MANATEE

User Reference Manual

V1.1-27.10.2026-EN for Firmware 1.09

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Introduction

A note from Fred

Thank you for choosing Manatee!

You have just adopted the most advanced and flexible digital synthesizer from **Fred's Lab**!

Drawing inspiration from classics of the early 2000s, Manatee combines nostalgic elements with modern twists. Beyond its ability to recreate iconic Pop / Dance / Trance / Electro / Ambient sounds, Manatee stands out with its extensive modulation options, full MPE support and built-in effects.

This project embodies three years of dedicated hardwork with much research and development, resulting in a completely fresh design with unique DSP algorithms, crafted from the ground up. Combining my best efforts and knowledge, Manatee is intended to be intuitive to operate, fast to brew original sounds with while offering very rich synthesis capabilities.

After trying out the factory presets, I encourage you to take time to explore the instrument. I hope it surprises you and sparks new ideas for your music!

Love from Bonn / Germany!
Fred

A note from Till & Bert

The Manatee desktop synthesizer was conceived, designed and programmed by Frédéric Meslin, Fred for short, with great attention to detail and the courage to innovate. Fred himself is a keyboardist in a jazz band and has many years of experience in programming and developing synthesizers in his own company. Before that, he worked for two well-known European synthesizer manufacturers after completing his studies.

Till & Bert

Introduction

Preface

Manatee is a purely polyphonic & multitibral digital synthesizer offering 10 to 16 voices - depending on sounds complexity - which are shared among four parts. Latest MPE - MIDI Polyphonic Expression - standard and regular polyphonic aftertouch are also supported.

But what exactly is a "Manatee"?

Manatee is the English name for one of the nicest marine mammals. With a round tail and being mostly herbivorous, it's sometimes referred to as a "sea cow". These water-dwelling animals can be found in the Caribbean and on the Atlantic coast of Brazil and Venezuela, the Amazon and in waters of West Africa. Their population is classified as endangered on the IUCN list.

About this Manual

This manual describes the Manatee running firmware version **1.09**. Later firmware versions may add features or change some details. The installed version is briefly shown on the display at boot, see Firmware Update.

Credits

Mechanical design, Electronics, Software & DSP Engineering: **Frédéric Meslin**

Introduction

Thanks

I would like to thank the following people for their contributions to the Manatee:

- **Serge "erewhon" Beauchamp:** on frontpanel graphics
- **Thilo "Voltage Life Support" Goldschmitz:** on packaging design
- **Moon-Sook Chan:** on administration duties during the Kickstarter campaign
- **Philippe Guérin:** on first series assembly & testing
- **Pierre Studievic:** on first series assembly, software quality & testing
- **Florian Ressel:** on second series assembly
- **Jacques & Marie-Francoise Meslin:** on Kickstarter fulfilment duties
- **Till Kopper & Bert Fleissig:** on the reference manual

Thank you to all the sound-designers, who crafted the factory presets & sound-packs and gave their precious feedback on the developing versions of the sound engine:

- **Ciara "Sara" Hopkins**
- **Thilo "Voltage Life Support" Goldschmitz**
- **Pierre Studievic**
- **Sami "Ollie" Sawme**
- **Till Kopper**
- **Michael "synth-nyc" Rosner**

Extra thanks

In no specific order, I would also like to pay tribute to:
Vadim Zavalishin, Stefan Stenzel, Frank Schneider, Oliver Rockstedt, Robert Bocquier, Hans-Josef Degen, Ixy "Ixindamix", Tom Wies, Franck "Les Sondiers" Guillois, Nicola Dudich, Andreas Reich, Karim Abbassaib & Quintin Copper, for their direct & indirect contributions to the project by teaching me valuable lessons in engineering, project management and music!

A heartfelt thank-you to all the **Kickstarter backers** who placed their trust in the Manatee and in Fred's Lab before, during and after the crowdfunding campaign. The financial support and motivation made this possible and was a critical condition to reach the manufacturing stage of this crazy project. Many thanks for your support!

Basics

Definitions

The following technical and musical terms are used consistently throughout this manual. Below are brief definitions to help you better understand their meaning in this context.

- **MIDI - Musical Instrument Digital Interface**
  MIDI is a communication protocol that enables electronic musical instruments, computers, and other devices to connect and exchange musical information, such as note data, control signals, and tempo.
- **MPE - MIDI Polyphonic Expression**
  MPE is an extension to the MIDI standard that enables expressive control over multiple parameters for each note played.
- **A Preset**
  A Preset is a stored sound configuration. One can easily recall presets to reproduce particular sounds without manually adjusting individual settings.
- **A Multi**
  A Multi is a stored configuration of a set of presets and the associated mixing parameters so that several sounds can be played simultaneously, allowing the creation of layers or multi-timbral setups.
- **A Part**
  A Part refers to an independent sound configuration within a multitimbral setup. Each part have its own set of sound parameters.
- **Multitimbral Setup**
  A Multitimbral Setup allows a synthesizer to produce and control multiple sounds simultaneously. It functions as several autonomous synthesizers but in a single device. Each sound, referred as a Part, have its own set of sound parameters, MIDI channels assignment, and can be played independently.
- **A Voice**
  A Voice is an abstract entity reproducing the sound of a single note, given the Part sound configuration. There are many voices in a polyphonic synthesizer, they are shared between the parts and get allocated, deallocated and stolen according to the MIDI notes being played.
- **A Spectrum**
  A Spectrum refers to the frequency content of a sound. Manatee spectra includes the fundamental and the subsequent 7 harmonics.

Basics

Definitions

- **The Spectrum Maker**
  The Spectrum Maker forges a sound timbre by applying mathematic transformations, such as rotation, formant control, inversion... to a reference spectrum. This enables dynamic timbre modulation, giving vivid & expressive base timbres for synthesis.
- **Generator**
  A Generator is a specialized sound source that reproduces, at a specific pitch, the spectrum crafted by the Spectrum Maker.
- **Oscillator**
  An Oscillator is a sound source that generates the basic sound waveforms (e.g., sine, sawtooth, square). The timbre created can be shaped and modified by other modules.
- **Filter**
  A Filter is a shaping module that attenuates or emphasizes certain frequencies in a sound.
- **Saturator**
  A Saturator is a shaping module that adds harmonics by distorting or saturating the signal. It adds warmth, grit, or overdrive to a sound, enhancing its character.
- **Delay**
  A Delay is a time based effect. It creates alterated multiple echoes of a sound or attenuated repetitions. It enhances the spatial dimension of a sound, providing depth.
- **EQ**
  An EQ is a shaping module that adjusts the level of specific frequency ranges in an audio signal. There are several functions included such as bell, shelf, notch or regular high/low - pass/cut to allow flexible tonal control.
- **Reverb**
  A Reverb, short for reverberation, is a time based effect simulating the reflections of the sound in an arbitrary acoustic space.
- **Envelope**
  An Envelope is a modulation source that triggers on a **note on** and releases with a **note off** event. It includes several stages like Attack, Decay, Sustain, and Release, and can be programmed to influence the volume or other characteristics of the sound.

Basics

Definitions

- **LFO**
  An LFO is a modulation source based on low-frequency waveforms to modulate various parameters of a sound, such as pitch, filter cutoff, or oscillator content.
- **Modulation Matrix**
  A Modulation Matrix is a system to freely route and dose modulation sources to many synthesis parameters. It is a flexible way to add movement to the sound.
- **Modulation Slot**
  A Modulation Slot is one entry in the Modulation Matrix. It specifies a modulation source, a modulation target, the amount of modulation and an optional Expressor.
- **Arpeggiator**
  An Arpeggiator is a module that automatically plays the individual notes of a chord in a sequential pattern. The pattern and playing pace can be defined through various parameters.

Manual Notations

To ease the reading and understanding of explaination found in this user manual, a few conventions were used:

• CAPITAL LETTERS denotes a sound engine or system parameter.
• **<KNOB>** denotes a physical knob.
• **[BUTTON]** denotes an illuminated switch or a button.
• **-LED-** denotes an LED - Light Emitting Diode.
• "DISPLAY" denotes a text or representation on the display.

Basics

Editing Philosophy

The Manatee user interface was designed with two objectives in mind:

- Allowing quick creation of effective sounds.
- Simplifying live edits with one hand.

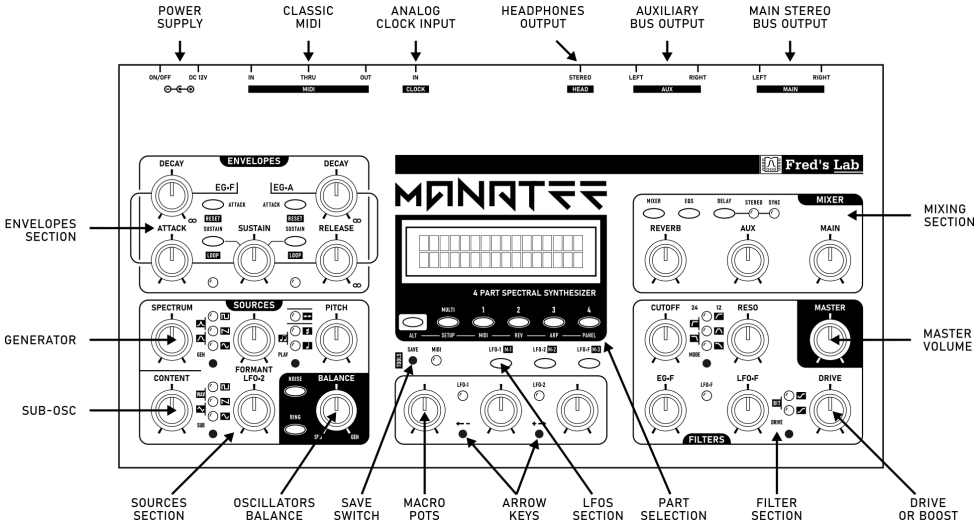
To achieve this, the layout does not closely follow traditional synthesizer conventions. Instead, the controls are arranged to make the operation fast and easy. Some modules are intertwined, and some sections may not be where your muscle memory expects them, at first. Please do not worry, after a couple of hours practicing it will feel simple and logical. This manual is here to guide you through that learning curve.

Some things to keep in mind: there are **specific sections** with dedicated knobs, LEDs and buttons and there is the **central section** with the LCD display and the 3 **<MACRO>** knobs located below it. While physical controls from the specific sections always edit the same parameter from the selected part, the **<MACRO>** knobs always edit the parameters being displayed on the screen. Up to 3 parameters can be displayed at a time, depending on the selected editing page.

Basics

Front Panel

Let us have a first look at the synthesizer front panel:



The front panel of Manatee is organized into five main sections: Envelopes, Sources, Macro Knobs, Filters, and Mixing + Effects. LFOs and advanced modulations share the the Macro Knobs section controls. At the top of the instrument, are found all the connectivity options, while the central section allows you to select the currently edited part and access deeper setting menus via the **[ALT]** button.

All knobs on the Manatee are **potentiometers**, not encoders. This choice was made to offer precise control and an analog-style tactile feel. However, this also means that the physical position of a knob does not always reflect the current value of a parameter, especially after loading a preset or switching between multi's parts. This is also particularly noticeable in the Macro Knobs section, where parameters change depending on the currently selected page.

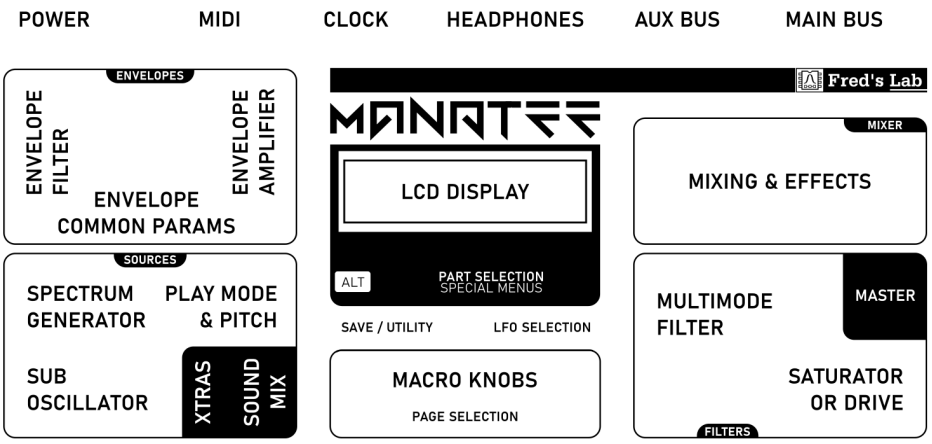
No need for great concern: each potentiometer can operate in one of three modes, JUMP, OFFSET, or CATCH, allowing you to tailor the response to your editing style. These modes will be explained in detail later.

Pay close attention to the navigation arrows located just below the **<MACRO>** knobs. These arrows are used to navigate between parameter pages or to select the current Preset or Multi, depending on the context.

Basics

Front Panel

The layout flows from top left to top right, like the shape of a smile. It begins with the contour of the sound (Envelopes), moves through timbre and movement (Sources and Macro Knobs), continues into the body of the sound (Filters), and finally reaches the ambiance stage (Mixing & Effects).



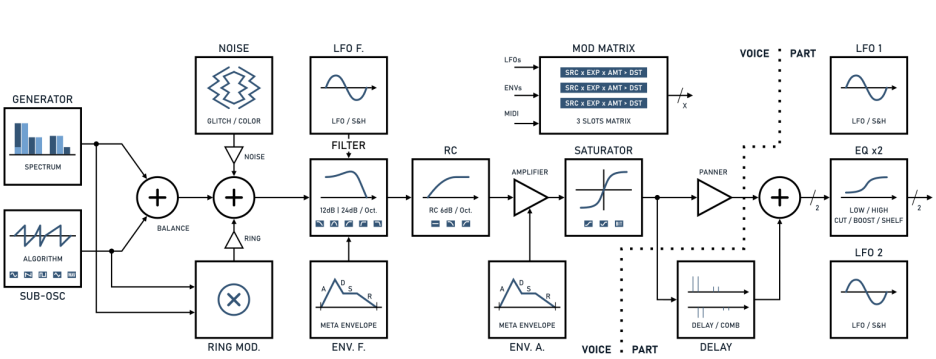
One distinctive characteristic of the Manatee is its shared envelope design. While there are two separate envelopes, one for the filter and one for the amplifier, some of their time parameters (ATTACK, SUSTAIN, and RELEASE) are initially linked. This shared control makes it quick and intuitive to shape the overall contour of a sound with just a few adjustments. When more detailed shaping is needed, the envelopes stages can be individually enabled or disabled, allowing more independence of the envelopes.

With the exception of the three LFOs and the Modulation Matrix, each synthesis block has its own section. The edition of these modules is performed exclusively through the **<MACRO>** knobs. Dedicated buttons labeled **[LFO-1]**, **[LFO-2]**, and **[LFO-F]** are provided, allowing you to quickly jump to the corresponding editing pages without having to scroll manually.

Basics

Signal flow

Let's look at the signal flow. Aside from its unique Spectral Generator, multitimbrality, and MPE support, the Manatee's architecture is quite conventional. It features two oscillators, two envelopes, three LFOs, and two filters with a distortion unit. What truly sets it apart are the innovative functionalities coming within each module, the powerful and flexible modulation system, and the high-quality built-in effects and mixing tools (EQs and Mix reverb).



When exploring the internal modules of the Manatee, it's important to distinguish between Voice, Part, and Multi level modules. Most modules operate per voice, meaning each of the 16 voices has its own independent instance. However, some modules are shared across voices within a part. These include LFO•1, LFO•2, the dual equalizer, delay, spectrum maker, and arpeggiator, all of which are per Part, producing a common output for all voices assigned to that part. Finally, the reverb module is at the Multi level, it is global, with only one instance shared across the entire instrument.

The Manatee is powered by two dual core DSPs, with the processing load being dynamically distributed between them. The resource allocator continuously optimizes performance to deliver the best possible results. To maximize polyphony, you are encouraged to disable unused modules, this frees up DSP cycles. As a rule of thumb, the simpler a preset is, the more voices it can support simultaneously.

Interface

Display

At the **home page** of a Multi or a Part, the screen top left indicates "MUL" or "P1" to "P4" respectively. One reaches the home page by pressing part buttons **[1]** to **[4]** or the **[MULTI]** button.

By default, if the synth is left untouched for 30 seconds, the display will automatically return to the currently edited part home page. This return behavior can be disabled in the system menu.

At a part home page, the configured MIDI channel is displayed after the "C:". The number of voices currently active is displayed after "V:". The percentage on the far right of the top line indicates the processors load. When using effects, this value can be greater than zero even if no notes are played.

The bottom line of the display shows the memory location of the multi (M1 to M16) or bank (A-D or I with the numbers 1 to 64) for parts, as well as the eight-character alphanumeric name assigned to the part and the category name with three letters.

If a Multi has been changed compared to the saved values, i.e. has been edited, an inverted "E" (for Edited) is shown at the top right of the display after "MUL" or the number of the part. An inverted I (for Imported) indicates that a Multi or a Part has been freshly received via SysEx and can now be tried out, but has not yet been saved. Without saving, multis or parts loaded via SysEx are replaced after the program change. This prevents accidental overwriting of data stored in the Manatee by multis and parts received via SysEx.

Interface

Macro Knobs

There are three **<MACRO>** knobs below the display. These are used to edit the parameters seen on the display, e.g. to select the memory bank and the memory number. Sometimes less than three **<MACRO>** knobs are used. Which **<MACRO>** knob does what is determined by the arrangement of the parameters on the display.

If you maintain pressed or lock the **[ALT]** switch while using a **<MACRO>** control, the value is changed in coarse steps. This eases the setting of bipolar parameters to exactly zero or some specific values.

Arrow buttons

You can navigate within the menus using the **[ARROW]** buttons to the right and left of the middle **<MACRO>** knob. The **[ARROW]** buttons can not only be used to scroll within menu pages, allowing access to the "advanced" parameters but also to click through from one section to another, as all menus are chained together, figuratively speaking. And once the last page of the last section is reached, another press of the **[ARROW]** in the current direction will jump back to the beginning, performing a full loop in the pages order.

There are some functions that can ONLY be accessed using the **[ARROW]** buttons.

ALT switch

The **[ALT]** switch grants access to advanced options and hidden features! You can lock the ALT mode by performing a double-click (two quick presses in a row) and unlock it with a single press. When ALT is active, the **[MULTI]** and part **[1]** to **[4]** switches become shortcuts to key menu pages like SETUP, MIDI, REVERBERATION, and ARPEGGIO. Additionally, pressing the **[LFO-1]**, **[LFO-2]** or **[LFO-F]** switches while holding ALT gives quick access to the Modulation Matrix slots.

ALT is also used in combination with any knob to enable coarse parameter editing. A full list of ALT combinations and their functions can be found later in this manual.

Interface

MIDI LED

The **-MIDI-** LED above the left **<MACRO>** knob is context-dependent.
If a part switch, **[1]** to **[4]** below the display is active (lit red), MIDI note events received on the selected part MIDI channel will blink the **-MIDI-** LED. However, the LED does not take into account the selected note range of a part. All other MIDI messages on the channel is ignored. Aftertouch, controller change or MIDI clock messages are not displayed. If the **[MULTI]** switch below the display is active, all MIDI note events triggering one the four parts will blink the **-MIDI-** LED.

Key Combinations

Here is a exhaustive list of the button combinations one can perform:

• **[ALT]** + **[4]** switch: scans all knobs at once and transfers their values to their respective parameters for the currently edited part. This is often called "manual" or "panel" mode. It synchronizes all potentiometers state with their corresponding Preset parameters value.

• **[ALT]** + **[SAVE]** button: opens the Tools pages: Version, Init and MIDI Clock, see **p. 65**.

• Hold **[DRIVE]** button: MIDI panic! All voices played by the Manatee are stopped. All MIDI controllers are also reset and the working memory of the delay is blanked. This function comes in handy when notes are stuck due to corrupted MIDI transmission or when you want to release on-going drones.

• Hold part **[1]** to **[4]** switch: sends a data dump of the part edit buffer via MIDI SysEx. Please refer to "Sending and receiving SysExes" part of this manual.

• Hold **[MULTI]** switch: sends a data dump the multi edit buffer via MIDI SysEx, consisting of the Multi data and the content of the four Parts contained therein, as a total of five SysEx dumps.

• **[ALT]** + **[GEN]** button: opens the Spectrum Editor, see **p. 27**.

• Hold **[ALT]** + Power switch: forces the Manatee to stay in bootloader. The display then shows "...AWAITING SYX...". A new firmware version can then be loaded via SysEx. To abort this procedure, just restart the instrument again without holding any switch or button.

Connection

Power input

At the back of the Manatee, on the left side, you'll find the main power switch used to turn the unit on and off. The Manatee comes with a universal power supply unit, compatible with 100–240 V and 50/60 Hz AC mains. It outputs a regulated 12 V DC through a 2.1 mm barrel connector (center positive), and includes a set of interchangeable mains plugs for international use.

The power supply provides up to 420 mA, while the Manatee typically consumes around 350 mA. To save energy, it is recommended to either unplug the power adapter from the socket or use a switchable power strip to turn it off when the instrument is not in use.

Audio outputs

The Manatee features both a Main and an Auxiliary audio output, each configured as stereo pairs using standard 6.35mm jack sockets. These outputs can also be reconfigured as four separate individual outputs, or one stereo output and two individual outputs, providing flexible routing options.

The Auxiliary output employs a TRS (Tip-Ring-Sleeve) socket. This allows an external audio signal to be fed into the Manatee through the ring contact of any of the Auxiliary output jacks. The input signal is then mixed directly to the Main output without processing, enabling you to connect an external instrument without the need for a mixer or inserting external audio effects on the Auxiliary bus by using the appropriate cables.

With an insert or Y-cable, you can use the Auxiliary outputs and inputs simultaneously. Typically, the two separate ends of such cables follow this convention:

- Black (tip) = output
- Red (ring) = input

Alternatively, the Auxiliary output can be used as a regular simple output, but in this case, an unbalanced TS (Tip-Sleeve) jack cable MUST be used to avoid signal issues.

Finally, the Manatee includes a stereo headphones output over a 3.5 mm socket for private monitoring.

Connection

MIDI DIN Sockets

At the back of the Manatee, next to the power input, you will find the familiar trio of DIN sockets for MIDI IN, THRU, and OUT. These ports are fully compliant with the standard +5V MIDI specification. Nothing fancy, just the reliable, standard MIDI connectivity one can always count on!

Presets & Multis

Overview

The Manatee always boots with the last-used Multi and activates Part 1. A **Multi** is a combination of up to four simultaneous sounds. Each individual sound is called a **Part** (also referred to as a **Preset** when stored independently). The Manatee can play four Parts at the same time. Parts are stored in four user banks ("A" to "D") of 64 slots each, plus the factory bank "I" (64 read-only presets).

A Multi stores its four Parts as self-contained copies. This means that editing a Part from within a Multi and saving that Part to a user slot does *not* alter the Multi, and vice versa: editing a Part outside of a Multi will not silently change any Multi that was already saved with that Part. This isolation prevents accidental overwriting of stored sounds.

Presets & Multis

Loading a Preset

Press one of the Part buttons **[1]**–**[4]** below the display to choose which slot inside the current Multi should receive the new preset (the button lights red). Then use the left **<MACRO>** knob to select a bank ("A"–"D" for user presets, "I" for factory presets), and the centre **<MACRO>** knob to dial in the number (1–64). The stored name and category appear immediately and the preset is loaded on the fly. Selecting "INI" loads a blank initialised preset as a starting point.

> Any unsaved changes to the current preset are lost when a new preset is loaded.

Presets & Multis

Saving a Preset

Make sure the Part you want to save is selected (its button must light red). Press **[SAVE]** to enter save mode, the display shows "SAVE" in the top-left corner. Press any Part button **[1]**–**[4]** at any time to cancel without saving.

Use the **[ARROW]** buttons (left / right of the centre **<MACRO>** knob) to choose the destination bank and slot. The lower display row shows the bank, slot number, and the name already stored there.

Naming: The three **<MACRO>** knobs let you edit the preset name (eight characters):

- **Left <MACRO>** - selects the character set: "ABC" uppercase letters, "abc" lowercase, "123" digits 0–9, "+/-" punctuation and symbols.
- **Centre <MACRO>** - moves the cursor (shown as an underscore) through the eight character positions.
- **Right <MACRO>** - selects the character at the cursor position.

Press **[SAVE]** again to confirm. The Part automatically jumps to the saved slot.

Setting the category: With a Part selected (its button lit), the right **<MACRO>** knob cycles through 20 categories (e.g. PAD, BASS, LEAD) while the preset name is shown on screen. To re-save quickly under the same name and slot, turn to the desired category and press **[SAVE]** twice in succession.

Presets & Multis

Sending and Receiving Presets via SysEx

Hold any Part button **[1]**–**[4]** for approximately 3–4 seconds to transmit the stored preset as a single SysEx file (211 bytes) from the MIDI output. The file can be recorded by a DAW or SysEx librarian for archiving.

A received SysEx preset is loaded into a temporary edit buffer, it does *not* overwrite any stored preset. A small "I" (import) indicator appears in the top-left of the display. Save the imported preset manually to any user slot (banks A–D, slots 1–64) using the normal save procedure described above.

Presets & Multis

Loading a Multi

Press **[MULTI]** below the display (it lights red). Turn either the left or centre **<MACRO>** knob to step through the 16 Multi slots (M01–M16). The name appears immediately and the Multi is loaded on the fly. Selecting "INI" loads a blank Multi for building a new combination from scratch.

> Unsaved edits to the current Multi are discarded when a new Multi is loaded.

Presets & Multis

Saving a Multi

The **[MULTI]** button must be lit before you can save a Multi. Press **[SAVE]**, choose a destination slot (M01–M16) with the **[ARROW]** buttons, edit the name with the three **<MACRO>** knobs (same procedure as for preset names), and press **[SAVE]** again to confirm. The Multi is saved together with all four of its Parts as self-contained copies.

Presets & Multis

Sending and Receiving Multis via SysEx

Hold **[MULTI]** for approximately 3–4 seconds to transmit five SysEx files in sequence: one Multi file (101 bytes) followed by the four Part files (211 bytes each). Some DAWs require multi-message reception to be enabled in their settings.

The four individual Part files can also be sent separately back to Manatee and saved independently to any user slot. The Multi file itself cannot be applied without also having the four Parts present.

> **Quick backup:** hold **[MULTI]** for 3–4 s at any time to dump the current working state to your DAW, even if you haven't pressed **[SAVE]** yet. The dump reflects the in-memory state, not the last saved state.

Presets & Multis

Part MIDI Parameters

Each Part within a Multi has its own MIDI channel, note range, velocity range, and audio routing. These settings are stored in the Multi, not in the Part. Select the Part you want to configure first (press **[1]**–**[4]**), then hold **[ALT]** and press **[1]** (legend MIDI) to open the Part MIDI pages. Three pages are available.



NHI

Note High

0 – 127

Highest MIDI note number this Part will respond to. Set to 127 to cover the full keyboard when splitting by channel only.

CHN

MIDI Channel

1 – 16 · OMNI · OFF

MIDI channel this Part listens on. "OMNI" responds to all channels. "OFF" silences the Part via MIDI.

NLO

Note Low

0 – 127

Lowest MIDI note number this Part will respond to. Set to 0 for the full range.

*Page 1/3 · Hold **[ALT]** + **[1]** (MIDI) to open this section.*



VHI

Velocity High

0 – 127

Highest velocity this Part sounds. Set to 127 for no upper velocity limit.

VLO

Velocity Low

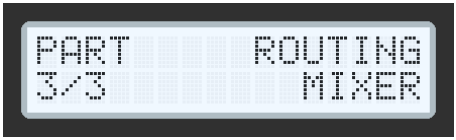
0 – 127

Lowest velocity this Part sounds. Combine with VHI to create velocity layers, e.g. a soft pad on 0–63 and a bright lead on 64–127.

Page 2/3

Presets & Multis

Part MIDI Parameters (continued)



`ROUTING`

Audio Output Routing

MIXER · MAIN · AUX · MAIN-LEFT · MAIN-RIGHT · AUX-LEFT · AUX-RIGHT

"MIXER" - Part enters the internal mixer; the **<AUX>** and **<MAIN>** knobs on the front panel set its send levels.

"MAIN" / "AUX" - stereo direct output to the Main or Aux output pair, bypassing the mixer.

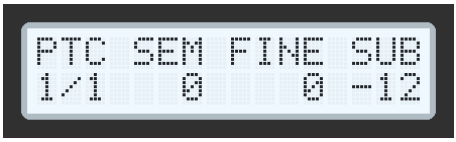
"MAIN-LEFT", "MAIN-RIGHT", "AUX-LEFT", "AUX-RIGHT" - mono direct output to a single jack. Route four Parts to four individual outputs for separate mixing or recording.

Page 3/3

Sound Generation

Every Part on the Manatee is built around a signal chain: **Spectrum Oscillator** and **Sub Oscillator** are the two primary sources, with **Ring Modulator** and **Noise Generator** as additional sources. These feed into the **Filter** and **Drive** section, then through the **Amplitude Envelope (EG-A)**, two parametric **EQs**, and the **Delay** effect. The **Reverb** is a shared Multi-level effect applied after the mixer. Three **LFOs**, two **Envelopes**, and a three-slot **Modulation Matrix** connect modulation sources to nearly any parameter.

The overall pitch of the Spectrum and Sub oscillators is set together by the **<PITCH>** knob and by the PTC (Pitch) and BAL (Balance) pages, accessible by pressing **[PLAY]** and stepping right with the **[ARROW]** buttons.



SUB

Sub Semitone

−36 – +36 semitones

Transposes the Sub Oscillator independently of the Spectrum Oscillator. Useful for organ-style intervals or layered fifths.

SEM

Semitone

−36 – +36 semitones

Transposes both oscillators together in semitone steps.

FINE

Fine Tune

−50 – +50 cents

Fine-tunes both oscillators together. Use **[ALT]** + Macro to snap exactly to 0.

*Press **[PLAY]** then ▶ to reach this page.*



GEN

Generator Level

0 – 255

Output level of the Spectrum Oscillator.

SUB

Sub Level

0 – 255

Output level of the Sub Oscillator.

BAL

Balance

−64 – +64

Stereo pan position of the mixed oscillator signal. Negative values pan left, positive values pan right. Can be modulated for ensemble effects.

Page immediately after PTC.

Sound Generation

Spectrum Oscillator

The Spectrum Oscillator uses *additive synthesis*: up to 8 harmonics form a **Spectrum**, and each harmonic is rendered using the selected **Wavelet** shape. Because each wavelet already contains its own overtones, the convolution of wavelet and spectrum can produce very rich timbres, far beyond what pure sinusoidal additive synthesis yields. The resulting waveform is visualised as a bar graph in the lower-left of the display whenever this page is active.

Eighteen spectra are available per Part: one editable USER spectrum plus seventeen factory presets. The **<SPECTRUM>** knob on the front panel selects the BASIS directly. The **[GEN]** button selects the Wavelet.



BASIS

Spectrum Basis

18 spectra, see **table p. 75**

Selects one of the 18 spectra. The **<SPECTRUM>** knob edits the same parameter. The bar graph on the display updates instantly.

WAV

Wavelet

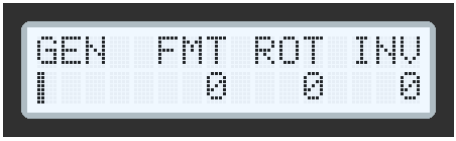
OFF · SIN · SAW · SQR · THI · NAR

Waveform convolved with each harmonic. "OFF" silences the generator. "THI" (thick pulse) and "NAR" (narrow pulse) add dense harmonic content. The **[GEN]** button cycles through these values on the front panel.

*Press **[GEN]** to navigate here.*

Sound Generation

Spectrum Oscillator (continued)



INV

Inversion

0 – 255

Swaps the amplitudes of strong and weak harmonics. At extreme values the result sounds completely different from the original spectrum.

FMT

Formant

−127 – +127

Shifts harmonic energy toward higher (positive) or lower (negative) partials, tilting the spectral envelope. Also the **<FORMANT>** knob on the front panel.

ROT

Rotation

−127 – +127

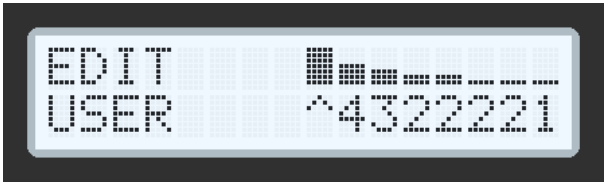
Shifts all harmonics up or down by the same amount, a circular rotation of the spectrum.

*Press **[ALT]** + **[GEN]** to open the Spectrum Editor and draw your own harmonic content for the "USER" spectrum, see* **p. 27**.

Sound Generation

Spectrum Editor

The Spectrum Editor lets you draw your own spectrum by setting the level of each of the eight harmonics of the Spectrum Oscillator. Hold **[ALT]** and press **[GEN]** to open it. The result is the Part's "USER" spectrum, stored with the Preset when you save it.



The top line shows "EDIT" and a bar graph of the eight harmonics. The bottom line shows the name of the selected spectrum and the level of each harmonic, from "0" to "8". The "^" marks the harmonic being edited.

Control	Function
Left **<MACRO>**	Creates a new random spectrum and selects "USER".
Centre **<MACRO>**	Selects the basis spectrum, see **p. 75**.
Right **<MACRO>**	Sets the level of the harmonic under the "^", in 16 steps.
[ARROW]	Moves the "^" to the previous or next harmonic.
[GEN]	Still selects the waveform applied to each harmonic.
[1]–**[4]**	Leaves the Spectrum Editor.

When a factory spectrum is selected, turning the right **<MACRO>** first copies it into "USER", so you always edit a copy and the factory spectra stay unchanged. The rest of the front panel stays active while the editor is open, so you can play and shape the sound as you edit.

Sound Generation

Sub Oscillator

The Sub Oscillator is a full second oscillator, not just a simple sub-octave generator. It runs independently from the Spectrum Oscillator and supports five classic waveforms plus FM synthesis. When SINE or TRIANGLE is selected, an internal modulator oscillator frequency-modulates the Sub Oscillator, producing metallic FM timbres. For SAW and SQR, the CNT parameter acts as pulse-width / wave-folding control, similar to PWM.

<table>
<tr>
<td>
</td>
<td>MOD
LFO-2 → Content
0 – 255
Depth of LFO-2 modulation applied to the CNT parameter. For pulse waveforms this creates PWM; for FM waveforms it modulates FM depth. Front-panel <LFO-2> knob.</td>
</tr>
<tr>
<td>WAV
Waveform
OFF · SIN · SAW · SQR · TRI · WAV
"OFF" disables the Sub Oscillator, as in an init preset. "SIN" and "TRI" enable FM mode on page 2/2. "WAV" uses an additional custom waveform slot (experimental). The [SUB] button cycles waveforms.</td>
<td>CNT
Content
0 – 255
For "SQR"/"SAW": pulse-width / wavefold amount (similar to PWM). For "SIN"/"TRI": FM modulation depth. The <CONTENT> knob edits this directly.</td>
</tr>
<tr>
<td colspan="2">Press [SUB] button to navigate here. Page 1/2.</td>
</tr>
</table>

Sound Generation

Sub Oscillator (continued)



EGF

Env-F → FM Depth

0 – 255

Modulates FM depth (CNT) with the Filter Envelope. Creates classic attack-transient FM timbres, the "electric piano" effect.

RATE

FM Ratio

/4 · /2 · x1 · x2 · x3 · x4 · x5

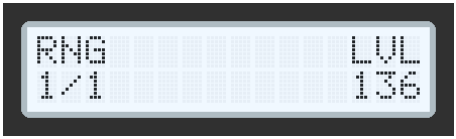
Frequency ratio of the FM modulator relative to the Sub Oscillator. "/4" and "/2" are sub-ratios; "x1" through "x5" are harmonic multiples. Only active in SINE or TRIANGLE mode.

Page 2/2 - only active in SINE or TRIANGLE waveform mode.

Sound Generation

Ring Modulator

The Ring Modulator multiplies the Spectrum Oscillator and Sub Oscillator signals, producing sum and difference frequencies of all partials. Two detuned or harmonically unrelated sources yield abstract, metallic or bell-like timbres. Activate it by pressing the **[RING]** button (lights red when active).



LVL

Level

0 – 255

Output level of the Ring Modulator signal added to the main signal path.

*Press **[RING]** to enable. Navigate to RNG page with the **[ARROW]** buttons.*

Noise Generator

The Noise Generator produces white noise that can be shaped by Sample-and-Hold rate and a tonal colour control. A low SNH rate gives classic analog-style noise; higher rates produce 8-bit / digital textures. Activate with the **[NOISE]** button (lights red when active).



LVL

Level

0 – 255

Output level of the noise signal.

SNH

Sample & Hold Rate

0 – 255

Controls the noise sample rate. At 0 the noise sounds like classic analog white noise. Higher values reduce the sample rate, adding a grainy, lo-fi digital character.

COL

Colour

−64 – +64

Tone colour. Negative values apply a low-pass filter (darker noise); positive values apply a high-pass filter (brighter, thinner noise). At extreme values the noise level drops significantly.

*Press **[NOISE]** to enable. Navigate to NOI page.*

Sound Generation

Filter

The main filter is a multi-mode digital filter. The front-panel **<CUTOFF>**, **<RESO>**, **<EG-F>** and **<LFO-F>** knobs control it directly. The **[MODE]** button cycles through models. The display shows a live frequency-response graph whenever this page is open.



RES

Resonance

0 – 255

Emphasises frequencies around the cutoff. At maximum values the filter begins to self-oscillate. Front-panel **<RESO>** knob.

MDL

Filter Model

OFF · LP2 · BP2 · HP2 · LP4 · HP4 · NTC · LP · HP

"LP2"/"LP4" - lowpass, 12 or 24 dB/oct. "BP2" - bandpass. "HP2"/"HP4" - highpass. "NTC" - notch (resonance controls depth). "LP"/"HP" - gentle 6 dB/oct RC-type filters. The **[MODE]** button cycles through these.

CUT

Cutoff

0 – 255

Filter cutoff frequency. Front-panel **<CUTOFF>** knob.

*Press the filter **[MODE]** button. Page 1/3 (GLYPH footer shows filter curve).*



TRCK

Keyboard Tracking

−200% – +200%

Scales the cutoff frequency with the played note. At 100% the cutoff tracks pitch exactly, preserving timbre across the keyboard.

EGF

Envelope-F Amount

−64 – +64

Bipolar modulation depth of the Filter Envelope on cutoff. Front-panel **<EG-F>** knob.

LOF

LFO-F Amount

−64 – +64

Bipolar modulation depth of LFO-F on cutoff. Front-panel **<LFO-F>** knob.

Page 2/3.

Sound Generation

RC Filter

A second, gentler filter cascades after the main filter. It uses a simple one-pole (6 dB/oct) topology, like a classic RC network, and can be linked to follow the main filter's cutoff and its modulations via the TRCK parameter.

<table>
<tr>
<td>
</td>
<td>TRCK
Tracking
NONE · NOTE · FCUT
"NONE" - RC filter is independent. "NOTE" - inherits the main filter's keyboard tracking amount. "FCUT" - RC cutoff moves in lockstep with the main cutoff and all its modulations (EGF, LFO-F, etc.).</td>
</tr>
<tr>
<td>RCF
RC Filter Model
NO · LP · HP
Selects RC lowpass, highpass, or disables the RC filter.</td>
<td>CUT
RC Cutoff
0 – 255
Sets the independent cutoff frequency of the RC filter.</td>
</tr>
<tr>
<td colspan="2">Filter page 3/3.</td>
</tr>
</table>

Sound Generation

Drive / Saturation

After the filters the signal passes through the Drive section. The front-panel **[DRIVE]** button selects the model and **<DRIVE>** sets the intensity. The display shows the saturation curve. Holding **[DRIVE]** sends an All-Notes-Off command and clears reverb and delay buffers.



`MIX`

Dry/Wet Mix

−64 – +64

Blends the dry and effected signals. At 0 both are equal. At +64 only the saturated signal is heard.

`MODE`

Drive Model

PURE · TUBE · FUZZ · BITC · COMP

"PURE" - transparent gain (use DRV to boost signal level after heavy filtering). "TUBE" - soft tube saturation. "FUZZ" - hard clipping distortion. "BITC" - bit crusher (audible digital artefacts at high drive). "COMP" - compressor.

`DRV`

Drive

0 – 255

Intensity of the effect. Front-panel **<DRIVE>** knob.

*Press **[DRIVE]** button to navigate here.*

Sound Generation

Envelopes

There are two envelope generators: **EG-F** (Filter) and **EG-A** (Amplitude). Rather than two full sets of knobs, they are driven by one **meta envelope**: the attack, sustain and release set with **<ATTACK>**, **<SUSTAIN>** and **<RELEASE>** apply to both envelopes at once. Each envelope then keeps its own decay, set with its own **<DECAY>** knob, and its own mode: its **[ATTACK]** and **[SUSTAIN]** buttons switch the attack and sustain stages on or off for that envelope only.

One gesture therefore reshapes both envelopes, while the decays and modes still let them differ: for example a short filter blip over a long, sustained volume envelope. With **[ALT]**, the same buttons switch RESET and CYCLE (legends RESET and LOOP).



REL

Release

0 – 255

Shared release time for both EG-F and EG-A. Front-panel **<RELEASE>** knob.

ATK

Attack

0 – 255

Shared attack time for both EG-F and EG-A. Front-panel **<ATTACK>** knob.

SUS

Sustain

0 – 255

Shared sustain level for both EG-F and EG-A. Front-panel **<SUSTAIN>** knob.

*Turn **<ATTACK>**, **<SUSTAIN>** or **<RELEASE>** to reach the ENV page.*



AMT

Amount

0 – 255

Modulation depth applied to the TARGET set on page 3/4. Works in conjunction with the EXPRESSOR.

DEC

Decay

0 – 255

EG-F decay time. Independent of EG-A. Front-panel **<DECAY>** knob of EG-F.

VE

Velocity

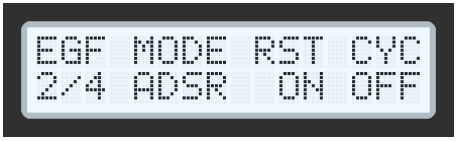
0 – 255

How strongly MIDI velocity scales the envelope amplitude. At 0 the envelope is velocity-independent.

EG-F page 1/4.

Sound Generation

Envelopes (continued)



`CYC`

Cycle (Loop)

-- · ON

When ON, the envelope loops continuously, useful for repeating rhythmic timbral effects without a held note.

`MODE`

Envelope Mode

xDxR · ADxR · xDSR · ADSR · GATE · AxxR

Selects which ADSR stages are active. "x" marks a disabled (zero) stage. "GATE" is instant rise/fall. "AxxR" skips Decay and Sustain. Also controllable via front-panel buttons.

`RST`

Reset

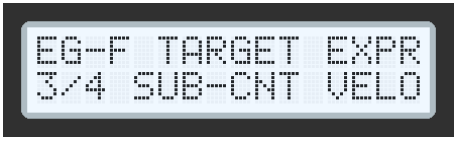
-- · ON

When ON (digital mode), Attack always starts from zero. When OFF (analog mode), Attack starts from the current envelope level, preserving the natural release tail of the previous note.

EG-F page 2/4.

Sound Generation

Envelopes (continued)



EXPR

Expressor

19 expressors, see **table p. 74**

Scales the modulation depth dynamically. For example, "MODW" makes the envelope's extra modulation amount follow the mod wheel.

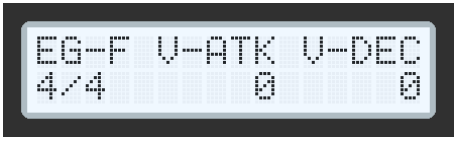
TARGET

Modulation Target

20 targets, see **table p. 72**

Optional second modulation target for EG-F (in addition to the fixed filter-cutoff routing via the front-panel **<EG-F>** knob).

EG-F page 3/4.



V-DEC

Velocity → Decay

0 – 255

Higher velocity shortens the Decay time.

V-ATK

Velocity → Attack

0 – 255

Higher velocity shortens the Attack time. A soft touch produces a slow fade-in; a hard hit produces an instant attack.

EG-F page 4/4.

EG-A (Amplitude Envelope) has exactly the same four pages as EG-F, described above. Turn its **<DECAY>** knob, or press one of its **[ATTACK]** / **[SUSTAIN]** buttons, to reach them.

Sound Generation

Envelopes (continued)



AMT

Amount

0 – 255

Modulation depth for EG-A's optional TARGET (page 3/4).

DEC

Decay

0 – 255

EG-A decay time. Front-panel **<DECAY>** knob of EG-A.

VE

Velocity

0 – 255

Velocity scaling of the EG-A amplitude.

EG-A page 1/4.

Sound Generation

Envelopes (EG-A continued)



CYC

Cycle

-- · ON

Looping mode for EG-A.

MODE

Envelope Mode

xDxR · ADxR · xDSR · ADSR · GATE · AxxR

Active ADSR stages for EG-A. Same options as EG-F.

RST

Reset

-- · ON

EG-A reset mode (digital vs analog retrigger behaviour).

EG-A page 2/4.



EXPR

Expressor

19 expressors, see **table p. 74**

Scales EG-A's target modulation dynamically.

TARGET

Modulation Target

20 targets, see **table p. 72**

Optional additional modulation target for EG-A beyond its default amplitude routing.

EG-A page 3/4. Page 4/4 (V-ATK / V-DEC) is identical to EG-F.

Sound Generation

Vibrato LFO

A dedicated per-Part LFO pre-wired to pitch. Always active, not in the Modulation Matrix. Reach it via **[PLAY]** → ▶▶.



AMT

Vibrato Depth

0 – 255 (MODW)

Depth of pitch modulation. Values above 0 create permanent vibrato even at modwheel 0. The Mod Wheel (CC#1) can increase depth beyond this base value.

FRQ

Vibrato Rate

0 – 255

Vibrato LFO speed. Set to 0 to disable.

RISE

Rise Time

0 – 32

Slow fade-in time for the vibrato. Mimics the natural vibrato swell of a wind or string player.

Tremolo LFO

A dedicated per-Part LFO pre-wired to amplitude. Reach via **[PLAY]** → ▶▶▶. Intensity is also controllable via MIDI CC#79.



AMT

Tremolo Depth

0 – 255 (MODW)

Depth of the volume modulation. Remote-controllable via MIDI CC#79.

FRQ

Tremolo Rate

0 – 255

Tremolo LFO speed. Set to 0 to disable.

RISE

Rise Time

0 – 32

Slow fade-in time for the tremolo depth.

Sound Generation

Play Modes

Each Part can be played in mono, legato, poly, or any of those with Unison voices. In Unison modes several voices play the same note simultaneously, detuned and panned for a rich ensemble effect. Unison modes use 2 voices per note, so the number of notes a Part can play at once is halved. Switch modes with the **[PLAY]** button or in this menu. The front-panel LEDs indicate the current mode.



WID

Unison Width

0 – 255

Stereo spread of the Unison voices. 0 = mono stack; 255 = maximum stereo spread. Use with DET for binaural pads.

MODE

Play Mode

MONO · LEGA · POLY · MONO (uni) · LEGA (uni) · POLY (uni)

"MONO" - monophonic, last note priority. "LEGA" - legato (no retrigger on held notes). "POLY" - polyphonic, up to available voices. The three Unison variants add stacked voices with detuning.

DET

Unison Detune

0 – 255

Detune amount between Unison voices. Small values create a lush chorus; large values give fat, almost atonal stacks.

*Press **[PLAY]** to open. Page 1/2.*



VOL

Part Volume

0 – 255

Per-preset volume level. Approximately 192 is a good starting point, leaving headroom to compensate for heavy filtering.

GLIDE

Glide (Portamento)

0 – 32

Portamento time. Notes slide smoothly from the previous pitch to the new one. At 0 portamento is disabled.

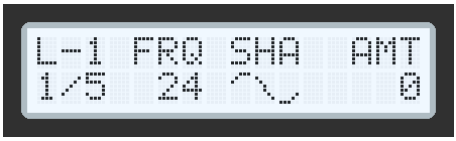
Page 2/2.

Sound Generation

LFOs

The Manatee has five LFOs per Part. **LFO-1** and **LFO-2** run at Part level (shared by all voices of a Part). **LFO-F** runs per voice (each voice has its own independent phase). Two additional hidden LFOs are dedicated to Vibrato and Tremolo.

All three main LFOs offer 19 waveform shapes selectable across three shape slots (SHA/SHB/SHC). When two or three shapes are active, each shape plays exactly one full cycle before advancing to the next, enabling complex multi-phase modulation patterns. LFO-F is permanently routed to filter cutoff via the front-panel **<LFO-F>** knob, and additionally to any Target set in its menu.



AMT

Amount

−127 – +127

Modulation depth applied to the TARGET parameter (set on page 3/5). Can be further scaled by the EXPRESSOR.

FRQ

Rate

0 – 255

LFO frequency. Its LED (**-LFO-1-**, **-LFO-2-** or **-LFO-F-**) blinks in time.

SHA

Shape A

19 shapes, see **table p. 76**

Primary waveform. "FLAT" outputs a constant offset (useful as a DC source when combined with SHB/SHC). "NONE" disables the LFO completely.

*Press **[LFO-1]**, **[LFO-2]** or **[LFO-F]** to open. Page 1/5.*

Sound Generation

LFOs (continued)



PHAS

Start Phase

FREE · RAND · VELO · 0° · 30° · 45° · 90° · 120° · 180° · 240° · 270°

Phase of the LFO at note start. "FREE" - runs continuously (analog-style). "RAND" - random per note. "VELO" - phase depends on velocity. Fixed degree values reset to a defined point.

SHB

Shape B

(same as SHA)

Second waveform segment. Active only when SHA ≠ NONE. One full cycle of SHB plays after SHA completes.

SHC

Shape C

(same as SHA)

Third waveform segment, playing after SHB.

Page 2/5.



EXPR

Expressor

19 expressors, see **table p. 74**

Real-time scaler for LFO amount. For example, "MODW" makes the modulation deepen as you push the mod wheel.

TARGET

Modulation Target

18 targets, see **table p. 72**

Destination parameter for this LFO. Note: LFO-F has a separate fixed route to filter cutoff via the front-panel knob; this TARGET is additive to that.

Page 3/5.

Sound Generation

LFOs (continued)



CK

Clocked

-- · ON

Enables MIDI-clock synchronisation. When ON, DURA sets the LFO period as a musical note value and FRQ (page 1/5) is ignored.

DURA

Duration

NONE · 8 BR · 7 BR · … · 1/4 · 3/16 · 1/6 · 1/8 · 1/12 · 1/16 · 1/24

LFO period in musical note values (when CK = ON). Covers from 8 bars down to 1/24 note. "NONE" keeps the free-running rate but still allows SYNC to reset the phase.

SYNC

Sync Reset

(same note values as DURA)

Resets the LFO phase on each clock boundary at this note value. Setting a shorter value than DURA truncates the waveform, which can create interesting harmonic effects.

Page 4/5.



FALL

Fall Time

OFF · 1 – 63 · INF

Fade-out time after note release. "INF" keeps the LFO running indefinitely after note-off, the default analogue-style behaviour. Finite values let the modulation fade gracefully.

1S

One-Shot

-- · ON

When ON, the LFO (including all active shapes) plays exactly one cycle then stops. Useful for one-time pitch sweeps or filter clicks.

RISE

Rise Time

OFF · 1 – 63

Delayed LFO: the amplitude slowly builds up from zero at note start. Creates the "auto-vibrato" effect common in wind/string patches.

Page 5/5.

Sound Generation

LFOs (continued)

LFO-2 and LFO-F have the same five pages as LFO-1. Press **[LFO-2]** or **[LFO-F]** to access them. LFO-F additionally modulates filter cutoff via the front-panel **<LFO-F>** knob at all times, independent of its TARGET setting. As it runs per voice, LFO-F offers the per-voice targets rather than those of LFO-1 and LFO-2 (see **table p. 72**).



AMT

LFO-2 Amount

−127 – +127

LFO-2 is also directly available as the MOD parameter in the Sub Oscillator (page 1/2), providing quick PWM modulation without using the Modulation Matrix.

FRQ

LFO-2 Rate

0 – 255

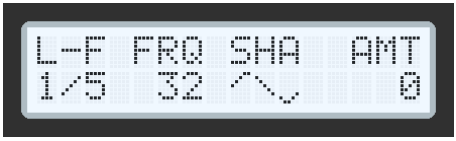
Press **[LFO-2]** to access LFO-2 pages.

SHA

LFO-2 Shape A

(same as LFO-1)

LFO-2 pages are identical in structure to LFO-1.



AMT

LFO-F Amount

−127 – +127

Front-panel **<LFO-F>** knob sets the cutoff modulation depth directly. This menu AMT applies to the optional extra TARGET.

FRQ

LFO-F Rate

0 – 255

LFO-F runs per voice, each voice has its own independent phase. Press **[LFO-F]** to access.

SHA

LFO-F Shape A

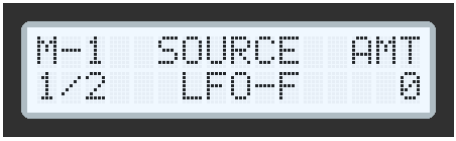
(same as LFO-1)

LFO-F pages are identical in structure to LFO-1.

Sound Generation

Modulation Matrix

Three modulation slots (**M-1**, **M-2**, **M-3**) each connect a SOURCE to a TARGET with a scalable AMOUNT and an optional EXPRESSOR that varies the depth in real time. These slots complement, rather than replace, the modulation already available within each LFO and Envelope menu. Hold **[ALT]** and press **[LFO-1]**, **[LFO-2]** or **[LFO-F]** (legends M-1, M-2 and M-3) to open slot M-1, M-2 or M-3.



AMT

Amount

−127 – +127

Modulation depth. Bipolar: negative values invert the modulation direction.

SOURCE

Modulation Source

17 sources, see **table p. 73**

The DC sources (fixed positive offsets) are useful for combining with an EXPRESSOR to route performance controllers, for example, "DC100%" with EXPR set to "MODW" makes the mod wheel directly control the target.

*M-1 page 1/2. Navigate to M-1, M-2, M-3 with the **[ARROW]** buttons.*

Sound Generation

Modulation Matrix (continued)



EXPR

Expressor

19 expressors, see **table p. 74**

Scales the modulation amount dynamically using a performance controller or internal signal.

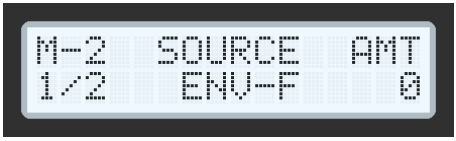
TARGET

Modulation Target

33 targets, see **table p. 72**

The Matrix provides access to targets not available in individual LFO/Envelope menus, such as Generator Pitch, Sub Pitch, Noise parameters, and Delay settings.

M-1 page 2/2. M-2 and M-3 have identical pages.



AMT

M-2 Amount

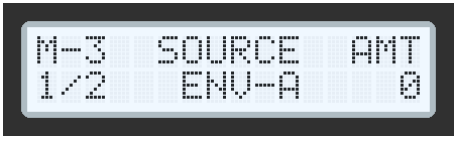
−127 – +127

SOURCE

M-2 Source

(same as M-1)

Second modulation slot.



AMT

M-3 Amount

−127 – +127

SOURCE

M-3 Source

(same as M-1)

Third modulation slot.

Sound Generation

Mixer

The Mixer combines the four Parts and routes them to the Main and Aux outputs. Three front-panel knobs - **<REVERB>**, **<AUX>** and **<MAIN>** - provide global send levels for the hall, and the two output pairs. The **[MIXER]** button opens the per-Part mixer menu, which contains three pages. Note: the Mixer only processes Parts whose ROUTING is set to "MIXER" (see Part MIDI Parameters).



MST

Main Level

0 – 255

Send level from this Part to the Main stereo output pair.

REV

Reverb Send

0 – 255

Amount of this Part's signal sent to the Reverb unit. The global **<REVERB>** knob sets the reverb return level.

AUX

Aux Level

0 – 255

Send level from this Part to the Aux stereo output pair.

*Press the **[MIXER]** button. Page 1/3. Select the Part first with **[1]–[4]**.*



FIN

Fine Tune

−50 – +50 cents

Fine pitch offset for this Part within the Multi.

SEM

Semitone Transpose

−36 – +36 semitones

Transposes this Part within the Multi. Stored in the Multi, not in the Part, useful for creating layered intervals.

Page 2/3.

Sound Generation

Mixer (continued)



LVL

Level

0 – 255

Volume of this Part in the mixer. Controllable via MIDI CC#7. Avoid very low values that are hard to recover from.

PAN

Pan

−64 – +64

Stereo pan position of this Part in the mixer. Controllable via MIDI CC#10.

Page 3/3. Stored in the Multi.

Sound Generation

Reverb

The Reverb is a Multi-level effect: one Reverb unit is shared across all Parts in a Multi. Its settings are stored in the Multi. The Reverb is only audible on Parts whose ROUTING is set to "MIXER". The Reverb output always appears at the Main Out and headphone output only. Open the Reverb menu with **[ALT]** + **[2]** (legend REV).



FBK

Feedback

0 – 255

Recirculation of the reverb signal. Higher values extend the tail; at 255 the reverb sustains indefinitely.

MDL

Reverb Model

NONE · HALL · ROOM · SPACE

Selects the reverb algorithm. "NONE" disables the reverb and frees DSP resources.

DIF

Diffusion

0 – 255

Echo density of the reverb tail. Low values give a metallic, grainy reverb; higher values smooth the tail into a lush wash.

*Hold **[ALT]** + **[2]** (REV) to open. Page 1/3.*



SIZ

Size

0 – 255

Virtual room size, affecting pre-delay and modal resonances. Low values produce tight, small-room ambience; high values simulate a cathedral.

VIBE

Vibe

DARK · BRGH

Overall character of the reverb. Subtle difference in tonality.

COL

Colour

0 – 64

Tone control for the reverb signal, darker or brighter.

Page 2/3.

Sound Generation

Reverb (continued)



LVL

Reverb Output Level

0 – 255

Pre-fader output level of the reverb, before the front-panel **<REVERB>** knob.

MONO

Mono Mode

OFF · ON

Collapses the reverb to mono when ON.

Page 3/3.

Sound Generation

Delay

The Delay is a Preset-level effect, so each Part has its own independent delay. It operates in parallel with the Part's dry signal. Models include a classic stereo echo, a Ping-Pong delay, and a Comb Filter. Delay TIME and FEEDBACK are available as Modulation Matrix targets, enabling chorus-style modulation with a slow LFO on TIME. Open the Delay menu with **[DELAY]**.



FBK

Feedback

0 – 255

How much of the delay output feeds back into the input. High values create long repeating echo trails.

MDL

Delay Model

NONE · ECHO · PGPG · COMB

"ECHO" - stereo echo. "PGPG" - ping-pong (alternate L/R). "COMB" - comb filter for metallic textures and extreme modulation effects.

TIM

Delay Time

0 – 255

Delay time. When changed while audio is playing, the pitch of existing echoes shifts transiently, useful for chorus effects when a triangle LFO slowly modulates this.

*Press **[DELAY]** button. Page 1/4 (GLYPH shows delay curve).*



VIBE

Vibe

DARK · BRGH

Tone character of the delay repeats.

POL

Polarity

POS · NEG

Inverts the polarity of the feedback signal. With negative polarity and short times, certain frequencies cancel or emphasise, useful for phaser-like effects with the Comb model.

COL

Colour

−64 – +64

Tone filter on the feedback path. Negative = low-pass (repeats get darker each echo); positive = high-pass (repeats get thinner).

Page 2/4.

Sound Generation

Delay (continued)



LVL

Delay Level

0 – 255

Output level of the delay effect mixed with the dry signal.

MONO

Mono

OFF · ON

Collapses the delay to mono.

Page 3/4.



CK

Clocked

-- · ON

Enables MIDI-clock sync. When ON, DURA sets the echo time as a note value; the TIM parameter on page 1/4 is ignored.

DURA

Duration

NONE · 8 BR · … · 1/24

Echo time as a musical note value (when CK = ON).

SYNC

Sync

(same note values)

Clears the delay buffer at this note-value interval, cutting off long echo tails rhythmically. Must be ≥ DURA.

Page 4/4.

Sound Generation

EQ1 and EQ2

Two parametric EQs sit after the Delay and before the Reverb send in the signal path. Both are Preset-level (per Part). They share the same parameter set: model, centre frequency and amplitude. Both CNT and AMP are available as Modulation Matrix targets, enabling dynamic EQ via velocity, LFO, or envelope. Open with **[EQS]**.

> The EQ curve in the lower-left corner of the display appears on an inverted background when the EQ is not available: the sound engine is already using too much DSP power to run it.



AMP

EQ1 Amplitude

0 – 255

Strength of the EQ effect at the selected frequency. Not available for LOCT and HICT (which have no gain control).

MDL

EQ1 Model

OFF · LOCT · LOSH · LOBO · HICT · HISH · HIBO · PKSH · PKBO · NOTC · COMP

EQ type (see table below).

CNT

EQ1 Centre

0 – 255

Centre frequency of the EQ effect.

*Press **[EQS]**. EQ1 page (GLYPH shows EQ curve).*



AMP

EQ2 Amplitude

0 – 255

Same as EQ1 AMP.

MDL

EQ2 Model

OFF · LOCT · LOSH · LOBO · HICT · HISH · HIBO · PKSH · PKBO · NOTC · COMP

Same models as EQ1. EQ1 and EQ2 are cascaded.

CNT

EQ2 Centre

0 – 255

Centre frequency of EQ2.

EQ2 page.

Sound Generation

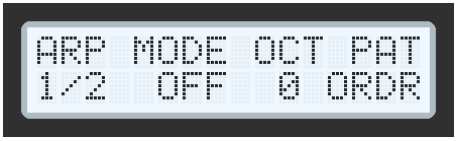
EQ1 and EQ2 (continued)

Code	Name	Description
OFF	Bypass	EQ disabled; frees DSP resources.
LOCT	Low Cut	Rolls off frequencies below CNT. No AMP parameter.
LOSH	Low Shelf	Attenuates or boosts the low-frequency shelf below CNT.
LOBO	Low Boost	Boosts frequencies below CNT.
HICT	High Cut	Rolls off frequencies above CNT. No AMP parameter.
HISH	High Shelf	Attenuates or boosts the high-frequency shelf above CNT.
HIBO	High Boost	Boosts frequencies above CNT.
PKSH	Peak Shelf	Attenuates a narrow band around CNT.
PKBO	Peak Boost	Boosts a narrow band around CNT.
NOTC	Notch	Deep cut at CNT, useful for removing resonances.
COMP	Compressor	Dynamic range compression; CNT = threshold, AMP = ratio.

Arpeggiator

Each Part has its own independent Arpeggiator. All Arpeggiatiors synchronise to the same tempo source (internal BPM, MIDI Clock or Analog Clock, set in Setup). The Arpeggiator can be very powerful in Multi mode: assign different Parts to different MIDI channels with different ARP patterns and use HOLD mode to create evolving rhythmic textures.

Open the Arpeggiator menu with **[ALT]** + **[3]** (legend ARP).



PAT

Pattern

ORDER · UP · DOWN · UP&DN · DN&UP · WALK · RAND

Playback order of the held notes. "ORDER" - as played. "UP"/"DOWN" - sorted by pitch. "UP&DN"/"DN&UP" - bouncing. "WALK" - varying order. "RAND" - random.

MODE

Mode

OFF · ON · HOLD

"ON" - arpeggiate held notes. "HOLD" - notes continue arpeggating after keys are released.

OCT

Octaves

0 – 7

Number of additional octaves the pattern repeats upward. 0 = single octave. 7 = 8 octaves total.

*Hold **[ALT]** + **[3]** (ARP). Page 1/2.*



MSK

Mask

ALL · M1 · M2 · M3 · M4 · M5 · M6 · M7

Rhythmic mask. "ALL" - every step plays. "M1" to "M7" insert rests to create rhythmic patterns, see **table p. 74**.

GRD

Grid

96 · 64 · 48 · 32 · 24 · 16 · 12 · 8 · 6 · 3 (MIDI ticks)

Time between consecutive arpeggiator steps, in MIDI clock ticks (24 ticks = 1 quarter note). 96 = whole note, 24 = quarter, 6 = 1/16.

GAT

Gate

(same tick values as GRD)

Duration of each note. If GAT > GRD, notes overlap. If GAT < GRD, there is silence between notes.

Page 2/2.

Setup

The Setup pages hold global system settings: tuning reference, clock source, display, UI behaviour, MPE configuration, SysEx device ID, and MIDI routing options. All changes are saved automatically after 5 seconds, no manual save step is required.

Open Setup by holding **[ALT]** and pressing **[MULTI]** (legend SETUP).



BDW

Bend Down Range

0 – 128 semitones

Maximum pitch-bend range downward in semitones.

REF

Reference Tuning

420 – 460 Hz

Concert A reference pitch in Hz. Default 440 Hz. Useful when playing alongside fixed-pitch instruments.

BUP

Bend Up Range

0 – 128 semitones

Maximum pitch-bend range upward in semitones.

Setup page 1: Tuning & Pitch Bend ranges.



BPM

Internal Tempo

30 – 285 BPM

Internal clock tempo in beats per minute. Applies to all Arpeggiatiors and clock-synced LFOs/Delays when SRC is "INT" or "AUTO" with no external clock present.

SRC

Clock Source

AUTO · INT · MIDI · EXT

"AUTO" - uses the internal clock unless MIDI or analog clock is received. "INT" - internal only. "MIDI" - MIDI clock only. "EXT" - analog clock input only.

PPQ

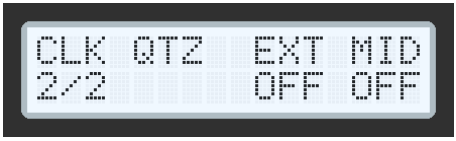
Analog Clock PPQ

1 · 2 · 3 · 4 · 6 · 8 · 12 · 16 · 24 · 32 · 48

Pulses-per-quarter-note for the analog clock input. Analog clock standards vary by manufacturer; 24 PPQ matches MIDI clock.

Setup page 2/3: Clock. The MIDI Clock page of the Tools shows the received tempo, see **p. 65**.

Setup



MID

MIDI Clock Quantise

OFF · ON

Quantises incoming MIDI clock to smooth out timing fluctuations from the sending device.

EXT

Ext Clock Quantise

OFF · ON

Quantises the analog clock input to reduce jitter from unstable external clock sources.

Setup page 3/3: Clock quantise.

Setup

User Interface



BACK

LCD Backlight

OFF · LOW · HIGH · SMRT

"SMRT" dims the display after a period of inactivity to save the backlight and reduce distraction on a dark stage.

LED

LED Brightness

LOW · MID · STD

Brightness of all front-panel button LEDs.

LCD

LCD Contrast

0 – 255

Display contrast. Very low values make the display nearly invisible.

Setup UI page 1/4.



MACS

Macro Pots Mode

JUMP · MOVE · GRAB

Same three modes for the three **<MACRO>** knobs below the display. Many users prefer MOVE or GRAB on stage to avoid parameter jumps.

POTS

Param Pots Mode

JUMP · MOVE · GRAB

How front-panel parameter knobs behave when the stored value differs from the physical knob position. "JUMP" - jumps to the physical position immediately. "MOVE" - applies relative changes from the current stored value. "GRAB" - ignores movement until the knob passes through the stored value (no jumps, but knob may need to travel far before anything happens).

Setup UI page 2/4.

Setup

User Interface (continued)



STAY

Stay on Page

-- · ON

When ON, the display remains on the current menu page when a different Part is selected, rather than jumping to that Part's home screen.

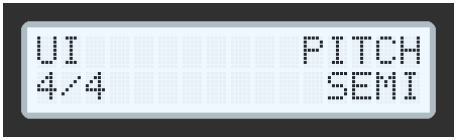
HOME

Return to Home

-- · ON

When ON, the display returns to the Part/ Multi home screen after a period of inactivity.

Setup UI page 3/4.



PITCH

Pitch Knob Mode

SEMI · FINE · SUB

Selects which pitch parameter the front-panel **<PITCH>** knob controls. "SEMI" - semitone transpose. "FINE" - fine tune (cents). "SUB" - Sub Oscillator semitone offset.

Setup UI page 4/4.

Setup

Output Boost



MAIN

Main Output Boost

0DB · 6DB · 12DB

Raises the level of the Main output by 6 or 12 dB, for example when the Manatee sounds too quiet in your mixer.

AUX

Aux Output Boost

0DB · 6DB · 12DB

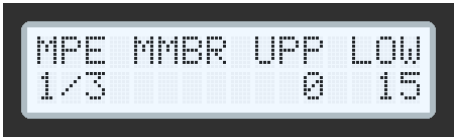
Raises the level of the Aux output by 6 or 12 dB.

Setup page, after the four UI pages.

Setup

MPE

MPE (MIDI Polyphonic Expression) allows per-note pitch bend, pressure and slide-expression from controllers such as the Roli Seaboard or Linnstrument. The Manatee supports both Upper and Lower MPE Zones, with configurable member channel counts and master bend ranges. Enable MPE in the Multi home screen with the right **<MACRO>** knob.



LOW

Lower Zone Members

0 – 15 channels

Number of member channels in the MPE Lower Zone (channels 1–15 from channel 16 up). 0 disables the Lower Zone.

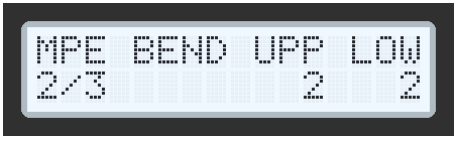
UPP

Upper Zone Members

0 – 15 channels

Number of member channels in the MPE Upper Zone (channels 2–16 from channel 1 down). 0 disables the Upper Zone.

*MPE page 1/3. Hold **[ALT]** + **[MULTI]** (SETUP) and navigate to MPE pages.*



LOW

Lower Master Bend Range

0 – 127 semitones

Master channel pitch-bend range for the Lower Zone.

UPP

Upper Master Bend Range

0 – 127 semitones

Master channel pitch-bend range for the Upper Zone. Member channels use the preset BUP/BDW values.

MPE page 2/3.

Setup

MPE (continued)



C74

CC#74 (Slide) Amount

0 – 255

Global scaling of CC#74 (the MPE Slide expression axis) to modulation targets.

AFT

Aftertouch Amount

0 – 255

Global scaling of polyphonic aftertouch (MPE pressure) messages to modulation targets.

MPE page 3/3.

SysEx



TX

SysEx Transmit

-- · ON

Enables SysEx output. Turn off only if SysEx data causes problems with downstream MIDI devices.

DEVID

Device ID

0 – 126

SysEx device identifier. Leave at 0 unless multiple Manatees are connected to the same MIDI port, set each unit to a unique ID.

RX

SysEx Receive

-- · ON

Enables SysEx input. Must be ON to receive Parts, Multis, or firmware updates via SysEx.

SysEx configuration page.

Setup

MIDI Routing

Eight pages control which MIDI message types are received and/or transmitted on the MIDI port. Navigate to them from the Setup menu.



ORDER

Note Priority

LAST · FIRST · LOW · HIGH

Voice stealing order in mono/legato modes.

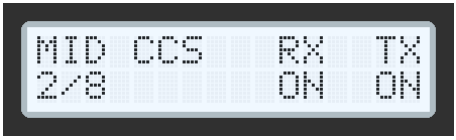
LOCAL

Local Control

-- · ON

When "**--**" (off), the front panel does not trigger sounds internally, useful when playing through a DAW with MIDI thru.

MIDI routing 1/8.



TX

CC Transmit

-- · ON

Enables transmission of CC messages when front-panel controls are moved.

RX

CC Receive

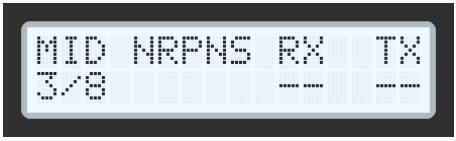
-- · ON

Enables reception of MIDI Continuous Controller messages.

MIDI routing 2/8: Continuous Controllers.

Setup

MIDI Routing (continued)



TX

NRPN Transmit

-- · ON

Enables NRPN output when parameters are edited.

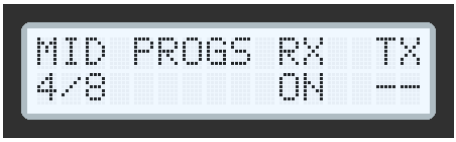
RX

NRPN Receive

-- · ON

Enables Non-Registered Parameter Number messages, which give full access to all preset parameters.

MIDI routing 3/8: NRPNs.



TX

Program Change Transmit

-- · ON

Sends Program Change when a preset is loaded.

RX

Program Change Receive

-- · ON

Enables MIDI Program Change for preset selection.

MIDI routing 4/8: Program Changes. · Routing 5–8 follows same RX/TX pattern for Clock, Transport, Active Sensing and Arp Notes.

Tools

The Tools pages show information about your Manatee and offer reset functions. Hold **[ALT]** and press **[SAVE]** to open them on the Version page. Use the **[ARROW]** buttons to step through the three pages: Version, Init and MIDI Clock. Press **[MULTI]** or a Part button **[1]**–**[4]** to leave.

Version



Code	Meaning
BRD	Main board revision: "6.6", or "6.x" for earlier boards.
BOOT	Bootloader version.
FIRM	Firmware version. This manual describes firmware 1.09.

Please include these three numbers when you contact support.

Tools

Init

Resets part of the Manatee to its initial state. Use the **[ARROW]** buttons to move the cursor under one of the three "GO!", then press **[SAVE]** to run it. The display confirms with "..INIT..".



Code	Function
SYS	Resets all Setup settings (tuning, clock, user interface, MIDI, MPE and SysEx) to their factory values and saves them. The Manatee then returns to the Multi home page.
MLT	Loads a blank initialised Multi, as when selecting "INI" while loading a Multi.
PRS	Loads a blank initialised Preset into the Part being edited, as when selecting "INI" while loading a Preset.

> "SYS" overwrites your Setup settings at once and cannot be undone. Note them down first if you want to restore them later. "MLT" and "PRS" only replace the sound being edited: stored Multis and Presets stay unchanged until you save over them.

MIDI Clock



Code	Meaning
INT	Internal tempo in BPM, as set on the Setup Clock page.
MID	Tempo of the MIDI clock being received, rounded to hide small fluctuations.
EXT	Tempo measured at the analog clock input.

A value of "0" means no clock is being received. The page updates live, which makes it handy for checking clock connections. While it is open, the sound controls of the front panel are ignored.

MIDI & Firmware Update

Firmware Update

The installed firmware version is briefly shown in the bottom-right of the display at boot after the Manatee logo, e.g. "F1.09". No settings on the Manatee itself are needed before updating, it only needs to be powered on and fully booted.

You will need a MIDI interface connected directly to your computer via USB (avoid USB hubs), and a direct MIDI cable from the interface's MIDI Out to the Manatee's MIDI In, no mergers, thru-boxes, or other MIDI devices in between. Do not interrupt the update by removing power or any cables.

Method 1 - Browser Updater (recommended)

Visit **fredslab.net/dev/** in a browser that supports Web MIDI (Chrome/Edge; not Safari). Select the firmware version, choose your MIDI interface for both In and Out, then click **START**. The display shows progress and the Manatee reboots automatically when done.

Method 2 - SysEx File

Download the firmware `.syx` file (~240 kB) from **fredslab.net/dev/firmwares/**. Send it with a SysEx utility or DAW, with at least 100 ms (recommended 200 ms) pause between SysEx messages. Only a MIDI Out → MIDI In connection is needed.

> **Emergency boot mode:** Hold **[ALT]** while powering on to boot into SysEx-update-only mode. The display shows "..AWAITING SYX..". This allows reflashing even if a firmware is corrupted. Power-cycle without **[ALT]** to return to normal boot.

MIDI Bank Select

Preset slots are addressed by Bank Select (CC#0) followed by Program Change. Bank 0 = factory bank I (slots 1–64); Banks 1–4 = user banks A–D (slots 1–64 each).

MIDI & Firmware Update

MIDI Continuous Controllers (CC#0 – CC#63)

All CC messages are channel-specific, they affect the Part listening on that MIDI channel. Enable CC reception in Setup (MIDI routing page 2/8).

CC#	Parameter	CC#	Parameter
0	Bank Select	27	Pitch Semitone
1	Modulation Wheel	28	Pitch Fine
2	Breath Controller	29	Pitch Balance
4	Foot Controller	30	Unison Detune
5	Glide Time	31	Unison Width
6	NRPN Data MSB	38	NRPN Data LSB
7	Part Level	44	LFO-1 Rate
10	Part Pan	45	LFO-1 Amount
11	Expression Controller	46	LFO-1 Shape A
12	Part Reverb Send	47	LFO-1 Shape B
13	Part Aux Level	48	LFO-1 Shape C
14	Part Main Level	49	LFO-2 Rate
16	Generator Spectrum	50	LFO-2 Amount
17	Generator Rotation	51	LFO-2 Shape A
18	Generator Inversion	52	LFO-2 Shape B
19	Generator Formant	53	LFO-2 Shape C
20	Sub Carrier Wave	54	LFO-F Rate
21	Sub Content	55	LFO-F Amount
22	Sub Content → LFO-2	56	LFO-F Shape A
23	Sub FM Rate	57	LFO-F Shape B
24	Sub FM → EG-F	58	LFO-F Shape C
25	Sub Semitone	59	Ring Enable
–	–	60	Noise Enable
–	–	61	Noise Rate (SNH)
–	–	62	Noise Colour
–	–	63	Delay Model

MIDI & Firmware Update

MIDI Continuous Controllers (CC#64 – CC#127)

CC#	Parameter	CC#	Parameter
64	Sustain Pedal	98	NRPN Address LSB
70	Generator Wavelet	99	NRPN Address MSB
71	Filter Resonance	104	Env Sustain (shared)
72	Env Release (shared)	105	EG-F Decay
73	Env Attack (shared)	106	EG-F Amount
74	Filter Cutoff	107	EG-F Cycle
75	Filter → EG-F Amount	108	EG-A Decay
76	Vibrato Rate	109	EG-A Amount
77	Vibrato Depth	110	EG-A Cycle
78	Tremolo Rate	111	EQ1 Model
79	Tremolo Depth	112	EQ1 Centre
80	Generator Level	113	EQ1 Gain
81	Sub Level	114	EQ2 Model
82	Ring Level	115	EQ2 Centre
83	Noise Level	116	EQ2 Gain
85	Filter Model	117	Matrix M-1 Amount
86	Filter → LFO-F Amount	118	Matrix M-2 Amount
88	RC Filter Cutoff	119	Matrix M-3 Amount
89	Drive Model	120	All Sounds Off
90	Drive Gain	121	Reset Controllers
91	Drive Mix	123	All Notes Off
92	Delay Time	124	Omni Off
93	Delay Feedback	125	Omni On
94	Delay Level	126	Mono Mode
95	Delay Colour	127	Poly Mode

All Notes Off: CC#123 is also triggered by holding **[DRIVE]** for 1–2 s, which additionally resets all controllers and clears the reverb and delay buffers. This message is not forwarded to the MIDI Out.

MIDI & Firmware Update

MIDI NRPNs

Non-Registered Parameter Numbers (NRPNs) give full bidirectional access to every preset parameter, including parameters that have no direct CC mapping. The NRPN address corresponds to the internal parameter ID:

- Preset parameters: `0x0000` – `0x00FF`
- Multi parameters: `0x0400` – `0x04FF`
- Multi Part parameters: `0x0800` – `0x08FF`
- System parameters: `0x1000` – `0x10FF`
- System Part parameters: `0x2000` – `0x20FF`

Send the address using CC#99 (NRPN MSB) then CC#98 (NRPN LSB), followed by the 14-bit value in CC#6 (Data MSB) and CC#38 (Data LSB).

Enable NRPN reception in Setup (MIDI routing 3/8).

SysEx Protocol

Every Manatee SysEx message begins with this header (all values in hex):

Byte	Value	Description
0	`F0`	SysEx start
1–3	`00 21 2C`	Fred's Lab MIDI Manufacturer ID (3-byte format)
4	`04`	Device family: Manatee
5	`00` = Dump · `01` = Request	Dump or Request identifier
6	`11` = Part · `12` = Multi	Message type
…	payload	Parameter data
last	`F7`	SysEx end

MIDI & Firmware Update

Identity Request Response

Send a Universal SysEx Identity Request (`F0 7E 7F 06 01 F7`) to query the Manatee. It responds with:

Bytes	Value	Description
0	`F0`	SysEx start
1	`7E`	Non-Realtime
2	`00`	Device ID (as configured)
3–4	`06 02`	General Information / Identity Reply
5–7	`00 21 2C`	Manufacturer ID
8–9	`04 00`	Device family (Manatee)
10–11	`00 00`	Device family member
12–15	`66 00 02 01`	Software version (byte 12 ÷ 100 = version, e.g. 0x66 → 1.02)
16	`F7`	SysEx end

Reference Tables

Modulation Targets

Targets offered by the TARGET parameter. LFO-1 and LFO-2 run once per Part, while LFO-F, EG-F and EG-A run per voice, so each offers its own set of targets. The Modulation Matrix offers all of them.

Code	Description	LFO-1/2	LFO-F, EGs	Matrix
NONE	No target: the modulation is switched off.	✓	✓	✓
VOLUME	Output volume.	✓	✓	✓
PANNING	Stereo position.	✓	✓	✓
PITCH	Pitch of both oscillators.	✓	✓	✓
BALANCE	Level balance between Spectrum and Sub Oscillator (BAL).	✓	✓	✓
GEN-ROT	Spectrum Oscillator rotation (ROT).	✓		✓
GEN-INV	Spectrum Oscillator inversion (INV).	✓		✓
GEN-FMT	Spectrum Oscillator formant (FMT).	✓		✓
GEN-PTC	Spectrum Oscillator pitch.		✓	✓
GEN-LVL	Spectrum Oscillator level.		✓	✓
SUB-CNT	Sub Oscillator content (CNT): pulse width or FM depth.		✓	✓
SUB-LO2	Sub Oscillator LFO-2 modulation depth (MOD).		✓	✓
SUB-PTC	Sub Oscillator pitch.		✓	✓
SUB-LVL	Sub Oscillator level.		✓	✓
NOI-SNH	Noise Generator sample & hold rate.	✓		✓
NOI-COL	Noise Generator colour.	✓		✓
NOI-LVL	Noise Generator level.		✓	✓
RNG-LVL	Ring Modulator level.		✓	✓
FLT-CUT	Filter cutoff.		✓	✓
FLT-RES	Filter resonance.		✓	✓
FLT-EGF	Filter envelope amount (EGF).		✓	✓
FLT-LOF	Filter LFO-F amount (LOF).		✓	✓
RC-CUT	RC Filter cutoff.		✓	✓
SAT-DRV	Drive / Saturation amount (DRV).		✓	✓
SAT-MIX	Drive / Saturation dry/wet mix (MIX).		✓	✓
DLY-TIM	Delay time.	✓		✓

Reference Tables

Modulation Targets (continued)

Code	Description	LFO-1/2	LFO-F, EGs	Matrix
DLY-FBK	Delay feedback.	✓		✓
DLY-COL	Delay colour (tone of the repeats).	✓		✓
DLY-LVL	Delay level.	✓		✓
EQ1-CNT	EQ1 centre frequency.	✓		✓
EQ1-AMP	EQ1 amplitude.	✓		✓
EQ2-CNT	EQ2 centre frequency.	✓		✓
EQ2-AMP	EQ2 amplitude.	✓		✓

Matrix Sources

Sources offered by the SOURCE parameter of Matrix slots M-1, M-2 and M-3. Combine a DC source with an EXPRESSOR to route a performance controller directly to a target.

Code	Name	Description
NONE	**None**	No source: the slot is off.
LFO-1	**LFO-1**	LFO-1 output.
LFO-2	**LFO-2**	LFO-2 output.
LFO-F	**LFO-F**	LFO-F output (per voice).
ENV-F	**EG-F**	Filter envelope output.
ENV-A	**EG-A**	Amplitude envelope output.
PART	**Part**	A fixed value that depends on the Part number (P1 to P4).
NOTE	**Note**	MIDI note number, for keyboard tracking.
VELO	**Velocity**	Note-on velocity.
VOICE	**Voice**	A fixed value that depends on the voice number, to spread voices apart.
RANDOM	**Random**	A random value picked for each note.
NOISE	**Noise**	A continuously changing random value.
DC100%	**DC 100%**	Constant positive value at full scale.
DC 66%	**DC 66%**	Constant positive value at 66% of full scale.
DC 50%	**DC 50%**	Constant positive value at 50% of full scale.
DC 33%	**DC 33%**	Constant positive value at 33% of full scale.
DC 25%	**DC 25%**	Constant positive value at 25% of full scale.

Reference Tables

Expressors

The EXPR parameter of LFO-1, LFO-2, LFO-F, EG-F, EG-A and the three Matrix slots scales the modulation depth in real time with one of these controllers.

Code	Name	Description
`NONE`	**None**	No expressor: the depth stays at the AMT value.
`RAND`	**Random**	A random value picked for each note.
`NOIS`	**Noise**	A continuously changing random value.
`LFO1`	**LFO-1**	The depth follows LFO-1.
`LFO2`	**LFO-2**	The depth follows LFO-2.
`SUST`	**Sustain pedal**	Sustain pedal (CC#64).
`PTBD`	**Pitch bend**	Pitch bend wheel.
`MODW`	**Mod wheel**	Modulation wheel (CC#1).
`BRTH`	**Breath**	Breath controller (CC#2).
`FOOT`	**Foot**	Foot controller (CC#4).
`EXPR`	**Expression**	Expression pedal (CC#11).
`PRES`	**Pressure**	Channel pressure (mono aftertouch).
`ENVF`	**EG-F**	The depth follows the filter envelope.
`ENVA`	**EG-A**	The depth follows the amplitude envelope.
`LFOF`	**LFO-F**	The depth follows LFO-F.
`VELO`	**Velocity**	Note-on velocity.
`BEND`	**Note bend**	Per-note pitch bend (MPE).
`AFTR`	**Aftertouch**	Polyphonic aftertouch, per-note pressure (MPE).
`CC74`	**CC#74**	MIDI CC#74, the MPE "slide" or timbre axis.

Arpeggiator Masks

Masks offered by the MSK parameter of the Arpeggiator. A dot marks a step that plays, an empty cell a rest. The eight steps then repeat.

Code	1	2	3	4	5	6	7	8	Description
`ALL`	●	●	●	●	●	●	●	●	Every step plays.
`M1`		●	●	●	●	●	●	●	Rest on step 1, the other seven steps play.
`M2`		●	●	●		●	●	●	Rests on steps 1 and 5: two groups of three notes.
`M3`		●		●	●		●	●	Rests on steps 1, 3 and 6.
`M4`	●	●	●	●		●		●	The first four steps play, then every other step.
`M5`	●			●	●			●	Steps 1, 4, 5 and 8 play: a symmetrical pattern.
`M6`			●		●		●		Steps 3, 5 and 7 play: sparse, off-beat notes.
`M7`	●	●			●				Steps 1, 2 and 5 play.

Reference Tables

Spectra

Spectra offered by the BASIS parameter of the Spectrum Oscillator, also selected with the **<SPECTRUM>** knob. Each picture shows the levels of harmonics 1 to 8, as the display draws them.

Display	Name	Description
	**User**	The Part's own spectrum, drawn in the Spectrum Editor. Until edited, it equals Root.
	**Root**	Fundamental only: a pure, sine-like tone.
	**Even**	Harmonics 2, 4, 6 and 8 with falling levels and no fundamental: heard an octave higher.
	**Odd**	Harmonics 3, 5 and 7 with falling levels and no fundamental: a hollow tone.
	**7-UP**	Mostly the 7th harmonic, with some of the 6th: high and glassy.
	**4 Sure**	Mostly the 4th harmonic, with some of the 5th: two octaves up.
	**Take 5**	Mostly the 5th harmonic, with some of the 4th.
	**TXBells**	Strong harmonics 2, 5 and 7 and a softer 4th: bell-like, in the style of FM bells.
	**BSplit**	Harmonics 1, 3, 6 and 8 at equal level: low and high partials split apart.
	**ANA-MUX**	Strong harmonics 4, 5 and 8 and a softer 2nd.
	**Whats47**	Strong 4th and 7th harmonics over a softer fundamental, with touches of the 5th and 8th.
	**Aaaah**	Energy around harmonics 5 to 8, peaking at the 6th: a vocal "aah" formant.
	**Early-V**	Strong fundamental and 5th harmonic, with softer 2nd and 4th.
	**Late-V**	Strong 3rd and 8th harmonics, with softer 4th and 7th.
	**Oddstep**	Harmonics 3, 5 and 7 with rising levels: the bright opposite of Odd.
	**Everise**	Harmonics 2, 4, 6 and 8 with rising levels: the bright opposite of Even.
	**Exponrg**	All eight harmonics, falling from the fundamental: warm and saw-like.
	**Fullbar**	All eight harmonics at the same level: bright and buzzy.

Reference Tables

LFO Shapes

Shapes offered by the SHA, SHB and SHC parameters of LFO-1, LFO-2 and LFO-F. The display shows each shape as a small picture. When several shapes are set, the LFO plays one cycle of each in turn.

Display	Name	Description
	**Off**	Slot switched off: this shape is skipped.
	Flat	One cycle of zero output, a rest between the other shapes.
	**Sine**	Smooth sine wave.
	**Triangle**	Linear rise and fall.
	**Saw up**	Rising ramp, then a jump down.
	**Saw down**	Jump up, then a falling ramp.
	**Square**	High for half the cycle, low for the other half.
	**Pulse 25%**	High for a quarter of the cycle.
	**Pulse 75%**	High for three quarters of the cycle.
	**WM wave**	Complex wave with a "W" first half and an "M" second half.
	**NU wave**	Complex wave with an "N" first half and a "U" second half.
	**Jump**	Two rising ramps, the second one reaching higher.
	**Bounce**	A falling ramp followed by a smaller one, like a bouncing ball.
	**Ridge up**	Short rising teeth, high in the first half, low in the second.
	**Ridge down**	Short teeth stepping downwards.
	**Roof**	Short teeth forming a rise and a fall.
	**Random**	A new random value for each step.
	**Slew straight**	Random values joined by straight slopes.
	**Slew step**	Random steps with smoothed transitions.

Technical Specifications

Processing	
DSP	2 × 200 MHz, 16-bit dual-core
DAC	4 × 24-bit Burr-Brown
RAM	64 Mbit fast PSRAM
Polyphony	10 – 16 voices (depending on patch complexity)
Timbrality	4-part multitimbral

Memory	
User Presets	256 slots in 4 banks (A–D), 64 each
Factory Presets	64 read-only slots (Bank I)
Multis	16 slots (M01–M16)
System Settings	1 global settings slot

Connections	
Power	2.1 mm DC jack, 12 V centre-positive
Current draw	350 mA maximum
MIDI	DIN-5 In · Thru · Out
Analog Clock	3.5 mm TRS, Tip = Clock, Ring = Start/Stop (1–10 V trigger)
Headphones	3.5 mm TRS stereo
Aux Out (L/R)	2 × 6.35 mm TRS (Ring = audio input, pass-through to Main)
Main Out (L/R)	2 × 6.35 mm TS

Controls	
Potentiometers	23 metal-shaft quality pots, panel-mounted with nuts
Illuminated buttons	18
Buttons	8
LEDs	22 red LEDs
Display	2 × 16 FSTN+ character LCD, dimmable LED backlight

Physical	
Chassis	Powder-coated steel with acrylic display cover
Dimensions	267 × 140 × 60 mm (without knobs)
Weight	1470 g
Feet	Rubber anti-slip feet

Technical Specifications

Support & Contact

Support portal	support.fredslab.net (registration required)
Website	fredslab.net
Email	info@fredslab.net
Address	Fred's Lab · Herwarthstraße 20 · 53115 Bonn · Germany
Office phone	+49 228 534 51657 (not for support, use the support portal)

Legal

Legal Notices

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Company Imprint

Here is the Fred's Lab company legal information:

•**Address:**

Frédéric Meslin Audiogeräte
Herwarthstraße, 20
53115 BONN
Germany

• **Website:** https://fredslab.net
• **E-Mail:** info@fredslab.net
• **Support:** support@fredslab.net
• **VAT ID Number:** DE307477586
• **LUCID Number:** DE3290376457863
• **WEEE Number:** DE13166103

Legal

Technical Support

For all support requests, you can contact our team via one of the following channels:

• Support System: https://support.fredslab.net

• Email: support@fredslab.net

• Postal Mail: Using the company address listed earlier in this manual.

When submitting a support request, please include the instrument model, serial number, the version numbers shown on the Tools Version page (see **p. 65**) and a detailed description of the issue you are experiencing. This helps us resolve your case more efficiently.

Remark: please **do not** contact us via social media or telephone. These channels do not allow us to properly track and manage support cases. Thank you for your understanding!

Product Warranty

Fred's Lab warrants this product to be free from manufacturing defects for a period of three (3) years from the date of purchase. This warranty covers the cost of repair or replacement, provided the product has been used under normal operating conditions and in accordance with its intended purpose.

However, this warranty does not cover the following:

- Normal wear and tear
- Damage resulting from failure to follow the user instructions
- Damage caused by negligence or misuse
- Damage resulting from use outside the intended context (e.g., not as a musical instrument)
- Products that have been modified or repaired by unauthorized parties

For full details, please refer to the most recent version of our General Terms and Conditions of Sale, available on our website:

https://fredslab.net/en/terms.html

Legal

Product Safety Notice (EU)

This product has been designed and manufactured in accordance with applicable European safety regulations, including the General Product Safety Regulation (EU) 2023/988.

Please observe the following general safety instructions:

- Read all instructions before using the device.
- Keep the instrument dry. Do not expose it to rain, moisture, or excessive humidity.
- Do not spill liquids on or bath the instrument in any sort of drink.
- Only use use water or soft glass cleaner instrument to clean the device.
- Do not wiggle plugs when attaching or detaching cords to the device.
- Only use power sources that are specified or supplied by Fred's Lab.
- Do not attempt to open, modify, or repair the instrument yourself. Servicing should only be carried out by authorized personnel.
- Do not allow unsupervised use with yound children.
- In case of malfunction, disconnect the instrument from its power source immediately and consult Fred's Lab support.

In accordance with Article 20 of the Regulation, we encourage all customers to report safety-related incidents or product hazards to us without delay. You can report issues through our support system at:

Email: support@fredslab.net

This product complies with all applicable CE marking requirements and has undergone conformity assessment before being placed on the market.

Risk of Hearing Damage

The Manatee, like any musical instrument used with headphones, earbuds, speakers, or PA systems, can produce high sound levels across a wide frequency range. Your hearing is **extremely sensitive** and can be permanently and irreversibly damaged by excessive volume.

Please always protect your ears, and those of your audience, by keeping volume at safe levels.

Declarations of Conformity

CE Conformity

1. Manufacturer and Representative Information

Frédéric Meslin Audiogeräte
Herwarthstraße, 20
53115 BONN
Germany
Contact: info@fredslab.net
Telephone: +49 228 53451657

2. Product Unique Identification
Manatee Digital Synthesizer
European Article Number: 4170000145219

3. Product Description
Desktop Electronic Music Synthesizer
Belonging to the category "multimedia electronic equipment"

4. Product Class
CLASS B Multimedia Equipment

5. Object of the declaration:
This equipment conforms to the following requirements:
• 2014/35/EU - Low Voltage Directive (LVD)
• 2014/30/EU - Electromagnetic Compatibility Directive (EMC)
• 2011/65/EU - Restriction of Hazardous Substances (RoHS) Directive
• 2012/19/EU - Waste Electrical and Electronic Equipment (WEEE) Directive

Declarations of Conformity

CE Conformity

Harmonized Standards Applied:
• EN 55032:2015 / Interference voltage / 150 kHz - 30 MHz
• EN 55032:2015 / Interference field / 30 MHz – 1000 MHz
• EN 61000-4-2:2009 / Immunity to electrostatic discharge (ESD)
• EN 61000-4-3:2006 + A1:2008 + A2:2010 / Immunity to HF electromagnetic radiation
• EN 61000-4-4:2012 / Immunity to fast transient electrical disturbances
• EN 61000-4-5:2014 / Interference immunity against surge voltages
• EN 61000-4-6:2014 / Immunity to conducted interference induced by HF fields
• EN 61000-4-11:2004 / Immunity to voltage dips, interruptions and voltage fluctuations
• EN 61000-4-8:2010 / Immunity to magnetic fields with energy frequencies *

* The Manatee does not contain any components that are sensitive to magnetic fields. The test is therefore not required according to EN 55035.

2011/65/EU (ROHS 2), 2012/19/EU (WEEE)

6. Testing entity

EMV Transferstelle
Hochschule Koblenz
Konrad Zuse Straße 1
56075 Koblenz
Germany

Additional Information:
The product has been tested by the specified independent laboratory in accordance with the above-listed harmonized standards and meets all applicable requirements.

Report: Testreport 1511/ 2023

Place and Date of Issue:
Bonn / Germany – 12/01/2023

Name and signature:

Declarations of Conformity

Canada: Interference Regulation

This device does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Interference-Causing Equipment Standard (ICES-003) of the Canadian Department of Communications.

Cet équipement n'émet pas de bruits radiofréquence dépassant les limites applicables aux appareils numériques de la Classe B prescrites dans le règlement sur les interférences radioélectriques (ICES-003) édicté par le Ministère des Communications du Canada.

USA: FCC Information

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Important: Changes and modifications made to the device without the approval of the manufacturer can void your authority to operate this device.

This device generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this device does cause harmful interference to radio or television reception, which can be determined by turning the device off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna.
• Increase the separation between the device and receiver.
• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
• Consult the dealer or an experienced radio/TV technician for help.