Re: What's the Toughest Branch in Electronics?

Source: http://sci.tech−archive.net/Archive/sci.electronics.design/2007−09/msg02071.html

- *From*: Don Bowey <dbowey@xxxxxxxxxxx>
- *Date*: Tue, 11 Sep 2007 18:21:05 −0700

On 9/11/07 4:15 PM, in article
1189552546.145068.76660@xxxxxxxxxxxxxxxxxxxxxxxxxxxxx, "osr@xxxxxxxxxx"
<osr@xxxxxxxxxx> wrote:

> On Sep 11, 6:26 pm, Don Bowey <dbo...@xxxxxxxxxxx> wrote:
>
> > On 9/11/07 1:18 PM, in article
> > no.spam−38062C.16170111092...@xxxxxxxxxxxxxxxx, "Al"
> > <no.s...@xxxxxxxxxx>
> > wrote:
> >
> > > In article
> > > <Xns99A86B032FE79wonkynillmail...@xxxxxxxxxxxx>,
> > > Gary Tait <classic...@xxxxxxxxx> wrote:
> > >
> > > > John Larkin
> > > > <jjlar...@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx>
> > > > wrote in
> > > > news:o82be3ttcnvrm8dah5nap2jgmqt4m6nua1@xxxxxxx:
> > > >
> > > > > It's just a definition, but I'd
> > > > > suggest that if the work
> > > > > doesn't
> > > > > involve working with
> > > > > electricity (which
> > > > > programming doesn't) than
> > > > > it's
> > > > > not "electronics."
> > > > > Programmers don't have to

> > understand anything about
> > electrons or fields or things
> > like that, and often don't.
>
> John

> It involves working with the hardware
> though.

> Sometimes software can make the hardware
> easier (read cheaper) to build.

> For microcontrollers and embedded systems,
> the software engineer needs to
> know about the hardware system to write
> their code, for the most part.

Also don't programmers have to know about field, physics, mechanics and
the like when they write programs that map magnetic and electric fields
for various configurations? Don't they need to know about gravity fields
when they write programs for space craft navigation? Don't they need to
know math to solve math problems? etc, etc, etc

Al

No, they download all that from Wikepedia. Real Engineers do hardware.− Hide
quoted text −

Whining crybabies, RF, Audio and Crypto are easy. I'm a Research
Associate at a large university, I supervise the equipment for three

major labs, much of which is often adapted from existing technology , but a lot of it is one off custom stuff for absolutely bizzare measurments. Two days a week I'm working weak signals in high fields, the rest of the week is a laser spectroscopy lab.

You have not lived until , in one weeks time, you work on a laser stabilized to a few gigahertz for 72 hour periods, need to measure sub nanoampere currents in a 60 kv field, coax a foreign student through a local traffic court's procedures, give a touring Nobel prize winner a lesson in the physics of your apparatus and then go fix a 1970s tek scope without a manual, then go figgure out how to make a scanning tunneling microscope see the field from single atoms. Then go bias the ccd in a new camera. I'm on call for any question from any student in any of the engineering departments and answer to a PhD in polymers,a Phd in EE, and a Phd in computer science.

If I screw up, somebody's phd gets delayed,money is lost, and if I dont keep my eyes open, people get hurt from lab safety problems. RF isn't the most diffcult by a long shot, its physical optics and detectors. The students I work with (we are no longer allowed to say "My Students", that is now politically incorrect), are all chemies and mechies, most have never held a voltemeter till they meet me. Try explaining Nyquist and Shannon in one thousand words or or less to a person who's native language is not english and who's had no prior experience with test equipment, or even wiring a light bulb. Asian U's seem to only teach theory with no labs for undergraduates!

So please dont tell me mere techs only build stuff, we clean up the apparatus till it works to the designer's specs, and then teach the students to understand it well enough that they can run it stand alone. But being a lab support type across multiple labs from Dc to Terahertz, including high vacuum, physics,optics, chemistry and instruments, Now thats a challenge. I have to learn whatever the current project is just as well as the students do, and before they do. And the real fun part is making sure it can survive a user who will abuse it to no end.

There is a reason Winfield Hill can write the book.... and I am no Winfield Hill by a long shot, and at six years in the job,still have lots to learn.
Every day is a new project, or recovering−modding a old one.

So in order,

small signal measurement in a large field environment
optical detection in noise
signal processing
long term frequency stabilization
anything higher then 35 ghz
equipment for quant mechanics experiments
chip design with less then 1 um features

> Emergency repairs with limited equipment.
>
> I hate to rant, but lab support engineer requires you to jump from technology to technolgy and do it in short periods of time with no budget.
> And if you dont get it right, the experimenters are effectively blind.
>
> It does make for a interesting, but stressful job.
>
> Steve Roberts

you quit too soon. I was just about impressed.

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