

The Robot Companion

Newsletter of the Dallas Personal Robotics Group

June, 1987

MINUTES OF MEETING ON 5/16/87

For one reason or another, we had a total of 5 people at the meeting. Only one, Walter, brought any programs for the library. Let's try to do better next time, ok?

Regardless of the turnout, we had a great round-robin discussion about the possibilities of vision, pattern recognition, navigation, and such. Brian promised to give a short discussion on using integrals, moments and variants for pattern recognition at the next meeting. If you don't know what these are, come and find out!

Other topics discussed:

- Brian's homebrew robot, and improvements he's making.
- FORTH language, its use in robots (Brian's)
- Ongoing project possibilities:
 - Vision digitizer
 - Maze running (as project or contest/demos)
 - Other high-level control applications, such as manipulating objects from another room, using only the remote console to 'see'.

Agenda for the June Meeting

The next regularly scheduled meeting will be held at the Heath/Zenith store in DALLAS, June 20, 1987 at 3:33 pm.

All attending paid-up members will receive the new DPRG bumper sticker.

We will see a demonstration of R/C planes under computer control using bidirectional feedback.

Brian will discuss the current state of Image Processing.

Joe Rowe will discuss and demonstrate motion and direction sensing using the Hero 2000.

We will also, given enough time, discuss the future of the users labs. What would you like to see done at them? One current plan is to have a robot maze time trials.

If you have anything for the club library, bring it on a PC/MS-Dos disk. If you want a current copy of the library, bring a disk in the above mentioned format, or \$2.00 to cover handling. Void where prohibited by law. Order before midnight tonight. Operators standing by. Oops, sorry! I got carried away.

See you there!

And speaking of the user lab, here's a note from Stan:

THINK LIKE A MOUSE

The next user's lab, which will be 2 weeks after the June meeting, will be at Walter & Bev Bryant's house. After the discussion at the last meeting, we decided to experiment with some 'mouse' algorithms. Universities have maze-running contests for miniature robots all the time -- so why not us? Our mouse is just a bit bigger (and smarter). Walter has agreed to clear out his living room for the day, so we can use his nice expensive parkay floor to run our robots on. We will use some cardboard boxes and such to set up a maze for our giant mice. The intent is for all of you intelligent guys to come up with a great mouse program, using sonar, light, or whatever sensors you want to guide your robot through the maze. If we have some success, it will make a great event for our next demo.

Here's some guidelines:

- The walls will be no less than 3 feet apart, for plenty of turning space. However, I suggest using sonar to keep your robot as close to the center of the path as possible.
- For starters, the maze will be a simple block-style maze, with only one path to the exit (no loops or open 'rooms'). If that gets boring, we'll add loops, rooms, odd angles, curves....
- Try to leave the program flexible as to the maze size and start/end points. We will define these later. If you like, make it an 'explore' program, where he keeps going until someone stops him (but try not to get stuck in a loop -- 'mark' where he's been so he doesn't repeat himself).
- For '2000 owners -- crashing through the walls is not acceptable as a solution!

Note to out-of-towners: If you have a good mouse program, send it to us and we'll try it out. We may also videotape the runs. If you don't have a chance to get your program to us by this lab meeting, send it anyway...we'll probably be doing this again, after the initial runs show us where the bugs are!

I hope we get lots of activity on this project. I would like to make it an ongoing project, not only for its challenge and possible demo use, but because an important part of robotics is navigation in unfamiliar territory. Let's see what we can do!

And still more from Stan:

BACK ISSUES

Anyone who has saved any of the old newsletters, please, PLEASE bring them to the next meeting! We are trying to compile a comprehensive set of back issues to distribute. Not only would the new members like to have them, but I doubt that anyone in the club has all of them! Once compiled, we will charge a small fee for a set to cover copying costs (probably about 2-3 dollars -- our newsletters haven't been known for bulk in the past). If you have some but can't come, PLEASE send them with someone else.

NEW COLUMNS

by Stan, club Secretary

Starting with this newsletter, there will be several regular monthly columns. The idea is to do it like the big guys do. That also means that YOUR contributions are important, too! If you have an idea, however small, we want to put it in the newsletter. Mention it at the club, call Greg Oliver, or send one of us a letter. Small seeds sprout big projects! The new ones you'll notice this issue are:

MINUTES - What happened at the last meeting.

AGENDA - What's going to happen at the next meeting and user's lab (and meeting times and places).

FROM THE LIBRARY - Library news, disks available, and any new programs received.

IN SEARCH OF - Anybody looking for anything? Books, magazine issues, parts, programs, designs...? Let us know, and we'll publish it -- remember that we're an international club, now! Any responses will also be printed.

HERO 1, HERO 2000 NEWS - News tidbits, questions and answers about the heathkit robots. Send us your questions and ideas!

HACKERS AND HOMEBREWERS - Software and Hardware suggestions, news, designs, etc. Anything non-heathkit, including software that's not specifically written for a robot (ie. clever algorithms that COULD be applied, such as vision and pattern recognition).

FEEDBACK - Your comments and suggestions about the club in

general, the newsletter, corrections, etc. -- YOU are responsible for producing this column, so let's hear what you have to say -- any project ideas?... complaints?... praise?...

Columns that may appear in the future:

ONGOING PROJECTS
INDUSTRY NEWS
NEW MEMBERS
REVIEWS
you name it...!

Of course, any miscellaneous feature articles are always welcome!

*** HACKERS AND HOMEBREWERS ***

Written by Stan Spielbusch

PARTS IS PARTS -- unless you can't find them!

One of the most frustrating things to me is finding a great design article in a book or magazine, and not being able to find one of the key components to complete it (usually an RCA analog IC or Motorola transistor)! I also often need things for my own designs like a specific Molex connector, a nice switch, or a large quantity of items that would break my bank if I bought them from Radio Shack.

If you are best friends with the purchasing manager for TI, you may not have this problem. However, the rest of us do. For a long time, even in Dallas, my only source for parts was Radio Shack and mail-order houses that advertise in BYTE. (The latter, by the way, is usually the first place I look because of price, and they usually have all of the common parts.) Little by little my resources grew, mostly by accident and asking friends. And, I was amazed that even some of my 'hacker' friends didn't know some of the places I did. In other words, don't count on the Yellow Pages to tell you everything.

I think the best local shop for parts is Off the Shelf Components (yes, that's their name). They have 2 locations; one at Royal and Stemmons, and one on Plano Rd. in the Campbell Rd area (right behind Wyatts cafeteria). Look for the "OSC" sign. They have a good stock of IC's, discrete components, switches galore, sockets, tools, and a little of everything. Their prices are usually better than Radio Shack, but not as good as mail order. Also the perfect place for connectors (they are a Molex distributor), heat shrink tubing, relays, and enclosures.

Other places to try:

Heathkit/Zenith store (of course!) -- I wouldn't say they have a large selection, but they do have an assortment of common IC's and such. Check it out next time you come to the meeting. (No, this is not a paid advertisement!)

Epic Electronics, on Plano Rd at Walnut (I think), next to Johnny's auto parts -- similar to Off-the-Shelf, but less selection. Also sells PC clones.

Tanner Electronics, on Harry Hines just north of Royal Ln. This place also sells surplus items (I found a great Epson display module and a 20 Amp-Hr lead-acid battery there). They also have an assortment of IC's and other components. Good place to check once a month for special items.

RCA electronics, on Forest Ln just east of Greenville. Remember those RCA IC's and transistors? If they can't get them, nobody can. They also have tons of tools and such, Fluke meters, and a nice SAM's book selection.

The Micro Store, on Central near Spring valley, across from Pancho's. They don't have components anymore (and they used to sell the R25X robot), but I like their book selection. A lot of books on AI, and most of the good books on programming languages. They also carry the Dr. Dobbs journal magazine (now called Software Tools, or something like that).

Sabet Electronics used to be a good scrounging place for components and surplus, but I heard a rumor that the surplus has been moved somewhere else. I have yet to confirm this, and have also heard that they still have a warehouse full of surplus. They also sell PC clones and parts very cheap.

Lolir Electronics, in Keystone Park (Central at Spring Valley). This has mostly PC clones and parts (also very inexpensive), but they have a few miscellaneous parts. Their current price sheet has a parallel-port driven EPROM programmer for \$119. They also have a store in Farmer's Branch and Ft. Worth.

Dallas Electronics Surplus, on Northaven Rd east of Denton Drive. This place is operated by an old man from some place like Austria. It's a great place to scrounge for mechanical parts, relays, motors, gears, and such. He also has some discrete parts, but don't expect to find a specific part number. He buys a lot of old boards and equipment from companies dumping their junk, and he loves to take the stuff apart and sell the pieces. You could even pick up mostly-complete tape drives, disk drives, printers, and other junk. It's in a warehouse, so I don't suggest going in the middle of a hot summer afternoon. Also be prepared to bargain, as nothing has a price marked on it.

If you're adventurous, you'll like the First Saturday Of The Month Sidewalk Sale (I don't know if it has a real name) at Ross and Central, next to the old Heath store. It starts at dawn and lasts til about 11 AM on the first Saturday of each month, rain or shine (so I hear). It started as a ham radio

sale, but now has a lot of computer-related sales. It's a lot of people unloading their old 'junk', along with a few full-timers selling parts, PC clones, etc. If you have something to sell, just take it down there and set up a card table. I don't think there's any charge for the 'weeds' sections, and about a \$5 fee for the parking lot. I've even seen a couple Hero-1's being sold there. I highly recommend going to this at least once, even if you don't do any homebrewing!

Rondure Co. -- this is an old wholesale and surplus place, on Butler between Maple and Denton Dr. It's only open Wed. 12-4 and on the 1st Sat. of the month from 10-2. This makes it an ideal stop after the sidewalk sale! They have a good selection of components up front, along with such things as disk drives and complete computers (used). In back, they have racks and racks of equipment, parts, and anything else they can get their hands on. They might also be a good spot for mechanical parts. Note to out-of-towners -- they do mail order, and their phone line is open 9 til 5 Monday through Thursday. (214)-630-4621.

Well, That's all the local places I know of right now. If you find a place, especially if it's a hole-in-the-wall (those are often the most fun), let us know! Out-of-towners, if you have a local spot that will sell mail-order, have them send us a catalog or phone number, and we'll mention them in the newsletter. Of particular interest are sources of mechanical parts, such as motors, gears, swivel assemblies, etc. I'm on the mailing list of a few such surplus places, which I'll mention in the next newsletter. Keep those projects going! We would love to see more homebrew robots AND additions to robots. If you can't make it to the club, send pictures, videos, etc., and we'll distribute them. My own project is a long way from being born as a robot, but this club has given me a lot of great ideas, and that keeps me going when things get discouraging!

IN SEARCH OF...

What are you looking for?

There are two things I'm looking for:

1. Does anyone have all of the Radio Electronics series on building the R-E robot (the one that just ended)? I would like to take a look at these, and also the articles on vision systems. Please bring to club meeting!
2. Does anyone have the book "How to Build a Computer Controlled Robot", by Ted Loofbourrow? This is the one

home-brew book I cannot find. I think it's out of print. Please let me know if you have it or know where I can get it.

Thanks,
Stan Spielbusch

Here's a letter we received, asking for robot tinkerers. We aren't a great number yet, but I think he came to the right place! I hope he keeps us informed on what he's doing and who he finds!

From Bret Webster & Associates
4622 Loleta Avenue
Eagle Rock, CA 90041
(213) 258-3136

05/15/87

Dear Walter:

I'm a Motion Control Camera Systems designer/builder/operator and have in the past also built several "normal" home-brew-robots...

I saw an old flyer listing your organization and am wondering if you could send a sample issue of your newsletter.

Also: I'm looking for a "master listing of robot tinkerers" around the country, (have you seen such a thing?) and thought if one doesn't exist - i'd compile one - including your members.

I have a project that requires inquiries to all of the roboteers I can find. (Details forthcoming). Please help!

Thanks

Brett Webster

If there are no objections, we will send him a copy of our current membership.

Last, but not least, here is more from Stan, concerning the library:

FROM THE LIBRARY

by Stan, club Librarian

Well, the library is off to a fair start, with some programs

from Joe Rowe and some from Walter Bryant. Whenever I put programs in the library, I will list them here. This month I got some programs indirectly (not from the original author), so forgive me (and correct me) if I list the wrong authors.

For the next meeting, all of the programs for both the Hero 1 and the Hero 2000 will be put on one disk. After that, the disks will be separated (we should have enough programs by then). I have adopted a standard naming convention for the file extension to designate the robot that the program is for:

.H1 -- HERO 1
.HJ -- HERO JR
.H2 -- HERO 2000
.HB -- HOMEBREW (may expand for language)

Any documentation files will have a third letter 'D' in the extension. If we get any other brands of robots in the club, we'll add naming conventions for them, too.

I will have a number of disks at the next meeting for distribution, but you may want to wait until we get a few more contributors. If you want one of the disks (MS-DOS format), bring a blank disk (preferably pre-formatted) or \$2.00. If you need another format or prefer listings, let me know. The price for listings will also be \$2.00 per disk, so I would definitely wait for more programs.

If you have any questions, suggestions, or special needs, please give me a call. H: (214) 699-1501 or W: (214) 458-6755.

To send in programs or order disks (\$3.00 through mail or send a blank disk), send programs/requests to:

Stan Spielbusch, 6102 E. Mockingbird Ln # 294, Dallas, TX 75214.

Now for the current programs:

HERO 1 (all written in BASIC)

CLAPMOVE - (Walter Bryant) This allows control of the robot's movements by clapping your hands. The robot asks if it can turn, or go straight, and you clap one or two times in response.

COMPASS - (Joe Rowe) This reads a special compass/light fiber device, allowing the robot to find true North within about 1 degree of accuracy. See one of our back issues for the hardware design.

CONCIOUS - (Joe Rowe) This is an ongoing project by Joe. It stores dates, times, appointments, reminders, etc. and the robot will wake up and remind you at the proper time. This is also being developed for the '2000, and is a fantastic application!

CONTCODE - (Walter Bryant) This allows 2 robots to talk to each other in continental code! They actually 'beep' at each other!

FORTUNE - (Bev Bryant) This is a cute fortune-teller program used at our demos. It tells your horoscope and a random fortune.

FRANKEN - (Joe Rowe/Walter Bryant) This is the Franken-bot skit program used at our demos. It contains the script for both actors, and runs one or the other depending on a keypad input.

GUNFIGHT - (Joe Rowe/Walter Bryant) This is the Gunfight skit program. This is the first skit program the club did. It also has both scripts in it, like Franken-bot.

SETDATE - (Walter Bryant) This is a short routine to set the day of week on the Hero's clock.

SETTIME - (Walter Bryant) This is a short routine to read the time clock and display it.

STORIES - (Bev Bryant) This is a random story-teller program used at demos. It can also sing Old MacDonald and play a numbers game.

WAKE-UP - (Joe Rowe) This is a routine that allows the robot to wake up at a specified time and run a program.

HERO 2000 (all in BASIC)

ALARM - (Walter Bryant) This is a simple alarm-clock routine.

AMERICAN - (Joe Rowe) This is the American robot script used in the Col. Warbot skit. (The German's part is for the Hero 1, and has yet to be submitted).

ARM-DEMO - (Walter Bryant) This is a short demo of the arm homing and reaching to the floor.

CHRISTMS - (Joe Rowe) This tells the christmas story. Nice inflection work.

CLOCKRUN - (Walter Bryant) This allows a program to run at a specified time.

CONCIOUS - (Joe Rowe) This is the continued consciousness program for the '2000. I understand it still has some work being done on it, but as it stands is a fantastic program. A list of codes used is in a .H2D file.

HEAD-KEY - (Walter Bryant) Utility routine to read the head keypad.

HOME-NAV - (Walter Bryant) This is Walter's pride and joy. It automatically navigates his house, while constantly keeping square with the walls and always knowing where he is. It also takes obstacles in stride. The house map is programmed in, but easily modified for your own house.

HOMEDEMO - (Walter Bryant) This is a demo of the wall-squaring part of HOME-NAV. This was used in a club demo,

- where the programmed map wouldn't do any good.
- MALL-ANN - (?) This was used to announce the skits at the demos.
- SCANNER - (Stan Spielbusch) This is a sonar mapping routine, which reads the sonar at 15 degree increments and maps it onto an X-Y grid. The result is printed out on a terminal (or printer). This could be a good start for a sophisticated maze program!
- SPK-DEMO - (Bud Collins) This looks like a neat demonstration program. It's menu-driven, using a terminal to select what it says, responses, etc. Presumable used to entertain people at a show or in the store.
- STANDUP - (Walter/Bev Bryant) This is about a 15-minute stand-up act used for a demo. It tells jokes, sings, and entertains, using its arm for gestures as well.
- XMASTREE - (Bev Bryant) This is a short program that sings "O Christmas Tree".
- XYZ-ARM - (Joe Rowe) This is a very useful and well-documented program that moves the arm to a given point in space. All you do is specify the X,Y, and Z coordinates and the wrist orientation! (I haven't looked, but this might be out of the Hero manual).

One note on the programs: some of them are lacking in documentation, Walter. Especially the Hero 1's. I realize that space is precious in the '1, but I would appreciate at least 2 or 3 lines at the top describing the program's purpose. All in all, I think it's a good start, and a good representation of what our club is about. Let's keep those programs coming in!