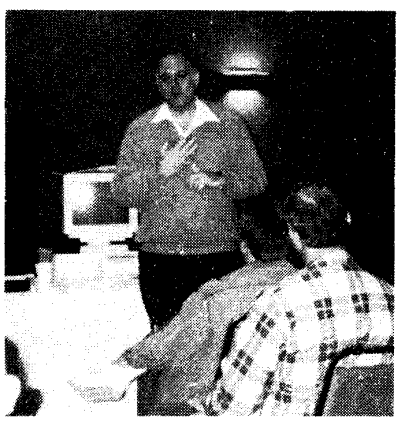
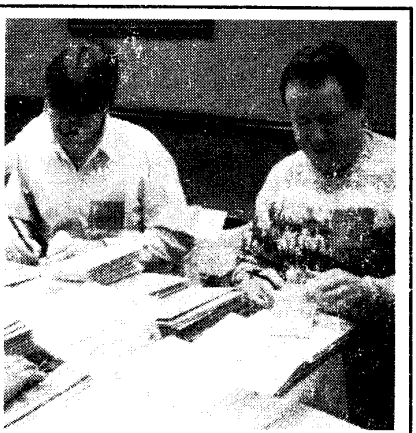
Covering the TI99/4A and the Myarc 9640

MICROpendium

Volume 9 Number 10 November 1992 $2.50



Chicago Faire brings out visitors, vendors and new products



Barry Traver's XB program for comparing program versions

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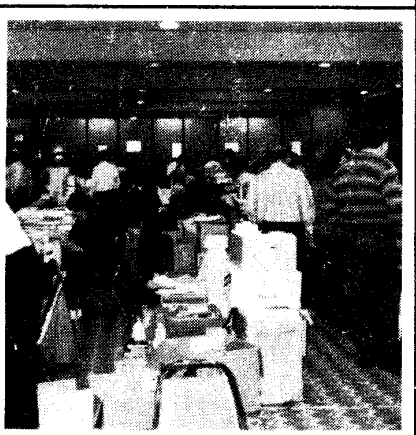
Bruce Harrison discusses structure in Assembly



Undocumented features of ACCEPT AT

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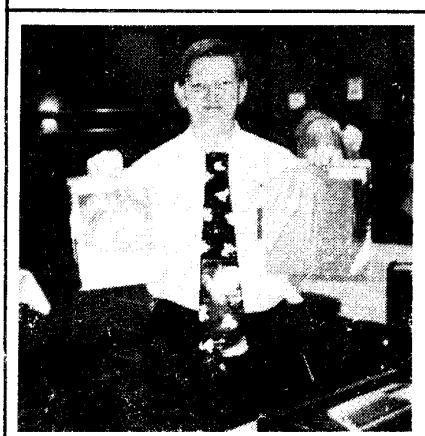
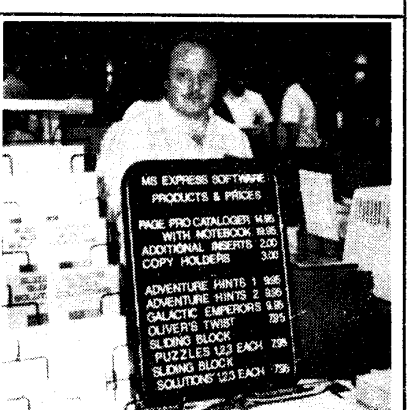
Regena maps out ski spots in Utah



Reviews of Telephone Dialer, Flags and Map, Return Labels, Amortization and Checklog



Photos by Gary Cox

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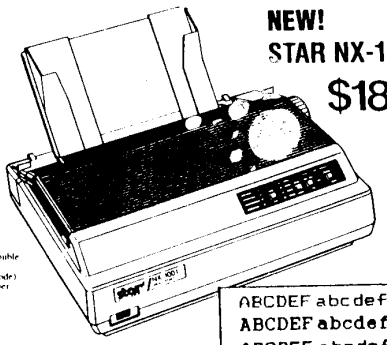

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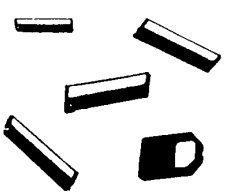

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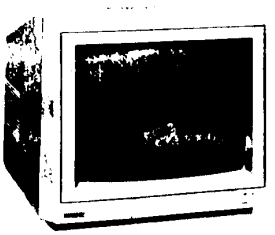

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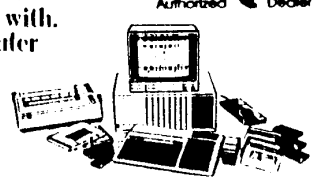

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Laura Burns.....**Editor**

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*READ THIS

Here are some tips to help you when entering programs from MICROpendium:
1. All BASIC and Extended BASIC programs are run through Checksum, the numbers that follow exclamation points at the end of each program line. Do not enter these numbers or exclamation points. Checksum was published in the October 1987 edition.
2. Long XBASIC lines are entered by inputting until the screen stops accepting characters, pressing Enter, pressing FCTN REDO, cursoring to the end of the line and continuing input.

Comments

Thanks for the Birdwell award

Laura and I are very happy to have received the John Birdwell Memorial Award for Lifetime Achievement in Computing at the Chicago TI Faire. We're honored to be selected and hope to continue to measure up. The handsome plaque has a place of honor at our office.

OPINIONS ON 40 PAGES

I had a chance to talk to many readers at the Chicago fair, and most of them seem to favor a higher subscription price for MICROpendium if it means that we can add eight more pages. I tend to think that most people who would want to report an opinion to me directly would be in favor of a $10 increase in the annual subscription price. But, those who didn't suggested we include other orphan computers in the hopes that we would be able to increase advertising revenue to help underwrite subscription prices. Laura and I have no expertise whatsoever with other machines, so that's not very promising. Moreover, it would cost several thousand dollars just to rent a mailing list to try to reach other computer users, whether it be Commodore users or others. Then, too, if we weren't able to gain more advertisers we'd still have to devote a certain number of pages to computers other than the TI. And the situation could result in even fewer pages of TI material than the 32 we're printing now.

Generally, user groups don't seem to be as supportive of a price increase as individual readers. One reader said he'd even accept a 24-page magazine if that means the price wouldn't increase. But I wouldn't be very happy with that. We're still thinking about it, so please continue to let us know what your opinion is. We figure to have a final decision by January.

CHICAGO PUTS ON ANOTHER SUCCESSFUL FAIR

Hal Shanafield of the Chicago TI User Group deserves a bit pat on the back for another successful fair. Though I thought the number of visitors was down somewhat from last year, visitors seemed to stay longer, which provided time for lengthy conversations. Vendors seemed to be fairly busy, especially Bud Mills with his new SCSI card for the TI and Geneve. The SCSI card is floppy/hard disk controller that controls any SCSI drive, up to eight of them simultaneously. Of course, you can't use any of the drives you currently use since they have to be SCSI drives. But for someone who's just getting into a hard drive, for example, it looks unbeatable. (The card is currently being sold without a DSR, which Bud expects to have available by December. Buyers cannot use the card without the DSR.)

Bud also says the Memex card for the TI should be available in early 1993. This card supports up to 16 megabytes of program memory using SIMM chips. The card comes with one megabyte of memory.

Incidentally, Ken Gilliland of Notung Software won the best costume prize at the post-fair dinner. The fair was held on Halloween.

Terrie Masters suggested at the dinner that TI users put together a 10-year commemorative of Black Friday next year. It's hard to believe that it was ten years ago that TI announced that it was leaving the home computer market. Terry suggested Atlanta, Georgia as a site. Whether this ever gets off the ground, it's certainly something to think about as we enter 1993.

ASGARD MEMORY CARD

Asgard also demonstrated its new Asgard Memory System card. This card supports from 128K to 512K of RAM when running programs designed to take advantage of the card. Chris Bobbitt says that the first program that will take advantage of the new memory card is First Draft, Asgard's new word processing program. AMC-compatible copies of this program are expected to be ready before the end of November. If so, expect a review of the card and the software in December.

LIMA UPDATE

Charles Good reports that the Lima TI Conference will be held May 14 and 15 at the Ohio State University Lima campus. The event is sponsored by the Lima Ohio User Group. For more information, contact Charles at 419-667-3131.

CECURE NOW OFFICIAL MYARC REPAIR CENTER

Don Walden of Cecure Electronics is now the official repair center for Myarc products. Don says Cecure finalized the deal with Myarc just before the Chicago TI fair. Cecure can be reached at P.O. Box 132, Muskego, WI 53150. Phone number is (419) 679-4343.

PC EMULATOR

The PC99 emulator software looks better than Mike Wright suggested earlier. Mike and PC programmer Greg Hill demonstrated the program using a PC. PC99 is a program that emulates a TI99/4A on a PC. The program is being done in several stages. The current stage is Stage 0. The final projected stage would be Stage 4. Stage 0 will run relatively simple TI BASIC programs that do not use sprites or I/O operations. Mike also demonstrated Parsec using PC99, minus the sprites. It's really quite an impressive program, though there's a long way to go before it supports all the features of a TI. But it is a good start.

Continuation of this project, according to Mike, depends largely on support by TI users. Some 125 MICROpendium readers responded to an item in August when the PC99 project was first announced.

PASCAL FOR THE GENEVE

I picked up a copy of the Pascal program for the Geneve at the Milwaukee TI Fair. (Incidentally, the Milwaukee fair blended TI, PC and Apple users very nicely, with a preponderance of TI vendors and visitors. There was a lot of used hardware and software available at bargain prices.) The program appears to require a hard disk. There is virtually no documentation, which makes it a bit of a challenge. I hope to eventually have it running, probably after checking out the TI-SIGs on Delphi or GEnie for advice.

—JK

Feedback

Harrison's Easy Data lauded for speed

Anyone who has ever been frustrated waiting for the computer to alphabetize large numbers of listed items or strings should consider Harrison Software's Easy Data. In the program I was using previously I had to wait more than half an hour to alphabetize 240 personalized license plates. I had to use 10 files to hold 2,400 plates. Using Easy Data I can now start my file size at 500 plates per file which alphabetizes in about 55 seconds. Bruce Harrison was also kind enough to provide free assistance in custom-tailoring Easy Data for my hobby of collecting these plate names.

Orval Beland
Saskatoon, Saskatchewan, Canada

Wants magazine fast

Although I have recently joined the Broward Users Group and am eligible for a discounted rate, I am renewing my regular subscrition. Why? Because I want it as soon as possible! I don't want to wait until the next meeting which I can attend only every other meeting time. I was also worried about the loss of advertising revenue. Specifically, Myarc's ads and their loss. MICROpendium is the only national TI publicatin and I wouldn't want to see its demise. I would be willing to pay a higher subscription rate if it could mean more articles for the TI/Geneve.

As you are aware, the number of our users is diminishing. This shrinking user base makes it less economically feasible for publishers to publish, software writers to program and hardware designers to design. A number of talented people have left the TI/Geneve community to pursue other interests. Every user and user group should make the effort to purchase new software or older software when possible. Also, there are a whole slew of inexpensive hardware upgrades for Midi, memory, mice, 80 column cards, multi-cartridge devices and so on.

Most importantly, let's not forget the heroes, the shareware/freeware/trialware authors who write excellent programs. If you use a program, please pay for it! It will encourage that programmer to stay with the TI/Geneve market.

I have personally donated to the MDOS buyout and subsequent source code disks even though I probably won't do a thing with them. I have also made shareware payments and know of a few that I haven't. That will be rectified in the next few weeks.

I encourage MICROpendium to keep up the excellent support and urge other users to do the same.

Greg Knightes
Davie, Florida

Go for 40 pages

Go for the 40 pages. I'm willing to pay the increased amount for MICROpendium and I am sure others will agree to it also.

I am so glad we have a magazine like MICROpendium to keep us up-to-date on new developments and programs. The $35 price is not too much for this.

Charles E. Kirkwood Jr.
Clemson, South Carolina

Would pay more

I would be happy to pay $35 annual subscription if you would publish 40 pages.

David Nuddleman
St. Ansgar, Iowa

Affordable TI

I just got back from the Chicago fair for the second time. This year was up beat; the mood was wonderful.

This letter is about support.

I only own a TI99/4A, no PC, no Mac, etc. I cannot afford to make that purchase, or I would. So I use what I have.

It is still less money to upgrade my TI than to go to a PC. But the only way that can happen is if there is both hardware and software. That will only happen if vendors make money from the users. I would rather support cottage industry over mega-company. I would by a SCSI interface today if software was in place and hang the cost, it will still be less money than those others.

I feel that we might have too much fairware as it gives little incentive to tackle the problems that can be solved. I care little about fancy box art; I want to use my TI.

Too many of us want something for nothing; it will not happen!

Support your TI hardware and software people and use your TIs and Geneve. If you do not buy, no one will have anything to sell; e.g., the Accelerator, no interest.

Craig Palmer
Springfield, Illinois

OPA writes open letter

This letter is addressed to the public, and is being mailed to all of our customers which have outstanding orders from us (OPA), to selected user groups, and to MICROpendium.

Anyone who receives this letter is free to pass it on to friends and/or user groups. Newsletter editors are welcome to publish it, if they so wish.

The aim of this letter is to address a number of false rumors regarding our company (OPA), and to talk about our current state of affairs regarding outstanding orders and the reason a lot of these rumors have gotten started in the first place.

After reading this letter, remember OPA is always reachable by phone any day of the week during the hours 8 a.m. through 11 p.m. EST at either 416-960-0925 or 416-963-TITI.

We also monitor at least once a week our BBS at 416-921-2731, plus the DELPHI, USENET and Fido TI ECHO networks for any mail to us, and reply as best and often as time permits us.

If the below information is not a satisfactory explanation, we are fully willing to discuss your order either by phone or letter, and I am sure we can come to some agreement.

Some of the rumors that have been floating around recently about us, we feel deserve to be shot down. They range from saying "we NEVER made any of our products and just out to rip the public off," to "we NEVER have shipped a product by mail and just deal with us in person."

However, as most of you know, we have thousands of very satisfied customers and of course we have shipped hundreds of our products by mail since we started ir business back in 1985.

We can, however, understand where some of these rumors are coming from

(See Page 7)

Feedback

(Continued from Page 6)

when you look at the following facts about which we feel the TI world needs to know. We would like to continue in the TI marketplace, but doing so is hard since the TI world is such a close-knit community that having just one unsatisfied customer reduces the total amount of orders.

The amount of daily orders and satisfying the needs of our customers is our main concern. Unlike other companies in the TI world, our customers have been the main source of our daily expenses and overhead plus employee salaries, because OPA is, most likely, the *only* company doing business in the TI world where the owners devote themselves exclusively to the enterprise and are independent of a salaried external job.

This means that a steady and increasing amount of orders is the only source of revenue to support ourselves and support future product developments. Again, because we have no outside job to cover our expenses, our product R&D cost has to be factored into the selling price of our products, and we still must stay competitive in the TI world.

We have been doing this very well since we started OPA in 1985, but over the last year we have run into a number of problems which have caused a tremendous shortfall of cash and lack of time in finishing some of our products.

Below you find a list of our products (if you wish, please contact us, for our latest catalog) each with a short explanation of their problems (if any).

• Phoenix 2001 Software: All of this line of software is being shipped and in stock. This currently includes TASS, DISKODEX and RECALLIT. One new product in final beta-testing will be added shortly.

• 9T9 Library & Assembly SIG: Since these programs come out of local 9T9 Toronto User's Group they are also available, in stock and being shipped. New Assembly SIG programs are being written and designed at the SIG meetings every Wednesday wherein OPA donates its time helping interested TIers in learning Assembly programming, hoping that new and great programs will be developed which will use more of the power of our expanded TI systems now available today.

• POP-Cart: Of the two versions of this product, the pre-programmed 256K version has been selling well and is in stock and being shipped. As for the custom version, finishing touches to customizing software that we use in making up your POP-Cart order are being scheduled; also, cash for the larger 512K EPROMs is being looked into. We plan within three weeks to have this financial problem solved; by that time, the customizing software will be finished, at which point we will start shipping the "custom" version to those with outstanding orders.

• TIM & SOB: This has been our best selling product, but also the one with the most outstanding orders, currently over 30. Being our best selling product, we indeed want to continue selling and shipping more of them. The first production lot sold so fast, we were quickly out of stock. This occurred during the time in which our own expenses and overhead were higher, and the R&D and production start-up costs of this product were also hitting us *hard*. This left us a major shortfall of cash, and incoming orders went towards things like heat, rent, food, and minimal necessities. Without these orders we would not be here today at all. We are very thankful that *we* were able to continue, The result was that we filled fewer orders on time because of part shortages, since we were unable to make the required economical bulk purchases. To alleviate this situation we had been arranging for an outside investment of money for the last six months, and as of today a solid group of investors has come with us, and will be recapitalizing the company as soon as the contract is finalized. Within three weeks, we'll be able to start rebuilding our stock of needed parts, and to begin filling the outstanding orders no later than mid-December 1992.

• ROS 8.14 & ROS_9: ROS 8.14 is still available through us, or through Bud Mills software. As for ROS_9, we have a couple of orders for it, but as of this date the software is not finished enough for EPROM use. We plan in the meantime to ship out a beta version on disk to those with outstanding orders for ROS_9 and over the next month, do tremendous testing and finishing of the ROS_9. I am sure you will be pleased with the final result. We know that ROS_9 will become the choice for most Horizon and RAMBO owners in the near future. We will release the beta version on disk shortly as ROS v8.38, containing 90 percent of new features of ROS_9.

• RAMBO/Horizon Upgrade: This product has been selling well through Bud Mills Services, but is also available directly through us and is in stock. Currently we have *no* orders for it, and have not for some time now.

• Morning Star RAMBO: This product was developed because the Morning Star memory card *never* had a DSR. Since it works the same as RAMBO (hardware-wise), we wrote a RAMBO compatible interface for it. It is in stock, but since I only know of two other people with one, besides ourselves, we doubt we'll see any orders for it.

• RAMBO Developer's Package: Until further notice, we are not going to produce this package, so we are going to return any current or future orders for it. Reasons for stopping it are too complex to go into in this letter, but anyone is welcome to call or write us about this wonderful product. In short, it has to do with protection of our work on it and the whole RAMBO project, and the direction we have been seeing our "RAMBO" work being used by other companies.

• GPL Programming Package: When we made up the catalog, since we never before published a 150 page manual we didn't envision the amount of work needed to put this package together, and with our other challenges, and time being rapidly used on meeting them, we just could not get around to finishing it. But we plan to do so as quickly as possible, and the recent addition of our own in-house photocopier will certainly reduce time spent on this and other printing needs. We will fill the few outstanding orders for this once the printing of the manual starts.

• Geneve EPROM Upgrade: We have a number of orders for this wonderful product, but have ran into a series of minor annoying problems in filling them, including our Geneve which was out of service for a few months (it seemed like years), and only recently got on-line again. We hope to schedule final work on this project within five weeks, and to start shipping soon after. If need be, we could ship a beta-version out now, but we prefer to do final bug-testing and finishing touches, since replacing EPROMs is costlier than disk update.

If you have any more questions, you're welcome to call us or write us any time at: OPA Oasis Pensive Abacutors 432 Jarvis St. #502 Toronto, Ont. Canada M4Y-2H3; 416-960-0925 or 416-963-8484 from 8 a.m. to 11p.m. EST.

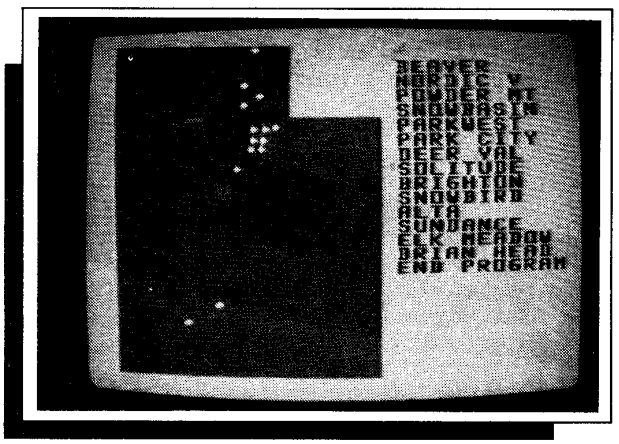
Gary Bowser
Toronto, Ontario, Canada

BASIC

Ski Utah

By REGENA

When November comes each year, our family thinks it is time to start thinking of snow and of snow skiing. Our ski patrol son started the rest of us skiing, and now our whole family enjoys skiing.



When last year's Fest West people were deciding where to hold Fest West '93, the San Diego people were just a little hesitant about traveling to Utah during the cold winter. My suggestion was that the Utah groups (SLaVe and OTIUG) ought to emphasize that Utah is known for its great snow and ski resorts, and we can combine Fest West with a ski vacation.

The Rocky Mountains and Wasatch range offer the greatest powder on earth, according to some ski experts. There are seven resorts within 40 minutes of the Salt Lake City airport. Slightly north, near Ogden, are three more resorts, and slightly south, near Provo, is another resort (Rober Redford's Sundance). Three more areas in Utah offer great skiing, one near Logan in the north and two in southern Utah. This month's program tells a little about our Utah ski resorts.

A map of Utah is drawn with white snowflakes marking the 14 ski resorts. A list of the resorts is at the right of the screen. Use the space bar to advance the arrow marker pointing to the resort, or use the up and down arrow keys to move the marker. As the marker is moved, the corresponding map position will blink. Press the Enter key to select a resort, and a brief description will be printed.

Several facts about each resort are given. The average annual snowfall gives you an idea how much snow falls each year. The vertical drop (by lift), base elevation and top elevation lift give you an idea how high these mountains are and how long the ski runs may be. Beginner, intermediate and advanced terrain are listed as percentages of the whole area, and all the resorts offer a good variety so all levels of skiers may enjoy the resorts.

The number of runs may give you an idea of the variety of skiing available. The area the resort covers is called the skiable acres. Several of the resorts in the Salt Lake area are not far from each other, and some of them have connecting runs. Night skiing, usually considered from 4 to 10 p.m., is available at several resorts. The output also lists whether snowboards are allowed or not.

The ski price listed in this program is the cost of an all-day, all-area adult lift pass. Most resorts have discounts for children and for senior citizens (some have free lift tickets). The cost listed is last year's ticket price because I haven't been able to get current information from all the resorts for this year, but it will give you an idea of the relative costs for each resort. Most resorts offer a "beginner" package which includes ski rental, a lesson and a lift ticket for a reduced price.

Many airlines, rental car companies, hotels and motels have ski packages available for vacation planning. Travel agencies can help you plan your Fest West/ski vacation or skiing at any other time. Ski information will be available at Fest West, you can write directly to chambers of commerce or the ski resorts, or you can write to me for more information about these resorts.

If anyone is interested, we can arrange ski trips for the Monday after Fest West. Part of my family will be going to one of the Salt Lake area resorts, and it would be fun to have a Fest West group ski together. Rental equipment is available at all the resorts.

If you are driving to Fest West from southern California, Nevada or Arizona, plan to ski the Thursday or Friday before Fest West at Brian Head, which is not far from Cedar City. Also, I will have an "open house" at my home for all Fest West travelers. If it's really cold weather, stop by my house and I'll have a pot of stew on. Just write to me ahead of time to let me know, and I can send you a street map and description of how to get here.

Now back to the program. The blue characters used to draw Utah are character 97. L1$ and L2$ draw a line of several characters. Lines 260-330 define the characters placed on the map for each ski resort. These lines also define X1 and Y1 coordinates for each site. Lines 340-360 define the colors as white on dark blue.

Lines 660-700 blink the character for the ski area on the map and blink the marker arrow while waiting for the user to press the space bar, arrow keys or Enter key. Lines 710-880 determine whether the marker should be advanced, should move up or shoule move down, or if the Enter key was pressed. Pressing the space bar moves the marker down one at a time, and at the bottom starts the marker again at the top. The arrow keys move the marker up or down but stop at each end. Selecting the last item, END PROGRAM, will simply end the program rather than selecting a resort.

Line 910 branches to the appropriate subroutine depending on the ski resort chosen. Each subroutine prints the name of the resort, RESTOREs a particular line of DATA, then prints a brief description of the location. Line 920 READs the appropriate line of DATA, then Lines 930-1040 print the facts for the particular resort. Lines 1050-1060 wait for the user to press a key after reading the screen; then the program will return to the map.

If you wish to save typing effort, you may have a copy of this program by sending $4 to *REGENA, 918 Cedar Knolls West, Cedar City, UT 84720.* Please specify that you need "Ski Utah" for the TI and whether you want cassette or diskette.

REGENA ON BASIC —

```
100 REM SKI UTAH !019
110 REM BY REGENA !071
120 DIM X1(15),Y1(15)!138
130 CALL CLEAR !209
140 PRINT TAB(5);"** SKI UTA
H **" !173
150 CALL CHAR(64,"000406FF06
04")!046
160 PRINT : :"UTAH HAS SOME
OF THE BEST  SKIING IN THE
WORLD." !054
170 CALL CHAR(97,"")!168
180 PRINT :"SEVEN RESORTS AR
E WITHIN A  40-MINUTE DRIVE
OF THE SALT LAKE CITY AIRPOR
T." !205
190 L1$="aaaaaaaa" !054
200 PRINT :"FOUR MORE RESORT
S ARE WITHINSIXTY MILES FROM
 SLC." !212
210 L2$="aaaaaaaaaaaaaaaa"
!169
220 PRINT :"ONE RESORT IS NE
AR LOGAN IN NORTHERN UTAH, A
ND TWO ARE  IN SOUTHERN UTAH
." !142
230 X=2 !017
240 Y=20 !067
250 PRINT :"AT THE MAP USE T
HE SPACE BAROR ARROW KEYS TO
 MOVE THE  ARROW, AND PRES
S <ENTER> TOSELECT." !249
260 FOR J=1 TO 15 !111
270 READ C$,X1(J),Y1(J)!229
280 CALL CHAR(97+J,C$)!083
290 NEXT J !224
300 DATA 00020702,1,11,00000
0000040E04,3,11,00000040E04,
4,12,40E04,5,11 !223
310 DATA 0000000000020702,6,
11,0000000000081C08,6,12,000
0000040E04,6,13 !240
320 DATA 000000020702,7,11,0
0000010381,7,12,040E04,8,11,
20702,8,12,000000020702,9,10
 !063
330 DATA 0000081C08,19,9,000
0000000081C08,20,7,,21,7 !14
0
340 CALL COLOR(9,16,5)!237
350 CALL COLOR(10,16,5)!022
360 CALL COLOR(11,16,5)!023
370 PJ=1 !082
380 X=2 !017
390 PRINT : :"PRESS ANY KEY
TO START.";!213
400 CALL KEY(3,K,S)!190
410 IF S<1 THEN 400 !154
420 CALL CLEAR !209
430 CALL SCREEN(8)!153
440 PRINT L1$;"baa" !223
450 PRINT L1$;"aaa";TAB(19);
"BEAVER" !101
460 PRINT L1$;"caa";TAB(19);
"NORDIC V" !233
470 PRINT L1$;"ada";TAB(19);
"POWDER MT" !072
480 PRINT L1$;"eaa";TAB(19);
"SNOWBASIN" !107
490 PRINT L1$;"fghaaaaaa PAR
KWEST" !214
500 PRINT L1$;"ijaaaaaaa PAR
K CITY" !236
510 PRINT L1$;"klaaaaaaa DEE
R VAL" !139
520 PRINT "aaaaaaam";L1$;"a
SOLITUDE" !067
530 PRINT L2$;" BRIGHTON" !0
63
540 PRINT L2$;" SNOWBIRD" !0
74
550 PRINT L2$;" ALTA" !000
560 PRINT L2$;" SUNDANCE" !0
51
570 PRINT L2$;" ELK MEADOW"
!157
580 PRINT L2$;" BRIAN HEAD"
!130
590 PRINT L2$;" END PROGRA"
!166
600 CALL HCHAR(23,31,77)!056
610 PRINT L2$:L2$ !149
620 PRINT "aaaaaan";L1$;"aa"
 !178
630 PRINT "aaaao";L1$;"aaaa"
 !179
640 PRINT L2$:L2$:L2$:L2$;!2
47
650 J=PJ !162
660 CALL KEY(3,K,S)!190
670 CALL HCHAR(X,Y,64)!136
680 CALL HCHAR(X1(J),Y1(J),9
7)!094
690 CALL HCHAR(X,Y,32)!131
700 CALL HCHAR(X1(J),Y1(J),9
7+J)!105
710 IF K=13 THEN 890 !177
720 IF K<>32 THEN 790 !015
730 J=J+1 !013
740 X=X+1 !041
750 IF J<>16 THEN 660 !141
760 J=1 !002
770 X=2 !017
780 GOTO 660 !229
790 IF (K<>69)+(K<>101)+(K<>
11)=-3 THEN 840 !173
800 IF J-1=0 THEN 660 !080
810 J=J-1 !014
820 X=X-1 !042
830 GOTO 660 !229
840 IF (K<>88)+(K<>120)+(K<>
10)=-3 THEN 660 !249
850 IF J+1=16 THEN 660 !135
860 J=J+1 !013
870 X=X+1 !041
880 GOTO 660 !229
890 CALL CLEAR !209
900 PJ=J !162
910 ON J GOSUB 1070,1130,119
0,1250,1310,1370,1430,1490,1
550,1610,1670,1720,1780,1840
,1900 !115
920 READ SNOW,VERT,B,TOP,BEG
,I,ADV,RNS,ACRE,NIGHT$,BOARD
$,C !114
930 PRINT :"AVG ANNUAL SNOWF
ALL: ";SNOW;CHR$(34)!237
940 PRINT "VERTICAL DROP: ";
TAB(21);VERT;CHR$(39)!231
950 PRINT "BASE ELEVATION: "
;TAB(21);B;CHR$(39)!028
960 PRINT "TOP ELEVATION LIF
T: ";TOP;CHR$(39)!174
970 PRINT "BEGINNER TERRAIN"
;TAB(23);BEG;"%" !097
980 PRINT "INTERMEDIATE TERR
AIN";TAB(23);I;"%" !017
990 PRINT "ADVANCED TERRAIN"
;TAB(23);ADV;"%" !090
1000 PRINT "NUMBER OF RUNS:
";RNS !090
1010 PRINT "SKIABLE ACRES: "
;ACRE !036
1020 PRINT "NIGHT SKIING: ";
NIGHT$ !124
1030 PRINT "SNOWBOARDS ALLOW
ED: ";BOARD$ !059
1040 PRINT "ALL-DAY PASS:  $
";C !067
1050 PRINT :"PRESS ANY KEY T
O CONTINUE";!203
1060 GOTO 400 !224
1070 PRINT TAB(4);"BEAVER MO
UNTAIN" !204
1080 RESTORE 1090 !163
```

(See Page 10)

REGENA ON BASIC—

(Continued from Page 9)

```
1090 DATA 450,1600,7200,8840
,35,40,25,16,364,BY ARR,YES,
17 !246
1100 PRINT :"LOCATED 111 MIL
ES FROM SLC. GO NORTH ON I-1
5 THEN TAKE  HWY 89 TO LOGAN
." !038
1110 PRINT "USE 4TH NORTH AN
D GO 37 MI  UP LOGAN CANYON.
" !140
1120 RETURN !136
1130 PRINT "    NORDIC VALLE
Y" !160
1140 RESTORE 1150 !223
1150 DATA 300,960,5500,6400,
30,50,20,12,85,YES,NO,13 !11
7
1160 PRINT :"55 MILES NORTH
OF SLC.      TAKE I-15 NORTH
 TO THE      OGDEN 12TH STRE
ET EXIT." !022
1170 PRINT "TURN EAST AND GO
 THROUGH    OGDEN CANYON." !
015
1180 RETURN !136
1190 PRINT "  POWDER MOUNTAI
N" !016
1200 RESTORE 1210 !027
1210 DATA 500,1300,7600,8900
,10,60,30,33,1600,YES,YES,19
 !097
1220 PRINT :"55 MILES NORTH
OF SLC.      TAKE I-15 NORTH
 TO THE      OGDEN 12TH STRE
ET EXIT." !022
1230 PRINT "TURN EAST AND FO
LLOW SIGNS." !204
1240 RETURN !136
1250 PRINT TAB(5);"SNOWBASIN
" !059
1260 RESTORE 1270 !087
1270 DATA 400,2400,6400,8800
,20,50,30,39,1800,NO,YES,22
!011
1280 PRINT :"53 MILES FROM S
LC.  TAKE    I-15 NORTH TO I
-84 EAST VIA EXIT 92 TO HUNT
SVILLE." !110
1290 PRINT "FOLLOW SIGNS TO
HWY 167." !185
1300 RETURN !136
1310 PRINT TAB(6);"PARKWEST"
 !248
1320 RESTORE 1330 !148
1330 DATA 300,2200,6800,9000
,22,30,48,50,850,NO,YES,26 !
222
1340 PRINT :"24 MILES EAST O
F SLC.  USE  I-80 AND HWY 22
4.  THERE AREFOUR MOUNTAINS
WITH TOURS." !233
1350 PRINT "TWO DESIGNATED H
ALF-PIPES   FOR SNOWBOARDERS
." !153
1360 RETURN !136
1370 PRINT TAB(6);"PARK CITY
" !015
1380 RESTORE 1390 !208
1390 DATA 350,3100,6900,1000
0,17,49,34,83,2200,YES,NO,39
 !072
1400 PRINT :"27 MILES EAST O
F SLC.  GO   EAST ON I-80 TO
 PARK CITY." !057
1410 PRINT :"NIGHT SKIING 4:
00-10:00 P.M." !194
1420 RETURN !136
1430 PRINT TAB(4);"DEER VALL
EY" !149
1440 RESTORE 1450 !012
1450 DATA 300,2200,7200,9400
,15,50,35,55,1000,NO,NO,41 !
175
1460 PRINT :"LOCATED SOUTHEA
ST OF SLC.   GO 28 MILES EAS
T ON I-80,   THEN 7 MILES OF
 STATE ROADS." !024
1470 PRINT "HI-SPEED QUAD CH
AR, NINE   TRIPLES, ONE DOU
BLE LIFT." !239
1480 RETURN !136
1490 PRINT TAB(5);"SOLITUDE"
 !239
1500 RESTORE 1510 !072
1510 DATA 410,2030,8000,1003
0,20,55,25,60,1100,NO,NO,26
!217
1520 PRINT :"LOCATED 12 MILE
S UP BIG     COTTONWOOD CANY
ON ON HWY 190OR, FROM I-15 T
AKE I-80 EAST" !016
1530 PRINT "TO I-215 EAST TO
 EXIT 6 AND FOLLOW SIGNS TO
SOLITUDE." !045
1540 RETURN !136
1550 PRINT TAB(5);"BRIGHTON"
 !227
1560 RESTORE 1570 !133
1570 DATA 430,1445,8755,1020
0,26,44,30,48,550,YES,YES,21
 !118
1580 PRINT :"25 MILES SOUTHE
AST OF SLC.  TAKE I-215 EAST
 TO THE      COTTONWOOD CANY
ON EXIT 6 AND" !049
1590 PRINT "CONTINUE TO THE
TOP OF BIG  COTTONWOOD CANYO
N." !218
1600 RETURN !136
1610 PRINT TAB(6);"SNOWBIRD"
 !239
1620 RESTORE 1630 !193
1630 DATA 500,3100,7900,1100
0,20,30,50,45,2000,NO,YES,36
 !046
1640 PRINT :"25 MILES SOUTHE
AST OF SLC.  TAKE I-80 EAST
TO I-215     SOUTH.  EXIT AT
 6200 SOUTH," !041
1650 PRINT "AND FOLLOW SIGNS
 TO LITTLE  COTTONWOOD CANYO
N RECREATIONAREA.  FEATURES
AERIAL TRAM." !076
1660 RETURN !136
1670 PRINT TAB(7);"ALTA" !16
6
1680 RESTORE 1690 !253
1690 DATA 500,2050,8550,1055
0,25,40,35,39,2000,NO,NO,21
!237
1700 PRINT :"25 MILES SOUTHE
AST OF SLC INLITTLE COTTONWO
OD CANYON ON STATE HWY 210."
 !234
1710 RETURN !136
1720 PRINT TAB(4);"SUNDANCE"
 !214
1730 RESTORE 1740 !047
1740 DATA 320,2150,6100,8250
,20,40,40,39,400,NO,YES,22 !
212
1750 PRINT :"40 MILES SOUTH
OF SLC.      LOCATED ON MOUN
T TIMPANOGOS.FROM SLC TAKE I
-15 SOUTH TO PROVO." !084
1760 PRINT :"MADE FAMOUS BY
ACTOR ROBERT REDFORD." !212
1770 RETURN !136
1780 PRINT "  ELK MEADOWS/MO
UNT HOLLY" !050
1790 RESTORE 1800 !108
1800 DATA 350,1200,9200,1040
0,14,62,24,30,345,NO,YES,19
!011
1810 PRINT :"LOCATED IN SOUT
```

(See Page 11)

Chicago TI Faire

Asgard shows First Draft, Bud Mills shows SCSI card

By GARY W. COX

The Chicago TI Faire has once again come and gone leaving attendees with a variety of new TI99/4A and Geneve products in their hands.

PC99 EMULATOR

One of the most interesting items at the fair was PC99 (TI Emulator) by Mike Wright and Greg Hill and distributed through CaDD Electronics. PC99 is a program which allows the IBM compatible PC user to operate his PC as if it were a TI99/4A running TI99/4A compatible programs. The project is far from completion but what does work looks intriguing. According to Wright, the TI GROMs and ROMs have been copied into a program on the PC, thus allowing actual TI emulation and not fake screens that fool you into thinking your PC is running as a TI99/4A.

The first display that you see on your PC is the TI color bar screen followed by the familiar selections for TI BASIC and Extended BASIC followed by the usual prompt seen in Extended BASIC. I got to sit at the keyboard and play a little with PC99 and I wrote a simple four-line program in XB which ran fine. I was also able to see Parsec running on the PC, with the exception of sprites. Sprites have not yet been implemented in the emulator package.

The program development is currently in what is called Stage 0 which is the first stage of development. The system is very slow, even on a 50mhz PC. The speed of the system is expected to dramatically increase as the operating system code is modified and optimized.

It is impressive that someone has actually been able to get this far on a TI emulator, but it is currently just a neat thing to see rather than something that can get much use running TI programs due to many incompatibilities that still exist as well as the slow operating speed.

Wright says the development of the PC99 project depends on the response he gets from TI users.

SCSI CARD

Also present at the fair was Bud Mills of Bud Mills Services (Horizon Computer) selling the SCSI controller card along with Don O'Neil, the designer, who was there to answer questions about the card. While the hardware was complete and the cards were available for sale the DSR (Device Service Routine) to operate the card is not expected to be available until December. According to Mills, 9640 News is expected to release a patch for MDOS to allow direct access to SCSI devices without the use of the DSR being developed. The SCSI card is expected to be able to access most of the SCSI devices available today. Also available from Bud Mills was the Horizon 4000 RAMdisk card. The Horizon 4000 provides all the modifications and features of previous cards plus more, including the Phoenix modification and RAMBO all built in. The card will also populate up to 8 megabytes of RAM chips to make a really large RAMdisk.

Michael Maksimik of Crystal Software displayed a variety of MIDI-related products, including MIDI Master 99 V2.3, MIDI Album 99, various song disks and a new enhanced cable design for his MIDI interface. Also new and functioning was software written by Maksimik which will operate a tape backup device on the Geneve. The software is expected to be released soon by 9640 News.

New from Ken Gilliland of Notung software was MIDI Volume 5, Disk of the Ancient Ones, containing scenes from the ages, and a Hieroglyph translator, among other things. For those interested in western related items, he has a disk called Disk of the Old West containing music, graphics, etc. related to the old west. For advanced BASIC owners he offered a new game called ARMOR.

Bruce Harrison of Harrison Software displayed a variety of programs, including Smart Connect — a program which allows the transfer of files between a TI and a PC compatible computer. New this year was Stor Mor ($5), a simple program that loads strings into low and high memory solving the problem of programmers running out of string space. Stor Mor might be thought of a sort of memory manager similar to what you find on PCs.

Among the busiest tables at the fair was the 9640 News table where Beery Miller displayed a variety of software for the Geneve, including GenPROG, Picture Transfer, HyperCopy, PC Transfer, PC Transfer Utilities, Identifile, 9640 News volumes 1, 2 and 3, Global War, Tetris for MDOS, Barricade, MODS versions H and F, ABASIC, V9938 manuals, MDOS source code, ABASIC source code and PSYSTEM source code and libraries. One new program was a backup program called Backup Miser which will backup a hard disk to floppy using data compression techniques to minimize the amount of disks needed.

FIRST DRAFT

Chris Bobbitt and David Bishop represented Asgard Software and displayed a number of new products, including Link Terminal Emulator, Page Pro Composer,

(See Page 12)

REGENA ON BASIC—

(Continued from Page 10)

```
HERN UTAH     NEAR BEAVER ON
I-15.  USE    THE BEAVER EXIT
 THEN GO" !008
1820 PRINT "EAST ON HWY 153.
" !092
1830 RETURN !136
1840 PRINT TAB(4);"BRIAN HEA
D" !037
1850 RESTORE 1860 !168
1860 DATA 400,1400,9600,1100
0,40,40,20,48,400,NO,YES,28
!002
1870 PRINT :"LOCATED IN SOUT
HERN UTAH AN HOUR AWAY FROM
CEDAR CITY.  TAKE THE PAROWA
N EXIT FROM" !012
1880 PRINT "I-15 AND GO EAST
 ON HWY 143.GREAT SKI PATROL
 AND SKI     INSTRUCTORS!" !1
71
1890 RETURN !136
1900 END !139
```

CHICAGO TI FAIRE—

(Continued from Page 11)

Invoice Management, Mail Room, Music Maker Sampler and Font Sampler. One of the biggest new items from Asgard was First Draft, a new word processor program with a built-in spell checker. Asgard also showed its new memory card for the 4A.

Present from MS Software was Mickey Cendrowski (Schmitt) and Mike Sealy demonstrating a new product called Page Pro Cataloger. The program prints a catalog of Page Pro Pictures quickly and easily.

Larry Conner of L.L. Conner Enterprises displayed a large number of TI cartridges, third party software, hard-to-find TI chips and such rare hardware such as a Ham radio Morse code transmitter interface for the TI99/4A.

Ron Markus of Ramcharged Computers had his usual assortment of software and joysticks, plus two new game programs called Astro-Mania and War on Sea, available for $9.95 each.

Del Wright and William Lucid of D. Wright Stuff were selling a variety of disk drives, quiet cooling fans, joysticks, power supplies, modulators and drive enclosures, among other items.

Ted Kieper of Competition Computer displayed parts, drives, cartridges, consoles and a good variety of expansion boxes, monitors and cables.

Mark Wacholtz of Media Ware Software displayed a new game called Super Space Acer, which is a neat game written my Mike Ward in the C programming language.

Don Walden of Cecure Electronics provided a variety of upgrades and parts for Geneves. Walden indicated that he is now an authorized repair center for Myarc products, including Geneves.

For those interested in BBS software Tim Tesch was demonstrating his BBS software, written in Extended BASIC and Assembly, which will run on either a TI99/4A or Geneve 9640. The software is $30. Tim mentioned that he will possibly be working on an Echo mail system for his BBS software sometime soon.

Mark Van Coppenolle of C.A.D.D. Electronics displayed an assortment of hardware and software for the TI and Geneve, including the GRAMulator and other products.

Many user groups were also represented, including Charles Good of the Lima group, Greg Larson of the Hoosier's user group, the Will County U.G., Milwaukee TI user group and me, from the Mid-South 99 Users Group.

TI users from across the U.S. were joined by TI'ers from Germany and Holland, including Berry Harmsen of the Dutch TI Users Group. The group has some 260 members. Harmsen showed a card which allows the user to put his speech synthesizer board onto a board for the PEB and using this special board the user can access TE2 speech capabilities without having the TE2 module. Another item was an archiver program which will compress assembly programs up to 60 percent of their original size. Once archived, it will still run without having to unarchive it. This would come in really handy for those with limited disk space.

Vendors at the Chicago TI Faire

Below is a list of the vendors present at the 1992 Chicago TI Faire:

Asgard Software, P.O. Box 1306, Rockville, MD 20849 (703) 255-3085

Bud Mills Services/WHT 166 Dartmouth Drive, Toledo, OH 43614 (419) 385-5946

C.A.D.D. Electronics, 81 Prescott Road, Raymond NH 03077 (603) 895-0119

Chicago TI 99/4A Users Group, P.O. Box 578341, Chicago, IL (708) 862-0182

Competition Computer Solutions, 2219 S. Muskego Ave. Milwaukee, WI 53215 (414) 672-1600

Crystal Software, 635 Mackinaw, Calumet Cityu, IL 60409-4014 (708) 891-2315

D. Wright Stuff, 2201 185 North Post Road, Indianapolis, IN 46219 (317) 895-1765

Fox Valley Users Group, 1536 Amarillo, Carpentersville, IL 60110 (708) 426-6301

Harrison Software, 5705 40th Place, Hyattsville, MD 20781-1727

Hoosier Users Group, P.O. Box 2222, Indianapolis, IN 46206

L.L. Conner Enterprises, 1521 Ferry St. Lafayette, In 47901 (317) 742-8146

Media Ware Software, 2141 NW 64th Ave, Suite 15, Sunrise, FL 33313-3950 (305) 749-4690.

Micropendium Magazine, P.O. Box 1343, Round Rock, TX 78680

Milwaukee Users Group, 7759 South Scepter Dr. #7, Franklin, WI 53132

MS Express Software, P.O Box 498, Richmond, OH 43944-0498 (614) 282-5627

Mudd & Co (708) 755-0051.

9640 News, P.O. Box 752465, Memphis, TN 38175-2465 (901) 368-1169

Notung Software, 7647 McGroarty Street, Tujunga, CA 91042 (818) 951-2718

Ramcharged Computers, 6467 E. Vancey Dr., Brookpark, OH 44142 1-800-669-1214 or (216) 243-1244

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Vereniging TI-Gebruikersgroep (Dutch TI Users Group) 1e Osterparkstr. 141e 1091 Gz Asterdam, The Netherlands.

Burns, Koloen receive Birdwell Memorial Award

Laura Burns, editor of MICROpendium, and John Koloen, publisher, were the recipients of the 1992 John Birdwell Memorial Award for Lifetime Achievement in Computing. The award was presented by the Chicago TI User Group at a banquet following the fair on Oct. 31.

The award honors the memory of the late John Birdwell, a well-known TI programmer and Chicago TI User Group member.

This is the second year the award as been presented. Last year's recipient was Barry Traver.

Koloen accepted the award and thanked MICROpendium's readers for their continued support of the magazine.

"We are honored to receive the award and hope to continue to earn your support in the years ahead,' Koloen told the audience.

EXTENDED BASIC (plus)

Comparing versions of the same program

By BARRY TRAVER
©1992 B. Traver

The original plans for this month's column were to comment on the JUMPAPEG programs, but we're postponing doing that for two reasons: (1) somehow the assembly code for the revised JUMPAPEG failed to appear in last month's column (but IS being supplied to you this month, and I do want you to have time to try out the new version before we talk about it), and (2) I just received a very interesting (and lengthy) letter from Ollie Hebert, who has suggested some further modifications and improvements to JUMPAPEG (so, thanks to Ollie, I may even have opportunity before next time to improve JUMPAPEG even a bit more.)

So what are we doing this month? Well, I thought I might talk a bit about some practical matters relating to the revision of programs, since we're already on the topic. There are right and wrong ways to do this, and I know what I'm talking about, because I've done both!

First, let me admit that I do not tend to always follow principles of good programming practice. You're supposed to plan out in detail what you want to do before you write a line of code, or so many of the books say. Well, I'm afraid that that's not the way I tend to do it (and my programs may reveal that even without my making a direct confession). I was glad to be reading a book on programming recently, however, which gave some indication that possibly MOST programmers do not program the way most book writers recommend.

The way my programs usually develop is this: I write a bare-bones working program that does the heart of what I want the program to do, and then after that is done (and it may be less than a dozen lines of code), I work on adding improvements to the program. The improvements may be such things as making the display less klutzy-looking (e.g., by changing PRINT and INPUT to DISPLAY AT and ACCEPT AT), putting in some error-catching routines (e.g., preventing the program from crashing when someone tries to open for input a non-existent disk file), or adding as many fancy features as I can think of.

This is the way my first published program, "Giant and Dwarfs" (published in the old 99'er Home Computer Magazine), was written. I kept thinking of new things to add, and then I would see if I could add them. At the end, I was running out of memory, so I had to keep working on "smushing" the program by hand to have a little more room to add another feature,

(See Page 14)

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EXTENDED BASIC PLUS—

(Continued from Page 13)

but the program kept growing bit by bit. At the end, I tried to rearrange and organize some of the code to make it look more like "structured programming," but I'm afraid that that was not the way the program was originally written. The finally published version doesn't look like "spaghetti code," but earlier versions would feel right at home in an Italian restaurant!

Extended BASIC is a "quick and dirty" language. It is often criticized for this reason, but it should be noted that this disadvantage of BASIC is also one of BASIC's real advantages. I often write "quick and dirty" programs of a dozen lines or so to accomplish a certain specific task that needs to be done at the moment. I immediately use the program to perform the task, and then I (usually) just throw the program away (i.e., I erase it from the disk, assuming I even bothered to save it to begin with). You can't do this in assembly or C (or at least I can't!).

An interpreted language like BASIC has real advantages in this area. If you make a mistake in your XB program, you just correct it and run it again at once: you don't

(See Page 15)

JUMPPEG/S

```
* JUMPPEG/S
*  (C) COPYRIGHT 1990, 1992
*   BY BARRY A. TRAVER
BASIC  EQU  >006A
GPLWS  EQU  >83E0
STRASG EQU  >2010
STRREF EQU  >2014
VMBW   EQU  >2024
VSBR   EQU  >2028
VSBW   EQU  >2020
WS     BSS  32
STRNG$ BSS  >FF
       DEF  BDDEF,BOARD,ENGLSH
       DEF  FRENCH,GRAB,MARK
BDDEF  LWPI WS
       LI   R0,>0468
       LI   R1,BDATA1
       LI   R2,8
       BLWP @VMBW
       LI   R0,>05F8
       LI   R1,BDATA2
       LI   R2,208
       BLWP @VMBW
RETURN LWPI GPLWS
       B    @BASIC
BDATA1 DATA >0000,>0000,>7C00,>0000
BDATA2 DATA >0000,>0000,>0000,>00FF
       DATA >809C,>A2A6,>AAB2,>A29C
       DATA >8088,>9888,>8888,>889C
       DATA >809C,>A282,>8488,>90BE
       DATA >809C,>A282,>8C82,>A29C
       DATA >8084,>8C94,>A4BE,>8484
       DATA >80BE,>A0BC,>8282,>A29C
       DATA >808C,>90A0,>BCA2,>A29C
       DATA >80BE,>8284,>8890,>9090
       DATA >809C,>A2A2,>9CA2,>A29C
       DATA >809C,>A2A2,>9E82,>8498
       DATA >0000,>0000,>0000,>00FF
       DATA >8080,>8080,>8080,>8080
       DATA >0000,>0000,>0000,>0080
       DATA >8080,>8080,>8080,>80FF
       DATA >001C,>3E7F,>7F7F,>3E1C
       DATA >0000,>0000,>0000,>0000
       DATA >0008,>1808,>0808,>081C
       DATA >001C,>2202,>0408,>103E
       DATA >001C,>2202,>0C02,>221C
       DATA >0004,>0C14,>243E,>0404
       DATA >003E,>203C,>0202,>221C
       DATA >000C,>1020,>3C22,>221C
       DATA >003E,>0204,>0810,>1010
       DATA >001C,>2222,>1C22,>221C
       DATA >001C,>2222,>1E02,>0418
BOARD  LWPI WS
       CLR  R0
       LI   R1,>8000
       LI   R2,768
LOOP1  BLWP @VSBW
       INC  R0
       DEC  R2
       JGT  LOOP1
       LI   R0,15
       LI   R1,BD1
       LI   R2,10
       BLWP @VMBWS
       LI   R0,47
       LI   R1,BD2
       BLWP @VMBWS
       LI   R0,79
       LI   R1,BD3
       BLWP @VMBWS
       LI   R0,175
       BLWP @VMBWS
       LI   R0,559
       BLWP @VMBWS
       LI   R0,655
       BLWP @VMBWS
       LI   R0,687
       LI   R1,BD4
       BLWP @VMBWS
       LI   R0,111
       BLWP @VMBWS
       LI   R0,591
       BLWP @VMBWS
       LI   R0,143
       LI   R1,BD5
       BLWP @VMBWS
       LI   R0,527
       LI   R1,BD6
       BLWP @VMBWS
       LI   R0,623
       LI   R1,BD7
       BLWP @VMBWS
       LI   R0,201
       LI   R1,BD8
       LI   R2,22
       BLWP @VMBWS
       LI   R0,233
       LI   R1,BD9
       BLWP @VMBWS
       LI   R0,265
       LI   R1,BDA
       BLWP @VMBWS
       LI   R0,361
       BLWP @VMBWS
       LI   R0,297
       LI   R1,BDB
       BLWP @VMBWS
       LI   R0,393
       BLWP @VMBWS
       LI   R0,489
       BLWP @VMBWS
       LI   R0,329
       LI   R1,BDC
       BLWP @VMBWS
       LI   R0,425
       LI   R1,BDD
       BLWP @VMBWS
       LI   R0,457
       LI   R1,BDE
       BLWP @VMBWS
       B    @RETURN
BD1    TEXT '_________1'
BD2    TEXT 'cv dv ev k'
BD3    TEXT 'k  k  k  k'
BD4    TEXT 'm__m__m__k'
BD5    TEXT 'cu du eu k'
BD6    TEXT 'cq dq eq k'
BD7    TEXT 'cp dp ep k'
BD8    TEXT '_____m__m__m__m_____1'
BD9    TEXT 'at bt ct dt et ft gt k'
BDA    TEXT 'k  k  k  k  k  k  k  k'
BDB    TEXT 'm__m__m__m__m__m__m__k'
BDC    TEXT 'as bs cs ds es fs gs k'
BDD    TEXT 'ar br cr dr er fr gr k'
BDE    TEXT 'k  k  k  k  k  k  k  k'
ENGLSH LWPI WS
       LI   R0,108
       LI   R1,ENG1
       LI   R2,4
       BLWP @VMBWS
       LI   R0,588
       BLWP @VMBWS
       LI   R0,120
       LI   R1,ENG2
       BLWP @VMBWS
       LI   R0,152
       BLWP @VMBWS
       LI   R0,536
       BLWP @VMBWS
       LI   R0,600
       BLWP @VMBWS
       LI   R0,140
       LI   R1,ENG3
       LI   R2,2
       BLWP @VMBWS
       LI   R0,524
       BLWP @VMBWS
       LI   R0,172
       LI   R1,ENG4
       LI   R2,1
       BLWP @VMBWS
       LI   R0,187
       BLWP @VMBWS
       LI   R0,556
       BLWP @VMBWS
       LI   R0,571
       BLWP @VMBWS
       LI   R0,204
       LI   R1,ENG5
       BLWP @VMBWS
       LI   R0,219
       BLWP @VMBWS
       B    @RETURN
ENG1   TEXT '   m'
ENG2   TEXT 'k   '
ENG3   TEXT '  '
ENG4   TEXT ' '
ENG5   TEXT '_'
FRENCH LWPI WS
       LI   R0,108
       LI   R1,FR1
       LI   R2,4
       BLWP @VMBWS
       LI   R0,120
       LI   R1,FR2
       BLWP @VMBWS
       LI   R0,152
       LI   R1,FR3
       BLWP @VMBWS
```

JUMPPEG/S was not included in last month's MICROpendium. It is included here in its entirety. Refer to last month's Extended BASIC Plus column for additional information.

EXTENDED BASIC PLUS—

(Continued from Page 14)

have to take the time to save it to disk and reassemble or recompile it before you can try out the revised version (which must, of course, be again loaded in before it can be run). In short, BASIC is a great language for the real workaday world, when you've got a simple but specific job to do and you want to do it as quickly as possible. Yes, you can also do "structured programming" in XB if you want to do so (particularly, for instance, through use of subprograms), but the point is that in BASIC you have a choice. If you've got the time to write "clean" and "pretty" code, that's great, but if you need to be "quick and dirty," you have that option.

Apart from the games, novelties, and educational programs that I write just because it's fun (the same is true of programs that have no apparent practical purpose — like embedding "hidden" messages in TI-Writer files? — which I write just to see whether I can do it), most of my programs tend to be "utility" programs. This means usually that they are programs that I wrote because I needed such programs and I didn't have them, so my only recourse was to write them myself.

So I do not think that doing "quick and dirty" programming is necessarily one of the "wrong" ways of programming. What can be a bad thing, however, is to go from revision to revision in such a way that you can't figure out how one differs from another.

I save the different versions as I go along, calling the first version PROG1, the second version PROG2, and so on. I may go from PROG1 to PROG20 before the program seems to be shaping up in a way that it is presentable to other people. Once in a while, a deadly, difficult-to-trace serious bug is introduced along the way, so it is really important to be able to go back to an earlier version that was missing that bug. Or it may be that you started developing the program in a direction that turned out to have insurmountable disadvantages or, worse yet, to be a complete dead end. Once again, you will be very grateful that you retained (for now) the earlier versions that were done before you went the wrong way at a crossroads.

In my "ideal" world of programming principles, I had things neatly worked out regarding line numbering: one digit number lines to take care of pre-scan duties, two-digit number lines to do some initial "set-up" housekeeping, three-digit number lines to serve as the basic core of the program, four-digit number lines for (GOSUB) subroutines, and five-digit number lines for (CALL SUB) subprograms.

Well, although I do try to put things in that order, I've learned to be more tolerant of how many digits there are in the line numbers for various lines, because it doesn't always work out that neatly. Yes, pre-scan, initial set-up, basic core, subroutines, and subprograms is the right order, but I don't worry about exact line numbers. What I do try to do (and recommend for you) is (1) that you start out so that successive line numbers differ by (at least) 10, and (2) that in the later stages of your programming you try to RESequence as rarely as possible.

XBCOMARER

There will probably be times when it is important for you to pinpoint exactly where PROG14 differs from PROG15, for instance. If you haven't RESequenced between the two, you can use my XBCOMPARER program to find out just where the programs differ. (I've included it with this column, in the hope that you may find it as useful as I have. It isn't an especially sophisticated program, but it does what is

(See Page 18)

JUMPPEG/S

```
       LI   R0,536
       LI   R1,FR4
       BLWP @VMBWS
       LI   R0,588
       LI   R1,FR5
       BLWP @VMBWS
       LI   R0,600
       LI   R1,FR6
       BLWP @VMBWS
       LI   R0,140
       LI   R1,FR7
       LI   R2,2
       BLWP @VMBWS
       LI   R0,524
       LI   R1,FR8
       BLWP @VMBWS
       LI   R0,172
       LI   R1,FR9
       LI   R2,1
       BLWP @VMBWS
       LI   R0,187
       BLWP @VMBWS
       LI   R0,556
       BLWP @VMBWS
       LI   R0,571
       BLWP @VMBWS
       LI   R0,204
       LI   R1,FRA
       BLWP @VMBWS
       LI   R0,219
       BLWP @VMBWS
       B    @RETURN
FR1    TEXT '___m'
FR2    TEXT 'm__l'
FR3    TEXT 'fu k'
FR4    TEXT 'fq k'
FR5    TEXT 'm__m'
FR6    TEXT 'm__k'
FR7    TEXT 'bu'
FR8    TEXT 'bq'
FR9    TEXT 'k'
FRA    TEXT 'm'
GRAB   LWPI WS
       LI   R0,>2500
       MOVB R0,@STRNG$
       LI   R2,STRNG$+1
       LI   R3,MGDATA
       LI   R4,37
GRAB2  MOV  *R3+,R0
       BLWP @VSBR
       AI   R1,->6000
       MOVB R1,*R2+
       DEC  R4
       JNE  GRAB2
OUT    CLR  R0
       LI   R1,1
       LI   R2,STRNG$
       BLWP @STRASG
       B    @RETURN
MGDATA DATA 80,83,86,176,179,182
       DATA 266,269,272,275,278,281,284
       DATA 362,365,368,371,374,377,380
       DATA 458,461,464,467,470,473,476
       DATA 560,563,566,656,659,662
       DATA 173,185,557,569
       EVEN
MARK   LWPI WS
       LI   R0,0
       LI   R1,1
       LI   R2,STRNG$
       LI   R5,>FF00
       MOVB R5,@STRNG$
       BLWP @STRREF
       LI   R2,STRNG$+1
       LI   R3,MGDATA
       LI   R4,37
MARK2  MOV  *R3+,R0
       MOVB *R2+,R1
       AI   R1,>6000
       BLWP @VSBW
       DEC  R4
       JNE  MARK2
       B    @RETURN
VMBWS  DATA VWS,VPN
VWS    BSS  32
VPN    MOV  *R13,R0
       MOV  @2(R13),R2
       MOV  @4(R13),R3
VLP    MOVB *R2+,R1
       AI   R1,>6000
       BLWP @VSBW
       INC  R0
       DEC  R3
       JNE  VLP
       RTWP
       END
```

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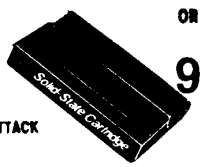

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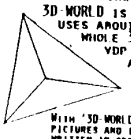

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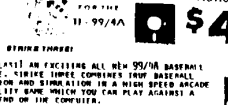

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EXTENDED BASIC PLUS—

(Continued from Page 15)

needed to be done.)

What if you did RESequence between PROG14 and PROG15, or — to make matters worse — you deleted lines and added lines as well? Well, don't give up, because there's still a way out, which may be harder for me to explain than it is for you to do.

Here are the steps: (1) RESquence both the programs so that they both start with 100 and have line increments of 10. (This step isn't completely necessary but it makes it easier to compare the programs when you go on to the next step.) (2) Print out both programs. (Before I do this, I like to add a line 90 ! OLD to the older version and 90 ! NEW to the newer version.)

And now for the hard-to-explain third step.... Look at both, and figure out where one program has a line that the other doesn't, and add a new REM line to the program that is missing the line. Suppose, so, we were looking at the following portion of code:

PROG14	PROG15
230 CALL CLEAR	270 CALL CLEAR
240 GOSUB 1000	280 PRINT MESSAGE$
250 PRINT MESSAGE$	290 CALL FAKEIT(A)
260 GOTO 800	300 GOTO 870
270 OPEN #1:F$, INPUT	310 OPEN #1:F$, INPUT

Okay. It looks like a line (GOSUB 1000 in PROG14) is missing between 270 (CALL CLEAR) and 280 (PRINT MESSAGE$) in PROG15, so we should add 275 REM to PROG15 before we save PROG15 back to disk. It looks like a line (CALL FAKEIT(A) in PROG15) is missing between 250 (PRINT MESSAGE$) and 260 (GOTO 800) in PROG14, so we should add 255 REM to PROG14 before we save it back to disk. Don't worry about the line numbers not matching up. We'll take care of that next!

When you've added the new REM lines to make up for any missing lines involving the two programs, you only have a fourth step to do: RESequence each of the programs before you save them back to disk as PROG14 and PROG15 respectively. Yes, the program lines will be different from what they were before, but identical lines in the two programs should now have the same line numbers.

Again, it's more difficult to explain than it is to do. I usually work on fixing up ten lines or so of code at a time, alternating between working with the older and the newer version, i.e., loading it in, adding REMs where needed, and saving it back to disk. (Actually, I don't even bother with step two. I am careful, however, to regularly do LIST 1 before I save a file back to disk, just to make sure I know which file I was working with last. The LIST 1 will put 90 ! OLD or 90 ! NEW on the screen, and I actually save the files as OLD and NEW so that I don't overwrite the original PROG14 and PROG15 files.)

After the fourth step, you are ready to use XBCOMPARER. (By the way, for XBCOMPARER to work, you must first save the two files to be compared in MERGE format, e.g., SAVE DSK1.PROG14M,MERGE.) If you found the last few paragraphs totally confusing, then I especially advice you not to RESequence your program as you go along unless absolutely unnecessary. Those four steps are only needed if you did a RESequence in between the two versions. If you simply added lines, deleted lines, or changed contents of lines, there's no problem: XBCOMPARER can handle those matters with ease. Just save the two files to disk in MERGE format, run XBCOMPARER, and you're in business.

Well, if you're like me in not always following the so-called "proper" guidelines in programming, I hope this column has been an encouragement to you, and I hope that you find XBCOMPARER to be a useful utility. Until next time, keep on programming and keep on compuTIn'!

XBCOMPARER

```
100 DISPLAY ERASE ALL :: CAL
L SCREEN(5):: FOR I=0 TO 12
:: CALL COLOR(I,16,1):: NEXT
 I !148
110 DISPLAY AT(1,1)ERASE ALL
:"XBCOMPARER":" COPYRIGHT (C
) 1992":"  by Barry A. Trave
r":"   MICROpendium edition"
 !100
120 DISPLAY AT(6,1):"The pro
grams to be compared must be
 in MERGE format and" !178
130 DISPLAY AT(8,1):"must ha
ve different names ifthey ar
e on the same disk." !021
140 OPTION BASE 1 :: DIM A(5
00),B(500),C(500):: D,E,F=0
:: G,H,I=1 !014
150 DISPLAY AT(11,1):"File #
1":" Example: DSK1.PROGRAM1"
 !178
160 DISPLAY AT(16,1):"File #
1":" Example: DSK1.PROGRAM2"
 !184
170 DISPLAY AT(21,1):"Output
 (printer or file):":" Examp
le: PIO or DSK1.RESULT" !118
180 ACCEPT AT(13,1):A$(1)!09
3
190 ON ERROR 200 :: OPEN #1:
A$(1),DISPLAY ,INPUT ,VARIAB
LE 163 :: CALL SCREEN(5):: D
ISPLAY AT(14,1):"" :: ON ERR
OR STOP :: GOTO 220 !007
200 CALL SCREEN(7):: DISPLAY
 AT(14,4):"FILE ERROR - TRY
AGAIN!" :: ON ERROR 210 :: C
LOSE #1 :: ON ERROR STOP ::
GOTO 180 !183
210 RETURN 180 !005
220 ACCEPT AT(18,1):A$(2)!09
9
230 ON ERROR 240 :: OPEN #2:
A$(2),DISPLAY ,INPUT ,VARIAB
LE 163 :: CALL SCREEN(5):: D
ISPLAY AT(19,1):"" :: ON ERR
OR STOP :: GOTO 260 !095
240 CALL SCREEN(7):: DISPLAY
 AT(19,4):"FILE ERROR - TRY
AGAIN!" :: ON ERROR 250 :: C
LOSE #2 :: ON ERROR STOP ::
GOTO 220 !013
250 RETURN 220 !045
260 ACCEPT AT(23,1):A$(3)!09
6
270 ON ERROR 280 :: OPEN #3:
A$(3),OUTPUT :: CALL SCREEN(
5):: DISPLAY AT(24,1):"" ::
ON ERROR STOP :: GOTO 300 !1
79
280 CALL SCREEN(7):: DISPLAY
 AT(24,4):"FILE ERROR - TRY
AGAIN!" :: ON ERROR 290 :: C
LOSE #3 :: ON ERROR STOP ::
GOTO 260 !092
290 RETURN 260 !086
300 GOSUB 540 :: GOSUB 570 !
124
```

(See Page 19)

EXTENDED BASIC PLUS—

(Continued from Page 18)

```
310 IF E<F THEN PRINT :E;"IS
 MISSING FROM ";A$(2): : ::
D=1 :: B(H)=E :: H=H+1 :: GO
SUB 540 :: GOTO 310 !081
320 IF F<E THEN PRINT :F;"IS
 MISSING FROM ";A$(1): : ::
D=1 :: A(G)=F :: G=G+1 :: GO
SUB 570 :: GOTO 310 !108
330 IF E=65535 AND F=65535 T
HEN 360 !210
340 IF B$=C$ THEN PRINT E;"I
S THE SAME IN BOTH" ELSE PRI
NT :E;"IS DIFFERENT": : :: D
=1 :: C(I)=E :: I=I+1 !249
350 GOTO 300 !124
360 CLOSE #1 :: CLOSE #2 ::
IF D=0 THEN PRINT :" THE PRO
GRAMS ARE THE SAME." ELSE PR
INT :" THE PROGRAMS ARE DIFF
ERENT." !172
370 IF D=0 THEN PRINT #3:"":
" THE PROGRAMS ARE THE SAME.
" :: GOTO 530 ELSE PRINT #3:
"":" THE PROGRAMS ARE DIFFER
ENT." !072
380 IF G=1 THEN PRINT :" NO
LINES ARE ";ELSE IF G=2 THEN
 PRINT :" THIS LINE IS ";ELS
E PRINT :" THESE LINES ARE "
;!050
390 IF G=1 THEN PRINT #3:"":
" NO LINES ARE ";ELSE IF G=2
 THEN PRINT #3:"":" THIS LIN
E IS ";ELSE PRINT #3:"":" TH
ESE LINES ARE ";!145
400 PRINT "MISSING";" FROM";
" "&A$(1);:: IF G<>1 THEN PR
INT ": ";!021
410 PRINT #3:"MISSING";" FRO
M";" "&A$(1);:: IF G=1 THEN
430 ELSE PRINT #3:": ";!169
420 FOR J=1 TO G-1 :: PRINT
A(J);:: PRINT #3:A(J);:: NEX
T J !230
430 IF H=1 THEN PRINT : :" N
O LINES ARE ";ELSE IF H=2 TH
EN PRINT : :" THIS LINE IS "
;ELSE PRINT : :" THESE LINES
 ARE ";!083
440 IF H=1 THEN PRINT #3:"":
 :" NO LINES ARE ";ELSE IF H
=2 THEN PRINT #3:"": :" THIS
 LINE IS ";ELSE PRINT #3:"":
 :" THESE LINES ARE ";!178
450 PRINT "MISSING";" FROM";
" "&A$(2);:: IF H<>1 THEN PR
INT ": ";!023
460 PRINT #3:"MISSING";" FRO
M";" "&A$(2);:: IF H=1 THEN
480 ELSE PRINT #3:": ";!221
470 FOR J=1 TO H-1 :: PRINT
B(J);:: PRINT #3:B(J);:: NEX
T J !233
480 IF I=1 THEN PRINT : :" N
O LINES ARE ";ELSE IF I=2 TH
EN PRINT : :" THIS LINE IS "
;ELSE PRINT : :" THESE LINES
 ARE ";!085
490 IF I=1 THEN PRINT #3:"":
 :" NO LINES ARE ";ELSE IF I
=2 THEN PRINT #3:"": :" THIS
 LINE IS ";ELSE PRINT #3:"":
 :" THESE LINES ARE ";!180
500 PRINT "DIFFERENT";:: IF
I<>1 THEN PRINT ": ";!162
510 PRINT #3:"DIFFERENT";::
IF I=1 THEN 530 ELSE PRINT #
3:": ";!155
520 FOR J=1 TO I-1 :: PRINT
C(J);:: PRINT #3:C(J);:: NEX
T J :: PRINT !010
530 PRINT #3:"" :: CLOSE #3
:: END !057
540 IF E<>65535 THEN LINPUT
#1:B$ ELSE 560 !005
550 K=ASC(SEG$(B$,1,1)):: L=
ASC(SEG$(B$,2,1)):: E=K*256+
L :: IF E=65535 THEN PRINT :
" END OF ";A$(1);" FILE": :!
094
560 RETURN !136
570 IF F<>65535 THEN LINPUT
#2:C$ ELSE 600 !048
580 M=ASC(SEG$(C$,1,1)):: N=
ASC(SEG$(C$,2,1)):: F=M*256+
N !069
590 IF F=65535 THEN PRINT :"
 END OF ";A$(2);" FILE": :!1
64
600 RETURN !136
```

THE ART OF ASSEMBLY — PART 17

Structure can be good — but ....

By BRUCE HARRISON
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In the very first of these articles we touched on the matter of structured programming, and haven't touched it since. Some time back we received a letter from one of our readers, who was annoyed that we had not taught our readers how to properly interface between "modules." There are a couple of good reasons (in our opinion) for not teaching that to TI programmers. On only about two occasions in the time that we've been writing Assembly for the TI have we found it necessary to link separately loaded object code "modules," and in both those cases the interface between them consisted of one DEF in the first one and one REF in the second. Big deal.

We have used the concept of modules in a non-trivial way on the PC computer. In one such instance there were some 20-odd separately assembled object files, with complex interactions required between them, and with very carefully designed interfacing to pass whole data segments as parameters from one module to another. The result, after the LINK process, was a single EXE file of some 117K bytes. The whole thing worked very well, even though it was written partly by one author and partly by another, with your columnist tying the whole together.

If we were in the unfortunate position of writing programs that required four or five programmers, with multiple overlays and such, then the idea of "modules" would make perfect sense, and

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THE ART OF ASSEMBLY—

(Continued from Page 19)

the overhead involved in parameter passing and such would become a necessary evil. On the TI, however, there are very few programs that need that kind of approach, and that's good, because we don't have the memory to throw away on parameter passing schemes.

In our opinion, the very concept of separate object modules to be linked by a Linker or linking loader is an example of "mainframe thinking." On the PC it sometimes becomes absolutely necessary because the Assembler will run out of symbol table space long before it runs out of space for the object code. The PC Assembler will tell you it's run out of memory, then report that 18K remains. That means it has used up the part of a 64K segment reserved for the symbol table, even though it still has 18K left for object code. The TI is far better than the PC in this respect. We have written some very complicated stuff on this machine, with what seemed like far too many labels involved, but never ran the TI out of symbol table space during Assembly. Conversely, our old Golf Score Analyzer, which assembled very nicely in one object file on the TI, had to be split into two object modules on the PC to perform exactly the same job. This quickly became a real pain just keeping track of what labels had to be declared "PUBLIC" and which "EXTRN" to make the modules link correctly. (PUBLIC and EXTRN on the PC are equivalent to DEF and REF on the TI, respectively.)

Even our Word Processor, which occupies most of both the Low and High portions of the 32K memory, assembles as just one object file. On floppy disks, it takes 30 minutes or so to assemble, and that's a pain, but it's still less painful than separating it into modules would be. (Assembling on RAMdisk takes only ten minutes.)

Okay, so you say you must make your program into separate object modules. Our advice, then, is to keep the parameter passing as simple as you can possibly manage. You may have noticed in our previous examples that we most often pass parameters to our own subroutines by loading registers with data and addresses before the BL instruction. That will work in separate modules also, provided only that there is a REF and DEF relationship between the calling part in one module and the subroutine in another. For example, module 1 could have need of a subroutine in module 2, called PRLINE. So long as there was a REF PRLINE in the first one and a DEF PRLINE in the second, registers could be set before the BL to carry over the necessary parameters.

There are two other approaches to doing this, both of which still require the REF and DEF, but which will perhaps give more flexibility in some circumstances. Let's say that the subroutine needs three parameters to operate. We could pass the parameters this way:

IN MODULE 1

```
REF     PRLINE    External referenced label
BL      @PRLINE   Call the subroutine
DATA    SCRROW    desired row on screen
DATA    SCRCOL    desired column on screen
DATA    STRADR    address of string to print
(program continues)
```

IN MODULE 2

```
        DEF     PRLINE      define entry point
        MOV     *R11+,R4    get first parameter in R4
        MOV     *R11+,R5    get second into R5
        MOV     *R11+,R6    get third parameter in R6
        (subroutine continues)
        RT                  Return to calling program
```

This will work, and the + included in the MOV *R11 instructions will correct the return address to return at the right point in the calling program, but we could just as easily have loaded R4, R5, and R6 before the BL, and that would work just as well. Each LI instruction takes four bytes. Each DATA takes two bytes, and each MOV *R11,RX takes two bytes, so the memory use is exactly the same, and performance should be identical.

Another approach, in case you want to leave your main program's registers alone, is to do the subroutine itself as a BLWP operation. This is a tad more complex, and requires another workspace of 32 bytes, but it can be done like this:

IN MODULE 1

```
REF     PRLINE
BLWP    @PRLINE   Branch and load workspace pointer
DATA    SCRROW    screen row
DATA    SCRCOL    screen column
DATA    STRADR    string address
        (program continues)
```

IN MODULE 2

```
        DEF     PRLINE
PRLINE  DATA    SUBWS       workspace address
        DATA    PRCODE      code address
PRCODE  MOV     *R14+,R4    get first parameter
        MOV     *R14+,R5    get second
        MOV     *R14+,R6    get third
        (subroutine continues)
        RTWP                Return to calling program
and WS
SUBWS   BSS     32          Subroutine's workspace
```

This too will work, but notice that considerably more memory is used. There are four extra bytes for the "Vector" location, and then there are the 32 bytes for the SUBWS. Of course that could be a single workspace shared by all subroutines in the module, and might therefore be "affordable" in the memory budget. Its main selling point is that the registers being used in the main program are not modified by the subroutine. Of course you must then remember not to change registers 13, 14, and 15 within the subroutine, as all those are needed for the RTWP to execute correctly. In this approach, you can also acquire data from the calling program's workspace registers, since R13 of the subroutine's workspace points to R0 of the calling workspace. You could then get the contents of the callers R2 into the subroutine's R9 by:

```
MOV   @4(R13),R9
```

As you can see, this is already getting complicated. Are you really sure this is necessary? There's an old expression for our usual guiding principle call KISS, or Keep It Simple, Stupid. We find it much easier to follow that principle by making programs assemble

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THE ART OF ASSEMBLY—

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into just one object file in the first place.

Of course this BLWP idea can be used in single object module programs as well as in those using multiple object files. We've shown this concept merely to illustrate how making the interface "clean" can introduce complications of its own for the programmer. This is not to say that one can't adopt such a way of doing all the subroutines. One certainly can, but must also keep in mind that the extra overhead involved in parameter passing may make the difference between a program that will fit in the TI's memory and one that will not. That, in essence, is why in our own programs we keep to the more risky but simpler way of interfacing to our subroutines.

We did use the BLWP method in one instance recently, where we were making a special subroutine to be called via a user-defined interrupt from Extended BASIC. In that particular case, we did some operations in the GPL Workspace to see whether Function-7 was being pressed at the keyboard. If not, we simply returned to XB with an RT instruction. If we found Function-7 was being pressed, we did a BLWP into a routine to dump the screen's contents to the printer. Using the BLWP in this case made sure we did not upset anything critical to the GPL interpreter in its own workspace. There were no parameters that needed to be passed in that instance, so the BLWP and RTWP instructions were all we needed to get into and out of our screen dump routine.

LINKERS RARELY USED

Some time back, we mentioned in this column that we use Art Green's RAG Assembler, and mentioned the advantages of that one over the TI Assembler. At the time when we purchased that software package from Art at an Ottawa Faire, he insisted on throwing in his Linker at no extra cost. It's still here in a drawer, never used. We have read over the documentation, but never found a situation where it would be useful to us. In those rare instances where our TI programs had to be loaded as separate modules, the linking capability of the E/A Object Loader itself was good enough. Certainly Art had something in mind when he wrote that Linker, and he provided a library of pre-assembled modules to go with it, but we've never really seen the need for either in our work.

Calling someone else's subroutines from a library through a linker requires a lot of study and consideration. We have always found it easier to use our own subroutines, and to simply copy them into the source code where needed rather than make them part of a "library."

Several years ago, your columnist was working for the government, and using a Wang PC at the office. There was a project in which we found it necessary to do lots of work with floating point numbers. Unfortunately there was no available library of routines available for that machine except in the BASIC Compiler's link library. Months of effort went into figuring out how to access and pass our own parameters into those routines from our own Assembly modules. When it was finished, we had a "demo" program that was a real knockout, in that it could make calculations and display numbers on the screen about 20 times the speed of a compiled BASIC program using the same floating point routines. When it was shown to the head man, he asked "Why do this?" and the project ended. We could have done this whole thing in one afternoon by simply writing the program in BASIC to start with, instead of insisting on making it an Assembly program. The point of this is that sometimes it just isn't worth the effort to try for the most perfect way of doing things. A way that works is enough in most cases.

At the risk of repeating ourselves, we'll say once more that there are as many ways of doing something in Assembly as there are people trying to do it. Each programmer finds a method that he can deal with, and then sticks to that method so long as it works. Our purpose is not to convert our readers to only our way of doing things, but that's how our source code examples are done because they are our own stuff, not somebody else's. If making your program into ten object modules to be linked by the linking loader or Art Green's Linker is what works for you, then by all means keep doing that! We promise not to scold you for it in this column. Well, maybe we will, but we won't mention your name while we scold you in this column.

Last month's installment was out of sync with the rest of this series. It should have been published in January 1993. However, in September we showed some methods to speed up your programs. Next month we will skip back a little and discuss some ways to slow down operations when you need to, so that the humans who operate your programs can keep up with the machine.

More power from Extended BASIC

Undocumented features of ACCEPT AT

By B. V. TAKACH

No matter how familiar one is with the TI99/4A machine and Extended BASIC, there are still surprises in store.

The background to my story is buried in Bob Relyea's report Using The Arrow Keys in Extended BASIC Programs (page 16, May '92 issue of TI SHUG News Digest).

The ACCEPT AT statement has undocumented features, which makes this unique statement even more powerful. One may use the up and down arrows in conjunction with the CALL KEY statement; both of these will function exactly as the enter key.

Where would one use this feature? Assume you have a program which requires one or more screens full of data entries (inputs) to calculate and execute the program. If an incorrect entry is made and discovered immediately after the enter key has been pressed or a few lines further down, there is no chance to correct the mistake until one reaches the bottom of the page — if there is an option at all — to go back to the top and step down line by line again

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Using the undocumented features one can freely move up or down the page using the two arrow keys only, and change the entries at will. It is very convenient, user friendly and professional.

The technique will work equally well within a FOR-NEXT loop or a line by line entry. Here is how it works:

First you fill the screen — or a portion of it — with the strings relating to the requested data using DISPLAY AT statements, including the name assigned to the requested data at the appropriate screen position.

Next you configure the ACCEPT AT lines, each followed by a CALL KEY statement, and an If-Then statement: If return variable = 11 then previous line. The CALL KEY statement need not follow the ACCEPT AT statement immediately. You may assign a new variable name to the entered data or have several assignment statements between ACCEPT AT and CALL KEY. However you may not command it to execute any calculation in between the two!

To be able to enjoy the total freedom of moving up or down, some of the options of the two statements (DISPLAY AT and ACCEPT AT) should be included. One has already been mentioned, namely a value ought to be placed in the screen position , where ACCEPT AT will look for it, by the DISPLAY AT statement, even if the value is 0. The second essential option is the size with a minus sign in the ACCEPT AT statement.

The last important feature is the On Warning Next line preceding the routine. This is essential to avoid the destruction of the screen whenever the letter O is pressed instead of zero, etc.

Believe me, it is magic if it is done properly.

Now for some program examples from my own programs. The purpose of the programs is immaterial and of no concern, thus I will not even mention the names.

EXAMPLE 1

```
680 DISPLAY AT(12,1):"WIDTH,
FIXED DIE?";DI$;D1
690 DISPLAY AT(13,1):"WIDTH,
WOV. DIE ?";DI$;D2
700 DISPLAY AT(14,1):"HEIGHT
,FIX. DIE?";DI$;E1
710 DISPLAY AT(15,1):"HEIGHT
MOV'G DIE?";DI$;E2
720 DISPLAY AT(16,1):"THICKN
.FIXED D.?";DI$;G1
730 DISPLAY AT(17,1):"THICKN
.MOV'G D.?";DI$;G2 :: GOSUB
2290
740 ACCEPT AT(12,22)SIZE(-5)
:D1 :: IF D2=0 THEN D2=D1 ::
 DISPLAY AT(13,21):D2
750 ACCEPT AT(13,22)SIZE(-5)
:D2 :: CALL KEY(0,X,Y):: IF
X=11 THEN 740
760 ACCEPT AT(14,22)SIZE(-5)
:E1 :: CALL KEY(0,X,Y):: IF
X=11 THEN 750
770 IF E2=0 THEN E2=E1 :: DI
SPLAY AT(15,21):E2
780 ACCEPT AT(15,22)SIZE(-5)
:E2 :: CALL KEY(0,X,Y):: IF
X=11 THEN 760
790 ACCEPT AT(16,22)SIZE(-5)
:G1 :: CALL KEY(0,X,Y):: IF
X=11 THEN 780
800 IF G2=0 THEN G2=G1 :: DI
SPLAY AT(17,21):G2
810 ACCEPT AT(17,22)SIZE(-5)
:G2 :: CALL KEY(0,X,Y):: IF
X=11 THEN 790
```

The above segment illustrates the line by line entry method. Lines 680 to 730 display the requests on rows 12 to 17. D1, D2, E1, E2, G1, G2 are the assigned variable names. These will be printed on the screen — initially being 0 — as zeroes on columns 22. Subroutine 2290 in line 730 contains the prompt, displayed on row 23: use up arrow to correct a previous entry. The purpose of the last two statements in line 740, also lines 770 and 800 are purely for convenience. The widths, heights and thicknesses are usually, but not necessarily always, identical; thus these lines save repeatedly typed in entries. Just another example of user friendliness.

Lines 740 to 810 are the data input lines. Once the program reaches 740, you may enter any numeric data and use the enter or the down arrow key to step to the next input line. You may edit the entries at will hopping up or down. The remarkably simple structure has an inherent implied protection against entering a string character. It will not accept it, and thanks to the preceding on warning next line it will not issue any warning, which would destroy the screen layout. The cursor will patiently remain on column 22 if you happen to press a letter key. Eventually you will wake up and press the appropriate key.

EXAMPLE 2

```
410 DISPLAY AT(1,1)ERASE ALL
:"AMBIENT TEMP.";T$;B
420 DISPLAY AT(2,1):"POURING
 TEMP.";T$;PT
430 DISPLAY AT(3,1):"EJECT.
TEMP. ";T$;ET
440 IF SR=0 THEN SR=55
450 DISPLAY AT(4,1):"SHOTRAT
E (shot/hour)";SR
460 DISPLAY AT(5,1):"SHOT WE
IGHT     ";W$;SW
470 GOSUB 2290
480 ACCEPT AT(1,22)SIZE(-4):
B :: CALL KEY(0,X,Y):: IF X=
11 THEN 160
490 ACCEPT AT(2,22)SIZE(-4):
PT :: CALL KEY(0,X,Y):: IF X
=11 THEN 480
500 IF PT<=SO THEN GOSUB 190
0 :: GOTO 490
510 ACCEPT AT(3,22)SIZE(-4):
ET :: DF=ET :: CALL KEY(0,X,
Y):: IF X=11 THEN 490
520 IF ET>=LI THEN GOSUB 190
0 :: GOTO 510
530 ACCEPT AT(4,22)SIZE(-4):
SR :: CALL KEY(0,X,Y):: IF X
=11 THEN 510
540 DISPLAY AT(5,1):"SHOT WE
IGHT     ";W$;SW :: ACCEPT A
T(5,22)SIZE(-6):SW :: CALL K
EY(0,X,Y):: IF X=11 THEN 530
550 IF SW<>0 THEN 620
560 DISPLAY AT(23,1)BEEP:"WI
SH TO ENTER VOL. (y/n) ?" ::
 CALL KEY(3,V,ST):: IF ST<>1
 THEN 560
570 IF (V=89)+(V=78)THEN 580
 ELSE 560
580 DISPLAY AT(23,1):: IF V=
78 THEN 540 ELSE DISPLAY AT(
5,1): "SHOT VOLUME (cc) ";SV
590 ACCEPT AT(5,22)SIZE(-6):
SV :: CALL KEY(0,X,Y):: IF X
=11 THEN 540
600 IF SV=0 THEN 540 ELSE 61
0
```

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```
610 SW=INT(SV*R11)/1000
620 DISPLAY AT(6,1):"DIE HEA
TER(kw)?                ENTER 0
 IF NONE      ";HQ :: ACCEPT
AT(7,22)SIZE(-6):HQ :: CALL
KEY(0,X,Y):: IF X=11 THEN 54
0
630 MT=SR*SW :: QT=(MT*CL)+(
(SO-ET)*CS*MT)+((PT-SO) *CLI
*MT)+(HQ*3600)
640 QT1=QT :: DISPLAY AT(9,1
):"GR.HEAT INP.IS";Q$;INT(QT
1)
650 DISPLAY AT(10,1):"GR.HEA
T INP.IS  (kW)";INT(QT/3600)
:: GOSUB 1910
```

My second example is similar to the first. It illustrates the use of the technique including a few other options. Lines 410 to 470 need no explanation, these work much the same as lines 680 to 730 in the first example. The CALL KEY and if-then statements in line 480 provide a graceful return to the previous screen page, if the display indicates by the default values of PT and ET that the wrong selection was made earlier.

Line 510 works just as well as 480 and 490 although we have an assignment statement sandwiched between ACCEPT AT and CALL KEY. The calculation in line 610 logically could have been calculated immediately following the ACCEPT AT statement in 590, however this would not work! The CALL KEY statement following it would be ineffective.

I guess you will expect an explanation of the following 4 lines from 620 to 650. Well here it is; These shouldn't even be published here, because they are irrelevant to this report. I have left them there to prove that the program segment is part of a real dinky-di program, and that it was not written for the sake of an example.

EXAMPLE 3

```
130 DIM Q$(32),V(32),H$(5),W
$(5)
140 Q$(0)="MACH.REPL.COST ($
)" :: Q$(1)="MACH.REPL.TIME
($)"
150 Q$(2)="INTEREST RATE (%)
 " :: Q$(3)="SPACE ($/UNIT S
Q.)"
160 Q$(4)="AREA USED (UNITS)
 " :: Q$(5)="INSURANCE ($/y)
  "
170 Q$(6)="MISC.FIX.CST.($/y
)" :: Q$(7)="HOURS WORKED (h
/y)"
180 Q$(8)="HYDR.FLUID ($/y)
 " :: Q$(9)="LUBRICANTS ($/y
)  "
190 Q$(10)="ELECTRICITY ($/y
) "
200 Q$(11)="FUEL/no melt/($/
Y)" :: Q$(12)="WATER ($/y)
    "
210 Q$(13)="DIE SPRAY ($/y)
  " :: Q$(14)="CONSUMABLES (
$/y) "
220 Q$(15)="WAGE RATE (gr.$/
h)" :: Q$(16)="LABOUR%(1 M.=
100%)"
230 Q$(17)="OVERHEAD(%on wag
e)" :: Q$(18)="DIE COST ($)
    "
240 Q$(19)="DIE LIFE  (shots
) " :: Q$(22)="REJECT RATE (
%)   "
250 Q$(20)="DIE CAVITIES (No
) " :: Q$(21)="CASTINGS/Y (N
o)   "
260 Q$(23)="DIE MAINT.($ tot
.)" :: Q$(24)="ALLOY COST ($
/kg) "
270 Q$(25)="TRIMMED WGHT. (k
g)" :: Q$(26)="METAL LOSSESS
  (%)"
280 Q$(27)="HANDLING ($/cast
.)" :: Q$(28)="TRIMMING ($/c
ast.)"
290 Q$(29)="FINISH   ($/cast
.)" :: Q$(30)="SHOT RATE (Sh
ot/h)"
300 Q$(31)="MELT. COSTS ($/k
g)"
310 H$(1)="DATE         " ::
H$(2)="JOB NAME/No." :: H$(3
)="ORDER No.    " :: H$(4)="M
ACH.TYPE/No"
320 H$(5)="CUSTOMER     " ::
GOSUB 1040 :: W$(1)=DA$
330 DISPLAY AT(9,1)ERASE ALL
:"Casting Cost & Mach. Load
   Estimation Ver.3 (1992)":
"by B.v.Takach,Aug.1987"
331 ON WARNING NEXT
340 DISPLAY AT(22,1):"PRINTO
UT ? (Y/N)" :: CALL KEY(3,K,
S) :: IF S=0 THEN 340
350 IF K=78 THEN P=0 :: DISP
LAY AT(22,1): :: GOTO 390 EL
SE IF K=89 THEN P=1 ELSE 340
360 IF P$="" THEN P$="PIO" :
: DISPLAY AT(22,1):
370 DISPLAY AT(14,1):"PRINT
DEV.No ";P$ :: ACCEPT AT(14,
14)SIZE(-7):P$ :: PR$=P$&",O
UTPUT"
380 FOR I=1 TO 5 :: DISPLAY
AT(I+14,1):H$(I)&" "&W$(I)::
 NEXT I :: FOR I=1 TO 5 :: A
CCEPT AT(I+14,14)SIZE(-14):W
$(I):: NEXT I
390 !DATA INPUT SECTION
391 S=15 :: X=0 :: L=4 :: GO
TO 393
392 S=31 :: X=16 :: L=4
393 CALL CLEAR :: DISPLAY AT
(1,1):"CASTING COST & MACH.L
OAD PGM==================
=======" :: DISPLAY AT(22,1)
:"use UP-ARROW key to to ret
urn to the previous line."
394 FOR CL=3 TO 21 :: DISPLA
Y AT(CL,1): :: NEXT CL
395 J=L :: FOR I=X+0 TO S
400 DISPLAY AT(J,1):Q$(I)&"
";V(I);:: J=J+1 :: NEXT I ::
 J=L
405 FOR I=X+0 TO S
406 ACCEPT AT(J,21)SIZE(-6):
V(I)
409 CALL KEY(0,KX,SX):: IF K
X=11 THEN I=I-1 :: J=J-1 ::
GOTO 406
410 !IF V(I)=-1 THEN V(I)=V(
I)*-1 :: I=I-1 :: J=J-1 :: G
OTO 406
420 J=J+1 :: NEXT I
421 DISPLAY AT(22,1): :: DIS
PLAY AT(23,1): :: DISPLAY AT
(22,1):"ANY CORRECTION ? (y/
n)"
422 CALL KEY(3,K,ST):: IF ST
<>1 THEN 422
423 IF (K=78)*(X=0)THEN 392
424 IF (K=89)*(X=0)THEN 391
425 IF (K=89)*(X=16)THEN 392
426 IF (K<>89)*(K<>78)THEN 4
22
```

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Newsbytes

Tex-Comp releases latest catalog

Tex-Comp has released a new 20-page catalog of items for the TI.

The catalog is available for $2, and includes $15 worth of coupons, including $5 off on the buyer's next purchase from Tex-Comp.

According to Jerry Price of Tex-Comp, the catalog features a number of software items that company has never offered before.

Write Tex-Comp, P.O. Box 33084, Granada Hills, CA 91344.

Asgard releases First Draft program

Asgard Software has released First Draft, a TI-Writer compatible word processing program which the manufacturer says enables users to create documents as large as the available disk space in either 40 or 80 columns. The 80-column version is compatible with TIM, Dijit, Mechatronics and the Geneve, according to the manufacturer.

The program has pull-down menus and a formatter which allows printing of multi-column documents with Page Pro 99 pictures.

According to the manufacturer, the program may be fully customized. A 25,000-word spelling checker is included, to which users may add words. Users can also use the Spell It! 200,000-word hard-disk dictionary with the program, the manufacturer says.

Also, according to Asgard, First Draft will load and save files in TI-Writer format as well as First Draft's own format. The manufactureer says the program includes a built-in disk manager accessible from the Editor that allows the user to delete and rename files, format a disk or add comments to files. Most key commands are the same as in TI-Writer.

The manufacturer says files may be easily merged or split apart. The user can create and edit parallel columns within the editor and newspaper-style columns within the formatter, according to Asgard. The Final Copy formatter features more than 20 new commands, the manufacturer says, including ones to allow the user to include Page Pro 99 pictures on pages and use multi-line headers and footers. The program contains built-in printer drivers for the most popular printers, according to Asgard, and the user can create others. The user can preview pages on the screen prior to printing them, according to the manufacturer.

First Draft is said to be compatible with Horizon RAMdisks, the Asgard AMS card, most other RAMdisks and the Myarc Hard and Floppy Disk Controller, and to function within the Funnelweb environment.

The program requires at a minimum a TI99/4A with a DS/SD (180K) floppy disk controller and 32K. A printer is recommended.

Suggested retail is $39.95, $29.95 for registered Spell It! owners. Add $3 shipping and handling, U.S.; $4, Canada; $7, air mail; $12, UPS second-day air in U.S.

Asgard also announces that its Asgard Memory System card can now be expanded to 512K by changing a chip and a jumper. The card is available for $119.95 plus $5 shipping and handling.

For information, or to order by check or money order, contact Asgard Software, P.O. Box 10306, Rockville, MD 20849-0306.

Cecure Electronics has new address

New mailing address for Cecure Electronics is P.O. Box 132, Muskego, WI 53150. New phone number for the compa-

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The last example shows the application of the technique in a FOR-NEXT loop. Lines 130 to 320 have been reprinted to aid better understanding of the routine. Line 331 is the useful line which eliminates the built-in self-destruct screen feature induced by a misplaced finger or a thumb or two. Line 380 is a typical unforgiving loop, where the said misplaced thumb can do irrecoverable damage; only function 4 followed by RUN would lead to salvation (left in to teach the user to be more careful!).

Lines 390-426 are the multi-page data input routine. Each for CL=3 to 21 loop will gather in one page of inputs until all 31 questions have been answered.

The purists may argue that the functions in line 393 could have been accomplished more elegantly. Indeed they could have been! One could have left the heading (line 1) standing and deleted the lines 2-23 by a for delete = 2 to 23 :: DISPLAY AT(delete) :: next delete line. Alas, the gain would have been nil! On the other hand the CALL CLEAR is clearly less defensible against an ERASE ALL in the first DISPLAY AT statement. I could have easily edited it out of the line, but again it may as well be left there for someone who may be inspired to create something more useful and much more beautiful.

The REM-ed out line 410 on the other hand is yet another story. Before this hidden gem of the ACCEPT AT potential was discovered — through discussions at one of our monthly club meetings — the program used the -1 correction routine. Line 410 did the (clumsy) trick. Upon the discovery of previously entered incorrect data, one would type in -1, which would then place the cursor on the previous line. At the same time the -1 entry had to be converted to get rid of the minus sign. The multiplication with -1 accomplished it.

Lines 421 to 426 give the final chance to make any changes to the page full of entries.

Well, if you have an application program where a mistaken key push would cause a re-run, try this so far unpublished XB feature.

Finally, before I sign off, do you know the difference between CALL CLEAR or ERASE ALL and the routine: for clear =1 to 24 :: Display at (clear,1) :: Next clear? Well, this is another story. You may read all about it next time!

MICRO-REVIEWS

Telephone Dialer and Flags and Map, Return Labels, Amortization, Checklog

By STAN KRAJEWSKI

Ratings for the software reviewed in this column are based on the Star system that follows.

★ Leave it alone, back to the drawing board.

★★ Needs improvements, but workable.

★★★ A good program, worth trying.

★★★★ Send your money and buy it.

NOTE: If the Geneve 9640 is NOT specifically mentioned in system requirements of any column I write, the program is TI 99/4A compatible only. Also, if the CorComp 9900 Micro Expansion System is not mentioned, these programs are compatible with it.

TELEPHONE DIALER & FLAGS & MAP

★★★

TELEPHONE DIALER

System requirements GENEVE 9640 OR TI 99/4A. 32K memory, disk drive and Extended BASIC. Telephone Dialer is a program anyone can operate. Let your computer do the dialing for you. This program auto loads from Extended BASIC then synthesizes the telephone tones to dial a pre selected number. By just putting the telephone handset to your monitor speaker, your TI will initiate the proper tones the telephone needs to dial a number. Upon entering the program the first thing you will see is the NAME prompt. At this time you can enter any one of the three DOS type program commands. To set up a directory the first command you would type is STORE. This command will then let you enter a name until you have entered all the names you would like in the directory. After the directory is complete you can call the number by just typing in the name or letters you have stored it by.

A DIR command is included to list the names and phone numbers you have entered. You will then be prompted after each listing "Delete or press and key to continue". A QUIT command is available to escape from the program and reload "DSK1.LOAD" from the Extended BASIC environment.

This program is easy to use and has enough features to make it useful. If your a person on the go, put the tones to a few frequently called numbers on a micro cassette recorder and put the telephone handset to the speaker to record those numbers for play back to the telephone mouthpiece. Otherwise it would make a useful telephone directory.

★★1/2

FLAGS AND MAP

Flags and Map auto-loads from Extended BASIC and displays the flags of five countries and includes the Olympic flag. A map of the United States is also included. In the screen with the map of the United States, there is a arrow that moves by working the joystick. You can move the arrow to any state, but pressing the fire

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Newsbytes

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ny is (414) 679-4343. Street address in Muskego is South 81 West 18878 Apollo Dr. Cecure Electronics is an authorized repair center for Myarc products.

New Sughrue series now available free

Jack Sughrue, author of the NEW-AGE/99 and IMPACT/99 series of writings about the 4A, recently completed a new series of articles for user group newsletter editors or any interested individuals. He says the articles are placed in the public domain and may not be offered for sale.

Sughrue has produced public domain material for the TI for 11 years. Most of his works originally appeared in newsletters of M.U.N.C.H. in Worcester, Massachusetts, or the Lima, Ohio, users group.

The new series "TI-101: Our 4A University" consists of long essays in the form of university class lectures on "how to use your TI as an educational tool."

TI-101, a 500-sector unarchived disk, may be obtained by sending either an initialized DSSD with appropriate mailer and postage or $4 to Sughrue at Box 459, East Douglas, MA 01516.

Sughrue also announces he has reduced his PLUS! program to $7.95 for individuals, and to $20 for groups. Groups may register all members and resell or give the program to them. Order from the above address.

T.I.G.E.R.S. produce Spanish newsletter

The T.I.G.E.R.S. (Texas Instruments 99/4A — Group of Everlasting, Recalcitrant Survivors) of Argentina has begun producing a Spanish-language newsletter, Rugidos.

The group has 14 members "and counting" according to Francisco T. Molina, the newsletter's editor.

For information, write Molina at Pacheco 542, (1429) Martínez, República Argentina.

CSGD prices reduced

Texaments has reduced prices on the Character Sets and Graphic Design Series. For information, contact Texaments, 53 Center St., Patchogue, NY 11772, (516) 475-3480 (voice) or (516) 475-6463 (BBS).

Send Newsbytes to MICROpendium Newsbytres, P.O. Box 1343, Round Rock, TX 78680.

MICRO-REVIEWS—

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button doesn't do anything, and pressing a key brings you back into Extended Basic. Due to this feature I feel the program needs improvements but is workable. Then again the flag graphics are very good and can be used.

Telephone Dialer and Flags and Map are available from Software and More, C/O Sam Carey, 5820 SE Westfork Street, Portland Oregon 97206-0742. These programs are Fairware and have a copying fee of $1 each plus $1 S&H. If you use and like the programs a donation of $5-$10 can be made.

★ ★ ★ ★

RETURN LABELS

D&L Software is really turning out quiet a few programs now since it conception! Return Labels is a excellent and easy to use label making program that makes letter size labels.

System Requirements are Geneve 9640 or the TI99/4A, 32K memory, disk drive, Extended Basic and a Epson compatible printer. A Auto-load feature is included on disk.

We have had label making programs since the TI's infancy. Some had graphics and others just printed your name and address. But, every Sunday's Newspaper in one of the inserts is the color ad for address labels and you still were tempted to send for them. The wording was smaller and neater, there was a monogram on the left corner of the label, and in general looked more professional because of the overall little size. Now with Return Labels, you can have all that and can finally read past that ad without feeling guilty. From the cute load screen of a label with the program title, to the final product, this program was well thought out. The program is user friendly and you can even get started without reading the docs. Once you enter into the Edit Label command you create your label by entering the information you want your label to have. While in the Print Label option, The computer will search the file with your last name and create the monogram with the first letter of your last name. No hassles of loading graphics to go with the text.

Each print out is half the size of a label. To compensate and take advantage of a full size label, the computer prints two labels for each input. Once you create a label you can save it to disk and reload it by typing in the file name you saved it as. You know your file is loaded because your name and address will appear on the screen. A company name can be used by typing it in as a last name. It will fill in the space where a first name should have been. The program asks your output device name, thus letting PIO & serial printer users have compatibility with this program. You also have a prompt to print as many labels as you like. Everything is thought of in this program, there is even a label counter on the screen. A prompt after printing asks if you would like to make more labels before it quits.

I sent some printer commands in Extended BASIC to the printer such as Italics and emphasized print and it worked. Even though the labels are printed in condensed print, it doesn't affect the ability to change fonts.

What else can this program do? It has a Graphic Editor. Once in this part of the program you can create your own graphic by turning on and off dots in the on-screen grid. The grid consists of 19 X 24 boxes with 11 active keys. All you have to do is move your cursor around with the arrow keys or joystick. You can then save your graphic to disk to be used at another time.

Return Labels can be purchased for $5.95 plus $1 S&H. Send to D&L Software, 89 Little Neck Avenue, Swansea Massachusetts 02777.

★ ★ ★

AMORTIZATION

System requirements are Geneve 9640 or TI 99/4A, 32K memory, disk drive, Extended Basic and a printer (EPSON compatible is recommended). This program comes on a SS/SD disk.

After the program auto-loads from Extended BASIC the Main Index will prompt you for a choice, 1- LOAN/MORTGAGE 2- INVESTMENT/SAVINGS. If you choose "1" LOAN/MORTGAGE the next screen will ask for the principal, Interest rate and the number of years desired. Upon completion of the calculations it will then display Monthly Payment, the Number Years you have entered and the payment you will have to make. At the bottom of the screen it will ask "Redo With another term?" This is handy as it will keep the same principal and the same interest rate, you just have to change the number of years. It then makes a new calculation and displays everything as before. The nice thingg is that the other calculations remain on the screen for reference and the new calculation is displayed underneath the last calculation. Pressing "2" in the sub menu, puts the cursor back up to the principal to add a new principal to calculate a new problem.

Pressing option "3" will give you your hard copy. First it asks for the month and year you took the loan out. At this time you find the feature that is not found in other loan calc programs which is, to add an extra amount to the principal and what month(s). Using this feature you can plan on reducing your term years and see the interest you can save.

Selection "2" from the Main Index calculates the interest you earn investing money. You can enter the amount of the investment, and the amount of money you want to add to your account each month. It allows you to enter the interest rate rate and the number of interest periods per year. You also enter the years your money will be invested. There is also a print option or you may page through on the screen. This program offers more than I have seen in other programs of its type. The author of this program likes to think that his programs offer something a little different. As you can see it does.

Amortization is available from D&L Software, 89 Little Neck Avenue, Swansea, Massachusetts 02777. The price is $7.95 plus $1 S&H.

★ ★ ★ ★

CHECKLOG

Here is a program that took several years to develop. The extra work the author did developing this program puts the program in a league of its own.

System requirements are Geneve 9640 or TI 99/4A, 32K RAM, disk drives, Ex-

(See Page 27)

User Notes

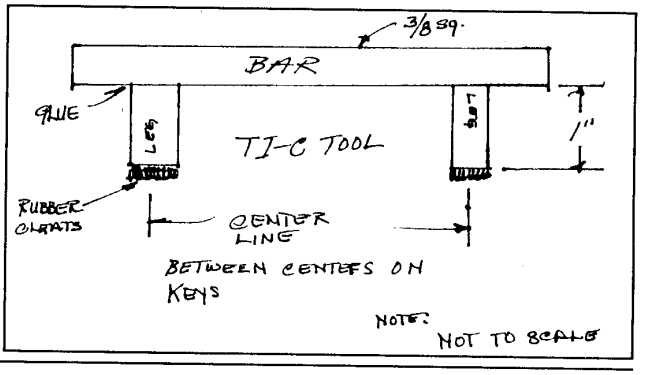
32000 fingers

This comes from Al Morgan, of Stratford, Connecticut. He writes:

In reference to Paul Heerman's User Note in your September 1992 edition, it is not necessary for anyone to have to use 32,000 fingers to work the Widget or the Cartridge Expander. A simple tool I have designed (see drawing below) has worked for me for many years. I used it on my TI99/4A using the Rave 99-101 keyboard and I have had no more problems in using 32,000 fingers to switch back and forth.

On the TI99/4A keyboard, the FCTN and the equal keys are but a short distance apart, which is approximately 3 inches from the center of the FCTN key to the center of the equal key. On the Rave 99 keyboard, which has and ALT key plus the equal key, the distance is approximately 7 7/8 inches. The distance between the two legs is determined by the distance from the center of the FCTN key to the center of the equal key. The same can be said for the the Rave 99 keyboard.

Whenever one wishes to switch from one cartridge to another, all one has to do is place the TI-C tool over or on the FCTN key and the equal key, press down, hold until you have switched the switch on the expander to the next cartridge you want, then release the TI-C tool and you're back in business and all your problems will be solved.



More Fibonacci

This comes from John H. Bull, a mem-

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MICRO-REVIEWS—

(Continued from Page 26)

tended BASIC and a printer is optional.

When I first sat down with this program I didn't know what to expect. OK sure, something to do the calculations in my checkbook instead of using a calculator. What I found instead was a complete record keeper, calculator, bill reminder and budget keeper. How can a program do all this you ask? With a Main Menu of 5 options that branches off into sub menus with many, many options to give much versatility to each option that the user might need to use. Your check book entries are kept on file by Month and year letting you edit and recall information by just entering the month and year needed.

Because of space limitations I cannot go into all the menu's, but I can give you the highlights. The main menu contains these modules: 1-Checklog 2-CheckPrint 3-CheckEval 4-CheckEdit 5-FastStatus. By entering 1-Checklog you are entering the enviroment you will be using most. Its menu consists of 1-Depst/Withdrw/Serv Chrg 2-Write Check 3-See Unpaid Bills 4-Enter New Bills 5-Standing (balance) 6-Search 7-Enter Returned Checks 8-Delete File. Each of these items are self explanatory. In the 2-Write Check option, it looks like this. BANK BAL. (calculates the balance as you enter each item)

DATE (this is the month you are working on)

DATE (date the check is written)

CHECK NUMBER (we all know what this is)

PAYEE (to whom the check is written)

FOR (info about the check)

AMOUNT (amount for which check is written)

CODE (a user definable code to reference the purpose of the check written to the default codes below)

N)ecessity E)ducation

C)redit/Load P)recommitted

L)uxury T)ax/Ins

I)mprovement G)ift

ATM withdrawals and Deposits are put in with option number 1-Depst/Withdrw/Serv Chrg. This and any other entry can be changed by just finishing your entry and then pressing Redo. You also may Abort any entry. Files are saved by pressing the "File and Return to Menu option. If you use the Continue option it will continue your entry and if you are in the Write Check option it will keep the date on screen for easy modifying and also increment the check numbers by 1 automatically. When in the Check Edit module from the main menu, editing is a breeze using the FCTN up and down arrow keys to scroll through a particular month.

I found this program to be very user friendly. Documentation is included on disk, However; you may start using the program with out having to read the docs. Monthly files do not take up much room on disk leaving you plenty of room for 1 or more years. There is a 2 drive option letting you use another disk for just your files if desired. Remember, this review just touches the power and versatility of this program and has much more to offer.

Now, this is a Fairware program that goes far beyond what you might expect out of a Fairware project. We must support programmers like this that venture into the Fairware area so they may continue with high quality programs such as this. You must specify the format you are using when ordering. The Fairware asking of Checklog is $10 to $15 and is available from Stephan Clarke, 6108 Wheeler St., Philadelphia, PA 19142.

If you would like your software or Hardware reviewed in this column, you may send it to: Stan Krajewski Route 6 Box 568-15 Live Oak, Florida 32060. If you would like it returned, please include postage. If you need to call me for any reason, you may reach me at 904-364-7897 E.S.T.

User Notes

(Continued from Page 27)

ber of the K'Town 99ers, in Knoxville Tennessee. He writes:

Number crunching with the TI is very satisfactory; that is why I bought mine back in 1983. The Users Notes in July and August brought back memories of Lorenzo di Fibonacci. His series was the first thing I tackled when learning Basic and the programs by Raguse and by Vogt are the two best I could devise for calculating the series. There are probably others.

Lorenzo demonstrated his series before the Emperor as a means of figuring the number of rabbits in a pen for each generation. I never could find out if he realized the importance of his Fibonacci NUMBER, the ratio of consecutive terms of his series. As the series grows, this number approaches closer and closer to a value that

(See Page 29)

Micropendium disks, etc.

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☐ **MICROdex99** (for use with MICROpendium Index II, 2 SSSD disks XB req.) $10.00

MICROdex99 by Bill Gaskill is a new product designed for use with MICROpendium Index II. The program allows users of MP Index II to modify their index entries as well as add entries. MICROdex99 supports many other functions, including file merging, deletion of purged records, record counting and file browsing.

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User Notes

(Continued from Page 28)

is about .6180339. One more line in the loop of either program will show this number dramatically. In Raguse's program it would be PRINT A/C. In Vogt's version it would be PRINT C(X+1)/C(X+2).

Perhaps unknown to Lorenzo, he had found a way to calculate the "golden mean", a ratio the Greeks had found and used in art and architecture a couple of thousand years earlier. They used it to set the ratio of the width to the length and of the height to the width of the Acropolis.

This number is also, apparently, one of the fundamental numbers of the universe — like pi and e. Spiral seashells seem to grow in ways that follow this ratio. It also has some peculiar mathematical properties: if the Fibonacci number is F, then 1/F=F+1 and (F+1)x(F+1)=F+2. A quicker way to calculate it is F=(SQR(5)-1)/2. I don't know how the Greeks did it but thank you, Earl Raguse and Merle Vogt, for bringing the subject up again.

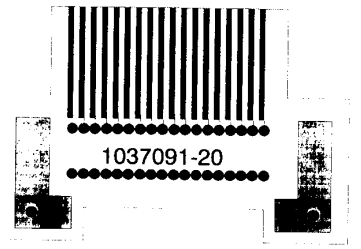
GROM port differences

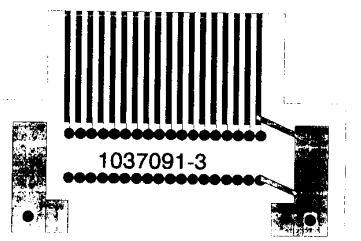
This comes from Dan Eicher, of Mooresville, Indiana. He writes:

Many people suffer from marginal cartridge ports that cause their systems to lock up at the worst possible moments. I have found that replacing the stock GROM port connector (18/36 connector, tin contacts) with a similar unit that has double-leafed, gold connectors practically eliminates this problem. The double-leaf gold units can be ordered from Digi-Key at 800-344-4539. Their part number is S1184.

If you do this modification, you may want to clean all your modules before use of the new connector.

Another item that I found out from observation is that TI had more than one version of the printed circuit board that the GROM connector attaches to. I have included a drawing that shows the revision numbers I found and the change to the printed circuit board.





Geneve batteries

This comes from Richard O. Olson of Seattle, Washington. He writes:

In regards to theUser Note in the August 1992 issue about changing the battery in

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1992 TI FAIRS

MARCH

T.I.C.O.F.F. (TI Computer Owners' Fun Faire — The IBM & Clone Owners' Fun Faire), 9 a.m.-4 p.m., March 14, Roselle Park High School, Roselle Park, New Jersey, $5. Contact Robert Guellnitz, Roselle Park Public Schools, 185 West Webster Ave., Roselle Park, NJ 07204, (908) 241-4550 (voice) or (908) 241-8902 (BBS).

APRIL

Northeast Computer Fair, April 4, Waltham High School, Waltham, Massachusetts, sponsored by TI99/4A User Group of the Boston Computer Society. Contact Ron Williams, 14 East St., Avon, MA 02322.

Dutch Annual TI-Fair, April 25, Utrecht, The Netherlands, sponsored by Dutch TI-Usergroup. Contact Drs. Erik C. van Wette, Hanninkhoek 39, 7546 AD Enschede, The Netherlands, phone: 31-53-778723.

Ottawa TI Fest, 10 a.m.-4 p.m., April 25, Merivale High School, 1755 Merivale Rd., Nepean, Ontario, Canada. Contact Ottawa Users Group c/o Bill Gard, 3489 Paul Anka Dr., Ottawa, Ontario, Canada K1V 9K6; (613) 523-9396 (home); (819) 994-8856 (work); (819) 994-8873 (work, attn. DSE 2).

MAY

TI Orphan Reunion, 10 a.m.-5 p.m. May 9, Innisfail Lions' Hall, Innisfail, Alberta, Canada. Contact Fred Kessler, Box 20, Sundre, Alberta, Canada, T0M 1X0, (403) 638-3916.

TI99/4A Users Group, UK, Annual Meeting, May 16, Princess Anne Training Centre, 10 Trinity St., Derby (Derbyshire, England). Contact Stephen Shaw, 10 Alstone Rd., Stockport, Cheshire England SK4 5H.

Multi User Group Conference, May 15-16, Ohio State University Lima Campus. Contact Lima 99/4A Users Group, P.O. Box 647, Venedocia, OH 45894 or phone Dave Szippl (419) 228-7109 or Charles Good (419) 667-3131 evenings.

SEPTEMBER

State of Washington TI Convention, Sept. 19, South End Pool Center, 402 E. 56th, Tacoma, Washington. Contact Jim Tomkins, (206) 756-0934.

OCTOBER

7th Internationale TI-Computer-Treffen, Oct. 9-11, Wiesbaden, Germany. Contact Horst Wiese, Eleonorenstr. 6, DW-6200, Wiesbaden, Germany. Please enclose International Reply Coupons (can be bought at U.S. Post Office).

Chicago International World Faire, Oct. 30-31, Elk Grove Holiday Inn, Elk Grove Village, Illinois. Contact Chicago Users Group, c/o Hal Shanafield Jr., 2515 Marcy Lane, Evanston, IL 60201-1111, or (708) 864-8644.

NOVEMBER

Milwaukee TI Faire, Nov. 1, Quality Inn, 5311 Howell Ave., Milwaukee, Wisconsin. Contact W99CC, P.O. Box 2723, Appleton, WI 54911 or (414) 535-0133.

TI-Faire, Nov. 28-29, Ashfield Boys High School Hall (next to Western Suburbs Leagues Club), Liverpool Road, Ashfield, NSW, Australia. Contact TIsHUG (Austraiia) Limited, P.O. Box 1089, Strawberry Hills, NSW 2012, Australia.

1993 TI FAIRS

FEBRUARY

Fest West "North" 93, Feb. 13-14, Howard Johnson Hotel, Salt Lake City, Utah. Contact Fest West "North" 93 Committee, 1396 Lincoln Apt. B, Ogden, UT 84404 or Salt Flats BBS, (308) 394-0064.

This TI event listing is a permanent feature of MICROpendium. User groups and others planning events for TI/Geneve users may send information for inclusion in this standing column. Send information to MICROpendium Fairs, P.O. Box 1343, Round Rock, TX 78680.

User Notes

(Continued from Page 29)

the Geneve, the part number listed for the 20mm Coin Cell Holder should have been BH800-ND instead of 600. Also, you can purchase the Coin Panasonic Lithium Battery BR2032 from Digi-Key (800-344-4539) for $1.78, catalog number P186.

I used the 23mm holder and it has legs on it to fit the same holes in which the original battery was placed. Using a solder wick to remove the old solder and placing the new holder took about 30 minutes. Also, I cannot see any reason for the extra wire, as mentioned in the August User Note. Also, Digi-Key has the same battery with legs that Myarc used, if you wish to solder in a new battery every 3-4 years. This battery is a PCB Coin Type, catalog number P196. It is priced at $2.43.

Improvements to Sink-It

This comes from Walter Chmara of Bensalem, Pennsylvania. He writes:

The point of this letter is two-fold. First, I haven't seen any mention of interest in the Milton Bradley expansion system in Feedback, though I've read other wish lists there. Secondly, I wanted to offer some improvements to Sink-It (June 1992).

Like most owners of the MBX, I hardly ever bother to hook it up just to play one or two games and then put it away again, especially knowing that some cartridges will play very well without it. But there is so much promise there, I really hate to just see it sit there, unused.

The MBX speech synthesizer sounds so superior to TI's that I would prefer to use that one when speech is desired in a program. This system adds 64 extra keys to the computer, as well as a joystick with a trigger, three other buttons and a rotating knob. And last, but not least, voice recognition! All those possibilities going to waste....

Since MB has washed its hands of this excellent piece of hardware, it would be nice if somebody electronically minded could come up with a cartridge which one could plug into the TI for programming access to the MBX's features. Just think of all the exciting new programming that would start pouring in from users around the world. Could TI-Dictation be far behind?

Okay, enough fantasizing. Here are the lines to merge into Sink-It that will reveal hidden ships at the end of a victorious game, and otherwise liven-up the play a little.

```
100 ! SINK IT! (VER.2) !116
1130 DISPLAY AT(24,1):"PLAY
SOME MORE? Y" :: ACCEPT AT(2
4,17)SIZE(-1)VALIDATE("YN"):
P$ :: IF P$="Y" THEN CALL DE
LSPRITE(ALL):: RUN !085
1135 END !139
1300 ESH=ESH-1 :: DISPLAY AT
(24,1):"WE GOT THE MAD COMPU
TER!!" :: CALL THEME(100)::
CALL REWARD(OSH,ESH):: CALL
THEME(200):: GOTO 1130 !195
1350 IF OCAR<5 AND VAL(OFS$)
=4 THEN DISPLAY AT(24,1):HIT
$ :: CALL ALERT(OCAR):: CALL
 DELAY !202
1410 IF OCRU<3 AND VAL(OFS$)
=3 THEN DISPLAY AT(24,1):HIT
$ :: CALL ALERT(OCRU):: CALL
 DELAY !239
1470 IF ODA<2 AND VAL(OFS$)=
1 THEN DISPLAY AT(24,1):HIT$
 :: CALL ALERT(1):: CALL DEL
AY !072
1530 IF ODB<2 AND VAL(OFS$)=
2 THEN DISPLAY AT(24,1):HIT$
 :: CALL ALERT(1):: CALL DEL
AY !074
1710 CALL CLEAR :: CALL SCRE
EN(5):: DISPLAY AT(12,7):"YO
U'RE DEAD" :: CALL THEME(400
):: CALL BUB !168
1810 SUB ALERT(1)!077
1820 CALL SCREEN(9):: DISPLA
Y AT(3,11):"DAMAGE!" :: ON A
 GOTO 1830,1840,1850,1860 !0
74
1830 DISPLAY AT(5,1):"DAMAGE
 CONTROL RESPONDING!" :: GOT
O 1870 !128
1840 DISPLAY AT(5,1):"THE EN
GINE ROOM IS FLOODING!" :: G
OTO 1870 !203
1850 DISPLAY AT(5,1):"HANGAR
 LEVEL HAS COLLAPSED!" :: GO
TO 1870 !132
1860 DISPLAY AT(5,1):"THE SH
IP IS BARELY FLOATING!" :: G
OTO 1870 !205
1870 FOR RED=1 TO 3 !204
1880 CALL SOUND(300,-3,0)::
CALL SOUND(300,-1,0)!054
1890 NEXT RED !113
1900 SUBEND !168
1910 SUB REWARD(OSH,ESH)!030
1920 CALL CHAR(108,RPT$("F",
64)):: A=OSH+ESH :: A$=STR$(
A)!136
1930 CALL SCREEN(11):: DISPL
AY AT(3,1):"YOU LEAD "&A$&"
SURVIVING SHIPS BACK TO PORT
!" !142
1940 DISPLAY AT(5,1):"THE AD
MIRAL PINS A MEDAL TO YOUR C
HEST!" !112
1950 SUBEND !168
1960 SUB BUB !069
1970 CALL CHAR(71,"609090600
609090618242418182424180609
0
90660909060")!132
1980 FOR S=1 TO 3 :: CALL SP
RITE(#3,S+70,16,140+S*2,80+S
,-10-S,0):: NEXT S !244
1990 FOR EFFECT=1 TO 50 !209
2000 CALL PATTERN(#1,72,#2,7
3,#3,71):: CALL SOUND(30,110
,30)!246
2010 CALL PATTERN(#1,73,#2,7
2,#3,72):: CALL SOUND(30,110
,30)!247
2020 CALL PATTERN(#1,72,#2,7
1,#3,73):: CALL SOUND(30,110
,30)!246
2030 CALL PATTERN(#1,71,#2,7
2,#3,72):: CALL SOUND(30,110
,30)!245
2040 NEXT EFFECT !067
2050 SUBEND !168
```

Switch misidentified

The article "Speeding up your console" (Sept. 1992) has a small mistake in that it describes the switch to be installed as a DPST (double pole single throw) switch. In reality, Mr. Slicer descripts a DPDT (double pole double throw) switch.

The same result can be accomplished with a SPDT (single pole double throw) switch. It is less expensive and both crys-

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User Notes

(Continued from Page 30)

tals can remain mounted on the board. Here's how:

Desolder one end of the old crystal, it doesn't matter which end. Solder the new crystal into the soldering pad with the old crystal, making sure that the numbers on the new crystal are indexed in the same direction as the old one. Connect a wire from each crystal to the outer terminals of the switch and the other end into the vacant pad where the original crystal was attached. Mount the switch as described in the article. This leaves the crystals on the board where they are less likely to be missed in any later trouble-shooting or repair.

Adding fractions

The following program is by Stephen Shaw of England. It adds fractions in Extended BASIC. Shaw challenges users to modify the program so that it reduces fractions to a normal format.

```
1 ! ADDING FRACTIONS
2 ! result is not reduced, e
g 12/16 would usually be sho
 n as 3/4, but not in this p
rogram
100 CALL CLEAR
110 DISPLAY AT(10,5):"--- +
--- = ---"
120 ACCEPT AT(9,5)SIZE(3)VAL
IDATE(DIGIT):A
130 ACCEPT AT(11,5)VALIDATE(
DIGIT)SIZE(3):B
140 ACCEPT AT(9,11)SIZE(3)VA
LIDATE(DIGIT):C
150 ACCEPT AT(11,11)SIZE(3)V
ALIDATE(DIGIT):D
160 GOSUB 230
170 DISPLAY AT(9,16):USING "
####":N
180 DISPLAY AT(11,16):USING
"####":L
190 DISPLAY AT(14,1):"ENTER
KEY FOR ANOTHER"
200 DISPLAY AT(1,1):"NORMAL
RESULT=";A/B+C/D
210 ACCEPT AT(24,12):A$ :: G
OTO 100
220 STOP
230 FOR X=2 TO B*D
240 IF INT(X/B)<X/B THEN 260
250 IF INT(X/D)=X/D THEN 270
260 NEXT X
270 L=X
280 N=INT(L/B)*A+INT(L/D)*C
290 RETURN
```

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