Notes on repairing my ARP OMNI_2 R Grieb 3/29/2012

I bought an Omni-2 on ebay in early 2012. It was described as "clean inside" with a suspected power supply problem. The pictures were dark and didn't show much. Anyway, when the unit arrived, I was dismayed to discover that it had been sitting in a moist environment (in Florida) for some time and had rust on the case, and serious corrosion on many of the connector contacts. At first I wasn't sure it was fixable, but decided to give it a go. There was a fried 0.68 ohm resistor in the power supply, and the fuse was blown. There was a 10 ohm resistor on the phaser board that was fried due to a tantalum cap shorting. I had read about the shorted tantalum keying capacitors which all Omni's seem to have, and quickly discovered that both +15 and -15 showed low resistance to ground. My plan for fixing the corroded ribbon cables was to cut off the ends and replace them with the crimp-on IDC type of DIP plugs. I placed an order for the DIP plugs, a bunch of capacitors, the fuse, and the fried resistors. In the mean time, I tested the switches, and found that many of them didn't work. I found a source for the same kind of switch and ordered replacements. Once my parts arrived, I quickly discovered that the ribbon cables used in the Omni are smaller than what the IDC plugs are designed for, so I had to replace both ends, and the cables as well. I replaced almost all of the tantalum caps on all boards with normal electrolytic caps with the same voltage rating and the same 20% tolerance. Tantalum caps are pretty pricey these days and I didn't see the need for them, especially in the keying circuits. I replaced the resistor, fuse and several tantalum caps in the power supply and tested and adjusted it separately.

Once all the caps and cables were good, I decided to power up the whole thing for the first time. The first problem that I found was in the VCA for the strings. This circuit uses a CA3086 transistor array, which was bad. (No strings) Luckily, I happened to have a CA3046 array which is an improved replacement, having matched transistors. Installing that fixed the VCA and I had strings! Next I found that only a few of the bass notes were working, even though some of the same keys would make sound in the strings mode. I discovered three bad 4000-series chips (Z34, Z39, and Z44) on the lower voicing board. The bass low-note-priority circuit will disable any note above where it thinks a note is down, so if one of the lowest note chips is bad, it can disable most of the bass notes. I replaced those three chips with machined-pin IC sockets and chips from my supply. (Nice to finally find a use for those old chips from the 70's!)

Next I found that many of the keys still didn't work, so I cleaned the contact wires and busbars with isopropyl alcohol. (I had already replaced the cable sockets under the keyboard and made new ribbon cables for it as well). Now all of the keys were working, but a few were a little flakey. (Pressing those keys many times since seems to have cleaned them, as they seem OK now.) Several of the keys were resting above the others when released, and one was rubbing the one next to it. Under each key is an L-shaped piece of metal which controls its resting position, and can also force it to one side if bent. These metal pieces can be bent (carefully) to fix any keys that are not quite even with the others. The plastic keycaps were pretty dirty when I got the unit, so I took off three and washed them. I used a scouring sponge and powdered cleanser to really get them clean. After I dried them thoroughly, and re-installed them, I noticed that the rest of the keys were glossy and the three that I had cleaned were not. Oops! Those three keys need polishing

now, although most people probably wouldn't notice. I cleaned the rest of the keycaps more gently and did not disturb the polish. One note: The four keyboard ribbon cables are not plugged in as you would expect under the keyboard. I suspect there was some sort of miscommunication between ARP and the company that made the keyboard. Pin one is clearly marked next to the sockets under the keyboard, but the plugs need to be rotated 180 degrees before you plug them in, or you won't get any sound.

I was poking around on the phaser board and found that one of the SAD512 BBD chips had no output. I bought one on ebay (ouch!) and now all three chips are putting out delayed versions of the input signal. When the new switches arrived, I replaced all but one of them, and now I have a few spares. Also, I forgot to mention that the slider pots were all in bad shape. I removed them from the pc boards, took them apart, cleaned the contacts and the housing, sprayed control cleaner on the resistive element, lubricated the slider itself with silicon grease from Home Depot, and reassembled them. Some of the pots are pretty far off-value (too high). Not sure what I will do about that.

Note: It seems that the gain through the phaser board is roughly 1, so it is possible to bypass this board for troubleshooting. I am using a 2.2 uF non-polarized cap between pins 5 and 6 of the unplugged cable. This connects the input and output to the board together.

I would like to thank Chris at www.thisoldsynth.com for his advice and suggestions. He is very knowledgeable about synthesizer repair issues.

By now you are thinking that I was crazy to put all of that effort into repairing an OMNI-2. There are certainly units around in much better shape than mine was, and which could be had for less than I paid. It was a mistake to buy anything this old without being able to see it in person, especially from someone who really didn't know that much about it. Anyway, I had fun working on it and will enjoy playing it as well. This was my practice synthesizer repair. Now I am ready for a Novachord (well, not really).