

# Teuthida Technologies Home

All about embedded systems engineering.

## Impressions of Masters 2012 [Updated]

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— Welcome to Masters!

First a disclaimer. There is no way that the [Microchip 2012 Masters Conference](#) can be summarized here. It is simply far too vast in scale and extent to do it justice. Instead, consider this to be a series of first person impressions, notes, recollections, and anecdotes.

To put things in perspective, this was my seventh time attending the Masters conference. Previous years attended were 2000, 2001, 2002, 2004, 2009, and 2011.



— The front door!

I'm not quite sure how long it's been there, but this year the conference was held at the luxurious J.W. Marriott. Here's the grand front resort entrance. It goes without saying that the hotel, its rooms, conference halls and public spaces were all luxurious and well appointed. The conference included three sumptuous meals a day with beverages, fruit and "treats" for those who got the munchies in between study courses.



— The "swag" of the year!

As is common at such events, all attendees went home with a little "swag" to remember their participation. In past years, little technology demos were often given out. The last few years this has been replaced by a note book, polo shirt and course notes thumb drive combo. This is a little disappointing as the gadgets were always fun, but to be honest, other than some fun playing with them, not much came of them, so the cost savings is sort of understandable, even if it is a bit of a downer.

As said earlier, this is my seventh Masters. Each year I have the same problem. There are many more courses that I would like to take than there are time slots in which to take them. This year there were 36 courses offered covering a wide range of topics. That's too many to list so instead here is the [Masters 2012 Event Guide](#). The class list is on pages 11 through 31. As for myself, I was kept busy learning about:

- Upcoming developments in Microcontrollers and Development Tools.
- Learning more details of the FreeRTOS software. I was fortunate enough to win the programming challenge and got a copy of the book Microchip PIC32 Edition of the FreeRTOS user's manual. I'll be doing a review of that soon.
- Using the Microchip Graphics Display Designer (GDD-X)
- Robust I2C communications with the PIC I2C peripherals.
- USB: Both the Generic Driver and CDC class devices.
- Bootloading, Application Mapping and Loading Techniques on a PIC32.
- An examination of Advanced Touch Screen Technologies: Projected Capacitance Touch.

As if that were not enough, the time slot between the end of studies and dinner was also utilized each evening.



— The Keynote Address  
(Picture from  
Facebook)

On Wednesday there was the interesting (OK not THAT interesting, but were did I have to go?) keynote address by [Steve Sanghi](#), the CEO of Microchip. Mr Sanghi has a direct, down-to-earth approach that is most refreshing and while not edge of your seat stuff, it was still very informative to hear the corporate perspective.

On Thursday, I was delighted to see the return of [Don McMillon](#)! Don is the self-proclaimed “Funniest Engineer in the World!”. Even though this was his second time at masters, the show was mostly new material and I had a great time. With all the serious engineering work going on, some levity was welcomed.

And then there’s Friday... On Friday, there was a Casino Night. During this event, I made the earth shattering discovery that I truly suck at poker. Thank goodness the \$1,000 I lost was only play money (Unlike some 2012 USA Presidential candidates, I do NOT make casual \$10,000 bets!).

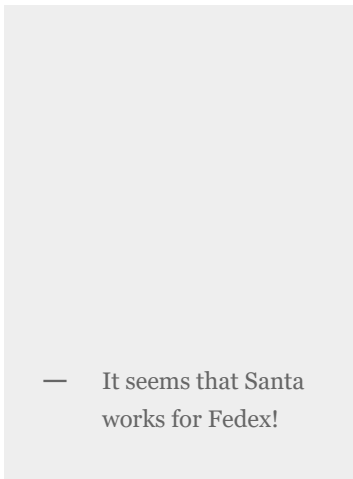
Finally, I have left what is possibly the best part for last. After dinner each evening, there were semi-formal discussion groups with various microchip teams in attendance to answer questions. I attended the XC16 and XC32 discussions. I learned a great deal of useful info. Here’s a sampling of some tasty tid-bits:

- XC32++ is ready! That’s right C++, with a FULL library by Dinkumware, a highly respected library specialist vendor. XC16++ is still in the very early phases and is rather much much further off.
- New PIC32s are coming that will support new modes that are faster and more compact than the current MIPS16 mode. Support is coming for higher speeds and much larger memory and a external memory interface. However, no target dates were given. Sigh... Marketing!
- One surprise was getting more clarity on the [Errata Issues](#) that I have written about before. It now seems that the first issue (with the prefetch cache) has only ever been seen with highly unusual configurations, not used by Microchip tools. Most developers need not worry about it. The second issue (with double writes to I/O registers) is more widespread and needs to be

taken seriously. In the mean time, new silicon is coming out very soon (weeks?) that address these issues. We should be seeing an Errata Update in a little while and I will post it here too.

- As the session was closing, somehow the discussion went to the topic of the use of assembly language by C programmers. To make a long story short, I indicated that the ONLY time I have ever used assembly language was to provide the special interrupt prologue and epilogue required by the FreeRTOS to save memory. At this point it was suggested that this was better done by the compiler itself and the Richard Barry (of FreeRTOS fame) should be contacted to see how progress could be made on this front. We'll see what happens, but that would be a cool addition to XC32.

There was one important thing that was missing though: There was no break out session for the XC8 compiler group. Perhaps they were too busy?



Oh and I forget... The really final final, even better thing about all the masters conferences is the deep discounting of developers tools. I felt like a kid in a candy shop with all those wonderful toys to contemplate! I admit that I had to restrain myself to a few choice selections. I'm sure I will be writing about them more very soon.

Perhaps I should start doing a mail bag segment on a You-Tube channel where I open my (interesting) mail? Then again, perhaps not.

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As always, your thoughts, comments, suggestions and encouragement are most welcome!

Peter Camilleri (aka Squidly Jones)

PS: I was giving some thought to the idea of FreeRTOS prologue/epilogue support in XC32, and it seems that it need not be complex. One idea would be to support the idea of an "Interrupt Stack" which would be used by ISRs. This option would support FreeRTOS and provide benefit to any case where multiple stacks are in use. This would be an easily set up option for compilers and the linker could allocate the space in a manner similar to the way the heap is currently allocated.

[Update] Shortly after the conference, I exchanged emails with Joe Drzewiecki of Microchip regarding this idea. This correspondence follows:

*Hello Joe;*

*I want to thank you again for a wonderful Masters Conference and especially for the very informative break out session on the XC32 compiler. The discussions covered a lot of ground and I learned a lot of new stuff.*

*I was thinking about the prologue and epilogue code for ISRs in FreeRTOS, and it occurs to me that what is involved here is the use of a special “Interrupt Stack” area. A stack set aside for use by ISRs. Implementation of this concept would be of use beyond FreeRTOS and include any system that runs multiple stacks.*

*I have updated my web site with a review of Masters 2012 here: <http://teuthida-technologies.com/> and included a bit about Interrupt Stack support in XC32.*

*I look forward to future developments;*

*Best regards; Peter Camilleri*

and here was Joe’s reply:

*Hi Peter!*

*Thanks for the props and the suggestions. We’ve had a very spirited discussion about your prologue/epilogue suggestion (go figure! :).*

*We’ll continue to discuss this, but may not act on it right away. There are many subtleties to it.*

*Hope to see you next MASTERS,*

*Joe*

Thanks Joe; It’s good to know I can still stir things up! 😊

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