

THE ROBOT COMPANION

the newsletter of the
Dallas Personal Robotics Group

May, 1988

***** URGENT URGENT URGENT URGENT URGENT URGENT *****

The May meeting happens to be on the 2ND Saturday this month! This is due to the Infomart's schedule, and we must play by their rules if we use their court. This newsletter is a late rush-job and may not have reached you in time, but you still have no excuse for not being there, since the meeting schedule has been printed in the newsletters since February! Note that the June meeting is also on the 2nd Saturday.

APRIL MEETING MINUTES

April 16, 1988 2:00 p.m.

- Bud stated that Heath/Zenith (and his career) have moved into Info-Mart. He may have access to an AutoCad wax mold cutting machine for a club demonstration.
- Bev invited all robot club members to aid in the post-event clean up at Info-Mart since it was our club's turn.
- We may hold our users lab once a semester at ----- college.
- Bud stated that the club would hold its 4th birthday party the next Saturday 2:00 pm at the Fort Worth Heath/Zenith store. (The turn out was very successful with about ten robots and fifteen humans in attendance.)
- Bev stated that volunteers were needed to man the Heath robots at the Fort Worth Museum's "Robots and Beyond" exhibit.
- Portions of two Heath/Zenith Hero 2000 demo tapes were played.
- Brian Vaceluke exhibited his home brew robot.

MAY MEETING AGENDA

The next meeting will be held at 2:00 P.M., May 14th at the Infomart in Dallas.

Old Business

- We will be amending the club's bylaws. If you have suggestions, you must let us know by this meeting.
- Treasury report.
- Birthday party report (pictures if available).
- Discussion of the state of user's labs.
- Logo contest update

New Business

- Upcoming projects -- What to do, where we are going, how to get there.

PRESIDENT'S CORNER

by Bev Bryant, President

First of all, I would like to thank Bud Collins for all of his help with the birthday party arrangements, decorations, party favors, etc. I especially want to thank him for providing transportation to the party for our "children", Robbie and Seldon.

Walter will be attending the next meeting, but he won't be lifting any robots.

I have contacted Hockaday school about having our user's labs there, and they have agreed to let us use their ceramics building one Saturday per month. However, there are three steps getting into the building. We would much prefer a facility with no steps. Does anyone have any other suggestions?

I have a question that I want you all to seriously think about -- why are YOU coming to the meeting this Saturday? Is it to see me stand up in front of all of you and talk? Is it to see Walter's hernia operation scar (which he isn't going to show anyway)? I really want to know what draws you to the meetings, and more specifically, what you hope to see each month but rarely or never do.

We have a lot of ideas for things to do floating around (Stan virtually flooded us with ideas in last month's newsletter). Whenever we have a demo to do for a mall or other organization, I'm amazed at how much we, as a club, get done in a short time. But in between times, the club doesn't do much more than talk. We desperately need to decide what we are going to do, and when we want it to be done. In the May meeting, the SIG leaders will be soliciting ideas and making lists. Each idea will be prioritized or vetoed (by voting, if necessary), given a deadline, and assigned to a person or persons for completion. Please don't take this lightly, nor be frightened by it. I think we all agree that we need such a plan for the club to be productive and enjoyable. Please bring your ideas to the meeting.

Please, please, please, if anyone out there has the Programming Language cartridge, the BASIC cartridge, or the RS-232 interface for the HERO Jr., bring it to the meeting or contact one of the club officers as soon as possible. Without these items, the HERO Jr. doesn't do much roboting at all. Brian Vaceluke is pretty sure that the cartridge data can be downloaded to EPROMs for use in other HERO Jrs, and the RS-232 interface can be duplicated. Let's give the Jr. some life!

HERO 2000 NEWS

by Walter Bryant

I realize that some of these are redundant, but I have listed some of the ongoing projects and ideas that I have for the HERO 2000 below.

Continuous Consciousness

Home Navigation

Workstation --

Writing with a felt-tip pen.

Cooking meals (refrigerator, microwave).

Working with building blocks.

Speech/Verbal Communication --

Tell semi-random stories (but still be logical).

Ask for instructions in multiple-choice format, human claps to indicate choice.

Two or more robots talking to each other.

Numerous end-effectors (gripper types) for specialized tasks.

HACKERS AND HOMEBREWERS

by Brian Vaceluke, Homebrew SIG Leader

This month I will talk about possible hardware improvements to the Hero 2000. Even though the Hero 2000 is far from a homebrew, it could serve as a starting point for someone who wants to experiment with advanced robotics hardware. Having built a robot from scratch, I realize that one could spend up to three years of evenings until any signs of "life" are seen from the beast.

First off, the Hero 2000 comes with a twelve socket back plane for hardware expansion. However, Heath/Zenith only supplies enough sockets for the initial cards used in the robot (ie. four sockets for a robot with an arm.) Then every time you purchase an accessory you have to disconnect the harness, remove all of the existing cards, remove the (about 14) screws that secure the backplane to the computer chassis, solder in the new connector, clean of the resin left as a result of soldering, and reassemble the unit once again. This can become tiresome if you buy several peripherals on DIFFERENT occasions. Why not add all of the connectors at one time? Because Heath/Zenith asks for over ten dollars per connector, about eighty dollars to do this. However, a surplus store named Tanner Electronics (at Belt line and I35E) has the same quality 72 pin gold plated connectors for one dollar each.

The Hero 2000 offers a half height 5-1/4" disk drive for about 400 dollars. If you want to add a second drive you have to add it as an external drive since there is no more room within the robot. But the cut out in the plastic side panel of the robot offers room for two stacked one third height drives if the hole in the metal filler panel is recut. If you shop around at computer stores (especially those that carry Compaq), one third height drives can be purchased as new "pull outs" for about 40 to 65 dollars each.

Also the Hero 2000's sonar capability can be expanded by using a pair of small DIP relays tied into the experimenter's card with very little extra circuitry. Then three more transducers (say one low on each side of the body and one on the arm) can be selected to replace the base sonar transducer using an "OUT" statement before a "SONARB" reading is executed.

I know that this is not just "pie in the sky" thinking since I have already completed the first proposal and the last two are nearly completed.

But what about some "pie in the sky" proposals? Why not make a co-processor that could piggyback in one of the two unused motor controller locations on the main motor controller board. They could be voice recognition and video digitizer co-processors.

The ideas outnumber the time available to implement them!

INDUSTRY NEWS

by Stan Spielbusch

The July, 1987 issue of Byte magazine (highly recommended for anyone interested in computers beyond word processing and spreadsheets) contained an article about a robotic Ping-Pong player. Designed and built as a PH.D. project, the robot can analyze the trajectory of a ball hit by an opponent, calculate the spin and drag, and predict where it will go. An expert system integrates vision data, robot capabilities, and task constraints to plan the appropriate motion for hitting the ball back.

The robot itself consists of 4 video cameras, 4 68020 computers, and a commercial robotic arm with customized electronics. Two processors run the vision, 1 processes the trajectory information, and the 4th CPU is the robotic controller. The vision system produces 3-D position, velocity, and spin vectors. Once the information is processed, it takes only 4-tenths of a second to make a motion, moving the paddle at 2 to 3 meters/sec.

Hero 1 - Meets the Joy-stick
 by: Richie Dean Vero Beach, FL

After reading the last "Robot Companion", I noticed that Stan Spielbusch was having to write most of the articles. So, I decided to help him this month. As you know, everyone including small children knows how to work a joy-stick like the ones that come with the Atari game system. So, I thought it would be a good add on to the Hero, that way people could communicate with it more easily. So, since I don't know much about hooking things up to the Hero, I thought this would also be a good easy project.

Here are the parts needed:

Qty	
1	9-pin male connector , Radio Shack #276-1537
5	1-1/4 inch insulated wires
1	3-1/2 inch insulated wire
	Standard soldering tools

Directions:

1. Remove 1/4 of an inch, from each end of the wires.
2. To pins 1,2,3,4,and 6 solder a 1-1/4 inch wire.
3. To pin 8 solder the 3-1/2 inch wire.
4. Insert the other ends of these wires into the small holes on the experimental board.
 - A. The wire from pin 8 goes to the hole marked D10
 - B. " " 1 " " D11
 - C. " " 2 " " D12
 - D. " " 3 " " D13
 - E. " " 4 " " D14
5. Now plug the joy-stick into the 9-pin male connector.

Well, I am sure there is a better way to connect this thing to the experimental board, like soldering it to the board itself. But, I didn't feel it was necessary. [Editor's suggestion: use longer cable (3 or 4 feet) and secure the robot-end of the wires so they won't come out of the experimenter's board. Now you have a remote control device (or leash).]

I have written a small sample program to try it out. But, this is just to show what it does, and to display the different value you get when you are using the joy-stick. Games can be made, and more people (especially children) can use it. I am presently working on a dragon and maze type game, where the user uses the joy-stick and fights monsters and walks around in the maze hunting for the large pot of gold.

Well, I hope you like this simple and inexpensive add on, and I hope someone could maybe make a program that will use the joy-stick to drive the Hero around, since most people like driving the robot around.

(see next page for demo program listing)

```
100 REM .....
110 REM . JOYSTICK DEMO .
115 REM . BY .
120 REM . RICHIE DEAN .
130 REM . VERO BEACH, FL .
140 REM .....
150 REM
160 REM A SIMPLE HARDWARE ATTACHMENT AND ANY
170 REM GAME MACHINE JOYSTICK IS NEEDED.
180 REM TO GET INSTRUCTION, READ THE MAY
185 REM ADDITION OF THE ROBOT COMPANION
188 REM
190 H=0
200 J=PEEK($C2A0):REM READ EXPERIMENTAL BOARD
205 DPRINT "$"
210 DPRINT J
220 IF J=247 THEN GOTO 300
230 IF J=239 THEN GOTO 400
240 IF J=254 THEN GOTO 500
290 GOTO 200
295 REM LEFT
300 H=H+10:HEAD=H
310 IF PEEK($C2A0)=247 THEN GOTO 300
320 GOTO 200
390 REM RIGHT
400 H=H-10:HEAD=H
410 IF PEEK($C2A0)=239 THEN GOTO 400
420 GOTO 200
490 REM FIRE BUTTON
500 H=0:HEAD=0
510 GOTO 200
600 END
```

FROM THE LIBRARY

by Stan Spielbusch, Librarian

HERO 1----

The demo program above, by Richie Dean, has been put in the library. Thanks, Richie!

HERO 2000---

Helloooooo..... Anybody out theeeeeerrrrrrre???????

.....
If you have a program to submit, put it on an MS-DOS format disk (double sided, double-density standard format) and bring it to the meeting or send to:

Stan Spielbusch
2404 Via Barcelona
Carrollton, TX 75006

***** Please ***** include a description of the program, either as comments in the program or as a separate .DOC file. I don't have the time to study each program to figure out what it does!

When you submit a disk, you receive credit for 1 disk in return. Let us know which one(s) you want, or if you just want your original disk back.

We currently have 2 disks in the library -- a combination HERO-1 and HERO-2000 disk (all programs in BASIC, text format), and a HERO-1 Assembler disk (see October '87 issue for details).

If you want a copy of a disk, the best way is to bring a blank, formatted PC-DOS/MS-DOS disk to the meeting and trade with me there. If you forget to bring a disk, we will have to collect \$2.00 per disk. Mail-order -- \$3.00 per disk -- no need to include a disk with order. Send orders to me (address above).