Assembly Notes for Version 2 OSCar MIDI pcb.   R Grieb 3/25/2021

Please use sockets for all IC's to facilitate future repairs. Most parts can be obtained from Mouser or Digikey. Either a 6850, 6850A, or 6850B can be used for the ACIA chip. This chip can be removed from the old MIDI board if it is socketed.   Please do not substitute parts unless you know what you are doing.   The 4 MHz Z80 chip can be either an NMOS Z80A chip, or a 780C-1 NEC part, or it can be a newer CMOS part Z84C0006, available from Mouser, or the 8MHz part.   The CMOS chips will draw less current, but you won't notice any real benefit.   The CPU will always run at 4 MHz, even if you install a 6 MHz or 8 MHz part.

The V2 MIDI board has several options which must be considered before populating it:

1) Type of Reset: You can chose to use the reset signal from the OSCar processor board as the reset to the Z80 by installing R15 as 0 ohms, or a jumper wire.   In this case, you would not install IC U10. If you prefer to use U10 to generate the CPU reset signal, install it, and **do not install R15**. Although both methods will work, I would suggest using U10.

2) SRAM battery backup configuration: The board supports powering the SRAM from two diodes, one from a backup battery, and one from the +5V supply. This allows wiring a Lithium battery holder directly to the MIDI board, using the holes provided, and removing the NiCAD battery from the control pcb, to prevent possible future damage if it were to leak. To use this option, install diodes D2 and D3 on the MIDI board. **Do not install D9 or R5 on the MIDI board in this case.** If you install D2 and D3, and not R5, you **must** have D9 installed on the OSCar processor board. For the SRAM backup battery, I suggest using a BR2/3 3V lithium battery and holder mounted to the bottom board of the OSCar.   This will last a very long time. If you mount it just inside the right end piece, it will be easier to get to.

If you prefer to leave the NiCAD battery in place and power the SRAM as before, install a zero ohm resistor or jumper at R5. **Do not install D2 or D3.** In this configuration, you need to check your processor board to see if zener diode D9 is installed.   This diode was not installed on many OSCar's. While it was fine with the old SRAM, operating the new SRAM on the voltage from the processor board if D9 is not present will damage it for sure. To make sure this is not a possibility, you can install a 5.1V zener diode at D9 on the MIDI board, although it's not needed if D9 is installed on the OSCar processor board. Note: If R5 is not installed and you are using the diodes as mentioned above, D9 **must** be installed on the processor board, not on the MIDI board.

Something to watch out for:

I had installed a new MIDI board on someone's OSCar, and was testing it.   Everything seemed good, so I decided to switch to a Lithium battery, using the two diodes as on the V2 MIDI board. D9 was installed on the OSCar processor board.   After I made the modifications, the synth sometimes would not work. I tried replacing a number of chips, with no success.   Finally, I found the issue.   Not powering the SRAM from the circuit on the processor board had affected the operation of the reset circuit on the processor board, and I was now getting a narrow glitch on reset at regular intervals. The MIDI board has its own reset circuit, so the synth was operating normally.   But the Z80 CTC chip which reads the waveform data from SRAM was being reset over and over, so it was never counting through the samples and there was no sound.   Luckily IC43 (74LS32) on the processor board was in a socket, so I simply bent out pin 2 so that RESETb on the processor board was always high.   This fixed the problem.

Here is a photo showing D9 installed in an early OSCar processor board:
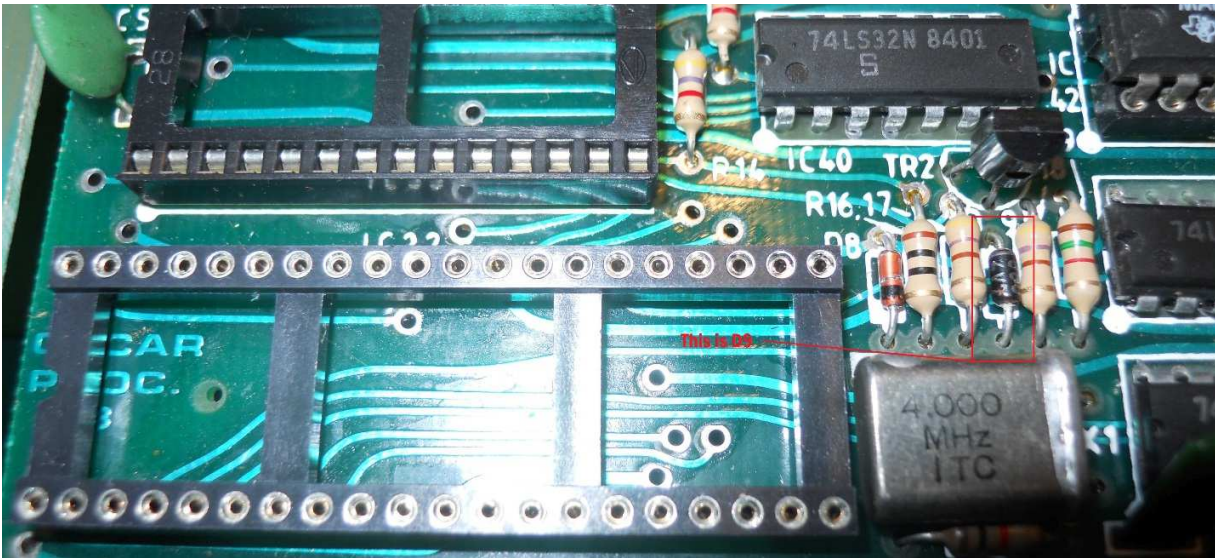
And here is a photo of a board that does not have D9: