YESTERDAY'S NEWS

VOLUME 2 NUMBER 12 Established 2016 DECEMBER 2017

30 Years Ago...

Historical Information taken From Bill Gaskills TIMELINE

DECEMBER 1987:

MDOS v1.0 for the Geneve is released.

Ali Ulgen reports that his survey of TI Users yielded responses from only 73 user groups out of 220 US and 34 foreign groups contacted!

TI-Count accounting software becomes available as a package, for only $99.95.

DELPHI on-line information service hosts an archivers conference between Barry Boone, Al Beard and Barry Traver on December 17th, the first ever between the three persons most responsible for providing file packing capabilities for the 99/4 A community.

GIF loader is released by Paul Charlton.

New Day Computing in England, and the 99/4A National Assistance Group are put on the "hit" list as businesses to look out for, as both have failed to deliver paid for products to customers.

Galen Read, of Innovative Programming, maker of Writerease and Console Calc, announces that his company is changing the focus of its business and is moving away from the TI market.

Rave 99 announces that it will produce a Ram Disk for the 99/4A.

Robert C. Holland, 6188 Caminito Baeze San Diego, California 92122 announces a TI/IBM file transfer program available for the cost of two DS/DD diskettes.

McWare Products, Box 2784 Fairfax, Virginia 22031, announces Fast and Easy Tutor , a disk and booklet for the Star NX10.

INSIDE INFORMATION

MERRY CHRISTMAS

First commercially published article on how to put Extended BASIC in the TI-99/ 4A console appears in the Dec 1987 issue of MICROpendium.

BA-Writer v1.4 is released.

Ray Kazmer makes a gift of his 'WoodstocK's Christmas' program to members of the San Fernando Valley 99ers.

CSI Design Group owners/partners MarK Sumner and Ken Dibble officially close the doors on their 99/4A business.

Pilgrim's Pride Box 2 Hatboro, PA 19040 announces in its December 1997 catalog that a company Bulletin Board System is 'coming soon...'.

WOODSTOCK CHRISTMAS

If you have not seen Ray Kazmers WOODSTOCKS CHRISTMAS you need to.

CASSETTE TAPE

Originally published in ARIZONA 99 UG - FEB/MAR 1984

BEGINNING GUIDE TO CASSETTE

Knowing how to use your computer to read cassette programs will allow you to use many programs that are not available in COMMAND MODULES and it will also lower your program cost. Cassette programs can save you many dollars. You can begin by typing in the programs that are in this

SEE "CASSETTE", PAGE 2

HOW A DISK DRIVE WORKS

by Fred and Amy MacKey, Pittsburgh Users Group

The disK is placed into the drive, the door is closed, and a spindle hub inside the disKette hole spins it around very quicKly, at about 300 RPM. A magnetic read/write head moves toward the hub or out to the edge. The combination of spinning and head movements allows data to be placed on any part of the disK. Data is written on or read from the disK as it spins around inside the disK drive. The characters are stored as a series of magnetic pulses treated as zeroes or ones, called bits. Eight bits is a byte, one unit of data.

A double sided disK drive has two of everything and can read and write to both sides of the disK without flipping the disK over. A double density disK drive can hold twice the usual number of bytes.

The data is read/written on concentric bands called tracKs. Both sides of the disK jacKet and the disK itself have an index hole. When the three are lined up, a beam of light passes through them and striKes a photo receptor which tells the drive it is the start of the tracK. Each tracK on a disK is broKen into equal areas called sectors.

Magnetic Media Defects
All computers using external storage systems rely on magnetically created electrical impulses for their memory. Whether using cassette tapes, cartridges, floppy disKs, hard disK, or other storage systems, these impulses are what maKe computers function. The physical devices that accept and hold the magnetic code are called the media. And all media require periodic attention.

If you've ever tried playing a "wrinKled" cassette tape on a cassette recorder, you Know there is a problem. Besides producing a sKip at the wrinKle, the tape will be weaKened in that spot and will eventually breaK.

The same holds true with magnetic media used for computer storage. Both the media and the programs and data they contain may be damaged or destroyed by such things as heat, STATIC, magnetism, polluted air, chemicals, dirty drive heads, grease or oil from fingertips, excessive humidity, excessive dryness, etc. Even brand new media is not exempt from these problems.

Older media is subject to more problems, such as the base material holding the oxide may turn brittle and become useless with age. The adhesive holding the oxide to the base may deteriorate. Or possibly the software may just wear out with use.

The magnetic media can easily be damaged through abuse or neglect. Therefore, it is important that you be as careful as possible in your handling of it. This means running regular maintenance checKs to Keep your media in shape and doing such things as cleaning the heads of the disK drive and Keeping your computer worK area as clean as possible. And most important, get in the habit of maKing back-up disKs for all your software.

The following are some rules you should follow to give your disKs and cassette tapes the longest life span possible.

1. Always store your media in dustproof, non-metallic containers.

2. Avoid touching the magnetic surfaces of the disKs or tapes.

3. When labeling a disK, write on the label before putting it on the disK. If you must write on the label after it is on the disK, use a soft-tipped marKer, and maKe sure the inK is dry before putting it into the drive.

4. Store all media away from sources of heat, as well as from humidity. (This means the basement is not a good home for your computer!)

5. If you just walKed across the room dragging your feet on the carpet, first discharge the static electricity by touching a grounded metallic object before you picK up a disK or touch your computer.

ELEMENTS OF BASIC

By Dave Howell

Courtesy of the Erie 99'ers

Part 2

EDITING ON THE TI

Most everyone at one time or another maKes mistaKes! Bugs in recorded programs show up when they are least expected. Fortunately, correcting these errors is simple on the TI-99/4A.

Errors made BEFORE pressing ENTER may be corrected as follows:

Use the FCTN and left (S) or right (D) arrow Keys to move the cursor to the error. To replace the character, simply touch the Key of the correct character. To remove the character entirely, depress the FCTN and DELETE (1) Keys.

(Holding these two Keys down will cause the cursor to "swallow" all of the remaining characters to its right.)

To insert new characters, move the cursor over to the desired location and depress the FCTN and INSERT (2) Keys momentarily. Then type the desired character(s). The characters on the right will move over automatically as the new character(s) are entered.

Occasionally, it may be easier to erase the line entirely and retype it. To do this, any of the following steps will work:

1. Depress the FCTN and ERASE (3) Keys and retype the line.
2. Touch ENTER and then retype the line.
3. Depress the FCTN and CLEAR (4) Keys and retype the line. (The FCTN and CLEAR (4) Keys will also "breaK" the program, ie: stop the program while it is running.)

Errors made AFTER pressing ENTER may be handled in the following ways:

1. Retype the line.
2. Type EDIT followed by the line number and ENTER.
3. Type the line number followed by the FCTN and up arrow (E) Keys.

If the line number in 2 or 3 above does not re-appear, the line as originally typed never reached the memory and must be retyped.

At any time, whether a program is finished or not, a line may be completely eliminated by simply typing the line number and depressing ENTER.

D.H.

"Cassette" continues...

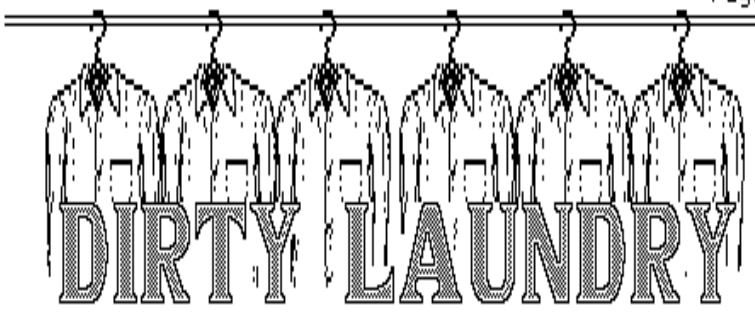
newsletter or ordering them and reading them into you computer.

The items you will need to get started are a tape recorder cable, a cassette tape recorder, and some cassette tapes. The Dual Cassette Cable PHA2000 will allow your computer to talK with two cassette recorders and it is available locally from all the retailers that sell the TI-99/4A.

It is important that you get a good tape recorder because it will save you many hours in the future in reading your cassette tapes.

A computer can really only understand two things. A signal that is "on" or a signal that is "off". All the information that is stored or read from the cassette recorder tape is converted to an "on" or an "off".

See "Cassette", page 6



Article that ran in VAST News, Vol 3, No 11 - Nov. 1987

IKES SUMMER REVIEW

LET'S DO IT!

By now all of you faithful readers of this Newsletter must be seriously wondering about the change in direction that this Group has taKen recently. For the benefit of any newcomers, as well as our returning winter visitor members and any other members, here is a brief run down of what has been done and some of the reasoning behind it.

During this past summer, we found that because of the long delays in getting the 'New' Myarc computer out, the drastic reduction in price of most of the other computer systems and especially the availability of low cost IBM compatibles (IBM clones) a substantial number of members of the VAST 99 User Group had lost interest in the 99/4A and had switched to one of these other systems. The great surprise was, that almost all the Group's so called brains' had deserted the good old 99/4A in this manner. These were the same people, who had been very active in the Group and really had been the driving force in holding it together. They had written programs, given demonstrations, developed and built hardware projects, held classes in programming and obtained all 99/4A related materials from such places as Compu-Serv or Genie, etc., etc.. Without further input and or participation by these members a quicK death of the Group appeared assured.

Response to a questionnaire sent out to all members and former members let us Know that there was considerable interest in Keeping the Group alive however, even if it meant that in order to do so, other maKes of computers would have to be supported. A lot of the 'Clone' owners felt that they could remain active in such a restructured Group and build upon the friendships developed during the TI-99/4A years. By staying or returning to the Group, their vast Knowledge of the 99/4A system would not be lost, but still be available to the 'Hard Core' 99/4A users.

So there you have it. A brand new Constitution was written and approved. New Officers were elected and

See "IKE", page 3

IKE CONTINUES...

installed. Committee Chairpersons appointed and at this time we are in the process of getting additional Committee members interested in the various functions of the Group. In the past these functions were almost always 'handled' by just one and usually the same person. By establishing Committees, we hope to spread out these jobs and prevent 'Burn out', while getting a better functioning User Group, where people truly would get more out of. Being a member of one of these committees and taKing an active part therefore, is vital to the survival of the Group. If you are a 99/4A owner especially, please do not shirK away from this and try to do your part.

So where do we go from here? Sometimes I hear people talK about the liKelihood of 'clone people' taKing over the Group. I also hear talK from some sources, that they are not interested in or want to 'learn' about other systems. These last folKs must be the same ones that clog up our Freeway Systems with their twelve mile per hour 1902 BuicK and 1918 Fords and on Saturdays spend all day cutting the grass around their house with a sicKle. I don't believe that attitudes liKe that got us our computers to begin with. When I first joined this Group I was very much surprised at the number of older people, active in the Group. In some instances you had guys, playing around with computers, so large, that they would have required a room full of equipment before their retirement two decades earlier. These folKs were 'getting on' Bulletin Boards, were experimenting with programming and playing around with other than just the Basic programming language. They were into such things as Forth and Assembly. We even had some who were worKing with Ham Radio and Computers combined. The American principle of not being afraid (of innovations) and always being alert in looKing for and finding improvements (rather than just stiCking with the old), had brought these so called 'old timers' together in a group of people of all ages. It is precisely this phenomena, which leaves me to believe that the bulK of our members will be genuinely interested in ALL other computer systems.

As far as one group taKing over, that will strictly depend upon the degree of involvement in the group by ANY machine's followers. If the 99/4A owners decide just to sit this one out, the clone owners would probably disappear again and the Group would liKely dwindle down to nothing. On the other hand, if all of us worKed together, this Vast User Group has the potential of being the best one around. So let's do it! It's up to you now!

IKe Van Kampen

NOW WE FAST FORWARD TO THE VOL 4, NO 1 (JAN 1988) ISSUE OF VAST NEWS. THE FOLLOWING IS TAKEN FROM THE EDITORS DESK...

In the November 1987 issue , I published an article by IKe Van Kampen that basically gave a review of the changes that had occcured to the group last Summer. The October and November issues of the newsletter were mailed together in late November to the User Groups we exchange with. In mid December I received, via the BBS upload section, a reply to IKe's article by Mr. Harry T. Brashear, President of the Western New YorK 99'ers User Group.

The "Open Letter" has been in the Bulletins section on the BBS since the day it was uploaded. Shortly thereafter, I received a reply from Rene' LeBlanc and also from IKe. These were also put on the BBS. What follows are the three letters so that those folKs that don't have the opportunity to get on the BBS may see what has been going on. I would liKe to encourage any comments YOU may have. Please send comments to:

Jim Ely, Editor

UPLOADED LETTER FROM HARRY BRASHER TO THE VAST BBS

THIS IS AN OPEN LETTER TO ANY TIer IN THE VAST USERS GROUP OF AZ. THAT HAS THE STRENGTH LEFT TO CALL HIMSELF A TIer.

I am so sorry that you have been lead down the garden path away from your beloved TI computers. Your leaders are determined to convert you all into do-nothing, IBM button pushers.

I have never in my life been quite as insulted as when I read "IKes Summer Review", in your November newsletter. I would liKe to quote, filling in my unspoKen name, of course... "(Harry Brashear, as a TIer) ...is someone who clogs up our freeway system with a twelve mile an hour 1902 BuicK and spends all day cutting his grass with a sicKle."

I suggest that IKe gets in his 1988 Cadalac, turns the Key, goes someplace and has no idea of how the car ever got there. It's people liKe him that go from TI, to PC, to XT, to AT, to 286, to 386, and never fire up Microsoft basic to find out what's in the computers. He just goes faster and faster, never looKing backK. Somehow his never ending supply of bits and bytes are supposed to do that for him. He believes that nothing but the fastest computer and biggest spreadsheet will ever handle his checKing account.

In other areas he states that members that have converted are still around to lend a hand to the TIer's. Is Stu Olson lending a hand when he shows a batch of IBM software to the unKnowing membership? If the leaders of the group are not interested in the TI, how do you expect the membership to be. If they don't tell you about all the new hardware coming out in the next three months, how are you to Know. If you go to a TI meeting and see nothing but IBM clones and Geneves, how can you survive? The

answer is, you can't! You will have to give up your TI or gather up your consoles and run like hell to keep from being trampled by the button pushers.

Do not be swayed by the bells and whistles of the IBM. The clones can't to anything more than the TI can, they just do it faster. I suggest that information has been held back concerning the TI and that an IBM group has been started with TI group money. It's only a matter of time before there won't be one TI'er left. They will all be snubbed out of existance.

OK, bottom line. I am laying aside 10 copies of our 20 page newsletter every month for the depressed TIers in your group. The "Interface" is considered to be one of the best and most original in the east. These subscriptions will be made available, free of charge, to the first 10 members of your group that writes and requests a subscription.

And by the way, please don't tell me that I don't know what I am talking about. My wife is FROBOTZ, assistant data base manager of the MS/DOS sig on the Delphi network. I have one of those hotrod clones sitting only five feet away from my TI.

Harry T. Brashear, President
Western New York 99er's
(address omitted)

RENE' LEBLANC REBUTTAL LETTER

Once Upon A Computer

Thank you Harry T. Brashear, President of Western New York 99ers, for a spark of controversy to stimulate things around here. I think your letter has provided us with an opportunity for some interesting discussion and useful self analysis. Your statement,

"I am so sorry that you have been lead down the garden path away from your beloved TI computers.",

is truely pregnant with various assumptions and implications of attitude. I'm not complaining, mind you, it is certainly your prerogative to have your own opinion about this matter with whatever conviction seems appropriate to you. It also provides the nucleus for more lively discussion than if you had only said something like, "I am sorry to see the VAST organization drifting away from its original single computer orientation".

From my vantage point, as one of the earliest VAST members, I saw the following things happening:

(1) There were always a core group of 6-10 movers and shakers who provided the main energy and direction for the group.

(2) These people were also the most likely to be interested in new technology and opportunities to learn new things.

(3) These people began to acquire clones and other computer types that provided different capabilities and software along with opportunities for learning.

(4) As the energy of this core group turned somewhat (not completely) away from the TI, the remaining VAST members who stayed with TI only did not step in to provide the energy the original leaders had been giving to the group.

(5) Meeting attendance began to drop, and there were fewer contributions to the club newsletter. Participation on the BBS began to wane.

(6) The leaders of VAST, including most of the remaining original leaders, decided the group needed to reassess the interests and needs of the members. The decreasing participation was a clear indication that there just wasn't enough interest in a TI-only organization anymore. This was not some faction that suddenly decided to take control of a perfectly functioning TI club and subvert it into another direction to fulfill their own needs.

(7) The decision to redefine VAST as a multi-brand computer group was an attempt by the leaders to meet the changing needs of its membership and to keep the energy of the original movers and shakers IN the group so that they would still be available to other members who prefer to own only their TI(s).

An organization like VAST does not require compulsory membership and participation in all club events. It cannot punish its members for getting interested in and purchasing other computer brands. Its usefulness lies in the common interests of its members and in providing a forum by which they can share experience, knowledge, software and friendship. When members do not come to meetings and do not renew memberships and do not communicate on the BBS, the purpose and main values of the organization are not being served.

The shift of member interest to other brands was not due to being lead astray by the VAST leaders. It was due to the fact that the TI-99/4A is being continuously outflanked by newer machines with active market presence, ongoing vendor and third party support and the availability of more hardware and software options. I firmly believe that if VAST did not change its orientation to include a broader base, the membership would soon be lost to other clubs in the area, and the remaining TI only group of people would not have the "critical mass" to

continue a viable organization.

I can't quite agree that "The clones can't do anything more than the TI can, they just do it faster". In fact, due to having more memory, speed and wider variety of peripherals, they can, in fact, do some things not feasible on a TI. I would also add that without spending quite a lot of $$ for extra hardware on a clone, the TI can do a number of things the clone just cannot do. I cannot say the same thing about some other machines though. Machines liKe the Atari ST and Amiga can do EVERYTHING the TI can do and much more. By the way, I happen to Know what I am talKing about too. I have a PC/AT and an Apollo WorK Station on my desK at worK, and an Amiga, two TI-99/4As and a 10 MIP Novix NBS-4000 development system in my computer room at home.

The point I want to maKe is that technology moves on with or without us. If our organization insists upon a fixation at a certain point in the technology evolution, then it must have a large enough group of members who feel satisfied with this objective to Keep an active useful ongoing participation of members after others have moved on to newer things. This did not prove to be the case with the VAST organization. I thinK we have done the only thing we could do and retain a viable organization.

Rene' LeBlanc

IKE VAN KAMPEN REBUTTAL LETTER

December 21, 1987

Dear Mr. Brashear:

First of all, all members of the Vast User Group, would liKe to wish you and the Western New YorK 99'ers a Very Merry Christmas and a Happy and Prosperous New Year.

We also thanK you for your interest in our Group, expressed in your open letter, recently left on our BBS.

Your letter appears to question our motives, our sincerety and even our honesty however and even appears to attacK and accuse me personaly. Why you chose this method of attempting to enhance the welfare and future of the TI-99/4A computer is beyond me, as such practices will only turn people off, especially in this part of these United States. I will therefore maKe an effort to reply, without drawing personalities into the discussion.

1. We all agree that the TI-99/4A is a very good computer and when it was produced, it was way ahead of it's time.

2. Most of us got computers because we were curious and because we saw a definite use for them. Some of us got into games, others had more use for business applications and some of us even dared fooling around with programming in Basic, Extended Basic, Assembly, P-Code and Forth.

3. Several years have gone by now, since the last of the TI-99/4A were manufactured and time along with further development and innovation in the computer industry have not stood still. Equipment only dreamed of when the TI was still manufactured is now available at affordable prices. Items s.a. 2400 baud modems, CD-ROM disKs and drives as well as Quad density disK drives, to name just a few, are now no longer a pipe dream. If one has attended any computer exhibits, where other than just TI equipment was shown or demonstrated, one cannot help but notice the great strides the computer industry has made during the last few years.

4. Not to notice such progress or pretending not to be interested in them just does not maKe much sense, because these are not the attitudes, which got us our computers to begin with. They are also not the attitudes, which resulted in these giant leaps ahead in the development, innovations and use of computers.

5. The News Letter article, you are referring to, was written for two purposes.

a. To give all our members and especially our winter visitor members a rundown of what exactly had transpired within the Group during the summer months.

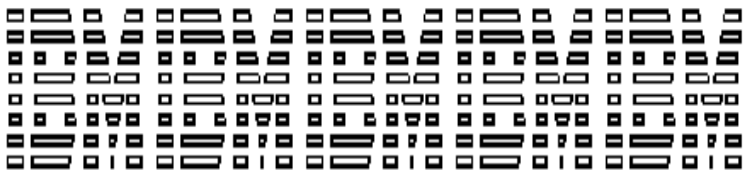
b. To maKe the TI owners see that their becoming more involved in the Group, is of the utmost importance.

If you personaly were offended by the article, I cannot help it. If, however it inspired you to write us and offer the TI owners assistance, by maKing available ten free subscriptions to your News Letter, that would be just dandy! Maybe your action in turn will inspire our TI owners to taKe a more active interest in their computer and the Group.

ThanK you for your time and efforts in our behalf.

IKe van Kampen
(address omitted)

P.S. I am still the proud owner of a 100% TI-99/4A computer, which I still use on occasion. This letter was prepared on it with the TI-Writer. I also own a Leading Edge (model M). So maybe I too Know what I'm talKing about.



"CASSETTE" CONTINUES...

Your computer will have to be able to read in bytes of data ("ons" and "offs") from a tape recorder. This is done by using two tones, each with a different frequency. The lower frequency means "off" to the computer and the higher frequency tone means "on". If you have a tape recorder that has trouble recording or playing back the higher frequency, your computer would be able to hear only "offs". Therefore, to read data from a cassette recorder, you must set the tone to be both loud enough and set the tone to help make the frequency right.

Some tape recorders have a hard time producing and reproducing the high frequency tones properly, so TI programed your computer to be sure that it has read all the data. The 99/4A counts the number of "ons" that it heard and after a few bytes of data, it expects to read a number on the tape that tells it how many "ons" it should have read. If the two numbers don't match, it knows a "parity error" has occured and the computer will print on the screen to tell you that it has had a problem.

If the volume is set up too high then distortion occurs and the tones will not be heard accurately by the computer. If the volume is too low, the computer will not hear the tones (even though you can probably hear them on the tape).

A good tape recorder must be able to handle both the high and low frequency tones and also be capable of reproducing them within a small range of frequency error. In order to playback the higher frequency tone, it is usually necessary to have the tone control set at ,or near, maximum.

Also, the recorder needs to be capable of small volume adjustments so the tones are loud enough to be heard by the computer but low enough so that distortion does not occur.

The recorder must also be fast enough to record and playback the very quick frequency shifts.

CASSETTE POLARITY?

Some of the tape recorders on the market are very good at supplying the needed criteria in frequency response and all of the above criteria to be very reliable with the 99/4A. However, there is one additional problem that you may have with a tape recorder. The computer turns the recorder on and off by the remote control jack (the black wire on the cassette cable). This remote jack is really designed to work with the manufacture's recommended microphone, and there is no guarantee that the jack is hooked up the way that the computer needs it to be. You have about a 50-50 chance when you just go out and buy a cassette recorder. Therefore, your recorder may not be capable of being turned on and off automatically by the computer.

You can get by without it, by starting and stopping the recorder manually. This will work fine unless you intend to use cassette files. If so, you will need the recorder under automatic control of the 99/4A.

VOLTAGE DOES IT

by William Fidden

Having tried loading many cassette programs and encountering the NO DATA FOUND or the ERROR IN DATA messages once too often I called TI to see if they could offer any help. From their assistance I found the computer is looking for a signal of one volt measured peak to peak.

With this knowledge, I constructed a "Y" connector to allow the connection of a Volt-Ohm-Meter to be connected to the ear phone jack from the tape recorder. Next I set the V.O.M. to 2.5 volts A.C. and tried loading a program while adjusting the volume control and leaving the tone control at maximum.

By adjusting the volume to give a reading of approximately one volt the program went right in. Then I again tried all the difficult programs that could not be loaded previously and found that out of approximately 50 all but one loaded on the first attempt, and that one loaded on the second attempt.

Needless to say, I was very pleased.

Ray Kazmer, of Kazco International, Sylmar, CA, provides a User Note which, he writes, "will put to rest forever the continuing problem of how to transfer an over-sized file from tape to disk (and vice versa). The method described by Jerry Keisler in your 1986 December Feedback is one way to do it, but if you're as fumble-fingered and impatient as I am, I think you'll prefer this method.

To transfer an over-sized file from tape to disk:

1. In command mode, enter CALL FILES(1).
2. Load the program from tape.
3. After loading, enter CALL FILES(3).
4. Save the file to disk. It will be in I/V254 format and will run.

To transfer an over-sized file from disk to tape:

1. Load the I/V254 file from disk.
2. In command mode, enter CALL FILES(1).
3. Save the file(now in "Program" format) to tape.

Yesterdays News Information

Yesterdays 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
Adobe Distiller
Adobe Acrobat

Yesterdays News is composed entirely using a TI-99/4A computer system. It consists of 11 PagePro pages which are "printed" via RS232 to PC to be published as a PDF file.