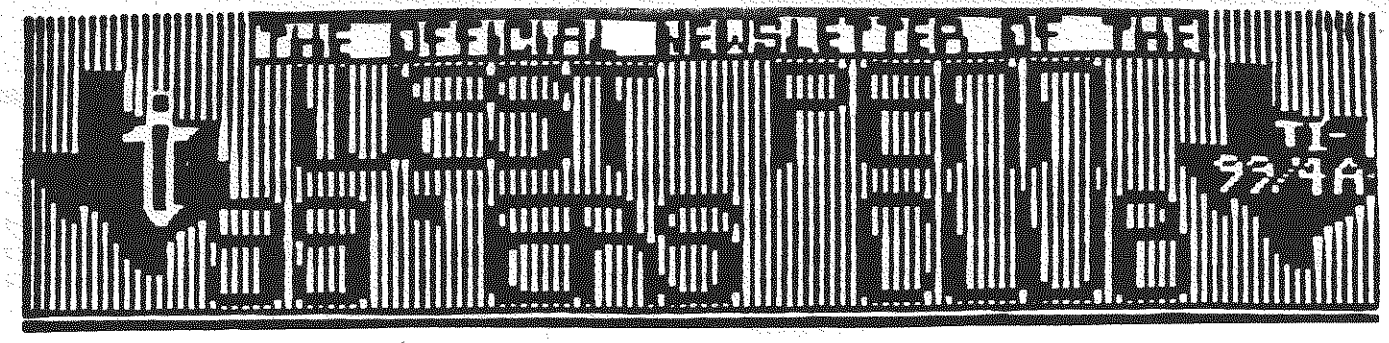


ISSUE #1 JAN 1989

FOR THE RECORD

by Frank N. Zic
(Acting Secretary)

The December meeting of the West Penn 99'ers got off to a late 7:30 start. It seems that everyone was in a gay holiday spirit. Then, too, it took a long time just to haul the huge, beautiful Christmas cake that Jan made into the kitchen. Nice work again Jan, you really had to see the cherry blocks made up like individual packages and surrounded by white icing. If you missed the last meeting, come to the next one. They are always interesting, thanks to John and all the others that participate at each meeting. The attendance was 38. It was nice to see some young faces of possible new members. Mr.&Mrs Jeff Ashley, Kevin Ashley and Mr. Ziegler and son. Thanks to Joe Ekl for his personal efforts and newspaper ads. Mickey and Rob (new Pres. and Librarian) handed out their personal thanks, a very nice disk full of Xmas songs. Jan gave a brief treasurers report with a new balance of $797.75. Quick approval of the last minutes was seconded. Scott asked how we all liked the free pizza and drinks at the last meeting. Response, you guess!! Thanks for your good leadership last year Scott. Keep up as V.Pres. It would be neglectful not to mention that even Jerry finally came to a meeting early.

The library has TI-Base V2.00 and Macflix. Rob mentioned he has entered a list of all freeware, fairware and games to the library. Scott reminded all that our 1989 dues should be paid as soon as possible. John had a hardware class to fix a console and check on a HRD that keeps lossing it's battery power. The Adventure classes have been discontinued. Next month TI Tips class will resume. Would you be interested in a Beginners Class at the next meeting and in the future? We got no direct response for an instructor but if there is real interest, I would be glad to teach the class. John demoed Freddy and a nice Wheel of Fortune. The Fortune game comes with an editor to make-up your own additional questions for endless future fun. The kit Multi-Mod for upgrading the Triton Super Extended Basic module was discussed as possibly a good move for about $23. It gives you Super XB,E/A,DM III and TI-Writer all in one cartridge. John also discussed the Winchester hard drive and it's 15 levels of directories.

The raffle was won by: 1 Jack Skinner(Extension cable). 2 Frank Zic (Chicago Hardware manual). 3 Jerry Petrulak (Marking Pen). Eric Zeno wanted to work on the two non-working 80 column computers, he may report on his progress next meeting. Eric is also selling a console with manuals for $45 or best offer. May the good 4's be with you.

WEST PENN 99'ERS CLUB INFORMATION

NEXT MEETING DATE: JANUARY 17 1989

MEETING LOCATION: UNITED PRESBYTERIAN CHURCH OF THE COVENANT

CORNER OF 4TH AND OAK STREETS, IRWIN

TIME OF MEETING: 7:00 P.M.

LIST OF WEST PENN OFFICERS FOR 1989

PRESIDENT:	MICKEY	335-0163
VICE PRESIDENT:	SCOTT	523-3754
TREASURER:	JAN	863-1575
RECORDING SEC:	ED	864-4924
CORRESPONDING SEC:	GENE	829-0469
LIBRARIAN:	ROB	864-1233
NEWSLETTER EDITOR:	JOHN	527-6656

GENERAL ITINERARY OF THE CLUB'S MEETING

6:45 P.M.	DOORS OPEN
7:00 P.M.	GENERAL MEETING
7:45 P.M.	DEMOS AND NEW INFO
8:45 P.M.	HARDWARE CLASS
8:45 P.M.	INTRO TO FORTH
11:00 P.M.	DOORS CLOSE

MEETING HIGHLIGHTS FOR THIS MONTH

HARD AND FLOPPY DISK CONTROLLER (HFDC) DEMO BY GARY TAYLOR (DON'T MISS THIS)

LIBRARY "DEMO OF THE MONTH" BY ROB EKL

LATEST SOFTWARE DEMOS BY JOHN WILLFORTH

RENEW YOUR MEMBERSHIP DUES!

$15.00 PER YEAR FOR INDIVIDUAL / FAMILY
$10.00 PER YEAR FOR JUST THE NEWSLETTER

DON'T FORGET THE WEST PENN 99'ERS OFFER BLANK DISKS / CASES / AND MICROPENDIUMS

TREASURER'S REPORT FOR DECEMBER 88

FROM JAN TRAYERS

12/20	CASH ON HAND	$56.50
12/20	LIBRARY SALES	71.00
"	MICROPENDIUMS	32.25
	DISK CASES	40.00
	DISK SALES	72.00
	RAFFLE	36.00
	DUES	286.00
	TI BASE & HOME PUB.	164.35
	TOTAL	$758.10
	PRIZES	- 20.00
	TOTAL	738.10
12/27	DEPOSIT	- 638.10
12/1	CASH ON HAND	100.00
12/20	BANK BALANCE	$ 739.25
12/20	POSTAGE	- 72.99
		666.26
12/22	MICROPENDIUM	- 30.00
		636.26
12/27	DEPOSIT	+ 638.10
	TOTAL	1274.36
	TOTAL CASH BALANCE	$1374.36

EDITOR'S Note,

Mickey Schmitt has kind of made me feel uneasy, because I'm used to trying to fill this page with some items that can be of general interest, but don't have a lot of content. Well with her complete and informative contribution, I can only apologize for not having the time to get a list of TAX PREPARATION software together for you as I had promised for this issue. I've got to go to school in Boston for a wee and as such must through this newslette together. Please forgive me again.

RAMCHARGED COMPUTER SYSTEMS

(formerly Ron's Computer & Video)

18038 SALLY AVENUE
CLEVELAND, OHIO 44135
(216)676-6675 (EVES. & WEEKENDS)

"YOUR TI-99/4A SPECIALIST"

Sale of Sales

From now until the end of January we are running a sale on some very popular TI items to re-aquaint ourselves with old freinds and get aquainted with some new ones. Some items are at prices that have never been dreamed of before. We would like to cation you that some items are of very limited quantity and the sale is limited to present stock. So don't delay and lose out this is a first come first serve sale.

PRODUCT	REG.	SALE	PRODUCT	REG.	SALE
THE ATTACK	4.95	2.59	TOMBSTONE CITY	4.95	1.99
TI INVADERS	4.95	1.99	CAR WARS	4.95	1.99
MUNCHMAN	5.95	3.49	CHISHOLM TRAIL	5.95	2.49
CONNECT FOUR	8.95	3.99	MIND CHALLENGERS	8.95	5.99
ADVENTURE (W/TAPE)	6.95	3.99	ADVENTURELAND (TAPE)	4.95	2.49
MISSION IMPOSSIBLE (TAPE)	4.95	2.49	VOODOO CASTLE (TAPE)	4.95	2.99
THE COUNT (TAPE)	4.95	2.49	STRANGE ODYSSEY (TAPE)	4.95	2.49
MYSTERY FUN HOUSE (TAPE)	4.95	3.99	GHOST TOWN (TAPE)	4.95	1.99
SAVAGE ISLAND SERIES (TAPE)	4.95	3.99	THE GOLDEN VOYAGE (TAPE)	4.95	2.49
SUPER DEMON ATTACK	9.95	3.99	MICROSURGEON	9.95	3.99
MUNCHMOBILE	6.95	3.99	MINUS MISSION	6.95	2.99
INTEGERS (GOOD MATH MODULE)	9.95	3.49	DIVISION 1	8.95	4.49
READING FLIGHT	9.95	6.95	HOME FINANCIAL DECISIONS	3.95	2.99
TAX/INV RECORD KEEPING	5.95	4.79	CHAMPIONSHIP BASEBALL (MBX ONLY)	8.95	2.99
SPACE BANDITS	8.95	6.99	SEWERMANIA	8.95	3.99
METEOR BELT	8.95	3.49	I'M HIDDING (MBX ONLY)	8.95	3.99
TERRY TURTLES ADVENTURE (MBX ONLY)	8.95	3.99	JAWBREAKER II	4.95	2.49
OLDIES BUT GOODIES II (TAPE)	4.95	1.99	MARKET SIMULATION (TAPE)	4.95	1.99
TEACH YOURSELF EX/BASIC (DISK)	4.95	1.99	CHECKBOOK MANAGER (DISK)	4.95	3.49
BEGINNER'S BASIC TUTOR (DISK)	4.95	1.99	TI JOYSTICKS (PAIR)	6.95	4.99
REP. RF MODULATOR (TV HOOK-UP)	12.95	7.95	BUSINESS MANAGER (DISK) (GREAT)	14.95	6.95
TI EXTENDED BASIC	49.95	42.95	TINY LOGO (TAPE)	7.95	2.99
JOTTO (WORD GAME (TAPE)	7.95	3.99	GARBAGE BELLY (TAPE) (X/B REQ.)	11.95	5.99
STRIKE FORCE 99 (TAPE) (X/B REQ.)	11.95	5.99	PAC-MAN	9.95	7.49
CENTIPEDE	9.95	7.49	BURGERTIME	14.95	8.99
TI PROGRAM RECORDER W/CABLE	49.95	32.95			

HOME FINANCIAL MANAGER - TI ALBUM INCLUDES - HOME FINANCIAL DECISIONS, PERSONAL REAL ESTATE, HOUSEHOLD BUDGET MANAGEMENT REGULAR 9.95 (NOW ONLY 3.99)

COMPUTER INTRODUCTORY PACKAGE - TI ALBUM INCLUDES - MULTIPLICATION 1, HOUSEHOLD BUDGET MANAGEMENT, TI INVADERS REGULAR 11.95 (NOW ONLY 4.99)

INSCEBOT Inc.
P.O. Box 291610
Pt. Orange, FL 32029
(904)767-3922

December 7, 1988

In working with TI-BASE version 2.0 we have uncovered an inconsistency which should be patched to provide the documented capability. The problem is in the RECALL directive and manifests itself when a record is RECALLed after being deleted from a sorted data-base. In this case the system hangs up and must be reloaded. The following procedure will correct the problem.

The procedure is to place this patch into your setup file so that TI-BASE will patch itself each time it is loaded. Proceed as follows:

1) Load TI-BASE
2) enter MODIFY COMMAND SETUP
   This should load the file "SETUP" and display it on the console monitor.
3) Use the insert line function (F4) to create new space at the beginning of the file.
4) Edit in the set of patches shown below.

The SETUP file should now look like this:

```
SET TALK OFF
CHANGE D2BA 1026 P1V2.0
CHANGE D2C2 D306 P1V2.0
CHANGE D2D6 1318 P1V2.0
CHANGE D2EA 100E P1V2.0
CHANGE D2F0 160B P1V2.0
CHANGE D300 B012 P1V2.0
CHANGE D302 06A0 P1V2.0
CHANGE D304 E2CA P1V2.0
CHANCE D306 0000 P1V2.0
CHANGE D308 045A P1V2.0
CHANGE E32C C2E0 P1V2.0
CHANGE E348 C80B P1V2.0
SET TALK ON
*      Welcome to TI-BASE
*    QUIT will terminate TI-BASE
*
*PRINTER EPSON
SET CURSOR 2
DISPLAY STATUS
*    FUNCTION (7) for help.
RETURN
```

A program to set up an Epson compatible printer. Run this program before TI Writer for example. JW

```
90 OPEN #1:"PIO"
100 CALL CLEAR :: R$=CHR$(27)
110 DISPLAY AT(1,10):"PRINTER SETUP": : :"1) RESET PRINTER":"2) ELITE (12 CPI)"
"3) NLQ":"4) CONDENSED":"5) SUPERSCRIPT":"6) ITALIC"
120 DISPLAY AT(10,1):"7) EMPHASIZED":"8) DOUBLE STRIKE":"9) DOUBLE WIDTH":"10) 8
-LINES/INCH":"11) 6-LINES/INCH"
130 DISPLAY AT(17,1):"12) EXIT TO XBASIC"
140 INPUT "SELECT ONE:":A
150 ON A GOTO 160,170,180,190,200,210,220,230,250,260,270,280
160 PRINT #1:R$&"@" :: GOTO 100          <- "@"
170 PRINT #1:R$&"M" :: GOTO 100
180 PRINT #1:R$&CHR$(120)&CHR$(49):: GOTO 100
190 PRINT #1:CHR$(15):: GOTO 100
200 PRINT #1:R$&"SO" :: GOTO 100
210 PRINT #1:R$&"4" :: GOTO 100
220 PRINT #1:R$&"E" :: GOTO 100
230 PRINT #1:R$&"G" :: GOTO 100
250 PRINT #1:R$&"W1" :: GOTO 100
260 PRINT #1:R$&"O" :: GOTO 100
270 PRINT #1:R$&"2" :: GOTO 100
280 END
```

Function(8) will save this command file on the system disk.

If there are any problems performing this modification, please contact INSCEBOT for assistance.

Sincerely,

Dennis D. Faherty
INSCEBOT Inc.

Techo Time 64K bytes of Memory on the 16 bit bus

by Lou Amadio and Geoff Trott

Ever since I first read about the "16 Bit 32K Memory In The Console" by Ron Marissen about 6 months ago I have been curious to find out just how much difference it would make compared to the standard 32K as provided by TI (on the 8 bit data bus). The project, however, was put off for a long time for one reason or another.

Recently, an opportunity arose to do some hardware hacking, so I approached Geoff Trott. Geoff did not need much persuading as he enjoys the odd hardware project, especially after many long hours editing the TISHUG News Digest. With the availability of 32K byte static RAM chips, we naturally wanted to use these as they are a good deal cheaper (per byte) than the 8K chips which Ron Marissen used in his original version. Ron described how to install 4, 8K RAM chips over the 2 system ROM chips. Although we now had 32K in one chip we still had to use 2 chips as each host chip in the console (the system ROMs) were only connected to half of the data bus of the TMS9900 CPU.

Apart from the 32K chips (2 of), we also needed another control chip. Geoff settled for a 74LS21 (dual quad input AND gate). Where the original article called for a total of 7 chips, Geoff managed to do it with only 3 - this simplified the construction considerably. So in fact, we ended up installing 64K byte of static RAM of which only 32K byte were required by the CPU. We were wondering whether we could bank switch the remaining 32K bytes, but this would require special software to be written. Geoff then struck upon the idea of manually switching different banks of this "free" 32K memory within the normal address range of the CPU (see notes on enhancements).

In the process of installing the 32K chips, Geoff decided to remove the 6810 Console (scratch pad) RAM (256 bytes) in order to give better access to some PCB tracks and simplify the circuit. The scratch pad RAM would now be part of the "free" 32K and thus was quadrupled in size to a full 1024 bytes. The normally unavailable 768 bytes could now be used for some unique utility software requiring high speed RAM, such as interrupt routines or load interrupt routines. Routines using this area would not be corrupted by running any current program.

This is how we initially used the new static memory:

32K CPU RAM on the 16 bit data bus
- Low memory >2000 to >3FFF
- High memory >A000 to >FFFF

1K Console RAM on 16 bit data bus
- 1K bytes available at >8000 to >83FF

The above memory could have battery back-up if required.

How did it perform?

Improvements in speed were expected since access to the 32K was now done as a "WORD" (16 bits) rather than than as a "BYTE" (8 bits), and also due to the elimination of memory "wait states" which were incorporated by TI into the design to allow for slow access memory chips. With all timings in microseconds, reading a word or byte takes .667 instead of 2, while writing a word or byte takes 1.5 instead of 4.333.

It was found that power requirements of the console were marginally reduced with this modification (including 2 6810 RAM chips removed).

The following programs were superficially tested in order to quickly gauge the performance of the new memory expansion.

TI-Writer - approximately 30% faster for Replace String: approximately 50% faster for enter/delete functions.

Multiplan - approximately 30 % faster.

Parsec - no difference?
TI Runner - noticeably faster
Buck Rogers - noticeably faster
TI Artist - satisfactory
Munchman - noticeably faster
Computer War - too fast?

The following programs did not work with the 16 bit 32K, possibly due to the way that the programs access VDP RAM:
Tennis, Ant Eater, River Boat Rescue, Submarine Commander.

How to do it

The instructions and diagrams below describe how to install the new memory chips. This article is not intended to be a step by step guide and anyone not thoroughly familiar with hardware hacking should consult the advice of their local "techo".

Minimum parts required are: 2 of 62256, 32K x 8 bit static RAMs
- 2 of 24 pin IC sockets
- 1 of 74LS21, dual quad input AND gates

1) Locate and remove the system ROM chips (U610 and U611) on the TI99/4A mother board and solder IC sockets in their place. These chips are in sockets in order to facilitate removal of the 32K memory expansion at a later date, if required. A good solder sucker is recommended for this step to prevent possible damage to the PCB or the chips. (Note that it is possible to add the 32K without removing any chips, but extra chips will have to be installed and other tracks/pins cut.)

2) Remove and discard the two Console (scratch pad) RAM chips (U603, U609 - part number 6810). This step frees up an input to stop the wait state generator as well as allowing the expansion of the scratch pad RAM to a full 1K byte.

3) Desolder pin 8 of U507 from the motherboard, cut the base of the pin and bend it out for further connection. You may find it easier to completely remove this chip, bend out pin 8, then replace it.

4) Carefully bend the legs of the 62256 chips in a little (mind static electricity) so that they will sit firmly on top of the host chips. Bend out pins 1, 2, 20, 22, 23, 26, 27 and 28 of each 62256 prior to installation to facilitate wiring later.

5) Place one 62256 chip over U610 and the other over U611, facing them the same way as the host chip. Pins 1, 2, 27 and 28 of the 62256s will hang over the end of the ROMs. Solder as per instructions below. Do not forget to mark each set in some way so that the bottom chips (U610, U611) are inserted into their correct sockets on the mother board.

6) Bend legs 7 and 14 of the 74LS21 in a little and bend all other pins out for further connections. Locate this chip over U507 (facing the same way) and solder as per instructions below.

Make the following connections using thin gauge insulated single core wire where necessary:

Pin 1 of both 62256s to pin 3 of U504 (A0(H)).
Pin 2 of both 62256s to pin 1 of U504 (A2(H)).
Pins 3 to 14 of 62256s to pins 1 to 12 of host ROM (U610 or U611).
Pins 15 to 19 of 62256s to pins 13 to 17 of host ROM (U610 or U611).
Pin 20 of both 62256s to pin 8 of 74LS21 (CS(L)).
Pin 21 of both 62256s to pin 19 of host ROM.
Pin 22 of both 62256s to pin 11 of U602 or pin 9/10 of U508 (DBIN(L)).

Pin 23 of both 62256s to pin 6 of U503 (A3(H)).
Pins 24 to 25 of 62256s to pins 22 to 23 of host ROM (U610 or U611).
Pin 26 of both 62256s to pin 2 of U504 (A1(H)).
Pin 27 of both 62256s to pin 16 of U608 (WE(L)).
Pin 28 of both 62256s to +5 volts.
Pin 1 of 74LS21 to pin 14 of U504 (>2000 page select).
Pin 2 of 74LS21 to pin 10 of U504 (>A000 page select).
Pin 3 of 74LS21 not connected.
Pin 4 of 74LS21 to pin 9 of U504 (>C000 page select).
Pin 5 of 74LS21 to pin 7 of U504 (>E000 page select).
Pin 6 of 74LS21 to pin 9 same chip (expand the selection gate).
Pin 7 of 74LS21 to pin 7 of U507 (host chip).
Pin 8 of 74LS21 to pin 20 of both 62256s (for chip select) and pin 12 of U606 (to disable the wait states and 16 to 8 bit converter).
Pin 10 of 74LS21 to pin 8 of U507 (scratch pad RAM select). Note: pin 8 of U507 should be disconnected from the mother board.
Pin 11 of 74LS21 not connected.
Pin 12 and 13 of 74LS21 to pin 14 same chip.
Pin 14 of 74LS21 to pin 14 of U507 (host chip).

Enhancements

The following enhancements were intended to make use of the available "free" 32K arising from installing 2 of 62256 chips inside the console. These modifications should only be carried out with caution. Depending on how the switching is arranged, the possibility exists for two lots of memory chips to be accessed simultaneously within the same address space. The results could be fatal! (to the chips that is!)

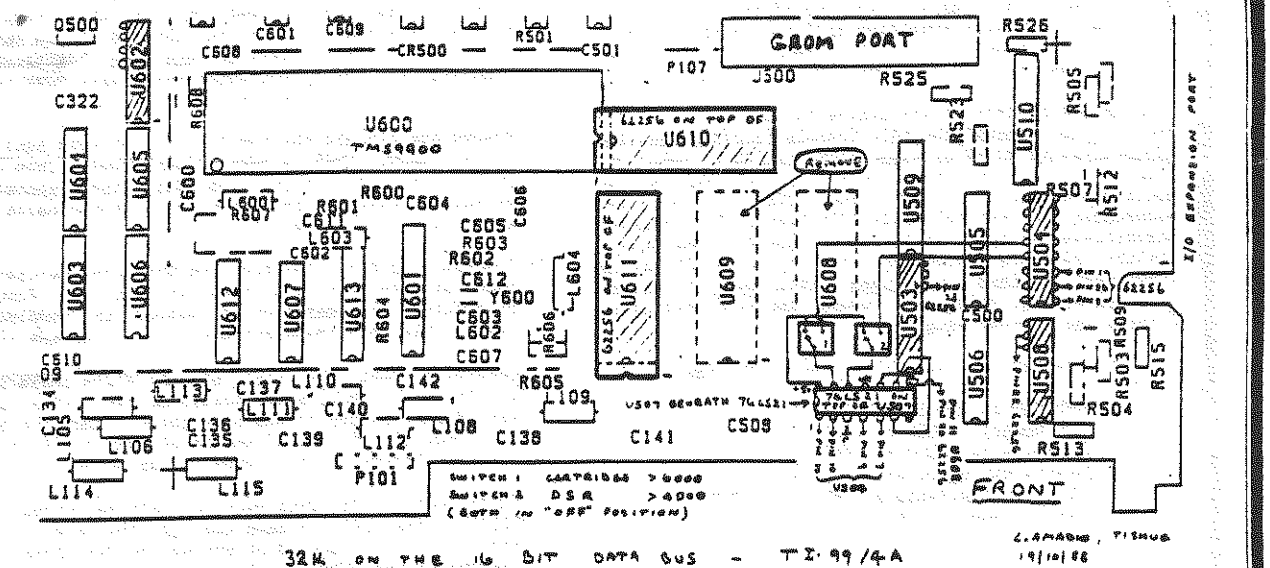
1) It is possible to invoke memory in the 8K cartridge space (>6000 to >7FFF) simply by installing a double throw switch from pin 12 (or 13) of the 74LS21 to pin 13 of U504 (>6000 page select). If pin 12 is linked to pin 14 as per instructions above, this link must be removed and the connection to pin 14 is wired as one of the switch positions (see diagram). This memory space must not be used by any other cartridge or device while this switch is active. It is advisable that this requirement be incorporated as part of the switching. Switch pin 12 of 74LS21 to +5 volts (pin 14 of 74LS21) to de-activate this function.

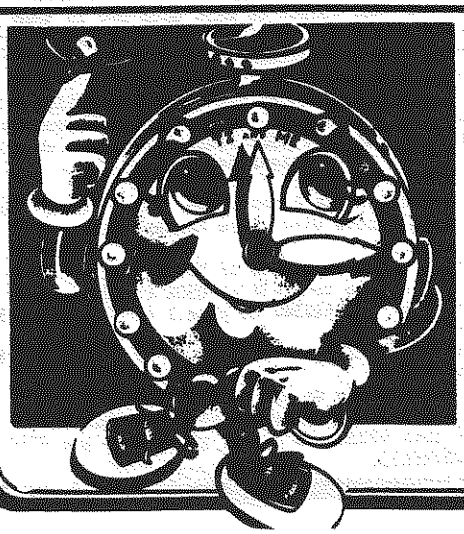
2) The DSR space (>4000 to >5FFF) can also be made available in static RAM by switching pin 12 (or 13 if already used) of 74LS21 to pin 12 of U504 (>4000 page select). Switch pin 12 of 74LS21 to +5 volts (pin 14 of 74LS21) to de-activate this function. The same precaution with respect to accessing more than one active memory applies as mentioned above.

If all of these modifications are carried out, then you have effectively used 49K bytes out of the 64K byte upgrade. The remaining 15K bytes cannot be easily used at this time. Perhaps what we need now is some sort of indicator to show that all is working as intended?

Watch this space!

The next hardware project will describe how to produce a truly versatile "SuperModule" containing Minimem, Editor Assembler and 4 manually switched 8K byte banks of battery backed RAM at >6000. @





IT'S TIME FOR MOST OF YOU TO PAY 1989 DUES FOR YOUR 1989 MEMBERSHIP IN THE WEST PENN 99'ERS.

Membership for all members is from Jan. 1 of a year to Jan. 1 of the next year. Some of you have already paid for 1989, and may not realize it. If you wait till the Feb. Issue comes out, I'll have a current list of those paid for '89. If you are sure you havn't paid, please send a check to "THE WEST PENN 99'ERS" in care of Jan Trayers the club Treasurer. A full Family membership is $15., and an Associate (newsletter only) membership, is $10

An Invitation

Some of you are now familiar with the new program MacFlix which allows TIs to view MacPaint files. MacPaint files are usually very well done graphics or pictures. I have already donated six disks to the club's library and there seemed to be great interest in obtaining more. I am a student at the University of Rochester and have access to four Apple CD-ROMs (each containing over 300 megabytes). Each CD-ROM contains many pictures in MacPaint format and if they are not in MacPaint format I can usually convert it into MacPaint.

So, this is the invitation: I am willing to take requests from the TI community of pictures that you are interested in. If you don't have anything specific you can be general-- such as requesting cartoon files or Christmas pictures. I also have available, to an extent, an optical scanner which will digitize drawings, handwriting, or photos. These can then be saved in MacPaint fomat then transferred to TI format. There is an unlimited source so the TI world can be filled with all sorts of new graphics soon. Our library already has a good start with those first six disks. I also printed out what is on each disk and gave them to the librarian to make a booklet out of. This will be helpful to you when you are looking for pictures that are currently in the library.

I hope to hear some feedback on this idea at the next meeting. My adress and phone number at the U of R is below.

Chris Pratt
P.O. Box 31438
River Station
Rochester, NY 14627-1438

(716)274-2088

WANTED:
Disk Controller Card for PEB
FOR SALE:
Disk Drives- Single Sided, Half-Heighth $5. to $10. each.
TI 99/4A NEW console in box $45.
Power Supplies- ± 12V. 1.0 A (XENTEK BRAND) - $5. or make offer.
Power Supplies- ± 12V. 1.0 A, ± 5V. .5A $5. or make offer.
Power Supply Module- ± 15V. 100 MA. (BOSTON TECH BRAND) $45. new, now $4.
AM-FM Suburu Radio, needs volume control $2.
Digital Clock- for car or any 12V. source, $3.
For the WANTED and FOR SALE above contact: ERIC ZENO, 414 Highland Road, Pittsburgh, PA 15235 Home (412) 371-4779, Work (412) 373-6997

REMINDER TO ALL MEMBERS OF THE WEST PENN 99'ERS... WE CAN PRINT ALMOST ANYTHING YOU CAN WRITE. WE WANT TO KNOW WHAT YOU THINK, AND MAYBE YOU HAVE LOOKED AT SOMETHING IN A WAY THAT NO ONE HAS EVER EXPRESSED IT BEFORE. MANY OF YOU THINK "EVERYBODY PROBABLY KNOWS IT". I GUARANTEE THAT THERE ARE MANY "TRICKS", "HINTS", AND SOME JUST PLAIN "GOOD WAYS TO DO SOMETHING" THAT WE HAVENT WRITTEN ABOUT IN THIS NEWSLETTER. WHY NOT WRITE ABOUT IT? IF YOU DO, GET IT INTO ME BY THE FIRST OF FEBRUARY. THANKYOU!

DISK DRIVES (#5)
by John F. Willforth

Last month I left you up in the air with several items. The code dic on the lower right of the page can be used with both 60-HZ and 50-HZ powered drives. The only difference is that you look at the outer band when adjusting 60-HZ units, and at the inner band for 50-HZ drives.

The other item left to your imagination was on what happens when an error does occur while reading or writing. This is of course the responsibility of the DSR stored on the disk controller card but switched into the CPU memory space. The errors can be found described in your disk controller manual and are indicated by either a BASIC error code, or an error encountered while using the Disk manager. So be careful which code you are really dealing with when one occurs.

This month I'd like to talk about a little troubleshooting of some of the basic type drives that TI used. They were Single Sided/Single Density (SS/SD) full height (3-3/8") thick, full power (about 1 to 1.3 Amp.) on +12 Volt DC. The drive was slow, noisy, expensive, and only held 360 sectors (90-K Bytes) of memory. But, hey, try to find anything as fast, smooth, cheap and with that much capacity in the personal/home computer market. You couldn't! So that makes it the BEST! There are thousands of these still running as good as the day they were first put into use 9 years ago.

They are mechanical, and today I'd like to talk about some of the mechanical failures in the SHUGART, TANDON, and MPI drive, the most common of TI drives.

I must assume you can get your drive out of your PEB or Stand-alone box. We will assume that the drive is sitting in front of you for this discussion. It is either a Shugart 400L, a Tandon TM-100, or the MPI model 51, however, the double sided versions of these drives can also be referenced here. The main difference being two heads and two head wires going to the drive logic board (the board attached to the top of the drive. Let's also slide the TI Shield (aluminum cover) off the drive. Next disconnect the HEAD WIRE Connector(s) from the right front of the logic board (even though these are keyed, and marked, you mark them so you will Know where to put them). Next all three of these drives have the logic board held in place by two screws. Remove them, and slide the board to the rear slightly out of a sloted channel and lift on the front of the board. This will expose the main mechanical parts of these three drives. You will have to remove a 2-1/2" x 3" snap on cover rear center of the MPI drives to see the HEAD(S). Be careful not to dislodge the cables attached to the rear of the logic board as it is lifted.

Common problem #1, gummy residue on the two shafts that guide the HEAD assembly. This causes difficulty writing/reading from a localized area of the disk, such as track 32 to 38. This can also be a broken HEAD wire, but cleaning these shafts will be easier, and less costly. A clean cloth with a little alcohol, and dry the area afterward, DO NOT LUBRICATE.

Common problem #2, dirty HEAD(S), cautiously lifting the pressure pad assy. on a single HEAD drive, or the upper HEAD on a two HEADED drive, clean the HEAD(S) with a clean cloth just dampened with alcohol (remember the water in alcohol can cause new problems).

Common problem #3, drive speed incorrect or erratic. Use the disc from last month's article, or the one that may already be on your disk drive, and either the DISK EXERCISER I showed you how to build in articles #2 and #3, or the PEB power connector and short pin 16 (the eighth edge-card pin from the right, going over the key-slot, all even numbered pins are on top of the board) to ground. The ground will be any of the odd numbered pins on the bottom of the board. Now with the drive running, adjust the Motor speed Pot. on the logic board of the Shugart R53 (marked Speed Adj.), and on the MPI R38 (left center), and on the Tandon the Pot. is on a small board attached to the back of the drive, and is labeled R4. Adjust the POTentiometer (variable resistor) until the bars on the outer ring of the disc appear to stand still. The drive should be at 300 RPM. It may pay to watch for awhile to see if it stays steady. You could have a dirty pulley or stretched belt, or dry or dirty spindle parts. Examine these parts to see if they are free. At least clean them, again with a modest amount of alcohol on a clean cloth. You may have to put a very small amount of oil on the spindle shaft or the hub bearing that lowers toward the disk as the door closes. Be very careful! A drop is enough and could be too much! As for the stretched belt, you will have to get one, since this cannot be replaced by a rubber band. A local computer repair center may be able to help you with a used one for your drive, if just to help you troubleshoot a problem. They may help you just to get your business after you destroy the drive trying to fix it yourself.

Common problem #4, In step #2, I mentioned a PRESSURE PAD. This applies to a single-sided drive, and is on the underside of the arm you lifted to clean the HEAD. They have fallen off, and thus cannot keep the diskette media against the HEAD on the otherside, resulting in a lot of read/write errors. This is common because the diskette can hit it on insertion, and tear it loose. A round 1/8" felt pad is glued into a recess opposite the HEAD. You decide how you want to repair this. If you don't use FLIPPIES, you might try your own felt repair.

Common problem #5, Transparent, or opaque write protect tabs, result in a disk being over written even though protected. Some old drives use a micro-switch to sense the tab, but most use an optical sensor, which can see right through some write protect tabs. In another similar but opposite problem exists on the older drives with micro-switches, they get out of adjustment and do not alway sense the tab. You may either have to replace the micro switch, or adjust it that it is reliable.

Well that does it for this month, I'll continue in this vein next month.....

THE MYARC HARD AND FLOPPY DISK CONTROLLER (MY EXPERIANCE - GARY TAYLOR)

I AM SO PLEASED WITH THE HFDC THAT I FEEL COMPELLED TO WRITE THIS ARTICLE SO OTHERS CAN FIND OUT ABOUT THIS MARVELOUS DEVICE. THE HFDC IS A CARD THAT REPLACES THE DISK CONTROLLER CARD IN THE P-BOX. IT ALLOWS YOU TO HAVE UP TO 4 FLOPPY DISK DRIVES AND 3 HARD DISK DRIVES. IT WILL SUPPORT THE OLD 90K SSSD FLOPPY DRIVES CLEAR UP TO THE NEW 1.44M DSQD FLOPPY DRIVES. IT WILL FORMAT HARD DRIVES UP TO 134 MEGABYTES EACH.

WHAT YOU GET

THE CARTON IT COMES IN CONTAINS A CIRCUIT CARD THAT FITS INTO THE PERIPHERAL EXPANSION BOX, A 70 PAGE MANUAL IN A LOOSE LEAF THREE RING BINDER, TWO CABLES NEATLY TUCKED INTO THE PROTECTIVE CARTON, SEVERAL DISKETTES CONTAINING SOFTWARE FOR THE GENEVE 9640 AND MYARC'S DISK MANAGER V (HDM5), AND A WARRANTY CARD.

SETTING THE SWITCHES

THERE ARE TWO SETS OF SWITCHES ON THE HFDC THAT MUST BE SET CORRECTLY FOR IT TO WORK, A SET OF 4 AND A SET OF 8. THE SET OF 4 SWITCHES IS FOR SETTING THE CRU ADDRESS OF THE CARD. MINE IS SET AT >1100. THE MANUAL HINTS AT THE SETTING BUT DOES NOT COME RIGHT OUT AND TELL YOU WHAT TO SET IT AT BECAUSE OF CONFLICTS THAT MAY EXIST WITH OTHER CARDS IN YOUR P-BOX. THE VARIOUS RAM DISKS THAT CAN OCCUPY THE SLOTS IN THE P-BOX HAVE THE GREATEST POTENTIAL FOR INTERFERRING WITH ITS OPERATION. THEY ASSUME THAT IF YOU HAVE ONE OF THESE DEVICES YOU MUST KNOW ABOUT CRU ADDRESSES. I WAS AWARE THAT THERE WERE ADDRESSES TO SET BUT I HAD NO IDEA WHAT THE VALUES WERE OF THE DEVICES THAT I HAD TO CONTEND WITH. I FOUND THAT MY TI DISK CONTROLLER IS SET AT >1100 SO I MERELY SET THE 4 DIP SWITCHES TO MATCH. IF I SET THE HFDC TO >1000, I CAN LEAVE THE TI CONTROLLER IN THE P-BOX AND CONTROL UP TO 8 FLOPPY DISK DRIVES.

THE SET OF 8 SWITCHES IS TO IDENTIFY THE TYPE OF FLOPPY DISKS THAT YOU HAVE INSTALLED. THE HFDC CAN CONTROL UP TO 4 FLOPPY DISK DRIVES. EACH SET OF TWO SWITCHES CAN BE SET TO 4 DIFFERENT VALUES AND TELL THE HFDC IF YOU HAVE 360K, 720K, OR 1.44M FLOPPY DRIVES. ADDITIONALLY, YOU CAN SET THE HEAD STEP RATE ON THE 360K DRIVES TO EITHER 16 OR 8 MSEC. THE TI CONTROLLER IS SET TO 20 MSEC AS A COMPARISON. YOU HAVE TO REMOVE THE CLAM SHELL COVERING FROM THE HFDC TO SET THESE SWITCHES BUT IT IS A SIMPLE TASK.

INSTALLATION

ONCE I SET THE SWITCHES I MERELY REMOVED THE TI DISK CONTROLLER CARD AND REPLACED IT WITH THE HFDC. I DID NOT HAVE A HARD DISK DRIVE WHEN I FIRST INSTALLED THE HFDC IN THE P-BOX. THE HFDC LOOKS FOR A HARD DISK DRIVE WHEN YOU FIRST POWER UP USING EXTENDED BASIC. IT TOOK THE HFDC ABOUT 45 SECONDS TO TIME-OUT LOOKING FOR THE NON EXISTANT HARD DISK BEFORE IT LOOKED FOR THE FLOPPY DRIVE. THE 45 SECOND WAIT IS UNBEARABLE AND IF YOU ARE NOT AWARE OF THIS SITUATION YOU MAY THINK THERE IS SOMETHING WRONG WITH THE HFDC. BUT ONCE IT FOUND THE FLOPPY DISK DRIVE I WAS ABLE TO FORMAT MY DISKETTES AS DSDD FOR A TOTAL OF 1440 SECTORS ON EACH DISKETTE. I LATER OBTAINED A 15 MEG HARD DISK DRIVE AND, USING THE TWO CABLES PROVIDED WITH THE HFDC, I WAS ABLE TO FORMAT THE HARD DISK IMMEDIATELY USING THE HDM5 PROGRAM SUPPLIED IN THE CARTON.

USING MDM5

THE MYARC DISK MANAGER 5 (HDM5) PROGRAM PACKED WITH THE HFDC MUST BE USED TO FORMAT THE HARD DISK. IT LOADS FROM OPTION 5 OF THE EDITOR ASSEMBLER CARTRIDGE AND WHEN FIRST EXECUTED WILL PROMPT YOU TO ENTER THE DATE AND TIME. THE HFDC HAS IT'S OWN CLOCK AND WILL TIME STAMP

continued on p. 10

cont. from p. 9

YOUR FILES WITH CREATION DATE. THE CLOCK IS NOT BATTERY BACKED UP AND THEREFOR WILL LOSE THE TIME AS SOON AS POWER IS SHUT OFF TO THE P-BOX. THE PROGRAM WILL THEN PERFORM ALL THE OPERATIONS YOU COME TO EXPECT FROM A DISK MANAGER IE. FORMAT A DISK, MOVE, COPY AND DELETE FILES ETC. HOWEVER THIS ONE WILL ALLOW YOU TO CREATE A DIRECTORY ON YOUR DISKS.

CREATING AND USING DIRECTORIES

WHEN DISKETTES WERE FORMATTED FOR 360 SECTORS IT WAS NOT VERY DIFFICULT TO KEEP TRACK OF WHAT WAS ON THE DISK. THE DISK DIRECTORY WOULD SUPPORT UP TO 127 FILES AND THAT LIMIT WAS RARELY IN JEOPARDY OF BEING USED. THE INCREASED STORAGE CAPABILITY OF HARD DISK DRIVES AND THE QUAD DENSITY DRIVES COULD NOT BE USED HOWEVER IF ONLY 127 FILES COULD BE ADDRESSED. MY HARD DISK FORMATTED TO OVER 59,000 SECTORS. TO SOLVE THIS PROBLEM THE HDM5 ALLOWS YOU TO CREATE SUBDIRECTORIES.

THE TOP LEVEL, ALSO KNOWN AS THE ROOT DIRECTORY, CAN HOLD UP TO 114 SUBDIRECTORIES IN ADDITION TO THE 127 FILES. EACH SUBDIRECTORY IN TURN CAN HOLD ANOTHER 114 SUBDIRECTORIES AND 127 FILES. TO ADDRESS THESE FILES WITHIN THE SUBDIRECTORIES YOU MUST ENTER THE PATHNAME OF THE FILES SO THAT THE DISK CONTROLLER CAN FIND IT. THE PATHNAME IS MADE BY STRINGING THE THE DEVICE NAME, WDS1, WITH THE DIRECTORY OR SUBDIRECTORY NAME. FOR EXAMPLE I HAVE PLACED MY ASSEMBLY LANGUAGE GAMES INTO A DIRECTORY CALLED AG. THE PATHNAME FOR MASH IS WDS1.AG.MASH. EACH COMPONENT OF THE PATHNAME IS IS SEPARATED BY A PERIOD(.). I HAVE FOUND THAT CARE MUST BE TAKEN WHEN ASSIGNING THE DIRECTORY NAME AS SOME PROGRAMS WILL ONLY ALLOW YOU TO ENTER FILE NAMES UP 10 CHARACTERS IN LENGTH. SO I DELIBERATELY USE SHORT SUBDIRECTORIY NAMES. SINCE 1.4 MEG DISKETTES ARE NOW POSSIBLE THE DISK CONTROLLER WILL ALLOW UP TO 3 SUBDIRECTORIES ON FLOPPY DISKETTES.

THERE APPEARS TO BE NO LIMIT TO HOW DEEP THE SUBDIRECTORIES CAN GO. ALTHOUGH THERE IS USUALLY A LIMITATION ON THE LENGTH OF THE PATH NAME THAT CAN BE ENTERED IN SOME PROGRAMS. PROGRAM THAT LET YOU ENTER THE DRIVE NUMBER BUT NOT THE DSK DESIGINATION ARE TAKEN CARE OF IN A COUPLE OF WAYS. THE EASIEST IS A SPECIAL SUBDIRECTORY CALLED DSK1. THE DISK CONTROLLER WILL SEARCH THIS DIRECTORY, IF IT EXIST, FIRST AND THAN THE PHYSICAL DSK1 DRIVE FOR THE FILE. FOR THOSE PROGRAM THAT REQUIRE THE DISK NAME TO BE DESIGNATED, LIKE MULTIPLAN WHICH REQUIRES THE DISKETTE TO BE NAMED TIMP, A SPECIAL SUBDIRECTORY CALLED DSK IS CREATED WITH A SUBDIRECTORY UNDER IT CALLED TIMP WHICH CONTAINS MY MULTIPLAN FILES.

ONE OF THE NICEST FEATURES OF THE DISK MANAGER MDM5 IS THE FIND COMMAND. IT WILL SEARCH ALL YOUR SUBDIRECTORIES LOOKING FOR THE FILE NAME YOU WANT AND DISPLAY THE PATHNAME OF ALL FILES WITH THAT NAME. THIS IS GREAT WHEN YOU KNOW THAT THERE IS A FILE OUT THERE BUT YOU FORGOT WHICH SUBDIRECTORY YOU PUT IT.

MYARC HAS A HIT

MYARC HAS HIT ON THEIR HANDS WITH THE HFDC. IT IS SIMPLE TO USE AND WORKS WITH THE TI-99/4A AND THE GENEVE 9640. INSTALLATION IS A SNAP AND IT SEEMS TO WORK WITH JUST ABOUT ANY HARD DISK DRIVE YOU CAN YOUR HANDS ON. I HAVE A 15 MEG WINCHESTER. I HAVE HEARD, BUT NOT CONFIRMED, THAT IT WILL EVEN WORK WITH THE TTL DRIVES THAT WERE DISCOURAGED BEFORE. A CALL TO MYARC CAN CONFIRM THIS SO IF YOU HAVE ONE OF THESE DRIVES IT JUST MIGHT WORK AFTERALL. THE EPROM IN MY CARD IS H10 AND I HAVE BEEN USING VERSION 1.27 OF MDM5.

Lightpen and joystick adapter

The schematic is for an adapter for 1 Atari compatible joystick to function as either joystick 1 or 2. It also provides a port for a lightpen. There are two switches on the adapter. One of these is a SPST used to activate and deactivate the lightpen. The other is a SPDT used to select the joystick for use as either #1 or #2. To wire in the lightpen, you can either wire it directly to the adapter or place a one-eighth inch mono earphone jack in the adapter to plug the lightpen in.

When wiring the adapter, you can either follow the directions that follow or follow the schematic I have included.

Directions:

1) pins 1 and 6 or the female connector, the one coming from the computer, are not connected.
2) pins 5, 7, and 9 on the male connector, the one going to the joystick, are not used.
3) wire pin #2 on the female connector to one side of the SPDT switch.
4) wire pin #3 on the female connector to pin #1 of the male connector.
5) wire pin #4 on the female connector to pin #6 of the male connector AND one position on the earphone jack (or one wire going to the lightpen if wiring it directly).
6) wire pin #5 on the female connector to pin #3 on the male connector.
7) wire pin #7 on the female connector to the other side of the SPDT switch.
8) wire pin #8 on the female connector to pin #2 on the male connector.
9) wire pin #9 on the female connector to pin #4 on the male connector.
10) wire the center pole on the SPDT switch to pin #8 on the male connector and to one side of the SPST switch.
11) wire the other pole of the SPST switch to one pole of the earphone jack (or to one of the wires going to the lightpen).

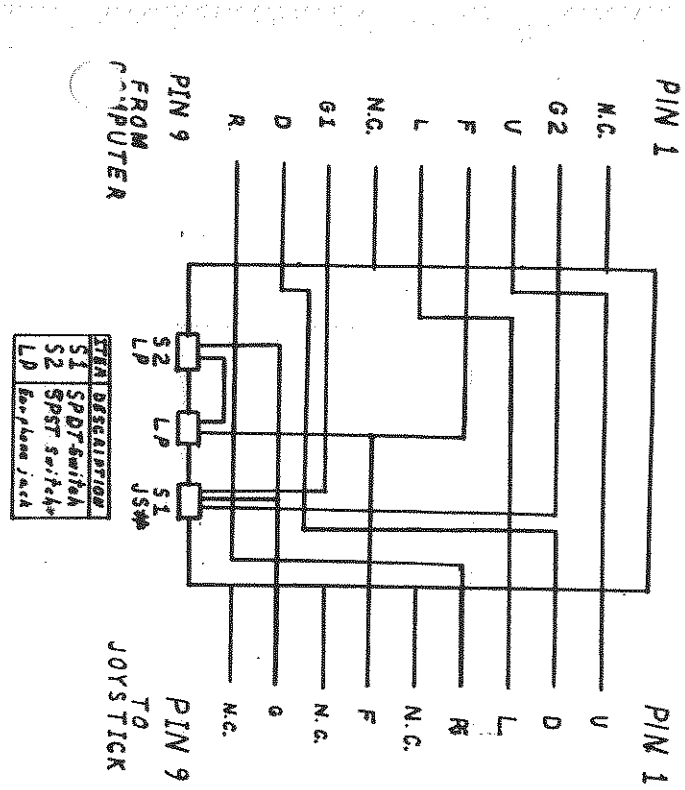
Parts List

Item	RS#	Price
Hobby Box	270-230	$ 1.69
1/8th" Jack	274-251	1.59
10' JS Extension	270-1705	5.49
SPST Toggle Sw.	275-602	1.29
SPDT Toggle Sw.	275-603	1.59

Note: The 10' joystick extension may be replaced by a male and female 9 pin connector. The part #s are 276-1427 for the male connector and 276-1428 for the female connector. They cost $.99 for the male and $1.19 for the female connectors.

ADAPTER SCHEMATIC

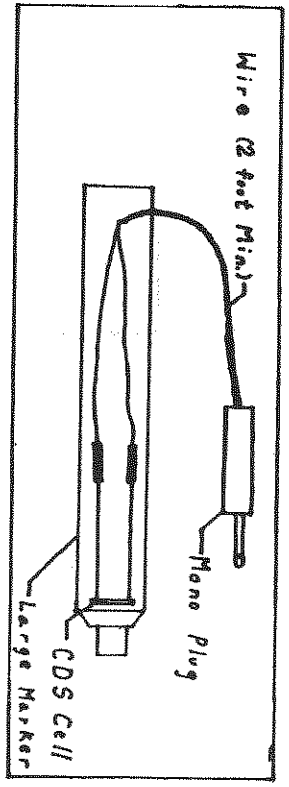
FOR 1 ATARI JOYSTICK & LIGHTPEN



SCHEMATIC

for

Lightpen Including Parts List & Prices



ITEM	Radio Shack #	PRICE
CDS Cell	276-1657	$1.96
Mono Plug	33-176	$2.49

TYPE IT IN...
PROGRAM OF THE MONTH

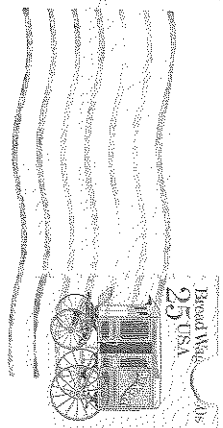
Here's a little suprise package for you. Our Bob "Graphics Master" Coffey has had this program hidden away for quite a while. If you own Display Master, it will write the program that allows you to view a disk full of Artist pictures. It names the file "DEMO" and places it on the disk of pictures so you will always have it.

```
10 ! DOCS: THIS PROGRAM WILL TAKE TI-ARTIST PICTURES AND
15 ! WRITE A DEMONSTATION FILE FOR USE WITH DISPLAY
20 ! MASTER.....enjoy!
100 !
110 ! PICTURE DEMO WRITER V 1.0
120 ! WRITTEN ON 4/27/87
130 ! BY ROBERT COFFEY JR.
140 !
150 LENGTH=20 :: FILE$=".DEMO" :: MODE$="D" :: SOURCE=2
160 DISPLAY AT(2,3)ERASE ALL:"P I C T U R E  D E M O": :
" W R I T E R V 1.0"
170 DISPLAY AT(8,1):"Source drive for pics>";SOURCE :: ACCEP
T AT(8,24)SIZE(-1)VALIDATE("12345"):SOURCE
180 DISPLAY AT(10,1):"Pause or Delay (P/D) > "&MODE$ ::
ACCEPT AT(10,24)SIZE(-1)VALIDATE("PDpd"):MODE$
190 IF MODE$="P" OR MODE$="p" THEN 210 ELSE DISPLAY AT(12,1)
:"Length of delay (sec) >";LENGTH :: ACCEPT AT(12,25)SIZE(-3
)VALIDATE(DIGIT):LENGTH
200 IF MODE$="d" OR MODE$="D" THEN FLAG=1 ELSE FLAG=0
210 DISPLAY AT(14,1):"Demo filename>DSK"&STR$(SOURCE)&FILE$
:: ACCEPT AT(14,20)S IZE(-12):FILE$ :: FILE$="DSK"&STR$(SOUR
CE)&"."&FILE$
220 DISPLAY AT(17,8):"Working..."
230 OPEN #1:"DSK"&STR$(SOURCE)&".",INTERNAL,RELATIVE,INPUT
:: OPEN #2:FILE$ ::INPUT #1:BUFF$
240 FOR X=1 TO 127 :: INPUT #1:BUFF$ :: IF BUFF$="" THEN 280
ELSE IF POS(BUFF$,"_P",1)=0 THEN 270
250 PRINT #2:".CLEAR;" :: PRINT #2:".LOADPIC"&CHR$(34)& "DSK
"&STR$(SOURCE)&"."&SEG$(BUFF$, 1,LEN(BUFF$)-2)&CHR$(34)&";"
260 IF FLAG THEN PRINT #2:".DELAY "&STR$(LENGTH)&";" ELSE
PRINT #2:".PAUSE;"
270 NEXT X
280 PRINT #2:".STOP;" :: CLOSE #2 :: CLOSE #1
290 DISPLAY AT(17,7)BEEP:"  D O N E !": : :"        Do anothe
r ?"
300 CALL KEY(0,K,S):: IF K<>78 AND K<>89 AND K<>110 AND K<>1
21 THEN 300
310 IF K=78 OR K=110 THEN END ELSE FILE$=SEG$(FILE$,5,LEN(FI
LE$)-4):: GOTO 160
```

WEST PENN 99'ERS

% John F. Willforth
R.D. # 1 BOX 73A
JEANNETTE, PA
15644

JANUARY 1989 ISSUE



MICKEY SCHMITT
196 BROADWAY AVE.
LOWER BURRELL PA 15068