PHONO SWITCH

I wish to record and play monophonic LPs and 45s (vertical cut). I am aware that you can physically install a switch on the turntable plinth or wherever possible. But, I am not sure how to electrically wire the switch to play vertical cut discs, so would appreciate the schematic of the mono/stereo switch.

P.S. My phono/preamp does not have a mono/stereo switch, and I understand the need for employing the switch at the turntable. Page 77 in the book *The LP Is Back* shows a print of a lateral/vertical switch. Is this one correct?

Lisa Marie Jastrzemski,
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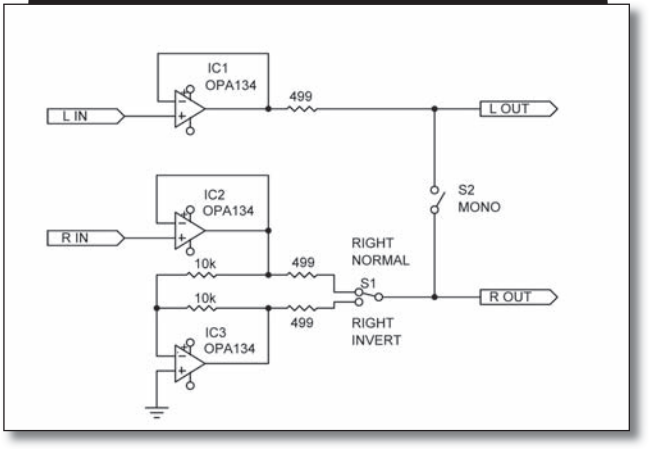
Gary Galo responds:

Your question is a little confusing, because monophonic LPs and 45-rpm records are always laterally-cut. I assume that you want to be able to combine the two channels to mono, and be able to switch between laterally-cut and vertically-cut records (vertically-cut recordings include all cylinders, Edison Diamond Discs, and most Pathé discs). The illustration on page 77 of *The LP Is Back* does show correct switching for laterally- and vertically-cut records at the phono cartridge input ("A Preamp for Vintage 78s," a modification of the McIntosh C-8 preamp originally published in *Audio Amateur*, 1/1985).

It is important that you mount this switch right next to the phono input jacks on the back of your preamp, minimizing lead lengths which can cause hum pickup at phono cartridge signal levels. You will also need a tonearm cable with a floating shield, as described elsewhere in that article.

If you are using a stereo preamp (or a pair of modified C-8s), I recommend doing the lateral/vertical switching at line level. **Figure 1** shows a circuit that will accomplish this. IC1 and IC2 are configured as

FIGURE 1: Line-level lateral/vertical/mono switching for 78-RPM recordings and cylinders.



unity-gain voltage followers for the left and right channels. IC3 is a unity-gain inverter for the right channel only. S2 is the mono switch, and S1 is the lateral/vertical switch.

In the "Right Normal" position, the two channels are summed to mono "in-phase" for laterally-cut recordings. The vertical noise component is cancelled. In the "Right Invert" position, the two channels are summed to mono "out-of-phase" for vertically-cut recordings. In this case, the lateral noise component is cancelled.

Use high-quality, low-offset FET-input op amps for the ICs 1-3, such as the Burr-Brown/TI OPA134 or OPA604, or Analog Devices' AD825. Supply rails can be ±15V, and be sure to include local supply bypassing close to the op amps. You can mount this circuit either inside an existing preamp or in an external enclosure. In the latter case, you could connect it through a tape-monitor loop in your preamp. You could probably use the preamp's own mono switch, assuming that it is located after the tape monitor loop (this is usually the case).

Bear in mind that a normal RIAA stereo phono preamp will not provide correct equalization for older recordings.

TEST EQUIPMENT

After reading the *Audio Electronics* 5/00 article about the Pico scope ADC-216, I decided to purchase the high-resolution 12-bit ADC 212/3 because at +$400 it was about half the price of the reviewed $800 16-bit version. I now have a situation in which I am setting up a test bench at a new home in the Portland, Oreg. area, so I would like to duplicate or improve upon the existing equipment at my test bench in northern California. I primarily use the ADC 212/3 as a spectrum analyzer to check for distortion, hum, and noise for the SE and PP tube amplifiers at 1W, 2W, and so on.

The only undesirable attributes of the Pico scope are the inability to set the 1kHz test signal at 0dB, fast response times versus resolutiontrade-off, and the 20V input limit. I saw the new 3000 series from Pico, but this series emphasizes the DSO (only 8 bit) rather than the spectrum analyzer, which is my primary use of this product.

Do you know of any new products by other manufacturers that now perform the spectrum analyzer functions of the Pico 212/3 better or for less money?

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Charles Hansen responds:

I'm not sure why you could not set a 1kHz test signal at 0dB. The 0dB level is referenced to the selected input range. If the input signal exceeds the 20V input limit of the ADC212/3, you can use an input attenuator network to divide down the input voltage. Response time versus resolution is the trade-off you must always make with FFT measurements, no matter whose equipment you use. I prefer a longer response time in order to achieve the best accuracy and resolution. Pico has an excellent application knowledge base at their website, and I have found their online support to be very helpful as well.

There are a number of PC-based test equipment suppliers. Some use interface units such as the Pico scope, some use PC sound cards. A quick web search turned up ATSpec Pro, Audio Precision, BitScope, National Instruments, Prism Audio, MultiScope, ProTek, RMAA Rightmark, PHS Spectra-Plus, Sound Technology SpectraSeries and Velleman. I leave it to you to determine your own cost-performance trade-off. *aX*