Introduction

Thank you for purchasing the Korg volca fm DIGITAL FM SYNTHESIZER. This digital synthesizer uses a 3-voice, 6-operator FM (Frequency Modulation) sound engine. In addition to the basic FM sound parameters, there are also a number of volca fm-specific parameters that provide further sound-editing capabilities. Sound files (SYS-EX/SYX) created on the Yamaha DX7 can be converted and loaded into the volca fm. Sounds created on the volca fm can be exported and shared with another volca fm. In addition, the volca fm also includes a built-in step sequencer, motion sequencer, and an arpeggiator—plus various voice modes—that can all add movement, depth, and expression to your volca fm sounds.

FM (Frequency Modulation) is based on synthesis elements known as operators. The volca fm sound engine uses six operators. Operators can function as either modulators or carriers; modulating operators apply modulation to audio-source carrier operators to create sound. The way that these modulating and carrier operators interact is called an algorithm; the volca fm provides 32 distinct FM algorithms.
In the EDIT mode, the parameters required for the FM sound source, such as the LFO waveform and speed as well as the EG level and rate, can be set for each operator.

TRANSPOSE slider
This slider raises or lowers the pitch in units of octaves or semitones.

VELOCITY slider
In PLAY mode, this slider controls the global velocity. In EDIT mode, this slider functions as the VALUE slider for editing the FM synthesis parameters.

OCTAVE ◀, ▶ / OPERATOR +, – buttons
In PLAY mode, these buttons change the octave range of the keyboard. In EDIT mode, these buttons select the operator to edit. By selecting "A" (All), you can edit parameters that apply to all operators.

SAVE/EXPORT button
When not in EDIT mode, this button saves the FM sound engine parameters. Press the SAVE/EXPORT button, and then use the PROGRAM knob to select the save location for the program. Press the SAVE/EXPORT button again to begin saving. To cancel the save operation, press the EDIT button before pressing the SAVE/EXPORT button.

Exporting
You can connect the volca fm's SYNC OUT jack to the SYNC IN jack of another volca fm unit, and export (transmit) FM sound programs and sequences to the other volca fm unit.
In EDIT mode, press the SAVE/EXPORT button so that the button blinks, and then use the PROGRAM knob to select the item to be exported. After selecting the item to be exported, press the SAVE/EXPORT button again to export it. The SAVE/EXPORT button lights up while the export operation is being performed. The SAVE/EXPORT button blinks again when the operation is finished.
Items to be exported
Crnt PGM (currently selected program), ALL PGM (all 32 programs), Crnt SEQ (current sequence), ALL SEQ (all 16 sequences), CLOnE (all previously listed items)

EDIT button
Use this button to toggle between the EDIT and PLAY modes. EDIT mode is the mode for specifying settings for FM synthesis parameters and exporting.

Specifying global parameter settings

Setting the MIDI channel
1. While holding down the MEMORY button, turn the volca fm on.
2. Keyboard buttons 1 to 16 correspond to the MIDI channels 1 to 16. Press the button that corresponds to the desired channel, and the LED below the keyboard button will light up.

Other parameters
1. While holding down FUNC button, turn on the volca fm.
2. Use the keyboard buttons 1–8 to set your preferences for any or all of the global parameters. (Refer to the table.)
3. When you have finished, press the ● (REC) button. Your settings will be saved, and the volca fm will restart. To cancel without making changes, press the ▶(PLAY) button.

Button		LED lit up		LED unlit	
	Parameter	Status	Display indication	Status	Display indication
1	Auto power-off function	*Enabled	AutoP On	Disabled	AutoP OFF
2	Battery type selection	Nickel-metal hydride	bAtt nH	*Alkaline	bAtt AL
3	Sync Out polarity	Fall	SyncOt Lo	*Rise	SyncOt HI
4	Sync In polarity	Fall	SyncIn Lo	*Rise	SyncIn HI
5	Tempo range settings	Full (10-600)	TEmPo FuL	*Narrow (56-240)	TEmPo nAr
6	MIDI Clock Src	*Auto	MdCLK Aut	Internal	MdCLK Int
7	MIDI RX ShortMessage	*On	MdShrt On	Off	MdShrt OF
8	Sync input/output unit	Once a step	SyncStp 1	*Once every 2 steps	SyncStp 2

*: Factory default setting

⏻ (Power) button
Press this button to turn the volca fm on. To turn the volca fm off, hold this button for approximately one second.

Auto power-off
The power-off function will automatically turn the volca fm off after roughly four hours have passed with no sound being produced. The auto power-off function can be disabled using the global parameters. (See global parameters.)

DC 9V ⊖–⊂–⊕ Jack
Connect the plug end of the optional AC adapter to this jack.
⚠ Only use the specified AC adapter. Using any AC adapter other than the specified model could damage the volca fm.

Keyboard buttons
Arranged as in a traditional keyboard, these buttons are used to play the volca fm.

MEMORY buttons
The volca fm is equipped with 16 memory locations that are used to save sequences. To load a sequence, press the MEMORY button, and then press one of the 1 through 16 buttons. Hold down the FUNC button and press the MEMORY (WRITE) button to enter the save-ready condition. In this condition, press one of the 1–16 buttons to save the currently selected program number and sequence in the button that you pressed.

CHAIN function
Multiple saved sequences can be linked together to create a longer and more interesting performance. Hold down the MEMORY button, and using the 1–16 buttons in which sequences have been saved, specify the range of sequences that you want to play. The sequences in that range will play back consecutively.

FUNC (function) button
To access various volca fm functions, hold down the FUNC button and press the appropriate keyboard button. The LED below the key will light to confirm your selection.
VOICE MODE
• FUNC + POLY: Up to three-note chords can be played.
• FUNC + MONO: One note at a time can be played.
• FUNC + UNISON: All three voices will sound in unison, operating as a mono synth.
CHORUS
• FUNC + CHORUS: This applies a chorus effect.
ARP ON/OFF
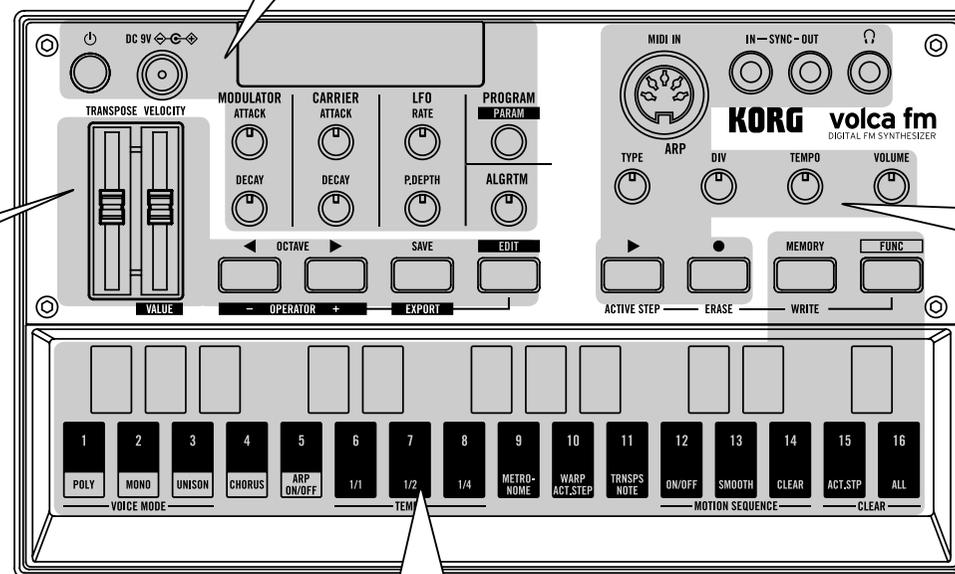• FUNC + ARP ON/OFF: This turns arpeggiator on/off.
Tempo settings
• FUNC + 1/1, 1/2, 1/4: The volca fm tempo can be set to one-half, one-quarter, or equal to the value of the incoming MIDI clock, the SYNC IN clock rate, or the current tempo knob setting.
• FUNC + METRONOME: When selected, the metronome will sound during sequence playback.
• FUNC + WARP ACT.STEP: If there are fewer than 16 active steps, they are compensated to occupy the same playback time as 16 steps.
Transpose setting
• FUNC + TRANSPS NOTE: Switches the operation of the TRANSPOSE slider to semitone units.

DISPLAY
The value of the selected knob, button, or function is shown in the screen.

Envelope Generator Controls
The envelopes [EG] control how fast an operator comes up to full level (Attack) and how fast an operator dies down (Decay) after the key is pressed or released.
MODULATOR
• ATTACK: This knob controls the EG attack for the selected MODULATOR operator.
• DECAY: This knob controls the EG decay for the selected MODULATOR operator.
CARRIER
• ATTACK: This knob controls the EG attack for the selected CARRIER operator.
• DECAY: This knob controls the EG decay for the selected CARRIER operator.

MOTION SEQUENCE
This function records knob or slider operations that are performed while a sequence is being recorded. Once the sequence has made a full cycle from the step where an operation was performed, record is automatically deactivated.
• FUNC + ON/OFF: This turns motion sequencing on/off.
• FUNC + SMOOTH: If this is turned on, the parameters change smoothly during each step according to the motion value recorded at the beginning of each step. If this is turned off, the parameters change abruptly at the beginning of each step.
TIP Some parameters won't play back smoothly.
• FUNC + CLEAR: All recorded knob adjustments will be erased.
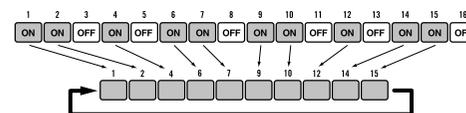TIP Motion Sequence can record operations of TRANSPOSE, VELOCITY and all clear knobs except TEMPO.

CLEAR (erasing data)
• FUNC + ACT.STP: All values in the active step will be deleted
• FUNC + ALL: All sequence data will be erased.
• FUNC + ● (REC/ERASE) during playback: Use the keyboard buttons to remove individual sounds.

ACTIVE STEP mode: FUNC button + ▶ (PLAY) button
Using the ACTIVE STEP mode, each step of the current sequence can be individually turned on or off; disabled (off) steps will be skipped during playback and recording .
While holding down the FUNC button, press the ▶ button (ACTIVE STEP) to enter active step mode.Each step of the current sequence can be turned on/off. Steps that are turned off are disabled and will be skipped during playback and recording. The LEDs below the keyboard buttons representing the active steps will light up. When you've finished, press the FUNC button to exit active step mode.

Restoring all factory default FM sound programs and sequence data
1. While holding down the FUNC and MEMORY buttons, turn the volca fm on. The ● (REC) and ▶ (PLAY) buttons will blink.
2. Press the ● (REC) button to restore the factory defaults and start volca fm. Press the ▶ (PLAY) button to cancel the reset operation and simply start volca fm.
⚠ Restoring the factory defaults will erase any saved FM sound program and sequence data.

LFO (Low Frequency Oscillator)
• RATE: This knob sets the LFO speed of the FM sound source parameters.
• P.DEPTH: This knob sets the depth of the LFO applied to the pitch of the FM sound source parameters.

PROGRAM
Normally, this knob selects the program. In EDIT mode, this knob selects the FM synthesis parameter.

ALGRTM
This knob selects the operator algorithm for the FM sound engine.

MIDI IN jack
By connecting a MIDI cable to this input, the volca fm can be played and controlled by the MIDI output of an external device. SYX sound data files for the Yamaha DX7 can also be received.

SYNC (IN, OUT) jacks
These jacks allow you to synchronize your volca fm to Korg volca, monotribe or other equipment—including an analog sequencer or a DAW. The polarity of the SYNC jacks can be set using the global parameters.
• SYNC OUT: a 5 V pulse of 15 ms is sent at the beginning of each step.
• SYNC IN: If this jack is connected, the internal step-clock will be ignored, and the volca fm sequencer will advance according to the pulses received here.

Ω (Headphone) jack
Connecting your headphones to this 1/8"stereo mini jack will mute the volca fm's internal speaker and allow you to create music in private.

ARP (Arpeggiator)
The arpeggiator plays the individual notes held on the keyboard in a rhythmic pattern.
• TYPE: Select one of the available arpeggiator patterns using this knob.
• DIV: Use this knob to change the note timing resolution of the arpeggiator.

TEMPO
The tempo knob sets the playback tempo for the arpeggiator and sequencer.

VOLUME
This is the master volume knob; use this to set the output level of volca fm.

▶ (PLAY) button
Pressing this button will cause the current sequence to begin playing. The ▶(PLAY) button will light up during playback. Press this button a second time to stop playback.

● (REC) button
This records your performance on the keyboard buttons as a sequence. If you press this button while stopped, you'll enter record-ready mode (the button will blink); when you then press the ▶(PLAY) button, recording will start (the button will light). You can also start recording by playing the keyboard when in record-ready mode. If you press the ● (REC) button during playback, recording will start from the point at which you pressed the button.

Installing the batteries
On the back panel, locate the battery compartment and slide off the cover. Insert the batteries—being sure to observe the correct polarity—and then replace the battery cover.
⚠ Turn the volca fm off before replacing the batteries.
⚠ Remove depleted batteries at once. Depleted batteries left in the battery compartment may leak over time, and may cause malfunctions. Also, remove the batteries if you will not be using the volca fm for an extended period of time.
⚠ Do not mix partially used batteries with new ones, and do not mix batteries of differing types.

Battery level indicator
When the volca fm is turned on, the LEDs below the keyboard buttons indicate the remaining amount of battery power. If all LEDs are lit up, the batteries are completely full. Fewer lit LEDs mean that the battery level is correspondingly lower.
⚠ When using the AC adapter, the remaining battery level will not be indicated correctly.
TIP Either alkaline or nickel-metal hydride batteries can be used. In order for the remaining battery level to be detected and indicated correctly, the type of batteries being used must be specified in the global parameters of the volca fm.
TIP If the batteries are running low during usage of the volca fm, the low battery warning "bAtt Lo" will appear in the display. If the batteries run down completely, the volca fm automatically turns off.
TIP It's not possible to turn off the low battery warning; however, you will be able to continue using the volca fm until the batteries have run down completely.

About the MIDI implementation chart
The volca fm can be controlled via MIDI; simply connect the MIDI output of an external MIDI device to the MIDI IN jack of the volca fm. The MIDI messages that can be received by the volca fm are listed in its MIDI implementation chart. You can download the MIDI implementation chart for the volca fm from the Korg Web site.