ETERNAL ENGINE EMI

# MARS

## TUBE SYNTHESIZER

Quickstart Guide

# SAFETY REQUIREMENTS AND OPERATING PROCEDURES FOR THE SYNTHESIZER

**Do NOT use the synthesizer with damaged tubes! This synthesizer uses a high voltage, which, if used improperly, can cause electric shock, and even kill you. If you are unsure about following all the steps in this manual, do NOT use the device. Connect only to grounded outlet. High voltage is not a joke. It is deadly to use the synthesizer under the influence of alcohol. The tubes reach high temperatures during use, do NOT touch them with your hands to avoid burns. Liquid spill on / into the device is inadmissible. It can cause electric shock, damage to the device, and fire. Do NOT leave the synthesizer unattended on. The Synthesizer is intended for use in an enclosed, dry environment only (at home or in a studio). If synthesizer was at temperature below +5 °C, then keep it at room temperature for 2-3 hours before usage. Otherwise this can cause condensation on the internal parts of the synthesizer. It can cause electric shock, damage to the device, and fire. Do not leave the Synthesizer plugged in when it is not in use. Do not subject the Synthesizer to sudden shocks or falls. The Synthesizer is not intended for use by children. The manufacturer assumes no responsibility for damage to third-party equipment resulting from use of the Synthesizer. The manufacturer is not responsible for damage caused by failure to observe safety precautions and operating instructions.**

# GENERAL RECOMMENDATIONS

Thank you for the buying “MARS”, a vacuum tube polyphonic musical synthesizer.

Please check:

- the integrity of the packaging
- completeness
- correct operation of the device

Read this manual carefully before using the synthesizer. Make sure you know the defenition of controls and jacks for external connections.

# DELIVERY SET

- tube synthesizer “MARS”
- power cable for connection to the power outlet
- power adapter AC 110-240V to DC 19.5V
- kit of tubes (2x 6Н1П, 2x 6Н2П)
- kit of spare tubes (1x 6Н1П, 1x 6Н2П)

# TECHNICAL SPECIFICATIONS

- Power supply voltage is 110-240V volts AC
- Power consumption in not more than 30 watts
- Output voltage is not less than 1 Vp-p
- External input voltage swing is 2.4 Vp-p
- Maximum control voltage swing is 0-10 V
- Keyboard range is 8 octaves
- Full sound range of the instrument is 12 octaves
- 99 presets memory

Manufacturer and importer reserve the right to modify the design, technical specifications, features, appearance, and equipment of the product without prior notice.

# PREPARATION FOR OPERATION

Carefully read the section on SAFETY REQUIREMENTS AND OPERATING PROCEDURES FOR THE SYNTHESIZER at the beginning of this manual!

Place the synthesizer on a solid dry surface. Ensure there is no damage to the case and glass balloon of the vacuum tubes. Make sure there is no condensation on the synthesizer case. If the synthesizer has been stored at a temperature below +5°C, let it acclimate at room temperature for 2-3 hours before use.

Install four vacuum tubes (2x 6N1P and 2x 6N2P) into the sockets with the corresponding markings. Visually check the position of the key on the vacuum tube relative to the key on the socket during installation. Incorrect installation of vacuum tubes can result in damage to the tubes, malfunction of the synthesizer, and electric shock.

Connect the power cord to the AC-DC adapter 110-240V AC to 19.5V DC. Use only the power cord equipped with grounding and the AD-DC power adapter provided with the synthesizer. Using the synthesizer without grounding or with an adapter of the wrong model may result in electric shock, unstable operation, increased noise, or malfunction of the synthesizer and other equipment.

Connect the DC Jack 5.5mm plug to the corresponding socket labeled 19.5V 2A DC on the rear panel of the synthesizer.

Connect the MASTER OUT of the synthesizer with a Mono Audio Jack TS 6.3mm plug to the line input of your audio amplifier or recording device. You can also use headphones with a Stereo Audio Jack TRS 6.3mm plug by connecting them to the PHONES output of the synthesizer.

Connect the MIDI OUT of your MIDI keyboard or MIDI interface to the KBD IN socket of the synthesizer. If you want to record controller signals from the synthesizer or use the MARS Control DAW plugin, connect the CTRL OUT of the synthesizer to the MIDI IN of your MIDI interface.

You can also connect the synthesizer to your PC using a USB 2.0 A to B cable to use USB connection alongside or instead of MIDI connection. The synthesizer is automatically detected in the Windows and MacOS system as a MARS Control device with two interfaces. The first interface is for data reception and transmission from the synthesizer, and the second is for reception only.

If you want to use CV/GATE control, connect the corresponding signal cables to the CV-1...4 and GATE sockets. CV-1 and CV-2 sockets are optimized for signals 0-5V peak to peak. CV-3 and CV-4 sockets are optimized for signals 0-10V peak to peak.

Avoid connecting or disconnecting cables from the synthesizer sockets while it is powered on. Interference caused during connection may result in unstable operation of the synthesizer and other devices or their malfunction.

Connect the power cord to a grounded 110-240V AC power outlet. Make sure the AC-DC adapter's power control LED is lit up. Turn the MASTER VOLUME / POWER knob on the front panel of the synthesizer clockwise until it clicks. Wait for the synthesizer self-test to complete. During the self-test, the LEDs on the front panel and segments of the nixie display may light up together or in random order. After the self-test, the letter "P" and the number of the last used preset will appear on the display. The synthesizer is ready for operation.

The full warm-up and establishment of operating modes for vacuum tubes takes at least 15 minutes. Until this period expires, some settings and synthesizer sound may slightly change.

To turn off the synthesizer, turn the MASTER VOLUME / POWER knob counterclockwise until it clicks. If you do not plan to use the synthesizer for an extended period of time, disconnect the AC-DC adapter cord from the power outlet.

After turning off the synthesizer, wait for at least 5 seconds to ensure smooth startup conditions for the synthesizer. Failure to comply with this condition may trigger overload protection.

If overload protection and short circuit protection are activated, turn off the synthesizer and wait for at least 10 seconds before turning it on again. If overload protection triggers every time you turn it on, it may indicate incorrect connection or incompatible AC-DC adapter, malfunction or mismatch of the power supply, malfunction or mismatch of the equipment connected to the synthesizer, or malfunction of one or more vacuum tubes, or malfunction of the synthesizer. In this case, we recommend contacting support for further instructions on troubleshooting connection errors or malfunctions.

# USING THE SYNTHESIZER AND ADDITIONAL FUNCTIONS

## WORKING WITH THE PROGRAM MENU

Select a preset from the synthesizer memory by rotating the PROGRAM encoder on the synthesizer's front panel. The display will show the letter "P" followed by the preset number.

To save the preset to the synthesizer memory, press the ENTER (STORE/CHANNEL) button. The ENTER (STORE/CHANNEL) and CANCEL buttons will light up, and the display with the letter "P" and the number of the current preset will start flashing. Select a new program number where you want to save the current preset settings by rotating the PROGRAM encoder and press the ENTER (STORE/CHANNEL) button again to confirm the save.You can cancel the operation by pressing the CANCEL button to exit the save mode. The flashing on the display will stop, and the lighting of the ENTER (STORE/CHANNEL) and CANCEL buttons will turn off.

To change the MIDI channel of the synthesizer, press and hold the ENTER (STORE/CHANNEL) button for 3 seconds. The display with letter “M” and the number of the current MIDI cannel will start flashing. Release the ENTER (STORE/CHANNEL) button. Change the MIDI channel number in the range from 1 to 16 by rotating the PROGRAM encoder and press the ENTER (STORE/CHANNEL) button to save the MIDI channel number or the CANCEL button to exit the MIDI channel change mode.

# WORKING WITH THE PRESET CONTROL PANEL

The front panel of the synthesizer consists of five functional groups: modulation matrix MOD-1...4; oscillator group OSC-1...4; filter and amplifier block VCF/VCA; envelope generators group EG-1...2; modulators group LFO and Vibrato.

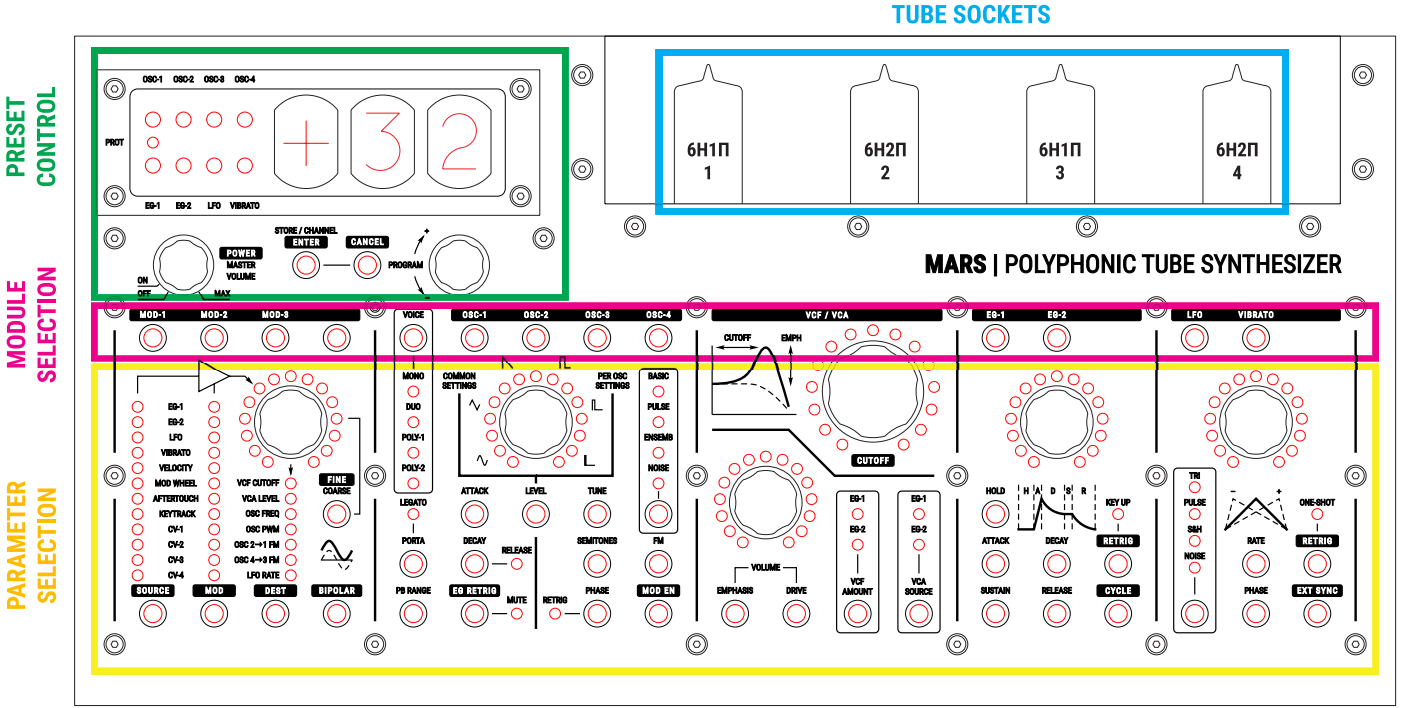
To change the desired parameter, first select the module in the corresponding group (MODULE SELECTION) using the MOD-1…4, OSC-1…4, EG-1…2, LFO/Vibrato buttons, and then select the module parameter using the buttons below (PARAMETER SELECTION). The current value of the selected parameter will be displayed on the LED ring around the control knob of the group. Rotate the knob to change the parameter. The new value will be displayed on the LED ring and on the nixie display within the parameter range (0…99, -50…+50, -24…+24, 0…12). Buttons marked with a rectangle are responsible for changing nonranged parameters. When pressed, the changed value will be displayed on the corresponding LEDs.

You can copy all parameters of the selected module to one or more other modules of the group by pressing and holding the button with the number of the current selected module and pressing respective buttons of the modules where you want to copy the parameters. After that, you can release the pressed buttons in any order.

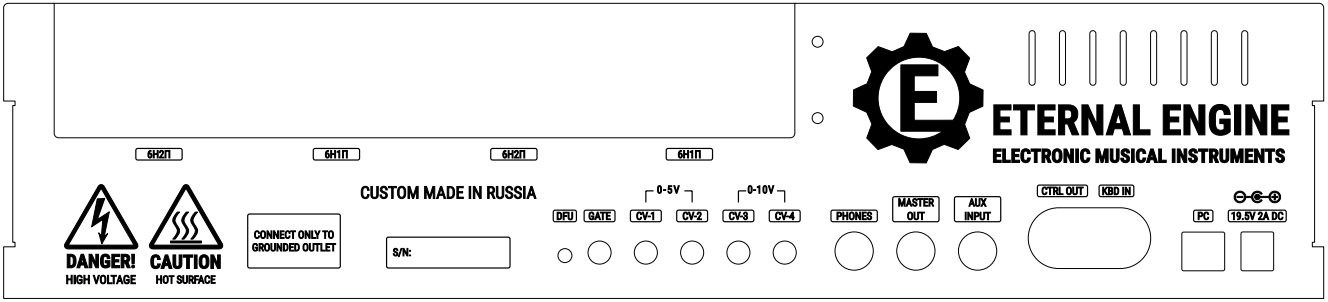
# UPDATING THE SYNTHESIZER FIRMWARE

To update the firmware, connect the synthesizer to the USB port of your PC using a USB 2.0 cable. Turn on the synthesizer. Using a non-metallic (plastic or wooden) object, press the DFU button located on the rear panel of the unit. The synthesizer will enter the DFU software update mode. Follow the instructions in the MARS Firmware Update document to complete the operation. If you want to cancel the synthesizer firmware update, turn off the synthesizer, then wait for at least 5 seconds, and turn on the synthesizer again.

# FRONT PANEL


TUBE SOCKETS
PRESET CONTROL
MODULE SELECTION
PARAMETER SELECTION
6H1П 1
6H2П 2
6H1П 3
6H2П 4
MARS | POLYPHONIC TUBE SYNTHESIZER
OSC-1 OSC-2 OSC-3 OSC-4
PROT
EG-1 EG-2 LFO VIBRATO
POWER MASTER VOLUME
ON OFF MAX
STORE / CHANNEL
ENTER
CANCEL
PROGRAM
MOD-1 MOD-2 MOD-3
VOICE
OSC-1 OSC-2 OSC-3 OSC-4
VCF / VCA
EG-1 EG-2
LFO VIBRATO
SOURCE
MOD
DEST
BIPOLAR
FINE
COARSE
MONO
DUO
POLY-1
POLY-2
LEGATO
PORTA
PB RANGE
COMMON SETTINGS
PER OSC SETTINGS
ATTACK
LEVEL
TUNE
DECAY
RELEASE
SEMITONES
EG RETRIG
MUTE
RETRIG
PHASE
BASIC
PULSE
ENSEMB
NOISE
FM
MOD EN
CUTOFF
EMPH
VOLUME
EMPHASIS
DRIVE
VCF AMOUNT
VCA SOURCE
HOLD
ATTACK
SUSTAIN
DECAY
RELEASE
KEY UP
RETRIG
CYCLE
TRI
PULSE
S&H
NOISE
RATE
PHASE
ONE-SHOT
RETRIG
EXT SYNC

# REAR PANEL


6H2П
6H1П
6H2П
6H1П
ETERNAL ENGINE
ELECTRONIC MUSICAL INSTRUMENTS
DANGER!
HIGH VOLTAGE
CAUTION
HOT SURFACE
CONNECT ONLY TO GROUNDED OUTLET
CUSTOM MADE IN RUSSIA
S/N:
0-5V
0-10V
DFU
GATE
CV-1
CV-2
CV-3
CV-4
PHONES
MASTER OUT
AUX INPUT
CTRL OUT
KBD IN
PC
19.5V 2A DC