

## JUNE 1997 ISSUE OF THE DPRG NEWSLETTER

The last meeting was the most successful meeting DPRG has ever had! We had the largest crowd in history (as far as I'm aware), and we had more robots in the May meeting than any previous meeting (as far as I'm aware). From the applause that filled the room during the robotics contest, it appears that a good time was had by all. This contest was the first contest in many years and we plan to continue having them every quarter (The next one will be August 16th). It was really interesting to see how each contestant approached the contest and came up with their various robotic creations. Also, we have voted using our new email voting method, to go after the 501c non-profit status. This will be a big boost for our Group in that incorporating will give us some liability protection, will keep us in good with the IRS, and allows us to be a true non-profit organization with all of the benefits. It's hard not to be proud of how far we've come in such a short time, and to be expectant of what the future holds for DPRG. Hey, this is only the beginning!



Look at the huge crowd at the May meeting. Officially we had 68, but a few more came in later pushing to total to over 70!!!

### Contest Summary

*by Clay Timmons* For those on the mailing list left wondering what really happened at the contest here is my account.

The room was about half full with more attendance than ever. Jim Brown opened up the meeting with a quick description of the contest then asked who wanted to go first.



Roger Arrick took the floor first with his simple robot named 1 bit. His witty remark about having a major brain (his not the robot's) got the crowd to laugh. 1 Bit consist of a 2x4 with wheels, a motor, and a bumper switch that shifts into reverse on impact. It cruised to the far wall with only a slight curve and hit the wall with a thud. It shifted into reverse and made all the way back.

Jim Brown went next with a robot named 2 bit. The most minaturized robot of the contest 2 bit was based on a small toy car. Using contact switches and latching relays it operated similar to Roger's 1 bit. 2 bit did not complete the course due to front end alignment problems causing the robot to drift from straight.



Eric Yundt came next with his robot named YaTu. YaTu was built on a toy car chassis and sported great form with a large shark man riding atop. Eric's last minute adjustments right before the meeting worked flawlessly. It raced forward, came to a complete stop, came back, and stopped again. It was extremely fast with a time of 9 seconds.

Jim Brown demonstrated the most unusual robot of the contest. A hybrid walker with two legs in the front and two wheels in the back. The first attempt veered a bit off course but the second run went clear to the far end hit the wall and shifted into reverse. Walking backward proved a bit more difficult causing a sort of jackknife problem. [Editors Note: Check out the source code.](#)



Clay Timmons had made some revisions to his One Week Wonder robot from last month's meeting. Renaming it to Line Feed it was a line following bot. The first few runs had it veering quickly off the line. A loose motor connector was replaced and the next run sent it down the course following the line. While rounding the bend at the far end of the course the robot got caught on the white tape. Ripping up part of the white tape the bot continued on getting slightly off course it ended up following the course boundary tape. One more run at it made it fine with much less damage to the course.



Roger Arrick next demonstrated his impressive D-bot. Sporting 6 wheels and a full PC with keyboard and monitor it was the largest in the contest. Roger put D-bot in a learn mode and manually drove thru the course. Next he put D-bot into playback mode and let it run the course itself. When D-bot attempted its U-turn it was a bit too close to the far wall. Turning slightly less than 180 degrees it headed straight for the audience! Roger ran to stop D-bot and made it just in time before anyone was run over. A second attempt demonstrated a flawless performance including a U-turn which the rules mention to be worth extra credit.

*(This paragraph inserted by Jim Brown)*

Jim Brown next demonstrated the Baby Bot II. It was built on an RC chassis and utilized the an 8031 processor board. Baby Bot II ran into the wall and then wouldn't start again. It turned out that a AA battery had popped out when it hit the wall.



Steve Rainwater demonstrated a very sophisticated and well built robot. When asked for the name of his creation he said it was nothing yet. Based on a large RC vehicle it sported a unique robot body from the Container Store to hide the electronics. Equipped with two sonar sensors mounted on servo motors it was the only robot in the competition with true obstacle avoidance. Unfortunately a previous collision had left something in the rear wheel steering broken. Making its way forward the breakdown did not cause much problem. In reverse the loose rear wheels made the robot go off course.



Clay Timmons tried his HERO-1 on the course using the learn/playback feature. Reading from the HERO manual he keyed in the proper sequence. Driving the HERO with the teaching pendant he had difficulty going straight. Colliding with the wall his wife made a comment about him driving that way all the time. With the steering problem unresolved Clay decided to try playback mode just for fun.

John Wadley demonstrated his creation based on a toy RC car. Having removed the tires from the wheels he called his machine low rider. Using line following navigation it took off without a hitch. Making its way down the course it demonstrated a surprising capability of begin able to back up and continue along the line. John explained that his robot did all this with no micro-processor! A board of components controlled the two motors using some sort of look up table bases on the sensor readings. Occasionally the robot would stop but without actually touching his robot he could make it continue with a bit of hand waving. The waving hand created enough shadow for his sensors to detect and start adjusting the steering accordingly.



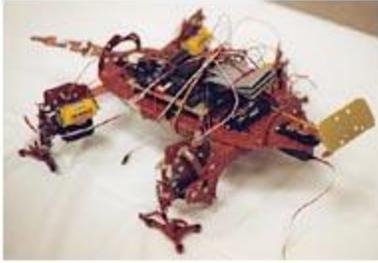
Next Jim Brown went to summarize the contest results. A few people had been timing robots and Jim announced the winners based on their numbers. No one spoke up at the time but the rules stated that the winners would be judged by audience applause.

After the meeting nearly everyone there went to look at robots and talk with their builders.

Contest Results		
Builder	Robot	Time
Roger Arrick	1 bit	19 sec
Jim Brown	2 bit	n/a
Eric Yundt	YaTu	9 sec
Jim Brown	Baby Bot III	n/a
Clay Timmons	Line Feed	30 sec
Roger Arrick	D-bot	13 sec
Jim Brown	Baby Bot II	n/a
Steve Rainwater	Nothing Yet	n/a
Clay Timmons	Hero-1	n/a
John Wadley	Low Rider	52 sec

n/a means the the time was not available since robot did not complete the course

Disclaimer: Sorry for any mis-spelled names and any reporting inaccuracies in my account of the contest. Ed Rivers videotaped the entire event. I wish I had a copy right now to get all these details right.



### **Roger Brings His New Walker Robot**

Roger brought in his new walker robot which is much improved from the previous version. The new walker robot has new improved linkage on the legs which allows the feet to stay stationary as the leg swings forward and backward. The new linkage gives a full range of motion for each foot by using a springs to allow each foot joint to bend slightly without sacrificing stability. It's sort of like 4 leg suspension. The batteries, like the previous version are placed on the leg to reduce the weight the platform must lift (appears to be a very wise placement). The new version also has a head that will support sensors and such, and a tail that moves as the head moves. The robot has two servos per leg and two additional servos to turn the head and linkage to move the tail (for a total of 10? servos). It was painted with a earthen pottery color flekstone type paint and looked like a little gecko. Its motherboard has dual processors: one for the main brain, and one that is a slave unit to control the servos and perhaps other sensors and motors. It wasn't ready to run the course, but if it works anything as well as the previous version it will be totally awesome by the August contest!



### **Roger Brings His Trilobot Robot**

Roger brought in his trilobot robot that his company, [Arrick Robotics](#), makes and sells. These robots have been purchased by colleges and other entities for studying artificial intelligence in their labs. The Trilobot uses the front wheel for steering and locomotion and the back two wheels are freewheeling. On the front the Trilobot uses a Poloroid type sonar system for navigation and has other sensors as well. Also, the Trilobot can utilize a radio modem to communicate between it and a PC for communicating commands to it and retrieving valuable sensor information back from it.

### **Other Robots at the Meeting**

Other robots at the meeting included Bryan Lyde's maze solving robot, Eric Yundt's Hero robot, James Vroman brought the GARP robot, and it seems that there may have been a few others that I missed. Even if they didn't compete, it was great getting to check out what others have done in there robots.

### **Motorola Donates HC11 books**

Motorola graciously send 25 of their 68HC11 databooks. They went really fast at the meeting. Many of the robots at the contest were using the BotBoardII by Marvin Green which utilizes Motorola's HC11 MCU. What I like about the HC11 is the analog ports and the superior timer facilites, and the EEPROM on chip. If you don't know about the HC11, you should check it out.

### **B.G.Micro Donates Catalogs**

James Vroman of Tech Tools managed to score about 25 catalogs from [B.G.Micro](#). B.G.Micro is a local mailorder surplus electronics vendor. They have very good prices on surplus electronics, and they have a great selection. These catalogs went very fast! I hope you didn't miss out.

### **Philips Semiconductor to donate books**

Don't miss out on the next meeting, Larry Kerns managed to contact Philips Semiconductor directly, and they mailed him 30 of their 8051 microcontroller manuals sets. Each set consists of two books and a CD rom. Larry Kerns couldn't make it to the last meeting, so he stated that he would bring them to the next meeting. Don't miss the next meeting and get your Philips Semiconductor databooks on the 8051 microcontroller variants that Philips Semiconductor provides. Thanks to Philips Semiconductor for their generous donation.