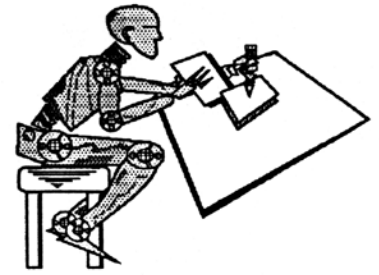


DPRG

DALLAS
PERSONAL
ROBOTICS
GROUP



March 1993

A Newsletter for Personal Robot Enthusiasts

February Meeting Highlights

The February DPRG meeting was, without a doubt, one of the best the club has ever had. Over 20 people attended to enjoy numerous robot demonstrations and talk technical for the afternoon. Some were informed of the meeting by the INTEROCITOR bulletin board.

Several mouths were seen hanging wide open as Bud Litman showed off his 3-wheeled mobile robot called 'Luther'. Controlled by a 68HC16 microcontroller and powered by a stack of rechargeable batteries, Luther roamed the floor looking for innocent victims to talk to, without placing tire tracks on their shoes. Bud also showed off his 'wall-tracking' software which uses the ultrasonic transducer to drive parallel to a wall. Although the system needs some tweaking, Luther did walk next to the wall, and damage to the meeting room was kept below the \$1000 limit. Just kidding Bud, thanks for a great demo.

Dutch Uselton brought his wheel-chair based robot which has an onboard IBM style computer and a CRT. His system includes dual-wheel motor drive and an ultrasonic ranging system. Dutch has also built an optical encoder feedback system consisting of two perforated wheels which interrupt optical sensors. The signals from the sensors are used by the guidance software to keep the robot on track. Thanks Dutch!

Roger Arrick brought a his 6-wheeled 'DBOT' along with a box of goodies including a compass sensor and some linear stepper motors.

Erick Wagner brought a box full of electronic stuff and gave it to anyone interested. A bag full of solid state relays was among the 'stuff'. Thanks Erick.

GREAT MEETING!

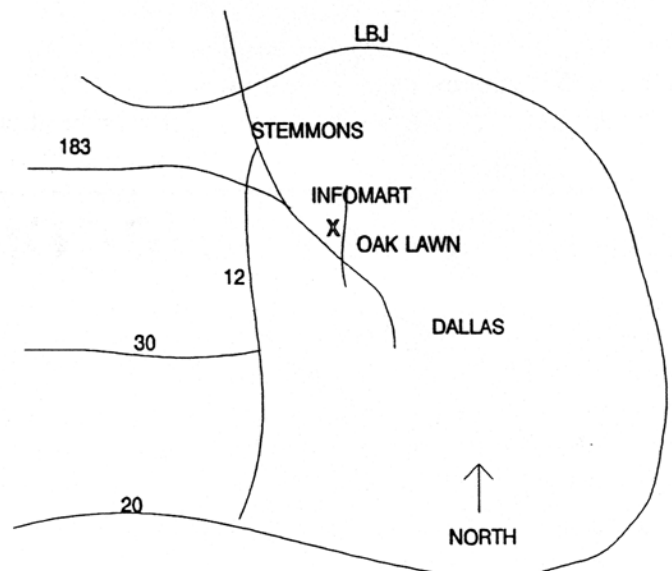
March Meeting Events

The March meeting will be on Saturday the 20th, 1:30pm at the INFOMART. Show up and bring your robot, robotic components or just your curiosity! Don't forget to see the vendor area on the lower level, excellent computer hardware and software bargains await you! The April meeting will be on the 24th, mark your calendar.

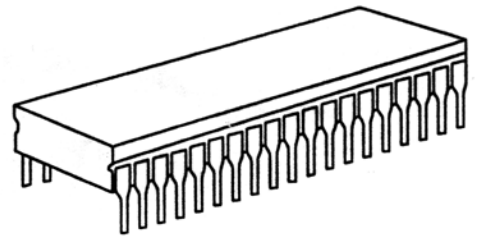
The following will almost surly be at the March meeting -

ROBOTS
MICROCONTROLLERS
BOOKS
SENSORS
MOTORS
IC'S
SOFTWARE

If you want to see this and more, show up!



Motor Drive Chips

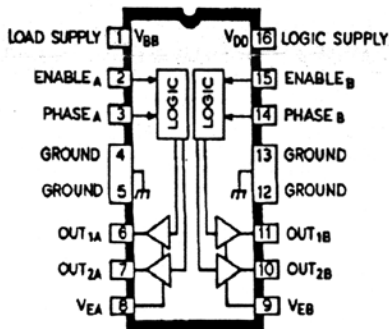


Bud Litman's demonstration at the February DPRG meeting included some interesting information about the motor drive chips offered by Allegro MicroSystems (Formerly Sprague Semiconductor).

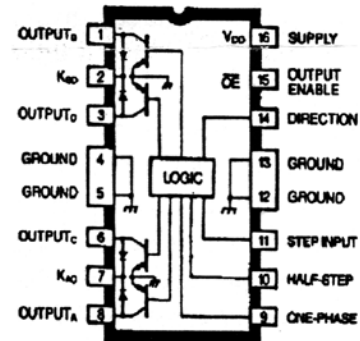
One of the chips, the UDN2993B Dual 'H' bridge driver, is excellent for driving 4-wire stepper motors which cannot be driven with the typical 'sink only' drivers. This chip will accept TTL inputs from a microprocessor in the form of phase control signals and can deliver 500 milliamps. Full step & half step modes can be implemented. The chip also has internal flyback diodes eliminating the need for external discrete components. Simply connect the 2993 directly to a 4, 6 or 8 wire stepper motor, to the logic supply source, motor supply source, and connect the phase inputs to your microprocessor. A subroutine can be written to output the correct phase patterns to the motor. This pattern, and the sequence in which it is sent, determines the motor's step angle and direction. The time delay between changing phase patterns will determine the motor's speed.

The other chip is the UCN5804B Unipolar driver with an on-chip translator circuit. The 5804 can drive any 5, 6 or 8 wire stepper motor up to 1.5 amps per phase. The translator eliminates the need for the controller to send phase patterns. Instead, the chip accepts 'STEP' and 'DIRECTION' signals which makes programming easy. Full and half step modes are selected via 2 additional input pins. To have complete control of the motor, 4 TTL digital outputs will be needed. In most applications, the step type will not change, in this case only 2 outputs are needed. Like the 2993, the 5804 also has internal flyback diodes making circuit construction easy.

UDN2993B



UCN5804B

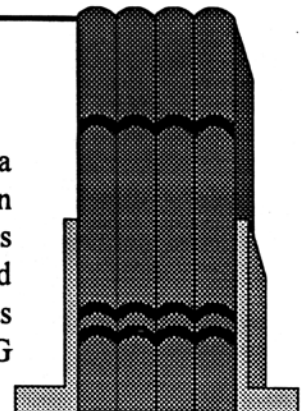


Where to get-um

The Allegro chips are available through distributors. Sterling Electronics in the Dallas area carries the line along with a \$25 minimum order. Their number is (214) 243-1600. You can reach the factory at (508) 853-5000. Both chips cost only a few bucks each. A data book will be available at the next DPRG meeting.

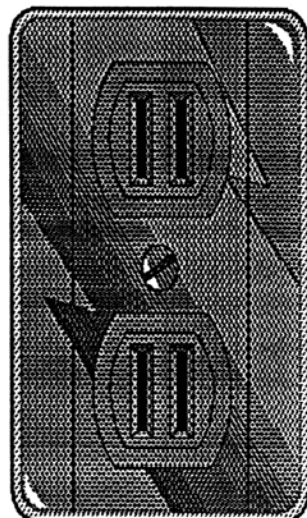
Book Review 'ANDROID DESIGN'

If you've been reading books covering robotics and related subjects, you may have seen a book by Martin Bradley Weinstein called 'ANDROID DESIGN'. This book was printed in 1989 by Hayden and holds a wealth of practical information for the robot builder. This is one of the few books you'll find that actually includes vendor names, phone numbers and part numbers. Unlike other books, the schematics and diagrams look as if someone has actually built this stuff! What a concept! A copy will be available at the March DPRG meeting.

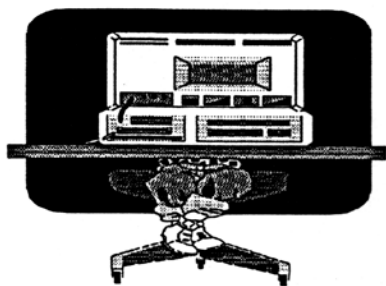


Use Proper Wire Sizes or Fry

How many times have you powered-up a newly built circuit only to find out that the wire you used acts exactly like a toaster element and that the heat generated by passing 10 amps through wire-wrap wire is sufficient to cook a package of frozen chicken breasts? Well, your not alone. Use the chart below to pick the wire sizes for your circuits and wiring harness. This information is especially useful when wiring high-current drive motors and battery packs for you mobile robot.



WIRE	DC CURRENT	WIRE	DC CURRENT
14 AWG	16 AMPS	24 AWG	3.4 AMPS
16 AWG	12 AMPS	26 AWG	2.6 AMPS
18 AWG	8.5 AMPS	28 AWG	1.9 AMPS
20 AWG	6.4 AMPS	30 AWG	1.3 AMPS
22 AWG	4.6 AMPS	32 AWG	NEVER MIND



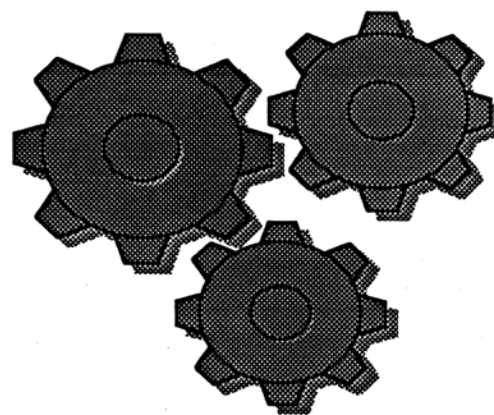
Robotics & AI Bulletin Board

The DPRG has linked up with Steve Rainwater who runs the largest robotics & AI related BBS in the country called the 'INTEROCITOR'. Steve came to the February meeting and encouraged members to use the system to send mail, share files and to enjoy conversation with others. The BBS is connected to other systems around the world and should be a great source of information. Areas on the system

include robotics, artificial intelligence, speech recognition, vision, natural language processing, neural networks and expert systems. DPRG meetings and other events are also posted. The phone number is (214) 258-1832. Use the normal N-8-1 parameters when calling and don't forget to leave Steve a thank-you message.

Parts Source of the Month

This month we'll take a look at the latest catalog from DC ELECTRONICS. The robotics experimenter will find common electronic components such as resistors, transformers and switches, in addition to some harder to find items such as specialized linear IC's. Several kits are available including an FM transmitter, an infrared remote control system and even a small robot arm made with plastic and small motors. A pretty good selection of MOSFET's such as the IRF530 are available which are perfect for DC and stepper motor drive circuits (look for a future article in this newsletter describing how to use MOSFET's). There are several printed circuit board etching kits offered in this catalog. The newest method consists of a special sheet which can be printed with a laser printer, applied to a copper clad board, then etched. A tin plating kit is also available to enhance the solderability of your new PC board. The last few pages of the catalog covers technical books and includes one of the greatest resources for the homebrew robotics builder: 'ROBOT BUILDER'S BONANZA' by Gordon McComb. This book contains tons of good information, GET IT! The fine people at DC Electronics have provided us with a whole box of their catalogs. Come to the March meeting and get yours or give them a call at (602) 945-7736.

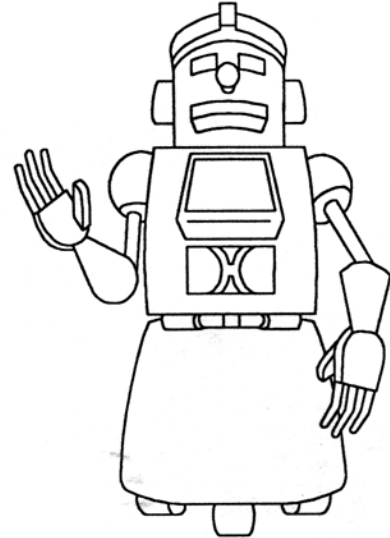


March Meeting:

Saturday the 20th, 1:30 PM
At the Dallas INFOMART

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- Robotics & AI Bulletin Board
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