



**AN EXTENDED BASIC DV80 FILE SPEAKER BASED ON TI'S
TEXT-TO-SPEECH**
by Charles Good
Lima Ohio User Group

Save time! Why not let the computer read this newsletter to you while you do something else useful at the same time. The Lima User Group and some other user groups offer their newsletters in DV80 text file format. Stephen Shaw of England once wrote a TEII/TI BASIC program to speak bible text files. I decided to write a program that will speak any DV80 text file without the necessity of using the TEII module. All you need is TI's TEXT-TO-SPEECH (ENGLISH).

In 1984 TI released TEXT-TO-SPEECH (ENGLISH) and most of its other disk based 99/4A software to the public domain. T-TO-SP has all the capabilities of TEII speech, but runs out of extended basic. The only disadvantages are that T-TO-SP takes about 1.5 minutes to load and it more or less fills the entire 32K memory expansion. This somewhat limits the size of any XB program that uses T-TO-SP. Besides the obvious advantage of not having to remove the XB module, T-TO-SP can use XB's LINPUT command to safely include quotation marks within strings of text to be spoken without crashing the program. Any attempt to use TI BASIC and the TEII to speak text from a DV80 file that includes quotes will crash the program.

I find it interesting that neither the TEII book nor the T-TO-SP docs mention the fact that you can't use lower case letters in your "text to be spoken" strings. Lower case letters are pronounced one letter at a time and not converted into words. I had to include some code to convert lower case letters (ASCII 96 and up) to their equivalent upper case ASCII codes. This translation of ASCII codes slows down program execution somewhat.

The program is simple to use. Just type in the DSKx.FILENAME of the DV80 text file to be spoken when prompted. The program reads in a text record (same as a TI Writer line), displays the text on screen, and speaks the text. The next record is read in from the file, displayed and spoken, etc. If a sentence is split between several records (TI Writer lines), annoying pauses in speech will occur as each part of the sentence is read in and converted to upper case. Other than this, the speech is pretty good. Deliberate misspellings to improve phonetics and the use of inflection symbols in the DV80 text file can further improve understandability of the resulting spoken text.

My program below and all necessary TEXT-TO-SPEECH files are available to members of the Lima User Group on disk 7328

of the Lima UG software library. The software and all necessary TEXT-TO-SPEECH files are also available on the electronic editions of this November 1992 Lima newsletter posted on GENIE and on the C.O.N.N.I. Newsletter Article Clearinghouse BBS.

90 ! by Charles Good, August 1992, based on ideas of Stephen Shaw. Requires TI's TEXT-TO-SPEECH, Extended Basic, and speech synthesizer.

```
100 CALL CLEAR :: CALL SCREE
N(5)
110 DISPLAY AT(6,1):" DV
80 FILE SPEAKER"
120 DISPLAY AT(12,1):" Pleas
e wati, loading TI's
```

```
TE
XT-TO-SPEECH data"
130 CALL INIT
140 DISPLAY AT(18,1):"
COUNTDOWN-- 4"
150 CALL LOAD("DSK1.SPEAK")
160 CALL SCREEN(11):: DISPLA
Y AT(18,1):" COUNTDOWN
-- 3"
170 CALL LOAD("DSK1.XLAT")
180 CALL SCREEN(14):: DISPLA
Y AT(18,1):" COUNTDOWN
-- 2"
190 CALL LOAD("DSK1.SETUP")
200 CALL SCREEN(4):: DISPLAY
AT(18,1):" COUNTDOWN-
- 1"
210 CALL LINK("SETUP","DSK1.
DATABASE")
220 DISPLAY AT(18,1):"
ZERO!!"
```

```
230 CALL SCREEN(16):: PRINT
: : : : : " DV80 FILE S
PEAKER": : : : : : : : : : :
: :
240 INPUT "DSKx.FILENAME ? "
:C$
250 ON ERROR 430
260 CALL CLEAR :: CALL SCREE
N(11)
270 OPEN #1:C$,INPUT
280 ON ERROR STOP
290 LINPUT #1:A$
300 PRINT A$
310 FOR T=1 TO LEN(A$)
320 A=ASC(SEG$(A$,T,1)):: IF
A>96 THEN A=A-32
330 B$=B$&CHR$(A)
340 NEXT T
350 CALL LINK("XLAT",B$,C$)
360 CALL LINK("SPEAK",C$,43,
120)
370 B$="" :: IF EOF(1)THEN 3
80 ELSE 290
380 CLOSE #1 :: CALL CLEAR :
: CALL SCREEN(9)
390 PRINT : : : "READ ANOTH
ER FILE? Y/N"
400 INPUT D$
410 IF D$="Y" THEN 230
420 END
430 CALL SCREEN(1):: CALL CL
EAR :: DISPLAY AT(12,1):"
FILE NOT FOUND" :: INPUT "
Press <ENTER>":D$
440 RETURN 230
```

****DONE****

TI-WRITER MANUAL STILL AVAILABLE DIRECTLY FROM TI

Member Ellen Kramer writes: "I recently had reason to call 1-800-TI-CARES for a TI Writer manual. The cost of this manual was \$1 plus tax (varies from state to state) plus shipping of \$1. Total for me was \$2.06.

****DONE****

***** TI-101 *****
OUR 4/A UNIVERSITY

by Jack Sughrue
Box 45Y
E. Douglas MA 01516

#6 THE COURSE TEXTS

In order for you to pass this course, Class, you have to have a decent working knowledge of the texts. Now, here is where we practice lots of flexibility (which, you may have noticed, abounds in this classroom). There are so many wonderful texts (and a few dogs) available for our TI, even now, that you should consider at least three for essential reading and the final projects. These will be worth one-third of your entire grade.

By texts I mean textware: the printed materials for your TI's. These would include your very best source, of course: the newsletters that come with club membership. This newsletter networking is THE BEST SOURCE of all because you are part of a group, even by long-distance mail.

Another essential source of educational and survival materials is the magazine devoted to your specific computer. There have been many, but there is only one left: *MICROpendium*. It's the only international source for all things (including advertisements) TI or Geneve. To own and use your computer to the fullest extent and not subscribe to *MICROpendium* is like owning a marvelous pair of eyeglass frames but not getting around to putting the lenses in so you can see properly. The subscription (from P.O. Box 1343, Round Rock, TX 78680) is only \$25 per year. Tiny price to keep your great computer great.

The third source is what we're discussing today, Class. And, yes, Ms. Bronte, this will include references to adult learners as well as to children.

The third source is the texts available. Note the word "available," Class. Availability of text written a decade ago may seem impossible, but not so. Most user groups have extensive libraries of texts for long-term loan. Individuals within groups sell off their text materials often. Such text materials can be found very inexpensively at every TI fair in America and Canada. And, again, *MICROpendium* lists agents and individuals from whom you may purchase lots of printed materials. For example, if you all look up here for a moment. I am holding the latest copy of THE magazine. Those up back can't see it, so I'll read it to you. "99-cent Book Blowout!" It's a publisher's clearance. You can buy books at 99 cents each. These include the following: THE ELEMENTARY TI, GAMES TI'S PLAY, COMPUTER PLAYGROUND, PROGRAMS FOR THE TI COMPUTER, USING & PROGRAMMING THE TI, INTRO TO ASSEMBLY LANGUAGE, and Volumes I & II of GAME WRITERS PACK and STARTER PACK, both packs from England. Some come with disks and/or cassettes at additional charges. But the point is this: these are still new books that cost on the average \$12-plus when they first came out. They are still the same good books, still new to anyone who has not read and used

them, and still available at almost giveaway prices. Not all ten of these books will suit every learner, but there is certainly something for everyone included in this collection. And that's just from the TEXCOMP ad (P.O. Box 33084, Granada Hills CA 91344; Phone: 818 366-6631). There are other advertisers in classifieds that also offer all kinds of text materials. So, Class, the stuff is available to anyone who wants it.

And did I mention Barry Traver? No? Wow! How is it possible that we are practically through this semester on such an important topic as the TI-99/4a computer and I did not mention its greatest advocate, the man who has done as much for the TI as any spokesperson for any organization that I know of. Rather than list all Barry's writing and speaking and programming efforts, his work on BRS's and for various magazines, his appearances at numerous fairs, I will just mention the relationship he has to the present topic, though I'm not sure it might be better saved until we discuss things next class. Ah, well, what the hell. Barry has a wonderful educational tool in the form of a diskazine. This diskazine is called GENIAL TRAVELER. The "zines" have been nothing short of remarkable. Volume after volume have been rich with educational wonders and remarkable, big bonuses. You have to experience GT to appreciate the jam-packed series. There's nothing like it.

Though I've given you Barry's address in a previous class, I'm well aware that some of you have not taken careful notes. Barry can be reached at 935 Green Valley Drive, Philadelphia PA 19128. I think when you send off for your magazine subscription today, you should also send a note to Barry asking about the cost of the numerous disks in his volumes of great materials.

What made me think of Barry is that one of the disks includes the second most complete list of all TI publications there ever was. A little synopsis goes with each. The first most complete list was in a series called NEW-AGE/99 by some old geezer from Massachusetts. I can't think of his name now, but I'm sure you can find references to him when you go searching through newsletters. He did a lot of reviews, too, but I think he approached things more from a visceral level than an intellectual one. Anyway, Barry's your better source here because of all the other things contained in the GT disks.

Now where was I, Class? Oh, yes, texts and tests. You'll be having some of this on the final, so wake up in the back, stick your gum behind your ears, and listen up! With your pencils.

Before I go any further, TI-ing or otherwise, I have to insist you get your hands on a copy - any copy - of THE SECRET GUIDE TO COMPUTERS by a bizarre and hilarious genius by the name of Russ Walter (22 Ashland Street #2, Somerville MA 02144-3202). This 8X11, 600-plus page, mindbogglingly wonderful book for layman or technowhiz is bursting at the seams with all you'll ever need to know about computers. Now in its 16th edition, it's a steal at \$15, but if you order two they are \$12 each. Four or more are \$9 each, shipping

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and taxes (except Massachusetts) included, so hook on with some friends or your user group. Once you have this remarkable and remarkably readable book in your hand (considered the world's top-rated tutorial by a list of experts and novices as long as your arm and a lot longer than mine), you will never again be the same; nor will your computer. You simply have to experience "Russy-poo" in order to understand that this is THE essential book for any person who owns a computer.

That aside, let's look at some very specific educational text materials for our TI.

First, there's a problem. When we talk educational text material, we must eliminate the modules and anything related to LOGO, as we will deal with these educational items on a particular basis in future classes.

Second, we must define educational in the specific context with which we have been structuring these classes. That means we really have to eliminate the "learning" that comes only from learning about the computer. Texts that teach us how to write programs, for instance, or texts that teach us how to balance a budget using our wonderful machine, are not really appropriate here, but typing in programs that specifically deal with education DO fit our class requirements. For example, the C.W.Engel book STIMULATING SIMULATIONS FOR THE TI-99/4A published in various forms from 1977 to 1984 by Hayden Publishers, was the first important educational tool for me. Not only did it have detailed instructions and flowcharts for each of the type-in programs, but it had enough errors from translating the programs from other computers to the TI that the intellectual puzzles of figuring out what went wrong and correcting it were wonderful educational opportunities. Many of the programs were "intellectual" games, rather than arcade. Later, with toots and whistles, they became more "arcadey" in other people's books, including other Hayden books. Hayden published the most TI-specific books. I wish they still did.

Ah, well. STIMULATING SIMULATIONS, though, is not the kind of text we need to locate and use for educating our youngsters and new oldsters.

The best book of the learning to program type is KIDS AND THE TI-99/4A, which also leads to some educational programs, too. It's the clearest, most direct, easiest "programming" book. Done in 33 lessons, it is still used in many classrooms today; not just with TI's but with other computers, also, and at very young grade levels. THE ELEMENTARY TI, mentioned in that TEXCOMP list earlier, is probably the best of that sort for adults.

But the kind of books which best exemplify the educational aspects of the programs typed in - in other words, the LEARNING FUNCTION - are the ones I'll hold up, now and give a say a word or two about. Another one from the TEXCOMP 99-cent list is COMPUTER PLAYGROUND (Datamost's TI version). Although this can be classified as a beginner programming book, it is so unusual that the logic it teaches in an incredibly entertaining way makes it a real winner for any learner. (It's geared for Grades 2-7.) The book is a combination workbook/coloring book and deals with BASIC in

such a puzzle-solving way that it becomes, itself, a complete course in thinking. It stands alone.

This is not to be confused with TI PLAYGROUND by Fred D'Ignazio, another Hayden book. Fred also wrote a similar book called TI WONDERLAND. Both books include programs written by students, and ALL the 40-plus programs are written FOR students. Each chapter is an educational game that is introduced with a section for parents and teachers and another for kids. Each game has one educational feature (such as subtraction) and follow-up activities that allow an almost unlimited number of modifications. The programs aren't just alphabet and number programs. Because it's a TI, the computer is able to have programs that teach color and music and drawing and hand/eye coordination very readily through these marvelously childlike and truly sophisticated programs. Very easy to type in and change all along the way. Lots of very positive rewarding, too.

Lest you think Hayden was the only publisher for TI - though I'd recommend you seek out their other books - there were many others, as you can see from these piles on my desk. Take, for example, TI GAMES FOR KIDS put out by COMPUTE!, one of the very best publishers of TI stuff, including Regena's two classics.

TI GAMES FOR KIDS proclaims its purpose right on the cover here: "Turn your TI into a teacher. Thirty-two games that teach and entertain, ready to type in and run."

This book takes the trouble to identify each of its activities by age level (3 to 17/adult) and educational function and subject: strategy, logic, memory, coordination, language arts, social studies, math, etc. (Strategy games include an excellent version of Fox and Geese, by the way.)

As I look over these other books, it's hard for me to say which I would recommend the most for educational use. I have a public school teacher friend who still uses the TI in his class. His favorite educational book is TERRIFIC GAMES FOR THE TI99/4A by Hal Renko and Sam Edwards. Let's see, this is published by Addison-Wesley. It has small size and type but is plenty thick. It contains some neat little drawings, to which you people up front can attest, for the 30-plus games. There are some unusual ones here: Genius at Work, Escher, Rainbow Square Dance, The Wolf and the Five Little Goats, Shakespearian Shuffle, Mini Mancala, and so on. Good stuff.

Remember, now, most of these are not made to be super arcade games. They are made to be typed in - usually with lots of explanations and helpful hints - and are meant to teach something while entertaining. And they do that well.

One of the most popular books ever of this sort was (and is) Steve Davis's PROGRAMS FOR THE TI HOME COMPUTER, self published in large 8X11 format. Although the type-in programs included many utility programs, the majority were educational or verging on the educational (like "Bar Graph Printer" and "Talking Calculator," for examples). There are very few people who did not get hung up on the probability game like "Ten-Up" and "Lucky Seven" or the maddening "Echo" of Simon fame. He even has a "French Teacher" program and a "Speed Reader." One of the best.

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Scholastic book publishers released a pile of multi-computer large format books, each containing about 40 programs for elementary school children to type in and use. Here's an example: COMPUTER OLYMPICS. Each of the books has a theme. This one is all Olympics. It opens with the torch that lights the Olympic Flame. There are programs that teach words in various languages; some that let you recall other records; some that require some math skill (like the weightlifting one) or word skill (like the rowing one). All are simple to type in, no matter what your computer, if you follow the rules on the various basics, and all are simple to execute. Actually, with the built-in motivation of the Olympics in Spain, this book on summer Olympics is perfect for teaching at home or school. Look into the other Scholastic books, too. They also teach you lots about the various basics, if you want to do some explorations. With the TI, though, you can easily slip in some color and sound not readily available on other computers listed in these books.

Because our time is running short and we only have a couple more classes this semester, I've got to finish off with these last two books, but, as you can see, I haven't even been able to talk about all these others in these piles. At the last TI fair I went to, I picked up additional copies of 19 different titles of TI books! (And paid a grand total of \$15, by the way.) Now everyone will be able to take two and give a two-minute review of each next time. You may come up and sign out two (or three, if you're interested in extra credit) to do for your reviews and your end-of-term projects.

Meanwhile, let me just mention these last two books. If you can get yourself a copy of Richard Mow and Ron Mumman's ACADEMIC TI, do it; even if you have to pay the full \$12.95. It's worth it. Published by Reston in 1984 (one of the newer books mentioned today), it was one of the few books totally devoted to TI as an educational tool. It told parents and teachers how to get the very most out of our computer EDUCATIONALLY. When you read the articles and do the worksheets and explore the options from modules to disks to LOGO to word processing and so on, you will be astounded at how magnificent our machine is and how out-of-date it isn't. It still does all the educational things it was geared up to do better than any other machine out there. Which is not to say it is as sophisticated as some of the biggies, but what it does educationally it still does better than anyone.

And the last book. Remember this, anyone? Ah, it's good to see so many hands up. THE BEST OF 99er is still around a lot of fairs and user groups. It's 368 8X11 pages are jam-packed with all the goodies that made the 4a the prize goodie of all. And Regena was really kicking up her heels in this one. Do you recall "Name That Bone" and all the Homework Helpers? The Computer Assisted Instruction was so popular with the TI then, the term was simply CAI. And everyone understood it. There was so much of it around for parents, teachers, and other kinds of humans. The BEST OF 99er is one of the very best.

So, Class, unless there are any questions, come and sign up for your books and ... Yes, Mr. Shakespeare? What do I

consider the Mother of All TI Books? Hmm. Well, my personal favorite for more reasons than I can begin to list, including some super educational reasons, has got to be Paul Garrison's THE LAST WHOLE TI99/4A BOOK: PROGRAMS AND POSSIBILITIES, published by Wiley Press in 1984. Even after all these years it is still my preferred TI piece of textware. It's 460 pages are lucid, witty, intelligent, relevant, and very worthwhile. The tutorials and the programs are excellent. They DO provide unlimited possibilities for growth. I never loan out my only copy of that one. Sorry.

Until next time then. Don't forget to bring your book reviews and all of your modules.

****DONE****

WHAT SORT OF NEW HARDWARE DO TI OWNERS WANT?

Jim Krych, ASGARD's director of hardware development, has informed the Lima US by phone that ASGARD plans to develop and market exciting new hardware for the 99/4A and Geneve. He emphasizes that ASGARD will NOT discuss specifics of future hardware development until products are actually ready for shipping.

Jim is asking for feedback from the entire TI community on the following questions:

- 1- What sorts of hardware would you like to see available for our computers?
- 2- What kind of software would you like for use on this hardware?

Jim suggests that MEMORY WILL NOT BE A LIMITATION for the potential new 99/4A hardware and software.

Please send your suggestions directly to:

Jim krych
802 Barry St.
Corpus Christi TX 78411

****DONE****

LETTER TO THE EDITOR FROM ALEXANDER HULPKE A TECHNICAL DISCUSSION OF CRU ADDRESSES

Gulpener Strasse 11
5100 Aachen
GERMANY

Dear Charles,

Since I'm working at the moment on my diploma thesis, I have not found much time to spend with my Geneve and this will most probably continue at least till the end of this year. The next months I have to learn for the diploma examinations.

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The real reason for this letter is the article of Joseph Cohen in the October 1992 issue of BB&P. When dealing with the CRU addresses one should say some words about the why of the arrangement of these addresses. For normal peripheral devices there is no need for a special CRU address (unless the DSR is written -a short thought- in an address specific way). There are just two requirements that must be met:

A) Different devices must be placed on different CRU addresses. This is due to the fact that the device is accessed via its address and confusion would arise soon otherwise. The software decoding feature implemented in the TI forced (at least) 128 CRU bits per device, though I know of none needing more than 20-30 bits. The first bit (the CRU base address) is a device switch. When set, the ROM of the card is mapped at >4000 - >5FFF in the CPU memory, allowing access to the built in routines. More about the access schema and the interface to the operating system later. We only should note that -to be detected by the operating system- a peripheral has to have a ROM and a CRU address. (This feature, which is standard in all modern bus systems such as Nu-Bus (Macintosh, NeXT) or Microchannel (PS/2), allows easy installation and identification of cards without messing with drivers as usual in the "ASSIGN.SYS" file of MS-DOS based computers.) It is (for example via the DEBUG program) possible to switch to several devices at the same time. This can be seen in several LEDs lighting at the same time. Since in this case bus drivers work against each other, this may lead to damage of the cards. (This is the only possibility to destroy hardware by software.)

B) There must be provisions on the card to allow setting it to the desired CRU address (since the addresses are decoded completely, this is more or less acquisition, whether a DIP-switch is installed).

TI met these requirements in the following way: For every device they intended to manufacture, a CRU address was reserved. The device had its address hard wired on board (not via a DIP switch and a standard 74LS85 decoder chip, but via a Prom). This has -obviously- the disadvantage that there never could have been more than 16 different devices. Of course, nearly all users have less than 16 devices, but a fixed schema would have meant that, once a device has occupied an address, no other might use this address or there would be incompatible combinations of devices.

As a result, most modern cards allow the user to select the base address via some DIP switches. This leads to some inconvenience when having to modify the base address, but most cards are factory preset to a standard address.

So why are there still preferred addresses for each card (It might have been much easier, if the cards were simply set on ascending base addresses by each user. A new device comes on a new address)? To see this, we must look closer at the access scheme:

Unlike with many other computer systems of that time, the TI accesses its peripheral devices by name instead of a number. Thus every device has in its ROM the supported names. The software in the ROM, also called DSR (for Device Service Routine), will do all device specific handling. So any programmer (unless he wants to write very special routines such as a fast disk copier) only has to use the standard file interface known from BASIC.

When trying to access a name, the standard DSRLNK routine, that is -more or less- the same in all applications, searches all CRU addresses for a device with this name. This search is done in ascending order. Thus devices responding to the same name as others -as the DSK1. emulation feature of RAMdisks or the Myarc HFDC- must be placed at lower CRU addresses than the original device. Since the disk controllers are set by factory at >1100 there is quite some request for a card at address >1000. If you place a RAMdisk at this address, you cannot access any longer the disk drives with the same name as the drives of the RAMdisk (unless the RAMdisk DSR does some special provisions if a file has not been found on it).

It is also possible for a device to return a request. So the TI RS232 device always responds to RS232/1 to RS232/4. However, if the card is at address >1300, it returns requests for RS232/3 and /4 as well as PIO/2 that have to be handled by a card placed at >1500 (I assume a modem would also respond to RS232/3 or similar, thus the placement: First RS232, modem, second RS232). If no second card is available the DSRLNK routine behaves as if RS232/3 etc. have not been found!

This explains the importance of the order of the cards. Nevertheless it seems to be much more clever to place an often overlaid device, such as a disk controller, at a high address. The reason for not acting this way is the initialization:

In addition to the entries for the supported devices, every DSR also has a special initialization entry. This allows the running of some routines that will pull ports to a defined level and to reset all devices (imagine, if the disk controller started writing by accident...). These routines are called early in the powerup process before the title screen shows up, again in ascending order. Unfortunately, some devices such as the disk controller card need memory, which is taken from the video RAM, due to the fact that an unexpanded TI only has 256 bytes CPU RAM which is entirely used by the operating system. The disk controller cards are placed at a relative low address, forcing the used memory most probably is at the upper edge of the video RAM. This may unfortunately collide with the 9938 AVDP: when this chip is set to one of the "new" video modes and the last byte of a 16K bank is read, the chip switches to the next bank automatically. This might result in terrible confusion of the disk DSR, since all information is seemingly lost. To

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avoid this, all AVDP cards use 10 (or so) bytes at the upper edge of the video RAM, so that access by the disk controller will never be to the highest address (in the first bank). Newer DSRs like the new DSR for the 80 Zeichen-Karte will move the memory used by the disk controller. However the old Mechatronic DSR needed to grab this memory prior to the disk controller, which forced it to address >1000.

Finally this will explain why the p-code peripheral is placed at the highest address: This peripheral contains solely software (though also a complete second ROM bank containing the SYSTEM.PASCAL file). the initialization routine will start the p-System. All devices must have been initialized prior, thus the card is forced to the highest address.

This should shed some light on the placement of CRU addresses. I should add that address >1000 is also used by the CorComp TripleTech card.

Yours,
Alexander

****DONE****

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*                           *
*   ADDRESS- P.O. Box 647   *
*             Venedocia Ohio *
*             45894         *
*   Published monthly except *
*   July and August        *
*   -----                *
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COLLECTING CARTRIDGES

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Collecting anything is one of the neatest hobbies a person can delve into, but collecting cartridges produced for the 99/4 and 4A is of course a special treat, because it's one of those "things TI" that keep the community interested and healthy.

Like most 99ers I've purchased my share of cartridges over the years and sold many of them (unfortunately) when the kids outgrew them, or I grew tired of them. Also like most 99ers, I never kept the original packaging that my newly purchased cartridges came in. Both selling the ones that I did buy, and not keeping the original packaging with the ones that I didn't sell proved to be mistakes now that I've decided to collect every module ever produced for the TI-99. The last major mistake I made is not buying more of the modules than I did back in the years 1984-1988, when the selection was at its best, and the prices were generally at their lowest.

Be that as it may, collecting TI cartridges in 1992 is no less enjoyable than it would have been in 1984-88, the cartridges are just harder to come by. In some cases the mass production modules like Munchman, Parsec, TI Invaders and the like are cheaper now than they have ever been, but I have found the others to be quite expensive, if you can find them.

Another item of interest that I have discovered is there are many more vendors still supporting cartridge sales than I originally realized, but what you may get unless you ask first, is used product, meaning what you are paying \$20 for is not a new cartridge, in original packaging, but a pre-owned cartridge with a manual, but sold in a ziploc bag. If new and in original packaging is important to you in your efforts to build a collection, then make sure that you ask the dealer first before laying out your money. If you just want to own the module and new with original packaging is not all that important, then you'll find your selection to be much larger since many of the dealers are continuously buying up used collections from owners who have decided to move on to other computers.

Every vendor that I have dealt with in building my collection has been extremely helpful and I can recommend ANY or ALL of them based upon my experiences so far. The ones that I have dealt with are:

Asgard Software, (Chris Bobbit/Harry Brashear)
 Braatz Computer Services, (Robert Braatz)
 Competition Computer, (Ted, Chris, Bill and Mike)
 Joy Electronics, (F. Rogers de Cordova)
 Jim Leshner, (Jim Leshner)
 L.L. Conner, (Larry Conner)
 TexComp, and (Jerry Price)
 TM Direct Marketing. (Terry Miller).

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GENERAL INFORMATION:

Between the years 1979 and 1990 there were 360 cartridges released or announced for the TI. Of that number, 275 verifiable titles actually exist. Honors for being the first cartridge produced for the TI-99 must be shared between several programs which were all ready for release when the TI-99/4 was announced (Diagnostic, Demonstration, Beginning Grammar et cetera). So far, honors for being the last cartridge to be produced for the TI-99 goes to Asgard's LINK telecommunications software, which was released in the 4th Quarter of 1990. If a person had started their collection in 1979 and purchased every cartridge ever produced for the TI-99, at manufacturer's suggested retail price, that person would have spent a total of \$11,381.00 on their collection. That is cartridge software only, and does not include the purchase of any hardware to run the cartridges.

Some 47 companies were involved in producing cartridges for the TI-99 at one time or another, some of whom never actually kicked a cartridge out the door (like Walt Disney), despite having finished the code for the cartridge. The most prolific producer of cartridges for the TI-99 was... you guessed it, Texas Instruments with 81 titles to their credit. Next came the Scott, Foresman Company with 43 cartridges produced or planned for release but not released. Others were:

- Addison-Wesley 7
- Artios 1 (Bill Bronos)
- Asgard 4
- Atarisoft 16
- Broderbund 2
- CBS Toys/Gabriel Ind. 1
- CSI Design Group 1 (Mark Sumner/Ken Dibble)
- Control Data Corp. 1
- DLM 8
- Data East 2
- DataBiotics 26 (Bill Moseid)
- DataSoft 1
- Exceltec/Sunware 16
- Fox Video 1
- Funware 13 (Michael Brouters)
- Imagic 7
- IUG 1 (Charles LaFara)
- John Phillips 9
- Looking Glass 3
- Micropal 2 (Roger Dooley/Tenex)
- Mechatronics GmbH 1
- Milliken Publishing 14
- Milton Bradley 19
- Navarone 20
- Norton Software 1
- Not-Polyoptics 1 (Gene Harter)
- Parker Brothers 3
- Personal Peripherals 1
- Pilgrim's Pride 1
- ROMIX 6

- SMK Electronics 1
- Scholastic Inc. 4
- Sega 3
- Sierra On-Line 3
- Sofemachine 3 (Jim Dranis)
- Software Specialties 3 (Glen Groves)
- Spinnaker Software 2
- Sunware/Exceltec 16
- Thorn-EMI 3
- Tigervision 10
- Triton 4
- Walt Disney 4

Not all of the companies listed actually produced modules, but all had their programs put "into a can" as Ken Hamai likes to term the process of placing a program in cartridge form, or their program was planned for module release.

WHAT TO LOOK FOR:

Depending upon the level of sophistication you wish to pursue in your collection, you can look at:

- new versus used,
- original packaging,
- cartridge design,
- cartridge color,
- label design, color and type (font),
- documentation, and
- program version or program content.

NEW VERSUS USED:

I always go for new, unopened, in original packaging first, then accept something less when I realize I'm not going to find a particular cartridge in new condition anymore. You'll find this is the most costly way to go about building your collection and I don't recommend it unless you have the money to spend. Used with any packaging is more than acceptable for most collections I would think, since the purpose of having the original packaging is to show what it looked like, not what it was when it came out of the factory. Plus, as I stated earlier, your selection grows appreciably when you look at the number of used cartridges available versus the number of new ones still around.

ORIGINAL PACKAGING:

The first modules produced for the TI-99 by Texas Instruments were housed in an ingenious looking 8.5" X 6" white cardboard box that carried TI part number 1037111-1. While it looked similar to the cardboard cartridge box most 99ers are familiar with today (TI part number 1043601-1, the one with the hook on top for display hanging purposes), old 1037111-1 came with a flip out front cover that made it look almost like a book. With this design a shopper or prospective purchaser could pull the instruction manual out of the front cover and never have to open the box housing the cartridge. Inside the box one found the cartridge and any

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miscellaneous paper such as the registration form, but there was no plastic tray like TI used on 1043601-1. Instead, the interior had a glued cardboard panel to hold the cartridge in place (much like what Navarone did with their cartridge software).

My best guess at the life of 1037111-1 is that it lasted from 1979 to early 1981. Although I can't verify this through an official TI flyer or document, the copyright dates on 1037111-1 and on 1043601-1 bear out the years. Few advertisements or TI promotional flyers ever included pictures of a cartridge's packaging though, so it's pretty hard to verify what month in 1981 the 1037111-1 packaging disappeared. My guess is that it occurred in early 1981 because TI tended to make major changes in the design of one component concurrent with the release or change in design of something else. Since the 99/4A upgrade to the 99/4 was introduced during the 2nd Quarter 1981, it seems logical that the change in cartridge packaging came about that same time in that year.

The cardboard box that most of us are familiar with, which most "new" cartridges still ship in today, carries TI part number 1043601-1. It is the one which has the display hanger on top and the "window" in front that is designed to show off the cover of the instruction manual. While it looks similar to 1037111-1, it is a quarter inch wider and a half inch longer than 1037111-1 (9" X 6.25"). Probably more noteworthy though is the fact that 1043601-1 introduced the plastic tray capable of securing the cartridge and any companion cassette or disk. The introduction of the plastic tray is also significant because it was capable of being used to house cassette only or disk only software as well as cartridge based software, which was something 1037111-1 could not do.

The other cardboard box used for cartridge packaging carried TI part number 1041342-1. It is the gray 8.5" X 6" box that housed Extended Basic. Like the original 1037111-1 white cardboard packaging, the 1041342-1's interior sported the glued panel to hold the XB cartridge in place, and it had the same 8.5" X 6" dimensions, but was a half inch thicker in order to accommodate the 224 page Extended Basic instruction manual.

My best guess at the life of the 1043601-1 packaging is that it lasted from the second quarter 1981 until the 3rd Quarter 1983 when it fell to the plastic tray with a heat sealed clear plastic cover. Virtually any cartridge software I've purchased, that was verifiably released in the 3rd or 4th Quarter 1983, or the 1st Quarter 1984, came in plastic. Had TI continued with the 99/4A I believe we would have eventually seen the end of cardboard packaging for cartridges. Once TI's existing stock ran out, plastic would likely have replaced everything, including disk and cassette software packaging. In fact, I have a brand new copy of the Bridge Bidding I cassette software, a program originally

released during the 1st Quarter of 1981, that came packaged in a green plastic tray and clear plastic cover. That tells me the product was pushed out the door in 1983, despite its original release date.

No matter how many plastic trays I've looked at, I have never been able to come up with one that carried a part number, so I have no idea what designation TI used for them. Most trays were black, but I have also seen tons of bright yellow ones, tan ones, mauve colored ones, green ones and red ones.

The last of the original TI packaging used for cartridges was the albums or 3-ring binders (part numbers 1035947-1 and 1035947-0002) that Texas Instruments used to house Editor/Assembler, Multiplan, SMU Electrical Engineering Library, TI Logo II, TI Writer, the two PHV Value Packs and all of the PHL Libraries including The Home Financial Manager, The Family Entertainer, The Elementary Educator, The Music Educator, The Super Programmer, The Scott, Foresman Speaking Math Teacher, The Scott, Foresman Speaking Reading Teacher, The Speaking Scholastic Spelling Teacher, The TI Arcade Game Series, The Milton Bradley Game Series, The Computer Introductory Package and the unreleased Foreign Language Instruction library that was developed for TI by Westinghouse Learning Corporation. The same album (part number 1035947-0002) was also used to house the instructor's manual material for TI's Computer Awareness program.

1035947-1 was far and away the most common of the two albums made for TI by the McBee Company of Springfield, Mo. It is the off-white colored vinyl 3" ring size binder. 1035947-0002 is the same size binder, but came in a dark blue color. Inside the binder as most of know, the cartridge(s) were housed in a clear plastic cartridge tray capable of holding up to four 6rom Port style command modules (cartridges).

Lastly, third party packaging for cartridges existed throughout the life of the TI-99 and after that I will not cover in much detail. Briefly, it ran the gamut from really solid, professional looking stuff to the plastic ziploc type baggies which are used almost exclusively today. My vote for the most solid packaging ever used for a TI-99 cartridge goes to Parker Brothers for the two-piece cardboard boxes they used for Frogger, Popeye and Q*Bert. My vote for the most attractive packaging ever used to house a TI-99 cartridge goes to Tigervision for the Miner 2049er box. At varying degrees of appeal, professional appearance and durability below these two are others such as the Navarone boxes, which were professionally printed ones in the early days, but that slipped to plain white boxes with no printing on them at all by 1986. Then of course there are the plastic bags used to house Miner 2049er just before Tigervision ended its support of the TI-99, and the DataBiotics and Asgard cartridges still in production today.

For collecting purposes you should also be aware that Atarisoft modules came packaged in two different size boxes. Because I own them, I can verify that programs such as Centipede, Defender, Donkey Kong, Picnic Paranoia, Protector II and Shamus were sold in large 10.25" X 7.5" environmentally wasteful boxes while other Atarisoft programs like Jungle Hunt and Moon Patrol were sold in more reasonably sized 5.25" X 7.5" boxes. It may be that all were sold in the large boxes at one time or another and they also may have all been sold in the smaller packages too. I don't know.

Lastly, from illustrations found in the 1984/85 Unisource Encyclopedia Catalog, it appears that Atarisoft may have actually had two different designs to their boxes, but the illustration may only be of the instruction manuals. I cannot tell, and am not willing to destroy the original shrink wrapping on the Atarisoft cartridges I own in order to find out.

CARTRIDGES and LABELS:

Four different style cartridges were produced for the TI-99 Home Computer at one time or another, by one company or another. First on the scene of course was the TI Grom Port cartridge that we all conjure up an image of when someone mentions Command Module, Solid State Software or just cartridge software. This first appeared for the TI-99 at the introduction of the computer itself during the 2nd Quarter of 1979. Next came the Atarisoft cartridges that were in somewhat of a flat Y shape that lacked the lip which the TI Grom Port cartridge used to prevent the module from being pushed into the Grom Port connector too far. Then came the Romox ECPC's (Edge Connector Programmable Cartridges) that were designed with the lip just mentioned, but the cartridge top slanted downward at a severe angle away from the lip, unlike the TI's basically flat with a beveled edge look. The ECPCs were used by Funware, the International Users Group (IUG) and to a lesser degree by Navarone as well as by Romox. Lastly, there were the I/O port cartridges that were only produced by Exceltec/Sunware as far as I can determine. These were cartridges that could plug only into the I/O Port on the right side of the console because their programming was too large for the 8K limitation the Grom Port was tied to. From memory, only a couple titles ever appeared that used these cartridges, and my research indicates that all were most likely provided by Exceltec (aka Sunware) even if the program was produced by another firm. Two such "large" programs that come to mind were Arcturus, which was a Zaxxon clone written by Bill Bies of Pittsburgh, PA, which took up a whopping 24K memory, and Miner 2049er which was released by Tigervision of Mundelein, IL.

As far as I can tell, all TI Grom Port cartridges produced by Texas Instruments between 1979 and about the 2nd Quarter of 1983 were black in color (yes I realize that black is not really a color) with black labeling and orange or yellow type on the labels. Black modules may still have been produced after the 2nd Quarter 1983, but I've not found one

in any of the titles released afterwards. Other companies like Scott, Foresman produced blue, red and white colored cartridges as well as black ones. Although I can't substantiate this assertion, it appears that the introduction of the beige colored 99/4A console in June 1983 and the planned release of the beige colored Hex-Bus peripherals may have brought with them the introduction of the white colored cartridges by TI, with their more colorful labels. The white cartridge casings looked better in the beige colored console I suppose?

For collecting purposes, it is important to make note of the labeling and cartridge colors that you have, since different combinations exist that make collecting cartridges all the more exciting. For example, Parsec can be found in the original black module, with a black label and orange type, a black module with a mauve label and yellow type, and a black module with a red label and gold type. I don't have one yet, but I suspect it was also released in a white colored module. The point is, you need to pay close attention to detail if you really want to have one of everything produced.

Finally, you will note that any module produced by TI after the 2nd Quarter of 1983 is missing the spring-loaded edge connector protector that was depressed when the cartridge is plugged into the Grom Port, but that springs out when the cartridge is removed. Looks like TI finally realized they were spending money on something that really wasn't all that functional.

DOCUMENTATION:

Documentation or instruction manuals for TI cartridges also went through a metamorphosis between 1979 and 1983. Anything produced from 1979 to about the 2nd Quarter of 1982 was released with the more bland covers that TI used when the 99/4 and 4A were first introduced. By the 2nd Quarter of 1982 TI decided to change the cover of the manuals because they lacked eye catching appeal and were losing shelf space to the competition. So you can find "new" product that comes with the original black cartridges with black labeling and orange or yellow lettering in the 1043601-1 cardboard box, but with a new, vividly colored artist-drawn cover on the instruction manual. Inside the manual you find the exact same information as the bland covered manuals, with no credits to the development team for the program, just a changed cover.

Sometime around the 4th Quarter of 1982 the insides of the manuals were changed in order to allow credit to be given to the development team, which consisted of the program designer, the programmer and the people whose voices were used if speech synthesis was part of the cartridge's capability. The practice of giving credit to the development team continued up to the last cartridge TI produced for the TI-99, which officially was Congo Bongo with a scheduled release date of 12/05/83.

PROGRAM VERSIONS:

Texas Instruments produced only a couple of updates to its original code for cartridges as far as I can tell, and those were Disk Manager and Extended Basic. We know that Terminal Emulator and TI Logo got new versions, but they also got new product numbers in the process so they really aren't too tough to track. But these are things to be on the look out for. Just because you own Extended Basic doesn't mean you've filled that slot in your collection. There are XB v100 and XB v110 to spend money on.

Remember too that some modules were produced by more than one company, so you will need to be on the look out for multiple versions of the same program. For example, I own a TI produced version of Numeration 2 (PHM 3031) and a Scott, Foresman produced version (SF 30216) that are both white cartridges, but have totally different labels. The TI version is a blue label with gold type in a typical TI design, while the Scott, Foresman version has a white label with blue type typical of the design shown in a Scott, Foresman advertisement in the November 1982 issue of 99er Magazine on page 53. Similarly, some modules ended up having name changes that were for all practical purposes the same program. For instance, DataBiotics' Magic Memory and TI Workshop are one in the same program. The same can be said for their Console Calc and TI Planner spreadsheets or Sofmachine's Jumpy and MAZE. Different names, but really the same programs. You have to decide if you want to spend the money it costs to buy two of the same program, just to get the different name on the label and documentation.

CREDITS:

I would like to thank Jerry Price of TexComp, Steve Mehr of the LA 99ers, Charles Good of the Lima, OH User Group and Mike Wright, the author of TI-Cyc, for providing the reams of information necessary to put this article together

****DONE******THE NEW FUNNELWEB EDITOR WILL BE READY SOON**

As of October 12 I (Charles Good) am still beta testing the Funnelweb v5 text editor I demonstrated at the May LIMA MUG Conference. It isn't ready for release yet, but I expect Tony McGovern to release Funnelweb v5 soon. The Lima UG will then make it available to the TI community for the cost of media and postage.

The new 40 and 80 column editors will be fully multilingual, with an option to choose English or foreign language commands and command line prompts each time the editor is booted. The 80 column editor will allow entering ASCII 0-254 directly from the keyboard, displaying 254 different characters on screen and allowing all of them to be printed with most printers.

****DONE******REVIEW OF REVIEWS**

By: Andy Frueh, Lima UG

Reviewing anything is a risky business. Reviewers have to know what they're talking about and are often criticized themselves for being too easy or too hard.

Sometimes, a company puts out material that is so refined, it sets new standards. After that, if a product not as refined or just plain awful come out, it gets attacked by reviewers. Is this fair? Really, it depends. Consumers have the right to expect premium quality, but often they want it at a less than premium cost. And conversely, manufacturers may think they've got a winner, and want to defend their product.

If we really look at this from a neutral view, I feel as a reviewer, I have the right to express my opinions as long as they are based on established facts or standards. When I mentioned a few issues back my displeasure with Asgard's "Disk O' Pvrates" advertising claims, Asgard wrote back saying that the problem would be corrected. I have since received a catalog showing the change. We should appreciate those businesses that listen to the consumers and try to please them when it is possible.

It is my sincere hope however, that if I ever say a product is terrible (which I don't think I have, but may someday), potential purchasers will not make their decision solely on this reviewer's opinion. I am not the only reviewer. No one is "THE" reviewer. When Charlie Good reviews Funnelweb, it is usually a glowing review. If someone else writes that it is an awful, clumsy program, that is their opinion and they are entitled to it, if, as I stated, they have proof or examples to back it up. Charlie never says "This is great" or "This is awful". Neither do I. Instead, following the practice of good reviewing, we say "I feel this is blank because of blank."

Besides that, I'll go to see a movie or preview a movie that gets "two thumbs down." Sometimes I agree, sometimes I don't. That's what makes Fairware so wonderful. Theoretically (i.e. if users of Fairware always paid), it would be the ideal system. Unfortunately, the only way most users can try out commercial programs is if they are a beta-tester, the user group demos it, or at a TI Fair.

Most of us who write reviews try to do two things constructively. I believe our first goal is to protect or advise consumers. We have used a product others might not, and report on it. Our second job is to advise companies as to what they seem to be doing right, and what needs change. Again, this is a personal thing. Pet peeves certainly shouldn't come into play, but sometimes they do. Of course, if anyone ever disagrees with a review in a newsletter or MICROpendium, each source will most likely publish the letter, or at least forward it to the author of the review.

****DONE****