

---

Subject: Reverse engineering the EDS card.

Posted by [Doug Wellington](#) on Sun, 09 Feb 2014 05:02:00 GMT

[View Forum Message](#) <> [Reply to Message](#)

---

Think I'll throw some little tidbits here every now and again as I figure out more of the details. The story so far (please let me know if you know more or I have made mistakes):

First, I'm fairly impressed by this thing. It's all surface mount, except for the headers and external connections, and the trace density is pretty high. That is, there's not much unused space. I don't know how many electrical layers they used, but it looks like some of the vias don't go all the way through, meaning it looks like more than a two layer board.

Ensoniq designed the ESP2 chip between 1990 and 1994. There are four ESP2 chips on the PARIS MAIN PCI board, and two on the PARIS MAIN DAUGHTER board, for a total of six per EDS-1000. There is a decent amount of information available on the net about the ESP2 chip. It's optimized for audio signals, 24 bit single precision, and it has three parallel function units, an address generator, an arithmetic logic unit and a multiplier/accumulator/shifter. The instructions are 96 bits wide (!) to support parallelism between those three units. According to the document that I have, dated 1995, the chip has enough memory for 300 instructions, but it says that future expansion sets that size to 1024 instructions. (I don't know if they ever expanded it.) I find it interesting that the ESP2 can execute 226 instructions per sample period at 44.1kHz. (And since the three function units run in parallel, they say that's like 678 conventional instructions.) There are 1024 registers in this thing too, so you can twiddle a lot of bits!

Something I find interesting about the EDS card is that there is a big 208 pin chip on it with the label ES1370 AudioPCI. I haven't had much luck finding information about this part. There are pictures online of a 100 pin version of the ES1370, and there is a preliminary specification document available, but it doesn't really give me much to go on. At this point, I'm not sure if they used this ES1370 just for interfacing with the PCI bus, or whether it's involved in more PARIS functions...

---