LETTERS

SEND YOUR COMMENTS TO THE EDITORS OF ELECTRONICS NOW MAGAZINE

Box Modifications

In the article "Build the Mod Box" (**Electronics Now**, May 1997), which I co-authored with Jack Orman, several errors were introduced into our original hookup diagram when it was redrawn for publication as Fig. 2.

First, R17 erroneously appears twice on the circuit board. The resistor that lies between R15 and C7 is actually R7, not R17. The other R17, which lies on the right edge of the board, is correct. Next, capacitor C13 also erroneously appears twice on the circuit board. The capacitor that connects between pins 8 and 9 of IC1 is actually C3. The other C13, which appears in the upper left-hand corner, is correct.

Finally, the connections to J2 and J4 are in error, and volume potentiometer R14 is missing. Here's how to fix that. Pad "U" connects to the hot side of R14 only. Then, the wiper of R14 connects directly to J2, J4, and pad "W."

All of these corrections can be cross-referenced to the schematic, which is correct.

THOMAS HENRY

Determining the Velocity of Propagation

I found James E. Cicon's article, "Build the Cable Reflection Tester" (**Electronics Now**, December 1996) to be very informative, but I believe that more discussion of velocity of propagation (V_P) was needed. The article seems to imply that V_P is a function of cable type, which is untrue. V_P is determined by the dielectric material (the insulation surrounding the center conductor). The less dense, or closer to air, the dielectric is, the faster the V_P.

Older cables with solid polyethylene dielectric do indeed have a V_P of 66%. Newer cables have an air-entrained or foam poly dielectric. Early foams started in the 72% to 78% range. Current foam-dielectric, 75-ohm, CATV cables (RG59, RG6, and RG11) have a V_P of 82%–85%, depending on the generation and the manufacturer. The 50-, 52-, and 93-ohm series cables, with foam dielectric, should also exhibit similar V_Ps.

In a bench test with a Time Domain Reflectometer (TDR), using a length of RG59 foam-dielectric cable, the following was found: V_P 66% at 80 feet; 75% at 90 feet; 83% at 100 feet; 84% at 101 feet. As can be seen, it's important to be close on the velocity of propagation. Manufacturers should provide that information in their spec sheets, but often don't. If you have access to a physically measurable piece of the same type of cable that you need to test, you can calculate or experimentally determine the correct V_P.

Good luck with your cable testing. And thanks to Mr. Cicon for the article and this neat idea. I certainly plan to build a Cable Reflection Tester.

DON KISER
Salinas, CA

Designing the JamMix

In the April 1997 "Letters" column, Charles Hansen's letter on op-amp substitutions for my "JamMix" project (**Electronics Now**, October 1996) was absolutely on the mark. To further the discussion, our main reason for specifying the MC1458C device centered on the kit builder.

The MC1458C is a commonly available part; we found it at RadioShack. Its ESD characteristics should be better than op-amps with FET front ends, so novice kit builders would be less likely to damage the chip. And it is somewhat easier for a novice to troubleshoot than a quad package, but less assembly effort is required and there is a lower chance for error than when using single op-amps.

Our JamMix design journal contains notes showing that we looked closely at the Motorola MC1458S, which has 20 times better power bandwidth than the MC1458C. But the part was not thought to be universally available, and was therefore rejected. In responding to Mr. Hansen's letter, we did not have a data sheet handy for the TL072 Texas Instruments device, but our National Semiconductor Databook cross-referenced it to their LF353. The chip is described as a wide bandwidth dual JFET input op-amp. The NE5532 is a Philips high-speed op-amp. Those are both fine parts and indeed good performance upgrades for the 1458 series. We look forward to testing the TL072 and NE5532 chips, and hope to discern the sonic improvement that Mr. Hansen suggests.

When we designed JamMix, the first prototype was laid out on a multi-purpose board. We then developed the printed-circuit board with hand assembly in mind, and installed it in a case. We detected no ill effects from component selection or layout, so decoupling capacitors did not seem warranted. We were able to eliminate ten devices and the associated circuit board real estate, although we fully agree it is good design practice to decouple at the chip, as a rule.

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Due to the volume of mail we receive, not all letters can be answered personally. All letters are subject to editing for clarity and length.

Sorry, Wrong Number

In my article "Build the Fuel Gauge" (**Electronics Now**, April 1997), I gave an incorrect telephone number for the parts supplier, Unicorn Electronics. The correct number is (607) 798-0260. I am sorry for any inconvenience that was caused.

JOHN PIVNICHNY EN