

# The Embedded Muse 46

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## Conspiracy Theory

As a member of the Embedded System Conference's Advisory Board, I get to read all of the attendee's comments about the show. One jumped out at me this week: "After hearing from a number of speakers that I should never design my own RTOS, I'm starting to think this is a conspiracy."

Year after year, surveys continue to show that some 70% of all real time OSES are custom made. This blows my mind. Every book on software engineering talks about creating (and using!) reusable code. Yet in the embedded world there's just not a lot of commercial software that we can actually buy/reuse. RTOSes are one of the very few packages commonly available and instantly reusable. Yet it seems most of us don't practice even this minimal amount of reuse.

80 or more different commercial RTOSes exist (see <http://www.embedded.com> and go to the Buyers Guide section for a listing). These come in just about every conceivable flavor. At least one runs on even the very smallest PIC processors (<http://www.slrf.com/simplesoft/micos/index.htm>).

VxWorks has the largest market share of any commercial RTOS (about 20%), followed (if you discount DOS, which for inscrutable reasons many developers list as a "real time" OS in their embedded apps) by pSOS (about 5%). Both of these now come from Wind River (<http://www.windriver.com>); at this week's show they announced that the products will eventually merge into a single new OS.

Often developers tell me they can't use an off-the-shelf RTOS because of royalty costs. Yet dozens have no royalty payments. Others complain that the up front price is too high: but some cost well under \$1000. Every conceivable pricing scheme exists.

After one too many engineers told me they write their own OS "because it's just not that big of a job" I grep'ed Jean Labrosse's uC/OS (<http://www.ucos-ii.com>), and found that it comprised some 4000 lines of C. Since most embedded code costs \$15 to \$30 per line, this represents \$60k to \$120k of effort – quite an investment.

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Now, I do know that this market is completely fragmented, and there are indeed cases where for very narrow and specific reasons some folks will have to write their own OS. This probably represents 2% of the market... not 70%. Just be aware of the real costs!

But maybe I'm part of the conspiracy!

## **Cool Product**

Dejan Durdenic of Croatia wrote to suggest that a casual mention – not quite a review – of neat products might make sense. Why not? I like the idea of broadly sharing experiences. Feel free to submit your own.

Dejan wrote:

I found small Italian company named SoftTec Microsystems ([www.softecmicro.com](http://www.softecmicro.com)). They make very nice logic analyzers and an interesting emulator for the ST6 family of microcontrollers. The products are VERY affordable in those days of rapid technology change when new chips come out almost every day.

## **Thought for the Week**

From Tom Decker:

There was an engineer, manager, and a programmer driving down a steep mountain road. The brakes failed and the car careened down the road out of control. Half way down the driver managed to stop the car by running it against the embankment narrowly avoiding careening off the cliff. They all got out, shaken by their narrow escape from death, but otherwise unharmed.

The manager said, "To fix this problem we need to organize a committee, have meetings, and through a process of exchanging ideas, develop a solution."

The engineer said, "No that would take too long, besides that method never worked before. I have my trusty pen knife here and will take apart the brake system, isolate the problem and correct it."

The programmer said, "I think you're both wrong! I think we should all push the car back up the hill and see if it happens again."

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## **About The Embedded Muse**

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