

Three New Prototyping Boards

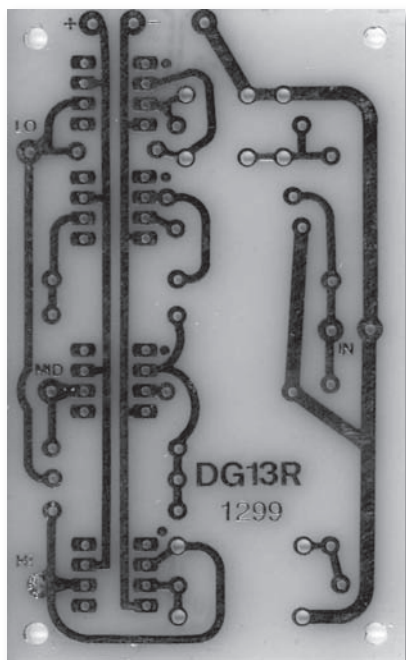


PHOTO 1: Old Colony's venerable DG-13R Electronic Crossover Board has given admirable service for a variety of IC op amp projects. Some board modifications are usually necessary, including cutting traces, drilling holes, and adding jumpers.

Old Colony D-4 Prototyping Board designed by D.H. Labs. \$5 from Old Colony Sound Lab, www.audioXpress.com.

Ben Duncan Research Prototyping Board StdBrd01 and TagBoard TAGBRD1A. Contact Ben Duncan at BDR-UK@dia1.pipex.com for purchasing information.

Audio builders making one-of-a-kind projects usually find that custom PC boards are cost prohibitive in very small quantities. Prototyping boards suitable for audio construction are available from many sources, but finding ones tailored specifically to IC op amp construction is more difficult.

Long-time readers of this magazine and its predecessors *Audio Electronics* and *Audio Amateur* have seen the venerable Old Colony DG-13R board put to good use in several of my projects (**Photo 1**). The DG-13R board measures $3 \frac{3}{16} \times 1 \frac{15}{16}$ ", and goes back to an article on electronic crossovers written by Ed Dell and Joshua Goldberg, published in 2/72 *Audio Amateur*. I used it for several second- and fourth-order electronic crossovers that I built over 20 years ago, and later found it suitable for many other op-amp projects. Most recently, I adapted it for the DC servo board in my Adcom GFP-565 preamplifier mod project (Feb. '04 *aX*) and for the phono preamp and line stage boards in the Music Library Pre-amp (March '05 *aX*).

The biggest problem with the DG-13R is that it usually needs to be modified for the project at hand by cutting traces, drilling extra holes, and adding jumpers. Even an electronic crossover project will require power supply bypassing not built into the PC layout. But I've found this board extremely handy over the past 25 years.

Radio Shack carries a number of "perfboard" type prototyping boards, including the 276-0149 project board shown in **Photo 2**. This board is only suitable for the smallest projects, be-

cause it measures only $2 \frac{27}{32} \times 1 \frac{27}{32}$ ". Radio Shack makes larger project boards, but all of their boards, including 276-0149, are made from phenolic, which is flimsy and not the best dielectric for audio. There's nothing more frustrating than finishing a circuit on one of these only to have the corner break off at the mounting screw hole.

Radio Shack's solder pads are also wimpy, and rarely survive desoldering and re-soldering if changes need to be made. The board shown in **Photo 2** is

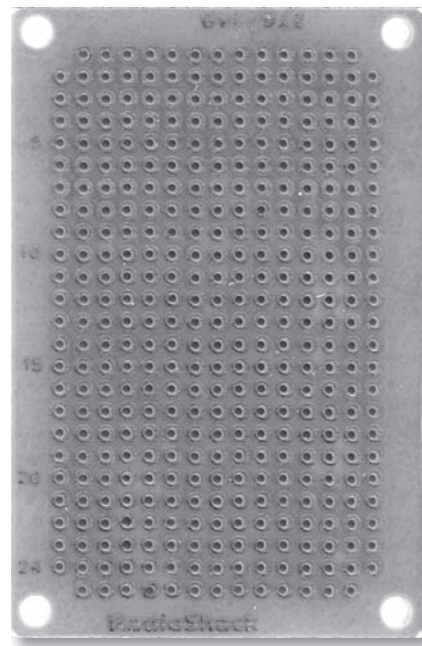


PHOTO 2: Radio Shack's 276-0149 project board. Its small size and flimsy phenolic construction and solder pads make it a poor choice for serious projects. The same board is sold by MCM Electronics, 21-4600.

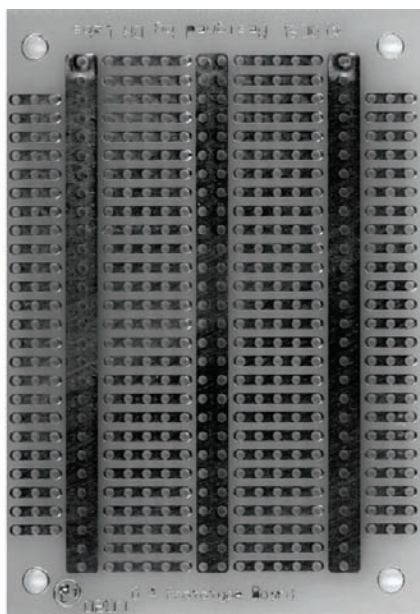
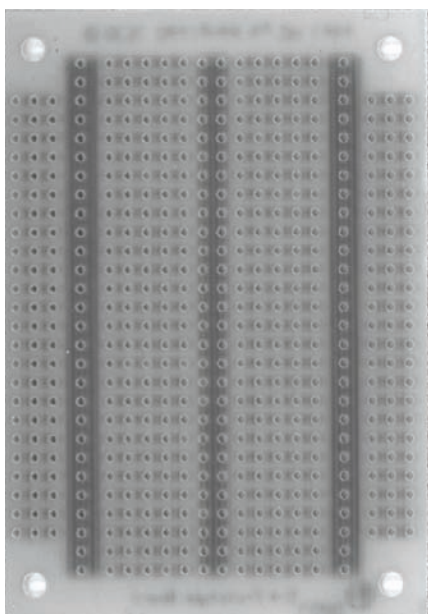


PHOTO 3: Top and bottom views of Old Colony's new D-4 Prototyping Board, designed by D.H. Labs. A ground trace runs down the center of the board, with power supply traces on either side. This board features high-quality fiberglass construction and durable traces.

also sold by MCM Electronics as 21-4600, but I don't recommend these boards for serious work.

After my Adcom GFP-565 modification project was published, Darren Hovsepian, owner of D.H. Labs, sent me a sample drawing of a prototyping board he had designed. I liked his concept and encouraged him to pursue making it and offering it for sale. After a few modifications to the board, Darren offered the finished design (for free) to Old Colony Sound Lab, in hopes that readers would find it useful. The Old Colony D-4 board is shown in **Photo 3**.

If you've been waiting for a suitable replacement for the Old Colony DG-13R, this is it. The D-4 measures $3\frac{1}{4} \times 2\frac{1}{4}$ " and features quality fiberglass construction with tinned, durable copper traces that should survive circuit modifications if they are necessary. Depending on the number of passive components involved, you can probably fit up to four 8-pin DIP packages on one board.

With projects involving many passive components, such as a phono preamp RIAA feedback network, two is probably more realistic. The bottom view in **Photo 3** shows the ground trace that runs through the center of the board,

along with power supply traces running along either edge. The board is very "generic" and should accommodate a



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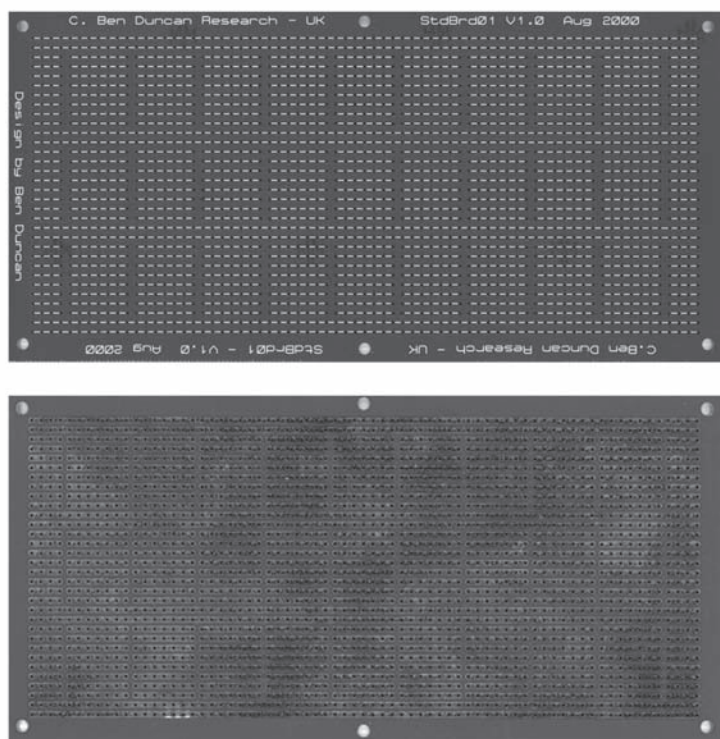


PHOTO 4: Top and bottom views of the StdBrd01 Prototyping Board from Ben Duncan Research. This board will accommodate at least 12, and up to 24 op amp circuits. Eight bus bars can be used for grounds and power supply rails. This board is available in natural or blue fiberglass, and is suitable for larger projects.

variety of IC op amp projects without needing any modifications. Power supply, ground, and parts connection traces are laid out intelligently, which facilitates local supply bypassing.

The D-4 is now my first choice for small audio op amp projects. Readers beginning the Adcom phono preamp modification or the Music Library Pre-amp I mentioned will find this board excellent for those projects, and much easier to use than the old DG-13R. The D-4 is a winner that should make life easier for many audio builders, and the \$5 price tag makes it a bargain. Thanks, D.H. Labs, for this excellent design, which I am already putting to good use!

Ben Duncan is a name well known to audio builders, and the owner of Ben Duncan Research (www.bdr-uk.dial.pipex.com). This audio designer has published countless articles and books, and a number of products he has designed are sold on the British Audio website www.britishaudio.co.uk/newproducts.htm (click on "More" and then "Ben Duncan Products"). Duncan's StdBrd01 prototyping board measures $7 \frac{9}{16} \times 3 \frac{3}{4}$ " and is

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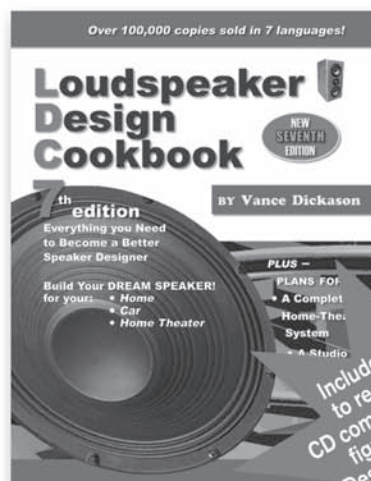
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suitable for larger projects (**Photo 4**). Like the Old Colony D-4, it's tailored for IC op amp use, and made of high-quality fiberglass and rugged tinned copper traces. The board has 30 DIP footprints that will accommodate 8, 14, and 16-pin packages. Duncan conservatively notes that, allowing for space taken up by passive components, at least 12 and up to 24 op amp circuits can fit on one board. The board also has 8 bus bars running the full length of the board that can be used for grounds and power supply rails. Unlike the D-4, Duncan's board orients the op amps along the width, rather than the length, of the board. Duncan's unique prototyping board layout is very intelligently designed, and should work very well for larger projects, in which multiple circuits are needed on the same board.

Duncan is also offering the TAGBRD1A Tag Board (**Photo 5**). This board measures 5 3/16 x 2 9/16" and contains 36 rugged plated through-holes and 24 non-conductive holes. This "Universal Wiring Panel" is intended for tube circuits and other applications requiring point-to-point wiring of larger components. You can also build raw power supplies using large rectifier diodes on this board.

Like the StdBrd01 prototyping board, the Tag Board features robust fiberglass construction. Strangely, neither of Duncan's boards is offered on the British Audio website, and currently there are no Internet sources selling this board. Contact Duncan directly at the e-mail address given at the head of this review for ordering information. *ax*



PHOTO 5: Ben Duncan's TAGBRD1A Tag Board is designed for point-to-point wiring, particularly tube circuits. The board is made of durable green fiberglass and rugged, plated-through holes.

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