

## How to test the cartridges

SID: It's pretty easy. Just plug a cart in (we use an Aprospand expander so we can insert and remove without shutting off the computer), load the *Stereo Player* software, and start playing a song. We use the song "Isla Bonita" (front side of disk) because it has several different waveforms. Listen carefully to the percussion—if it sounds funny, suspect the filter caps. If you get no sound or very faint, it could be about anything, but start by replacing the SID. Then check for solder bridges. Next, use a logic probe on the SID chip and see if any pins are at the wrong levels.

If the cart tests good, remove it by turning off the Aprospand and unplugging it. Put a new cart in to test and turn the slot back on. Occasionally the SID chip won't initialize properly when cut in like that (in the middle of a tune). If that happens (sound will be funny), hit "R" to restart the current song (doesn't reload it from disk). (Also use "R" when the song ends and you still have more carts to test.)

SL: A little more involved. The basic idea is to send a file of six hi-res graphics pictures from a Mac (that's what we used anyway—the file of pics is called "Six Pictures" on the Mac floppy enclosed) to the C-64 (or C-128 in C-64 mode) and use a special program ("swiftlink test" on the enclosed 5.25" C-64 disk) to receive and display them. "Swiftlink test" uses simple X-modem to receive the data at 38,400 bps, which tests each cart at the upper limit of speed. If it detects an error in the transmission it will increment the border color to let you know. You should not get any errors unless the connection is loose or the cart is bad. A correct display of the six graphics screens reinforces that the cart is working properly.

We found the *VersaTerm Pro* on the Mac works great to send the files—it can keep up at 38,400 bps (not all programs can). Just set the file type to "Binary X-modem" before sending, and of course make sure the communication parameters are 8-N-1.

We use a simple 3-wire null-modem cable (TxD, RxD, GND) to make sure that the pull-up resistors on the other handshake lines are exercised.

"Swiftlink test" performs important initialization on each SL when you RUN it; therefore you have to toggle the C-64's power and reload/run the program before testing each unit. Noel Nyman wrote the program quickly one day, so if you would like him to modify it, let me know.

X-modem starts out with the receiving computer sending the transmitting computer an "Ok, start sending" packet. So, if the transmission never begins, suspect the transmit circuit on the SL-232. If the Mac starts the transmission but no graphics show up on the C-64, suspect the receive section of the SL-232. The steps we use to debug often are:

- 1) Replace socketed chips (it's easy to do!).
- 2) Check for solder bridges.
- 3) Check the NMI-IRQ switch (we've had a few bad ones)

4) Use a logic probe on the ACIA to see if any lines are at the wrong logic level.

Bryan can help you debug particularly pesky cases—you shouldn't have many though.

### **Making cartridge/disk labels**

Cartridge labels: Load the appropriate image into *Pagemaker* (“SID Label Long” for SID; “SwiftLink Label Long” for SL). Load however many sheets you want to print of the Avery full-page label material into the Laserwriter and print away! I have been cutting the labels out by hand but a little ingenuity could probably automate the process. Note that the labels need to be cut a little smaller than their actual edges to fit in the label recess in the cart shell. **IMPORTANT**: Do not use a photocopier to print the labels—the toner will come off very easily. The Laserwriter toner seems to stick much better.

Disk labels: Basically the same as above except use the Avery address label material. There are separate files for the *Stereo Player* disk, *Stereo Editor* disk, and the 3 *SL-232* software disks.