB Tone
38	X	O (0 - 31)	LC/LB Nuance Shape
39	X	O	LC/LB Nuance Amount
40	X	O	LC/LB Gate/Mute
44	O	O	HC Tone
45	O	O	HB Tone
46	X	O (0 - 31)	HC/HB Nuance Shape
47	X	O	HC/HB Nuance Amount
48	X	O	HC/HB Gate/Mute
52	O	O	CL Tone
53	O	O	CB Tone
54	X	O (0 - 31)	CL/CB Nuance Shape
55	X	O	CL/CB Nuance Amount
56	X	O	CL/CB Gate/Mute
60	O	O	CY Tone
62	X	O (0 - 31)	CY Nuance Shape
63	X	O	CY Nuance Amount
64	X	O	CY Gate/Mute
68	O	O	HH Tone
70	X	O (0 - 31)	HH Nuance Shape
71	X	O	HH Nuance Amount
72	X	O	HH Gate/Mute
76	O	O	MA Tone
78	X	O (0 - 31)	MA Nuance Shape

Function		Transmitted	Recognized	Remarks
	79	X	O	MA Nuance Amount
	80	X	O	MA Gate/Mute
	84	O	O	TB Tone
	85	O	O	GU Tone
	86	X	O (0 - 31)	TB/GU Nuance Shape
	87	X	O	TB/GU Nuance Amount
	88	X	O	TB/GU Gate/Mute
Program Change		X	X	
System Exclusive		O	O	Pattern backup, Firmware updates
System Common	Song Pos	X	X	
	Song Sel	X	X	
	Tune Req	X	X	
System Real-Time	Clock	O	O	
	Commands	Start/Stop	Start/Stop/Continue	
System Common		X	X	
Aux Messages		X	X	

Protect your investment!

Please take a quick moment to locate your serial number located on the rear panel of your drum machine near the **Phones** jack.

Cycle Analogic ® Drum Drone™ or Beat Bot™

Serial Number: _____

Warranty and Maintenance

Our Bots are made by robots using surface mount technology. No user or human serviceable parts inside.

Never open your Drum Drone or Beat Bot. Doing so will automatically void your warranty and risk damage to the device.

Your Drum Drone or Beat Bot comes with a one (1) year warranty free from manufacturer defects.

The warranty does not cover accidental damages.