AFTER TOUCH™

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From The Editor

AFTER LISTENING to the Evatone Sound Sheet in our June 1987 issue, many of you wrote to request more information on Yamaha's new MIDI Wind Controller. As you may have guessed from the cover photo, this issue contains a more detailed introduction to the WX7, beginning on page 10. In answer to other reader requests, this issue also features more 4-operator patches (all from readers), covering two generations of instruments–the DX100 and the TX81Z. There are also articles and hot tips from readers, plus answers to reader questions. Next month will have more of the same, plus a few surprises!

Keep your suggestions, hot tips, patches, questions, and articles coming in. Keep letting us know what you want and need, and we'll do our best to get it into AfterTouch for you.

In closing, here is some important information for AfterTouch readers. Some of it you have seen before, but much of it is new. Please read all of these items carefully, so that you will know how to get the information you need in the most efficient way.

New Address: Please notice that we have a new mailing address, which became effective beginning with the July 1987 issue. Our current address is as follows: AfterTouch, P.O. Box 7938, Northridge, CA 91327-7938.

Foreign Correspondents: We have received many requests for AfterTouch from outside the United States. For a short time, Yamaha tried to support these requests. Unfortunately, the costs of these foreign subscribers have become prohibitive. AfterTouch is supported by Yamaha Music Corporation USA as a free informational service to its users; therefore, AfterTouch subscriptions are available only to residents of the United States.

Back Issues: Previous issues of AfterTouch are sent out free of charge–all you have to do is ask. However, if a request for back issues is combined with a subscription request or other material, chances are good that it will not be fulfilled. All requests for AfterTouch subscriptions go to our Mailing List input service. After the addresses are entered, the postcards and letters are normally kept on file (in keeping with various postal regulations). To be absolutely sure that you receive any available back issues that you want, make back issue requests separately, and include the indication "ATTN: Back Issues" on the envelope. Please do not send back isue requests on the attached subscription postcard.

Product Literature: All requests for literature on individual products or entire product lines must be sent directly to Yamaha. (The address is: Yamaha Music Corporation USA, P.O. Box 6600, Buena Park, CA 90622). 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 directly to Yamaha.

–TD

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After you have filled in the relevant information, put a stamp on the postcard and mail it to us. When we receive the card, we'll put you on our permanent mailing list, and you will receive twelve issues of AfterTouch absolutely free! There is absolutely no obligation, and no other strings are attached.

(By the way, if you received *this* issue in the mail, you are already on our permanent mailing list, so you don't need to send in another card.)

Also, don't limit yourself to just sending in your address: Let us know what you want to read, and what *you* have to offer (see page 19 for details). We look forward to your input.

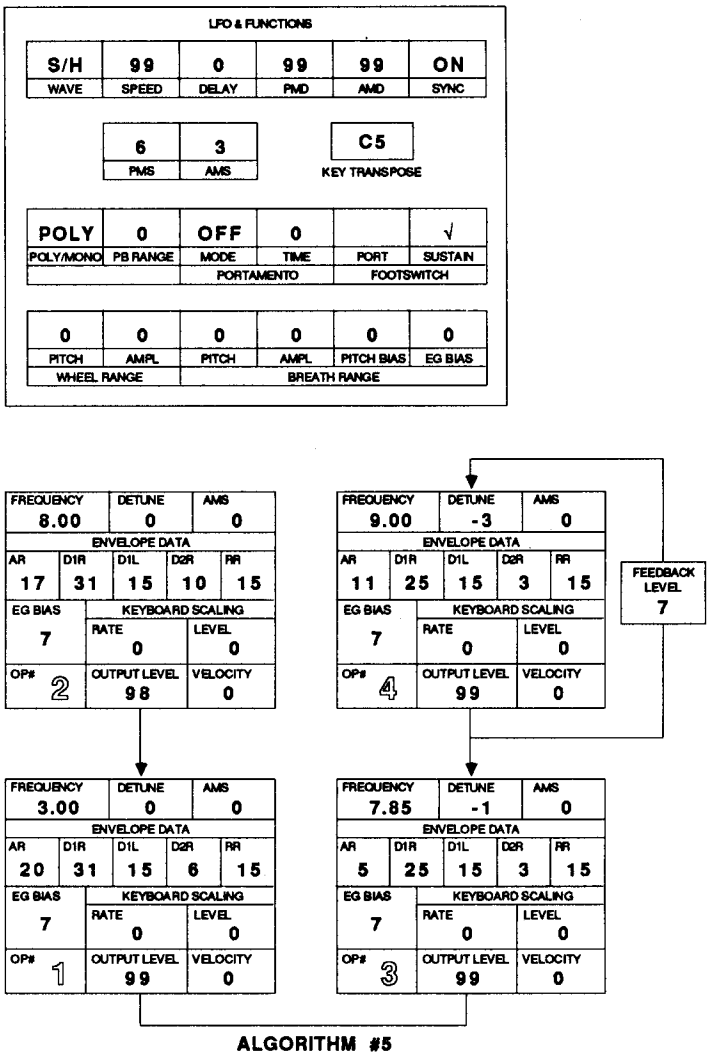
To receive AFTER-TOUCH every month, absolutely free, just put your name and address on the enclosed card and mail it to us.

DX100

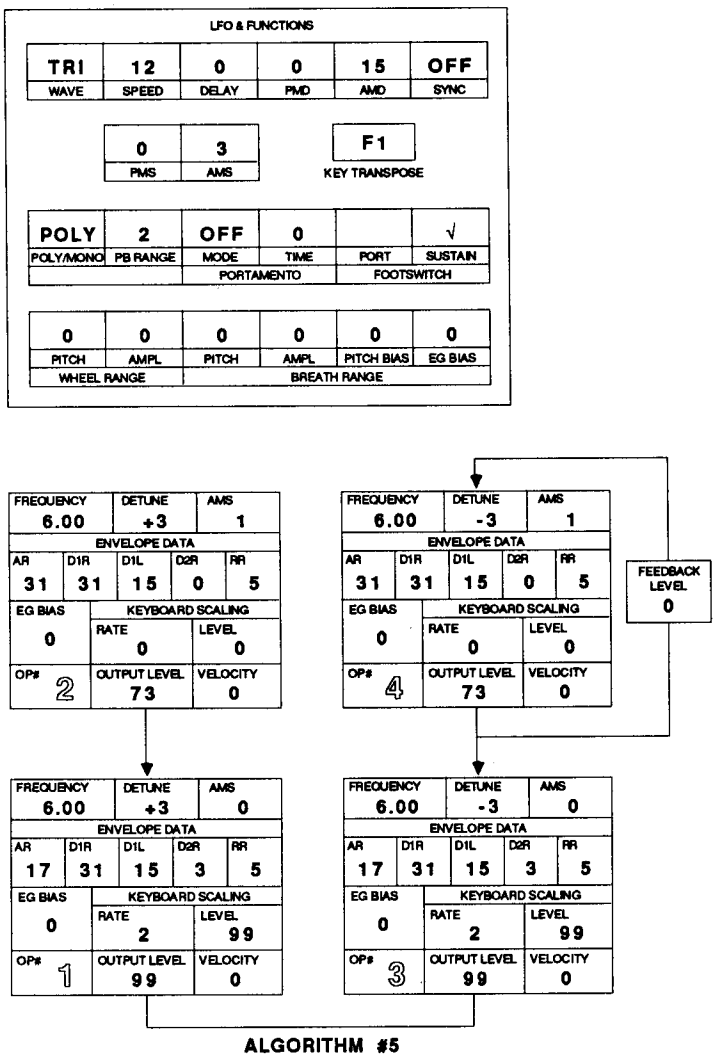
Bacon. A New DX100 Voice By Ken Como.

Notes:

This sound effects patch is sure to wreak havoc with recording engineers and technical people. Different effects can be achieved by altering the LFO values for Speed, PMD, and AMD.



FingrBrass. A New DX100 Voice By David Barton.



Notes:

This patch uses non-standard carrier frequencies combined with detuning to create a chorus-like effect that increases the "thickness" of the DX100 sound dramatically. Because of the unusual frequency ratios used to create this effect, the Transpose parameter must be set so that middle C equals F1.

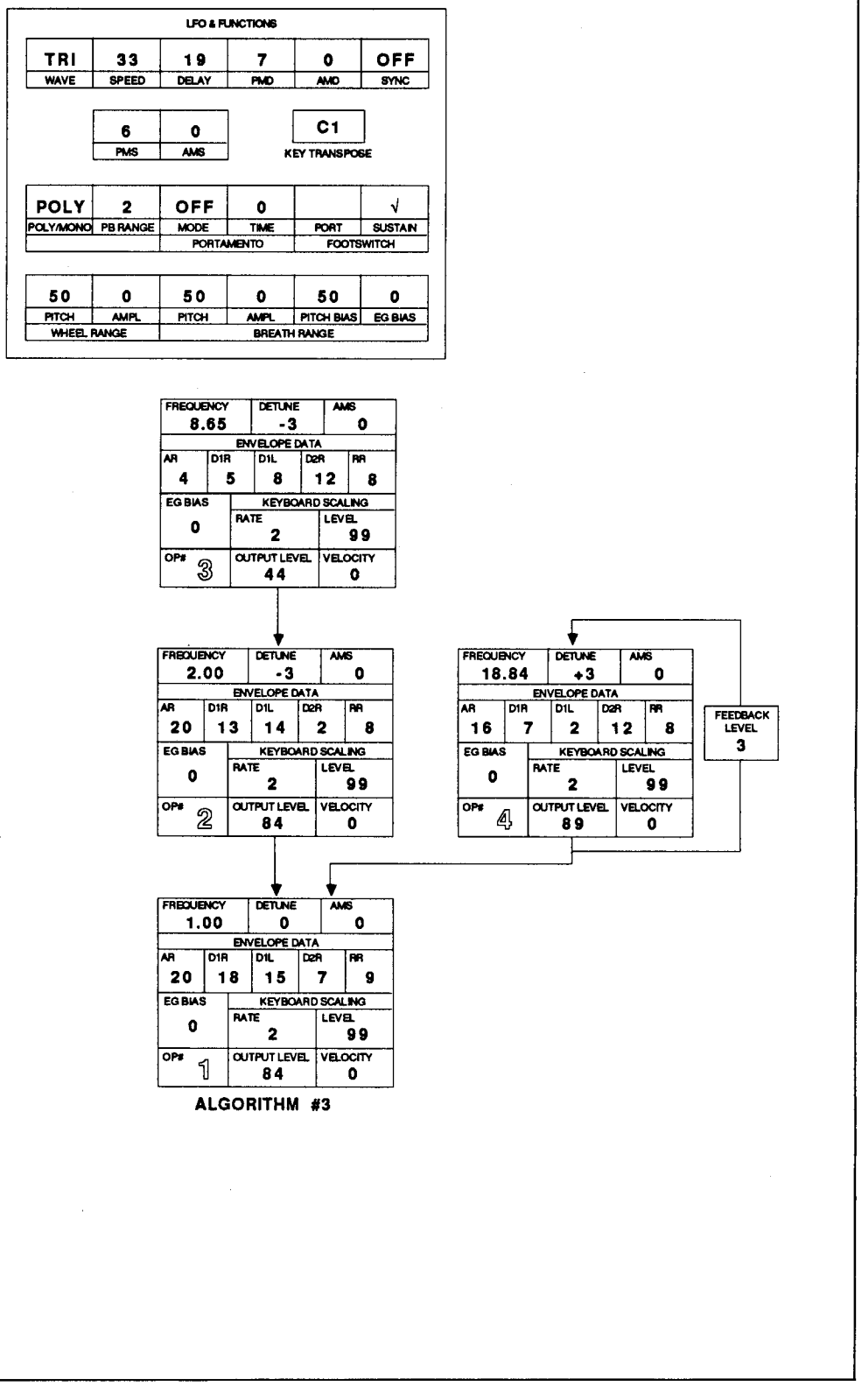
DX100

BASH! A New DX100 Voice By Stephen Cooper.

Notes:

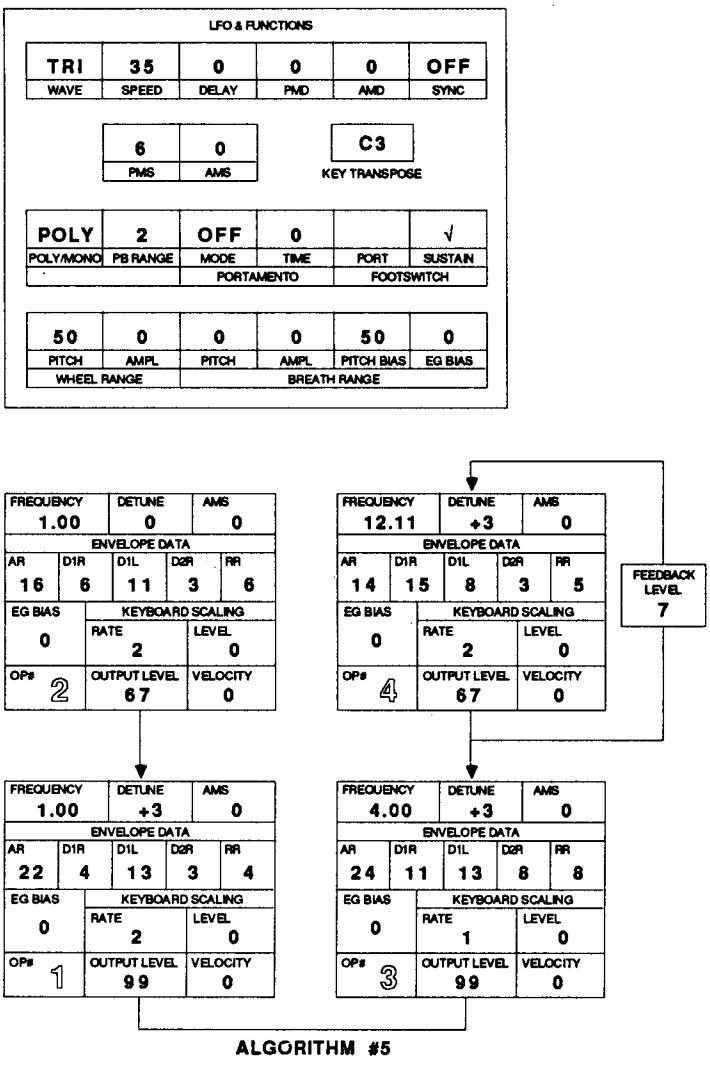
This is definitely not a sound to use as an orchestral pad! It is useful the way a gong sound is useful–as a rhythmic accent.

For best results, play single notes or octaves in the lower half of the keyboard.



ALGORITHM #3

DXLollipop. A New DX100 Voice By J. Fritz Orzelek.



Notes:

This patch owes portions of its genesis to the Electric Piano #1 ROM voice in the DX100. Although the patch was carefully designed with the parameters listed, there is room for creative experimentation.

Here are a few suggestions. Adjust the AR of Op #4 down to 11–15 for interesting arpeggiation effects; adjust the output level of Op #4 down to 63–70; try a frequency ratio of 2.00 for Op #2.

TX81Z

Flauter. A New TX81Z Performance Setup By David Forbus.

Notes:

This TX81Z performance setup is based on two voice patches: "PerfFlute" and "BreathOrgan" (both from the TX81Z's internal ROM bank B).

name: Flauter

assign mode	NORM
micro tune select	5 C
effect select	OFF

1 : PercFlute				5 :				
2 : BreathOrgn				6 :				
3 : BreathOrgn				7 :				
4 :				8 :				
inst. number	1	2	3	4	5	6	7	8
number of notes	2	3	3	0	0	0	0	0
voice number	B31	B32	B32	I01	I01	I01	I01	I01
receive ch.	1	1	1	4	5	6	7	8
key limit /L	C-2	C-2	C-2	C-2	C-2	C-2	C-2	C-2
key limit /H	G 8	G 8	G 8	G 8	G 8	G 8	G 8	G 8
detune	+0	+3	-3	+0	+0	+0	+0	+0
note shift	+12	+0	+0	+0	+0	+0	+0	+0
volume	99	99	99	99	99	99	99	99
out assign	LR	L	R	LR	LR	LR	LR	LR
lfo select	1	1	1	VIB	VIB	VIB	VIB	VIB
micro tune	ON	ON	ON	OFF	OFF	OFF	OFF	OFF

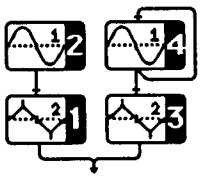
OPERATOR

	op1	op2	op3	op4
on/off	ON	ON	ON	ON
out level	99	74	99	73
freq. type	RTO	RTO	RTO	RTO
fix range	255	255	255	255
freq. coarse	5	13	8	11
freq. fine	7	0	0	9
detune	-3	+3	+3	-3

-1-	-2-	-3-	-4-
2.02	4.00	2.00	4.02

voice name: SpacStngLt

algorithm no. 5
feedback 7



ENVELOPE

attack rate	31	29	31	29
decay 1 rate	6	6	6	6
decay 1 level	12	12	12	12
decay 2 rate	10	10	10	10
release rate	4	4	4	4
eg shift	OFF	OFF	OFF	OFF

LFO

waveform		sync	ON
speed	33	delay	0
amp mod depth	7	sens	1
pitch mod depth	27	sens	5

SCALING/SENS

rate	0	0	0	0
level	20	53	20	26
ams on/off	ON	ON	ON	ON
sens eg bias	0	0	0	0
key vel	0	0	0	0

FUNCTION

mode	POLY	mid C =	C 2
portamento	FULL	rev rate	0
porta time	0	pb range	5
vol	99	pitch	50
pitch	0	amp	0
amp	0	eg bias	0
pitch	50	p bias	+0
amp	0		

TX81Z

Panner. A New TX81Z Performance Setup By David Forbus.

Notes:

This TX81Z performance setup is based on two voice patches: "SpacStrngLt" and "SpacStrngRt" (both new).

Since the two voice patches are identical except for their envelopes and names, save time as follows: Program one voice and store it; then, edit the envelope and name to create the second voice, and store the result to another memory location.

name: Panner	1 : SpacStngLt	5 :
assign mode NORM	2 : SpacStngRt	6 :
micro tune select OCT.	3 :	7 :
effect select OFF	4 :	8 :

inst. number	1	2	3	4	5	6	7	8
number of notes	4	4	0	0	0	0	0	0
voice number	I01	I02	I01	I01	I01	I01	I01	I01
receive ch.	1	1	3	4	5	6	7	8
key limit /L	C-2	C-2	C-2	C-2	C-2	C-2	C-2	C-2
key limit /H	G 8	G 8	G 8	G 8	G 8	G 8	G 8	G 8
detune	+0	+0	+0	+0	+0	+0	+0	+0
note shift	+0	+0	+0	+0	+0	+0	+0	+0
volume	99	99	99	99	99	99	99	99
out assign	L	R	LR	LR	LR	LR	LR	LR
lfo select	1	1	VIB	VIB	VIB	VIB	VIB	VIB
micro tune	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

OPERATOR

	op1	op2	op3	op4
on/off	ON	ON	ON	ON
out level	99	74	99	73
freq. type	RTO	RTO	RTO	RTO
fix range	255	255	255	255
freq. coarse	5	13	8	11
freq. fine	7	0	0	9
detune	-3	+3	+3	-3
	-1- 2.02	-2- 4.00	-3- 2.00	-4- 4.02

ENVELOPE

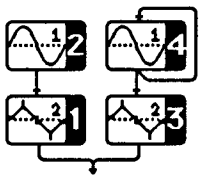
attack rate	6	11	6	11
decay 1 rate	7	5	7	5
decay 1 level	0	0	0	0
decay 2 rate	0	0	0	0
release rate	3	1	3	1
eg shift	OFF	OFF	OFF	OFF

SCALING/SENS

rate	0	0	0	0
level	20	53	20	26
ams on/off	ON	ON	ON	ON
sens eg bias	0	0	0	0
key vel	0	0	0	0

voice name: SpacStngRt

algorithm no. 5
feedback 7



LFO

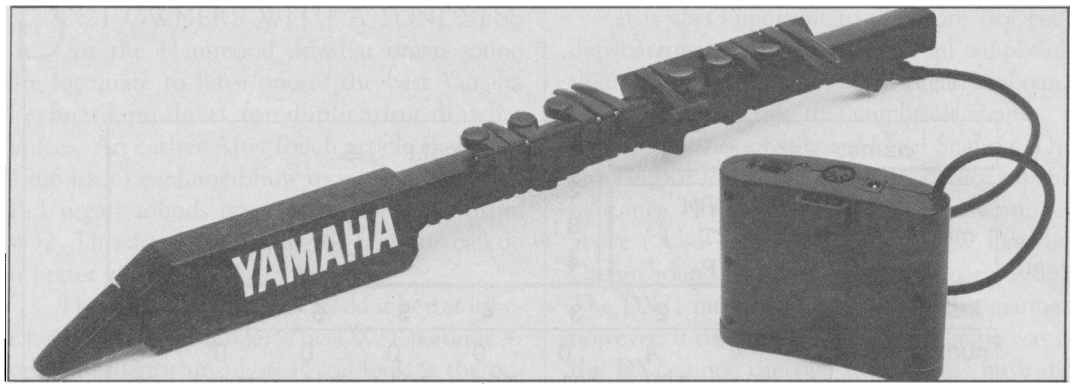
waveform		sync	ON
speed	33	delay	0
amp mod depth	7	sens	1
pitch mod depth	27	sens	5

FUNCTION

mode	POLY	mid C =	C 2
portamento	FULL	rev rate	0
porta time	0	pb range	5
vol	99	pitch	50
pitch	0	amp	0
amp	0	eg bias	0
pitch	50	p bias	+0
amp	0		

WX7

An Introduction To Yamaha's New MIDI Wind Controller.



WX7 MIDI wind controller.

THE WX7 is a MIDI wind controller designed for use by saxophone players (and those who play other woodwind instruments). Like other MIDI controllers, the WX7 makes no sound by itself–it must be connected to a MIDI synthesizer or tone generator. The tone generator produces the sound, and the WX7 controls and shapes the sound produced by the tone generator.

Unlike such MIDI controllers as the KX88, however, the WX7 has no keyboard. Instead, it is equipped with a saxophone-like mouthpiece and saxophone-like keys. Variations in breath pressure are sensed by the wind sensor inside the WX7 to control the tremolo, vibrato, tone, and articulation of the sound source. Breath pressure can also control the volume (via MIDI Volume messages) of the sound source.

If you want to connect the WX7 to a synthesizer that does not accept Breath Control, you can switch the WX7 so that its output is converted to aftertouch data. The tone module will respond to the aftertouch data exactly as if Breath Control data were being transmitted.

Wind & Lip Control

The WX7 features two "Wind Curves," providing two modes of response to breath pressure. You can adjust both the Wind Zero setting (the breath threshold at which a note will speak) and the wind Gain setting (the amount to which the WX7 responds to breath pressure).

The WX7's detachable mouthpiece features a durable transparent plastic reed that responds to variations in lower lip pressure to create note bending. Unlike a normal saxophone, note bending via lip pressure is consistent across the entire pitch range, even in the lowest register.

The WX7 has two lip settings, Lip Zero (the minimum lip pressure needed to produce note bending) and Lip Gain (the amount to which the WX7 responds to lip pressure), both of which are fully adjustable to suit your playing style. For added versatility, two different mouthpiece playing modes are possible:

1) The Tight Lip mode, which corresponds to a normal embouchure: A bite is applied to the reed, and loosening or tightening this bite lowers or raises the pitch.
2) The Loose Lip mode, which is unique to the WX7: No lip pressure is applied when playing at normal pitch–you just blow. In this mode the WX7 actually becomes four times more sensitive to lip pressure than in the Tight Lip mode.

Normally, when you play the WX7, the air goes down the center of the instrument, as with a regular saxophone. You can select a tighter blowing feel simply by inserting a plug into the instrument's drain hole. Two plugs are supplied, to close or partially close the drain hole, providing three types of blowing feel to suit your individual playing style.

Keys & Fingering

The WX7's keys are highly responsive; due to the nature of the instrument, the key action is lighter and more precise than that of a normal saxophone, enabling fast and effortless playing. The standard Boehm fingering system is utilized, in an economical arrangement of 14 keys. Fingering is light and responsive throughout the range of the instrument.

Unlike many MIDI instruments, the WX7 does not have the feel of a machine–its keys can be customized to suit your performing technique. The playing height of each key may be adjusted by inserting special plastic shims (0.2

or 0.5 mm thick) under the base of the key.

With the WX7, you can change registers without overblowing. There are five octave transposition keys conveniently located near the left thumb. The pitch may be raised by one, two, or three octaves, or lowered by one or two octaves, for a total range of seven octaves–twice the range of a regular saxophone. Also, since the WX7 is a digital device, no embouchure adjustment is required throughout the seven octave range.

As mentioned above, normal saxohone fingering may be used on the WX7, with a variety of fingering positions to make playing easier and faster, especially in the middle register. There are also two fingering innovations, which increase the WX7's playing potential greatly:

1) For each note, three special fingering configurations allow the note to be raised by one octave without the need of overblowing, providing melodic flexibility unavailable on even the finest saxophone.
2) Execution of trills on the WX7 is actually simpler than on a regular saxophone (where trill keys must be selected according to the pitch of the note being played). Two conveniently-located trill keys are used to execute half-tone and whole-tone trills, no matter what note or register is being played. The trill keys may also be used for alternative fingering of notes.

Other Controls

The normal playing key of the WX7 is C (as with a flute or oboe). It is also possible to adjust the playing key to Eb, Bb, or C raised one octave.

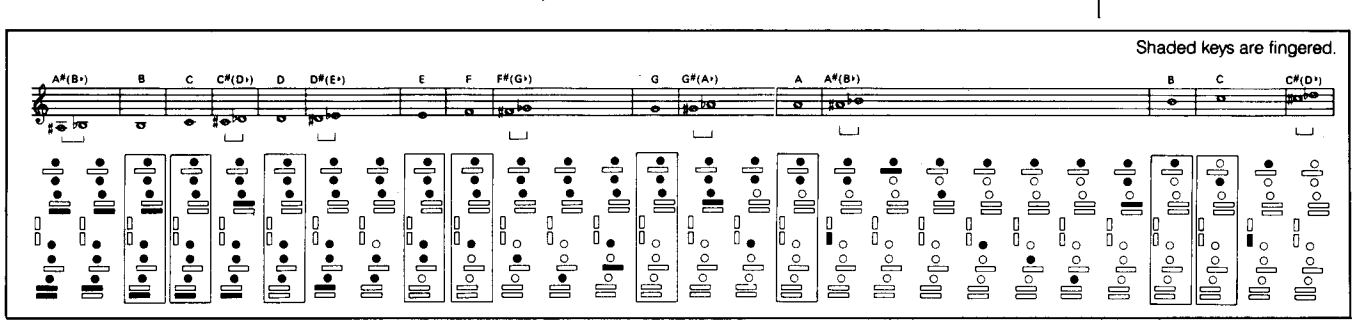
Many saxophone players create note bends by partially opening certain keys; the WX7 uses MIDI technology to create the same effect. It comes complete with a Pitch Bend Wheel, which is operated by the right thumb. This wheel functions in the same way as the Pitch Bend Wheels on DX synthesizers. Used in conjunction with lip pressure, this provides powerful expressive potential.

The WX7 is also equipped to play two notes at a time. This is done by using the Hold key, which can be set to one of four different functions:

1) In the NORMAL mode, when you press the Hold key while playing a note, the WX7 "remembers" that note. Every time you play a note, the held note will also be heard, until the Hold key is pressed again.
2) The FOLLOW mode allows the held note to follow the lead line at any selected interval, for parallel harmony passages.
3) The WX7 can transmit MIDI data on two separate MIDI channels (channels 1 and 2 or 3 and 4) for completely independent control of two MIDI sound sources. Using the Hold key in the DUAL NO BREATH mode, the held ntoe is continuously sustained (until the Hold key is pressed again) on one MIDI channel, while the lead line is sent out on the other MIDI channel.
4) In the DUAL USE BREATH mode, the held note is heard only when you play a note; the pitch, volume, and tone of both notes can be controlled by lip and breath pressure.

The WX7 weighs less than a pound. A compact MIDI/Power pack (which can be hooked onto the player's belt) supplies power–six AA batteries (or an optional PA-1 power adapter) are needed.

The WX7's list price is $995.00. With its combination of extensive performance and MIDI features, it is sure to open up new worlds of expression for electronic musicians.



This diagram shows the basic fingering scheme of the WX7.

DX21

How To Simulate Drawbar Organ Sounds With The DX21. By Louis Zednik, Jr.

DX21 OWNERS WITH A FONDNESS for the Hammond drawbar organ sound are fortunate to have one of the best Yamaha keyboard products for duplicating drawbar voices. An earlier AfterTouch article (February 1986 issue) explained how to set up Hammond B-3 organ sounds on a DX7 using algorithm #32. This article will show you how you can do it better with a DX21.

The reason the DX21 can do it better is because of its Dual mode. The DX21 features 4-operator algorithms; but, if you look at the operators in each voice as part of a combination created for use in Dual mode, you are actually looking at eight operators. If both the A voice and the B voice are set to algorithm #8, you have a super-algorithm that can simulate eight drawbars of a Hammond B-3. The DX7 can only simulate six drawbars using algorithm #32.

The drawbar Hammond organs actually had nine drawbars, but it was very seldom necessary to use all nine in a voicing pattern. So, eight out of nine has a powerful potential to create an infinite variety of sounds.

First, visualize each of the operators in the two voices as being equivalent to one drawbar (or flute footage). Next, assign drawbar frequency ratios to each operator. The following chart shows the choices available–the drawbars are not given in their original order on the B-3, but in low-to-high pitch order.

Organ Drawbar	Flute Footage	Frequency Ratio
#1	16′	0.50
#3	8′	1.00
#2	5⅓′	1.50
#4	4′	2.00
#6	2⅔′	3.00
#5	2′	4.00
#7	1⅗′	5.00
#8	1⅓′	6.00
#9	1′	8.00

Each of the operators (or drawbars) sounds a single sine wave at its given frequency ratio. Select the eight that you want out of the nine possible drawbars. The more avant-garde reader may wish to experiment with other frequency ratios.

The next step is to simulate the amount that each drawbar is pulled out–the amplitude (or loudness) of each flute footage. This is done by adjusting the Output Level for each operator.

It is also important to duplicate (for each drawbar/operator) the changes in amplitude that occur over the range of the organ keyboard. On DX instruments, this amplitude shaping is done by means of Keyboard Level Scaling. This process (for the DX7) is described very capably by Lance Armstrong in the article mentioned above ("Use Your DX7 To Duplicate Drawbar Organ Sounds," AfterTouch, February 1986). The DX21 must be scaled in a similar manner; however, it cannot be scaled in the same way as the DX7, since the two instruments have different Level Scaling parameters. The chart at the end of this article shows some suggested Keyboard Level Scalings.

In experimenting with this approach, I have found that the most pleasing blend of drawbars is obtained by "hop scotching" frequency ratios on adjacent operators within the same algorithm. Here is one example of this technique:

DX21 Operator	Flute Footage	Frequency Ratio
1 Bank A	16′	0.50
2 Bank A	2⅔′	3.00
3 Bank A	2′	4.00
4 Bank A	1′	8.00
1 Bank B	8′	1.00
2 Bank B	4′	2.00
3 Bank B	1⅗′	5.00
4 Bank B	1⅓′	6.00

Alternatively, one of the operators can be used for the 5⅓′ flute footage: Call up the DX21's 1.57 frequency ratio and adjust with detuning.

If the "footages" are intermixed in this way, the DX21's Balance control lever can be used to produce pleasing, real-time variations in the drawbar combinations.

Finally, here is a chart that gives suggested Level Scaling and Output Level values for the frequency ratios in the above setup.

Frequency Ratio	Level Scaling	Output Level
0.50	20	86
3.00	30	99
4.00	40	81
8.00	50	90
1.00	10	99
2.00	25	83
5.00	44	81
6.00	47	75

DX7 II FD/D

How To Change The Voice Combinations in DX7 II Performance Memories. By Tom Darter.

DX7 II FD digital FM synthesizer.

THE PERFORMANCE PLAY MODE ON the DX7 II FD/D opens up new realms of flexibility in live performance. At the same time, it presents musicians with yet another level of programming to comprehend.

As with Voice programming, one of the easiest ways to start learning how to program Performances is to edit already-existing Performance memories. This gives you the ability to hear the result of a change in one parameter without having to worry about starting from the blank page known as INIT PERF.

Unfortunately, there is one very important aspect of a Performance memory that cannot be changed in Performance Edit mode: the voice or voices used as the raw sound material. The "Voice Mode" LCD screen under button 28 shows you the selected voices in a given Performance memory, but gives you no way to change those selections.

Let's say that you are playing the DX7 II's Internal Performance #3 (String Bass-Guitar). You know that this Performance is a Split consisting of Internal Voice 27 (StringBass) and Internal Voice 57 (GuitarBox). You are happy with all aspects of this Performance, but want to try internal voice 3 (PickGuitar) as the top voice in the Split (instead of GuitarBox). How do you proceed?

Well, if you use the standard method, you call up the two voices you want (INT 27 and INT 3) in Voice (Split) mode, and then press the Performance button. Unfortunately, this calls up an INIT PERF to the Performance Play/Edit buffer. Does this mean that you have to write down all of the parameters from the original Performance (#3), and then enter them one at a time with your new Voice combination?

The answer is no! There is a way to change Voice combinations while retaining all of the other parameters from a desired Performance memory. This is how you do it:

1) Pick the Performance memory you want to edit, and decide on the voices you want to use in place of the current voices.
2) Enter Peformance Play mode and call up the Performance memory you want to edit.
3) Now, press and hold the Performance button; you will see "Sending program change No. _____" in the LCD, but ignore it.
4) While holding down the Performance button, press the Voice Mode Select button that corresponds to the type of Voice combination you want (Single, Dual, or Split). The LED above the Performance button will go out, but don't worry.
5) Now, release the Performance button and select the voices you want, using the A/B, 1-32/33-64, and number buttons.
6) Press the Performance button again. Instead of seeing the dreaded "INIT PERF" in the name display, you will see the name of the Performance memory you selected in step 2 above. The Performance Play–Edit buffer now contains all of the parameters from that Performance, except that the Voice numbers are now the ones you have just selected.
7) At this point, you may wish to enter Performance Edit mode to change the Performance name. If not, simply Store this new Performance to the memory location of your choice.

Using this technique, you can alter the Voice combinations in your Performances just as easily as you alter all of the other Performance parameters.

RX5

Panning Techniques For The RX5. By Hank Hehmsoth.

THE VOICES in the RX5 are top-quality digital PCM sounds. The exhaustive edit capabilities offer much exploration–the parameters are enormous. However, there are other important elements in the RX5 beyond the edit parameters. Nothing "lifts" the sound of a voice as much as panning it or doubling it in the stereo field. Each voice achieves a special quality, almost startling in comparison to the original monophonic voice. Careful manipulation of the Copy Voice function (Key Assign Job #09) and the Output Channel Assign function (Key Assign Job #6), combined with an understanding of the fixed stereo positions in the RX5, can yield amazing results.

The RX5's Pan/Output Channel Setup

Output channels are fixed permanently to specific pan positions in the stereo field. Pan positions in the stereo field are represented by the numbers 1 through 15: 1 is the farthest right position, 8 is dead center, and 15 is the farthest left position. The permanent pan positions of the RX5's twelve output channels are as follows:

Output Channel	Stereo Position
1	8
2	9
3	9
4	12
5	10
6	6
7	4
8	13
9	3
10	11
11	5
12	8

There are a number of important things to notice about this setup:

1) There are two channels (1 and 12) assigned to pan position 8–dead center is always useful (more on this later).
2) There are two channels (2 and 3) assigned to pan position 9 (just right of center). This is to support voices SD1-3 (snare drum) and RIM1-2, so that rimshots and snare strikes can occur in the same pan location.
3) There are a number of channel pairs that are equally left and right of dead center. First, the double "nested" pairs with pan positions 12 and 4 (channels 4 and 7) and pan positions 10 and 6 (channels 5 and 6); then, the single pairs with pan positions 13 and 3 (channels 8 and 9) and positions 11 and 5 (channels 10 and 11). The nested pairs in channels 4 through 7 are good for grouped instruments such as toms.
4) Do not trust the arrows in the owners manual diagrams for specifics on pan placement. For example, look at the placement of channels 8 and 9 as shown in the "Drum Set" chart on the owners manual inside back cover: Since these two channels have pan location values of 13 and 3, they are equidistant from center; the arrows in the chart give a very different impression.
5) There are 10 different pan positions implemented in the RX5's layout, but there are 12 Copy locations. This fact can give you a full panning spectrum for a special sound or group of sounds, and still leave you 2 Copy locations for other purposes such as voice editing.

Panning Left to Right

The chart below shows the output channels in a special order, arranged according to pan position from left to right.

Stereo Position	Output Channel(s)
13	8
12	4
11	10
10	5
9	2, 3
8	1, 12
7	6
6	11
5	7
4	9
3	

You can use this arrangement to create panning effects by duplicating certain voices in the Copy locations and assigning those Copy locations to output channels. Here is an example using the Electric Tom sounds. Start by copying the four Electric Tom sounds into ten Copy locations, as follows:

1) Copy E. TOM 1 to Copy locations #1, #2, and #3.
2) Copy E. TOM 2 to Copy locations #4, #5, and #6.
3) Copy E. TOM 3 to Copy locations #7 and #8.

4) Copy E. TOM 4 to Copy locations #9 and #10.

Now assign the ten Copy locations to output channels:

5) Assign Copy #1 to Channel 8.
6) Assign Copy #2 to Channel 4.
7) Assign Copy #3 to Channel 10.
8) Assign Copy #4 to Channel 5.
9) Assign Copy #5 to Channel 2.
10) Assign Copy #6 to Channel 1 or Channel 12.
11) Assign Copy #7 to Channel 6.
12) Assign Copy #8 to Channel 11.
13) Assign Copy #9 to Channel 7.
14) Assign Copy #10 to Channel 9.

At this point, it can get very confusing to use the RX5 keys in Real Time Write mode. I've found that it helps enormously to use the KX88 as a velocity-sensitive MIDI input. The MIDI note numbers 24-35 (corresponding to the notes C0 through B0 on the KX88) are assigned to Copy locations 1-12. Playing a rising chromatic scale will pan your Electric Toms from left to right, while playing a downward chromatic scale will pan the Electric Toms from right to left. You can also edit the pitch of the various TOM voices stored in the Copy locations, so that you will have ten different Electric Toms panning left to right!

Variations on Panning

Now that you understand the relationship between the pan locations and the output channels, and know how to use the 12 Copy locations, you can find many ways to experiment with pan locations. For instance, organize the pan locations in terms of their increasing distance from center:

Pan Location	Output Channels	Relation To Center
8	1, 12	dead center
10	5	2 to the left
6	6	2 to the right
11	10	3 to the left
5	11	3 to the right
12	4	4 to the left
4	7	4 to the right
13	8	5 to the left
3	9	5 to the right

The above chart shows pairs of output channels that spread out equally from center. Using the Copy locations, these paired positions could be used to good effect. Since pan location 9 (channels 2 and 3) has no complementary position on the RX5, it is not included in this chart.

Another possibility (again involving the Copy locations) involves taking two voices, each copied to 6 Copy locations, and moving them across the stereo field at a constant rate. One sound would move through pan locations 13-12-11-10-9-8 (channels 8-4-10-5-2-1), while the other voice would move through pan locations 9-8-6-5-4-3 (channels 3-12-6-11-7-9).

Velocity Sensitivity and Pan

Here we'll use the beauty of stereo doubled voice applications in combination with pan positions. Output channels 8 and 9 have the widest dispersal in the RX5's stereo field (from position 13 to position 3). Copy a voice to Copy locations #1 and #2; then assign Copy #1 to Channel 8 and Copy #2 to Channel #2. Now, play the two voices simultaneously by striking the appropriate notes (C0 and C#0) on a velocity-sensitive controller such as the KX88. The stereo location will depend on the relative velocity of the two notes being played. There are some great effects available here. Try it with headphones. Each velocity variant changes the "mix" of the stereo voice, creating the pan effect.

Using the four equidistant pairs from the chart above, it would be possible to create four doubled stereo voices, each of which could be moved in equal amounts to the left and right.

Of course, other pairs of pan locations could be combined to create off-center pan ranges (or mutually exclusive pan ranges). For example, one voice could be assigned to locations 13 and 8 (channels 8 and 1), while another could be assigned to pan locations 8 and 3 (channels 12 and 9). The first stereo voice would move from far left to center, while the second would move from right to center. The thoughtful RX5 designers allowed for this by assigning two outputs to pan position 8 (dead center).

Here is a great Electric Tom and Snare setup, using doubled (stereo) voices and a velocity MIDI keyboard. Start by duplicating voices into Copy locations, as follows:

Continued on page 20

Questions

Answers To Questions From Readers. By Tom Darter.

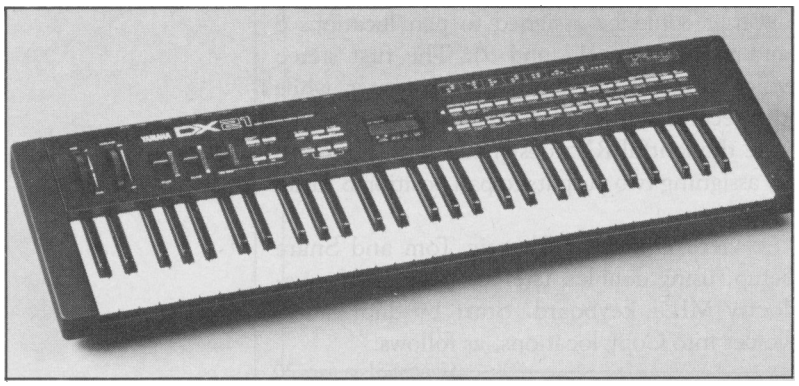
OOPS alert! There was a major error in the July 1987 Questions column. One of our very perceptive readers caught it, and asked about it as part of his question to AfterTouch. This month's column opens with his question, and continues with both the answer to his question and the correction to the July 1987 error. Please accept our apologies for allowing this error to be printed.

How can you MIDI another synthesizer to only one split portion of a DX21 in Split mode? Also, page 18 of the July 1987 issue of AfterTouch indicated falsely that "the DX21 does not have a cassette storage feature, so it is impossible to save DX21 voices onto cassette." Please explain this error in your magazine.

First things first. The DX21 receives on only one MIDI channel at a time, so it is impossible for only one portion of a Split to react to incoming MIDI messages. The DX21 reacts to MIDI messages based on its own internal setup; therefore, if incoming MIDI Note messages cross over the Split Point, the DX21 will play the other voice in the Split. In order to access only one of the Split voices, your MIDI master keyboard must give you the ability to set key limits for the MIDI channel assigned to the DX21.

Worst things last. The error you found was the result of a mixup that occurred during production of the July 1987 issue. Originally, two questions and two answers were involved; an unfortunate mutant graft resulted in the incorrect information you spotted. We apologize for not catching the error. In order to clear up any possible confusion, we are reprinting both original questions below, with the correct answers.

DX21 FM digital synthesizer.



I want to load my DX21 voices (stored on cassette) into a DX7, and then add the extra nuances provided by the two additional operators. How do I proceed?

There is no way to proceed. First of all, the DX7 does not have a cassette interface, so it is impossible to load anything into a DX7 from cassette. Also, the 4-operator architecture of the DX21 is completely different from that of the 6-operator DX7. In other words, there is no direct way to transfer a voice patch from one instrument to the other.

Is it possible to load 4-operator voices from a DX100 into a QX5 sequencer via cassette, perform some sort of System Exclusive editing on them, and transfer them into an FB-01—all without the use of a computer?

There are lots of problems, with this idea. Granted, the DX100 does have a cassette interface; however, it is impossible to load DX100 voice data from cassette into a QX5: The QX5 cassette interface is designed to load sequences that have been saved to cassette from its internal memory (or from that of another QX5), so it would not be able to read DX100 voice information stored on cassette via the DX100's cassette interface.

Next, the QX5 is simply a digital sequencer; while it has an extensive Edit mode for editing of sequence data, it has no ability to perform edits on voice data.

Finally, the FB-01 does not have a cassette storage feature either; and, if it did, you would still have one more problem: The voice data of the DX100 is not compatible with the voice data of the FB-01.

Most of the current Yamaha 4-operator synthesizers are compatible: Voices created on the DX21, DX27, DX27s, DX100, and TX81Z are consistent with each other, and may be loaded from one unit to another via MIDI.

The FB-01 voice, however, has a different structure—as does the FB-01 itself. All of the other instruments mentioned above give you the ability to edit voices or create new voices using nothing more than the instrument's front panel. The FB-01, however, is a tone module pure and simple. It contains a large number of permanent internal voices (240), but gives you no direct way to edit these voices or create new ones. In order to do that, you must connect the FB-01 to a computer (via MIDI) and use a CAV (Computer-Aided Voicing) program created for use with the FB-01.

Is it possible to record MIDI commands onto a sequencer that will change the DX21's Play mode from Single to Dual or Split?

The DX21 has two basic Play modes: Play and Performance. Play mode is really a "Play Single" mode: It is used to play through the DX21's various permanent (ROM) and programmable (RAM) Voice memories. The Performance mode, which has 32 Internal memory locations, includes parameters for specifying Single, Dual, or Split mode (plus the voice or voices to be called up for each Performance).

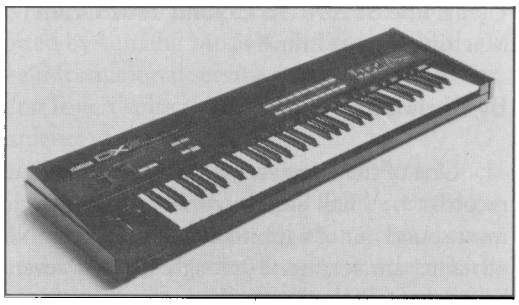
In other words, you can use the DX21's Performance mode memories to set up 32 combinations of voices in Single, Dual, and Split mode—and these can be called up via MIDI Program Change messages. In order to take advantage of this, you must set the DX21 to Performance mode and make sure that the DX21's MIDI Channel Info parameter is ON. With this setup, it is possible both to send Program Change messages from the DX21 to your sequencer and to receive Program Change messages from your sequencer with your DX21.

Even though I own a 6-operator DX7, I am very interested in checking out the 4-operator DX9 patches that have been printed in AfterTouch. How can I program these DX9 voices into my DX7?

Since the DX7 and the DX9 share the same envelope generator architecture, it is relatively easy to program DX9 voices into a DX7.

First, you must find an appropriate algorithm on the DX7. Most of the DX7's 6-operator algorithms have the feedback loop connected to operator #6, while the DX9, with only four operators, always has the feedback loop connected to operator #4. Therefore, the simplest way to transfer algorithms is to associate operators 1-4 on the DX9 with operators 3-6 on the DX7. Once you make this connection, the translation from DX9 algorithm to DX7 algorithm is quite straightforward:

DX9 Algorithm	DX7 Algorithm
1	1
2	14
3	8
4	7
5	5
6	24
7	31
8	32



DX9 FM digital synthesizer.

In seven of the eight translations, the operator shift is the same:

DX9 Operator	DX7 Operator
1	3
2	4
3	5
4	6

In the case of the DX9's algorithm #3, however, the operator shift is different:

DX9 Operator (Algorithm #3)	DX7 Operator (Algorithm #8)
1	3
2	5
3	6
4	4

In all cases, however, operators #1 and #2 on the DX7 will not be used.

The other important difference in programming is in the area of Level Scaling. The DX7 has a very sophisticated Level Scaling scheme, involving a number of parameters, while that of the DX9 is much simpler. The single Level Scaling parameter of the DX9 is equivalent to that of the DX7's Right Scale Depth parameter. The DX9's (Right Scale) curve always Negative Exponential, and the "Break Point" for the curve is fixed at A1.

Therefore, in order to translate DX9 Level Scaling values to the DX7, you need to do the following: 1) Set the Break Point for all DX7 operators to A1; 2) Set all Left Depth values to 0; 3) Set all Right Curves to Negative Exponential; 4) Enter the DX9 Level Scaling values as Right Depth values for the appropriate operators.

Hot Tips

Reader Tips For The SPX90, YMC10, RX11, And More.

Using The SPX90 To Expand Your Drum Machine Sound Library

By Chris Corso

One of the constant struggles for the home-recordist or small studio manager is to get the most sound out of a limited amount of gear. Not all of us are fortunate enough to own several brands of synthesizers, drum machines, and effects. One obvious solution is the creative use of outboard gear.

One particular problem is the redundancy in sound that results when you use the same drum machine for most or all of your work. Using the SPX90 digital multi-effects processor, I've found some unique ways to avoid the same old boring drum sounds. Utilizing the Pitch Change presets on the SPX90 (numbers 21-24) to alter various instruments in your "kit" can yield results that range from startling to bizarre.

One favorite trick of mine is to use Preset #21(A) to lower the pitch of just the snare (to give it a nice fat pocket). Along these lines, lowering or raising the pitch of the hi-hat instantly gives a new identity to your drum sound. Other instruments, such as cowbell, open hi-hat, and handclaps, take on a new personality when their pitch is altered. Speaking of handclaps, try this patch edit (starting from preset #23) for a really full chorus of clappers:

L Pitch: +12
R Pitch: −12
L fine: +8
R fine: −8
L delay: .2ms
R delay: .1ms

If you'd like to make your entire drum kit sound a bit more electronic, try running the entire mix of drums through this patch (starting from preset #23 or preset #22):

L Pitch: −6
R Pitch: −12
L fine: +8
R fine: −8
experiment with delays of 1ms to 8ms

By raising the respective pitches, you can recreate the sound of those old electronic drum machines, which can sound great for Rap, Hip-Hop, and Techno Pop. This really makes your drum machine become something entirely different, and more personal.

Incidentally, all of these patches sound great with acoustic drums, as well as with percussion instruments. Depending on how you mix your balance of wet/dry signal, you have total control over just how much you change or enhance the overall sound.

* * * *

RX11 Programming Tips

By Chris McGrone

I would like to share some useful shortcuts and tips I have garnered while learning to program my RX11 with increasing efficiency over the last couple of years:

While assembling patterns into a song, it is convenient to start by assembling short segments of the song into "sub-songs" on unused song memory numbers. This makes it easy to check for transitional problems between patterns, since you don't have to scroll through the entire song memory to get to the transitions in question. For example, you might not know how abruptly you want to change tempo between patterns 44 and 45 (verse and refrain). A two-pattern song using these patterns would allow for very facile experimentation as you determine the degree to which you want the tempo to change.

Sometimes you may want to remove individual voices at certain points in a pattern you are working on. Rather than wipe out the whole voice, press the CLEAR button while simultaneously striking the objectionable voice at the desired moment (in Real Time Record mode). Make sure that the Quantize function is set to the same ratio as it was when the voice was recorded, since you can't wipe out an "off" note easily with a lower quantize value when you are cleaning the voice.

Very effective, human-sounding snare rolls can be accomplished by taking both SD1 and SD2, setting them both to the same voice (light snare, for instance), varying their normal and accent volume levels to taste, and overdubbing individual snare hits at varying quantize values to create a finely-syncopated roll that would be almost impossible to record with two fingers "live" (all at once, in real time). Adjusting instrument levels and accent levels on the two

snares makes four separate strike volumes possible–ample variation for some very expressive nuances.

If you have a pattern that you like but want to experiment with it, save it to another pattern memory number and "play with it" there. It may turn into a good development for a later refrain in a song, and the original pattern remains unaffected.

* * * *

Using A Breath Controller With The FB-01

By Mark Turner

As you may know, the FB-01 accepts Breath Controller data only as a means to control modulation, and not to control the envelope. However, certain Yamaha keyboards, such as the KX88 and the DX7 II, have assignable controller functions. This gives you a compromise solution, if you want to control the FB-01's envelope with a Breath Controller.

If you assign the Breath Controller so that it controls the volume of the FB-01, then blowing harder or softer into the Breath Controller will result in a louder or softer tone from the FB-01.

This is similar to the traditional use of the Breath Controller (when assigned to the EG Bias on a DX7). For example, you can play a key on the keyboard and create a crescendo with the Breath Controller.

This MIDI assignment is also different from the traditional use of the Breath Controller. For example, if the voice has touch sensitivity, the volume of any note played will depend on both how hard the key is struck and how hard the Breath Controller is blown into.

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If you just have a question regarding the use of Yamaha professional musical 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 Yamaha AfterTouch product users, send in something to our "Letters" column. We'll do our best to print names, addresses, and phone numbers of all those who are interested in starting up regional users groups.

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RX5

Continued from page 15

1) Copy E. TOM 1 to Copy locations #7 and #9.
2) Copy E. TOM 2 to Copy locations #6 and #8.
3) Copy E. TOM 3 to Copy locations #2 and #4.
4) Copy E. TOM 4 to Copy locations #1 and #3.
5) Copy SD 2 to Copy locations #10 and #12.

Now assign the Copy locations to output channels:

6) Assign Copy #1 to Channel 1.
7) Assign Copy #2 to Channel 5.
8) Assign Copy #3 to Channel 8.
9) Assign Copy #4 to Channel 6.
10) Assign Copy #6 to Channel 10.
11) Assign Copy #7 to Channel 4.
12) Assign Copy #8 to Channel 11.
13) Assign Copy #9 to Channel 7.
14) Assign Copy #10 to Channel 9.
15) Assign Copy #12 to Channel 12.

This creates the following setup:

Instrument	Pan Range	MIDI Notes
E. TOM 4	13-8	C0/D0
E. TOM 3	10-6	C#0/D#0
E. TOM 2	11-5	F0/G0
E. TOM 1	12-4	F#0/G#0
SD 2	8-3	A0/B0

Each doubled voice is represented by two notes on a MIDI keyboard, and the relative velocity of the two notes (when played simultaneously) will determine the pan position of each doubled voice.

As you can see, there are many possibilities for creating unique stereo effects by using the RX5's Copy locations in conjunction with the stereo positions of the twelve output channels.