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From The Editor

WELL, THE ILLUSTRATED letter on the right just about says it all! Many of you have been wondering where AFTERTOUCH went after the first issue. As you can see, rumors of our disappearance were greatly exaggerated. Here we are in issue #4, and it's time to set the record straight.

First of all, it has taken us a while to work out the best and most efficient way to get the material in AFTERTOUCH written and produced; we could have gone for speed from the beginning, but we were more concerned with getting the information right. As a result, we experienced some delays along the way while preparing issues #2, #3, and #4.

In addition, we have had to work out the best way to create and maintain a mailing list. We began with a Yamaha warranty list. All of you on that original list should have received the first three issues. At the same time, however, we received thousands of handwritten postcards and requests, most of which came from our initial distribution to Yamaha music dealers. Rather than merge these two lists a little at a time (which could have created mass confusion in the memory of our computer), we decided to stay with the original list for the first three issues. Beginning with this issue, we have created a new mailing list, and everyone who has requested AFTERTOUCH should now be on this list.

Where does that leave you if you weren't on the original list? Well, if you didn't pick up the November 1985 and December 1985 issues in stores, it's quite likely that you haven't seen them yet. But don't worry: All of you have been included on a special list that is due to receive both as back issues, direct from the Yamaha warehouse.

Where do we go from here? Well, now that the mailing list is all put together, and now that the initial growing pains have subsided, expect to receive AFTERTOUCH regularly. Every month. In fact, you should receive issues #5 and #6 with less than a month wait for each, because we have collected a *lot* of information for you.

Two thoughts in closing: 1) To reader Arden Henderson—special thanks for your creative letter of concern. 2) To all of you—enjoy issue #4, and keep those cards and letters (and questions and patches and articles) coming!

—*TD*

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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 AFTERTOUCH to suit your musical needs.

DX7

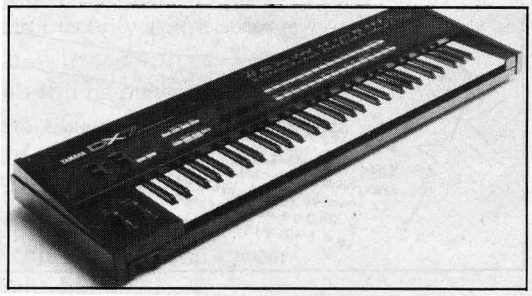
An Introduction To Five New DX7 Voices From AFTERTOUCH Readers. By Tom Darter.

THIS MONTH, WE HAVE no less than *five* new DX7 voices submitted by readers of AFTERTOUCH. You will find the voice charts on pages 5 through 9. Each one offers a number of points of interest, so let's get right to them.

BASPIANBRS

This program (on page 5) shows how the keyboard Level Scaling and the breath controller EG Bias can be used to create the effect of *three* different sounds from from one DX7. The programmer, Jim Johansen, explains as follows:

"Using algorithm #5, I set operators #1 and #2 for a bass sound, with a break points of A2 for operator #1 and D3 for operator #2. They appear on the left side of the keyboard. Operators #3 and #4 give you a tine piano sound. On top of this, I used operators #5 and #6 for a breath-controlled brass sound. Operators #3, #4, #5, and #6 all have the same break point—A2. They appear on the right side of the keyboard.



DX7 FM digital synthesizer.

Operators #1 and #2 have a curve of LEFT +L and RIGHT -L, while operators #3, #4, #5, and #6 have the opposite curve. This creates the split. Because operators #5 and #6 have Amplitude Modulation Sensitivity (A MOD SENS) of 3, you hear the breath-controlled brass only when you blow into the BC1 breath controller. Breath Control Range must be set to 99 with EG BIAS on.

"I like to watch peoples faces when I play about four bars of bass plus piano (which most synthesizers will do, and then bring in the brass with the breath controller. It really floors 'em!"

SITAR VIII/SYNPATHY

These two patches (on pages 6 and 7) were created by Charlie Foege. Although SITAR VIII was designed so that it could be used by itself, SYNPATHY was created mainly as a layered voice to be used in conjunction with SITAR VIII. Here is the programmer's explanation:

"The SITAR VIII patch is my eighth 'transmutation' of what was originally a BELL sound. I own a sitar myself, and have been quite particular about making this patch sound as close as possible to the real thing. With this sound, I had to compromise the sound of the 7 top (melody) strings and the 18 bottom (sympathetic) strings of the sitar, all in one patch. In order to make sure that the sympathetic sound would not get in my way while playing a lead line, I oriented my compromise to emphasize the melody strings of the sitar. With a second tone generator, I add the SYNPATHY patch to the sound of the SITAR VIII, and a beautiful combination of programs occurs."

WHIRLIEPNO

This voice (on page 8) is intended to emulate the sound of a well-known electric piano. The programmer, Nick Reiser, has this to say:

"This is a rather simple voice which came about when I discovered (by accident) how pure the sound of the square wave is on the DX7. That is the predominant sound here, along with a positive sawtooth (operators #1 and #2) for depth (and for the attack sound).

"What is neat for me about this voice is that it is playable from one end of the keyboard to the other. The timbres shift nicely as you move up and down the keyboard, and the sound stays close to that of its electric ancestor. You also have the feeling that you are playing a non-electronic instrument. There are appropriate rewards for digging in (velocity-wise) in all keyboard locations.

"It's easy to neglect this distinctive sound from the late '60s and early '70s, since it lost out to another famous electric piano sound in the long run. We forget that it voices beautifully, including clusters around middle C, that it sounds pretty to begin with, and that it can be a very welcome change of pace from your stock electric piano sounds."

ACOU GUIT

This final reader voice (on page 9) comes from L. Kevin Rockwell, who chose to let his patch speak for itself. You might find it interesting to compare it to Gary Leuenberger's PICKGUITAR patch, from the first issue of AFTERTOUCH (October 1985).

BASPIAN-BRS. A New DX7 Voice Created By Jim Johansen.

WAVE	SPEED	DELAY	PMD	AMD	SYNC	PMS
TR1	35	0	0	0	OFF	1

LFO

R1	R2	R3	R4
94	67	95	60
L1	**L2**	**L3**	**L4**
50	50	50	50

PITCH ENVELOPE

KEY TRANSPOSE: C2

OSC SYNC: ON

FUNCTIONS

POLY/MONO	RANGE	STEP	MODE	GLISSANDO	TIME
POLY	2	0	NA	OFF	0
	PITCH BEND			PORTAMENTO	

(CONTROLLER)	RANGE	PITCH	AMPLITUDE	EG BIAS
MOD WHEEL	53	ON	OFF	OFF
FOOT CONTROL	NA	NA	NA	NA
BREATH CONTROL	99	OFF	OFF	ON
AFTERTOUCH	NA	NA	NA	NA

FREQUENCY	DETUNE	AMS
1.00	0	0

ENVELOPE DATA

R1	R2	R3	R4	RS
99	20	0	0	7
L1	**L2**	**L3**	**L4**	
99	0	0	0	

KEYBOARD SCALING

CURVE BREAKPOINT DEPTH

L	+L	D3	L	0
R	-L		R	99

OP#	OUTPUT LEVEL	VELOCITY
2	80	0

FREQUENCY	DETUNE	AMS
14.00	0	0

ENVELOPE DATA

R1	R2	R3	R4	RS
99	35	99	65	7
L1	**L2**	**L3**	**L4**	
99	45	45	0	

KEYBOARD SCALING

CURVE BREAKPOINT DEPTH

L	-L	A2	L	99
R	+L		R	0

OP#	OUTPUT LEVEL	VELOCITY
4	60	7

FREQUENCY	DETUNE	AMS
1.00	0	3

ENVELOPE DATA

R1	R2	R3	R4	RS
90	52	25	54	7
L1	**L2**	**L3**	**L4**	
99	99	99	0	

KEYBOARD SCALING

CURVE BREAKPOINT DEPTH

L	-L	A2	L	99
R	+L		R	0

OP#	OUTPUT LEVEL	VELOCITY
6	78	0

7

FREQUENCY	DETUNE	AMS
1.00	0	0

ENVELOPE DATA

R1	R2	R3	R4	RS
95	62	17	58	7
L1	**L2**	**L3**	**L4**	
99	95	32	0	

KEYBOARD SCALING

CURVE BREAKPOINT DEPTH

L	+L	A2	L	0
R	-L		R	99

OP#	OUTPUT LEVEL	VELOCITY
1	99	0

FREQUENCY	DETUNE	AMS
1.00	0	0

ENVELOPE DATA

R1	R2	R3	R4	RS
99	35	99	65	3
L1	**L2**	**L3**	**L4**	
99	45	45	0	

KEYBOARD SCALING

CURVE BREAKPOINT DEPTH

L	-L	A2	L	99
R	+L		R	0

OP#	OUTPUT LEVEL	VELOCITY
3	99	3

FREQUENCY	DETUNE	AMS
1.00	0	3

ENVELOPE DATA

R1	R2	R3	R4	RS
72	78	20	57	5
L1	**L2**	**L3**	**L4**	
99	99	99	0	

KEYBOARD SCALING

CURVE BREAKPOINT DEPTH

L	-L	A2	L	99
R	+L		R	0

OP#	OUTPUT LEVEL	VELOCITY
5	99	0

ALGORITHM #5

Notes:

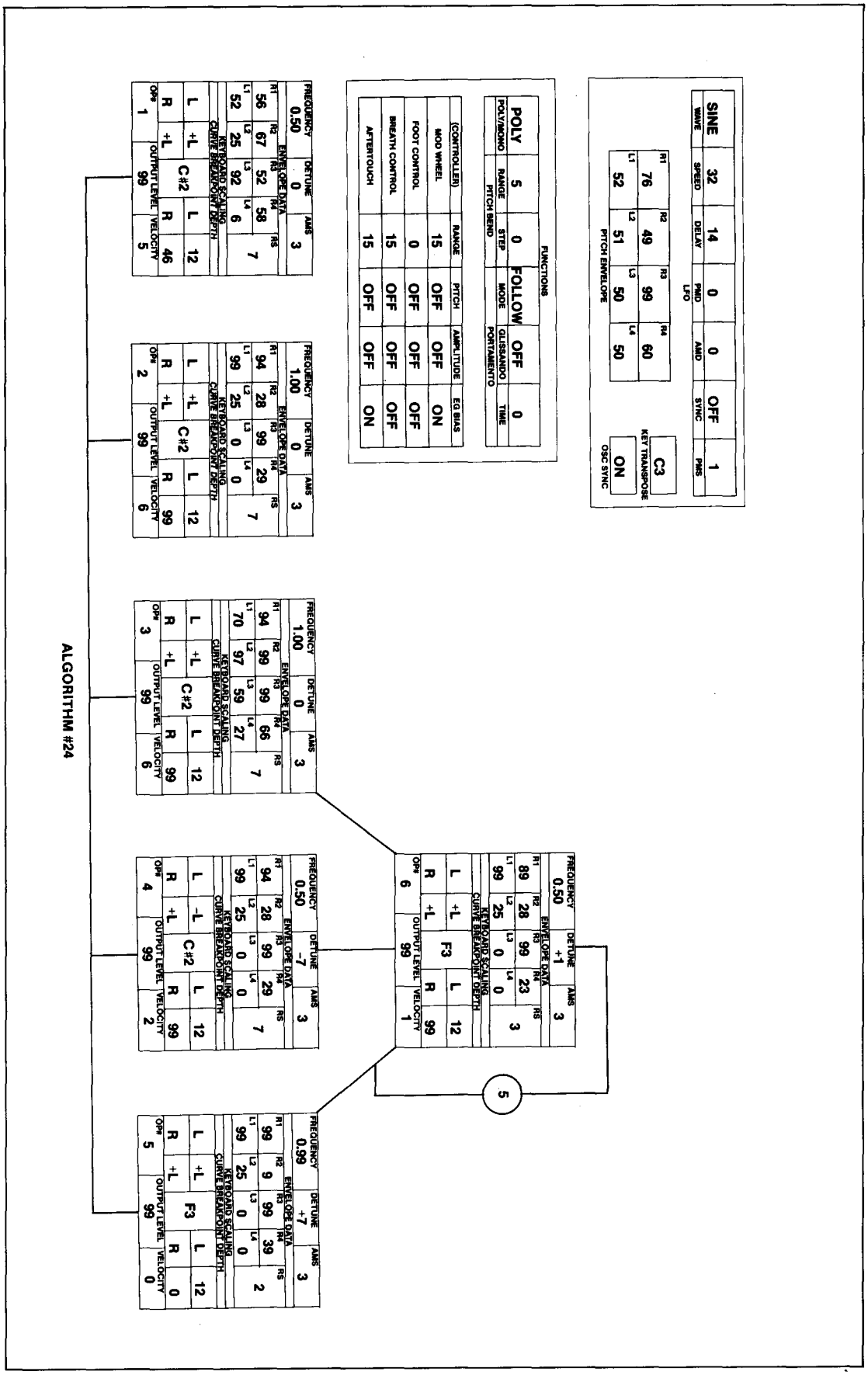
Ops #1 and #2 create the bass sound.

Ops #3 and #4 create the tine piano sound.

Ops #5 and #6 create the brass sound, which is activated using the BC1 breath controller.

The bright "tine" sound (created by having Op #4 at a frequency of 14.00) keeps the piano sound audible after you bring in the brass with the breath controller.

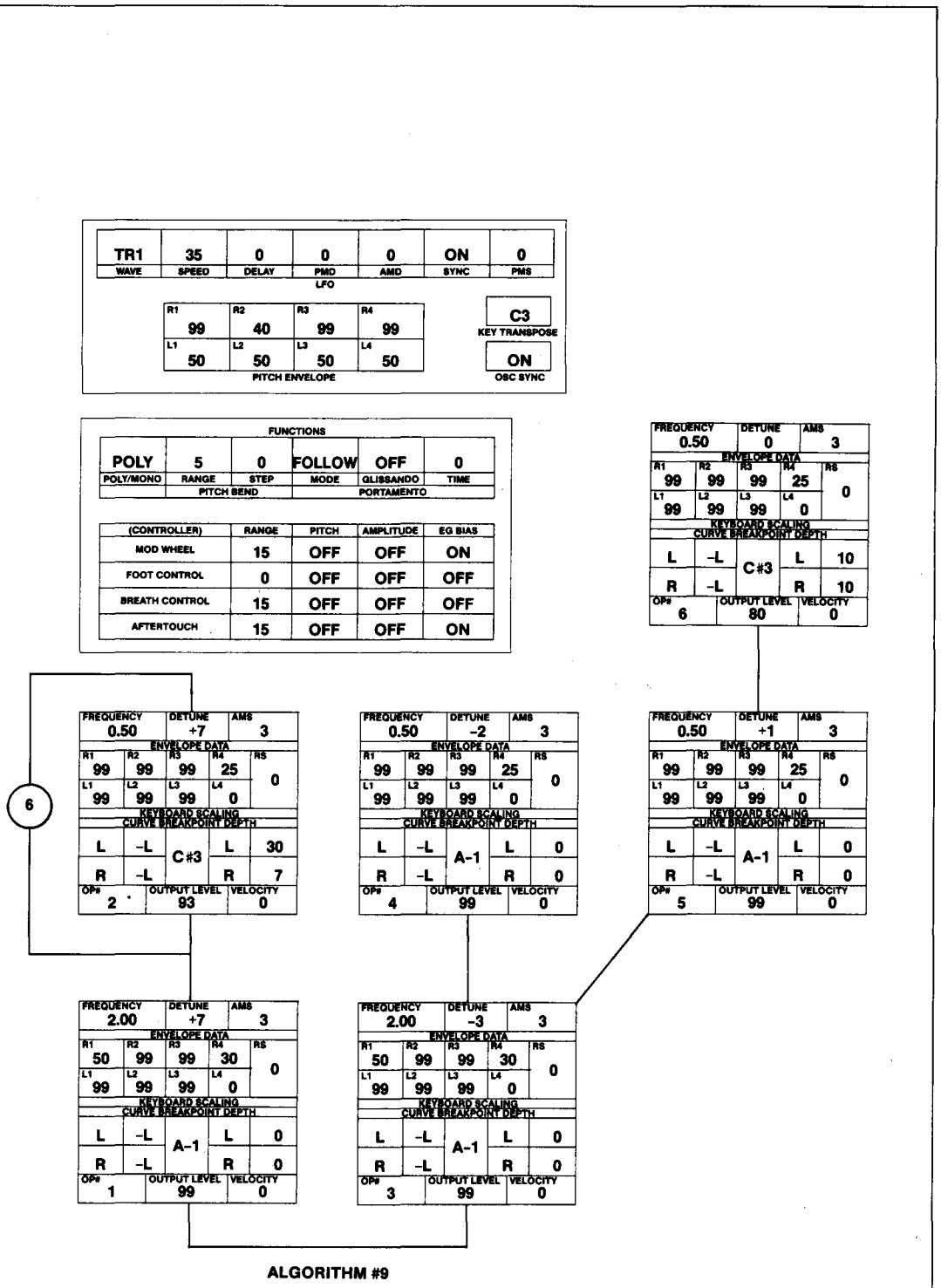
SITAR VIII. A New DX7 Voice Created By Charlie Foege.



Notes:

For more information on this voice, see page 4.

SYNPATHY. A New DX7 Voice Created By Charlie Foege, For Use With SITAR VIII.



WAVE	SPEED	DELAY	PMD	AMD	SYNC	PMS
TR1	35	0	0	0	ON	0

LFO

R1	R2	R3	R4
99	40	99	99
L1	L2	L3	L4
50	50	50	50

PITCH ENVELOPE

KEY TRANSPOSE: C3

OSC SYNC: ON

FUNCTIONS

POLY/MONO	RANGE	STEP	MODE	GLISSANDO	TIME
POLY	5	0	FOLLOW	OFF	0
	PITCH BEND			PORTAMENTO	

(CONTROLLER)	RANGE	PITCH	AMPLITUDE	EG BIAS
MOD WHEEL	15	OFF	OFF	ON
FOOT CONTROL	0	OFF	OFF	OFF
BREATH CONTROL	15	OFF	OFF	OFF
AFTERTOUCH	15	OFF	OFF	ON

OP 6: FREQUENCY 0.50 | DETUNE 0 | AMS 3
ENVELOPE DATA: R1 99 | R2 99 | R3 99 | R4 25 | RS 0; L1 99 | L2 99 | L3 99 | L4 0
KEYBOARD SCALING
CURVE BREAKPOINT DEPTH: L -L C#3 L 10; R -L R 10
OP# 6 | OUTPUT LEVEL 80 | VELOCITY 0

OP 5: FREQUENCY 0.50 | DETUNE +1 | AMS 3
ENVELOPE DATA: R1 99 | R2 99 | R3 99 | R4 25 | RS 0; L1 99 | L2 99 | L3 99 | L4 0
KEYBOARD SCALING
CURVE BREAKPOINT DEPTH: L -L A-1 L 0; R -L R 0
OP# 5 | OUTPUT LEVEL 99 | VELOCITY 0

OP 4: FREQUENCY 0.50 | DETUNE -2 | AMS 3
ENVELOPE DATA: R1 99 | R2 99 | R3 99 | R4 25 | RS 0; L1 99 | L2 99 | L3 99 | L4 0
KEYBOARD SCALING
CURVE BREAKPOINT DEPTH: L -L A-1 L 0; R -L R 0
OP# 4 | OUTPUT LEVEL 99 | VELOCITY 0

OP 3: FREQUENCY 2.00 | DETUNE -3 | AMS 3
ENVELOPE DATA: R1 50 | R2 99 | R3 99 | R4 30 | RS 0; L1 99 | L2 99 | L3 99 | L4 0
KEYBOARD SCALING
CURVE BREAKPOINT DEPTH: L -L A-1 L 0; R -L R 0
OP# 3 | OUTPUT LEVEL 99 | VELOCITY 0

OP 2: FREQUENCY 0.50 | DETUNE +7 | AMS 3
ENVELOPE DATA: R1 99 | R2 99 | R3 99 | R4 25 | RS 0; L1 99 | L2 99 | L3 99 | L4 0
KEYBOARD SCALING
CURVE BREAKPOINT DEPTH: L -L C#3 L 30; R -L R 7
OP# 2 | OUTPUT LEVEL 93 | VELOCITY 0

OP 1: FREQUENCY 2.00 | DETUNE +7 | AMS 3
ENVELOPE DATA: R1 50 | R2 99 | R3 99 | R4 30 | RS 0; L1 99 | L2 99 | L3 99 | L4 0
KEYBOARD SCALING
CURVE BREAKPOINT DEPTH: L -L A-1 L 0; R -L R 0
OP# 1 | OUTPUT LEVEL 99 | VELOCITY 0

ALGORITHM #9

These DX7 voices 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.

Notes:

This voice is intended to be used in combination with the SITAR VIII voice on the opposite page.

For more information on both voices, see page 4.

DX7

WHIRLIE-PNO. A New DX7 Voice Created By Nick Rieser.

WAVE	SPEED	DELAY	PMD	AMD	SYNC	PMS
TR1	32	0	0	0	OFF	0

LFO

R1	R2	R3	R4
99	99	99	99
L1	**L2**	**L3**	**L4**
50	50	50	50

PITCH ENVELOPE

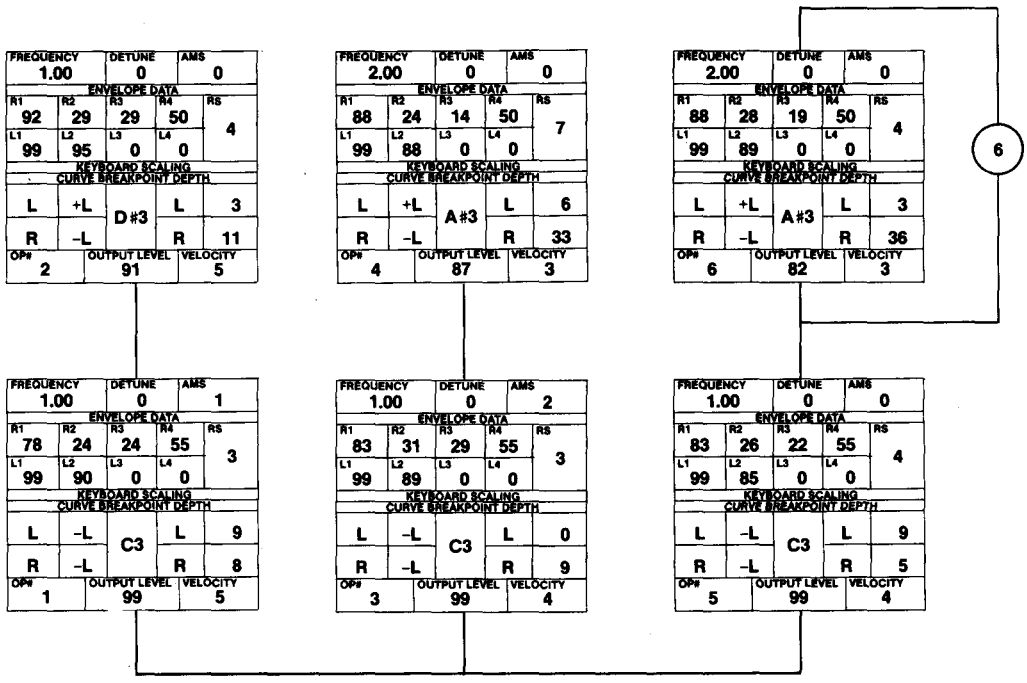
KEY TRANSPOSE: C3

OSC SYNC: OFF

FUNCTIONS

POLY/MONO	RANGE	STEP	MODE	GLISSANDO	TIME
POLY	NA	NA	NA	OFF	0
	PITCH BEND			PORTAMENTO	

(CONTROLLER)	RANGE	PITCH	AMPLITUDE	EG BIAS
MOD WHEEL	99	NA	ON	ON
FOOT CONTROL	0	NA	NA	NA
BREATH CONTROL	0	NA	NA	NA
AFTERTOUCH	0	NA	NA	NA



ALGORITHM #5

Notes:

To increase the "bite" of the sound, raise the output level of Op #2.

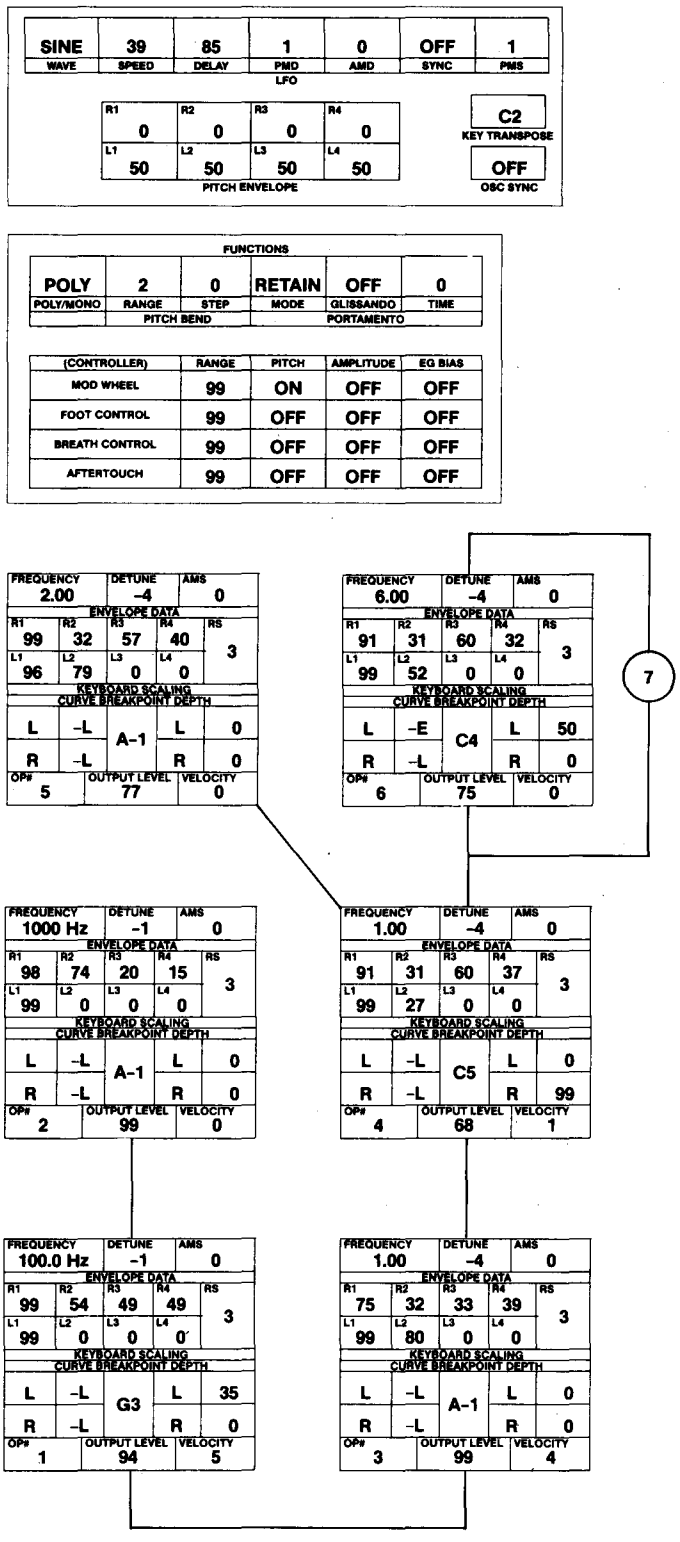
Try raising the output level of Op #2 to suggest different models of the same basic instrument.

For additional tremolo sound, raise AMS of Op #2 or #4 for a mild effect. For a more pronounced effect, raise AMS of Op #5

To add "spike" to the low end, raise the L Scale Depth of Op #4 or #6—but take it easy on Op #6!

For more information on this voice, see page 4.

ACOU GUIT. A New DX7 Voice Created By L. Kevin Rockwell.



ALGORITHM #14

Notes:

Ops #1 and #2 produce the "stuff"—the pick sound.

DX100

Yamaha's Newest 4-Operator Digital Synthesizer. By Tom Darter.

THE NEWEST MEMBER of Yamaha's family of 4-operator FM digital synthesizers weighs in just under 6 pounds and is powered by six C batteries. It sports a full 4-octave (49-note) mini-keyboard, and comes equipped with extensive MIDI implementation.

In addition to being light-weight and battery-operated, the DX100 has an extensive library of FM voices—192 in all—included as part of its permanent ROM memory; this is in addition to its 24-voice user-programmable RAM memory. If you are just starting out in FM digital synthesis, these permanent voices can be a powerful learning tool: By investigating how they work, you can gain a lot of understanding of the process of voicing, which you can then apply to the creation of your own sounds in the 24-voice RAM memory.

As you work with the voices, you may discover that certain groupings of sounds are useful for performances or studio work. Using the DX100's Bank Play mode, you can combine sets of voices from both voice memories into groupings that suit your musical needs.

The Voice Memories

To access the 24-voice internal RAM memory, simply press the INTERNAL PLAY button. You can then select a voice from the Internal memory by pressing any one of the numbered buttons (1-24). At this point, the display will indicate the voice number and voice name. These are preceded by a "P," indicating that you are in Internal Play mode. For example, if you press the INTERNAL PLAY button and then select voice 1, you will see the following:

P 1 IvoryEbony

To play through the voices in the 192-voice ROM memory, you must enter Preset Search mode, which is accessed as part of the Function mode. First, press the FUNCTION button, then press any one of the four PRESET SEARCH selector buttons (these are the same as the four BANK buttons used in Bank Play mode).

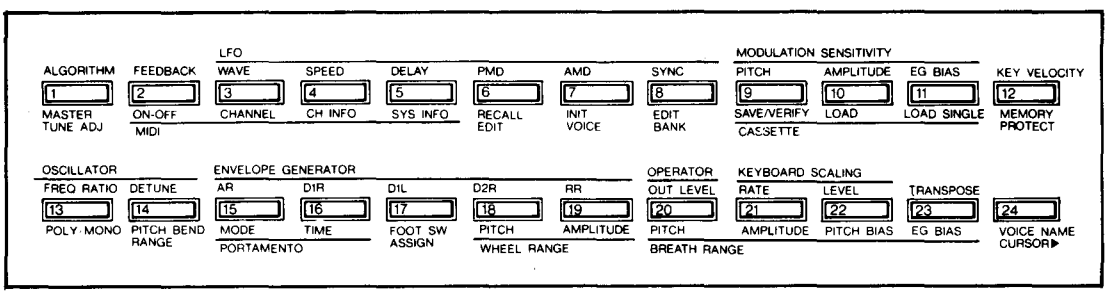
Each one of the PRESET SEARCH buttons gives you access to a group of 24 presets, which are selected using the 24 numbered buttons. The groups are numbered 1 through 4. The display will show you indicate the group number, voice number, and voice name. These will be preceeded by an "F," indicating that you are in the Function mode (Preset Search). For example, if you pressed the FUNCTION button, the PRESET SEARCH button 3, and the numbered voice button 2, you would see the following in the display:

F302 Easy Clav

Some quick addition should tell you that this approach only gives you access to 96 of the internal presets. In order to reach the other 96 presets, you have to enter Shift mode. To do that, simply hold down the INTERNAL PLAY button and press the +1/YES button.

By the way, if you enter Shift mode while in Function Preset Search mode, you will find that you have returned to Internal Play mode. (This happens automatically when you press or hold down the INTERNAL PLAY button.) Return to Function mode by pressing the FUNCTION button; then, when you press one of the PRESET SEARCH buttons and select a voice, you will find yourself in the Shift mode groups of preset voices.

At first, you may be confused by the fact that the Shift mode voices are numbered the same as the Normal mode voices, and there is no indication in the display (other than the voice name) that differentiates between the two. Therefore, if you enter Shift mode, then return to Function Preset Search mode and call up group 3, voice 2, you will see the following display:



This portion of the DX100's front panel displays the instrument's voice and function parameters. The voice parameters are named above the 24 buttons, and the function parameters are named below. All of the performance function parameters (13-24) are memorized as part of the data for each voice in memory.

F302 Rich Strg2

Remember that the Normal mode preset for group 3, voice 2 is "Easy Clav" (see above). As you become familiar with the preset voices, you won't have any trouble remembering where you are.

To return to Normal mode from Shift mode, simply hold down the INTERNAL PLAY button and press the -1/NO button.

As we mentioned above, the DX100's two voice memory sets (Internal and Preset) can be combined into performance groups called Banks. These four banks each contain 24 voices, which can be grouped and order according to your needs.

To enter Bank Play mode, start from Internal Play mode by pressing the INTERNAL PLAY button. Then press one of the four BANK PLAY buttons (A-D) and select one of the voices in that bank by using the numbered buttons (1-24). The display will tell you that you are in Bank Play mode by adding the bank name (A-D) next to the "P" that indicates Internal Play mode. If you call up Bank C, voice 21, the display will show this message:

PC21 Xylosnare

When shipped from the factory, the Bank memory contains the first 96 voices of the Preset memory (the Normal mode voices), in their original order.

You should know that the Shift mode also works in Bank Play mode. By entering the Shift mode while in Bank Play mode, the correspondingly numbered voice from the second set of Preset voices (the Shift mode voices) will be selected. This only applies to voices stored in the Bank memory from the 192-voice Preset corresponding to the voice number stored in that location is called up from its position in either the Preset or Internal memory.

Voice Parameters & Edit Mode

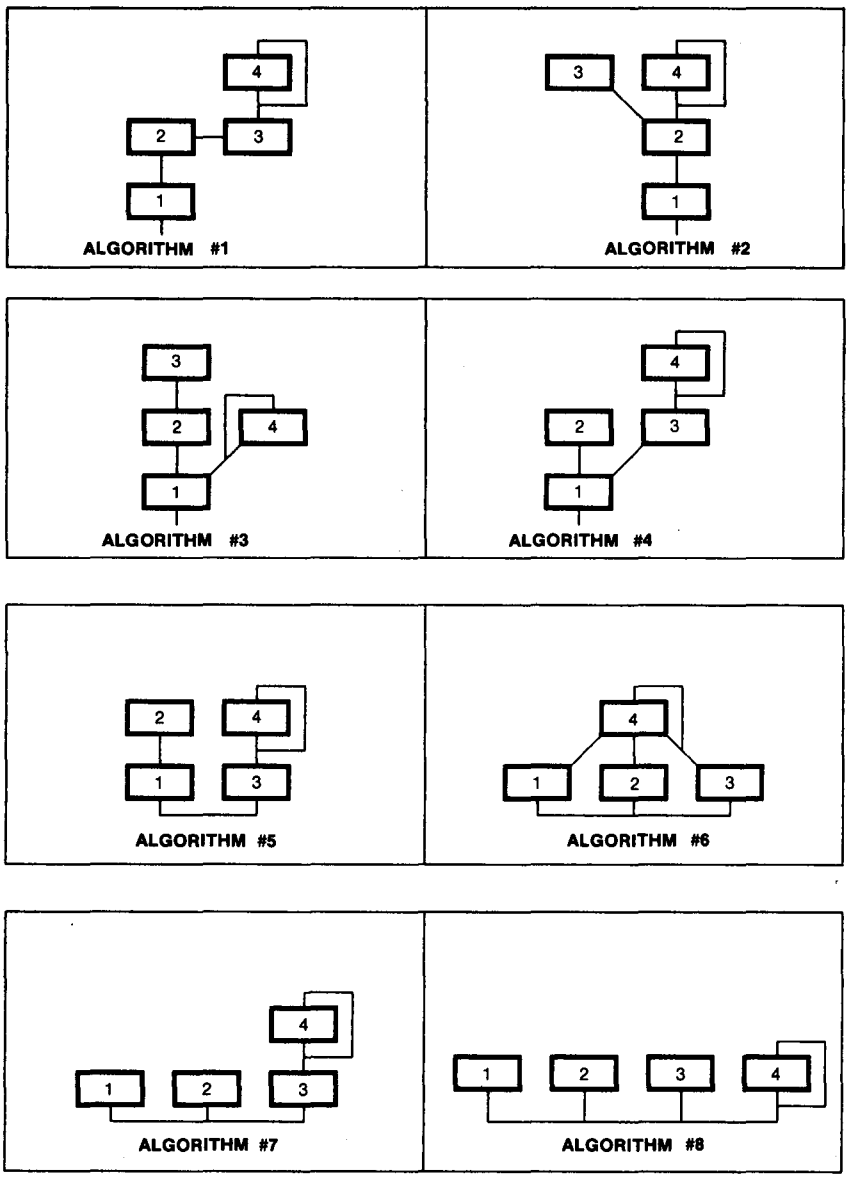
The DX100's front panel allows easy access to all of the voicing parameters, and the display helps out by reminding you where you are at all times.

The numbered-button portion of the front panel (on the right) shows the instrument's voice and parameter functions. The voice parameters are listed above the 24 buttons, while the function parameters are listed below. All of the performance function parameters (13-24) are memorized as part of the data for each voice in memory.

To access the voice parameters, press the EDIT/COMPARE button. The left side of the display will show the following:

E1111

The "E" tells you that you are in Edit mode; the "1111" display shows that all four operators are ON. While in Edit mode, you can turn operators off and on by using the OPERATOR/AMS ON-OFF buttons. When you turn an operator OFF, the display for that operator will read "0." As you might expect, the four operators are shown from right to left in



Here are the eight algorithm forms for the DX100 FM digital synthesizer. These same algorithms are used in the DX21 and DX27.

Continued on page 20

CX5M

How To Use The CX5M DX21 Voicing Program With The DX27 Or DX100. By Kevin Laubach.

YAMAHA HAS INTRODUCED a new line of FM digital synthesizers that are based on a 4-operator, 8-algorithm system of voicing. Shortly after the introduction of the first instrument in this line, the DX21, Yamaha also introduced a CX5M program (YRM305) designed to help musicians program voices on the DX21. Since then, two other synthesizers have been introduced that use the same 4-operator system as the DX21—the DX27 and the DX100. Since all three of these instruments use the same basic FM configuration, it is possible to use the CX5M's DX21 Voicing program (YRM305) as a voicing aid for any of the three instruments.

What follows is a step-by-step guide for setting up the CX5M and the YRM305 DX21 Voicing program for use with the DX27 and DX100 digital synthesizers. For more information on the operation of the program itself, please consult the YRM305 Owner's Manual.

CX5M music computer.

Step 1: MIDI Connections

Connect the MIDI OUT of the CX5M to the MIDI IN of the DX27 or DX100, and connect the MIDI IN of the CX5M to the MIDI OUT of the DX100 or DX27.

Step 2: MIDI Setup For The DX100/27

First of all, you must make sure that MIDI functions are ON. Use the following procedure:

1) Press FUNCTION/COMPARE. You are now in the Function mode.

2) Press MIDI:ON-OFF. The display should show whether MIDI is ON or OFF. Press YES and display will show this message:

   fMidi:on

Now you must make sure that the instrument is set to receive and transmit on MIDI channel 1. Use this routine:

1) Press FUNCTION/COMPARE. You are now in the Function mode.

2) Press MIDI:CHANNEL. The display should show whether OMNI mode is ON or OFF.

3) Press MIDI:CHANNEL again. The display will show the current MIDI Receive channel. Use the data entry slider to s et the number to 1. The display should show this:

   f Midi R Ch= 1

4) Press MIDI:CHANNEL once again. The display will show the current MIDI Transmit channel. Use the data entry slider to set the number to 1. The display should show this:

   f Midi T Ch= 1

Finally, you must make sure that the instrument's MIDI System Exclusive Information is ON. Do as follows:

1) Press FUNCTION/COMPARE. You are now in the Function mode.

2) Press MIDI:SYS INFO. The display will show whether system info is ON or OFF. Press YES and the display should read as follows:

   f Sys.Info:on

3) Now press INTERNAL (PLAY) to get back to the normal Play mode.

Step 3: CX5M/DX Voicing Setup

Before inserting the program cartridge or making any peripheral connections, make sure the the CX5M's power is *off*. Then do the following:

1) Insert the YRM305 DX21 Voicing cartridge into the top cartridge slot of the CX5M.

2) Be sure that the CX5M's video/audio cable is properly connected to a video monitor and amplifier. (The audio connection is important if you want to hear the CX5M's key clicks and error sounds.) Of course, you must also connect the DX100 or DX27 to an audio system so that you can hear what you

are doing!

3) If you plan on using cassette tape to load or save data, connect the CX5M to a cassette recorder using the standard cassette cable (red plug = MIC, white plug = EAR, black plug = REM).

4) If you plan to use an FD05 Disk Drive to load or save data, be sure that the disk drive is connected to the CX5M's rear slot (using the CA01 Single Cartridge Adaptor and the FD051 Disk Drive Interface.

5) Now power up the CX5M and video monitor (and disk drive if installed in the system).

6) After a few seconds you will see the Directory of all voices in memory. If everything is properly connected, the program will automatically get the voices from the RAM (random-access memory) of the DX synthesizer to which it is connected. There are 24 voices in RAM in the DX100 and DX27; the DX21 has 32 voices in RAM.

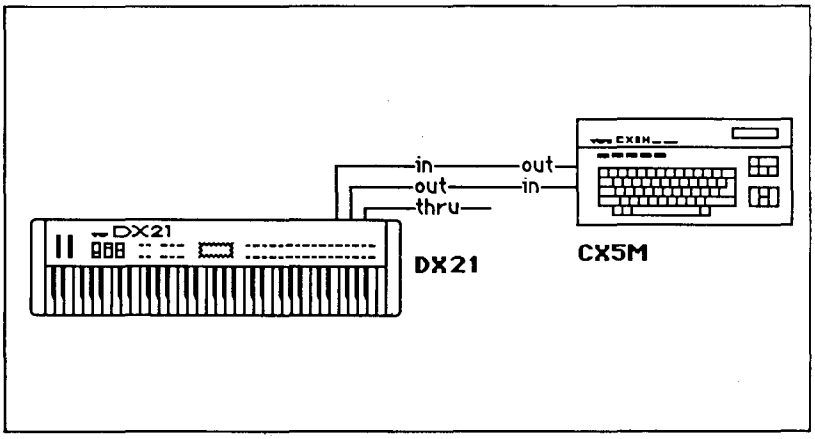
Step 4: Begin Voicing

Now it's time to begin working on a voice. Press F1 on the CX5M's keyboard to enter the Edit mode. You can now make parameter changes on either the CX5M screen or the DX synthesizer. Both the DX and the CX5M screen will be updated instantly.

If you are using the MU01 Mouse with the computer, simply point to the parameter you wish to change and click the left Mouse button. Then press and hold the right Mouse button while moving the Mouse left to decrement (decrease the value) or right to increment (increase the value). This makes editing much easier. (By the way, the Mouse cannot select either Transposition (TR) or Feedback (FB) directly. However, once these parameters are accessed using the CX5M's cursor keys, they can be altered in the usual way with the Mouse.)

There are eight parameters that the DX21 has which the DX100 and DX27 do not have. These parameters are Foot Volume Range, Chorus switch, and the six Pitch Envelope Generator parameters (Pitch EG Rate 1, Pitch EG Rate 2, Pitch Rate 3, Pitch EG Level 1, Pitch EG Level 2, and Pitch EG Level 3). If you change these parameters on the CX5M, nothing will happen to the DX100 or DX27.

If you would like to create or edit a patch that uses velocity, you should connect a velocity keyboard (such as the DX7 or KX88) to the MIDI IN of the CX5M. Now, in order to play the DX100, DX27, or DX21 from that velocity keyboard, you must turn on the CX5M's MIDI merge function, so that Key On information from the velocity keyboard will pass through the CX5M and reach the synthesizer you are programming. Use the following procedure:



Basic MIDI connections for using the CX5M DX21 Voicing Program (YRM305) with the DX21, DX27, or DX100.

1) Press the F7 button. The top left display will read as follows:

   Midi Ch=

2) Press the SELECT button. Now the top left display will show this message:

   Midi Merge?

3) Press the YES button. The top right display will respond with this confirmation message:

   Me=on

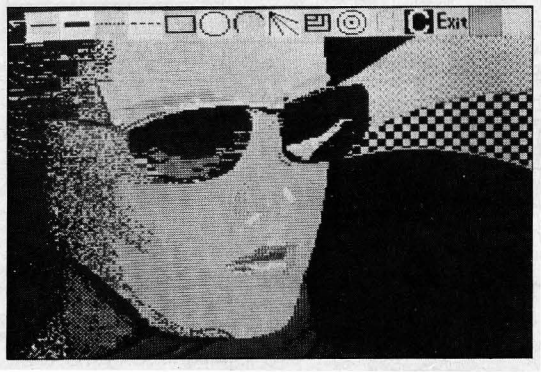
At this point, incoming MIDI data from the velocity keyboard will be mixed with MIDI data from the CX5M program, and both will be sent to the DX keyboard you are programming.

One final technical note: Unlike previous FM digital tone generators such as the TX7 and TX816, the performance function data and voice data are combined into one data type for the DX100, DX27, and DX21. Also, since these 4-operator systems are configured differently, their voice data is not compatible with that of the 6-operator systems such as the DX7 or TX816.

Questions

Three Pages Of Answers To Questions From Readers.

Does Yamaha plan to release general-purpose MSX software for the CX5M computer in the near future?
With the exception of the TeleWord package and the Graphics Artists program, Yamaha intends to keep its focus on music-related software for the foreseeable future. However, there is a lot of general-purpose software available for the MSX computer (which will of course run on the CX5M). One major distributor of MSX software is NYRAC, a company based in Alabama. If you're interested in finding out the availability of various MSX software and games packages, write to them directly for information: NYRAC, 732 Karen Rd., Montgomery, AL 36109.



Sample screen display from the GARo1 Graphic Artist program, one of the few non-music programs created by Yamaha for the CX5M music computer.

Sometimes I get a "BATTERY LOW" message in the LCD display of my DX7 right after I turn it on. When I call up the Battery Check function to double-check this, I get a normal reading. What gives?
What you have is a software glitch caused by the FC7 pedal. When the FC7 is connected to the modulation input, and when the pedal is fully depressed (forward) when you turn your DX7 on, it will send an anomalous message to the function area that calls for a battery check and gives the readout "BATTERY LOW." This message usually means nothing, and calling up the Battery Check function again will give a normal result.

To avoid this little gremlin, simply make sure that the FC7 pedal is not fully depressed (pushed down to maximum value) when you turn on your DX7. Then everything will operate as normal.

Why does this happen? Well, the FC7 was developed after the DX7, and this minor software incompatibility is the result. Remember, this strange readout will occur only if the FC7 is fully depressed when you turn your DX7 on.

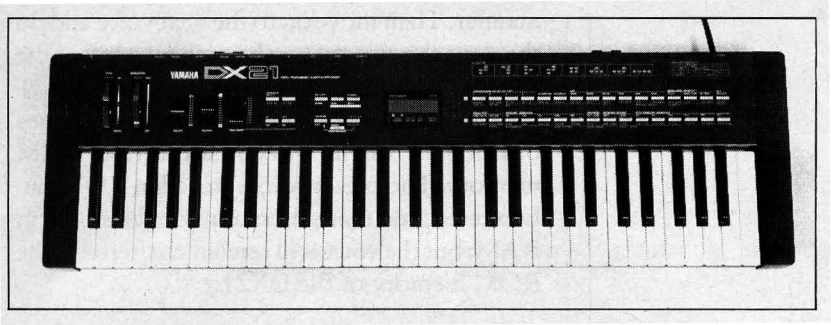
I took my Yamaha RAM-1 cartridge to a friend's house, and lost a bunch of data after plugging it in to his DX7. I don't understand how this could happen, since I had the cartridge's Memory Protect switch in the ON position.
Once again, we are dealing with a software incompatibility, one that crops up between different generations of DX7s and RAM-1 cartridges, but *only when the Memory Protect Switch is ON!* The memory protect function, if not compatible with a particular generation of DX7, can cause a FORMAT CONFLICT message, or a loss of data.

To avoid this problem, simply leave the Memory Protect switch OFF at all times. Then you will have no loss of data, and no Format Conflict problems.

Also, don't worry too much about losing data with the Switch in the OFF position. Remember, the DX7, when turned on, has its Cartridge Memory Protect ON. Also, when you initiate a Save To Cartridge function, the DX7 always asks "Are You Sure?" In other words, you have to make two conscious decisions before you can erase data on a cartridge. The third backup offered by the Cartridge's own Memory Protect switch should be unnecessary.

But how did this happen, you may ask? Good question. There are a number of reasons, all leading to the same result, all having to do with the relative age of the DX7 and the RAM-1. Unforeseen software incompatibilities cropped up after various units were on the market. Remember, though, you can avoid *all* of these problems by putting the RAM-1's Memory Protect Switch to OFF and leaving it there.

When I go into dual mode on my DX21, one of the voices will sometimes have a completely unwanted LFO effect—something that was *not* part of the original voice program. What can I do to eliminate this problem?
Not too much. The architecture of the DX21 includes only *one* LFO, and that one LFO is shared by the two tone modules. Therefore, when you go into Dual or Split mode, the LFO can only operate *one* way on the two chosen voices. If one of the voices chosen (for the Split or Dual sound) is assigned to LFO modulation, then *both* voices will have LFO modulation, even if the settings for the second voice would



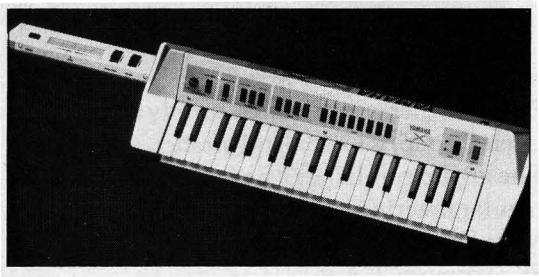
DX21 FM digital synthesizer.

indicate that no modulation should be taking place.

The best way to deal with this problem is to reprogram the LFO for voices that you plan to use in Split or Dual mode, so that the settings you choose will operate equally well for both voices.

I use a KX5, but when I turn it off to save batteries during recording, my DX7 seems to transpose keys randomly. I am able to remedy this only by first switching the KX5 to MIDI channel 2 and then turning off power. Why does this happen?

Yet again, we are dealing with various software revisions in the two instruments, revisions that went in different directions. As a result, the KX5, when turned off, sends a byte of data that resets the transposition of the DX7 down three keys. The only sure way to avoid this problem is to do as you suggest: Always turn the KX5 to MIDI channel 2 before turning it off—then the DX7 won't receive the gremlin-like byte.



KX5 strap-on MIDI keyboard controller.

I have a DX7 and a TX7. I loaded the TX7's "A" set of voices into the DX7, but some of the voices seem to be missing—when I play the DX7, there is no sound. Did I transfer the voices improperly?

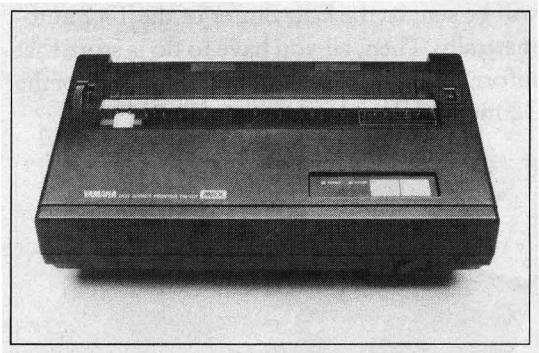
No, but your DX7, if used by itself, may not have the correct function settings to play all of the voices. For example, voice 17 in set A is "BC FLUTE." If the breath controller's EG bias is OFF, or if the range of the breath controller is set to 00, the voice will not sound even if you use a breath controller. Many of the important effects for these two sets of voices are tied to specific function settings: Many vibrato and tremolo effects, for example, are triggered by the Mod Wheel or the Foot Pedal.

If the DX7 is used *with* the TX7, the extra Function Memory set contained in the TX7 will compensate for the DX7's limited global Function Memory. When these TX7 voices are used in the DX7 by itself, you have to make adjustments to the Function Memory as you go, in order to gain access to everything that has been programmed into the voice.

The voice sets provided with the TX7 are identical to those shipped with the TX216. A full documentation for the voices can be found in the TX216 Performance Notes.

Is there any way to print double-width letters with the PN101 printer used in conjunction with the CX5M? I would like to have access to more than one basic type format.

A number of type formats can be accessed by using the "LPRINT" mode in BASIC. Details can be found on page 14 of the PN101 owners manual.



PN101 printer, designed for use with the CX5M music computer.

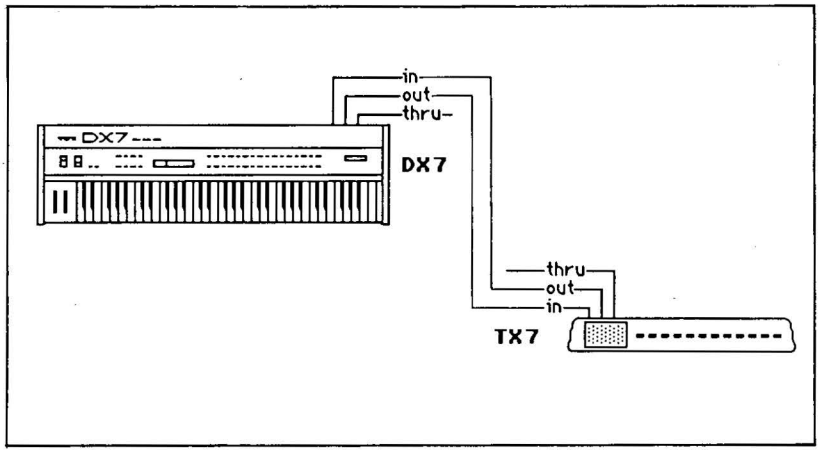
My DX7 makes an awful banging sound when keys hit the board. Is there a way of correcting this?

The DX7 action is adjustable. Take your instrument to an authorized service center and have them look into the problem.

I own a TX7 and a DX7, and I would like to know how I can edit one sound on the DX7 and transfer it to the TX7 without dumping all 32 voices into the TX7's memory.

First of all, don't use the "MIDI TRANSMIT" function on the DX7, or you *will* send all 32 voices to the TX7. Here's the correct procedure for sending just one voice:

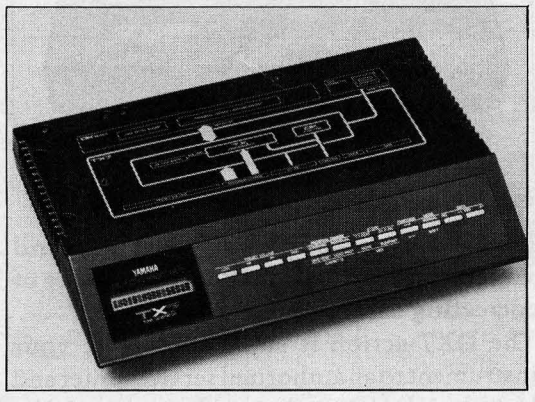
Questions *Continued*



Basic MIDI connections for using a TX7 tone generator with a DX7 synthesizer.

First, make sure that both instruments are connected properly, with the MIDI IN of the DX7 going to the MIDI OUT of the TX7, and the MIDI OUT of the DX7 going to the MIDI IN of the TX7. Then, make sure that the MIDI section of both instruments is set to "SYS INFO AVAIL."

Now, after you have edited and stored a voice in memory on your DX7, return to Play mode and press the key that calls up that voice memory (1-32). The voice data stored in that position (plus the current DX7 function data) will be sent to the Edit Buffer of the TX7 automatically. Then, all you have to do is store that information from the Edit buffer into one of the 32 memory locations in your TX7.



CX5M music computer.

TX7 FM digital tone generator.

I own a DX21. For my needs I must raise and/or retune the instrument one half-step up, all voices. I must be doing something wrong, because I always wind up tuned where I started. Can you help me?
Remember that the Transpose setting is part of voice data, and must be stored as part of the memory for *each voice*. Go into Edit mode, transpose the voice to the desired setting, and then STORE the new voice data in the usual manner. Then move on to the next voice and do the same thing, until you have changed all of the transpose settings.

Remember that *permanent* voice changes only occur in the 32-voice internal RAM memory. The preset voices stored in ROM can be altered, and these alterations can be stored in RAM, but the voice will remain unaltered in the ROM memory of the DX21.

Are there any CX5M Users Groups already active? I am thinking of trying to start my own group, but it would sure help if I could contact some other groups for information.
We know of two organized, active groups, one located in New York, and one in Southern California.

The New York CX5M Users Group holds regular meetings, publishes a newsletter, and maintains a growing library programs and patches. For information, write to: New York CX5M Users Group, 551 Central Ave., Suite 22B, Cedarhurst, NY 11516; or call 718-461-8057.

The other group, called simply the CX5M Users Group, is located in Torrance, California. The group publishes a newsletter and holds regular meetings. For information, write to: Mike Dwyer, CX5M Users Group, 5218 Scott St., Torrance, CA 90503.

To help defray postage costs, please send a self-addressed, stamped envelope with your request for information.

I have a question about the YMC10 MIDI to Tape-Sync Converter. Can it be used to record MIDI information onto cassette?
No. The YMC10 converts MIDI clock information into FSK tape-sync timing code. That timing code, run back through the YMC10 from tape, will sync units that operate from a MIDI clock.

Final Touch

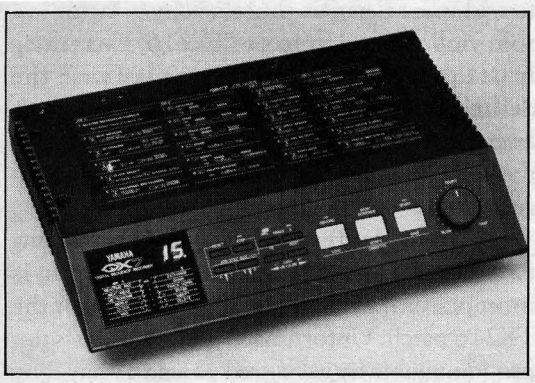
Hot Tips For The QX7, QX1, TX816, CX5M, And KX88.

Using The QX7 As "Sub-Mix" For MIDI Controlled Effects.

By David Schoenbach.

For serious studio and live-performance applications you may want to set up your QX7 as a "slave" to a QX1 sequencer. For example, let's say that you have a multi-part sequence recorded in the QX1, and wish to enhance playback by including a number of MIDI-controlled effects units, such as the D1500 Digital Delay or the REV7 Reverb Unit. Using MIDI, you can access a number of signal-processing presets in these machines, which respond to MIDI program change numbers.

By slaving the QX7 clock to the QX1 [ET mode], you can separately change programs on up to 16 different effects units, each on its own MIDI channel. In this way, the MIDI effects



QX1 digital sequence recorder.

QX7 digital sequence recorder.

program changes will not affect the instruments connected to the QX1, but will only affect the effects devices connected to the MIDI OUT of the QX7. Keeping the information separate in this way will also allow you to try a number of different "effects mixes" without affecting the basic sequence as recorded in the QX1.

* * * *

Detuning Voices In The TX816 Via The QX1.

By Gary Leuenberger & David Bristow.

Often, it is desirable to detune two or more voices on the TX816 (or whatever MIDI sound source is being used) *without* having to go in and edit the actual voice or detune the actual synthesizer module. This can be done with the QX1 as the controlling device in a sequence. Simply INSERT a PITCH BEND change at the TOP OF TRACK for the track/voice you wish to "push" out of tune.

For example, the TF modules 1 & 2 in the TX816 contain factory presets for a piano sound in position 1, and these presets are only slightly out of tune. Suppose you wish to create the effect of a "Honky Tonk" piano for the opening of a piece, but want to go back to a straight piano sound later in the piece. The easiest way to do this is to INSERT a PITCH BEND of some value (for example, 005-010, depending on much detune you want) at the top of track 2. To cancel the effect later in the piece simply INSERT a PITCH BEND of 000 at the desired measure.

Remember to cancel the effect. It is good basic "QX1 Housekeeping" to always cancel control codes at the beginning or end of a

BANK/CHAIN; otherwise, they may be carried on the the next BANK/CHAIN playback (with undesired effect). Therefore, if you use detune for the entire piece, INSERT a PITCH BEND 000 at the end!

* * * *

Transferring Individual CX5M Voice Files From One Voice List To Another

By Dennis Anderson

Because of the versatility of the YRM102 FM Voicing Program, many CX5M users are sure to be filling up a lot of 48-voice lists with new and unique voices and storing these lists on cassettes. Eventually, the user is going to wish that there was a way to "lift" one voice from one list and "drop" it into another list, so that the user can establish voice packages for various applications.

For purposes of this example, let's say that you want to "lift" voice #33 from one voice list (FILE 1) and "drop" it into another voice list

Final Touch *Continued*

(FILE 5) that is stored on another cassette. Single voice transferring can be accomplished by using the following procedure:

1) Call up an existing set of 48 voices from cassette (FILE 1) that contains the voice you would like to "lift"—voice #33 ("Swoosh").

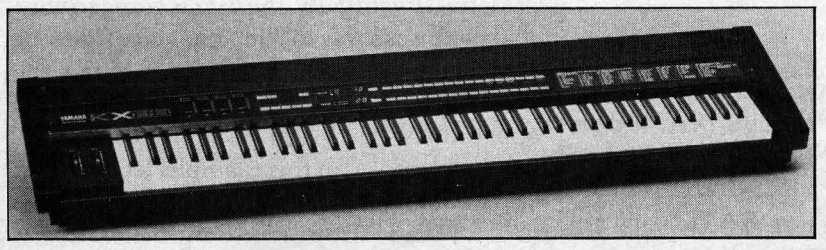
2) Call up #33 from the menu. Voice #33 ("Swoosh") will appear on the screen, and it can be played on the music keyboard. In the top right-hand corner of the screen, you will see "SBUF (33)," which tells you that voice #33 is now in the storage buffer.

3) Remove the cassette containing FILE 1 from your machine and insert the cassette containing FILE 5. Load in FILE 5.

4) When FILE 5 is in, the new set of 48 voices will be listed on the screen, and in the upper right-hand corner, the message "FILE 5 OK" will replace "SBUF (33)." *This is the critical moment!* Voice #33 from the previous file is still in the computer, but only in the Storage Buffer, *not* in the new list of voices. Voice #33, "Swoosh," can still be played from the music keyboard, but it will go away as soon as you start entering commands, with one exception:

5) With the message "FILE 5 OK" still appearing in the upper right-hand corner, type in "re" and then hit ENTER. "Swoosh" will now appear in slot #33 in the new voice list, replacing the voice that was in #33. Actually, "Swoosh" can be located in any one of the voice memory slots: Simply type "re ##" (where ## equals the number of the voice that you do want to replace with "Swoosh").

Although this process is a slow one (since two cassette LOAD functions have to be dealt with to transfer voices around), the added flexibility of being able to create custom voice lists makes the wait worthwhile!



KX88 MIDI keyboard controller.

Using The KX88/76 To Turn Off TX216/816 Function Controls Temporarily

By Tom Darter

In many situations, you can use the Controller Assign (CA) mode on the KX88 or KX76 to defeat unwanted function control in a TX module, without actually changing the Module's function memory.

Let's say that you are involved in a TV soundtrack session, and have your KX76 hooked up to a number of instruments, including a TX216 rack-mount tone generator. You have been asked to put together a thick, string-like sound by MIDIing a number of synthesizer modules together. The part calls for sharp attacks on the keyboard. You have three instruments sounding good together, and decide to add some clarity in the attack by bringing in a solo violin sound from the TX216. Everything is fine, except that when you play with the desired sharp attack on the keyboard, you get an annoying vibrato from the TX216. Obviously, the sound you have called up has vibrato programmed to respond to aftertouch.

None of the other instruments is responding to aftertouch, so that MIDI information is unimportant for them, and unwanted for the TX216 patch. Unfortunately, the TX216 is not programmable by itself, and you don't have any programming software hooked up. What do you do?

The obvious answer is to reprogram the KX76 so that its aftertouch controls *nothing*. Enter Controller Assign mode by pressing the CA button. Then press BANK A button 4 to access the afterouch function. The BANK A display will show "AC" [for Aftertouch Controller], and the BANK B display will display "13" [hex]. Looking in the controller code preset table, you will see that "13" stands for the aftertouch function. Therefore, the KX76's aftertouch has been programmed to function as aftertouch. A very logical assignment, which we are now going to defeat.

Using the BANK B program select switches [following the hex numbering above each switch], reprogram aftertouch [AC] to controller code 06 [hex], which has *no* function. Now the aftertouch from the KX76 will have no effect, and you can play all of your instruments together with no unpleasant side-effects.

Touch Response

Letters From Readers About Users Groups.

HERE ARE SOME letters from fellow AFTERTOUCH readers, all concerning Users Groups. One is already part of a group in his area, another wants to try and start a group in his area, and the third wants information concerning any groups already formed in her area. If you are interested, contact them and offer your help. Also, for more information on other Users Groups, look in the AFTERTOUCH Questions column in this issue and in the November 1985 issue.

* * * *

In response to your inquiry about Users Groups, I am writing to inform you of a group in Portland, Oregon. Our DX7 Users Group started in October of 1985, and currently has about 30 members. The group's main function is educational. We also have a master library with over 2,400 DX7 sounds. The group meets once a month to discuss programming techniques and swap patches. We intend to expand into other areas of the YCAMS system in due time. We also write a monthly "Patch Of The Month" column in a local musicians' magazine. If anyone is interested in our users group or a copy of the "Patch Of The Month," please send a self-addressed, stamped envelope to the address below, or call 503-667-3304.
Mike Klinger
Denny's Strings & Things
1605 N.E. Kelly
Gresham, OR 97030

I have recently purchased a CX5M and am very pleased with the unit. The only complaint I have is that specific instruction is not available. For this reason, I would like to start a CX5M Users Group in the Harrisburg, Pennsylvannia area. If you live in this area and would like to help out in getting a group started, please write to me at the address below.
John C. Boglovits
300 Ramsey Place, Apt. 320
New Cumberland, PA 17070

I am interested in being involved in a DX7 Users Group, because I think all of us Yamaha people ought to put our knowledge together. If anyone has information concerning a group in my area, please send it to the address below.
Sharon A. Smith
13005 S.W. Green Drive
Culver, OR 97734

Write To: AFTERTOUCH, P.O. Box 2338, Northridge, CA 91323-2338.

WE INVITE YOU TO CONTRIBUTE TO AFTERTOUCH. If you've developed a novel use of one of the AFTERTOUCH products, write it up and send it to us. Don't worry about your writing style—just get the information down. If we decide to use your idea as a full article in AFTERTOUCH, we'll try it ourselves, write it up in the magazine, put your name on it, and send you a check for $100.00.

If you've got a hot tip on applications or use, send it along to our "Final Touch" column. If we use it, you'll receive full editorial credit, plus a check for $25.00.

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 AFTERTOUCH. (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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Continued from page 11

the display. Therefore, if you turned operators #2 and #4 OFF, the display would show the following:

E1010

Once you enter the Edit mode, individual voice parameters are called up by pressing the numbered button that corresponds to that parameter. For example, if you enter the Edit mode to modify the "IvoryEbony" voice, pushing button 1 (ALGORITHM) will call up the following display:

E1111 ALG= 3

At this point, you can use the +1/YES and -1/NO buttons or the data entry slider to make changes in the value for the Algorithm parameter. Once you make a change in a voice parameter value, the "E" in the display will change to "e"—this lets you know that you have made some changes. For example, if we changed the Algorithm value to 4 as our first edit, the display would respond with this message:

e1111 ALG= 4

If you want to compare your edited voice with the original, just press the EDIT/COMPARE button again. The display will show this:

C1111 ALG= 3

The "C" is your reminder that you are comparing the original to your edited version of the voice.

One final point of interest: Once you have called up a particular voice parameter in Edit mode, pressing the same parameter button again will increase the value of that parameter by one step. In other words, successive use of the parameter button will have the same effect as the +1/YES button. This can be useful for some quick editing changes. In order to decrease the value of a parameter, you must use the -1/NO button or the data entry slider.

To access the function parameters, press the FUNCTION/COMPARE button. The left side of the display will show "F," indicating that you are in Function mode. Once you make a change in one of the performance function parameters (13-24), the left side of the display will show "f"—another simple reminder that ther have been some changes made.

If you press the FUNCTION/COMPARE button a second time, the display will change to "C," letting you know that you are comparing the original performance function data with your edited version. As with the voice parameter buttons, pressing the function parameter buttons again after calling up the function will cause the value to be increased by one. (Remember that the non-performance parameters (1-12) are not part of any single voice memory—they are global values for the instrument. Therefore, those values, once changed, will remain at that new value as you switch back and forth from "f" to "C.")

As you can see, the DX100 offers you access to a large library of voices, and gives you a lot of control over the creation of your own FM digital sounds.