

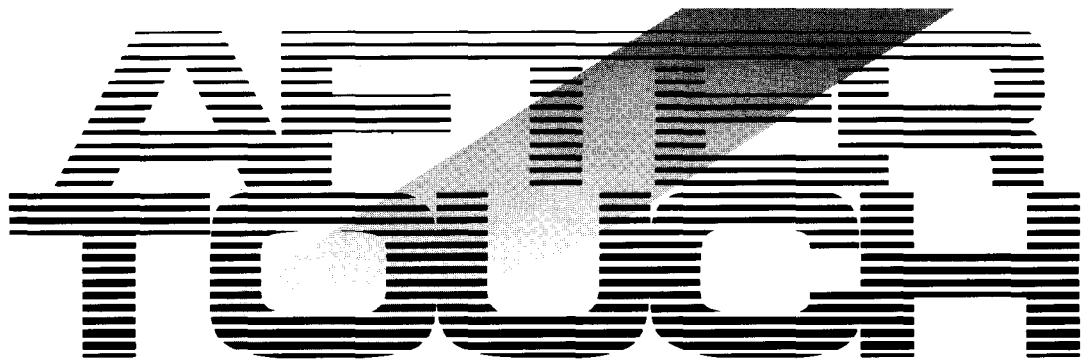
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KX76



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 YAMAHA®



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From The Editor

WELCOME TO OUR 13TH ISSUE! This milestone marks the beginning of the second year of publication for AfterTouch. We've really enjoyed putting the magazine together for you, and we've appreciated all the feedback we've received. Keep it coming!

In this issue, you will find a wide array of FM voices: two 4-operator voices for the DX100, one DX7 patch, and a complete, eight-slot, combination voice for the TX816! Of course, all of these voices can be used with many other units, so give them a try.

Also, you will find information on the KX88/76 MIDI keyboard controllers and on the YRM504 FM Music Macro II Program cartridge for the CX5M, plus hot tips from readers for the REV7, CX5M, and QX7/21.

And now, in keeping with recent tradition, I would like to share some more information with you on how to get material concerning Yamaha products. This time, we are revisiting territory originally covered in the Questions column:

Service Manuals & Owners Manuals: In the May 1986 issue, we printed some information (in the Questions column) on how After-Touch readers (and all users of Yamaha professional musical products) could get service manuals and owners manuals. Although the specific question concerned manuals for instruments no longer in manufacture, the answer was intended to cover *all* manuals (for both current and older products).

Well, since then, the basic procedure for ordering manuals has changed somewhat, so I

would like to give you the correct, up-to-date information:

Service manuals may be purchased by the consumer through the Yamaha Electronic Service Division Parts Department if available. Some of the older model service manuals may not be available. Inquiries and orders can be made by phoning 800-654-3687 from California, or 800-854-3619 from all other states. The call will be answered by an automated reception system; if you have a touchtone phone, you can reach the Parts Department directly by dialing 604 after the automated service answers. If you don't have a touchtone phone, just wait for one of the attendants to answer your call.

Owners manuals must be purchased from an authorized Yamaha Digital Musical Instruments retailer. (Owners manuals are not available directly from Yamaha.) The authorized retailer may order owners manuals for any correct Yamaha product, as well as for a wide variety of discontinued products. Contact your local authorized Yamaha dealer for details.

We would like to apologize for any inconvenience that may have resulted from recent use of the now-incorrect information concerning manuals published in our May 1985 issue.

Next month we will focus on MIDI accessory units such as the YME8, YMM2, and YMC10, and show how you can use them to expand the capabilities of your MIDI music system. There will also be more patches from readers, plus a long-overdue visit to the Questions column to answer some of your recent queries. See you then!

—TD

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Also, don't limit yourself to just sending in your address. Let us know what kind of articles you want to read. The more input we receive, the more we will be able to tailor the information in AFTERTOUCHE to suit your musical needs.

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**PLUKD
CLAV. A
New DX7
Voice By
Brian
Kapitan.**

TRI	21	0	0	0	ON	4
WAVE	SPEED	DELAY	PMD	AMD	SYNC	PMS
LFO						
R1	R2	R3	R4	C3		
99	99	99	99	KEY TRANSPOSE		
L1	L2	L3	L4	ON		
50	50	50	50	OSC SYNC		
PITCH ENVELOPE						

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	7.00	DETUNE	0	AMS	0
ENVELOPE DATA					
R1	R2	R3	R4	R5	
90	67	21	82		0
L1	L2	L3	L4		
99	85	0	0		
KEYBOARD SCALING					
CURVE BREAKPOINT DEPTH					
L	-L	D#1	L		0
R	-E		R		2
OP#	OUTPUT LEVEL	VELOCITY			
4	78	7			

FREQUENCY	2570Hz	DETUNE	0	AMS	0
ENVELOPE DATA					
R1	R2	R3	R4	R5	
99	82	75	0		0
L1	L2	L3	L4		
99	87	0	0		
KEYBOARD SCALING					
CURVE BREAKPOINT DEPTH					
L	-L	D3	L		30
R	-L		R		0
OP#	OUTPUT LEVEL	VELOCITY			
6	99	1			

FREQUENCY	11.22	DETUNE	-2	AMS	0
ENVELOPE DATA					
R1	R2	R3	R4	R5	
75	45	36	19		2
L1	L2	L3	L4		
99	87	0	0		
KEYBOARD SCALING					
CURVE BREAKPOINT DEPTH					
L	+L	A-1	L		0
R	-L		R		18
OP#	OUTPUT LEVEL	VELOCITY			
2	67	6			

FREQUENCY	0.50	DETUNE	0	AMS	0
ENVELOPE DATA					
R1	R2	R3	R4	R5	
99	30	34	46		0
L1	L2	L3	L4		
99	80	0	0		
KEYBOARD SCALING					
CURVE BREAKPOINT DEPTH					
L	-L	A-1	L		0
R	-L		R		0
OP#	OUTPUT LEVEL	VELOCITY			
3	99	7			

FREQUENCY	3.00	DETUNE	0	AMS	0
ENVELOPE DATA					
R1	R2	R3	R4	R5	
99	64	0	8		0
L1	L2	L3	L4		
85	48	0	0		
KEYBOARD SCALING					
CURVE BREAKPOINT DEPTH					
L	-L	A#2	L		0
R	-L		R		25
OP#	OUTPUT LEVEL	VELOCITY			
5	99	4			

FREQUENCY	1.000Hz	DETUNE	0	AMS	0
ENVELOPE DATA					
R1	R2	R3	R4	R5	
99	33	14	38		2
L1	L2	L3	L4		
99	80	0	0		
KEYBOARD SCALING					
CURVE BREAKPOINT DEPTH					
L	+L	E3	L		99
R	-L		R		0
OP#	OUTPUT LEVEL	VELOCITY			
1	99	1			

ALGORITHM #16

Notes:

Try releasing a key quickly to create unusual harmonic structures.

This DX7 voice 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.

TX816

THIS TX816 VOICE PATCH USES ALL eight of the slots in a TX816 FM digital rack-mount tone generator system. The sounds are created in groups of two. What this means is that you can still take advantage of these sounds, even if you don't own a complete TX816 system. If you have a TX216, two DX7s, or a DX7/TX7 combination, you can reproduce each individual sound in this TX816 setup.

If you *do* have a full TX816 rack, the sounds are set up to be playable as follows:

Electric Piano—playable in all ranges

Strings—assigned to foot controller, playable in all ranges

Brass—assigned to breath controller, playable in middle/upper ranges

Bass—playable in low ranges (level scaling prohibits upper ranges)

Because the voice charts contains so much data, we did not have enough space to reproduce a graphic representation of each algorithm. However, we did provide you with information concerning the structure of each algorithm, under the column labelled "ALS." In that column, each Carrier operator is indicated with a "C." Modulator operators are indicated by numbers that represent the Carrier operators that they are modulating. Operators involved in the feedback loop are indicated by a dot in front of their number in the "# OP" column.

Here are notes on the various sound pairs that make up this combination sound for the TX816:

SLOTS 1 & 2

Electric Piano sound:

Rhodes1/Rhodes2

This electric piano sound differs somewhat from the normal DX/TX electric piano sound. It was created using a component voicing approach: Slot 1 creates the body of the sound, while slot 2 creates the tine sound and the "knock" of a traditional electric piano. Changing the frequencies of operators #3, 4, and 5 in slot 2 will produce different types of tine sounds.

SLOTS 3 & 4

String sound:

Live Str1/Live Str2

Scott did all the hard work on this sound, which has reverb built in! This FM voicing

technique that has been around for about a year, but has just recently caught on with sound programmers. The key to the reverb in this sound is the fixed frequency modulator in the number two position in a stack.

SLOTS 5 & 6

Horn sound:

BloHorns1/BloHorns2

It is sometimes difficult to create brass sounds that play well with both a slower, softer attack and a faster, sharper attack. When using the breath controller, however, many of the concerns in programming such a sound are minimized. Changing Rate 1 for operator #1 in both voices should allow you to fine tune the sounds to suit your own taste.

SLOTS 7 & 8

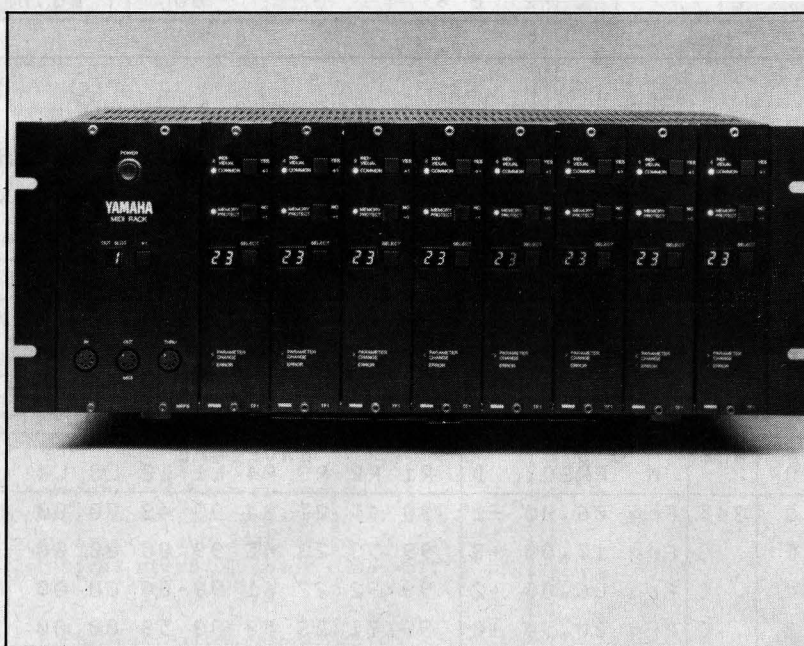
Bass sound:

SuprBas1/SuprBas2

SuprBas1 is an edit to the now famous SUPERBASS DX7 voice. (the author of that voice is unknown to us, so if the original author

An Introduction To A New TX816 Combination Patch. By Scott Plunkett & Michael A. Huisman.

The data charts for these eight voices can be found on pages 6-9.



happens to be reading—nice, very nice . . .). The edits smooth out the voice so that it can be combined with another sound—the SUPERBASS voice is great by itself but sometimes is too strong to combine with other voices. SuprBas2 is more of a Moog-type bass sound. Combining these two voices together seemed to work well. If you play in mono mode, you can get a Chicago/David Foster type of bass sound.

TX816 rack-mount FM digital tone generator system.

TX816 Continued

Rhodes1. By Scott Plunkett & Michael A. Huisman.

VOICE NO.:01 VOICE NAME : Rhodes1

ALGORITHM: #06 TRANSPOSE:MIDDLE C=C 2 F.B.LEVEL: 04 OSC KEY SYNC: ON

PITCH ENVELOPE								L F O						
PR1	PR2	PR3	PR4	PL1	PL2	PL3	PL4	WAVE	SPD	DLV	PMD	AMD	PMS	SYNC
99	99	99	99	50	50	50	50	TRIANGL	14	00	01	00	1	OFF

# OP	ALS	O S C			ENVELOPE								KBD SCALE				S			OL		
		M	FREQ.	D	R1	R2	R3	R4	L1	L2	L3	L4	LD	LC	BP	RD	RC	Krs	Kvs		Ams	
.6	5	Frq	01.00	+7	95	29	20	50	99	81	82	00	04	+L	D	3	34	-L	3	4	3	77
.5	C	Frq	01.00	+6	94	20	20	45	99	95	00	00	00	-L	G#2	00	-L	4	4	3	99	
4	3	Fix	87.18	+0	99	60	35	74	99	35	27	00	10	+L	F	2	54	+L	3	3	3	85
3	C	Frq	01.00	+0	95	50	62	73	99	00	00	00	00	-L	G	3	99	+L	2	3	3	93
2	1	Frq	01.00	+5	99	21	00	76	97	44	00	00	10	+L	D	3	12	-L	3	5	3	89
1	C	Frq	01.00	-4	99	24	57	53	99	00	00	00	00	-L	A	-1	00	-L	3	5	3	98

POLY/MONO			<PORTAMENTO>			<MODULATION>					
POLY			Mode	Glsnd	Time	M.W	F.C	A.T	B.C		
POLY			Retain	OFF	00	Range	08	08	15	08	
LEVEL ATT			Split	<P.B.WHEEL>		Pitch	ON	OFF	OFF	OFF	
07			Low	High	Range	Step	Amplt	OFF	OFF	OFF	OFF
07			C -2	G 8	07	00	EG.bi	OFF	OFF	OFF	OFF

Rhodes2. By Scott Plunkett & Michael A. Huisman.

VOICE NO.:02 VOICE NAME : Rhodes2

ALGORITHM: #22 TRANSPOSE:MIDDLE C=C 4 F.B.LEVEL: 07 OSC KEY SYNC: ON

PITCH ENVELOPE								L F O						
PR1	PR2	PR3	PR4	PL1	PL2	PL3	PL4	WAVE	SPD	DLV	PMD	AMD	PMS	SYNC
82	99	99	99	50	50	50	50	SAW DWN	15	00	02	00	4	OFF

# OP	ALS	O S C			ENVELOPE								KBD SCALE				S			OL		
		M	FREQ.	D	R1	R2	R3	R4	L1	L2	L3	L4	LD	LC	BP	RD	RC	Krs	Kvs		Ams	
.6	345	Frq	06.00	+1	99	45	27	34	99	48	00	00	20	-L	C	4	00	-L	3	4	0	80
5	C	Frq	17.00	+3	99	58	23	45	99	00	00	00	99	-L	E	4	24	+E	3	5	0	73
4	C	Frq	06.08	+2	99	92	22	61	99	00	00	00	99	-L	E	3	16	-L	2	6	0	73
3	C	Frq	00.50	+0	99	71	23	58	99	59	00	00	99	-L	E	3	08	-L	2	5	0	80
2	1	Fix	75.86	+0	99	62	69	40	99	00	00	00	00	-L	G#3	99	+L	2	1	0	94	
1	C	Frq	00.50	+7	99	62	69	40	99	22	00	00	00	-L	A#2	00	-E	2	5	0	99	

POLY/MONO			<PORTAMENTO>			<MODULATION>					
POLY			Mode	Glsnd	Time	M.W	F.C	A.T	B.C		
POLY			Retain	OFF	00	Range	08	08	15	08	
LEVEL ATT			Split	<P.B.WHEEL>		Pitch	ON	OFF	OFF	OFF	
07			Low	High	Range	Step	Amplt	OFF	OFF	OFF	OFF
07			C -2	G 8	07	00	EG.bi	OFF	OFF	OFF	OFF

Live Str1. By Scott Plunkett & Michael A. Huisman.

VOICE NO.:03		VOICE NAME : Live Str1																															
ALGORITHM: #15		TRANSPOSE:MIDDLE C=C 3				F.B.LEVEL: 07				OSC KEY SYNC: OFF																							
PR1		PR2		PITCH ENVELOPE		PR3		PR4		PL1		PL2		PL3		PL4		WAVE		SPD		DLY		L F O		PMD		AMD		PMS		SYNC	
84		95		95		60		50		50		50		50		50		SINE		30		00		18		00		1		OFF			
# OP	ALS	M	O	S	C	D	R1	R2	R3	R4	L1	L2	L3	L4	LD	LC	KBD	SCALE	BP	RD	RC	Krs	Kvs	S	Ams	OL							
6	4	Frq	03.00	-7			84	36	10	16	99	99	95	00	00	+L	C#4	00	-L	0	0	0	0	0	59								
5	4	Frq	01.00	-6			84	36	10	12	99	99	95	00	18	+L	C#4	00	-L	0	1	0	0	0	75								
4	3	Fix	2.455	-3			84	36	10	00	99	99	99	00	06	-L	B 2	00	-L	0	1	0	0	0	80								
3	C	Frq	01.00	+6			38	07	07	41	93	92	92	00	31	-L	A 2	00	-L	0	1	3	0	0	99								
.2	1	Frq	01.00	+7			44	36	10	22	99	99	99	00	00	-L	G 2	00	-L	0	1	0	0	0	78								
1	C	Fix	1.820	+0			45	35	10	48	99	99	99	00	31	-L	A 2	00	-L	0	1	3	0	0	99								
POLY/MONO		<PORTAMENTO>				Mode		Glissnd		Time		<MODULATION>				M.W		F.C		A.T		B.C											
POLY		Retain				OFF		00		Range				08		15		08		15													
LEVEL ATT		Split		<P.B.WHEEL>		Range		Step		Pitch				ON		OFF		OFF		OFF		OFF											
07		C -2 6 8		07		00		Amplt				OFF		OFF		OFF		OFF		OFF		OFF											
								EG.bi				OFF		ON		OFF		OFF		OFF		OFF											

Live Str2. By Scott Plunkett & Michael A. Huisman.

VOICE NO.:04		VOICE NAME : Live Str2																															
ALGORITHM: #15		TRANSPOSE:MIDDLE C=C 3				F.B.LEVEL: 07				OSC KEY SYNC: OFF																							
PR1		PR2		PITCH ENVELOPE		PR3		PR4		PL1		PL2		PL3		PL4		WAVE		SPD		DLY		L F O		PMD		AMD		PMS		SYNC	
84		95		95		60		50		50		50		50		50		SINE		31		00		33		00		1		OFF			
# OP	ALS	M	O	S	C	D	R1	R2	R3	R4	L1	L2	L3	L4	LD	LC	KBD	SCALE	BP	RD	RC	Krs	Kvs	S	Ams	OL							
6	4	Frq	03.00	+6			84	36	10	00	99	99	95	08	00	+L	C#4	00	-L	0	0	0	0	0	68								
5	4	Frq	01.00	+6			84	36	10	00	99	99	95	07	18	+L	C#4	00	-L	0	1	0	0	0	74								
4	3	Fix	2.951	-3			84	36	10	00	99	99	99	00	06	-L	B 2	00	-L	0	1	0	0	0	77								
3	C	Frq	01.00	-5			37	12	10	42	96	94	94	00	31	-L	A 2	00	-L	0	2	3	0	0	99								
.2	1	Frq	01.00	-6			44	36	10	34	99	99	99	00	00	-L	B 2	00	-L	0	1	0	0	0	76								
1	C	Fix	1.905	+0			56	35	10	43	99	99	99	00	31	-L	A 2	00	-L	0	1	3	0	0	92								
POLY/MONO		<PORTAMENTO>				Mode		Glissnd		Time		<MODULATION>				M.W		F.C		A.T		B.C											
POLY		Retain				OFF		00		Range				08		15		08		15													
LEVEL ATT		Split		<P.B.WHEEL>		Range		Step		Pitch				ON		OFF		OFF		OFF		OFF											
07		C -2 6 8		07		00		Amplt				OFF		OFF		OFF		OFF		OFF		OFF											
								EG.bi				OFF		ON		OFF		OFF		OFF		OFF											

X816 Continued

BloHorns1. By Scott Plunkett & Michael A. Huisman.

VOICE NO.: 05		VOICE NAME : BloHorns1																																							
ALGORITHM: #18				TRANSPOSE: MIDDLE C=C 3				F.B.LEVEL: 07				OSC KEY SYNC: ON																													
PR1		PR2		PITCH ENVELOPE PR3 PR4		PL1		PL2		PL3		PL4		WAVE		SPD		L F 0 DLY PMD		AMD		PMS SYNC																			
92		93		88		60		47		49		50		50		SINE		29		00		00 00 3 OFF																			
# OP	ALS	M	O S C FREQ.	D	ENVELOPE								KBD SCALE				S			OL																					
					R1	R2	R3	R4	L1	L2	L3	L4	LD	LC	BP	RD	RC	Krs	Kvs		Ams																				
6	5	Frq	01.00	-1	42	39	28	03	99	94	88	07	04	+L	F	2	00	-E	0	1	0	70																			
5	4	Frq	01.00	-5	60	39	31	40	99	98	81	01	24	-L	C	3	00	+L	0	3	0	82																			
4	1	Fix	2.512	+1	49	39	32	46	99	98	81	00	24	-L	D	4	16	-L	0	3	0	82																			
.3	1	Frq	01.00	-5	60	39	32	67	99	81	81	00	35	-L	C	3	02	-L	0	3	0	78																			
2	1	Frq	01.00	-5	61	46	42	71	99	98	86	00	49	-L	F#3	00	+L	0	2	0	80																				
1	C	Frq	01.00	-5	59	30	32	56	99	77	81	00	00	+L	C	4	00	+L	3	7	3	95																			
POLY/MONO		<PORTAMENTO>			Mode			Glissnd			Time			<MODULATION>				M.W				F.C				A.T				B.C											
POLY		Retain			OFF			00			Range				08				08				08				15														
LEVEL ATT		Split			Low			High			<P.B.WHEEL>			Range				Step				Pitch				ON				OFF				OFF				OFF			
07		C -2			G 8			07			00			EG.bi				OFF				OFF				OFF				ON											

BloHorns2. By Scott Plunkett & Michael A. Huisman.

VOICE NO.: 06		VOICE NAME : BloHorns2																																							
ALGORITHM: #18				TRANSPOSE: MIDDLE C=C 2				F.B.LEVEL: 07				OSC KEY SYNC: ON																													
PR1		PR2		PITCH ENVELOPE PR3 PR4		PL1		PL2		PL3		PL4		WAVE		SPD		L F 0 DLY PMD		AMD		PMS SYNC																			
81		63		95		60		52		50		50		50		TRIANGL		30		44		05 00 3 OFF																			
# OP	ALS	M	O S C FREQ.	D	ENVELOPE								KBD SCALE				S			OL																					
					R1	R2	R3	R4	L1	L2	L3	L4	LD	LC	BP	RD	RC	Krs	Kvs		Ams																				
6	5	Frq	01.01	+0	99	80	20	70	99	75	00	00	00	-L	A	-1	00	-L	7	1	0	97																			
5	4	Frq	01.00	-1	83	22	16	50	97	61	00	00	00	-L	A	-1	00	-L	0	1	0	81																			
4	1	Frq	01.00	+0	66	28	15	50	75	75	50	00	00	-L	A	-1	00	-L	0	1	0	99																			
.3	1	Frq	01.00	-6	44	15	17	56	99	86	86	00	00	-L	G	3	00	-L	2	0	0	74																			
2	1	Frq	01.00	+1	48	19	15	64	88	77	00	00	00	-L	A	-1	00	-L	2	2	0	94																			
1	C	Fix	1.000	+0	49	24	19	60	99	86	86	00	00	-L	A	-1	00	-L	2	2	3	99																			
POLY/MONO		<PORTAMENTO>			Mode			Glissnd			Time			<MODULATION>				M.W				F.C				A.T				B.C											
POLY		Retain			OFF			00			Range				03				08				08				15														
LEVEL ATT		Split			Low			High			<P.B.WHEEL>			Range				Step				Pitch				ON				OFF				OFF				OFF			
07		C -2			G 8			07			00			EG.bi				OFF				OFF				OFF				ON											

SuprBas1. By Michael A. Huisman.

VOICE NO.: 07 VOICE NAME : SuprBas1

ALGORITHM: #17 TRANSPOSE: MIDDLE C=C 3 F.B.LEVEL: 07 OSC KEY SYNC: ON

PR1	PR2	PITCH		ENVELOPE				WAVE	SPD	DLY	L	F	O	AMD	PMS	SYNC
		PR3	PR4	PL1	PL2	PL3	PL4				PMD					
99	99	99	99	54	50	50	50	TRIANG	31	00	00	00	00	3	ON	

# OP	ALS	M	O	S	C	FREQ.	D	ENVELOPE								KBD SCALE					Kvs	S	Ams	OL	
								R1	R2	R3	R4	L1	L2	L3	L4	LD	LC	BP	RD	RC					Krs
6	5	Fix	416.9	+0				99	99	65	99	99	99	00	00	00	-L	A	-1	00	-L	4	3	0	99
5	1	Frq	07.00	-2				99	99	38	99	99	99	00	00	00	-L	E	3	99	-L	7	7	0	70
4	3	Frq	03.00	-2				81	53	41	78	99	97	00	00	00	-L	G	3	99	-L	7	7	0	78
3	1	Frq	00.50	+6				61	99	99	14	99	99	99	00	00	-L	A	-1	00	-L	7	1	0	75
.2	1	Frq	02.02	-5				95	99	19	59	84	86	00	00	00	-L	A	-1	00	-L	5	5	0	83
1	C	Frq	01.00	+2				99	64	33	67	99	86	00	00	00	-L	D	3	99	-L	2	2	0	99

POLY/MONO	<PORTAMENTO> Mode	Glsnd	Time
POLY	Retain	OFF	00

<MODULATION>				
	M.W	F.C	A.T	B.C
Range	08	08	08	15
Pitch	ON	OFF	OFF	OFF
Amplt	OFF	OFF	OFF	OFF
EG.bi	OFF	OFF	OFF	OFF

LEVEL ATT	Split Low High	<P.B.WHEEL> Range Step
07	C -2 G 8	07 00

SuprBas2. By Michael A. Huisman.

VOICE NO.: 08 VOICE NAME : SuprBas2

ALGORITHM: #22 TRANSPOSE: MIDDLE C=C 3 F.B.LEVEL: 04 OSC KEY SYNC: ON

PR1	PR2	PITCH		ENVELOPE				WAVE	SPD	DLY	L	F	O	AMD	PMS	SYNC
		PR3	PR4	PL1	PL2	PL3	PL4				PMD					
99	95	95	60	50	50	50	50	SINE	29	63	35	08	08	1	OFF	

# OP	ALS	M	O	S	C	FREQ.	D	ENVELOPE								KBD SCALE					Kvs	S	Ams	OL	
								R1	R2	R3	R4	L1	L2	L3	L4	LD	LC	BP	RD	RC					Krs
.6	345	Frq	01.00	+0				81	88	38	48	93	99	00	00	00	-L	F	2	99	-L	3	7	0	94
5	C	Frq	00.50	+0				99	05	00	99	99	92	00	00	00	-L	F	2	99	-L	3	0	0	99
4	C	Frq	01.00	+0				99	05	00	99	99	92	00	00	00	-L	F	2	99	-L	3	0	0	96
3	C	Frq	01.00	+0				99	05	00	99	99	92	00	00	00	-L	F	2	99	-L	3	0	3	95
2	1	Frq	00.50	-5				99	73	46	53	99	99	00	00	00	-L	A	-1	00	-L	3	3	1	92
1	C	Frq	01.00	-5				99	29	35	99	99	99	07	00	00	-L	F	2	99	-L	3	1	3	99

POLY/MONO	<PORTAMENTO> Mode	Glsnd	Time
POLY	Retain	OFF	00

<MODULATION>				
	M.W	F.C	A.T	B.C
Range	08	08	08	15
Pitch	ON	OFF	OFF	OFF
Amplt	OFF	OFF	OFF	OFF
EG.bi	OFF	OFF	OFF	OFF

LEVEL ATT	Split Low High	<P.B.WHEEL> Range Step
07	C -2 G 8	07 00

X Series

Use The KX88 Or KX76 For Real-Time Control Of FM Voice Parameters.
By Bob Frye.

WHILE THE KEYBOARD FEEL OF the KX88 and KX76 MIDI keyboards makes them attractive for many musicians, it is the programmability of the nineteen available performance controllers which makes the instruments so versatile. These controllers give musicians an unprecedented amount of control over timbre and gestural nuance. In the electronic medium, these gestural expressions may be interpreted and translated into new musical techniques and languages. And, of course, many of the day to day problems that the professional musician encounters with MIDI may also be solved with the KX Series.

The KX88 and KX76 have three operating modes: Play, Controller Assign (CA), and

be changed easily and quickly by loading any one of the sixteen Code Memories into active use.

Controller Assign Mode

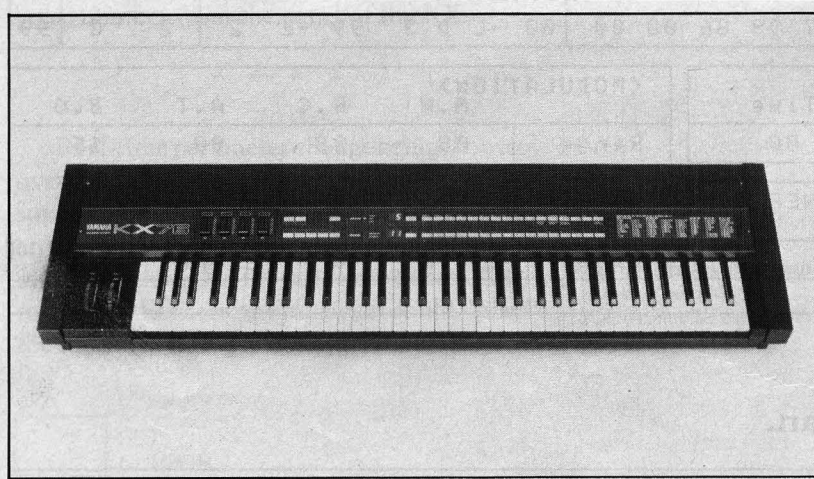
The actual programming of the performance controllers is done in the Controller Assign Mode, (and, for more adventurous tasks, the Parameter Assign Mode). The Controller Assign Mode allows the user to take any of the Controller Code preset functions (assigned to hexadecimal numbers 00-3F) as well as any of the user-definable Controller Codes (hexadecimal numbers 40-FF) and assign them to any of the performance controllers. The preset functions cover those MIDI jobs that are most often used, such as Pitch Bend, Modulation, Breath Control, Transpose, MIDI Channel Assign, Volume, MIDI Clock Speed (for the internal MIDI clock), MIDI Start and Stop, and many others.

Parameter Assign Mode

The real power of the KX Series lies in the Parameter Assign Mode. In this mode, any of the 192 user-definable Controller Codes may be defined to be *any* MIDI code. Once defined, these codes are then assigned to performance controllers in the CA Mode.

There are two main sub-modes of PA Mode, Parameter Change and Universal Parameter. The Parameter Change sub-mode enables you to assign any Yamaha System Exclusive MIDI code to any of the 192 undefined Controller Codes (hexadecimal numbers 40-FF). With the Universal Parameter sub-mode, you can assign any other manufacturer's MIDI codes to one of the UP controller codes. This is an extremely powerful feature, allowing an unusual amount of interaction between various manufacturer's System Exclusive information.

Parameter Change brings control over Yamaha FM instruments to new levels of sophistication. When used in conjunction with instruments like the TX816 (which accept real-time parameter changes), it opens up a whole new world of expressiveness for electronic musicians. Let's take a step-by-step approach to programming the KX Series. For this example, we will work with the Frequency Coarse control for operator #6. To begin with, we need to get into PA mode. Follow these steps:



KX76 MIDI keyboard controller.

Parameter Assign (PA). Let's take a closer look at each one.

Play Mode

The Play mode is the one which most people are familiar with. It provides three types of keyboard operation: Single, Split, and Dual. In the Split and Dual modes, the KX will transmit on any *two* MIDI channels, and the split point (in Split mode) is fully programmable.

The nineteen performance controllers (two wheels, four continuous sliders, two toggle switches, five momentary switches, breath controller, aftertouch, two foot controllers, and two foot switches) may be used in the Play mode to execute any type of MIDI command. These performance controllers are fully programmable, and the KX88 and KX76 have sixteen memory locations called Code Memories where different controller setups may be stored. The actual identity of the KX units may

1. Place the KX in the Parameter Assign mode by pressing the MODE switch. The LED readout will read CA to indicate Controller Assign. This is the Controller Assign mode.
2. Now press and *hold* the MODE switch until the Upper LED reads PA. You are now in the Parameter Assign mode.

We will now use one of the Controller Code numbers (40-FF) and enter the MIDI data to define that Controller Code. The necessary MIDI data can be found in the KX88/76 owners manual on pages 31-33. The KX will prompt you as to what data is required at each stage of the process. For this example, we will assign the Frequency Coarse of operator #6 to Controller Code 51. Follow these steps:

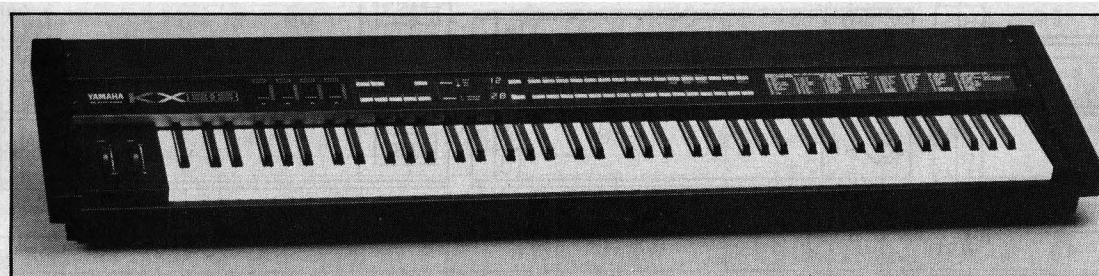
1. Enter the Parameter Change sub-mode by pressing Bank A switch 12, which is labeled Parameter Change. The Upper LED will now read PC.
2. The Controller Code which you wish to define must now be entered. This is done by pressing the Bank B switches 0-F, which are labeled in hexadecimal. When programming in this mode, any Hex data must be entered by following the printing as it appears in hexadecimal, above the Bank B buttons themselves. For this example, enter Controller Code 51.
3. The Upper LED will now read LM, prompting you to enter the Parameter's range of value (or *limit*). This data is obtained from the tables on pages 31-33 of the owners manual. The Data Limit for Coarse Frequency of any operator in the DX/TX voice is 31. To enter this data into the KX, press Bank B button number 4. (This is described in the owners manual on page 11, where Bank B buttons 1-6 are shown to represent Data Limits 3, 7, 15, 31, 63, 99).
4. The Upper LED will now read G,

prompting you to enter the Parameter's Group number. Again, this information is printed on pages 31-33 in the KX owners manual. Coarse Frequency for operator #6 is in Group 00. Enter this data by pressing the appropriate Bank B buttons.

5. The Upper LED will now read SG, prompting you to enter the Parameter's Sub Group number. Coarse Frequency of operator 6 is in Sub Group 0.
6. The Upper LED will now read P, prompting you to enter the Parameter number. For operator #6 Coarse Frequency, it is number 12. Remember that this and other hexadecimal numbers must be entered as per the Hex notation above the Bank B buttons.

At this point, you have entered the codes necessary to define Controller Code 51 to "mean" Coarse Frequency of operator #6. We must now take the final step, and enter Controller Assign mode to assign that Controller Code to a Performance Controller. An appropriate controller would be the Continuous Slider 4 (which we will use for this example), though you could use other controllers such as Aftertouch or one of the Foot Controllers. Follow these steps:

1. Press the MODE button, and the LED will read CA. You are now in the Controller Assign mode.
2. Press the Bank A button that is labeled CS4 above the #8 button. The Upper LED will show C4, indicating Continuous Slider 4.
3. You may now enter the Code number 51 by pressing the appropriate Hex numbers above the Bank B buttons. This assigns the Controller Code 51 (defined as operator #6 Coarse Frequency) to Continuous Slider 4.
4. This setup may now be stored in one of



KX88 MIDI keyboard controller.



Series *Continued*

the Code Memories by pressing the Bank A button number 15, which is labeled SAVE. Use the Bank B buttons 1-16 to choose a Code Memory location. The selected Code Memory number will appear in the lower LED and will flash. Press the appropriate Bank B button a second time, and the setup will be saved to the selected Code Memory.

After you have completed all of these steps, go back to the Play mode by pressing the MODE switch, and explore the control you now have over the Coarse Frequency of operator #6. Whenever you wish to return to the original (unaltered) voice, simply call up the voice number from the panel of the KX.

* * * *

Real-time parameter change brings control over Yamaha FM instruments to new levels of sophistication. It is possible to write code for any parameter within the Edit or Function modes of the DX/TX voice modules. With earlier synthesizers, the musician could "play" the sound, defining it's identity in real time, as

each parameter would have its own front panel control.

With the advent of 6-operator FM synthesis and it's 145 voice parameters, it would be physically impossible to have separate controls for every parameter. So, while FM brought us an amazingly powerful new way to generate sound, we did not yet have the ability to control any of the edit mode parameters *directly* in real time.

This musically important technique is now possible with the KX88 and KX76, combining the accuracy and precision of FM digital synthesis with the power of real-time parameter control. This technique is particularly well suited for the musicians working in the film and television industries, where new and vital sounds are constantly needed. These players often play directly to a scene, and the ability to have extended real-time control over the actual sound is very enticing.

The technique of real-time parameter control will enable musicians to create an entirely new range of expressive sounds that were previously impossible. The KX88 and KX76 give electronic musicians full control over the kind of gestural nuance that acoustic musicians have always savored.

Use this blank table to keep records of your KX88 or KX76 controller assignment programs.

SET NUMBER

MIDI CHANNEL	A	B		
TRANSPOSE	A	B		
KEY ASSIGN MODE	single	dual	split	
SPLIT POINT				
BANK	2 (1-32)	8 (1-128)		
fs1		A	B	
fs2		A	B	
fc1		A	B	
fc2		A	B	
CS1		A	B	
CS2		A	B	
CS3		A	B	
CS4		A	B	
W1		A	B	
W2		A	B	
BC		A	B	
AT		A	B	
TS1		A	B	
TS2		A	B	
MS1		A	B	
MS2		A	B	
MS3		A	B	
MS4		A	B	
MS5		A	B	

Notes:

CX5M

IN THE LAST TWO ISSUES OF *AFTER-TOUCH*, we have explored some of the usages of CAV (Computer-Aided Voicing) programs in conjunction with the FB-01 FM tone module. In this issue, we will look into the area of "CAM" programs, and will explore some of the capabilities that CAM programs may offer you.

CAM is an acronym for Computer-Aided Music. Computer-Aided Music programs involve such areas as MIDI sequencing and live performance using computers. The YRM504 FM Music Macro II program, which is the focus of this article, is also a CAM program, although it doesn't fall exactly into either of the categories just mentioned. Just as CAV programs involve the editing or creation of electronic instrument voices through the use of a computer, CAM programs involve the creation or performance of music with the aid of a computer. Any program that can be used for this purpose is a CAM program.

What Is The YRM504?

The YRM504 is a Program cartridge for Yamaha's CX5M music computer. The name of the program is FM Music Macro II. Some of you may already be familiar with the YRM104 FM Music Macro Program cartridge; the YRM504 Program cartridge is an updated version of the YRM104 cartridge (with many new features).

The CX5M's programming language is MSX BASIC. When you boot up (power up) the CX5M, you are automatically placed in MSX BASIC. MSX BASIC has program statements that allow you to access the *internal* sound chip of the CX5M, but they do not give you access to the SFG05 MIDI/FM tone generator module that may be plugged into the CX5M's slide slot. The FM Music Macro II program allows you to access the SFG05 FM tone generator module from within MSX BASIC through an extensive set of extra program commands.

Here are the main features of the YRM504 FM Music Macro II Program cartridge:

- up to four voices can be specified for simultaneous performance
- up to 8 tracks may be defined
- built-in rhythm instrument sounds can be used to create original rhythm patterns;

or, one of six predefined rhythm patterns may be used

- volume and pitch can be changed during performance to create various specialty sounds and sound effects
- performance data can be output through MIDI terminals for playing other MIDI-compatible instruments such as the DX and TX series of FM digital synthesizers and tone generators

How Does The YRM504 Program Create Music?

The FM Music Macro II program interprets strings of characters (data) to determine what notes to play and for how long. Character strings appear between quotation marks (" ")



in MSX BASIC. Here are two examples of valid string data:

1. "Mickey Mouse" is a character string that is twelve characters in length, containing Mickey, a space, and then Mouse.
2. "213-555-1212" is also a string that is twelve characters in length, containing numbers and minus signs (-). This is still considered string data for a single string, because it appears within one set of quotes.

Notes

Notes are specified by string data containing the symbols c,d,e,f,g,a, and b. Most of us should be familiar with these symbols, as they correspond directly with the notes of the scale. To

An Introduction To The YRM504 FM Music Macro II Program Cartridge. By Michael A. Huisman.

CX5M music computer.

cause the first five notes of the C major scale to be played, we would supply the following data to the program:

```
"cdefg"
```

To specify sharps, a "#" or "+" symbol should immediately *follow* the note to be raised by a half step. To specify flats, a "-" symbol should immediately *follow* the note to be lowered by a half step. To cause the first five notes of the D major scale to be played, we would supply the following data to the program:

```
"def#ga"
```

Octave

The notes in the above strings would all be played within a single octave. The "o" symbol is used to designate higher and lower octaves. The basic (default) octave setting is "o3" when first using the program (or after any initialization). All note data following an "o" symbol will be played in the new octave specified. To cause the first five notes of the A major scale to be played in a stepwise sequence, we would supply data as follows:

```
"o2abo3c#de"
```

This causes the first two notes (A and B) to be played in octave two, while the remaining notes (C#, D, and E) will be played in octave three.

There is an alternative method for specifying octave: The less-than symbol (<) may be used to *raise* notes by one octave, while the more-than symbol (>) may be used to lower notes by one octave. Once again, any change is in effect until a new octave specification is made.

Rhythmic Values

Obviously, we need to be able to specify the durations (lengths) of notes and rests. This is accomplished by the "L" symbol followed by a length value. "L8" says that all notes following are in eighth-note increments, while "L16" says that all notes following are in sixteenth-note increments. Dotted values are specified with a period (".") placed after the *note* to be extended.

Rests are specified just as note lengths, except that the "R" (rest) symbol is used in

place of the "L" symbol. The first two phrases of "The Star Spangled Banner" would be specified as follows:

```
"L8geL4ceg<cR4L8e.L16dL4c>ef#gR4"
```

The PHRASE Statement

The FM Music Macro II program uses the PHRASE statement to convert the character strings we supply as data into notes that the CX5M can play (and we can hear). The PHRASE statement must know two things: It needs to know what instrument the phrase is for, and what the phrase is. An example of the PHRASE statement is as follows:

```
100 _PHRASE(1,"cdefg")
```

This PHRASE statement causes the program to convert the character string "cdefg" into the first five notes of the C major scale.

The PLAY Statement

Once a character string has been processed by the PHRASE statement, we can then cause playback to occur by using the PLAY statement. The PLAY statement has two requirements: It needs to know what instrument to play, and which track to play. An example of the the PLAY statement is as follows:

```
110 _PLAY(1,1)
```

This PLAY statement causes the program to play the phrase that was prepared in line 100.

Rhythms

The FM Music Macro II program has built-in rhythm instruments and rhythms. Tempo is user-selectable, and there are six preset rhythms (ranging from a sixteenth-note pattern to a waltz). User-defined rhythms can also be created using the following selection of rhythm instrument voices: hi-hat (closed and open), bass drum, high tom, and low tom.

Sample Program

The sample program printout accompanying this article gives one example of an experi-

Continued on page 20

```

10 *****
20 *
30 *   YRM-504 MIDI Macro II Example Program
40 *
50 *   program originally published in YRM-504 Owner's Manual
60 *   comments and minor modifications by Michael A. Huisman 10/86
70 *   italics are comments for article - do not enter in CX5M
80 *
90 *****
100 CLS                               clears screen
110 _INIT                             initializes instruments
120 _TRACK(2)                          requests two tracks for data
130 INPUT "NUMBER OF BARS";X          input number of bars to play
140 IF X<=0 THEN 100                  disallows zero and neg.# input
150 DIM A$(X)                          allocates space of x # of bars
160 _INST(1,1):_INST(2,3)              sets 1 note to inst 1, 3 to inst 2
170 _MODI(1,11):_MODI(2,9)            sets inst 1-voice 11,inst 2-voice 9
180 _USERHYTHM                         necessary to use rhythm instruments
190 _SELP(4)                            selects pattern # 4 (rock)
200 _TEMPO(150)                         sets tempo to 150 bpm
210 '
215 ' lines 230 thru 270 read data from the DATA statements in lines 450-510,
216 ' then prepare the data via the PHRASE statement so playback can occur.
220 '
230 READ M,A$,B$                       reads phrase data in lines 450-510
240 IF M=0 THEN 290                     end of data? then goto next section
250 _PHRASE(1,A$,M)                     interprets data in A$ for inst 1
260 _PHRASE(2,B$,M)                     interpret data in B$ for inst 2
270 GO TO 230                           go to read next line of data
280 '
283 ' lines 290 thru 340 request which chord to play for each bar up to the
285 ' number of bars specified in line 130.
287 '
290 PRINT "INPUT CHORD TO AUTO-PLAY"    print info to screen
300 PRINT "C [c].D- [d].E- [e].F [f].G [g].A- [a]"
310 FOR I=1 TO X                         loop number-of-bars times
320 PRINT USING "###";I;:INPUT A$(I)    ask for chord to play
330 IF A$(I)="b" OR A$(I)>"h" OR A$(I)<"a" THEN PRINT CHR$(7):GOTO 320
340 NEXT I
342 '
344 ' lines 350 thru 360 are used as setup for the program just prior to
346 ' playing.
348 '
350 _STANDBY                             set instruments to wait for START
360 _RHYTHM(X*4)                          rhythm = # of bars x beats/bar
362 '
364 ' lines 370 thru 410 are used to play the prepared musical phrases. The
366 ' chords to play are determined by converting user input to marker #'s in
368 ' line 380
369 '
370 FOR I=1 TO X                          loop for # of bars requested
380 M=ASC(A$(I))-96                       convert chord requests->marker #'s
390 _PLAY(1,1,M):_PLAY(2,2,M)            play track 1 and 2 at marker M
400 IF I=1 THEN _START:ELSE _WAIT(1)    1st time? start playback else wait
410 NEXT I
420 '
427 ' lines 450 thru 510 contain the data for the musical phrases
433 ' data elements are seperated by commas (,)
440 ' 1st data item -- marker number
443 ' 2nd data item -- bass line
446 ' 3rd data item -- accompanment
448 '
450 DATA 1,L8o2aa<a>ar8a<a>a,%20r4L8(o2a<ce)r4[>a<ce)r4
460 DATA 3,L8o3cc<c>cr8c<c>c,%20r4L8(ceg)r4[ceg]r4
470 DATA 4,L8o3dd<d>dr8d<d>d,%20r4L8(dfa)r4[dfa]r4
480 DATA 5,L8o3ee<e>er8e<e>e,%20r4L8(egb)r4[egb]r4
490 DATA 6,L8o3ff<f>fr8r<f>f,%20r4L8(cfa)r4[cfa]r4
500 DATA 7,L8o2gg<g>gr8r<g>g,%20r4L8(o2b<dg)r4[>b<dg]r4
510 DATA 0,"",""

```

Sample program listing for use with the YRM504 FM Music Macro II Program cartridge and the CX5M music computer.

DX100

SUPER BASS. A New DX100 Voice
By Rich Rozmarniewicz.

LFO & FUNCTIONS					
TRI	25	0	9	0	OFF
WAVE	SPEED	DELAY	PMD	AMD	SYNC
5		0		C2	
PMS		AMS		KEY TRANSPOSE	
POLY	2	NA	0	--	ON
POLY/MONO	PB RANGE	MODE	TIME	PORT	SUSTAIN
PORTAMENTO			FOOTSWITCH		
NA	NA	NA	NA	NA	NA
PITCH	AMPL	PITCH	AMPL	PITCH BIAS	EG BIAS
WHEEL RANGE			BREATH RANGE		

FREQUENCY	DETUNE	AME		
2.00	-3	0		
ENVELOPE DATA				
AR	D1R	D1L	D2R	RR
25	9	0	0	7
EG BIAS		KEYBOARD SCALING		
		RATE	LEVEL	
0		0	0	
OP#	OUTPUT LEVEL	VELOCITY		
3	71	0		

FREQUENCY	DETUNE	AME		
1.00	0	0		
ENVELOPE DATA				
AR	D1R	D1L	D2R	RR
31	14	6	5	7
EG BIAS		KEYBOARD SCALING		
		RATE	LEVEL	
0		0	0	
OP#	OUTPUT LEVEL	VELOCITY		
4	63	0		

7

FREQUENCY	DETUNE	AME		
0.50	0	0		
ENVELOPE DATA				
AR	D1R	D1L	D2R	RR
31	5	12	5	7
EG BIAS		KEYBOARD SCALING		
		RATE	LEVEL	
0		1	0	
OP#	OUTPUT LEVEL	VELOCITY		
2	73	0		

FREQUENCY	DETUNE	AME		
0.50	0	0		
ENVELOPE DATA				
AR	D1R	D1L	D2R	RR
31	5	12	5	7
EG BIAS		KEYBOARD SCALING		
		RATE	LEVEL	
0		1	0	
OP#	OUTPUT LEVEL	VELOCITY		
1	99	0		

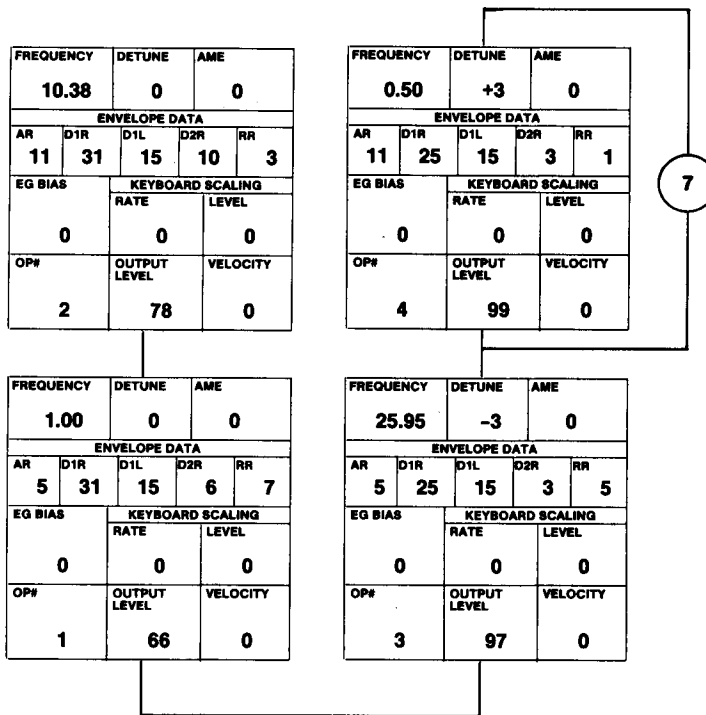
ALGORITHM #2

These DX100 voices can also be loaded into the DX21, DX27, and DX27S 4-operator synthesizers.

DX100

NOIZE. A New DX100 Voice By Ken Como.

LFO & FUNCTIONS					
S/H	99	0	99	0	OFF
WAVE	SPEED	DELAY	PMD	AMD	SYNC
6		0		C5	
PMS		AMS		KEY TRANSPOSE	
POLY	4	FULL	0	--	ON
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			



ALGORITHM #5

Notes:

The basic "noise" in this patch is created by Ops #3 and #4, while Ops #1 and #2 add a noisy, resonant whistle. To hear more of the whistle, raise the output level of Op #1; to hear the noise only, lower the output of Op #1.

To change the "shape" of the noise, alter the envelope values to suit your taste.

Final Touch

A REV7 Patch For Use With Drum Sounds.

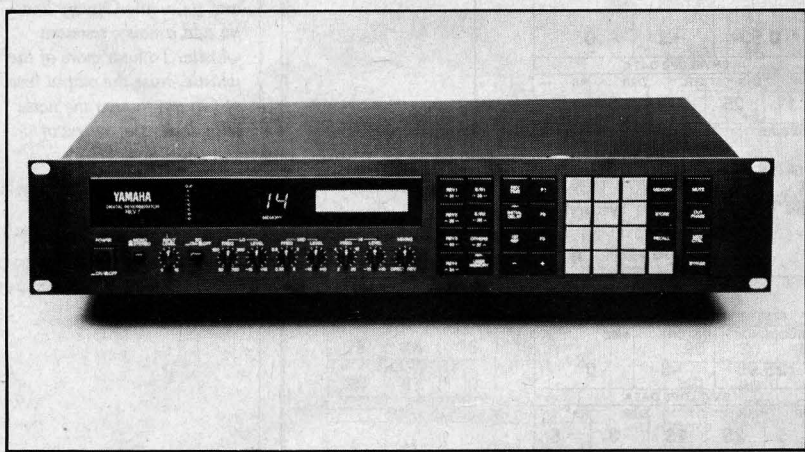
By Ken Como.

This is one of my favorite patches for use with both Drum Machines and real drums. Start with the Early Reflection 2 preset, #6, and use these settings:

LIVENESS: 10
 INITIAL DELAY: 5.0 ms
 1ST DELAY: 0.0 ms
 1ST LEVEL: 10%
 MODE: 5
 ROOM SIZE: x20.0
 DIFFUSION: 10

By mixing the reverb level to full and removing the original drum sounds from the mix, you'll find yourself with a real "nasty" drum kit.

This patch has great applications for creating sounds with a special "kick" (such as toms or



techno-funk snares) in both recorded and live uses. The sound is similar to the processed tom sound in the Mr. Mister song "Is It Love?". I have found that I lean towards using the REV7 as an instrument (full reverb mix) rather than as an effect. Used in that way, it produces some very interesting textures.

* * * *

Using The Extra Voice Slots In Your CX5M Voicing Programs To Index Your FM Voices.

By Cindy Koenig.

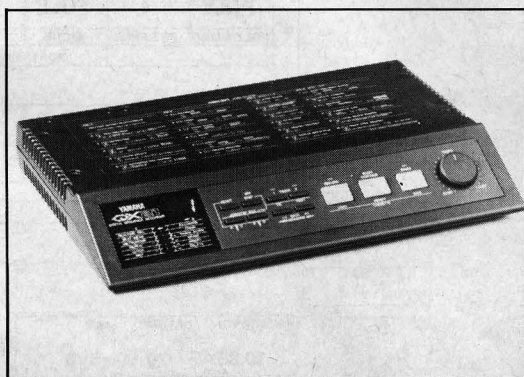
Most of the CX5M's Voicing Program cartridges (such as the YRM304 TX7/TF1

Hot Tips For The REV7, The CX5M, And QX7/21.

QX21 digital sequence recorder.

Voicing program and the YRM305 DX21 Voicing program) have memory slots for 48 voices, while the instruments themselves only have internal memory space for 32 voices. (The DX100 and DX27, which operate with the YRM305 program, only have space for 24 user-programmable voices!) While many find this extra memory space in the CX5M desirable for storing extra programs, I have found this extra voice directory space useful for another purpose.

When you connect your FM digital synthesizer to the CX5M (equipped with the proper



Voicing Program cartridge) and turn both units ON, the internal RAM memory of the synthesizer is loaded into the CX5M. As you look at the voice directory on the screen, the 32 voice names (24 in the case of the DX100 and DX27) are displayed in memory slots 1-32, while the other memory slots simply say "init voice." At this point, I type in blank spaces in all of the "init voice" locations, and then use the now-blank voice name locations in the top right of the screen to type in indexing information for the basic set of voices (see the accompanying diagram).

In this way, I am able to print out voice directories on my PN101 printer, and the identifying

REV7 digital reverbator.

This CX5M screen display shows how the extra voice memory locations in the various FM Voicing programs can be used to create an index for your synthesizer voice files.

Hard Copy?		YNS Midi Ch= 1 Me=off			
1	Brass	17	Elec organ	33	DX100
2	Brass	2	Mid Pipe	34	VOICES
3	Brass	3	Harpicord1	35	GROUP A
4	Strings	1	Clav 1	36	CINDY
5	Strings	2	Wibe	37	KOENIG
6	Strings	3	Hamarimba	38	4 30 86
7	Orchestra	23	Kotokoto	39	
8	Piano	1	Flute 1	40	
9	Piano	2	25	41	
10	Piano	3	26	42	
11	E Piano	1	27	43	
12	Jazz Guit	28		44	
13	Guitar	2	29	45	
14	LeadSynth1	30		46	
15	Solid Bass	31		47	
16	SyntheBass	32		48	
F1		F2	F3	F4	F5
dir/edt		store	cp/sw 1	recall	print
F6		F7	F8	F10	
file		midi.ch	cp/sw 8	hcopy	

index information is already part of the printout! It is an easy matter to refer to my folder of printouts, locate the file names I want on my discs, and call up the desired voice file quickly. I have found this to be a very useful way to keep track of my growing voice library.

* * * *

Re-Channelizing MIDI Data On the QX7 & QX21 Sequencers.

By Ken Como.

During the process of loading tracks into the QX7, I sometimes forget to select the MIDI channel before beginning to RECORD a sequence; at other times, I simply change my mind regarding my choice of MIDI channel. In either case, I have data on the "wrong" MIDI channel.

If you catch errors like this in the initial stage (the first recording), it is possible to correct the problem. Basically, the technique is similar to bouncing tracks on tape; only in this case, you are bouncing digital MIDI data. Follow these steps (on either the QX7 or QX21):

1. Take the Track 1 data, which is on the wrong MIDI channel, and EXCHANGE it with the



CX5M music computer.

- empty Track 2 (Job B-1).
2. Now that Track 1 is empty, plug the MIDI OUT of the QX7 into the MIDI IN of the QX7!
3. Set the correct MIDI record channel (Job A-6), set the QX unit to RECORD (Job A-1), and push the START button. The data from Track 2 will be recorded onto Track 1, but it will now be recorded on the MIDI channel you have specified.
4. Finally, EXCHANGE the position of the corrected data (Job B-1), placing it onto Track 2.

Once this exchange is completed, ERASE the old data, which is now back on Track 1 (Job B-4), and you are ready to proceed.

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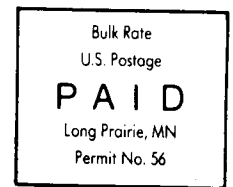
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CX5M

Continued from page 14

ment using the FM Music Macro II program. The program was originally printed as part of the YRM504 owner's manual. Some slight modifications have been made to the program, and nearly every line has an accompanying comment—so that those readers who have no experience reading BASIC can understand what is going on.

The program generates a bass line and a "comping" part in time with one of the preset rhythms. There is data (remember the character strings?) for six different chords: C, Dmin, Emin, F, G, and Amin. The program asks for the number of bars to play, and then asks for a chord for each one of the bars. Once the user has completed inputting the chords, playback begins immediately. Take a few minutes to look at the sample program—note how the DATA statements correspond directly with what will be played.

While this sample program does show some

of the musical capabilities of the FM Music Macro II program, the graphics capabilities of the CX5M are not exploited at all. It is possible to include extremely colorful graphics statements as part of the program. You could expand on the sample program to include graphics that will show on the computer screen while the music is running!

* * * *

The CX5M music computer, used in conjunction with the FM Music Macro II Program cartridge (YRM504), offers a number of capabilities not available in most music software. For those who are interested in combining color-graphics with FM sounds, or for those with a keen interest in computers and music, the FM Music Macro II program should prove most rewarding.