



# Interview: John Hansen

*By Hispabrick Magazine*

**Name:** John Hansen  
**Age:** 46  
**Occupation:** Software Engineer  
**Nationality:** United States  
**Website:** <http://bricxcc.sourceforge.net> and <http://www.mindboards.net/>

## **How did you get involved in MINDSTORMS?:**

I happened upon the LEGO® TECHNIC Search Sub (<http://guide.lugnet.com/set/8250>) on clearance at the local Zany Brainy store back in June of 2000. I posted on lugnet back then (<http://news.lugnet.com/loc/us/tn/nas/?n=7>):

*I'm relatively new to LEGO and Lugnet. For no rational reason I started dumping cash into LEGO in March of 2000. I found some clearance items at ZanyBrainy back then. I bought some stuff from TRU during the BOGO 50% sale. I snagged shuttles and barcode multi-sets from KayBee Toy Outlet at 100 Oaks and Factory Stores of America.*

Then in August of 2000 Mark Overmars, the author/creator of RCX Command Center (RcxCC), posted this message on Lugnet (<http://news.lugnet.com/robotics/rcx/nqc/?n=720>):

*I decided to make the source code available such that others can do these things. The source code is now available on the RcxCC home page*

<http://www.cs.uu.nl/people/markov/lego/rcxcc/index.html>

*RcxCC was written in Delphi. The program is reasonable well structured (I think) but not very well documented. So better be an experienced Delphi programmer before you start working on it. Good luck, and please keep me updated about new versions.*

Since I was an experienced Delphi programmer I decided that I would take on the challenge of adding support in RcxCC to the new RCX 2.0 and the Scout bricks. I downloaded a copy of his source code and started working on replacing the communication layer with a Delphi version of the code used in Dave Baum's NQC compiler. I posted on lugnet in April of 2001 (<http://news.lugnet.com/robotics/rcx/nqc/?n=1052>):

*I'm working on a revision to Mark Overmars' fantastic RcxCC program. I'm an experienced Delphi programmer so that's no problem. But I'm not all that experienced with NQC or the RCX generally. I've got a the latest version of NQC, a Cybermaster,*

*an RCX 1.0, the 2.0 beta firmware, the VisionCommand firmware, and a Scout. So I'll be testing it myself over the next few days. But I'd like to ask for volunteers to try it out.*

John Barnes from HiTechnic was one of the folks I worked a lot with early on, adding a number of features that he requested. Later, Dave Baum asked me to take over the NQC project (<http://news.lugnet.com/robotics/rcx/nqc/?n=1560>) since I had worked with him quite a bit while making changes to RcxCC and eventually renaming it at the request of TLG to BricxCC (<http://news.lugnet.com/robotics/rcx/?n=1448>). Bricx is pronounced Bricks to indicate that the IDE supports more than one brick and keeps the R, C, and X from the original name.

When The LEGO Group (TLG) began working on the NXT they got 4 AFOLs together to form the MINDSTORMS Users Panel. A year later they expanded that group, at which time I was invited to join because of my work with BricxCC. I had worked with Michael Barrett Anderson, a former LEGO employee, for a number of years while implementing support for new programmable bricks released by TLG, such as the Spybot. He was also in the MUP2 group. He and I began working together on a text-based programming language that would work with the standard NXT firmware. Michael named the resulting language NeXT Byte Codes or NBC. It was an assembly language compiler and it was first used by a group of programmers within TLG to migrate their LEGO Assembler programs that worked with the RCX to new text-based assembly language programs that worked with the NXT. A bit later I implemented a C-like programming language on top of the NBC layer which I designed to be very similar to Dave Baum's Not Quite C (NQC) for the RCX/Scout/Cybermaster/Spybot. I called it Not eXactly C since it was a lot closer in many ways to C than NQC. Since then I have been honored to participate in each of the subsequent community partner groups organized by LEGO for the MINDSTORMS product line.

## **How do you contribute to the MINDSTORMS community?:**

My main contribution has been enhancing, extending, and improving the BricxCC IDE to give users of LEGO MINDSTORMS bricks a wide range of useful tools for programming robots. When the NXT arrived on the scene my contributions included developing the first and only cross-platform compiler for text-based programming languages for the NXT. It is used on Mac OS X, Linux, FreeBSD, and Windows OSES around the world. While the BricxCC IDE is still a Windows only tool, most of its tools that support the NXT

are also available in a GUI utility called NeXT Tools on both Mac OSX and Linux. I also have made a number of fixes and enhancements to the LEGO NXT firmware and make it freely available in binary and source code form as the enhanced NBC/NXC firmware which is 100% compatible with the standard firmware and can be used when programming with NXT-G using the LEGO® MINDSTORMS NXT software.

In addition to the tools that I provide to the community, I also have participated on blogs and forums, such as on news.lugnet.com, the old nxtasy blog and forum, and, now, the newly created MINDBoards website at [www.mindboards.net](http://www.mindboards.net), [forums.mindboards.net](http://forums.mindboards.net), and [blog.mindboards.net](http://blog.mindboards.net). I try to help people learning about LEGO MINDSTORMS when they either have questions about one of my tools or programming languages or generally about firmware issues or hardware problems.



**Name:** Ralph Hempel

**Age:** 48

**Occupation:** Electrical Engineer specializing in Embedded Systems

**Nationality:** Canadian

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#### **How did you get involved in MINDSTORMS?**

When the RCX came out, I was one of the people who, within a few weeks of it being released, cracked the firmware code, and then I made one of the first replacement firmwares – pbLua. Marcus Noga made the legOS firmware and we were all invited to the Extreme Mindstorms panel at Mindfest [1].

After that, I kept in touch with Michael Andersen and I kept showing him updates to the pbForth tools, such as a servo driver, and even a DCC train controller.

He passed this on to Flemming Bundgaard and (I'm guessing here) when it came time to get the NXT ready for release, LEGO contacted a group of known community leaders that had individual specialties. John Barnes had the third party sensor development, Steve Hassenplug and Dave Schilling were builders and robot competitors, and I had lots of firmware experience.

So basically, keeping in touch with LEGO insiders over the

I also have had the privilege of writing a book about programming the NXT using Not eXactly C. It's called "NXT Power Programming, Robotics in C", published by Variant Press. The 2nd edition was released in September of 2009 and is available for purchase from Amazon.com and other online bookstores.

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years made it possible for the original MUP to participate and grow into the MCP program.

#### **How do you contribute to the MINDSTORMS community?**

I have been involved with MINDSTORMS since the early RCX days when I wrote pbLua which I continue to maintain. In 2006, a few weeks after LEGO released the source code for the NXT firmware I had pbLua working on the NXT. I also created the pbForth firmware for the NXT, which allows you to write software that is compiled on the brick itself.

In 2007, I helped Chris Anderson (Editor in Chief of Wired) with decoding raw GPS signals from the Bluetooth port. Although Chris went on to use RobotC in his project, my contributions helped to make the project a reality.

I'm a co-author of a chapter in "Lua Programming Gems" available on Amazon...

I also co-authored a book entitled "Extreme MINDSTORMS", together with Dave Baum and Luis Villa and I wrote a book on Spybotics, another programmable LEGO brick.

[1] <http://www.hempeldesigngroup.com/lego/mindfest/panel.html>

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