## TEXAS INSTRUMENTS

# **TI Forum**

by Ron Albright & J. Zitram

#### **Program Ideas Wanted**

A recent message from 99 programmer Jim Reiss is very heartening. Jim writes:

"I'm a software author in search of a project. My TECHIE utilities described in the November Computer Shopper being a finished product, I have programming time free to produce something new. I would appreciate any help anyone can give me in the way of suggestions for what to

## **Errata**

In the December TI Forum column, two pictures were mislabeled. While correctly identified in the column as being photographs of the "99AT" system from Ryte Data (210 Mountain Street, Haliburton, Ontario, Canada), the photographs were mislabeled as being the "9640 computer" from Myrac, Inc. (241 Madisonville Road, Basking Ridge, NJ). We apologize for any confusion this may have brought produce; what do you see a need for, what type of program would you like to see? Please let me know."

Perhaps we can unite those who have ideas for programs that currently are not available for the 99 family of computers and those who are able (and willing) to write them. Drop us a line here at *Computer Shopper* if you have an idea, or think you can take an idea and make it work. Call it formal market research!

#### Legends Fix

Jeff Bunting of Compuserve's TI Forum has discovered a fix to a bug in Asgard Software's LECENDS adventure program. The bug caused the program to lock up in a particular room. An Extended BASIC statement needs to be changed to fix the bug. The line as fixed should read:

1475 CALL C2(1)::CALL LINK ("L", "DSK1.D13")::CALL T::CALL LINK("L", "DSK1.D12")::CALL C2(16)::GOTO 1905.

#### Squeeze Programs On The Way

99ers Al Beard and Barry Boone have been developing "squeeze" protypical disk files. The shortened files can be unsqueezed to make them usable again, and in the meantime they can be transferred or stored more efficiently. We will have more on these programs as news becomes available.

#### Agee Reports On Chicago Fair

The annual Chicago TI Fair, one of the largest for 99ers in the country, drew large crowds and much interest again this year.

Warren Agee, a programmer from Detroit who especially likes C99, submitted the following report:

"I had the pleasure of attending the Fifth Annual Chicago TI Fair, one that is fast becoming the grand-daddy of national TI/Geneve gatherings. This was the third consecutive fair I have attended, and it gets better every year. A good number of people showed up, and although I don't have the exact attendance figures, the room seemed just as full as last year. The fair itself seemed very well-organized, with a 'mixer' the evening before the show (which I did not attend) and a banquet for vendors, fair organizers, and other VIPs (which I did attend). itself, highlighting new products; 2) A brief summary of all the great personages I had a chance to meet; 3) A brief description of the banquet afterwards.

"Unfortunately, there were too many people to meet and not enough time to spend sufficient time at every single booth at the show, but I think I did manage to see most of the 'new & exciting' products at this year's gathering."

Genial Computerware: this booth, headed by the ever-popular luminary J. Peter Hoddie, was very busy all day long, and for good reason: they released PC-Transfer by Mike Dodd, which facilitates the transfer of data between the 99/4A or Geneve and an MSDOS system. It can format an IBM 360K disk with a TI drive, and transfer files between the two systems, both ways. CorComp has been selling a similar product for quite some time, but it's on a cartridge and costs twice as much as PC-Transfer, which sells for \$25. Also released was Remind Mel by John Johnson, which is a very slick calendar program that helps manage a monthly schedule. Price: \$15. Lastly, they had a new program called Graphics Expander (by JPH) which takes a TI Artist or CSGD font and changes its size. Written entirely in assembly, it allows you to stretch a font horizontally and vertically, and you can save the result as either a TI Artist or CSGD font. That means you

# The GENEVE 9640 by MYARC, Inc.

## a complete upgrade system for the TI99/4A

### Features include:

- 640K RAM, expandable to 2MBytes with optional memory expansion cards.
- Real time Clock with day, date, and battery backup
- 32K High Speed no wait state static RAM, upgradeable to 64K
- V9938 Advanced video processor with 7 graphics modes, three are VGA comparable
- Up to 256 colors displayable on the screen simultaneously
- Interface for the optional MYARC Mouse and support from Advanced Basic
- Built in sound chip with three tones and one noise
- TMS9995 CPU, 12MHz clock and pipeline "U" processor, for the speed of a 80286 AT
- Compatable with MYARC, TI and Corcomp floppy disk controllers and RS232 cards
- Standard T199/4A Joystick compatable
- Hard Drive compatable with the MYARC Hard & Floppy Disk Controller with streamer tape backup support

## Software included:

- MYARC-DOS with commands similar to MS-DOS, but as advanced as OS/2
- Cartridge Saver Program to save cartridges to diskette
- MY-Word Processor with 80 column by 26 line display and compatable with TI-Writer files
- Microsoft Multiplan upgrade with increased memory and speed plus 80 column by 26 line display
- MYARC Advanced Basic, 80, 40, and 32 column support, the fastest and most advanced on the market, plus MYARC and TI-Extended Basic compatable
- UCSD PASCAL version 4.22 run time, allows the loading and running of thousands of standard PASCAL programs, such as FORTRAN 77 and COBOL
- MYARC GPL Interpreter loads and runs cartridges saved to disk at a comparable speed to the TI99/4A or over three times faster



# For details on the complete GENEVE 9640 system phone MYARC, Inc. (205)854-5843 or write for a free brochure to, P.O. Box 140, Basking Ridge, NJ 07920

## a complete upgrade system for the TI99/4A

The GENEVE 9640 by MYARC, Inc.

#### Features include:

- 640K RAM, expandable to 2MBytes with optional memory expansion cards.
- 8 Real time Clock with day, date, and battery backup
- 6 32K High Speed no wait state static RAM, upgradeable to 64K
- V9938 Advanced video processor with 7 graphics modes, three are VGA comparable
- Op to 256 colors displayable on the screen simultaneously.
- Interface for the optional MYARC Mouse and support from Advanced Basic
- Built in sound chip with three tones and one noise
- TMS9995 CPU. 12MHz clock and pipeline "U" processor. for the speed of a 80286 AT
- Standard T199/4A Joystick comparable.
- & Hard Drive compatable with the MYARC Hard & Floppy Disk Controller with streamer tape backup support

#### Recta constraints and set

- $_{\mathcal{R}}$  MYARC-DOS with commands similar to MS-DOS, but as advanced as OS-2.
- & Cartridge Saver Program to save cartridges to diskette
- MY-Word Processor with 80 column by 26 line display and compatable with T[-Writer files
- & Microsoft Multiplan upgrade with increased memory and speed plus 80 column by 26 line display
- # MYARC Advanced Basic. 80, 40, and 32 column support, the fastest and most advanced on the market, plus MYARC and TI-Extended Basic compatable
- UCSD PASCAL version 4.22 run time, allows the loading and running of thousands of standard PASCAL programs, such as FORTRAN 77 and COBOL
- g: MYARC GP1 Interpreter loads and runs cartridges saved to disk at a comparable speed to the T199/4A or over three times faster



For details on the complete GENEVE 9640 system phone MYARC, Inc. (205)654-5843 or write for a free brochure to, P.O. Box 140, Basking Ridge, NJ 07920

#### \* TI Forum continued from page 194

can easily convert fonts to either formatl Again, very slick; and it sells for \$10. Peter also gave a presentation at 3:00 p.m. during the show, at which he gave a brief autobiography of himself and demonstrated his company's new software. Startling revelation: the J in his name stands for James.

Ryte Data: I only was able to get a brief demonstration from this company, but I thought it appropriate to mention Ryte Data's new 99AT Expansion System for both the /4A and Geneve. It looks like an IBM PC on the

outside [See photos in the December TI Forum column], but the innards have been rearranged to hold a large power supply, up to four half-height drives (including a hard drive), and five slots for standard TI size cards made by TI, Myarc, CorComp, Horizon, Foundation, Mechatronic, etc. Now that the Myarc Geneve computer is available, we need a new expansion box, and here we have one. Price: \$155 with 135 watt power supply and built-in system interface. Just plug in your Geneve and assorted cards, some drives, and you're all set. \$165 for the above with 99/4A interface cable set installed.

McCann Software: I give this the

#### Sinclair Survival continued from page 344

latest start times are determined at the same time as well. The program will now determine the Float of the acitivity. This is the amount of spare time available to perform that particular job. Those activities which have a zero float are the critical activities and must be performed on time or the entire project will be delayed. The lines connecting these activities are now highlighted and this becomes the Critical Path.

Once completed you can produce a number of different reports.

Units—This will list all of the vital data about your project in time units. All time units are measured from the start of the project, at time 0.

DATES—This will derive calendar dates for the earliest and latest start times and the earliest and latest finish times. T/COST—If you have entered costs against each activity, this option will display the total cost of the project.

**HOLS**—This option will list all holidays which you have defined (if you have defined such) earlier in the program.

MSTONE—will list all start and end milestones previously defined. These milestones will be listed against the earliest start and earliest finish for each activity.

You may also make printed copies of all of the information produced by this program.

SPEC—will print the specification sheet and holiday details and all milestone details.

LIST—will produce a complete list of the project activities, their durations, prerequisites and costs. CHART—will produce a copy of the complete bar chart. I will be this chart that you will usually use to

"Most Interesting Announced Product" award of the show. I also hope that they change their name, because the new product isn't software, it's hardwarel The "Avanti 99" is a multiprocessor board for the TI/99/4A powered by the NC4016 Forth Engine. Details that I have were a bit sketchy, but this is what the handout says, in part: The Avanti 99 is fully programmable. Each card has an 8K battery-backed DSR RAM fully accessible to the programmer. The NC4016 Forth Engine on each card has 48K or its own high-speed static RAM, and each card has the CM-Forth operating system in ROM. Several of these cards can be installed

monitor your project and to display it to others.

UNIT—will print the report of each activity with the duration, early and late start dates and finishes and all float details shown in time units.

DATES—will print the early and late start and finish dates of each activity.

QL Project Planner may just be the tool you require in order to get the most out of your valuable time.

These programs—along with others we will look at in months to come still exist although you may have to check with a few dealers to find them. They are available now at a greatly discounted price as compared with their original retails, making them more of a bargain than ever before. (If you cannot find a dealer who has stock on these programs, drop me a note in care of *Computer Shopper* and enclose a SASE.) and used for different operations in the PEB at the same time. One card is fast—they say it runs a 5 MIPS, which stands for 5 Million Instructions Per Second. Apparently, as you add more cards, you can have a total of 25-30 MIPS of computing power. For some reason that sounds more like a marketing maneuver than fact. I will defer to the experts on that matter. Suggested retail price is \$500, available before January 1.

DIJIT Systems had their AVPC card running Multiplan in 80 columns. Asgard was there with their full line of software, and a smiling Chris Bobbitt wearing an Asgard tee-shirt: Jim Horn manned the DOS/Compuserve TI Forum booth while the entire TI Forum message base scrolled by continuously on his transportable Zenith computer (I think), complete with an inoperative shift key. It was a great pleasure to see Terrie Masters again at the LA 99ers booth, and I had the honor of meeting Tom Freeman for the first time. Richard Mitchell had his customary position on the floor in the Bytemaster Booth show his String Master utility for programmers and various issues of the Smart Programmer and Super 99 Monthly. Jack Riley was holding up the fort at the Myarc booth while being bombarded with questions about everything from "where is the HDCC" to "why did you wear a polkadotted tie." Where is the HDCC? Real Soon Now. Lou Phillips, who was scheduled to speak, was conspicously absent at the show. This was a shame, since people asked Jack continued on page 375

TUIN CORPORATION A DISK DRIVE MANUFACTURER			
NEWUpgrade your system or your nonRLL driveTwice the speed or Twice the capacity orTwice the number of drives.Hard Disk Controller - a 50% reduction indisk access time or an increase of 50% to200% in disk capacity or double the numberof drives up to four in your system.PC XT Disk Controller\$160PC AT Disk Controller\$177	NEW AT CONTROLLEP 4 FLOMMES AND 2 MOD Controls two internal FODs 5% and and by and two external FDDs 5% and an 3% in addition to controlling 2 HCDs with FLL or MFM encoding Hend 20/Floppy (4) Fite	CONTROLLERS Hard (2) Controller for XT\$60 Hard (2) Controller RLL for XT\$75 Hard (2) Controller RLL for AT\$109 Hard (2) Controller RLL for AT\$143 Hard (2) Floppy (2) Controller for AT\$131 Hard (2) Floppy (2) Controller RLL for AT\$175 DISK DRIVE + CONTROLLER	
10 MB CARTRIDGE DISK DRIVE High capacity floppy disk drive with	Complete line of Floppy Disk DrivesCall	20MB + Controller	
removable cartridge for PC XT and AT. Great for interchange and backup. Add additional capacity when you need It. Internal Drive\$699 Internal Drive SCS1\$669	5¼ HALF HEIGHT HARD DISK DRIVES FOR THE PC XT/AT	48MB + Controller (AT)40MS\$452 48MB + Controller w/Floppy (AT)40MS\$482 Quantity Discounts Available.	
External Drive\$799 Additional 10MB ea\$35	30MB RLL85 MS\$212 48MB RLL85 MS\$290 30MB RLL40 MS\$250		
TANDY51/4Half Height Hard Disk Drive/Kits.Tandy 1000 30 MB Kit\$34948 MB Kit\$449	48MB RLL40 MS\$310 (408) 432-9025		



#### **COMPUTER SHOPPER, FEBRUARY 1988** Page 375

#### Ti Forum continued from page 374

several technical questions during his presentation that he could not answer Peter Hoddie helped Jack out at the tail end of the presentation by talking about My-Word (and My-Word 2) and demonstrating My-Art. Regarding My-Word 2, Peter says in general he plans to make My-Word function more like a main-stream word processor. That means <insert> continuously inserts as you type, <br/>
<br/>
deletes as you backspace, etc. A significant improvement will be macros, where you can define any key combination (including predefined ones) to do anything you want. He would basically like to see My-Word completely user-definable. He did not specify a completion date, but estimates that perhaps it would be ready by mid to late winter.

I met Mike Dodd, whom Peter describes as "scary, he is so good." Only fifteen years of age, he does work for Myarc, writes commercial software (like PC Transfer), and authors a Geneve column for MICROpendium. Now if J. Peter Hoddie calls Mike Dodd scary, that scares me even more Great talent, and a nice guy to boot.

Lesse now...anyone else I missed? I missed Paul Charlton, but that was because he could not make it to the show. I finally got to meet Barb Wiederhold, owner of the Queen Anne Computer Shoppe in Seattle, Washington, a computer-evangelist extraordinare. I heard they had to pry the microphone away from her at the

mixer held the night before. She was at it again during the show, when she spoke about the future of the TI and Geneve markets. Quite an enthusiastic harly who is genuinely excited about the Geneve 9640. Scott Darling, Sysop of the TI Roundtable on GEnie was also present.

That's it for the facts concerning the Chicago TI Fair. I'm sure I've missed something, but there was a lot to see, both in booths and people. Even though I go because I own a /4a, what brings me back year after year is the people. At the banquet held after the show, I sat at a table with Peter Hoddie, Mike Dodd, Corson Wyman, Todd Kaplan, Jim Horn, and some others (whose names do not ring a beli at the moment, sorry!!) I got this great sense of community which I seldom feel sitting in front of the screen typing away on Compuserve. All these people, whether they be programmers, marketing-types, vendors, or everyday hobbiests and users, flew or drove hundreds and thousands of miles to gather in one spot to talk techie and spend their money. We even had two people from Italy and two from the Netherlands in attendance! What commitment (and lack of sanity, as Peter might say) we all have! What friends we have made! What fun we have had! I'm already shining my shoes for the next fair...bring on 1988 and the next show!

#### **Ron's Part**

A great idea...even if I say so

monthly) event. So, send a postcard with your name and address on it to be eligible. The software coffers are mostly bare, but here is what I will be giving away. Each month, the Forum receives several newsletters from the super user groups supporting TI. Starting with this issue, I will give away all the newsletters received in that current month to the lucky winner. This will serve two purposes. First, the user groups will have another reader for their fine publications and, hopefully, entice someone to be a new subscriber. Secondly, it will allow us to share the incredible wealth of information that flows across the Forum from the groups with someone who may not be aware of what is going on at the "grassroots" level of the TI community. So keep sending your groups newsletters and keep sending the postcards and we will facilitate the networking. Deal? This month's set of newsletters goes to Roy Moglia of St. Petersburg, Florida. Congratulations, Roy! Newsletter of the month (for

November, 1987), by the way, goes to the Ottawa TI 99/4A Users Group (P.O. Box 2144, Station D, Ottawa, Ontario, Canada K1P 5W3). 20 pages of pure information. Kudos go out to the editor. Ruth O'Neill. Nice job!

This month marks the fourth anniversary of MICROpendium. Begun by John Koloen and Laura Burns in February of 1984, this is the last remaining magazine totally dedicated to the life and times of the TI 99/4A Home Computer. Started with a great deal of courage and dedication (the magazine debuted just after the "Black Friday" abandonment of October 31, 1983), the magazine has continued with an admirable regularity since then. It continues today with reviews, tips and regular columns. Even if you just want the keep up with the products and producers in the TI marketplace, MP is chock-full of ads and product announcements. They are the one printed source of information

continued on page 376



myself. The giveaway will continue to be a monthly (or at least, semi-



Roman and Roman and an approximation of a second se

СМІ	Micropolis	Rodime
IMI	Microscience	Seagate
Maxtor	Miniscribe	Tandon
	Quantum	
	Mi Models	
IN-HOUSE	SERVO WREEENG C	APABILETIES.

Peripheral Repair Corp. offers one of the fastest turn around times in the industry - without you paying an extra expedite fee. All work is performed in-house by factory trained technicians. Your winchester disk drive is tested with the latest stateof-the-art diagnostic equipment, and all HDA repairs are performed in our certified, class 100 clean room.







#### TI Forum continued from page 375

on the new Myarc 9640 computer, with a regular column offered there by Mike Dodd. Contributors have included such TI notables as Peter Hoddie, Barry Traver, John Clulow, and Mack McCormick. Hats off to MP for a monumental run. You can get a sample issue for \$2 by sending to *MICROpendium*, P.O. Box 1343, Round Rock, Texas 78680. I think subscriptions run \$17 per year for, usually, 48 pages per month. Well worth it.

Since this issue will get out in January, I wanted to remind you all of the "TI XPO 88" planned for Las Vegas on February 27 and 28th. It will be at the Palace Station Hotel. Contact the Southern Nevada Users Group for details. Address is SNUG, P.O. Box 26301, Las Vegas, NV 89126, or call voice (702) 647-1062 or use the BBS at (702) 648-1247. Should be a blast so plan on attending.

Bob Guellnitz, Advisor to the Student Council of Roselle High School in New Jersey wrote to tell us about the Third Annual T.I.C.O.F.F. they have scheduled for March 26. The fundraiser (proceeds go to the scholarship fund of Roselle H.S.) this year will also feature a PC Clone gathering in conjunction with the usual TI vendors and products. Will make for a bigger show and more interesting for all concerned for each to see how "the other half lives." Plan to attend if your are in that area. It has always been a great show. well-organized and well-attended. You can get more information by calling (201) 241-8902 or 241-4550. The brilliant Edgar Dohmann, a member of the Johnson Space Center TI Users Group (near Houston, Texas) has written a new cartridge-based program for the TI called "TI Workshop." According to the information available to the Forum, the software lets you view and edit every kind of memory (including VDP) in the TI system. The "Workshop" includes a configuration manager (to specify output devices), a disk manager (that operates entirely from menus), a program debugger, an enhanced editor and assembler (which lets you edit files and assemble them

for running as Display/Fixed 80 files), a program label cross reference utility, and can even load and run programs. The program is produced by DataBiotics (P.O. Box 1194, Palos Verdes Estates, CA 90274) and sells for \$49.95. If you are into exploring the "innards" of the 99/4A, this may be worth checking into.

Jay Leber of the TITEX User Group wrote to let us know about the availability of some neat artwork from Hopeton Willis. A series of 25 cartoons drawn by Willis, the art can be loaded into TI Artist, GRAPHX, or Joypaint 99 and then used to build your own cartoons or use as is. The drawings come on a floppy disk for TI Artist or Joypaint 99 (\$10.00) or on two disks for GRAPHX (\$11.00). You can order from Jay Leber at 36 Fox Place, Hicksville, NY 11801. Be advised that some of the cartoons are (cough) "X-Rated" and may not be suitable for children or others. Specify which version you want when ordering.

Do you have one of those super 3-slot widgets from CorComp? This is a little device that plugs into the TI console cartridge port and allows you to have up to 3 separate cartridges "online" at once and select the one you want without plugging and replugging. It has been around for years, and some users have noted that, because of its size, it may wobble in the slot and reset itself at the most inopportune times. From the Houston Area Users Group comes the tip to place some selfsticking cushions (Radio Shack Catalog #64-2346; 89 cents) on the widget's feet. It leads to a tighter fit and elimination of the wobble. Try it out. From the Ryte Data newsletter (\$14/year from Ryte Data, 210 Mountain Street, Haliburton, Ontario, Canada KOM 1S0) comes this hack. From Bob Lawson, the piece explains reading the following in the TMS-9918 Technical Manual: "The load resistor (RL, pin 36 to ground) defines the sharpness of the edges on the video signals. A lower resistor value gives faster fall times and a sharper picture." Bob then proceeds to tell how he improved his video signal by replacing the 580 ohms resistor at R212 pin 36

Accepted		
* DATASTAR P.O. Box 2007 Sioux City, Ic	-	
Your Complete Disk All Diskettes 100% Certified From Major		
THE HOTSPOT	5¼" White Box	
Colored Diskettes	Diskettes	
5¼″ DSDD	\$3.00 Per Box	
10 Color and 5 Color Rainbow Pack Polybagged in 10's w/Tyvec Sleeve, Labels and Tabs.	Includes Tyvec Sleeves, Labels and Tabs.	
Minimum 100	Minimum 30 Boxes	
5¼" Bulk Diskettes — No Sleeve 5¼" Bulk Diskettes — w/Tyvec 5¼" High Density Bulk w/Tyvec 5¼" High Density White Box 3½" Micro SSDD Bulk — 50/Polybag . 3½" Micro DSDD Bulk — 50/Polybag . 3½" Micro DSDD Bulk — 50/Polybag .		

Minimum Order 100

## 1-800-634-0192

Shipping: \$3.00/First Hundred, \$2.00/Each Hundred Thereafter C.O.D. \$1.90

VISA --- MASTERCARD --- PRE-PAYMENT

continued on page 377





#### **TI Forum** continued from page 376

to ground with a 330 ohm resistor recommended in the manual (the manual, according to Lawson, recommended 390 ohms, but they are "sometimes hard to find in ¼ watt"). The resistor change, according to the author, produced a 40% improvement in the picture and marked reduction in the white shadows plaguing some displayed characters. See Figure 1 for a schematic of the location involved. Again, take this hack at your own risk and it is certainly recommended that you be handy with a solder iron before attempting such a modification. But, certainly, food for thought.

#### **Instructions** Available

I have some instructions available as written by John Clulow, on how to add 64K of RAM memory on the 16 bit TI bus. This corresponds to the memory space of the 32K memory expansion card. The instructions included where to buy the needed parts in a kit form as well for about \$27. I think you can download the step-bysteps plans on the TI Roundtable on GEnie (John is a frequent contributor there, as well as the other hardware gurus like John Johnson and Mike Ballman). Or, you can send a SASE to the Forum and I will send out a copy. The modification, reportedly, not only expands the memory but also improves the TI execution speed, since the RAM

you write to me, I will try to include any other schematics I have laying about (the most interesting being from John Willforth on how to install the X8 "module"-at least the chipsinside the console). Amazing what the hardware types come up with! Remember, do not undertake any hardware modifications unless you are thoroughly familiar with the process (soldering, chip replacement, etc.) involved.

#### **Tigercub Sellout**

Jim Peterson, the legendary "Tigercub" himself (Tigercub Software, 156 Collingwood Avenue, Columbus, OH 43213), wrote to let us know of a big sale he is having on his super software. Everything in the catalog is reduced to \$1 per program. That's right! All 130 of the Tigercub programs are only a buck each with a \$1.50 per order for the media (cassette or disk). At these prices, there is a \$10 minimum order. The Tigercub has also prepared three disks full of text files, tips, and tutorials on programming. They are available for \$5 each. Don't miss out!

#### Winding Down

As usual, too much to say and not enough room to do any of it justice. I will have to put off a planned review of "String Master" (Bytemaster Computer Services, 171 Mustang Street, Sulphur, LA 70663; \$19.95) for another time. The month I review it, I will also make it a giveaway! So keep



#### For Home, School, Or Office!

Includes MS-DOS Operating System, Two Program Disks, User's Guide, Guick-Reference Guide, and Owner's Manual.

		ENTI	
X'ma	as S	pecia	Sale OFF
UP	TO	<b>50%</b>	
ARD:			(Minf (

MOTHER BOARD:	•	Quantity	
CT 4.77/8MHz			. 3/3.
T 4.77/10MHz		• • • • • • • • • •	. 367.
aby AT 12MHz		<b></b> .	\$285.
NTERFACE CARD:			
Iona/Graphic/Printer (Short)			\$35
olor/Graphic/Printer (Short)			\$35
GA W/Printer			\$99
T Multi I/O			
(T I/O Plus II		· · · · · · · · · · · ·	\$36
Parallel Printer			\$10
lame I/O			\$10
lock			\$17
llock + R\$232			\$27
IS-232 Serial			
T 1.2MB Drive Card	••••••••		532
T I/O Serial/Parallel/Game			
n ivo ocheur eigiici/vaniic		•••••	. 430. t70
prom Writer Card		•••••	. 8/3.
ACCESSORIES:			
Skeys Keyboard (XT)			\$30
Akeys Keyboard (XT/AT)			524
OIKEYS Keyboard (XT/AT)			122
SOW Power Supplies (XT)	••••••	•••••	122
SOW Power Supplies (Baby AT)	•••••••••••	• • • • • • • • • •	- 444. 211
OOW Power Supplies (Reg. AT)		• • • • • • • • •	. 790. 167
ianius Mouse GM-6	• • • • • • • • • • • • •		. 477, 410
norma mouse om o,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	, , , , , , , , , , , , , ,	••••••••	. #4U. 611
oystick			. #11.
fouse Pad	• • • • • • • • • • •		
iender Changer (MM,FF)	• • • • • • • • • • • • •	••••••	
rinter Cable 6FT	• • • • • • • • • • • •		., 35.
Centrenic Cable 6FT			, , <b>34</b> ,
IS-232 Cable (MM, MF) 6FT			
WAY RS-232 Switch Box	• • • • • • • • • • • • •	• • • • • • • • • •	. 315.
WAY Centronic Switch Box			. 117,
(TIAT SYSTEM			
kany, Many More Unlisted Items.			
Velcome To Inquire.			

- 512K Random Access Memory.
- Two 5%" 360K Drives. • 12" Menechrome
- Monitor. ISBN Style 84-Key Keybeerd.
- NS-DOS 3.2 Operating System with User's Guide and 2 Disks.
- Parallel Interface.
- 4 Expansion Slots.
- Hercules Graphics Compatible
- Color Card Included.

Zonith—The Quality Gees in Before the Name Gees On. For decades, Zenith has been making fine electronics for home and business. Products built to perform and to last. They have put their experience to work to develop the 157-2 Personal Computer. Now you can order this IBM compatible computer at a price that's



almost 50% less than what you could pay for a comparable system. Why buy a noname clone when you can own a Zenith? This kind of quality, at such a LOW price, makes this a computer deal you can't afford to pass up!

Zenith Data Systems are made by skilled engineers to exacting specifications. The Zenith Model 157-2 Computer is expandeble to \$40K RAM. A hard disk drive can be added with addition of controller card. The MS-DOS Disk operating System is the most widely used system available. Order one or more Zenith Computers for your home or business today!

90-Day	/ Limited
lanufactur	er's Warranty.

trademarks of International Business

Machines Corp.

Value Priced At (BM and 1914 PC/XT are registered

**List: \$1499.00** 

Item H-3164-7344-054 8/H: \$49.50 each

To Order Toll-Free: 1-800-32	B-0609 Credit Card of by phone, 24	elomers con order sours a day, 7 days a weak.
Contraction of the second s 1405 Xanium Lane N/Ninneepole, NN 55441-4494	Name	
Send	Address	Apt #
handling. (Minnesota residents add 6% esles tax. Sorry, no C.O.D. orders.)	City	
	State	_ZIP
CHECK: My check or money order is enclosed. (No delays in proceesing orders paid by check.)	Phone	
Acct. No Exp	Sign Here	

