

APRIL 2005 MINUTES

At 12:00, April 9, 2005 with 30 in attendance Dale Wheat brought the meeting to order.

Dale asked if there was any pending or new official business.

Dale presented the idea of requesting impromptu presentations with no advanced warnings from various members of the club. He wanted the inductee to talk about what they are doing with robotics and what tools they are using. He wanted the presentations to explore the talent and resources already available in the club. He felt that some members are very focused and skilled at specific aspect of robot building and the presentation would be a good first step in sharing talents.

Dave Anderson brought the new chassis for Journey Robot, or Jbot for short, that he and Mike Hamilton are putting together. Jbot contains materials that David had not worked with much, like nylon and fiberglass. After machining and handling the nylon bulkheads would easily become stained and look really nasty. So Dave learned how to dye nylon using black [Rit Dye](#). The basic process is to clean the parts with acetone. Mix up the dye in hot water, nearly boiling, with the parts in a coffee can and slosh it around for about a half hour. The parts dyed to a rich chocolate brown color with a finish that resembles anodized aluminum and they certainly looked like they were made out of more expensive material than standard white nylon.

Ron Grant presented a professional printed circuit board schematic and layout program called Eagle (<http://www.cadsoft.de/>). For a nonprofit hobbyist, all features of the program are available for free with the exception of a physical size limit of approx. 4"x3" and two board layers or (\$125 for approx. 4"x6" and 4 layers). If you want to sell your boards, these two versions are available for \$49 (for the 4"x3" version or \$600 (\$125+\$475) for the 4"x6" version. See the Cadsoft site. There is a version that can do boards up to 64"x 64" just in case you want to make a really complex robot controller or want to go retro and make a computer using say 7400 series TTL. Eagle has an extensive library of parts + you can make your own. Lot's of cool features including a very flexible auto router.

David Ellis did a quick show and tell covering Al William's book "Build Your Own Printed Circuit Board". He passed around several samples of the circuit boards he had made after reading the book.

Chris Franz showed an LCD test panel he had constructed.

Dave Martineau demonstrated a toy robot arm that he had repaired and modified.

With no further business the meeting was adjourned.

David D. Ellis
DPRG Secretary

MARCH 2005 MINUTES

At 12:00, March 12, 2005 with 24 in attendance Dale Wheat brought the meeting to order.

Steve Rainwater gave an update on the new member management web pages. You can now sign up or renew online with a credit card or PayPal from the DPRG web site. When you sign up using the web page the member's page is automatically updated so the Treasurer no longer has to do this. Once a person is list on the member's page they can sign in and update their member information. An additional benefit is that the memberships are like magazine subscription in that they start the date you enter and going until the same time next year. There is still an option to pay later for cash or check.

A question was raised about new club t-shirts. Dale reported that no one was specifically tasked with that but it was in the works and we could expect to hear more about it.

Bill Cole presented the work that had been done on the hardware library. The goal was to create an online inventory and checkout system. All the items would be bar-coded and cataloged. Members would be able to check out the item for a month. There would also be a waiting list for the item but if no one was on the waiting list then the current user could renew the loan. He was pleased to announce that there was a lot more stuff than he realized, such as a complete FIRST robot kit, Motor Minds, and several Parallax kits. This made the project both larger than expected and also more important. So far he had finished getting pictures made of the items for the online catalog and was in the process of getting a parts list for each kit. He hoped to get this online in the next month or so. Bill was able to bring a printout of the catalog to meetings which he passed around.

Bill also brought in a large trunk (Dale referred to it as the treasure chest) with most of the items. I was thought that perhaps it would be brought to the monthly meetings or more likely a member could go online and request to check out an item. The item would then be brought to the next meeting. The items could also be checked out at the RBNO.

It was also noted that the library book list was updated on web site.

Cynthia Rivers let everyone know what video she had available and reminded everyone that if they want DVD's to email her and she would bring it to the next meeting.

Dale reminded everyone that Roborama was just 8 weeks away. Some one asked if the Roborama would include Firefighting. Dale said that the opportunity to qualify was at the Table top. The only person expressing interest was David Anderson but ultimately no one entered. He hoped to do the qualifications the same time next year and get a better turnout with more advertising.

Dale Wheat gave an introduction to LEDs. The presentation included information on such topics as the different color any types, ultra bright LEDs, forward voltage and current limiting resistor selection for proper current, PWM to vary brightness and diode matrix. His presentation included several demos. One showing an array of LED's with different colors including IR. Another using PWM to produce different brightness's and colors. And a final demo showing 12 LED's flashing in sequence but only controlled by 4 IO lines in a diode matrix.

Ron Grant's tank demo was an example of doing a motor retrofit on a toy. He demoed simple PWM without encoders then with encoders and PID. When the tank was running "slow" using low-duty cycle PWM it was easy to stall it. With PID the tank was able to run up over his feet.

John Drummond demoed his Java Stamp Can Collecting Robot which now has an operational gripper.

David Martineau had some items to sell.

With out further business the meeting was adjourned.

David D. Ellis
DPRG Secretary

FEBRUARY 2005 MINUTES

Prior to the meeting, DPRG member Scott Sumner assisted with setting up the monitors when the projector bulb blew. Thanks to Scott for the assistance.

At 12:00 AM with 37 in attendance Dale Wheat brought the meeting to order. Dale announced that the DPRG Table Top 2005a and Trinity Firefighting contests would be the following Saturday, 2/19, and would begin at 12:00 noon. He asked for persons intending to enter the Firefighting contest. David Anderson was the only one present that intended to compete. Dale proposed that the Firefighting competition be held at the DPRG Warehouse on that Saturday if necessary. He also proposed that Dave or anyone else could qualify for the Trinity contest at the RBNO. There was no opposition to this.

Dale Wheat did an introduction to Sonar and showed some different modules. Including older Polaroid style modules available at Tanners and a range of sonar modules from Devantech. John Williams showed the upcoming "Ping" sonar unit from Parallax. David Anderson demonstrated how his robot, SR04, uses two Polaroid 6500 sonars to line up with a wall. Ron Grant demonstrated a graphical display of live sonar telemetry from his new robot.

John Swindle presented an overview of his work with audible, omnidirectional sonar. The sonar is intended to be educational, and thus uses audible frequencies. The sonar uses parts, such as a PC, cheap speakers, and microphones, that hobbyists already have. The sonar is inspired by the prospect of having a robot that wins a Can-Can prize without ever leaving Area A (in other words, the robot doesn't move!). John showed the basics of sonar: speed of sound, echoes, signal strength vs. distance, frequency, directionality, rep rate, blanking, and noise. He described how a phased array could be used to increase the signal strength in a desired direction. He showed how the inverse system function can be used to equalize a ping's echo, thereby eliminating ringing. He showed how waveform averaging (summation) can eliminate noise such as speech, pings from competing sonars, and vacuum cleaners. Waveform averaging requires lots of pings, which takes lots of time, so John is working on ways to have multiple pings in flight and ways to eliminate the need for blanking. Then he showed why a 4 kHz ping can't easily detect a coke can (frequency is too low) and discussed why 40 kHz sonars can't easily detect soft things (frequency is too high). John was quick to note that "There is much more to learn!"

Ron Grant did a quick show and tell of the hack he did to a \$50 RC tank toy (normally \$150) from Wal-Mart. He also showed the balancing robot (not Tip) that he was working on and gave a demonstration of it balancing.

UTA Industrial Engineering Professor, Dr. Brian Huff, and some students did a very interesting show and tell one of the Autonomous Ground Vehicles, AGV, they are developing. It too was based on the same big RC tanks from Wal-Mart. The AGV featured New Micro's soon to be released Differential Drive Module, NMI-DDM. It was also had outfitted with optical motor encoders, onboard GPS, wireless telemetry, a tilt and pan head with sonar and 3 Sharp IR distance sensors is driven by a separate NMI ISOPOD, and a CAN-Bus network to tie it all together.

Eric Sumner showed his new 400Mhz Xscale processor controller board from Gumstix.

Dale showed some of the prizes for the TT 2005a contest. BG Micro donated 2 pan and tilt assemblies, a breadboard and prototyping wire kit as well as a multimeter. New Micros donated 2 TinyArm and 2 TinyAVR controllers. He announced that Tanners would be giving gift certificates.

Dale asked for volunteers for the upcoming contest and said he would post a list of jobs that needed volunteers on the email list.

Dave Martineau gave away some spare equipment. He also showed his IR tester and Lego gripper.

With no further business the meeting was adjourned

David D. Ellis
DPRG Secretary

JANUARY 2005 MINUTES

37 were in attendance.

A motion was made, to ratify the election results from the December 11, 2004 meeting rather than conduct the election again. The motion was seconded and passed unanimously.

President - Dale Wheat

Vice-President - Ron Grant

Secretary - David Ellis

Treasurer - Martin Meier

Librarian - Charlie Youngblood

The 2005 DPRG Calendar was presented at meeting with the following dates:

01/08/2005 Meeting
02/12/2005 Meeting
02/19/2005 Tabletop 1, Firefighting
03/12/2005 Meeting
04/09/2005 Meeting
05/14/2005 Meeting
05/21/2005 RoboRama 1, Talent Show
06/11/2005 Meeting
07/09/2005 Meeting or Special Event (BBQ)
08/13/2005 Meeting
08/20/2005 Tabletop 2
09/10/2005 Meeting or Special Event (BBQ)
10/08/2005 Meeting
11/12/2005 Meeting
11/19/2005 RoboRama 2
12/10/2005 Meeting

It was announced that the current yearly dues were due and that starting in January dues would be calculated like magazine subscription. A DPRG membership would start when dues were initially paid and would need to be renewed one year later.

Dale introduced the DPRG Webmaster, Steve Rainwater and asked him to go over the proposed changes to the DPRG website. The highlights of the proposed changes are to allow memberships to be paid online, to have a small template based homepage for each member and to allow each member to have a dprg.org based email address that will forward email to a member specified address. Steve hopes to have the online membership done within the week and to have the other web features soon. Steve also solicited a volunteer for the vacant Postmaster position.

Dale was asked about taping of events and deferred the question hoping to have something for the next meeting. He introduced Cynthia Rivers and informed the meeting that videos of past events were available from Cynthia as VHS tapes for \$12.00 plus tax and DVD's for \$14.00 plus tax.

Will Kuhnle gave an excellent presentation on the basic principles of gears and gear trains. The presentation covered gear types and the relative pros and cons of each type. Basic formulas for gear ratios, output RPM, output torque, and inertia at output were discussed as well as the importance of each. Rules of thumb for gear train efficiency were also included. Gear specifications and standards were also touched upon. The presentation was planned to only 30 minutes but once the questions, answers, and discussions got going the session expanded to nearly an hour.

Jeff Koenig presented two solar cell and voltage regulator modules. The two devices each featured: Two 60 mm Square Solar Cells, from All Electronics item number SPL-60, a Texas Instruments switching power supply demo board with REG711 switching regulator, and 2 Maxwell 50 Farad ultracapacitors each.

Will Kuhnle presented an early six-legged prototype, and his two four-legged robots, Cow One and Cow Two.

Jon Williams presented a soon to be released Parallax Professional Development Board. The PDB works with the BS1 (SIP), all BS2-24, BS2p40 modules, and the Javelin Stamp. It has a socket and programming connection for Ubicom SX28 (not available when BS2p40 installed) and the "Stamp" modules may be programmed via serial (DB-9) or USB connectors.

The board features a good size proto board and the following I/O hardware:

- 16 discrete LEDs
- 6 7-segment LEDs
- parallel port of LCD (with contrast pot)
- 2 10K pots
- audio amplifier (can use built in or external speaker)
- L293D high-current driver
- 8 pulled-up push-buttons
- 8 pulled-up dip switches
- pulse generator (1 Hz, 10 Hz, 100 Hz, 1 kHz)
- RJ-11 port (can be configured for 1-Wire or X-10 connections)
- Extra serial port with RS-232 level converter
- DS1307 RTC (I2C)

Jon pointed out that with the wide variety of IO circuitry on the PDB one can very quickly prototype and test a circuit before moving it to something more permanent.

(Note: The PDB has not yet been released by Parallax and specifications reported are subject to change)

With no further business the meeting was adjourned

David D. Ellis
DPRG Secretary