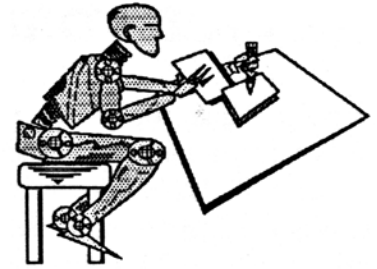# DPRG

April 1993   A Newsletter for Personal Robot Enthusiasts

March Meeting Highlights

If you missed the March DPRG meeting, well, too bad. Steve Rainwater gave an excellent demonstration of his BBS complete with 36" VGA monitor. The Interocitor BBS is now the official DPRG bulletin board and can be used by members to exchange ideas and software. 200 meg of AI and robotics related files are available for download. The number is (214) 258-1832.

Mitch brought and demonstrated his computer controlled robot arm. He connected a Radio Shack Armatron to his own Intel 8051 based single-board controller by chopping off the hand control cable and attaching its leads to a series of MOSFETs. The MOSFETs can be turned on with the digital I/O pins on the 8051. After conquering the hardware, Mitch wrote a program in C, compiled it creating an Intel hex file, then programmed the processor. All software development was handled on a PC. The crowd enjoyed the demo even though several members were wounded when the arm's battery was plugged in backwards. Good Job Mitch!

The DPRG's librarian Steve, brought (strangely enough) the DPRG library. This has become a major source of information for club members. If you have any books or software you would like to donate to the club, contact Steve Conrardy.

Roger did NOT bring his 6-wheeled 'DBOT' due to the lack of a forklift. Other goodies were brought but I don't remember what they were.

EXCELLENT MEETING!

April Meeting Events

The April meeting will be on Saturday the 24th, 1:30pm at the Dallas INFOMART. Several members are expected to bring their personal robots. Dutch is planing to bring his wheel-chair based robot which is controlled with a PC and has an ultrasonic ranger. Steve Rainwater will try to bring the beginnings of his new robotic creation based an a remote controlled car chassis. Steve will be using the platform to implement some AI software.

Attendees of the April meeting can pick up their FREE Motorola 68HC11 data book. First come, first served, of course.

APRIL IS CAMERA MONTH! Bring your project. Photos will be used for the newsletter.

So, show up and bring your robot or just your curiosity, and don't forget to see the vendor area on the lower level.

President's Note

Thanks for taking time out of your busy schedule to chill-out and read about something fun: Personal Robotics. If you've attended any DPRG meetings lately, you may have noticed that the crowd is growing. Over 30 people (not counting androids) where at the February meeting, one of the largest showings in years! If you've been receiving the newsletter but haven't attended the meetings, now's the time. With the number of robots in the club growing right along with the members, you're sure to find something or someone interesting. Don't forget Saturday the 24th at Infomart.

Roger Arrick

The Motorola 68HC11
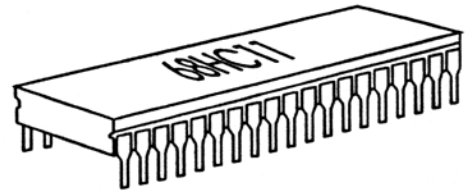
Anyone building robots or any other complicated piece of equipment probably uses a microcontroller chip of some kind or another. There are two main 'CAMPS' in the microcontroller world just like in the personal computer world - Intel and Motorola. Intel was the first to put a microcomputer, ROM, RAM and peripheral devices on a single chip and call it a microcontroller. This arrangement eliminated the normal multi-chip solutions and most of the glue logic necessary to create a programmable product. Motorola has caught and maybe even surpassed Intel with their 68HC11 series chips. They are very similar to the 6800 cpu chip but contain ROM, RAM, and peripherals all in one package. There are more than a dozen varieties, some contain UARTS, some A/D ports and some have watchdog timers. Want the details? Come to the April DPRG meeting and get a free HC11 data book containing all the specs you would ever want to know, hardware and software.
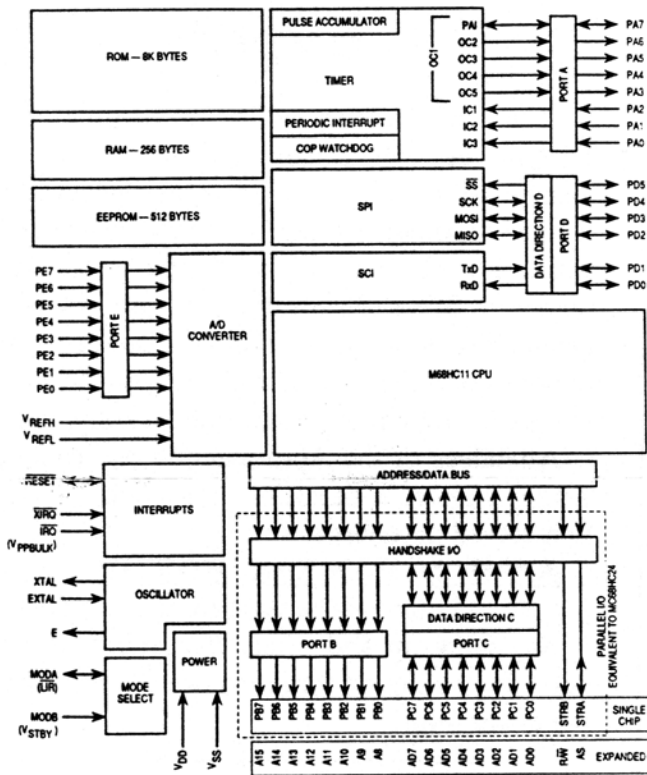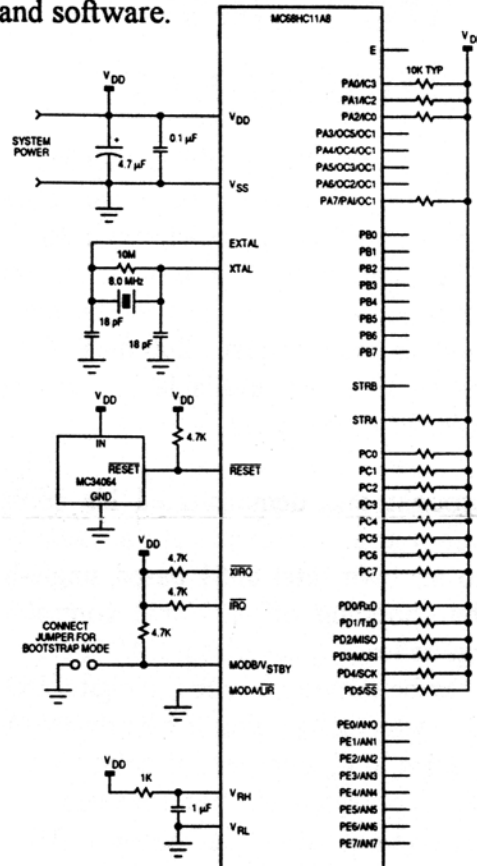
Figure 1-1. Block Diagram

Figure 2-22. Basic Single-Chip-Mode Connections

BBS Update   (214) 258-1832

If you're a frequent caller to the BBS, you may have noticed several interesting, new files. 'SONAR.ZIP' is a text file containing a wealth of technical information about the Polaroid ultrasonic transducer and driver board. Several issues are addressed which should help a homebrewer decide how to implement a ranging system. If you're doing ultrasonics, or plan to, download this! Another interesting file called 'SEQUENCE.ZIP' contains source code for driving stepper motors from a PC. The documentation is almost non-existent but some valuable information is in there somewhere. A file called 'ROBI_R1.ZIP' is a text file containing a proposed universal motor drive interface standard. Bob Namsel from Seattle has some very interesting ideas. If you're building a DC motor control, take a look at this one. You'll need the latest version of PKUNZIP to use these files - download it first. Many DPRG members, including the president, can be contacted through the BBS using E-Mail. Your comments and suggestions are appreciated.

8051 / Ultrasonic Code

You may think this space is too small to conquer a topic like this, but it's not. The code at the right can be used on any 8051 to read a distance from a Poloraid driver & sensor. The distance is returned in the A register in inches x 2. P3.6, 7 control the driver board. If you can't enter this much code, it will be out on CD soon.

```
;RETURN # INCHESx2 IN A. 0=BAD READING.
;12MHz crystal. P3.6=-INIT, P3.7=+ECHO.
RDU:    MOV     A,#0            ;Clear count.
        CLR     P3.6           ;Start ranging.
RDU1:   MOV     R1,#150        ;Delay 300us.
        DJNZ    R1,$           ;a 2 inch trip.
        INC     A              ;Increment count.
        CJNE    A,#180,RDU2    ;Maxed out?
        MOV     A,#0           ;0=bad reading.
        AJMP    RDU3           ;Done.
RDU2:   JNB     P3.7,RDU1      ;Loop if no echo.
RDU3:   SETB    P3.6           ;Stop ranging.
        RET                    ;done.
```

Clinton to Protect Personal Robots

Newly elected President Clinton has been feeling the pressure from personal robot builders around the nation recently due to an apparent omission of funds dedicated to underprivileged androids. The media was shocked when over 300,000 robot enthusiast marched on Washington last Thursday chanting "NO ROBOTS, NO PEACE!". Coky Robotson, reporter for USA Tomorrow, said "I've never seen so many pocket protectors in my life!" The protestors argue that robots must be protected against all possible hazards and that instituting a 'sen tax' against robots without sensors would be a reasonable way to fund an insurance program. Especially since robots without sensors have more accidents often knocking them senseless and causing repairs costing cents. An astonished public viewed the awesome sight on TV as anti-robot groups confronted the robot builders holding signs reading "GET A JOB" and "ROBOTS CAN'T CLIMB STAIRS". Several robots left the group in disgust when their builders started playing tetris on laptop computers. During the march, several protesters placed their robots on the President's new running track resulting in an oil slick over 200 yards long. A closer look revealed that the slick was contaminated with battery acid, bent coat hangers and even low-level nuclear waste! Leroy Geekton, President of "Computerized Robots Against Persecution" says "Robot builders are geared-up for a fight!". He says, without this program, robots without bumper switches would be hurt the most because damage can go undetected for years. Geekton and others claim the President promised their groups funding in a closed door meeting before the election. In a recent television interview, Clinton said "I didn't say that" and "If I did, I wouldn't say it again". At this point, the outcome is unsure, meanwhile the Industrial Robotics Union has threatened to strike to help their automated brothers, and programmable VCRs are considering a work stoppage (No loss, VCRs rarely let us program them anyway).

Join the Dallas Personal Robotics Group

The Dallas Personal Robotics Group (DPRG) is growing like wildfire! We would like to invite you to become an official member of the club.

AS A BONAFIDE MEMBER YOU WILL RECEIVE →

The annual membership fee is $20. If you're working with robots, sensors, microcontrollers, or AI software, your investment will payoff many times over. The funds will be used to pay for postage, printing, to promote the group, and will not be used to purchase limousines for the officers. Use the enclosed membership sheet.

- ◆ Newsletters containing:
  - Articles of interest to robot builders.
  - Schematics of useful circuits.
  - Source code to read sensors & drive motors.
  - Book reviews.
  - Software reviews.
  - Wit and humor.
- ◆ Access to the largest BBS of its kind on the planet.
- ◆ Access to a library of robot related books and mags.
- ◆ Meetings featuring:
  - Technical seminars.
  - Free data books.
  - Free catalogs.
  - Sometimes free parts.
- ◆ Networking with other robot builders.
- ◆ A warm gooey feeling.

DPRG
DALLAS PERSONAL ROBOTICS GROUP

April Meeting:
Saturday the 24th, 1:30 PM
At the Dallas INFOMART

Inside -

- **March meeting highlights**

- **Motorola's 68HC11 controller**

- **Clinton protects robots**

- **Much more . . .**
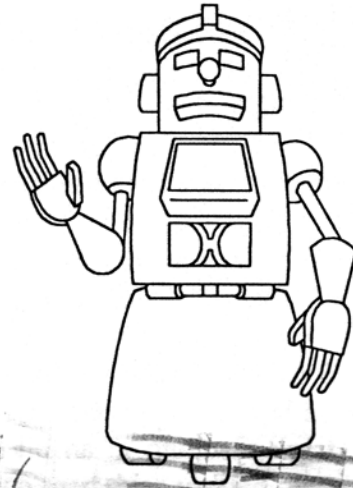
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