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WINNIPEG Newsletter

November-December Newsletter

The Winnipeg 99/4 Users Group is a non-profit organization created for users by users of Texas Instruments 99/4A Home Computers and compatibles. The content of this publication doesn't necessarily represent the view of this user group.

Next General Meeting - Date : T.B.A. ¦ Contact Paul
Time : T.B.A. ¦ Degner for more
Place: T.B.A. ¦ information.

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EDITORIAL:

These past two months much change has taken place. One of our members has left the TI for the pursuit of the big blue, namely Charles Carlson. We also lost our TI BBS in the process which is sadly missed by all. We wish Charles all the best and hope he stays in contact with us as he was a valued member of our group.

We also like to note that Brian Lesko picked up Gordon Richards TI system. We hope he enjoys his new system.

MISCELLANIA:

Miscellaneous news and reminders.

You may be interested to know that MICROpendium has contacted C. Regina of Compute! fame and she has agreed to start contributing in January.

Rumours exist that 87 will be the year of the PC-TI. Several companies (one very notable) have expressed their intentions in this area.

Over 130 original entertainment, education and programming utility programs in Basic and Extended Basic on cassette or disk. Only $3.00 each! Eighteen different full-disk collections, just $12.00 each! Descriptive catalogue $1.00 refundable. TIPS FROM TIGERCUB full-disk collections of 50+ programs and files from Tigercub Tips newsletters, Vol. I, II and III $15.00 each; any two $27.00; all three $35.00 postpaid. NUTS & BOLTS (#1) and (#2) full disks of 1000 utility subroutines in XBasic 'merge' format, ready to merge into your own programs: $19.95 each, both for $37.00 with documentation, postpaid. Orders to Tigercub Software, 156 Collingwood Ave., Columbus, OH 43213.

I have complete plans for building a clock with a analog to digital converter on a card. I will send one out to anybody for $10.

A report on how to change the TI disk controller from 20 ms head step to 12 ms will be in next month's newsletter.

We have a new advertiser in our newsletter. Manitoba Telephone System has placed a advertisement for the next three issues. I think this is a great way to advertise because our newsletter reaches across Canada and into the United States as well as overseas.

Art Green, member of the Ottawa Users' Group, has developed a new operating system for the Horizons RAMdisk. It will function like a GRAM device in that it can download modules to disk. I should have this pretty soon.

OUT AND ABOUT:

Feature articles from the various newsletters we received each month.

QUAD DENSITY TI DISK CONTROLLER update (R/D COMPUTING V 1.15)

Several people have written in regarding the quad density PROM modification mentioned in issue V 1.7 some time ago.

In examining the TI disk controller manuals, it becomes obvious that TI did lay out the card & software specifications to accomodate future versions. For example, at address 004A - 004B is stored the value for number of sectors per disk. This word could hold a very large number (ie: FFFFFFFFFFFFFFFF)!!

The next byte 004C indicates the DSR version (0=nothing special, 1=version 2 DSR, 2=density & features for (new) DSR). The next byte 004D holds the drive #.

What is involved here is a change to the controlling software contained on two PROM (Programmable Read Only Memory) chips on the TI Disk Drive Controller (DDC). These are removed (they are the 24 pin IC's to the left of the 40 pin IC designated FD1771) and replaced with two custom EPROMs with a new Device Service Routine.

DOS80 then allows the use of 80 tpi (track per inch) drives in the system. You can obtain 1440 sectors of information on one side of one disk.

As the TI disk controller reads the timing byte in the console operating system, the transfer of information is synchronized with the system. This is similar to the method that Myarc uses with their disk controller to get QUAD DENSITY double-sided operation from their disk controller.

To utilize the modifications completely, Miener Martin also wrote an EPROM based disk manager (in GPL) for DOS80 which is contained on a special EPROM card in a command module. This approach works the same as Disk Manager II with additional features.

You have to select the 80 tpi format when first accessing the drive due to the fact that the PAB software stores certain information about drives in use. To start with a 40 track disk and later request a catalogue from an 80 track disk would return errors to the system.

To make this available would involve quantities of the DSR EPROM, English translation of the DOS80 disk manager and more instructions! We need to hear from more users who would like to see this project come 'out of the lab'. In fact, if this seems worthwhile, get a friend to write us as well. We'll see what can be done.

80 COLUMN update:

After a delay of approximately three months.

Mechatronic has produced the long awaited 80 Colum Display unit mentioned previously in MICROpendium, Computer Shopper and R/D Computing.

Want to see your TI "grow up"? This new display will knock your socks off! 'Other' machines have had 80 column cards available for years (another benefit of open information and architecture). It's about time that the powerful 9900 in your TI 99/4A had a graphics processor which takes full advantage of the system.

This device plugs into the I/O port on the right side of the computer. A small ribbon cable goes into the console to plug into the 9918A VDP socket. The interface cable plugs into the right side of the 80 Column Display unit (80CD). The circuit board is housed in a black metal case about 4" x 12" by 1" high. The reason this was done is that this allows ALL 4A owners to use this new graphics display board.

As noted previously, PE Box card designs have not come to fruition due to the fact that all the graphics information is not present out on the expansion bus. In our opinion, this format just works fine. The "modification" is a snap - no soldering or technical knowledge is needed. You simply open up the console, remove the 9918A, replace with the cable end and it's done. (If you're unsure how to accomplish the job, detailed instructions with clear diagrams are included).

Now for all the good stuff; the 80CD is compatible with all your TI 99/4A software running in '40 column' mode. This includes modules, cassette and disk programs. The 9938 chip supports all the original 9918A commands.

We've been testing this device to the limit. New software is being written as you read this. Information has gone back to Mechatronic regarding how many should be produced before Christmas 1986.

There is a waiting list. If you want an 80 Column Display Unit, to reach you before 1987, you must send us a firm order ASAP. Otherwise we cannot promise delivery anytime before first quarter next year.

Ryte Data; Box 210 Mountain Street; Haliburton, Ontario; Canada K0M 1S0; 705-457-2774

Speaking About Speech By Ron Albright (Genial Travler 1.2)

The more I read about the "new" developments and software for other machines, the more impressed or infuriated I become with Texas Instruments. Whether you realize it or not, TI was light-years ahead of the remainder of the home computer industry in virtually everything except, of course, consumer marketing and common sense. One of the features which remains the industry leader and is, at the same time, the most neglected and overlooked feature available for our machine is the Text-To-Speech access. With the speech synthesizer and the Terminal Emulator II cartridge (or disk-based Text-To-Speech program for XB), you have a feature unrivaled on any other machine. Sure, others have "speech", and some even boast "unlimited vocabulary", but if you have ever heard these facilities on another machine, you realize how far ahead TI was (and still is) in synthetic speech. What I would like to do in this article is give you an overview of speech synthesis on the TI and, hopefully, revive some interest in this incredible facility.

The chip used in our speech synthesizer is the TMS5220, a p-channel MOS device packaged in a 28-pin DIP. It is a second-generation speech chip, which followed the TMS5100 used in the Speak and Spell toys appearing in 1977.

While the TMS5220 is capable of all 3 types of synthetic speech (linear predictive coding, wave-form modulation, and phoneme-stringing), our machine uses the most memory-efficient form, linear predictive coding or LPC (but has the capability for allophone-stringing). LPC in our machine requires a small 3K memory to hold the 128-allophone library, 7K to accommodate the 650-rule TEXT-TO-SPEECH set for translating English-language text into allophonic equivalents and for contouring inflections with the help of pitch modifiers to help make the speech more natural. The allophone library and the rules for stringing them are held in the TEII GROM chips. The synthesizer holds the speech chip and the resident speech vocabulary (memory location >9000). The system is not perfect (as you may have learned hopefully by experience) but even with this small ROM requirement, TI achieved 92% translation accuracy. You can correct the remaining 8% with changing text.

Let us digress for clarity. Of what do we speak when we discuss allophones? Allophones are the most fundamental of any of the linguistic components, including phonemes, diphones, and morphs. An analysis of the English language shows that about 40 allophonic sound characteristics can provide the needed variations for all 45 standard phonemes. For example, the phoneme for the letter "p" in English is rounded and aspirated in the word "poke", rounded and unaspirated in "spoke", aspirated in "pie", slightly aspirated in "taper", released in "appetite". These acoustically different "p"'s -- so-called voiceless bilabial stops -- are allophonic variations of the phoneme "p". Thus, allophonic speech produces better quality than phonemics, because the allophones provide most of the subtle variations each English phoneme can encompass AND use each variation in the appropriate relationship. Phonemic speech sounds mechanical and is limited; allophonic speech is much better though still not perfect... the transition between allophones make the speech sound unnatural and intonations are characteristically monotonic. But allophonic speech is an ideal compromise based on size of vocabulary, memory requirements, quality

and versatility of speech.

So, knowing that we use an allophonic speech system, how does it work, in generalizations? Text, from keyboard input, is converted into the appropriate allophones, which are then converted into LPC data which activates the TMS5220 to generate immediate speech. Well, it's not quite that simple. For the text to be converted to the "appropriate" allophones, rules must be applied; 650 rules, to be exact. The rules, based on a U.S. Navy Laboratory system, are complex, to say the least. For example, in the process of translating the word "space", the allophone-stringing algorithm looks first at the "s" and supplies an initial allophone for /s/. But for the "p", it finds a rule where the left environment is an "s". Also, since the "p" is not a final sound, the algorithm translates the "p" accordingly. Next the rule is invoked that applies to an "a", where the right-sided environment consists of a single consonant and the word ends with a word-final silent "e". This rule selects the appropriate "long-a" allophone. Finally, the rule for 'ce' inserts an /s/ component in the allophone string to replete the 'c' in the text; the rule says the 'e' is silent. As we have stated, 92% of the time the rules work... not bad! Compound words give it problems, often easily corrected by hyphenating... e.g., "base-ball".

Not only does the TI system convert text to component allophones, it also, through the rule set, translates secondary and primary speech-stress points into pitch variations. Contouring algorithms divide sentences into two major stress profile types: a falling mode, where the pitch level drops following a primary stress point (as occurs in a normal sentence making a statement), and a rising mode, which occurs in sentences terminating in a question mark. This adds even more normal quality to speech. Remember how many times you have heard "Ready to start?"... notice how the pitch varies in a rising tone on 'start'.

So, all in all, it's a very complex system that TI engineers gave us. We have sparse but utilitarian documentation in the TEII manual. It discusses, ever so briefly, how to access both the text-to-speech via "OPEN #1: 'SPEECH', OUTPUT" and the allophone library directly, through "OPEN #1: 'ALPHON',INTERNAL". It also briefly defines the manual override feature to vary pitch and slope through the "//XX YY". This feature may deserve more comment.

You can vary greatly the pitch and slope of speech through the use of the //xx yyy command. I have heard a sparse few programs where the computer sings. Perhaps the most widely distributed is the "ABC SONG" seen in Tigercub Tips (Jim Peterson, Tigercub Software, 156 Collingwood Avenue, Columbus, Ohio 43213). Look at that program, and see how Jim changes the pitch and slope to produce synthetic singing. The key formula is one where the slope is calculated from the set pitch by Y(slope)=(X(pitch)/10). We are told in the manual (p. 34) that this gives the best results. So, by changing the pitch to simulate singing of notes and adjusting the slope through this formula, we can approach singing. Further, we can set stress points in our own text through use of " " (sets primary stress point in a sentence), "_" (sets secondary stress points within a sentence), and ")" (shifts stress points within a word). So, we need not rely on the 92% accuracy TI accomplishes with the rule set... in fact, we can achieve realism approaching 100% with symbols input manually within our text.

Through use of "OPEN #1:'ALPHON',INTERNAL" we can directly access the 125 alphons (but we said 127; 126 and 127 are pauses) in the TEII Grom library. They are listed in the manual with a rather Spartan description of their use. These alphones are strung together as CHR$ statements; CHR$(10)&CHR$(22)&CHR$(x).... Again, we are allowed to change pitch and slope through manual input, this time, by sending a CHR$(252)&CHR$(xx), where the CHR$ statement following a CHR$(252) sets a new pitch for us and by sending a CHR$(251)&CHR$(yy), where CHR$(251) changes slope to the following CHR$(yy). Stress points can be set with CHR$ numbers 253 (primary stress with rising contour), 254 (primary stress with falling contour), and 249 (secondary stress point). While you can change pitch and slope of allophones, the only way (I know of) to increase the duration of the sound is to string allophones, i.e., CHR$(N)&CHR$(N)&CHR$(N) to increase the duration of allophone "N" three- fold. A way to implement the RPT$ function in BASIC would do the trick!

The following program is a interesting application of what we have learned about speech and allophones. There are other ways to use the marvelous utility of speech. I hope we can revive interest in the easily accessible facility and incorporate its technology into more programs.

The program mentioned was written by Howie Rosenberg, of the TI Forum Expert Member Board. It reflects an innovative way to use speech on the TI... i.e., music and sound effects. It plays a musical theme through several different allophones which simulate (to my ear) everything from a a trumpet to a guitar. Try it out, and try writing some variations yourself!

```
100 CALL CLEAR
110 DIM ALL$(125)
120 PRINT "MUSIC TEST HOWIE ROSENBERG"
130 PRINT " (modified by Barry Traver)"
140 PRINT "Requires TEII & Spch. Synth."
150 PRINT " For you music men out there"
160 PRINT "this test is illustrative of"
170 PRINT "some sounds of which the TI"
180 PRINT "is capable. The sounds can"
190 PRINT "be mixed with CALL SOUND to"
200 PRINT "produce 4-part harmony with"
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210 PRINT "a variety of instruments as"
220 PRINT "the fourth voice."
230 PRINT " I'd be interested to see if"
240 PRINT "anyone out there does any-"
250 PRINT "thing with this, e.g., some"
260 PRINT "music, an editor, etc."
270 PRINT " Share your thoughts with"
280 PRINT " Howie Rosenberg"
290 PRINT " 19 7th Avenue"
300 PRINT " Farmingdale, NY 11735"
310 PRINT " (C.I.S.  74216,1640)"
320 FOR I=1 TO 125
330 READ ALL$(I)
340 NEXT I
350 OPEN #1:"ALPHON",INTERNAL
360 PRINT :" ALLOPHONE"::
370 FOR N=1 TO 16
380 READ N
390 GOSUB 500
400 NEXT N
410  PRINT :" Now _you_ try some! Allo-phone numbers
range from 1to 125.  In general, vowel"
420 PRINT "sounds (1-72) are more musi-cal than
consonant sounds(73-125)."::" Enter 126 to stop."
430 INPUT N
440 IF (N<1)+(N)126)THEN 430
450 IF N=126 THEN 480
460 GOSUB 500
470 GOTO 430
480 CLOSE #1
490 STOP
500 L=LEN(STR$(N))
510 PRINT TAB(3-L);STR$(N)&" ";ALL$(N)
520 A$=CHR$(252)&CHR$(21)
530
B$=CHR$(N)&CHR$(N)&CHR$(N)&CHR$(N)&CHR$(N)&CHR$(N)
540 C$=CHR$(126)&CHR$(252)&CHR$(16)
550 D$=CHR$(N)
560 E$=CHR$(126)&CHR$(252)&CHR$(11)
570 G$=CHR$(126)&CHR$(252)&CHR$(5)
580 I$=CHR$(126)&CHR$(252)&CHR$(54)
590 K$=CHR$(126)&CHR$(252)&CHR$(50)
600 M$=CHR$(252)&CHR$(48)
610 O$=CHR$(252)&CHR$(45)
620 Q$=CHR$(252)&CHR$(38)
630 S$=CHR$(126)
640                     ARP$=A$&B$&C$&D$&E$&D$&G$&D$
&I$&B$&K$&D$&M$&D$&O$&D$&Q$ &D$&S$
650 PRINT #1:ARP$
660 RETURN
670      DATA      _A_ddition,_A_nnuity,delt_A_,_D_n
time,_AU_tonomy,an_D_nimity,_E_limina
te,_E_nough,cont_E_xt,anci_E_nt
680    DATA   west_ER_n,synth_E_s_I_s,_I_nane,t_OO_k
on,d_O_nation,ann_U_al,_U_nique, _A_bove,instr_U_ment
690                                          DATA
_U_nderneath,ros_E_s,base_E_nt,seek_ER_,rati_O_,funn_Y_,h_A_t,h_O_t,h_
EI_ght,c_AR_t,h_OU_se,s_OU_ght
700                                          DATA
h_EA_t,p_IER_ce,s_E_t,th_ER_apy,t_A_ke,h_U_rt,_I_ssue,ch_OI_ce,c_OO_k,p
_OOR_ly,h_OR_se,b_OA_t,sh_OO_t
710                                          DATA
_HU_t,b_OO_t,h_A_d,_O_dd,h_I_de,c_AR_d,l_OU_d,s_AW,s_EE_d,h_EEL_,h_EAR_
,s_AI_d,th_ERE_,d_AY_,h_EAR_d
720                                          DATA
h_I_d,h_IL_l,th_IN_k,b_OY_,c_OU_ld,p_OOR_,c_ORE_,l_OW_,sh_OE_,a_U_d,sk_
ULL_,p_ULL,a_OO_n,_L_ike,bow_L_
730           DATA          awf_UL_           or
we_LL_,_M_ay,hu_M_,_N_ice,sa_N_e,thi_N_k,thi_NG_,_R_eal,_W_i
tch,_WH_ich,_Y_ou,_B_ad,da_B_
740                                          DATA
_D_ig,bi_D_,_G_ive,_G_o,ba_G_,_J_ug,bu_DGE_,_TH_is,clo_THE_,_V_ine,ali_
VE_,_Z_oo,doe_S_,a_Z_ure
750                                          DATA
bei_GE_,s_K_ate,_C_ase,ma_K_e,_K_ey,_C_ough,s_P_ace,_P_ie,na_P_,s_T_ake
,_T_ie,la_T_e,_CH_urch,_F_at
760                                          DATA
lau_GH_,_H_it,_H_one,_H_ut,_S_een,mi_SS_,_SH_ine,wa_SH_,_TH_ing,wi_TH
770                                          DATA
1,3,7,13,15,24,29,32,49,59,64,69,75,81,83,85
```

TI-99/4A MODIFICATION TO ACCEPT THE TIM 9904A CLOCK DRIVER by David Caron (Ottawa T.I.99/4A Users' Group v5.8 October 1986 newsletter)

To many of you, I am still a stranger, however I intend to change that. I will start with a brief explanation of the reason why I decided to write this article.

Last December I was an enthusiastic programmer, like most of you. However that drastically changed when my power supply broke down. This failure was due to an accidental short while I was modifying my console. Little did I know that this was only the beginning. After I finally replaced the power supply, I accidentally blew 9 chips on the mother board while attempting to repair my ancient TV-set (moral: unpolarized TV-sets to NOT mix well with computers). During the summer my teacher was so kind as to let me compare his functioning TI-99/4A with mine. Shortly afterward, I found myself trying to repair two TI's. Over the summer I discovered several interesting differences between my TI and my teacher's TI (I own a beige TI-99/8I while my teacher possesses a black TI-99/4A).

One of the differences was the fact that the black computer uses a TIM 9904 clock driver which is now obsolete (the only place you will find one is in another black console). However the beige model contains a TIM 9904A clock driver which is nearly identical to the TIM 9904 and which can be bought at Arrow Electronics for

about $17.00 (cheaper than another TI). I also happen to have one left over if anyone would like to save more money by buying a used clock driver. The difference between the two drivers are:

1. The 9904 (in the black console) uses a 48 MH (Mega Hertz) crystal while the 9904A (in the beige console) uses a 12 MH crystal.

2. The 9904 uses a 22 pF (Pico Farid) capacitor while the 9904A uses a 47 pF capacitor.

3. And finally, the 9904 uses a 0.33 uH (micro Henry) coil while the 9904A uses a 3.3 uH coil.

If by some unlucky chance your TIM-9904 gets blown sky high by your soldering GUN, TV-set, or other HIGH voltage devices, simply read on for step by step instructions on how to save your TI from becoming an addition to the garbage pile.

1. Remove the TIM 9904 which is mounted in a socket (thank goodness!, few of them are). The chip is the smaller one of the two which are smothered in sticky white stuff (the 9904A does not need a heat sink and therefore you will not have to ruin its appearance with more of the heat sink paste).

2. Desolder the 48 MH crystal from the board (warning use a soldering iron and a solder sucker). Replace the crystal with a 12 MH crystal. (What Radio Shack does not sell, Active Components will).

3. Desolder the 22 pF capacitor from the board and replace it with a 47 pF capacitor.

4. Desolder the 0.33 uH coil and replace it with a 3.3 uH coil.

5. Solder one end of two 0.1 uF capacitors to pin 10 of the socket (on the other solder side). Solder the other end of one of the capacitors to pin 13, and the remaining end of the other capacitor to pin 20 so you end up with two capacitors in series from pin 13 to pin 20, joined at the junction to pin 10.

6. Pop in the TIM 9904A into the socket.

7. Turn on the computer and congratulate yourself on your success.

NOTE: Do not take after me and make the modifications while your computer is turned on.

If by chance you are still curious as to what happened to the two computers I was attempting to fix, you will be relieved to know that I fixed mine in August and my teacher's in September after he had a chance to voice his thoughts about the shape his computer was returned in.

REVIEWS:

This column presents reviews of materials that may be of interest to the user. The views expressed are the opinions of the reviewers, exclusively.

The following was attained from Paul Meadows of Lower Sackville, Nova Scotia through TimeLine on October 25, 1986.

MYARC'S GENEVE
Who needs it? We do!
Scott Flinn Oct. 18, 1986

I have just finished reading The Orphan Chronicles by Ronald Albright. As advertised, it is a remarkable book which answers virtually all of the seemingly unfathomable questions left behind by Texas Instruments. Although I was never really bothered by being a computer orphan (I certainly don't remember where I was when I heard THE news about TI's departure from the market), I must admit to being extremely relieved upon finding the TI Nova Scotia (TINS) club. The mild but constant worries about blowing another power board (I had already blown one), or wearing out another cartridge port connector (I had already gone through three) were ended. This discovery coincided perfectly with my introduction to TMS 9900 assembly, and the answers, hints and advice I found at the club were invaluable (needless to say appreciated).

So what does this have to do with The Orphan Chronicles and Myarc's new computer? In his book, Mr. Albright makes it very clear that, although the TI community is currently thriving, we are all going to have to work very hard to ensure its continued existence. The two points he addresses most directly are, firstly, that we must actively pursue the production of hardware and software, either by producing it ourselves, or by buying it from others, thereby encouraging the talented programmers to continue; secondly, we must never become discouraged to the point where we may consider the possibility of getting a "better" machine. Toward the latter end, Mr. Albright strongly suggests that TI'ers forget about the prospects of a new compatible machine and concentrate on getting the most from their TI's. At this point I will be charitable, and will interpret Mr. Albright's remarks in a favorable way. I assume his reasoning is that if we allow ourselves to dream too much about a new and better computer, we may actually succeed in convincing ourselves that we actually need it. Once this happens, if the computer has not yet arrived (and Mr. Albright believes that one never will), then we may conclude that, since a new computer would be better, but a new TI compatible is not available, we must abandon TI and get a real computer like an Atari, or an IBM. This type of thinking could be very detrimental to the continued existence of the TI community, and Mr. Albright makes a noble and selfless attempt to warn people away from it. His most persuasive argument is the simple, almost rhetorical question "WHO NEEDS IT? WHAT CAN'T YOU DO ALREADY?". This question has already been put to me several times, and I must honestly say that it

stopped me dead in my tracks. My immediate response was "Well... um... ah... 80 columns. Yeah, that's the ticket, 80 columns! I need 80 columns." But try as I did, I was unable to think of a single example of an application which, though too demanding for the TI, could be handled by the new machine. Word processing, spreadsheet, data base, telecommunications, computation, sound, even graphics; in spite of the 40 column limitation, all are handled extremely well by the existing machine, with the most exciting software and hardware only now reaching the market. A good friend of mine - an Apple \\c owner - just recently phoned me, more excited than I have ever seen him, to tell me about the latest technological miracle from Apple. Apparently, Apple is about to release a new computer which, though not unusually better than their existing machines, will have truly unbelievable sound capabilities; a fifteen voice, fully interfacable synthesizer built right in to the computer. I almost didn't have the heart to tell him that such a beast has existed for the TI for about three years now (namely the FORTI Music System, driven with FORTH based software). Once the inanity of GPL has been circumvented, it becomes all too clear that the TI-99/4A is actually a very fast, very powerful computer. My own favorite passtime is comparing the raw speed of the TI with other machines (ie. number of integer additions, multiplications, comparisons, branches, block moves, etc. per second). It compares VERY well with all but the newest machines, such as the Atari, the Amiga, the Panasonic Executive Partner, etc.

With a language like FORTH available, Myarc's XBasic II plus 512K card, etc., the question "What do you need a new computer for?" is a very good one. But it can be answered! In fact, there are three good reasons. The first one becomes obvious if, instead of asking what can't be done now, one asks oneself what can be done now. My own applications have included extensive use of TI-Writer, TE-II and Fast-Term, self-written programs for inventory management (23,000 item inventory), yacht club handicap calculations and records, one and two dimensional function graphing, games of all types, and many others. Each and every one of these applications would benefit from the capabilities of the new computer. The 80 column advantage really is quite large, making word processing, telecommunications, and spread sheet software far easier to use. Self written data base applications would certainly profit from the far greater memory. These applications are obviously disk based, and require hours rather than minutes to perform simple tasks. The mathematical and number crunching programs would certainly benefit from increased speed, and better graphics would be a non-essential but much welcomed plus in this area as well. The second reason can be summed up quite simply: imagine what its potential will be! Who would have guessed when they bought their TI five years ago that today their little machine would still be capable of doing all of the things the "newer, bigger and better machines" are only now achieving? If you had asked someone four years ago "What do you want a computer for? What could you possibly use it for?", you can be certain that the answer would not have been "Oh, I want to use my FORTI board to play 'Chariots of Fire' in twelve synthesized voices", or "Well for starters, I'm going to set up a BBS, and then I'll use it to write The Orphan Chronicles in my spare time". One thing is clear: a new machine will be a better machine. It can only be better, because, while keeping the TI spirit, it will be able to do everything the TI can do now... and much more. Thus, if the TI was capable of so much, and still compares favorably to other machines four or five years newer, it is only reasonable to expect that a new machine, when pushed to its limits, will do things that we can't even imagine now, because nothing else can do it yet. While on the surface, Myarc's claim of a machine "2-3 times faster" is not particularly stunning, once you realize just how fast the TI is now (when GPL is not used and the program is not graphics intensive), it becomes clear that the speed will only be equalled by the best of the modern machines. Its graphics, according to the description of the V9938 video processor given by Ryte Data and others, will be unquestionably better than any computer less than six times the price; and it has more internal memory than any small business is ever likely to need. Definite answers can not be given now as to what will be done with the machine that can't already be done. Only time will tell what will be produced when a machine with such capabilities is pushed to such limits as only TI'ers have had the need to achieve.

Finally, we must all at some time face the hard fact that, although the TI-99/4A is a phenomenally durable creature, it cannot possibly live forever. We are faced with two scenarios. Firstly, we can all be content in the knowledge that what we have now is a small piece of quality that will serve us unerringly for many fruitful years. With the products now available, and those that are undoubtedly waiting in the wings, we can build our systems to a point where the choice to obtain an upgrade would be a matter of taste, not necessity. Further, there are those among us who will always be content with what they have, for whatever reason. If a person uses powerful computers at their place of employment, having something at home that plays reasonable games and calculates square roots accurately may well be all that is ever desired. However, no matter how powerful the peripheral system becomes, the fact remains that the computers themselves are not being manufactured. Eventually they will wear out, as everything must, and with the heart removed, the system will be useless. All but a determined and clever few will write off their investments as worthwhile, but expended, and will either

get the newest computer currently offered, or will leave the computer world entirely.

The second scenario includes the fact of a new computer. It would be nice if, when the heart of powerful system dies, it could be replaced with something equally good; a point which I believe is common to us all. But it makes even more sense to replace that heart now if the replacement brings with it all of the peripherals. It is certainly true that a TI with a 512K expansion card with RAM disk capability, the new eighty column card or the V9938 video processor installed on the mother board, cartridge software that permits direct use of the expansion RAM, and a number of compiler languages such as FORTH and 'Small C' as well as Myarc's "better" Extended Basic would probably be roughly as good as the new machine (note that not ALL of these features exist yet). But does it not make more sense to spend the same amount of money, perhaps even less, to get all of this rolled into one package, particularly when it replaces some of the most easily damaged and uneasily repaired parts of the machine such as the keyboard, cartridge port and power supply? And when we are guaranteed, at least for a little while, that such an upgrade will be supported by a manufacturer who has plans, however questionable, for IBM compatibility, a complete C language, and who knows what else? Perhaps the most reasonable thing of all, however, is that, while the TI community can not possibly be hurt by a better computer with a high degree of compatibility, it will be helped enormously, to the point of its very survival. The TI is now heading toward a dead end. Myarc is offering a chance, however small, for the TI legacy to continue in the face of a competition whose strength grows geometrically. When Mr. Albright made the remark that we should dismiss the idea of a new computer, he was working under the assumption that such a computer would never be produced, and that thinking about it was an unnecessary temptation. The chance of a new computer appearing is now quite high (reliable rumor has it that the machine is finished and will become available as soon as the documentation is complete), and we must begin thinking about what we will do should it arrive. Naturally not everybody is going to either want or need such an upgrade, and there should be no pressure to make the switch, particularly since the TI is, after all, quite adequate. However, the pioneers among us, new and old, must be willing to do our job as thoroughly and with as much commitment as we possibly can. It is up to us to see that the Myarc computer survives so that in the coming years, as TI systems begin to falter, it will in turn be able to ensure that the TI community survives. With so many disappointments in the past, it is easy to be bitter toward rumors of a promised land, but we must not deal ourselves the final blow by turning our backs on the only opportunity Fate is likely to offer.

The following was attained from the Ottawa Users' Group November Newsletter.

A Review of Joypaint 99 by Bob Boone.

Sorry folks; you want an impartial review, this isn't it!

I sell the program AND I like the program!

Joypaint 99 is an icon driven graphics package written in machine language and marketed by Great Lakes Software, 804 E Grand River Ave, Howell, Michigan 48843

I highly recommend it and suggest that if you want it, you also want Joypaint Pal as well. Joypaint 99 lists at $39.95 US and Joypaint Pal lists at $9.95(add $3 for shipping) or is available from me for $50 CDN and $12(add $3 for shipping) respectively.

The program has many nice features of both GRAPHX and TI-ARTIST and some that neither of these fine have. In many respects it resembles MacPaint on the Apple MacIntosh machine.

To select a draw option simply put your cursor over the selection desired, press the fire button and its yours. Options are always visible at the left of your screen or across the top of the screen as well. The two most exciting options (not available elsewhere) are UNDO and AIRBRUSH. Undo will cancel the effect of your last command to the program. If you do a fill and it 'bleeds' into a part of the picture you hadn't intended it to, you can now undo the damage instead of starting from scratch. Airbrush allows you to 'lightly paint a pattern into your picture'. Each pass over an area 'drops more paint', so to speak and the pattern becomes more and more clear each pass. A delightful effect long awaited for by me, for one.

With Joypaint-99, you can load, save, catalog, delete and print files to I/O devices(drive and printer). You can 'zoom' with FATPIXELS and see the effect on your picture at the same time! INVERT, CUT, PASTE, MOVE, COPY and MAGNIFY are only some of the additional options available. Draw circles, squares; connect lines; clear parts of your pictures or the whole 'page' and even more exciting SCROLL your picture too.

With Joypaint Pal you can load and save files from/to TI-Artist and Graphx and you also now acquire the ability to REDUCE sections of your pictures.

Bob Boone operates Computer Download Unlimited (CDU) from 25 Ottawa Street; Arnprior, Ontario; Canada; K7S1W7; (613) 623-7841

HELPFUL HINTS AND TIPS!
(FOR THE USERS, BY THE USERS!)

This column features tips brought to my attention from members of this group. WARNING: These hints and

tips are to be used at your own risk!

DISK DRIVE ALIGNMENT
by Rick Lumsden

I recently purchased a used Tandon TM-100/2 drive from a fellow that had claimed that one head was giving problems with read and write on side #2. I figured for the $25 asking price I would buy it and try to repair it and if not I would use it as drive #3 in SSSD. When I hooked it up it did not take long and I found that it indeed was giving some problems, however they showed up on both sides. I loaded up a Disk Fixer program and proceeded to read each sector jotting down the bad ones in the process. After that I tried the same thing again but to my surprise, the same sectors were not erroring. I then started to check the drive out further but could see nothing mechanically amiss. Back to the Disk Fixer and now the drive refused to work at all. It made a very quiet noise when the head attempted to step, but I could no longer access anything. I now had visions of $25 floating out the window. Figuring I had nothing to lose, I then tore into it with a little more determination. Watching the heads when trying to access sectors showed the head was not moving at all. I then came to the conclusion that the stepper motor was at fault. I also knew that removal of the motor meant tearing the entire drive apart and thus throwing it hopelessly out of alignment. I removed the stepper and could find nothing wrong but did notice the shaft that connects the stepper to the head was loose. Now I was sure I had found the problem but knew I was going to have to spend a few more dollars to have it re-adjusted. I phoned a few local companies about their alignment rates and got prices ranging form $45 to $120. After spending $25 initially, I was not about to sink some more cash into the drive when I was not 100% sure I fixed the problem. Well, out with the Disk Fixer again, and to my amazement, I could access sector 0 an 1 but no further. I loosened off the adjusting screws and continued to adjust the heads until I could read all sectors. This is by no means a 5 minute job but it does work. Now I just set the drive speed with the method I had written about in an earlier newsletter and hooked the whole mess up again.

It has been two months since I did that and have yet to have any problems with that drive. I know it is not perfect but the price was right and if it continues to work well I may spring for the alignment yet. As I said this is not a job you would attempt with to do in 5 minutes but about 1/2 hour worth of fiddling can save you a few dollars. I have since built up a box and power supply(using one of those surplus TI console PS's), used a disk head cleaner on it and set it up beside the PEB as drive #3.

HIGH RESOLUTION MONOCHROME FOR YOUR TI

by Rick Lumsden

I was talking to Paul earlier and he had mentioned an article in his newest Ryte Data newsletter dealing with substituting the TMS9918A VDP chip with the TMS9928A. I had purchased this chip locally a few months back with the hope of an article dealing with this change. I had the spec manuals for both chips and to me it seemed they were indeed very similar with only three pins different. The 3 that were different were #35,36 and 38. Looking at the console schematics I found that 35 and 38 were not used anyway and 36 was the composite video out. The pins on the 9928 output a yellow, blue-yellow and red-yellow from the 3 pins mentioned. The VDP manual also showed a circuit to take these outputs and convert them to a composite or RGB signal. I didn't have the gumption to attempt the circuit construction so I put the chip away until Paul came up with his newsletter in hand and prodding stick in the other.

The article said that one could just remove the 9918 and replace it with the 9928 with no other mods. I tried it and was pleased to see a very sharp picture when I powered up, albeit in black and white. I then thought, since this is the luminance(black and white) signal and my Commodore monitor has a luminance jack on the back side I would try it there. The result was FANTASTIC!!!! I have never seen text so sharp on the TI. I loaded up Funnelwriter and changed the default colors to white on black and the result is superb. The actual modification is extremely simple since the 9918 is already socketed and all you do is remove it and replace with the 9928. Again this negates any color, but if you use your TI for Word Processing, Spreadsheets or with Terminal programs, this is one mod you will love.

The following appeared on TimeLine which was posted by Rick Lumsden (RICK.A1612).

Here is an idea for the hardware hackers out there. I was going through the manual for the 9918,9928,9929 series of VDP chips and came across something I found that may offer some interesting possibilties. The 9918a (used in the 4A) has an external VDP input on pin #35. This pin is not used on the 4A and is intended for cascading VDP chips but it also mentions input from Video Disk, VCR, etc. I tried hooking my VCR directly to this pin but all I accomplished was a system reset. The manual also mentions a matching circuit so maybe that is all that is required, I don't know. The possibilities are endless if this can be made to work.

The 9918a sets up the screen in the following order. Backplane set to black. This is why you see black when

you use a CALL SCREEN(1). Next is the external video. This is where the pin 35 input would be displayed. Then the Backdrop plane which is the border you see around some screens. Then comes the pattern plane where all the stationary graphics are. The other 32 planes are your sprite planes. It seems to me that if you were able to use the external VDP, one could input pictures from a VCR camera, or a Video Disk player and then use the upper planes for computer generated graphics. Talking with Paul Degner (PAUL.A156E), he mentioned using the VCR camera and then dumping the resulting screen to disk. In effect a picture digitizer. I'll throw the ball in the court here because I do not have the necessary electronics background to go any further. For all I know about electronics, this may all be impossible but it does look promising.

The following appeared on TimeLine which was posted by Terry Atkinson (TERRY.A147E) of Dartmouth, Nova Scotia in regards to Rick's question.

Rick (and other interested souls):
I can't remember where I got this from, but it may help in your quest for a (possible) digitizer. Begins:
Question: Is it possible to utilize the External Video input on the TMS9918A?
Answer: Yes, it is possible on the 4A, because the VDP 9918a has an external video input which puts the external video as the background. You need to interface your external video to the 9918a input pin 35 on the chip. The external video signal must be synced to the 9918a by way of a genlock to its crystal frequency and the signal must be of the same amplitute as the 9918a's composite video signal. Also your title program must enable the external video to be visible by setting bit 7 of register 0 in the 18a to 1 and the backdrop color (vdp register 7 lower 4bits) should be set to transparent 0.
Hardware is required. If you try everything above without a Genlock you will see what you expect except your background or external video in will will drift and wave.
By the way if you want to hook up two 4A's video together you can do without a Genlock by disconnecting a crystal in one the 4A's and hooking that 4A's crystal input to the other 4A's crystal. Then connect one composite video out to the others' external vdp input and the others composite video output is used. Also, reset/sync pins(34) of each 18a should be conected together. These instructions are almost verbatim from the 9918a VDP data manual from TI.

The following appeared in the November issue of MICROpendium in the User Notes section.

Joe Nuvolini, Sysop of the Villa...TI electronic bulletin board (303-574-2567) in Colorado Springs, Colorado, offers the following suggestions for users of Paul Charlton's Fast-Term:
From time to time people have had difficulty during disk access on certain BBS's during 300 baud XMODEM downloads with Fast-Term. I know the problem arises sometimes on my Techie board. Paul Charlton made a patch to correct the problem and I finally located a copy of it. The only problem I encounted in making the correction is that I found the bytes that needed changing in the same sector but at a different address. Additionally, the original code was slightly different. In mine I had to change bytes 82 through 99. The original version is printed first, followed by my version.
Implementing this patch to Fast-Term V1.16 (and perhaps other versions if the problem is present) will allow users to download files longer than 40 records from BBS's. Edit the second program image file (UTIL2 for most users), sector No. 22 (21 if you start from 0), starting at byte 74.

Vers 1	Vers 2	Change to
74 C020	82 C020	0221
76 CCCE	84 CCD0	FF00
78 1303	86 1303	9801
7A 0201	88 0201	D0B3
7C CFDA	8A CFDA	1603
7E 10E1	8C 10E1	0620
80 0221	8E 0221	D0B2
82 FF00	90 FF00	1003
84 9801	92 9801	0201
86 D0B3	94 D0B5	CFDA
88 16F8	96 16FB	10DC
8A 0202	98 0202	0202

Do not make these corrections to your original Fast-Term disk. Copy the UTIL2 file to a newly initialized disk and make the changes using your favorite sector editor. Copy the remaining Fast-Term file to this disk and try to download with it before copying the corrected file to your working copy of Fast-Term. I tried my modified version at both 300 and 1200 baud on a file that was 64 sectors long and it worked just fine.

MICROpendium is a monthly magazine devoted to the TI-99/4A. Subscription from Canada costs $20.50 US. Mail to: MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

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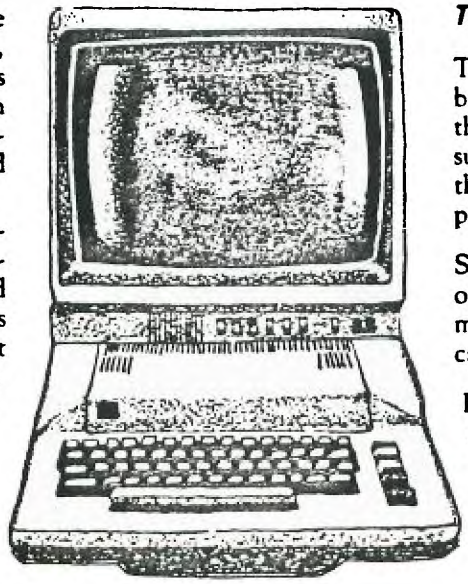

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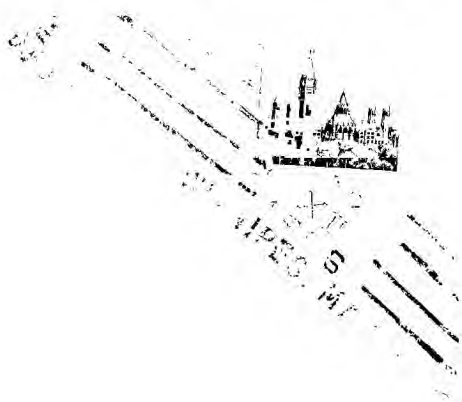

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