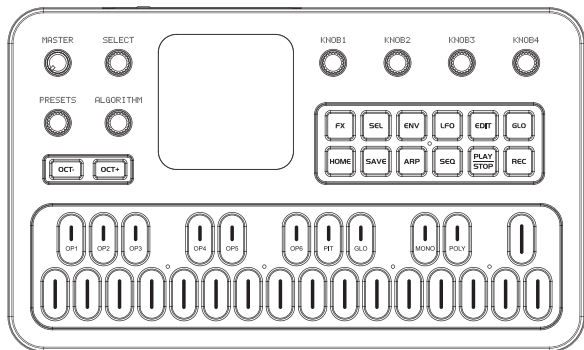


Detailed User Manual

FM-1 Synthesizer



■ ① MASTER (Potentiometer)

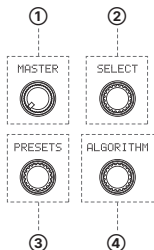
Controls the **main audio output volume**.

- Turn **clockwise** to increase volume, **counter-clockwise** to decrease.

■ ② SELECT (Encoder)

Switches between **pages within the current mode**. Many modes have 2 pages of parameters.

- Turn **clockwise** → go to Page 2
- Turn **counter-clockwise** → go back to Page 1
- The bottom bar of the display shows the current page, for example: 1/2 Arpeggio or 2/2 Arpeggio
- In **FX mode**, SELECT scrolls through the 6 effect slots (positions 1–6 in the chain)



■ ③ PRESETS (Encoder)

Scrolls through the **128 presets** (numbered 001–128).

- Turn **clockwise** to go to the next presets, **counter-clockwise** for the previous presets
- The selection **wraps around**: scrolling past 128 goes back to 001, and vice versa
- Each turn **immediately loads** the selected presets — you will hear the change right away
- While scrolling, a **presets list popup** appears on screen showing:
 - The presets number (e.g. 001)
 - The presets name (e.g. PIANO 3)
 - A highlight on the currently selected presets
 - The popup disappears after about 1 second of inactivity
- The top bar of the display always shows the currently loaded presets number and name

■ ④ ALGORITHM (Encoder)

This encoder has **two functions** depending on whether OCT–/OCT+ is held:

Normal (no buttons held) — Algorithm Select:

- Turn to select the FM synthesis **algorithm** (01–32)
- The FM-1 has 32 algorithms that define how the 6 operators are connected
- When changed, the screen shows the **algorithm diagram** — a visual representation of how operators are routed (which ones are carriers, which are modulators, and the feedback path)
- The diagram popup disappears after about 1 second

While holding OCT– or OCT+ — Transpose:

- Hold **OCT–** and turn ALGORITHM → adjust transpose downward (0 to –12 semitones)
- Hold **OCT+** and turn ALGORITHM → adjust transpose upward (0 to +12 semitones)
- The screen shows:

Transpose

XX

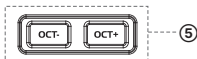
Where XX is the current transpose value (e.g. -3 or +5)

- Transpose shifts all notes by the set number of semitones without changing octave
- Transpose is saved to global settings automatically

■ ⑤ OCT- / OCT+ (Buttons)

Shift the entire keyboard up or down by **one octave per press**.

- Press **OCT-** → shift down one octave (range: down to -3)
- Press **OCT+** → shift up one octave (range: up to +3)
- Each press shows a popup:



Octave

XX

Where XX is the current octave offset (e.g. -2 or +1 or 0)

Octave LED indicator (the LED next to OCT- or OCT+):

Octave Value	LED Behavior
0 (default)	Both LEDs off
±1	Slow blinking
±2	Fast blinking
±3	Solid on

The LED is on the **OCT-** side if octave is negative, on the **OCT+** side if positive.

Combo — Reset Octave & Transpose:

Press **OCT-** and **OCT+** simultaneously to reset both Octave to 0 and Transpose to 0.

2. Center — 1.54" TFT Display

EN

The display is divided into three areas:

Area	Content
Top bar	Current voice number + voice name (e.g. '032 BRASS 1')
Center area	Mode-specific content — parameters, oscilloscope waveform, effect chain grid, algorithm diagram, etc.
Bottom bar	Current mode name and page indicator (e.g. '1/2 LFO')

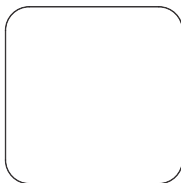
Battery icon appears in the top-right corner with a visual level indicator.

Temporary popups appear in the center area (overlying the current mode) when you:

- Change preset → shows voice list
- Change algorithm → shows algorithm diagram
- Change octave → shows Octave X

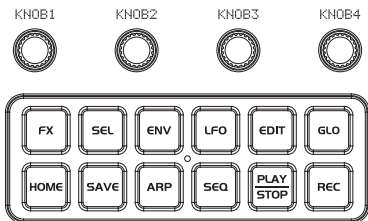
- Change transpose → shows Transpose X
- Adjust volume → shows Volume X
- Save preset → shows Preset Saved
- Battery critically low → shows LOW BATTERY (stays until battery recovers)

All popups disappear automatically after about 1 second unless noted otherwise.



TFT Display

3. Right Panel — Parameter Knobs & Function Buttons EN



■ 3.1 KNOB 1 – KNOB 4 (Encoders)

Four parameter encoders whose function **changes depending on the current mode**. The bottom bar on the display always indicates what each knob controls. Specific mappings per mode:

■ In FX (Effect Chain) Mode

The knobs control the **currently selected effect** (highlighted with a blinking dot):

For Filter and Reverb (effects with sub-types):

Knob 1	Type — select sub-type
Knob 2	Parameter 1 — first audio parameter
Knob 3	Parameter 2 — second audio parameter
Knob 4	Effect On/Off

For Delay, Distortion, Chorus, Phaser:

Knob 1	Parameter 1
Knob 2	Parameter 2
Knob 3	Parameter 3
Knob 4	Effect On/Off

Detailed effect parameters:

Effect	Knob 1	Knob 2	Knob 3
Filter	Type: Low Pass / Band Pass / High Pass	CutOff: 100 Hz – 20,000 Hz (100 steps, logarithmic)	Q (resonance): 0 – 100
Reverb	Type: Room / Hall / Plate	Decay: 0% – 100% (10% steps)	Mix: 0% – 100% (10% steps)
Delay	Decay: 0% – 100%	Rate: 0% – 100%	Mix: 0% – 100%
Distortion	Gain: 0% – 100%	Tone: 0% – 100%	Level: 0% – 100%
Chorus	Freq: 0% – 100%	Depth: 0% – 100%	Mix: 0% – 100%
Phaser	Freq: 0% – 100%	Depth: 0% – 100%	Mix: 0% – 100%

The bottom bar shows the exact parameter value, for example: CutOff: 1004Hz or Mix: 70%.

■ In ENV Mode

Knob 1	Knob 2	Knob 3	Knob 4
Attack (0–8)	Decay (0–8)	Sustain (0–8)	Release (0–8)

Each value is shown as a bar graph on screen (more blocks = higher value).

■ In LFO Mode

Page 1:

Knob 1	Knob 2	Knob 3	Knob 4
Wave	Speed (0–99)	PMD (0–99)	AMD (0–99)

Page 2:

Knob 1	Knob 2	Knob 3	Knob 4
Delay (0–99)	Pitch Sens (0–7)	Lfo Sync (0–1)	Osc Sync (0–1)

Wave types: Triangle, Saw Down, Saw Up, Square, Sine, Sample & Hold

■ In Edit Mode (varies by selected operator/section)

OP1–6, Page 1 (Envelope): Rate 1–4 (0–99)

OP1–6, Page 2 (Envelope): Level 1–4 (0–99)

OP1–6, Page 3 (Tuning): Detune (0–14), FreqCoarse (0–31), FreqFine (0–99), OscMode (Ratio/Fixed)

OP1–6, Page 4 (Sens & Level): A ModSens (0–3), KeyVelocity (0–7), Out Level (0–99)

OP1–6, Page 5 (Scaling): L Depth (0–99), R Depth (0–99), BreakPoint (A-1 - C7)

OP1–6, Page 6 (Scaling): L Curve (–LN/–EX/+LN/+EX), R Curve (–LN/–EX/+LN/+EX), RateScale (0–7)

Pitch Envelope, Page 1: Rate 1–4 (0–99)

Pitch Envelope, Page 2: Level 1–4 (0–99)

Globe: Algorithm (0–31), Feedback (0–7), Osc Sync (On/Off), Transpose (0–48)

■ In Globe Mode

Page 1:

Knob 1	Knob 2	Knob 3	Knob 4
Note Channel (1-16)	Effect Channel (1-16)	Pitch Bend Up (1-24)	Pitch Bend Down (1-24)

Page 2:

Knob 1	Knob 2	Knob 3	Knob 4
Reset Patches	Globe Save	-	-

■ In ARP Mode

Page 1:

Knob 1	Knob 2	Knob 3	Knob 4
Mode	Octave (1-4)	Rate	Tempo (30-300 BPM)

Page 2:

Knob 1	Knob 2	Knob 3	Knob 4
Gate (20-100%)	Swing (50-75%)	Latch (On/Off)	-

■ In SEQ Mode

Page 1:

Knob 1	Knob 2	Knob 3	Knob 4
Pattern (1-16)	Clear	Rate	Tempo (30-300 BPM)

Page 2:

Knob 1	Knob 2	Knob 3	Knob 4
Gate (20-100%)	Swing (50-75%)	-	-

■ 3.2 Function Buttons — Top Row

■ FX (Effect Chain)

Press to **enter Effect Chain mode**. The screen shows a 3×2 grid of the 6 effect slots, each displaying:

- Effect name (Filter, Reverb, Delay, Distortion, Chorus, Phaser)
- A **blinking dot** under the currently selected slot
- **Bright box** = effect is ON, **dim box** = effect is OFF

How to use FX mode:

- Turn **SELECT** to move the blinking dot between the 6 effect slots
- Turn **Knobs 1-4** to adjust the selected effect's parameters (displayed in the bottom bar)
- Press **FX again** to return to Home screen

■ SEL (Effect Select / Reorder)

Works only inside **FX mode**. Used to **lock an effect for reordering**:

- Press **SEL** → the currently highlighted effect becomes "grabbed" (dot stops blinking, becomes solid; SEL LED turns on)
 - Turn **SELECT** → the grabbed effect **swaps positions** with adjacent effects in the chain
 - Press **SEL again** → release the effect into its new position (SEL LED turns off)
- This lets you rearrange the order effects are applied (e.g. put Distortion before Reverb, or Delay before Chorus).

On/Off toggle: Turn the rightmost knob (Encoder 4) clockwise to turn the selected effect ON, counter-clockwise to turn it OFF. The effect box changes brightness accordingly.

■ ENV (Envelope)

Press to **enter ADSR Envelope editing mode**. The screen shows 4 parameter boxes:

- **Attack** — How quickly the sound reaches full volume after a key is pressed. Range: 0–8. Value 0 = instant attack (immediate full volume). Value 8 = very slow fade in.
- **Decay** — How quickly the sound drops from peak to the sustain level. Range: 0–8.
- **Sustain** — The volume level maintained while a key is held. Range: 0–8. Higher = louder sustained note.
- **Release** — How long the sound takes to fade out after the key is released. Range: 0–8. Value 0 = abrupt cutoff. Value 8 = long fade out.

Adjust each with **Knobs 1–4**. Values are shown as block bar graphs. Press **ENV again** to return to Home.

■ LFO (Low Frequency Oscillator)

Press to enter LFO editing mode. The LFO adds periodic modulation to the sound.

Page 1 (use SELECT to navigate):

- **Wave** (Knob 1): LFO waveform shape. Options: Triangle, Saw Down, Saw Up, Square, Sine, Sample & Hold.
- **Speed** (Knob 2): LFO oscillation speed. Range: 0–99. Higher = faster modulation.
- **PMD** (Knob 3): Pitch Modulation Depth. Range: 0–99. Higher = wider pitch wobble.
- **AMD** (Knob 4): Amplitude Modulation Depth. Range: 0–99. Higher = more tremolo.

Page 2:

- **Delay** (Knob 1): Time before LFO kicks in after note-on. Range: 0–99.
- **Pitch Sens** (Knob 2): How much the LFO affects pitch. Range: 0–7.
- **Lfo Sync** (Knob 3): Whether LFO resets on each new note. 0 = Free, 1 = Sync.
- **Osc Sync** (Knob 4): Whether the oscillator phase resets on each new note. 0 = free-running, 1 = sync.

Press **LFO again** to return to Home.

■ EDIT (Operator Editing)

Press to enter **deep FM synthesis editing**. This is where you shape the fundamental tone of each FM-1 voice.

The FM-1 synth has **6 Operators (OP1–OP6)**. Each operator is a sine wave oscillator that can

either produce sound (carrier) or modulate another operator (modulator). The Algorithm setting (changed via the ALGORITHM encoder) determines how operators connect.

How to use Edit mode:

- Press **EDIT** to enter. The bottom keyboard keys now act as section selectors.
- Press a **combo key** on the keyboard to select what to edit:
 - **OP1 – OP6**: Select individual operator parameters
 - **PIT**: Pitch Envelope (how pitch changes over time)
 - **GLO**: Global synthesis parameters (Algorithm, Feedback, Osc Sync)
 - **MONO**: Switch to monophonic mode (one note at a time, last-note priority)
 - **POLY**: Switch to polyphonic mode (up to 12 simultaneous notes)
- The LED for the currently selected operator/section lights up solid.
- Turn **SELECT** to page through that section's parameters (up to 6 pages per operator).
- Adjust parameters with **Knobs 1–4**.
- Press **EDIT again** to return to Home.

■ GLO (Globe — Global Settings)

Press to enter **global device settings**.

Page 1 — MIDI & Pitch:

- **Note Channel** (Knob 1): Which MIDI channel the keyboard sends/receives notes. Range: 1–16.
- **Effect Channel** (Knob 2): Which MIDI channel controls effect parameters. Range: 1–16.
- **Pitch Bend Up** (Knob 3): Maximum upward pitch bend range in semitones. Range: 1–24.
- **Pitch Bend Down** (Knob 4): Maximum downward pitch bend range in semitones. Range: 1–24.

Page 2 — System:

- **Reset Patches** (Knob 1): Turn clockwise to initiate factory reset. A confirmation screen appears:
 - Turn **Knob 4** to confirm reset (restores all 128 voices to factory defaults)
 - Turn **Knob 1** again to cancel
 - After successful reset, shows "Reset Success"
- **Globe Save** (Knob 2): Turn to save all global settings (MIDI channels, pitch bend, speaker, etc.) to flash memory. Shows "Globe Saved" briefly.

Press **GLO again** to return to Home.

■ 3.3 Function Buttons — Bottom Row

■ HOME (BT / Home Screen)

Long-press to toggle BT. HOME LED blinking = BT on but not connected; HOME LED solid = BT connected; HOME LED off = BT off.

Press at any time to return to the **Home / Oscilloscope screen**. The oscilloscope shows the synthesizer output as a real-time waveform — a yellow line on a gray background that moves with the sound you play.

■ SAVE

Press and hold to save the current preset to flash memory.

- When pressed, the device saves any pending changes (voice parameters, effect settings, sequencer patterns, global settings)
- The SAVE LED lights up while saving
- The screen shows Preset Saved briefly
- After releasing the button, the LED turns off

FM-1 SysEx Bank Save (via MIDI):

When the device receives a FM-1 voice bank via MIDI SysEx, a bank selection screen appears. Turn **Knob 1-4** to choose which bank (A/B/C/D) to save the received voices into. Saved successfully after a brief delay.

■ ARP (Arpeggiator)

The arpeggiator automatically plays notes in a pattern when keys are held.

To activate:

- Press **ARP** → the ARP LED lights up, arpeggiator becomes active
- The display enters ARP settings mode

To use:

- Hold one or more keys on the keyboard
- The arpeggiator plays them automatically in the selected pattern
- Key LEDs light up as notes are triggered
- Adjust settings with Knobs 1-4 (see parameter table)

Arpeggiator Modes:

Mode	Pattern
Up	Low note → High note, repeat
Down	High note → Low note, repeat
Inclusive	Low → High → Low (bouncing, including endpoints)
Exclusive	Low → High → Low (bouncing, excluding endpoints)
Random	Random order
Order	In the order keys were pressed
Repeat	Repeat each note before moving to the next

Latch mode: When Latch is ON, notes continue playing even after you release the keys. Press new keys to change the pattern. Turn Latch OFF to stop.

To deactivate:

Press **ARP** while in ARP mode → the arpeggiator stops, ARP LED turns off, returns to Home.

Important: If the sequencer (SEQ) is currently active, pressing ARP will show "Disable SEQ to enter" on screen. You must turn off SEQ first.

■ **SEQ (Sequencer)**

A **16-step pattern sequencer** for creating and playing back note sequences.

To activate:

- Press **SEQ** → SEQ LED lights up, STOP LED lights up, sequencer becomes active
- The display enters SEQ settings mode
- The keyboard keys now function as 16 step indicators (LEDs show filled/empty steps)

Recording a sequence:

- Press **REC** → REC LED and PLAY LED light up, recording starts
- Play notes on the keyboard — each note is recorded into the next step
- Filled steps have their LEDs lit
- Press **REC** again to stop recording (switches to playback mode)

Playing back:

- Press **PLAY/STOP** → PLAY LED lights up, STOP LED turns off
- The sequence plays through the filled steps
- The current step's LED blinks as it plays
- Press **PLAY/STOP** again to stop (STOP LED lights up, PLAY LED turns off)

Step LED indicators during playback:

- **Solid LED** = step has notes
- **No LED** = step is empty
- **Blinking LED** = current playback step

Pattern management:

- 16 independent patterns (1-16) available
- Select pattern with **Knob 1** in SEQ mode
- Patterns are stored in flash memory

To deactivate:

Press **SEQ** while in SEQ mode → sequencer stops, all transport LEDs turn off, returns to Home.

Important: If the arpeggiator (ARP) is currently active, pressing SEQ will show "Disable ARP to enter" on screen. You must turn off ARP first.

■ PLAY/STOP

Transport control for the **sequencer** (only works when SEQ is active):

- Press while stopped → starts playback (PLAY LED on, STOP LED off)
- Press while playing or recording → stops (STOP LED on, PLAY and REC LEDs off)
- If SEQ is not active, shows "Enable SEQ first" on screen

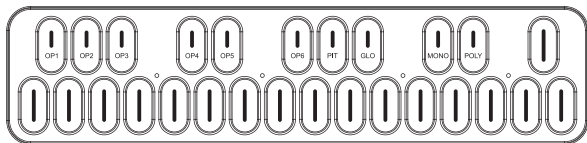
■ REC

Recording control for the **sequencer** (only works when SEQ is active):

- Press while stopped or playing → enters record mode (REC + PLAY LEDs on)
- Press while recording → exits record mode, continues playback (REC LED off, PLAY stays on)
- If SEQ is not active, shows "Enable SEQ first" on screen

4. Bottom — Keyboard & Combo Keys

EN



4.1 Piano Keys (27 Keys)

Standard piano-style keys for playing notes.

- Each key has an LED that lights up when pressed
- The actual MIDI note number is calculated as: key position + 53 + (octave × 12) + transpose
- The default range (octave 0, transpose 0) covers roughly F3 – G5
- In normal mode: keys play notes directly (polyphonic or monophonic depending on setting)
- In ARP mode: keys are fed into the arpeggiator
- In SEQ mode: keys input notes into sequencer steps

4.2 Combo Function Keys

Certain keys are labeled with secondary functions. These labels are active only in Edit mode:

Key Label	Function
OP1-OP6	Select Operator 1-6 for editing. LED solid when selected.
PIT	Select Pitch Envelope for editing
GLO	Select Globe parameters (Algorithm, Feedback, Osc Sync, Transpose)
MONO	Switch to Mono mode — only one note plays at a time
POLY	Switch to Poly mode — up to 12 notes can play simultaneously

When in Edit mode, **all 8 OP/PIT/GLO keys have LEDs that blink** to indicate they are selectable. The currently active selection has a **solid LED**. The MONO/POLY LEDs indicate the current mode: the active mode has a solid LED, the inactive mode blinks.

5. MIDI Connectivity

EN

Three MIDI interfaces are active **simultaneously** — you can use all three at once:

Interface	Connection
USB MIDI	Connect via USB cable to a computer or DAW. Appears as a standard USB MIDI device.
BLE MIDI	Wireless MIDI to iOS/Android/Mac/Windows devices that support BLE MIDI
3.5 MIDI IN	Traditional MIDI cable (31250 baud). Connect to hardware synths, controllers, etc.

What the FM-1 receives via MIDI:

- **Note On/Off** with velocity → triggers the internal synth engine
- **Pitch Bend** → bends pitch within the configured range (see Globe settings)
- **Control Change** → various parameter control
- **FM-1 SysEx voice dumps** → import standard Yamaha DX7 voice banks (32 voices per bank). After receiving, you choose which bank slot (A/B/C/D) to save to.

What the FM-1 sends via MIDI:

- **Note On/Off** with velocity from keyboard, arpeggiator, or sequencer
- Notes are sent on the configured **Note Channel** (1–16, set in Globe mode)

6. Battery & Power

EN

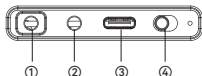
- **Battery level** is shown as an icon in the top-right corner of the display
- When battery is **critically low**, a full-screen **LOW BATTERY** warning appears and stays visible until the battery is recharged or the device is powered off
- The warning takes priority over all other screen content — you need to recharge to clear it

■ Speaker

- The FM-1 has a **built-in speaker** for monitoring without headphones; plugging in headphones automatically mutes the speaker.

7. Rear Panel Interface

EN



① **3.5mm Audio Output:** It is recommended to use headphones with a standard TRS connector. Using other types of connectors may cause audio output noise and prevent the built-in speakers from being muted.



TRS Audio Headphones

② **MIDI input Port:** Use a 3.5 mm-to-MIDI adapter to connect to external devices that support MIDI OUT.

③ **USB:** USB connection port.

④ **Power:** Used to turn the FM-1 synthesizer on/off.

8. Technical Specifications

EN

Product Dimensions	161.5 (L) x 96.5 (W) x 28.6 (H) mm
Product Weight	251 g
Keys	27-key silicone keybed
Knobs	1 x 300° Volume Knob, 7 x 360° Control Knobs
Battery Life	12 hours
Output	USB Type-C port Wireless MIDI (Windows/Mac/iOS/Android) 3.5mm Audio Out Jack
Input	3.5mm MIDI IN Jack
Power	Battery or USB Bus Power
Battery Model	DTP704060
Nominal Voltage	3.7V
Rated Capacity	2000mAh
Operating Frequency Band	2403~2478MHz
Maximum RF Power	9dBm

★Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This equipment 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. This equipment 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 equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment 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 equipment 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.

FCC Radiation Exposure Statement

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

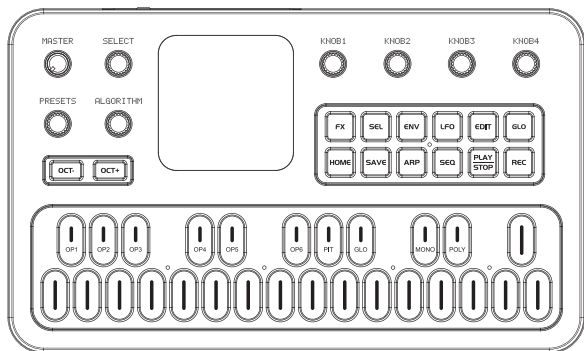
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1)This device may not cause harmful interference.

(2)This device must accept any interference received, including interference that may cause undesired operation.

详细用户手册

FM-1 合成器



■ ① MASTER (主音量旋钮)

控制主音频输出音量。

- 顺时针旋转增大音量，逆时针旋转减小音量。

■ ② SELECT (页面选择编码器)

切换当前模式下的不同参数页面。大多数模式有 2 个页面。

- 顺时针旋转 → 切换到第 2 页
- 逆时针旋转 → 切回第 1 页
- 屏幕底栏显示当前页码，例如：1/2 Arpeggio 或 2/2 Arpeggio
- 在 FX 模式中，SELECT 用于在 6 个效果槽位之间滚动选择

■ ③ PRESETS (音色预设编码器)

浏览 128 个音色预设 (编号 001-128)。

- 顺时针旋转切换到下一个音色，逆时针切换到上一个音色
- 选择会循环：超过 128 自动回到 001，反之亦然
- 每次旋转立即加载所选音色 — 即时听到变化
- 滚动时，屏幕显示音色列表弹窗，包含：
 - 音色编号 (例如 001)
 - 音色名称 (例如 PIANO 3)
 - 当前选中音色的高亮显示
- 弹窗在停止操作约 1 秒后自动消失
- 屏幕顶栏始终显示当前加载的音色编号和名称

■ ④ ALGORITHM (算法编码器)

该编码器根据 OCT-/OCT+ 是否被按住，具有两种功能：

正常使用 (未按住任何按键) — 算法选择：

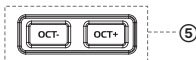
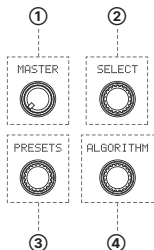
- 旋转选择 FM 合成算法 (01-32)
- FM-1 有 32 种算法，定义了 6 个算子的连接方式
- 改变时，屏幕显示算法图 — 直观展示算子之间的连接路由 (载波/调制/反馈路径)
- 图示弹窗约 1 秒后自动消失

按住 OCT-/OCT+ 时 — 移调功能：

- 按住 OCT- 并旋转 ALGORITHM → 向下移调 (0 到 -12 半音)
- 按住 OCT+ 并旋转 ALGORITHM → 向上移调 (0 到 +12 半音)
- 屏幕显示：Transpose XX (例如 -3 或 +5)
- 移调功能在不改变八度的情况下，将所有音符偏移指定的半音数
- 移调设置会自动保存到全局设置中

■ ⑤ OCT- / OCT+ (八度按键)

将整个键盘上移或下移一个八度。



- 按 **OCT-** → 下移一个八度（最低至 -3）
- 按 **OCT+** → 上移一个八度（最高至 +3）
- 每次按下显示弹窗：Octave XX（例如 -2、+1 或 0）

八度 LED 指示灯：

八度值	LED 状态
0（默认）	两个 LED 均熄灭
±1	慢闪
±2	快闪
±3	常亮

八度为负值时 LED 在 **OCT-** 侧，正值时在 **OCT+** 侧。

组合键 — 重置八度和移调：

同时按下 **OCT-** 和 **OCT+** 可将八度和移调同时重置为 0。

2. 中央 — 1.54 英寸 TFT 显示屏

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显示屏分为三个区域：

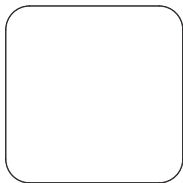
区域	内容
顶栏	当前音色编号 + 音色名称（例如 032 BRASS 1）
中央区域	模式相关内容 — 参数、示波器波形、效果链网格、算法图等
底栏	当前模式名称和页码指示（例如 1/2 LFO）

电池图标显示在右上角，带有电量指示。

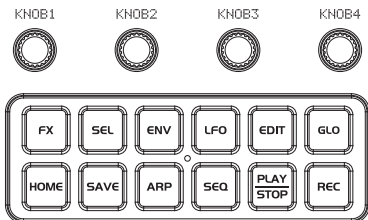
临时弹窗在以下操作时出现（覆盖当前模式内容）：

- 切换音色 → 显示音色列表
- 改变算法 → 显示算法图
- 改变八度 → 显示 Octave X
- 改变移调 → 显示 Transpose X
- 调节音量 → 显示 Volume X
- 保存预设 → 显示 Preset Saved
- 电池电量极低 → 显示 LOW BATTERY（电池恢复前持续显示）

除特别说明外，所有弹窗约 1 秒后自动消失。



显示屏



■ 3.1 KNOB 1 – KNOB 4 (参数编码器)

四个参数编码器的功能随当前模式而变化。底栏始终显示每个旋钮对应的参数名称。

■ FX (效果链) 模式下的参数

旋钮控制当前选中的效果 (闪烁圆点标识) :

滤波器和混响 (带子类型的效果) :

旋钮 1	类型 — 选择子类型
旋钮 2	参数 1 — 第一个音频参数
旋钮 3	参数 2 — 第二个音频参数
旋钮 4	效果开关

延迟、失真、合唱、移相器 (无子类型的效果) :

旋钮 1	参数 1
旋钮 2	参数 2
旋钮 3	参数 3
旋钮 4	效果开关

各效果详细参数:

效果	旋钮 1	旋钮 2	旋钮 3
滤波器 Filter	类型: Low Pass / Band Pass / High Pass	截止频率: 100 Hz – 20,000 Hz (100 级, 对数分布)	Q 值 (共振) : 0 – 100
混响 Reverb	类型: Room / Hall / Plate	衰减 Decay: 0% – 100% (10% 步进)	混合 Mix: 0% – 100% (10% 步进)
延迟 Delay	衰减 Decay: 0% – 100%	速率 Rate: 0% – 100%	混合 Mix: 0% – 100%
失真 Distortion	增益 Gain: 0% – 100%	音色 Tone: 0% – 100%	电平 Level: 0% – 100%
合唱 Chorus	频率 Freq: 0% – 100%	深度 Depth: 0% – 100%	混合 Mix: 0% – 100%
移相器 Phaser	频率 Freq: 0% – 100%	深度 Depth: 0% – 100%	混合 Mix: 0% – 100%

底栏显示精确参数值, 例如: CutOff: 1004Hz 或 Mix: 70%。

■ ENV（包络）模式

旋钮 1	旋钮 2	旋钮 3	旋钮 4
Attack 起音 (0-8)	Decay 衰减 (0-8)	Sustain 延音 (0-8)	Release 释放 (0-8)

每个值以方块条形图显示（方块越多 = 值越大）。

■ LFO（低频振荡器）模式

第 1 页：

旋钮 1	旋钮 2	旋钮 3	旋钮 4
Wave 波形	Speed 速度 (0-99)	PMD 音高调制深度 (0-99)	AMD 振幅调制深度 (0-99)

第 2 页：

旋钮 1	旋钮 2	旋钮 3	旋钮 4
Delay 延迟 (0-99)	Pitch Sens 高音灵敏度 (0-7)	Lfo Sync 同步 (0-1)	Osc Sync (0-1)

波形类型：Triangle（三角波）、Saw Down（下锯齿）、Saw Up（上锯齿）、Square（方波）、Sine（正弦波）、Sample & Hold（采样保持）

■ Edit（编辑）模式

OP1-6（每个算子 6 页参数）：

页码	参数（旋钮 1-4）
第 1 页 — 包络	Rate 1, Rate 2, Rate 3, Rate 4 (0-99)
第 2 页 — 包络	Level 1, Level 2, Level 3, Level 4 (0-99)
第 3 页 — 调音	Detune (0-14)、FreqCoarse (0-31)、FreqFine (0-99)、OscMode (比率/固定)
第 4 页 — 灵敏度与电平	A ModSens (0-3)、KeyVelocity (0-7)、Out Level (0-99)
第 5 页 — 键盘缩放	L Depth (0-99)、R Depth (0-99)、BreakPoint (A-1 - C7)
第 6 页 — 键盘缩放	L Curve (-LN/-EX/+LN/+EX)、R Curve (-LN/-EX/+LN/+EX)、RateScale (0-7)

■ Globe（全局设置）模式

第 1 页 — MIDI 与弯音：

旋钮 1	旋钮 2	旋钮 3	旋钮 4
音符通道 Note Ch (1-16)	效果通道 Effect Ch (1-16)	弯音上 Pitch Up (1-24 半音)	弯音下 Pitch Dn (1-24 半音)

第 2 页 — 系统：

旋钮 1	旋钮 2	旋钮 3	旋钮 4
重置音色 Reset Patches	保存全局 Globe Save	-	-

■ ARP（琶音器）模式

第 1 页：

旋钮 1	旋钮 2	旋钮 3	旋钮 4
模式 Mode	八度范围 Octave (1-4)	速率 Rate	速度 Tempo (30-300 BPM)

第 2 页:

旋钮 1	旋钮 2	旋钮 3	旋钮 4
门限 Gate (20-100%)	摇摆 Swing (50-75%)	锁定 Latch (开/关)	-

■ SEQ (音序器) 模式

第 1 页:

旋钮 1	旋钮 2	旋钮 3	旋钮 4
模式编号 Pattern (1-16)	Clear	速率 Rate	速度 Tempo (30-300BPM)

第 2 页:

旋钮 1	旋钮 2	旋钮 3	旋钮 4
门限 Gate (20-100%)	摇摆 Swing (50-75%)	-	-

■ 3.2 功能按键 — 上排

■ FX (效果链)

按下进入**效果链模式**。屏幕显示 3×2 网格的 6 个效果槽位，每个显示：

- 效果名称 (Filter, Reverb, Delay, Distortion, Chorus, Phaser)
- 当前选中的槽位下方有一个**闪烁圆点**
- **亮色方块** = 效果已开启，**暗色方块** = 效果已关闭

操作方法:

- 旋转 **SELECT** 在 6 个效果槽位之间移动闪烁圆点
- 旋转 **KNOB 1-4** 调节选中效果的参数 (参数名称显示在底栏)
- 再次按 **FX** 返回主屏幕

■ SEL (效果选择 / 排序)

仅在 **FX 模式** 中有效。用于**锁定效果并重新排序**

- 按 **SEL** → 当前高亮效果被“抓取” (圆点由闪烁变为常亮; SEL LED 亮起)
- 旋转 **SELECT** → 被抓取的效果与相邻效果**交换位置**
- 再次按 **SEL** → 将效果放置到新位置 (SEL LED 熄灭)

这允许您重新排列效果的处理顺序 (例如将失真放在混响前面，或将延迟放在合唱前面)。

开/关切换: 旋转最右侧旋钮 (编码器 4) 顺时针开启选中效果，逆时针关闭。效果方块亮度相应变化。

■ ENV (包络)

按下进入 **ADSR 包络编辑模式**。屏幕显示 4 个参数框:

- **Attack (起音)** — 按键后声音达到最大音量的速度。范围: 0-8。0 = 瞬时起音 (立即最大音量)，8 = 极慢渐入。

- **Decay (衰减)** — 声音从峰值降到延音电平的速度。范围：0-8。
 - **Sustain (延音)** — 按住琴键时保持的音量电平。范围：0-8。值越高 = 延音越响。
 - **Release (释放)** — 松开琴键后声音消失的时间。范围：0-8。0 = 立即静音，8 = 长时间渐弱。
- 使用 **KNOB 1-4** 调节各参数。数值以方块条形图显示。再次按 **ENV** 返回主屏幕。

■ LFO (低频振荡器)

按下进入 **LFO 编辑模式**。LFO 为声音添加周期性调制效果。

第 1 页 (使用 SELECT 切换页面)：

- **Wave (KNOB 1)**：LFO 波形。选项：三角波、下锯齿、上锯齿、方波、正弦波、采样保持。
- **Speed (KNOB 2)**：LFO 振荡速度。范围：0-99。值越高 = 调制越快。
- **PMD (KNOB 3)**：音高调制深度。范围：0-99。值越高 = 音高颤动越大。
- **AMD (KNOB 4)**：振幅调制深度。范围：0-99。值越高 = 颤音效果越强。

第 2 页：

- **Delay (KNOB 1)**：LFO 在音符触发后延迟启动的时间。范围：0-99。
- **Pitch Sens (KNOB 2)**：LFO 对音高的影响量。范围：0-7。
- **Lfo Sync (KNOB 3)**：是否在每个新音符时重置 LFO。0 = 自由运行，1 = 同步。
- **Osc Sync (KNOB 4)**：是否在每个新音符时重置音头。0 = 自由运行，1 = 同步。

■ EDIT (算子编辑)

按下进入 **深度 FM 合成编辑**。在此塑造每个 FM-1 音色的基本音色特征。

FM-1 合成器有 **6 个算子 (OP1-OP6)**。每个算子是一个正弦波振荡器，可以作为载波（直接产生声音）或调制器（改变其他算子的声音）。算法设置（通过 ALGORITHM 编码器更改）决定了算子的连接方式。

操作方法：

- 按 **EDIT** 进入。底部键盘按键此时作为功能选择器使用。
- 按键盘上的 **组合功能键** 选择编辑内容：

- **OP1 - OP6**：选择单个算子的参数进行编辑
- **PIT**：音高包络（音高随时间的变化）
- **GLO**：全局合成参数（算法、反馈、振荡器同步）
- **MONO**：切换到单音模式（一次只发一个音，后触优先）
- **POLY**：切换到复音模式（最多同时发 12 个音）

- 当前选中的算子/功能的 LED 常亮。
- 旋转 **SELECT** 翻页浏览该部分的参数（每个算子最多 6 页）。
- 使用 **KNOB 1-4** 调节参数。
- 再次按 **EDIT** 返回主屏幕。

■ GLO (Globe — 全局设置)

按下进入 **全局设备设置**。

第 1 页 — MIDI 与弯音:

- **音符通道 Note Channel** (KNOB 1) : 键盘发送/接收音符的 MIDI 通道。范围: 1-16。
- **效果通道 Effect Channel** (KNOB 2) : 控制效果参数的 MIDI 通道。范围: 1-16。
- **弯音上 Pitch Bend Up** (KNOB 3) : 向上弯音最大范围 (半音数)。范围: 1-24。
- **弯音下 Pitch Bend Down** (KNOB 4) : 向下弯音最大范围 (半音数)。范围: 1-24。

第 2 页 — 系统:

- **重置音色 Reset Patches** (KNOB 1) : 顺时针旋转发起恢复出厂设置。出现确认界面:
- 旋转 **KNOB 4** 确认重置 (将所有 128 个音色恢复为出厂默认)
- 再次旋转 **KNOB 1** 取消
- 重置成功后显示 "Reset Success"
- **保存全局 Globe Save** (KNOB 2) : 旋转保存所有全局设置到闪存。短暂显示 "Globe Saved"。再次按 **GLO** 返回主屏幕。

■ 3.3 功能按键 — 下排

■ HOME (BT/主屏幕)

长按开关BT, HOME LED 闪烁 BT 打开未连接, HOME LED 常亮 BT 连接, HOME LED 不亮 BT 关闭。

随时按下可返回**主屏幕 / 示波器画面**。示波器以实时波形显示合成器输出 — 灰色背景上的黄色线条随您演奏的声音运动。

■ SAVE (保存)

按住以将当前预设保存到闪存。

- 按住时, 设备保存所有待处理的更改 (音色参数、效果设置、音序器模式、全局设置)
- 保存期间 SAVE LED 亮起
- 屏幕短暂显示 Preset Saved
- 松开按键后 LED 熄灭

FM-1 SysEx 音色库保存 (通过 MIDI) :

当设备通过 MIDI SysEx 接收到 FM-1 音色库时, 出现音色库选择界面。旋转 **KNOB 1-4** 选择存入哪个库 (A/B/C/D)。短暂延迟后保存完成。

■ ARP (琶音器)

琶音器在按住琴键时自动按模式播放音符。

激活方法:

- 按 **ARP** → ARP LED 亮起, 琶音器激活
- 显示屏进入 ARP 设置模式

使用方法:

- 按住键盘上一个或多个琴键
- 琶音器按选定模式自动播放
- 触发音符时对应琴键 LED 亮起
- 使用 KNOB 1-4 调节设置 (参见上方参数表)

琶音器模式：

模式	演奏方式
Up (上行)	从低音到高音, 重复
Down (下行)	从高音到低音, 重复
Inclusive (包含)	低→高→低 (含端点来回跳动)
Exclusive (排除)	低→高→低 (不含端点来回跳动)
Random (随机)	随机顺序
Order (按键顺序)	按照按键按下的顺序
Repeat (重复)	每个音符重复后再移到下一个

Latch (锁定) 模式：锁定开启时，即使松开琴键，音符仍继续播放。按新键可改变模式。关闭锁定以停止。

关闭方法：在 ARP 模式中再次按 ARP → 琶音器停止，ARP LED 熄灭，返回主屏幕。

重要提示：如果音序器 (SEQ) 正在运行，按 ARP 将显示 "Disable SEQ to enter"。您必须先关闭 SEQ。

■ SEQ (音序器)

16 步模式音序器，支持录制和回放。

激活方法：

- 按 **SEQ** → SEQ LED 亮起，STOP LED 亮起，音序器激活
- 显示屏进入 SEQ 设置模式
- 键盘按键此时作为 16 步指示器 (LED 显示已填充/空步)

录制序列：

- 按 **REC** → REC LED 和 PLAY LED 亮起，开始录制
- 在键盘上弹奏音符 — 每个音符录入下一步
- 已填充步的 LED 亮起
- 再次按 **REC** 停止录制 (切换到播放模式)

回放：

- 按 **PLAY/STOP** → PLAY LED 亮起，STOP LED 熄灭
- 序列播放已填充的步
- 当前播放步的 LED 闪烁
- 再次按 **PLAY/STOP** 停止 (STOP LED 亮起，PLAY LED 熄灭)

步 LED 指示灯说明：

LED 状态	含义
常亮	该步包含音符
熄灭	该步为空
闪烁	当前播放到该步

模式管理：有 16 个独立模式 (1-16) 可用。在 SEQ 模式下使用 KNOB 1 选择模式。模式存储在闪存中。

关闭方法：在 SEQ 模式中再次按 SEQ → 音序器停止，所有传输 LED 熄灭，返回主屏幕。

重要提示：如果琶音器（ARP）正在运行，按 SEQ 将显示 "Disable ARP to enter"。您必须先关闭 ARP。

■ PLAY/STOP（播放/停止）

音序器的传输控制（仅在 SEQ 激活时有效）：

- 在停止状态下按 → 开始播放（PLAY LED 亮，STOP LED 灭）
- 在播放或录制状态下按 → 停止（STOP LED 亮，PLAY 和 REC LED 灭）
- 如 SEQ 未激活，显示 "Enable SEQ first"

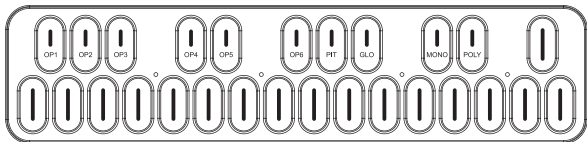
■ REC（录制）

音序器的录制控制（仅在 SEQ 激活时有效）：

- 在停止或播放状态下按 → 进入录制模式（REC + PLAY LED 亮）
- 在录制状态下按 → 退出录制，继续播放（REC LED 灭，PLAY 保持亮）
- 如 SEQ 未激活，显示 "Enable SEQ first"

4. 底部 — 键盘与组合功能键

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4.1 钢琴键（27 键）

标准钢琴式按键用于弹奏音符。

- 每个按键都有 LED，按下时亮起
- 实际 MIDI 音符编号计算方式： $\text{按键位置} + 53 + (\text{八度} \times 12) + \text{移调}$
- 默认范围（八度 0，移调 0）大约覆盖 F3 - G5
- 在普通模式下：直接弹奏音符（复音或单音取决于设置）
- 在琶音模式下：按键输入给琶音器处理
- 在音序模式下：按键将音符录入音序器步

4.2 组合功能键

部分琴键标注有第二功能。这些标签仅在 Edit（编辑）模式下有效：

按键标签	功能
OP1 - OP6	选择算子 1-6 进行编辑。选中时 LED 常亮。
PIT	选择音高包络进行编辑
GLO	选择全局参数（算法、反馈、振荡器同步、移调）
MONO	切换到单音模式 — 一次只发一个音
POLY	切换到复音模式 — 最多同时发 12 个音

在 Edit 模式下，所有 8 个 OP/PIT/GLO 按键的 LED 闪烁表示可选择。当前激活的选择 LED 常亮。MONO/POLY LED 指示当前模式：当前模式的 LED 常亮，另一个闪烁。

三种 MIDI 接口**同时工作** — 可以同时使用所有三种：

接口	连接方式
USB MIDI	通过 USB 线缆连接电脑或 DAW。作为标准 USB MIDI 设备识别。
BLE MIDI	无线 MIDI 连接 iOS/Android/Mac/Windows 支持 BLE MIDI 的设备。
3.5 MIDI IN	传统 MIDI 线缆连接（31250 波特率）。连接硬件合成器、控制器等。

FM-1 通过 MIDI 接收的内容：

- **Note On/Off（音符开关）** 带力度 → 触发内部合成引擎
- **Pitch Bend（弯音）** → 在设定范围内弯曲音高（参见 Globe 设置）
- **Control Change（控制变化）** → 各种参数控制
- **FM-1 SysEx 音色转储** → 导入标准 Yamaha DX7 音色库（每库 32 个音色）。接收后选择保存到哪个库槽位（A/B/C/D）。

FM-1 通过 MIDI 发送的内容：

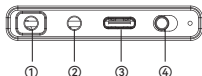
- 来自键盘、琶音器或音序器的 **Note On/Off** 带力度
- 音符通过设定的**音符通道**发送（1-16，在 Globe 模式中设置）

6. 电池与电源

- **电池电量**以图标形式显示在屏幕右上角
- 电池**电量极低**时，出现全屏 LOW BATTERY 警告并持续显示，直到充电或关机
- 该警告优先于所有其他屏幕内容 — 需要充电才能清除

■ 扬声器

- FM-1 内置**扬声器**，可在无耳机时监听，插入耳机后扬声器自动静音。



① 3.5音频输出插孔：建议使用TRS图示耳机，否则可能导致音频输出噪音以及扬声器无法关闭。

② MIDI 输入端口：使用3.5mm转MIDI适配器连接到支持 MIDI OUT 的外部设备。

③ USB：USB连接端口。

④ 电源：用于打开/关闭FM-1合成器



TRS图示耳机

8. 技术规格

产品尺寸	161.5 (L) x 96.5 (W) x 28.6 (H) mm
产品重量	251 g
琴键	27键硅胶琴键
旋钮	1个300° 音量旋钮，7个360° 控制旋钮
续航时间	12小时
输出	USB-C型接口 无线MIDI连接Windows/Mac/ios/Android 3.5mm音频输出接口
输入	3.5mm MIDI IN 接口
电源	电池供电或USB供电
电池型号规格	DTP704060
电池标称电压	3.7V
电池额定容量	2000mAh
工作频段	2403~2478MHz
最大射频功率	9dBm
修订	2026-7-28

◆ In the interest of product improvement, specifications and/or product content (including but not limited to appearance, packaging design, manual contents, accessories, dimensions, parameters and display screens) are subject to change without prior notice. Please consult your local supplier for accurate product information. Specifications and features (including but not limited to appearance, colours and dimensions) may differ between models. All images are for illustration purposes only.