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Foreword

Every instrument has a story…

The Taurus 3 story starts for me at the 2006 NAMM show just months after Bob Moog's passing, when we were secretly showing Little Phatty prototypes to a select few. This was my first NAMM show and I was a newcomer to the world of electronic musical instruments.

The first day, I stood leaning against the wall across from our booth, watching a blank poster with a picture of Bob quickly fill up with adoring messages and tributes to someone who had touched so many lives. It was an incredibly moving experience and quite a surreal way to take in the responsibility that had been passed on to us. Many, after writing a goodbye note to Bob on the poster, told me about "the time I met Bob" or how Bob's instruments had changed their lives.

Invariably, the question followed, "When are you guys going to make another Taurus?"

At the time I didn't have an answer but this became a much-debated question among folks at Moog Music as the requests continued. Should we release the Taurus again? What exactly would it be? Would people really want to buy it? And most importantly: What made the Taurus I such a coveted instrument?

Over the last few years we have repeatedly asked these questions until Mike Adams proposed last year that we put this to our customers. It was a simple proposal and one that I think truly reflects on the vital relationship between you, our customers, and us here at Moog Music. The proposal was that if enough of you committed in advance to purchase a new Moog Taurus, we would begin the task of designing such an instrument.

Personally, I was skeptical about how many people *really* wanted a Taurus but I'm used to being wrong about these things! The response was overwhelming and the excitement the announcement generated was incredible. Thus, the genesis of the Taurus 3 began...

Last week, I sat in the control room of the beautiful Echo Mountain Recording Studio in Asheville with my partners Steve Dunnington and Amos Gaynes and Taurus aficionado Michael Caloroso. We listened critically to Michael's Taurus I and our Taurus 3, making sure the T3 shared every detail and nuance of the original.

The results are stunning. The Taurus 3 not only captures the original sounds of the Taurus I in full, but instantly expands upon its capabilities and offers many new dimensions to its sonic palette including LFOs, external CVs, and transposable arpeggiators. We are extremely proud and excited for you to begin making music with this instrument!

As we prepare to ship the first Taurus 3 pedals, this is really only the very beginning of the story. We are waiting for you to continue it…

Thank you to all the early adopters who made the commitment to us at Moog to go forward with this project. Your faith in us allowed us to create this instrument, and your enthusiasm, comments, suggestions and discussions were all essential to its successful development. We consider ourselves to be the luckiest company in the world to be blessed with you all.

Thank you to our industrial design partners Axel Hartmann and Klaus Weber, who kindly discarded my hand-drawn sketches and crafted the beautiful and functional design that we have built. The hard work and heart they put into the Taurus 3 design are deeply appreciated and immediately recognizable.

Thank you to our terrific engineering team, Steve Dunnington, Amos Gaynes, Rick Shaich, Eric Church and David Rankin, a supportive and inspired group of colleagues whose contributions are immeasurable. Thanks to all of you for getting us through the struggles of birthing this instrument.

Thanks to Greg Kist for his dedication and attention to detail in creating this fine manual you are about to read.

Thanks to Michael Caloroso who drove to Asheville from upstate New York in winter weather to listen with a critical ear to our prototypes and confirm that we "got it right".

Finally, a heartfelt thank you to our fearless leader Mike Adams who continually rides the helm of our little factory here in Asheville with integrity, heart, and dedication to Bob Moog's values and legacy.

Our job is to provide you with tools that you fall in love with, tools that have an inexhaustible vocabulary and work to expand our sonic universe.

The Taurus 3 fits the bill. We hope you enjoy it immensely and look forward to hearing from you.

Cyril Lance
Chief Technical Alchemist

How to Use this Manual

The *Setup and Connections* section below explains how to unpack, setup and connect the Taurus 3, and provides a quick start to get you up and running with your new instrument. Please read this section first!

The *Components* section offers detailed explanations of the components that create and modify sound.

For those interested in MIDI interface specifics, see the section titled *How the Taurus 3 handles MIDI* (page 50), as well as the *MIDI Implementation Chart*, which appears in Appendix B.

Throughout the manual you will see icons that point out additional information:


This icon indicates an important note concerning the operation of the Taurus 3.


This icon indicates a useful performance or programming tip.


This icon indicates technical information for the advanced user or the technically curious.

Setup and Connections

The following should get you set up and running quickly. When exploring the Taurus 3 for the first time, you may want to place the instrument on a table or other study surface so that you can easily reach and activate the front panel controls in order to become familiar with the basic operation.


NOTE: We encourage you to read the entire manual at some point to learn more about the instrument and gain a better understanding of what you can do with the Taurus 3.

Check the contents in the shipping carton

The Taurus 3 is shipped with the following items:

1. Taurus 3 Bass Synthesizer
2. Power cord
3. Taurus 3 User's Manual
4. Warranty registration card

What you will need

In addition to the Taurus 3 and provided accessories, you will need:

1. A stand or table sufficient to support the Taurus 3 (45 lbs).
2. A ¼" instrument cable
3. An amplifier or mixer (the Taurus 3 does not provide a headphone output)

Set up

Make sure you have an adequate place to set up your Taurus 3. You may want to place the instrument on a table or other study surface so that you can easily familiarize yourself with its operation. Keep in mind that the Taurus 3 is a substantial instrument, and the surface you place it on should be capable of supporting 45 lb. Use caution when lifting the Taurus 3 out of the carton and be sure to use proper lifting techniques. Save the carton and all packing material in case you need to ship the instrument for any reason.

NOTE: When moving or transporting the Taurus 3, do not lift the instrument by the pedals or by the footguard.

Connect to Power

Connect the power receptacle (on the side panel) to a wall outlet using the supplied AC power cord. The universal power supply will operate with a power source from 90 to 250 Volts AC, 50/60Hz.

Power up

Turn the power on. You will see the LCD light up and briefly display a start-up message:

Taurus 3
Version X.X

After a few seconds the start-up screen will disappear and the current Preset will appear in the display. The **PRESET** button will be illuminated in AMBER. The current preset location and Preset name will be displayed on the top line of the LCD screen. The lower line of the LCD will display the Active Parameter along with the parameter value. The Active Parameter value can be modified at any time using the **CONTROL** Footwheel.

Connect to Amplifier

Set the **VOLUME** Footwheel to minimum before connecting to an amplifier or mixer. Adjust the amplifier level for a comfortable listening level, and then slowly bring up the volume level on the Taurus 3.

Start Playing

Use the **VALUE** knob to scroll through the Presets. All 52 preset locations (A1 – M4) are loaded with sounds from the factory, and all but A1 – A4 are user-programmable (presets A1 – A4 are fixed in memory, but these can be edited and saved to other locations). Once a Preset is dialed up, you can tweak the parameters to your liking using the front panel controls. Any edits made to the current Preset will cause the **PRESET** button to change its illumination from AMBER to RED, indicating that it has been modified. To return to the original sound, press **PRESET**. The **PRESET** button allows you to toggle between the stored Preset and the edited Preset until you switch to a new Preset. Note that edits made to a Preset will be lost if they are not saved prior to switching to a new Preset. For information on saving an edited Preset, refer to 'Storing Presets' on page 29.

Warranty registration

Use the supplied Warranty card or Moog's on-line warranty registration system to activate your warranty. For on-line access, go to the Moog web site (www.moogmusic.com) and click on the "Product Register" tab. For either registration method, if you complete all the requested information, Moog Music will send you a complimentary gift.

NOTE: The Taurus 3 is recommended for an operating temperature between about 50 and 100 degrees Fahrenheit. It is safe to operate the synthesizer outside of this range (between 0 and 125 degrees F), but the T3's voltage controlled oscillators (VCOs) may not remain in tune. A warm up period of about 5 minutes is recommended to achieve maximum oscillator stability. The warm up period may be longer if the T3 has been stored outside the recommended operating temperature range.

Overview and Features

The Taurus 3 ('T3') is a monophonic analog bass synthesizer that is an updated version of the classic Taurus I synthesizer. The T3 features 2 ultra-stable oscillators, a genuine Moog 24dB/Octave low pass filter, two envelope generators and a Low Frequency Oscillator (LFO). The T3 front panel offers edit controls for real-time adjustment of the Modulation, Oscillator, Filter, Envelope Generator and Arpeggiator parameters, plus dedicated controls for Octave Switching, Glide, Transposition and Volume. The User Interface section on the far left side has controls for the selection and management of Presets, the adjustment of global parameters, and access to System Exclusive MIDI functions and utilities. The T3 features 52 factory Presets; four are fixed in memory and 48 are user-programmable.

Here's a brief description of the front panel.

Front Panel:

1. The Volume Footwheel - Adjusts the output volume of the T3.
2. The LCD display and User Interface - Provides controls to access, edit and store Presets, perform global operations, and access System Exclusive MIDI functions.
3. The 'Select Level' button - Toggles between Upper and Lower panel functions for editing Presets. 'Upper' selects the Oscillator & Filter functions (indicated by RED LEDs), while 'Lower' selects the LFO & Arpeggiator functions (indicted by AMBER LEDs).
4. The Oscillator/LFO section - The Oscillator section provides controls to adjust the frequency of Oscillator B (coarse and fine tuning), select the Octave of both oscillators, adjust the Oscillator Mix and Glide rate, and set the Volume Envelope Generator parameters. The LFO section provides controls to select the LFO Wave, Rate, Amount (Oscillators and Filter), and LFO sync.
5. The Filter/Arpeggiator section - The Filter section provides controls for adjusting Cutoff Frequency and Resonance, Envelope Amount, and Filter Envelope parameters. The Arpeggiator section provides controls to select the Order, Pattern, and Octave of the arpeggiator, as well as select the Arp ON/OFF and Latch ON/OFF conditions.

Front Panel (con't):

6. The Control Footwheel - A performance control for the real-time adjustment of parameter values. The accompanying LED bargraph indictor displays the approximate parameter value.
7. Four 'Quick Access' footswitches to select four Presets in a given bank.
8. Footswitches for Bank selection, for Transpose, Glide, and Decay ON/OFF, and for Octave UP/DOWN.

Side Panel:

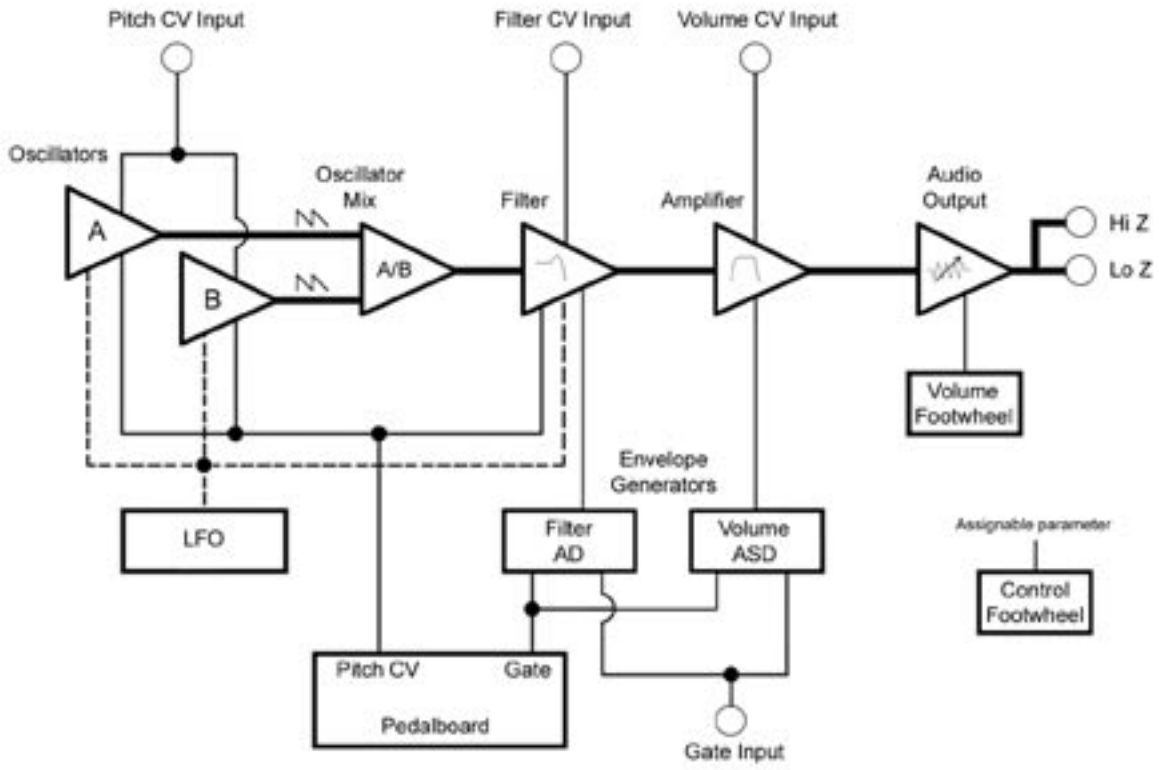
The side panel provides connections for Power, MIDI, Control Voltage Input and Audio Output:

1 2 3 4

1. Power Socket/Switch – Power input to the T3.
2. Audio Output jacks – Two monophonic audio output connections (Hi Z/Lo Z).
3. Control Voltage jacks – Control Voltage inputs for Pitch, Filter, and Volume, and a Gate input to trigger the Filter and Volume envelope generators. CV inputs allow the T3 to be controlled from expression pedals (like the Moog EP-2), or CV devices like the Moogerfooger® CP-251 Control Processor or MP-201 Multi-Pedal. The Gate input can be triggered with a gate signal.
4. MIDI – Provides MIDI Input/Output connections to other MIDI devices through either standard MIDI DIN or USB connections (software selectable).

Signal Flow

The diagram below shows the flow of the audio, modulation and control voltage signals in the Taurus 3. Heavy lines are used to indicate audio signals, which flow from left to right. Lighter lines indicate the control voltages (CV's), which flow from the top and bottom. Dotted lines indicate the modulation routings.



As shown in the block diagram above, the source signals for the T3 are created by two voltage-controlled oscillators (labeled 'A' and 'B'). The output levels of the oscillators are adjusted relative to one another with an A/B Mixer before being passed to a Lowpass Filter. The Lowpass Filter sculpts the tone of the signal according to the settings of the Cutoff and Resonance filter parameters, and the Filter AD envelope. The signal then passes to the amplifier stage, where the Volume ASD envelope shapes it. Finally, the signal is routed to the AudioOutput section, where the overall level is set by the Master Volume menu parameter and dynamically adjusted with the Volume Footwheel controller

The Pedalboard is the main control source of the Taurus 3. Each time a pedal is pressed, the pedalboard produces Pitch CV and Gate signals. The Pitch CV determines the pitch of the oscillators; it is also applied to the Filter to control the Filter Cutoff parameter. The Gate signal simultaneously triggers the Filter and Volume Envelope Generators. The T3 can also be controlled through a MIDI connection (not shown), or through external CV and Gate connections. The resulting sound depends on the combined parameter settings of the oscillators, filter, envelope generators and LFO, plus any external CV signals that may be applied.

Basic Operation

The T3 has two operating modes: Master and Preset.

- Master mode allows you to access and change global parameters and other utility options. A complete list of the Master mode functions and parameters is shown on page 30.

- Preset mode allows you to access the presets and manipulate the sound from the front panel controls. Preset mode is the main operating mode for editing and playing the T3. Information on Preset mode is found on page 28.

When the T3 is powered on, it starts up in Preset mode. In this mode, Presets are selected using the **VALUE** encoder, the **PRESET** access footswitches, or the **BANK** footswitch in combination with the footpedals (see *Selecting Presets*, page 26). In Preset mode, you'll see the current Preset displayed on the top line of the LCD display, and the Active Parameter displayed on the lower line. The **PRESET** button is illuminated in AMBER. When you modify a Preset, the **PRESET** button changes from AMBER to RED, and an asterisk ('*') appears beside the Preset name, indicating that you have edited the sound. You can toggle between the stored (unmodified) Preset and the edited Preset simply by pressing the **PRESET** button (this acts a Compare function). Note that any edits made to a Preset must be saved prior to selecting a new Preset, or those edits will be lost (for more, see *Storing Presets*, page 29).

Editing Presets

In Preset Mode, Presets can be edited either by using either the **CONTROL** footwheel or the **VALUE** encoder. Either of these controls will modify the Active Parameter. The Active Parameter is always displayed on the bottom line of the LCD display; it is also indicated by a corresponding panel switch that is illuminated when that parameter is active. The following front panel parameters can act as Active Parameters:

Oscillators:	*Filter:*	*Volume Envelope:*	*LFO:*	*Arpeggiator:*
B FREQ (Osc. B Coarse)	CUTOFF	ATTACK	RATE	ON/OFF
BEAT (Osc. B Fine)	RESONANCE	DECAY	PITCH AMT	LATCH
GLIDE (Glide Rate)	ATTACK	SUSTAIN	FILTER AMT	ORDER
OCTAVE	DECAY		LFO SYNC	PATTERN
MIX	FILTER EG AMOUNT		MODWHEEL	OCTAVE
				RATE

Moving the **CONTROL** footwheel changes the value of the Active Parameter. The change in value is updated on the LCD display as well as the LED bargraph.

To edit with the **VALUE** encoder, press the **CURSOR** button to move the cursor to the bottom line of the display, then rotate the **VALUE** knob in the desired direction. The displayed value will change by +/-1 per click. When editing 12-bit parameter values (0 - 4095), you can advance the value +/-10 by pressing the **VALUE** pushswitch while turning the knob.

The Components

Let's take a closer look at the features and functions of the components that make up the Taurus 3, starting with the Oscillator/LFO section. Then we'll cover the Filter/Arpeggiator section, Control Footwheel, the Footswitch section, the Pedalboard, the Volume Footwheel, the Input/Output Side Panel, and the User Interface section.

A. The Oscillator/LFO Panel

The dual-function Oscillator/LFO control panel provides controls to adjust Oscillator and LFO parameters. The function of the controls in this panel depend on the status of the **SELECT LEVEL** button, which is used to toggle between Upper and Lower panel functions. When 'Upper' is selected, the **SELECT LEVEL** button is illuminated RED and the control panel buttons allow you to select any one of the eight Oscillator parameters. When 'Lower' is selected, the **SELECT LEVEL** button is illuminated AMBER, and the control panel buttons allow you to select the eight LFO parameters. Once a parameter has been is selected, the parameter value can be modified using either the **VALUE** encoder knob or the **CONTROL** footwheel.

A.1. Oscillator

Two oscillators, designated 'A' & 'B', serve as the sound source of the T3. These are analog Voltage Controlled Oscillators (VCOs) that can produce a total musical range of 5 octaves.

Oscillator A serves as a master oscillator to which Oscillator B is tuned. The waveform of both oscillators is a fixed sawtooth wave.

The frequencies of the oscillators are mainly controlled by the pedalboard control voltage (CV), which creates a scaled pitch voltage that allows the oscillators to be played in an equal tempered scale. Other control voltages that can affect the oscillator frequencies include the Glide function, Octave switch, Oscillator B Frequency Offset controls (B.FREQ & BEAT), Pitch CV Input (on the side panel), Fine Tune control, and the LFO.

Oscillator Panel Controls:

B. FREQ:
Selects the coarse frequency offset for Oscillator B. The adjustment range is approximately 2 octaves (from about -1 octave to +1 octave).

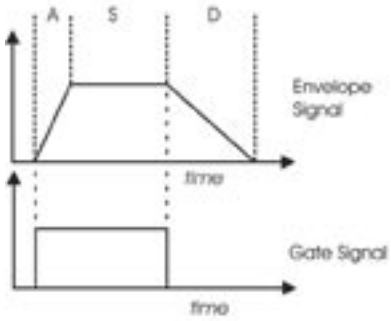
BEAT:
Selects the fine frequency offset for Oscillator B. The adjustment range is approximately +/- 50 cents.

GLIDE:
Selects the Glide parameter, which sets glide rate between notes. The glide rate can vary from virtually instantaneous to a very long glide (approximately 5 seconds per octave) when set to the maximum value. The **GLIDE** footswitch, located below the control panel, turns the Glide effect ON/OFF.

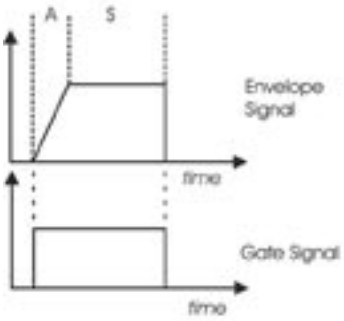
OCTAVE (LO, MED, HI):
Selects the Octave parameter, which adjusts the octave setting of both oscillators. The three available octave settings are LO, MED and HI, which correspond to octave settings of 32', 16' and 8'.

MIX:
Selects the Mix parameter, which allows the outputs of Oscillator A and B to be mixed in varying amounts. A Mix value of '0' is the equivalent to 100% Oscillator A and 0% Oscillator B. A Mix setting of '4095' is just the opposite. A setting of '2047' is essentially a 50/50 mix of both oscillators.

ATTACK, SUSTAIN, DECAY:
The last three switches in the Oscillator panel select the Attack, Sustain and Decay parameters for the Volume Envelope Generator. The Attack time parameter is adjustable from 5 to 560 msec. The Decay time parameter is adjustable from 50 msec to 2.8 seconds. The Sustain level parameter is adjustable from 0 to 100%. The **DECAY** footswitch (located below the control panel) applies the Decay segment to the release of a note when it is switched ON. When the **DECAY** footswitch is OFF, the release time is instantaneous.



DECAY Footswitch = ON



DECAY Footswitch = OFF

Additional CV control:

The **PITCH** jack on the side-panel is a CV input for external control of the oscillator pitch. This input controls the frequencies of both oscillators. A 1-volt change of this voltage will change the pitch by NOMINALLY one octave. The jack accepts 0 to +5 volts, or an expression pedal like the Moog EP-2.

The **GATE** jack on the side panel is a trigger input that accepts a Gate trigger signal (+5V). A Gate trigger applied to this input will cause both envelope generators (Volume and Filter) to trigger.

A.2. LFO

Modulation effects in the Taurus 3 are provided by a wide-range LFO that allows you to select from four waveforms, adjust modulation amounts to two destinations (Pitch and Filter), and set the LFO sync option.

LFO Panel Controls:

SQUARE, TRIANGLE, RAMP, SAW:

Selects the LFO waveform. These four switches act like Radio Buttons; pressing one switch deselects any others. One of these four switches will always be illuminated whenever the LFO panel is selected.

RATE:

Selects the LFO Rate parameter. The frequency range is 0.01 to 100 Hz. In addition to adjusting the rate with the **VALUE** encoder or **CONTROL** footwheel, the LFO rate can be modified by the Tap Tempo function (see page 22).

LFO AMOUNT FILTER/LFO AMOUNT PITCH

Selects the LFO Amount parameter for the Filter and Pitch (Oscillators), from zero to full scale (100%).

MODWHEEL (PITCH + FILTER)

Selects the MODWHEEL parameter, which allows the **CONTROL** footwheel to act like a Modulation Wheel. This parameter is accessed by pressing both **LFO AMOUNT** switches simultaneously. When this 'hot key' combination is activated, both **LFO AMOUNT** panel switches will be illuminated and 'MODWHEEL: XXXX' will appear on the bottom line of the display:

When MODWHEEL is selected, the **CONTROL** footwheel functions like the Mod Wheel found on a Voyager or Little Phatty – it is used to dynamically control the amount of modulation that is programmed for the Pitch and Filter LFO modulation parameters. MODWHEEL will remain as the active parameter until a new parameter or a new preset is selected. As an active parameter, MODWHEEL and its associated value can be stored for later recall, allowing you to program a constant modulation amount for a given preset.

NOTE: When MODWHEEL is selected, the **CONTROL** footwheel will transmit the MIDI Continuous Controller (CC) values for Modulation.

LFO Panel Controls (con't):

LFO SYNC (OFF, KB, MIDI)

Selects the sync options for the LFO. A setting of 'OFF' means that the LFO is free-running. A setting of 'KB' will cause the LFO to be restarted from 0 degrees every time a pedal is depressed (this means 0V for the Triangle and Ramp waveforms, and the top of the Square and Sawtooth waveforms). When LFO SYNC is set to 'MIDI', the LFO RATE parameter becomes a MIDI clock divider offering 20 different time value options as shown in the table below. The divisor is based on 24 clocks per quarter note (the MIDI standard). Note that if no MIDI clock is present when LFO SYNC is set to 'MIDI', the LFO will run at the rate stored in the Preset for the free-running condition, but divided by the clock divider setting.

CLOCKS/ NOTE	TIME VALUE	LFO CLOCK DIVIDER	MIDI CC VALUES
2	1/32 note triplet	/32T	122 – 127
3	1/32 note	/32	116 – 121
4	1/16 note triplet	/16T	109 – 115
6	1/16 note	/16	103 – 108
8	1/8 note triplet	/8 T	097 – 102
9	Dotted 1/16 note	/16D	090 – 096
12	1/8 note	/8	084 – 089
16	Quarter note triplet	/4 T	077 – 083
18	Dotted 1/8 note	/8 D	071 – 076
24	**Quarter note**	**/4**	**065 – 070**
32	Half note triplet	/2 T	058 – 064
36	Dotted quarter note	/4 D	052 – 057
48	Half note	/2	045 – 051
64	Whole note triplet	WH T	039 – 044
72	Dotted half note	/2 D	033 – 038
96	Whole note	WH	026 – 032
144	Dotted Whole note	WH D	020 – 025
192	2 Whole notes	2 WH	013 – 019
288	3 Whole notes	3 WH	007 – 012
384	4 Whole notes	4 WH	000 – 006

Additional CV control:

The **FILTER** jack on the side-panel is a CV input for external control of the filter cutoff parameter. The jack accepts 0 to +5 volts, or an expression pedal like the Moog EP-2. A voltage applied to this jack is added to the setting of the filter cutoff control. A one volt change in the control voltage will change the cutoff frequency of the filter by about one octave.

B – The Filter/Arpeggiator Panel

The dual-function Filter/Arpeggiator control panel provides controls to adjust Filter and Arpeggiator parameters. As with the Oscillator/LFO panel, the function of the controls in this panel depend on the status of the **SELECT LEVEL** button. When 'Upper' is selected, the control panel buttons panel allow you to select any one of the five Filter parameters. When 'Lower' is selected, the control panel buttons allow you to select any one of the Arpeggiator parameters.

B.1. Filter

The Filter provides either dynamic or fixed timbre tonal modifications. Dynamic changes are programmed by a dedicated Envelope Generator, which provides independent Attack and Decay envelope contours to open and close the filter. The Filter is the classic Moog 24dB/octave low-pass filter design.

The Filter panel provides controls for the filter Cutoff and Resonance parameters as well as controls for the filter envelope Attack and Decay parameters, and the envelope Amount.

Filter Panel Controls:

AMOUNT:
Selects the filter envelope Amount parameter. This adjusts the Amount of the envelope that is applied to the filter cutoff, from 0 to 100%.

ATTACK, DECAY:
These buttons select the filter envelope Attack and Decay time parameters. The Attack time is adjustable from 5 to 56 msec. The Decay time is adjustable from 50 msec to 2.8 sec.

CUTOFF:
Selects the filter Cutoff parameter. Filter Cutoff can be adjusted from 20 Hz to 20KHz.

RESONANCE:
Selects the Resonance parameter. Resonance is adjustable from 0 to self-oscillation.

TECH NOTE: Like the Taurus 1, the source of the Taurus 3 filter envelope generator is a pulse signal, which is great for simulating the timbre of a plucked string. Adjusting the filter envelope attack time slows the rise time of this pulse, but it also limits how far up the pulse rises. This means that for a given filter envelope amount setting, as the attack time increases, the perceived envelope amount decreases.

B.2. Arpeggiator

The Arpeggiator is a note pattern generator based on the notes played on the pedalboard and stored in the note stack (the note stack is a 'memory bank' for the arpeggiator). For any note or series of notes that are played, the arpeggiated pattern is determined by the Order, Pattern and Octave settings, along with the Latch and other parameters in the Advanced Preset menu.

The Arpeggiator control panel provides controls to select the Order, Pattern, Octave, and Latch parameter values, as well as Arp ON/OFF and Arp Rate.

Arpeggiator Panel Controls:

ORDER:

Selects the arpeggiator Order parameter, which determines the order in which notes are sequenced. The available selections are UP, DN (Down), and ORDER where:

UP - Notes are sequenced from the lowest note to the highest
DN - Notes are sequenced from the highest note to the lowest
ORDER - Notes are sequenced in the order that the note stack was filled

PATTERN:

Selects the arpeggiator Pattern parameter, which determines the sequence playback mode. The available modes are LOOP, B/F (Back/Forth) & ONCE, where:

LOOP - When the sequence reaches the end, it loops back to the starting point
B/F - When the sequence reaches the end, it reverses direction and returns to the starting point
ONCE - The sequence makes a single pass and then stops

OCTAVE:

Selects the arpeggiator Octave parameter, which determines the overall note range of the sequence. The available values are -2.1, -2, -1, 0, 1, 2, 2.1. With the exception of '-2.1' and '2.1', all values specify octaves. When these values are selected, the sequence will play the original note entered, and then the same note transposed by octaves until the octave limit is reached. For '-2.1' and '2.1' values, the sequence will transpose up or down two octaves and then back one octave towards the original pitch. For example, if the arpeggiator was sequencing a single note ('C1'), and '2.1' was chosen as the Octave value, the sequence would be 'C1 - C2 - C3 - C2'.

For more on Arpeggiator operations, see *Appendix A - Arpeggiator Examples.*

Arpeggiator Panel Controls (con't):

ON/OFF:
Sets the arpeggiator ON/OFF condition. When ON, the Arpeggiator creates patterns of notes based on the Order, Pattern, Octave and Latch parameter settings, plus any applicable Advanced Preset settings. If the **TRANSPOSE/PGM** footswitch is programmed to control 'ARP ON/OFF', that footswitch can be used to toggle the Arpeggiator function ON and OFF.

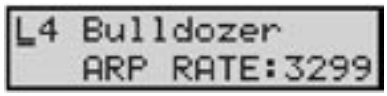
When the Arpeggiator is ON, an 'A' appears in the bottom line of the display:

LATCH:
Sets the arpeggiator Latch ON/OFF condition. When the arpeggiator is ON and the Latch is OFF, the arpeggiator outputs notes only when notes are being played. If Note Latch is ON then the arpeggiator can be started by pressing a note and then stopped by pressing that note again.

When the arpeggiator is ON and the Latch is ON, the arpeggiator runs when a pedal is pressed and continue after that pedal is released until the Latch is turned OFF. The notes the arpeggiator plays are based on the note stack. If Note Latch is OFF, then the note stack only has one note in it. If Note Latch is ON, then each new note played is added to the note stack.

When the Latch is ON, an 'L' replaces the 'A' on the bottom line of the display:

ARP RATE (ON/OFF + LATCH)
Selects the ARP RATE parameter, which allows you to adjust the arpeggiator rate using the **CONTROL** footwheel. This parameter is accessed by pressing the ARP **ON/OFF** and **LATCH** switches simultaneously. When this 'hot key' combination is activated, both the **ON/OFF** and **LATCH** panel switches will be illuminated simultaneously and 'ARP RATE: XXXX' will appear on the bottom line of the LCD display:



Arppegiator Rate will remain as the active parameter until a new parameter or a new preset is selected.

NOTE: "ARP RATE' is part of the Advanced Presets menu parameters. When activated by the 'hot key' combination, however, ARP RATE becomes an actve parameter that can be dynamically controlled with the **CONTROL** footwheel and stored for later recall. This option allows you to adjust the Arp Rate parameter in a live performance situation.

C – The Control Footwheel

The **CONTROL** Footwheel is a performance control used to modify the value of the Active Parameter. An illuminated slot in the wheel's face helps to identify the position of the wheel. A 15-element LED bargraph to the left of the footwheel displays the approximate value of the Active Parameter.

When editing values that change continuously, the action of the **CONTROL** footwheel depends on the setting of the Analogue Mode parameter (SNAP, PASS-THRU, or TRACK). When the Analogue Mode parameter is set to SNAP, the active parameter will snap instantaneously to the setting of the footwheel. In PASS-THRU mode, the parameter value stays constant until the footwheel passes through the current value. In TRACK mode, the parameter value moves in the same direction as the footwheel (up or down) until the value and footwheel positions are identical.

When editing parameters that have discrete values (such as the 'LO-MED-HI' Octave parameter), the **CONTROL** footwheel will SNAP instantaneously to the value regardless of the setting of the Analogue Mode parameter.

NOTES: The **CONTROL** footwheel will transmit the MIDI CC message that corresponds to the active parameter. For a complete list of MIDI CC messages, see '*How the TAURUS 3 handles MIDI*' on page 50

D – Footswitches

The eight footswitches in the footswitch section provide controls for selecting individual Presets and Preset Banks, and for turning selected functions ON/OFF. All of the footswitches have an LED above the switch mechanism, which illuminates when the switch is in the ON state.

The four **PRESET** footswitches select individual Presets from within a given bank of Presets. A bank contains four Presets and there are 13 Banks, which provide a total of 52 Presets as shown in the table below. Unlike the other footswitches on the panel – which are independent of each other – the four **PRESET** footswitches work similar to radio pushbuttons; when a new Preset is selected, it deselects the previous Preset. The first bank contains the original Taurus Presets ('TAURUS III' replaces the original "VAR' preset in location A1), while the other 12 banks feature brand new Presets from the factory.

The **BANK** footswitch allows you to select any one the 13 available banks (A–M). Although pressing the **BANK** footswitch initiates the process, the actual bank selection is made using the 13 pedals on the pedalboard. When the **BANK** footswitch is pressed, the Bank footswitch LED blinks and the function of the pedalboard temporarily changes to a 'bank selection' function. Pressing one of the 13 footpedals will now select the new bank as shown:

FOOTPEDAL	BANK	PRESETS			
		1	2	3	4
C1	A	TAURUS III	TAURUS	BASS	TUBA
C#1	B	B1	B2	B3	B4
D	C	C1	C2	C3	C4
D#1	D	D1	D2	D3	D4
E1	E	E1	E2	E3	E4
F1	F	F1	F2	F3	F4
F#1	G	G1	G2	G3	G4
G1	H	H1	H2	H3	H4
G#1	I	I1	I2	I3	I4
A1	J	J1	J2	J3	J4
A#1	K	K1	K2	K3	K4
B1	L	L1	L2	L3	L4
C2	M	M1	M2	M3	M4

During the bank selection process, the LCD will display the currently selected bank and preset location:

NOTE: When selecting Banks using the footwheels, the LCD becomes a non-editable display. You cannot select the Bank or Preset using the VALUE encoder in this mode.

To change the bank, simply press a footpedal. For example, pressing the C# footpedal will select bank B:

After making a bank selection, press the BANK footswitch again to load the new preset (in this example, 'B2') and the Bank LED will stop flashing. The LCD will now display the Preset at location B2:

As an alternate method, while the Bank LED is flashing, you can press any of the four Preset footswitches to immediately switch to the chosen preset within the selected bank without having to press the BANK footswitch a second time. For example, suppose you have just selected bank D (footpedal D#):

If you now press Preset footswitch #3, the Taurus will immediately switch to Preset D3. The Bank LED will stop flashing and the LCD will display the new Preset:

NOTE: If you press the **BANK** footswitch by mistake, pressing it a second time will cancel the Bank Selection function.

The **TRANSPOSE/PGM** footswitch is a dual-function program switch. It operates either to initiate the Transpose function, or to access alternate functions for the **GLIDE**, **DECAY** and **OCTAVE** footswitches.

Transposition:

To set the transpose interval, press and release the **TRANSPOSE/PGM** footswitch. The TRANSPOSE LED will blink slowly and the LCD will indicate that Transpose Mode is enabled:

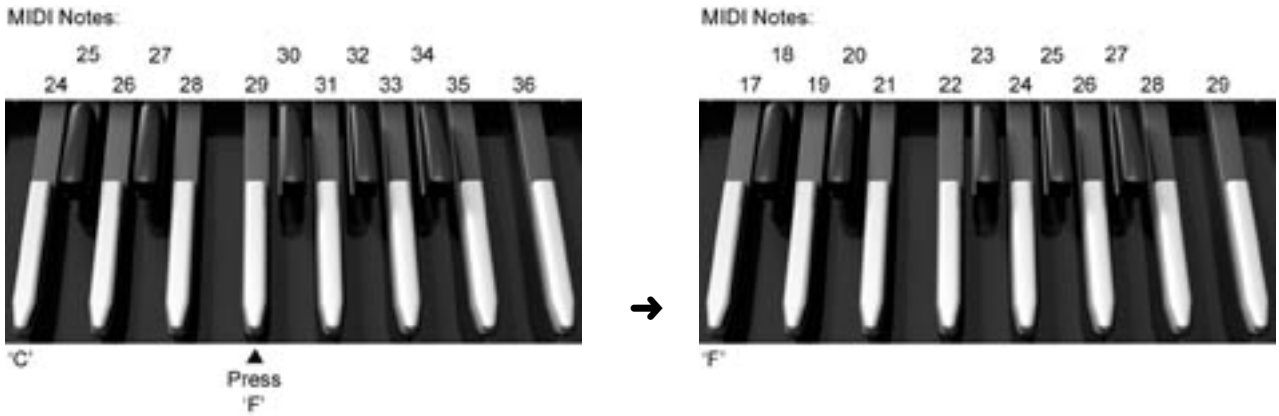
The transposition interval is set with the pedalboard, which allows you to transpose down in half-step increments up to -1 octave. The blinking LED indicates that the T3 sound engine has been temporarily disconnected from the pedalboard, and the pedalboard can now be used to set the transpose interval. At this point, the next pedal that you press will use that note as the lowest pedal note, and all other notes on the pedalboard will be referenced to that root note. When you press a pedal, the LCD will display the transposition note along with the number of half-step increments in the transposition interval:

Press the **TRANSPOSE/PGM** footswitch again to complete the operation. The TRANSPOSE LED will be ON continuously to indicate that the Transpose function is active. To turn off the Transpose function, press and release the TRANSPOSE footswitch (the Transpose LED will blink), press the top-most pedal (C), then press the TRANSPOSE footswitch. The Transpose LED turns OFF, indicating that the Transpose feature is inactive.

NOTE: The Transpose function affects all presets globally. That is, if you activate the Transpose function and switch presets, Transpose remains active.

Here is an example of setting the transposition interval:

To transpose the pedalboard down seven half-steps, press the **TRANSPOSE** footswitch, then press "F" (footpedal #6, MIDI Note 29), and press the **TRANSPOSE** footswitch again. This will shift the pedalboard root note to an 'F' (MIDI Note 17) as shown:



The **GLIDE, DECAY** and **OCTAVE** footswitches are used to turn their respective functions ON/OFF, and also to access performance parameters not available on the control panel.

The **GLIDE** footswitch enables or disables the portamento effect between notes. Glide is ON when the footswitch LED is illuminated. The glide rate parameter is selected in the oscillator section. In PGM Mode, the **GLIDE** footswitch functions as the LFO Tap Tempo control.

The **DECAY** footswitch controls the release portion of the Volume envelope. When **DECAY** is ON, the sound decays at the rate set by the DECAY parameter when the envelope Gate switches off. When **DECAY** is off, the sound dies out immediately when the envelope Gate switches off. The Decay parameter is ON when the footswitch LED is illuminated. The volume Decay rate parameter is selected in the oscillator section. In PGM Mode, the **DECAY** footswitch functions as the Arpeggiator Tap Tempo control.

The **OCTAVE** footswitch is used to shift the octave of the instrument up by one octave. When the **OCTAVE** footswitch is ON, the instrument tuning changes by +1 octave for both oscillators. When the **OCTAVE** footswitch is OFF, the instrument returns to the original tuning for both oscillators. Octave shift is ON when the footswitch LED is illuminated. In PGM Mode, the **OCTAVE** footswitch functions as the Note Latch ON/OFF control.

PGM Mode:

To access PGM mode, press and hold the **TRANSPOSE/PGM** footswitch. The Transpose LED will blink rapidly (approximately double the rate of the Transpose function), indicting that you are in PGM Mode. In this mode, the **GLIDE**, **DECAY**, and **OCTAVE** footswitches access alternate functions as described above:

GLIDE - LFO Tap Tempo
DECAY - Arpeggiator Tap Tempo
OCTAVE - Note Latch ON/OFF

Press and hold the **TRANSPOSE/PGM** footswitch to exit PGM Mode. The rapidly blinking LED for PGM Mode overrides the Transpose LED (you can be transposed and be in PGM Mode). You can also perform a transpose function in PGM Mode; the only difference is that after setting the transposition interval, the Transpose LED will blink rapidly to indicate that you are in PGM Mode. If you exit PGM Mode when transposed, the Transpose LED will be lit solid.

NOTE: Tap Tempo values can be stored in a Preset.

E – Pedalboard

The Taurus 3 features a 13-note pedalboard (1 octave, C to C). When combined with the **OCTAVE** and **TRANSPOSE** functions, the pedalboard has a playable range of 3 octaves. The pedalboard produces MIDI velocity, and transmits MIDI Note On and Note Off messages polyphonically.

PERFORMANCE TIP: Although the Taurus 3 does not send Pitch Bend messages, it will respond to them. The Pitch Bend range is set by the Pitch Bend UP/DOWN menu in Advanced Presets, making it possible to set independent Pitch Bends on a per-Preset basis.

NOTE: When moving or transporting the Taurus 3, do not lift the instrument by the pedals or by the footguard.

F – Volume Footwheel

The Taurus 3 has two independent monophonic outputs. The level of both audio outputs is adjusted by the **VOLUME** footwheel, although the actual output level depends on a combination of the **VOLUME** footwheel setting, the Master Volume parameter, and any external control voltage applied to the **VOLUME** jack.

An illuminated slot in the wheel's face helps to identify the position of the wheel in dim environments.

External CV Control: The **VOLUME** jack on the side panel is a control voltage input for external control of the Output level. The jack accepts a positive control voltage from 0 to + 5 volts, or an expression pedal like the EP-2. A voltage of 0 volts silences the Taurus 3, and a voltage of +5 volts corresponds to the maximum output level set by the **VOLUME** footwheel and the Master Volume parameter.

NOTE: The **VOLUME** footwheel transmits MIDI CC #07

G – Input/Output Panel

The Side Panel provides all of the input and output connections. In addition to two Audio Output jacks, there are CV and Gate inputs, and connections for MIDI and power.

Power Connector:
This is a standard AC power inlet, Use only a power cord designed to mate with this receptacle. The Taurus 3's built-in universal power supply is designed to work with power inputs of 90-250 Volts AC, 50/60 Hz.

IMPORTANT SAFETY NOTE – Do not alter the power connector in any way. Doing so can result in the risk of shock, injury or death. Be familiar with the safety instructions printed at the beginning of this manual. If the connector is damaged, refer servicing to qualified personnel only.

Audio Out:
The Audio Out jack provides two unbalanced line-level signals for connecting to an amplifier or mixer. Use the 'HI-Z' output when connecting to the instrument inputs of an amplifier. This is the classic Taurus output stage. Use the 'LO-Z' output for connecting to a line-level input on a mixer or amplifier.

CV Inputs:
The Pitch, Filter and Volume CV jacks supply power and will accept an expression pedal such as the Moogerfooger EP-2 (ring = +5.5 supply to the pedal, tip = variable CV return), or a control voltage from 0 to +5 Volts. The Gate Input accepts a +5 Volt Gate trigger signal.

MIDI Connectors (DIN and USB):
These are connections for MIDI In/Out. MIDI I/O is user configurable for either connection type. For more information on configuring MIDI options, see *MIDI Setups*, page 38.

H – Interface Panel

The Interface Panel is located on the far left of the instrument. The Interface Panel provides a status display and controls for all of the Taurus 3 software functions.

The status display is an LCD screen located in the center of the panel above the panel controls. When the T3 is first powered on, the screen displays the message:

Taurus 3
Version X.x

This message will stay on the screen for a few seconds, and then the screen will change, displaying the active preset. This preset will be the last Preset in use when the Taurus 3 was powered off.

Panel Controls:

Master:
Pressing the **MASTER** button places you in Master mode. In this mode, the **VALUE** knob is used to scroll through the Master mode menus for the Taurus 3. For a list of the Master mode menus, see page 31.

Preset:
Pressing the **PRESET** button places you in Preset mode. In this mode, the **VALUE** knob is used to select the preset. The **PRESET** switch also functions as 'compare' button, allowing you to toggle between stored and edited presets. For more on Preset Mode, see page 28.

Value:
VALUE is a rotary encoder used to access menus and options, and select presets. Depending on the selected parameter, the **VALUE** knob will adjust numeric values up/down or toggle among discrete options. The encoder has a built-in push button (called the **VALUE** pushswitch) that is used for the preset naming operation and for advancing though Master menu.

Cursor:
The **CURSOR** button is used to navigate in the LCD display. In either Master or Preset mode, the **CURSOR** button is used to cycle through the parameters in the display, allowing you to make edits and changes.

Store:
The **STORE** button is used to enter changes and store edited presets in PRESET mode and to execute SysEx and System Utility functions in MASTER mode.

Selecting Presets

Presets are selected using one of four methods:

1. Using the **VALUE** encoder
2. Pressing one of the four **PRESET** access footswitches
3. Pressing the **BANK** select footswitch followed by one of the Footpedals
4. Via MIDI Program Change commands

NOTE: Panel controls and footswitches will have no effect if the 'Local Control' parameter is set to 'OFF'. MIDI Commands, however, will always take effect regardless of the Local Control status

VALUE Encoder

Rotating the **VALUE** encoder clockwise advances the Preset by one, while rotating the encoder counter-clockwise decrements the Preset by one. In either case, the new Preset appears in the display and is immediately available to be played (you do not need to 'activate' a Preset to hear it). Note that when the Menu Wrap parameter is ON (default = ON), preset selections will wrap around when the last Preset location is reached (M2, M3, M4, A1, A2...) and also when the first Preset location is reached when moving in the reverse direction (A3, A2, A1, M4, M3...).

PRESET Footswitches

Pressing one of the four **PRESET** footswitches selects one of the four Presets within the current bank. For example, if you are in Bank A, then the four **PRESET** footswitches select Presets A1-A4. If you are in Bank G, however, then the four **PRESET** footswitches select presets G1-G4.

BANK Select Footswitch

The **BANK** footswitch allows you to switch to any one the 13 available banks. When you press the **BANK** footswitch, the function of the Pedalboard temporarily changes to a 'bank selection' function, where each footpedal selects one of the 13 banks as follows:

FOOTPEDAL	BANK	PRESETS
C1	A	A1 – A4
C#1	B	B1 – B4
D	C	C1 – C4
D#1	D	D1 – D4
E1	E	E1 – E4
F1	F	F1 – F4
F#1	G	G1 – G4

FOOTPEDAL	BANK	PRESETS
G1	H	H1 – H4
G#1	I	I1 – I4
A1	J	J1 – J4
A#1	K	K1 – K4
B1	L	L1 – L4
C2	M	M1 – M4

Pressing the **BANK** footswitch causes the Bank LED to blink. To select a new bank, press one of the footpedals, then press one of the four **PRESET** footswitches to complete the selection. The Bank LED will go off and the new Preset will be loaded.

NOTE: If you press the **BANK** footswitch by mistake, pressing it a second time will cancel the Bank Selection function.

MIDI Program Change Commands

With Local Control set to 'ON' or 'OFF', and Program Change Receive set to 'YES', Presets can be changed by MIDI Program Change Commands received on the current MIDI In channel. Valid program change command values are from 00 – 51, which corresponds to Presets A1 – M4.

NOTE: MIDI Program Change Command values outside of the valid range (00 – 51) are ignored.

Preset Mode

Preset mode is the default mode when the T3 is powered on. Preset Mode is used to access presets and provide control for editing, naming and storing sounds.

In the User Interface, Preset sounds are selected using the **VALUE** encoder (see '*Selecting Presets*' page 26). Rotating the encoder knob in either direction (CW or CCW) increments or decrements the Presets by one per click. The Preset location appears in the upper left corner of the display and the Preset name appears next to that on the top line of the display. The display cursor appears under the Preset location as shown.

When a new Preset is loaded, the **PRESET** button is illuminated AMBER, indicating that the internal Preset Buffer is active, and contains the stored (unedited) values of the current Preset. If the **PRESET** button is pressed, or if any changes are made to the stored values of the Preset, the **PRESET** button changes from AMBER to RED, indicating that the Edit Buffer is active and contains the modified version of the current Preset (an asterisk ('*') will also appear next to the edited Preset name). You can toggle between the stored and edited sound by pressing the **PRESET** button, which acts like a COMPARE function, allowing you to compare the sound of the original and edited presets.

NOTE: When switching between Master and Preset modes, the last used Preset appears in the display.

Storing Presets

To store a preset, press the **STORE** button. This function is used to save an edited preset, or to change the location of a stored preset.

When you press **STORE**, the LCD will display a message similar to the one shown at left. The top line shows the location where the preset will be saved, and the name of the preset which is currently saved in that location. Use the **VALUE** knob to change to the desired preset location, then press the **CURSOR** key to move the cursor to the lower line of the LCD. 'OVERWRITE: NO' is the default setting, which prevents you from accidently overwriting a favorite preset. At this point, if you decide that you do not want to save the preset, simply press **STORE** and the T3 will return to Panel Mode without saving.

If you are sure you want to save the preset to the selected location, use the **VALUE** knob to select 'OVERWRITE:YES', then press **STORE** and the preset will be saved.

Changing A Preset Name

Changing a preset name is a simple operation; the characters in the name are individually selected by moving the cursor to the desired location and scrolling through the character list. To change a preset name, press the **CURSOR** button until it advances to the first letter of the name. Use the **VALUE** knob to select the desired character or number. Press the **VALUE** pushswitch to move the cursor forward to the next letter. Repeat this action until all desired characters have been changed.

Preset names consist of any combination of 12 letters, numbers and punctuation characters. In order, the available characters are:

(space) A B C D E F G H I J K L M N O P Q R S T U V W X Y Z 0 1 2 3 4 5
6 7 8 9 a b c d e f g h i j k l m n o p q r s t u v w x y z ! # $ % & ( ) * ? @

Press the **CURSOR** button once to select the first character in the name as shown.

Use the **VALUE** knob to select a new character as shown. Use the **VALUE** pushswitch to advance to the next letter, then use the **VALUE** knob to select the next letter. Continue in this manner until the desired name change is complete. When finished, press the **STORE** button to enter the name change into memory. You will be presented with the 'Save to' message as described above. Select the desired memory location and press **STORE** to save the new name.

Master Mode

Master mode accesses the global settings and Advanced Preset settings for the Taurus 3, and the options for sending and receiving data.

To enter master mode, press the **MASTER** button. By default, the first master menu entry is Tuning Mode. When switching between the Master and Preset modes, the last used master menu entry appears.

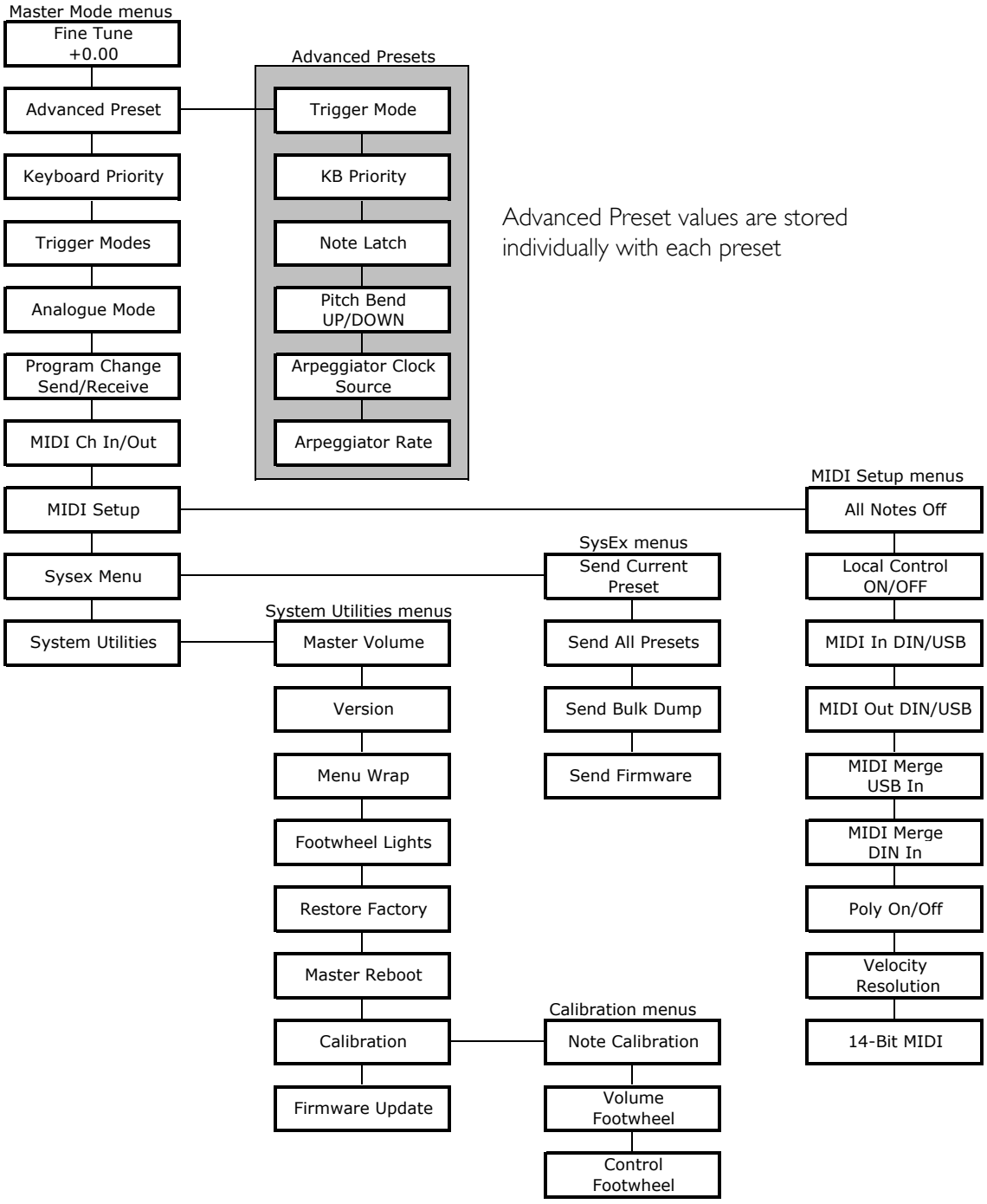
When the master menu is active, the **VALUE** knob is used to scroll through menu entries. To change a particular menu entry, you must press the **CURSOR** button to enable the parameter value for editing. The selected parameter value will be underlined and can now be changed. Use the **VALUE** knob to change the value (in Master Mode, the **CONTROL** footwheel has no effect on values).

If a menu contains more than one parameter value for editing, repeatedly pressing the **CURSOR** key will advance through the values. Press the **MASTER** button to disable the **CURSOR** and return to the Master Menu. When you reach the end of the menu entries, advancing the **VALUE** knob will wrap back to the first entry if the Menu Wrap parameter setting is 'ON'.

A chart of the Master Mode Menu Structure appears on the next page, and detailed descriptions of the Master Mode menus follows.

A. Master Mode Menu Structure

The chart below shows the structure of the Master Mode menus. With the exception of the Advanced Preset parameters, which are individually stored with each preset, all Master Mode menu parameters effect the T3 globally.



B. Master Mode Menus

Here are the Master Mode menu items :

FINE TUNE:

The Fine Tune parameter allows you to adjust the tuning of the T3. To make an adjustment, use the **CURSOR** button to highlight the Amount parameter value, the use the **VALUE** knob to adjust the tuning. The adjustment range is from -1024 to +1023, representing roughly plus and minus a third.

NOTE: In the FINE TUNE menu, pressing the **VALUE** pushswitch while rotating the encoder knob changes the value by +/-100 per click.

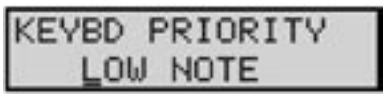
ADVANCED PRESET:

Advanced Preset is a set of menus that allows you to access additional parameters for each preset. These parameters are stored individually for each preset. There are nine Advanced Preset menus:

- Trigger Mode
- Keyboard Priority
- Note Latch On/Off
- Pitch Bend Amount Up/Down
- Arpeggiator Clock Source
- Arpeggiator Rate

For more information, see *Advanced Preset Menus*, page 35.

KEYBOARD PRIORITY (KEYBD PRIORITY):



Allows you to select from three keyboard priority options. For monophonic instruments like the T3, keyboard priority determines what happens when more than one key (or in this case, a pedal) is pressed. A setting of LOW NOTE causes the lowest pedal pressed to sound, a setting of HIGH NOTE causes the highest pedal pressed to sound, and a setting of LAST NOTE causes the most recent pedal pressed to sound. To change the keyboard priority, use the **CURSOR** button to highlight the parameter, then use the **VALUE** knob to set the new parameter value.

Values: LOW NOTE, HIGH NOTE, LAST NOTE;
the default is LAST NOTE

TRIGGER MODE:

Allows you to select from three trigger mode options. For monophonic instruments like the T3, trigger mode determines how the envelopes are triggered when more than one pedal is pressed on the pedalboard. A setting of ON means that the envelopes are not retriggered until the pedal(s) are released. A setting of OFF will retrigger the envelope of a new note from the current envelope level. A setting of RESET will force the envelope from to restart from 0 each time a note is triggered. To change the trigger mode, use the **CURSOR** button to highlight the parameter, then use the **VALUE** knob to set the new parameter value.

Values: ON, OFF, RESET
the default is ON

ANALOGUE MODE:

Analogue mode controls what happens when the **CONTROL** footwheel is adjusted to alter the active parameter. In SNAP mode, the parameter will 'snap' instantaneously to the footwheel setting. In PASS-THRU mode, the parameter value stays constant until the footwheel passes through the current value. In TRACK mode, the parameter value moves in the same direction as the footwheel (up or down) until the value and footwheel position are identical. To change the analogue mode, use the **CURSOR** button to highlight the parameter, then use the **VALUE** knob to set the new parameter value.

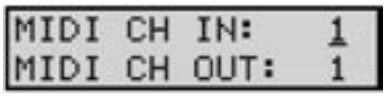
Values: SNAP, PASS-THRU, TRACK; the default value is TRACK

PROGRAM CHANGE SEND/RECEIVE

Allows you to enable or disable the T3's transmission (SND) and reception (RCV) of MIDI program changes. To change the status of either parameter use the **CURSOR** button to highlight the parameter, then use the **VALUE** knob to set the new parameter value.

Values: ON, OFF;
the default values are ON for both SND and RCV

MIDI CHANNELS IN/OUT:



Allows you to select the T3 MIDI In and Out channels. The T3 can send and receive on only one channel at a time, but the send and receive channels can be set independently. To change the MIDI channel, use the **CURSOR** button to highlight the desired parameter, then use the **VALUE** knob to select the new parameter value.

Values: OFF, 1 – 16;
the default values are 1 for both MIDI In and MIDI Out

MIDI SETUP:

MIDI Setup is a set of seven menus to configure T3 MIDI options. For complete information on MIDI Setup menus commands, see *MIDI Setup Menus,* page 38.

SYSEX:

SysEx (System Exclusive) is a set of commands to transmit and receive selected presets, bulk dumps and firmware dumps. For complete information on SysEx commands, see *System Exclusive Menus,* page 42.

SYSTEM UTILITIES:

System Utilities is a set of commands used to perform a system reboot, restore factory default values or perform various system calibrations on the instrument. For complete information, see *System Utilities Menus, page 44.*

PERFORMANCE TIP: You can quickly change a Master Menu parameter during performance by first entering Master Mode and select the desired parameter menu using the **VALUE** knob, then return to Preset Mode. When you are ready to make the change, press Master. The desired menu item will be displayed, allowing you to quickly make adjustments.

C. Advanced Preset menus

The Advanced Preset menu provides a set of additional programming parameters for each Preset. These parameters are stored individually for each Preset. To access the Advanced Preset menus, press the **CURSOR** button. This will highlight the menu options shown on the second line of the display. Once highlighted, use the **VALUE** knob to scroll through the menus.

TRIGGER MODE (TRIGR):

Allows you to control the triggering of the Envelope Generators as pedals are played. Selecting GLOBAL means that the Preset inherits the Global priority setting; any other selection overrides the global setting. Selecting LEG ON (Legato ON) means that if more than one pedal is pressed and a new note sounds (based on the KB Priority setting), then the Envelope Generators are not retriggered. Selecting LEG OFF means that the Envelope Generators are triggered every time a pedal is pressed. Selecting LEG RESET will force the envelope from to restart from 0 each time a note is triggered. To change the trigger mode, use the **CURSOR** button to highlight the parameter, then use the **VALUE** knob to set the new parameter value.

Values: GLOBAL, LEG ON, LEG OFF, LEG RESET

KEYBOARD PRIORITY (KB PRIOR):

Allows you to select from four keyboard priority options for a given Preset. Selecting GLOBAL means that the Preset inherits the Global priority setting; any other selection overrides the global setting. A setting of LOW NOTE causes the lowest pedal pressed to sound, a setting of HIGH NOTE causes the highest pedal pressed to sound, and a setting of LAST NOTE causes the most recent pedal pressed to sound. To change the keyboard priority, use the **CURSOR** button to highlight the parameter, then use the **VALUE** knob to set the new parameter value.

Values: GLOB (global), LOW NOTE, HIGH NOTE, LAST NOTE

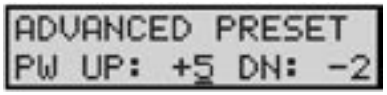
NOTE LATCH ON /OFF:

Allows you to control the action of the Envelope Gate, enabling you to sustain notes without keeping a pedal held down. When NOTE LATCH OFF is selected, the Gate goes on and the note is held as long as a pedal is held down. When the pedal is released, the Gate goes off and the note is released according to the DECAY settings. When NOTE LATCH ON is selected, once a pedal is pressed, the Gate stays open until that pedal is pressed again. If a new pedal is pressed (depending on the KB Priority), the Gate behaves according to the Trigger Mode and stays on until that pedal is pressed again. This allows you to play sustaining drones without a Sustain Pedal. To change the Note Latch status, use the **CURSOR** button to highlight the parameter, then use the **VALUE** knob to set the new parameter value.

Values: ON, OFF

NOTE: Used in conjunction with ARPEGGIATOR LATCH ON, the NOTE LATCH ON setting allows you to build up chords in the arpeggiator note stack.

PITCH BEND AMOUNT UP/DOWN:



Allows you to set the positive (UP) and negative (DN) ranges for receiving MIDI Pitch Bend commands. The settings are specified in semitones. To change either parameter, use the **CURSOR** button to highlight the parameter, then use the **VALUE** knob to select the new parameter value.

Values - UP: 0, +2, +3, +4, +5, +7, +12
DN: 0, -2, -3, -4, -5, -7, -12

ARPEGGIATOR CLOCK SOURCE (ARP CLK):

Allows you to select the source for the Arpeggiator Clock. When 'INT' is selected as the clock source, the Arpeggiator runs from its own internal clock. In this mode, when the Arpeggiator is switched ON the Arpeggiator Clock rate is adjusted either with the **CONTROL** footwheel, or by using the Tap Tempo function, or by issuing a MIDI CC#90 command. When 'MIDI' is selected as the clock source, the Arpeggiator is driven from an externally applied MIDI Clock. In this mode, the MIDI Clock synchronizes the Arpeggiator to the sending device (a software DAW, for example).

Values: INT, MIDI

ARPEGGIATOR RATE (ARP RATE):

Allows you to set the Arpeggiator Rate. When the ARP CLOCK parameter is set to 'INT', the actual Arp Rate value is set with the **VALUE** encoder. When the ARP CLOCK parameter is set to 'MIDI', the arpeggiator rate is synchronized to the incoming MIDI clock, and the Arp Rate parameter sets the Clock Divider values according to the table below. The divider value determines how many notes the arpeggiator will play on a 'per-measure' basis. Note that if no MIDI clock is present when ARP CLOCK is set to 'MIDI', the arpeggiator will run at the rate stored in the Preset for the 'Internal' setting, but divided by the Clock Divider value.

CLOCKS/ NOTE	TIME VALUE	ARP RATE CLOCK DIVIDER	MIDI CC VALUES
2	1/32 note triplet	/32T	122 – 127
3	1/32 note	/32	116 – 121
4	1/16 note triplet	/16T	109 – 115
6	1/16 note	/16	103 – 108
8	1/8 note triplet	/8 T	097 – 102
9	Dotted 1/16 note	/16D	090 – 096
12	1/8 note	/8	084 – 089
16	Quarter note triplet	/4 T	077 – 083
18	Dotted 1/8 note	/8 D	071 – 076
24	**Quarter note**	**/4**	**065 – 070**
32	Half note triplet	/2 T	058 – 064
36	Dotted quarter note	/4 D	052 – 057
48	Half note	/2	045 – 051
64	Whole note triplet	WH T	039 – 044
72	Dotted half note	/2 D	033 – 038
96	Whole note	WH	026 – 032
144	Dotted Whole note	WH D	020 – 025
192	2 Whole notes	2 WH	013 – 019
288	3 Whole notes	3 WH	007 – 012
384	4 Whole notes	4 WH	000 – 006

NOTE: You can also assign the Arpeggiator Rate as the active parameter by simultaneously pressing the ARP ON/OFF and ARP LATCH panel buttons. This allows you to control the arpeggiator rate using the **CONTROL** footwheel.

D. MIDI Setup Menus

MIDI Setup menus are used to select the T3 MIDI options. To enable MIDI Setup menus, press the **CURSOR** button. This will highlight the menu options shown on the second line of the display. Once highlighted, use the **VALUE** knob to scroll through the menus.

ALL NOTES OFF:

Allows you to issue an 'All Notes Off' message to the MIDI output, shutting off all active notes on the T3 and/or any attached MIDI tone modules or keyboards. This command is the equivalent of a MIDI panic button used to silence stuck notes. To issue the command, simply press the **STORE** button (you do not have to enable this menu with the **CURSOR** button).

LOCAL CONTROL:

Allows you to turn control of the T3's synth engine ON or OFF locally. When set to 'ON', the pedalboard, footwheels, and front panel controls affect the internal sound engine, as well as generate MIDI commands depending on the MIDI routing settings. When set to 'OFF', the pedalboard, footwheels and panel controls no longer affect the sound engine, but will still send MIDI commands. Note that a setting of 'OFF' will also prevent double triggering in the event you are using a MIDI sequencer with both the MIDI IN and MIDI OUT connected, and the sequencer is echoing MIDI data back to the T3. To change the Local Control setting, use the **CURSOR** button to highlight the control value, then use the **VALUE** knob to change the setting.

Values: ON, OFF; the default is ON

MIDI INPUT:

Allows you to select the MIDI input connection. Since the T3 offers both MIDI DIN and USB connections, several input options are possible. To specify the MIDI input connection, use the **CURSOR** button to highlight the input selection, then use the **VALUE** knob to select the desired input.

Values: NONE, DIN, USB, DIN/USB; the default is DIN/USB

TECH NOTE: 'DIN' is an abbreviation for 'Deutsches Institut für Normung' (the German Institute for Standardization). 'DIN connectors' commonly refer to a family of circular connectors that were standardized by DIN for commercial electronic use. When the MIDI standard was released in 1983, it specified a 5-pin DIN connector as the standard hardware interconnection, thus the 'MIDI DIN' connector.

MIDI SETUP (con't)

MIDI OUTPUT:

Allows you to select the MIDI output connection (None, DIN, USB or both). To specify the MIDI output connection, use the **CURSOR** button to highlight the output selection, then use the **VALUE** knob to select the new output.

Values: NONE, DIN, USB, DIN/USB; the default is DIN/USB

MIDI MERGE USB INPUT:

Allows you to select the routing of the MIDI Merge function for the USB input. When MIDI Merge is ON, the T3 will echo all MIDI data received at the USB MIDI Input port to the selected MIDI Output port, merged with any MIDI data generated by the T3. This allows you to pass MIDI data thru the T3, even though the T3 has no dedicated MIDI Thru connector. To change the selected MIDI output port, use the **CURSOR** to highlight the output parameter, then use the **VALUE** knob to select the desired output.

Values: NONE, DIN OUT, USB OUT, DIN/USB OUT;
the default is NONE.

MIDI MERGE DIN INPUT:

Allows you to select the routing of the MIDI Merge function for the DIN input. When MIDI Merge is ON, the T3 will echo all MIDI data received at the MIDI DIN Input port to the selected MIDI Output port, merged with any MIDI data generated by the T3. To change the selected MIDI output port, use the **CURSOR** to highlight the output parameter, then use the **VALUE** knob to select the desired output.

Values: NONE, DIN OUT, USB OUT, DIN/USB OUT;
the default is NONE.

NOTE: When using MIDI Merge, take precautions to insure that you do not create a MIDI feedback loop (where the output is passed back into the input and then merged with the output again). A feedback loop can result in unwanted side effects, like a locked-up T3. If this should this occur, cycling the power should resolve the condition.

MIDI SETUP (con't)

POLYPHONIC SETUP:

Allows you to set up multiple Moog synths as a polyphonic synth stack. The settings are 'POLY: OFF' or 'POLY: (#) of (##)'. The first number represents which note this particular T3 is assigned to play, the second number sets the total number of available voices. For example, if you had an T3 and a Voyager RME, you would set the T3 to 'POLY: 1 of 2'; on the Voyager RME you would go to 'MIDI Key Order' on the Master menu and set the RME to be note 2 of 2 (note that the Voyager must also have the latest firmware installed). Connect the MIDI OUT from the T3 to the MIDI IN on the Voyager. You should now be able to play duophonically, with the T3 sounding the first note played on the keyboard and the Voyager RME sounding the second note. If all available voices are in use, additional notes will not sound until enough keys are released to free a voice. MIDI Continuous Control numbers (MIDI CC's) are consistent between the Voyager and Taurus 3, so any parameter changes such as pitch bend and mod wheel, filter cutoff and so on, should affect all voices simultaneously.

If you have two Taurus 3 synths, you would connect MIDI OUT from the first one to MIDI IN on the second, then you would turn on MIDI MERGE on the second T3 and connect its MIDI OUT to the MIDI IN on the first T3. Turn off LOCAL CONTROL on the first T3 so that it is controlled only by the MIDI data that is shared between the two synths.

If you have more than two Moog synths, connect them so that MIDI passes through each synth and the last is connected to the first; but make sure that the first synth does NOT pass MIDI through to the next, or you will create a MIDI feedback loop. The "first synth" in this description should always be the one on which you are playing the keys. If the first synth is an T3, make sure MIDI MERGE is turned OFF on this synth. If the first synth is a Voyager, make sure that you are connecting MIDI OUT from it to the MIDI IN on the second synth; do not use the MIDI THRU jack on the first synth, only on subsequent synths (voice 2 or higher).

The default setting is POLY: OFF.

NOTE: When the Arpeggiator is activated, it overrides any POLY mode settings.

MIDI SETUP (con't)

VELOCITY RESOLUTION:

Allows you to select the MIDI velocity output resolution of the T3. A setting of FULL provides the full output range (0-127). A setting of 1 provides a fixed velocity output value of 100. A setting of 2 provides two velocity values, a setting of 4 provides four velocity values, a setting of 8 provides eight velocity output values, etc. See the table below for the complete range of all settings. To change the velocity resolution, use the **CURSOR** to highlight the parameter, then use the **VALUE** knob to select the desired resolution.

Values: FULL, 1,2, 4, 8, 16, 32;
the default is FULL

VELOCITY RESOLUTION	MIDI VELOCITY OUTPUT RANGE
FULL	0 – 127 (continuous)
1	100 (fixed)
2	64, 127
4	32, 64, 96, 127
8	16, 32, 48, 64, 80, 96, 112, 127
16	8, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96, 104, 112, 120, 127
32	4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, 52, 56, 60, 64, 68, 72, 76, 80, 84, 88, 96, 100, 104, 108, 112, 116, 120, 124, 127

14 BIT MIDI:

Allows you to select whether the **CONTROL** footwheel will transmit MIDI CC messages as 14-bit values (two bytes) or 7-bit values (one byte). Regardless of this menu setting, the T3 always responds to 14-bit CC messages. To change the setting, use the **CURSOR** to highlight the ON/OFF parameter, then use the **VALUE** knob to make the desired selection.

Values: ON, OFF; the default is ON

E. System Exclusive (SysEx) Menus

SysEx menus are a set of commands to transmit and receive selected presets, bulk dumps and firmware dumps. To enable SysEx menus, press the **CURSOR** button. This will highlight the menu options shown on the lower line of the display. Once highlighted, use the **VALUE** knob to scroll through the menus. To activate a command, press the **STORE** button.

SEND CURRENT PRESET:

This option allows you to send the current Preset (as system exclusive data) for archiving to a computer or transferring to another T3. This operation requires another T3, or a computer with a MIDI interface and a program that can accept a SysEx dump. You must enable the device that is to receive the SysEx data. Once the remote device is enabled, press **STORE** to initiate the data transfer.

The LCD will briefly display a 'SENDING CUR PRESET' status message. When the transfer is complete, the display will return to the SYSEX menu.

SEND ALL PRESETS:

This option allows you to send the system exclusive data for archiving the complete bank of Presets in the T3's memory. To complete this command, enable the device that will receive the SysEx data, then press **STORE** to initiate the data transfer.

When the data transfer process starts, the LCD will briefly display a 'SENDING ALL PRESETS' status message. When the transfer is complete, the display will return to the SYSEX menu.

BULK DUMP:

This option allows you to save the entire state of the T3 (including all global data and Preset data) for later recovery. To execute a bulk dump, enable the device that will receive the SysEx data, then press **STORE** to initiate the data transfer.

When the data transfer process starts, the LCD will briefly display a 'SENDING BULK DATA' status message. When the transfer is complete, the display will return to the SYSEX menu.

SEND FIRMWARE:

This option allows you to save the entire state of the T3 (including all global data and Preset data) for later recovery. To execute a bulk dump, enable the device that is to receive the SysEx data, then press **STORE** to initiate the data transfer.

During data transfer, the LCD will display the status of the transfer process. When the operation has finished, the display will return to the SYSEX menu.

Receiving SysEx Data

The T3 is able to receive System Exclusive data at any time without any special prior setup. SysEx files are recognized and received automatically whenever a SysEx data transfer is initiated. The T3 LCD screen will display the status of SysEx data transfers as follows:

SINGLE PRESETS:

The LCD screen will briefly display a 'RECEIVING SINGLE PRESET' message whenever a single preset is transmitted via SysEx. The preset will automatically be written to the current preset location. For example, if the current preset location is H4 when the SysEx is received, the new preset data will be written into location H4.

ALL PRESETS:

The LCD screen will display a 'RECEIVING PRESETS' message when a bank of presets is transmitted. The transmitted bank will replace the current bank.

BULK DUMP:

The LCD screen will display a 'RECEIVING BULK DUMP' message when a bank of presets is transmitted.

FIRMWARE UPDATES:

The LCD screen will display a 'RECEIVING FW' message when a firmware update is transmitted. Status update messages will appear on the second line of the display as the transmission executes. After the firmware update is completed, the T3 will automatically reset and an 'UPDATE SUCCESS' message will be displayed.

F. System Utilities Menus

System Utilities provide a set of useful system-level commands to set global options, restore factory defaults and calibrate the T3. To enable System Utilities menus, press the **CURSOR** button. This will highlight the menu options shown on the second line of the display. Once highlighted, use the **VALUE** knob (or press the **VALUE** pushswitch) to scroll through the menu.

MASTER VOLUME:

Allows you match the T3's output level to the amplifier. Generally, the MASTER VOLUME parameter should be set so that the maximum desired volume for any preset is achieved when the **VOLUME** footwheel is set to maximum. When using the T3 with a bass amplifier, plug the Taurus into the high-level amplifier input and set the amplifier volume control about ½ of the way up or less. With the **VOLUME** footwheel at maximum, set the MASTER VOLUME parameter for the desired volume. To adjust the setting, press the **CURSOR** button to move the cursor to the value field, then use the **VALUE** knob to select the desired value.

TECH NOTE: The MASTER VOLUME parameter duplicates the function of the Output Level rotary control found on the Taurus 1.

VERSION (VERS):

This menu simply displays the current version of the operating system.

MENU WRAP:

Allows you to enable or disable menu wrapping. When menu wrapping is enabled ('ON'), menus and Preset numbers will wrap back to the beginning when you reach the end. When disabled ('OFF'), menus and Preset numbers will not wrap. To enable/disable menu wrapping, press the **CURSOR** button to move the cursor to the ON/OFF parameter field, then use the **VALUE** knob to select the desired value. The default is 'ON'.

FOOTWHEEL LIGHTS (FW LIGHTS):

Allows you to turn the footwheel lights ON or OFF, or have them pulse at the LFO rate (both the VOLUME and CONTROL footwheel LEDs will pulse, providing a visual indication of the LFO rate). To adjust the setting, press the **CURSOR** button to move the cursor to the value field, then use the **VALUE** knob to select the desired value.

Values: ON, OFF, LFO; the default is ON

RESTORE FACTORY:

Allows you to perform a 'Factory Restore', which will restore the global default values and all factory presets. To execute this operation, press **STORE** to activate.

NOTE: You should back up any presets you wish to save prior to performing this action.

You will be asked to confirm this operation (Yes/No). If you are unsure, select NO and press **STORE** to return to the System Utilities menu without any action. If you are sure you wish to continue, use the **VALUE** knob to change from NO to YES and press **STORE.** This will restore the factory default global values, performance presets and factory presets.

While the restore process is taking place, the LCD will briefly display a series of status messages. When complete, the screen will briefly display a 'SUCCESS' message and return to the System Utilities menu.

MASTER REBOOT:

Allows you to perform a Master Reboot of the T3, which is similar to turning the power OFF and ON. To perform this action, press **STORE.**

You will be asked to confirm this operation (Yes/No). If you are unsure, select NO and press **STORE** to return to the System Utilities menu without any action. If you are sure, use the **VALUE** knob to select YES and press **STORE**. This will reboot the T3.

CALIBRATION:

Allows you to calibrate the Taurus 3. The calibration utilities allow you to perform individual calibrations on the **VOLUME** and **CONTROL** Footwheels and the Note Range. For example, the Note Calibration operation individually tunes each note exactly for each oscillator and octave setting. This tuning information is stored in the T3 EEPROM and referenced when playing a note to guarantee that the oscillators will be in tune. These individual calibrations ensure that the T3 performs predictably and precisely. To access the calibration options, press **STORE**, then use the **VALUE** knob to select the desired calibration.

NOTE: All calibration procedures should be thoroughly reviewed before proceeding. Observe the following precautions and recommendations before attempting any calibration operation.

1. The T3 must be at a stable and constant temperature during calibration. You should allow a warm up period of at least 5 minutes before beginning any calibrations.

2. The Note Calibration procedure takes up to 30 minutes to cover the MIDI note range of 0 - 60. If you are performing this calibration, allow sufficient time for the calibration process to complete.

3. The T3 is calibrated at the factory. The Note Calibration operation is not necessary unless the T3 goes out of tune.

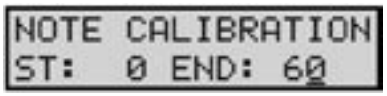
4. You can exit out of a calibration at any time by pressing the MASTER button. For the Note Calibration operation, only those notes that have already been calibrated will be saved. The remaining notes will revert to their previous calibration values. Interrupting the Note Calibration operation in this manner may result in inaccurate tuning.

5. Note Calibration is not meant for overall tuning drifts, such as if the T3 is just 10 cents sharp. Use the **FINE TUNE** control to adjust for small tuning drifts as needed.

CALIBRATION (con't)

NOTE CALIBRATION:

Allows you to perform Note calibration. This calibrates individual notes exactly for each oscillator and octave setting. Press **STORE** to access the Note calibration menu.



The Note calibration menu will be displayed, allowing you to set the calibration range. The default note range is MIDI notes 0 - 60. To change the range, use the **CURSOR** button to move to the start or end field, and use the **VALUE** knob to select the MIDI note value. Then press **STORE.**

NOTE: A full Note calibration using the default range can take about 30 minutes to complete. By specifying a narrower range of notes (for example, just the range of the T3 without octave transpose (24 - 36), or with octave transpose (24 - 48), you can shorten the calibration time.

You will be asked if you wish to proceed. Use the **VALUE** knob to select YES or NO. If you are uncertain or if you change your mind about performing this calibration, select 'NO' and press **STORE**. You will be returned to the System Utilities Calibration menu. Otherwise, select 'YES' and press **STORE**.

Calibration will begin, and the display will appear as shown. The values displayed are the MIDI note number being calibrated, the calibration frequency, and the measured frequencies of Oscillators A & B. Note calibration will proceed through the specified range of MIDI notes, tuning each note individually, first for Oscillator A and then Oscillator B.

NOTE: You can exit out of Note calibration at any time by pressing the MASTER button. Only those notes that have been calibrated up to that point will be saved. The remaining notes will revert to their previous calibration values. Interrupting the Note Calibration operation in this manner may result in inaccurate tuning.

When Note calibration is complete, a 'SUCCESSFUL' message will appear on the display and the new calibration values will be stored in the T3's EEPROM. To exit the calibration, press **STORE** to return to the System Utilities Calibration menu or press **MASTER** to exit the calibration and return to the highest level of the System Utilities menu.

CALIBRATION (con't)

VOLUME WHEEL

Allows you to calibrate the **VOLUME** Footwheel. Press **STORE** to access the **VOLUME** Footwheel calibration menu.

You will be asked if you wish to proceed. Use the **VALUE** knob to select YES or NO. If you are uncertain, or if you change your mind about performing this calibration, select 'NO' and press **STORE**, and you will return to the System Utilities Calibration menu. To proceed with the calibration, you should first move the **VOLUME** footwheel to its middle position, then select 'YES' and press **STORE**.

The Volume Wheel calibration menu will appear. To calibrate, move the **VOLUME** footwheel to the maximum position (UP) and minimum (DN) positions.

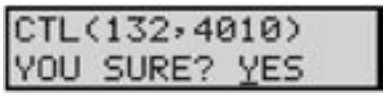
As you move the footwheel, the display will update the maximum and minimum values. To complete the calibration, press **STORE**. You will be returned to the Calibration menu.

NOTE: If this calibration is done incorrectly, the footwheel may not operate normally. If this should this happen, try recalibrating the footwheel again using the procedure above.

CALIBRATION (con't)

CONTROL WHEEL:

Allows you to calibrate the **CONTROL** Footwheel. Press **STORE** to access the **CONTROL** Footwheel calibration menu.



You will be asked if you wish to proceed. Use the **VALUE** knob to select YES or NO. If you are uncertain, or if you change your mind about performing this calibration, select 'NO' and press **STORE**, and you will return to the System Utilities Calibration menu. To proceed with the calibration, you should first move the **CONTROL** footwheel to the middle position, then select 'YES' and press **STORE**.

The Control Wheel calibration menu will appear. To calibrate, move the **CONTROL** footwheel to the maximum position (UP) and minimum (DN) positions.

As you move the footwheel, the display will update the maximum and minimum values. To complete the calibration, press **STORE**. You will be returned to the Calibration menu.

NOTE: If this calibration is done incorrectly, the footwheel may not operate normally. If this should this happen, try recalibrating the footwheel again using the procedure above.

FIRMWARE UPGRADE ENABLE/DISABLE:

The last menu in the System Utilities menu allows you to enable or disable reception of Firmware Updates. The default is OFF. The OFF state protects the Taurus from inadvertently entering a Firmware Update cycle.

How the Taurus 3 handles MIDI

When you adjust any one of the Taurus 3 panel controls, MIDI Continuous Controller (CC) messages are transmitted to the MIDI Output. The information contained in these MIDI messages varies according to the selected parameter. For example, when **GLIDE** is selected as the active parameter, rotating the **VALUE** encoder or adjusting the **CONTROL** Footwheel generates MIDI CC data corresponding to the Glide Rate parameter (CC#5).

The chart on the following pages list the default MIDI CC data that is generated for each front panel control.

NOTE:

1. Many of the T3 parameters support high resolution, 14-bit MIDI CC messages, which allow for finer control and smoother changes when the T3 is controlled from a sequencer or DAW. For these high resolution parameters, the MSB indicates the 'regular' CC number, and the LSB indicates the high-resolution 'fine' control value. If you are only sending 7-bit MIDI CC messages to control these parameters, use the MSB channel number by itself.

2. For the T3 to transmit 14 bit MIDI CC messages, the '14-Bit' parameter (Master Menu/MIDI Setup) must be set to 'ON' :

SECTION	CONTROL	FUNCTION	CC	VALUE/RANGE
Footwheels	CONTROL	Adjusts the active parameter. The MIDI CC parameter transmitted by the CONTROL footwheel depends on the active parameter that is being modified.	Varies	0 – 127
	VOLUME	Adjusts the output volume	7	0 – 127
Interface Panel	MASTER	Master mode switch	-	-
	PRESET	Preset mode switch	-	-
	CURSOR	Navigation control	-	-
	STORE	Data entry/store control	-	-
Oscillator	B FREQ	Adjusts the coarse offset frequency of Oscillator B	**MSB 10** LSB 42	0 - 127
	BEAT	Adjusts the fine offset frequency of Oscillator B	**MSB 11** LSB 43	0 – 127
	GLIDE	Sets the portamento rate time	**MSB 5** LSB 37	0 – 127
	OCTAVE	Selects the octave setting of the oscillators	74	42 (LO) 85 (MED) 127 (HI)
	MIX	Adjusts the balance (mix) of Oscillators A & B	**MSB 15** LSB 47	0 – 127
	ATTACK	Adjusts the volume envelope attack time	**MSB 28** LSB 60	0 – 127
	SUSTAIN	Sets the volume envelope sustain level	**MSB 30** LSB 62	0 – 127
	DECAY	Adjusts the volume envelope decay time	**MSB 29** LSB 61	0 – 127
LFO	LFO RATE/CLOCK	Adjusts the LFO frequency/clock divider	**MSB 3** LSB 35	0 – 127
	FILTER	Adjusts the Filter modulation amount	**MSB 6** LSB 38	0 – 127
	PITCH	Adjusts the Oscillator modulation amount	**MSB 8** LSB 40	0 – 127
	MODWHEEL	Adjusts combined Filter and Oscillator amounts	**MSB 1** LSB 33	0 – 127
	SYNC	Sets the LFO sync mode	102	42 (OFF) 85 (KY) 127 (MIDI)
	SQUARE	Selects the LFO Square Wave	68	31
	TRIANGLE	Selects the LFO Triangle Wave	68	63
	RAMP	Selects the LFO Ramp Wave	68	95
	SAW	Selects the LFO Sawtooth Wave	68	127

Taurus 3 MIDI CC messages

SECTION	CONTROL	FUNCTION	CC	VALUE/RANGE
Filter	AMOUNT	Adjusts the amount of the filter envelope	**MSB 27** LSB 59	0 – 127
	ATTACK	Adjusts the filter envelope attack time	**MSB 23** LSB 55	0 – 127
	DECAY	Adjusts the volume envelope decay time	**MSB 24** LSB 56	0 – 127
	CUTOFF (SEE NOTE 1)	Adjusts the filter cutoff frequency	**MSB 19** LSB 51	0 – 127
	RESONANCE	Adjusts the filter resonance	**MSB 21** LSB 53	0 – 127
Arpeggiator	ORDER	Selects the Arpeggiator Order	118	31 (UP) 63 (DN) 95 (ORDER) 127 (RAND)
	PATTERN	Selects the Arpeggiator Pattern	117	42 (LOOP) 85 (B/F) 127 (ONCE)
	OCTAVE	Sets the Arpeggiator Octave range	116	18 (-2.1) 36 (-2) 54 (-1) 73 (0) 91 (1) 109 (2) 127 (2.1)
	ON/OFF	Starts and stops the Arpeggiator	90	63 (OFF) 127 (ON)
	LATCH	Enables/disables the Arpeggiator Latch	91	63 (OFF) 127 (ON)
	ARP RATE	Adjusts the Arpeggiator Rate	**MSB 4** LSB 36	0 – 127
Footswitches	GLIDE	Turns GLIDE ON/OFF	65	63 (OFF) 127 (ON)
	DECAY	Turns DECAY ON/OFF	88	63 (OFF) 127 (ON)
	OCTAVE	Turns OCTAVE ON/OFF	89	63 (OFF) 127 (ON)

Taurus 3 MIDI CC messages

Appendix A - Arpeggiator Examples

The Arpeggiator takes the currently played note or group of notes and generates a note sequence based on the Arpeggiator ORDER, PATTERN and OCTAVE settings. Here are some examples of sequences generated by the Arpeggiator for specific settings:

Example 1. Notestack = C1, E1 & G1
ORDER = UP
PATTERN = LOOP
OCTAVE = 2

Arpeggiator plays: C1 C2 C3 E1 E2 E3 G1 G2 G3 C1 C2 C3...

Example 2. Notestack = C1, E1 & G1
ORDER = DOWN
PATTERN = LOOP
OCTAVE = -2

Arpeggiator plays: C1 C0 C-1 E1 E0 E-1 G1 G0 G-1 C1 C0 C-1...

Example 3. Notestack = C1, E1 & G1
ORDER = ORDER
PATTERN = LOOP
OCTAVE = 2

Arpeggiator plays: C1 E1 G1 C2 E2 G2 C3 E3 G3 C1 E1 G1...

Example 4. Notestack = C1, G1
ORDER = ORDER
PATTERN = B/F (BACK/FORTH)
OCTAVE = 2

Arpeggiator plays: C1 G1 C2 G2 C3 G3 G3 C3 G2 C2 G1 C1 C1 G1 C2...

Example 5. Notestack = C1, E1, G1
ORDER = UP
PATTERN = LOOP
OCTAVE = 2.1

Arpeggiator plays: C1 C2 C3 C2 E1 E2 E3 E2 G1 G2 G3 G2 C1 C2...

Appendix B - MIDI Implementation Chart

MIDI Implementation Chart

Moog Music — Date: 12/28/09
Taurus 3 Analog Bass Synthesizer — Version 1.0

FUNCTION		TRANSMITTED	RECOGNIZED	REMARKS
Basic channel	Default	1	1	
	Changed	1-16, OFF	1-16, OFF	User selectable
Mode	Default	3	4	
	Messages	X	X	
	Altered	X	X	
Note number		0 - 60	0 - 60	The transmitted note numbers follow the OCTAVE and TRANSPOSE switch settings, providing a total range of three octaves. With no octave transposition and TRANSPOSE = 0, the transmitted note range is 24 - 36.
Velocity	Note ON	O	X	
	Note OFF	X	X	
After touch		X	X	
Pitch Bend		X	O	Pitch Bend is received but not transmitted. PB RANGE IS Programmable from 0 to +/- 12 semitones.
Control change		O	O	1, 5-8, 10, 11, 15, 19, 21, 23, 27-30, 33, 35-38, 40, 42, 43, 47, 51, 53, 55, 56, 59, 60-62, 65, 68, 74, 88, 89, 90, 91, 102, 116,117, 118
Program change		O	O	
	True Number	00 - 51	00 - 51	
System Exclusive		O	O	
System Commands				
	Song Position	X	X	
	Song Selection	X	X	
	Tune	X	X	
System Real Time				
	Clock	X	O	Receives Timing Clock
	Commands	X	O	Receives START, CONTINUE & STOP
Aux messages				
	Local Off	X	X	
	All Notes Off	O	O	
	Active Sense	X	X	
	System Reset	X	X	

Legend: O = Yes, X = No

Modes: Mode 1 - Omni On, Poly; Mode 2 - Omni On, Mono; Mode 3 - Omni Off, Poly; Mode 4 - Omni Off, Mono

Appendix C - Service and Support Information

Moog Limited Warranty

Moog Music warrants its produces to be free of defects in materials or workmanship and conforming to specifications at the time of shipment for a period of one year from the date of purchase. During the warranty period, any defective products will be repaired or replaced, at Moog Music's option, on a return-to-factory basis. This warranty covers defects that Moog Music determines are no fault of the user. In countries outside of the USA, contact the Moog authorized distributor listed on our web site (www.moogmusic.com) for service.

Returning your Product to Moog Music

You must obtain prior approval in the form of an RMA (Return Material Authorization) number from Moog Music before returning any product. You can request an RMA number on-line using the 'Product Register' link on the Moog Music home page or call us at (828) 251-0090. The Taurus 3 must be returned in the original inner packing including the foam inserts. The warranty will not be honored if the product is not properly packed. Once packed, send the product to Moog Music Inc. with transportation and insurance charges paid.

What we will do

Once received, we will examine the product for any obvious signs of user abuse or damage as a result of transport. If the product has been abused, damaged in transit, or is out of warranty, we will contact you with an estimate of the repair cost.

How to initiate your warranty

Please initiate your warranty on-line at www.moogmusic.com by clicking on the "Product Register" tab. If you do not have web access, fill out the all the information on the included warranty card and mail to:

Moog Music, Inc.
Attn: New Product Registration
2004-E Riverside Dr.
Asheville, N.C. USA 28804

Appendix D - Caring for the Taurus 3

Clean the Taurus 3 with a soft, moist cloth only – do not use solvents or abrasive detergents. Heed the safety warnings at the beginning of the manual. Don't drop the unit. If you are shipping your Taurus 3 to the factory for servicing, we recommend using the original shipping carton, or an ATA approved Road Case. Shipping the Taurus 3 in a non-ATA case or packaging other than the original carton will void the warranty. When setting up the Taurus 3, be sure your stand or table is capable of holding at least 45 lbs.

IMPORTANT SAFETY NOTE: Do not open the chassis. There are no user serviceable parts in the Taurus 3. Maintenance of the Taurus 3 synthesizer should be referred to qualified service personnel only.

Appendix E - Specifications

Type:

Programmable monophonic analog bass synthesizer w/52 presets

Synth Engine:

Oscillator Section:

Oscillators A & B:

Octave: 32', 16', 8'

Wave: Sawtooth

Oscillator B Frequency Offset:

-1 octave to +1 octave

Glide Rate: 0 to 0.5 sec

Level: Osc A/B Mix (100/0 to 0/100%)

Volume Envelope:

Attack Time: 5 to 560 msec

Decay Time: 50 msec to 2.8 sec

Sustain Level: 0 to 100%

Filter Section:

Type: -24dB/oct Low Pass

Cutoff: 20Hz to 20KHz

Resonance: 0 to Self-oscillation

Filter Env. Amount: 0 to 100%

Filter Envelope:

Attack Time: 5 to 56 msec

Decay Time: 50 msec to 2.8 sec

Modulation Section:

LFO Rate: 0.1 Hz to 100 Hz

Waveform: Triangle, Square, Ramp, Sawtooth

Destination: Pitch, Filter

Amount: 0 to 100%

Pedalboard:

13 keys (C-C)

Transmits polyphonic MIDI Note On/Off with velocity

Performance Controls:

Control Footwheel w/LED bargraph display

Volume Footwheel

Footswitches: Glide, Decay, Octave, Bank, Presets (4), Transpose/PGM

User Interface:

LCD Display, 2 x 16 characters

Mode switches:

Master

Preset

Selection/Navigation controls:

Cursor

Store

Value encoder (with pushswitch)

Side Panel:

AC Power Inlet (universal power supply, 100-250 VAC, 50-60 Hz, power consumption: 15 Watts)

Power ON/OFF

Audio Output (2)

Control Voltage Inputs:

Pitch CV: 0 to + 5V

Filter CV: 0 to +5V

Volume CV: 0 to +5V

Keyboard Gate: +5V trigger

MIDI In, Out

USB

Outputs:

Monophonic Hi Z Out

Monophonic Lo Z Out

Dimensions:

24.5" x 23.5" x 8.75"

(622 mm x 597 mm x 222 mm)

Weight:

45 lb (20.4 kg)

Operating System;

Flash upgradeable via MIDI SysEx

Specifications subject to change without notice

Appendix F - MIDI Program Change Commands

The Taurus 3 uses a Bank/Location numbering system to select presets. If you are using a MIDI Controller, sequencer or DAW to remotely control the Taurus 3, these devices will transmit standard MIDI Program Change commands (0 - 127) to select T3 presets. The table below shows the relationship between MIDI Program Change commands and T3 Presets.

MIDI PROGRAM CHANGE	TAURUS 3 PRESETS
0	A1
1	A2
2	A3
3	A4
4	B1
5	B2
6	B3
7	B4
8	C1
9	C2
10	C3
11	C4
12	D1
13	D2
14	D3
15	D4
16	E1
17	E2
18	E3
19	E4
20	F1
21	F2
22	F3
23	F4
24	G1
25	G2

MIDI PROGRAM CHANGE	TAURUS 3 PRESETS
26	G3
27	G4
28	H1
29	H2
30	H3
31	H4
32	I1
33	I2
34	I3
35	I4
36	J1
37	J2
38	J3
39	J4
40	K1
41	K2
42	K3
43	K4
44	L1
45	L2
46	L3
47	L4
48	M1
49	M2
50	M3
51	M4

Glossary

Here are a few key terms that cover the basics of sound generation as used in the Taurus 3 synthesizer.

Amplitude – The strength of a sound's vibration measured in Decibels (dB). Amplitude corresponds to the musical term Loudness.

Continuous Controller (CC) – A type of MIDI message used to transmit control commands. These commands are digital control signals for parameters such as volume, vibrato and panning.

Control Voltage – Control voltages (also called CVs) are used in analog synthesizers to affect changes in the sound. In the case of pitch, pressing a key on the keyboard sends a control voltage that determines the pitch of the oscillators. The keyboard CV is set to produce an equal tempered scale. As you play up the keyboard, the CV is raised and the pitch increases. The pitch can also be affected by other CV sources, like an LFO, often used to produce vibrato. Other major synthesizer components that respond to CV's include the filter (the higher the CV, the higher the filter cutoff frequency) and the amplifier (the higher the CV, the higher the gain, or volume).

Envelope – An envelope describes the contours that affect the characteristics of a sound (pitch, tone and volume) over time. For example, when a string is plucked, its amplitude is suddenly very loud, but then dies out gradually. This describes the Volume envelope of the sound. We observe that the initial part of the plucked sound is very bright, but then the brightness fades away. This describes the Tonal envelope contour. We also hear the frequency of the sound go slightly higher when the string is plucked, and then drop slightly as the note fades. This is the pitch envelope contour. A synthesizer can create these kinds of changes by applying electrically generated envelopes to oscillators (affecting pitch), filters (affecting tone) and amplifiers (affecting volume).

Envelope Generator – A circuit that generates an envelope signal. The envelope generator creates a time-varying control voltage that can be applied to any voltage controlled circuit. The Taurus 3 features two envelop generators: a Volume Envelope Generator with three adjustable parameters (Attack, Sustain and Decay), and a Filter Envelope Generator with two adjustable parameters (Attack and Decay). 'Attack' and 'Decay' are specified as time parameters, while 'Sustain' is a level setting. Attack specifies the onset time of the envelope. For example, the sound of a plucked string starts suddenly, meaning its volume envelope has a fast attack time. Sustain is the level at which the envelope sustains after the initial transient (the attack portion). Decay specifies how long the envelope takes to fade away. An Envelope Generator uses a trigger to start and stop the envelope. This trigger is called a Gate signal, and it's produced whenever a footpedal is pressed. The gate signal turns on and stays on as long as a pedal is held down; when the pedal is released, the gate signal turns off. When the gate turns on, the Envelope Generator is triggered and the envelope signal moves through the Attack segment. For the Volume envelope, the CV settles at the Sustain level as long as the gate signal is on. When the gate goes off, the envelope goes through the Decay segment if the T3's **DECAY** footswitch is ON. If the **DECAY** footswitch is OFF, however, the envelope release time is instantaneous. For the Filter envelope, the CV simply moves through the Attack and Decay segments.

EEPROM – EEPROM stands for 'Electrically Erasable Programmable Read Only Memory'. This is a type of digital memory used to store information, even after the power is turned off. In the Taurus 3, the EEPROM is used to store global settings and presets, and operating system parameters such as tuning information.

Filter – A circuit that removes some frequencies and allows other frequencies to pass through the circuit. A filter has a cutoff frequency that determines the point at which frequencies begin to be removed. A lowpass filter is one in which frequencies above the cutoff frequency are removed and all frequencies below the cutoff are passed through. A highpass filter is one in which frequencies below the cutoff frequency are removed and frequencies above the cutoff are passed through. A bandpass filter has two cutoff frequencies that define a frequency band, outside of which the frequencies are removed.

Frequency – The rate of vibration in sound measured in Hertz (Hz or cycles per second). The average hearing range of the human ear is from 20 to 20,000 Hz. Frequency corresponds to the musical term 'pitch', but the two terms are not always interchangeable. Frequency is an objective measurement of a sound, while pitch is the perception of a sound, low, high, or mid-ranged. A low frequency corresponds to a low-pitched sound such as a bass; a high frequency sound corresponds to a high-pitched sound such as a piccolo. In music, a change in pitch of one octave higher equals a doubling of the frequency.

Frequency Modulation – Also known as FM, Frequency Modulation describes the technique of using one oscillator to modulate the frequency of another. In FM, the modulating oscillator is called the 'modulator', while the other oscillator is known as the 'carrier'. The carrier oscillator is the one you hear. When the modulator frequency is very low (about 6Hz), the effect is described as vibrato. As the modulator frequency is raised into the audio range, new modulation frequency components are created, and the effect is perceived as adding new overtones to the carrier signal.

Glide – Also called portamento, is the slowing down of pitch changes as you play different notes on the keyboard. Certain acoustic instruments, like the trombone or the violin, create this effect when the performer adjusts the tubing or string length. The speed of the glide is the glide rate. In synthesizers, a Glide Rate control determines the speed of the glide between notes.

Harmonic – A sound is made up of simple vibrations at many different frequencies (called harmonics) that give a sound its particular character. This corresponds to the musical term timbre or tone color. A harmonic sound, such as a vibrating string, is one in which the harmonics are mathematically related by what is called the harmonic series. These sounds are typically pleasing to the ear and generally the consecutive vibrations have the same characteristic shape or waveform. An enharmonic sound, such as a crash cymbal, is one in which the harmonics are not mathematically related. Their waveforms look chaotic. White noise is an enharmonic sound that contains equal amounts of all frequencies.

LED (Light Emitting Diode) – An electrical component that lights up when a voltage is applied.

Low Frequency Oscillator – Commonly referred to as an 'LFO', this is a special type of oscillator that generates signals primarily below the range of human hearing (generally below 20 Hz). LFOs are typically used as a source of modulation. For instance, an LFO with a triangle waveform, set to about 6 Hz and modulating the pitch of a VCO results in vibrato. Changing the LFO waveform to a square wave will result in a trill. An LFO modulating a VCA with a triangle wave creates tremolo.

Mixer – A circuit for combining multiple sound sources or signals. The Taurus 3 uses a simple mixer to mix the 'A' & 'B' oscillators.

Modulation – Modulation is the use of a control voltage to shape a tone. Modulation has a source, a destination, and an amount. This could be as simple as the filter cutoff of a VCF (a modulation destination) being changed by the front panel cutoff control (the source), or as complex as mixing multiple CVs together to modulate filter cutoff. Modulation is used in synthesis to create complex sounds and add variation.

Noise – A random audio signal having no fundamental, and where all the harmonics have equal strength (more or less). Noise can be used as either an audio or modulation source. When used as an audio source, noise can be used by itself to synthesize explosions or wind noises, or can be mixed with other waveforms to create noise artifacts, such as breath sounds. When used as a modulation source, noise can introduce instabilities to a sound, such as a 'pitch cloud' effect when noise modulates an oscillator.

Note Stack – Term that describes the notes held in memory for the Taurus 3 Arpeggiator function.

Oscillator – A circuit that electronically 'vibrates'. When used as a sound source, an oscillator is the electronic equivalent of a vibrating reed, or string. When amplified, an oscillator produces a pitched sound whose frequency is determined by one or more control voltages. Changes to these voltages correspond to changes in pitch. An oscillator's vibration can have different shapes or waveforms, such as a triangle, sawtooth, or square wave. The Taurus 3 has two oscillators; both oscillators produce sawtooth waves.

Pitch – The subjective perception of sound. A bass guitar generates low pitches, while a flute generates high pitches.

Pole (or poles) – A term referring to the design of a filter circuit. Each filter pole adds 6dB/Octave of attenuation to the filter response, so while a single pole filter has a 6dB/Octave response, a 4-pole filter (like the one in the Taurus 3) has a 24dB/Octave response.

Sample and Hold (S&H) – A circuit that generates a random control voltage at regular intervals. Traditional sample and hold circuits employ white noise as a signal source, taking periodic samples of this signal and holding that sample (a voltage level) until the next sample is taken. Since the signal source is noise (a random audio signal), the output of the S&H circuit is also random. The sampling interval is typically controlled by a low frequency oscillator (LFO). By adjusting the speed of the LFO, the speed of the S&H circuit can be varied.

Sound – Audible vibrations of air pressure. For electronic sounds such as those produced by a synthesizer, loudspeakers are used translate the electrical vibrations into the changes in air pressure which we perceive as sound.

Subtractive synthesis – A method of creating tones using harmonically rich (bright) source material, and then removing (or in some cases emphasizing) various frequency components to create the desired sound.

Synthesis – The generation of sound by electronic means, where the programmer/performer has the ability to change the pitch, volume, timbre and articulation.

Taurus 3 – A monophonic analog bass synthesizer that is an updated re-creation of the original Taurus bass synthesizer.

Timbre – Pronounced 'tamber', it refers to the quality of a sound by its overtones. An unprocessed sawtooth wave has a bright timbre, while a triangle wave has a mellow timbre.

Tremolo – Technically a form of low frequency amplitude modulation, tremolo is a smooth audible pulsing of volume. In synthesizers, tremolo is produced when a 5-6Hz LFO triangle or sine wave signal is applied to a voltage controlled amplifier.

Waveform – The shape of an oscillator's vibration. This determines its timbre. Commonly used waveforms in subtractive synthesis are sawtooth, triangle, square, or rectangular. Different waveforms have different timbres. A sawtooth has the greatest number of harmonics, and sounds bright and buzzy. A square wave has only odd harmonics, and sounds bright, but hollow, like a clarinet. A rectangular wave can vary in shape, but typically has a bright but thin sound, and a triangle wave's harmonics are so low in amplitude that it sounds muted and flutelike.

VCA – Abbreviation for 'Voltage Controlled Amplifier'. A VCA is an amplifier circuit where the gain is a function of the control voltage. In the Taurus 3, the VCA is paired with the Volume Envelope Generator to specify the articulation of a sound. Another CV source for the VCA in the Taurus 3 is the Volume CV Input.

VCF – Abbreviation for 'Voltage Controlled Filter'. A VCF is a filter circuit where the filter cutoff frequency is a function of the control voltage. A VCF is used to control the timbre of a sound. In the Taurus 3, the VCF is paired with the Filter Envelope Generator for dynamic control. Other CV sources for the VCF include the Keyboard Amount, Modulation Matrix and Filter CV Input.

VCO – Abbreviation for 'Voltage Controlled Oscillator'. A VCO is an oscillator circuit where the oscillator frequency is a function of the control voltage. In the Taurus 3, the VCO is primarily controlled from the pedalboard. Other CV sources for the VCO include the LFO and Pitch CV Input.

Vibrato – Technically a very low frequency modulation, vibrato is a smooth, mild pitch warble. In synthesizers, vibrato is produced when a 5-6Hz LFO triangle or sine wave signal is applied to a voltage controlled oscillator, causing the pitch to deviate slightly above and below the base frequency.

Notes

Text and illustrations by Greg Kist, Cyril Lance, Steve Dunnington, and Amos Gaynes