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Re: [time-nuts] What's best an HP 58503A, Z3805A, or Z3801A upgraded to 58503A?

Magnus Danielson Sun, 30 Nov 2014 14:13:07 -0800

Bob,

> As far as I can see, there are really only two basic sets of hardware here.
>
> 1) The earlier 10811 / Motorola design
>
> 2) The later 260 / Furuno design.

Having dig deep into the Z3801 firmware, I can say that it has many features that doesn't even exist on the Z3801 hardware. Well, sort of. The reason that Z3801 is so easy to convert to 58503 is because it is essentially the same design in different packaging. The Z3801 firmware even has the code for loading a second FPGA which isn't even on the Z3801 PCB, but there is an empty position for such an FPGA on the PCB, and it fits the FPGA the secondary image is for. Dropping in such an FPGA, mounting some more components on other location of the PCB and you have more functionality at your hands. I doesn't take much imagination to realize that this is part of the conversion process. I'd love to see the photos of a 58503 PCB as well as a converted Z3801.

It also makes good sense to anyone building these things to have a large common core.

There is the Z3815A which has the hockey-puck / Furuno combination.
I've seen that more Z38xx variants have been listed here, but I have not kept track of them all. Have someone complied a list?

> The rest is packaging and luck. ADEV performance wise, some of the 3801's do
> quite well, some not quite as well. There was a lot of variation in the 10811
> since it was not targeted at ADEV. Phase noise wise, the 10811 design will be
> better. Both will have spurs. The 10811 designs are older and may have more
> running hours on them. Either one may have been impacted negatively by the
> salvage process.

The Z3801 attempted to have good hold-over phase stability rather than phase-noise property. It does a drift calibration using least-square drift fitting, which indicates that focus was on hold-over properties, with active drift compensation. It's not bad, but it may or may not be what you are looking for.

None of the techniques is very difficult, it's just that it's a fully integrated package of several pieces.

Cheers,
Magnus

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