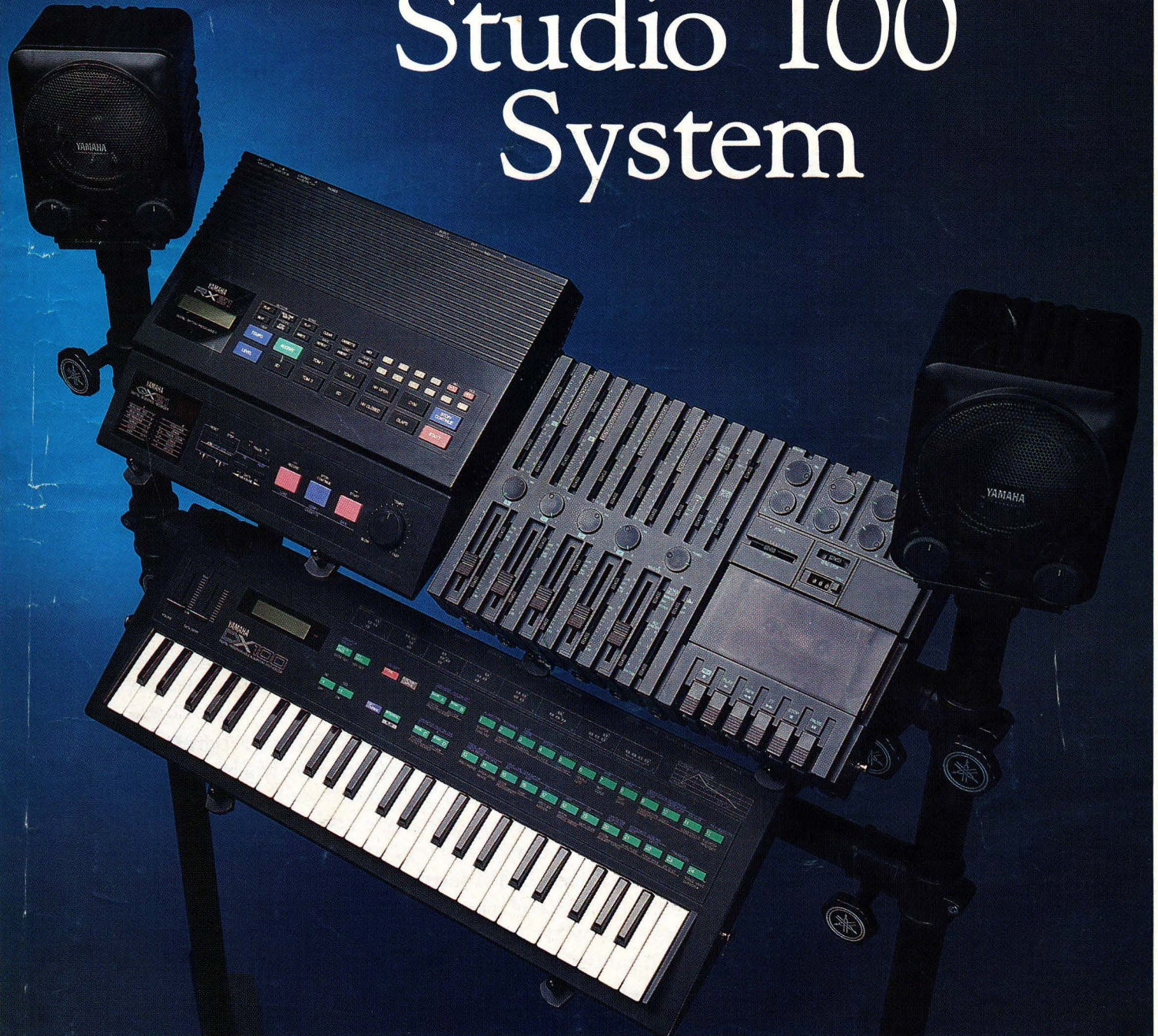




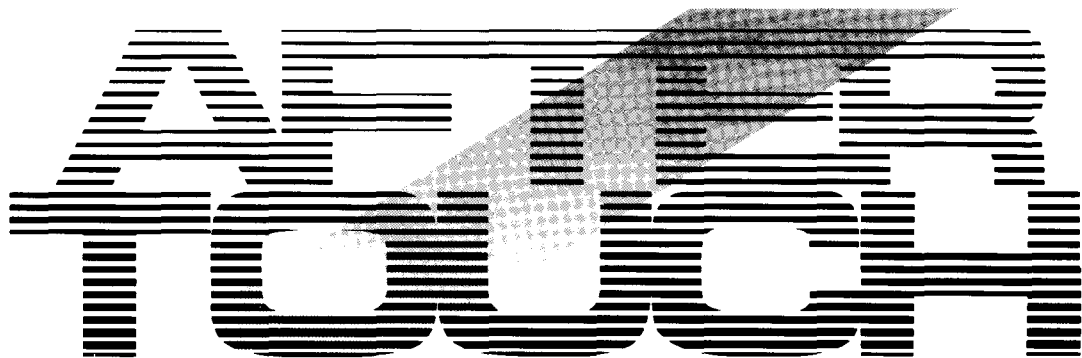
THE OFFICIAL PUBLICATION OF THE YAMAHA USERS GROUP

Studio 100 System



AUGUST 1986

 **YAMAHA**®



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August 1986

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*A product of
GPI Editorial Services
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CA 91323-2338*

AFTERTOUCH is published monthly. Third class postage paid at Long Prairie, MN and additional points of entry. **SUBSCRIPTIONS:** Free. Address subscription correspondence to AFTERTOUCH, P.O. Box 2338, Northridge, CA 91323-2338. **POSTMASTER:** Send form 3579 to P.O. Box 2338, Northridge, CA 91323-2338.

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From The Editor

FOR MONTHS NOW, we have been receiving requests for more coverage of Yamaha's family of 4-operator FM digital synthesizers. Recently, we also started receiving 4-operator voices from readers. This month, we will begin to share those patches with all of our readers.

On pages 6 and 7, you will find two new DX21 patches from AfterTouch readers, and pages 8 and 9 feature two new DX100 patches from readers.

Users of these popular 4-operator units are of course aware that the voice structure of the DX21 and DX100 are completely compatible, so you will be able to take advantage of all four voices if you own one of the following FM digital synthesizers: DX21, DX27, DX27S, or DX100.

With this compatibility in mind, we have also provided, on page 13, a blank voicing chart for the DX100 family of synthesizers, in the standard AfterTouch format. The DX100 is also featured as part of our overview of the Studio System 100, beginning on page 10.

In this issue, we also continue our coverage (begun in the last issue) of Yamaha's new FB-01 FM tone module: Beginning on page 14, you will find an introduction to the YRM506 FB-01 Editor Program cartridge for the CX5M music computer. Next month, we will look at another CAV (computer-aided voicing) program for the FB-01, one that operates on the Apple Macintosh computer.

For DX7 owners, there is a patch that you can use to enhance the drum and cymbal sounds of your RX11 or RX15 digital rhythm pro-

grammers. And for CX5M owners, we are offering a couple of hot tips from readers; for novel applications of your CX5M music computer system, see page 18.

In the next few months, you can look forward to a lengthy article on how to convert DX7 patches for use with the DX100 family of 4-operator synthesizers, an in-depth look at the use of the RX family of rhythm programmers, and advice on how to use the KX76's MIDI control capabilities in real time. We'll also have voices from readers, tips on programming, answers to reader questions, and more. Watch your mailbox—more is on the way, and soon!

In closing, I want to repeat last issue's comments about your mail to us: We at AfterTouch are happy to receive specific questions concerning the use of Yamaha professional music products, and we will answer as many of them as we can in the Questions column; however, requests for general product information must be sent to Yamaha [Yamaha International Corp., P.O. Box 6600, Buena Park, CA 90622].

More importantly, if you have a complaint or suggestion about the *design* of a particular Yamaha product or product line, that correspondence should also be sent to Yamaha. And, if have a comment about Yamaha's advertising, marketing, or corporate policies, those should go to Yamaha as well. The staff of AfterTouch works *only* on AfterTouch. We are happy to hear your thoughts on these subjects; but, if you want your thoughts to reach the decision makers, you should send them to Yamaha.

—TD

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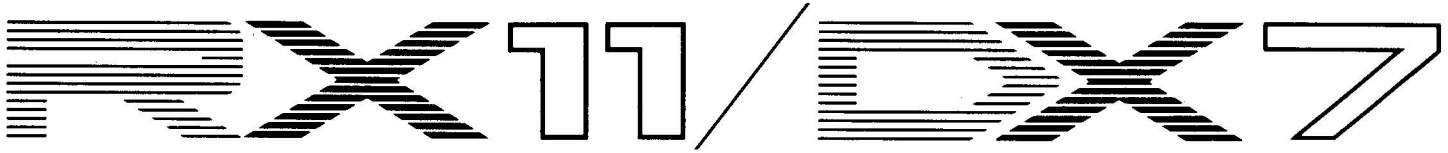
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Also, don't limit yourself to just sending in your address. Let us know what kind of articles you want to read. The more input we receive, the more we will be able to tailor the information in AFTERTOUCHE to suit your musical needs.

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**Enhancing
The Sound
Of Your
RX11 Or
RX15 With
A DX7. By
Stephen
Solum.**

WE OFTEN OVERLOOK the many ways to use MIDI with an RX11 or RX15 digital rhythm programmer, content merely to sync it with the rest of our system and set it in a corner to play by itself. This article will describe a new use for MIDI on the RX: layering sounds from a DX7 or other synthesizer onto the RX to alter or enhance the basic drum sounds. I've included an example of a DX7 patch (see page 5) that will add power and depth to the bass drum and toms, and sparkle to the cymbals. Later, I'll also explain how to use the patch if you own a 4-operator synthesizer like a DX9.

The patch, called SOL-RXPLUS, uses operators #1 and #2 to create fundamentals approximately one octave below each tom sound, to make them heavier and let them ring a little longer. The bass drum addition isn't so much a tuned pitch as it is a low frequency "thud" to balance the tom sounds. Operators #3-#6 are used to make a "ping" trailing off to a very high frequency sizzle, which adds dynamic

channel 4.

3. On the RX, hold down the green FUNCTION key while pressing the grey MIDI OUT button. The display should read:

CH INFO AVAIL

If, instead, the display says "CH INFO UNAVAIL," push the orange +1/YES button to get the setting you need.

4. Now, hit the TOM1 instrument button and move the DATA ENTRY slider to change the MIDI send channel for TOM1 to agree with your DX7 setting. If you set the DX7 to receive on MIDI channel 4, as suggested above, you should set the RX display for TOM 1 to read as follows:

TOM1 TRNS CH=04

5. Repeat this procedure with the rest of the toms, the bass drums, and the crash and ride cymbals. Check the other instrument buttons to make sure they are set for something other than "TRNS CH=04."
6. When it all checks out, push the grey MIDI OUT key twice more to get the RX back to its basic "SELECT PTN" display.

At this point, we must "tune" the DX7 sounds to the RX by directing each RX instrument button to play a certain key on the DX7. Follow these steps:

1. On the RX, hold down the green FUNCTION button while pressing the grey MIDI IN button twice. The display should read:

OMNI ON

2. Hit the TOM1 button and move the DATA ENTRY slider so the display reads as follows:

TOM1 NOTE = 52

3. Hit TOM2 and repeat the procedure, and so on with the other relevant instrument keys, using these key numbers:

| | |
|------|------|
| TOM1 | = 52 |
| TOM2 | = 48 |
| TOM3 | = 45 |

Continued on page 20

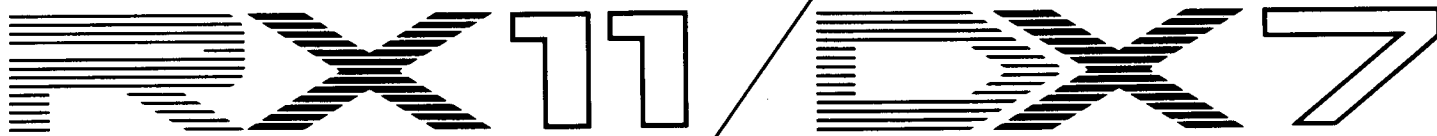


RX11 digital rhythm programmer.

range and high end to the ride and crash cymbals.

After entering the patch (which won't sound like much by itself), set up the RX this way:

1. Connect a MIDI cable from the MIDI OUT of the RX to the MIDI IN of the DX7.
2. On the DX7, press the FUNCTION key and the green VOICE/PARAMETER key (#8), and use the DATA ENTRY slider to set the DX7's MIDI receive to the channel you want to use; for this example, let's say MIDI



| | | | | | | |
|----------------|-------|-------|-----|---------------------|------|-----|
| TR1 | 35 | 0 | 0 | 0 | ON | 0 |
| WAVE | SPEED | DELAY | PMD | AMD | SYNC | PMS |
| LFO | | | | | | |
| R1 | R2 | R3 | R4 | C3 KEY TRANSPOSE | | |
| 99 | 99 | 99 | 54 | | | |
| L1 | L2 | L3 | L4 | ON OSC SYNC | | |
| 50 | 50 | 50 | 44 | | | |
| PITCH ENVELOPE | | | | | | |

| FUNCTIONS | | | | | |
|----------------|-------|-------|------------|-----------|------|
| POLY | 0 | 0 | NA | 0 | 0 |
| POLY/MONO | RANGE | STEP | MODE | GLISSANDO | TIME |
| PITCH BEND | | | PORTAMENTO | | |
| (CONTROLLER) | RANGE | PITCH | AMPLITUDE | EG BIAS | |
| MOD WHEEL | NA | OFF | OFF | OFF | |
| FOOT CONTROL | NA | OFF | OFF | OFF | |
| BREATH CONTROL | NA | OFF | OFF | OFF | |
| AFTERTOUCH | NA | OFF | OFF | OFF | |

| | | | | | |
|------------------|--------------|----------|----|-----|---|
| FREQUENCY | 55.80 | DETUNE | 0 | AMS | 0 |
| ENVELOPE DATA | | | | | |
| R1 | R2 | R3 | R4 | R5 | 0 |
| 99 | 99 | 99 | 60 | | |
| L1 | L2 | L3 | L4 | | |
| 99 | 99 | 99 | 0 | | |
| KEYBOARD SCALING | | | | | |
| CURVE | BREAKPOINT | DEPTH | | | |
| L | -L | C4 | L | 99 | |
| R | -L | | R | 0 | |
| OP# | OUTPUT LEVEL | VELOCITY | | | |
| 5 | 99 | 0 | | | |

| | | | | | |
|------------------|--------------|----------|----|-----|---|
| FREQUENCY | 2089Hz | DETUNE | 0 | AMS | 0 |
| ENVELOPE DATA | | | | | |
| R1 | R2 | R3 | R4 | R5 | 0 |
| 99 | 99 | 99 | 35 | | |
| L1 | L2 | L3 | L4 | | |
| 99 | 99 | 99 | 0 | | |
| KEYBOARD SCALING | | | | | |
| CURVE | BREAKPOINT | DEPTH | | | |
| L | -L | C4 | L | 99 | |
| R | -L | | R | 0 | |
| OP# | OUTPUT LEVEL | VELOCITY | | | |
| 6 | 66 | 0 | | | |

| | | | | | |
|------------------|--------------|----------|----|-----|---|
| FREQUENCY | 0.50 | DETUNE | +7 | AMS | 0 |
| ENVELOPE DATA | | | | | |
| R1 | R2 | R3 | R4 | R5 | 0 |
| 98 | 99 | 99 | 45 | | |
| L1 | L2 | L3 | L4 | | |
| 99 | 57 | 99 | 0 | | |
| KEYBOARD SCALING | | | | | |
| CURVE | BREAKPOINT | DEPTH | | | |
| L | -L | E2 | L | 0 | |
| R | -L | | R | 99 | |
| OP# | OUTPUT LEVEL | VELOCITY | | | |
| 2 | 73 | 0 | | | |

| | | | | | |
|------------------|--------------|----------|----|-----|---|
| FREQUENCY | 4.44 | DETUNE | 0 | AMS | 0 |
| ENVELOPE DATA | | | | | |
| R1 | R2 | R3 | R4 | R5 | 0 |
| 99 | 99 | 99 | 25 | | |
| L1 | L2 | L3 | L4 | | |
| 99 | 99 | 99 | 0 | | |
| KEYBOARD SCALING | | | | | |
| CURVE | BREAKPOINT | DEPTH | | | |
| L | -L | C4 | L | 99 | |
| R | -L | | R | 0 | |
| OP# | OUTPUT LEVEL | VELOCITY | | | |
| 4 | 30 | 0 | | | |

| | | | | | |
|------------------|--------------|----------|----|-----|---|
| FREQUENCY | 0.50 | DETUNE | 0 | AMS | 0 |
| ENVELOPE DATA | | | | | |
| R1 | R2 | R3 | R4 | R5 | 0 |
| 99 | 89 | 83 | 49 | | |
| L1 | L2 | L3 | L4 | | |
| 99 | 44 | 99 | 0 | | |
| KEYBOARD SCALING | | | | | |
| CURVE | BREAKPOINT | DEPTH | | | |
| L | -L | A#2 | L | 0 | |
| R | -L | | R | 99 | |
| OP# | OUTPUT LEVEL | VELOCITY | | | |
| 1 | 99 | 0 | | | |

| | | | | | |
|------------------|--------------|----------|----|-----|---|
| FREQUENCY | 10.00Hz | DETUNE | 0 | AMS | 0 |
| ENVELOPE DATA | | | | | |
| R1 | R2 | R3 | R4 | R5 | 0 |
| 99 | 99 | 99 | 42 | | |
| L1 | L2 | L3 | L4 | | |
| 99 | 99 | 99 | 0 | | |
| KEYBOARD SCALING | | | | | |
| CURVE | BREAKPOINT | DEPTH | | | |
| L | -L | C4 | L | 99 | |
| R | -L | | R | 0 | |
| OP# | OUTPUT LEVEL | VELOCITY | | | |
| 3 | 99 | 0 | | | |

ALGORITHM #14

SOL-RX-PLUS. A New DX7 Voice (For Use With An RX11 Or RX15) By Stephen Solum.

Notes:

This patch uses Ops #1 and #2 for the drum enhancement, while Ops #3-#6 are used for the cymbal enhancement.

For more information on this patch, see the accompanying article on page 4.

Remember, this patch isn't designed to be used by itself, but rather in conjunction with an RX11 or RX15 digital rhythm programmer.

This DX7 voice can also be loaded into all the other Yamaha 6-operator FM digital synthesizers and tone generators, including the DX1, DX5, TX7, TX216, TX816, and TF1.

DX21

TIN SYNTH.
A New DX21
Voice By
John
Cocchiarella.

| LFO & FUNCTIONS | | | | | |
|-----------------|----------|-------|--------------|---------------|---------|
| TRI | 35 | 8 | 10 | 0 | OFF |
| WAVE | SPEED | DELAY | PMO | AMD | SYNC |
| 6 | | 0 | | C3 | |
| PMS | | AMS | | KEY TRANSPOSE | |
| POLY | 12 | FULL | 0 | ON | ON |
| POLY/MONO | PB RANGE | MODE | TIME | PORT | SUSTAIN |
| PORTAMENTO | | | FOOTSWITCH | | |
| 50 | 0 | 0 | 0 | 50 | 0 |
| PITCH | AMPL | PITCH | AMPL | PITCH BIAS | EG BIAS |
| WHEEL RANGE | | | BREATH RANGE | | |

| DX21 ONLY | | |
|----------------|-----|----------|
| PITCH ENVELOPE | | |
| PR1 | PR2 | PR3 |
| 99 | 99 | 99 |
| PL1 | PL2 | PL3 |
| 50 | 50 | 50 |
| CHORUS | | FOOT VOL |
| ON | | 40 |

| FREQUENCY | DETUNE | AME | | |
|---------------|------------------|----------|-----|----|
| 0.50 | +1 | 0 | | |
| ENVELOPE DATA | | | | |
| AR | D1R | D1L | D2R | RR |
| 31 | 31 | 15 | 0 | 6 |
| EG BIAS | KEYBOARD SCALING | | | |
| | RATE | LEVEL | | |
| 0 | 0 | 0 | | |
| OP# | OUTPUT LEVEL | VELOCITY | | |
| 3 | 83 | 0 | | |

| FREQUENCY | DETUNE | AME | | |
|---------------|------------------|----------|-----|----|
| 6.00 | -2 | 0 | | |
| ENVELOPE DATA | | | | |
| AR | D1R | D1L | D2R | RR |
| 31 | 10 | 15 | 0 | 7 |
| EG BIAS | KEYBOARD SCALING | | | |
| | RATE | LEVEL | | |
| 0 | 0 | 0 | | |
| OP# | OUTPUT LEVEL | VELOCITY | | |
| 4 | 75 | 0 | | |

7

| FREQUENCY | DETUNE | AME | | |
|---------------|------------------|----------|-----|----|
| 0.50 | -3 | 0 | | |
| ENVELOPE DATA | | | | |
| AR | D1R | D1L | D2R | RR |
| 31 | 31 | 15 | 0 | 7 |
| EG BIAS | KEYBOARD SCALING | | | |
| | RATE | LEVEL | | |
| 0 | 0 | 0 | | |
| OP# | OUTPUT LEVEL | VELOCITY | | |
| 2 | 67 | 0 | | |

| FREQUENCY | DETUNE | AME | | |
|---------------|------------------|----------|-----|----|
| 1.00 | +3 | 0 | | |
| ENVELOPE DATA | | | | |
| AR | D1R | D1L | D2R | RR |
| 27 | 31 | 14 | 6 | 6 |
| EG BIAS | KEYBOARD SCALING | | | |
| | RATE | LEVEL | | |
| 0 | 0 | 0 | | |
| OP# | OUTPUT LEVEL | VELOCITY | | |
| 1 | 99 | 0 | | |

ALGORITHM #2

These DX21 voices can also be loaded into the DX27, DX27S, and DX100 4-operator synthesizers; all voice parameters, with the exception of those listed in the "DX21 ONLY" box, can be loaded into these units.

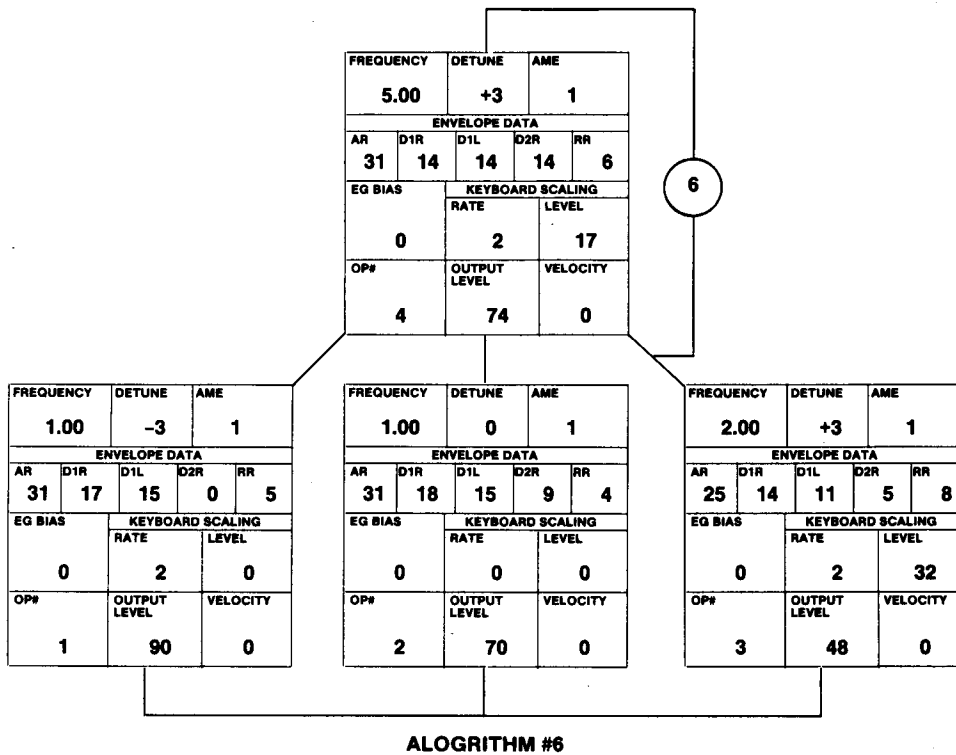
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DX21

HOOT-GLOCK. A New DX21 Voice By J.H. Kane.

| LFO & FUNCTIONS | | | | | |
|-----------------|----------|--------------|------------|---------------|---------|
| TRI | 53 | 33 | 0 | 43 | ON |
| WAVE | SPEED | DELAY | PMD | AMD | SYNC |
| 6 | | 0 | | C3 | |
| PMS | | AMS | | KEY TRANSPOSE | |
| POLY | 2 | FULL | 0 | ON | ON |
| POLY/MONO | PB RANGE | MODE | TIME | PORT | SUSTAIN |
| PORTAMENTO | | | FOOTSWITCH | | |
| 50 | 1 | 50 | 0 | 50 | 0 |
| PITCH | AMPL | PITCH | AMPL | PITCH BIAS | EG BIAS |
| WHEEL RANGE | | BREATH RANGE | | | |

| DX21 ONLY | | |
|----------------|-----|----------|
| PITCH ENVELOPE | | |
| PR1 | PR2 | PR3 |
| 56 | 99 | 99 |
| PL1 | PL2 | PL3 |
| 99 | 50 | 99 |
| CHORUS | | FOOT VOL |
| OFF | | 99 |



Notes:

This patch sounds great with digital reverb, and does interesting things with the sustain pedal depressed.

DX100

**BRIT
RODES. A
New DX100
Voice By Ken
Como.**

| LFO & FUNCTIONS | | | | | |
|-----------------|----------|--------------|------------|---------------|---------|
| TRI | 0 | 0 | 3 | 0 | ON |
| WAVE | SPEED | DELAY | PMD | AMD | SYNC |
| 6 | | 1 | | C3 | |
| PMS | | AMS | | KEY TRANSPOSE | |
| POLY | 0 | FULL | 0 | -- | ON |
| POLY/MONO | PB RANGE | MODE | TIME | PORT | SUSTAIN |
| PORTAMENTO | | | FOOTSWITCH | | |
| 50 | 0 | 0 | 0 | 50 | 0 |
| PITCH | AMPL | PITCH | AMPL | PITCH BIAS | EG BIAS |
| WHEEL RANGE | | BREATH RANGE | | | |

| FREQUENCY | DETUNE | AME | | |
|---------------|------------------|----------|-----|----|
| 1.00 | -3 | 0 | | |
| ENVELOPE DATA | | | | |
| AR | D1R | D1L | D2R | RR |
| 31 | 10 | 10 | 8 | 2 |
| EG BIAS | KEYBOARD SCALING | | | |
| | RATE | LEVEL | | |
| 0 | 0 | 37 | | |
| OP# | OUTPUT LEVEL | VELOCITY | | |
| 2 | 67 | 0 | | |

| FREQUENCY | DETUNE | AME | | |
|---------------|------------------|----------|-----|----|
| 15.00 | +2 | 0 | | |
| ENVELOPE DATA | | | | |
| AR | D1R | D1L | D2R | RR |
| 31 | 13 | 0 | 0 | 10 |
| EG BIAS | KEYBOARD SCALING | | | |
| | RATE | LEVEL | | |
| 0 | 0 | 0 | | |
| OP# | OUTPUT LEVEL | VELOCITY | | |
| 4 | 55 | 0 | | |

5

| FREQUENCY | DETUNE | AME | | |
|---------------|------------------|----------|-----|----|
| 1.00 | -1 | 0 | | |
| ENVELOPE DATA | | | | |
| AR | D1R | D1L | D2R | RR |
| 31 | 10 | 10 | 8 | 8 |
| EG BIAS | KEYBOARD SCALING | | | |
| | RATE | LEVEL | | |
| 0 | 0 | 21 | | |
| OP# | OUTPUT LEVEL | VELOCITY | | |
| 1 | 99 | 0 | | |

| FREQUENCY | DETUNE | AME | | |
|---------------|------------------|----------|-----|----|
| 3.00 | +3 | 0 | | |
| ENVELOPE DATA | | | | |
| AR | D1R | D1L | D2R | RR |
| 31 | 13 | 0 | 0 | 10 |
| EG BIAS | KEYBOARD SCALING | | | |
| | RATE | LEVEL | | |
| 0 | 0 | 26 | | |
| OP# | OUTPUT LEVEL | VELOCITY | | |
| 3 | 72 | 0 | | |

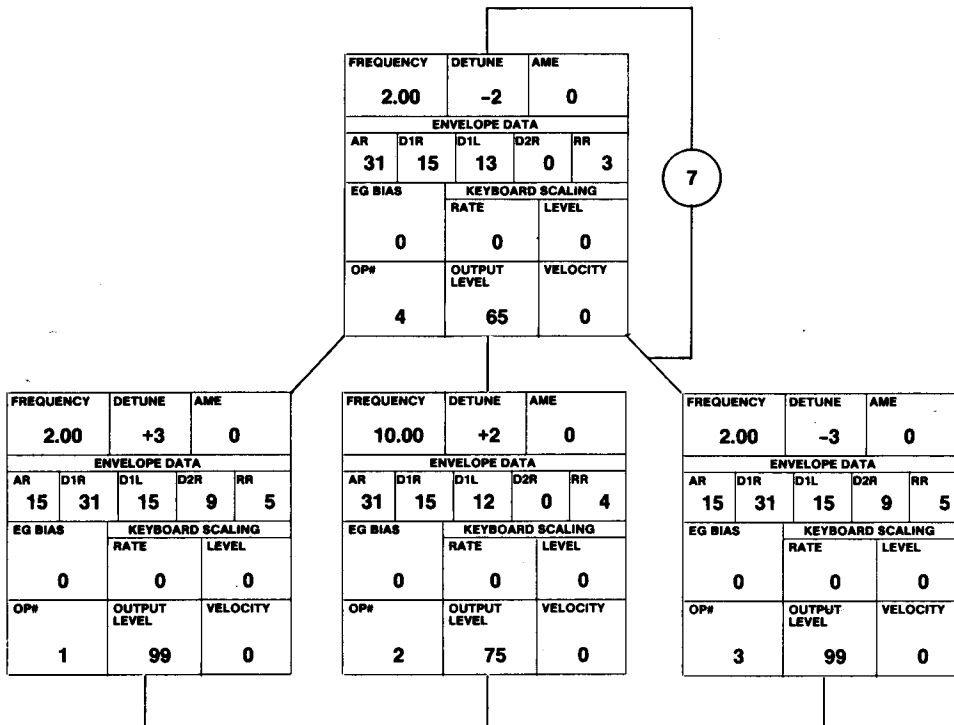
ALGORITHM #5

These DX100 voices can also be loaded into the DX21, DX27, and DX27S 4-operator synthesizers.

DX100

BELLA. A New DX100 Voice By Stephen Cullo.

| LFO & FUNCTIONS | | | | | |
|-----------------|----------|-------|--------------|---------------|---------|
| TRI | 35 | 0 | 0 | 0 | OFF |
| WAVE | SPEED | DELAY | PMD | AMD | SYNC |
| 6 | | 0 | | C2 | |
| PMS | | AMS | | KEY TRANSPOSE | |
| POLY | 4 | FULL | 1 | -- | ON |
| POLY/MONO | PB RANGE | MODE | TIME | PORT | SUSTAIN |
| PORTAMENTO | | | FOOTSWITCH | | |
| 50 | 0 | 0 | 0 | 50 | 0 |
| PITCH | AMPL | PITCH | AMPL | PITCH BIAS | EG BIAS |
| WHEEL RANGE | | | BREATH RANGE | | |



ALGORITHM #6

Notes:

You can vary the sound a lot by changing the output level of Op #4: if increased slightly (up to 75), the result is a stringier sound; if decreased (down to 0), the sound is more like a whistling bell.

Also, try algorithms #5, #7, and #8 for a more bellish sound.

Studio 100 System

An Introduction To Yamaha's Compact, Affordable, Fully-Integrated Home Recording System. By Tom Darter.

AS TECHNOLOGY BECOMES both more affordable and more compact, it becomes more and more possible to gather together a group of powerful instruments and create subtle music in a small space on a small budget. The Yamaha Studio 100 System is a great example of this growing trend in music technology. Although each component of the system can function in a number of musical settings (separately or in various combinations), when brought together they combine to form a single, integrated unit for making and recording music.

Each part of the Studio 100 System is important. The QX21 digital sequence recorder functions as both a MIDI recorder and a MIDI playback unit. The DX100 FM digital synthesizer is used as both a tone generator and an input keyboard for the sequencer. The RX21 digital rhythm programmer adds the percussion dimension to the system. The MT1X multitrack

extensive MIDI implementation.

The DX100 has an extensive library of FM voices—192 in all—included as part of its permanent ROM memory. There is also a 24-voice, user-programmable RAM memory. Voices can be loaded into this RAM memory through the DX100's data cassette interface or via MIDI.

The DX100 features full function memory per voice. And, although the DX100 is not velocity sensitive itself, its voices can be programmed to respond to velocity sent to it from an external MIDI source. For more information on the DX100, see the cover story in the January 1986 issue of *AfterTouch*.

RX21 Digital Rhythm Programmer

The RX21 is designed to sit on top of the QX21 digital sequence recorder. It is equipped with nine drum and percussion sounds: BD (bass drum), TOM1, TOM2, TOM3, SD (snare drum), CLAPS, HH CLOSED (closed hi-hat), HH OPEN, and CRASH (crash cymbal).

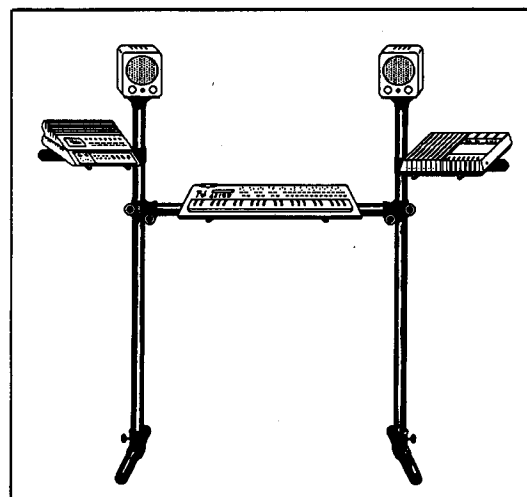
These sounds can be programmed into patterns and songs using the RX21's memory, and playback can be synchronized to the QX21 via MIDI. If you use the YMC10 MIDI to Tape Sync Converter with your Studio 100 System, you can also sync the RX21's playback performance to a sync track recorded onto the MT1X.

It is also possible to play the RX21's sounds from the DX100 keyboard via MIDI. These keystrokes from the DX100 can be recorded into the QX21 digital sequence recorder; on playback, these keystrokes will drive the drum sounds in the RX21, and the drum part will be part of the sequence stored in the QX21.

For more information on how to play the RX21 from a MIDI keyboard such as the DX100, see the article in the November 1985 issue of *AfterTouch*. And, for more general information on the operation of the RX21, see the cover story in the next issue of *AfterTouch* (September 1986) on the RX family of digital rhythm programmers.

QX21 Digital Sequence Recorder

A digital sequence recorder is an instrument that stores digital information received via MIDI for later playback through one or more



The ST100 stand is designed specifically for the components of the Studio 100 System.

cassette recorder functions as both the tape recording medium and the mixer for the system. The KS10 speakers function as both amplifiers and monitor speakers for the stereo outputs of the MT1X. Finally, the ST100 stand provides a compact housing for the other components of the Studio 100 System.

Here is a quick overview of the various units that come together to form the Studio 100 System:

DX100 FM Digital Synthesizer

The DX100 is a 4-operator, 8-algorithm digital synthesizer. It weighs in just under 6 pounds, and is powered by six C batteries (or a 12-volt DC adapter). It has a full 4-octave (49 note) mini-keyboard, and comes equipped with

MIDI-controllable synthesizers, tone generators, or drum machines. Information in the QX21 is stored as digital data representing a series of MIDI-transmitted events. These events may be notes on (with or without velocity information), notes off, controller change values (such as pitch bend), or program change values.

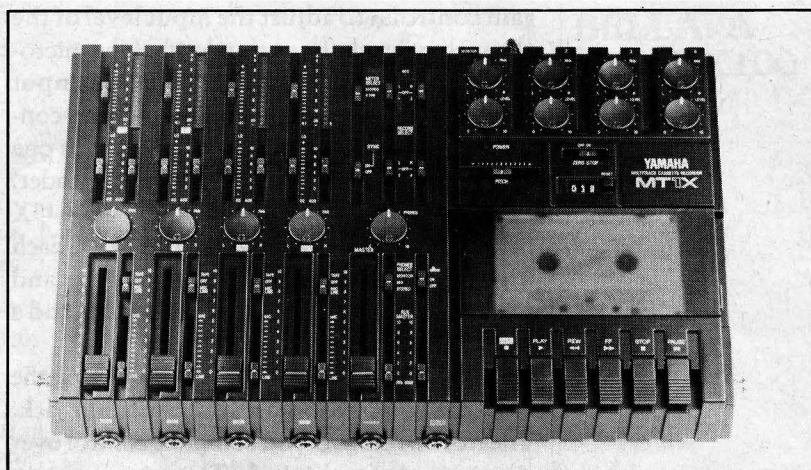
Most operations of the QX21 are achieved using one of the instrument's many "Job" functions. These are separated into four groups: A, B, C, and D. All of these Job functions are described in the QX21 owner's manual, and are outlined in the diagram printed on top of the instrument. You can step through Job function set A using the JOB STEP A/C button, and you can step through set B using the JOB STEP B/D button. Job function sets C and D are accessed while holding RESET and pressing the A/C or B/D buttons. Basic real-time recording is Job A-1.

Real-time recording is simple on the QX21. After choosing the MIDI record channel (Job A-6), defining the time signature (Job A-2), and setting the knob to the appropriate tempo, simply return to Job A-1, then press the RECORD button followed by the START button. The QX21 gives you two bars of count-down, and the recording starts. When you are finished, press the STOP button, and the QX21 will cease recording at the end of the bar.

Let's take a close look at the basic recording layout of the QX21, because the terminology can be confusing. First of all, there are two "tracks" on the QX21. These are simply memory locations for MIDI data, and operate very differently than the tracks of a tape recorder. Since a single MIDI "track" can contain information that encompasses 16 MIDI channels, it is quite possible for one "track" of the QX21 to control sixteen different instruments, each playing different music.

All recording in the QX21 goes onto TRACK 1. This is the only live recording track. TRACK 2 is the storage track, and information from a first recording pass must be moved to TRACK 2 if you wish to overdub. If you Record again on TRACK 1 before moving the first take to TRACK 2, it will be erased and replaced by the new recording.

So, in Record mode, MIDI information received is recorded onto TRACK 1. This data on TRACK 1 can be moved to TRACK 2 by means of EXCHANGE (Job B-1), which ex-



MT1X multitrack cassette recorder.

changes the data on TRACK 1 with the data on TRACK 2. This is used most often after the very first recording, to exchange the newly recorded material on TRACK 1 with the blank TRACK 2, prior to recording the first overdub.

To record the first overdub, pick a new MIDI record channel (if desired), set TRACK 2 for playback, and go into RECORD mode again. You will then record on TRACK 1 while listening to the material already in TRACK 2.

After you have material on both TRACK 1 and TRACK 2, there are a number of useful Job functions that allow you to combine the information in various ways.

Remember that multiple channels of MIDI data can be stored on a single TRACK with MIDI channel integrity maintained for each. For example, an instrument part can be recorded via MIDI channel 1 on TRACK 1, and exchanged (Job B-1) to TRACK 2; then a second instrument part can be recorded on the now blank TRACK 1 via MIDI channel 2. If you are happy with both takes, you can track down (Job B-3) the new material to TRACK 2. This process can be repeated for up to 16 separate parts on 16 MIDI channels.

The QX21 operates in much the same as its older brother, the QX7. For more on the operation of the QX7, see the article on the "7 System" in the November 1985 issue of *AfterTouch*.

MT1X Multitrack Cassette Recorder

The MT1X can function as a 4-track cassette tape recorder, as a 4-channel mixer, or as both.

The mixer section features three-position input selectors (TAPE, MIC/LINE, and OFF),

Studio 100 System *Continued*

gain controls (to adjust the input level of the channel to match the output level of the microphone or instrument connected to the input jack), input faders, 2-band EQ, and pan controls. These controls are provided for each one of the 4 inputs. There is also one Master Fader.

The MT1X is equipped with an AUX SEND jack and stereo AUX return jacks. Each input channel has an AUX SEND fader, and there is also a master AUX SEND fader and a master AUX RETURN fader.

In addition to its master stereo outputs, the MT1X is equipped with a phone monitor jack. The front panel goes you complete control over monitor mix for this jack: There is a separate monitor gain control for each channel, plus a separate monitor pan control for each channel.

In the record section, it is possible to record on all 4 tracks at once. There are Peak Level indicators for each track. The MT1X is equipped with dbx noise reduction.

Other special features of the MT1X include the following: a pitch control, which can be used during recording or playback to vary the tape running speed up or down by as much as 10%; SYNC IN and SYNC OUT jacks, which can be used when the YMC10 MIDI Sync Converter is used with the system; and a sync switch, which is turned ON if the recorder is to be used for synchronized operation with MIDI products like synthesizers and drum machines. In future issues of *AfterTouch*, we will offer specific

examples of applications of some of these special features.

KS10 Keyboard Speakers

The KS10 keyboard speaker is designed specifically for use in keyboard systems; its size (smaller than a bread box) and weight (4 pounds) make it an ideal monitor speaker for portable systems like the Studio 100 System.

Each KS10 features a 4-inch, full-range, Mylar/Polymar speaker for clear sound reproduction. Volume and Low Boost controls are mounted on the front of the speaker enclosure for your convenience. The frequency response of the KS10 speaker is 20Hz to 20kHz. The Low Boost control boosts low frequencies to a maximum of 11db, with a peak at 100Hz.

A built-in amplifier provides 6.5 watts of output power. Since the KS10s are powered speakers, the Studio 100 System does not need an external amplifier. The input connector on the back is a standard 1/4" phone jack, making it easy to connect the KS10s to the outputs of the MT1X (or to the outputs of any of the tone generators in the Studio 100 System). Two KS10 speakers give the Studio 100 System full stereo capability.

ST100 Studio 100 System Stand

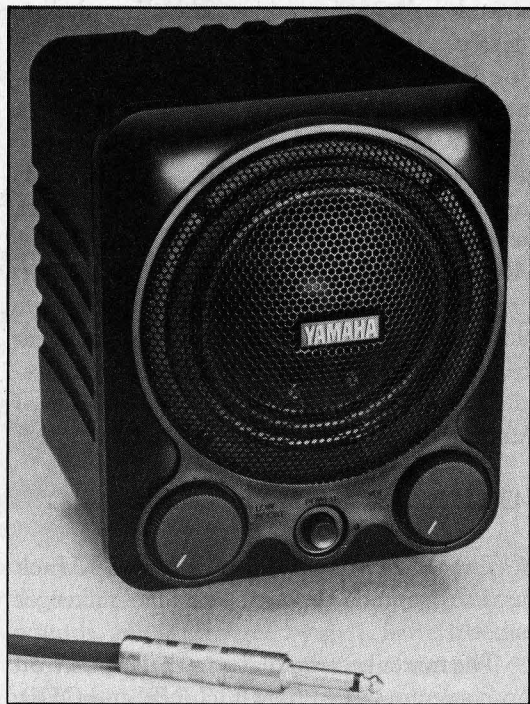
The ST100 stand is the final component of the system—it was specifically designed for use with the Studio 100 System. Consisting of high quality black aluminium alloy tubing and glass reinforced polycarbonate fittings, the ST100 is fully adjustable and can be assembled in a matter of minutes.

The vertical bars are topped by mounts for the KS10 speakers. Speakers attach to the mounts, and the speaker mounts can be rotated horizontally so that the speakers can face in any direction.

The three adjustable support bars can be set at any height, and can be adjusted to tilt the equipment at convenient angles. Two of these supports, the outside support arms, can extend outside the upright legs, or can be positioned perpendicular to the central support bar (or in between the uprights) for an even more compact setup.

Using the ST100 stand, you will be able to set your Studio 100 System up in an efficient space that suits your needs.

KS10 powered monitor speaker.



DX100

| DX21 ONLY | | | |
|----------------|-----|-----|----------|
| PITCH ENVELOPE | | | |
| PR1 | PR2 | PR3 | |
| PL1 | PL2 | PL3 | |
| CHORUS | | | FOOT VOL |

| | | |
|---------------|------------------------|----------|
| FREQUENCY | DETUNE | AME |
| ENVELOPE DATA | | |
| AR | D1R | D2R |
| EG BIAS | KEYBOARD SCALING LEVEL | |
| OP# | OUTPUT LEVEL | VELOCITY |

| | | |
|---------------|------------------------|----------|
| FREQUENCY | DETUNE | AME |
| ENVELOPE DATA | | |
| AR | D1R | D2R |
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| OP# | OUTPUT LEVEL | VELOCITY |

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| FREQUENCY | DETUNE | AME |
| ENVELOPE DATA | | |
| AR | D1R | D2R |
| EG BIAS | KEYBOARD SCALING LEVEL | |
| OP# | OUTPUT LEVEL | VELOCITY |

| LFO & FUNCTIONS | | | |
|-----------------|--------------|------------|------------|
| WAVE | SPEED | DELAY | PMD |
| | | | AMD |
| | | | SYNC |
| PMS | | AMS | |
| KEY TRANSPOSE | | | |
| POLY/MONO | PB RANGE | MODE | TIME |
| | | PORT | SUSTAIN |
| | | PORTAMENTO | FOOTSWITCH |
| PITCH | AMPL | PITCH | BIAS |
| WHEEL RANGE | AMPL | PITCH BIAS | EG BIAS |
| | BREATH RANGE | | |

Blank Voicing Charts In The AFTER-TOUCH Format.

This blank voicing chart can be used to record patches for the DX21, DX27, DX27S, and DX100 4-operator synthesizers.

CX5M / FB-01

IN THE LAST ISSUE of AfterTouch, we introduced the FB-01 FM MIDI Tone Module and the principle of CAV—computer-aided voicing. In this issue, we will look at the new YRM506 FB-01 Editor Program cartridge for the the CX5M—an excellent example of CAV at work.

Computer-aided voicing is not a new idea. Many of us have used the CX5M programs (or those for other computers such as the Apple II series, the Apple Macintosh, the IBM PC, and so on) for creating or editing DX7 voices. In the case of the FB-01, computer-aided voicing is especially important, because the FB-01 *cannot be voiced from its front panel.*

In general, though, CAV programs offer at least three important advantages for voice programmers:

Introducing The New YRM506 FB-01 Editor Program Cartridge. By Michael A. Huisman.

1. Ease of voicing: CAV programs allow you to see more about what is "going on" in a voice because of the computer monitor's size. A computer monitor is larger in size than the display on the front panel of a synthesizer. Further, related data can be viewed together on one screen. An example is being able to view a complete operator envelope rather than just one segment of the envelope.
2. Additional storage: CAV programs usually allow you to store your voices (and all of your precious voicing work) to the computer's storage device, such as a diskette or a data cassette. The number of voices that can be saved on a single diskette far exceeds the internal voice storage of almost any synthesizer currently on the market.
3. Additional voicing control: CAV programs sometimes allow you to access parameters not accessible from the front panel. As mentioned above, the FB-01 has the ability to voice new patches using its extensive MIDI capabilities—but NOT from its front panel. In order to edit voices or create new voices on the FB-01, one *must* use a CAV program.

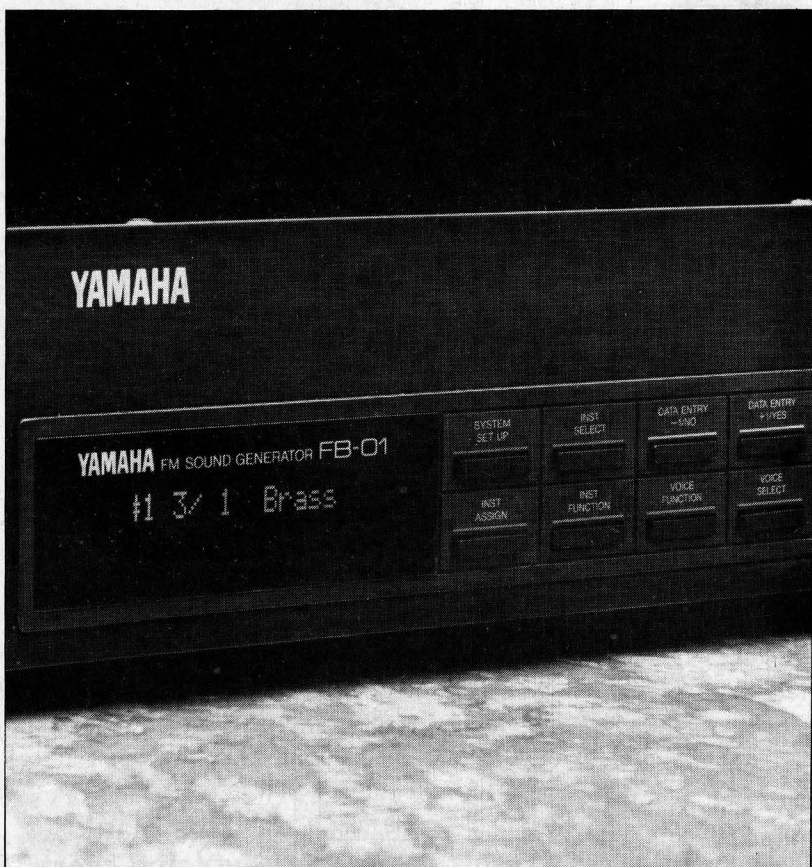
What is the YRM506?

The YRM506 is a program cartridge for the CX5M music computer. It allows you to create and edit voices and configurations in Yamaha's FB-01 FM tone module. This permits a virtually limitless number of new voices to be created for the FB-01. Here are some of the program's main features:

- The voices contained in the FB-01 MIDI tone generator can be edited, and new voices can be created from scratch.
- Data can be displayed on the screen as it is entered from the CX5M's computer keyboard. (Sound can also be output for monitoring the voices as the data is entered.)
- Voices can be saved onto a floppy disk (when using the SFG05 MIDI/tone generator unit with the CX5M).
- Voices can also be saved on cassette tape or a Data Memory Cartridge (UDC01) and later utilized with the FM Music Macro II Program cartridge (YRM504) and/or the FM Music Composer II Program cartridge (YRM501).
- Both the voice data and the table of voices can be printed out using an optional printer (PN101).

A Quick Overview Of The Program

The YRM506 program utilizes the concept



1. Ease of voicing: CAV programs allow you to see more about what is "going on" in a voice because of the computer monitor's size. A computer monitor is larger in size than the display on the front panel of a synthesizer. Further, related data can be viewed together on one screen. An example is being able to view a complete operator envelope rather

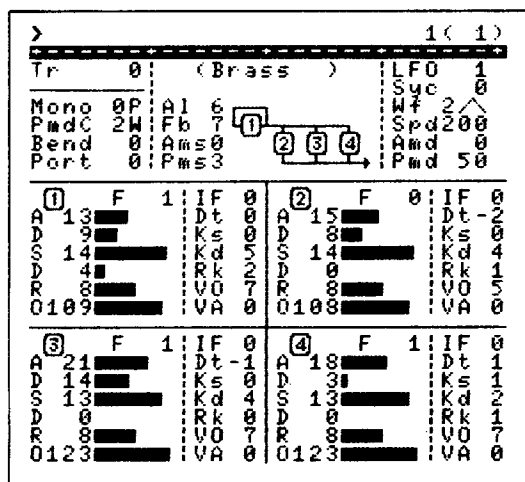
FB-01 FM digital tone module.

of blocks. There is a Voicing Block, a Configuration Block, and a File/Transfer Block. When editing or creating voices, you use the Voicing Block. When editing or creating a configuration, you use the Configuration Block. Similarly, when transferring data between the program and the FB-01 or when saving or loading files from disk or cassette, you use the File/Transfer Block.

The Voicing Block

The Voicing Block allows you to edit all of the FB-01's voice parameters. Figure 1 shows the voice editing screen as it appears on the monitor. From this screen you can edit these parameters:

- algorithm number
- feedback level
- operator on/off for each of the four operators



| | 0 | 1 | 2 | 3 |
|----|-------|-------|-------|-------|
| 0 | 0.50 | 0.71 | 0.79 | 0.87 |
| 1 | 1.00 | 1.41 | 1.57 | 1.73 |
| 2 | 2.00 | 2.82 | 3.14 | 3.46 |
| 3 | 3.00 | 4.23 | 4.71 | 5.19 |
| 4 | 4.00 | 5.64 | 6.28 | 6.92 |
| 5 | 5.00 | 7.05 | 7.85 | 8.65 |
| 6 | 6.00 | 8.46 | 9.42 | 10.38 |
| 7 | 7.00 | 9.87 | 10.99 | 12.11 |
| 8 | 8.00 | 11.28 | 12.56 | 13.84 |
| 9 | 9.00 | 12.69 | 14.13 | 15.57 |
| 10 | 10.00 | 14.10 | 15.70 | 17.30 |
| 11 | 11.00 | 15.51 | 17.27 | 19.03 |
| 12 | 12.00 | 16.92 | 18.84 | 20.76 |
| 13 | 13.00 | 18.33 | 20.41 | 22.49 |
| 14 | 14.00 | 19.74 | 21.98 | 24.22 |
| 15 | 15.00 | 21.15 | 23.55 | 25.95 |

Figure 2: The operator frequencies available in the FB-01 FM tone module.

- output level for each operator
- velocity sensitivity for each operator's output level
- operator frequency (which consists of the frequency, the inharmonic frequency and detune amount—Figure 2 shows the possible operator frequencies)
- five-stage envelope for each of the four operators (the five individual segments of the

envelope are: attack rate, 1st decay rate, sustain level—breakpoint when 2nd decay rate is not equal to 0, 2nd decay rate, and release rate)

- velocity sensitivity for each operator's attack rate [Note: Please see last issue's article on the FB-01 for more about this new voice parameter.]
- LFO settings (the LFO values in the FB-01 are: waveform select (sawtooth, square, triangle and sample/hold), amplitude modulation depth and sensitivity, pitch modulation depth and sensitivity, LFO sync on/off, and LFO enable on/off)
- key scaling type for each operator (negative-linear curve or positive-exponential curve)
- key scaling depth for each operator
- rate scaling depth for each operator
- poly or mono mode
- pitch bender range (up to one full octave in half-step increments)
- portamento time
- pitch modulation depth controlling device

Figure 1: The edit screen for the Voicing Block in the YRM506.

XSM / FB-01

Continued

(you can choose between aftertouch, modulation wheel, breath controller, foot controller, or none—if no LFO is desired)

- voice transposition
- voice name editing/entry

You can also view all the voices in a bank (see Figure 3), copy the values for one operator

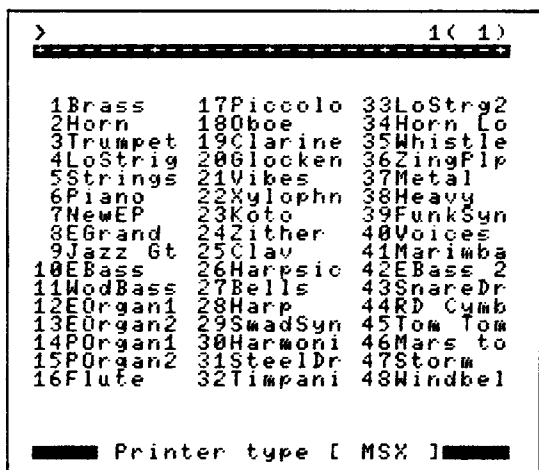


Figure 3: The Bank voice display screen of the YRM506.

to another, recall a voice you edited by a simple keyboard command (CTRL R), copy one voice from one location to another, or swap two voices' locations within a bank (see Figure 4).

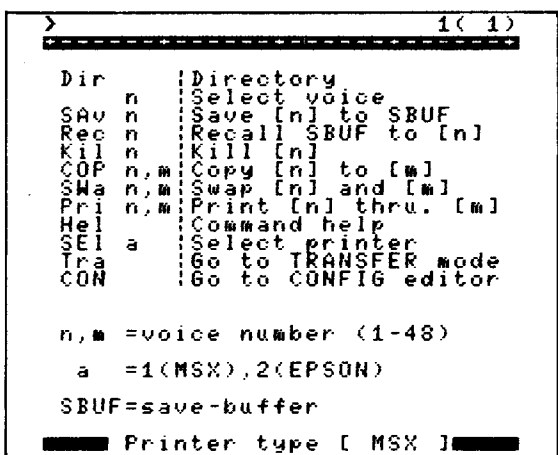
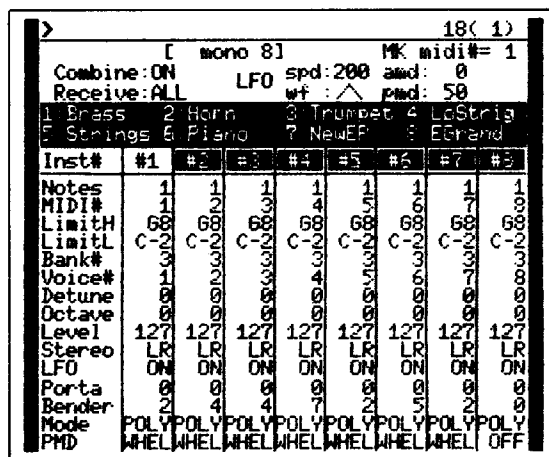


Figure 4: The voice transfer screen of the YRM506.

The Configuration Block

The Configuration Block allows you to edit all of the parameters that make up a configuration. In the Configuration Block's configuration editing screen you can also set values for the

FB-01's LFO that are independent of the values in a configuration. Figure 5 shows the configu-



ration edit screen as it appears on the monitor. From this screen you can edit parameters for:

- MIDI channel assignment
- number of notes assigned to the instrument
- low key limit for the instrument
- high key limit for the instrument
- the bank number of the voice assigned to the instrument
- the number of the voice assigned to the instrument
- the output level (volume) for the instrument
- octave transposition (two octaves down, one octave down, none, one octave up, or two octaves up)
- detune amount
- stereo panning position (either L—left, R—right, or LR—center) [Note: Yes, the FB-01 has stereo outputs!]
- LFO on or off
- pitch bender range
- portamento time
- poly/mono mode

- pitch modulation depth controlling device (you can choose between aftertouch, modulation wheel, breath controller, foot controller, or none—if no LFO is desired)

The last 4 parameters above (beginning with “pitch bender range”) can override the value stored with the voice by assigning a different value in a configuration—without affecting the voice data.

There are also a number of parameters that affect *all* the voices in a configuration. These include:

- voice combine mode on/off
- keycode receive mode (odd, even or all MIDI note numbers)
- LFO waveform

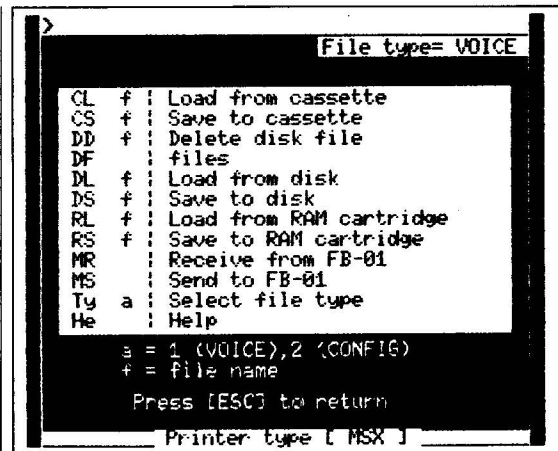


- LFO speed
- Amplitude Modulation Sensitivity (AMS)
- Pitch Modulation Sensitivity (PMS)

The File/Transfer Block

The File/Transfer Block is used to manage the voice and configuration data that are stored on data cassette, disk, or Data Memory Cartridge (UDC01). It is also used to send and receive voices and configurations to and from the FB-01. Figure 6 shows the File/Transfer screen as it appears on the monitor. From this

Figure 6: The File/Transfer screen of the YRM506.



screen you can perform the following operations:

- load a file from cassette
- save a file to cassette
- delete a file on a disk
- list all the files on a disk
- load a file from disk
- save a file to disk
- load a file from a Data Memory Cartridge
- save a file to a Data Memory Cartridge
- receive a voice bank from the FB-01
- send a voice bank to the FB-01
- receive configurations from the FB-01
- send configurations to the FB-01
- select voice or configuration file type

* * * *

As you can see, the new YRM506 FB-01 Editor Program cartridge is an excellent example of CAV (computer-aided voicing). It opens the door to all of the voicing capabilities of the new FB-01 FM tone module, and gives you complete control over those powerful parameters. With the CX5M and the YRM506 cartridge, you will be able to create your own library of sounds for the FB-01.

CX5M music computer.

Final Touch

Hot Tips For The CX5M Music Computer.

Echo Effects With The CX5M

By P.J. Otto

I have discovered a way to use the FM Music Composer (YRM101) or FM Music Composer II (YRM501) cartridges with the CX5M to generate a variety of interesting echo effects. In some ways, these effects have advantages over using a digital delay.

Here is an example of how it works:

Enter the notes and commands shown in Figure 1 into part 1 of your Music Composer program. Next, copy part 1 to part 2. Then insert a sixteenth-note rest just before the repeat sign in part 2, as shown in Figure 2. Now, play the composition. The second part is offset by the sixteenth-rest, which creates a slap echo effect.

Try changing the sixteenth-rest to a thirty-second-rest, and play the song again. The shorter rest creates a doubling effect. Change the sixteenth-rest to a dotted sixteenth-rest or a dotted-eighth-rest, and you get interesting syncopation effects.

You can enhance the sound of the echo by adjusting part 2 to be softer than part 1 by using



Figure 1: Part 1 as it would be displayed on the CX5M's monitor screen.

the volume or dynamics commands. Try inserting a "P" at the beginning of part 2. This gives the echo a more natural sound. You can also expand the depth of the echo by designating



Figure 2: Part 2 consists of part 1 with a sixteenth-rest inserted before first double bar.

each part to a different speaker. Try inserting OUTR after the voice number in part 1, and OUTL after the voice number in part 2. This "stereo" effect can give the echo an even more interesting sound. Once you have experimented with a single echo for a while, try copying part 2 to part 3, and double the length of the rest in part 3. This will create a second regeneration. Using this method, you can create up to seven echoes.

This procedure is especially useful in that you can create echoes within a composition without having to use any special patches or

external devices. Another advantage is that when you create an echo, it is always synchronized, even if you change the tempo of your composition. Also, unlike a digital delay, the computer generates each part. Therefore, there is no decay of sound quality for each regeneration.

I'm sure you will find that, once you get the hang of it, this method of creating echoes offers endless possibilities.

* * * *

Accessing The QX1 Through The CX5M Music Composer Program

By Curtis Smith

The CX5M FM Music Composer Program cartridges (YRM101 and YRM501) are excellent step-time data-entry programs. The program contains thorough musical commands that control tempo, dynamics, voices, and the like, and each part can be sent out on the same or on different MIDI channels. The major flaw of the CX5M is the limited capacity for direct data storage and the 8-voice polyphony.

The QX1 stores massive amounts of musical data, addresses a total of eight MIDI channels, stores and dumps RX patterns and DX voices and functions and is, in a nutshell, a thoroughly integrated MIDI controller. The major flaw in the QX1 is the step-time data-entry procedure. One must hover over the tiny LCD window and go through dozens of time-consuming operations.

For quite a while I have worked on a method of first entering data into the CX5M Music Composer, and then MIDing that data to the QX1. This process takes advantage of the best features of both machines while minimizing the negative aspects of both.

Since the CX5M is capable of only 8-voice polyphony, sending information to the QX1 can require data dumps of several coordinated CX5M play files to enter a composition containing greater than 8-voice polyphony. Coordination of CX5M files can be a problem if the tempo changes are not exactly the same in each file.

Entering a master tempo control part (or parts) into the CX5M Music Composer will take care of the coordination problem. This part

(or parts) can contain rests or note data, and it should be included in each file destined for the QX1. If the control part is entered in part 1, parts 2-8 of file #1 can contain music data, voice changes, volume changes, portamento values, and so on—tempo is governed by the master part. After entering, editing, and saving file #1, parts 2-8 can be cleared of their data, leaving part 1 (the master tempo controller) in memory to control the tempo of file #2. File #2 can then be entered, edited, and saved. Clearing parts 2-8 again will leave part 1 as a tempo controller for file #3, and so on.

Having entered into the CX5M a series of files with a tempo controller, we can transfer all of this data (one file at a time) to the QX1. Select a Bank/track on the QX1, and put the unit in RECORD mode. Load file #1 into the CX5M. Press RUN on the QX1 and wait for its two-measure countdown. The CX5M file can be played at any time after the countdown—don't worry about synchronizing the files for now; we'll cover that after we get all of the data entered into the QX1.

When file #1 is entered into the QX1, file #2 can be entered. Once again, select a Bank/track on the QX1, and put it in RECORD mode. Load file #2 into the CX5M, and transfer

it over to the QX1 in the same way. Repeat this process to load all of the CX5M files to the QX1.

Needless to say, the CX5M files must contain the MDON command. If you don't want to send the tempo control part to the QX1 with each data dump, just omit the MDON command on that part—it will still control the sequence without being sent to a MIDI recorder.

When all of the files are saved on the QX1 disk, they will have to be synchronized, as they will probably start on different beats or bars of their respective tracks. In the EDIT mode, you can step through your files and document where they begin. If a file begins on beat three of bar five, for example, Job Command 20 in UTILITY Mode (Measure Delete) can be used to delete bars, while Job Command 10 in EDIT Mode (Clock Move) can be used to move the music data to bar 1, clock 0000 of the track. The file will then begin immediately in the PLAY mode. All files can and should be adjusted using this process.

Once all of the files have been adjusted so that they are properly synchronized, they can be arranged on the desired Banks and tracks, edited further on the QX1, or mixed together and sent out to the desired MIDI channels for playback.

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Do you have a great new DX7 patch, a CX5M program, or a great pattern for the RX11? Send them in—we'll pay \$25.00 for each one used.

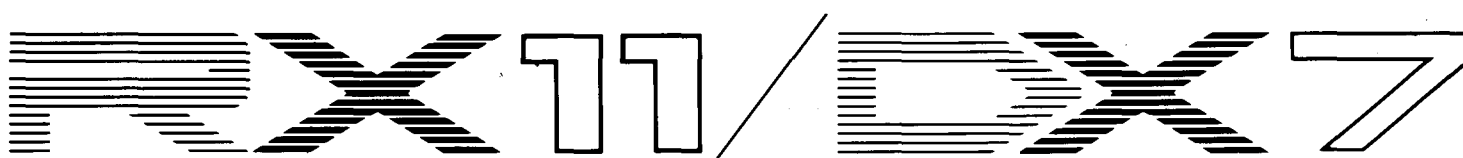
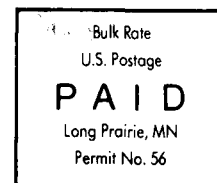
By the way, we cannot assume liability for the safe return of unused ideas, patches, or manuscripts. We will only be able to return unused material to you if you enclose a self-addressed, stamped envelope with your material.

If you just have a question regarding the use of Yamaha professional products, send it along too, and we'll do our best to answer it in the pages of AFTERTOUC H. (We regret that we won't be able to answer questions through the mail, but we will use all of your questions to guide us in our choice of future topics.)

Finally, if you just want to get something off your chest, or if you'd like to establish direct contact with other X users, send something in to our letters column, "Touch Response." We'll do our best to print names and addresses of all those who are interested in starting up regional users groups.

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91323-2338.**



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| | |
|-------|------|
| TOM4 | = 42 |
| BD1 | = 39 |
| BD2 | = 40 |
| RIDE | = 78 |
| CRASH | = 95 |

[Note: RX15 owners won't have TOM4 or BD2.]

4. Now set your normal volume level on the RX, and start with the DX7 volume off. While hitting the toms or cymbals buttons (or playing a slow pattern that uses them), slowly bring up the DX7 volume until you start to hear the change. It's subtle, but you should begin to hear the drum set sound bigger and more alive.

Once you have put this basic setup together, there are a number of things you can do to alter the sound to your taste:

- Change the MIDI key numbers from the list above to alter the tunings of the DX7 drum and cymbal sounds.

- Lower the relative volume level of either the drum or cymbal enhancements from the DX7 by lowering the OUTPUT LEVEL of operators #1 or #3 respectively.
- Change the "ring" or "holdover" time of the composite drum and/or cymbal sounds by altering the EG RATE 4 of operators #1 and/or #3 respectively.

If you have a 4-operator synthesizer (such as a DX9), you must choose either the drum or cymbal enhancement. For the drums, use algorithm #2 and set the OUTPUT LEVELs of operators #3 and #4 to 0. Then set up operators #1 and #2 as per my patch. For the cymbal enhancement, use algorithm #2 and set your operator #1 to read like operator #3 on my patch, operator #2 to read like my #4, operator #3 to read like my #5, and your operator #4 to read like my #6.

Hopefully, this DX7 patch will not only be useful to you, but will also serve as a starting point for your own experiments in modifying the sound of your RX11 or RX15 digital rhythm programmer. Good luck!