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YCAMS

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Issue #6

From The Editor

WHAT CAN WE SAY? Under the circumstances, I guess we just have to say "oops!" Last month, in issue #5 of AFTERTOUCH, we managed to let some rather major errors escape detection. As a result, I'm sure that we have some confused readers out there, who may be wondering why the ELEC GRAND patch on page 7 doesn't sound very much like a piano, or who may want to know what happened to part of a paragraph in the article on TeleWord (pages 10-11).

Time to straighten things out. Here is a list of the errors, complete with corrections:

First of all, we managed to get two of the DX7 patch charts on the wrong pages: Each chart is internally correct; but, because they got put on the wrong page, the titles and notes for the charts are wrong. Oops #1. Turn to pages 6 and 7 in issue #5. The chart on page 7 (algorithm #1) belongs with the title and notes on page 6, and the chart on page 6 (algorithm #13) belongs with the title on page 7. In other words, the algorithm #13 chart (on page 6) is the ELEC GRAND patch, and the algorithm #1 chart (on page 7) is the SPACEMUSIC patch.

Moving right along, we come to page 11 in issue #5, in the TeleWord article. If you look at the first paragraph of the section titled "The TWE01 Word Processor Cartridge," you may notice that a few lines are missing; three, to be exact. Oops #2. Here is the complete paragraph as it should have run:

"For access to even more flexibility for your computer system, watch for the CX5M Word Processor/TeleWord Enchancer cartridge (TWE01, formerly called the TeleWord Enchancer cartridge). Scheduled for release by mid-'86, the TWE01 cartridge will offer significant enhancements to the basic package provided by the TeleWord module. Even without the TeleWord module, the TWE01 Word Processor cartridge will provide CX5M users with a basic word-processing package, allowing them to create letters, memos, reports, or any kind of written communication. These documents can then be printed (using the Yamaha PN101 printer) or stored on a variety of devices, including Yamaha Micro Floppy Disc Drives (FD03 or FD05) or any standard cassette tape recorder."

Finally, we mispelled a reader's name. Even though Ken Leivers' name is correctly spelled on the contents page and on the first page of his article in issue #5, the letters managed to mutate themselves in my From The Editor column, leaving us with "Lievers." Oops #3.

At least five different people proof AFTERTOUCH at different stages of the game, but none of us noticed that the patch diagrams had switched positions. The three lines from the TeleWord article disappeared during the printing process, and the mispelled name is *obviously* a case of spontaneous typographic mutation. Equally obviously, we're only human.

I hope this clears up all of the confusion. Apologies to Doug Cooper (creator of SPACEMUSIC), Gregory Emler (creator of ELEC GRAND), Ken Leivers, and all of the rest of you. We'll do our best to make sure that this kind of mixup never occurs again. See you next issue. —*TD*

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Morton Subotnick &

Part 1 Of An Exclusive Interview. By Tom Darter.

FOR MORE THAN twenty years, Morton Subotnick has been a leading composer of music produced by electronic means, as well as a restless experimenter in a variety of musical contexts, including multimedia presentations and compositions for acoustic instruments plus electronic sounds. His famous electronic composition *Silver Apples Of The Moon*, released by Nonesuch in 1966, was the first piece of electronic music to be commissioned by a record company.

Subotnick has used a variety of electronic musical instruments to produce his compositions. Most recently, he has turned his attention to the Yamaha Computer-Assisted Music System (YCAMS). His 1986 piece *Return*, composed for TX816 and QX1, is available on New Albion Records.

Although Subotnick has only worked with Yamaha instruments for a short time, his deep understanding of the electronic medium has led him to a number of innovative uses of YCAMS. In part 1 of this exclusive interview, he discusses his initial work with the TX816 and QX1. Next month, in part 2, he will describe some of the techniques he used in *Return*, and will outline some of his upcoming musical projects.

* * * *

TD: *When did you first get involved with the YCAMS products?*

MS: It was just a year ago, for a piece commissioned by the Fromm Foundation, *The Key To Songs*.

TD: *The commission didn't necessarily involve using Yamaha instruments, did it?*

MS: No, it was just a commission to do what I wanted. I wrote the piece for six instruments and YCAMS, specifically the QX1 and TX816. The instrumental group included 2 pianos, marimba, xylophone, viola, and 'cello.

TD: *What led you to choose the TX816 and the QX1 for The Key To Songs?*

MS: First of all, I appreciated the ability to program the instruments using real FM, and I

Subotnick in his home studio, with (L to R) DX7 FM digital synthesizer, CX5M music computer, QX1 digital sequence recorder, TX816 rack-mount FM digital tone-generator system, and D1500 digital delay.

"I was impressed with the richness of the TX816 and the number of voices possible. I felt that these capabilities would make it *possible* to do the piece with live electronics instead of tape."
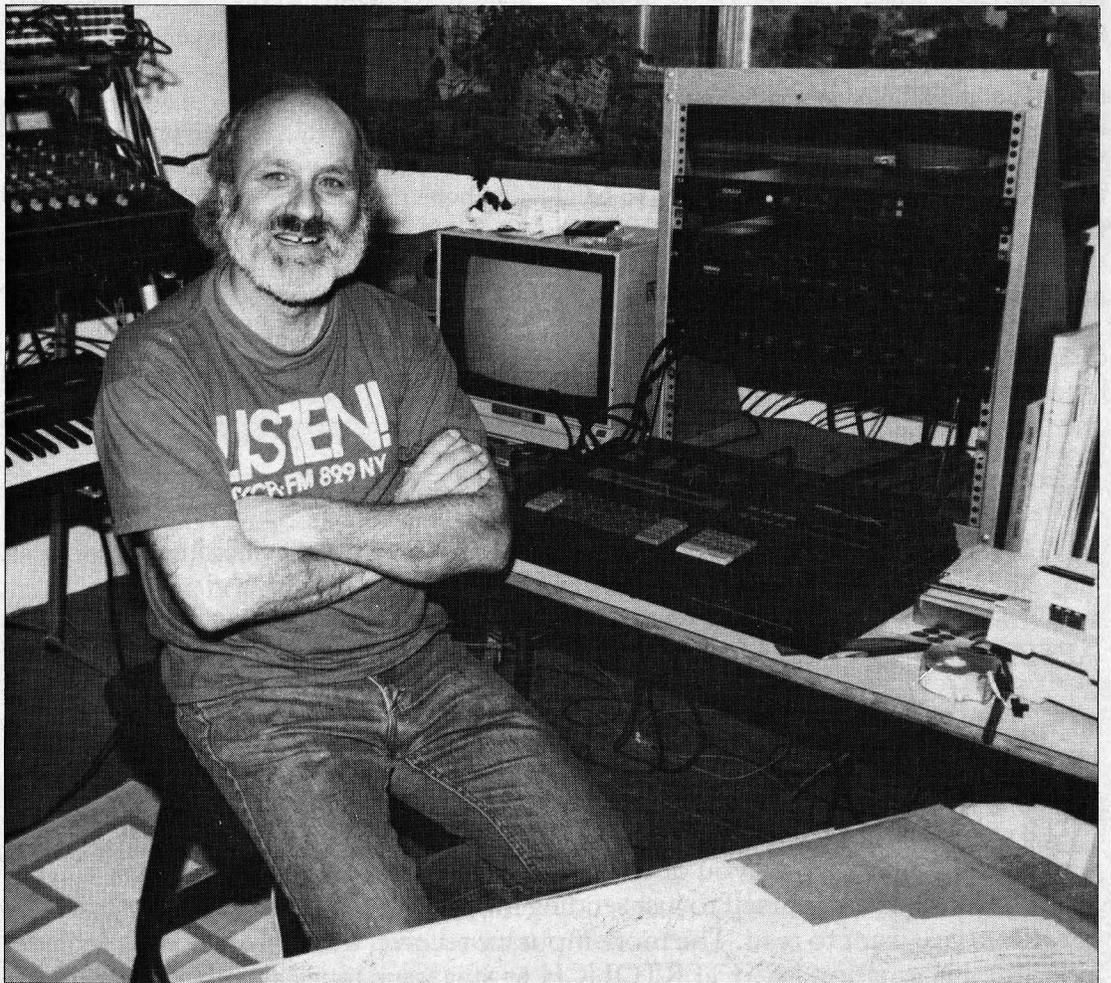
YCAMS

was impressed with the richness of the TX816 and the number of voices possible. I felt that these capabilities would make it *possible* to do the piece with live electronics instead of tape—which is the one thing I've not been able to do, without using an enormous amount of equipment, and that gets so complicated that it's bound to break down midstream. The capabilities of YCAMS made me feel that it was possible to do the piece in terms of live instruments and live computer, without the computer taking on either a secondary role or a simply coloristic role. I wanted the computer to be an individual instrument.

The basic idea for the piece is one that I've had in mind for several years now. I did a piece at IRCAM, using their large computer facilities, where the instruments and the computer sounds are parallel all the way through: There is a computer sound for every live sound. Instead of processing a live sound with computer, I *added* a computer sound to it. For instance, I used the computer to add a decay to the marimba that turns into a voice. This is the kind of thing that people have done with sampling, or have tried to do with sampling. I've been taking a different track, trying to do it with what I call parallel synthesis.

Anyway, with the TX816, I felt there was enough richness to do this kind of piece for performance, with the number of voices and with the complexity of the voice structure. And the QX1 allowed me to program the electronic portion of the score. And, because of its stop/start and slow/fast features, I could write starts and stops into the piece where needed and get coordination between the instruments and the computer. It worked out fine.

TD: *Was the QX1 actually performed by a seventh person?*

MS: Yes, it always is; and there's a score for that person.

TD: *And the score essentially involves changing tempos and starting and stopping the QX1?*

MS: Right. Actually, there's not much tempo change to worry about, because the musicians, with practice, always seem to stay with the QX1. If the musicians haven't played it much, the tempo change feature becomes more important. It was performed once in San Diego without too much rehearsal, and the QX1 player had to change tempos all the time, to catch up to the conductor or slow down. Of course, it was great that he was able to do this;

otherwise, all of the musicians would have been lost forever! But after the players become familiar with the piece, there hasn't been a need to change tempo during performance.

TD: *How does the start/stop feature work in terms of coordination with the other musicians?*

MS: For instance, there'll be places where the six musicians are alone, and the computer part is supposed to enter when the ensemble plays a particular chord. The relationship is written into the part: The start or stop point, and the BANK involved. For example, the part might say "STOP BANK 1, measure 17." So the player would stop the QX1 at the end of bar 17. The next direction might say "START measure 18 four measures later," so the player would restart the same BANK playing after counting four bars of rest.

The result of all of this, however, is that the QX1 part and the other musicians' parts have different bar numbers. You have to have a separate part for the QX operator, because he has to look at the QX1: It stopped at 17, and there were four measures in between. I didn't want the QX to run for four measures, so I started it up again on its bar 18, when the ensemble is at bar 21. There's a different measure structure for the QX than there is for instruments, but that's not a real problem. It just takes a little bit of getting used to.
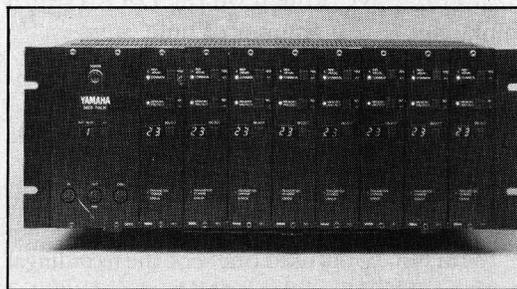
TD: *How did you program sounds for the TX816?*

MS: For *The Key To Songs*, the only stock preset instrument I used was the marimba; the rest of it was done from scratch. I had to learn the equipment and program it in five weeks, so I didn't have time to experiment. I know a lot about programming piano sounds, and I've done that a lot, so I created a whole series of piano sounds that would complement the pianos. Then I started with the original marimba sound, and made a series of other instruments—variations on the marimba—that would give different attack structures and so

"I started with the original marimba sound and made a series of other instruments—variations on the marimba—that would give different attack structures and so forth."

Morton Subotnick *Continued*

> "I had to learn the equipment and program it in five weeks, so I didn't have time to experiment."

forth.

Next, I took the basic vocal sound in the TX and restructured it, adding a lot of my piano sound to the vocal sound. I mixed them together. You don't hear it directly, because it's always integrated into an attack that happens when an instrument plays; but the result, after the instrument attack, is an organ/vocal/'cello-type sound.

As I said, I didn't have that much time. I spent about two weeks programming instruments, and the other three weeks getting the piece programmed into the QX1. The piece had basically been written already. I was waiting for the TX and the QX.

TD: *Was it completely notated?*

MS: Well, it was about 80% notated. There are computer solos, and those weren't notated; they were only sort of graphed out. Actually, I had more than five weeks. The instrument parts had to go out to the players, and they did—within the five week period after I first received YCAMS instruments. Then I had time to go back and work on the instrument sounds some more, and do the computer solo parts. I had another four weeks for that.

TD: *Did you use any computer enhancement to program the sounds, or did you just program on a DX7?*

MS: I used the CX5M music computer. I could not have done it on the DX7, I don't think. Not in that amount of time, anyway.

TD: *Is that the way you still work?*

MS: Yes.

TD: *For* The Key To Songs, *were you working with one TX816 or two?*

MS: One.

TD: *But you used two for* Return, *right?*

MS: No, I only used one. For the *recording*, I used two TX816s and two QX1s in order to get it played from beginning to end, because there are seven QX1 disks involved. But at any given time you only hear one TX816. We're going to remix it, however, because *The Key To Songs* and *Return* are going to come out as a CD, and we're going to redo *Return* using two TX816s simultaneously.

TD: *To add to the overall richness of the sound?*

MS: Yes, to add some slight detuning and get a richer sound. We'll use a series of SPX90s, to process the sound a little bit, which I didn't do on the original recording of *Return*.

TD: *Do you work with a producer?*

MS: For *The Key To Songs*, Michael Hoenig

did the producing, and he's going to work with me on the CD version of *Return*.

TD: *What is the significance of the title* The Key To Songs?

MS: It comes from a book by Max Ernst. I can't really pronounce the original French title, but I guess *The Week Of Kindness* is the best English translation. It's a surreal collage book made up of 19th century etchings that he's restructured. And they're really strange, and exotic, and beautiful. He divides the week up into what he calls the "seven deadly elements." There's "Blood" and "Fire" and so on; and the end of it is called "The Key To Songs." Sunday I think is called "The Key To Songs," or Saturday, whichever Ernst has chosen for the last day of the week. So I used that for the title of the piece, since it was the most musical of the titles of the days. I also went back and picked up a little bit of Schubert, Schubert songs from *Die schoene Muellerin*; they add that dimension of 19th century etchings to create the surreal, collage quality in the piece.

I imagine the piece as a ballet. I used the book as if the images were ballet dancers in a set. What I intend to do one day with a ballet company is go through the book with them, and show them what I was thinking while the music was being created. I think it *sounds* like a ballet.

Also, the LA Philharmonic has commissioned me to expand *The Key To Songs* for orchestra, YCAMS, and the four solo instruments—the two pianos and the two mallet instruments. The viola and the 'cello will become the string parts of the orchestra.

TD: *When are you going to start working on that?*

MS: Well, I'm going to start soon, but I won't finish it until I've solved a few problems. For a thing like that where they'll probably have about three hours of rehearsal with the orchestra, I want to make sure that the computer is able to follow the conductor, because you're not going to get the conductor and the orchestra to have the time to learn how to follow the computer part. There are several possible approaches, and I haven't yet figured out which one to take. One possibility is to have the pianists not play the original piano parts at all, but play the computer part using two KX88 keyboards, which is something I'm considering very seriously. The original piano parts would then become part of the orchestral score, and the mallets would remain exactly as they are.

GUITAR-DAMP. A New DX7 Voice By Reggie Turner.

TR1	28	0	0	0	OFF	3
WAVE	SPEED	DELAY	PMD	AMD	SYNC	PMS

LFO

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

PITCH ENVELOPE

C3
KEY TRANSPOSE

OFF
OSC SYNC

FUNCTIONS

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

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

FREQUENCY	DETUNE	AMS
8.08	-5	0

ENVELOPE DATA

R1	R2	R3	R4	RS
99	49	80	75	2
L1	L2	L3	L4	
99	0	0	0	

KEYBOARD SCALING

CURVE	BREAKPOINT		DEPTH
L	-L	L	99
R	-E	C3 R	0

OP#	OUTPUT LEVEL	VELOCITY
3	60	6

FREQUENCY	DETUNE	AMS
8.00	0	0

ENVELOPE DATA

R1	R2	R3	R4	RS
99	60	43	99	2
L1	L2	L3	L4	
99	79	0	75	

KEYBOARD SCALING

CURVE	BREAKPOINT		DEPTH
L	-L	L	65
R	-E	C3 R	0

OP#	OUTPUT LEVEL	VELOCITY
6	75	6

FREQUENCY	DETUNE	AMS
0.50	-7	0

ENVELOPE DATA

R1	R2	R3	R4	RS
99	49	80	50	0
L1	L2	L3	L4	
99	99	0	0	

KEYBOARD SCALING

CURVE	BREAKPOINT		DEPTH
L	-L	L	90
R	-L	G3 R	44

OP#	OUTPUT LEVEL	VELOCITY
2	99	2

FREQUENCY	DETUNE	AMS
0.50	0	0

ENVELOPE DATA

R1	R2	R3	R4	RS
99	25	80	99	0
L1	L2	L3	L4	
99	99	0	99	

KEYBOARD SCALING

CURVE	BREAKPOINT		DEPTH
L	-L	L	45
R	-L	G3 R	10

OP#	OUTPUT LEVEL	VELOCITY
5	90	3

5

FREQUENCY	DETUNE	AMS
0.50	-7	0

ENVELOPE DATA

R1	R2	R3	R4	RS
99	48	85	50	3
L1	L2	L3	L4	
99	50	0	0	

KEYBOARD SCALING

CURVE	BREAKPOINT		DEPTH
L	-L	L	0
R	-E	A-1 R	0

OP#	OUTPUT LEVEL	VELOCITY
1	99	0

FREQUENCY	DETUNE	AMS
0.50	0	0

ENVELOPE DATA

R1	R2	R3	R4	RS
99	58	85	58	3
L1	L2	L3	L4	
99	50	0	0	

KEYBOARD SCALING

CURVE	BREAKPOINT		DEPTH
L	-L	L	0
R	-E	A-3 R	0

OP#	OUTPUT LEVEL	VELOCITY
4	99	0

ALGORITHM #4

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

DX7

TR1	13	0	60	39	ON	1
WAVE	SPEED	DELAY	PMD	AMD	SYNC	PMS

LFO

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

PITCH ENVELOPE

KEY TRANSPOSE **C2**

OSC SYNC **ON**

FUNCTIONS

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

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

OP 6

FREQUENCY	DETUNE	AMS
2.02	-3	0

ENVELOPE DATA

R1	R2	R3	R4	RS
85	27	16	20	0
L1	L2	L3	L4	
90	99	94	0	

KEYBOARD SCALING

CURVE	BREAKPOINT	DEPTH	
L	-L	C8	L 1
R	-E		R 17

OP#	OUTPUT LEVEL	VELOCITY
6	99	1

OP 2

FREQUENCY	DETUNE	AMS
1.00	+7	0

ENVELOPE DATA

R1	R2	R3	R4	RS
27	35	9	20	0
L1	L2	L3	L4	
94	99	17	0	

KEYBOARD SCALING

CURVE	BREAKPOINT	DEPTH	
L	-E	G2	L 1
R	-E		R 5

OP#	OUTPUT LEVEL	VELOCITY
2	82	1

OP 4

FREQUENCY	DETUNE	AMS
2.00	-4	0

ENVELOPE DATA

R1	R2	R3	R4	RS
99	27	16	20	0
L1	L2	L3	L4	
90	99	94	0	

KEYBOARD SCALING

CURVE	BREAKPOINT	DEPTH	
L	-E	G2	L 1
R	-L		R 1

OP#	OUTPUT LEVEL	VELOCITY
4	70	0

OP 5

FREQUENCY	DETUNE	AMS
0.50	+4	0

ENVELOPE DATA

R1	R2	R3	R4	RS
18	75	16	20	0
L1	L2	L3	L4	
90	99	95	0	

KEYBOARD SCALING

CURVE	BREAKPOINT	DEPTH	
L	-E	C2	L 1
R	-E		R 1

OP#	OUTPUT LEVEL	VELOCITY
5	92	1

OP 1

FREQUENCY	DETUNE	AMS
1.00	+4	0

ENVELOPE DATA

R1	R2	R3	R4	RS
99	34	99	38	0
L1	L2	L3	L4	
99	51	50	0	

KEYBOARD SCALING

CURVE	BREAKPOINT	DEPTH	
L	-E	G1	L 1
R	-E		R 1

OP#	OUTPUT LEVEL	VELOCITY
1	99	1

OP 3

FREQUENCY	DETUNE	AMS
1.00	0	0

ENVELOPE DATA

R1	R2	R3	R4	RS
99	40	23	38	0
L1	L2	L3	L4	
99	64	94	0	

KEYBOARD SCALING

CURVE	BREAKPOINT	DEPTH	
L	-L	G2	L 1
R	-L		R 1

OP#	OUTPUT LEVEL	VELOCITY
3	99	2

ALGORITHM #9

Notes:

Compare this patch to the one on page 9: Both use algorithm #9, but in very different ways.

SLAP-
RHODES. A
New DX7
Voice By
Kevin M.
Bevins.

TR1	18	0	5	69	OFF	1
WAVE	SPEED	DELAY	PMD	AMD	SYNC	PMS
		LFO				

R1	R2	R3	R4
99	99	99	99

L1	L2	L3	L4
50	50	50	50

PITCH ENVELOPE

C3
KEY TRANSPOSE

ON
OSC SYNC

FUNCTIONS

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

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

Operator 6

FREQUENCY	DETUNE	AMS
6.00	0	0

ENVELOPE DATA

R1	R2	R3	R4	RS
99	99	62	99	4
L1	L2	L3	L4	
99	99	0	0	

KEYBOARD SCALING

CURVE		BREAKPOINT		DEPTH
L	-L	A-1	L	0
R	-L		R	0

OP#	OUTPUT LEVEL	VELOCITY
6	99	5

Operator 2

FREQUENCY	DETUNE	AMS
7.00	+5	0

ENVELOPE DATA

R1	R2	R3	R4	RS
95	50	35	78	3
L1	L2	L3	L4	
99	75	0	0	

KEYBOARD SCALING

CURVE		BREAKPOINT		DEPTH
L	-L	A-1	L	0
R	-L		R	0

OP#	OUTPUT LEVEL	VELOCITY
2	57	7

Operator 4

FREQUENCY	DETUNE	AMS
0.50	0	0

ENVELOPE DATA

R1	R2	R3	R4	RS
59	99	99	71	5
L1	L2	L3	L4	
99	99	99	0	

KEYBOARD SCALING

CURVE		BREAKPOINT		DEPTH
L	-L	A-1	L	0
R	-L		R	0

OP#	OUTPUT LEVEL	VELOCITY
4	75	0

Operator 5

FREQUENCY	DETUNE	AMS
9.00	0	0

ENVELOPE DATA

R1	R2	R3	R4	RS
99	99	38	99	5
L1	L2	L3	L4	
99	99	0	0	

KEYBOARD SCALING

CURVE		BREAKPOINT		DEPTH
L	-L	A-1	L	0
R	-L		R	0

OP#	OUTPUT LEVEL	VELOCITY
5	70	7

Operator 1

FREQUENCY	DETUNE	AMS
0.50	+2	1

ENVELOPE DATA

R1	R2	R3	R4	RS
96	25	25	67	3
L1	L2	L3	L4	
99	75	0	0	

KEYBOARD SCALING

CURVE		BREAKPOINT		DEPTH
L	-L	G3	L	99
R	-L		R	0

OP#	OUTPUT LEVEL	VELOCITY
1	99	2

Operator 3

FREQUENCY	DETUNE	AMS
1.00	+2	0

ENVELOPE DATA

R1	R2	R3	R4	RS
99	64	33	71	0
L1	L2	L3	L4	
99	86	0	0	

KEYBOARD SCALING

CURVE		BREAKPOINT		DEPTH
L	-L	C3	L	0
R	-L		R	99

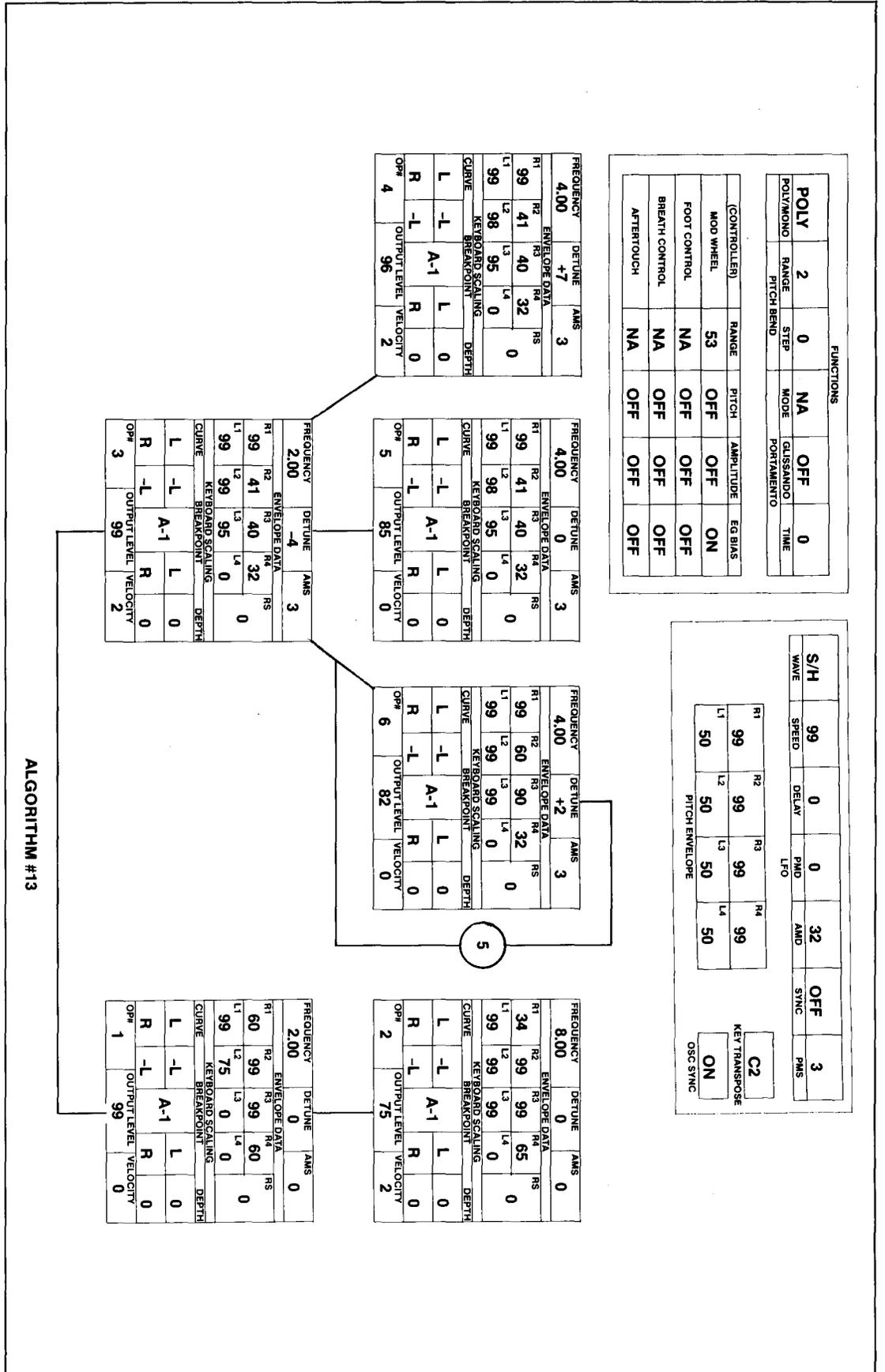| OP#	OUTPUT LEVEL	VELOCITY
3	99	2

ALGORITHM #9

7

Notes:

This patch is a split voice, with thumb-slap bass on the left and Rhodes on the right.

Ops #1 and #2 create the Rhodes sound, while ops #3, #4, #5, and #6 are used for the slap bass.

DX7

SHRINGING. A New DX7 Voice By Cam Roberts.

ALGORITHM #13

FUNCTIONS

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

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

PITCH ENVELOPE

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

LFO

WAVE	SPEED	DELAY	PMD	AMD	SYNC	PMS
S/H	99	0	0	32	OFF	3

KEY TRANSPOSE: C2
OSC SYNC: ON

Operators

OP# 4 — FREQUENCY 4.00, DETUNE +7, AMS 3

	R1	R2	R3	R4	RS
ENVELOPE DATA	99	41	40	32	0
	L1	L2	L3	L4	
	99	98	95	0	

KEYBOARD SCALING: CURVE −L / −L, BREAKPOINT A-1, R / L, DEPTH 0
OUTPUT LEVEL 96, VELOCITY 2

OP# 5 — FREQUENCY 4.00, DETUNE 0, AMS 3

	R1	R2	R3	R4	RS
ENVELOPE DATA	99	41	40	32	0
	L1	L2	L3	L4	
	99	98	95	0	

KEYBOARD SCALING: CURVE −L / −L, BREAKPOINT A-1, R / L, DEPTH 0
OUTPUT LEVEL 85, VELOCITY 0

OP# 3 — FREQUENCY 2.00, DETUNE −4, AMS 3

	R1	R2	R3	R4	RS
ENVELOPE DATA	99	41	40	32	0
	L1	L2	L3	L4	
	99	99	95	0	

KEYBOARD SCALING: CURVE −L / −L, BREAKPOINT A-1, R / L, DEPTH 0
OUTPUT LEVEL 99, VELOCITY 2

OP# 6 — FREQUENCY 4.00, DETUNE +2, AMS 3

	R1	R2	R3	R4	RS
ENVELOPE DATA	99	60	90	32	0
	L1	L2	L3	L4	
	99	99	99	0	

KEYBOARD SCALING: CURVE −L / −L, BREAKPOINT A-1, R / L, DEPTH 0
OUTPUT LEVEL 82, VELOCITY 0

OP# 2 — FREQUENCY 8.00, DETUNE 0, AMS 0

	R1	R2	R3	R4	RS
ENVELOPE DATA	34	99	99	65	0
	L1	L2	L3	L4	
	99	99	99	0	

KEYBOARD SCALING: CURVE −L / −L, BREAKPOINT A-1, R / L, DEPTH 0
OUTPUT LEVEL 75, VELOCITY 2

OP# 1 — FREQUENCY 2.00, DETUNE 0, AMS 0

	R1	R2	R3	R4	RS
ENVELOPE DATA	60	99	99	60	0
	L1	L2	L3	L4	
	99	75	99	0	

KEYBOARD SCALING: CURVE −L / −L, BREAKPOINT A-1, R / L, DEPTH 0
OUTPUT LEVEL 99, VELOCITY 0

Notes:

Use modulation wheel to introduce brightness.

SINCE ITS INTRODUCTION, the QX1 digital sequence recorder has undergone a number of software revisions. The most recent of these, called Version 6, is implemented in the newest units. Version 6 software contains a number of new Job Commands, plus a number of other improvements in the unit's overall operational system. (A complete list of the Job Commands for the QX1's Version 6 software can be found on page 13.)

The basic operating software for the QX1 resides in four ROM chips. To update your unit to software version 6, you just have to purchase the new chips and have them installed by an authorized Service Center. Contact your Yamaha dealer for details.

Before describing the new Job Commands in detail, let's look at some of the other operational changes that are implemented in the QX1's Version 6 software:

First of all, the Version 6 software allows you to enter Program and Control changes during the two-bar countdown in real-time RECORD mode. Also, a SUSTAIN OFF command is entered automatically whenever you press the STOP button at the end of a recording in RECORD mode.

In addition, Job Command numbers are repeated automatically in all modes. This means that it is possible to work through a series of operations using the same Job Command without having to enter the Job Command number repeatedly.

Finally, the Version 6 software makes it possible to use the MIDI OMNI mode while in RECORD mode. In PLAY mode, of course, you must still assign a specific MIDI channel for each MIDI OUT terminal. OMNI mode is only functional in RECORD mode.

Now that we have described some of the operational changes in the Version 6 software for the QX1, it's time to take a closer look at the new Job Commands made available in this new software revision.

RECORD Mode
Job Command 05:
Record Cancel
This Job Command erases the most recent data created in the RECORD Ready mode, and returns you to the RECORD mode BANK Directory display. The same result can also be accomplished by pressing the Fast REWIND button followed by the RECord button.

Details On The New Job Commands And Other Improved Features Of The Version 6 software For The QX1. By Tom Darter.

EDIT Mode
Job Command 17:
Measure Erase
This new operation allows you to erase data from specific measures in your compositions, while leaving the original measure structure intact. This function only operates on the currently-selected EDIT track.

After calling up this Job Command, you are asked to specify the TOP and LAST measures, and press ENTER. Be advised, though: This Job Command functions like most of the other "Increaseable Space" Job Commands in EDIT mode: Unlike many of the QX1 Utility Job Commands, this one *does not* have a secondary, "Are you sure?" step. Once you press ENTER, the deed is done. (Of course, if you accidently delete measures that you do not wish to delete, you can restore them using Edit Job Command 16—Edit Cancel.)

Compare this Job Command to Utility Job Command 20 (Measure Delete). Measure Delete erases both the data in the measures and *the measures themselves*. Also, Utility Job Command 20 erases measures for all tracks in the chosen BANK, while Edit Job Command 17 only erases data from the currently selected EDIT track.

UTILITY Mode
Job Command 24:
Bulk Delete
This new Job Command allows you to erase Bulk data from a QX1 disk, a function that was, surprisingly enough, *not* available in earlier QX1 software. This Job Command makes it possible to edit and update your QX1 Bulk data files.

**UTILITY Mode**
Job Command 25:
TX Voice In
The QX1 is optimized for use with the TX816 rack-mount FM digital tone-generator system. Even so, the earlier versions of QX1 software made it difficult to save a set of TX816 voices to a QX1 disk: It was necessary to have *two* Bulk memories for each TF1 module in the TX816 (one for voice data, and one for function data).

In order to save a complete set of TX816 voices to a QX1 disk, it was necessary to use sixteen complete operations of Utility Job Command 21 (Bulk In). For each one of these operations, you had to specify the MIDI OUT

 QX1 *Continued*

terminal which would initiate each Bulk Dump Request signal, the MIDI channel for each operation, and the Bulk data Format code. It was also necessary to make sure that the names of these Bulks contained information that let you know which module they came from, and whether they consisted of voice or function data.
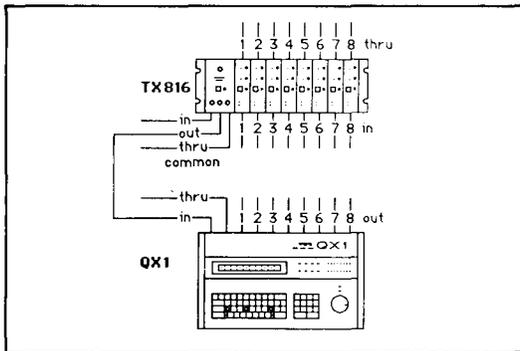
Basic MIDI connections to take advantage of the QX1's new "TX Voice In" and "TX Voice Out" Job Commands when working with the TX816.

Also, since each QX1 disk can hold only 16 Bulks, it was impossible to store more than one set of TX voices on a disk using Utility Job Command 21. This made it very hard to establish a TX voice filing system.

With the new Version 6 software, this entire situation is changed. Using Utility Job Commands 25 and 26 ("TX Voice In" and "TX Voice Out"), it is possible to store or load an *entire* set of TX816 voices using only one Job Command operation.

In order to take advantage of this new Utility operation, start by making sure that you have the correct MIDI connections between the QX1 and TX816. First, connect each one of the QX1's numbered MIDI OUT ports to the same-numbered MIDI IN ports of the TX816: These ports can be found on the back panel of the individual TF1 modules in the TX816. (These are the TX816's Individual MIDI IN ports.) Next, connect the QX1's MIDI IN port to the TX816's MIDI OUT port, located on the front panel of the TX's master control module. (See the accompanying diagram.) Finally, make sure that each module in the TX816 is set to Individual mode (using the buttons on the front panel of each TF1 module).

Now call up Utility Job Command 25. Specify the Bulk number (1-16) and press ENTER. Then type in the name for the Bulk (using up to eight characters) and press ENTER again. At this point, all you have to do is follow the prompts from the QX1: It will tell you to set the TX816's OUT slot to 1 (using the button on the front panel of the TX's master control

module) and press ENTER. After the QX1 is finished with module 1, it will prompt you again, asking you to set the TX816's OUT slot to 2 and press ENTER again. The operation continues in this fashion until the data from all eight modules has been stored on the QX1 disk.

Before pressing the ENTER key each time, make sure that the OUT slot specified by the QX1 matches the one you have chosen on the TX816. This will ensure that it will be possible to load this data back into the TX816 without problems (using Utility Job Command 26).

Remember that Utility Job Command 25 can *only* be used in conjunction with the TX816. When saving data from any other Yamaha X series instrument (including the TX216) onto a QX1 disk, it is necessary to use Utility Job Command 21.

Obviously, the new "TX Voice In" Job Command can save you a lot of time. Also, it will make it much easier to develop a file system for TX816 voice sets. Each complete TX816 Voice Bulk uses about 65K bytes of memory: Since each QX1 disk can hold 795K bytes of data, it is possible to store up to *twelve* complete sets of TX816 voice data on one disk using Utility Job Command 25 (TX Voice In). With the earlier Bulk storage format, it was only possible to store *one* set of TX816 voices on each QX1 disk.

UTILITY Mode
Job Command 26:
TX Voice Out

This Job Command allows you to load Bulk data (created using Utility Job Command 25) back into the TX816, using just one Job Command operation.

To use this function, first make sure that you have the proper MIDI connections between the QX1 and the TX816. (Use the setup described above—see the accompanying diagram.) Also, make sure that all of the TX816 modules are set to the Individual mode.

After calling up Utility Job Command 26, specify the Bulk number and press ENTER. The QX1 will ask "Are you sure?" Answer "yes" by entering "Y" (hold the Down-SHIFT button and press the TRNS/Y button). The QX1 will take care of everything else, and will load all of the patch data into the TX816 without any further prompting.

Remember that this Job Command can only be used to load Bulk data that was saved to the

QX1 disk using Utility Job Command 25 (TX Voice In), and that this Job Command can only be used in conjunction with the TX816. Also, TX816 Bulk data loaded using Utility Job Command 21 (Bulk In) *cannot* be reloaded into the TX816 using this Job Command.

UTILITY Mode
Job Command 27:
Time Sign Modify

Those of you who use the QX1's EDIT mode a lot know that it is possible to specify a different time signature for each measure of your composition (in the EDIT "Increaseable Space" mode). If you deal with changing time signatures a lot, you also know that it is important to specify the time signatures *before* you enter any data into the measures.

Here's the problem: If you change a time signature in EDIT mode for a measure that already has note data (or data of any kind) in it, you will find that the QX1 will become confused. In fact, the QX1 will lock up completely when you try to exit EDIT mode. All of a sudden, you will find it impossible to access your data. Very vexing, to say the least!

Of course, you can avoid this problem by always making sure to enter the time signatures for each bar *before* entering any note data. No problem, except that it is sometimes necessary to change the timing of a musical passage (especially in film and TV work) *after* the note data has been entered.

What to do? First, make sure that you do not try to change time signatures (for bars with data in them) in EDIT mode! Get out of EDIT mode, and enter the UTILITY mode; then, call up Utility Job Command 27.

As with other Job Commands of this sort, the QX1 will ask you to specify the BANK, the TOP and LAST measures, and the new data (in this case, the new time signature). After you press ENTER, the QX1 will ask "Are you sure?" Answer "yes" by entering "Y" (hold the Down-SHIFT button and press the TRNS/Y button).

If measures are lengthened using this function, the extra space will be filled with rests; if measures are shortened, the excess data will be deleted from the end of the original measures.

Let's say that you use Utility Job Command 27 to change the time signature of a measure from 4/4 to 5/4. The new (5/4) measure will contain all of the original measure's data in its first four beats; the last beat of the new measure will be filled with rests.

Now let's change the time signature in the other direction: Let's say that you use Utility Job Command 27 to change the time signature of a measure from 4/4 to 3/4. The new (3/4) measure will contain the data of the first three beats of the original measure; the last beat of the original measure will be erased—lopped off from the end of the original measure!

Obviously, this new function is a very valuable one. Remember this: If you want to change the time signature of a measure that already contains data, *do not do it in EDIT mode!* Enter UTILITY mode and use Job Command 27.

This Job Command list includes all of the Job Command functions offered in the Version 6 software for the QX1.

QX1 Job Command Table

Play Mode		Utility Mode	
01	□ Disk Change	01	★ Disk Change
02	★ Status/Switch	02	★ Status
03	★ Output Assign	03	★ Chain Edit
		04	★ Chain Name Change
Record Mode		05	★ Chain Directory
01	□ Disk Change	06	★ Chain Delete
02	★ Status/Switch	07	★ Bank Name Change
03	★ Output Assign	08	★ Bank Backup
04	★ Receive Condition	09	★ Bank Copy
05	★ Record Cancel	10	★ Bank Delete
		11	★ Disk Initialize
Edit Mode		12	★ Disk ID Set
01	□ Disk Change	13	★ Disk Backup
02	□ Status/Switch	14	★ Track Mix
03	★ Output Assign	15	★ Track Delete
04	★ Receive Condition	16	★ Data In
05	★ Gate Time Ratio	17	★ Data Out
06	★ Steps Per Measure	18	★ Time Display
07	■ Copy Measure	19	★ Measure Insert
08	■ Transpose Measure	20	★ Measure Delete
09	■ Time Quantizing	21	★ Bulk In
10	■ Clock Move	22	★ Bulk Out
11	■ Gate Time Modify	23	★ Bulk Directory
12	■ Velocity Modify	24	★ Bulk Delete
13	■ Note Length Set	25	★ TX Voice In
14	■ Bend Delete	26	★ TX Voice Out
15	■ Control Delete	27	★ Time Sign Modify
16	■ Edit Cancel		
17	■ Measure Erase		

★ = All modes
□ = Play mode, Record mode, Edit mode
■ = Edit "Increasable Space" mode

RX21L

Using MIDI Key Assignments With The New Latin Percussion Rhythm Controller. By Tom Darter.

THE RX21L IS THE NEWEST member of the growing series of digital rhythm programmers from Yamaha. Using the same cost-effective format as the RX21, the RX21L gives the electronic musician control over 16 exciting Latin percussion sounds.

Since all of the RX digital rhythm programmers are equipped with MIDI, they offer musicians a number of interesting options: Through MIDI connections to other instruments, the overall capabilities of the RX series can be expanded far beyond those available in each basic unit.

One of the most exciting possibilities in this direction gives musicians the ability to play the various drum sounds in the RX instruments from a MIDI-equipped keyboard, such as the DX7 or KX88.

Notes are designated by numbers in MIDI code. The overall note range is 128 notes (0 to 127), far larger than the range of a piano. The standard key numbers on a 5-octave synthesizer such as the DX7 are 36 to 96.

The RX series units contains a routine whereby each of the drum sounds will respond to a certain MIDI key number. When the corresponding key is played on a MIDI keyboard, the drum assigned to that key number will sound.

RX21L digital rhythm programmer.

Perhaps the biggest advantage of this setup is that the RX units respond to velocity information sent via MIDI. So, if you control the drum sounds from a velocity-sensitive MIDI keyboard, you can play each sound with a wide variety of volume inflections. All of this is possible through MIDI, even though the RX series units aren't touch-sensitive by themselves.

All of the Yamaha drum machines have pre-assigned MIDI key numbers for the drum and percussion sounds they contain. The RX11 and RX15 allow you to change these key assignments, while the key assignments of the RX21 and RX21L are fixed.

The first part of the chart on page 15 shows how MIDI key numbers are assigned to the basic drum sounds of the original three RX units when they leave the factory. Since the RX11, RX15, and RX21 all share the same basic sounds, the factory assigned key numbers for those units are virtually identical.

The RX21L, on the other hand, offers an entirely new palette of percussion sounds: 3 conga sounds, 2 bongo sounds, 2 timbale sounds, 2 agogo sounds, 2 cuica sounds, 2 whistle sounds, tambourine, cowbell, and claves. All of these instruments have been given *new* MIDI key assignments. This means that these new Latin percussion sounds can be accessed (via MIDI) simultaneously with the basic drum sounds found in the RX11, RX15, and RX21. The MIDI key assignments for these new Latin percussion sounds can be found in the second part of the chart on page 15.

The basic setup for taking advantage of MIDI key assignments is simple: Just connect the MIDI OUT of your velocity-sensitive keyboard to the MIDI IN of your RX unit. From there on, each one of the machines works according to its own operational system. [For details on the MIDI operations of the RX11, RX15, and RX21 see the articles on RX Series MIDI key assignments in the Nov. '85 issue of AFTERTOUCH.] Here is the approach to use with the RX21L:

After turning the RX21L on, press the black MIDI control button. The display will read:

CLOCK: INTERNAL

Press the MIDI button again, and you will see:

RECEIVE CH = 01

Make sure that the RX21L is set to the same MIDI channel as your keyboard.

After setting the MIDI channel, press the MIDI button one more time. The display will show:

CH INFO AVAIL

With this display chosen, the RX21L will

respond to key information from your keyboard.

Switching to another section of the MIDI button's menu will disable the "CH INFO AVAIL" setting, and the RX21L will no longer respond to key information from your keyboard. Likewise, calling up any of the other functions from the black control keys, such as pattern PLAY or song PLAY, will disable the

MIDI channel connection.

You can, however, use the TEMPO, LEVEL, ACCENT, and instrument keys without interrupting the MIDI connection to the keyboard. This is important, because you may need to adjust these controls to take full advantage of the volume control supplied by the touch-sensitivity of the keyboard.

Note	Key #	RX11	RX15	RX21	RX21L
G# 1	44	BD2			
A 1	45	BD1	BD	BD	
(A# 1)					
B 1	47	TOM4			
C 2	48	TOM3	TOM3	TOM3	
C# 2	49	SD2			
D 2	50	TOM2	TOM2	TOM2	
D# 2	51	RIMSHOT	RIMSHOT		
E 2	52	SD1	SD	SD	
F 2	53	TOM1	TOM1	TOM1	
F# 2	54	CLAPS	CLAPS	CLAPS	
G 2	55	COWBELL	COWBELL		
G# 2	56	SHAKER	SHAKER		
A 2	57	HH CLOSED	HH CLOSED	HH CLOSED	
(A# 2)					
B 2	59	HH OPEN	HH OPEN	HH OPEN	
C 3	60	CRASH	CRASH	CRASH	
(C# 3)					
D 3	62	RIDE	RIDE		
(D#)					
E 3	64				CONGA L
F 3	65				CONGA H OPEN
F# 3	66				CONGA H MUTE
G 3	67				BONGO L
G# 3	68				BONGO H
A 3	69				TIMBALE L
A# 3	70				TIMBALE H
B 3	71				TAMBOURINE
C 4	72				COWBELL
C# 4	73				CLAVES
D 4	74				AGOGO L
D# 4	75				AGOGO H
E 4	76				CUICA L
F 4	78				CUICA H
F# 4	79				WHISTLE 1
G 4	80				WHISTLE 2

These are the MIDI key numbers assigned to the RX drum and percussion sounds when the instruments are shipped from the factory. The assignments can be changed in the RX11 and RX15, while those in the RX21 and RX21L are fixed.

Final Touch

A REV7 Sound-Effects Patch.

By Ken Como.

For all REV7 owners who are *Poltergeist* fans, here is a patch you will love. Start with the Reverse Gate preset, #24, and use these settings:

    LIVENESS: 6
    INITIAL DELAY: 100.0 ms
    1ST DELAY: 100.0 ms
    1ST LEVEL: 0%
    MODE: 4
    ROOM SIZE: x9.5
    DIFFUSION: 8

Finally, set the reverb mix to full reverb. Then, try it: "Mommy, Mommy . . . ."

REV7 digital reverberator.

*   *   *   *

Using The QX1 As A Sound-Effects Editor For Film And Video Projects.

By Leslie Mizzell.

I have found a way to use the QX1 as a very powerful sound-effects editor when working on film and video projects. It works very well when used with a SMPTE sync box such as the

QX1 digital sequence recorder.

Hot Tips On Programming And Recording The RX11, Using The QX1 For Film & Video Sound-Effects Control Without SMPTE, and Overdubbing Control Data On The QX21 & QX7; Plus A New REV7 Patch.

Roland SBX-80, but I have also used it to sync scenes two to three minutes long without using SMPTE, and have found it to be off no more than one frame by the end of the sequence. For most applications, this is better than can be hoped for when using other non-sync methods.

At this point, I will assume that SMPTE sync is *not* being used. First, enter EDIT mode on the QX1; name the scene you are working on, and then set up as follows:

    Tempo = 60
    Time Signature = 1/4

Okay, now you have some choices. If you are working in video, the frame rate is 30fps (frames-per-second); go to Job Command 06 (Steps Per Measure) and enter 0013—this will divide each measure into 30 equal divisions (frames).

For film, the usual division is 24fps; if that is what you need, go to Job Command 06 (Steps Per Measure) and enter 0016—this will divide the measure into 24 equal steps (frames). You can get sub-frame accuracy (if you need it) by entering 0008 for 48 steps (two per frame) or 0004 for 96 steps (four per frame).

To illustrate how this works, let's use a specific example. Here is a hypothetical sound-effects "hit chart" from a video tape:

    1) 00:01:11 dog bark
    2) 00:01:14 radar beep
    3) 00:02:28 door slam
    4) 00:03:27 radar beep
    5) 00:04:25 ray-gun blast

Let's say that your "dog bark" sound is stored in a sampling keyboard which is connected to the QX1's track 1; the "radar beeps" are in a DX7 connected to track 2; and the "door slam" and "ray gun blast" are in another DX7 which is connected to track 3.

Since we're dealing with video, enter 0013 for Steps Per Measure. Then go into Insert mode on track 1. The measure number in the display equals the seconds reading in SMPTE; so measure 0001 equals the 1st second, measure 0002 equals the 2nd second, and so on.

Looking at the "hit chart," we see that we have a dog bark at 1-second-11-frames. Enter in a key number to trigger the "dog bark," a note value for length, and make sure it starts at step

11 of measure 1.

Now, switch to track 2, and enter your "radar beeps" at measure 1 step 14, and measure 3 step 27. Do the same thing on track 3, with the addition of a Program Change command to change from the "door slam" to the "ray gun blast" somewhere between the two events.

If you drive the QX1 from a SMPTE sync box you can layer this stuff for an entire project without ever losing sync. Without SMPTE sync, it is still very good—I've used both methods with excellent results.

* * * *

Mixing And Programming Techniques For The RX11.

By Ken Como.

My basic setup for use of the RX11 is as follows: Instrument sounds are split full right and left in order to add effects in the main mixing console. The instruments panned right are dry while the left outputs are wet. By doing this, I am able to use a gated reverb (on a REV7) on the TOMs while keeping the rest of the instruments dry.

Also, by using two snare drum sounds, I can layer SD 1 over one of the TOMs to add "crack" to the programming—SD 2 holds down the main snare track. The amount of "crack" added by SD 1 is determined by its individual volume.

In addition to the standard sounds on the RX, I have found that you can alter the timbre of the given preset sounds by programming certain rhythms. Here is one example:

Set the Instrument Level of the CRASH cymbal to 00, and the Accent Level to about 15. Then program four accented hits on the CRASH cymbal, quantized for 1/4 notes. Now, quantize at 1/16, and program one *unaccented* CRASH right after each accented CRASH. The result will be a choked cymbal sound, since the *unaccented* CRASH will interrupt the normal envelope of the *accented* CRASH.

This method of programming will work in either real-time or step-time mode. The amount of timbre change is in direct relation to the quantize factor of the unaccented instrument sound—the rhythmic relationship between the accented and unaccented note.

By programming in this fashion, we are *interrupting* the envelope of the basic preset sound, thereby producing new percussive sound textures for use in rhythmic patterns. Remember, the timbre change is in direct relation to the Quantize factor of the unaccented event, since it defines the rhythmic relationship between the accented preset strike and the 00-volume unaccented strike.

* * * *

Mixing MIDI Control Changes On the QX21 & QX7.

By David Schoenbach.

You can add pitch-bend, breath-control, or any other controller information to an existing track by adding or mixing control data with your original performance. This will enable you to refine some types of expression that are hard to control while recording in real time. When mixing tracks that contain control data, you may notice an undesirable "jumping around" of the controller settings. Here is one way to avoid this problem by filtering out control changes during the initial performance:

1) Turn the Control Change function OFF (using Job Command C-2). This will filter out existing Control Change information.
2) Set the desired MIDI channel for recording (using Job Command A-6).
3) RECORD a part on track 1 (start by pressing RECORD, then START).
4) Now, move this part to track 2, using Track Down (Job Command B-3) or Exchange (Job Command B-1).
5) Turn the Control Change function ON (using Job Command C-2).
6) Turn the Echo Back function ON (using Job Command C-4). When this function is ON, incoming data at the MIDI IN jack (in this case controller data only) is mixed with note data already in the sequencer.
7) RECORD control changes *only* on track 1 until you are satisfied with the performance.
8) Track Down to track 2 (using Job Command B-3) to combine the two sets of data.

Using this approach, you can start by inputting note data *only*, and then add nuance by adding controller data as an overdub.

Questions

Answer To Questions From Readers.

CX5M music computer.

In the Questions column of the Jan. '86 issue of AFTERTOUCH, there was mention of a company called NYRAC, a distributor of software for MSX computers. I understand that these programs will run on the CX5M music computer. Can you give me more details on the *kinds* of programs available from NYRAC?

NYRAC distributes more than 150 MSX programs, many of which will operate on the CX5M. Here is a partial list of available titles in various areas:

MUSIC: *Voice Utility #1* from **TX Software**.

BUSINESS: *Wordprocessor, Cards* (database), *Mailshot* (wordprocessing plus *Cards*), and *Spreadsheet*, all from **Computermates**; *WDPro* (word processing) and *Home Budget*, both from **Kuma**; and *Database, Mailer, Home Accounts*, and *Stock Control*, all from **MST**.

RECREATIONAL: Many of the most popular game titles from **Activision**; a number of original games on SOFTCARD (software the size of a credit card!), all from **Electric**; and more than 20 of the best arcade games from **Konami**, all in cartridge form.

In addition, NYRAC offers an extensive selection of books on MSX computers, which cover topics like BASIC programming, MSX graphics and sound, machine code, and system routines.

For a complete catalog and price list, write to: NYRAC, P.O. Box 210173, Montgomery, AL 36121; or call 205-277-2048.

I am one of the many who have had problems with the Yamaha RAM-1 cartridge because I left the cartridge's Memory Protect switch in the ON position. Is there any way to retreive any of the data from a RAM-1 cartridge *after* a disaster has occurred?

Yes, there is. As we know, the glitch in the RAM-1 cartridge only happens when the Memory Protect switch is left ON: Essentially, the glitch goes through this switch position and randomly rewrites the memory. If this switch is left in the OFF position, no problems should arise.

If you have the switch in the ON position and a disaster does occur, it is still possible to transfer the voices off of the cartridge. This procedure uses the internal memory of the DX7, so make sure to store your internal voices elsewhere before starting. Then follow these steps:

1) For the *last* time, turn the RAM-1's Memory Protect switch ON.
2) Plug the cartridge into the DX7.
3) Turn on the DX7.
4) Enter the Test mode by holding down the FUNCTION, #16, and #32 buttons simultaneously.
5) Press the +1/YES button repeatedly, until you reach "TEST 9 RAM."
6) Press the #1 Voice Select button.
7) Turn the DX7 off; then turn it back on.
8) Check the Internal Memory of the DX7 for voices.
9) If the voices are there, then reformat the cartridge using Function 11.
10) Turn the cartridge's Memory Protect switch OFF, and resave the voices to the cartridge.

For more information on the Yamaha RAM-1 cartridge, see the Questions columns in the Jan. '86 and Feb. '86 issues of AFTERTOUCH.

Do you know of any colleges that offer any Summer courses or workshops on programming the DX7 or using the YCAMS instruments?

We have recently received information from three universities concerning Summer offerings that will focus on these areas. Here is the rundown:

Stanford University's Department of Music will be offering a Summer Workshop entitled "Synthesis And Composition On Small Advanced Systems." This two-week course will be offered twice, from 6/23 to 7/4 and from 7/7 to 7/18. The course will include a detailed

exploration of the theory and programming of the Yamaha X series of digital synthesizers, and will also explore MIDI-based music systems. Lectures are scheduled for weekday mornings, with afternoons reserved for "hands on" application sessions. Faculty will include John Chowning, Jean-Claude Risset, and David Bristow, plus guest lecturers Gary Leuenberger and Don Lewis. Each session will be limited to 15 participants. The fee for the course is $950. Applications and inquiries should be sent to CCRMA, Summer Workshops, Department of Music, Stanford University, Stanford, CA 94305; for information, call 415-723-4971.

San Jose State University's Summer Arts Institute will be presenting a hands-on course called "Computer/Electronic Music And Contemporary Media," which will be held at Cal Poly in San Luis Obispo from July 6th through August 3rd. Allen Strange will direct the four-week session, which will cover applications of computer and electronic music in relation to film, video, dance, theatre, poetry, and other dynamic arts. The scheduled guest faculty will include Morton Subotnick, Michael Boddicker, John Strawn, Dan Wyman, and Dominic Milano. In addition, the students will have the opportunity to work in an intermedia environment with leading artists, choreographers, dancers, film makers, actors, and directors. Yamaha X series instruments will be featured prominently in the workshop. For audition and registration/tuition information, write to Summer Arts 86, 400 Golden Shore Drive, Long Beach, CA 90802-4275; or call 213-590-5768. For further course details, contact Professor Allen Strange, Electro-Acoustic Studio, Department of Music, San Jose State University, San Jose, CA 95192; or call 408-277-2905.

The University of Chicago's Department of Music will offer an "FM Synthesis/MIDI Seminar" from July 14-27. The focus of the seminar will be the Yamaha Computer-Assisted Music System (YCAMS). Faculty and guest lecturers will include John Chowning, Suzanne Ciani, Jim Cooper, Terry Fryer, Gary Kendall, Gary Leuenberger, Howard Sandroff, and Morton Subotnick. Seminar tuition (including all course material) is $1100, and the application deadline is June 1st. For information and registration, write to: FM/MIDI Seminar, University of Chicago, Office of Continuing Education, 5835 South Kimbark Avenue, Chicago, IL 60647; or call 312-962-1722.

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

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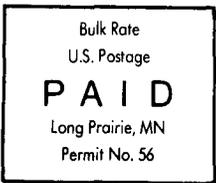
RX21L

Like many digital rhythm units, the RX21L does not have touch-sensitive drum keys. By itself, the machine offers only two volume levels for each drum sound—basic volume and accent volume. The overall volume range in the RX21L is 0-31, with the accent level being added to the basic level. Therefore, if you program the CONGA L to have a basic level of 23, setting the accent level to 08 will extend the accent level to the maximum volume of 31 (23 plus 8). Accent volume only occurs when you hold down the ACCENT key before striking one of the percussion keys.

In order to take advantage of the full range of volume offered by touch-sensitivity from the keyboard, you should set the basic level to cover the full range of volume you desire for each percussion sound, because the touch-sensitivity only operates within the basic range. (The accent level is added only when the ACCENT key is depressed.)

Also, remember that the RX21L's internal programming responds only to patterns played on its front-panel drum keys: It will not record percussion strokes played via MIDI into its internal PATTERN memory. This does not mean that the RX21L can only be used in live performance while connected to a MIDI keyboard—the keystrokes from the keyboard can be recorded into a MIDI sequencer, and on playback those keystrokes will drive the percussion sounds in the RX21L, complete with full velocity control.

Most of the RX21L's percussion sounds can be played simultaneously, with these exceptions (which cannot coexist in the *exact* same time space): CONGA H OPEN and CONGA H MUTE; CUICA L and CUICA H; WHISTLE 1 and WHISTLE 2.