

**YAMAHA**

# DX5

DIGITAL PROGRAMMABLE ALGORITHM SYNTHESIZER







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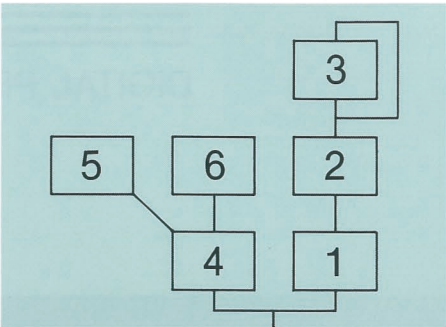
The Yamaha DX series FM digital synthesizers are already legend throughout the music industry, throughout the world. The DX9, DX7 and DX1 can be found on more stages, in more recording studios, and in use by more musicians than any other synthesizer. The reason: FM digital tone generation and unmatched playability. The FM (Frequency Modulation) tone generation system was pioneered by Yamaha, and remains the most effective means of producing the broadest variety of rich, natural voices in use today. In addition to unsurpassed sound, the DX synthesizers are renowned for their superb playability, with a remarkable range of real-time effects that can be used to enhance any performance. Now, Yamaha proudly introduces the DX5 Digital Programmable Algorithm Synthesizer. This superb DX instrument offers dual tone generator channels—32 voices per channel—that can be used independently or combined, 64 “performance” memories which can be programmed with combinations of voices from both channels and a full range of performance effect parameters, 16-note polyphonic output from each tone generator channel, a fully velocity and aftertouch responsive keyboard, dual ROM or RAM1 cartridge capability for an extra 64 to 128 “on-line” voices and for storing and retrieving your own original voices, and full MIDI compati-

bility allowing the DX5 to function in a state-of-the-art digital music system.

## FM Synthesis

If you're involved in the music field, no doubt you are already aware of the Yamaha FM digital tone generation system and what it can do. Let's do a quick “review”, however, just in case digital FM synthesis is new to you. “FM” stands for Frequency Modulation, the key to the success of this system. Basically, each tone generator—one per channel in the DX5—has 6 independent digital oscillators, each with its own 8-parameter envelope generator. Each oscillator-plus-envelope generator unit is called an “operator”. Some of these operators are configured to operate as “carriers”, producing a portion of the fundamental waveform for a voice, while others are configured as “modulators” which frequency-modulate (thus “FM”) the carrier waveforms. The modulation of one waveform by another—at a close frequency ratio—can produce a limitless range of extremely complex harmonic structures far more intricate than any achievable with an analog synthesizer. And, since each operator has its own envelope generator—and a highly sophisticated envelope generator it is, extremely complex time-based level and

timbre variations can be programmed, effectively simulating the sound of well-known acoustic instruments or creating totally new effects.



This “algorithm”—one of 32 possible arrangements of operators on the DX5—uses operators 4 and 1 as carriers, while operators 2, 3, 5, and 6 function as modulators.  
EG/PITCH EG



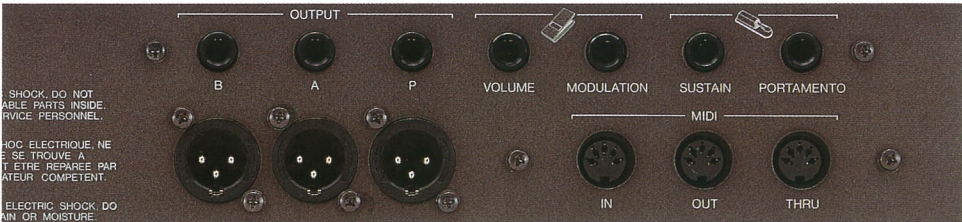
This waveform shows the eight parameters programmable in the envelope generators associated with each operator: Level 1 (L1) through Level 4 (L4), and Rate 1 (R1) through Rate 4 (R4).

## The Voice Channels and Memories

The DX5 has two tone generator channels, each with 32 switch-selectable voice memory locations. Any of the 64 available voices can be used independently, or two—one from each channel—can be combined in a number of ways. In the DUAL keyboard mode, for example, the two voices selected will sound simultaneously. This makes it possible to play two entirely different voices together—say, harp and flute—or you can combine different portions of a string ensemble for a really full string sound, or you could combine different elements of a complex single voice such as acoustic grand piano. In the SPLIT keyboard mode you can assign any voice from channel A to the left side of the keyboard and any voice from channel B to the right side of the keyboard—you program the split point. Thus you could play a bass voice with the left hand while playing an electric piano voice with the right hand, all on a single keyboard. Of course, in the SINGLE voice mode you can play any one of the 64 available voices.

## The Performance Memories

In addition to the two 32-voice memory groups, the DX5 has 64 “performance” memories. Each of these memory loca-



tions can be programmed to select any voice or voice combination from the two voice channels. Each can be programmed with a complete set of performance parameters appropriate to the selected voice or voice combination. In other words, by simply selecting one performance memory, you automatically call the programmed voice combination along with corresponding pitch wheel, modulation wheel, foot controller, breath controller, keyboard aftertouch, portamento/glissando, keyboard mode, split point, and other parameters.

## External Cartridge Memory

The DX5 has two cartridge slots—corresponding to tone generator channels A and B. These accept Yamaha ROM voice cartridges, each containing 64 voices in two switch-selectable banks of 32 voices. Optional Yamaha RAM1 cartridges are also available which can be used to store 32 of your own original voices. Thus, with two voice cartridges installed, you have 64 internal voices

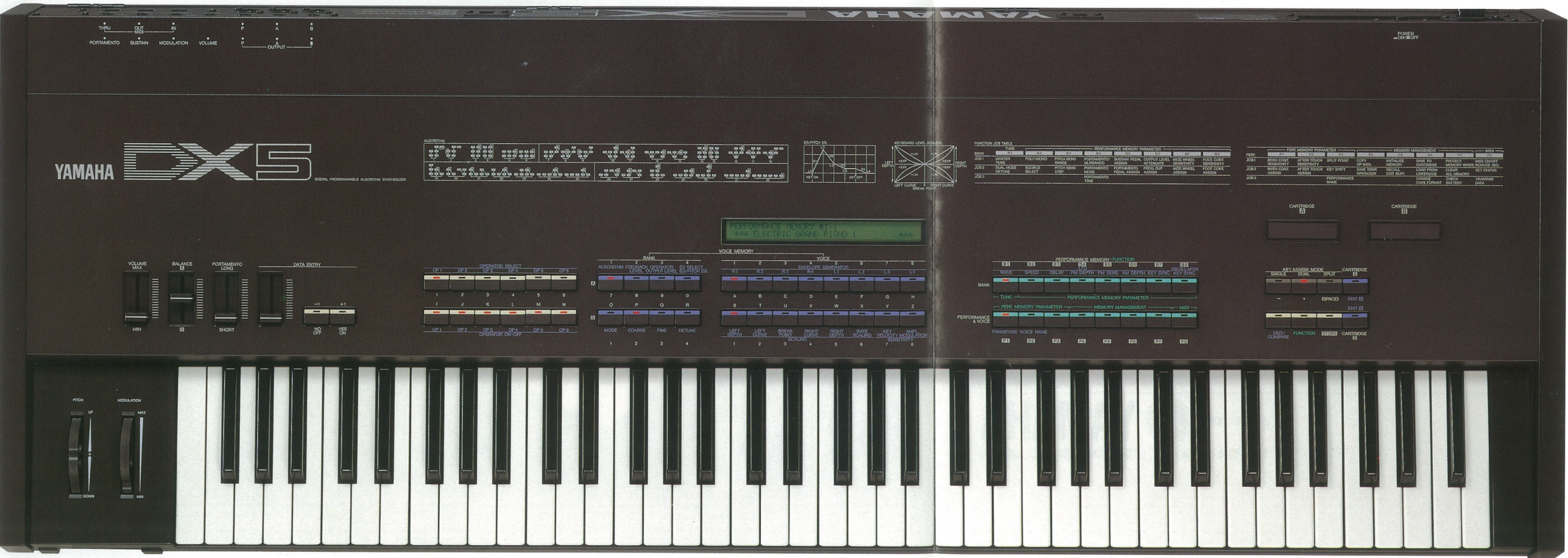
plus 64 external voices which can be selected instantly from the DX5 panel switches. The DX5 also accepts a performance ROM or user-programmed RAM1 cartridge containing a complete set of 64 performance memories. The DX5 comes with two voice ROM cartridges and one performance ROM cartridge giving you 128 pre-programmed voices and 64 pre-programmed performance combinations that can be used as soon as you take your DX5 out of the box.

## Programming

The Yamaha digital FM tone generator system offers unlimited potential for creating your own voices. Whether you need conventional synthesizer voices, brilliant simulations of acoustic instruments, totally new and original sounds that as yet exist only in your imagination, or even sound effects for film or video production, the DX5 can make them real. Although programming the DX5 is nothing like programming a conventional analog synthesizer, a little practice will give you access to a much vaster range of voicing possibilities than you ever thought possible. A large 40 character, two-line liquid crystal display panel makes the job easier by displaying all pertinent data while programming.

## Keyboard Scaling

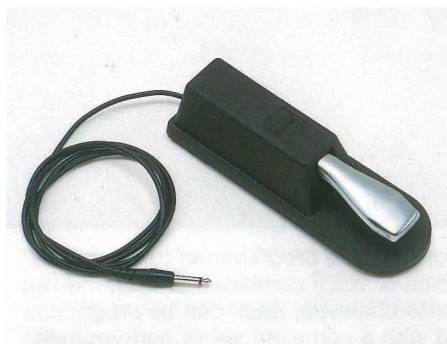
Extensive keyboard scaling control is another reason the DX5 is far superior to conventional synthesizers. This feature makes it possible to vary the levels of the notes across the keyboard range to precisely mimic the level scaling of acoustic instruments or simply achieve a desired effect. Many synthesizers have a keyboard follower control that permits raising or lowering the level of the keyboard's high-range notes. The DX5, however, offers a choice of four different level scaling curves, and the depth of each curve can be adjusted over a broad range. Further, the “break point” of the curve can be set at any note on the keyboard. A Rate Scaling function is also provided which can be used to shorten the envelope of the high keyboard range in relation to the low notes, thus making it possible to simulate the natural sustain characteristics of many acoustic instruments.





## MIDI Compatibility

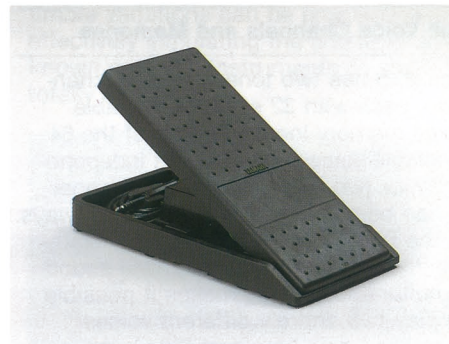
"MIDI", for Musical Instrument Digital Interface, is the new world-standard system for data communication between digital musical instruments. Yamaha and other manufacturers are producing a broad variety of MIDI compatible equipment including keyboard instruments, rhythm machines, sequencers, modular tone generators and music computers which can be linked together to provide musical control that can only be described as revolutionary. The DX5 is fully compatible with the MIDI system, and is the ideal choice as a keyboard instrument to function as the core of a sophisticated digital MIDI music system. With an advanced sequencer like the Yamaha QX1 or the smaller QX7, for example, you can digitally record and play back literally anything you can play on the DX5—including keyboard sensitivity, pitch and modulation control, voice changes, etc. Add a TX816 8-module FM tone generator system and you can play or sequence 8 completely different voices simultaneously. The possibilities are limitless.



**FC-4 Footswitch**



**FC-5 Footswitch**



**FC-7 Foot Controller**



**BC-1 Breath Controller**

## SPECIFICATIONS

### Keyboard

76 keys E0—G6 (Key Velocity & After Touch Response)

### Sound Source

FM Tone Generator: 6 Operators × 2 (A,B), 32 Algorithms

### Simultaneous Note Output

POLY Mode: 32 notes (SINGLE), 16 notes (DUAL), 16 + 16 notes (SPLIT). MONO Mode: 1 note (SINGLE, DUAL), 1 + 1 note (SPLIT)

### Internal Voice Memory

64 (A32 + B32)

### Internal Performance Memory

64

### External Voice Memory

64 (ROM × 2)

### External Performance Memory

64 (ROM)

### Controls

VOLUME, BALANCE, PHONES VOLUME, PORTAMENTO TIME, PITCH WHEEL, MODULATION WHEEL, DATA ENTRY.

### Selectors

VOICE MEMORY, EDIT PARAMETER, PERFORMANCE MEMORY/FUNCTION, CARTRIDGE (A,B), KEY ASSIGN MODE (SINGLE, DUAL, SPLIT), EDIT/COMPARE, FUNCTION, STORE, OPERATOR SELECT, OPERATOR ON/OFF, DISPLAY SELECT (EG/PITCH EG)

### Voice Parameters

ALGORITHM, FEEDBACK, OSCILLATOR (MODE, DETUNE, COARSE, FINE, KEY SYNC), EG (RATE, LEVEL), PITCH EG (RATE, LEVEL), KEYBOARD LEVEL SCALING (BREAK POINT, CURVE, DEPTH), KEYBOARD RATE SCALING, KEY VELOCITY SENSITIVITY, AMPLITUDE MODULATION SENSITIVITY, OPERATOR OUTPUT LEVEL, LFO (WAVE, SPEED, DELAY, PMD, PMS, AMD, KEY SYNC), TRANSPOSE, VOICE NAME.

### Function Parameters

MASTER TUNE, DUAL MODE DETUNE, POLY/MONO, SOURCE SELECT, PITCH BEND RANGE, PITCH BEND STEP, PORTAMENTO/GLISSANDO, PORTAMENTO MODE, PORTAMENTO TIME, SUSTAIN PEDAL ASSIGN, PORTAMENTO PEDAL ASSIGN, OUTPUT LEVEL ATTENUATE, PROG. OUT ASSIGN, MOD. WHEEL SENSITIVITY, MOD. WHEEL ASSIGN, FOOT CONT. SENSITIVITY, FOOT CONT. ASSIGN, BRTH. CONT. SENSITIVITY, BRTH. CONT. ASSIGN, AFTER TOUCH SENSITIVITY, AFTER TOUCH ASSIGN, SPLIT POINT, KEY SHIFT, PERFORMANCE NAME, COPY OF DATA, SAVE TEMP OPERATOR, INITIALIZE MEMORY, RECALL EDIT BUFF., SAVE TO CARTRIDGE, LOAD FROM CARTRIDGE, CHANGE CART. FORMAT, PROTECT MEMORY WRITE, CLEAR ALL MEMORY, CHECK BATTERY, MIDI ON/OFF, REMOTE SEQ., SET STATUS, TRANSMIT DATA.

### Display

LCD (40 characters × 2)

### Connecting Terminals

OUTPUT (A. B. P) × 2 (balanced, unbalanced), PHONES

### Control Terminals

FOOT SWITCH (SUSTAIN, PORTAMENTO), FOOT CONTROL (MODULATION, VOLUME), MIDI (IN, OUT, THRU)

### Power Requirements

U.S. & Canadian Models: 100 ~ 120 V, 50/60 Hz  
General Models: 100 ~ 120/200 ~ 240 V, 50 Hz

### Power Consumption

35 W

### Dimensions/Weight

1229(W) × 113(H) × 441(D) mm  
(48.4" × 4.4" × 17.4") / 18 kg (39.7 lbs)

### Standard Accessories

Music Stand, ROM Voice Memory Cartridge (64 voices) × 2, ROM Performance Memory Cartridge (64 performances), AC Cable

### Optional Accessories

RAM-1 Data Cartridge, FC-7 Foot Controller, FC-4 or FC-5 Footswitch, BC1 Breath Controller, MIDI Cable, LG 100 Stand

*Specifications subject to change without notice.*

For details please contact:

SINCE 1887



**YAMAHA**

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