ROCKY MOUNTAIN 99'ers

TIC TALK

ELECTION OF OFFICERS

We will be electing new officers during the September meeting. Our group needs the involvement of more of our membership. In return for your participation you will be rewarded by meeting other members and learning more about how to better utilize your home computer. The nominations will be open for anyone to offer their participation to the group.

The strength of our group is dependent on everyone getting involved. You can start by offering your help on any of the committees(library, program, newsletter, special interest groups, etc.). More people helping will encourage the officers and chairmen to expand our group activities. Improving our library, better monthly meeting workshops, and a better newsletter will benefit everyone. It is always better to have more people doing a little than to expect the few to do everything - especially since we are all volunteers.

Be assured that the officers and chairmen will be happy to work with anyone who is willing to help out in any way. Why not take a chance and get involved? You will be the winner in the long run.

AUGUST MEETING

AUGUST 14

Jefferson County Fairgrounds

Auditorium 7:00 PM

6th Ave. West to Indiana Ave.

NORTH TO ALASKA

AUGUST 1984

| S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	(14)	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

TWIN DISK DRIVES:

by Ron Moore TIBUG

Some time ago, Greg Lane and I discussed the possibility of using two slim-line disk drives in place of the single, normal size drive in the Peripheral Expansion Box. There are a number of advantages with this concept as the drives used are double sided, not the normal *single* sided format, therefore giving twice the capacity per diskette, and if using two slim-line drives in the Peripheral Box - 4 times the capacity would be available. The TI Disk Controller Card is designed to access up to three disk drives.

A number of factors had to be taken into consideration during the feasibility study and they were:- physical compatability - would everything fit inside the Box; Electrical interfacing - between the Controller Card and drives; and power supply loadings. The last factor proved to be far more difficult than first imagined. It was most desirable to have the twin drives totally integrated within the Peripheral Box, with the twin drives using the internal regulated power supply, thus saving the need for having an external power supply to feed the second internal drive and the need for ANOTHER 3 pin mains plug. (That was one of the reasons for the Peripheral Box, wasn't it?)

Keep in mind that the internal regulated power supply feeds power to all the installed Peripheral Cards, as well as the disk drive and if any overloading damaged the power supply of the Box, it would almost certainly damage all the installed Cards as well. Now that could be expensive, so it was critical that the two new slim-line drives would have to have a combined power consumption of no more than the original disk drive. *Upon* detailed investigation, the original TI drive proved to have a surprisingly low power consumption and many of the slim-line and normal size disk drives available actually had higher consumption requirements than the original drive. TEAC was the only brand of the desired high quality that would meet the specifications required. Two TEAC double sided drives combined, actually consume slighly less power than the one single sided original drive, and there, also lies another benefit. Because the TEAC drive motors have such low power drain, they are designed to be left running for a period after data has been retrieved, and when it comes to copying diskettes, the access time between the drives is very low, making for very fast copying times indeed.

The drives chosen were the 40 track per side variety, giving 718 total available sectors per diskette instead of 359. The Disk Controller Card can handle up to 999 sectors, and though this figure could be reached by using 80 track per side drives, the lack of
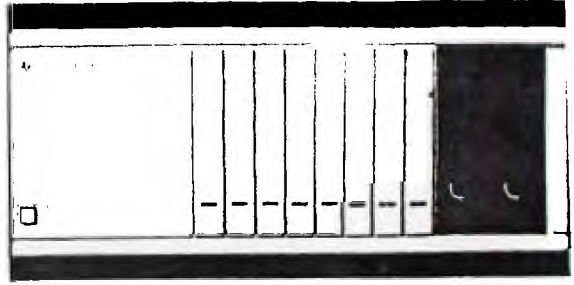
compatability between the diskettes formatted with 80 tracks, and all of the existing software for Texas, made the 80 track drives not really feasible. The capacity per Peripheral Box has risen from approximately 90Kb to 360Kb, but by far the greatest advantage is with the comprehensive programmes of Multiplan, *Editor/Assembler* and TI-Writer. The proceedure is to have the programme diskette in drive #1 and the data base diskette in drive #2. This cancels the need to be continually inserting and withdrawing diskettes from a single drive.

The proceedure for initializing dikettes to double sided configuration is well explained in the disk memory system handbook enclosed with the Disk Controller Card. The 'Disk Manager 2' module also included does the formatting to double sided, and also has a prompt for double density mode. Unfortunately, the double density mode is created within the Disk Controller Card and even though most of the drives investigated could handle this format, it requires major redesign of the Controller Card itself to create this modulation process. However, it would double the existing capacity now available, which, in the case of these twin doulble sided drives, a capacity of 8 times the original (90Kb to 720Kb), but that is for the future. The twin TEAC double sided drives I installed a few months ago in Greg's and my own Peripheral Boxes have been most satisfactory.

A final note. Don't necessarily rush out and buy "double sided" diskettes, as we have used many so called "single sided" diskettes of varying brands in the double sided format, without one failure.

(reprinted from TI BUG - Feb. 84)

DRAW PROGRAM

Reprinted from article in "Mass Users of the Ninety nine and Computer
Hobbyists" newsletter by Don Mason, May 7, 1984.

```
100 CALL CLEAR :: CALL SCREEN(2):: K=2 :: W=32 :: FOR S=88 TO 136
    STEP 8 :: CALL CHAR(S,"FFFFFFFFFFFFFFFF00"):: NEXT S
110 CALL CHAR(42,"00003C3C3C3C"):: CALL
    COLOR(1,14,2,8,13,3,9,4,5,10,6,8,11,7,9,12,10,11,13,12,14,14,15,16)
120 FOR S=88 TO 136 STEP 8 :: DISPLAY
    AT(1,K):CHR$(S)&" "&CHR$(S+1):: K=K+4 :: NEXT S
130 CALL HCHAR(2,1,32,736):: CALL SPRITE(#1,42,16,17,121):: Y=3 ::
    X=16 :: CALL SOUND(-100,660,9)
140 CALL JOYST(1,K,S):: X=X+SGN(K):: Y=Y-SGN(S):: IF Y>24 THEN Y=1
    ELSE IF Y<1 THEN Y=24
150 IF X>32 THEN X=1 ELSE IF X<1 THEN X=32
160 CALL LOCATE(#1,Y*8-7,X*8-7):: CALL KEY(1,K,S):: IF S=0 THEN 140
    ELSE IF Y>1 THEN CALL SOUND(-90,-2,15):: CALL HCHAR(Y,X,W):: GOTO 140
170 IF K=19 THEN 130 ELSE CALL GCHAR(Y,X,W):: CALL SOUND(-90,880,7)::
    CALL HCHAR (1,2,W):: GOTO 140
```

This program came from an article from THE SMART PROGRAMER. It is
presented in hopes that it might help you better understand how to
group to gether and modify some of the different routines from the book
by MILLER GRAPHICS (SMART PRGRAMING GUIDE FOR SPRITES).

The program requires that you have Extended Basic and a joystick to use
it.   This program allows you to draw on the screen using only the
joystick and the fire button.

When you run the program the screen will go black and fourteen
different colored boxes[Ed. program as listed gave seven boxes, two
colors each] will be displayed at the top of the screen.   Inbetween
each colored box is a black box and it can be used as a color, or to
erase a small part of your drawing. To pick up a color move the white
dot with the joystick on top of the color your want, on the top row and
press the fire button. The color you have picked up will be displayed
in the upper left hand corner of the screen.

Now you can move the white dot to any location on the screen and
wherever you want to put a color block just press the fire button, you
can hold down the fire button and draw as you move the white dot
around. [Ed. When I tried this program my joystick would allow only
one diagonal to work, plus horizontal and vertical.] The program will
(automatically) go from the bottom of the screen to the top to get a
new color.

When you are ready for a new color just go back up to the top of the
screen and pick it up. If you want to erase your drawing from the
screen just .move the white dot up to the top of the screen, anywhere on
the first row and press the 1 key. After the screen is erased your
white dot will be at its starting position but it will still be loaded
with the last color you were using.

[Editor. Kids should have fun with this one.]

DISKS AND DRIVES PART 2

By T. D. Bell

(The following article is reprinted from the Central Ohio Ninety-Niners, Inc. Newsletter, SPIRIT OF 99 - MARCH, 1984.)

Disk technology is constantly moving forward and new types of drive systems have been appearing over the years that could make our 5-1/4 inch floppies obsolete (as well as the 8" versions). One of these new types is the 96-tpi (tracks per inch) format 5-1/4 diskette. It requires very high precision disks and disk drives to operate. Instead of the usual 40 tracks, it has 80 on each side. (Remember that disks are double-sided unless they don't pass stringent factory tests.) A double-sided, double density 5-1/4" disk of this type could hold one megabyte of information, or as much as an 8" DSDD disk.

The big development seems to be the reduction of size as well as an increase in storage capacity. Some disks that supposedly hold one Mb are under 3-1/2 inches in diameter. The not-so-wonderful part is the leaders in this technical research can't make up their minds on a standard size. There are presently three sizes: Sony's 3-1/2", Tabor's 3-1/4" and Hitachi's 3". These mini-disks do have one standard: they use a very high density cobalt ferric oxide magnetic coating rated at 135 tpi. With this very small size and with improvements in their circuitry, their drives can be powered by batteries. This means you could expect to see them in portables as well as in desk top models.

Fnally, there is the Winchester hard-disk system (no, not the gun). Winchester was a code name used by IBM for a hard disk. Unlike the mini-floppies, this disk spins at 3600 rpm and the heads fly over the surface. In fact, they are air-borne. Winchesters lay an extremely dense pattern of data because of the high speed. They sometimes incorporate multiple disks, called platters, with heads in single units that have capacities of 60 Mb or more. Now you know why they are expensive. Hard disks use the same coating as mini-floppies, except it is much thinner. This thin structure allows for very high data resolution. At this time, the cost of a hard disk drive for a home computer is prohibitive. As technology advances however, the cost should decrease. Prices in the $1000 range for 10 megabytes are not unusual.

DISK DRIVES

Now for the machinery that enables us to use the floppies - the drive. There are five main parts in a drive that concern the end user.

1. The main spindle which spins the disk at 300 rpm and is belt-driven.
2. The drive motor.
3. The read/write head (or heads).
4. The index/sector detector.
5. DC stepper motor to locate the head in the correct position.

The main spindle spins at 300 rpm thanks to two imported gerbils. Seriously, the speed is maintained by a tachometer and special servo system to keep it constant. When the drive address is selected, the drive motor accelerates to its speed of 300 rpm and stabilizes in less than 250 miliseconds. The motor also activates momentarily when the front latch is closed and when the system is booted up. It remains active for approximately five seconds. The motor is a 12v DC standard.

The read/write head assembly is positioned by a split band positioner mounted to a stepper motor. The head itself is a glass-bonded ferrite structure with a life expectancy of 20,000 operating hours. The head is held in contact with the disk by a pressure pad not unlike those found in audio cassettes.

In DS/drives the second head acts as a pressure pad. When a file is selected, the head moves in or out from track to track making contact with the disk through the head access slot until it finds the requested track. After the correct track has been selected, the appropriate sector is located by the index/sector detector which is an assembly consisting of an LED and a PHOTOCELL. The index hole cut in the disk jacket allows light from the LED to strike the disk or to pass through the index hole when one goes by. When the light passes through, it strikes the photo-cell, resulting in an electrical impulse that tells the computer the position of the disk and the sector the head is positioned over at that instant.
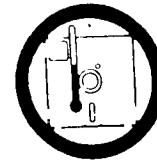
Finally, there is the write-protect switch. In some drives, depending on the cost or quality, there is a photo-cell and LED arrangement that detects the notch cut in the top of the jacket. If the notch is covered with a tape tab, the write protect swith disables the write electronics. (The operation is reversed for 8 inch disk drives.) This switch is operated by means of a mechanical finger to detect the open notch.

The following drawings will help you visualize the location of the various parts and their relationship to one another. In addition, the author wishes to thank Tandon Corporation for their help in preparing this article.
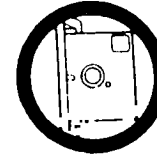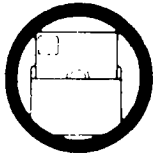
(reprinted from MSP 99 UG Newsletter - June 84)
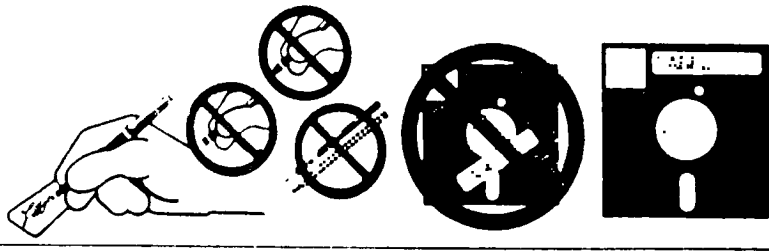
- Write on labels *before* affixing them to the jacket
- Use only fine line felt tip pens — never ballpoint pens or pencils
- Do not erase labels after they are placed on the jacket
- Do not cover any jacket holes or openings with labels
- Affix label directly to the jacket. Never place a new label on top of an old one

Protect
Proteger
Protéger
Schutzen

Never
Nunca
Jamais
Nie

No
No
Non
Falsch

Never
Nunca
Jamais
Nie

10°C — 52°C
50°F — 125°F

Insert Carefully
Insertar
Inserer avec soin
Sorgfaltig
Einsetzen

LOGIC
CIRCUIT
BOARD

FIGURE 2-1
DISK DRIVE OUTLINE DRAWING

Tandon CORPORATION.
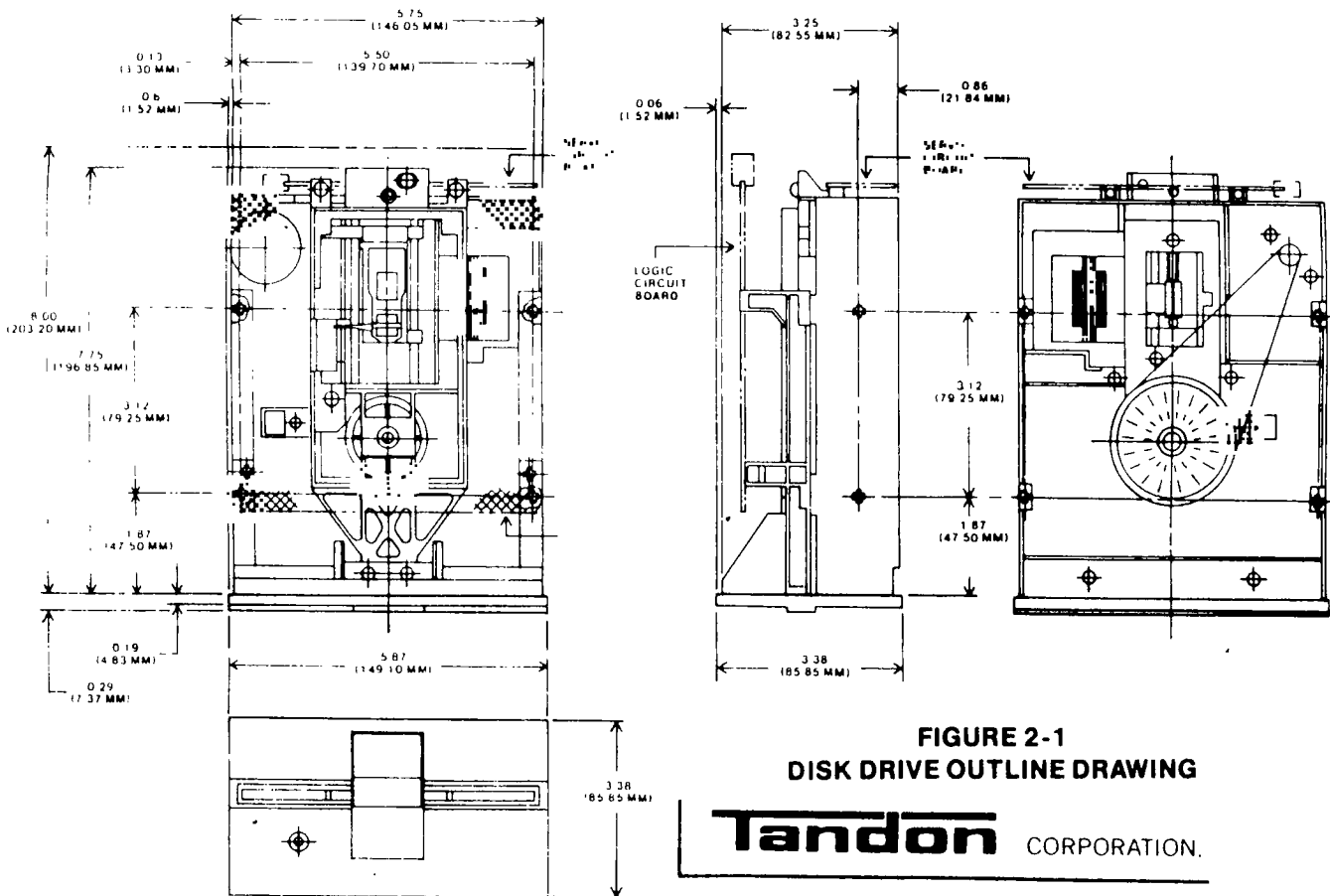
NOTES: 1. DIMENSIONS ARE GIVEN IN INCHES. METRIC EQUIVALENTS ARE IN PARENTHESES.
2. TOLERANCE ON ALL DIMENSIONS · 0.020 INCH, UNLESS OTHERWISE SPECIFIED.
3. WEIGHT IS APPROXIMATELY 3 POUNDS (1.35 KILOGRAMS).
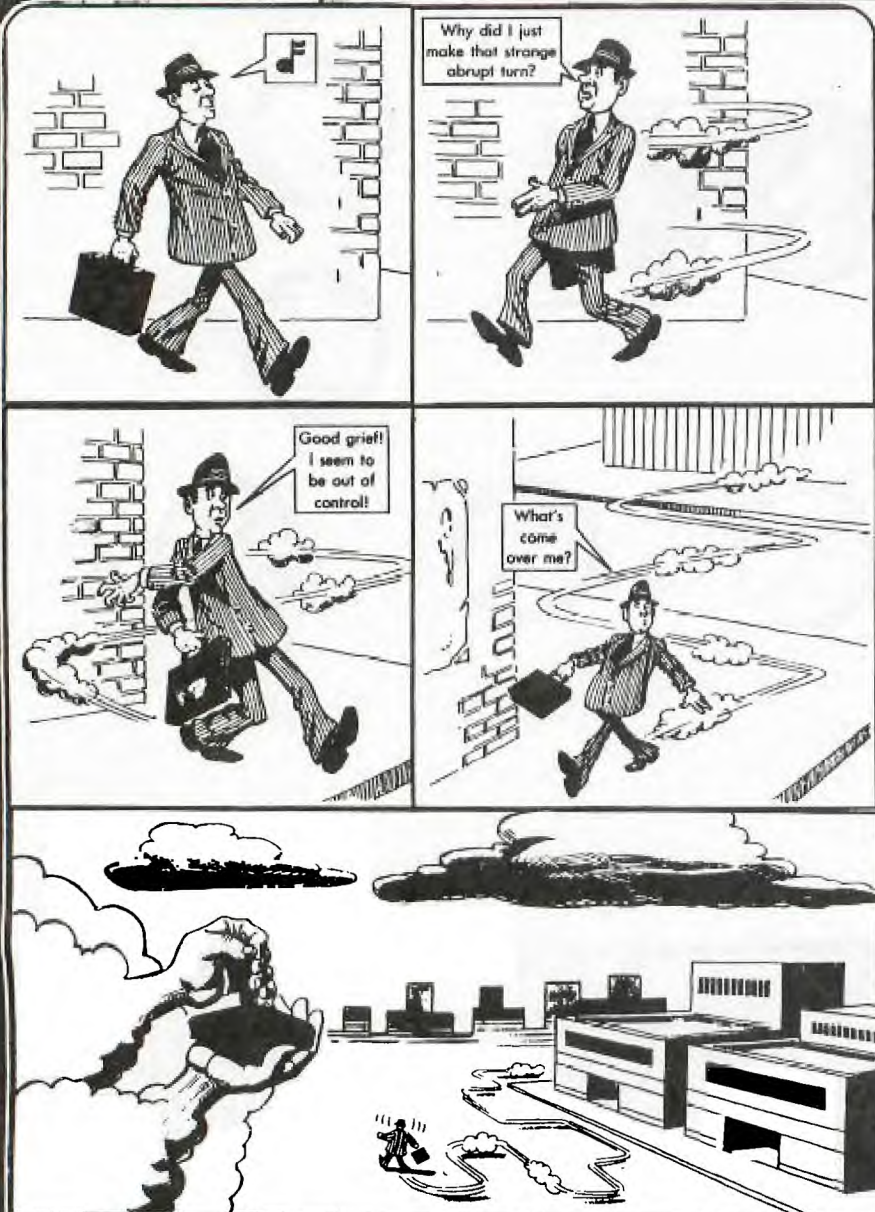
MICRO was a real-time operator and dedicated multi-user. His broad-band protocol made it easy for him to interface with numberous input/output devices, even if it meant time-sharing.

One evening he arrived home just as the sun was crashing, and had parked his Motorola 68000 in the main drive (he had missed the S100 bus that morning), when he noticed an elegant piece of liveware admiring the daisy wheels in his garden. He thought to himself, "She looks user-friendly, I'll see if she'd like an update tonight".

Mini was her name, and she was delightfully engineered with eyes like COBOL and a Prime mainframe architecture that set Micro's peripherals networking all over the place.

He browsed over to her casually, admiring the power of her twin, 32-bit floating point processors, and enquired "How are you Honeywell?". "Yes, I am well", she responded, batting her opitcal fibres engagingly and smoothing her console over her curvilinear functions.

Micro settled for a straight line approximation. "I'm stand-alone tonight", he said. "How about computing a vector to my base address, I'll output a byte to eat, and maybe we could get offset later on".

Mini ran a priority process for 2.6 milli-seconds then transmitted "8K, I've been dumped myself recently, and a new page is just what I need to refresh my disks. I'll park my machine cycle in your background and meet you inside. "She walked off, leaving Micro admiring her solenoids and thinking, "WOW, what a global variable, I wonder if she'll like my firmware."

They sat down at the process table to a top of form feed of fiche and chips and a bucket of baudot. Mini was in conversational mode and expanded on ambiguous arguments while Micro gave occasional acknowledgements although, in reality he was analysing the shortest and least critical path to her entry point. He finally settled on the old "would you like to see my bench-mark subroutine", but Mini was again one step ahead.

Suddenly she was up and stripping off her parity bits tor eveal the full functionality of her operating system software. "let's get BASIC, you RAM", she said. Micro was loaded by this stage, but his hardware polling module had a processor of its own and was in danger of overflowing its output buffer, a hang-up that Micro had consulted his analyst about. "Core", was all he could say.

Micro soon recovered, however, when she went down on the DEC and opened her device files to reveal her data set ready. He accessed his fully packed root device and was just about to start pushing into her CPU stack, when she attempted an escape sequence.

"No, no!" she piped. "You're not shielded".

"Reset, baby", he replied. "I've been debugged".

"But I haven't got my current loop enabled, and I can't support child processes", she protested.

"Don't run away", he said, "I'll generate an interrupt".

"No that's too error prone, and I can't abort because of my design philosophy".

Micro was locked in by this stage though, and could not be turned off. But she soon stopped his thrashing by introducing a voltage spike into his mains supply, whereupon he fell over with a head crash and went to sleep.

"Computers", she thought as she compiled herself", "all they ever think of is Hex".

Magic Sprite
by Robert Barger   (reprinted from Central Texas UG)
June 84 Newsletter

Since so many people didn't understand or pick up on it at the presentation, here it is again--but this time on PAPER! That's right:
the "neat sprite magic" that was spoken of in last month's newsletter!

These call routines execute and stay executed outside of regular program mode. Don't ask me why--I found out how to do this by
accident. Here's an example.

Type this in Extended BASIC:

        FOR T=0 TO 14 :: CALL COLOR(T,16,5) :: NEXT T :: CALL SCREEN(5)::ACCEPT AT(1,1) :A$

Now your screen should be white on blue, but here comes the neat part!! Press FCTN 4. Hey neat-- it stayed white on blue and look,
even the cursor is white! Now you can continue to use your computer in regular command mode and it will continue to be white on blue as
long as you don't get an error or until you execute another out of programming command (without a number in front of it). From now on
if you want to clear the screen type CALL CLEAR:: ACCEPT AT(1,1):A$ and then press FCTN 4 as you did when changing the screen colors.
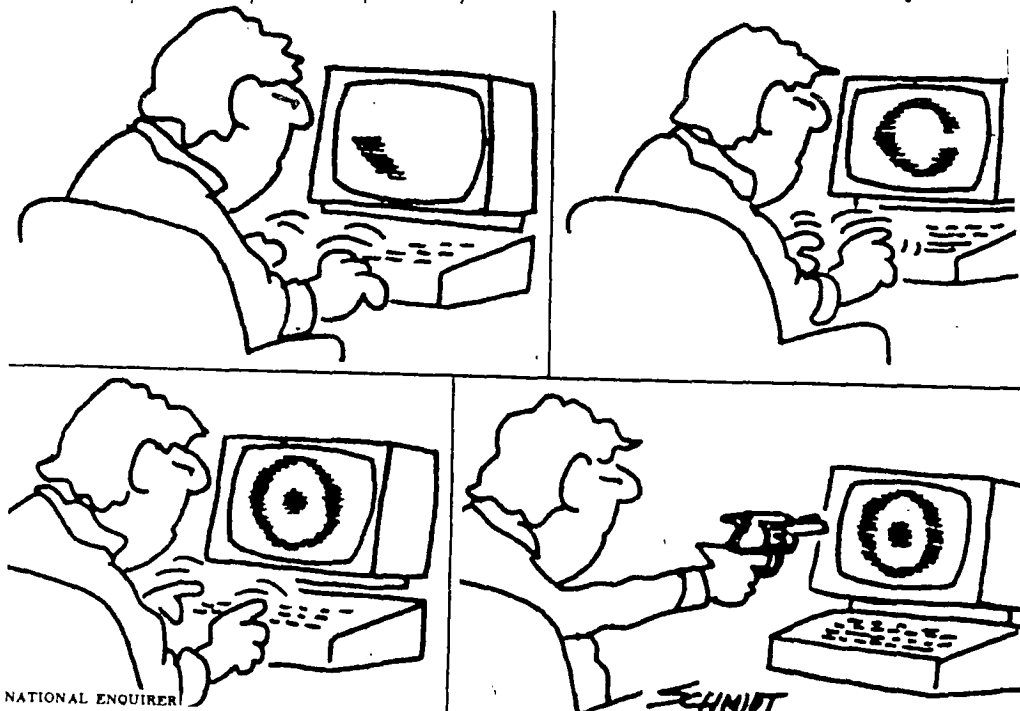
Hey, I got an idea!   Let's try this out with sprites!

Type: CALL SPRITE(#1,82,16,100,100,0,1):: CALL CLEAR::ACCEPT AT(1,1):A$

Press FCTN 4 again

Are you catching on yet? All you do is type ::ACCEPT AT (1,1):A$ after a command in command mode. You can use any variable. I chose
A$ for my convenience. Here is the basic format for these commands:

        [command]::ACCEPT AT(1,1):A$

That's all there is to it. If you have any further questions, don't hesitate to ask me at the meeting.

NATIONAL ENQUIRER

SCHMIDT

Rocky Mountain 99'ers

TIC TALK

This publication is printed monthly for the benifit of the membership of the Rocky Mountain
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     Littleton, CO 80161
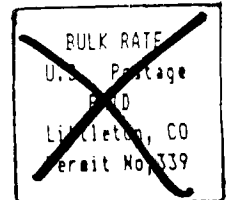
        Edmonton Users' Group
        P.O. Box 11983
        Edmonton,Alberta Canada T5J3L1


```
**********************************
* Do you see stars on the label *
* this means your membership is  *
* now due.  Send in your renew-  *
* al today so you don't miss a   *
* single issue of TIC-TALK!!!    *
**********************************
```