

The Love/Hate Relationship with Technology

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I recently came across a factoid indicating that 18% of all VCRs in the U.S. are flashing '12:00.' I had to chuckle since I have two VCRs (one is the old BETA format) at home that are usually flashing '12:00' as well as a new 2.4 GHz cordless telephone with answering system that flashes 'CL' to indicate that the time is not set. It seems I live in an area where the power grid fluctuates enough every few days that these devices lose the clock setting. I have given up resetting them each time it happens and just reset the device if I need the clock feature to record a program.

These devices though, demonstrate the love/hate relationship we have with technology. In general, we love the base technology that these devices give us: the ability to copy a TV program for subsequent viewing, the ability to rent a movie and watch it without commercial interruptions, to record a telephone call so that we do not miss an important message, etc. However, we do not always like the design, implementation or cost of the technology since it creates an ongoing use, maintenance or budget issue. Even a \$15-20 clock radio has a 9V battery backup to preserve the clock setting when the power is out! (On a related note, how many of us can reset the time in our car radio/stereo system without digging out the instruction manual?)

We are all thankful that most new VCRs, as well as clock radios, can read the time signal being broadcast by WWVB to automatically reset the clock if the power is out and comes back on. In North America, NIST – the National Institute of Standards and Technology, located in Fort Collins, CO – operates radio station WWVB that is dedicated to transmitting the time codes. While this technology solution to the flashing '12:00' may be an example of over-engineering the problem (the battery backup is a cheap solution that works very well), it is an example of how technology continues to evolve and solve problems.

As a given technology becomes mature, many of the parts of the technology that we dislike will gradually be eliminated. The problem is that sometimes before the technology becomes mature or reaches a sufficient market share, newer technology replaces the old (BETA format?) and we start over with a new set of design and implementation problems, always chas-

ing the promise that the new technology will be better.

In the area of sound and vibration technology, we have the same love/hate relationship. We utilize both hardware and software that give us base technology that is so exciting and so powerful that we cannot resist the chase of a better, quicker approach to solving our sound and vibration problems. We love what the new hardware and software can do for us in terms of smaller, better, faster and sometimes cheaper solutions. However, this technology has a number of problems that contributes to the hate part of the relationship. Is the amount of time and money that we are spending on the technology giving us a productive return? The answer is 'yes' but probably not a resounding 'yes.'

Today, it is getting increasingly difficult to find hardware that can exist without a computer. This is not necessarily a good thing.

Recently, in order to supplement data acquisition equipment in a lab for undergraduates, I needed to add a random noise source to each of five independent stations. In the past, several companies offered stand-alone random noise generators, but I could not find any vendor, new or used equipment, that offered a simple solution. However, if I want to connect it to a computer and download the arbitrary (random) signal, no problem. In the end, I was able to find a hobby kit that generates pink noise that I can modify for my application. Technology solved my problem but I had to invest significant time to find the solution and make it work.


Even when I want to utilize a computer to control the hardware, I need to deal with the hardware interface compatibility issue (serial, parallel, GP-IB, USB-1.1, USB-2, Firewire, PXI, 10/100 Ethernet, etc). The hardware interface has continually improved in capability and bandwidth over the last 20 years. This moving and evolving nature of technology is a necessary but annoying love/hate issue that we deal with continuously.

Probably the most significant love/hate relationship that we have with respect to sound and vibration technology is in the area of software. From the operating system to the application programs, we have created a monster that we love to hate. Hardware functionality has often been replaced by software flexibility and user-

friendly graphic interfaces. Hardware costs have been replaced or extended by software costs plus software maintenance costs. In order to justify the development and maintenance teams required to develop software, vendors need to have funding from software and software maintenance on a continuing basis. Users need to have improved capability in terms of function, speed and support to justify the software upgrade and maintenance costs.

How many times have you received an update of software to find new features that are great but old features that no longer work or are missing altogether? Sometimes, software simply does not do what it is supposed to do. Frequently, software that utilizes a scripting language is revised so that existing scripting sequences no longer work or work at a speed that is no longer acceptable. Interestingly, software users call some of these frustrating problems bugs, but vendors call them features.

Ultimately, as a technology becomes mature, there should be fewer and fewer new features that require a new software purchase and fewer and fewer software bugs that require a software maintenance purchase. Eventually the system starts to collapse onto itself. Users begin to decide that the software they have is good enough and the value added by purchasing the newer version cannot be justified. Vendors do not have the funds to develop the newer versions of the software and now everyone has a problem. We need to find a new paradigm for the software love/hate situation but renting software is probably not the answer.

I am not abandoning the chase of newer and better technology nor am I advocating that others abandon it. I hope that the chase produces better hardware and software solutions for our sound and vibration problems with fewer negative side effects. I worry about the trends indicating that our numbers are so few and our market so small that we will have fewer options in our chase of technology in the future. I do not know how we can maximize the love and minimize the hate when it comes to technology but I advocate continuing the chase. I would be the last to wish for the good old days of slide rules instead of calculators! 

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