YESTERDAY'S NEWS

## 30 Years Ago...

Historical Information taken from Bill Gaskills TIMELINE

May 1988:

TI-BASE Version 1.0 is announced by Texaments.

Front Range 99ers BBS moves from Monty Schmidt's Techie BBS software running on a TI-99/4A to a PC-clone running Thom Foulks Message Hub BBS program.

TI-Runner Level Editor is released by EB Software, Mountain View, California.

FULGENT 9640 BUSINESS SYSTEM for the Geneve is announced by Bryght Data of Towan da, Pennsylvania. The software never appears.

The first Lima, Ohio User Group sponsored MULTI USER GROUP CONFERENCE takes plac e in the campus cafeteria on the Lima Campus of Ohio State University.

FunnelWeb v4.1 is released on May 30, 1988.

The GRAMulator GRAM device ships from CaDD Electronics. According to articles ppearing in various User Group newsletters the device works flawlessly and has ore features than the out-of-production Gram Kracker.

COMPUTE! Magazine undergoes a drastic design change.
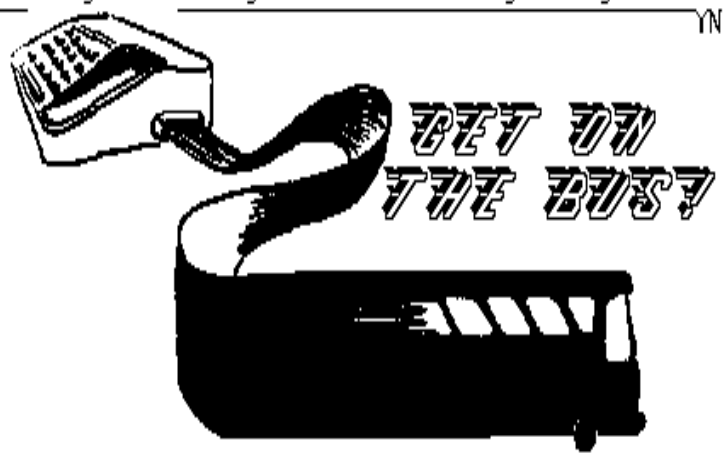
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GET ON THE BUS!

EPYX 500XJ JOYSTICK REVIEW

by Keith Bergman   MICROPENDIUM 12/88

Well, it finally happened. After a year and a half of faithful (if clunky) service, my TI joysticks began to fail. Soon, they were so unresponsive I had to get rid of them. They had served me well, but I decided to get some other stick.

About this time I remembered that not long ago a company had come out with a joystick modeled to fit into the human hand. The 500XJ sounded great, so I bought one.

After connecting it to my "Y" adapter (the 550XJ is a Commodore/Atari model), I tried it out on Parsec and Munchman. While it did not, as one ad says, "triple" my Munchman high score, I did notice improvement. The little Munch-person never missed a turn.

I should explain that the 500XJ is a "modern" stick with microswitches inside. These are supposed to make the 500XJ the most accurate stick around. However, there is a big drawback: The stick makes a little "click" when you move and a "clack" when it moves back to center position. This annoyed me to no end, but if you live near a subway or jetport you may not notice the noise.

While results with Munchman and Parsec were good, I was not impressed with the stick's handling on the diagonals. It seemed to get stuck in one of the four main directions now and then, and its overall response was not great.

ELEMENTS OF BASIC

By Dave Howell

Courtesy of the Erie 99'ers   Part 7

About The MEMORY

Many people who bought the TI-99/4a wanted to Know at least something about what goes on inside the mysterious little box. Even today, there is still widespread belief that this Knowledge is so scientifically obscure as to go over the heads of most mortals. Don't believe a word of it! This is nothing more than propaganda put out by "experts" who confuse everyone by using jargon words they don't explain.

What do those magic words--memory, RAM, ROM, 16K--mean?

A computer's "memory" is the type that comes on little silicon chips inside the TI-99/4A. There is another Kind of memory sometimes called mass memory or external storage that resides outside the computer--on cassette tape or disK.

A "K" is a measurement of the amount of memory in a computer. Mathematically, K stands for 1000 but in measuring the size of a computer's memory, the number is actually 1024 which is 2 raised to the tenth power or 2x2x2x2x2x2x2x2x2x2. Computers perform all functions in powers of 2 since electricity is either on (1) or off (0). Using 1000 as K is a number close enough to 1024 and 1000 is a number that people can get a handle on pretty easily.

Actually, 1024 (or more precisely, 1024) refers to 1024 bytes of memory and 1 byte of memory equals 1 character on the Keyboard. Thus, 1K of memory holds a little more than 1000 characters (letters, digits and punctuation marKs) or somewhere around 40 lines of average "basic" lines.

Obviously, the more K's a computer has in its RAM, the larger and more complex programs can be handled. RAM is an acronym for "Random Access Memory." RAM is used to hold any program and data temporarily. The computer user has total control over the contents of RAM. Any item in RAM can be changed at any time while the computer is on. If the computer loses power or the user accidently hits the FCTN-Plus Keys, the program and/or data in RAM vanishes. That is why smart users save their "serious" work on cassettes or floppy disKs every 15 minutes or so.

The TI-99/4A has RAM capacity of 16K (16,384 characters to be exact). The TI Memory Expansion card adds another 32K of RAM for a total of 48K.

The TI-99/4A as with all home/personal computers, also contains another Kind of memory – ROM (Read Only Memory). As the name applies, ROM cannot be written to or changed. It already has a program permently stored in it. The 26K of ROM in the TI-99/4A holds, mostly, the TI BASIC interpreter and a thing called the operating system. To maKe a long story short, the ROM converts the Keyboard stroKes to the binary (or machine) language and carries out the program commands.

As noted earlier, it taKes 1 byte of memory to store 1 character or Keyboard stroKe. To store 1 byte, 8 memory cells are needed. each one of these memory or storage cells in a silicon chip either has an electrical charge "on", or does not have an electrical charge "off".

     an "on" bit is written as a 1
     an "off" bit is written as a 0

So 1 byte or one Keyboard character requires 8 bits or 8 memory cells. In early computers, each memory cell was a transitor or vacuum tube. Imagine the number of transitors and vacuum tubes required in those early computers!

To store the number zero, the 8 bits of memory will have this configuration:

```
        off on on off off off off off
zero =   0   1  1  0   0   0   0   0
```
LiKewise for the following digits and characters:
```
  one = 0 1 1 0 0 0 0 1
  two = 0 1 1 0 0 0 1 0
three = 0 1 1 0 0 0 1 1
    A = 0 1 0 0 0 0 0 1
    B = 0 1 0 0 0 0 1 0
    C = 0 1 0 0 0 0 1 1
    + = 0 0 1 0 1 0 1 1
```

So, The fundamental unit of memory is the bit- a memory cell on a silicon chip. With 8 bits to a byte, a 16K rated memory having 16,384 bytes (8 x 1024) has 131,072 (8 x 16,384) bits of memory. With everything in the computer reduced to "on" and "off" situations (1 or 0), the huge number of bits required for simple programs was overwhelming in the days of bulKy vacuum tubes and subsequent transitors. But with the development of the integrated circuit operating at the speed of electricity (186,000 miles per second), computing with the 131,072 bits is now a piece of caKe!

The on-off patterns of the 8 bits in each byte have been standardized throughout the computing industry. These standardized patterns are Know as the ASCII Character Code found in most programming texts and computer manuals.

Several BASIC statements are used in programs to access the memory. Among those to be discussed in this column include: LET, INPUT and READ...DATA.

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EPYX continues...

I also tried the stick on Popeye, Barrage, Q*Bert, High Gravity and other games. The same things happened with all of these games, and that the fewer diagonals required by the game, the better I did. I also found that the fire button occasionally would stick a little with games that required lots of quick, repeated presses of the fire button.

I also tried the stick on Picasso Publisher, an art program. The stick worked great, and I think it was because a program like Picasso doesn't require split-second movements like a game. I really enjoyed drawing with the 500XJ.

As to why it gets an A+ under Ease of Use, let me define my terms. By Ease of Use I mean how good your hand feels after getting 7,976,883 at Space Marauders and gripping the joystick for 11 hours. The joystick is broad on top and narrower on the bottom. It fits almost perfectly in the left hand. The fire button is on the right side so that when you hold the stick, your index finger is resting on the button. Your middle finger gets a little finger rest, and the other two hold the narrow part of the stick. Your thumb parks itself into a little slot on the top, near the cord. This design is very good for your hand, unless you have a habit of keeping the joyhstick in a death grip. In that case, you'll have just as much hand fatigue as with any other stick.

This neat design is also a big drawback. The stick is designed for "the average hand." Small children have a very hard time using the 500XJ, if they can use it at all. And, if you have big hands, your fingers may miss the slots and leave you holding the joystick in such a way that you can't press the fire button.

The joystick is a welcome addition to computer clutter, unless you have a professional-looking, office-like setup. The thing is deep red – the color of a red Corvette. There is a big red label with black stripes that taper down, and a red handle. It looks sleek and stylish, but the sticker seems to have been put on there for another reason: to make it obvious when someone has opened up the stick and voided the five-year warranty (the sticker is one big piece).

The Epyx has some problems. It is definitely not the "perfect" joystick. But if you want a nice, responsive (mostly), sleek joystick, you can't go wrong with the 500XJ unless you have small hands. Borrow one from a friend or test drive one at a local computer store.

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SYSTEM OF THE MONTH
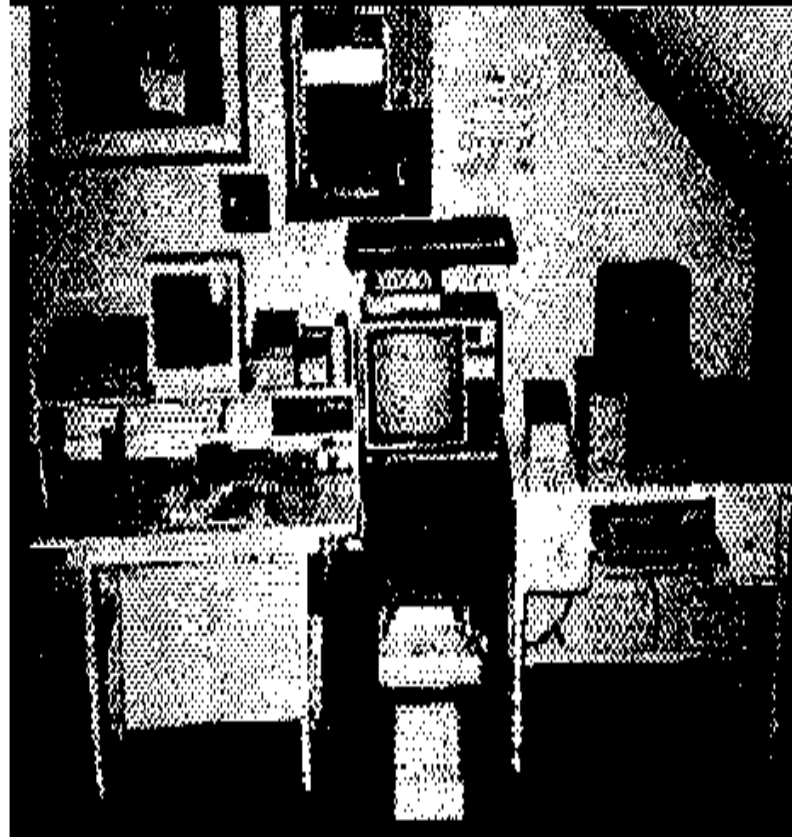
MICROpendium August 1994　　　Tony Knerr (Gazoo)

Dual system great for programming

This month's System of the Month is owned by Tony Knerr, of Downingtown, Pennsylvania.

The main system (left in the photo) is a TI99/4A with a TI RS232, CorComp RAMdisk, Horizon RAMdisk, CorComp Triple Tech, P-GRAM Plus, Myarc floppy disk controller and Myarc Hard and Floppy Disk Controller. The floppy ontroller controls two 5.25-inch, 360K floppy drives and the HFDC controls a 5.25-inch 720K floppy, 3.5-inch 1.44-megabyte floppy and two 20-megabtye hard drives. The hard drives are installed in the Peripheral Expansion Box with an external power supply. The four floppy drives are above and right of the keyboard. Peripheral items include a 1200 baud Atari modem, Casio MT540 Synthesizer for use with Midi-Master, Rave 99 101-Key Keyboard, Magnavox 14-inch color monitor and Epson Apex 80 dot-matrix printer. The TI console is hidden behind the backboard of the desk, along with the power supplies for the drives. The switch box on the right front table leg near the floor-standing PEB turns it all on and off.

The second system (right in the photo) is also a TI that includes a TI 32K card, TI RS232, Rave speech card, P-GRAM

SYSTEM continues...

Plus, CorComp disK controller and a TI monitor. There are two 5.25-inch, 360K floppy drives and a Myarc Personality Card with 20-megabyte hard drive. The hard drive can format only 15 megabytes.

Both computers are connected via RS232 cable and are able to share the printer through a switchbox.

"This setup is excellent for programming, as I can run a time-consuming utility or assembly on one while worKing on the other," Knerr writes. "Some of my worK includes P-GRAM Utilities v2, a completely rewritten disK manager for the personality card that allows hard drive formatting up to 15 megabytes, many Extended BASIC music programs, as well as Midi-Master music files. I also host meetings of the Chester County TI Users Group and am a member of the Philadelphia Area TI Users Group."

Unusually, while most programmers worK in assembly or Extended BASIC, Knerr says he is available to write programs for anyone with a GRAM device who needs a special purpose GPL program.

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NEVER RELEASED OFFICIAL T.I. PERIPHERALS: THE MILTON BRADLEY MBX EXPANSION SYSTEM

MBX
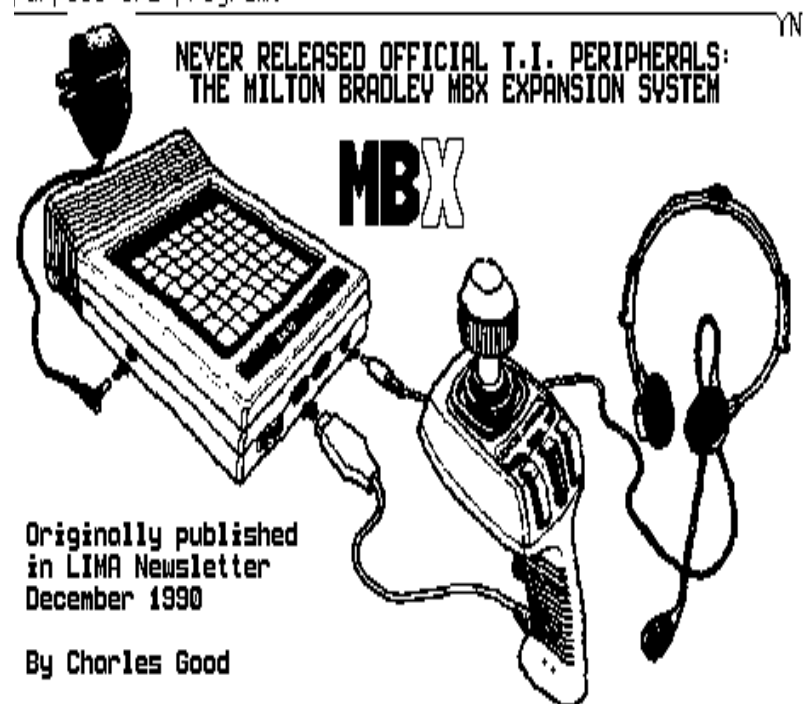
Originally published in LIMA Newsletter December 1990

By Charles Good

This device was (and maybe still is) literally years ahead of the competition when first introduced to the public at the January 1983 Consumer Electronics Show. When attached to the TI99/4A it allows speech recognition with specific Milton Bradley game and educational modules. The user speaKs instructions into a microphone, and the 99/4A understands the spoKen words and responds accordingly. With the MBX system, our old fashioned 99/4A's can do tricKs that even the most sophisticated modern home game machines can't do. Voice recognition is NOT available even today for Nintendo and Sega game systems. These days

you can find voice recognition hardware costing hundreds of dollars advertised in Computer Shopper for use with MSDOS and MAC computers. In T.I.'s last complete price list of 99/4A products published in June 1983, the MBX system lists for $129.95. It's too bad only only about 300 were ever made!

Although the title of this article might suggest that the MBX system was made by T.I., this is not so. The MBX was manufactured and sold by the Milton Bradley Company. T.I., under license from Milton Bradley, manufactured and sold the specific software modules designed for use with the MBX. The MBX system comes pacKaged in a box with the the same Kind of "photograph of the product on a blacK backGround with white letters" style found on 99/4A console boxes. The actual MBX hardware is in the same gray plastic used for the most recent 99/4A consoles and official T.I. cassette program recorders. As aa registered 99/A owner, I received by mail in early November 1983 from T.I. (not from Milton Bradley) an advertisement describing the MBX and MBX specific software. Apparently Milton Bradley intended to have the MBX on store shelves for the 1983 Christmas season, but canceled all further production after BLACK FRIDAY. There is no serial number on my recently purchased used MBX, but it bears a sticKer that says "MBX Control number 8310". This may mean that my unit was manufactured in the 10th weeK of 1983. My guess of 300 MBX units actually produced is based on the very limited availability of this product for sale at TI shows I have attended and in the possession of T.I. owners Known to me, as well as the fact that UNISOURCE once advertised that they had 200 MBX's for sale.

There are three parts to the MBX "system", the control box, the joysticK, and the headset/microphone. The heart of the system is of course the control box. It measures 10 x 7.5 x 2.5 inches and includes its own built in speech synthesizer. This box plugs into the joysticK AND the cassette recorder ports of the 99/4A console. The MBX system is designed to be used with just the console and specific software cartridges. There is no provision in any of the MBX software modules for disK usage. Since one of the MBX connections occupies the cassette jacK, you can't use a cassette recorder either. You must disconnect the regular speech synthesizer to use MBX. To hear speech, the two speech synthesizers cannot coexist.

The control box has a side port for the required AC power source. On the front of the control box are two 9 pin male D ports for joysticKs, a jacK for the headset/microphone, and an on/off switch. When you slide this switch to the ON position the MBX control box responds by saying "ready" in a well modulated female voice. This voice, and all speech generated by the MBX system, comes from a speaKer at the top back of the control box, not from the monitor speaKer. Music and other non-speech sounds continue to be heard from the

monitor's speaker. Only spoken words (synthesized speech) are heard from the MBX system's speaker. You have to turn on the MBX before you turn on the console in order for the 99/4A to recognize the presence of the MBX. When activated, the MBX system disables the FCTN/0 QUIT console keypress. On the top of the control box is a 64 position membrane keypad. The top row of 8 keys on this keypad functions in the same way with all the MBX software modules that utilize this keypad. These top row keys include RESET, VOLUME UP (the volume of the speech coming from the MBX's built in speaker, not the music and sounds coming from the monitor speaker), VOLUME DOWN, MIC (toggles on and off the ability of the microphone headset to "hear" spoken words), YES, NO, PAUSE (stops game action), and GO. The action of other 56 positions on the control box keypad is specific to the particular software module in use. A very decorative keypad overlay comes with those software modules designed to utilize the rest of the MBX control box keypad. These overlays slip easily and snugly over the top of the keypad.

The headset superficially resembles a set of "walkman" earphones, but in fact contains no earphone speakers. The things that cover your ears are just pads. The microphone is positioned in front of your mouth and its position is adjustable. Physically the headset unit is flimsy. The wire leading to the microphone is thin and subject to stretching and damage at the point where it enters the adjustable microphone arm of the headset as the microphone arm is adjusted back and forth. Fortunately a handheld microphone designed to plug into a cassette recorder will also work with the MBX if the headset microphone breaks. The advantage of the headset over a handheld microphone is that the headset allows easy two handed manipulation of the special MBX joystick.

One joystick comes as standard equipment with each MBX system. A second joystick is listed in T.I.'s last 99/4A price list for $29.95 and can be plugged into the second joystick port on the control box. This would give each of two players their own separate joystick. In actual use of the MBX software modules a second joystick isn't really needed. Only one player at a time uses the joystick. The two joystick ports on the control box respond the same. There is no "joystick #1" and "joystick #2" as there is with the 99/4A console. The MBX joysticks are very fancy and cannot be used by themselves directly from the 99/4A's joystick port. Likewise, you can't use regular joysticks from the MBX console. Movement of the MBX joystick handle is very smooth. The device is described in promotional literature as a "triple-axis analog control that allows 360 degree object rotation and left to right and front to back proportional control of all movements." The word ANALOG suggests infinitely variable control. The MBX joystick's arm appears to produce the same kind of 8 direction movement typical of joysticks. The "analog" infinitely variable control is the rotating knob on the end of this joystick arm. With some MBX games this knob

will rotate the object under control to face any direction, for example to orient a gun prior to shooting. In the MBX baseball game this knob controls the force of a batter's swing. Minimum swing power results in a bunt. A trigger style fire button is included with the MBX joystick, as well as three other buttons. These three buttons resemble mouse buttons and have specific purposes when using specific MBX software modules.

How does MBX allow the 99/4A to respond to voice commands? At the beginning of each session with an MBX software cartridge that allows voice recognition as an option, the user is asked if he wants to use voice recognition. This is always optional. All the MBX cartridges can be used WITHOUT voice recognition by using the keyboard and/or the MBX keypad for input instead. If voice recognition is chosen, the user is asked which commands are to be given in voice. It is possible to use voice for some commands and the console keyboard or MBX keypad for other commands, or to have all non joystick input by voice. The computer then directs the user to speak the possible commands (big, small, left, right, pencil, pen, centerfield, shortstop, etc) into the MBX microphone. This "voice training" of the MBX to recognize the user's voice patterns is repeated twice. Voice patterns are stored digitally on chips inside the MBX for the duration of the session, until the MBX is reset or shut off. This voice pattern storage is probably similar to that of some modern telephone answering machines. My home answering machine does not store the greeting message on cassette tape. Instead, my "This is the Good household answering machine..." message that greets incoming calls is stored on a chip and played to callers every time I don't answer the phone quickly enough. As with the MBX, I can quickly erase my "stored on a chip greeting" and replace it with another on my answering machine. An MBX user can use any word desired for a particular command, as long as the user is consistent in using this word. For example, in CHAMPIONSHIP BASEBALL a user can speak the imaginary name of a fielder when asking for a particular fielding position. During voice training the computer can ask the user to speak the word "shortstop" and the user can reply "Tony". As long as the user remembers that Tony is playing shortstop, the game will work OK.

After voice training the game begins and the computer responds to sounds it hears via the MBX microphone. Users have to be careful to ONLY speak when they want the computer to perform some action. Casual conversation by the user can result in unexpected things happening as the computer interprets some of this conversation as specific spoken commands. The solution to this problem is to turn off the MIC using the MBX keypad when response to voice commands is temporarily not desired. A small symbol continuously on screen indicates the ON/OFF status of the microphone.

How well does it work? How reliable is MBX's voice

recognition? It is about 80-90% reliable. Sometimes the MBX either totally ignores a verbal command, or the command is incorrectly interpreted as a different verbal command. Part of the problem is that during the excitement of game play, a player's voice may sound different than it did during voice training. In CHAMPIONSHIP BASEBALL it can be very annoying to command a throw to "second" and instead see the ball thrown to "centerfield". All voice commands can instead be activated from the 99/4A Keyboard of the MBX's Keypad with almost 100% reliability. All the modules designed for use with the MBX, even those that absolutely REQUIRE the MBX, can be used totally without voice recognition. For really serious accurate game play, one should bypass the MBX's voice recognition feature. My testing panel is divided in their preference for voice recognition. Meaghan, my 5 year old daughter, likes to use voice recognition. I think she finds voice easier then reading the MBX overlay or memorizing complex 99/4A Keypress sequences. Ian and Colin, ages 12 and 9, both prefer not to use voice recognition. High scores are important to these two serious game players, and such scores are easier to obtain with accurate game control.

What software is available? The following cartridges by Milton Bradley were specifically designed for use with the MBX expansion system. All these include speech synthesis and many also allow voice recognition. The speech synthesis of these software modules (but not speech recognition) can be accessed using the regular TI speech synthesizer without using the MBX system. They were officially released by T.I. in 1983 and 1984. The last (June 1983) 99/4A catalog published by TI lists these modules for $50 and $60. I have seen some of the "MBX system required" modules listed by TRITON in the past for as little as $3. Currently they are all available from L.L. Conner Enterprise for $15. Quoting from the booklet TEXAS INSTRUMENTS HOME COMPUTER PROGRAM LIBRARY that came packaged with many TI modules sold in late 1983:

"The BRIGHT BEGINNING SERIES includes four games which teach elementary programming, music, and other learning concepts. Ages 4-8."
HONEY HUNT
SOUNDTRACK TROLLEY
TERRY TURTLE'S ADVENTURE (MBX system required)
I'M HIDING (MBX system is required).

"The ARCADE PLUS SERIES has six arcade style games that take you from home town ball parks to meteor belts far, far away."
CHAMPIONSHIP BASEBALL (MBX system required)
SEWERMANIA
SUPER FLY
SPACE BANDITS
BIGFOOT
METEOR BELT

I have been told that Barry Boone has written some software that will allow programming the MBX and its non standard joystick. Such software would turn the MBX into something much more significant than a game enhancement. So far, this software has not been made available to others.
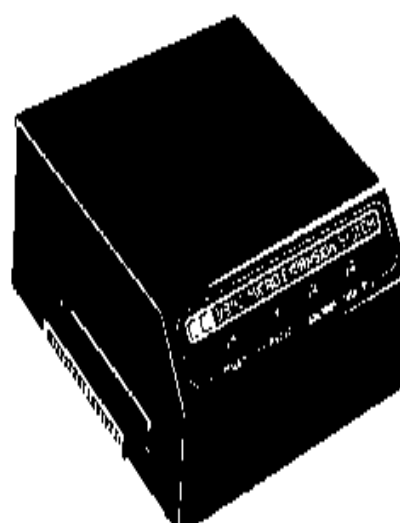
CorComp Inc.

9900 MICRO EXPANSION SYSTEM

MICROpendium

April 1985

Review by John Kolean

The 9900 Micro-Expansion System is CorComp's computer in a box. A very small box at that. Measuring 5 1/2 x 5 1/2 x 2 7/8 inches , the expansion system provides users with 32K of expansion memory, a disk controller and one serial and parallel port. Weighing less than 1 1/2 pounds, the black metal box provides many of the functions offered by the bulky TI Peripheral Expansion Box in a size that can easily fit into a shoebox or briefcase.

Performance: The 9900 Micro Expansion System works like a charm. It is cooled entirely through convection, which means that there's no noisy cooling fan to contend with, as in the PEB. When you plug it in, you'll hear nothing. Which is great, particularly if you do a lot of work with your computer at night when the rest of the family is trying to get to sleep.

It's a very cool box, too, transferring little heat to the outside. I expected the top of the box to get as hot as the GROM port of the TI-99/4A. But it remains cool to the touch. One "coffee warmer" on the desk is enough.

It would be difficult to say what the heart of this device is, though the disk controller seems to be the one element that has the greatest utility. This is basically identical with the disk controller card thatCorComp sells for the PEB. The documentation for it is the same, also.

The controller allows the user to access up to four floppies, ranging from single-sided, single-density to double-sided, double-density. The connection for the controller is the same 25-pin jack used in the TI disk controller card.

The RS232 and parallel ports are also located in the back of the box. These use the same cables that are used with the TI RS232 and parallel ports. A second RS232 port may be added at additional cost.

The box itself is connected directly to the console's peripheral port. Users with a Speech Synthesizer would plug the synthesizer into the console and then plug the 9900 into the Speech Synthesizer. The box fits perfectly into the console or Speech Synthesizer. During the month I reviewed the box, not once did it separate from the synthesizer, indicating a perfect fit.

The 32K expansion memory worked just as expected, flawlessly. I found no discernable difference between the speed of operations conducted in the 9900 expansion memory and identical operations conducted in the TI expansion memory card. For example, the time it took to recalculate a 98-cell spreadsheet using Microsoft Multiplan was 55 seconds for the TI card and the CorComp expansion memory.

Like the CorComp disK controller card, the insides of the 9900 box are easy to get at. All that needs to be done is to remove four screws. The user then gently pulls the top of the box off, revealing the main circuit board. As with the disK controller card, the user may modify the 9900 disK controller step times by flipping an array of switches on the upper board.

There is some third-party software that will not operate with the CorComp disK controller. This seems to be a problem with some software that uses sector by sector protection schemes. There is no hard and fast rule about this, but I recommend that you checK with the vendor about compatibility when buying third-party software for use with any non-TI produced hardware.

The 9900 Micro-Expansion System comes with CorComp's wonderful disK manager program. It is also totally compatible with TI's DisK Manager cartridge. The program is identical to the disK manager software that comes with the CorComp disK controller card. This was reviewed in the November 1984 issue of MICROpendium.

CorComp considers the 9900 box to provide TI users with the potential for a portable computer. There is some truth to this. The console, 9900 box and power supplies could easily fit into an attache case. A disK drive with power supply probably could be squeezed into one, also. However, you'd still have to lug a monitor around. Compared to the PEB, however, the CorComp box seems liKe a portable.

If there is a limitation built into the 9900 Micro-Expansion System, it lies in the fact that it cannot be expanded. There is no apparent way in which to add memory or other functions or devices. The box is fully loaded and configured by the manufacturer.

Also, the absence of a power switch seems to be an oversight on the part of CorComp. An inline switch between the power supply and the box would have been easy enough to install, if a box-mounted switch were not possible. As it is, users must either plug it into a power strip that includes a switch or must pull the plug on it after every use. I thinK most users will plug it into a power strip.

Ease of Use: The system is simple enough to connect that only neophytes will need to read the manual (though I would be the last to recommend that anyone ignore the printed word). There is only one way to connect the device to the console and only one way to connect other devices to its peripheral ports.

Documentation: The manual that comes with the 9900 Micro-Expansion System is thorough in dealing with the disK controller and RS232 functions, but offers little information about the expansion memory. There are actually two manuals. One, a 42-page, booK-sized manual that details the RS232 functions. This is punched for a three-hole binder and comes with a slicK, heavy cover. The pages are numbered and it includes a table of contents. It provides a wealth of useful and technical information about the RS232/PIO functions and how to use them.

The other manual provides four pages of information about the expansion memory and a large number of pages about the disK controller. It includes a table of contents with page number references for the section on the disK controller, but, incredibly, none of the pages are numbered. Although there are enough references to maKe one believe that the booK was written for the 9900 Micro-Expansion System, virtually all of the material comes from the manual that came with the company's disK controller card, which was far better organized. Each page of the CorComp card manual seems to have been reduced in size by 50 percent for the 9900 Micro-Expansion System version so that two pages could be printed on each side of the 8 1/2 x 11 paper. The paper is folded in half, horizontally. There are no holes for use with a binder, nor are the margins wide enough to permit them. Without the page numbers, I find this document to be virtually useless as the reference manual it claims to be. I have no doubt that it is loaded with information, but I do not intend to spend a lifetime looKing for it.

Value: At $429, the box represents a sizable investment for any user, but many dealers are offering generous discounts.

Anyone who is looKing for a noiseless expansion system for use with a TI-99/4A will want to give this box some consideration. Users with limited space, or who want the computer to fit on a desK without taKing it over, may find the 9900 Micro-Expansion System a wise investment. No larger than a pair of Speech Synthesizers, the system puts power & functionality in a box that can be held in 1 hand.

Yesterday's News Information
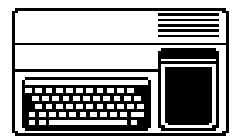
Yesterday's News is a labor of love offered as a source of pleasure & information for users of the TI-99/4A & Myarc 9640 computers.

TI-99/4A HARDWARE
Black & Silver computer
Modified PEB
WHT SCSI card with SCSI2SD
Myarc DSQD FDC
Myarc 512K Memory Card
Horizon 1.5 meg Ramdisk
TI RS232 card
Corcomp Triple Tech Card
1 360K 5.25 floppy drive
1 360K 3.50 floppy drive
1 720K 5.25 floppy drive
1 720K 3.50 floppy drive
80K Gram Kracker
Samsung Syncmaster 710mp

TI-99/4A SOFTWARE
PagePro 99
PagePro Composer
PagePro FX
PagePro Headline Maker
PagePro Gofer
TI Artist Plus
GIFMania

PC HARDWARE
Compaq Armada 7800 Notebook
Compaq Armadastation
Samsung Syncmaster 710mp

PC SOFTWARE
Dead,Dead,Dead Windows 98se
FileCap
prn2pbns
Irfanview
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