CLOAD
MAGAZINE
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SEPTEMBER 1978

Aftershocks...

Well, we rebounded from our little earthquake last month with no permanent damage. Our recorder came out O.K. after a session with the doctor. We've had two aftershocks of about force 3 on the Richter Scale (perceptible, but no damage) and are getting good at "leading" earthquakes. About two seconds before the shock, there is a funny ground movement that is not directly perceptible, but it "feels" like an earthquake is about to hit. Strange world we live in out here.

Renewals! Those of you who wished to renew their subscriptions at our old rate were probably dissappointed/angered/incensed at our not accepting them yet. The reason goes something like this: we started out with one year of full funding from a separate organization, whose purpose in life involves industrial devices and evil profits. Before the magazine could accept subscriptions beyond one year, it had to show it could be at least self-supporting, if not profitable. After six months of operation, enough data was obtained to show that (at our $36.00/year rate) the operation was stable enough financially to continue without need for rescue. At this point we are committed to continue the magazine indefinitely.

The next subject on the itinerary is piracy. Contrary to popular belief, piracy did not die out with square-rigged ships and muzzle-loading cannons. It is presently a profession in the software industry. Those people who market programs fall into two categories: those who write their own software, and those who don't. Those people who write their own deserve every encouragement - like f'rinstance money. Those who don't write their own software fall into two categories: those who pay the author, and those who don't. CLOAD Magazine is making a gallant try at the former, as is Radio Shack, various other (conventional) magazines, and a few organizations. On the horizon, however, if one spys carefully into the ocean of ads one can spy the familiar skull-and-crossbones of the latter category. They are evidenced by 1/8 page ads in popular journals, selling software with familiar titles and/or descriptions. Please do <u>not</u> purchase their products.

Yes, CLOAD Magazine is being pirated. Pending legal action forbids us to mention names of the parties involved, but I might be so crude as to point out that (possibly for the first time in computer history) the pirate versions of our individual programs are being marketed at a substantially higher price than the original. This is an honorable distinction, and we meet it with mixed emotions. In passing, we would like to mention some people who are <u>not</u> members of the parasitic profession, though it cannot be an exhaustive list. We've omitted such venerable institutions as Dr. Dobbs Journal and People's Computers on the grounds that no one could suspect such action from them anyway.

Byte Magazine - 70 Main Street, Peterborough, NH 03458
Cload House - P.O.Box 524, Mercer Island, WA 98040
Creative Computing Magazine - P.O.Box 789, Morristown, NJ 07960
Dump Magazine - no address on file
Kilobaud Magazine - Peterborough, NH 03458
Level I Magazine - P.O.Box 8316, Anaheim, CA 92802
Personal Computing - 1050 Commonwealth Avenue, Boston, MA 02215
Personal Software - P.O.Box 136, Cambridge, MA 02138

Small System Software - P.O.Box 483, Newbury Park, CA 91320
Tape Talk - P.O.Box 54014, San Jose, CA 95154
TRS-80 Computing - P.O.Box 158, San Luis Rey, CA 92068
TRS-80 Newsletter - 7554 Southgate Road, Fayetteville, NC 28304

We'd like to list all the numerous authors that have submitted work to us. We feel that in rating originality as our highest desired quality, we've done a fair job of winnowing out the true programmers from the Xerox machines. We'd also like to thank people like Mr. Charles W. Evans (who submitted Yield-to-Maturity last month) for the total unselfishness it takes to place code in the public domain.

'Nuf said. On to other things. After several months of interim hacking and coughing, we have a new editor, Dave Lagerquist. We expect that there will be a marked improvement in all aspects of our magazine. Or else...

Two bug corrections:
In the check stub program "Check" (April issue) Line 295 has the assignment T=T+1. This should read T=T+2.
In the Pinball program entitled "Pinball" Level II (August issue) delete Line 6050. Insert Line 6100 A$=INKEY$:IF A$=""THEN 6120 (note no space between quotes). Insert Line 6110 IF A$=" "THEN D=D+1 ELSE D=D-1. If you wish to re-record this corrected version, remember to put a piece of tape over the left hole in the back of the cassette (otherwise the "record" key on your recorder is disabled).

Announcement: A new publication has started up in Washington, DC. It's a monthly offering, specializing in machine language software (true grit...). Subscriptions are $4.50/6 issues starting with June 1978. Free sample for a stamped, self addressed envelope and info on what type of machine you have (4K Level I, 16K Level II, 16K Level II Disk, etc.).
insiders™ - 2617 42nd Street NW, #2, Washington, DC 20007

Announcement 2: Steve Heller of 12 Upland Avenue, Upland, PA 19015 is doing some work in cryptography. He has a program which encodes an input message by the Hellman-Diffie Algorythm (for those of you who are into CIA-type work - or maybe counter-CIA). Contact him for more info.

Announcement 3: If all user groups dedicated to TRS-80 computing would send us a 3 by 5 inch card with all pertinent information about the group, we'll compile and publish the list as a user service. Also, if anyone has a friend who has a TRS-80 (or is thinking about it...) send us his/her name and we'll send out a sample copy. This goes for Radio Shack stores as well. We won't be happy (or rich) until everyone subscribes.

We have fielded a request for a description of "Life". This is one of the first true computer games. The original author is John Conway of the University of Cambridge, Cambridge, England. Those interested are urged to read the article "Mathematical Games" in the October 1970 issue of Scientific American Magazine. Basically, the rules are as follows:

1. Every counter with 2 or 3 neighbors (horizontally, vertically or diagonally) lives till the next generation.
2. Every empty cell with exactly three neighboring counters gives birth to a new counter.
3. Every counter with 0, 1, 4, 5, 6, 7 or 8 neighbors dies, either from exposure of overcrowding.

The Basic language version of this game is a good example of how a lightning fast computer is sometimes too slow for comfort. There are traditionally three ways to

speed up a given software operation. One is to buy a bigger machine. IBM makes a lot of sales based on saving time. Another is to re-write the program, paying particular attention to techniques which lessen the computer's workload. The last is to re-write the program in machine language. Depending on the software tools involved, this is either the easiest or the hardest way to go. A machine language version of Life is on our list of things to do.

This month I'd like to talk about that section of the computer which we'd all like more of...memory.

Recall last month's talk where our Z-80 computer-on-a-chip is always interacting with memory. This month I'd like to break that memory block down into ROM, keyboard, screen and RAM. "ROM" stands for Read-Only-Memory. It's the kind of stuff that works like microfilm - you can read it, but if there's an incorrect byte of data in it, that's too bad. If it simply must be corrected, the chip has to be replaced with one that has the right information. These are custom chips that cost many coins to set up and manufacture. So much for their bad points. They have one good point. When the power is turned off, the contents of memory are unaffected. When power is turned back on, all the data is there. In the TRS-80, the first 4K of a Level I machine is ROM (Level II machines have the first 12K). This means that the data stored in memory from 0000 Hex to 0FFF Hex (0000 H to 2FFF H in Level II machines) is permanent. This is where a large, expensive, machine language program is stored. It's called the Basic Interpreter, and its purpose for existance is to translate a program written in the Basic language into a series of machine language commands that the Z-80 chip can handle. Because it's in ROM, it "stays there", and every time the TRS-80 is turned on, it's ready to speak in Basic. Larger computers almost invariably do not have this feature. They must load the language they are to use after power-up (called bootstrapping, or initial program load).

The next memory type on our list is the keyboard. It is an example of "memory mapped I/O" which is a fancy way of saying that the Z-80 chip thinks it's memory, but it's obviously a piece of hardware. When you depress a key, a pattern appears in several phantom memory locations. The Z-80 chip, in the course of its duties, occasionally stops by for a look at these locations. If there is any pattern other than the null pattern (that pattern corresponding to no key depressed) then it will decode it into a slightly modified form of ASCII. This piece of hardware is best utilized through the program provided in ROM, documented in the T-Bug Monitor.

The next piece of memory is the screen itself. The 1K block of memory from 3C00 H to 3FFF H is memory that can be written into and read out of. Its outstanding feature is that it is visible. The ASCII contents of memory can be seen just by looking at the screen. This is a powerful technique, and it allows the screen on the TRS-80 to do things that more expensive computer terminals find difficult, if not impossible.

The last piece of memory on our list is RAM. This stands for Random-Access-Memory. You can read from and write into any byte of your choice. When you have a 4K or 16K (or 32K for you high rollers) machine, this is the memory that is being referred to. It should be pointed out that all memory in the TRS-80 is random access memory (unless you count the tape cassettes, which isn't fair) and that which is referred to as RAM should be called RWM or Read-Write-Memory. For historic reasons (ROM didn't exist at the beginning) we call it RAM, and knowledge of this misnomer is the first obfuscatory step in the recognition of the Compleat Programmer. Really old geezers call it "core". They remember vacuum tubes, too.

Most of this memory is available to the programmer to put his/her Basic program into (called user space). Those who are using the T-Bug, or the Editor-Assembler, play around in this area in happy disregard that Basic ever existed. More next month.

Regis Milet

# C L O A D  I N F O  S H E E T

Level I 4K programs - side I  Level II 16K programs - side II

All Level I 4K programs will run on a Level I 16K machine.

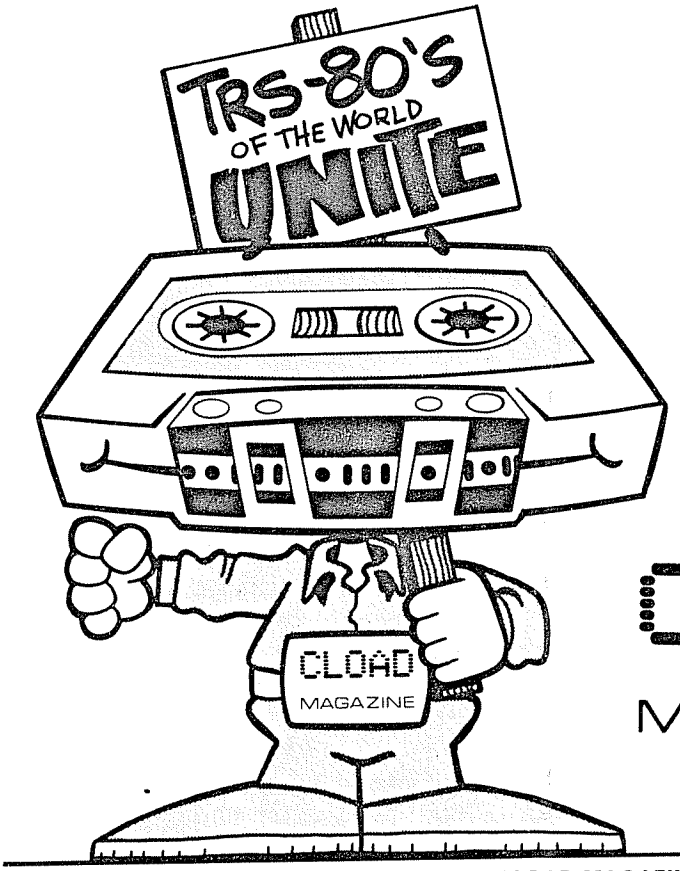
Some, but not all, Level II programs will run on a Level II 4K machine.

Subscriptions - $36.00/year (no tax).

Single issues $3.50 each, prepaid (please add 6% sales tax on orders from California). Level I issues available from March 1978. Tapes from June on have both Level I and Level II.

Playback level varies from machine to machine. Try around 7 or so and experiment. A small AM radio placed near the keyboard helps a great deal.

Numbers on the label are turns count. Rewind cassette completely, set counter to 000 and programs are easy to find.

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Box 1267
Goleta, CA 93017
(805) 964-2761
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