

## Sound Concepts

BY JAY CRAGGS

**W**ELCOME BACK, EQUIPMENT freaks. Last time we covered some basic audio routing concepts. In this issue, we're going to use those ideas to assemble a medium-sized conventional guitar rack and a guitar synth system. By keeping in mind the approaches discussed last issue and using the systems shown here as examples, you will be able to assemble a great sounding system based around the gear you are now using.

Listing components and grouping them by function, as in Fig. 1, greatly simplifies the process of system design. Note that the guitar synth module and the traditional guitar preamp are similar in that they both create the raw timbres that the systems are enhancing. Viewing your synth modules as preamps can demystify much of the MIDI Guitar routing game.

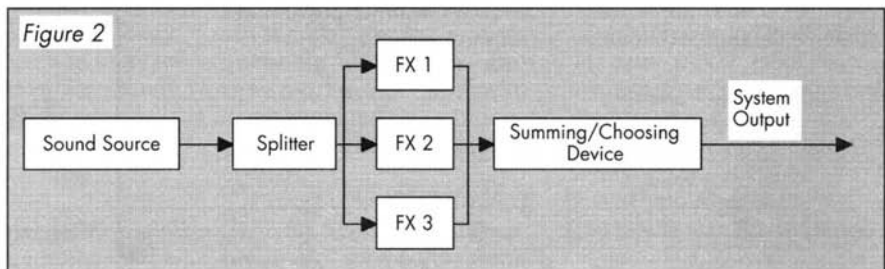
Once your equipment list is established, setting up your system is simply a matter of applying good routing concepts. The block diagram (Fig. 2) illustrates the concept behind both of the rigs in this article, a tried-and-true

approach.

As we discussed last issue, routing effects and dry source sounds in parallel will yield the best audio quality. Remember to set all of the effects to 100% "wet" to avoid degradation of your original tones.

will affect the sound of the other!

Mixers allow you to combine audio signals. Splitters always have gain stages, which means that they all use active electronics (op amps and other solid state devices). It is possible to design a mixer, however, that utilizes



There are two basic building blocks in parallel audio routing: *splitters* (sometimes called audio distribution amplifiers) and *mixers*. Splitters create duplicates of a signal without loading down the original, avoiding the loss of power and high frequencies that would come from simply using a Y-cord to split the signal. Also, the outputs from a splitter are *buffered*, which means that they are isolated from one another. If they weren't, turning down the volume in the mix on one of the outputs could

only passive electronics (limited mainly to wire, resistors, and capacitors) in their audio paths. This results in an increased dynamic range (don't have to worry about overloading the inputs), a higher S/N (*Signal-to-Noise ratio*; higher is better), and lower THD (*Total Harmonic Distortion*). The mixers discussed in this article are different from the vast majority of mixing boards in that they feature passive electronics and are automated via MIDI.

When choosing routing system components (splitters, choosers, etc.) there are several products to consider. When looking for splitters, you will most likely find two competing products: the Rane SM-26 and the Uptown Technologies GREAT DIVIDE. The two passive mixing units that I have had the most luck with are the Niche Audio Control Module (ACM) and Uptown Technologies' FLASH. Both have excellent specs and MIDI implementation. The ACM's selling point is MIDI-controlled volumes, but it can *only* be controlled via MIDI—there are no front panel controls. FLASH's strength is extremely fast switching time, unusual flexibility,

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Figure 1

	Conventional Guitar System	Guitar Synth System
<b>Tone Generators</b>	Boogie Quad Preamp	Roland GR-50
<b>Effects</b>	TC Electronics Chorus Rocktron Intellifex Roland DEP-5	Korg A3 Roland SE-50 Roland Pitch Shifter
<b>System Output</b>	Boogie Power Amp & Speakers	D.I.'s to Stage Monitor and PA Main board

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affect the volumes on the other (you can experience a similar coupling if you plug two guitars into the inputs of a single guitar amplifier—in many designs, the volume knob on one guitar

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and control from both the front panel and MIDI. In the following diagrams I've used FLASH. Decide for yourself which units best suit your application(s).

You will be able to tie together many of the concepts I've discussed by studying the two system diagrams. I suggest tracing the signal flow through the systems, and comparing this to the flow chart above. Here is a brief analysis of the two system diagrams:

**Quad Preamp System:** Signal flows from the guitar pickups into the preamp, and then from the preamp effects send to channel one of the passive mixer. In this particular splitter, channel 1 is "normalled" to channel 2, resulting in a 1x4 split. Split 1 of the preamp effects send is Y-jacked into the first stereo input of the passive mixer. This is done to provide original unaltered preamp signal to both sides of the stereo signal. This "dry", or unaltered preamp signal allows the player to eliminate all effects from the system when desired. The remaining three splits are routed in parallel to the inputs of the three effects. The stereo outputs of the three effects are routed to the three remaining stereo inputs on the passive mixer. The effects units are set at 100% wet and blended with the dry preamp signal by the passive mixer (FLASH). The stereo outputs of the passive mixer are routed into channels 3 and 4 of the splitter, and the outputs of channels 3 and 4 of the splitter are routed into the effects return of the preamp. Channels 3 and 4 of the splitter are used to adjust the gain of the effects return signal. Finally, the stereo outputs of the preamp are routed to a stereo power amp and speakers. Sound selection is made either over MIDI or manually from the FLASH's front panel. This system allows you to select dry preamp sounds, effected sounds, or any combination of dry and effected sounds.

**GR-50 System:** This system has a stereo tone generator (guitar synth module), so a slightly different splitter configuration is called for. Signal flow is from the guitar synth stereo outputs to the inputs of splitter channels 1 & 2. The outputs of splitter channels 1 and 2 are then routed to the stereo input 1 on the passive mixer (FLASH). This is the

"dry", or unaltered GR-50 signal that allows the player to eliminate all effects from the system when desired. The remaining 3 splits are the sum of the GR-50 stereo output (this mono summing is a feature of GREAT DIVIDE 4) and are routed in parallel to the inputs of the three effects. The stereo outputs of the three effects are routed to the three remaining stereo inputs on the passive mixer. The effects units are set at 100% wet and blended with the dry preamp signal in stereo. Finally, the stereo outputs of the passive mixer are patched into D.I.'s which interface the system with stage and monitor amplification. Sound selection is made either over MIDI or manually from FLASH's

front panel. This system also allows a very large combination of input selection, layering, and stereo imaging choices.

## Combo System

If you were to combine a system like the Quad Preamp System with one like the GR-50 System, you would have both halves of your signal well under control, and sounding simply incredible.

By spending a little time studying these diagrams, you will begin to understand how audio flows through the systems. Once you understand that, you will be able to apply this approach to your own system. Good luck, and happy layering.

