THE ROBOT COMPANION

the newsletter of the
Dallas Personal Robotics Group

June, 1988

!!!!! BBS !!!!!

The club now has its own Bulletin Board System! Thanks to David Ratcliff, who is dedicating his computer to the task, all members can now upload/download programs and other files, upload newsletter articles, and trade messages with other users! Please try it at least once to see what things are going on. DPRG members have downloading privileges, but anyone can call in and use the message system. Hopefully we can get a lot of input from non-members as well. If any of you know of another robotics group or robotics BBS, be sure to let us know so we can communicate with them, and let them know about us! The number is (214) 231-2836. It runs at 300/1200/2400 baud. Let us know what you think!

DPRG Members: You are already signed up on the BBS. Log on with your first and last name as they appear on the mailing label. Your password is your zip-code (5 digits). Once you log on, I suggest that you change your password, to make the BBS more secure. To change your password, use the C)hange Setup option from the main menu.

MAY MEETING MINUTES

MAY 14, 1988 2:00 p.m.

The newsletter was amended to the effect that the club may, at the option of the officers, send complimentary newsletters to parties who could be influential in the field of personal robotics.

It was decided to continue looking for a suitable location for the user's labs, but if no alternative is found, we will take advantage of Hockaday School's offer of the ceramics building.

The Homebrew SIG was re-organized as the Hardware SIG (see notice below).

JUNE MEETING AGENDA

The next meeting will be held at 2:00 P.M., June 11th at the Infomart in Dallas.

The main activity will be going over the list of proposed projects, prioritizing them, and assigning them to specific volunteers. If you have any project ideas, this is the time to voice them!

We will show some of the demos that we do for the DALTRUG meeting.

Bud Collins will show pictures from the robot birthday party.

PRESIDENT'S CORNER

by Bev Bryant, President

The Users' Lab just broke up and we had a blast! We had good attendance, interesting questions, even more interesting answers and great demos!

Ed Rivers demoed his program for the Daltrug meeting on his HERO I. This program, which includes 16 different short demo routines, is going to be useful for more than just the Daltrug meeting though. It will come in very handy for demoing the HERO I anywhere, anytime (particularly in the Infomart lobby).

Stan Spielbusch demoed his program in which the robot detects an object in front of him and picks it up. This would probably be most effective if we allow a non-club member to place the object to prove that placement was more or less random.

Robert Roe brought his HERO 2000. He was having problems getting his robot to communicate with his terminal. We think he is on his way now.

Much discussion took place on the advantages of the disk drive versus the advantages of the remote control. At this point, I think the jury is still out until more information is received.

The most exciting point of the Users' Lab for me was getting into the new bulletin board set up for us by David Ratcliff. This is going to be a real boon the club. David and Stan showed me how to get into the BBS, download a file, register into the BBS and move around to the different areas. Everyone needs to get into this BBS and see for themselves how easy, accessible and advantageous this asset is! After Stan got my modem working (with a simple gender adapter), getting into the BBS was a breeze! We will be using the BBS to communicate between members, broadcast messages to the entire membership, submit articles to the editor for the newsletter and store and transfer club programs. The number is 231-2836. Call NOW!

The Daltrug demo is June 11 and we need help. Stan is planning to show his pickup routine. Walter and I will probably demo the HERO 2000 singing 'Daisy'. Ed will run his demo program with 16 different functions. Brian will try to bring his homebrew. We need demos and people to run them.

Date: June 11. Place: Infomart. Time: **11 AM.** Be there!

I continued discussions with Robert Roe about having our Users' Labs at Hockaday. Robert will be out of town for most of the summer but he feels there would be no problem with having our Labs at the high school where he teaches. A new Science Building (scheduled for occupation in the Fall) would be available for our use starting in September/October. The facility is ramp access with 18-foot wide halls and we would probably have access to a classroom. We'll discuss it at the meeting and decide then.

HERO 2000 NEWS

by Stan Spielbusch, Editor
(since **Walter** didn't produce this month)

I finished my 2000! His name is Herbie, and he was born on May 20th. For those of you contemplating building one, it took me 35 hours to complete the main robot with a disk drive, 12 hours for the arm, and 8 hours for the remote console (all times include tests and adjustments). Please note that this is basically the second '2000 I've built, and I've had other building experience as well, so for a first-time builder plan on spending about 50% to 100% more time than that (it's more important to be careful than fast!).

Once again, I'm soliciting ideas for "operating system" modifications for the '2000. I would also be interested in finding out where to get the original source code! Leave any suggestions you have in a note to me on the BBS!

Apologies: I had previously mentioned that with the disk drive (running a program in the DOS BASIC), the '2000 will not be able to go to sleep and wake up again to continue the program. This is not the case (I misunderstood Brian's comment). Using the BASIC SLEEP command is no problem -- however, the problem is that if you use the RESET/WAKE key on the keypad to wake the robot up, it is no longer in DOS, and the disk drive must be re-booted.

HACKERS AND HOMEBREWERS

Announcement: As decided at the May meeting, the "Homebrew" SIG has been renamed to the "Hardware" SIG. The Homebrew SIG members seemed to all have different goals, so it was decided that a single club project would not be advantageous to anyone. Therefore, we have re-focused our efforts. The Hardware SIG will be involved in any hardware-oriented projects, at the moment focusing on the HERO 2000 and HERO 1 modifications, such as the ones suggested by Brian Vaceluke in the last newsletter. In addition, the Hardware SIG will provide support for any homebrewers, including parts sources, suggestions, and technical assistance. (See the Hardware area of the BBS for a current parts source listing) This will allow each homebrewer to pursue his own goals, and still benefit from the group.

PARTS SOURCES

I have recently visited Tanner Electronics (Dallas, TX), and was pleasantly surprised by their new store. They have moved to I-35 and Belt Line Rd. (in Carrollton), on the southwest corner. Their new location is much larger, and they have a much more professional look. The store is very similar in design to Off the Shelf Components, but their prices rival mail-order. They still carry a large selection of surplus items, mostly new, still-in-the-box items, often with documentation. For instance, they have a variety of stepper motors, from $1.95 to $3.95 each. They have some large EPSON LCD displays (80 by 24), with documentation, for $19.95. They have a huge selection of discrete components, IC's, transistors, relays, etc., all at very reasonable prices. I highly recommend their store, and if you haven't been to the new location, do it!

While at the new store, pick up a copy of Nuts & Volts Magazine. It's a national "traders" magazine, full of classified ads and mail-order house ads ranging from ham radio to computers. I found some good surplus deals in it. You can write for a free sample issue: Nuts & Volts Magazine, P.O. Box 1111, Placentia, CA 92670.

CORRECTION!

The joy-stick interface in last month's newsletter had a bug --
Pin 6 should go to DIO, and Pin 8 should go to GND.
Thanks, Richie for pointing this out.

Here's a letter from Richie to the HERO 1 SIG leader (Greg Oliver), and Greg's response:

Dear Greg,

I am a proud owner of a Hero 1, and I am full of questions about (ask Stan S.). Anyway he told me you could probably help me more with my Hero Problems.

1. First of all, I can't use the input statement in basic, why?
2. Is there any way to check Hero's keypad to see if a key is being pushed and if not, continue with the program or demo.
3. How is the closed loop thing for Hero's idle wheels coming along.

Well, I just got my voice synthesizer for the robot, so I hope to be submitting some more Hero programs to help the club in any way. I have been trying to recruit members in Florida. Well, that is it for this letter.

Thank you,
Richie Dean

Greg's Reply:

First of all, thanks for writing. I was beginning to wonder if we here around Dallas were the only ones still building the Hero 1. Adding the synthesizer will really improve your Hero. By the way, around here, we all have names for our 'Pets', mine is named 'Odie'. What's yours? Anyway, here I go with an attempt to answer your questions.

1. First of all, I will make the following assumptions.

You can enter a program, and run it. This tells me that your serial port is working, and you have the right parameters in your terminal/computer to 'talk' to the Hero. We (meaning Ed Rivers) have found that if we use the Tandy Model 100 portable, we get errors if we use the parameters (7 bit, no parity), but if we use 8 bit, no parity, we get some characters back from the robot in graphic mode. This makes for very hard to read code. I am working on my own Model 100 terminal program to overcome this problem. So, if the terminal/computer is not the problem, then perhaps you are trying to use the syntax common to Microsoft versions of BASIC, i.e.,

```
INPUT "STRING PROMPT";VARIABLE
```

Note the semi-colon between STRING PROMPT and VARIABLE. This should be a space in the Hero. Is that the answer? If not, perhaps you are assuming that you can input character strings. Remember that this version of BASIC is INTEGER ONLY BASIC! No strings, and no decimal numbers. Are you trying to input Y or N or something like that? If the above doesn't answer your question, send me a copy of the code, and I'll try it in Odie.

2. If you do not have a copy of Mark Robillard's book "Hero 1: Advanced Programming and

Interfacing", I suggest that you try to get one. In it, he give a lot more subroutine addresses than are listed in the Heath documentation. For example, on page 68, he explains about "INKEY", at location F788, which returns the keyboard status. Carry is set if a key is pressed, and the A register contains the value of the key. So much for machine code, how about BASIC? You will have to enter a machine language program and call it with a USER call. Here is an example:

```
STATUS  DEFB    0       ;STATUS BYTE
ENTER   CLR     STATUS  ;SET STATUS TO ZERO
        JSR     INKEY   ;CHECK FOR KEYPRESS
        BCC     EXIT    ;NO KEY PRESSED
        STAA    STATUS  ;SAVE KEY VALUE AT LOCATION 'STATUS'
EXIT    RTS             ;RETURN TO BASIC
```

Assemble this, to some location, say 0100H. Now in BASIC you would have to code your program like this:

```
10 POKE $3F,$01
20 POKE $40,$01
30 A=PEEK($0100)
40 IF A = 0 THEN 30
50 IF A > 9 THEN 30
60 ON A GOSUB 100, 200, 300, 400, 500, 600, 700, 800, 900
70 GOTO 30
100 PRINT "KEY PRESSED WAS 1"
110 RETURN
200 PRINT "KEY PRESSED WAS 2"
210 RETURN
... you can figure the rest, I'm sure. This checks
    for every keypressed, and ignores zero and keys over '9'.
```

3. As for the closed loop thing, as far as I know, that was just a suggestion that Stan made. I don't know of anyone is actually working on it. (How about it, guys?) Such a project is far beyond MY capabilities. I just about know which end of a solder gun is the handle. Well, enough so that I can build a kit.

That's about it for this month. Let me hear from the rest of you out there, PLEASE!

INDUSTRY NEWS

by Stan Spielbusch

TWO-LEGGED WALKER

Neldon Wagner, now working with the University of Portland's Applied Research Center, has single-handedly designed a two-legged walking (or more correctly, balancing) machine. I-Lean, which stands about 4 feet tall and weighs only 16 pounds, can balance "her"self by detecting inertial changes and correcting for them. She uses hand-made hydraulics for muscles, and has an off-board 68000 controller for a brain. The next "step" is to combine individual "controlled falls" into a steady walking movement. In the process of development, it was necessary to invent an easier way to invert an 8 x 8 matrix in software. Wagner's new method, which allows such computations for joint angles to take place in real time, is being patented. He is just now reaching the resource limit of a single 68000 processor, and will soon be transferring to a multiple-processor system.

(Original article in May, 30 issue of Electronic Engineering Times)

FROM THE LIBRARY

by Stan Spielbusch, Librarian

ALL LIBRARY PROGRAMS NOW AVAILABLE ON THE BBS!

The HERO 1/HERO 2000 BASIC disk has been split up into 2 disks (HERO 1 on one disk, HERO 2000 on another). This is in anticipation of much new software coming our way, as well as in keeping with two separate file areas on the BBS! Watch the BBS for the latest programs and updates.

HERO 1----

Ed Rivers has submitted a program that he wrote for use at the Infomart demonstrations -- IMART.SRC (.OBJ and .LST also included). It is particularly useful for the booth in the lobby. You can give the robot simple commands from the radio remote, such as turn 180 degrees, say "hi little boy", go straight, wave goodbye, or enter a movement-seeking mode. Using this in conjunction with the remote's standard movement capability, the robot can appear very smart (well, to little kids, at least). The program is written in assembler, and is now on the HERO 1 Assembler disk (and on the BBS!).

HERO 2000---

I have added three programs to the library that were adapted from the HEATH Intelligent Machines series educational program:

MORSCODE.H2 -- Listens and decodes "whistled" morse code. Includes the alphabet and digits. Some work could be done on this to include word and sentence breaks. Also, it would be easy to reverse the process (robot speak morse code), since the code database is already in it.

PICKUP.H2 -- Simple demo in which the robot detects an object in front of it, picks it up, and hands it to you. Nice example of the math required to get the arm to do a simple task like that.

WRITER.H2 -- The robot writes a word on a piece of paper on the floor. It will write a word up to 4 letters long on an 8-1/2" by 11" sheet of paper. Some work needs to be done to improve this program, because it has trouble keeping steady contact with the paper. The program requires a special spring-loaded case for a felt-tip marker, and a gripper attachment to hold the marker firmly.

I have also added two other programs:

PSYCHO.H2 -- This is the well-known ELIZA program adapted for the HERO 2000. You type your question, and it speaks the response. I have also speeded up the algorithm quite a bit -- the original version was irritatingly slow. If anyone has some time to twiddle with it, I think it could be made much more appealing. The list of key words and responses is fairly limited right now. A lot more could be added. I have enhanced a version on another system (a Tandy pocket computer), but have no way to transfer it except re-typing. Some day, maybe. As it stands, this is a good party/kid/old folk pleaser.

BLOCKS.H2 -- If you have heard of the BLOCKWORLD program, you'll know what this is. After the robot sets up its "block world", using 1.25" blocks that you hand to him, you instruct him to place one particular block on top of another. He will know if he has to clear off one or both of the blocks before doing it, and will give appropriate comments as he performs the operations. A very impressive demo, using the arm, voice, and "real objects". The number of blocks, size of the blocks, and number of "stacks" is variable Documentation is included in the file BLOCKS.H2D.

I will soon be submitting an extension of this program, which uses alphabet blocks to spell out messages, including turning the block so that the proper side faces out (uses all 6 sides of the blocks). I have the program working, but need to clean up the movements a little and write some documentation.

.....

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

OR, PREFERABLY, UPLOAD IT TO THE BBS!

****** 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 3 disks in the library -- a HERO-1 BASIC disk, a HERO-2000 BASIC disk, and a HERO-1 Assembler disk.

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. Or, you can download the programs you want, or the entire library, from the BBS. 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 Stan (address above).

--------- Last minute addition -- A note from Bud Collins: ----------

I want to thank all of you who attended the Robot Fourth Birthday Blast. I am bringing pictures for the club to the next meeting (Second Saturday). This is my first time using the robot bulletin board, so I hope this gets thru alright.

I have completed CAM training, so I will be able to show you how to take an ACAD drawing to a wax modeling machine. We will need to schedule some time during the week.

Bud Collins -- Heath Zenith @ Infomart 214-746-5315

CLUB INFORMATION

The Dallas Personal Robotics Group is a non-profit organization of individuals interested in learning about personal robots, sharing ideas, working on projects, and informing the public about the world of personal robotics. We are open to anyone who has an interest in personal robotics, whether or not they currently have a robot, and whether or not they have any knowledge of robotics.

Meetings are now held at the Infomart in Dallas, at 2:00 P.M. on the Saturday of their choice (see schedule below).

To become a member and receive the newsletter, have access to our program library, and be involved in our monthly clubs and user's labs, simply fill out the form below, and send it with $10.00 to the Walter Bryant, Treasurer (address below). For more information about the club, write to Bev Bryant, club president (address below, same as Walter's).

If you are interested, but not sure you want to be a member, feel free to visit our meetings. If you like, we can send you a sample issue of the newsletter. And please feel free to call our robotics BBS (number below).

Tentative Meeting Schedule (1988):

Jun 11 July 9 Aug 13 Sep 10 Oct 15 Nov 19 Dec 17

Club officers:

President:	Bev Bryant	Vice-president:	Ed Rivers
Treasurer:	Walter Bryant	Secretary:	Brian Vaceluke

Back Issues

A complete set of back issues, from the formation of the club in 1984 to the present, is available for $3.00. Add $2.00 postage & handling if ordering by mail. Contact Stan Spielbusch, Editor, 2404 Via Barcelona, Carrollton, TX 75006.

BBS NUMBER: (214) 231-2836 300/1200/2400 baud.

M E M B E R S H I P A P P L I C A T I O N

Dallas Personal Robotics Group
c/o Walter Bryant, 814 Mockingbird Circle, Lewisville, TX 75067

NAME (please print)_____

ADDRESS_____

CITY_____STATE_____ZIP_____

HOME PHONE (_____) _____-_____ WORK PHONE (_____) _____-_____

TYPE OF ROBOT (if any)_____

TYPE OF COMPUTER (if any)_____ MODEM? _____BAUD