AFTER TOUCH™

THE OFFICIAL PUBLICATION OF THE YAMAHA USERS GROUP

TX1P Piano Tone Generator

MARCH 1988

YAMAHA®

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RX5

A New RX5 Voice Edit By Kevin Nagata.

Notes:

For the best effect, hit the instrument pad 2-3 times.

Voice Name: **By The Sea**		Origin: **Crt-Gun**	
JOB #	**PARAMETER**	**RANGE**	**NEW VALUE**
02	**Pitch**	-3600 ~ 2400	**-400 cent**
03/1	**Attack Rate**	1 ~ 99	**50**
03/2	**Decay 1 Rate**	1 ~ 99	**09**
03/3	**Decay 1 Level**	1 ~ 60	**01**
03/4	**Decay 2 Rate**	1 ~ 99	**99**
03/5	**Release Rate**	1 ~ 99	**20**
03/6	**Gate Time**	100 ~ 6500	**6500 ms**
04/1	**Bend Rate**	-60 ~ 60	**21**
04/2	**Bend Range**	1 ~ 60	**-10**
05	**Inst Level**	0 ~ 31	**23**
06	**Sound Loop**	OFF / ON	**ON**

RX5

A New RX5 Voice Edit By John Louis Kluck.

Voice Name: **Funk Punch**		Origin: **Crt-CgaHMT**	
JOB #	**PARAMETER**	**RANGE**	**NEW VALUE**
02	**Pitch**	-3600 ~ 2400	**+1900 cent**
03/1	**Attack Rate**	1 ~ 99	**99**
03/2	**Decay 1 Rate**	1 ~ 99	**41**
03/3	**Decay 1 Level**	1 ~ 60	**51**
03/4	**Decay 2 Rate**	1 ~ 99	**37**
03/5	**Release Rate**	1 ~ 99	**60**
03/6	**Gate Time**	100 ~ 6500	**6500 ms**
04/1	**Bend Rate**	-60 ~ 60	**00**
04/2	**Bend Range**	1 ~ 60	**00**
05	**Inst Level**	0 ~ 31	**28**
06	**Sound Loop**	OFF / ON	**ON**

RX5

Voice Name: **Triangle**		Origin: **Crt-AgoLO**	
JOB #	**PARAMETER**	**RANGE**	**NEW VALUE**
02	**Pitch**	-3600 ~ 2400	**+2200 cent**
03/1	**Attack Rate**	1 ~ 99	**70**
03/2	**Decay 1 Rate**	1 ~ 99	**22**
03/3	**Decay 1 Level**	1 ~ 60	**23**
03/4	**Decay 2 Rate**	1 ~ 99	**01**
03/5	**Release Rate**	1 ~ 99	**30**
03/6	**Gate Time**	100 ~ 6500	**0100 ms**
04/1	**Bend Rate**	-60 ~ 60	**0**
04/2	**Bend Range**	1 ~ 60	**0**
05	**Inst Level**	0 ~ 31	**31**
06	**Sound Loop**	OFF / ON	**ON**

A New RX5 Voice Edit By Jamie Miller.

Notes:

You can use another voice in the same output channel to mute the triangle: Pick the sound you want to use as a mute, then lower the Level and Attack Rate to 01.

RX5

Voice Name: **Heavy Machine**		Origin: **Crt-BD 3**	
JOB #	**PARAMETER**	**RANGE**	**NEW VALUE**
02	**Pitch**	-3600 ~ 2400	**-2000 cent**
03/1	**Attack Rate**	1 ~ 99	**99**
03/2	**Decay 1 Rate**	1 ~ 99	**01**
03/3	**Decay 1 Level**	1 ~ 60	**04**
03/4	**Decay 2 Rate**	1 ~ 99	**02**
03/5	**Release Rate**	1 ~ 99	**14**
03/6	**Gate Time**	100 ~ 6500	**0100 ms**
04/1	**Bend Rate**	-60 ~ 60	**10**
04/2	**Bend Range**	1 ~ 60	**-01**
05	**Inst Level**	0 ~ 31	**28**
06	**Sound Loop**	OFF / ON	**ON**

A New RX5 Voice Edit By Jamie Miller.

Notes:

Use this sound sparingly. When in need of industrial noise, this is the one.

TX81Z

Velocity And Positional Crossfading On The TX81Z. By Karl Franz Marquez.

WOULDN'T IT BE GREAT IF YOU could select two sounds from your synthesizer, and then be able to play either sound A, sound B, or a mix of sound A and B without having to press a single other button?

In a way, some samplers already have this capability. It is known as crossfading. The basic idea is this: Certain sounds, of which the piano is a prime example, have the natural, acoustic ability to change not only their amplitude (volume), but their whole harmonic structure, depending on how hard or soft we strike the keys.

If we were to sample a piano while playing very lightly on a key, and then replay our sample with our velocity sensitive sampling keyboard, we would encounter a problem. As we play our sample, we discover it does not sound very realistic, even if we were very careful about getting a nice "clean" sample. This is due to the fact that there is only a single velocity sample being played per key on the keyboard. Whether we play our keys soft or hard, we are hearing the same sound, only we hear it softer or louder– sort of like decreasing or increasing the volume on our amplifier as we play. The great, complex sound structure of our piano is lost. Instead, we are left with a rather flat and undimensional sound. What can be done?

Enter crossfading. Taking our piano as an example–if we were able to sample our piano twice, one time while playing the key softly and the other while striking the key harder, we could then devise a system by which the sampling keyboard could determine at which velocity we are playing and decide which one of the two samples to play back.

Ideally, we would want to be able to have a sample at all 127 possible velocity levels, and play back the appropriate one; but that would take immense amounts of memory, and in the computer world, memory means dollars. Instead, we can create a mix of both samples; and then, when we press a key somewhere between soft and hard, we can get a sound that is a proportional blend between both.

The same crossfading concept can be applied to the TX81Z with a few added features, and all that is needed is a TX81Z, a velocity-sensitive keyboard, and a stereo mixer (although this last piece of equipment is not essential).

The TX81Z has stereo outputs, and includes capabilities for panning a sound from one output to the other. This is where our journey into crossfading begins. I assume that you know a little about how to move through the different menus of the TX81Z; if not, take some time with the manual and get acquainted with it.

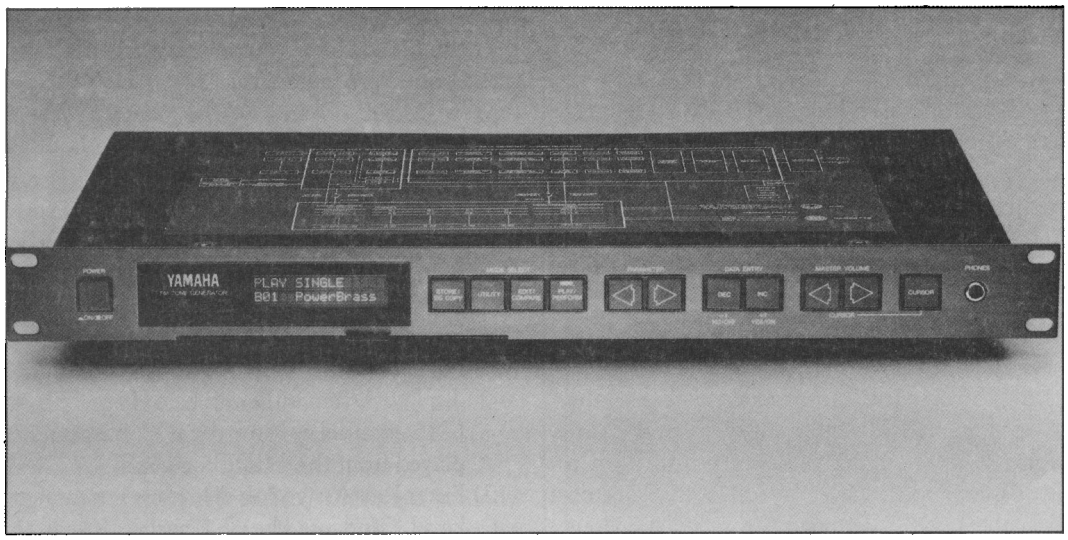
To experiment with crossfading, follow these steps:

1) Go into the Single Utility mode, and move through the different options until you see "EDIT EFFECT 2?".
2) Press "YES," and you will see the "SELECT" display. If this is set to "velocity," go to step 3; if not, use the INC and DEC keys until "velocity" is selected.
3) Press the Parameter Up button once, and you will see the "DIRECTION" display. Choose the direction "I–›II" by again using the INC and DEC keys.
4) Press the Paramter Up button once more; this time the screen will show the "Pan Range" display. Use the INC key until the range equals "99."
5) Now go to the Performance Edit mode, and enter the following performance parameter values:

Assign Mode: NORM
Micro Tune Select: OCT.
Effect Select: PAN

Instrument Number:	1	2
Number of Notes:	4	4
Voice Number:	A13	A07
Receive Channel:	1	1
Key Limit /L:	C-2	C-2
Key Limit /H:	G 8	G 8
Detune:	0	0
Note Shift:	0	0
Volume:	95	80
Output Assign:	I	II
LFO Select	1	2
Micro Tune:	OFF	OFF

6) Make sure that your keyboard's MIDI OUT port is connected to the TX81Z's MIDI IN port, that your keyboard's MIDI output channel is set to channel 1, and that BOTH of the TX81Z's audio outputs are connected to your amplifier. If you have a stereo mixer hooked up between your TX81Z and your amplifier, make sure that the panning controls for both inputs are set to the center position, so you will hear the sound through both



TX81Z FM digital tone generator.

speakers. Unique channel switching can be done if one output is panned left and the other right, so experiment and see what you can come up with.

Now if you play on the keys lightly you will hear an electric piano sound. If you play the keys harder, you will hear an acoustic piano sound. Play around with it for a while until you get adjusted to the feel, and you can switch between one and the other easily. Notice that there is a velocity range at which both sounds will be heard at once. Also, notice that keeping a key pressed will make all other keys played remain assigned to the same output channel no matter how hard or soft these additional notes are played. The first note sustained will determine the sound of the other notes. (This only works with physical sustaining of the keys, not with notes sustained using the sustain pedal.) With some practice, you can learn to incorporate this feature to improve your performance.

All sorts of combinations of sounds can be used. The effect seems to sound best when the output of the TX81Z is blended wtih that of another synthesizer. Go into Performance Edit and change the voice numbers to select other patches. Other good combinations are: Clavinet & Strings, Clavinet & Brass, and Brass & Strings. Another good idea is to create two identical patches, and then modify the EG of one so that it has slower attack than the other. This will allow you to play smooth legato and bright staccato parts with the same sound, adding a new dimension to your performance.

So much for velocity crossfading. The TX81Z also allows panning based on note value. This will permit us to select which sound to play depending on where on the keyboard we play. This is not to be confused with creating "splits." In a split, one particular group of keys is set for one sound, while another group is set for a different one. Positional crossfading could be called a "soft-split," in that a definite key does not exist that is the boundary between one sound and the other. Instead, keys on opposite sides of the keyboard will play different sounds, and keys toward the center will play a mix of the two. In order to try this effect, the only change that has to be made to the previous procedure is to go into the "EFFECT EDIT 2?" menu and change the "Select" from "velocity" to "note." Notice again that the old trick of keeping one key pressed still works. That is, press a key on one side of the keyboard, keep it pressed, and play a key on the opposite side—the same sound will still be heard.

You will probably have noticed by now that the only limitation to this idea is the fact that you have effectively cut your polyphony in half, and in many cases a 4-voice synthesizer just won't do. Fortunately, the TX81Z is not only a very powerful, but also rather inexpensive FM tone generator. If you can afford to own two, then you can set both of them identically and have one respond to odd MIDI notes while the other responds to even MIDI notes. This will not only give you back your 8-voice polyphony, but will also allow you to have up to 16 voices in Single mode.

RX5

Secrets For Creating Professional Bass Lines On The RX5. By Carl Akers.

THE PROBLEMS WITH WRITING BASS lines directly on the RX5 (using one of its internal bass sounds and an external MIDI keyboard) stem from the following: 1) The preset bass sound needs editing (a minor problem); and 2) THE DAMP function must be on in order to control the release of the bass notes–to control the overall length of the bass notes. These DAMP commands may overlap, and cause other notes to be lost or shortened.

For example, to write a 16th-note bass line within a two-bar pattern, I always ended up writing the first 16th-note, then waiting for the pattern to recycle, and cautiously and painstakingly entering the second 16th-note in a hit-or-miss manner: If I played it a fraction too early, the DAMP command from the previous note would cause the second note to be damped and not heard, requiring me to either 1) clear the first note and rewrite it with a quicker release; or 2) enter the second note a little earlier; or 3) slow the tempo so that the release times were easier to judge and play.

Trying to enter the third and fourth 16-notes brought the same frustrating problem. This stems from the fact that each key played on the MIDI keyboard must be totally lifted up before you can play the next note. This is a very uncomfortable way to play, since most of us are used to hitting the next note as the previous note is on its way up. The result is that the first note can be entered simply enough, but the second note must contend with a DAMP command from the first note.

The result of this overlapping of DAMP commands with later notes was a sloppy bass track, often incorrectly timed or containing annoying gaps, and much RX memory being used carelessly.

Fortunately, there is a solution to help bass tracks sound professional, and it requires a mixture of DAMP on and DAMP off procedures. Here is the setup procedure:

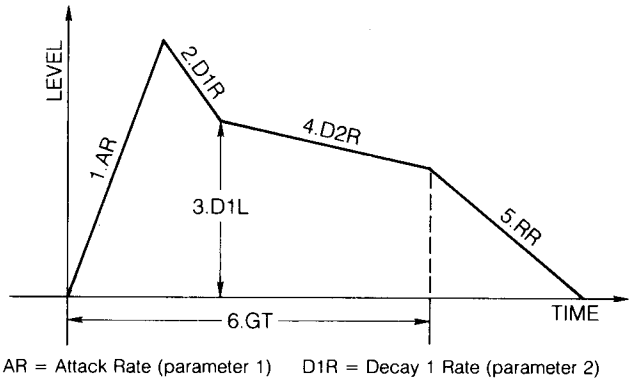
1) First, connect the MIDI OUT port of your MIDI keyboard to the MIDI IN port of the RX5. Set the keyboard to transmit on channel 1.
2) Enter MIDI Job #4 on the RX5, and press the #2 button to access the Assign Pitch display. Assign either "E bass H" or "E bass L" to channel 1. Now the RX5 bass can be played from the MIDI keyboard.
3) Enter Key Assign Job #1, press instrument key L, and use the +1 and −1 keys to access the appropriate bass voice (as chosen above).
4) Enter Edit Voice Job #1, and press instrument key L to access the appropriate bass voice for editing.
5) Enter Job #3 and press the #4 button to access the "decay 2 rate" parameter. Set this between 20 and 30.
6) Enter Job #6 and turn the sound loop ON.
7) Now enter Job #7 and store your new voice by pressing the YES button twice.

Now, if DAMP is on, the bass voice on the RX5 can be held as long as you hold a key down on your MIDI keyboard. When DAMP is off, you have no control over the length of the bass note–it will sound until it dies out (or until cut off by a new note). Finally, to commence in Real Time Write mode, it is best to turn Quantize off.

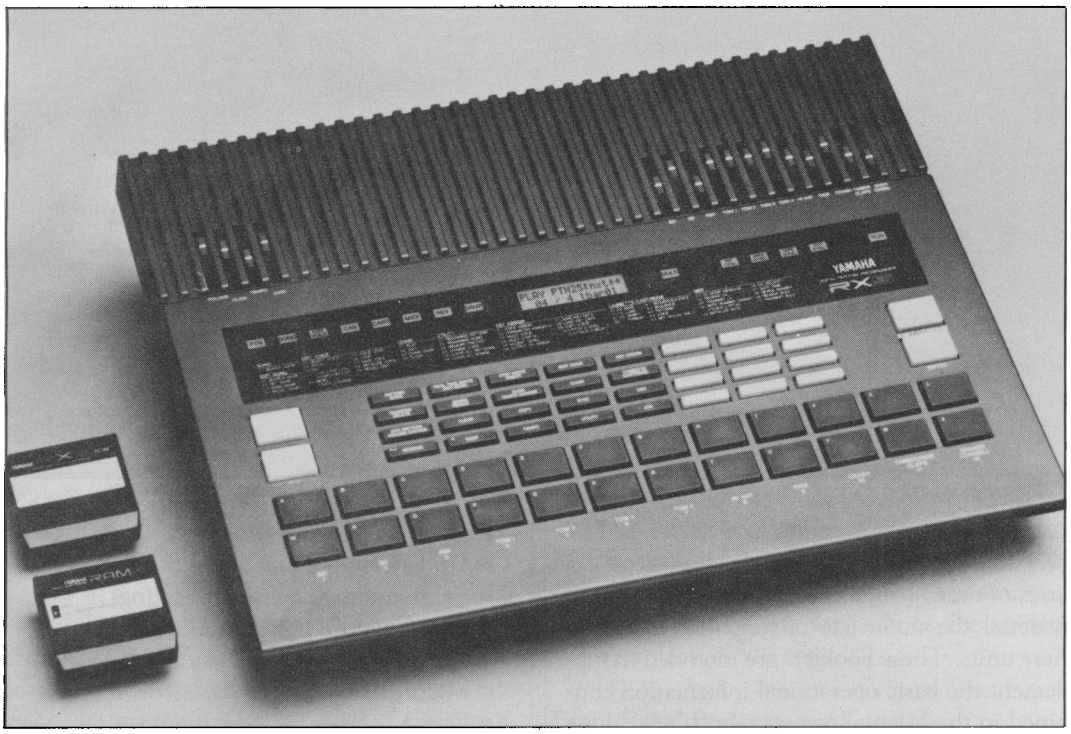
Now that we have outlined the setup that leads to our solution, let's reiterate the problem: Using the DAMP function in real time write mode, it is easy for a slight overlap to occur, which means that the DAMP command from the first note will obliterate the onset of the second note. One possible solution involves making sure to release the first note quicker; this will leave a gap, but the second note can be entered easily. Unfortunately, the same set of problems will exist between notes two and three.

The best solution involves starting with the setup outlined above. Then, for the first three 16th-notes in the beat, turn the DAMP function off and play as you would any normal keyboard line (the key may be on its way up as you

Voice Edit parameters for the RX5's envelope generator.



AR = Attack Rate (parameter 1) D1R = Decay 1 Rate (parameter 2)
D1L = Decay 1 Level (parameter 3) D2R = Decay 2 Rate (parameter 4)
RR = Release Rate (parameter 5) GT = Gate Time (parameter 6)



RX5 digital rhythm programmer.

strike the next note). These notes will be perfectly seamed together, since the Note On of each new note acts as a Note Off to the previous note.

If the fourth 16th-note is followed by a rest, as the pattern recycles, turn DAMP on, and enter the note at the appropriate time, holding the MIDI key down for the precise timing (16th-note). This is also a good spot for a "pop" or accent in the bass line. The result is four smooth 16th-notes, each with a clear entrance and exit, with no gaps or overlaps.

If the four 16th-notes are followed by a held note (such as a dotted half-note) instead of a rest, don't turn the DAMP on until you reach the dotted-half. (Remember, without the DAMP function, it is impossible to control the timing of the RX5's bass voice precisely.)

From all of this, it is easy to deduce a rule for each note in any particular bass pattern: If a *note* occurs next after the note in question, DAMP should be *off*; it a *rest* occurs next after the note in question, DAMP should be *on*.

When writing patterns using these rules, start from the beginning of the pattern, and conquer each problem as it arises.

It may be difficult to enter the first note exactly on the first beat, so, to insure accuracy, it is often easier to enter the first note with Quantize on.

Should an error occur when using DAMP on, care must be taken to clear the entire length of the note–if you clear only the first half of the note, the note will not be heard on playback, but the DAMP command remains written in the Pattern memory, where it will act on any ensuing notes attempting to sound at the point of the DAMP, often causing notes to disappear for no apparent reason. The only way to clear a DAMP command is in Real Write mode, and any "loose" DAMP commands both eat up the RX5's memory and are troublesome for the programmer. Scan through Pattern Edit mode to see where your DAMP commands have fallen.

For notes written with DAMP off, clearing the "hit" on the note is sufficient, as the entire duration will be erased.

After a while, the operation will become second nature: Simply let the pattern recycle in Real Time Write mode, and switch between DAMP on and DAMP off, alternating between listening, clearing, and entering.

Utilizing these techniques will ensure that your velocity sensitive RX bass voices smoothly flow together into tight tracks, complete with dynamics, pops, holds, and precision–with no gaps, overlaps, timing errors, or wasted memory.

DX7 II Booklets

Information On Supplemental Booklets For The DX7 II Family.

DX7 II FD digital FM synthesizer.

SINCE THE RELEASE of the second generation of DX7 synthesizers (DX7 II FD, DX7 II D, and DX7s), Yamaha has created a series of twenty Supplemental Booklets to cover in detail the multitude of functions found on these units. These booklets are intended to supplement the basic operational information contained in the original owners manuals for these instruments.

Here is a complete list of titles for the series of Supplemental Booklets on the operations of the DX7 II family of synthesizers:

- Quick Reference Guide
- DX7s Quick Guide
- Memory Management
- Memory Management for the DX7s
- Voicing Parameter Reference Guide
- Utility Parameter Reference Guide
- Advanced Controller Usage
- Realtime Parameter Change
- Advanced MIDI Applications
- MIDI Technical Data and Charts
- Modifying the Preset Voices
- Creating New FM Voices
- Understanding Fractional Scalings
- Programming Fractional Scalings
- Exploring the Preset Microtunings
- The Mathematics & History of Microtuning
- The Acoustics of Microtuning
- The Psychoacoustics of Microtuning
- Advanced Microtuning Data
- Macrotuning

For a time, Yamaha made these booklets available to anyone who asked for them, free of charge. However, due to the increasing costs of production for these materials, it has become necessary for Yamaha to charge a nominal fee for these publications.

Each Supplemental Booklet is available for the price of $3.00; or, if you prefer, the entire set of twenty Supplemental Booklets is available for the price of $45.00. These may be ordered directly from your authorized Yamaha dealer.

DX7s FM digital synthesizer.

TX1P

An Introduction To Yamaha's New Sampled Piano Tone Generator. By Tom Darter.

THE NEW TX1P Piano Tone Generator from Yamaha is a one rack-space tone module that offers a number of sampled voices created with Yamaha's exclusive Advanced Waveform Memory technology. The unit features 16-note polyphony, full MIDI implementation (including full velocity sensitivity), three built-in effects, and much more.

Basic Voices

The TX1P provides five sampled voices: Grand Piano, Upright Piano, Electric Piano, Harpsichord, and Vibraphone. Each voice can be called up using one of the five Voice buttons on the unit's front panel.

Effects

The TX1P is equipped with three effects: Chorus, Transposed Delay, and Chord Play. Both the Transposed Delay and Chord Play effects are programmable for each of the unit's five voices. The Chorus effect is preset, but it is possible to control the depth of the Chorus effect from a remote MIDI controller. Here is a brief outline of each effect.

Chorus: This adds a rich, "swirling" effect to the selected voice. The Chorus depth can be controlled from a MIDI controller (controller number 93–or "5D" in hexidecimal).

Transposed Delay: This can be used to create a single repeat, multiple repeats, a single transposed repeat, or multiple transposed repeats following the initial sound. The basic parameters are Delay Time, Pitch Shift, Feedback, and Effect Level. These may be programmed for each voice in the TX1P. The unit comes equipped with factory Transposed Delay settings for each voice. (See the accompanying diagram.)

Chord Play: With this effect, you can specify certain notes on the keyboard to play chords rather than single notes. The TX1P is initially programmed to play major chords on every note for the three piano voices, octaves for the harpsichord voice, and fourths for the vibraphone voice. These may be reprogrammed for each voice in the unit.

Front Panel Programming Controls

The TX1P's front panel controls allow alteration of all of the programmable effect parameters mentioned above, in addition to allowing access to a number of other important performance-oriented parameters. In addition to the standard +1/INC and −1/DEC buttons, the TX1P has the following programming buttons:

- Master Tune
- Transpose
- Transposed Delay
- Receive Channel
- Note Limit
- Chord Set

Obviously, the *Transposed Delay* and *Chord Set* buttons open up the programmable fields for those two effects. The *Master Tune* button allows fine-tuning of the unit's intonation. The *Transpose* button allows programming of transposition for each of the unit's voices. The *Receive Channel* button is used to set the basic MIDI situation for the tone module. Finally, the *Note Limit* button allows programming of upper and lower note limits for each of the instrument's voices.

Front Panel Performance Controls

Beyond the obvious Master Volume pot and headphone jack, the TX1P's front panel also has a number of other performance controls, which make it easy to turn the unit's effects on and off. These on/off switches control the following effects:

- Chorus
- Transposed Delay
- Chord Play

MIDI Performance Controls

The TX1P's five instrument voices can be called up from a remote MIDI keyboard, using Voice Selector buttons 1-5 (which correspond to MIDI Program Change numbers 00-04, to clarify a confusing situation).

In addition, the unit's effects can be turned on and off from a remote MIDI keyboard using Voice Selector (Program Change) buttons, as follows:

Continued on page 20

This chart shows the factory Transposed Delay settings for each of the TX1P's voices.

PARAMETER	PIANO 1	PIANO 2	E. PIANO	HARPS.	VIBES
DELAY TIME	0.05	0.03	0.1	0.04	0.14
PITCH SHIFT	+ 7	- 12	+ 7	0	0
FEEDBACK	0	0	7	7	4
EFFECT LEVEL	99	80	99	64	75

DMP7

A Detailed Look At Yamaha's Digital Mixing Processor. By Eric Turkel & Howard Massey.

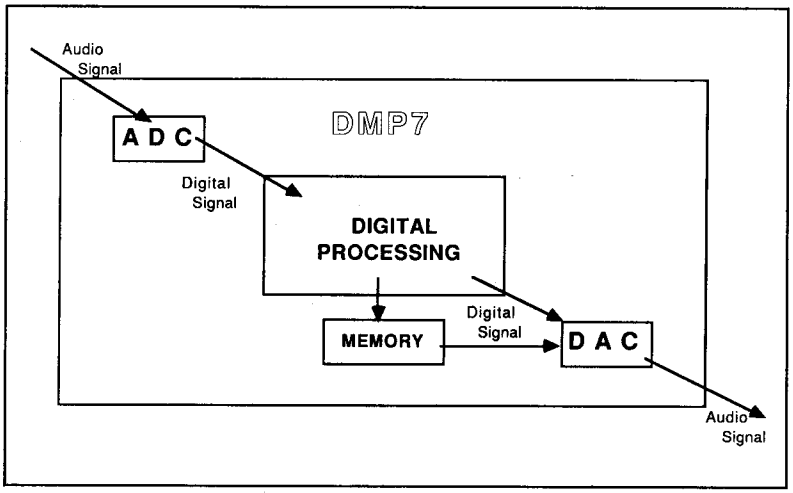
WALK INTO THE FINEST recording studios in the world and you'll find automated mixing boards. Many of these studios are also doing a good deal of audio processing and storage solely in the digital domain, thus approaching the so-called "tapeless" studios we've all been hearing about.

But for many musicians performing live, or working in their home studios, such a setup was little more than an expensive dream–until the release of the Yamaha DMP7 digital mixing processor. Priced at just $3,995.00, the DMP7 provides an inexpensive means for MIDI-controlled mixing and signal processing–and it performs all of its magic in the digital domain!

What this means is simply that incoming audio signal is converted by an Analog-to-Digital Converter (or ADC) into a stream of 16-bit binary numbers–that is, the data is sampled–at a rate of 44.1 kHz, same as a CD. These numbers can then be manipulated instantaneously by the DMP7's microprocessor in a number of ways–levels and pan positions can be altered, equalization performed, and even reverb, delay, phasing, chorusing, and flanging effects can be added. The beauty of performing these processes digitally is that no extra noise is added, as it is with more usual "analog" units. The modified signal is then passed on to another chip called a Digital-to-Analog Converter (DAC) and changed back into an audio signal. (See Figure 1.)

By working strictly in the digital domain, all the manipulations performed by the DMP7 can be remembered by its own memory circuits and stored for later recall. What's more, as we shall see shortly, the DMP7 boasts extensive MIDI implementation, meaning that the entire process of mixing and processing your sound can be under the control of any MIDI controller or sequencer!

Figure 1. This shows how the DMP7 processes audio signal in the digital domain.



Basic Controls

But first things first. Let's begin by describing the basic layout of the DMP7, and then talk more about specific applications. In a nutshell, the DMP7 is a portable (23 lbs.), rack-mountable, 8-input, stereo-output mixer, with 3-band digital parametric EQ and three discrete effects sends per channel.

The front panel is a model of simplicity: There are ten faders–eight channel faders, one master fader, and one external effects return master. All of these faders are motorized, so that when you're using a MIDI sequencer or controller to automate your mix, you can actually see all your mix moves at a glance as they occur. Mute switches are provided above each channel fader, with embedded LEDs continuously displaying the on/off status of each channel. To the right of the panel is a small data entry and parameter select section, featuring increment-decrement switches as well as a data entry slider. In this area, there's also a two-line, 16-character, back-lit LCD for easy viewing of relevant information about operations you are carrying out. A cartridge port is provided, too, allowing for the storage of DMP7 data onto a standard RAM4 cartridge.

The rear panel of the DMP7 is also very straightforward. A built-in digital interface allows you to cascade up to four DMP7's together, giving you 32 channel inputs–with still only a single digital-to-analog conversion process! All channel inputs are line level, unbalanced (hi-Z), and have rotary trim pots, which allow the user to select levels from −20dBv to +4dBv. This allows you to fine-tune the input levels of each channel for optimal performance–a real plus when you're mixing together several disparate audio sources (such as the relatively high level output of an RX5 rhythm controller with the relatively low level output of DX7 II FD synthesizer). There's also a stereo headphone output (the level of which is controlled by the master fader) as well as two pairs of master stereo output jacks, one balanced (600 ohm) and the other unbalanced (15k ohm). You can also access an external signal processor from the DMP7; the effects send and return jacks are unbalanced and fixed at a

nominal level of +4dBv.

Signal Processing

The three-band parametric equalization available for each input channel is quite sophisticated. Like all other DMP7 functions, it is digital, meaning that, unlike analog equalization circuits, virtually no noise or distortion is added to the source. Each of the three bands offers continuously adjustable center frequencies with flexible bandwidth (Q) and up to 15 dB of gain or attenuation. The high and low frequency bands also offer a choice between peak and shelving types of EQ.

As we mentioned earlier, there are actually three effects sends in all, and signal can be routed from any channel to any or all of these three discrete banks of effects, either pre- or post-fader. Effects send 1 and 2 are each internally patched to their own bank of 17 different on-board digital signal processing programs, similar to those found in the Yamaha SPX90 II, but with increased bandwidth (20 Hz to 20 kHz). Sends 1 and 2 can be routed to any one of the following programs, and, if you choose, you can even have both sends access the same program:

1) Reverb 1–Hall
2) Reverb 2–Room
3) Reverb 3–Vocal
4) Reverb 4–Plate
5) Flange A
6) Flange B
7) Chorus A
8) Chorus B
9) Phasing
10) Tremolo
11) Symphonic
12) Early Reflections 1
13) Early Reflections 2
14) Gated Reverb
15) Reverse Gate
16) Delay L + R
17) Stereo Echo

Effects send 3 can access any one of five built-in digital effects, or it can be viewed as the DMP7's link to the outside world, since it can alternatively be utilized to route signal to any standard external signal processor via the analog send/return jacks on the back panel of the DMP7. In that instance, you can choose programs 6, 7, or 8 in order to add digital EQ to the returning signal. Here is a list of the five effects send 3 built-in programs, plus the three external send modes:

DMP7 digital mixing processor.

1) Stereo Echo
2) Flange
3) Chorus
4) Phasing
5) Panpot
6) External Low EQ
7) External Mid EQ
8) External High EQ

For each of the internal signal processing programs, there are a number of user-adjustable parameters, so you can fine-tune a stereo delay, reverb time, or chorus speed, for example. Signal is routed from each channel to any or all of the three effects sends with an ingenious routine called "fader flip." This is roughly equivalent to the "fader reverse" functions found in many professional mixing desks, only here we are using the motorized channel faders themselves as sends. Not only does this help keep the front panel of the DMP7 uncluttered, it also allows for instant visual recall of signal routings to the sends. Thes routings, like all other adjustable DMP7 parameters, can also be stored in either internal or RAM4 cartridge memory. A simple press of the "fader flip" button once

again restores all the channel faders to their normal input attenuation functions, and the motorized controls actually restore each of them to the position they were in before being flipped.

A built-in stereo compressor is also available at the stereo buss. This allows you to automatically "even out" the peaks and valleys of a mix by softening (attenuating) the loudest portions of the sound. The compressor sensitivity can be set at anywhere from 0% to 100%, with lower values yielding more subtle effects and higher values giving you that real "punchy" sound that boom boxes, for example, are so famous for.

The DMP7 and MIDI

All in all, the DMP7 offers more than 200 adjustable parameters. A digital "snapshot" of these settings, called a "scene," can be stored in any one of 30 internal memory slots, or to a RAM4 cartridge (which offers another 67 slots) for instant recall at any time. Scenes can also be recalled remotely from any MIDI sequencer or controller issuing standard MIDI program change commands. This feature makes the DMP7 an invaluable live keyboard mixer, since you can literally call up an entirely different mix–with different effects for each of your instruments–with the push of a single button. Thus, you could set up a different mix for each song, or even for each part of a song!

Perhaps even more impressively, the DMP7 allows you to map each of the over 200 parameters to any MIDI note or controller number. This not only allows you to adjust any parameter remotely from any MIDI controller, but also permits the use of a MIDI sequencer to actually "record" and "play back" an entire mix in real time. This is particularly important when you're doing complex mixing, involving many EQ, pan, level, and effects changes during a single song. Each operation, or "mix move," can be overdubbed into a MIDI sequencer, allowing you to create perfect automated takes–just like you'll find in any professional recording studio. With the use of the Yamaha MSS1 synchronizer, you can even sync perfectly all of your DMP7 mix moves to SMPTE time code–a necessity when scoring for film or video. Bulk DMP7 data can also be sent to external storage devices such as the MDF1, DX7 II FD, or QX3. System Exclusive messages can carry either the contents of its internal or RAM4 cartridge mix scene memory, parameter assignment tables, or program change assignment tables.

Live Applications

Since every single parameter and event is controllable via MIDI, the DMP7 has numerous applications in both live performance and recording situations. One typical setup is to use the DMP7 as a mixer in conjunction with a unit like the Yamaha TX802 tone generator or TX16W sampler, each of which offers eight discrete audio outputs. This setup can be further enhanced by making a MIDI "handshake" connection (OUT to IN, IN to OUT) between the DMP7 and either a QX3, QX5, or QX21 MIDI sequencer. (See Figure 2.)

By setting the DMP7 to receive on a different MIDI channel than either the TX802 or TX16W, you can have the sequencer either call up different DMP7 "scenes" (with program change commands) or actually perform the mix for you (with control change and/or note number commands).

Even more sophisticated live setups are possible, with several DMP7s cascaded together and being controlled by both a QX3 sequencer and by numerous MIDI real-time controllers, including those provided by the DX7 II FD/D synthesizer and the MCS2 MIDI workstation. (See Figure 3.)

Recording Applications

An extension of this concept allows you to use the DMP7 in a recording situation. Here, the audio outputs from each track of an 8-track

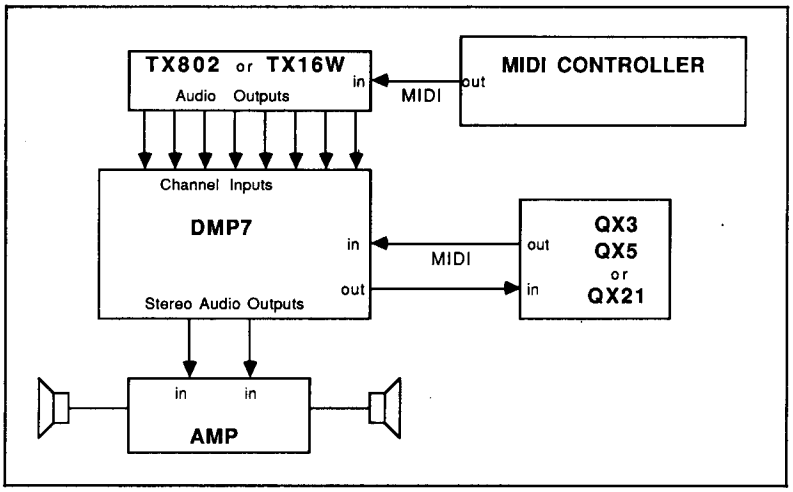


Figure 2. A basic live performance setup using the DMP7.

multitrack recorder are routed to the channel inputs of the DMP7. The first step in the session is to record an analog sync tone (like the FSK tone generated by the Yamaha QX3 or QX5 sequencer) on one track of your multitrack tape. Now, play the tape, routing the sync tone to the tape input of your QX3 or QX5 sequencer, and set it to receive tape clock signal.

After you've sequenced and recorded all your audio tracks in the usual way, handshaking MIDI connections are set up between the sequencer and the DMP7, and you can begin mixing, making sure that the sequencer is recording your mix moves in real time. Again, you can overdub these moves into the sequencer over and over again, until you get the "perfect" mix. Now, when you play back your audio tape, the sequencer will faithfully recreate for you your last mix (and bear in mind that both the QX3 and QX5 even allow you to record different

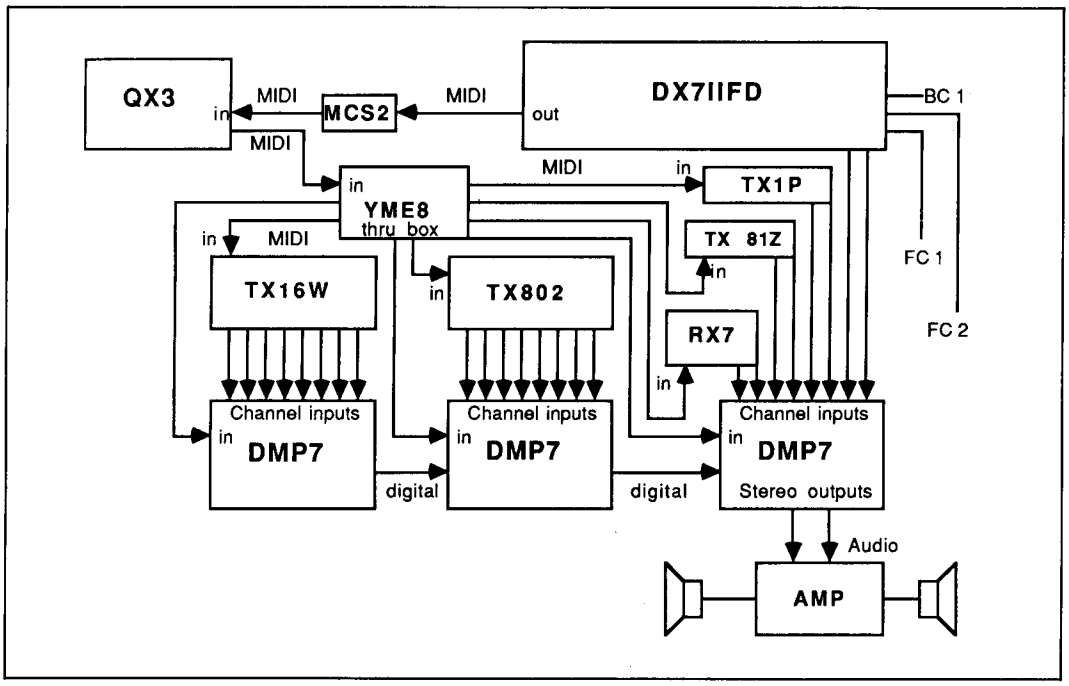


Figure 3. A complete live performance setup using multiple DMP7s.

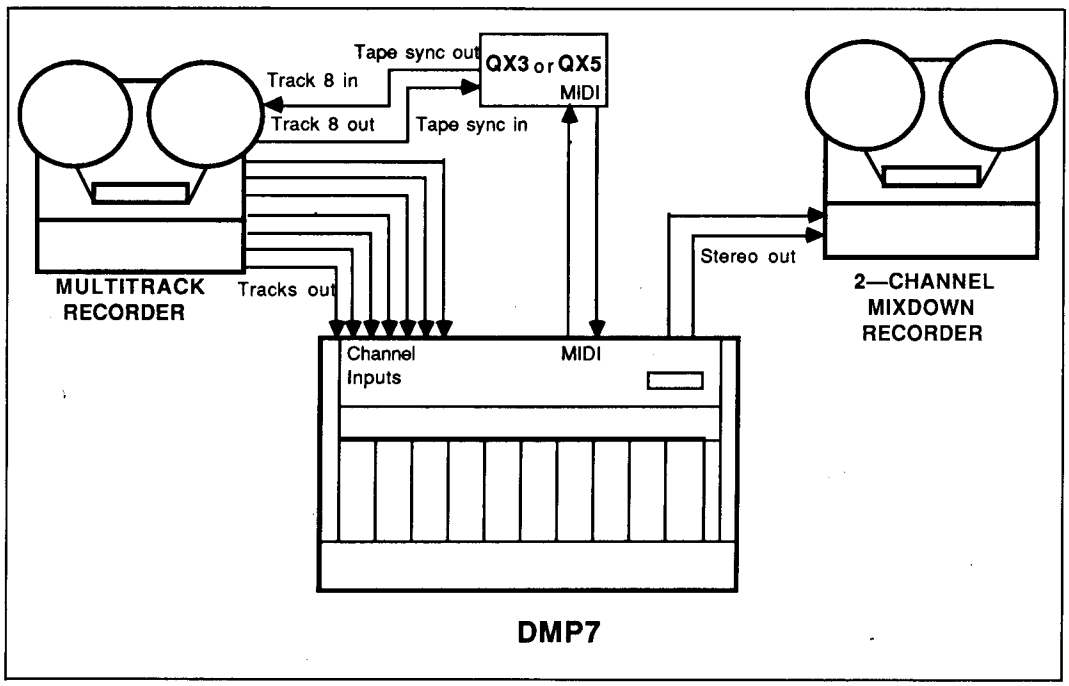


Figure 4. A basic recording setup using the DMP7.

takes on different sequence tracks for later evaluation)–and the motorized DMP7 faders will show you each move as it was made, in sync with the recorded musical events. (See Figure 4.)

One of the most advanced DMP7 applications is to use one or more in conjunction with a Yamaha MSS1 in order to score for video or film. Here, one track of the multitrack tape must first be "striped" with SMPTE time code generated by the MSS1. This code is then played into the MSS1, with which you must now create a "tempo map," correlating the SMPTE addresses to MIDI clock and song position pointer, in conjunction with your chosen tempo and meter changes. This is accomplished by either entering data into the MSS1 in real time or step time, or with the use of "tap" buttons.

At this point, you can begin sequencing as usual, except that you can now correlate MIDI evnts with specific SMPTE addresses–and you can also start your multitrack tape playing back at any point, with the sequencer quickly and accurately "locking up" at that point. DMP7 mixes can be performanced in real time, right alongside your performance, or can be overdubbed later.

Alternatively, the MSS1 has a "MIDI event mode," where sequences of program and controller change commands can be send as particular SMPTE values are received. This allows you to call up different DMP7 scenes and to alter specific DMP7 parameters in sync with visual events. Either way, the end result is a completely editable, easily repeatable performance of both your music and your mix–and one that is perfectly locked to the images. (See Figure 5.)

Substitute a digital recorder for the analog multitrack, feed the SMPTE time code to the MSS1 directly from the video tape, and you've got a ready-made–and inexpensive–"tapeless studio," where all manipulations (and all sound storage) are performed in the digital domain. No matter how sophisticated or straightforward the application, in both live performance and the studio, the DMP7 is up to the challenge.

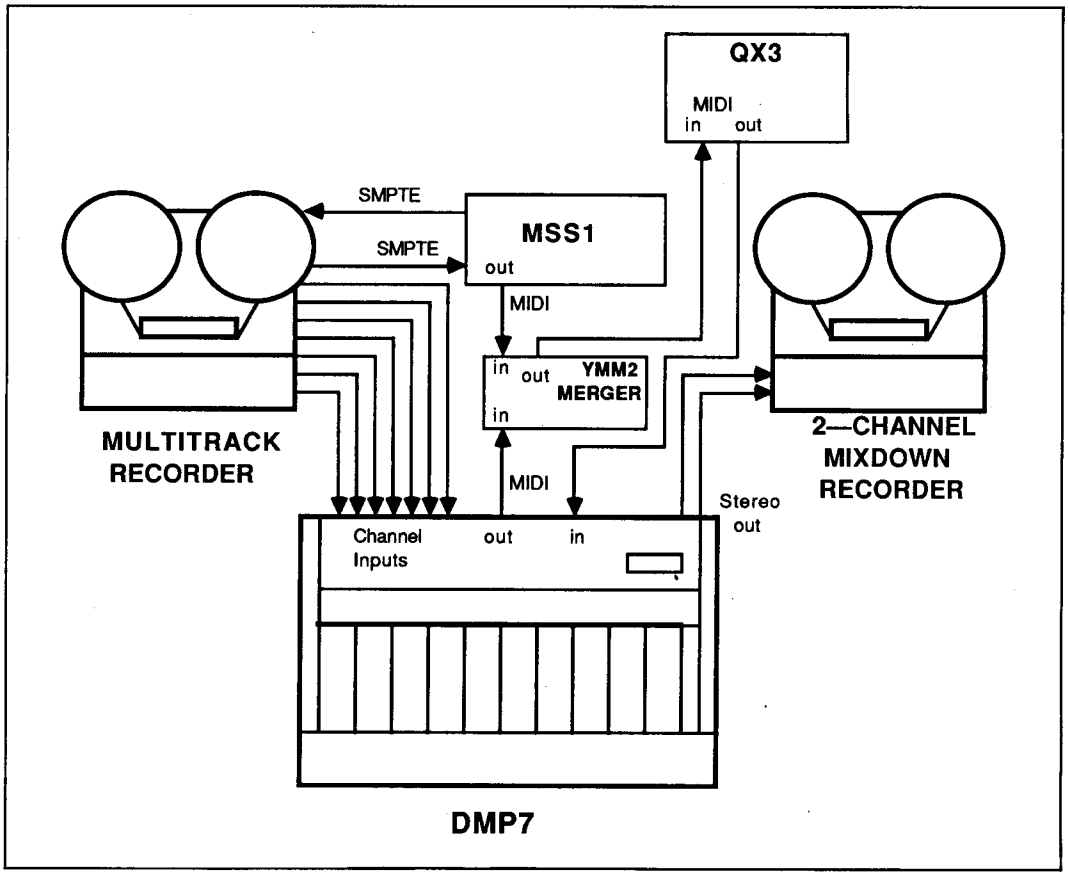


Figure 5. A recording setup for film or video, using the DMP7 in conjunction with the MSS1 MIDI-SMPTE synchronizer.

Hot Tips

Reader Tips For The FB-01 And DX7 II FD.

Two "Battle-Sound" Configurations (Including Seven New Voices) For The FB-01

By Rick Lingenberg

I have created the two FB-01 Configurations for the simulation of battle sounds. These Configurations involve seven new voices, plus one voice from the FB-01's extensive ROM library (Helicop, from Bank 7, #47). The data for the two Configurations and the seven new voices is given below. Using your computer voice editor fo the FB-01, enter the data for each voice exactly as shown.

Each battle-sound voice works best if played using certain keys.

Plain: :Play C5, then C2, then release C5.

BombDrp: Play C6, then C#5, then release C6.

Explode: Play C1 and D1 at the same time.

Helicop: Play F1.

MachGun: Play G1.

MachG2: Play A1.

CarHorn: Play A1.

Race2: Play C2, then C3, then release C2. When sound gets high, release all notes and start again using C3 and C4.

```
BANK A:                    BUFFER: BATTLE
SYSTEM CHAN: 1  Q=C3  V: 5  PLAY CHAN: 1
1:EXPLODE 2:HELICOP  3:MACHGUN 4:MACHG2
5:PLAIN   6:BOMBDRP  7:BRASS   8:BRASS
LFO WAV: TRI  AMD: 115      COMBINE: ON
    FRQ: 110  PMD:   0      RECEIVE: ALL
INSTRMNT #1  #2  #3  #4  #5  #6  #7  #8
NOTES     3   1   1   1   1   1   0   0
MIDI CH   1   1   1   1   1   1   7   8
BANK      2   7   2   2   2   2   3   3
VOICE    47  47  48  31  18  32   1   1
OCTAVE   +1   0  +1  +1   0   0   0   0
DETUNE   +3  +3  +3  +3  +3  +3   0   0
STEREO    R   R   R   R   R   R  LR  LR
LEVEL   127 127 127 127 120 114 127 127
KYLIMHI  D1  F1 G#1  B1  C5  G8  G8  G8
KYLIMLO C-2 D#1 F#1  A1  C2 C#5 C-2 C-2
LFO      ON  ON  ON  ON  ON  ON  ON  ON
KBDMODE POLYPOLYPOLYPOLYMONOMONOPOLYPOLY
P/B RNG   4  12  12   4  12  12   2   2
PORTA     0   0   0   0 127 127   0   0
PMDCTRL  OFF OFF OFF OFF OFF OFFMODWMODW
```

```
BANK A:                    BUFFER: ROADWAR
SYSTEM CHAN: 1  Q=C3  V: 5  PLAY CHAN: 1
1:EXPLODE 2:HELICOP  3:MACHG2  4:CARHORN
5:RACE2   6:BOMBDRP  7:BRASS   8:BRASS
LFO WAV: TRI  AMD: 115      COMBINE: ON
    FRQ: 110  PMD:   0      RECEIVE: ALL
INSTRMNT #1  #2  #3  #4  #5  #6  #7  #8
NOTES     3   1   1   1   1   1   0   0
MIDI CH   1   1   1   1   1   1   7   8
BANK      2   7   2   2   2   2   3   3
VOICE    47  47  31  13  12  32   1   1
OCTAVE   +1   0  +1  +1   0   0   0   0
DETUNE   +3  +3  +3  +3  +3  +3   0   0
STEREO    R   R   R   R   R   R  LR  LR
LEVEL   127 127 127 119 114 114 127 127
KYLIMHI  D1  F1 G#1  B1  C5  G8  G8  G8
KYLIMLO C-2 D#1 F#1  A1  C2 C#5 C-2 C-2
LFO      ON  ON  ON  ON  ON  ON  ON  ON
KBDMODE POLYPOLYPOLYPOLYMONOMONOPOLYPOLY
P/B RNG   4  12   4  12  12  12   2   2
PORTA     0   0   0   0 127 127   0   0
PMDCTRL  OFF OFF OFFMODWMODW OFFMODWMODW
```

```
BANK B: RICKS 19           BUFFER: PLAIN
SYSTEM CHAN: 1  Q=C3  V: 5  PLAY CHAN: 1
-----------------------------------------
ALGORITHM:   3              LFO:  ENABLED
FEEDBACK :   7                WAVE: TRI
TRANSPOSE:   0        2       FREQ: 112
AMPL SENS:   0                AMD :   0
PTCH SENS:   0      1 3       PMD :  42
KYBD MODE: MONO               SYNC: OFF
P/B RANGE:  12       -4
PORTAMNTO: 127
PMOD CTRL:  OFF             NAME: PLAIN

OPERATORS  -1-     -2-     -3-     -4-
ATTK/VEL   31/0    31/0    31/0     3/0
DEC/RSCL   31/0    31/0    31/0     9/0
SUSTAIN    15      15      15       0
DECAY(2)    0       0       0       0
RELEASE     2       3       1       3
KYSCLC/D   0/ 0    0/ 0    0/ 0    0/ 0
OUTP/VEL  107/7   127/7    89/7   127/7
FRQ/DTUN  0.50    0.71    1.00    1.00
```

```
BANK B: RICKS 19           BUFFER: BOMBDRP
SYSTEM CHAN: 1  Q=C3  V: 5  PLAY CHAN: 1
-----------------------------------------
ALGORITHM:   3              LFO:  ENABLED
FEEDBACK :   0                WAVE: TRI
TRANSPOSE:   0        2       FREQ: 112
AMPL SENS:   0                AMD :   0
PTCH SENS:   0      1 3       PMD :  42
KYBD MODE: MONO               SYNC: OFF
P/B RANGE:  12       -4
PORTAMNTO: 127
PMOD CTRL:  OFF             NAME: BOMBDRP

OPERATORS  -1-     -2-     -3-     -4-
ATTK/VEL   31/0    31/0    31/0     2/0
DEC/RSCL   31/0    31/0    31/0    16/0
SUSTAIN    15      15      15      15
DECAY(2)    0       0       0       0
RELEASE     2       3       1      13
KYSCLC/D   0/ 0    0/ 0    0/ 0    0/ 0
OUTP/VEL  107/7   107/7    89/7   127/7
FRQ/DTUN  2.00    4.00    1.00    1.00
```

```
BANK B: RICKS 19           BUFFER: EXPLODE
SYSTEM CHAN: 1  Q=C3  V: 5  PLAY CHAN: 1
-----------------------------------------
ALGORITHM:   1              LFO:  ENABLED
FEEDBACK :   0        1       WAVE: TRI
TRANSPOSE: 126-               FREQ: 119
AMPL SENS:   0        2       AMD :  114
PTCH SENS:   0                PMD :   83
KYBD MODE: POLY       3       SYNC: OFF
P/B RANGE:   4
PORTAMNTO:   0        4
PMOD CTRL:  OFF             NAME: EXPLODE

OPERATORS  -1-     -2-     -3-     -4-
ATTK/VEL   11/0    11/0    13/0    31/0
DEC/RSCL    5/0     6/0    21/0     7/0
SUSTAIN     0       0      15       0
DECAY(2)    0       0       0       0
RELEASE     0       3       0       7
KYSCLC/D   0/ 0    0/ 0    0/ 0    0/ 0
OUTP/VEL  114/0   112/0   106/0   127/0
FRQ/DTUN 12.11    3.14    1.73    0.50
```

```
BANK B: RICKS 19           BUFFER: MACHGUN
SYSTEM CHAN: 1  Q=C3  V: 5  PLAY CHAN: 1
-----------------------------------------
ALGORITHM:   3              LFO:  ENABLED
FEEDBACK :   7                WAVE: TRI
TRANSPOSE:  12-       2       FREQ: 221
AMPL SENS:   3                AMD :  115
PTCH SENS:   0      1 3       PMD :   0
KYBD MODE: POLY               SYNC: OFF
P/B RANGE:  12       -4
PORTAMNTO:   0
PMOD CTRL:  OFF             NAME: MACHGUN

OPERATORS  -1-     -2-     -3-     -4-
ATTK/VEL   13/0    24/0    31/0    24/0
DEC/RSCL   31/0    31/0    31/0    31/0
SUSTAIN    15      15      15      15
DECAY(2)    0       0       0       0
RELEASE     0       4       0      11
KYSCLC/D   0/ 6    0/ 1    0/ 6    0/ 1
OUTP/VEL  127/7   127/7   127/7   127/7
FRQ/DTUN  5.19    4.71    4.00    0.50
```

Continued on page 18

```
BANK B: RICKS 19        BUFFER: MACHG2
SYSTEM CHAN: 1  Q=C3  V: 5  PLAY CHAN: 1
-----------------------------------------
ALGORITHM:    1              LFO:  ENABLED
FEEDBACK :    7       1        WAVE: TRI
TRANSPOSE:   24-               FREQ: 221
AMPL SENS:    2       2        AMD :  115
PTCH SENS:    6                PMD :   83
KYBD MODE:  POLY      3        SYNC: OFF
P/B RANGE:    4
PORTAMNTO:    0       4
PMOD CTRL:  OFF              NAME: MACHG2

OPERATORS   -1-      -2-      -3-      -4-
ATTK/VEL    31/0     31/0     31/0     31/0
DEC/RSCL    31/0     31/0     31/0     31/0
SUSTAIN       15       15       15       15
DECAY(2)       0        0        0        0
RELEASE        0        3        0       15
KYSCLC/D    0/ 0     0/ 0     0/ 0     0/ 0
OUTP/VEL  127/7    127/7    127/7    127/7
FRQ/DTUN 25.95    18.84    13.84     0.50
```

```
BANK B: RICKS 19        BUFFER: CARHORN
SYSTEM CHAN: 1  Q=C3  V: 5  PLAY CHAN: 1
-----------------------------------------
ALGORITHM:    3              LFO:  ENABLED
FEEDBACK :    0                WAVE: TRI
TRANSPOSE:    0       2        FREQ: 205
AMPL SENS:    0                AMD :   0
PTCH SENS:    0     1 3        PMD :   0
KYBD MODE:  POLY               SYNC: OFF
P/B RANGE:   12      -4
PORTAMNTO:    0
PMOD CTRL:  MODW             NAME: CARHORN

OPERATORS   -1-      -2-      -3-      -4-
ATTK/VEL    31/0     31/0     31/0     31/0
DEC/RSCL    31/0     31/0     31/0     31/0
SUSTAIN       15       15       15       15
DECAY(2)       0        0        0        0
RELEASE       15       15       15       15
KYSCLC/D    0/ 0     0/ 0     0/ 0     0/ 0
OUTP/VEL  117/0    117/0     97/0    127/0
FRQ/DTUN   2.00    11.28    10.99     0.79
```

```
BANK B: RICKS 19        BUFFER: RACE2
SYSTEM CHAN: 1  Q=C3  V: 5  PLAY CHAN: 1
-----------------------------------------
ALGORITHM:    3              LFO:  ENABLED
FEEDBACK :    7                WAVE: TRI
TRANSPOSE:    0       2        FREQ: 112
AMPL SENS:    0                AMD :   0
PTCH SENS:    0     1 3        PMD :  42
KYBD MODE:  MONO               SYNC: OFF
P/B RANGE:   12      -4
PORTAMNTO:  127
PMOD CTRL:  MODW             NAME: RACE2

OPERATORS   -1-      -2-      -3-      -4-
ATTK/VEL    31/0     31/0     31/0     21/0
DEC/RSCL    31/0     31/0     31/0     31/0
SUSTAIN       15       15       15       15
DECAY(2)       0        0        0        0
RELEASE        2        3        1        3
KYSCLC/D    0/ 0     0/ 0     0/ 0     0/ 0
OUTP/VEL  107/7    127/7     89/7    127/7
FRQ/DTUN   0.50     0.71     1.00     1.00
```

* * * *

Transferring Single Voices Between Disk Files On The DX7 II FD

By Dan Linehan

If you own a DX7 II FD and have a single voice in one disk file that you would like present in another disk file, this tip is for you.

Before the procedure is outlined, some background information is required. First, the disk drive on the DX7 II FD is designed to be used as a mass storage device in that only bulk groups of 64 voices and 32 performances can be contained in a file (other types of data, such as MDR data and Cartridge fractional scaling data can also be stored, but we are only concerned here with voice data). The RAM4 cartridge can also store this type and quantity of data, with the advantage that single voices and performances can be transferred to or from Internal memory to Cartridge memory.

The information listed above is the basis for this procedure. A file on disk which contains the voice you want transferred is loaded into Internal memory, then from there into Cartridge memory. Next, the file on disk that you want to contain this voice is loaded into Internal memory. Finally the desired voice (now in Cartridge memory) is saved in the desired location in Internal memoy, and the revised file is then resaved onto the disk.

The procedure is outlined below. For simplicity, I have assumed that File #2/Voice #1 will be transferred to File #1/Voice #1. Starting from one of the three Voice modes, follow these steps:

1) Insert a RAM4 cartridge into the cartridge port and push the Edit button.
2) Press the Cartridge Utility button (#15), and format the cartridge for Voice & Performance data using the standard procedure.
3) Insert the disk containing Internal File-#1 and Internal File #2 into the disk drive on the DX7 II FD.
4) Push the Disk Utility button (#16) until the Disk INT menu appears.
5) Call up the directory, select File #2, and load the file into Internal memory using the standard procedures.
6) Press the Cartridge Utility button (#15) until the Load/Save menu appears. Save the Internal memory to Cartridge. (You have now transferred File #2 from disk to Cartridge memory.)
7) Press the Disk Utility button (#16) until the Disk INT menu appears.
8) Call up the directory, select File #1, and load the file into Internal memory using the standard procedures. (You have now loaded File #1 from disk to Internal memory.)
9) Press the Single Voice Mode button to return to Play mode, and then push the

Cartridge button to select the Cartridge voices.

10) Press button #1 to select the voice to be transferred.
11) Now, press and hold the Store button; while doing so, press the Internal button, the #1 button, and the Yes button in that order. (You have now transferred Voice #1 from File-#2 to File-#1.)
12) Now push the Edit button, and press the Disk Utility button (#16) until the Disk INT menu appears.
13) At this point, you have two options: 1) call up your original File #1 and write your edited file into the original location (erasing the original version of the file); or 2) Call up a new file location, give it a name, and save the edited file to a new location. In either case, use the standard save procedure.

Use Pan Assignments In The FB-01 To Divide Sounds For Independent Signal Processing

By Neil Panton

In several of my "saved" Single configurations, I split one instrument to the left side, and route all others to the right side. By doing this, I am able to equalize one of the FB-01 voices on a separate channel of my mixer.

This allows me, for example, to have a bass sound on my left channel, plus multi-voiced soft strings or brass accompaniment on the right channel. The strings or brass can often be equalized together to be blended into background harmonies, while the bass is equalized to be strong and punchy.

LET US HEAR FROM YOU! We want AfterTouch to be an information network for *all* users of Yamaha professional musical products, so please join in. We're looking for many different kinds of material.

Have you created an incredible patch for the DX7 II, the DX100, or any of the other members of the Yamaha FM digital synthesizer family? How about a program for the CX5M II music computer or a great pattern or voice for the RX5? Send in your patches, programs, and patterns. If we use your material, we'll give you full credit plus $25.00 for each item used.

Have you discovered a trick that increases the musical flexibility of one of the Yamaha AfterTouch products? Send it in to our "Hot Tips" column. If we use your hot tip, you'll receive full credit plus a check for $25.00.

Have you developed a new approach to one of the Yamaha AfterTouch instruments, or have you discovered an important secret regarding their use? Put it on paper and send it to us. Don't worry about your writing style—just get the information down. If we decide to use your material as a full article in AfterTouch, we'll write it up, put your name on it, and send you a check for $100.00. (An AfterTouch article always covers at least one magazine page—which translates to at least four double-spaced pages of typescript.)

By the way, we cannot assume liability for the safe return of unused ideas, patches, or manuscripts. We will only be able to return unused material if you enclose a self-addressed, stamped envelope with your submission.

If you just have a question regarding the use of Yamaha professional musical products, send it along too, and we'll do our best to answer it in the pages of AfterTouch. (We regret that we won't be able to answer questions through the mail, but we will use all of your questions to guide us in our choice of future topics.)

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

AfterTouch is your publication. Let us hear from you!

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TX1P

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Voice Selector #	Effect
27	Chorus OFF
28	Chorus ON
29	Trans. Delay OFF
30	Trans. Delay ON
31	Chord Play OFF
32	Chord Play ON

The TX1P is also implemented to respond to the following MIDI controllers: Volume (07), Sustain (64), Key Hold (66), Soft Pedal (67), and Chorus Depth (93).

The Back Panel

The TX1P's back panel offers MIDI IN and MIDI THRU ports, plus two audio output jacks. For the best sound using the Chorus effect, use both outputs. If you are using a mono sound system, simply insert a plug into only one of the outputs.

The Yamaha TX1P Piano Tone Module weighs 7.5 pounds. It is available now at authorized Yamaha music dealers for a suggested retail price of $895.00 For more information, write to Yamaha Music Corporation USA, Digital Musical Instruments Division, P.O. Box 6600, Buena Park, CA 90622-6600.