.....Ryte Data.....
Dedicated to 99/4A and 9900 Computer Systems
2.00
VER 1.4
1985

BOX 210 MOUNTAIN STREET
HALIBURTON, ONTARIO K0M 1S0
CANADA

R/D COMPUTING NEWSLETTER

By the time we go to press, Myarc should have both their new operating system AND a 512k card available. Originally the new operating system was to be available by August - the way things go... We should be receiving both of these for review. Stay tuned for detailed information on these new products. We've been told that work is still progressing on the new system. Final engineering diagrams have been sent to several equipment manufacturers for some of the OEM parts required. Several of the magazines and trade journals are VERY interested in publishing data... so the word will spread throughout the industry once they are ready to publicly acknowledge the system. With the status of the TI universe, this STILL seems rather secretive. After all, shades of Big Blue, we cannot really use a PC II routine. Then again an opinion in Creative Computing listed the TI 99/4 as one of "The World's Worst Computers". (along with most of the others... except Apple II's). A certain distributor in California has stated that they should have Myarc units to DEMONSTRATE by September 15th... Any bets?

Oh yes, Myarc is now shipping their DOS software on disk (rather than the old Disk Manager II) with the DS/DD card. This gives you further system access and the ability to check disks etc. without having to change modules. VERY NICE!

You can have this new disk manager by writing Myarc or asking your dealer.

NEWS FLASH OF THE MONTH!

We have received an "EXTENDED BASIC II plus module manufactured by MECHATRONIC by Apesoft of West Germany. This is great! The module runs ALL the XBasic programs; it appears to be totally code compatible. The documentation says that this module is under license from Texas Instruments and Apesoft. Spent all day programming the host of new commands: VERY high resolution graphics and speedy operation. Quite frankly haven't seen anything like this running under "Basic" on the TI ...EVER! The graphics are superb; SUPERIOR to anything except bit map mode under Assembly. The module holds 44k of preprogrammed memory - high res graphic basic. It acts just like Extended Basic, only faster with complex graphics, block moves, direct VDP access with direct memory access (DMA) (through VDP memory), PLUS additional commands which extend the language. It is also possible to save and recall programs in memory image format, perform dot-matrix screen dumps, WINDOWS, pixel accuracy plotting, various CALL LINK subprograms which include INVERT, SETCOL, CLSCRN, CENTRE, SETBLE/CLTBLE/TABLE, VALUES, RECT/CLRECT, ARCUS/CLARCS, , RESET, IFSET, SETTO, GRAFIC, MOVE, TURN, CIRCLE, AXIS/HSTDIA/CRCDIA/ WRITE/ DSPLAY/ACCEPT, SHIFT, GSAVE/ etc. In fact, there is almost too much to cover effectively. Worse, the manual is in German (thus far) - which makes for some very "interesting" translating.

At any rate, we haven't seen anything like this running on the TI yet. We understand that we should be able to offer this product Real Soon Now. No US price has been set.

SOONER we will have an English version of disassembled GROM codes and GPL programming tips! The US price has been set at $14.95. The book is over 200 pages of hardcopy listings of console GROMs, ROMs and GPL listings/ routines/ interpreters and commentary. The text is limited to fairly standard remarks and is being translated into English at

this time. Advance orders are being accepted, on the basis of shipping when available. We will hold your $14.95 until we ship the book.

The letter which accompanied the package made note that they have a GPL assembler for creating new program code. Suggestions to alter existing code and burning new EPROMs were made regarding powerful utilities & new modules. We also understand that Millers Graphics will be offering a GPL assembler Real Soon Now (when fully translated from German again, I assume).

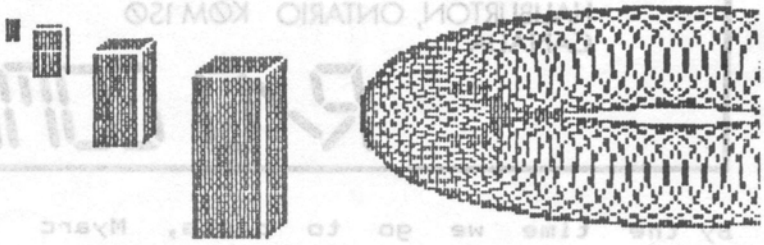
The same person has sent us an EPROM module design that lets you put your own code on chip, download GROMs of any description, bankswitch up to 40k of memory and/or add the 8k RAM chip with Assembly code access & utilites on EPROM thru the module port. We are having a problem with the language barrier, but should have a report and permission to reprint the design by next issue. This device looks as if it could radically change several "options" for the 4A. A custom operating system could be written to provide several utilities, features etc. without needing to have 32k, Editor Assembler & disk drives. If you do have these, additional POWER and programming routines are possible. An EPROM programmer (which runs off the main console) completes the circuitry design for those who would like to have toolboxes on tap. The EPROM device is slated to be produced by a German company in the near future. We have the design layout and a photo of a beta unit in hand. This will also be published for those who wish to burn custom EPROMs.

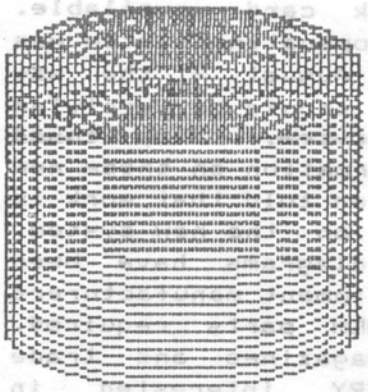
Remember how we mentioned the 32k memory upgrade INSIDE the console... it rolled in the door this month as well. Seems that, according to Berne Elsner and Phil West - from the TI Users Group in T.I.U.P., Australia, TI decoded the addresses within the console for the memory expansion: yet used some 33 chips for the 32k card. You can accomplish the same thing using only FOUR chips, a few capacitors and lengths of ribbon cable! The cost would be around $40.00 US plus time & effort. This would be for those without the 32k card.

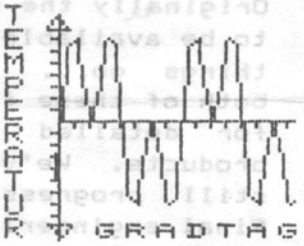
MICROCOMPUTER

Opsoft

SOFTWARE







MITTLERE ANALYSEN

REVIEW:

Having used the Foundation 128k card for the past year+ (flawless performance and ease of use are the operative words here), none the less, I was looking forward to seeing the Myarc 128k card. It is rare to see a product remain uncloned in the industry. Over the past week, we have been using the new 128k card / print spooler in one of our 4A's. Works just as advertised with the 96k banks of extra memory and the onboard EPROM logic installed.

Upon power up you CALL PART(90,6) where 90(x)=RAMDISK and 6(y)=print spooler memory in Kbytes. The sum must equal 96 for the memory banks beyond the 32K "standard" (bank 0). This configuration allows you to use the card as Drive #1 to 5. This last drive number is a new feature for those with the maximum 4 drives. The new cards can be used in a number of ways: exactly as a drive, as a file volume access and/or as a print spooler.

This last feature is a big drawing card! I find nothing more agravating than waiting for the printer to finish a long job. With the buffer you simply send the output to SPPIO - and the printer leaps to life while the system goes BACK to its previous task! This feature is very well behaved and works

under Basic, TI Writer, MultiPlan and Assembly. The card is reported to be compatible with Pascal as well (I cannot verify this personally).
All aspects of this card work very well. The versatility and USEFULLNESS of the features make the additional memory a good productivity investment. Seeing a file come up within seconds is a joy. For example a large text file will load from the RAMDISK in nine seconds compared to 27... a 300% increase in speed. Makes saving files less of a chore - provided you save the last edit t disk. If you set the RAMDISK as drive 1, your LOAD programs will execute immediately / a disk directory lists fully at memory speeds. Nice changes from the slower drive speeds.
One aspect does concern us, the card case is fabricated from plastic rather than the metal clamshell case of old. Just seems a little less rugged. Then again, overkill vs costs was always part of TI's problem. Cards for Apples are often a bare board. period. After very extensive use and with a full set of cards in the PE Box, this didn't cause any problems what so ever.
In conjuction with Myarc's new Disk Mangager III, the 128k card becomes a more powerful system all around. We will review this program next issue. It is vastly superior to DM II, starting to approach the practicality of MS-DOS... yet with some even more powerful commands. The CLONE command works well as a mass copy device using sector by /sector access.
Obviously Myarc sees the need to build bridges between the 4A environment and the new. This approach makes a great deal of sense; giving current owners several choices. The obvious question is cost. With high marks all around, I would recommend this peripheral for any user with the PE Box. You can buy the 32k card and upgrade later to 128k, but the additional uses make the extra memory well worthwhile.
WE ARE LOOKING FOR OTHER INNOVATIVE CIRCUIT DESIGNS. We have located a gentleman in Pennsylvania who has designed a clock card and a DSR card for the PEB which allow for some other interesting system uses & modifications to the workings of the 4A. With Texas Instruments no longer providing products the famous "third party" has a chance to offer the type of products seen on Apple and IBM's.

Some other VERY interesting "hardware hacking" has been done on the 4A: including beefing up the power supply for the PE Box, replacing the 8k of system ROM with a battery backed circu replaced the 4k RAM and ROM in the Mini Memory module with 8k, MM GROMs and battery backup; in addition to the designs published in 1 & 2. Several new ideas are floating around which change and/or improve the TI 994/A in significant ways. Again, we would like to hear from users, programmers, hardware hackers et al regarding these projects: to easy? difficult? obscure? limited? wish lists? questions?

XXXXX We cannot cover the 32k modification right now; the details will be laid out in the next issue. In addition we will have a set of designs from Ron Gries of the E/A module fame. He has designed a real time clock circuit, a SS or DS/DD RAM disk card for the PEB (battery backed too!), an EPROM reader / writer and a couple of other devices. We're told that the operating system for the DSR RAM disk is being written (about 60% complete) and a kit will be offered. The circuit is quite complex and would require a plated through board, chip sockets and expert knowledge. Three prototypes exist - all wire wrapped and constructed individually. David Romer is using one to copy the freeware disks for the E/A module noted last issue.

One of the new circuits allows you to put your entire system on a timer, turn it on at a preset time, enter Extended Basic, access a disk program (named LOAD of course) and then run another program "unattended". This can also be used in situations where the power has gone off and come back on again when your home control system was working. Without a modification of this sort, the title screen would greet you instead of the proper house conditions. Thanks, Ron!

Have you heard about "The Nod" from the people at Godbout (I forget - now Stride Micro?); a mouse/light pen device which follows your head movements? Basically you move the cursor by looking at the screen area you want. No mouse handling or pen pointing / touching. A Natural! Does anyone have a lightpen design that is worked out for the TI?

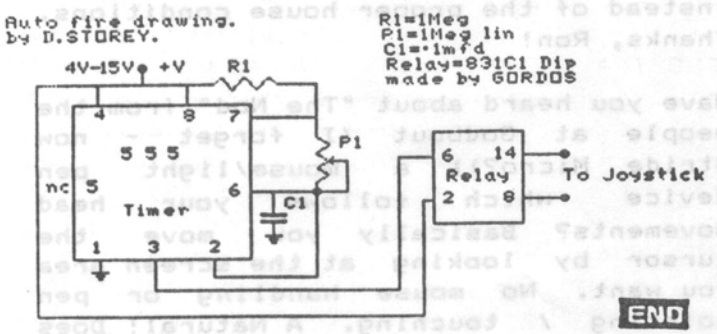
We have received software from a number of excellent sources. Beginning with this issue, reviews of new programs will be run each month. First is TERMINAL- AIDE tm Phoenix Software, Inc. 305 Hummel Avenue, Lemoyne, PA 17043-9990
The program is a useful utility for those who upload files to BBS or database systems. You are provided with the tools required to create and then send files, programs, letters etc. to the host system. Saves endless amounts of connect time compared to typing (unless you are flawless at 300/1200!) For the dedicated telecommunicator this program is well worth the cost. The documentation is included on the disk. Adequate and clear, it also provides tips and points to using the program. You can use TI Writer to create and edit your files for a powerful and flexible approach. Write Phoenix for information.

AUTO FIRE PROJECT

by David Storey

I have been asked by several people why is it that the auto fire add on for the Atari does not work on the TI99/4A. Well the 99 does not have any voltage output at the joystick port. It also has to have a physical contact making and breaking for the fire button to work.

This prompted me to come up with this simple circuit. It uses a 555 timer and a relay. R1 and P1 deal with the time constant. This circuit works well although it is a bare bones circuit and could be modified to give more range of firing speed but, I will leave that up to you. Here is the circuit, you will need a battery I used a 9 volt as it is compact. This circuit as is will run with voltages from 4 volts to 15 volts.



CorComp Triple Tech Card:
We have received promotional material from CorComp announcing their Real time Clock and Printer Buffer Card.
This is another innovative product for the 99/4A which combines function and utility. Rather than introducing a single function product, CorComp has gone the one extra step.
The clock function is accessed from Basic, Extended Basic or Assembly so the feature can be included within many programs written on the machine. As real time clocks are new to the TI world, you won't find much software that makes use date/time stamping files or applications. With MS-DOS machines a clock card will automatically give each disk file you create or edit a unique time & date... a real treat when you're trying to figure out which version was the last update! Now all we need is a DOS patch that does the same...
Having a printer buffer (64k worth: larger than most TI Writer files) makes the card a wise purchase. You are able to send the output to the buffer which frees your computer for other tasks. This can be a real timesaver in listing programs, word processing or spreadsheet work. The card has a special cable which feeds the data to the RS-232 port on a first in first out basis.
Included on the card is a connector area to re/install the board from your speech synthesizer. This does reduce the horizontal footprint of your system - it also removes your load interrupt switch! Some people are plauged by having their system "lock up" at random. The speech synthesizer connections can be the culprit. Fewer contacts to worry about when you transfer the speech board to the PE Box. This touch also paves the way for developing a new speech synthesizer for the TI...
Another version is a stand alone clock which connects to the usual system bus port. The same accuracy and programming apply, only this unit INCLUDES a load interrupt switch! I guess the switch is very popular among certain owners.
All things considered, the card seems to be quite useful. A unique combination of features, straightforward operation and reasonable price make this another winner.

Now to take up from last issue: the MPB clock card has just arrived. This unit is a battery backed real time clock with an 8 bit multiplexed, 8 channel input A/D converter. It can be used to monitor Ø to 5 volt electrical signals from any real world source. The design is from Gary Emmich, Tony Albanese and sold as a kit from MPB 5522 E. Harry, Wichita, Kansas 67218 for $41.5Ø US. You are required to order the chips and parts from a supplier and assemble the finished unit yourself. It will take an experienced assembler about two hours to put it together (longer for electronic novices). Disk software is supplied to initalize the clock and test the A/D functions. The clock card is memory mapped into the system so it does not interfere with any other ports.

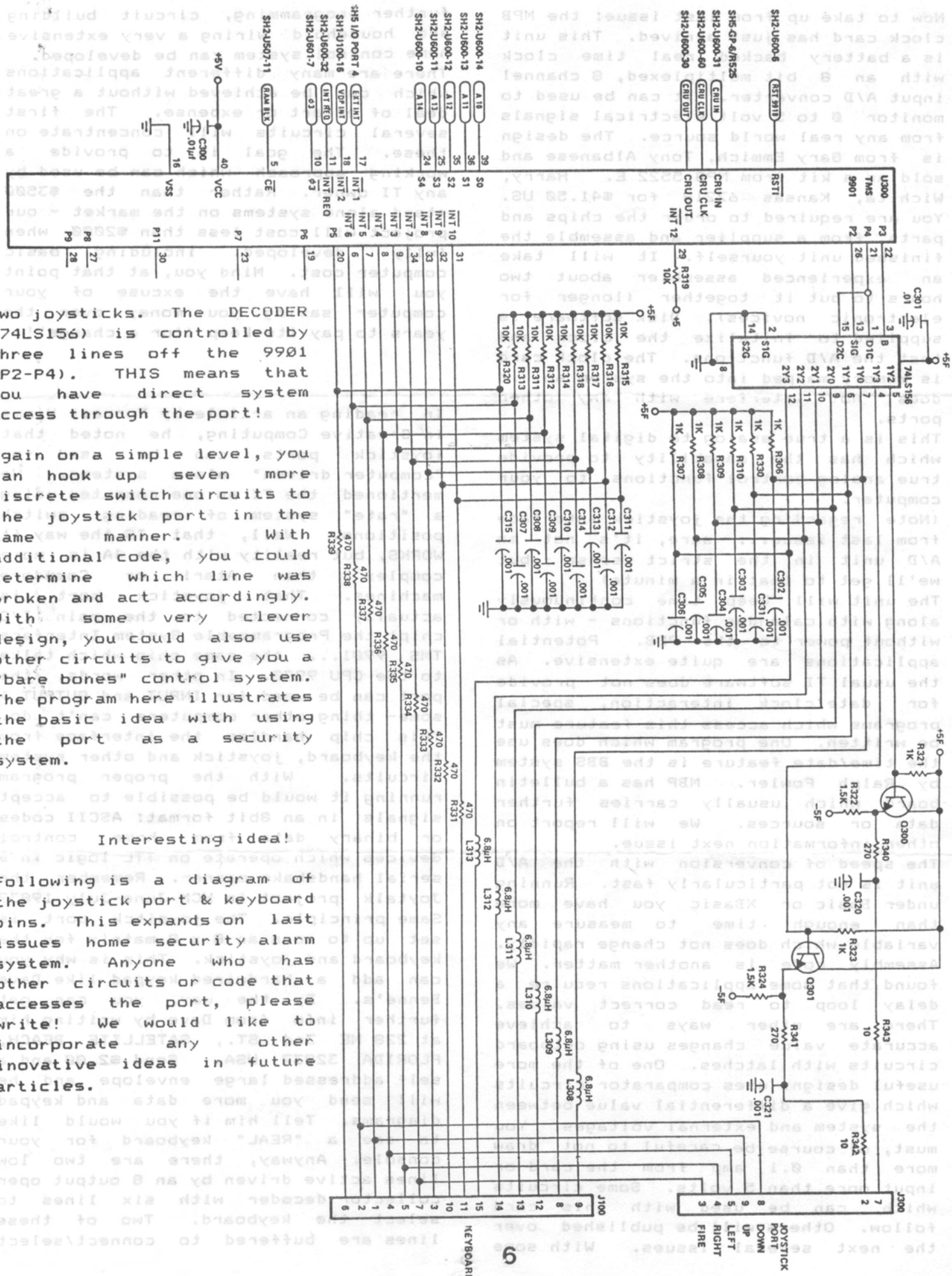
This is a true analog to digital system which has the capability to provide true analog control functions to your computer.

(Note regarding the joystick interface from last issue... sure, it's not an A/D unit in the strict sense - but we'll get to that in a minute)

The unit will keep time continuously along with calandar functions - with or without power to the PEB. Potential applications are quite extensive. As the usual TI software does not provide for date/clock interaction, special programs which access this feature must be written. One program which does use the time/date feature is the BBS system by Ralph Fowler. MBP has a bulletin board which usually carries further data or sources. We will report on other information next issue.

The speed of conversion with the A/D unit is not particularly fast. Running under Basic or XBasic you have more than enough time to measure any variable which does not change rapidly. Assembly code is another matter. We found that some applications require a delay loop to read correct values. There are other ways to achieve accurate value changes using outboard circuits with latches. One of the more useful designs uses comparator circuits which give a differential value between the system and external voltages. You must, of course be careful to not draw more than Ø.1 amp from the card or input more than 5 volts. Some circuits which can be used with this card follow. Others will be published over the next several issues. With some further programming, circuit building and household wiring a very extensive home control system can be developed. There are many different applications which can be achieved without a great deal of effort or expense. The first several circuits will concentrate on these. The goal is to provide a working approach which can be used by any TI owner. Rather than the $35ØØ stand alone systems on the market - our project will cost less than $2ØØØ when fully developed; including basic computer cost. Mind you, at that point you will have the excuse of your computer saving you money over the years to pay its keep (for a change)!

In reading an article by Forrest Mimms in Creative Computing, he noted that joystick ports can be used for "computer driven" alarm systems. He mentioned the TI as one computer using a "rate" system of reading switch positions. Well, that IS the way it WORKS, but reality with the 4A is more complex than Atari or Commdore machines. That joystick port is actually connected to the main I/O chip: the Programmable System Interface TMS 99Ø1... the same chip which talks to the CPU 99ØØ. In other words, the port can be used for INPUT and OUTPUT > some- thing other computers can't do. This chip handles the interface from the keyboard, joystick and other system circuits. With the proper program running it would be possible to accept signals in an 8bit format: ASCII codes or binary data from home control devices which operate on TTL logic in a serial handshake manner. Remember the Joytalk project in HCM June-July 1983? Same principle. The joysitck port is set up to scan an 8 x 8 matrix for the keyboard and joystick. This is why you can add a hardwired keypad like Dave Benne's. By the way, you can get further info from Dave by writing him at 228 NE 3rd ST., SATELLITE BEACH, FLORIDA 32937 USA. Send $2.ØØ and a self addressed large envelope and he will send you more data and keypad diagrams. Tell him if you would like to see a "REAL" keyboard for your console. Anyway, there are two low lines active driven by an 8 output open collector decoder with six lines to select the keyboard. Two of these lines are buffered to connect/select



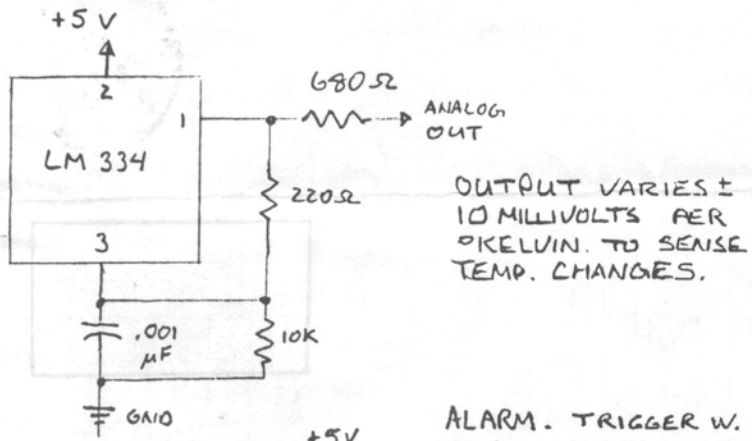
two joysticks. The DECODER (74LS156) is controlled by three lines off the 9901 (P2-P4). THIS means that you have direct system access through the port!

Again on a simple level, you can hook up seven more discrete switch circuits to the joystick port in the same manner. With additional code, you could determine which line was broken and act accordingly. With some very clever design, you could also use other circuits to give you a "bare bones" control system. The program here illustrates the basic idea with using the port as a security system.

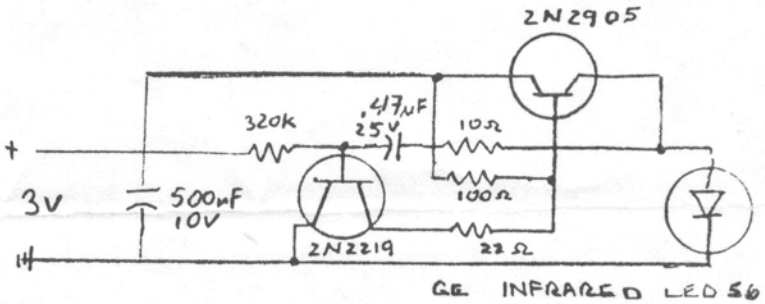
Interesting idea!

Following is a diagram of the joystick port & keyboard pins. This expands on last issues home security alarm system. Anyone who has other circuits or code that accesses the port, please write! We would like to incorporate any other inovative ideas in future articles.

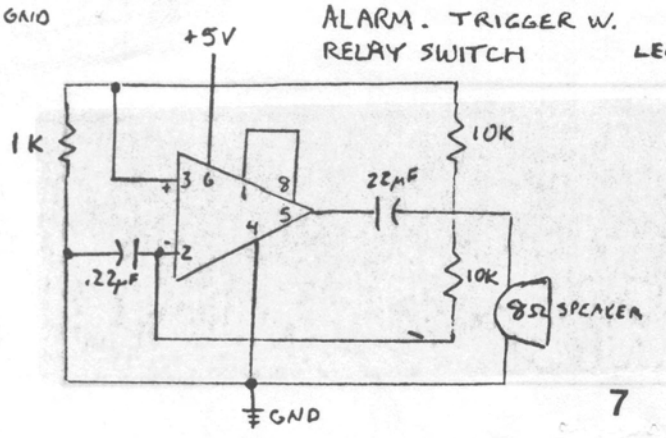
```
1 REM  **********************
2 REM  *CONSOLE BASIC or XB*
3 REM  *JOYSTICK PORT HOME *
4 REM  *SECURITY PROGRAM   *
5 REM  *BARE BONES ONLY!   *
6 REM  **********************
10 CALL CLEAR
20 A$="HOME SECURITY SYSTEM"
30 FOR T=1 TO LEN(A$)
40 COL=COL+1
50 CALL HCHAR(12,2+COL,ASC(SEG$(A$,T,1)))
60 CALL SOUND(50,440,1)
70 NEXT T
80 FOR T=1 TO 1000
90 NEXT T
100 FOR P=1 TO 10
110 PRINT
120 NEXT P
130 CALL CLEAR
140 PRINT "How many minutes do you want"
150 PRINT "the computer to wait before"
160 PRINT "it goes into protect mode?"
170 PRINT
180 INPUT "":A
190 PRINT
200 PRINT "What character do you want"
210 PRINT "to use to keep the alarm"
220 PRINT "from sounding?"
230 PRINT
240 PRINT
250 PRINT
260 INPUT "":SECURITYCHAR$
270 PRINT
280 PRINT "How many minutes do you want"
290 PRINT "the computer to wait before"
300 PRINT "it sounds the alarm?"
310 PRINT
320 INPUT "":STIME
330 PRINT
340 PRINT "Press space bar when you are
350 PRINT "ready to leave."
360 CALL KEY(0,KEY,STATUS)
370 IF KEY=32 THEN 390
380 GOTO 360
390 TIME=A*14000
400 CALL CLEAR
410 PRINT "COMPUTER NOW IN PROTECT MODE
420 FOR T=1 TO TIME
430 NEXT T
440 CALL CLEAR
450 CALL JOYST(2,A,B)
460 IF B<>-4 THEN 480
470 GOTO 450
480 CALL CLEAR
490 PRINT "You now have";STIME;"minutes
500 PRINT "to enter security code"
510 PRINT "before alarm sounds."
520 TIMEOUT=STIME*1000
530 FOR T=1 TO TIMEOUT
540 CALL KEY(0,KEY,STATUS)
550 IF KEY=ASC(SECURITYCHAR$)THEN 620
560 NEXT T
570 CALL CLEAR
580 CALL SOUND(500,-3,0)
590 FOR X=1 TO 200
600 NEXT X
610 GOTO 580
620 CALL CLEAR
630 PRINT "Protect mode disabled"
640 END
```

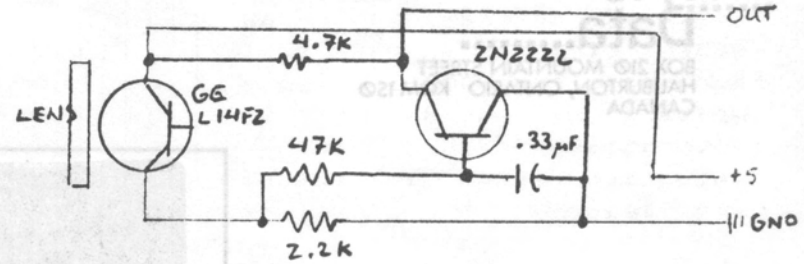


OUTPUT VARIES ± 10 MILLIVOLTS PER °KELVIN. TO SENSE TEMP. CHANGES.



GE INFRARED LED 56





INFRARED SENSOR BEAM FOR INTERIOR DOORS/HALLS ETC.

Dear Sirs:

I was very happy to hear than someone will be producing a TI compatible computer soon. No matter how good a computer is, I don't think it can last without new products (both hardware and software) to stimulate growth. I think the 99-4A is far superior to any other home computer but I am often ostracized because I own one (actually, I own three). The new computer proposed should help give the 9900 family some respectability.

The sound/music capabilities on the 99-4A are easy to use and more than adequate. As far as the speech is concerned, I think that since it is so complex, it should be added later if possible. I would like to be able to obtain the speech capabilities later, but it would not be a strong selling point.

I am very excited about the possibilities of this new computer and if I could, I would buy one right now. The price is not very important to me because I paid $400 for my first 99-4A and I still think I got a good deal. I hope everyting goes well and the computer is available soon.

Bob Keahey

R/D Computing is published monthly by Ryte Data in Haliburton, Ontario. All material contained herein is taken from sources believed to be accurate. No responsibility for errors, omissions or misprints is assumed. Articles may be reprinted with credits by users groups for publication.

Articles dealing with Texas Instruments 99/4A and 9900 based computers are published. Special attention is given to data on upgrading and modifying the 4A console & system. Information and material for consideration is solicited from owners, users groups, hardware manufacturers, software publishers etc. Please send all correspondence to Ryte Data R/D, 210 Mountain Street, Haliburton, Ont. K0M 1S0 Canada. We cannot accept responsibility for materials submitted and, unless stated otherwise, will assign all manuscripts, letters etc. for publication. ONLY Manuscripts with sufficient postage and self/addressed mailer will be returned. Subscription rate is $10.00 per year US funds. Overseas add $5.00 airmail postage. Back issues, subject to availability, are $2.00 each. Technical reprints may be published by special arrangement.

Ryte™ Data
BOX 210 MOUNTAIN STREET
HALIBURTON, ONTARIO K0M 1S0
CANADA