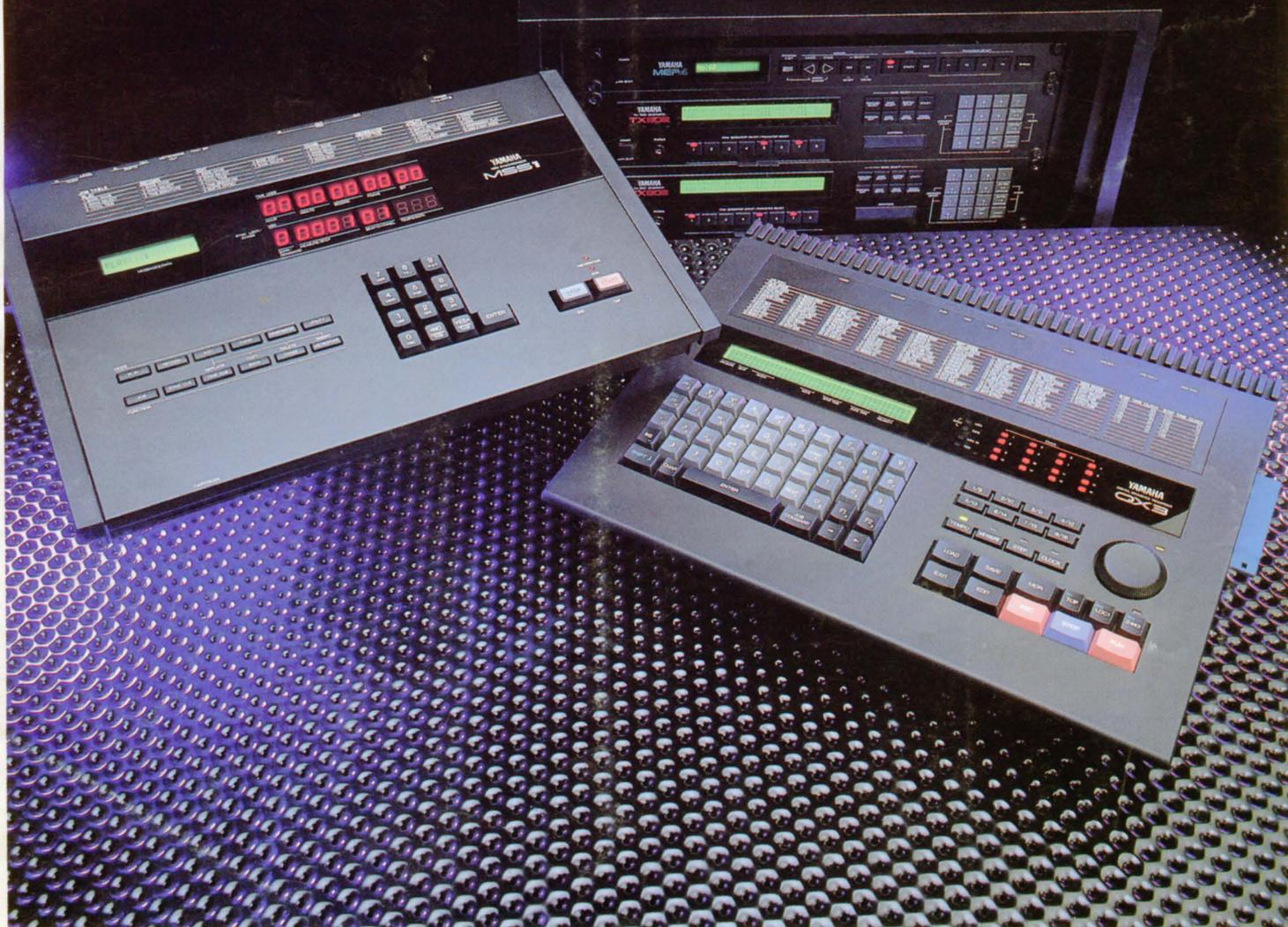




THE OFFICIAL PUBLICATION OF THE YAMAHA USERS GROUP <sup>TM</sup>

# QX3 / MSS1



AUGUST 1987

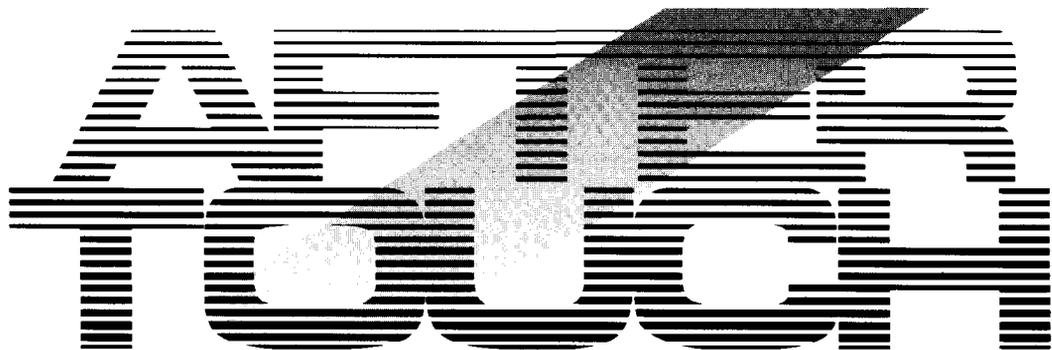
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August 1987

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# From The Editor

**M**ANY OF YOU may have recognized the cover art from last month's "Return of the Reader" issue as being part of an AfterTouch poster that appeared earlier this year. It was a special project, put together by photographer Wynn Miller. Unfortunately, we didn't give Wynn credit last month. Our regular cover photographer, Jim Hagopian, was listed on the masthead, and we neglected to add a notice with the proper credit for the "Reader" cover. Our apologies to Wynn Miller for this oversight, and our thanks to him for doing such a great job on this AfterTouch poster and cover.

This month's issue features 4-operator patches from readers, covering two generations of instruments—the DX9 and the DX100. There are also Hot Tips and Questions from readers, plus the MEP4 applications article postponed from an earlier issue. You will also find short introductions to the two new products featured on the cover: the QX3 digital sequence recorder and the MSS1 MIDI SMPTE synchronizer.

Next month, we'll continue with more 4-operator patches from readers, once again covering two generations of instruments—the DX100 and the TX81Z. There will be reader articles too, plus more Hot Tips and Questions. Also, there will be information on more new products from Yamaha. And, before the end of the year, we will finally publish the long-promised, long-anticipated article on 6-operator to 4-operator patch conversion.

So, 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.

Also, please notice that we have a new mailing address, which became effective beginning with last month's issue. The new address is as follows: AfterTouch, P.O. Box 7938, Northridge, CA 91327-7938.

In closing, here is our monthly repeat of some information we get asked for every month:

**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 literature on specific products must go 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.

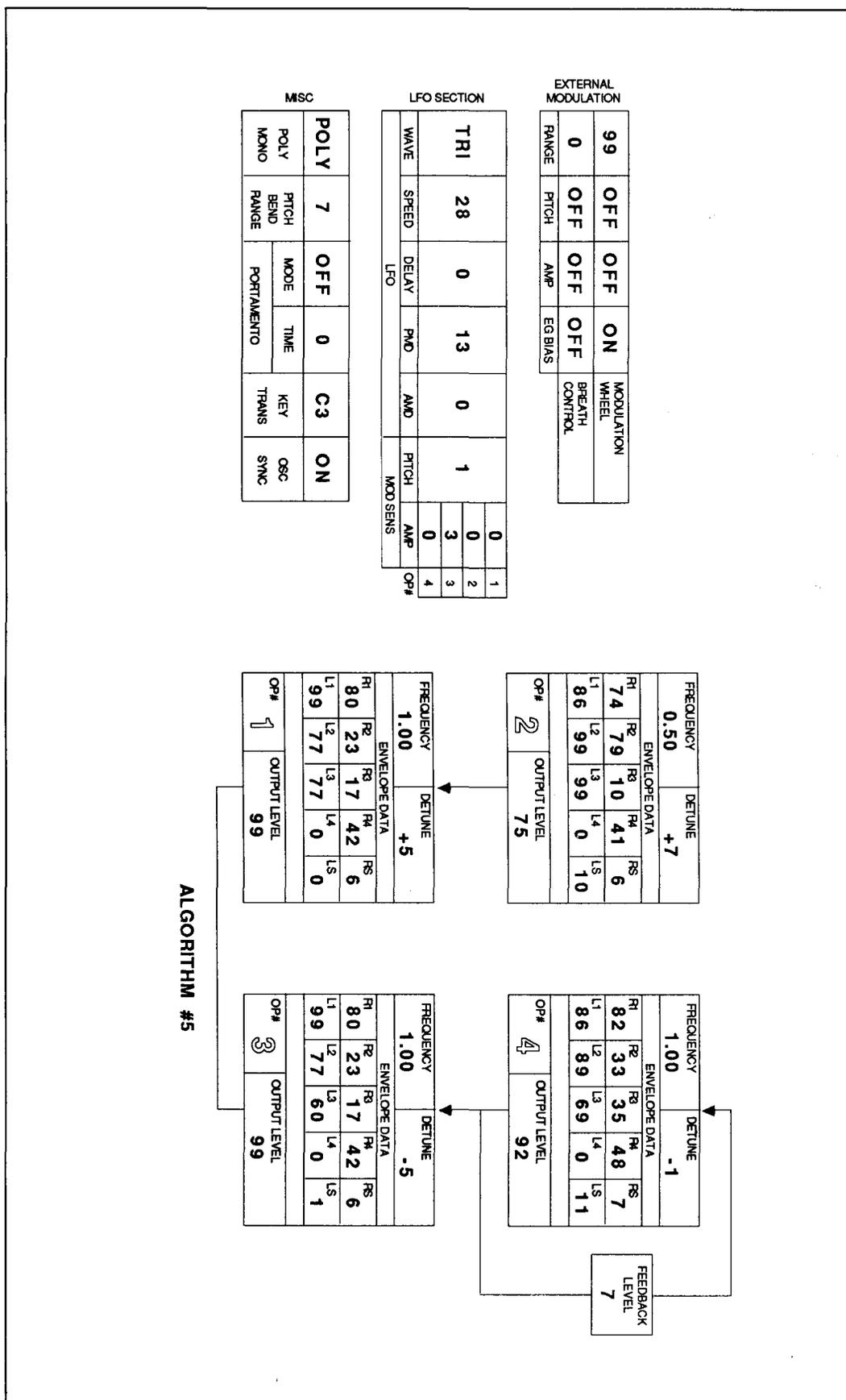
To receive **AFTER-TOUCH** every month, absolutely free, just put your name and address on the enclosed card and mail it to us.

# DX9

## FUNK SYNTH PIANO. A New DX9 Voice By Brian William Niles.

### Notes:

This patch is great to use as a solo instrument for classical music. The album "Bachbusters" by Don Dorsey was the inspiration for this sound.





# DX100

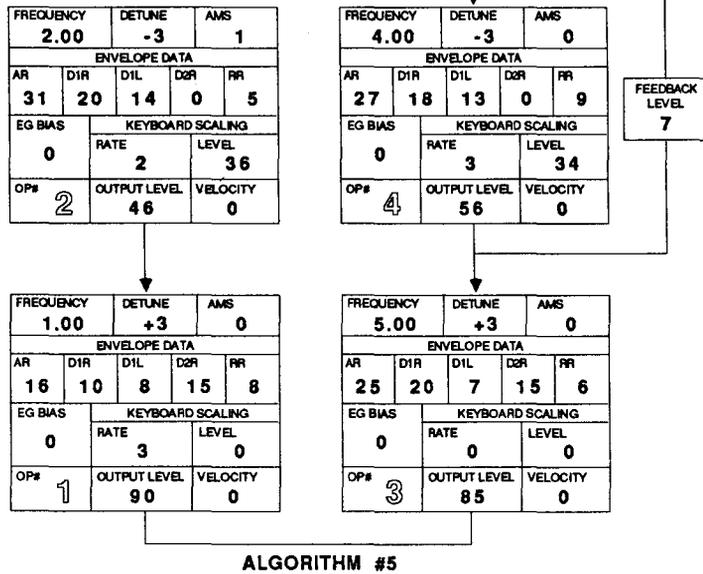
**Harmallets. A  
New DX100  
Voice By Dave  
Anderson.**

LFO & FUNCTIONS					
TRI	31	13	14	30	OFF
WAVE	SPEED	DELAY	PMD	AMD	SYNC
5		3		C2	
PMS		AMS		KEY TRANSPOSE	
POLY	4	OFF	0		✓
POLY/MONO	PB RANGE	MODE	TIME	PORT	SUSTAIN
PORTAMENTO			FOOTSWITCH		
99	0	50	0	50	0
PITCH	AMPL.	PITCH	AMPL.	PITCH BIAS	EG BIAS
WHEEL RANGE		BREATH RANGE			

**Notes:**

*This is a good African mallet patch with a twist. Regular playing touch will produce the Mallet sound, while touching the keys lightly and quickly will produce "harmonics."*

*If the patch is programmed on a DX21, add the Chorus parameter.*



# DX100

Great 88. A  
New DX100  
Voice By S.E.  
McMayon.

LFO & FUNCTIONS					
TRI	35	0	0	0	OFF
WAVE	SPEED	DELAY	PMD	AMD	SYNC
5		0		C3	
PMS		AMS		KEY TRANSPOSE	
POLY	2	OFF	0		√
POLY/MONO	PB RANGE	MODE	TIME	PORT	SUSTAIN
PORTAMENTO			FOOTSWITCH		
50	0	0	0	50	0
PITCH	AMPL	PITCH	AMPL	PITCH BIAS	EG BIAS
WHEEL RANGE			BREATH RANGE		

FREQUENCY	DETUNE	AMS		
3.00	-3	0		
ENVELOPE DATA				
AR	D1R	D1L	D2R	RR
24	5	13	2	5
EG BIAS	KEYBOARD SCALING			
0	RATE	LEVEL		
	0	82		
OP#	OUTPUT LEVEL	VELOCITY		
3	62	0		

FREQUENCY	DETUNE	AMS		
1.00	+3	0		
ENVELOPE DATA				
AR	D1R	D1L	D2R	RR
24	5	13	2	5
EG BIAS	KEYBOARD SCALING			
0	RATE	LEVEL		
	0	99		
OP#	OUTPUT LEVEL	VELOCITY		
2	79	0		

FREQUENCY	DETUNE	AMS		
3.00	-3	0		
ENVELOPE DATA				
AR	D1R	D1L	D2R	RR
29	5	13	5	5
EG BIAS	KEYBOARD SCALING			
0	RATE	LEVEL		
	0	78		
OP#	OUTPUT LEVEL	VELOCITY		
4	57	0		

FEEDBACK  
LEVEL  
7

FREQUENCY	DETUNE	AMS		
1.00	-3	0		
ENVELOPE DATA				
AR	D1R	D1L	D2R	RR
21	6	13	5	5
EG BIAS	KEYBOARD SCALING			
0	RATE	LEVEL		
	2	8		
OP#	OUTPUT LEVEL	VELOCITY		
1	99	0		

ALGORITHM #3

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

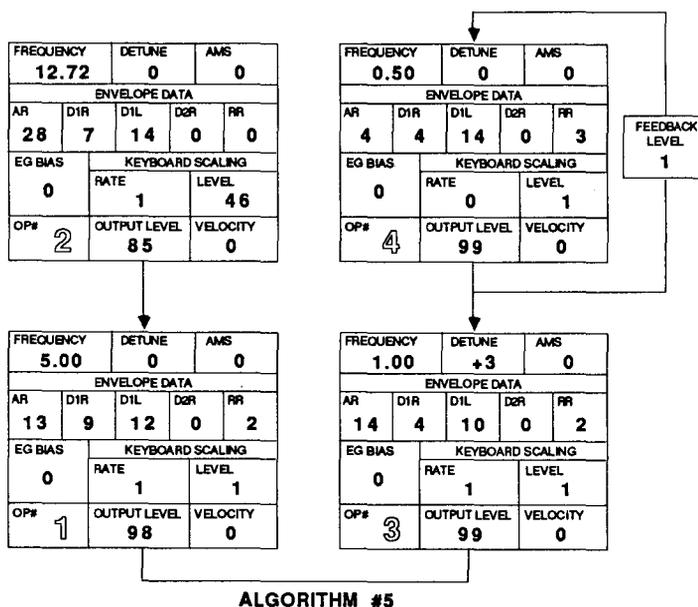
**COSMOS. A**  
**New DX100**  
**Voice By**  
**Daniel P.**  
**Estabrooks.**

LFO & FUNCTIONS					
S/H	84	0	71	0	OFF
WAVE	SPEED	DELAY	PWD	AMD	SYNC
5		0		C3	
PMS		AMS		KEY TRANSPOSE	
POLY	7	FULL	7		√
POLY/MONO	PB RANGE	MODE	TIME	PORT	SUSTAN
PORTAMENTO			FOOTSWITCH		
50	0	0	0	50	0
PITCH	AMPL	PITCH	AMPL	PITCH BIAS	EG BIAS
WHEEL RANGE			BREATH RANGE		

Notes:

You should be able to "feel" this one! Amplitude of 100db @ 3 feet with a range of 80Hz to 20kHz flat should about do it.

Play the lowest and highest C notes on the DX100 for 7 seconds, then release.



# MSS1

**T**HE YAMAHA MSS1 is a SMPTE-compatible MIDI synchronizer designed for use in home recording as well as motion picture, television, and professional recording applications. It provides an easy, cost-effective way to synchronize MIDI devices to SMPTE time code. The MSS1 can lock any clock-driven MIDI device precisely to SMPTE time code replayed from a multitrack tape recorder or video tape unit.

The MSS1 is fully compatible with all four SMPTE formats: 30-frame, 30-drop-frame, 25-frame, and 24-frame. In addition, a precision SMPTE time code generator is built into the MSS1, so that you can generate and record your own SMPTE time code tracks on virtually any type of audio or video reproduction equipment.

The MSS1 can also be programmed to transmit MIDI Program Change and Control Change messages in a precisely-timed sequence timed to SMPTE time code from a master tape.

The MSS1's memory holds up to 7168 beats—obviously, it can record extremely long compositions. The overall memory is divided into 10 memory banks, which can be called up in any order in Chain mode to create full-length compositions from smaller parts.

Tempos can be entered into the MSS1 simply by tapping a button on the front panel. This does away with stiff, robotic performances, and adds a new sense of human feel to sequenced music.

## Front-Panel Displays

The MSS1 provides a number of front-panel displays to give you constant feedback on the status of the unit's operations, including a 16 x 1 backlit LCD, two rows of large, 10-position, 8-segment LED displays, a green LED indicator light, and two red LED indicator lights. These various displays give you the following information.

**16 x 1 LCD (Message/Data Display):** shows operating modes, program data, and user prompts when necessary.

**Upper LED (Time Code Display):** shows SMPTE time code in hours, minutes, seconds, and bits.

**Lower LED (MIDI Data Display):** in PLAY and RECORD modes, shows bank, measure, beat, and tempo. In MIDI Event

mode, shows command type, step number, MIDI channel, and command data.

**Green LED (SYNC/CLOCK indicator):** lights when the MSS1 is locked to received SMPTE data.

**Red RUN LED indicator:** lights when the MSS1 is in RECORD or PLAY mode.

**Red METRONOME LED indicator:** blinks as a visual tempo display.

## Front-Panel Controls

The MSS1 gives the user a multitude of front-panel controls, including six MODE keys, six FUNCTION keys, a 10-key numeric data-entry pad (which, in addition to the 10 numbered keys, has a </NO key, a YES/> key, and an ENTER key), and START and STOP keys. These give you control over the following:

**MODE Keys:** These allow you to access the MSS1's six basic modes of operation: PLAY, RECORD, EDIT, CHAIN, GENERATOR, and UTILITY.

**FUNCTION Keys:** These allow you to access the MSS1's six basic function modes, JOB, SONG CUE, TIME CUE, BANK, CHASE, and METRONOME. In EDIT mode, the last four function keys access the REPLACE, COPY, DELETE, and INSERT functions.

**10-Key (+) Numeric Pad:** These keys are for entering virtually all types of data. The NO and YES keys allow selection of certain types of data (as well as allowing control over incrementing and decrementing data). The function of the ENTER key is obvious.

**START and STOP Keys:** These start and stop most functions; the STOP key is also used to cancel or exit in certain situations.

\* \* \* \*

With its list price of \$1195.00, the new Yamaha MSS1 MIDI-SMPTE synchronizer is a cost-effective time-code controller—one that offers both great flexibility and ease of operation.

**Yamaha  
Unveils Its  
New MIDI  
SMPTE Syn-  
chronizer.**

# QX3

## An Introduction To Yamaha's Newest Digital Sequence Recorder. By Tom Darter.

**T**HE NEW QX3 digital sequence recorder is a 16-track MIDI sequencer with a built-in 3.5" disk drive. Each of the 16 tracks can contain unlimited simultaneous polyphony. The total capacity of the QX3 is 48,000 notes with velocity (in Chain Play mode). Up to 24,000 notes can be recorded in one pass. The time resolution of the unit is 96 clocks per quarter-note.

The QX3 is designed to be a full-feature sequencer like the QX1; at the same time, though, the QX3 offers a number of significant improvements over its older brother. Some of the most obvious (16 tracks instead of 8 and a disk drive that uses the smaller, denser, more durable 3.5" disks) are mentioned above, but there are many more. Unlike the QX1, the QX3 receives and records aftertouch data. It generates and receives MIDI Song Position Pointer, and can be synced to an external MIDI clock or tape clock for both recording or playback. The QX3 features 512K of internal RAM, which almost completely eliminates the long "executing now!" delays found on the QX1. Finally, the QX3 offers a combined Play/Record mode and greater accessibility to all functions, both of which make the QX3 significantly easier and less time-consuming to operate than the QX1.

The unit's front panel includes a number of features designed for ease of operation. These include a 40x2 LCD with a variable contrast control, Note Value and Note Name keys, a numeric keypad for entering data, Track Select keys, an Editing Dial, F1 and F2 keys, and much more. The Editing Dial can be used to set tempo, move through measures (in Play/Record mode), move through events in a track (in Edit mode), or to select a file number (when saving to or loading from disk). The Function Key feature allows you to assign any procedure up to 128 keystrokes long to the F1 or F2 keys.

### Record/Play Mode

The QX3 offers Real Time, Step Time, and Punch-In recording. Punch-In recording may be performed manually or automatically. Punch-In can begin or end anywhere (even in the middle of a measure), and can be used in conjunction with a fully-implemented Auto-Locate feature.

The QX3 offers great range in defining time signatures. The basic beat for a time signature ranges from whole notes (x/1) to thirty-second

notes (x/32), and the number of beats ranges from 1 to 64. As with the QX1, different time signatures may be used in a single song, and time signature changes are shared by all tracks. However, unlike the QX1, the time signature of a measure cannot be changed once the measure has been recorded.

Each track on the QX3 holds data for one MIDI channel. In other words, channel data is not recorded. The MIDI channel of outgoing data is determined by the Output Channel setting for each track. If you want to record incoming data that involves a number of MIDI channels simultaneously, you need to record on two or more tracks, and set each track to receive on a different MIDI channel. Receive Channel and Output Channel settings may be different.

The QX3 has two MIDI OUT ports, and each track may be assigned to either or both of these two OUTs for playback. The unit also has an Echo Back function that allows incoming MIDI data to be merged with outgoing MIDI data at the unit's MIDI OUT ports.

The QX3 has 32 Job Commands available in the Record/Play mode, as follows:

- 1) Click
- 2) Click Beat
- 3) Count In
- 4) Measure Locate
- 5) Auto Punch Point
- 6) Foot Switch
- 7) Setup Save
- 8) Setup Load
- 9) Song Clear
- 10) Erase Track
- 11) Sync Clock
- 12) Echo Back
- 13) Output Channel
- 14) Output Port
- 15) Receive Channel
- 16) Receive Event
- 17) Remote In
- 18) Remote Out
- 19) Song Select In
- 20) MIDI Monitor
- 21) Memory Status
- 22) Disk Status
- 23) Disk Format
- 24) Disk Copy
- 25) Number of Files
- 26) File Rename
- 27) File Kill
- 28) E-Seq File Load
- 29) QX1 Data In



QX3 digital sequence recorder.

- 30) QX1 Data Out
- 31) Rel Tempo Record
- 32) Time Display

### Edit Mode

In the Edit mode, the QX3 offers an extensive set of 29 Job Commands, as follows:

- 1) Clock/Beat
- 2) Gate Time Ratio
- 3) MIDI Control
- 4) Event Display
- 5) Measure Copy
- 6) Measure Erase
- 7) Measure Create
- 8) Measure Delete
- 9) Mix Track
- 10) Erase Track
- 11) Transpose
- 12) Note Shift
- 13) Gate Time Modify
- 14) Velocity Modify
- 15) Crescendo
- 16) Quantize
- 17) Chord Sort
- 18) Chord Separate
- 19) Clock Move
- 20) Rel Tempo Erase
- 21) Memory Status
- 22) File Include
- 23) Note Extract
- 24) Ctrl Extract
- 25) P.Bend Extract

- 26) Prog Extract
- 27) A. Touch Extract
- 28) Excl Extract
- 29) Spot Extract

Many of these Jobs access functions that are self-evident, and still others will be familiar to QX1 users. Here is a quick rundown on some of the new Edit mode features:

**Transpose** allows you to shift all notes a fixed amount over a specific area of a track.

**Note Shift** allows you to convert any given note to another note over a specific area of a track.

**Chord Sort** allows you to rearrange chords vertically.

**Chord Separate** allows you to separate chords by a given clock interval to create "instant arpeggios."

**File Include** allows you to combine 2 songs into a new song; additional parts can then be added to this new song.

**Spot Extract** allows you to remove all data in a specific range.

. . . . .

The QX3 combines the professional features of the QX1 with the ease of operation and flexibility of the QX5. Moderately priced at \$1595.00, this newest addition to the QX series offers the operating ease and reliability that only a dedicated hardware sequencer can provide.

# MEP4

## Using The MEP4 In Live Applications. By Scott Plunkett.

**W**ITH ITS ABILITY to solve MIDI system problems and create MIDI effects, the MEP4 MIDI event processor has proven itself to be a great tool in studio applications. One of the hidden strengths of the MEP4, though, is its usefulness in live applications.

If you have never worked with the MEP4, you will need a brief tour before you can understand what follows: The MEP4 MIDI event processor has four microprocessors, each of which is capable of manipulating MIDI data that appears at its MIDI IN independently. Each microprocessor has six programmable sections, as follows:

- 1) Data Presetter: This section allows you to send a program change, a pitch bend position, and any two controller messages.
- 2) Channel Filter: This section allows you to filter incoming channel messages so that only certain channels are recognized. Any combination of channels may be selected.
- 3) Message Filter: This section can be used selectively—like the channel filter—to recognize only certain MIDI messages and ignore others.
- 4) Data Modifier: This section allows you to alter MIDI messages. There are a number of possible changes that can be made to any selected message.
- 5) Delay Processor: This section can be used to delay the MIDI output of a processor for up to three seconds.
- 6) Output Assigner: This section allows you to select the output channel and OUT port (there are four MIDI OUT ports on the MEP4).

Each processor can be programmed separately, and any number of processors can be combined to create complex effects.

To show you the usefulness of the MEP4 in performance, I will describe a MIDI system I recently used in a number of live shows. While preparing the system, I encountered familiar problems—those that are inherent to all large MIDI systems. The MEP4 helped solve these problems by offering alternatives that would not have been possible otherwise.

The system consisted of two controller keyboards—a KX88 and a DX7 II—plus a rack of tone generators, including a Yamaha TX816, a sampler, and an analog synthesizer. The DX7 II

could also be accessed as a tone generator through MIDI (as well as being controlled by its own keyboard). The MIDI outputs of the two controllers were merged together, sent to the MEP4, and distributed to the tone generators through a Yamaha MJC8 MIDI junction controller.

The biggest setup problem with a system like this is deciding how the controllers and tone generators will be split up. That is, how can each tone generator be addressed both separately and in a group? There are basically two solutions to this problem: 1) Separate the tone generators by MIDI channel; or 2) Keep all of the tone generators on the same MIDI channel and use key limiting or zoning to separate them.

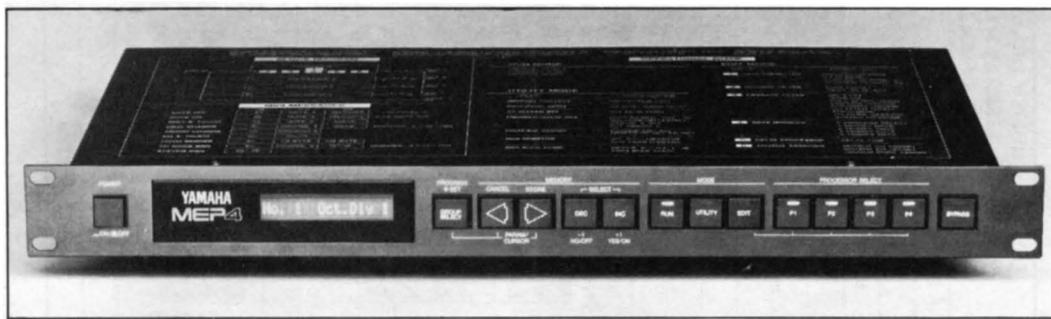
The advantage of putting the instruments on different MIDI channels is that you can access the entire MIDI note range of any single tone generator without affecting any other tone generator. The disadvantage is that you can't play multiple tone generators on different MIDI channels unless your controller keyboard has split and dual modes that will output more than one channel at a time. Or, to put it a slightly different way, the number of tone modules you can address simultaneously will depend on the number of channels your controller will output at the same time.

The advantage of key zoning is that you can keep all of the tone generators on the same MIDI channel, so it's easy to address all of them at the same time. The disadvantage is that it isn't always easy to keep musical parts from overlapping into adjacent zones. You must constantly transpose all of your voices, depending on whether they appear in a zone on the upper or lower part of the keyboard. And, since all of the tone generators are on the same channel, they all respond to the same program change, pitch bend, and controller information.

In my case, I needed three or four separate sounds at my disposal during some songs, but only one main sound for others. So, I wanted a system which would allow me to address at least four sounds separately, but which would also allow me to combine all of the tone generators at times to create one of those tasteless, larger-than-life, MIDI monstrosity, sounds.

### Using The MEP4 To Channelize

The solution to my problem was to divide the system four ways (by MIDI channel), and



MEP4 MIDI event processor.

let the MEP4 change the controller channel assignments. The MIDI channel assignments were set as follows:

<b>Controller</b>	<b>Transmit Channel(s)</b>
KX88	1,2
DX711	3
<b>Tone Generator</b>	<b>Receive Channel</b>
TX816 modules 1-4	1
Analog Synthesizer	1
TX816 modules 5-8	2
DX7 II	3
Sampler	4

With this setup in mind, let's say that you want the KX88 to control the first four modules of the TX816, the analog synthesizer, and the sampler. This means that when the KX88 outputs channel 1, its output needs to be converted to channel 1 and channel 4. Let's also say that you want the DX7 II to play the second four modules of the TX816, so you want to convert the DX7 II's output from MIDI channel 3 to channel 2.

You can use two of the MEP4 processors to take care of the KX88. First, set the Channel Filters so that both processors only recognize data coming in on MIDI channel 1. This guarantees that no data from the DX7 II (which is transmitting on MIDI channel 3) will be mistakenly sent to the wrong tone generators. You can then set the Output Assigner on the first processor to channel 1, and the Output Assigner on the second processor to channel 4.

Similarly, you can use a single processor to handle the output of the DX7 II. This time, the Channel Filter will be set to recognize data on MIDI channel 3, and you'll use the Output Assigner to send the data out on MIDI channel 2.

The advantage of this system is that, by using the Channel Filters and Output Assigners on the MEP4, any of the tone modules can be accessed in any combination by either of the controllers. And, since the MEP4 can make

program changes (via its 60 different programs), the relationship between the controllers and tone modules can be changed as often as necessary.

### Program Changes

By using the Data Presetters on the MEP4, you can send up to four separate program change commands at once. This means that, by changing a program on your controller keyboard, you can send four different program changes on four different MIDI channels.

For instance, by pressing program number 1 on the KX88, you could make the following changes in the system described above:

Tone Generators	MIDI Channel	Program Change
analog synth	1	3
TX816 1-4	1	3
TX816 5-8	2	5
DX7 II	3	2
Sampler	4	9

The great thing about this arrangement is that you don't have to set all of the patches for a particular song to the same program number. If you were accessing all of these instruments on the same MIDI channel, they would all jump to the same program when you made a program change from the KX88. If you wanted to use the same sound from a particular tone generator in different MIDI configurations, you would be forced to save that sound to at least two different patch memories. The MEP4 lets you avoid this problem.

Another advantage of this system is that it is easy to set up and modify. If you decide to mix a group of brass sounds from different tone generators, you can easily change which sounds are mixed by changing the programs that are called from the Data Presetters.

*Continued on page 15*

# MEP4

## StringsUp. A New MEP4 Setup By Scott Plunkett.

PROCESSOR 1				PROCESSOR 2				PROCESSOR 3				PROCESSOR 4			
DATA PRESETTER		DATA PRESETTER		DATA PRESETTER		DATA PRESETTER		DATA PRESETTER		DATA PRESETTER		DATA PRESETTER		DATA PRESETTER	
PROGRAM	ON	15	40	PROGRAM	ON	09	40	PROGRAM	ON	11	40	PROGRAM	OFF		
PITCH	ON	00	01	PITCH	ON	00	01	PITCH	ON	00	01	PITCH	OFF		
CONTROL 1	ON	07	55	CONTROL 1	ON	00	00	CONTROL 1	ON	07	46	CONTROL 1	OFF		
CONTROL 2	ON			CONTROL 2	ON	55		CONTROL 2	ON			CONTROL 2	OFF		
CHANNEL FILTER				CHANNEL FILTER				CHANNEL FILTER				CHANNEL FILTER			
OMNI:	OFF			OMNI:	OFF			OMNI:	OFF			OMNI:	OFF		
1				2				2				2			
MESSAGE FILTER				MESSAGE FILTER				MESSAGE FILTER				MESSAGE FILTER			
NOTE OFF	ON			NOTE OFF	ON			NOTE OFF	ON			NOTE OFF	OFF		
NOTE ON	ON			NOTE ON	ON			NOTE ON	ON			NOTE ON	OFF		
POLY A. TOUCH	OFF			POLY A. TOUCH	OFF			POLY A. TOUCH	OFF	***		POLY A. TOUCH	OFF		
CONTROL NO.	ALL			CONTROL NO.	ALL			CONTROL NO.	OFF			CONTROL NO.	ALL		
PROGRAM CHANGE	ON			PROGRAM CHANGE	ON			PROGRAM CHANGE	ON			PROGRAM CHANGE	OFF		
CH A. TOUCH	ON			CH A. TOUCH	ON			CH A. TOUCH	ON			CH A. TOUCH	OFF		
PITCH BEND	ON			PITCH BEND	ON			PITCH BEND	ON			PITCH BEND	OFF		
CH MODE MES.	ON			CH MODE MES.	ON			CH MODE MES.	ON			CH MODE MES.	OFF		
SYSTEM MES.	ON			SYSTEM MES.	ON			SYSTEM MES.	ON			SYSTEM MES.	OFF		
DATA MODIFIER				DATA MODIFIER				DATA MODIFIER				DATA MODIFIER			
MSG	9n,xx,yy			MSG	9n,xx,yy			MSG	9n,xx,yy			MSG	Bn,07,yy		
1	OFFS xx,v = -12			1	OFFS xx,v = +36			1	OFFS xx,v = +36			1	OFFS yy,v = -19		
2				2				2				2			
3				3				3				3			
4				4				4				4			
DELAY PROCESSOR				DELAY PROCESSOR				DELAY PROCESSOR				DELAY PROCESSOR			
DELAY TIME	0			DELAY TIME	0			DELAY TIME	0			DELAY TIME	0		
OUTPUT ASSIGNER				OUTPUT ASSIGNER				OUTPUT ASSIGNER				OUTPUT ASSIGNER			
OUT-CH ASSIGN	1			OUT-CH ASSIGN	2			OUT-CH ASSIGN	3			OUT-CH ASSIGN	3		
OUT-CH OFFSET	0			OUT-CH OFFSET	0			OUT-CH OFFSET	0			OUT-CH OFFSET	0		
OUTPORT ASSIGN	1			OUTPORT ASSIGN	1			OUTPORT ASSIGN	1			OUTPORT ASSIGN	1		

### Notes:

This is an MEP4 program that I use to solve a problem that is very similar to the one described in the accompanying article. The KX88 keyboard is split, and a high string sound is played from the lower half of the keyboard. A slightly busier part is being played in the right hand. Here's a brief description of what each processor is doing:

Processor 1 sends a program change (15) and volume command (07, 55) to the first four modules of the TX816 and the analog synthesizer. This is the sound that is being played by the right hand on the upper half of the KX88. The upper half of the KX88 is transmitting on MIDI channel 1, so the Channel Filter is set to accept only messages that appear on this channel. All of the messages on channel 1 are recognized (Message Filter), except for Polyphonic Aftertouch, since the KX88 doesn't transmit this message. The Data Modifier is used to transpose the voice down an octave, and the processor is set to output on MIDI channel 1.

Continued on page 15

## Setup Notes, Continued.

Processor 2 sends a program change (9) and volume command (07,55) to the last four modules of the TX816. This is the sound that is being played by the left hand on the lower half of the KX88. The lower half of the KX88 is transmitting on MIDI channel 2, so the Channel Filter is set to accept only messages that appear on this channel. Again, all of the messages on channel 2 are recognized except for Polyphonic Aftertouch. The Data Modifier is used to transpose the voice up three octaves, and the processor is set to output on MIDI channel 2.

Processor 3 sends a program change (11) and volume command (07,46) to the DX7 II. Notice that the Channel Filter is set to receive messages on MIDI channel 2, so the DX7 II will also be playing parts from the lower half of the KX88 keyboard. This is a good example of how the MEP4 allows you to use more than one tone generator to play the same part. The Message Filter of processor 3 is set differently than that of the first two processors. In addition to filtering out Polyphonic Aftertouch, the processor is filtering out Control Changes (the "..." means that all Control Changes are ignored). The reason for this is that processor 4 will be used to modify Control Change messages for the DX7 II. The Data Modifier moves the voice up three octaves, and the data is sent out on MIDI channel 3.

Processor 4 is normally reserved for the sampler in my setup. Since the sampler isn't being used here, the processor is being put to a different use. Once again, the Channel Filter is set to receive only channel 2. The Message Filter only recognizes Control Channel messages. The Data Modifier then offsets the volume message (Bn,07) by -20, and the processor sends data out on MIDI channel 3. Basically, this setup is used to keep the DX7 II's volume mixed down in relation to that of the last four modules of the TX816.

## Transposing Voices

In live performance, you are often forced to play parts on the lower part of the keyboard that, ideally, should be located on the upper part of the keyboard. For instance, if there is a fairly busy right hand part that has to be played at the same time as a high string line, the string line will end up being played by the left hand on the lower part of the keyboard. Unless you want that high string part to sound like a 'cello part, you will have to transpose the string voice. In addition, if you want to use the same string voice with four different transpositions during a show, you would need to store four different versions of the same sound for each affected tone generator.

The Data Modifiers in the MEP4 can take care of this problem. This sort of change is very simple, but requires some knowledge of MIDI messages. If you normally go glassy-eyed when dealing with technical things, don't panic. You can save yourself a lot of time and work by learning just a few of the most useful messages.

In order to transpose a voice, you need to modify a MIDI Note On message. This message consists of three bytes (bytes, bits, and all of those other computer terms aren't really important to the musical applications we are talking about here—The MEP4 owners manual explains most of these terms if you would like to know more about them). The Note On message looks like this:

9n,xx,yy

The first byte—"9n"—is called the status byte. Very simply, the "9" says that "This is a Note On message," while the "n" represents the MIDI channel that the message is in. The first data byte—"xx"—corresponds to the MIDI note number: It tells the tone generator which note to play (and is the byte we will want to change to transpose the voice). The second data byte—"yy"—indicates how hard the note is played, and is called the velocity byte.

With the MEP4's Data Modifier, you can use the Offset feature to add or subtract a fixed value to either "xx" or "yy." If you Offset the "xx" byte (the MIDI note number) of a Note On message, you will transpose the voice.

Now, here comes the payoff of this little MIDI lesson. In the case of our string line example, let's say we want to transpose the voice up three octaves. Since adding 12 to a note num-

ber will move it up an octave, we can transpose a voice up 3 octaves by setting an "xx" Offset of +36. [NOTE: Not all keyboards use the same system of sending Note Off messages. If you run into a problem with the dreaded stuck-note syndrome, you may have to use one of the MEP4's other processors to offset the Note Off messages.]

You can also use the idea outlined above to offset volume. The Data Presetter sends a one-time-only volume command when an MEP4 program is selected, but if you move a MIDI volume pedal, all of the tone generators will jump to the same volume. Normally, you will want one tone generator to have a lower volume than the others. The tricky part is keeping the proper mix as you change the volume with a MIDI volume pedal. By applying a volume offset with the MEP4, you can do this.

The MIDI message for volume is as follows:

Bn,07,yy

The status byte—"Bn"—says that "This is a MIDI Control Change message." The second byte—"07"—indicates that this message will control MIDI volume. The final byte—"yy"—is the data byte, and its value will be determined by the position of the volume pedal. The possible values for "yy" are 0-127.

By offsetting the value of "yy," the MEP4 can control the relative volumes between tone generators. If you Offset "yy" by -20 on one of the processors, for instance, the MEP4 will always subtract 20 from the current volume pedal position. Whichever tone generator is affected by this will consistently be playing at a lower volume relative to the other tone generators. Once again, this saves you the effort of individually modifying the volume of the patches within the tone generators themselves.

## Beating MIDI

I like to think of the MEP4 as a sort of MIDI "Swiss Army Knife." The above examples only begin to suggest the possible uses of the MEP4, but they do describe some of the uses that I find most valuable in live applications. As MIDI systems grow, they have a tendency to become unwieldy: They create restrictions that make it difficult to do all of the things you expect to be able to do. The MEP4 can help you overcome these restrictions, so that you can make the most efficient use of your system.

# Hot Tips

## An SPX90 Patch For Recording Guitars And Basses Direct

By John R. Barnes

I have a very simple SPX90 patch that works very well for guitars and basses recorded direct. I am just one of the many people with small 4-track studios on tight budgets where direct is the only possible way to record. I have never really liked the direct sound of a guitar or bass, but this patch makes the instrument sound as if it were being played and recorded through a miked amplifier—with better fidelity!

Start with the Early Reflection 1 preset, #5, and use these settings:

TYPE: HALL  
ROOM SIZE: 1.7  
LIVENESS: 4  
DELAY: 10.0 ms  
LPF: THRU



## Reader Tips For The SPX90, CX5M, FB-01, And More.

SPX90 digital multi-effects processor.

I use four different versions of this patch (depending on the mood I'm in), but this is my favorite. Other users might like to try the "Plate" and increase the room size. The balance should be set from about 30% to 40% effect.

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## Create Sequences With 16-Note Polyphony Using The CX5M Music Composer Cartridge

By Boyd Stamey

There is a way to use the FM Music Composer Cartridge programs (YRM101 and YRM501) to create sequences up to 16 notes wide. You can play up to 8 voices with the CX5M's internal tone module (SFG01 or SFG05) and 8 more independent notes on a MIDI synthesizer. The secret lies in the way you assign MIDI channels to the parts.

As explained in the Music Composer manual, you can simply double the parts played via the FM Music Composer by assigning them to a

MIDI channel and having a MIDI synthesizer play the same part. This is good, but I wanted to be able to play *additional* parts via MIDI. Well, there is a way, but you have to understand how the FM Music Composer counts voices to take advantage of it. Here is the scheme:

- 1) The FM Music Composer begins counting voices on Part 1, then on Part 2, and so on to Part 8.
- 2) After it counts 8 internal (SFG) voices—if no MIDI voices have been counted, it will then count up to 8 MIDI voices.
- 3) Once it counts any MIDI voices, all voices after that are counted as MIDI voices.
- 4) Once it counts 8 MIDI voices, it won't play any more voices after that.

In other words, there are as many as 16 notes that can be assigned to the Music Composer's 8 Parts, if you keep the above scheme in mind.

This is how you can make this scheme work for you:

- 1) Assign parts to be played only by the CX5M to Part 1, then Part 2, and so on.
- 2) If any of these parts are to be doubled by the MIDI synthesizer, assign them to the next available higher numbered Parts.
- 3) Assign the parts to be played only by the MIDI synthesizer to the remaining Part numbers as needed.

Here is an example using the CX5M's 8 internal voices and a completely independent set of 8 other voices being played by a MIDI synthesizer:

PART 1: BASS	(poly=1)
PART 2: BRASS	(poly=3)
PART 3: PIANO	(poly=3)
PART 4: FLUTE	(poly=1)
PART 5: STRINGS	(poly=3) MDON=1; VOL=0
PART 6: SYNTH	(poly=3) MDON=2; VOL=0
PART 7: GUITAR	(poly=2) MDON=3; VOL=0

Parts 1 through 4 will be played only by the CX5M voices (for a total of 8 voices), and Parts 5 through 7 will be played only by the external MIDI synthesizer—an FB-01 would be ideal for this application—for an additional 8 voices.

Now let's say that we want to double the MIDI synthesizer SYNTH part with the CX5M BRASS part. We need to change the order of

the parts, or we will lose some of the voices on the highest tracks. If, for example, we simply assign a MIDI channel to Part 2 and delete Part 6, we will have the following: By the time we get to Part 5, the FM Music Composer will have counted seven MIDI voices, leaving only one voice—and we need four. (Remember, once the program counts one MIDI voice, all subsequent voices are counted as MIDI voices.)

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### Creating Subtle Harps Voices With The FB-01

By Don F. Hill

I use an FB-01 FM tone module with my Yamaha ME-50 organ. The FB module has three harp voices: 3-28 Harp, 7/25 Harp2, and 7/26 Harp3. I was dissatisfied with these. They didn't sound the way harps ought to sound, especially in a glissando—where a harpist runs his or her hands over a series of strings, leaving them vibrating. On a keyboard instrument, one can try to produce a glissando effect, but the “plucking” and “snapping” of the strings doesn't sound right.

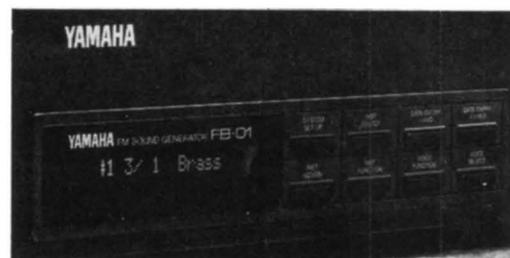
Without other means of voicing, it occurred to me to try to create better harp sounds using voices already at hand in the FB-01. This could be done by stacking in the Configuration mode.

I started with the 3/28 Harp voice on Instrument #1, channel 1, with 4 notes assigned as the maximum level of 127. I like the harp set down one octave (-1) on my upper organ keyboard manual, since the lower harp strings are the usual ones we hear. To modify this basic sound, I tried to increase the plucked effect, and found that if I set instrument #2 on channel 1 also and gave it 3 notes, I was left with 1 note for Instrument #3 (on channel 1) for another voice. It turned out that both were needed.

On Instrument #2, I experimented until I located 7/18 PluckGt. At a level of 116, with octave at 0 and detune at +10, this addition gave a bit more pluck to the harp string sound. On Instrument #3, the voice added was the 7/22 Lute, also at level 116 and octave 0.

This combined harp sound seems much more harp-like to me, and one can run a finger over an octave of keys, holding the last by aiming at it as one's finger glides—this causes a glis-

FB-01 FM digital tone module.



sando effect with more plucking sounds of strings, the way a harpist catches them along the way up or down a glissando.

For the sound of a softer harp, the same Configuration can be used; but instead of 7/22 Lute on Instrument #3, use the 7/24 SftHarp.

The above two Configurations are much alike, both recreating the sound of the harp's lower strings. For the higher harp strings, a third Configuration is needed, as follows: For Instrument #1, keep the 3/28 Harp set at volume 127 and octave -1 as before. Add 7/27 SftKoto on Instrument #2, with a level of 110, octave of 0, and detune of +10. On Instrument #3, add 7/24 SftHarp at level 116. Somehow, this combination produces a higher sound, even though the Instrument #1 harp voice hasn't changed. Evidently, the SftKoto creates the effect.

These settings will give you three additional harp voices on your FB-01. They can all be stored as Configurations; or, you can store just the first one as a Configuration, and make the slight changes that create the other two setups manually.

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### Setting Up An A/B Balance Control For The DX7 II In Voice Mode

By Eugene Beer

After playing with my new DX7 II for a couple of weeks, I began to wish that it had an A/B balance control to set the patch balance for tone generators A and B in Dual and Split modes. This capability is provided for in Performance mode, but that requires one to decide in advance what pairs of patches are to be stored together in Performance memory. I have 64 Single patches, and, on the spur of the moment, I want to be able to hear any one of them paired with any other with adjustable balance.

*Continued on page 20*

# Questions

## Answers To Questions From Readers. By Tom Darter.

I own a TX81Z, which I use primarily with my QX1. Is there any way of accessing the Performance patches via MIDI Program Changes? It seems that Program Changes only call up the Internal and ROM Voice patches.

The TX81Z's MIDI Program Change parameter has three basic settings—Off, Common, and Individual—which determine how the unit will respond to Program Change messages:

**Off:** The TX81Z ignores MIDI Program Change messages.

**Common:** The TX81Z looks up the corresponding Voice Number or Performance Number in its Program Change memory, and reacts accordingly.

**Individual:** The TX81Z's "instruments" receive Program Changes separately (over the assigned MIDI channels), and each looks up its Voice Number from the Program Change Table. If the Table entry is a Performance Number, it is ignored.

The TX81Z's internal memory contains 4 banks of 32 permanent (ROM) Voice memories, 1 bank of 32 programmable (RAM) Voice memories, and 1 bank of 24 programmable (RAM) Performance memories. In the Program Change Table, these memory locations appear as follows:

Memory Bank	Abbreviation
RAM: Voice Bank I (1-32)	I01-I32
ROM: Voice Bank A (1-32)	A01-A32
ROM: Voice Bank B (1-32)	B01-B32
ROM: Voice Bank C (1-32)	C01-C32
ROM: Voice Bank D (1-32)	D01-D32
RAM: Performances (1-24)	PF01-PF24

When shipped from the factory, the TX81Z's Program Change parameter is set to "Common," and the factory defined Program Change Table assigns the available Program Change numbers (1-128) as follows:

Program Change Number	TX81Z Program Number
1-32	I01-I32
33-64	A01-A32
65-96	B01-B32
97-128	C01-C32

In order to call up Performance memories using MIDI Program Change messages, you

need to program the TX81Z's Program Change Table accordingly. The most straightforward approach involves setting the TX81Z to respond to MIDI Program Change numbers 1-24 by calling up Performances 1-24. To do so, follow these steps:

- 1) Press the Utility button.
- 2) Press the left and right Parameter keys until the LCD reads as follows:

UTILITY MODE  
Midi Control?

- 3) Press the +1/YES button to access the MIDI parameters.
- 4) Press the right Parameter key (12 times) until the LCD reads:

UT MIDI CONTROL  
Edit P.Cng Tbl?

- 5) Press the +1/YES button. The LCD will now read:

UT MIDI CONTROL  
P G M 1 = I 0 1

- 6) Press and hold the +1/INC button until the LCD reads as follows:

UT MIDI CONTROL  
P G M 1 = P F 0 1

- 7) Press the right parameter button. The LCD will now read:

UT MIDI CONTROL  
P G M 2 = I 0 1

- 8) Press and hold the +1/INC button until the LCD reads as follows:

UT MIDI CONTROL  
P G M 2 = P F 0 2

Continue the above process until you have assigned PF01-PF24 (the TX81Z's Performance memories) to Program Change numbers 1-24 in the unit's Program Change Table. These Table settings are stored as part of the TX81Z's System Setup memory, and will be retained in the unit even when the power is turned off.

*Continued on page 19*

My basic setup consists of a DX7 and a Korg DW-8000. When I MIDI the two together, the DX7 is the master keyboard, and both units are set to MIDI channel 1. When I need to disconnect the two (so that they play independently), I simply change the Korg to MIDI channel 2. When I do this, though, the last notes or chords continue to ring out of the Korg. The only way to stop this is to hit the "Write" button on the Korg (which resets its circuitry). What gives?

The basic MIDI messages for a note played on a keyboard consist of two parts: A Note On (transmitted when you press down a key) and a Note Off (transmitted when you let go of a key).

If you hold down a chord on your DX7 when the Korg is set to receive on MIDI channel 1, it receives the Note On messages for the notes in the chord from the DX7; however, if you change the Korg to MIDI channel 2 while you

are still holding the chord on the DX7, the Korg will not receive the Note Off messages when you let go of the chord on the DX's keyboard. The Note Off messages are still being sent on MIDI channel 1 by the DX, but the Korg is now set to MIDI channel 2.

The solution is simple: Always make sure that you are *not* holding down any keys on the DX7 when you change the Korg from MIDI channel 1 to MIDI channel 2. Let go of the chord first (which will cause the DX7 to send Note Off messages to the Korg), and then change the Korg's MIDI channel setting.

This is not an isolated situation caused by your particular combination of instruments—it is universal to all MIDI keyboards. The MIDI slave unit must receive Note Off commands before you change its MIDI channel assignment; otherwise, you will be left with the infamous "stuck note" syndrome.

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# Hot Tips

*Continued from page 17*

This would require 4096 Performance memories to set the pairs of patches up in advance, assigning balance to CS1.

Fortunately, there is a way to achieve A/B balance control while not in Performance mode. It requires editing MIDI IN Control Volume in each of the voices for which Dual mode operation is desired. Once this parameter is changed, it is important to note that these voices will not sound at all in Single or Dual modes unless a MIDI cable is used as described below. Follow these steps:

- 1) Connect the MIDI OUT of the DX7 II to its own MIDI IN. (If the DX is controlling another tone generator, connect the MIDI OUT of the DX to the MIDI IN of the tone generator, and connect the MIDI THRU of the tone generator to the MIDI IN of the DX.)
- 2) Press the Edit button, and then press the

MIDI 1 button (31) until you access the MIDI IN display; set the MIDI Control Number of CS1 to 11, and set the MIDI Control Number of CS2 to 12. (Note that this and the next step involve global changes.)

- 3) Using the MIDI 1 button (31), access the display that includes the "Local" parameter, and set Local to OFF (or you will only get 4-note polyphony from the DX in Dual mode).
- 4) Edit all of the Voice memories that you think you might want in Dual or Split combinations as follows: Using Voice Edit button 26, set the MIDI IN Control parameter to a value of 99.

Now, when you call up any of these voices in the Dual or Split Voice modes, CS1 will control the volume of Voice A, while CS2 will control the volume of Voice B.