

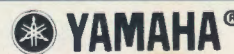


THE OFFICIAL PUBLICATION OF THE YAMAHA USERS GROUP

TX81Z FM Tone Generator



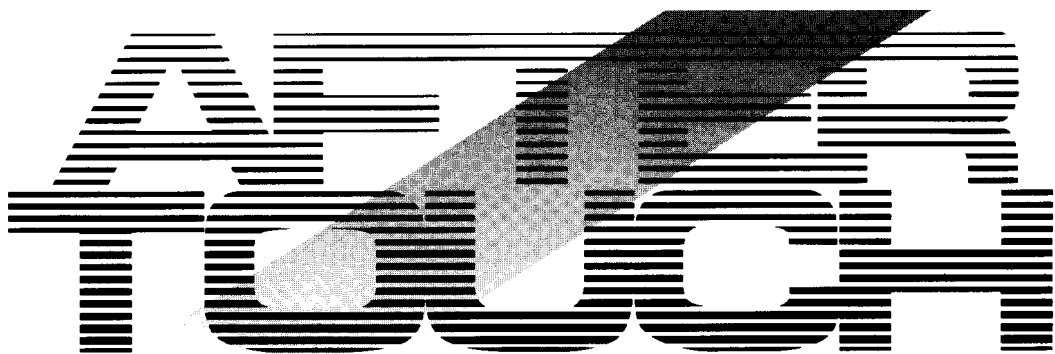
FEBRUARY 1987



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February 1987

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Issue #17

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From The Editor

FOR FEBRUARY, WE CONTINUE our new year's look at new products with an introduction to the new TX81Z FM digital tone generator, plus part one of an in-depth look at the QX5 digital sequence recorder. This month's issue also includes a number of reader patches—for both the 6-operator DX7 family and the 4-operator DX100 family.

Next month, there will be more 4-operator patches, featuring reader-submitted voices for the DX9 and some special new voices created for the TX81Z. Also in March; an introduction to the new RX5 digital rhythm programmer.

Credit-where-credit-is-due department: Both this month's cover photo of the TX81Z and last month's cover shot of the DX7 II FD/D were taken by Jim Hagopian.

Finally, it is time once again to reprint some information about AfterTouch subscriptions, AfterTouch back issues, and Yamaha product literature. Longtime AfterTouch readers may be very familiar with the procedures regarding all of these items, but we still get many questions about these items every month from newer readers. I want to make sure all of you know exactly how to get the service you want as quickly as possible, so here goes:

Warranty Cards & AfterTouch: We have received a number of letters from Yamaha users complaining that they expected an AfterTouch subscription because they recently purchased a product and sent in a warranty card, but still haven't received an issue. It is true that our initial mailing was developed from a warranty card list, but no subscriptions were sent to those names—just a sample mailing of the first three

issues. In order to receive a free subscription, you need to send us your request on the attached postcard below. And remember, don't combine your subscription request with a request for back issues: Send the two requests separately.

Back Issues: If a request for back issues is combined with a subscription request or other material, chances are it will not be fulfilled. All requests for AfterTouch subscriptions must go to our Mailing List input service. After the addresses are entered, the 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 issue requests on the attached subscription postcard.

Product Literature: All requests for specific product literature must go directly to Yamaha (Yamaha International Corp., 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 to Yamaha.

We are very happy to offer AfterTouch as a free informational service. In order to make sure that we can serve your needs (and continue to offer these various services free), we must ask you to help us by sending different requests in different envelopes. Thanks.

—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.)

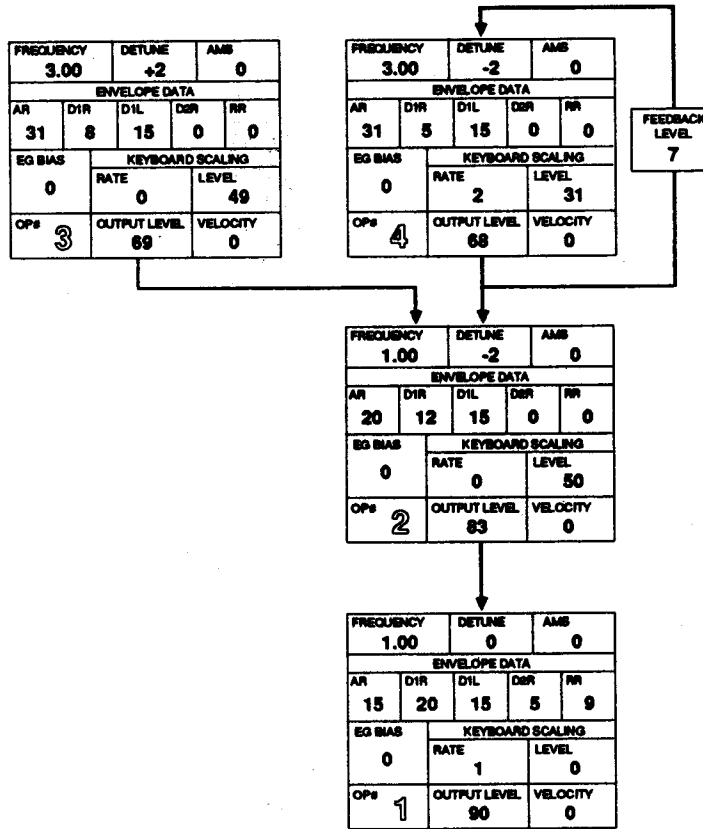
Also, don't limit yourself to just sending in your address: Let us know what you want to read, and what *you* have to offer (see page 19 for details). We look forward to your input.

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

DX100

SUPER SYNTH.
A New DX100 Voice
By Warren Stephens.

LFO & FUNCTIONS					
TRI	35	0	0	0	OFF
WAVE	SPEED	DELAY	PHD	AMD	SYNC
6		0		C2	
PMS		AMS		KEY TRANSPOSE	
POLY	2	FULL	0		√
POLYMONO	PS RANGE	MODE	TIME	PORT	SUSTAIN
PORTAMENTO			FOOTSWITCH		
50	0	0	0	50	0
PITCH	AMPL.	PITCH	AMPL.	PITCH BIAS	EG BIAS
WHEEL RANGE		BREATH RANGE			



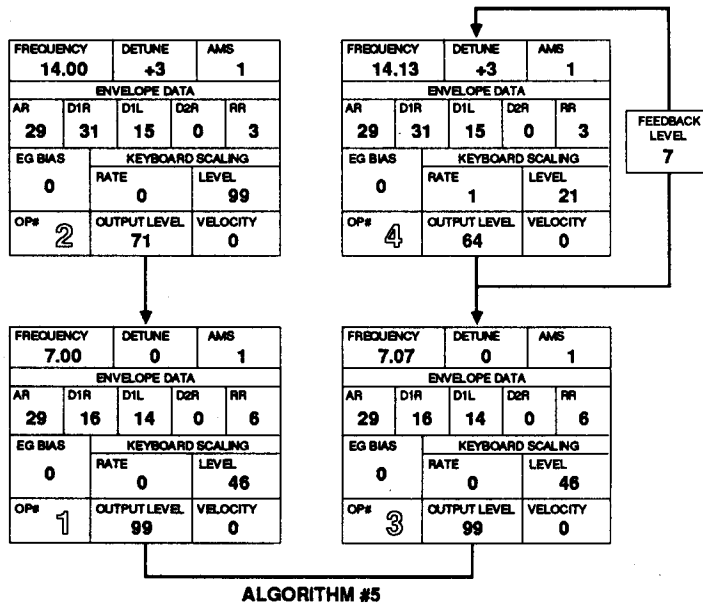
ALGORITHM #2

These DX100 voices can also be loaded into the DX21, DX27, and DX27S 4-operator FM digital synthesizers, and into the new TX81Z 4-operator FM digital tone generator.

DX100

**THIK THING.
A New DX100
Voice By David
Barton.**

LFO & FUNCTIONS					
TRI	33	0	27	7	OFF
WAVE	SPEED	DELAY	FMD	AMD	SYNC
5		1		D1	
PMS		AMS		KEY TRANSPOSE	
POLY	5	FULL	0		✓
POLY/MONO	PB RANGE	MODE	TIME	PORT	SUSTAIN
PORTAMENTO			FOOTSWITCH		
50	0	0	0	0	0
PITCH	AMPL	PITCH	AMPL	PITCH BIAS	EG BIAS
WHEEL RANGE		BREATH RANGE			



Notes:

This voice uses detuning (which is not available as a function) to create a chorus effect. Because of the strange frequency ratios used to create the effect, transpose must be set so that middle C equals D1.



**DOUG
17SYNT.
A New DX7
Voice By
Doug Orlando.**

TR1	35	0	0	0	ON	3
WAVE	SPEED	DELAY	PMD	AMD	SYNC	PMS

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

PITCH ENVELOPE

C2
KEY TRANSPOSE

ON
OSC. SYNC

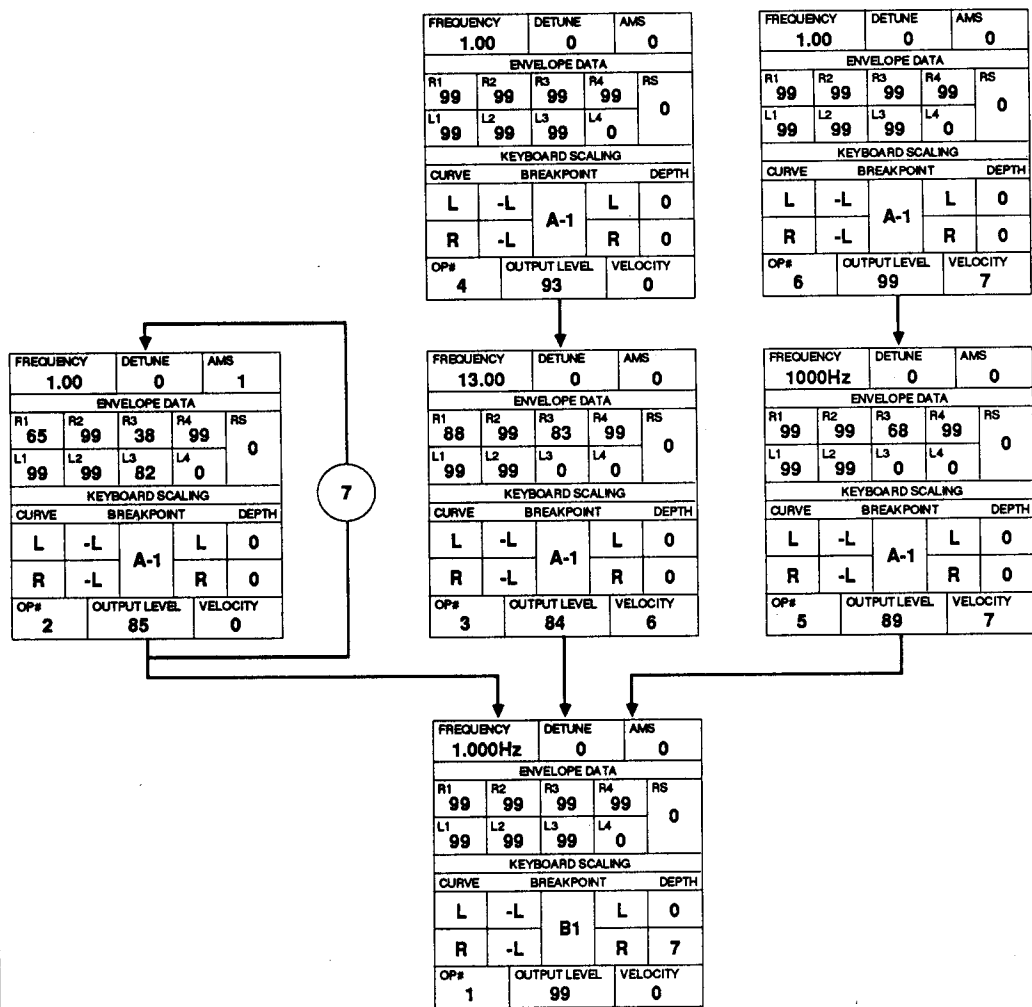
POLY	2	0	RET	ON	0
POLYMONO	RANGE	STEP	MODE	GLISSANDO	TIME
	PITCH BEND		PORTAMENTO		

(CONTROLLER)	RANGE	PITCH	AMPLITUDE	EG BIAS
MOD WHEEL	99	OFF	OFF	ON
FOOT CONTROL	99	OFF	OFF	ON
BREATH CONTROL	99	OFF	OFF	ON
AFTERTOUCH	72	ON	OFF	OFF

Notes:

This voice has a very percussive analog synth sound when played hard; when played with low velocity, the percussive operators will not be heard.

As with most analog-type sounds on the DX, this one will sound best when played through some sort of chorus unit.



ALGORITHM #17



**EUROPA.
A New DX7
Voice By
Christopher
Gillis.**

TR1	35	0	0	0	ON	3
WAVE	SPEED	DELAY	PMD	AMD	SYNC	PMS

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

PITCH ENVELOPE

C3
KEY TRANSPOSE
ON
OSC. SYNC

POLY	2	0	OFF	OFF	0
POLYMONO	RANGE	STEP	MODE	GLISSANDO	TIME
	PITCH BEND		PORTAMENTO		

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

FREQUENCY	4.00	DETUNE	+3	AMS	0
ENVELOPE DATA					
R1	99	R2	99	R3	99
R4	33	RS	0		
L1	82	L2	82	L3	82
L4	99				
KEYBOARD SCALING					
CURVE	BREAKPOINT		DEPTH		
L	-L	A3		L	0
R	-L			R	57
OP#	3	OUTPUT LEVEL	99	VELOCITY	0

FREQUENCY	2.00	DETUNE	-2	AMS	0
ENVELOPE DATA					
R1	99	R2	99	R3	99
R4	38	RS	0		
L1	99	L2	99	L3	99
L4	99				
KEYBOARD SCALING					
CURVE	BREAKPOINT		DEPTH		
L	-L	A-1		L	0
R	-L			R	0
OP#	2	OUTPUT LEVEL	60	VELOCITY	0

FREQUENCY	7.079Hz	DETUNE	0	AMS	0
ENVELOPE DATA					
R1	99	R2	64	R3	99
R4	53	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#	6	OUTPUT LEVEL	99	VELOCITY	2

0

FREQUENCY	2.00	DETUNE	+1	AMS	0
ENVELOPE DATA					
R1	58	R2	64	R3	99
R4	48	RS	0		
L1	80	L2	99	L3	95
L4	0				
KEYBOARD SCALING					
CURVE	BREAKPOINT		DEPTH		
L	-L	A-1		L	0
R	-L			R	0
OP#	1	OUTPUT LEVEL	99	VELOCITY	0

FREQUENCY	8.00	DETUNE	0	AMS	0
ENVELOPE DATA					
R1	99	R2	99	R3	44
R4	43	RS	0		
L1	99	L2	99	L3	39
L4	0				
KEYBOARD SCALING					
CURVE	BREAKPOINT		DEPTH		
L	-L	A-1		L	0
R	-L			R	0
OP#	4	OUTPUT LEVEL	89	VELOCITY	0

FREQUENCY	2.00	DETUNE	0	AMS	0
ENVELOPE DATA					
R1	99	R2	99	R3	51
R4	42	RS	0		
L1	99	L2	99	L3	69
L4	0				
KEYBOARD SCALING					
CURVE	BREAKPOINT		DEPTH		
L	-L	A-1		L	0
R	-L			R	0
OP#	5	OUTPUT LEVEL	99	VELOCITY	0

ALGORITHM #19

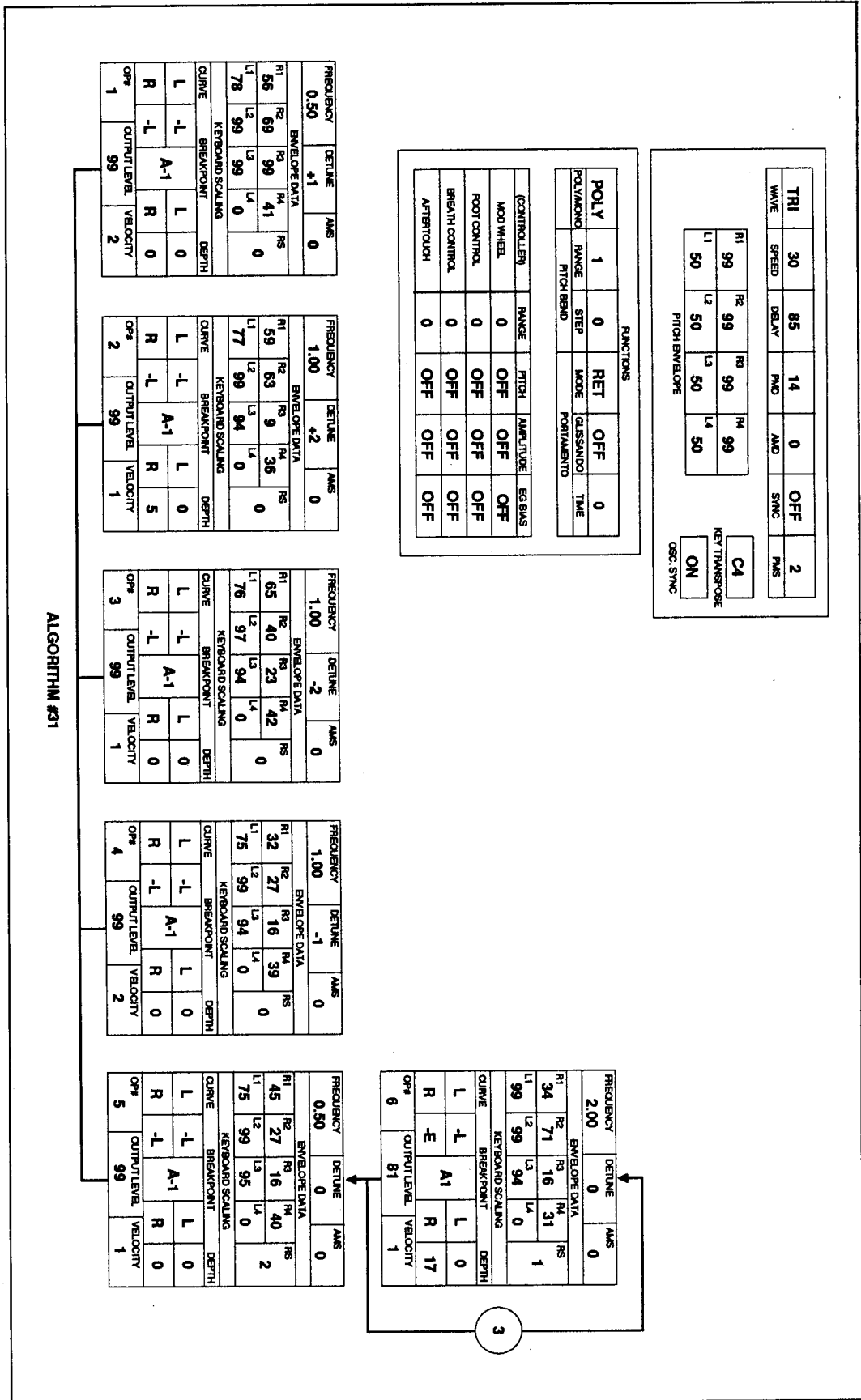
Notes:

The "aftersweep" heard when the keys are released is caused by the level 4 settings of Ops #1, #2, and #3: level 4 of the modulators (Ops #2 and #3) climbs to full output while level 4 of the carrier (Op #1) falls to zero.



REV HARMONY.
A New DX7
Voice By
Jim Hughes.

These DX7 voices can also be loaded into all the other Yamaha 6-operator FM digital synthesizers and tone generators, including the DX5, TX7, TX216, TX816, TF1, DX1, and DX7 II FD/D.



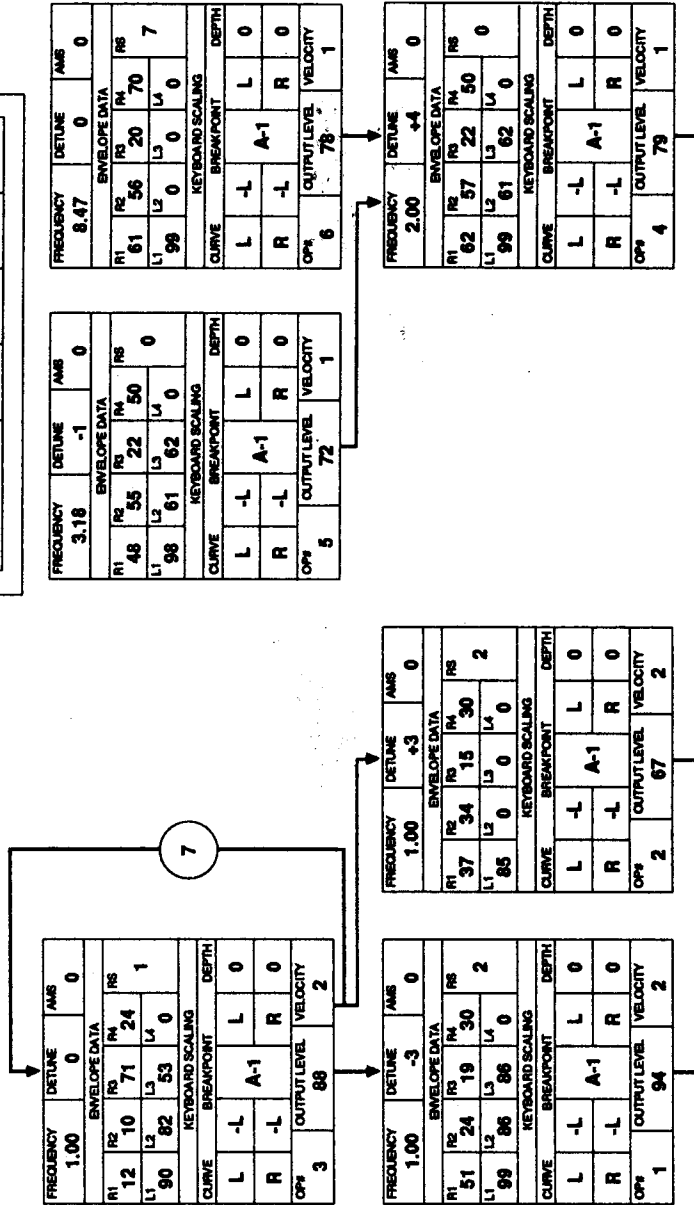


FAIRLIGHT.
A New DX7
Voice By
Steven Cooper.

FUNCTIONS					
POLY	2	0	OFF	OFF	0
POLY MONO	RANGE	STEP	MODE	GLISSANDO	TIME
	PITCH BEND				PORTAMENTO
(CONTROLLER)	RANGE	PITCH	AMPLITUDE	EG BIAS	
MOD WHEEL	0	OFF	OFF	OFF	
FOOT CONTROL	0	OFF	OFF	OFF	
BREATH CONTROL	0	OFF	OFF	OFF	
AFTERTOUCH	0	OFF	OFF	OFF	

TRI	35	0	5	0	ON	1
WAVE	SPEED	DELAY	PND	AMD	SYNC	PMS
						C3
						KEY TRANSPOSE
						OFF
						CSC SYNC

PITCH ENVELOPE					
R1	R2	R3	R4	R5	R6
94	67	99	99	99	99
L1	53	50	50	50	50



ALGORITHM #20

Notes:

Hold down keys for synthesizer sound; a light, quick touch will give you wood bells.

TX81Z

An Introduction To Yamaha's New FM Digital Tone Generator. By Scott Plunkett.

THE YAMAHA TX81Z IS AN 8-note, 4-operator FM tone generator that fits in a single rack space. It has 128 internal ROM voices and 32 user-programmable RAM voices. You can also load voices from a DX21, DX27, or DX100 to expand your sound library quickly.

Like the Yamaha FB-01 tone generator, the TX81Z is capable of producing eight different voices simultaneously. You can store any combination of the ROM and RAM voices in one of the 24 Performance Memories for instant recall. All of the voice parameters are programmable from the front panel, with a choice of eight different wave shapes for each operator.

Performance Mode and Performance Edit

In Performance mode you can select any of the 24 Performance Memories. The Performance Memories contain the information that determines which voices will play, how they are tuned, what their volume is going to be, and other related parameters. All of these parameters are fully editable in the Performance Edit mode.

In Performance Edit you first determine how many notes will be assigned to each voice, then you choose the voices that will play. This is called an instrument. Any combination is possible, from a simple dual instrument arrangement (with four notes per voice) to eight separate instruments (with one note per voice).

Each instrument can be set to receive on a separate MIDI channel. This is very useful if you are using the TX81Z with a sequencer or a controller that will send multiple MIDI channels. There are also two assign modes that determine how the instruments will respond to incoming MIDI data. In Normal mode, each instrument plays on its assigned channel with its assigned polyphony. In Alternate mode, incoming notes that match the basic MIDI reception channel cycle through the assigned instruments. For instance, if you have eight instruments assigned to a performance, each time you play a note it will play a different instrument. If you put eight slight variations of the same voice in a performance, you can create a nice ensemble effect with the Alternate mode.

If you don't have a keyboard that can simultaneously output multiple MIDI channels, you can create keyboard splits by assigning different high/low key limits for each instrument.

The relative volume and output assignment of each instrument is programmable too. An instrument can be assigned to either one of the TX81Z's stereo outputs or to both outputs.

Each instrument can be individually tuned. If you need to transpose an instrument in a Performance Memory, you can use the note shift feature to move it in semitones over a four octave range. For smaller detunings, there is a Detune feature for each instrument. This is particularly good for creating chorus effects when used as a "dual detune."

The TX81Z has two independent LFOs and a vibrato mode for complex modulation effects. The two LFOs are for instruments that need amplitude modulation or both amplitude and pitch modulation. If you need to have only pitch modulation, you can select the vibrato setting for an instrument. In the vibrato mode each instrument adopts the LFO setting from the assigned voice. This means that you can have up to eight independent LFOs in a performance. One of the 11 micro tune scales can be selected for a performance group. These allow you to use tunings other than standard equal tempered tuning. Instruments in a Performance Memory can either be assigned to the equal tempered scale or to the selected micro tune scale. You may also add one of the TX81Z's three effects—delay, pan, or single note chord.

All of the performance parameters can be stored to one of the 24 Performance Memories. Like voices, performances can be named. The name is displayed at the top of the LCD window for quick identification whenever a performance is selected.

In addition to the Performance Edit mode, there is a Performance Utility mode. The performance utilities help you create and edit your performances, but are not saved with them. This is where you initialize a performance. There are several preset initialization types to choose from (single, dual, split, poly 4, mono 8), so that you can find the one that most closely suits your needs. There is also a voice edit feature, so that you may edit a voice in a performance without going to the Single Edit mode (where voice editing normally takes place).

Play Single and Single Edit

The Play Single mode is where you select individual RAM and ROM voices for playing

and editing. Every voice plays with full 8-note polyphony, without any of the effects or added features in Performance mode. When you find a voice you want to edit you enter the Single Edit mode to change it.

The TX81Z uses FM synthesis to produce sound, so the programmable parameters in Single Edit are similar to the other DX/TX FM synthesizers. A multiple page approach is used in Single Edit. For instance, if you want to edit the

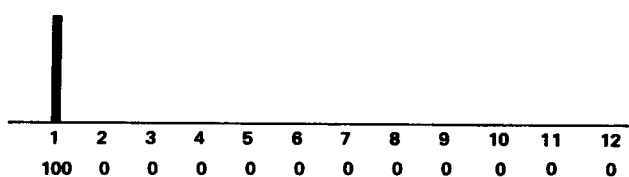
speed of the LFO, you must first go to the "Edit LFO?" display. When you press the YES button, you will enter the LFO editing page and the associated parameters will appear for you to edit. All of the parameters in the Single Edit mode are stored with each voice.

The first parameter you can edit when you enter Single Edit is the algorithm. There are eight algorithms, and a graphic representation of each is given in the LCD as you scroll

This chart shows the harmonic content for each of the TX81Z's eight available waveforms. The amplitude (volume) of each harmonic partial is given as a percentage of the fundamental.

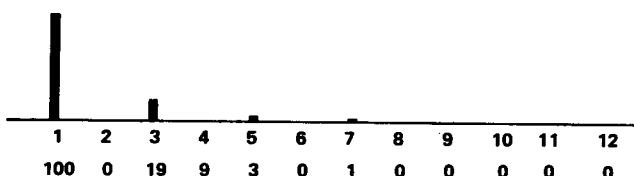
W1

Sine wave. Only fundamental.



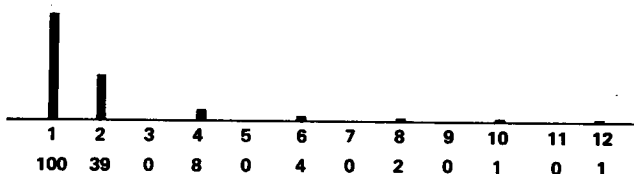
W2

Odd partials somewhat like a square wave



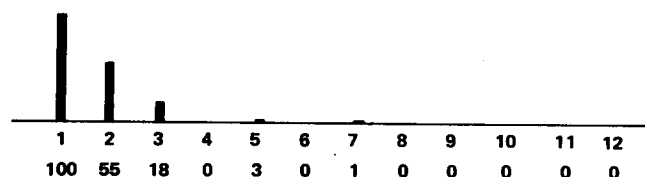
W3

Even partials.



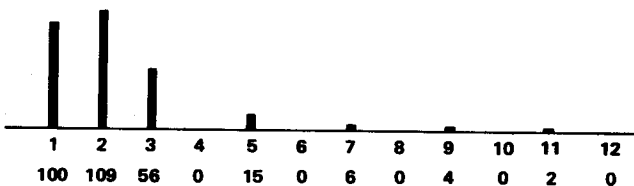
W4

Partial 2, 3, 5, 7,



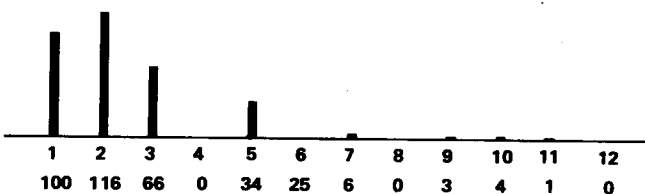
W5

Partial 2, 3, 5, 7, 9 (stronger partials than W4)
Second partial is stronger than fundamental.



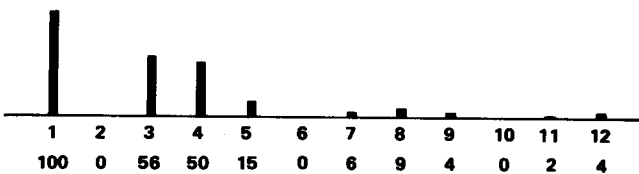
W6

Partial 2, 3, 5, 6, 7, 9, 10, 11, ... (no 4, 8, ...)
Second partial is stronger than fundamental.



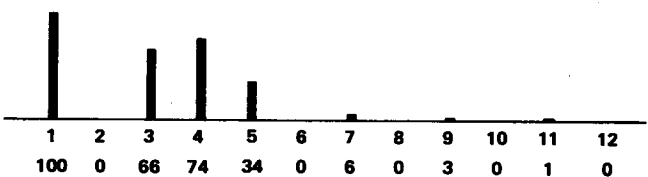
W7

Partial 3, 4, 5, 7, 8, 9, ... (no 2, 6, 10, ...)



W8

Partial 3, 4, 5, 7, 8, 11, ... (no 2, 6, 8, 10, ...)



through them. There is also a pullout menu underneath the TX81Z that shows the algorithms and lists all of the available editing parameters.

In the LFO page you can program the wave and speed of the LFO, determine the delay before the LFO enters, and turn LFO sync ON or OFF. The initial amount of pitch and amplitude modulation can be set here as well. The Sensitivity page follows, allowing you to determine the pitch modulation, amplitude modulation, EG bias, and key velocity sensitivity for the voice.

The Edit Frequency page is where you change the coarse and fine frequency settings of all the operators. For the first time in a 4-operator instrument, fixed frequencies are available. Also for the first time, eight different waveshapes are available for each operator. In addition to sine waves, there are seven waveshapes that have more complex harmonic structures. This not only means that you can create sophisticated timbres using fewer operators, it also offers a relatively unexplored area for creating unique sounds.

The EG page includes the same five-stage envelope that the DX100 uses. Four rates and one level are programmable for each operator. There is also an EG Shift parameter that has been added to the TX81Z. This feature "compresses" the EG range. Normally, the EG changes the operator output level from -96dB (no sound) to 0dB (maximum). You can use EG Shift to change the range from -48dB to 0dB, -24dB to 0dB, or -12dB to 0dB. If you apply this to a modulator, you can create a more defined attack and quickly make large timbre changes. Other voice parameters include feedback, operator detune, operator output level, and operator scaling. Both rate and level scaling are available for each operator.

You can determine how each voice will respond to MIDI Controller information in the

Function page. Pitch and amplitude modulation may be controlled by a foot controller, modulation wheel, or breath controller. A foot controller can also be assigned to change volume, and the breath controller can control EG bias (for changing volume and timbre) and pitch bias (for directly controlling pitch). All control parameters can be set over a wide range (0-99), so different amounts of each effect can be controlled from a single controller. In the Single Utility mode, there is a feature that allows all of the breath control assignments to respond to aftertouch messages, in case you don't want to use a breath controller.

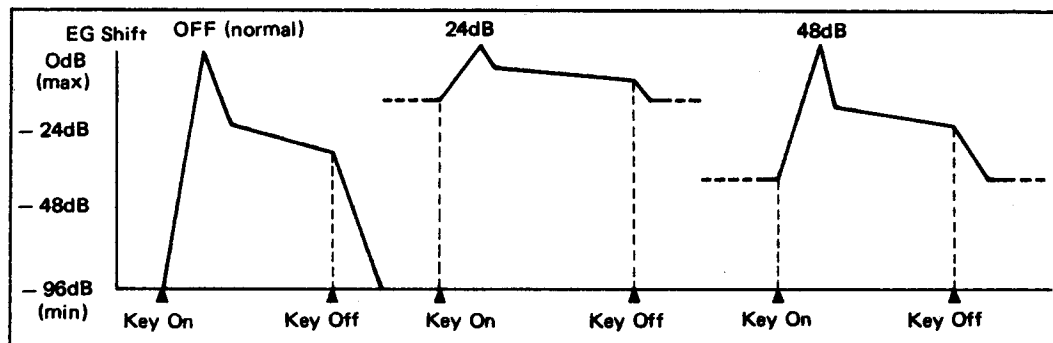
The Function page is where you also select edit mode assignments (poly, mono), pitch bend range, portamento time, portamento type (full time, fingered), and voice names. The voice transposition feature lets you transpose the voice over a four-octave range, and there is a reverb feature that automatically affects all of the operator EG release rates to create a reverb effect. This effect is adjustable in seven steps to simulate different reverb times.

Single Utility

Parameters that aren't programmable as part of a voice-master tune, memory protect on/off, voice initialize, and edit recall functions—are accessed in the Single Utility section of the TX81Z. This is where you will also find the MIDI control parameters, cassette parameters, the three effect setups, and two user-programmable micro tune tables.

Parameters on the MIDI Control page determine how the voices in the TX81Z will respond to incoming MIDI messages. The basic MIDI transmit and receive channels can be set. You may filter out control change, pitch bend, and system exclusive information if needed. There is also a feature that lets you choose a global MIDI channel for pitch bend and control

This diagram shows how the TX81Z's EG Shift parameter changes the overall range of the envelope generator.



change commands. This means that you can have all of the instruments in a performance on different MIDI channels, and add modulation or pitch bend effects to all of them simultaneously by sending messages over the global channel you have selected.

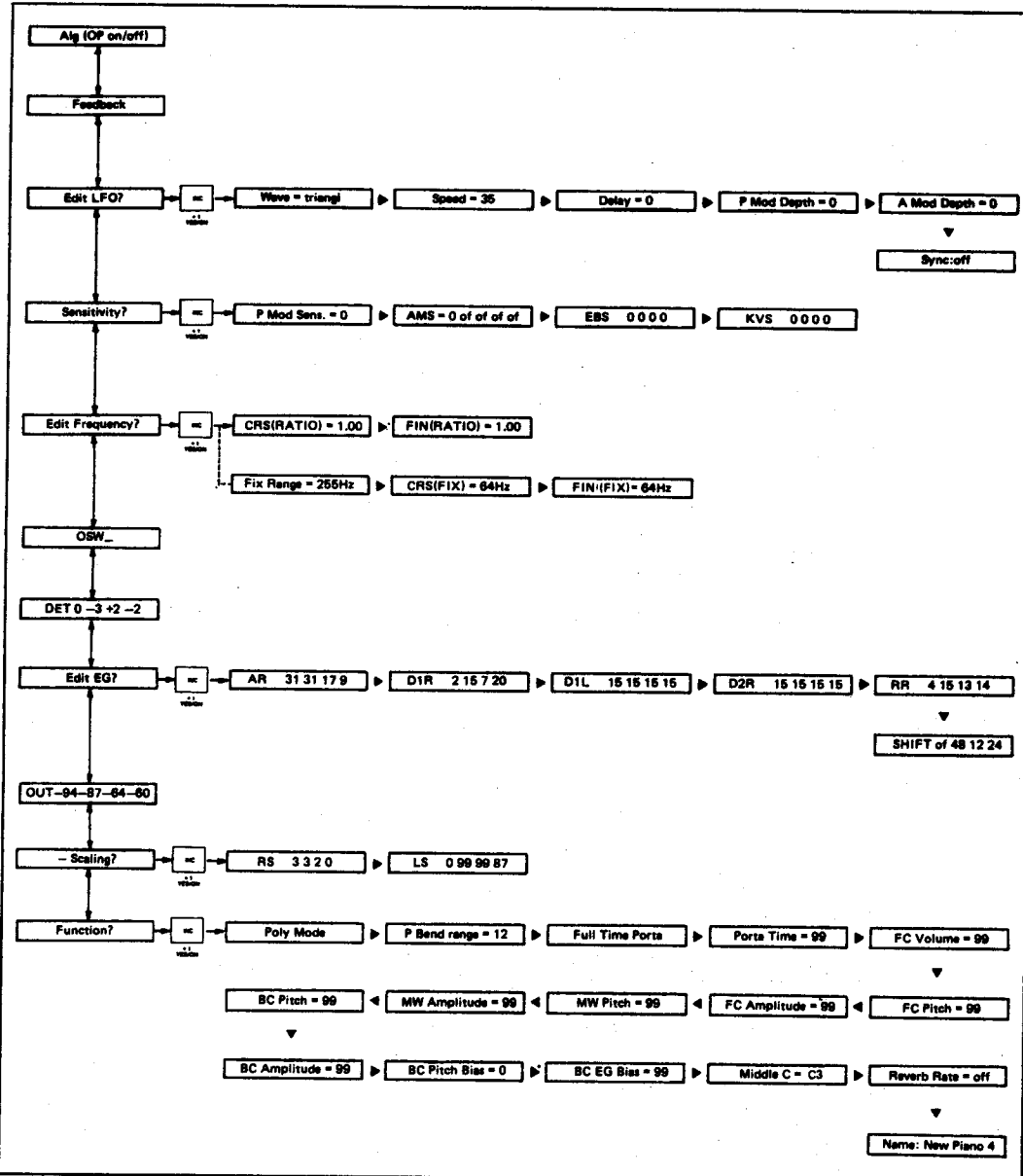
You can initiate MIDI system exclusive bulk data dumps from the MIDI Control page. This is useful if you want to send data to another TX81Z or a storage device, like the Yamaha MDF1 or a computer. Voice data, Performance data, and Setup data can be sent separately. There is a menu for the Setup data that allows you to individually send system information (your MIDI setups), the current settings of your program change table, the settings for the three

effects, or the data for the two user-programmable micro tuning tables.

The MIDI page includes the Program Change Table. The table determines how the TX81Z will react to program change commands that appear at its MIDI input. You may assign any of the internal RAM or ROM voices or any of the 24 performances to be selected by a single program change command. You can initialize and edit the Program Change Table. There is also a Program Change select mode that gives you the option of filtering out incoming MIDI program change messages, changing all instruments in a performance from a common program change (on the basic MIDI receive chan-

Continued on page 19

This chart shows the parameters available in the TX81Z's Single Edit mode.



QX5

A Detailed Guide To Creating Music With The QX5 Digital Sequence Recorder, Part 1. By Scott Plunkett.

THE YAMAHA QX5 Digital Sequence Recorder is a sophisticated MIDI sequencer that offers a wide variety of composing and arranging options. In this and the next issue of *AfterTouch*, we will take a closer look at some of these options, and see how they can help you simplify and arrange your work. For a brief description of the QX5's features, see the introductory article on the QX5 in the December 1986 issue of *AfterTouch*.

Using Macros and Guide Tracks

The 32 macros are powerful tools for almost any musical job. A macro can be something as simple as a single program change or something as complex as an entire track of 16 channels worth of MIDI data. Since the macros can be tailored to meet the particular needs of the music you are working on, they can be particularly useful when you are recording and developing a song.

When you want a macro to play, you insert a macro "call" into a track. This indicates the place in the song where the macro will begin playing. You can call a macro from any track or macro, but you may find it easier to specify a guide track to take care of the job. This will make it easier to edit as the composition becomes more complex.

Before you begin writing, save the data in the QX5 to cassette tape and clear the machine with the Clear command in Track Edit. Prepare a guide track by using the Create mode in Measure Edit. The Create command allows you to insert empty measures of any time signature into a track. For instance, if the piece is in 4/4 time throughout its entire length, you can tell the QX5 to create about 100 measures in 4/4 and use that as your guide track. If you have a more complex composition, you can change time signature whenever you need to, even from measure to measure. When you are finished, go

to Track Edit mode and use the Exchange command to swap Track 1 with Track 3. You now have the guide track on Track 3, and have Track 1 empty and ready for recording.

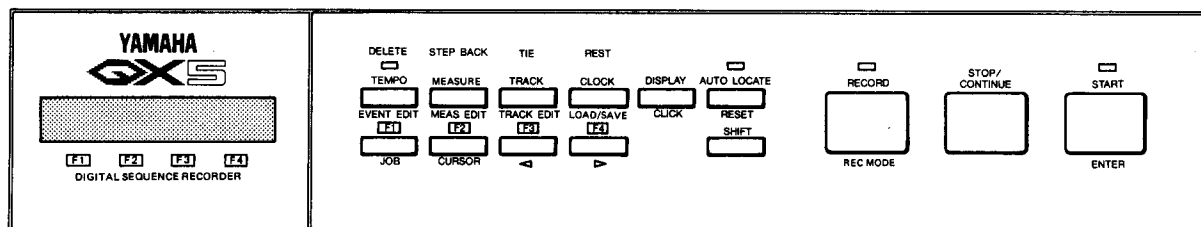
Now you can use the macros to build your drum track quickly. First, record the drum part for the intro of the song on Track 1. Put the drum part on Macro 1 using the Exchange command. You can now record the drum track for the verse of the song and put it on Macro 2 (using the Exchange command again). Record as many drum parts as you like and put them on separate macros.

When all the drum tracks are recorded and on separate macros, Exchange Track 1 with Track 3. The guide track is now on Track 1 and ready to edit. Enter Event Edit and put the appropriate macro calls at the starting points of all the sections (verse, chorus, etc.) of the song. If a verse repeats, you don't have to worry about creating new parts; you simply call the verse macro again at the location where it repeats. When you are finished, press Start to hear the fully composed drum part. If you decide that you want to try a completely different song structure, you can enter Event Edit at any time and change the macro calls. This ability to test alternate arrangements is one of the most powerful features of the macro system.

At this point, you could continue using macros to build up the bass and keyboard parts in a similar fashion. The only limitation is that no more than four macros can be playing at once. But, since you can combine as many parts into a single macro as you like, this never becomes a serious problem. For instance, you could combine all of the verse drum, bass, and keyboard parts together and have a single verse macro.

In addition to the convenience and flexibility it offers, the macro system is also an invaluable memory saver. In many sequencers, you have to duplicate a verse every time it needs to be

Front panel of the QX5.





QX5 digital sequence recorder.

played. If the verse uses 2,000 notes and is repeated four times in the song, it takes up 8,000 notes of the sequencer's memory. By taking advantage of macros, you use only one quarter of the memory you would normally use on the verse sections.

Building Tracks from Macros

Once you have decided on the song structure, you will sometimes find it useful to construct a continuous track from your macros. Using your existing drum macros, you can construct a continuous drum track on Track 8. First, Exchange Track 1 with Track 3 to put the guide track back where it belongs and to keep Track 1 open for editing. Next, use the Copy command in Track Edit to copy the intro drums from Macro 1 to Track 8. Unlike the Exchange command, the Copy command puts a copy of the drum data in Track 8 and leaves the data in Macro 1 as well. This offers you some degree of protection in case you change your mind while editing and want to return to the recorded version.

Copy the verse drum track from Macro 2 to Track 1. By using the Insert command in Track Edit, you can now paste the verse drum part into Track 8. The Insert command allows you to put the contents of Track 1 into another track at any specified measure. For example, if your intro drum part is 16 measures long, you can paste the verse drums into Track 8, measure 17. Track 8 will now play the intro and verse drum part. If the first verse repeats, you can paste the verse again at the measure where the repeat begins. You can continue building the drum

track by following the same two steps: 1) Copy the needed macro to Track 1; and 2) Insert Track 1 into Track 8 at the appropriate measure. You will find that the destination measures are identical to the macro call locations in the guide track, so if you ever get lost, you can check Track 3 for the proper macro numbers and locations.

After you have finished creating your drum track, you may decide to enhance the sampled drums with other synthesized drums or even another drum machine. Sometimes this can be a problem if the note assignment for a snare drum, for example, is C2 on one drum machine and A3 on the other. Fortunately, the QX5 has a Shift feature that gives you the ability to defeat this problem. First, Copy Track 8 to Track 1—this will erase the contents of Track 1, so be sure there is nothing that you want to keep. Next, enter Track Edit and choose the Shift feature. Select Shift Note, and shift C2 to A3. This will change every C2 in Track 1 to A3. You can change note assignments for the kick, toms, and all the others drums by using the same technique.

Since it is possible that the new note assignments will play unwanted parts on the first drum machine, you should put the drum machines on different MIDI channels. You can use the Shift command in Track Edit again to change the MIDI channel assignment. Select Shift Channel and choose the new channel. Set the second drum machine to the new channel and play the sequence to make sure everything is the way you want it. If you are satisfied, use the Track Down command in Track Edit to move the data from Track 1 to Track 8. This mixes in the

material from Track 1 without disturbing the existing data on Track 8. You now have your completed drum part on Track 8.

Even after you have completed the drum track, you can still edit any of the drums at any time. As you continue to work on the song, you may decide that the hi-hat part needs to be changed. First, Copy Track 8 to Track 1 for editing. Now, you need to isolate the hi-hat part so that you can work on it without affecting the other drums on the track. The Extract command in Track Edit allows you to isolate or delete almost any kind of MIDI data. In this case you will want to use Extract Note, select the note number that corresponds to the hi-hat and move it to an empty track. For instance, if the hi-hat note number is B2, you could have the QX5 Extract all B2 notes in Track 1 and move them to Track 2. Then, use Exchange in Track Edit to exchange Track 1 and Track 2. You now have the hi-hat part on Track 1 and are ready to edit.

When you are finished, use Track Down and mix Track 1 to Track 2. Turn off Track 1 and Track 8, and listen to the song with Track 2 playing the drums. If you like the new drum track, Copy it to Track 8 to replace the old one. You will find that the Extract command is one of the QX5's most useful features. You can combine parts when it is convenient and never have to worry about being able to separate them when editing is necessary.

Track Recording

Once you have a completed drum track to play with, you can record the bass part. You can either use the macro method of construction, as you did with the drums, or the track method. With the track method, you record the whole part on Track 1, using Realtime Record, Punch in Record, and Copy to go from song section to song section. This is different from the macro method because you construct the part from the beginning of the song to the end, in a linear fashion. Reorganizing the song structure is not as simple with the track method as the macro method, but it's easier to monitor your progress with the track method. A combination of both techniques is also possible. Since you've already used the macro approach, try recording the entire bass part on Track 1 using the track record method.

Before you begin recording, it's a good idea to

clear Track 1 using the Clear command in Track Edit. Since you don't need the guide track (Track 3) at this time, turn it off. Also, be sure that Track 8 is turned on. Set the QX5 to Realtime Record, and press Start to begin recording. You will get a two bar count and recording will begin. Record the intro and verse bass parts and stop the machine.

When you are ready to record the chorus bass part, you can either continue in Realtime Record or use Punch in Record. To use Realtime Record, you set the measure number to the first measure of the chorus and press Record and Continue. You will get the same two bar count as you did at the beginning but you will begin recording at the beginning of the chorus.

If you decide to use Punch In Record, you must first set the punch-in and punch-out points. You can set the punch-in point to be the beginning of any measure in the song. The punch-out point will occur at the end of the specified punch out measure. In this case, you will want the QX5 to punch in at the beginning of the chorus and punch out at the end of the chorus. Make sure the QX5 is in the Punch In Record mode (hold down Shift and press Record until you see Punch In in the display), and press Record and Continue to start playback at a spot before the punch-in measure. The QX5 will begin playing and the Record LED will light, but actual recording won't start until you reach the punch-in measure. At the end of the selected record section, the QX5 will punch out—preserving any data that comes after the punch out point. Pressing Stop returns you to the measure where playback began—before the punch point—so that you can keep recording the part over until you are satisfied.

The advantage of Punch In Record is that it makes it possible to play along and get comfortable with the feel of the song before recording takes place. It also keeps your hands free for playing, so that you don't have to worry about being the engineer and the performer at the same time.

If you are recording a song with a typical song structure, it is likely the second verse will follow the chorus. Rather than punch in and record as you have been doing, you can copy the first verse to the second verse with the Copy command in Measure Edit. The Copy command lets you specify a measure or range of measures to be copied to the end of Track 1. Select the first

verse measure to be copied, and they will be pasted immediately after the chorus. Once you have recorded the basic sections of the song—verse, chorus, bridge—you can construct practically the entire part with the Copy command.

When you have finished recording the bass part, move it to Track 7 using the Exchange command. The bass and drums are now on Tracks 7 and 8. Record the rest of the parts—keyboard, percussion, and so on—and put them on Tracks 5 and 6. You can use either the macro or linear method of recording. Here is a condensed description of each method:

Macro method:

- 1) Construct a guide track using the Create function.
- 2) Record a section of the song in Realtime Record.
- 3) Move the recorded section to an empty macro.
- 4) Repeat steps 1 and 2 to record all of the sections of the song and place them on separate macros.
- 5) Use the guide track to determine the song structure.

Track method:

- 1) Record a section of the song in Realtime Record.
- 2) Use Realtime or Punch In Record to record all the major sections of the song.
- 3) Use Copy to build the song structure.

System Exclusive

The next step is to insert MIDI System Exclusive data into the song. Most MIDI messages are common to all of the different makes and models of synthesizers. For instance, all MIDI synthesizers recognize a Note On message and will respond by playing the specified note at the specified velocity. Unlike other MIDI data, System Exclusive messages pertain only to a particular make or model of synthesizer. They will be ignored by any other synthesizer in the system. These messages usually pertain to voice parameter changes, but can include almost anything the manufacturer desires.

The ability to include voice information as part of the composition is one of the most common uses for System Exclusive data in a sequence. There are two basic ways to accomplish this: 1) voice bulk data dumps; and 2) individual voice messages.

Most MIDI instruments allow you to send and receive voice information via MIDI using System Exclusive bulk data dumps. Since the QX5 will record this information, you can add blank measures to the beginning of the composition (using the Create command in Measure Edit), and store the bulk voice data for your synthesizers. When you play the sequence back, the correct voices will automatically be loaded before the sequence begins. The advantage of this method is that you don't have to worry about the voice data slowing down the QX5 while the sequence is playing. The disadvantage is that a voice bulk is usually quite large and can

For your reference, this Job Table is supplied on the top panel of the QX5. It shows how to access the various Job groups, and gives a quick guide to Event Edit mode and Step Record mode.

YAMAHA QX5

STEP RECORD

FREE MEMORY

STEP	250
1/04	080% 064
STEP TIME	GATE TIME VELOCITY

⇕ DISPLAY ⇕

M=0001-01-00/96	
1/04	080% 064

STEP TIME	CLOCK	STEP TIME	CLOCK
1/02	192	1/18	24
1/03	128	1/24	16
1/04	96	1/32	12
1/06	64	1/48	8
1/08	48	1/64	6
1/12	32	1/96	4

EVENT EDIT

MEASURE	BEAT	CLOCK
M=0001-01-00/96		
NOTE (1) C.. 3 064		
EVENT DATA		

NOTE AFTER TOUCH EXCLUSIVE
PITCH BEND MACRO
CONTROL TEMPO
MODE MEASURE

SEARCH ← F1 → CHANGE
F3 BACK F2 CURSOR
F4 FWD F3 -1
F4 +1
SHIFT + RECORD DELETE
SHIFT + STOP INSERT
SHIFT + START REPLACE

JOB TABLE

TEMPO	MEASURE	TRACK	CLOCK
▼	▼	▼	▼
Press with SHIFT ▶	Press with SHIFT ▶	Press with SHIFT ▶	Press with SHIFT ▶
EVENT EDIT	MEAS EDIT	TRACK EDIT	LOAD/SAVE
SEARCH CHANGE	COPY DELETE REMOVE SHIFT QUANTIZE TRANSPOSE VELOCITY GATE TIME CRESCENDO CREATE	EXCHANGE COPY TR.DOWN CLEAR CUT INSERT EXTRACT CLOCK MOV THIN OUT SHIFT	TAPE SAVE TAPE LOAD TAPE VERIFY MIDI RECEIVE SETUP STORE SETUP RECALL
Press Twice ▶	Press Twice ▶	Press Twice ▶	Press Twice ▶
SETUP	MONITOR	MIDI 1	MIDI 2
BEAT/MEASURE CLICK REPEAT MEM.PROTECT FOOT SWITCH LOCATE DELAY	INPUT MONITOR OUTPUT MONITOR	INPUT ASSIGN OUTPUT ASSIGN VELOCITY AFTER TOUCH PITCH BEND CONTROL CHNG	REMOTE IN REMOTE OUT ECHO DEVICE NUMBER

eat up a lot of memory.

An alternative to this method is to send data for individual voices as part of the sequence. Some synthesizers will send voice data from the MIDI output when you make a program change. That is, if you are recording a part and press a program number, the QX5 will record the actual voice data instead of the Program Change number. The synthesizer will receive this information when the sequence is playing back, but it will sometimes take a moment before it is ready to play. Also, the amount of data needed for even a single voice can slow down data transmission, which can make the tempo drag. It is best to send individual voice data during rests or relatively sparse musical passages. The main advantage (a big one) in sending individual voices is that it takes up much less memory than bulk voice data dumps.

Using System Exclusive data, you can also do real time parameter changes as part of a sequence. You could assign a TX7 parameter—for example, operator 6 Frequency Coarse—to one of the sliders on a KX76 or KX88. As you start recording, move the slider and the timbre of the TX7 sound will change. After you have recorded the data you can perform many of the standard edit operations, like quantize and clock move. For those of you who are particularly adventurous, you can edit any byte in a System Exclusive message in Event Edit.

If you have never worked much with MIDI System Exclusive data on a sequencer, it is something you will want to explore. Recording and editing System Exclusive voice data can add a unique sound to your compositions. Since these sorts of parameter changes are often hard to access and control in real time performances, they are sometimes ignored. With the aid of the

QX5, you can alter virtually any aspect of a synthesizer voice while the sequence is playing.

After you are done recording all of the System Exclusive parts, move them to Track 4. This will be your System Exclusive track. Tracks 1 and 2 are now the only two tracks that are still open. It is a good idea to leave Track 1 blank in case you decide to do more recording or editing at a later date. Leave Track 2 open to function as a safety track while you are editing information on Track 1. For example, let's say you decide to record a new part and then quantize it. First, record the new part on Track 1 and Copy it to Track 2. Next, go to the Quantize command in Measure Edit and quantize the new part. If you find that you aren't happy with the way the part feels after it has been quantized, you can Copy Track 2 to Track 1 and get the original part back. You can also use an empty macro if you need to make a copy of Track 1 and you have no other tracks available.

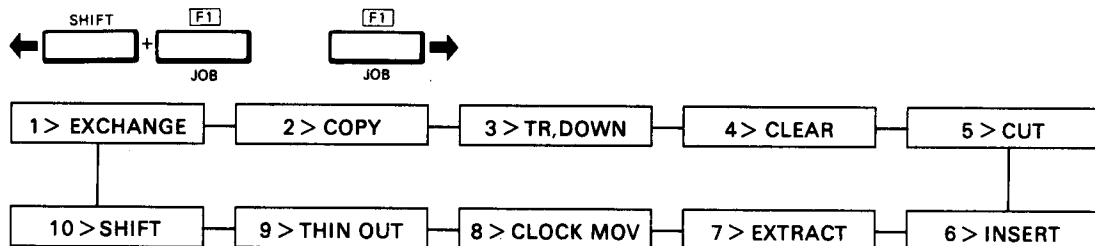
At this point you have a completed sequence. Some parts are on tracks and some on macros. Your track layout should look like this:

- Track 1 blank
- Track 2 blank
- Track 3 guide (macro calls, meter changes)
- Track 4 system exclusive
- Track 5 percussion
- Track 6 keyboards
- Track 7 bass
- Track 8 drums

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Next month, we will discuss alternate ways to configure tracks on the QX5, and will take a close look at one of the unit's most powerful features: Event Edit. See you then!

Jobs in the Track Edit mode of the QX5.



TX81Z

Continued from page 13

nel), or letting each instrument in a performance receive program change commands individually on their own MIDI channel.

Finally, there is a Key Number mode that determines how the TX81Z reacts to incoming MIDI Note On commands. The TX81Z can receive all incoming notes, just odd note numbers, or just even note numbers. If you play two TX81Zs simultaneously, and set one of them to receive only even note numbers and the other to receive only odd note numbers, you can have what amounts to a single 16-note TX81Z capable of playing up to 16 individual instruments.

The Cassette Control page gives you the ability to save your work to a standard audio cassette. You can save, verify or load 32 voices, 24 performances, or entire setups (with all of the setup options available in the MIDI Control

page). You can also load just one voice or performance if necessary.

The TX81Z includes three effects—delay, pan, chord—that can be edited in Single Utility. The delay time, feedback amount, effect level, and pitch shift amount are all programmable for the delay. Although this effect sounds like a digital delay, it actually creates the delay effect by retriggering the voice at a lower velocity. This creates an extremely clean-sounding delay. The pitch shift feature can be set in semitone increments so that the voice will be transposed every time it is echoed.

The panning effect moves the voice between output I and output II. Panning can be controlled by the LFO, Note On velocity, or note number (the voice pans as you move from one

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TX81Z

Continued from page 19

end of the keyboard to the other). To further enhance the effect, pan direction and pan depth are programmable. Chord, the third effect, lets you set up a chord (up to four notes) and assign it to any MIDI note. 12 different chords can be defined and assigned to different MIDI notes.

Finally, the two user-programmable micro tune scales can be initialized and edited in the Single Utility section. On many electronic instruments only standard equal tempered tuning is available. Most acoustic instruments don't have this limitation. For instance, when string players perform as a section, they often deviate from strict equal tempered tuning. You can use the micro tuning scales to imitate these

types of tunings or to experiment with new tunings. There are 11 preset micro tune scales that can be used with a performance or as a starting point for building the two user micro tune scales. Any new scales you create can be stored and used with a performance as well.

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The TX81Z list price is \$495.00. Its multi-timbral capabilities make it an ideal addition for writing and sequencing. Front panel user programmability guarantees that you will always be able to create new voices and the eight waveforms, three effects and micro tune tables add a unique flavor to the sound of FM synthesis.