

■ BY VERN GRANER

## ROBO RESOLUTIONS 2009

MY NEW YEAR'S RESOLUTION IS 1650x1280 ;)

It's a brand new year and a great opportunity to make some Robo Resolutions! Regular readers of this column are familiar with articles documenting my first hand experiences with the robotic, artistic, and sometimes silly contraptions I am apt to find myself in the thick of making or displaying. As this is the first column of the new year, I decided to take the opportunity to offer some New Year's Resolutions based on first-hand experience. (Remember, "experience" is what you get just after you need it!)

### **RESOLUTION #0: BUILD SOMETHING**

Though I've emphasized this to many of the regulars that attend meetings of The Robot Group here in Austin, TX, I can't say it enough: Build something! You'll discover that Building = Experience + Learning! It's a completely different thing to build something yourself than it is to just read about a project or observe someone else making it. Until you actually build a device, you have nothing to fix, troubleshoot, or improve.

Once you have a prototype, you will inevitably come up with ideas and optimizations that you may carry to a new version of the same project or, in some cases, to an entirely different project.

As you assemble your parts to test your theories, things can get very complicated very quickly. These challenges encourage you to be imaginative and creative in order to deal with problems as they arise. This is exceptionally good exercise for your brain and the lessons learned from overcoming these real-world problems will stay with you a lot longer than ones you've simply read about.

### **RESOLUTION #1: TEACH SOMETHING!**

The old saw goes "the best way to learn something is to teach it." My first hand experience in this area bears this out. Teaching IS learning! If there's something about which you are curious, you may find the best way to become well-versed is to teach that subject to others. Though your skills may not be PhD level, you probably know more about something than someone (especially kids, though they are sure to think otherwise!). FIRST robotics and other student-centric competitions are usually dying for mentors, judges, or tutors to help with events. Don't be afraid to call and offer to help at these events. The lives you touch and the people you meet can change your life.

### **RESOLUTION #2: CHALLENGE YOURSELF!**

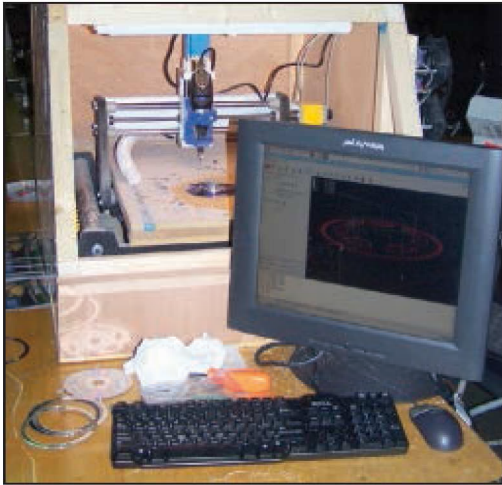
Get out of your comfort zone! If you're an analog electronics person, it might be time to look into dipping a toe into some digital circuits. Or, if you're really good with software but are a little intimidated by mechanical linkages and servo motors, take a

stab at building a software-controlled mechanical project. There is something particularly engaging about making electronics that move! Giving yourself a task that is outside your comfort zone is a good way to keep your skills sharp and to increase your knowledge — in some cases, your professional value, as well.

Find an area where you have an interest but little or no practical experience and take a stab at it. You can do this by finding others you can "swap" skills with or by taking a course at a local community college. The idea is to expand your knowledge and explore your talents. For example, with a newly

■ Vern Graner at Dorkbot Austin in 2006 giving a presentation on the (then) forthcoming RoboSpinArt machine — how it should work, the work accomplished, the problems encountered, and how they were solved.





■ The newly assembled PROBOTIX Fireball V90 CNC router system, ready to be explored!

constructed PROBOTIX Fireball CNC router at hand, I plan to start working with 3-D and 2-D CAD software, GCODE, and learn as much as I can about small part fabrication.

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### **RESOLUTION #3: SET DEADLINES**

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Another old saying goes "If it weren't for the last minute, nothing would ever get done." It's important to have a deadline to make sure you can finish a project. Setting a personal deadline is good, but if you make a commitment to other people, you are more apt to NOT allow the time-line to slip.

Enter a contest. Volunteer in a Science Fair. Join a team working to create something for Maker Faire, Dorkbot, RoboMagellan, or some other competition. Doing this will help polish your scheduling skills (or delegation skills!) and also help you get comfortable with pressure and thinking on your feet. The feeling of confidence and accomplishment that comes from meeting a deadline for an event or exhibit is like nothing else I've ever felt.

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### **RESOLUTION #4: LEARN TO SAY NO**

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Charles Robert Buxton once said, "You will never find time for anything.

If you want time, you must make it." For me, time is one of the hardest things to make. In this regard, I'm my own worst enemy as I give my time away as fast as I make it!

In the last year, I had to make some hard choices about the amount of time I had and the number of things I wanted to do. I discovered that there is really only so much "me" to go around. In order to give your all to a project, you first have to have an inventory of "you" from which to draw.

If you have time challenges to deal with, your most powerful weapon can be one word: no. This is so much harder than it appears on the surface. I know I could fix that small stereo amplifier. I know I could find and replace the bad light in that string of rope lights. I know I could help judge the Science Fair at the local elementary school. Though we may be capable (as in have the skill), to perform a task, what we probably don't have is available hours. In addition, you want to make sure you don't give away so much of yourself that you don't have any time left for you!

For example, I discovered it's better to give 100% on one project than to only be able to give 50% on two projects. Measure the values and try to balance your time. Examine your motivations. Do you feel like you have to fix that rope light string just because you can, or do you want to do it as a learning exercise/fun experience? There is a critical difference. If the goal of the work is to learn or keep your diagnostic chops up, then by all means, get to work. However, if the goal of the exercise is to have lights around the bake sale table before Friday (and you know darn well the Mrs. will be in a tizzy if the lights don't work!), it might be better to put the broken string into the junk parts bin and just go buy a set of lights to get the job done.

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### **RESOLUTION #5: KNOW WHEN TO SAY WHEN**

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It's a masterpiece — the

embodiment of your vision. It's been months in the making and now exhibits the sheen of your high-gloss polishing. Of course, it's not really done yet, but it's close. Just a few changes left to do. A bit of optimizing ... add in that new bit of circuitry and another re-work of the software to support it, then it'll be ready. Except for that one more thing you thought of doing while you were re-working the software.

The preceding results are what I refer to as "The Perpetually Almost-Done Project." I have a few of these going (some I can see from where I sit right now, as a matter of fact).

I'm not saying don't improve on projects or designs as you go, just know it's important to remember the scope of the work and make sure you put the *real* good ideas down for the *next* version of the device and just do the needed stuff now. At some point, you just have to call your current iteration complete. Give it a revision string, i.e., MY PROJECT V1.0 and save those great ideas for MY PROJECT V2.0.

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### **RESOLUTION #6: STAY HEALTHY**

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When our focus is centered on the project, when we're concentrating on solving a problem, or stressing to meet a deadline, we tend to forget that our bodies are the ultimate machine. Like any machine, we need to pay attention to operational safety and maintenance. In many cases, electronics work is sedentary by nature, sitting at a workbench, using the computer, or even reading an exciting electronics magazine. :) All tends to lead to chair-butt syndrome (a.k.a., the middle-age spread).

Stretch, get up, get outside, see some sunshine. Knock off work well before midnight or heck, take the entire night off and go to bed early. Tomorrow will wait. Lay off the junk food and have a salad now and then. Do all the things the old wife's tales (and sometimes the old wives!) tell us. It really is important to watch out for yourself since you





■ Nic Graner learning to solder at age nine. One of the first things he was taught was to always wear safety glasses!

only get one body per lifetime. On a side note, I checked with my original manufacturer and it seems there's no warranty on hair follicles, dang it!

Though we may preach it to others, sometimes we don't always pay attention to safety precautions. For example, do you wear safety glasses while soldering, cutting, or doing any work that can create flying debris? Do you have an exhaust fan to take fumes from solvents and soldering out of your breathing area? Do you eat at your workbench and, if so, do you handle solder or tools that have come in contact with industrial cleaners and the like? Do you wear gloves when using cleaning agents, lead based solder and other known hazardous substances? Many solvents are trans-dermal and act as a vehicle to take some toxins right through your skin and into your blood stream. I learned this the hard way when I noticed a strange taste in the back of my throat after using a

trichloroethane-soaked rag to clean up a couple of copper clad circuit boards!

## RESOLUTION #7: SHARE YOUR WORK

Document your projects. Take pictures of your work and then take a moment or two to write up descriptions and schematics. If you write software, spend a few moments going through and adding comments. This makes it easier for others to "get" what you're doing and gives you aids to use for talking about it.

Having documentation allows you to engage with other folks that have similar interests. Also, having to explain a project to someone can help to solidify the concepts in your mind as articulating what it is you're doing is an excellent way to reinforce and clarify project ideas. I've found that when I run into a problem on a build, sometimes just going over the problem verbally with someone else can help you see a possible solution that eluded you.

Consider writing about your project for a magazine. For those of you not otherwise aware, *Nuts & Volts* and their sister publication, *SERVO Magazine*, will pay you for well written articles! This is a great way to help finance your hobby.

The articles you read in these pages are (for the most part) written by amateur writers and fellow hobbyists that have taken a few moments to get their thoughts down on paper (well, on disk). If you've already created a blog or if you have



■ The upgraded "PONGINATOR MK3" control system incorporating ideas from MK1 and 2.

a nice collection of photos on one of the many picture-sharing websites, you may already have everything you need to write up an article, share it with your fellow readers, have a nice bullet point for your resume (i.e., "Internationally published technology magazine article author"), and get PAID for doing it! Check the resources for a link to the *Nuts & Volts* writers guidelines page.

## LETS GET STARTED!

I figure seven is a lucky number so I guess I'll stop the resolutions here. I'm really looking forward to writing about some of the fun stuff I have planned in the coming months. I also want to invite you to let me know if there are topics or items you'd like to see reviewed, built, or covered in an article. Suggestions, comments, and observations are quite welcome. As always, you can reach me via email at [vern@txis.com](mailto:vern@txis.com). **NV**

■ Vern Graner (seated) discusses a problem in the firing sequence of the Ponginator Software with André LaMothe at Maker Faire Austin 2007. This discussion led directly to a re-write of the way the guns fired which eliminated motor positioning errors.

## RESOURCES

- The Robot Group  
[www.robotgroup.org](http://www.robotgroup.org)
- PROBOTIX FireBall v90 CNC router — [www.probotix.com](http://www.probotix.com)
- André LaMothe NURVE software  
[www.xgamestation.com](http://www.xgamestation.com)
- FIRST Robotics  
[www.usfirst.com](http://www.usfirst.com)
- RoboMagellan — [www.robo-games.net/rules/magellan.shtml](http://www.robo-games.net/rules/magellan.shtml)
- Maker Faire  
[www.makerfaire.com](http://www.makerfaire.com)
- THE PONGINATOR MK3  
<http://makerfaire.com/pub/e/2185>
- *Nuts & Volts* Writers Guidelines  
[www.nutsvolts.com/writers\\_guidelines.php](http://www.nutsvolts.com/writers_guidelines.php)

