YAMAHA DX21

DIGITAL PROGRAMMABLE ALGORITHM SYNTHESIZER

Since its introduction, FM Digital Synthesis has totally revolutionized the synthesizer field. Generating sounds through a whole new technology, Yamaha DX synthesizers can reproduce acoustic tones with uncanny accuracy, as well as creating electronic sounds with a depth and tonality unmatched by any previous synthesizer system. Simply stated, it is the richest, most expressive sound available in any electronic keyboard.

The DX21 is the newest addition to the line up of Yamaha Digital Programmable Algorithm Synthesizers. Like the other DX synthesizers it is totally user programmable. With 4 operators and 8 algorithms it provides a simplicity that makes it ideal for the person just entering the exciting world of FM digital synthesizers, while being sophisticated enough for the musician already familiar with electronic keyboards.

Recent advances in state-of-the-art digital technology have provided the DX21 with its most extraordinary feature, dual FM tone generators. Any two of its 32 RAM programmable voices can be combined and played simultaneously, or split so that the voices are assigned to left and right sections of the keyboard. The DX21 also features a special 32 performance memory system. Programmable with such information as play modes, split assignments, detune, key shift and pitch bend data, it automatically recalls—along with the voice—the

most important real-time performance parameters programmed for that voice. Instead of having to worry about correct settings, the musician is free to play! The features don't stop there. Another first is a built-in stereo chorus effect. Besides the regular keyboard controls, expression and sound modification can be achieved with the unique Yamaha Breath Controller. A 128-voice preset ROM memory is built-in, from which voices can be called into the RAM memory as desired. A cassette interface permits unlimited voice storage. Of course, the DX21 is MIDI compatible, capable of interfacing with digital sequencers, drum machines, music computers and other DX synthesizers, the heart of a highly versatile network. The Yamaha DX21 represents a new age in synthesizer performance and flexibility for all musical applications.

FM Digital Synthesis: The Key to Superior Voice Quality

Instead of VCOs, VCAs and VCFs, the DX synthesizers use "operators" to generate sound. An operator is basically a digital sine wave generator combined with an envelope generator that can be used alone or in combination with other operators. A combination of operators is called an "algorithm"—represented on the DX panel by the diagrams of little
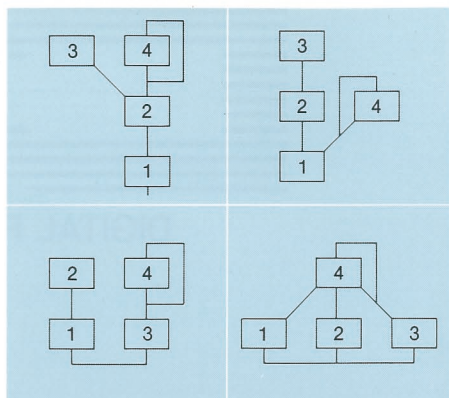
Some of the operator combinations that form algorithms. This is the key to the incredible DX sound.

blocks (operators) connected in various ways. Each diagram represents one possible combination of operators available to you. The operators are either connected "horizontally" so that each contributes its own pitch to the sound—similar to a conventional electronic organ—or "vertically". In vertically connected configurations, the upper operator modulates the lower operator at a precisely controllable frequency ratio, resulting in highly complex music waveforms that are the key to the DX system's incredible sound. Some operators even permit the application of feedback—so they modulate themselves. Further, the envelope generators incorporated in each operator make it possible to produce time-based timbre variations

(just like acoustic instruments) as well as level variations. Choosing which operators and algorithms to use, and how, is the prerogative of you, the musician. As you can see, the possibilities are vast. Unlike conventional ADSR envelope generators, in which attack, decay, sustain level and release time can be controlled to some extent, the DX21 EGs use a unique concept that gives complete control over five parameters that form the envelope. Also, each parameter can be set in discrete increments to ensure precision and repeatability. An independent Pitch Envelope Generator can vary pitch from a fraction of a tone to over 8 octaves. Such detailed control of sound was never possible before and is another reason why acoustic voices in the DX synthesizers sound so real.

Three Ways to Play

The DX21 has 32 RAM (Random Access Memory) voice memories, organized in two banks of 16 voice selector keys. Due to the DX21's two FM tone generators, these voices may be selected three ways: SINGLE, DUAL or SPLIT play modes. In Single Play Mode any of the 32 available voices may be played individually. The Dual Play Mode combines voices from both "A" and "B" banks of voice selectors, with variable balance between voices. Similarly, the Split Play

ENVELOPE GENERATOR
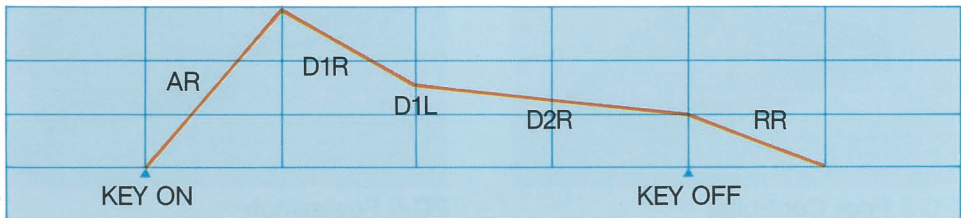
Mode calls up two voices, but the selected voices do not play together. Instead, the "A" and "B" banks are assigned to the left and right of an assigned "split" key so that, for example, the left hand plays a bass voice while the right plays a piano voice. This split point can be assigned anywhere on the keyboard.

128 Pre-Programmed Voices Built In

The DX21 comes with 128 outstanding pre-programmed voices permanently stored in an internal ROM memory (Read Only Memory). Organised into groups of 8, these voices can be loaded singly or in groups into the 32-voice RAM memory. You can combine any of the pre-programmed voices with your own original voices—loaded from

cassette tape—in the 32 RAM memory locations to create the ideal "voice set" for your musical needs.

32 Performance Memories

In addition to the RAM and ROM memories, there is also a special 32 Performance Memory System. Programmable with data on play modes, key shift, detune and pitch bend, it will automatically recall these real-time performance parameters as well as the voice or combination of voices. All you do is press a key to select the desired voice and performance parameter combination, and play!
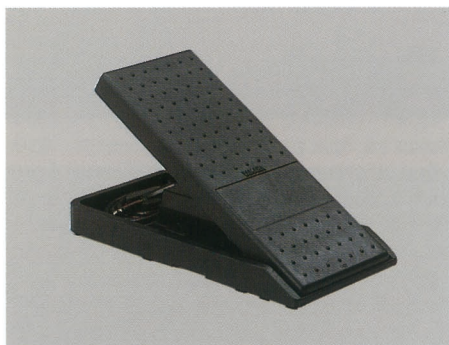
Cassette Storage

Unlike some electronic keyboards, the player is not limited by the number of voices already programmed into the DX21. A cassette interface is built in, so an unlimited number of voices can be programmed and stored on cassette tape. Cassette voices can then be loaded into the RAM memory when needed—singly or as a complete set of 32 voices. After you've been programming your own voices for a while, you'll build up an extensive library of sounds and voices that can be loaded and used whenever needed.

MIDI Functions

The DX21 offers a broad range of MIDI functions that make it exceptionally useful in virtually any MIDI system application. For example, it can be set to transmit and receive on any of the 16 available MIDI channels. It can perform bulk transmission or reception of the entire contents of the voice memory to or from another DX21. And, although the DX21 itself does not have keyboard velocity sensitivity, the tone generators are responsive to velocity sensitivity. Therefore, an external MIDI keyboard can be used to drive the DX21 tone generators with full keyboard touch response.
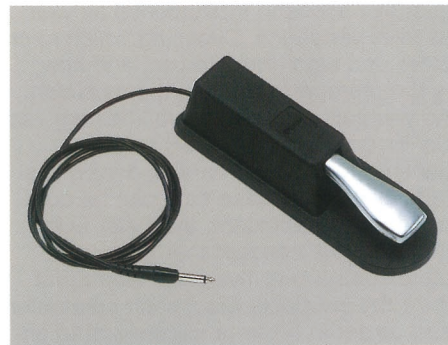
FC-7 Foot Controller
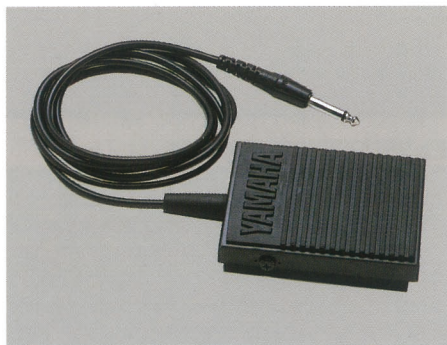
FC-5 Footswitch

FC-4 Footswitch

BC-1 Breath Controller

LC-21S Carrying Case

SC-21 Carrying Case

SPECIFICATIONS

Keyboard
61 keys, $C_1 \sim C_6$

Sound Source
FM Tone Generator: 4 operators × 2 (A,B),
8 Alogorithms

Simultaneous Note Output
Polyphonic: 8 notes (SINGLE), 4 notes (DUAL),
4 + 4 notes (SPLIT) Monophonic:
1 note (SINGLE, DUAL), 1 + 1 note (SPLIT)

Internal Memory
128 ROM voice memory
32 RAM voice memory
32 RAM performance memory

Controls
PITCH BEND WHEEL, MODULATION WHEEL,
VOLUME, BALANCE, DATA ENTRY

Display
LCD (16 characters × 2 lines)

Connecting Terminals
OUTPUT MIX/A, OUTPUT B, PHONES, CASSETTE

Control Terminals
FOOTSWITCH (SUSTAIN, PORTAMENTO),
FOOT CONTROLLER (VOLUME), MIDI
(IN, OUT, THRU)

Dimensions/Weight
909(W) × 82(H) × 270(D) mm
(35.8'' × 3.2'' × 10.6'') 8 kg (17.6 lbs.)

Power Requirements
U.S. & Canadian Models: 120 V, 50/60 Hz
General Models: 220 ~ 240 V, 50 Hz

Power Consumption
7 W

Standard Accessories
Music Stand, Cassette Cable

Optional Accessories
FC7 Foot Controller, FC4 or FC5 Footswitch,
BC1 Breath Controller, LC-21S or SC-21
Carrying Case, LG-21 Stand, MIDI-03 or
MIDI-15 MIDI Cable

Specifications subject to change without notice.

For details please contact:

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