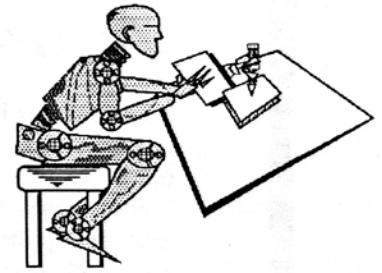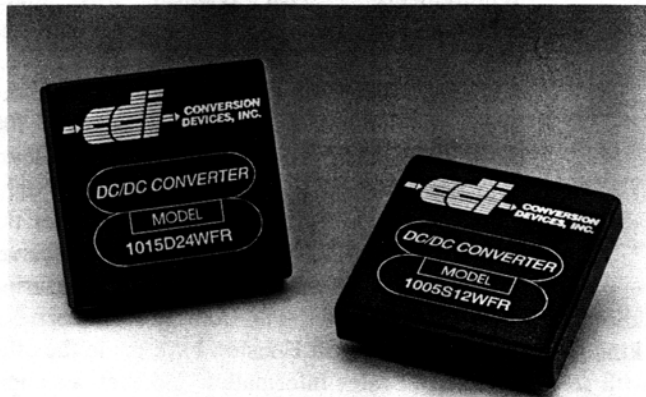# DPRG

DALLAS PERSONAL ROBOTICS GROUP

November 1993   A Newsletter for Personal Robot Enthusiasts

Conversion Devices, Inc. Donates DC-DC Converters

As every home-brew robot builder knows, the power supply system must be solid. It's often the first thing designed and built. Battery power is precious, so it must also be as efficient as possible. In recent years, many builders have resorted to switching power supplies to increase the efficiency and reduce heat. Many simply gave up trying to build these circuits due to their complexity and need for unusual components such hand-wound coils. Another option is becoming affordable - DC to DC converters. These little modules house a complete regulator circuit capable of accepting unregulated DC (Battery) and provide regulated voltage perfect for running small computers. As power consumption on PC components continues to drop, these converters are becoming more and more enticing. One company leading in this market is Conversion Devices Inc. in Brockton, MA. They manufacture a huge variety of DC-DC power converters with a wide range of input voltages and output voltages - some having an efficiency greater than 80%! Their latest catalog contains almost 130 pages of converters along with a **GREAT** technical section covering theory of operation, applications and even a glossary of terms. This catalog could almost double as a text book! Not only are these folks good at making converters, apparently they are nice people too. After considering the needs of the DPRG, Harlan Batchelder at CDI kindly donated over $1,000 worth of converters for our use! These units output 5V or 12V. Pick up your CDI catalog and converter at the November meeting. **Thanks CDI!**

Robot Contest November 20th

It's finally here! After several months of preparation, your ready, right? The DPRG robot contest will take place at the Dallas infomart. If you have a creation that may complete the course, bring it. There will be tons of robots, cameras and even some humans.

Robotics/AI BBS

(214) 258-1832

President's Note

Greetings fellow robot enthusiasts! Welcome to another issue of the DPRG newsletter. The November contest is upon us! Over the past few months we've seen some amazing designs being tested, even a vision-navigated robot built by Susan and Kino. We're expecting several participants and no two are the same. Bring your camera if you can.

We'll also be demonstrating the wireless data link from Comrad. This little unit is perfect for remote control of your creation. The range is 200 feet indoors and baud rates of 38.4 are possible. It's much more affordable than other units currently on the market. The manufacture has made a special discount available to DPRG members too - about $300 for a complete set.

I'll be showing the DC-DC converters from CDI at the meeting and will be giving out their catalogs. If your a DPRG member, your eligible to receive one of these units at no-charge. If you're not a member, I wish you were.

We still have a truck-load of Intel and Motorola microprocessor data books to give away.

The November meeting should be a great one. Don't let the weather stop you! See you there.

Roger Arrick

Affordable Wireless Data Link

Robot builders have always had a need for a wireless data link to control their creations. Many have tried the relatively simple infra-red circuits but quickly found the need was greater than this line-of-sight method could offer. RF receiver/transmitter systems must be the answer but are hard to build, expensive to buy and offer limited range. Several companies now make off-the-shelf RF data links that offer the perfect solution with one exception, price. Often, a setup can cost more than $1,000 - Yikes! Well, now theres a unit that breaks the price/performance barrier, the Comrad CCL901-DP. This package comes complete with two Comrad CCL901 transceiver units, two power adapters, two serial cables and a manual. Also included in the package is Host/Remote software for use with IBM style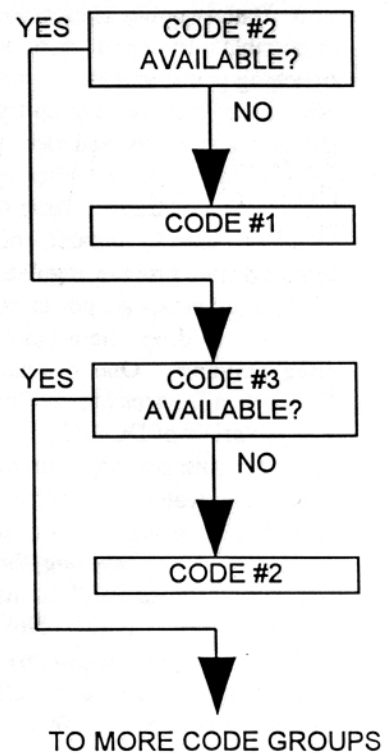 personal computers. This software is a much more important feature now than it would have been a few years ago when PC's were to expensive to put on mobile robots. But now for under a few hundred dollars a builder can create a system with normal PC components with power to spare. These components now have very low power requirements. That coupled with high-efficiency power supplies and your in business. Now, back to the Comrad. These units run on 9V and simply act as an RS232 link to the remote equipment. Speeds from 1,200 to 38,400 baud are possible at distances of 200 feet indoors and one-third of a mile outside! The units operate at 902-928 MHZ which eliminates the need for an FCC license. Each transceiver comes housed in a small plastic box measuring 3.75" x 6.26" x 1.38" and weighs about a pound. A removable, 4.25", rubber antenna is provided too. The Comrad setup carries a list price of $429.95 which is hundreds less than most other units. The kind folks at Flanders Sales in Houston have made the offer to sell to club members at a discount. They have provided the DPRG with several packets of sales information and even a sample package. Contact Roger Arrick for this information or come to the November meeting at Infomart to see the units in action. You may also contact Flanders Sales Inc. at 1160 Dairy Ashford, Suite 609, Houston, TX 77079 (713) 589-6829 - Bob Conroy.

# Salvage OTP Microprocessors

By Roger Arrick

Many microprocessors such as 8051's and the new PIC's now come in OTP (One-Time-Programmable) versions. These units do not have the window package common to erasable ones which helps reduces costs. Engineers like them because they can be programmed in-house in low to medium quantities which allows software changes to occur quickly an eliminates the expense of factory programmed parts. Even though these parts cost less than their reprogrammable brothers, an engineer still grits his teeth when some must be discarded due to a software change. After all, it's a complete, working computer chip, only a few ones and zeros need to be changed inside to make it control the world. After thinking about this dilemma for about 12 seconds and realizing that most control programs don't even use half of the available ROM space, I came up with the following solution which can save many of these OTP's from the dump. Upon reset the processor simply executes a small chunk of code (sometimes only one instruction!) to test for another chunk of code beyond the first chunk, if it exists then it jumps there, where it executes the same check for more code, etc. If no code exists beyond the current program then the current program is executed as normal. This method works because most ROM space is initialized to all ones (FF hex). If a program is there, it won't be FF (unless of course there is a valid instruction that uses that code). The check routine simply looks at the first byte beyond the existing code, if it's not FF then it jumps to it. This allows the programmer to take programmed OTP microprocessors and add new code beyond the existing code and have it execute instead of the old code resulting in one-each salvaged microprocessor chip. Many times the code simply needs a new ORG statement to be relocated, other times may require a little more work. My guess is that this method works better than drilling a hole in the top of the chip and putting it in a UV eraser!

Flowchart:

YES ← CODE #2 AVAILABLE? → NO → CODE #1

↓

YES ← CODE #3 AVAILABLE? → NO → CODE #2

↓

TO MORE CODE GROUPS

Pictures Needed for Robot Book

John Gutmann has been building robots for years and is now writing a book entitled 'ROBOT HOBBY'. He has asked members of the DPRG to submit pictures for possible inclusion in his book. 35mm black and white prints are preferred but color is OK. The picture should include a robot and its builder. Submit photos to:

> John W. Gutmann
> Robot Hobby T.C.M.
> P.O. Box 2050
> Stn Mtn, GA 30086
> (404) 972-7082
> BBS: (404) 978-7300
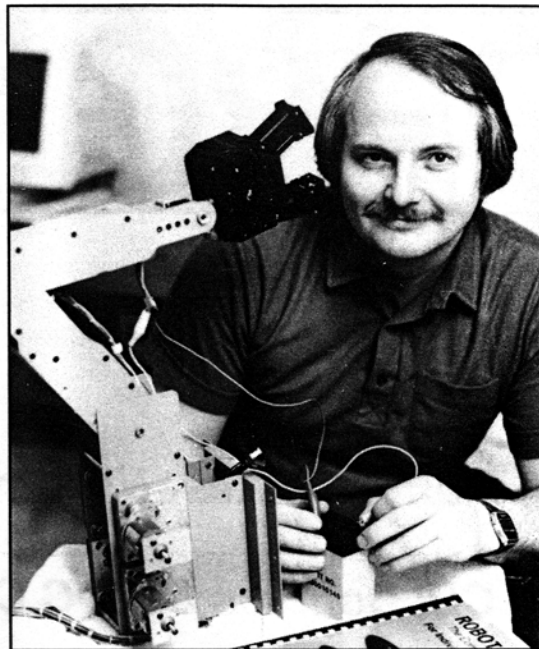
Hero 2000 Robot for Sale

The Hero 2000 is probably the most powerful personal robot ever manufactured commercially. There were several accessories available for the 2000 including an arm and a remote keyboard. Joe Rowe is interested in selling his 2000 complete with the arm, remote keyboard and charger cart. $1,000 or best offer. Contact Joe Rowe at (214) 690-1575.

Credit-Card-Size GPS Receiver

NavCore MicroTracker is a 5-channel, global positioning system (GPS) receiver packaged in a 2" x 2.8" x 0.53" module weighing only 2 oz. MicroTracker has the same interface, software and general performance features of NavCore V GPS receiver (EEPN, July '91, p. 7). Its time-to-first-fix is 20 to 30 seconds and it can dynamically track in foliage and urban environs and under severe
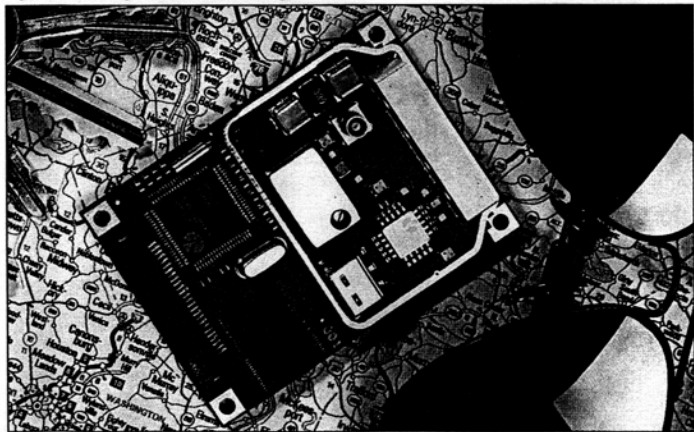
shock and vibration conditions. Further, new power management circuitry reduces the receiver's average power dissipation to 670 mW. And a differential GPS option can improve accuracy from 100 meters to 5 meters 95% of the time. MicroTracker costs $480 each/200 and operates with inexpensive passive antenna. ROCKWELL INTERNATIONAL CORP., P.O. Box C, Newport Beach, CA 92658-8902. (800) 436-9988
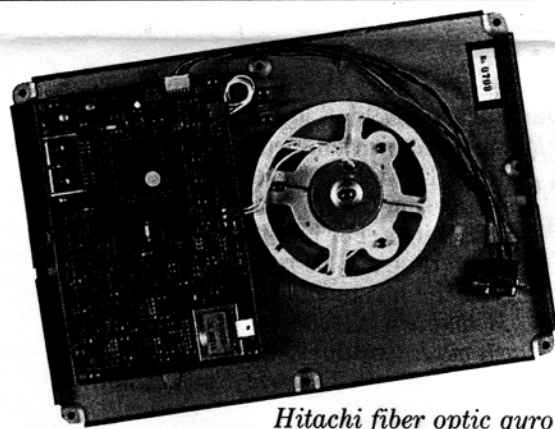
Hitachi fiber optic gyro

★ The **Hitachi Optical Fiber Gyro** is for automotive navigational systems. It detects vehicle rotations, and a one-chip microcomputer analyzes the data to provide the vehicle's azimuth.

The first commercially available automotive gyro based on fiber optics, it has already been installed as the azimuth sensor of certain Toyota vehicles.

The gyro improves on existing automotive navigation systems through its polarization-maintaining fibers, which result in fine resolution, low drift, and high accuracy.

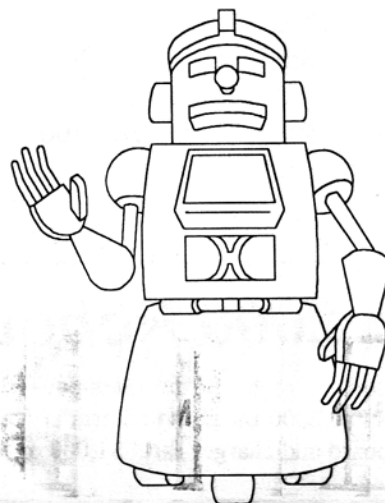*Hitachi Ltd.* and *Hitachi Cable Ltd.*, Tokyo, Japan. Hiroshi Kajioka, Shigeru Oho, and Toshio Katsuyama.

DPRG

DALLAS PERSONAL ROBOTICS GROUP

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

Inside -

- **Robot Contest November 20th**

- **CDI Donates DC-DC Converters**

- **Credit Card Size GPS Receiver**

- **Salvage OTP Micro-Controllers**

FORT WORTH, TX
P M
NOV 15
1993
761

USA 29
HELP ... CHILDRE
I pledge
allegiance...