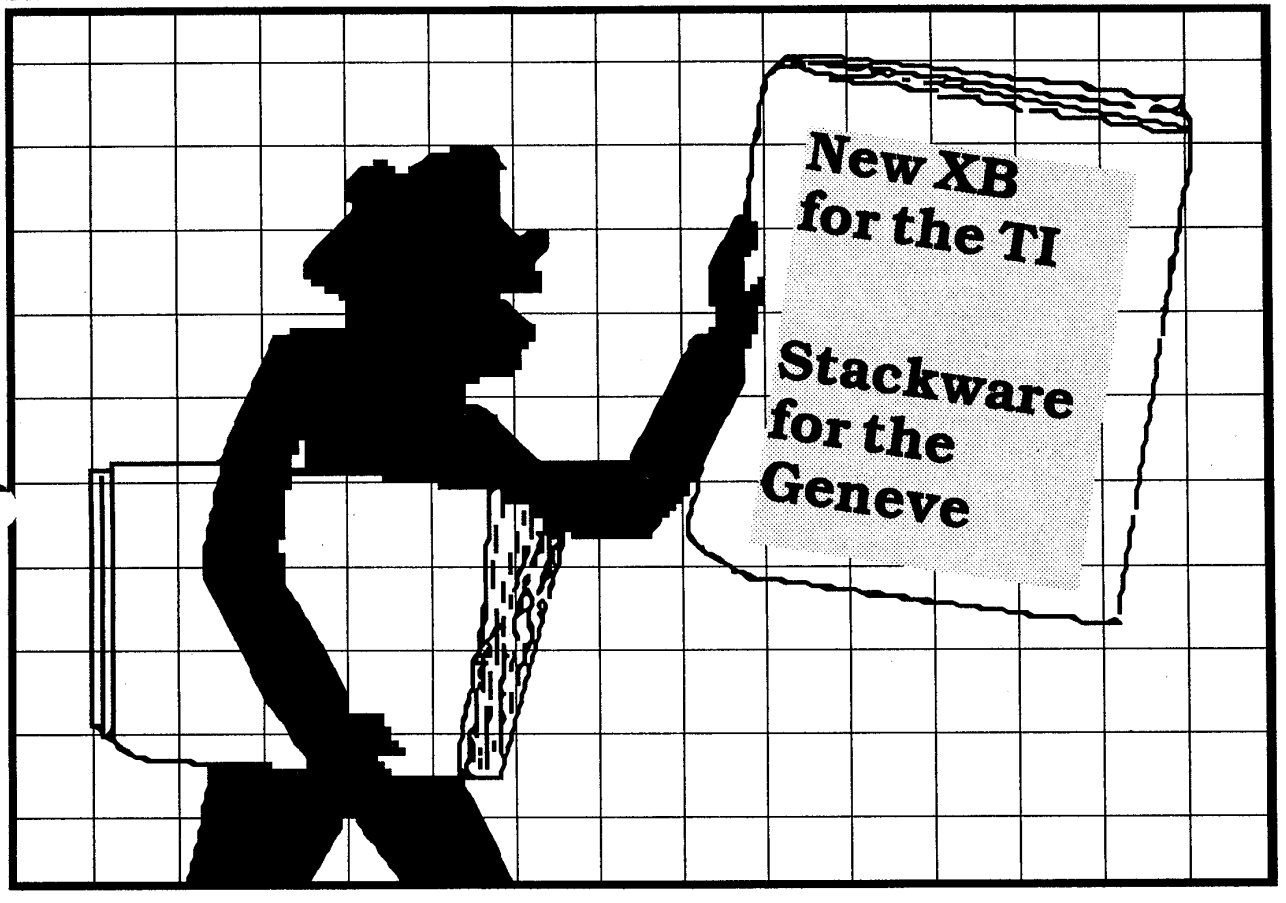
Covering the TI99/4A and the Myarc 9640

MICROpendium

Volume 8 Number 3 April 1991 $2.50



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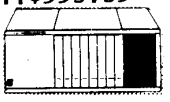

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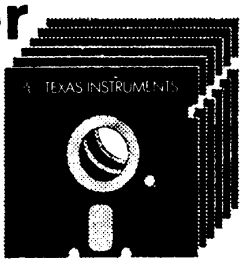

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Regena on BASIC
United States information ..... Page 10

Extended BASIC
Programming with tokens ..... Page 13

MICROpendium index
The last half of 1990 ..... Page 17

TI-Base user's guide
Custom input screens ..... Page 18

MY-BASIC
PAINTSEE lets you view MY-PAINT pictures ..... Page 25

Quad-density disks
And disk manager performance ..... Page 27

HQ__Stacks
McCann Software announces stackware for the Geneve .. Page 28

RICH GKXB
New XB here for GRAM devices; cartridge to come .... Page 28

BASIC/Assembly
Sprightly explanations ..... Page 29

Reviews
MICROreviews: Turbo-Pasc '99 Tutor, Sliding Block Puzzles, The Ring Companion, Page Pro Banner Maker ..... Page 31
CHECKtrack ..... Page 33

Newsbytes
More fairs, a new source for the Tony Lewis manual, and a software firm changes name and direction ..... Page 34

User Notes
An Extended BASIC routine that sorts anything, global substitution in text files, and a balldrop program ..... Page 35

Classified ..... Page 39

***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.

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Comments

It's spring, time for new products

This edition of MICROpendium is newsier than usual. Several products are debuting, including a RICH GKXB and HQ__Stacks. RICH GKXB is an expanded version of Extended BASIC that is faster than XB and yet 100 percent compatible. It was developed by Richard Lynn Gilbertson. GKXB has 157 new commands and will be available in a GRAM version that runs out of GRAM Kracker and similar devices. (I suppose it would also run out of GPL on the Geneve.)

McCann Software has released a graphical user interface (GUI) for the Geneve called HQ__Stacks. Mike McCann says that applications for HQ__Stacks are easy to write and expects a number of programs to become available in the near future.

Isn't spring wonderful!

AN APOLOGY TO A READER

I said something very stupid last month to a reader that I wish I could take back. And I'm going to tell you about it in hopes that he (I didn't get his name) will make note of it.

The reader called, angrily, to complain about Myarc's advertisement of its hard and floppy disk controller. Specifically, he accused MICROpendium of fraud for publishing an advertisement with false information. The information he regarded to be false is the claim that the hard and floppy disk controller "interfaces with standard, off the shelf ... streamer tape drives." Assuming it actually interfaces, we all know you cannot use a streamer tape with the HFDC. Myarc says this is a software problem, but this reader says it is our problem for printing the ad without a disclaimer.

I argued lamely — it was late in the day — that the advertising we publish helps to keep the cost of the magazine down and that Myarc was working on supporting streamer tape, etc. I then told him I would contact Myarc and ask that the wording of the ad be changed.

I felt then and feel now that my response was woefully inadequate. While it is a dangerous thing for a publisher to pretend to oversee the content of advertising, in this case every HFDC owner knows that it doesn't support streamer tape as claimed.

Lou Phillips called me after receiving my letter and notified me that Myarc would have no more to do with us. He says that the HFDC will support a streamer tape and, further, that I've been negative about Myarc "since day one."

I'm sorry that Lou has such a negative impression about MICROpendium, but I think we have been more than fair all along. We will continue to cover Myarc products as we always have — fairly and accurately.

And, dear reader, if you are there, I hope this sets matters straight with you.

MIDI MARKETING

It turns out that Asgard Software may not be marketing Mike Maksimik's MIDI interface for the TI. Asgard had been promoting it for months, but now it seems that it is working on renegotiating the deal. According to reports on the boards, Maksimik is setting up his own company and may be marketing the device on his own. We'll keep you posted as things develop.

—JK

Feedback

Product suggestions

Promoters of the TI99/4A wherever you may be:

Dear software and hardware designers,

If you would like to give the TI99/4A new life, may I recommend that you look to the applications to ham radio.

Could someone please write a Packet Radio terminal program? Maybe a BBS program for Packet Radio — or a Mailbox program for Packet Radio would be nice. Networking programs seem to be in great demand as well. The possibilities seem to be great.

Is it possible to get TTL signals from the peripheral port on the TI99/4A? Just knowing how to get a TTL signal from the TI would put the console in great demand.

On a more sophisticated level, there is a need for a program to convert fax files to pictures.

And then there is Slow-Scan Television, but I don't think the TI has enough memory for that — but who knows?

Does anyone make an internal modem that will work in the TI expansion box?

Are there any expansion cards that we could plug our favorite plug-in modules into to make them on-board accesssible for the 99/4A or the Myarc?

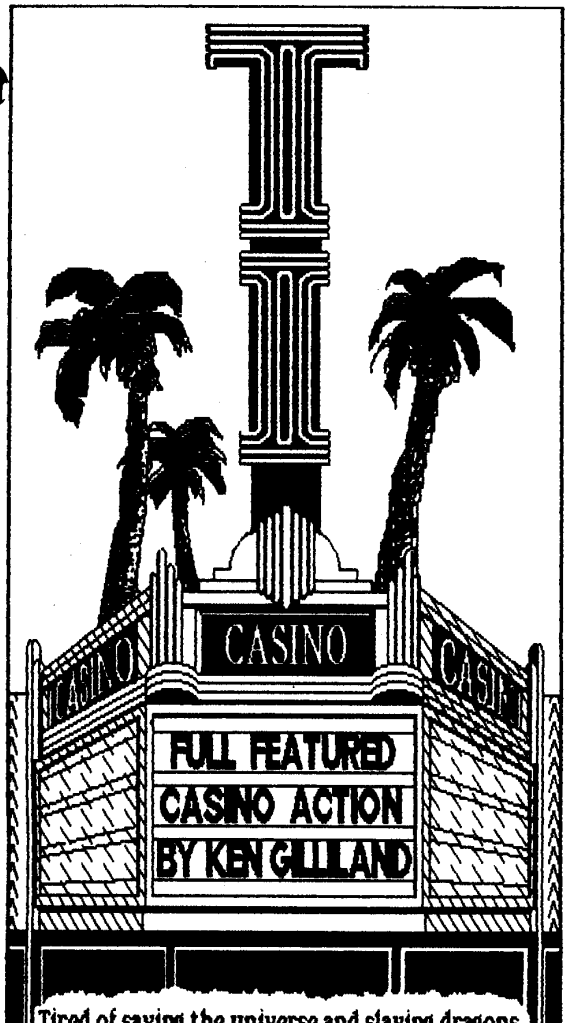
Are there any experimental expansion cards with a place for upgradable chips or home written EEPROMs?

I would be glad to hear from you through your magazine as many others would, I'm sure.

Mark Edwards
Port Huron, Michigan

Readers are encouraged to answer the above questions. However, as far as we know, no commercially marketed internal modem card exists for the TI, though we have heard of users who have worked on such projects. The Widget cartridge expander and OPA's Gismo allow users to access from three to eight cartridges directly from the console. Super Cart modules, of course, may be built by users to combine the GROM chips of several TI modules into one cartridge. (No similar devices are available for the Geneve.) Some users have experimented with the use of EEPROMs with the TI and we have published several articles by Tony Lewis about this subject (May and August 1990).—Ed.

(See Page 8)



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Feedback

(Continued from Page 6)

Golf Score Analyzer manual changed

Our thanks to Bill Gaskill for his kind review of our new Golf Score Analyzer (February 1991). We have one small addition. Between his writing the review and its publication, we revised the manual for the program to include page numbering and a table of contents, so it should be a bit easier to use than the original version.

We'd like also to express "in public" our thanks to Mr. Tony Warren of Madison, Wisconsin, for providing the initial inspiration for the program, and for his invaluable help throughout the long process of development. We literally could not have done it without Tony.

Bruce Harrison
Harrison Software
Hyattsville, Maryland

Where's ESD?

The Comments section (February 1991) mentions Electronic Systems Development Corp. developing a hard-floppy controller. I would like to know, and I am sure that other readers would also, how to contact this company regarding that controller.

W.A. Ragsdale
San Diego, California

The address is P.O. Box 23805, Washington DC 20006. — Ed.

TI still generates interest in Australia

After being involved with the TI family of computers since 1982 and receiving MICROpendium since March 1985, I'm still astounded that there is still so much interest generated in a totally obsolete system! I have been Coordinator of ATICC (Adelaide TI Computer Club) since its inception in January 1983 and we still attract a few new members each year, justifying our existence.

The only thing that really gripes me is the total lack of support that we down here in Australia get from Myarc and the Geneve. We still don't have the Pal versions that we ordered three years ago! My NTSC Geneve hasn't run for over 15 months due to the problems I and many others have. The Geneve is a total non-event as far as we are concerned!

Fred Cugley
Brahma Lodge, Australia

HFDC quirks

As spoiled as I have become with the Myarc HFDC and hard drive on my Geneve, there are some quirks and limitations that I doubt are unique to my system. I hope someone has figured a way around them. The first problem is not being able to get the HFDC to run standard 360K floppy disk drives. I tried every possible configuration listed in the manual, but none worked. I ended up having to leave my original TI controller in the PEB so the floppy drives could be used at all.

Second, the DSK1 directory emulation is too limited. The 127-file limit is OK for combining MY-Word, Telco and MDM in one directory, but forget trying to squeeze TIBASE in. At least it was possible to make a simple change to TIBASE's load program in Extended BASIC so it could be accessed from a directory, but a number of programs cannot be modified in this manner. The ideal solution would be a piece of software that allows a user to specify drive specifications for each file that may be accessed by a given program. If anyone has developed such a program, he can be assured eternal gratitude by HFDC users.

Finally, is there any reason only 188K of RAM is listed as available when CHKDSK is run? This severely limits RAMdisk emulation plus it makes one wonder why the HFDC software takes up nearly 400K, providing that is the reason.

The speed and convenience of a hard drive are immeasurable. If the problems listed above can be solved, TI and Geneve owners will have even more potential for a professional, convenient system that will satisfy them for many more years.

Eric Wilson
Reston, Virginia

Until a more complete version of MDOS is available, you will not be able to use the HFDC to control floppies on a Geneve. The 127-file limit corresponds to the maximum number of filenames that the TI can handle on a single disk.—Ed.

Don't type in carats for MENU1 file

For readers who keyed in the MENU1 command file from my February 1991 TI-Base column, I neglected to mention in the text that the carat symbols (^) are not part of the command file. They were included to show number of spaces to be used for the menu layout and number of spaces from column 1 in the user's editor program. If you have typed the file in, the carats must be removed and the command file resaved to get it to run. If you have yet to key it in, leave the carat symbols out.

Bill Gaskill
Grand Junction, Colorado

Scholarships raised at Computer Expo

Thank you very much for your support of our Computer Exposition. This year the Exposition earned over $4,000 for student scholarships, and we indeed owe this in part to you. We are very appreciative indeed.

Bob Guellnitz
Roselle Park Public Schools
Roselle Park, New Jersey

Enjoys Traver articles

I continue to enjoy your mix of articles and am now particularly following Barry Traver's BASIC Assembly articles.

I was able to supply Mr. Clark (Feedback January 1991) with a copy of the SKYSCAPE program together with a selection of other programs which I felt he might enjoy.

Jacques Groslouis
Bathurst, New Brunswick, Canada

Feedback is a forum for TI99/4A and Geneve 9640 users. The editor will condense submissions when necessary. We ask readers to restrict themselves to one subject for the sake of simplicity. Mail Feedback items to **MICROpendium, P.O. Box 1343, Round Rock, TX 78680.**

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BASIC

United States information

By REGENA

First, let me thank all of you who voted for me at the recent Fest West '91 in Anaheim, Calafornia. I was honored to receive the "Outstanding Writer" award for the past 10 years. I started writing in 1981, and have written six published books, chapters and sections in eight other books and more than 200 articles in 18 different magazines (not all TI-related). I was happy, too, that MICROpendium received the award for the best publication. Bud Mills received the award for the best hardware. There was not a clear-cut software winner — which shows how much great software there is for our TI99/4A.

Fest West was great. The convention was well organized and worthwhiile. It is still amazing to see how much software and hardware is being produced for our computer. And, of course, it's always fun to get together with TI friends. I would like to emphasize how important it is to stay involved with a user group if you want to get the most out of your computer. Regional conferences are held throughout the year in various parts of the world.

A recent letter to the editor wondered why I still write in TI BASIC even though he felt most people have an Extended BASIC cartridge. Many of the letters I receive are from people who do not have many accessories, but just the basic TI. In fact, I often have cassette requests. A couple of years ago, a different TI user appeared — a person receiving a hand-me-down TI. A lot of my requests are from grandparents giving to their grandchildren or from other beginning programmers and educators using TIs in classrooms with limited budgets. They are just as "true" TI users as those with expanded systems.

Since Jerry Stern started his Extended BASIC column, I have even more reason to stay with BASIC. However, many of his programs can be converted to BASIC and many of mine can be used in XB (convert as you type it in). You may usually type my programs in using XB (the editor is better). If it doesn't run in XB, SAVE it then run it in regular BASIC. The main ones that cannot be used in XB are programs containing graphics in character sets 15 and 16. Conversion programs are available that allow XB to use those sets if you do not also use sprites.

My fifth-grade son has been studying the United States this year. I have previously written graphics programs to learn the various sections of the United States plus one quiz program to learn the capitals of the 50 states. The students' latest project, though, was to learn basic facts about each state. A database program would be the ideal way to use the computer with facts, but here is a way to do it without a commercial program.

Unfortunately, there are a lot of DATA statements, but that is how the information about the 50 states gets into the computer. Lines 108-110 read in the names of the 50 states in the S$ array. Lines 116-123 receive the name of the state you type in and compare it with the list in S$. The variable J indicates which state is chosen (in order of joining the Union). Lines 126-130 branch to the appropriate subroutine. The subroutines are in Lines 5-104 and simply RESTORE a certain line of DATA then RETURN. It would be simpler if we could use a variable in the RESTORE statement, but we don't have that option.

Line 131 reads the data, then Lines 132-133 print the information on the screen — capital, date of statehood, nickname(s), state bird, state flower, state song and state motto(s). After the screen is printed, press the ENTER key to try another state.

Let me describe another way to program this. All the data could be read into an array to start with — thus eliminating the need of the subroutines. I originally wrote this program using this method, but I could use only six items for each state before I ran out of memory. First DIM S$(50,6) for the 50 states and six pieces of information, such as state, capital, statehood, nickname, bird and flower. The DATA statements look the same, except the state name is before the capital and delete the items not used. To read in the information:

```
108 FOR S=1 TO 50
109 FOR J=1 TO 6
110 READ S$(S,J)
111 NEXT J
112 NEXT S
```

When the name of a state A$ is typed in, it is compared to S$(J,1). Then the statements to print the information are

```
132 PRINT "STATE #";J;A$::"CAPITAL: ";S$(J,2)::"STATE
HOOD: ";S$(J,3)::"NICKNAME: ";S$(J,4)
133 PRINT :"BIRD: ";S$(J,5)::"FLOWER: ";S$(J,6)
```

This gives you two ideas for writing your own database-type programs. The method printed here is longer, but allows more information. The second method is perhaps a more efficient way of programming but fills memory more quickly.

If you wish to save typing effort, you may have a copy of STATE INFORMATION by sending $4 to *REGENA, 918 Cedar Knolls West, Cedar City, UT 84720. Be sure to specify cassette or diskette and that you need the TI version.*

STATE INFORMATION

```
1 REM STATE INFORMATION !193
2 REM BY REGENA !071
3 DIM S$(50)!157
4 GOTO 105 !184
5 RESTORE 138 !231
6 RETURN !136
7 RESTORE 140 !233
8 RETURN !136
9 RESTORE 142 !235
10 RETURN !136
11 RESTORE 144 !237
12 RETURN !136
13 RESTORE 146 !239
14 RETURN !136
15 RESTORE 148 !241
16 RETURN !136
17 RESTORE 151 !244
18 RETURN !136
19 RESTORE 153 !246
20 RETURN !136
21 RESTORE 156 !249
22 RETURN !136
23 RESTORE 157 !250
24 RETURN !136
25 RESTORE 159 !252
26 RETURN !136
```

(See Page 11)

REGENA—

(Continued from Page 10)

```
27 RESTORE 160 !253
28 RETURN !136
29 RESTORE 162 !255
30 RETURN !136
31 RESTORE 163 !000
32 RETURN !136
33 RESTORE 165 !002
34 RETURN !136
35 RESTORE 167 !004
36 RETURN !136
37 RESTORE 169 !006
38 RETURN !136
39 RESTORE 171 !008
40 RETURN !136
41 RESTORE 173 !010
42 RETURN !136
43 RESTORE 175 !012
44 RETURN !136
45 RESTORE 177 !014
46 RETURN !136
47 RESTORE 179 !016
48 RETURN !136
49 RESTORE 181 !018
50 RETURN !136
51 RESTORE 183 !020
52 RETURN !136
53 RESTORE 185 !022
54 RETURN !136
55 RESTORE 187 !024
56 RETURN !136
57 RESTORE 190 !027
58 RETURN !136
59 RESTORE 191 !028
60 RETURN !136
61 RESTORE 192 !029
62 RETURN !136
63 RESTORE 194 !031
64 RETURN !136
65 RESTORE 195 !032
66 RETURN !136
67 RESTORE 197 !034
68 RETURN !136
69 RESTORE 200 !037
70 RETURN !136
71 RESTORE 201 !038
72 RETURN !136
73 RESTORE 203 !040
74 RETURN !136
75 RESTORE 205 !042
76 RETURN !136
77 RESTORE 207 !044
78 RETURN !136
79 RESTORE 209 !046
80 RETURN !136
81 RESTORE 211 !048
82 RETURN !136
83 RESTORE 213 !050
84 RETURN !136
85 RESTORE 215 !052
86 RETURN !136
87 RESTORE 217 !054
88 RETURN !136
89 RESTORE 219 !056
90 RETURN !136
91 RESTORE 221 !058
92 RETURN !136
93 RESTORE 222 !059
94 RETURN !136
95 RESTORE 224 !061
96 RETURN !136
97 RESTORE 226 !063
98 RETURN !136
99 RESTORE 228 !065
100 RETURN !136
101 RESTORE 230 !067
102 RETURN !136
103 RESTORE 232 !069
104 RETURN !136
105 CALL CLEAR !209
106 PRINT "  ** UNITED STATE
S **": : :"TYPE THE NAME OF
A STATE ANDPRESS <ENTER>." !
110
107 PRINT :"INFORMATION ABOU
T THE STATE WILL BE GIVEN."
!139
108 FOR S=1 TO 50 !119
109 READ S$(S)!206
110 NEXT S !233
111 DATA DELAWARE,PENNSYLVAN
IA,NEW JERSEY,GEORGIA,CONNEC
TICUT,MASSACHUSETTS,MARYLAND
,SOUTH CAROLINA !061
112 DATA NEW HAMPSHIRE,VIRGI
NIA,NEW YORK,NORTH CAROLINA,
RHODE ISLAND,VERMONT,KENTUCK
Y,TENNESSEE,OHIO,LOUISIANA !
181
113 DATA INDIANA,MISSISSIPPI
,ILLINOIS,ALABAMA,MAINE,MISS
OURI,ARKANSAS,MICHIGAN,FLORI
DA,TEXAS,IOWA,WISCONSIN !122
114 DATA CALIFORNIA,MINNESOT
A,OREGON,KANSAS,WEST VIRGINI
A,NEVADA,NEBRASKA,COLORADO,N
ORTH DAKOTA,SOUTH DAKOTA !22
8
115 DATA MONTANA,WASHINGTON,
IDAHO,WYOMING,UTAH,OKLAHOMA,
NEW MEXICO,ARIZONA,ALASKA,HA
WAII !084
116 PRINT : : :"ENTER THE NA
ME OF A STATE": :!124
117 INPUT A$ !247
118 IF A$="" THEN 234 !209
119 FOR J=1 TO 50 !110
120 IF A$=S$(J)THEN 124 !202
121 NEXT J !224
122 PRINT :"STATE NOT FOUND.
": :!238
123 GOTO 116 !195
124 CALL CLEAR !209
125 PRINT "STATE #";J;A$ !06
9
126 IF J>25 THEN 129 !185
127 ON J GOSUB 5,7,9,11,13,1
5,17,19,21,23,25,27,29,31,33
,35,37,39,41,43,45,47,49,51,
53 !170
128 GOTO 131 !210
129 K=J-25 !070
130 ON K GOSUB 55,57,59,61,6
3,65,67,69,71,73,75,77,79,81
,83,85,87,89,91,93,95,97,99,
101,103 !141
131 READ C$,D$,N$,B$,F$,E$,M
$,M2$ !010
132 PRINT :"CAPITAL: ";C$:"S
TATEHOOD: ";D$: :"NICKNAME:
";N$: :"BIRD: ";B$:"FLOWER:
";F$ !212
133 PRINT :"SONG: ";E$: :"MO
TTO: ";M$:M2$ !110
134 CALL KEY(3,K,S)!190
135 IF K<>13 THEN 134 !123
136 CALL CLEAR !209
137 GOTO 116 !195
138 DATA DOVER,"DECEMBER 7,
1787","FIRST STATE, DIAMOND
STATE, BLUE HEN STATE",BLUE
HEN CHICKEN,PEACH BLOSSOM !2
04
139 DATA OUR DELAWARE,LIBERT
Y AND INDEPENDENCE,"" !095
140 DATA HARRISBURG,"DECEMBE
R 12, 1787",KEYSTONE STATE,R
UFFED GROUSE,MOUNTAIN LAUREL
,"HAIL, PENNSYLVANIA" !003
141 DATA "VIRTUE, LIBERTY, A
ND",INDEPENDENCE !188
142 DATA TRENTON,"DECEMBER 1
8, 1787",GARDEN STATE,EASTER
N GOLDFINCH,PURPLE VIOLET,OD
E TO NEW JERSEY !149
143 DATA LIBERTY AND PROSPER
ITY,"" !058
144 DATA ATLANTA,"JANUARY 2,
 1788","PEACH STATE, EMPIRE
STATE OFTHE SOUTH",BROWN THR
ASHER,CHEROKEE ROSE !210
145 DATA GEORGIA,"WISDOM, JU
STICE AND",MODERATION !141
146 DATA HARTFORD,"JANUARY 9
, 1788",CONSTITUTION STATE,R
OBIN,MOUNTAIN LAUREL,THE HIL
LS OF MY CONNECTICUT !127
147 DATA QUI TRANSTULIT SUST
INET,HE WHO TRANSPLANTED STI
LL   SUSTAINS !166
```

(See Page 12)

REGENA—

(Continued from Page 11)

```
148 DATA BOSTON,"FEBRUARY 6,
 1788","BAY STATE, OLD COLON
Y STATE,PURITAN STATE, BAKED
 BEAN   STATE",CHICKADEE !04
5
149 DATA MAYFLOWER,ALL HAIL
TO MASSACHUSETTS,ENSE PETIT
PLACIDAM SUB      LIBERTATE Q
UIETEM !228
150 DATA "BY THE SWORD SHE S
EEKS      PEACE, BUT PEACE O
NLY UNDER LIBERTY" !141
151 DATA ANNAPOLIS,"APRIL 28
, 1788","OLD LINE STATE, FRE
E STATE",BALTIMORE ORIOLE,BL
ACK-EYED SUSAN !028
152 DATA MARYLAND! MY MARYLA
ND!,"FATTI MASCHII, PAROLE F
EMINE","MANLY DEEDS, WOMANLY
 WORDS" !020
153 DATA COLUMBIA,"MAY 23, 1
788",PALMETTO STATE,CAROLINA
 WREN,YELLOW (CAROLINA) JASM
INE,CAROLINA !159
154 DATA "ANIMIS OPIBUSQUE P
ARATI,     PREPARED IN MIND A
ND         RESOURCES" !198
155 DATA "DUM SPIRO, SPERO
           WHILE I BREATHE, I
 HOPE" !083
156 DATA CONCORD,"JUNE 21, 1
788",GRANITE STATE,PURPLE FI
NCH,PURPLE LILAC,OLD NEW HAM
PSHIRE,LIVE FREE OR DIE,"" !
040
157 DATA RICHMOND,"JUNE 25,
1788",OLD DOMINION,CARDINAL,
FLOWERING DOGWOOD,CARRY ME B
ACK TO OLD        VIRGINNY !
102
158 DATA SIC SEMPER TYRANNIS
,EVER THUS TO TYRANTS !014
159 DATA ALBANY,"JULY 26, 17
88",EMPIRE STATE,BLUEBIRD,RO
SE,"NEW YORK, OUR EMPIRE STA
TE",EXCELSIOR,EVER UPWARD !1
30
160 DATA RALEIGH,"NOVEMBER 2
1, 1789","TARHEEL STATE, OLD
 NORTH     STATE",CARDINAL,DO
GWOOD,THE OLD NORTH STATE !0
23
161 DATA ESSE QUAM VIDERI,TO
 BE RATHER THAN TO SEEM !238
162 DATA PROVIDENCE,"MAY 29,
 1790",LITTLE RHODY,RHODE IS
LAND RED,VIOLET,RHODE ISLAND
,HOPE,"" !132
163 DATA MONTPELIER,"MARCH 4
, 1791",GREEN MOUNTAIN STATE
,HERMIT THRUSH,RED CLOVER,"H
AIL, VERMONT" !170
164 DATA FREEDOM AND UNITY,"
" !148
165 DATA FRANKFORT,"JUNE 1,
1792",BLUEGRASS STATE,CARDIN
AL,GOLDENROD,MY OLD KENTUCKY
 HOME !250
166 DATA "UNITED WE STAND, D
IVIDED WE FALL","" !083
167 DATA NASHVILLE,"JUNE 1,
1796",THE VOLUNTEER STATE,MO
CKINGBIRD,IRIS,WHEN IT'S IRI
S TIME IN       TENNESSEE !09
5
168 DATA AGRICULTURE AND COM
MERCE,"" !146
169 DATA COLUMBUS,"MARCH 1,
1803",BUCKEYE STATE,CARDINAL
,SCARLET CARNATION,BEAUTIFUL
 OHIO !236
170 DATA WITH GOD ALL THINGS
 ARE      POSSIBLE,"" !014
171 DATA BATON ROUGE,"APRIL
30, 1812","PELICAN STATE, BA
YOU STATE, SUGAR STATE, CREO
LE STATE" !230
172 DATA EASTERN BROWN PELIC
AN,MAGNOLIA,GIVE ME LOUISIAN
A,"UNION, JUSTICE, CONFIDENC
E","" !083
173 DATA INDIANAPOLIS,"DECEM
BER 11, 1816",HOOSIER STATE,
CARDINAL,PEONY,"ON THE BANKS
 OF THE WABASH, FAR AWAY" !0
30
174 DATA THE CROSSROADS OF A
MERICA,"" !185
175 DATA JACKSON,"DECEMBER 1
0, 1817",MAGNOLIA STATE,MOCK
INGBIRD,MAGNOLIA BLOSSOM,"GO
, MISSISSIPPI" !198
176 DATA VIRTUTE ET ARMIS,BY
 VALOR AND ARMS !004
177 DATA SPRINGFIELD,"DECEMB
ER 3, 1818",LAND OF LINCOLN,
EASTERN CARDINAL,MEADOW VIOL
ET,ILLINOIS !117
178 DATA "STATE SOVEREIGNTY,
 NATIONAL UNION","" !064
179 DATA MONTGOMERY,"DECEMBE
R 14, 1819","HEART OF DIXIE,
 YELLOWHAMMERSTATE",YELLOWHA
MMER OR FLICKER !159
180 DATA CAMELLIA,ALABAMA,AU
DEMUS JURA NOSTRA DEFENDRE,W
E DARE DEFEND OUR RIGHTS !13
4
181 DATA AUGUSTA,"MARCH 15,
1820",PINE TREE STATE,CHICK
DEE,EASTERN WHITE PINE CONE
AND TASSEL,STATE OF MAINE !1
77
182 DATA DIRIGO,"I DIRECT, O
R GUIDE" !074
183 DATA JEFFERSON CITY,"AUG
UST 10, 1821",THE 'SHOW ME'
STATE,BLUEBIRD,HAWTHORN,MISS
OURI WALTZ !064
184 DATA SALUS POPULI SUPREM
A LEX     ESTO,LET THE WELFAR
E OF THE       PEOPLE BE THE
SUPREME LAW !225
185 DATA LITTLE ROCK,"JUNE 1
5, 1836",LAND OF OPPORTUNITY
,MOCKINGBIRD,APPLE BLOSSOM,A
RKANSAS,REGNAT POPULUS !064
186 DATA THE PEOPLE RULE !13
6
187 DATA LANSING,"JANUARY 26
, 1837","WATER-WINTER WONDER
LAND,     WOLVERINE STATE, AU
TOMOBILE STATE",ROBIN !231
188 DATA APPLE BLOSSOM,"MICH
IGAN, MY MICHIGAN","SI QUAER
IS PENINSULAM       AMOENAM,
 CIRCUMSPICE" !055
189 DATA "IF YOU SEEK A PLEA
SANT       PENINSULA, LOOK AB
OUT YOU" !004
190 DATA TALLAHASSEE,"MARCH
3, 1845",SUNSHINE STATE,MOCK
INGBIRD,ORANGE BLOSSOM,SWANE
E RIVER,IN GOD WE TRUST,"" !
191
191 DATA AUSTIN,"DECEMBER 29
, 1845",LONE STAR STATE,MOCK
INGBIRD,BLUEBONNET,"TEXAS, O
UR TEXAS",FRIENDSHIP,"" !086
192 DATA DES MOINES,"DECEMBE
R 28, 1846",HAWKEYE STATE,EA
STERN GOLDFINCH,WILD ROSE,SO
NG OF IOWA !234
193 DATA OUR LIBERTIES WE PR
IZE AND  OUR RIGHTS WE WILL
MAINTAIN,"" !202
194 DATA MADISON,"MAY 29, 18
48",BADGER STATE,ROBIN;,VIOL
ET,ON WISCONSIN,FORWARD,"" !
239
195 DATA SACRAMENTO,"SEPTEMB
ER 9, 1850",GOLDEN STATE,CAL
IFORNIA VALLEY QUAIL,GOLDEN
POPPY,AETERNA CALIFORNIA !07
2
196 DATA EUREKA,I HAVE FOUND
 IT !142
197 DATA SAINT PAUL,"MAY 11,
```

(See Page 13)

REGENA—

(Continued from Page 12)

```
1858" !071
198 DATA "GOPHER STATE, NORT
H STAR     STATE, LAND OF 10,
000 LAKES,LAND OF SKY-BLUE W
ATERS",LOON !071
199 DATA SHOWY LADY'S SLIPPE
R,HAIL! MINNESOTA,L'ETOILE D
U NORD,THE STAR OF THE NORTH
 !155
200 DATA SALEM,"FEBRUARY 14,
 1859",BEAVER STATE,WESTERN
MEADOWLARK,OREGON GRAPE,OREG
ON STATE SONG,THE UNION,"" !
180
201 DATA TOPEKA,"JANUARY 29,
 1861","SUNFLOWER STATE, WHE
AT       STATE, JAYHAWK STATE
",WESTERN MEADOWLARK !062
202 DATA SUNFLOWER,HOME ON T
HE RANGE,AD ASTRA PER ASPERA
,TO THE STARS THROUGH
 DIFFICULTIES !106
203 DATA CHARLESTON,"JUNE 20
, 1863","MOUNTAIN STATE, PAN
HANDLE    STATE",CARDINAL,RHO
DODENDRON !222
204 DATA WEST VIRGINIA HILLS
,MONTANI SEMPER LIBERI,MOUNT
AINEERS ARE ALWAYS FREE !139
205 DATA CARSON CITY,"OCTOBE
R 31, 1864","SAGEBRUSH STATE
, SILVER      STATE, BATTLE B
ORN STATE" !239
206 DATA MOUNTAIN BLUEBIRD,S
AGEBRUSH,HOME MEANS NEVADA,A
LL FOR OUR COUNTRY,"" !210
207 DATA LINCOLN,"MARCH 1, 1
867",CORNHUSKER STATE,WESTER
N MEADOWLARK,GOLDENROD,BEAUT
IFUL NEBRASKA !121
208 DATA EQUALITY BEFORE THE
 LAW,"" !050
209 DATA DENVER,"AUGUST 1, 1
876",CENTENNIAL STATE,LARK B
UNTING,ROCKY MOUNTAIN COLUMB
INE !082
210 DATA WHERE THE COLUMBINE
S GROW,NIL SINE NUMINE,"NOTH
ING WITHOUT PROVIDENCE, OR D
IVINE WILL" !074
211 DATA BISMARCK,"NOVEMBER
2, 1889","FLICKERTAIL STATE,
 SIOUX     STATE",WESTERN MEA
DOWLARK,WILD PRAIRIE ROSE !0
87
212 DATA NORTH DAKOTA HYMN,"
LIBERTY AND UNION, NOW AND
FOREVER, ONE AND INSEPARABLE
","" !253
213 DATA PIERRE,"NOVEMBER 2,
 1889","SUNSHINE STATE, COYO
TE STATE",RING-NECKED PHEASA
NT,PASQUEFLOWER !027
214 DATA HAIL! SOUTH DAKOTA,
UNDER GOD THE PEOPLE RULE,""
 !247
215 DATA HELENA,"NOVEMBER 8,
 1889",TREASURE STATE,WESTER
N MEADOWLARK,BITTERROOT,MONT
ANA,ORO Y PLATA !105
216 DATA GOLD AND SILVER !12
0
217 DATA OLYMPIA,"NOVEMBER 1
1, 1889",EVERGREEN STATE,WIL
LOW GOLDFINCH,COAST RHODODEN
DRON !160
218 DATA "WASHINGTON, MY HOM
E",ALKI (INDIAN),BY AND BY !
068
219 DATA BOISE,"JULY 3, 1890
","GEM OF THE MOUNTAINS, GEM
   STATE",MOUNTAIN BLUEBIRD,
SYRINGA !026
220 DATA HERE WE HAVE IDAHO,
ESTO PERPETUA,EXIST FOREVER
!173
221 DATA CHEYENNE,"JULY 10,
1890",EQUALITY STATE,WESTERN
 MEADOWLARK,INDIAN PAINTBRUS
H,WYOMING,EQUAL RIGHTS,"" !2
29
222 DATA SALT LAKE CITY,"JAN
UARY 4, 1896",BEEHIVE STATE,
CALIFORNIA GULL,SEGO LILY,"U
TAH, WE LOVE THEE" !115
223 DATA INDUSTRY,"" !095
224 DATA OKLAHOMA CITY,"NOVE
MBER 16, 1907",SOONER STATE,
SCISSOR-TAILED FLYCATCHER,MI
STLETOE,OKLAHOMA !064
225 DATA LABOR OMNIA VINCIT,
LABOR CONQUERS ALL THINGS !2
16
226 DATA SANTA FE,"JANUARY 6
, 1912",LAND OF ENCHANTMENT,
ROADRUNNER,YUCCA,"O, FAIR NE
W MEXICO" !000
227 DATA CRESCIT EUNDO,IT GR
OWS AS IT GOES !172
228 DATA PHOENIX,"FEBRUARY 1
4, 1912",GRAND CANYON STATE,
CACTUS WREN,BLOSSOM OF SAGUA
RO CACTUS,ARIZONA !064
229 DATA DITAT DEUS,GOD ENRI
CHES !254
230 DATA JUNEAU,"JANUARY 3,
1959","THE LAST FRONTIER, LA
ND OF  THE MIDNIGHT SUN, THE
 GREAT LAND" !129
231 DATA WILLOW PTARMIGAN,FO
RGET-ME-NOT,ALASKA'S FLAG,NO
NE,"" !074
232 DATA HONOLULU,"AUGUST 21
, 1959",ALOHA STATE,NENE (HA
WAIIAN GOOSE),RED HIBISCUS,H
AIL! GREAT ALOHA STATE !218
233 DATA UA MAU KE EA O KA A
INA I KA PONO,THE LIFE OF TH
E LAND IS      PRESERVED IN R
IGHTEOUSNESS !204
234 CALL CLEAR !209
235 END !139
```

EXTENDED BASIC

Programming with Tokens

By JERRY STERN
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Every programming language has its limitations. Yes, even Texas Instruments Extended BASIC. Each programming statement can do only certain things, and some projects are just impossible to do, according to the manual. There is no way to read a program into another program, for instance. And no way to use a program to make changes to that second program. According to the manual, that's not possible.

To be more precise, there is a way, but Texas Instruments did not publish the details. There were only clues; hints that such a project was possible. Texas Instruments Programming Aids III included a program that directly reads and writes programs in merge format. *99'er Magazine* published some limited information on this technique in 1982 and 1983.

To write programs that make changes in other programs directly on disk, we must

(See Page 14)

EXTENDED BASIC—

(Continued from Page 13)

first understand how Extended BASIC uses disk merge files. Every line of a computer program is stored on disk as a series of numbers between 0 and 255. Each line of the program has one line in the file, so the length of the lines is variable, and may be as short as four characters or as long as 163 characters. The storage format for programs on disk has been called by several names; it is the "token format" or the "crunch format," or sometimes "memory image format." A token, for our purposes, is an integer in the range from 0 to 255, that represents a specific item in a disk program file. That item may be a programming statement, like PRINT, or a letter or number, or a symbol that identifies the next set of tokens as a line number or a string variable. To simplify some terminology, I'll call the tokens from 1 to 127 ASCII codes, because they match the standard telecommunications codes of that type.

I've used tokens to write several programs for this column. Look at SUBINDEX (11/88), LINESAVER (1/89), RESEQ2 (7/89), SPRITE BUILDER (8/89), SPRITE TESTER (9/89), AND SOUND STAGE (8/90).

Also in MICROpendium, Bob Carmany wrote a program for the July 1990 issue that created a listing of all the tokens. There have been many versions of this program floating through user groups over the past decade, and most of them have been shorter, but Bob's program is the cleanest, most professional version that I've seen so far. There is an old version in *The Best of 99'er*, Volume I that does the same thing in an ocean of remarks statements (74 remarks in an 83 line program). I've won't try to recreate that routine, because the listing that such a program creates requires extensive editing to clean up the problems surrounding the few unused codes. These listers are great for deciphering the codes, but it is simpler to just list the codes here, together with the codes that do not print in such an automated listing.

Let's begin with an explanation of why tokens exist, and what they are. Unlike our computers, we humans work better when we understand what we are doing. Tokens are the result of using our little chunks of semiconducting silicon in the most efficient way possible.

Nearly all computers "think" in terms of eight-bit bytes. Everything the computer does is represented as a series of bytes. The byte can only represent a number from zero to 255. There are only those 255 codes to work with, so the limitations of how many different instructions there might be in a programming language must be 255 less the number of codes used for other things. Every programming statement, like PRINT or DATA, has its own number to represent it in the computer or in a merge format disk file. PRINT is number 156; DATA is 147. Every time the print statement occurs in the disk merge file, there is a number 156. Unless it occurs in a line number, number 156 always means PRINT.

Again, every statement is represented by a number between 129 and 255. Line numbers are stored as the two bytes that begin each line or follow the special line number token 201 in the middle of a line. There are four more special tokens, like the line number token, that have special meanings. Token 0 ends every line. A pair of token 255s ends every program listing. And last, but very useful, tokens 199 and 200 indicate quoted strings and unquoted strings. Now, that's ALL there is to understanding tokens. Next, the byte by byte details.

Every program line ends with token 0.

The ASCII codes 1 to 31 are telecommunications codes, like carriage return (13), or ring a bell (7).

Code 32 is the blank space. Although program lines have blank spaces in them when displayed on screen, there are no blank spaces in disk files. The on-screen blanks are inserted by the display routine. The only code 32s used in a merge file as blank spaces are those spaces inside string expressions, as in "Nine Trapped Outer Space Symbols Lurk Within This Very Headline!"

Punctuation fills ASCII codes 33 to 47, 58 to 64, 91 to 86, and 123 to 127. Like the space character, punctuation using these codes is only found inside strings. Characters like the commas in a CALL SOUND(100,440,1) statement are not true commas using ASCII code 44, but token commas used only for separating statement portions. The token comma is number 179.

The upper case alphabet fills ASCII characters 65 to 90, and the lower case alphabet uses 97 to 122. The binary versions of these numbers reveal some good planning by the developers of ASCII. The number 65 in binary is 1000001, and 97 is 1100001. To convert between upper and lower case, simply add or subtract 32, or binary 100000. Only the sixth bit will change. The remaining tokens, from 129 to 254, except for 199 to 201, represent program commands and command punctuation. Finally, every program file ends with two token 255s by themselves on the last line.

Token 199 signals that a quoted string will follow. 199, 3, 83, 85, 77 indicates a quoted string, three bytes long, using ASCII characters to spell SUM. In the program listing, this would display as "SUM" and the second quotation mark is provided by the computer's internal display routine — after the 77, the next token represents the next statement in the program line.

Token 200 is used in the same way as 199, but for unquoted strings. These are strings that are not enclosed in quotes, such as numbers, or unquoted DATA statements. The tokens 200, 3, 83, 85, 77 also spell out SUM, but not inside quotation marks.

Token 201 always precedes a two-byte line number, and every line begins with two bytes for the line number, so line numbers are always either two or three bytes. That means that line number 32000 and line number 10 both use the same amount of memory and the same amount of disk space. In a token system like TI Extended BASIC, there is no storage space advantage to using low line numbers; the only advantage gained from low line numbers is easy reading when editing a program listing.

The line numbers use this format: The first byte is equal to the line number divided by 256, and rounded downward. The second byte is the remainder from that division by 256. So line number 100 is 0, 100; line 260 is 1, 4; line 1000 is 3, 232.

Variable names are stored simply as the

(See Page 15)

EXTENDED BASIC—

(Continued from Page 14)

ASCII letters of their names. The variable SUM is just 83, 85, 77, and SUM$ is 83, 85, 77, 36. A variable array is stored as the variable name, the token for open parenthesis (183), the number within, and a closing parenthesis (182). SUM(5) is 83, 85, 77, 183, 200, 1, 53, 182.

There are no tokens for subprogram names. CALL CHAR is stored as the token for CALL (token 157), and an unquoted string for the subprogram name. CALL CHAR is 157, 200, 4, 67, 72, 65, 82.

Assembling a program in token format requires combining all these types of tokens and ASCII codes. Before writing a program that uses tokens, you must write a dummy program that uses all the statements that will be in the final program, including every possible variation on those statements. That program doesn't have to execute properly— it only has to be free of syntax errors. Save the program in merge format and in text format:

```
SAVE DSK1.TOKEN1, MERGE
LIST "DSK1.TOKEN2"
```

Next, run this month's program. TOKENDEMO serves two purposes. First, TOKENDEMO is a research tool that can examine the sample file you've prepared to see how a particular statement works in preparation for writing programs that will write or modify other programs. Second, as a demonstration of how tokens work, I've used it at user group meetings to explain exactly how tokens fit together. TOKENDEMO takes two disk files of the same program, one merge file and one text file, and matches them up line by line to display the text with the tokens that built the text.

(See Page 16)

Token Numbers and Descriptions

0: end of line marker
1-31: communications codes
32: space
33: !
34: "
35: #
36: $
37: %
38: &
39: '
40: (
41:)
42: *
43: +
44: ,
45: -
46: .
47: /
48: 0
49: 1
50: 2
51: 3
52: 4
53: 5
54: 6
55: 7
56: 8
57: 9
58: :
59: ;
60: <
61: =
62: >
63: ?
64: @
65: A
66: B
67: C
68: D
69: E
70: F
71: G
72: H
73: I
74: J
75: K
76: L
77: M
78: N
79: O
80: P
81: Q
82: R
83: S
84: T
85: U
86: V
87: W
88: X
89: Y
90: Z
91: [
92: \
93:]
94: ^
95: _
96: `
97: a
98: b
99: c
100: d
101: e
102: f
103: g
104: h
105: i
106: j
107: k
108: l
109: m
110: n
111: o
112: p
113: q
114: r
115: s
116: t
117: u
118: v
119: w
120: x
121: y
122: z
123: {
124:
125: }
126:
127: delete character
129: ELSE
130: ::
131: !
132: IF
133: GO
134: GOTO
135: GOSUB
136: RETURN
137: DEF
138: DIM
139: END
140: FOR
141: LET
142: BREAK
143: UNBREAK
144: TRACE
145: UNTRACE
146: INPUT
147: DATA
148: RESTORE
149: RANDOMIZE
150: NEXT
151: READ
152: STOP
153: DELETE
154: REM
155: ON
156: PRINT
157: CALL
158: OPTION
159: OPEN
160: CLOSE
161: SUB
162: DISPLAY
163: IMAGE
164: ACCEPT
165: ERROR
166: WARNING
167: SUBEXIT
168: SUBEND
169: RUN
170: LINPUT
176: THEN
177: TO
178: STEP
179: ,
180: ;
181: :
182:)
183: (
184: &
186: OR
187: AND
188: XOR
189: NOT
190: =
191: <
192: >
193: +
194: -
195: *
196: /
197: ^
199: quoted string
200: unquoted string
201: line number
202: EOF
203: ABS
204: ATN
205: COS
206: EXP
207: INT
208: LOG
209: SGN
210: SIN
211: SQR
212: TAN
213: LEN
214: CHR$
215: RND
216: SEG$
217: POS
218: VAL
219: STR$
220: ASC
221: PI
222: REC
223: MAX
224: MIN
225: RPT$
232: NUMERIC
233: DIGIT
234: UALPHA
235: SIZE
236: ALL
237: USING
238: BEEP
239: ERASE
240: AT
241: BASE
243: VARIABLE
244: RELATIVE
245: INTERNAL
246: SEQUENTIAL
247: OUTPUT
248: UPDATE
249: APPEND
250: FIXED
251: PERMANENT
252: TAB
253: #
254: VALIDATE
255: end of file marker

EXTENDED BASIC—

(Continued from Page 15)

To get a feel for the token format, run TOKENDEMO on itself. Type these commands to load TOKENDEMO, create a merge file and a text file, and see the codes inside the code.

OLD DSK_TOKENDEMO
SAVE DSK_TOKEN1, MERGE
LIST "DSK_TOKEN2"
RUN

There are only two prompts to answer—the names of the merge file and the text file to display. The default names may be changed in lines 80 and 90. You'll need the reference list of tokens handy to understand the display of tokens. Try to follow a few lines all the way through their token listings.

TOKENDEMO begins with a fancy title screen that uses moving sprites to run the word TOKENS! across the screen. The CALL LOAD statements in lines 190 and 250 stop and start the sprite motion so that all the sprites start together. These CALL LOADs require both the 32K memory expansion and the CALL INIT on line 180 to work, so if you do not have the memory expansion, delete lines 180, 190, and 250.

The two sample files you created above are read into TOKENDEMO starting at line 310. The text file always begins with one blank line, so line 330 reads an extra line that is not matched up with a line from the merge file. Lines 340 and 350 read only the first program line from each file. The loop begins on line 360, and it is backward from the usual method of reading in a file. The loop displays the previous line first, then reads the next line and loops back to 360 again. This is needed to keep the lines in the two files matched up, because the text file may have one, two, or three lines for each line in the merge file. TOKENDEMO must display the first 80-character line of the text file, display the tokens found in the merge file, and then read the next line set into memory to test whether the text is continued. If it is, the rest of the line is added to the display, and another text line is read in. Once the entire text line is displayed, the program uses the subprogram PAUSE to signal that it is ready for the next pair of lines.

Once you understand the token format, nearly any program that manipulates files becomes possible. You could write a program that searches other programs for DEF statements, and copies them to a file with a REMark statement that identifies where they came from. Or search for any other statement, and make changes in just that statement; perhaps CALL SOUND could be changed in a set of programs from buzzer sounds to doorbells, or from a buzzer to a CALL SAY statement of "That is incorrect." But not, "Impossible!" Token programming techniques don't need that word.

TOKENDEMO

```
80 FNM$="DSK2.TOKEN1" !DEFAU
LT FILE NAME FOR MERGE FILE
!105
90 FNT$="DSK2.TOKEN2" !DEFAU
LT FILE NAME FOR TEXT FILE !
070
100 ! TOKENDEMO !073
110 ! JLS 4/91; TIXB !011
120 CALL CLEAR !209
130 CALL BLUE !145
140 DISPLAY AT(7,9):"TOKEN D
EMO" !000
150 DISPLAY AT(10,2):"Shows
A Program as Tokens" !098
160 DISPLAY AT(13,3):"Jerry
Stern   April 1991" !244
170 RANDOMIZE !149
180 CALL INIT !157
190 CALL LOAD(-31806,64)!110
200 CALL MAGNIFY(2)!223
210 DATA 84,79,75,69,78,83,3
3 !066
220 FOR L=1 TO 7 !065
230 READ T :: CALL SPRITE(#L
,T,INT(RND*9)+8,L*24-16,30,0
,30)!010
240 NEXT L !226
250 CALL LOAD(-31806,0)!051
260 DISPLAY AT(16,3):"Merge
file:";FNM$ !009
270 DISPLAY AT(19,4):"Text f
ile:";FNT$ !200
280 ACCEPT AT(16,14)VALIDATE
(UALPHA,DIGIT,".-")SIZE(-15)
BEEP:FNM$ !206
290 ACCEPT AT(19,14)VALIDATE
(UALPHA,DIGIT,".-")SIZE(-15)
BEEP:FNT$ !216
300 CALL DELSPRITE(ALL)!115
310 OPEN #1:FNT$,DISPLAY ,VA
RIABLE 80,INPUT !201
320 OPEN #2:FNM$,DISPLAY ,VA
RIABLE 163,INPUT !246
330 LINPUT #1:T$ !206
340 LINPUT #1:T$ !206
350 LINPUT #2:T2$ !001
360 CALL CLEAR :: DISPLAY AT
(1,1):T$ !038
370 TR=8 :: TC=1 :: FOR L=1
TO LEN(T2$)!229
380 TN$=STR$(ASC(SEG$(T2$,L,
1)))!176
390 IF TC+LEN(TN$)>29 THEN T
C=1 :: TR=TR+1 !031
400 DISPLAY AT(TR,TC):TN$ !1
06
410 TC=TC+1+LEN(TN$)!112
420 NEXT L !226
430 IF EOF(1)THEN CALL PAUSE
 :: GOTO 530 !050
440 T3$=T$ :: LINPUT #1:T$ :
: LINPUT #2:T2$ !180
450 IF LEN(T3$)<80 THEN CALL
 PAUSE :: GOTO 360 !052
460 LN$=STR$(ASC(SEG$(T2$,1,
1))*256+ASC(SEG$(T2$,2,1)))&
" " !117
470 IF LN$=SEG$(T$,1,LEN(LN$
))THEN CALL PAUSE :: GOTO 36
0 !239
480 DISPLAY AT(1,1):T3$&T$ !
054
490 T3$=T3$&T$ :: LINPUT #1:
T$ :: IF LEN(T3$)<160 THEN C
ALL PAUSE :: GOTO 360 !122
500 IF LN$=SEG$(T$,1,LEN(LN$
))THEN CALL PAUSE :: GOTO 36
0 !239
510 DISPLAY AT(1,1):T3$&T$ !
054
520 LINPUT #1:T$ :: CALL PAU
SE :: GOTO 360 !114
530 CLOSE #1 :: CLOSE #2 !17
7
540 STOP !152
29505 SUB BLUE !149
29510 ! SWITCHES DISPLAY TO
WHITE ON BLUE; JLS 7/88 !230
29515 CALL SCREEN(5):: FOR L
=0 TO 14 :: CALL COLOR(L,16,
1):: NEXT L :: SUBEND !202
30820 SUB PAUSE !236
30830 DISPLAY AT(24,2):"PRES
S ANY KEY TO CONTINUE" !088
30835 CALL KEY(0,K,S):: IF S
<1 THEN 30835 !049
30840 SUBEND !168
```

Attend
a
TI Fair

MICROpendium Index

Index covers second half of 1990

Here is the second half of the 1990 MICROpendium index. The first half appeared in the March edition. For instructions, refer to that issue. The index is maintained by Elton Schooling. The entire index, covering 1984-1990 is available on two SSSD disks from MICROpendium for $6. Included on the disks are a number of companion programs that make use of the index more efficient.

INDEX90B

```
10 REM INDEX90B MICROpendium
 INDEX for 1990, Jul to Dec,
 Publisher John Koloen, edit
or Laura Burns. !114
20 REM Compiled by Elton Sch
ooling, 4014 57th St., Sacra
mento, CA 95820 !173
30 REM Sort routine by David
 Romer and John Clulow. Ob-
tained from Boston Computer
Soc., TI994/A User Group. Fo
r use with printer or with !
254
32 REM screen display. !126
35 REM Because of many entri
es the '90 index is divided
into '90A, Jan. to June, and
 '90B, July to Dec. !101
40 REM For your printer you
may need to change line 160.
 !202
50 REM For longer dwell time
 on screen increase the DELA
Y number in line 330. !210
52 CALL INIT !157
54 CALL CLEAR !209
56 CALL LOAD("DSK1.SORT")!07
9
60 OPTION BASE 1 !137
70 CALL CLEAR !209
80 DIM N$(122)!201
90 INPUT "OUTPUT TO PRINTER?
(Y/N)":P$ !247
100 CALL CLEAR !209
110 PRINT "WORKING" !139
120 FOR I=1 TO 122 :: READ N
$(I):: NEXT I !064
130 CALL LINK("SORT",N$(),12
2)!188
140 CALL CLEAR !209
150 IF P$="Y" THEN 160 ELSE
290 !093
160 OPEN #1:"PIO" !253
170 PRINT #1:TAB(24);"MICROp
endium INDEX, 1990B, Jul to
Dec" !140
180 PRINT #1: : : :!103
190 FOR J=1 TO 122 :: IF J=1
05 THEN 200 ELSE 220 !117
200 PRINT #1: : : : :: PRINT
 #1:TAB(35);"PAGE 24" :: PRI
NT #1: : : : : : : : : :: :
GOTO 220 !197
210 PRINT #1: : : : : :: PRI
NT #1:TAB(31);"PAGE 25, INDE
X 1990B" :: PRINT #1: : : :
: : : : : :!208
220 IF J/2=INT(J/2)THEN 240
!249
230 PRINT #1:N$(J);:: GOTO 2
50 !240
240 PRINT #1:TAB(40);N$(J)!1
88
250 NEXT J !224
280 GOTO 360 !184
290 CALL CLEAR !209
300 CALL SOUND(500,110,0,131
,0,196,0)!005
310 PRINT TAB(7);"MICROpendi
um INDEX, 1990B" :: PRINT :
: :!059
320 PRINT "DATE AND PAGE NO.
 ARE LISTED TOGETHER. JAN 85
 p.16 BECOMES 1/85/16.": : :
!005
330 FOR J=1 TO 122 :: PRINT
N$(J):: FOR DELAY=1 TO 200 :
: NEXT DELAY :: NEXT J !018
340 PRINT : :!006
350 PRINT "DATE AND PAGE NO.
 ARE LISTED TOGETHER. JAN 85
 p.16 BECOMES 1/85/16." :: G
OTO 390 !062
360 PRINT #1: : :!178
370 PRINT #1:"DATE AND PAGE
NO. ARE LISTED TOGETHER. JAN
 85 p.16 BECOMES 1/85/16." !
146
375 PRINT #1: : : : : : : :
: : : :: PRINT #1:TAB(23);"M
ICROpendium Index, 1990B, Pa
ge 25" !142
380 CLOSE #1 !151
390 END !139
400 DATA BAS AVAILABLE SOFTW
ARE 7/90/10,X-BAS SOUND EFFE
CTS 7/90/12,C99 POLYNOMIAL R
OOTS 7/90/16 !225
410 DATA GENEVE MY-BASIC SCH
ED MANAGER 7/90/18 !184
420 DATA TI-BASE SPEED-UP 7/
90/25,DISK DRIVES CHAINING 7
/90/26,TOKENS PROGRAM WRITER
S 7/90/27 !082
430 DATA PAGE PRO LINE FONT
7/90/29,SPELL-IT SPELLING CH
ECKER REV 7/90/30,INTERFACE
STD & DES GUIDE REV 7/90/32
!114
440 DATA UK FAIR REPORT 7/90
/32,THREE COLUMNS USNO 7/90/
34,SOUTH CAL COMP GROUP CORR
 USNO 7/90/34 !106
450 DATA DISK CARD CATALOG U
SNO 7/90/34,TI-BASE FILE UTI
LITY USNO 7/90/36 !228
460 DATA BAS REVIEWING MATH
FACTS 8/90/10,XBAS/AL MEMORY
 CIRCS 8/90/19,XBAS NOISES S
OUNDS & SILENCES 8/90/12 !01
2
470 DATA EEPROM CIRCUITS 8/9
0/27,TI-BASE PRINTER DRIVERS
 8/90/31,DISK DRIVES CHAININ
G 8/90/32 !097
480 DATA MY-BASIC GENEVE SCH
EDULER 8/90/34,GENEVE MY-BAS
IC SCHEDULER 8/90/34,DISK AS
SEMBLER V2.0 GENEVE REV 8/90
/38 !193
490 DATA TI-BASE V3.0 ENHANC
ED REV 8/90/39,SUBROUTINE PR
OGRAMMING USNO 8/90/42,SCRUM
 BRAIN GAME USNO 8/90/43 !03
6
500 DATA DIRECTORY FIX USNO
8/90/43,MY-BASIC COLORFUL DE
SIGNS USNO 8/90/43,MULTICOL
UPDATE FUNNELWEB USNO 8/90/4
4 !047
510 DATA MECHATRONIC MOUSE/T
IA USNO 8/90/44,READ-ALL LIS
TS FILES USNO 8/90/44,GENEVE
 DISKASSEMBLER V2.0 REV 8/90
/38 !024
520 DATA DATA BASES TO TI-BA
SE 9/90/9,BAS BOOKS OF THE B
IBLE 9/90/10,XBAS SQUASHED D
IRECTORIES 9/90/13 !043
530 DATA C99 HEAT AND HUMIDI
TY 9/90/15,XBAS/AL HIDE ASSE
MB IN XB PROG 9/90/17,ASSEMB
LY IN XBAS PROGRAMS 99/90/17
 !180
540 DATA MY-BASIC GRAPHICS V
IEWER 9/90/26,THE MISSING LI
NK REV 9/90/29,WINDOWS 9640
REV 9/90/31 !117
550 DATA 9640 WINDOWS REV 9/
90/31,TI BULLETIN BOARD LIST
```

(See Page 18)

MICROPENDIUM INDEX90B—

(Continued from Page 17)

```
INGS 9/90/33,DIR AUTO REPEAT
 USNO 9/90/36 !020
560 DATA HOURLY RATES AUTO R
EPAIR USNO 9/90/36,REMINDERS
 FOR NOTEPAD USNO 9/90/36 !1
46
570 DATA BAS FAIRISLE PATTER
N DESIGN 10/90/9,XBAS GAS MI
LEAGE BARCHARTS 10/90/13,MY-
BASIC PATCH AND KENO 10/90/1
7 !237
580 DATA USER GROUP UPDATE 1
0/90/19,TI BULLETIN BOARDS 1
0/90/15,DR. NIM GAME 10/90/2
9,XBAS TUTORIALS REV 10/90/3
3 !220
590 DATA STARFLEET DRAWINGS
III REV 10/90/33,TISHUG REV
10/90/33,LOGO VIDEO INSTRUCT
ION 10/90/34 !013
600 DATA DISKREVIEW BUG FIX
USNO 10/90/35,REMINDERS CATA
LOG USNO 10/90/35,XBAS FROM
RAMDISK OS USNO 10/90/37 !04
0
610 DATA CC MANAGER LOAD FRO
M EA USNO 10/90/37,APPLE PEE
KS USNO 10/90/37,PRINTER CAB
LE MAKING TIPS USNO 10/90/37
 !178
620 DATA COPY DV/80 FILES US
NO 10/90/38,DV/80 FILES COPY
 USNO 10/90/38,WORKING WITH
SOUND USNO 10/90/38 !089
630 DATA TML/TIA/TIWR PICS I
N DOCS 10/9/26,TIA/TML/TIWR
PICS IN DOCS 10/90/26,TIWR/T
ML/TIA PICS IN DOCS 10/90/26
 !208
640 DATA USER GROUP UPDATE 1
1/90/8,BAS SUBROUTINES IN MU
SIC 11/90/10,XBAS CALEND JUL
IAN/GREGORIAN 11/90/14 !174
650 DATA XBAS/AL CHARACTERS
& COLORS 11/90/18,MY-BASIC S
UBDIRECTORIES 11/90/26,TI-BA
SE COMMAND FILE EDITORS 11/9
0/27 !235
660 DATA TI BULLETIN BOARDS
11/90/29,ASGARD MOUSE REV 11
/90/30,TWELVE DAYS OF CHRIST
MAS 11/90/10 !186
670 DATA CALENDAR XBAS 11/90
/14,BULLETIN BOARDS TI 11/90
/29,MOUSE ASGARD REV 11/90/3
0 !144
680 DATA ARTIST PRINT SHOP R
EV 11/90/31,PAGE PRO HEADLIN
E REV 11/90/32,CHICAGO FAIRE
 REPORT 11/90/6 !085
690 DATA 24PIN PRINTER PAPER
 FEED USNO 11/90/38,PRINTER
24PIN PAPER FEED USNO 11/90/
38 !014
700 DATA DISK CATALOG DV/80
FILE USNO 11/90/38,9640=GENE
VE,GENEVE=9640 !016
710 DATA RESCUING RAMDISK 12
/90/7,RAMDISK RESCUE 12/90/7
,BAS SCRIPTURE QUIZ 12/90/9,
XBAS PRINTER POTPOURRI 12/90
/12 !104
720 DATA PRINTER POTPOURRI X
BAS 12/90/12,TI-BASE PROGRAM
 SEGMENTS 12/90/16,C99 POLYN
OMIAL ROOTS 12/90/17 !087
730 DATA POLYNOMIAL ROOTS C9
9 12/90/17,XBAS/AL REDEF CH
RDEF 12/90/18,TI'S OUT OF CL
OSET 12/90/21 !148
740 DATA GEN-TRI FOR GENEVE
12/90/27,GENEVE GEN-TRI 12/9
0/27,MDOS .97H GENEVE FLEXIB
ILITY 12/90/28 !225
750 DATA GENEVE FLEXIBILITY
MDOS .97H 12/90/28,PC PURSUI
T MODEMS 12/90/32,MODEMS PC
PURSUIT 12/90/32 !220
760 DATA USER GROUP UPDATE 1
2/90/34,GERMAN TI SHOW REPOR
T 12/90/35,YET ANOTHER PAINT
 PROGRAM REV 12/90/36 !108
770 DATA YAPP REV 12/90/36,H
ARDBACK HARD DISK BACKUP REV
 12/90/38,XBAS MODULE EXPAND
ER REV 12/90/40 !059
780 DATA PAGE PRO POSTER MAK
ER REV 12/90/41,TIUG GRAPHIC
S ENCYCLOPED REV 12/90/41,PO
STER MAKER PAGE PRO REV 12/9
0/41 !020
790 DATA GRAPHICS ENCYCLOPED
IA TIUG REV 12/90/41,DOUBLE
COLUMN PRINTING USNO 12/90/4
2,SURE FIRE BOOT TRACKING US
NO 12/90/43 !098
800 DATA BOOT TRACKING SURE
FIRE USNO 12/90/43,RAMDISK/C
HARA1FIX USNO 12/90/44,CHARA
1FIX/RAMDISK USNO 12/90/44 !
166
810 DATA REMINDERS SEARCH US
NO 12/90/44,APTITUDE TEST US
NO 12/90/46 !126
```

THE TI-BASE USER'S GUIDE — 10

Custom input screens

By BILL GASKILL
©1991 by B. Gaskill

As any TI-Base user already knows, the APPEND directive is used to input data into a record. But may times you may want to allow a user to see an entire record on screen, which cannot be done with APPEND if any of the input fields exceed 23 characters in length. So a custom input screen is the alternative.

The ADDSCRN command file below illustrates one way of creating a file that displays all of the input fields on a single screen that is also able to accept data all from one screen: There are no doubt other ways to get the job done, but in my experimentation with TI-Base I have found this method to be the most efficient for my uses.

The critical directives used in ADDSCRN are APPEND BLANK, LOCAL and REPLACE, along with the WHILE, ENDWHILE loop that is set up to maintain the display until the LOCAL X1 is equal to the word "END".

The LOCALS X1-X5 are used as holding areas for data that is keyed in, so that their values or contents can be transferred to the fields in a blank record appended to the active data file.

Lines 9-18 set up the screen display only once and then a WHILE, ENDWHILE loop is created to make the input of data a repetitive function.

(See Page 19)

TI-BASE USER'S GUIDE—

(Continued from Page 18)

Note that each input field is REPLACEd into the target record immediately after it is typed in. The command file could also have been written to accept all input fields into memory before writing the data to disk too. The method used writes each record faster though, so I suggest using it.

```
* addscrn 06/01/90
* copyright 1990 by Wm. Gaskill
CLEAR
LOCAL X1 C 32
LOCAL X2 C 20
LOCAL X3 C 15
LOCAL X4 C 05
LOCAL X5 C 03
WRITE 01,03 "SUBJECT:"
WRITE 04,03 (32-)
WRITE 07,03 "SOURCE:"
WRITE 08,10 (20-)
WRITE 11,07 "^^TYPE:"
WRITE 12,14 (15-)
WRITE 15,05 "^^DATE:^^^^^^^^PAGE:"
WRITE 16,12 "_____^^^^^^^^____"
WRITE 20,04 "END in Subject field exits;
to menu"
WHILE X1<>"END"
READSTRING 03,03 X1
IF X1="END"
RETURN
ELSE
APPEND BLANK
REPLACE SUBJECT WITH X1
READSTRING 07,10 X2
REPLACE SOURCE WITH X2
READSTRING 11,14 X3
REPLACE TYPE WITH X3
READSTRING 15,12 X4
REPLACE DATE WITH X4
READSTRING 15,26 X5
REPLACE PAGE WITH X5
MOVE
WRITE 03,03 (32 )
WRITE 07,10 (20 )
WRITE 11,14 (15 )
WRITE 15,12 (05 )
WRITE 15,26 (03 )
ENDIF
ENDWHILE
RETURN
```

The WRITE statements at the end of the ADDSCRN command file are used to clear the input fields on the screen display after each record. In V3.0 you may use WRITE, DISPLAY or PRINT to repeat a character so that you would not have to use so much program space to get the job done. In V2.0 you would have to use a;

```
WRITE 03,03 "^^^^^^^^
```

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#1. THE SINGING TI-99/4A SPEECH & MUSIC DISK
This is the disk everyone is talking about. The computer voice actually sings to animated graphics. Includes routines by master programmer Ken Gilliland. Bert & Earnie, Maltilda & much much more. 2 disk sides, speech & 32 K req. Exbasic autoload.

#2. WHEEL OF FORTUNE, BLACKJACK & JOKER POKER
Three fantastic freeware programs on one disk. Professional quality and the best "wheel" game around at any price. Vanna would love it !

#3. DUMPIT
This disk helps you transfer many TI modules to disk. Recommended for users with some programming ability. Ed/Assembler and "widget" recommended.

#4. PRINTART
Two disk sides filled with files that print out great quality pictures on most printers. Many famous TV and comic characters on this disk. "Beam me up Scotty."

#5 ORIGINAL TI SALES DEMO DISK WITH TI-TREK GAME
This disk is packed full of assorted files of all types. Graphics, speech etc. Contains complete TI-TREK game for Speech Editor or TE-II module.

#5A. TI MUSIC/GRAPHICS
A great collection of music and matching graphics. Great examples of music & sprite programming.

#6. EXBASIC MUSIC
A two disk side collection of music & graphics that we consider some of the best.

#7. SPACE SHUTTLE MUSIC/GRAPHICS
One of the real outstanding examples of programming. This disk has it all. Great graphics, music, and continuity. A real salute to the space program. It is almost like watching a movie!

#8. LOTTO PICKER
This program randomly generates numbers for use in the various state lotto games and even runs a simulated lotto game. Easy to modify for pick 6 etc. games. A great learning and fun disk.

#9. MONA LISA PRINT OUT
This disk prints out a near photo quality picture of that lady with the clsssic smile. We understand it was made by digitizing the original with a super powerful computer and converting the output to run on the TI-99/4A. Impresses everyone who sees it! Requires Epson printer compatibility.

#10. GOTHIC PRINT
This disk lets you type out a phrase on the screen and then print it out in gothic (Old English) style. Looks like hand-lettered calligraphy. Use for invitations, announcements and business cards.

#11. ANIMATED CHRISTMAS CARD "WOODSTOCK"
This disk was actually originally sent to TEX-COMP as a greeting from master programmer Ray Kazmer. It was just too good not to share! One of the best examples of computer animation and graphics you will see on any computer!

#12. TI-99 OLOPY
This great piece of programming actually simulates and plays the famous board game. For legal reasons we cannot name the game but "do not pass Go! but go directly to Jail!"

#13. STRIP POKER (PG RATED)
Play Poker against your TI-99/4A. When you win a hand she loses--a piece of her clothes that is. Don't worry about being a lousy poker player. Another file is included where you don't even have to know an ace from a king.

#14. FIGURE STUDY (PG RATED)
A collection of Playboy type centerfolds that can be printed out at your command. Use with any printer.

#15. STAR/EPSON PRINTER DEMO
This 2 sided disk contains a large collection of demo programs to put your Star/Epson compatible printer through its paces. Learn what control codes can do! Lots of text and graphics examples. Second side has a great tutorial on printer graphics with examples!

#16. SIDEWAYS PRINTOUT
This program allows you to print out the material from your printer sideways. Great for spreadsheets, banners and large graphics. Second side contains some new enhancements for Multiplan not available on the TI upgrade.

#17. TI FORTH DEMO
This demo disk was released by TI to show the power of Forth. Fantastic music and graphics. Ed/Assem and 32K required!

#18. TI DIAGNOSTIC
This program loads into the Mini-Memory module and checks out your entire system. Much better than disk based diagnostics that cannot be used if a problem in the disk system is at fault. Complete documentation on second side.

#19. TI WRITER/MULTIPLAN UPGRADE
This disk released by TI adds real lower case to your TI Writer, speed to Multiplan and other enhancements. Easy to use., just substitute new files for old! Instructions included.

#20. ACCOUNTS RECEIVABLE
This self contained prize winning program loads and runs in Exbasic and has all the features found in a progessional accounting system. Complete with documentation and a second disk side with report generating programs.

#21. DATA BASE DEMO DISK
A progessional data base program that was originally written to store various magazine articles from computer magazines and then find them by name, subject, key word, or publication. Fast, easy to use and easy to adapt for other applications. Come complete with sample data to make learning data base processing easy. Completely menu driven and unprotected.

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#22. ASTROLOGY
This one is as good as anything you will see in an arcade. Great color graphics and displays of the Zodiac. Enter your birthdate and learn about your sign, your lucky days and famous events in history on your birthday. Even prints out a report. Can be used as a great moneymaker at a charity event. Help guide your spouse's career.

#23. WILL WRITER
Enter your answers to a group of computer asked questions and this program then writes you a last will and testament. Now you can leave your TI-99/4A to your favorite nephew. Works with any printer. Appears legal in all states but better check that out!

#24. ENGINEERING CALCULATIONS
A two sided computer handbood of dozens of the most often used engineering and technical formulas. A real time saver. Does conversions, calculations and even designs electrical circuits. A must for anyone whose profession or hobby involves scientific calculations. Even has medical and communications applications.

#25. MEDICAL ALERT
This disk contains many menu accessible files covering most everyday medical emergencies. A good "what to do until the doctor or paramedic comes" guide. Well written and organized. Could very easily save a life!

#26. R RATED GAME
It was bound to happen. A talented (but demented) programmmer in Germany wrote an Invaders type game but with most unusual guns and targets. Definitely not what you would find at your neighborhood arcade. Not only a great party game but some great programming. You must be over 18 to order this one!!

#27. KIDS LEARNING
An educator in Georgia put this two sided disk collection of educational programs together. Contains great material. Math, geography, reading improvement, and even IQ testing. All high quality programs for kids of all ages.

#28. LOADERS AND CATALOGERS
We put together a collection of the best programs that catalog and load a group of programs on a disk. Just try them, pick the one you like and transfer it to another disk with the file name LOAD and you are in business.

#29. LABEL MAKER I
Two great programs for making custom labels for disks, addresses video tapes or any other application. Even contains a graphic display of the TI-99/4A console. Now you can create custom labels of any number by just typing in the lines as you want them. Uses standard tractor labels.

#30. HOUSEHOLD BUDGET PRINTOUT
With this disk you print out the data you have stored with the TI HBM Module. HBM is a great module that can be used for many home and small business applications but TI forgot to include a printout function. This program comes with full instructions and we are sure that your HBM Module will now start being used. Fantastic programming job.

#31. MORSE CODE TRAINER DISK
This disk has everything you need to learn and practice Morse Code for the various FCC license exams. It also is great for scout groups and school "ham" clubs for group training and merit badge qualification. Professional quality.

#32. EXBASIC XMAS MUSIC
Two disk sides full of high quality xmas music that can be played throughout the holiday season and then used as a learning tool since it contains wonderful arrangements and graphics. Autoloading and menu driven.

#33. CHECKERS & BACKGAMMON
A collection of great checkers and backgammon games for the TI-99/4A. These are professional in quality and will keep you busy for hours.

#34. SOLITAIRE & SCRABBLE
Another collection of classic games for the TI-99/4A. Exbasic & 32K req.

#35. PROGRAMMING AIDS & UTILITIES I
A collection of some unusual programs of interest to programmers. One program shows a group of opening title displays, another is a cross reference program as good as any of the commercial ones, plus a great disk management utility.

#36. STRICTLY BUSINESS
A collection of various programs for evaluating loans, calculating interest, and other financial items such as return on investment and security performance. Two disk sides filled with financial and business related programs.

#37. LAPD COOKBOOK
This unofficial police cookbook was put together by one of our boys in blue who is also a gourmet chef. (Yes, it contains jailhouse chili) Over 50 great receipes from soup to nuts on two disk sides and each separate side can be called up on screen or printer in exbasic from a menu. As good as any of the new PC computer cookbooks we have seen.

#38. GREAT 99/4A GAMES VOL. I
A collection of professional games in assembly and exbasic that all load from a menu in exbasic. Includes a great ski game where you dodge the trees in a fast downhill run. We have included only the best.

#39. GREAT 99/4A GAMES VOL. II
Still more of the great ones from all over the world. The quality, graphics and speed of many of these games will make you wonder why they were never released commercially.

#40. ARTIFICIAL INTELLIGENCE
This disk contains the famouse computer program "Eliza" where you type in a question or a problem you are having and "Eliza" helps you find the solution. Also contains one of the better bio-rhythm programs so you can analyze all your emotional problems at one sitting.

#41. VIDEO GRAPHS MODULE BACKUP DISK
This disk is a backup of the discontinued Video Graphs Module from TI. For legal reasons, it can only be purchased for backup use by owners of the original module. Do not order UNLESS you have the original module and intend to use this disk only for backup purposes. Exbasic autoload...

#42. FUNNELWEB FARM UTILITY
You heard about this one, now direct from Australia is the latest version of this fantastic utility that puts everything at your command. From one program you can access word processing, editor assembler, telecommunications and just about everything else. A freeware program complete with documentation on a second disk side.

#43. BEST OF BRITAIN, VOL I
Now for the first time, a collection of the best 99/4A games Britain has to offer including the famous "Billy Ball" series of arcade games. Great graphics, action and excitement.

#44. LABEL MAKER I GRAPHICS
A disk filled with graphics for the Label Maker I disk (#29). Dozens of great graphics for custom labels!

#45. BEST OF BRITAIN, VOL II
This disk contains an outstanding 3-D graphics adventure game for the TI-99/4A. Carfax Abbey lets you actually move through a four story mansion complete with bats and vampires. You actually are placed in each room and go up and down stairs and through secret panels. Legend of Zelda... look out!

#46. SUPER TRIVIA 99
A great trivia game for 1 to 4 players with great questions and capability to add your own and print out the files. This one is a real challenge.

#47. INFOCOM RAPID LOADER
If you have Infocom games this is for you. Loads all TI Infocom games in only 28 seconds and permits new screen colors and improved text display. Comes with all documentation on disk.

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#48. GHOSTMAN (from England)
This Pacman/Munchman type game starts at a slow pace and slowly speeds up to a break-neck pace. A totally new experience.

#49. DEMON DESTROYER (from France)
This great assembly game starts where Invaders leaves off. Add features like descending aliens and closing walls. Hours of great arcade action.

#50. OH MUMMY (from Germany)
Move through the chambers of a Pyramid in search of hidden treasure. Fantastic graphics and great entertainment.

#51. BERLIN WALL (from Canada)
This game requires a mine field to be crossed before escaping from E. Berlin. Good graphics and a real challenge.

#52. ANIMATION 99 (from Germany)
THIS IS THE ONE!!! A demo disk filled with computer animation routines like you have never seen before on any computer. See famous cartoon figures move with more realism that on Sat. morning TV. This disk received a standing ovation when previewed at a local users group. We have even included instructions how to do it yourself on the second disk side. This one is a show stopper!!!

#53. HACKER/CRACKER
A collection of disk copying programs that copy TI disks by tracks. If one of these can't copy a protected disk nothing will. We included a collection of the very best ones including both TI and CorComp compatible. These programs require 2 disk drives and 32K of memory.

#54. ASTRONOMY
This program from Australia plots the heavens and teaches you about the solar system. A great learning and reference tool. Exbasic and 32K required. Don't confuse this one with our Astrology demo. They are not the same...ask Nancy!

#55. SCREEN DUMP
This program allows you to dump disk and even module programs to a Star/Epson compatible printer. Comes with easy to follow plans to build a load interrupt switch which is needed to dump module programs. This dump program by Danny Michael is considered the best of the bunch! Complete with documentation.

#56. SPREAD SHEET
OK, it's not Multiplan but it works great and handles many spread sheet applications. A great way to learn to use spread sheet software. Comes with full instructions and documentation.

#57. TELCO
Considered one of the best data communications programs for the TI-99/4A. Complete with documentation.

#58. PR BASE
The alltime most popular and widely used data base program for the TI-99/4A. A freeware program that is widely supported and updated.

#59. GRAPH MAKER
A collection of the best programs for producing graphs and charts from your data. Exbasic and printer.

#60. FREDDY
A fantastic game where you guide the hero through underground passages filled with danger. Nintendo quality, great graphics and fast action. One of the best we have ever seen!!!

#61. THE MINE
A fast action game from F.R.G. that will keep you going for hours. Many screens and skills required.

#62. DISK MANAGER II MODULE BACKUP
The complete TI Disk Manager II on Disk. For legal reasons it is only available to owners of the original module for backup use.

#63. ASTROBLITZ/MAZOG
A pair of great games that continue where Parsec and Munchman leave off. Imagine Parsec with enemy space craft coming from in front and in back of your ship!!!

#64. MAJOR TOM/SPACE STATION PHETA
A pair of great space games. These two are going to keep you in front of the 99/4A for hours. Great!

#65. PERFECT PUSH
An all new space game where you assemble and launch a rocket ship in outer space while avoiding a space monster. This one is professional in very way..graphics, speed and action!!!

#66. HEBREW TYPEWRITER
This program converts your TI-99/4A keyboard into a typewriter that displays Hebrew letters on the screen. Can also be printed when used in conjunction with screen dump program (included). Great for religious training or making your copy of the dead sea scrolls or ten commandments!

#67. GENEALOGY
Now you can set up your family tree and store or print out the records. Great for keeping track of family relationships and records.

#68. CHESS
The original computer chess game Sargon has been reprogrammed for the TI-99/4A. Now play chess with your computer. Documentation included. Exbasic autoload.

#69. COMPUTER PLAYER PIANO/KEY-BOARD CHORD ANALYSIS
A unique music program which displays a piano on the screen and actually plays your selections.

#70. TI RUNNER II
The very latest (and best) "runner" game based on TI Runner and Star Runner. Great action, graphics and entertainment.

#71. KIDS LEARNING II
Two more disk sides loaded with the best in educational programs. Kids improve their math, spelling and comprehension skills while having fun.

#72. CERBERUS
Fantastic space game from Germany. Pilot your ship through narrow and crooked channels in space without colliding. Great graphics and music.

#73. CRYPTO (gram)
One of the best word games we have seen for any computer. Set up like a TV game show with great screen displays.

#74. LABEL MAKER II
Make labels for holidays and special events. You compose the text and select the resident graphics for the occasion.

#75. DISK CATALOGER
Now you can organize your disk files with this great utility. Files, sorts, and prints your records. Easy to use.

#76. PROGRAMMING AIDS AND UTILITIES II
A collection of very useful material. Includes a program to convert basic to exbasic so your old basic programs will load & run in exbasic, even with graphics. Also includes two on screen diagnostic programs to test your keyboard and processor. A great merge utility is also on this disk.

#77. MICROdex 99
A database program by Bill Gaskill which files and retrieves data such as magazine articles. A sample database is included.

#78. ARTCON+ BY RAY KAZMER
ATTENTION GRAPHX AND TI ARTIST USERS!!!
This program lets you convert Exbasic graphics to TI Artist and Graphx pictures. Also contains a new MAC-RLE (2) for converting from Artist to Graphx.

#79. DM1000 V3.5
One of the most popular disk managers for the TI-99/4A. Originally a rip-off of the CorComp manager, it has been improved and refined by talented users all over the world. This version is deemed the most reliable to date and is far advanced over the TI Disk Manager II. Distributed by permission from CorComp.

#80. BIRDWELL DISK UTILITY
A must if you are iunto programming and software development. Besides being a great disk manager, it has provision for copying sectors, comparing files and is menu driven. Complete with documentation.

#81. HOME ACCOUNTING SYSTEM
A complete family & small business accounting system including a checkbook manager, budget analysis, mailing list and an inventory program. Complete with documentation. Easy to modify for specific needs.

#82. CROSSWORD PUZZLES
This program from Australia creates a different puzzle each time you run it. Self contained with definitions and vocabulary taken from a leading crossword dictionary. Great crossword fun.

#83. HOME APPLICATION PROGRAMS
A two disk side collection of useful programs for the home. Includes banking, cooking, home bar guide, utility records, and much much more. Something for everyone.

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#84. GALACTIC BATTLE/SPY ADVENTURE
A pair of great commercial quality games from EB Software of TI Runner fame. Galactic Battle is a space "trek" type strategy game for one or more players. Spy Adventure is an adventure game that will keep you guessing for hours.

#85. AUTOBOOT UTILITY
This utility which can be installed on a disk loads and runs or displays most files. Now you can have a disk with exbasic programs, Editor Assembler programs and TI Writer files and run or display them all from exbasic.

#86. COLUMN TEXT III V3.2
A very useful utility for printing TI Writer and 99 Writer II files in separate spaced columns. Saves hours in producing a newsletter. Complete with documentation.

#87. ARCHIVER III
This utility allows you to "pack" or combine several files into one for space utilization. A number of boards are sending files packed to save transmission costs. This utility will let you pack and/or unpack these files.

#88. AUSSIE GAMES VOL 1
A collection of games from our friends down under. Includes a great card game and board game! Hours of fun and entertainment. Includes Matchmaker & TILO.

#89. PROCALC
This is an on screen calculator for decimal/hexidecimal conversions and much more. A must for the serious programmer.

 # 90. JET CHECKBOOK MANAGER
This checkbook manager is considered the ultimate with every feature you can think of for keeping track of your checking account and keeping records of your spending for budget and tax purposes. Complete with documentation.

#91. "THE MAZE OF GROG"(St. Valentine)
Ray Kazmer has created a great maze game with fantastic graphics and the characters from his now legendary "Woodstock" disk. Fun for all!!!

#92. HOUSEHOLD INVENTORY
Written by 99/4 programming great Charles Ehninger, this prize winner originally sold for $59.95. Keeps track of household, business or personal items by category and provides automatic updating for inflation etc. A must for tax and insurance records!

#93. THE 1991 KBGB GIRLIE CALENDAR
This latest offering from programming master Ken Gilliland prints out a jumbo 12 month calendar with a knockout centerfold pinup for each month. If you like our #14 Figure Study disk, you will flip over this one. For Adults Only!! Exbasic & d/m printer.

#94. GREAT 99/4A GAMES VOL. 111
If you have seen vols. 1 & 2 of this series you know we only provide the very best. This latest volumn is also filled with a collection of great ones!

#95. WEATHER FORECASTER
The weather predictions are amazingly reliable and accurate! A great game "Lawnmower" and a mini database are also included to make this disk a fantastic value.

#96. STATISTICS & SORTING
Two great assembly utilities by John Clulow. STAT is a set of statistic routines for use in exbasic. SORT allows sorting by two separate fields and a choice of two types of sorts.

#97. MEMORY MANIPULATOR
This powerful utility lets you explore the entire memory in your 99/4A system and take apart what you find. User friendly!

#98. DAYS OF EDEN & DOORS OF EDEN
Two bible games)non-fiction) that work with the TI Adventure Module.

#99. GREAT 99/4A GAMES VOL. IV
This disk features the works of J. Péter Hoddie. All of these games are of commercial qualaity and well worth the donation requested!

#100. ASSULT THE CITY (T. of DOOM)
An exciting game for use with the Tunnels of Doom module. Several Exbasic bonus games are included.

#101. ENCHANCED DISPLAY PACKAGE
This screen enhancement utility lets you do 40 columns, windowing, reverse scrolling, clock/alarm, and a whole host of other great tricks in exbasic. Fully documented.

#102. COLOSSAL CAVES ADVENTURE
This classic adventure now available for the 99/4A is what led to the Zork series. Hours of text adventuring.

#103. SORGAN, THE 99/4A ORGAN
This program which is currently selling for big bucks on module turns your 99/4A into an electronic organ. Sound effects, different instruments and voices, chord forms, color graphics with complete control of all.

#104. C99 COMPILER AND LIBRARY
This two-sided (flippy) disk gets you into C programming with your 99/4A. Comes with a great collection of utilities such as text & graphics. (E/A)

#105. KING'S CASTLE+
A great arcade style assembly game formerly offered on module. Also includes an EB "Trek" game and a collection of sprite & graphics from Tigercub's Jim Peterson.

#106. QUEST (Dungeons & Dragons)
One of the best D&D games around! You must destroy the Dark Lord to free your homeland! Complete with documentation on disk.

#107. STAR TREK MUSIC ALBUM
Ken Gilliand's music and graphics version of the TV theme and the three motion pictures. (Exbasic)

#108. FUNLPLUS BY JACK SUGHRUE
Fantastic disk packed with Funnelweb (#42) templates, utilities and prog. to augment and configure Funnelweb. Unbeliveable collection of fantastic aids to make the best even better!

#109. TI-WRITER MINI MANUAL
This disk prints out a five page TI Writer manual with everything you need to know to use TI Writer or the many clones such as 99Writer II. Additional aids for using this powerful word processor are included.

#110. DISK + AID
A powerful disk sector editor formerly sold for $20. Menu Driven and easy to use.

#111. POP MUSIC & GRAPHICS
This exciting disk from Germany features music/graphics written in 100% assembly and what comes from the TI sound chip is sure to astound you.

#112. INVOICE PACK
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M Y - B A S I C

PAINTSEE lets you view MY-PAINT pictures

By JIM UZZELL
©1991 DDI Software

This month's program is PAINTSEE, a companion to last month's MY-PAINT. PAINTSEE is used to view MY-PAINT pictures in four sizes. See last month's edition for information about MY-PAINT pictures.

First, those of you that may have tried to convert a TI XB program to MY-BASIC 2.99A that uses CALL DISTANCE OR CALL COINC have discovered they do not work correctly. I was told MY-BASIC is all new code, not cloned from Extended BASIC; maybe if they had copied this routine we would not have this problem. The following can be used as a temporary (hopefully Lou will read this) fix.

```
100 CALL CLEAR
110 CALL SPRITE(#3,66,2,24,1
5)
120 CALL SPRITE(#2,65,10,16,
64)
130 CALL DISTANCE(#3,#2,I)::
PRINT I;"LINE 130":"CALL DIS
TANCE"
140 CALL POSITION(#3,T,U)::P
RINT T;U;"SPRITE B"::CALL PO
SITION(#2 POSITION(#2,V,W)::
PRINT V;W;"SPRITE A"
150 Z=(V-T)^2+(W-U)^2::PRINT
 Z;"LINE 150":"DIFF OF POSIT
ION SQUARED"
160 PRINT "EXAMPLE OF HOW FA
R B IS FROM A"
170 CALL KEY(A,S,K)::IF K=0
THEN 170
```

Run this in TIXB first to see the correct value, then run it in MY-BASIC.

Second, any TIXB program that you are converting to MY-BASIC that uses a program statement that uses a FOR IF routine on the same line MUST be separated into two program lines.(MY-BASIC 2.99A)

The following is another example of the MOD command and may make more sense than the example in the mybasic manual.

```
1 CLS
50 CALL GRAPHICS(1,1)
100 REM EXAMPLE OF MOD
101 REM FOR PRINTING
105 REM NORMAL DENSITY GRAPH
ICS
106 REM ESC "K" n1 n2 m1 m2
...etc
110 REM USING CSGD GRAPHICS
120 REM 5 CHARS(H) X 5 CHARS
(V)
125 REM AS EXAMPLE
130 A=5::B=5
140 FOR Y=1 TO 3
150 S=(A*B*8)
160 R=MOD(S,256)
170 X=INT(S/256)
180 PRINT "TOTAL COL TO PRIN
T ";S
190 PRINT "        VALUE OF n
1=";R
200 PRINT "        VALUE OF n
2=";X
210 REM LOOP THRU A 7x8 AND
9x11
220 REM TO SHOW HOW n1 and n
2 CHANGE
230 A=A+2::B=B+3::NEXT Y
```

Most printer manuals have a chart to help you calculate these values. Change the values of A and B in line 130 and rerun then compare values to chart which I hope, will give you a better understanding of how MOD can be used.

In the MY-PAINT program published in the March edition of MICROpendium, the SIZE command in line 1660 should be -9, to allow for a seven-character filename.

All programs used in the column require MY-BASIC 2.99A and either MDOS 1.14F or MDOS .97h.—Ed.

PAINTSEE

```
1 REM DDI SOFTWARE (C) 1990
100 REM        PAINTSEE
110 CLS
120 CALL GRAPHICS(2,2)
130 DIM J(1600),PC(16),PR(16
),PG(16),PB(16),J$(40)
140 DISPLAY AT(20,1):"*LOAD*
 DSK"; :: ACCEPT AT(20,11):T
D$
150 DISPLAY AT(20,1):" " ::
OPEN #1:"DSK"&TD$&"-CR",INTE
RNAL,INPUT ,VARIABLE 128160
FOR X=2 TO 16 :: INPUT #1:PC
(X)
170 INPUT #1:PR(X) :: INPUT
#1:PG(X) :: INPUT #1:PB(X)
180 CALL PALETTE(PC(X),PR(X)
,PG(X),PB(X)) :: NEXT X
190 FOR X=1 TO 40 :: INPUT #
1:J$(X) :: NEXT X :: CLOSE #
1
200 GOTO 720
210 ! 2x SIZE
220 U=1 :: FOR X=1 TO 80 STE
P 2 :: N=1
230 FOR Y=1 TO 80 STEP 2 ::
J(Y)=VALHEX(SEG$(J$(U),Y,2))
240 CALL DCOLOR(J(Y),5)
250 CALL POINT(1,X+56,Y+80)
260 CALL POINT(1,X+56,Y-N+80
)
270 CALL POINT(1,X-N+56,Y+80
)
280 CALL POINT(1,X-N+56,Y-N+
80)
290 NEXT Y :: U=U+1 :: NEXT
X :: GOTO 360
300 ! NORMAL SIZE
310 U=1 :: FOR X=1 TO 40 ::
M=0 :: FOR Y=1 TO 80 STEP 2
320 J(Y)=VALHEX(SEG$(J$(U),Y
,2))
330 CALL DCOLOR(J(Y),5)
340 CALL POINT(1,X+76,Y-M+10
0)
350 M=M+1 :: NEXT Y :: U=U+1
 :: NEXT X
360 CALL RESETPLT :: END
370 ! 3x SIZE
380 U=1 :: FOR X=1 TO 120 ST
EP 3 :: N=1 :: P=2 :: S=0
390 FOR Y=1 TO 120 STEP 3 ::
 J(Y)=VALHEX(SEG$(J$(U),Y-S,
2))
400 CALL DCOLOR(J(Y),5)
410 CALL POINT(1,X+36,Y+60)
420 CALL POINT(1,X+36,Y-N+60
)
430 CALL POINT(1,X+36,Y-P+60
)
440 CALL POINT(1,X-N+36,Y+60
)
450 CALL POINT(1,X-P+36,Y+60
)
460 CALL POINT(1,X-N+36,Y-N+
```

(See Page 26)

MY-BASIC—

(Continued from Page 25)

```
60)
470 CALL POINT(1,X-N+36,Y-P+
60)
480 CALL POINT(1,X-P+36,Y-N+
60)
490 CALL POINT(1,X-P+36,Y-P+
60)
500 S=S+1 :: NEXT Y :: U=U+1
 :: NEXT X :: GOTO 360
510 ! 4x SIZE
520 U=1 :: FOR X=1 TO 160 ST
EP 4 :: N=1 :: P=2 :: R=3 ::
 S=0
530 FOR Y=1 TO 160 STEP 4 ::
 J(Y)=VALHEX(SEG$(J$(U),Y-S,
2))
540 CALL DCOLOR(J(Y),5)
550 CALL POINT(1,X+24,Y-R+48
)
560 CALL POINT(1,X+24,Y-P+48
)
570 CALL POINT(1,X+24,Y-N+48
)
580 CALL POINT(1,X+24,Y+48)
590 CALL POINT(1,X-R+24,Y+48
)
600 CALL POINT(1,X-P+24,Y+48
)
610 CALL POINT(1,X-N+24,Y+48
)
620 CALL POINT(1,X-N+24,Y-R+
48)
630 CALL POINT(1,X-N+24,Y-P+
48)
640 CALL POINT(1,X-N+24,Y-N+
48)
650 CALL POINT(1,X-R+24,Y-R+
48)
660 CALL POINT(1,X-R+24,Y-P+
48)
670 CALL POINT(1,X-R+24,Y-N+
48)
680 CALL POINT(1,X-P+24,Y-R+
48)
690 CALL POINT(1,X-P+24,Y-P+
48)
700 CALL POINT(1,X-P+24,Y-N+
48)
710 S=S+2 :: NEXT Y :: U=U+1
 :: NEXT X :: GOTO 360
720 DISPLAY AT(10,18):" SIZE
"
730 FOR D=1 TO 4 :: DISPLAY
AT(11+D,18):D;" ";STR$(D)&"x
" :: NEXT D
740 CALL KEY(0,K,S) :: IF S=
0 THEN 740
750 CLS :: ON K-48 GOTO 310,
220,380,520
```

```
 0 1656 1326 436 1313 2637 3343
4745 2045 3232 3142 3296 676 793
2145 3269 1371 1585 1709 1710 1834
2427 1144 3112 1866 1371 1750 2233
1555 801 2939 3448 1369 1579 1703
1706 1705 1708 1830 1833 1834 1837
2920 798 3314 3449 1374 1714 1713
1712 1590 1718 1708 1707 1835 1834
1833 1842 1841 1840 1843 1842 1832
2924 1700 3843 2180 2122 TOTAL
135041
```


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MICROdex 99: A completely independent data base that is dedicated specifically to the indexing of books, journals, magazines and newsletters. An excellent example of TI-99 relative file programming for the aspiring Extended Basic programmer. Many features like sorting, subfiles, indexing, querying etc are included. Fills a SS/SD disk. **$10**

JUNCTION SOFTWORKS
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This advertisement created with PAGE PRO 99 by Ed Johnson.

Take a break ...
...Attend a TI fair this year

Asgard releases new banner maker for use with Page Pro pix and fonts

Asgard Software has released Page Pro Banner Maker, which uses Page Pro pictures and headline fonts, according to Chris Bobbitt of the company.

He says Page Pro Banner Maker allows the user to enter up to 280 letters and 32 pictures in a single banner. Banners can be created and saved to be edited and reused later. According to Bobbitt, the program gives a clear on-screen representation of how the banner will turn out.

Bobbitt says the program eliminates "babysitting" other than periodic checks for paper jams and ribbon density, allowing the production of as many banners desired at one sitting.

He says the program is faster than most banner programs, has 80-column support, works with a hard drive and has an interface that allows the user to select pictures and fonts directly from catalog listings.

Page Pro Banner Maker requires a TI99/4A with 32K, a disk system, an RS232 and an Epson or compatible printer. The package includes a 16-page manual, a pro-gram and an example disk with seven Page Pro Headline format fonts and nine Page Pro format pictures, and a reference sheet for the artwork. Thirty other headline fonts are available in Asgard's Page Pro Headline Fonts series and in the Page Pro Headline Maker. According to the company, a converter from TI-Artist to Headline Font format is scheduled to be available soon at no cost.

Suggested retail price of Page Pro Banner Maker is $12.75. To order, send a check or money order with $2.50 shipping and handling to Asgard Software, P.O. Box 10306, Rockville, MD 20849. Telephone number for the company is (703) 255-3085.

Quad-density disks and disk manager performance

By JAN ALEXANDERSSON

The following was originally written for the Swedish user group newsletter Programbiten.

A disk stores data as sectors of 256 bytes each. Such a sector is the smallest amount of data that you can write to a disk, so the computer always writes a whole sector at a time. You sometimes write to a data file with PRINT #1:A,B,C which is less than 256 bytes. The computer will store it in a buffer in RAM until it can write the whole sector. Don't forget to close the file with CLOSE #1 because there may still be data in the buffer.

DISK HEADER

There are 2 special sectors number 0 and 1 on a disk for management of all files on the disk. Sector 1 has pointers, sorted by filename in alphabetic order, which points to the sector with the file header. This file header shows filename, file structure (DIS/VAR 80, INT/VAR 128, PROGRAM, etc.) and which sectors that contain data belonging to the file. Sector zero has general information about the disk, ie. the number of sides, tracks per side, sectors per track and a table of which sectors are occupied so the computer knows which sectors it can use for a new file. TI made the table in such a way that it can hold only 1600 sectors. A single-sided, single-density disk uses 360 sectors and a 360-kilobyte DS/DD disk uses 1440 sectors.

If you have a disk with more than 400 kilobytes (1600 sectors) there is no space for all the sectors. This is the reason why a 512K Myarc RAMdisk cannot use more than 400 kilobytes. The remaining 112K is used as 32K expansion RAM, printer buffer and working memory for Myarc Extended BASIC II. The Horizon RAMdisk solved the problem by using 2 disk numbers, each with 360 kilobytes (1440 sectors) on each card. The CorComp 512K RAMdisk uses 32K as expansion RAM and the remaining 480K is used as a RAMdisk. This can be managed by the use of an additional sector for marking of used sectors. An empty RAMdisk will then have 3 used sectors (0-2).

QUAD-DENSITY (5.25-inch)

There is a Myarc disk controller (with DS/QD EPROM) and a Myarc hard and floppy disk controller (HFDC). HFDC EPROM H6 isn't dependable because saving a file from BASIC or TI-Writer will destroy the disk (DM V works despite this). You must have EPROM H10 or H11 for quad-density. Both types of disk controller can use disks with 720 kilobytes DS/QD (double-sided, quad-density). This means that there are 2880 sectors. Myarc has solved the problem with sector zero by letting each bit mark 2 sectors at the same time (1 allowcation unit is 2 sectors) which means that you cannot use less than 2 sectors for file header and 2 sectors for data. The shortest possible file is then four sectors long. Despite this, a program will write and read single sectors of 256 bytes. A disk drive for quad-density can read single-density and double-density but only write quad-density.

The file headers are mainly stored on sectors 2-33 to speed up the search of files. This means that a normal SS/SD or DS/DD disk can have 32 file headers for fast access. Higher numbers are used if there are more than 32 files. The computer will also store data on sectors 2-33 if there are fewer than 32 files but not until all other sectors are used.

A DS/QD disk with a 2 sector file header can have only 16 file headers on sectors 2-33 with fast access. My Myarc HFDC cannot store any data sectors on sectors 2-33 when I have a few long files. This often happens when you have archived files.

DISK MANAGER FOR 720 KILOBYTES DS/QD

There are some disk managers suitable for used with quad-density disks. They include:

- Funnelweb 4.30 Quick Directory
- Funnelweb 4.30 Show Directory (40 or 80 columns)
- Funnelweb 4.30 Disk Review (40 or 80 columns)
- Myarc CALL DIR
- Myarc DM III
- Myarc DM V for HFDC
- Disk Utilities

You cannot use DM1000 for quad-density because it will misunderstand sector zero and that 1 allocation unit is equal to 2 sectors. Hard Master will show the total number of sectors in a wrong way for quad-density disks.

The disk managers than work with quad-density disks all show the same number of free and used sectors. This corresponds to the marked allocation units in sector zero. The file length is shown in different ways:

DS/QD	Header	Data sectors	Minimum
FW QD	1	used	2
FW SD	1	used	2
FW DR	2	even number	4
CALL DIR	2	used	3
DM III	2	even number	4
DM V	2	even number	4
DSKU	2	even number	4

Older versions of Funnelweb may differ from this. Funnelweb QD and SD show how much space is needed for copying to a smaller disk. CALL DIR shows the number of sectors that cannot be used to increase the file. If you have an odd number of data sectors, then there is 1 free sector which can be used only by the particular file. DM V, DSKU and FW DR show the number of sectors that cannot be used by other files. None of the disk managers has any way of knowing that sectors 2-33 cannot be used for data but only for file headers.

TI-Writer behaves strangely because the shortest possible file has 2 data sectors when you save it to a DS/QD disk. If this file is copied to a smaller disk then it will have a total length of 3 sectors. Despite this, 3 data sectors can be used with TI-Writer on a quad-density disk.

You can also use 3.5-inch DS/DD 720K drives in the same was a 5.25-inch DS/QD drives.

HIGH DENSITY (3.5-inch)

The Myarc HFDC can handle DS/HD, 1.44-megabyte 3.5-

(See Page 28)

McCann to market stackware for Geneve

Graphical user interface promises point-and-click ease of use

HQ__Stacks, a new program for the Geneve, is now available from McCann Software.

According to the manufacturer, the program features a graphical user interface screen in which all objects are mouse or key-controlled "point and click" for ease of use and program size is not limited by available RAM memory. The program features color objects and screens and Epson graphic "dither shaded" screen dumps. Spokesman Mike McCann says stackware is easy to write so lots of new software is expected; games and learning programs are easy to write for children to use.

According to the manufacturer, the Browser-Stackware editing environment includes an object placement definition and variable editor with powerful graphic, field and art object types, "click and drag" interactive object sizing and placement and automatic editing through browser point and locate capability. An object script editor has, according to the manufacturer, robust scripting language allowing for short scripts and user extension, a goto error feature, high level interface to MDOS XOP calls and high level graphics, sound and palette control.

The MDOS command line interface utility has MDOS disk operating system features from inside HQ__Stacks and the TODOS feature within the scripting language.

The program has a built-in "F7" help system for pop-up windows.

The manufacturer says the HQ__Stacks artwork resource program includes drawing and editing tools for backdrop, icon or object art work; art work from HQ__Stack or Artist-Instances and pictures, with the HQ__Stacks art work storage format published for easy conversion; TPA and Artist Fonts; and Palette Editor.

HQ__Stacks is available for $49.95. A demo program is available for $10, deducted at time of purchase. Prices in-clude U.S. shipping and handling.

For information or to order, write McCann Software, 4411 N. 93rd St., Omaha, NE 68134.

New XB cartridge in the works; GRAM version available on disk

Richard Lynn Gilbertson of Portland, Oregon, has developed a new version of Extended BASIC, called RICH GKXB. The GRAM version, usable with devices such as the Gramulator, GRAM Kracker or the P-GRAM card, is available through CaDD Electronics, 81 Prescott Rd., Raymond, NH 03077.

Gilbertson says he expects a cartridge version to be available through another company in May or June.

The program runs XBASIC and BASIC programs "with no problems, no crashes," Gilbertson says. Other features of the program are "tacked on," he notes.

He says the program is 100 percent compatible with Extended BASIC and TI-BASIC, but is much faster. In addition, he has added 157 commands to Extended BASIC.

(See Page 29)

QUAD-DENSITY—

(Continued from Page 27)

inch drives but the software is not ready. I haven't seen any information about how the allocation units will be organized. I suspect that it will have an allocation unit of 4 sectors. This would mean that the shortest file is 8 sectors long.

HARD DISK

My 20-megabyte hard disk has an allocation unit of 2 sectors so the files will have 2 sectors for file header and an even number of data sectors. The shortest file will be 4 sectors long. Both CALL DIR and DM V will show 3 sectors for the shortest file in this case. This is rather strange because a 20-megabyte hard disk is similar to a DS/QD, 720K disk. A hard disk can have a maximum >FFFF allocation units and a 20-megabyte hard disk uses >99C0.

A 40-meg. hard disk has 4 sectors per allocation unit so the smallest file will be 8 sectors. Myarc DM V will show only a 4 sector file header and used data sectors. The unused but occupied data sectors will not be shown, so the disk manager will show 5 sectors for the smallest file that occupies 8 sectors.

I haven't seen any information about an 80-meg. hard disk, but I think that it wil have 8 sectors per allocation unit. The smallest file will be 16 sectors, whihc will be shown as 9 sectors by the disk manager.

A hard disk with more than 7 heads will be work with the Myarc HFDC, according to Reach Twyning, of EAR user group. There are only 3 address lines for head select. Small hard disks will use pin 2 for write precompensation, medium size will not use it and large size will use it as the most significant bit for head select. Most HFDCs cannot us the third address contact for WDS3, according to Asgard Reflections.

BASIC ASSEMBLY

Sprightly explanations

By BARRY A. TRAVER
©1991 B.A. Traver

At this point, you should have a complete version of GRAPHICOMP 1.5, an XB graphics compiler which turns XB graphics statements into equivalent assembly source code. Even if you don't know or understand anything about assembly language, GRAPHICOMP enables you to increase dramatically the speed of complex displays on the screen.

The purpose of this final article in the series is to tie up as many loose ends as possible, particularly with regard to sprites, although other topics will be briefly touched as well. For example, a number of people have tried to persuade me to expand GRAPHICOMP into a full BASIC compiler. Let me say here that — even though I would love to see such a utility as much as anyone — I have neither the time nor the technical expertise to create such myself.

GRAPHICOMP was created for a specific limited purpose: to create screen displays quickly in assembly. For that reason, a number of graphics statements were omitted. For instance, I have not supplied any assembly counterpart to PRINT. It wouldn't have been difficult to add that: it would simply be a matter of MOVing the contents of lines 2 through 24 up one line and then doing the equivalent of a DISPLAY AT (which GRAPHICOMP can handle easily) for line 24. I left out PRINT because it is rarely if ever needed (DISPLAY AT is ordinarily much more useful).

CALL COINCIDENCE and CALL GCHAR were omitted for a different but simple reason: GRAPHICOMP is concerned with screen writes rather than with screen reads. It is already the largest XB program I think I have ever written (90 sectors), and if I were to add yet more enhancesments, I think it would be to improve the treatment of the "write" statements already included rather than to attempt to add "read" statements which would incline GRAPHICOMP to a new and different direction.

In short, GRAPHICOMP does a fairly capable job of doing what it was intended to do — write source code for rapid screen displays AND act as a tutorial to help people learn assembly if they want — but I have no intention of promoting GRAPHICOMP beyond its level of competence! The purpose of this column is to give some beginning instruction in combining BASIC and assembly, and I will let others more qualified tackle the difficult goal of creating a full-fledged BASIC compiler, capable of turning a complete BASIC program into assembly. In the meantime, we'll do our best to demonstrate that even novices can write semi-professional programs that make the best of both worlds (BASIC and assembly), for I do believe that XBASIC is still adequate for most tasks and only occasionally needs assistance from assembly.

Sprite commands supported in GRAPHICOMP are CALL COLOR, CALL DELSPRITE, CALL LOCATE, CALL MAGNIFY, CALL MOTION, CALL PATTERN, and (naturally) CALL SPRITE. In VDP memory, there are three areas that are important in this respect: (1) the VDP Pattern Table (which contains character definitions, whether used for normal characters or for sprites), (2) the Sprite Attribute Table (which contains information on screen position, character code, and color for each sprite), and (3) the Sprite Motion Table (used if you want the sprite to have automatic motion).

The Pattern Table is divided into eight-byte blocks for each character definition. Remember: you can think of a byte as "equivalent" to a two-digit hexadecimal number, so eight bytes is really equivalent to to a sixteen-digit hexadecimal number. If in XB you wanted to redefine the asterisk to be a hollow box, you could do that with a CALL CHAR(42,"FF8181818181FF"). Well, in assembly, you would place >FF81, >8181, >8181, >81FF at the appropriate eight-byte location in VDP memory where the pattern for ASCII 42 is stored. That is what is happening, whether it is done with an XB CALL CHAR or with an XB CALL LINK. GRAPHICOMP makes it simple, by computing the appropriate location for you.

The Sprite Attribute Table is divided into four-byte blocks for each sprite. The first byte contains the (sprite-)row value, the second byte contains the (sprite-)column value, the third byte contains the character code, and the fourth byte con

(See Page 30)

RICH GKXB—

(Continued from Page 28)

Most commands are special syntax for saving memory, he notes, calling up more than one command function at once, but the regular XBASIC or BASIC commands may be used if desired.

With the program, he notes, "you don't need a Supercart or Editor/Assembler module. It does the work of three cartridges."

E/A 3 and E/A 5 programs will run from Extended BASIC program mode or command mode, Gilbertson notes. The loader can be set up by typing in the name as a string variable or a string. The program will also load and run Advanced Diagnostics.

A user can CALL COINC as many times as desired in the same command. A joystick auto-repeat function is available and the user can scan up to four joysticks at once and scan all six key modes with one command, JOKE (JOystick-KEys).

He expects to incorporate a number of commands from the GKXB source code with the permission of Craig Miller, he notes.

He says that character sets 15 and 16 can be used, providing sprites are not used, without using an assembly program, and that windows are included in his program.

BASIC/ASSEMBLY—

(Continued from Page 29)

tains the color. That's (almost) all there is to it! For example, if the four-byte block for a particular sprite contained the data >0038, >2A0F, the sprite's position would be row >00 (or decimal 0) and column >38 (or decimal 56), its character code would by >2A (or decimal 42, the ASCII number for an asterisk), and its color would be >0F (or decimal 15), which would be white, since assembly starts counting at 0.

Note that we're not talking about character rows and character columns here (i.e., 24 rows and 32 columns in normal graphics mode) but pixel rows and pixel columns (i.e., 192 columns and 256 columns). A pixel is essentially a dot on the screen, so this grid allows very precise positioning of sprites. Since assembly starts counting at 0, possible sprite-rows run from >00 (or decimal 0) to >BF (r decimal 191), a total of 256 possibilities. Similarly, possible sprite-columns run from >00 (decimal 0) to >FF (decimal 255). (By the way, you can actually place sprites at any of 256 rows, but only the first 192 will be visible on the screen. This information is helpful, however, if you want to "hide" a sprite. See XB manual for details.)

The Sprite Motion Table is divided into four-byte blocks for each sprite. The first byte indicates the vertical or up/down motion of the sprite, and the second byte indicates the horizontal or left/right motion. The third and fourth bytes should be set to zero (but don't ask me why!). Values of sprite velocity in XB or assembly can range from 127 (or >7F) to — 128 (or >80, but I'm not going to explain here how negative numbers are handled in hexadecimal — let GRAPHICOMP compute that for you!).

When defining a sprite with (motionless) CALL SPRITE, it's largely just a matter of defining the location, pattern, and color in the Sprite Attribute Table. If you look at the source code produced by GRAPHICOMP, however, you will find something additional that is recommended. It is a good idea for you to disable all sprites that have a number higher than the highest numbered sprite that you are using. To do this, just place the value of >D0 in the first byte (the byte normally used for sprite-row position) of the first unused sprite. Incidentally, this method for disabling sprites is also made use of in CALL DELSPRITE(ALL).

Let's consider CALL LOCATE, CALL PATTERN, and CALL COLOR. Each of these is simply a matter of changing the appropriate byte(s) in the Sprite Attribute Table for the sprite involved. To change position, change the first two bytes. To change character code, change the third byte. To change color, change the fourth byte. Again, GRAPHICOMP computes the appropriate locations for you. It couldn't be simpler!

Dealing with sprite motion is just slightly more complicated. There are two things that need to be done besides writing appropriate values to the Sprite Motion Table: (1) you must temporarily enable interrupts (with a LIMI 2) and then disable them (with a LIMI 0), and (2) you have to tell the computer the maximum number of sprites in motion (placing the number at >837A). GRAPHICOMP handles both of these considerations for you, determining the number of the highest moving sprite from the data furnished to it.

Screen graphics is a large part of almost any computer program ... Assembly language allows us to speed up the screen display, resulting in more professional looking programs.

CALL DELSPRITE for a sprite is a matter of hiding the sprite by giving it a sprite-row position of >C0 (remember: only sprite-rows >00 through >BF are visible on the screen), while CALL DELSPRITE ALL involves writing >D0 to the first byte of the first sprite, thus disabling all sprites. (See comments earlier in this article.)

CALL MAGNIFY is handled in an entirely different way. It does not involve writing to the Pattern Table, the Sprite Attribute Table, or the Sprite Motion Table, because it is a value that affects all sprites equally. Changing the magnification is a matter of writing to VDP register 1, which contains memory, screen, and graphics mode information. This register has 8 bits, numbered 0 to 8. Bit 0 tells whether you are executing a 16K rather than a 4K RAM operation. (Set it, i.e., set it to 1!) Bit 1 tells whether the screen display is to be visible. (Set it!) Bit 2 tells whether to allow VDP interrupts. (Set it!) Bits 3 and 4 have to do with text mode and multi-color mode. (Leave them reset, i.e., set to 0). Bit 5 is not used. (Leave it reset.) Finally, bits 6 and 7 are the ones you're interested in: bit 6 tells whether you are using one-character or four-character sprites, while bit 7 tells whether to increase (or "magnify") the size.

For CALL MAGNIFY(1), we thus want to write to VDP register 1 the value 11100000 binary or >E0 hexadecimal. For CALL MAGNIFY(2), we want 11100001 binary or >E1 hex; for CALL MAGNIFY(3), 11100010 or >E2; for CALL MAGNIFY(4), 11100011 or >E3. To write this value to VDP register 1, we make use of the VWTR ("VDP Write To Register") utility, as the code produced by GRAPHICOMP illustrates.

Well, we come to the conclusion of somewhat ambitious project, and I hope you have found it worthwhile. Screen graphics is a large part of almost any computer program (how many programs can you think of that do not involve output to the TV screen or monitor? — it's difficult to imagine a computer without thinking of the screen display). Assembly language allows us to speed up the screen display, resulting in more professional looking programs.

By the way, if you don't have a ready-to-run copy of GRAPHICOMP 1.5, you're reminded that there are at least two easy ways to obtain one: (1) subscribe to the appropriate monthly disks from MICROpendium (highly recommended!) or (2) send a check for $4 to Barry Traver, 835 Green Valley Drive, Philadelphia, PA 19128 (being sure to specify that you are a current subscriber to MICROpendium and would like me to send you on disk GRAPHICOMP 1.5).

Next month we hope to move on to other topics and/or programs, combining BASIC and assembly. Let me know what you're interested in! Until then, keep on compuTIn'!

Traver publishes a diskazine for TI users called Genial TRAVelER.

MICRO-REVIEWS

Turbo-Pasc '99 Tutor, Sliding Block Puzzles, The Ring Companion, Page Pro Banner Maker and an update for YAPP

Ratings for the software reviewed in this column are based on a star system as follows:

★Leave it alone, back to the drawing board.

★★Needs improvements, but workable.

★★★ A good program, worth trying.

★★★★ Send your money and buy it.

★★★ TURBO-PASC'99 TUTOR

Dan O'Quinn isn't a heavy-duty programmer, or so he claims, but he has managed to produce one of those "necessaries" for the community. I am speaking of a disk and hard-copy package that will get you started with the German born Turbo Pascal package that came out a few years ago.

Before I get into the package, I should mention that the Pascal that I'm talking about is NOT the P-code card from TI. Turbo is a real Pascal language in software form with a compiler. The package was introduced in Germany but was not intended for the American market. The documentation for it was only recently translated and is now being handled by L. L. Conner. If you're looking for a speedy language and you know Pascal, here's your chance.

Back to the purpose of this review; Dan heard a member of his local group mention that he was having some trouble with the docs of Turbo Pascal. (Actually the quote was; "The docs were translated from German to English by someone that didn't speak either language!") Well, it wasn't *that* bad, but nevertheless, Dan decided that since he knew a little Pascal, he could correct some of the problems — which he has.

The package consists of two disks (flippies): one with Pascal programs, the other with the source code so that you can see how it all works. The manual contains explanations of the Pascal commands and how they relate to Extended BASIC, also some information pertaining to the sample programs.

The manual isn't that big of a deal, really, though very necessary. Most of the effort and the value of the program is with the disks. Since there has been very little use of this super language in the community to date, and every little bit helps.

The cost of the tutorial is $12, including shipping. One dollar of that goes to the Midlands 99er Users group to help them out, too. Send to: Dan O'Quinn, Route 4 Box 565, Walterboro, SC 29488.

The Turbo Pascal Package is only available from L. L. Conner, 1521 Ferry Street, Lafayette IN 47901 The cost is $59.95, plus $3 shipping.

★★★★ SLIDING BLOCK PUZZLES AND SOLUTIONS - SERIES 1

For all of you who take your enjoyment from mind bending games, this one is the winner of the year.

If you have been around this community long enough, (which may be TOO long) you may remember a program that appeared in 99er magazine called Mosaic Puzzle. It was a fabulous program utilizing sprites and super smooth movement. It was a full screen number or letter puzzle where you moved the numbered blocks to create a new number arrangement. This is the same concept, but it grew up.

Now you get three sizes of blocks to work with, having to shift them around to get a huge one from one corner to the other. It ain't easy!

In the first series there are three puzzles, each a little tougher than the last. The third one would require 90 moves if you didn't make a mistake — you will, plenty of them.

One very nice feature is than you can save a puzzle at any point you're at. When you come back to the game, it first asks if you have a saved puzzle and returns it to you if you want. (So what else would you expect from adventure game programmers?)

If you get to the point where you're going to pull all the hair out of your head, you can send off to the company for the solutions to the puzzles. It's another program that makes the moves right in front of you, one at a time. You can see as many of them as you need then return to the puzzle.

The graphics are neat, the docs are superb and the game is addicting. If this is the product quality we can expect in the future from MS Express Software, they are going to have a long and prosperous life.

Series One Puzzles cost $7.95, plus $1 shipping.

Series One Solutions cost $7.95, plus $1 shipping.

Send your money to MS Express Software, P.O. Box 498, Richmond OH 43944.

★★★★ THE RING COMPANION

If you want something that is educational, musical, and enhanced with great graphics; call on Ken Gilliland of the newly formed NOTUNG Software company. Ken has never failed to give this community some of it's most unusual and innovative software — The Ring Companion continues the legend.

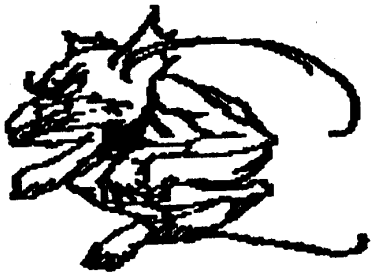
This package is an introduction to Richard Wagner's "Der Ring des Nibelungen." I — in my ignorance of music — would classify this as a musical fantasy. Because I lack education in the field of "good" music, I can only tell you that it sounds great on the TI, but I can't tell you much about the story itself.

The package consists of two disks containing instances, pictures, educational text and music bits called "leitmotifs." What it puts me in mind of is the concept of "Peter And The Wolf." Remember how each instrument represented a character, mood or place? That's what the 30 leitmotifs teach you. With each one there is a text

(See Page 32)

MICRO-REVIEWS—

(Continued from Page 31)
explanation of the bit that you will hear.



There are 14 instances and pictures that may be printed out for whatever you may need them for. The little critter, (a troll, I think) is an example of what you get. Neat stuff!

The Ring Companion is only $8, plus $1 for postage. There is also a disk of full selections from the opera for $5 that you should consider at the same time, but it's optional.

You know, I think I'll climb up on my soapbox right about here: I bought my wife a Adlib music card for her computer for Christmas. The cost was $119 for the card and $39.95 for each disk of music. I wish this community would quit selling itself short on programs. Take Harrison Software for instance — their music disks are up to an hour long and they only charge about $4 for it. These TI prices are just about "copy cost" in the MS-DOS world. Try giving these people a more support for their hard work, folks.

Send your money to: Notung Software, 7647 McGroarty Street, Tujunga, CA 91042.

★ ★ ★ ★

PAGE PRO BANNER MAKER

Every month we get blessed with the "Page Pro Product of the Month." This month it's a banner maker that uses Page Pro Headline Fonts and pictures.

This is a neat program for a lot of reasons, not the least of which is "batch" processing of banners. You can type a number of banners in and then set up the program to print them all out unattended. Each banner can have up to 256 characters in it, including as many different pictures as you want, wherever you want them in the chain.

Since the there are already a couple of disks of Headline fonts, you have quite a selection to choose from. There are seven new fonts included with the package, just in case you haven't gotten into the Headline utility yet.

When a font is selected, you can print it out in the normal size or have it expanded to fit the page. Any Page Pro picture you have may also be used. Simply pressing CTRL-P positions the picture flag, then you enter the file name for it. Various letter and word spacing is also an input option. All of the information for a banner can be saved and used over again.

As with most of the programs that are coming out these days, the banner maker can be configured for both 40 and 80 columns. The 9938's are finally starting to get a real workout.

There are two disks with the package containing the programs, fonts, and a number of pictures for special events. The docs are remarkably extensive for such a simple, friendly program, too.

It's an Asgard product and the cost is $12.95 plus $2.50 shipping and handling. Asgard Software, P.O. Box 10306, Rockville MD 20849.

YAPP UPGRADE

There's been a major upgrade to YAPP, the 80-column paint program from Asgard that was reviewed in the December 1990 MICROpendium. The hardcopy printout has now been included in the program itself. You can print a picture (GIF included) in any size you want, or even blow up a small part of the picture. The update charge is $5, plus $2.50 shipping, and you must include your original YAPP master disk with the money. It's worth it!

If you would like me to review your software in this column, send it to Harry T. Brashear, 2753 Main St., Newfane, NY 14108. If you would like it returned, include a SASE.

1991 TI FAIRS

FEBRUARY

Fest West 91, Feb. 16-17, Ramada Main Gate, Anaheim, California. Contact Fest West 91 Committee, c/o Bill Nelson, 11692 Puryear Lane, Garden Grove, CA 92640, or call Users Group of Orange County BBS, (714) 751-4332.

MARCH

Family Computer Exposition and Ham Radio Festival, (formerly TICOFF), March 6, Roselle Park High School, 185 West Webster Ave., Roselle Park NJ 07204. Sponsored by students of the high school and the Old Bridge Ham Radio Club. For information call (201) 241-4550 or call the 24-hour informational BBS at (201) 241-8902.

APRIL

Northeast TI99/4A Home Computer Fair, April 6, Central Middle School, Waltham, Massachusetts. Contact Justin Dowling, The Boston Computer Society, One Center Plaza, Boston, MA 02108.

Canadian TI-Fest, April 27, Merivale High School, Ne-pean, Ontario, Canada. Contact Bill Gard, 3489 Paul Anka Dr., Ottawa, Ontario, Canada K1V 9K6 or (613) 523-9396 or Fax (819) 997-2194 Attn: DMES 2.

MAY

TI Orphan Reunion, May 11, Innisfail Lions Hall, Innisfail, Alberta, Canada. Contact Fred Kessler, Box 20, Sundre, Alberta, Canada T0M 1X0 or (403) 638-3916.

TI99/4A Users Group, UK, Annual Meet, May 11, The Music Hall, The Square, Shrewsbury, England. Contact Stephen Shaw, 10 Alstone Rd., Stockport, Cheshire, England, SK4 5AH.

Multi User Group Conference, May 18, Reed Hall, Ohio State University Lima Campus. Contact the Lima User Group, P.O. Box 647, Venedocia, OH 45894, or phone Dave Szippl evenings, (419) 228-7109.

SEPTEMBER

6th International TI User Treffen, Sept. 13-15, Berlin. Contact Henry Hillsberg, Uhlandstr. 70, (W) 1000 Berlin 31, Germany.

Convention, weekend of Sept. 21, Tacoma, Washington. Contact Barb Wiederhold, (206) 546-1865 (BBS) or (206) 546-1205.

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.

CHECKtrack

TI-Base application puts you in charge of your checkbook

By JOHN KOLOEN

Keeping track of the family budget is one task made more efficient by home computers. This fact is made obvious by the large number of programs and spreadsheet templates dedicated to balancing checking accounts. The best of such programs not only tell you how much money you've got in your checking account but where it goes, by category.

Bill Gaskill, author of CHECKtrack, has created a number of financial programs. One which comes to mind is the ambitious Personal Auditor Home Accounting System (reviewed Aug. 1989). Though CHECKtrack is not as complicated as Personal Auditor, it does its job very well without the user having to learn a great deal about accounting.

CHECKtrack runs out of TI-Base V3.0, which like CHECKtrack is distributed by Texaments.

Even an infrequent user of TI-Base should have little difficulty in learning to use CHECKtrack. The CHECKtrack database loads like any other TI-Base database. The system menu screen offers the user 13 options selectable by a single keypress. They are: Add, Browse, Calc, Edit, Find, Help, Print, Query, Redo, Summ, Update, Void and eXit.

The first thing you'll want to do with CHECKtrack is to make a copy of it and put the original away in a safe place. If you want to run CHECKtrack out of a single drive, you'll also need to copy the OVRLAY/P file from TI-Base to the CHECKtrack disk.

Prior to entering transactions, the new user will want to enter his checking account balance, which is done through the Query command. It's a simple process that doesn't need to be described here.

Next, you'll want to select Print from the system menu. This will result in a list of 7 reports: Accounts File, Account Range, Check Range, Date Range, Description Search, Monthly Report and Year-To-Date Report. At this point, though, the Accounts File is what you want. It consists of 60 accounts, numbered from 1 to 60, with corresponding descriptions. For example, account number 36 is designated for Laundry/Cleaning expenses. This is where you get to customize CHECKtrack to meet your own needs. If you don't have significant laundry and cleaning expenses, you might want to change the account description to something else, such as Garden Expenses. You can modify the descriptions for 59 of the accounts, though you should not change account numbers. However, you can create additional accounts if you like. Also, avoid trying to turn an income account into an expense account, such as changing "Gross Wages," an income account, into "Groceries," an expense account. After making your changes to the Accounts File, you can return to the system menu and start entering data.

Although the manual recommends you start entering your data from the beginning of the year, that may be unrealistic for those who buy the program during the middle of the year. The major reason to go back to Jan. 1 is to have solid year-to-date figures. If you've got the time, by all means start from the beginning. But CHECKtrack remains useful no matter when you start using it.

To enter transactions, select Add from the system menu. The resulting screen has prompts for check number (or SER for bank service charge or DEP if it is a deposit), date, account number, description (the account file description appears at the beginning of one line and you use the remainder of the line to enter the name of the payee), and enter the amount of the deposit or expense. The data is then saved and you are prompted for the next entry. Typing END in the check number field will return you to the system menu.

Now, if you want to browse through all the financial records, select Browse from the menu. If you want to edit a transaction, select Edit. If you want to modify the accounts file, select Update. If you want to create month-end totals, select Calc. If you want to search for a particular check by account number, check number of date, select Find. The Query command is used to create custom queries. You'll need to refer to the TI-Base manual for instructions. Redo is used for emergency editing of totals in the Summary File, which contains the deposit and paid out totals. The Summ(ary) command is used to display totals of deposits and expenses and month-end balances for the entire calendar year. This data may be output to a printer or viewed on the screen. And, you can select Void to void a check.

Documenation: CHECKtrack comes with a thoroughly adequate 8-page manual. It's a handy 5½ x 8½ inches and takes you step-by-step through the program. The only thing it lacks is a section on what happens when things go wrong, but if you follow the instructions things aren't likely to go wrong.

Ease of Use: I found CHECKtrack to be extremely easy to setup and use. Unless you decide to add categories to the Accounts File you don't even have to have a TI-Base manual. Although CHECKtrack is set up to work out of DSK1, you can easily have the data disk accessed from any other drive, though you'll need to know a little about TI-Base to do it (or at least have a TI-Base manual handy).

The only shortcoming I found was the inability to correct a mistake on the data entry screen, though this is easy enough to do from the system menu. In terms of the data entry screen, it would have been nice to have the date field automatically supplied with the current date as a default, instead of having to enter it manually each time you enter a transaction, but that's a minor criticism.

Value: Those who already use TI-Base V3.0 and want to know where their money goes will find CHECKtrack to be a terrific value. The price of $14.95 plus shipping is another reason why TI-Base is a worthwhile investment for TI and Geneve users. (Yes, CHECKtrack works just fine, not to mention faster, on the Geneve.)

Review

REPORT CARD

Performance	**A**
Ease of Use	**A**
Documenation	**A**
Value	**A**
Final Grade	**A**

Cost: $14.95 (add $3 shipping/handling; $8 overseas)
Distributor: Texaments, 53 Center St., Patchogue, NY 11772
Requirements: TI99/4A or Geneve, memory expansion, disk drive, XB or E/A, TI-Base V3.0, printer optional

Newsbytes

Orphan Reunion set for May in Alberta

The TI Orphan Reunion is scheduled to be held May 11 in the Innisfail Lions Hall, Innesfail, Alberta, Canada, according to Fred Kessler. For information, contact Kessler at Box 20, Sundre, Alberta, Canada, T0M 1X0 or call (403) 638-3916.

TI User Treffen set

The sixth International TI User Treffen is scheduled for Sept. 13-15 in Berlin, Germany. For information, contact Henry Hillsberg, Uhlandstr. 70, (W) 1000 Berlin 31, Germany.

Notung Software updates programs

Ken Gilliland of Notung Software has announced that the company has updated several of its programs.

Filmlib (V3.01) has an enhanced display and menuing system.

TI Casino (V2.03) has minor bugs cleaned up and now has a "Bouncer" to rid the casino of deadbeats who don't pay their bills off.

The **Star Trek: Next Generation Calendar** is now also available in a fiscal year version (June 1991 to June 1992).

All updates are free provided that the user returns his original disk(s) and proper return postage with a mailer.

Address for Notung Software is 7647 McGroarty St., Tujunga, CA 91042.

Company changes name, product focus

Bill Gaskill, owner of PRK DataBasics of Grand Junction, Colorado, has announced that his company is changing names and refocusing its product line more toward the support of TI-Base and TI-Base applications. The new company name is Junction Softworks, with a new address of 2310 Cypress Court, Grand Junction, CO 81506. Gaskill says several customers expressed initial confusion about the PRK portion of the former company name, believing that its product line was focused on TI's PRK module software.

As part of the new focus, Junction Softworks has bundled its **Membership Manager** program with **Newsletter Exchange**. According to Gaskill, together they provide tools for automating the recurring tasks user groups face in managing membership rosters and in keeping track of their newsletter exchange program. Price for the three-disk set is $25.

Gaskill also announces the availability of **The TI-Base User**, a bi-monthly newsletter for TI-Base owners. Volume 2, the second year's issues, is now offered at a subscription price of $20. Six issues of at least 12 pages per issue and at least one program disk during the year are guaranteed. Volume 1, which consists of more than 80 pages of newsletters from 1990 and several programs on disk, is available for $22.

Junction Software also offers **Timeline 99**, a book that Gaskill says chronicles significant events in the life of the 99/4A and 9640 computers and the community that has supported them. The price of the book is $18, which includes shipping and handling.

The company has retained its sales and support for **Personal Auditor** and **MICROdex 99**. **Personal Auditor** (reviewed Aug.'89 MICROpendium) is a home accounting system, while **MICROdex 99** is a relative file-based indexing tool for books, journals, magazines, newsletters and the like. **Personal Auditor** is available for $23. **MICROdex 99** sells for $10. Both prices include shipping and handling.

Updates slated for Lewis manual

Tony Lewis says he has sold the rights to his *Interface Standard and Design Guide for TI99/4A Peripherals* to Jeff Guide as of 1991. Guide will be the sole distributor for the manual and utility programs, but Lewis says he will still be available to answer inquiries concerning the manual's contents.

According to Lewis, Guide is updating and enhancing the manual format. He notes that the new manual may not be available for a while and the final price of the enhanced manual has not been set.

New programs have been added to the utility disk for DSR writers. According to Lewis, Wayne Stith has provided some standalone subroutines, such as VSBR, that can be put into a DSR (these external routines cannot be used by REF or DEF in a standalone DSR; they will be loaded outside the >4000 block by the 4A). Lewis has written a program called EE/DSR for persons who want to program an EPROM, EEPROM or static RAM in one of the peripheral spaces. It is a modified version of John Johnson's DSRSL program which now will load an executable program (E/A option 5) into the >4000 peripheral space from a disk file (DSRSL could not load programs into the peripheral space, unless the file was modified). Now, Lewis says, a DSR author can write his or her DSR, save it via the RAG Linker, then load the program into the memory chip.

This eliminates the problem of using the Editor/Assembler package for creating DSRs, Lewis says; the E/A system will not allow the user to save a memory image (option 5) program that is AORG'd to the >4000 block. The EE/DSR program has some error checking included to insure that a true memory image program is being loaded into the memory chip, and that the total number of bytes being loaded is less than 8K long, Lewis says. He says the program has also been rewritten to insure that it works properly with the EEPROM programmer design that was presented last year in a series of MICROpendium articles. He says the program should work equally well if a static RAM or EPROM is used.

EE/DSR is available on some of the major computer networks. For inquiries regarding the manual and utility programs, write Jeff Guide, P.O. Box 244, Lorton, VA 22079.

Computer recyclers to meet in May

The International Computer Products Remanufacturing Association will hold its spring convention at the Marriott Hotel in Washington, D.C., May 16-18.

Organizers say all businesses involved in recycling computer products may attend. Registration is $75 for members and $19. for non-members. For agenda and speakers, contact Geri Ethen, (503) 222-3215.

User Notes

An XB routine that sorts anything

This comes from Sam Carey, of Portland, Oregon. He writes:

This program lets you sort numbers or characters, in descending or ascending order. When you first run the program it asks for a printing device name. After you tell it the printer's name, it asks you if you want characters or numbers, 1 or 2, respectively. After that it asks if you want decreasing order (i.e. 10, 9, 8, ...) or increasing order (1, 2, 3, ...), 1 or 2, respectively. Then you type in the items you want to sort. When you're done typing, type a zero and press Enter. After a short pause, it will print out the sorted list.

A minor modification to line 20 will allow you to dump sorted file to another device instead of a printer. Simply replace PIO with DSKx.FILENAME and the sorted data will be saved to a D/V80 file that can be loaded into TI-Writer or other word processor.

```
 J CALL CLEAR !209
20 DISPLAY AT(14,1):"PRINTIN
G DEVICE NAME?":"PIO" :: ACC
EPT AT(15,1)SIZE(-28):PD$ !1
69
30 OPEN #1:PD$ :: PD=1 !209
40 CALL CLEAR !209
50 DISPLAY AT(1,1):"PRESS 1
FOR CHARACTERS     ORPRESS 2
FOR NUMBERS" !121
60 CALL KEY(0,K,S):: K=K-48
:: IF K<1 OR K>2 THEN 60 ELS
E O=K !225
70 DISPLAY AT(4,2):"ENTER A
ZERO (0) WHEN DONE" !184
80 DISPLAY AT(6,1):"PRESS 1
FOR INCREASE       ORPRESS 2
FOR DECREASE" !073
90 CALL KEY(0,K,S):: K=K-48
:: IF K<1 OR K>2 THEN 90 ELS
E M=K !253
100 IF O=2 THEN 310 !060
110 DIM B$(200),C$(0)!058
120 FOR B=0 TO 200 !147
130 DL=B+9 :: IF DL>23 THEN
DL=23 :: DISPLAY :!222
140 DISPLAY AT(DL,1):STR$(B)
&":" :: ACCEPT AT(DL,5):B$(B
)!195
150 IF B$(B)="0" THEN N=B ::
 GOTO 170 !200
160 NEXT B !216
170 FOR C=0 TO N-2 !066
180 J=C+1 :: FOR D=J TO N-1
!027
190 IF M=2 THEN 220 !223
200 IF B$(C)>B$(D)THEN 240 !
218
210 GOTO 250 !073
220 IF B$(C)<B$(D)THEN 240 !
217
230 GOTO 250 !073
240 C$(0)=B$(C):: B$(C)=B$(D
):: B$(D)=C$(0)!050
250 NEXT D !218
260 NEXT C !217
270 FOR E=0 TO N-1 !067
280 PRINT #PD:B$(E)!250
290 NEXT E !219
300 END !139
310 DIM Z(200)!174
320 FOR B=0 TO 200 !147
330 DL=B+9 :: IF DL>23 THEN
DL=23 :: DISPLAY :!222
340 DISPLAY AT(DL,1):STR$(B)
&"=" :: ACCEPT AT(DL,4):Z(B)
!185
350 IF Z(B)=0 THEN N=B :: GO
TO 370 !134
360 NEXT B !216
370 FOR C=0 TO N-2 !066
380 J=C+1 !006
390 FOR D=J TO N-1 !147
400 IF M=2 THEN 430 !178
410 IF Z(C)>Z(D)THEN 450 !14
9
420 GOTO 460 !028
430 IF Z(C)<Z(D)THEN 450 !14
8
440 GOTO 460 !028
450 P=Z(C):: Z(C)=Z(D):: Z(D
)=P !008
460 NEXT D !218
470 NEXT C !217
480 FOR E=0 TO N-1 !067
490 PRINT #PD:Z(E)!238
500 NEXT E !219
510 END !139
```

Tip and question on using MDOS

This comes from Martin Zeddies, of Wolfsburg, Germany. He writes:

There is a lot of trouble for Germans to get software for the Geneve. Despite this, I have been learning to program TMS Assembler under MDOS without much documentation. With some other Germans, I tried out some short assembler routines and found that strange things can happen.

One of these things you can try for yourself with the following 3-line assembler program:

```
SFIRST B      ESTART
START RT
SLAST END
```

While I made it work in MDOS 1.14, using Clint Pulley's QDA Assembler (V1.4) to assemble the source code into object code, I changed the object code using the LDR Linker (V1.3) to a program image file.

After you do this, you can start the program file direct from MDOS 1.14! The program needs only parts of a second to run and the cursor reappears in the next line. It seems that the program had done all that it should do.

However, when you try to start the program a second time, the cursor disappears and never comes back.

My question is: Do you know why the computer works fine on the first call of the program but crashed when the program was run a second time?

Okay, Geneve users, anyone have the answer? Let us know.—Ed.

Program allows global substitution in text files

The following item appeared in the TIsHUG News Digest. It has to do with a program written by Tom Wynne of the Puget Sound 99ers.

Tom Wynne has developed a program called Pre-Formatter that may be of use to those who want to do global changes on TI-Writer or other D/V80 files without using TI-Writer.

As listed here, the program will place carriage returns at the end of each line. It also gives the user the option of replacing all spaces with the required space character as symbolised by the caret. Users may easily modify this latter option to permit search and replace of any character by changing line 200. In line 200, C1$ represents the character to be changed and C2$ represents the character you want to replace it with.

When the program is run, the user is

(See Page 36)

User Notes

(Continued from Page 35)

prompted for the filename of the file to be modified. (As published here, it works out of drive 2, but readers may change the drive designation to any other drive.) If carriage returns already exist on the file, additional carriage returns will not be added.

The user should be able to modify the carriage return replacement option by changing lines 360 and 370. The carriage return is identified by CHR$(13).

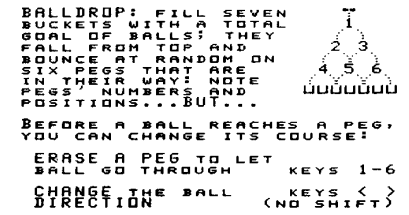
Extremely large files may result in a Memory Full error message. Also, the program does not create a second file for the output so it's a good idea to backup the file you want to process through Pre-Formatter or save a copy of it under a different name. Users may want to modify the program so that it creates a second file for output.

```
1 !SAVE "DSK1.PREFORMAT" !00
7
100 !**********************
 !073
110 !*     PRE - FORMATTER  *
 !159
120 !*    PUTS CR'S AT END  *
 !158
130 !*    OF EACH LINE AND  *
 !120
140 !*    REPLACES SPACES   *
 !197
150 !*     WITH REQUIRED    *
 !148
160 !*          SPACE       *
 !067
170 !*     BY TOM WYNNE     *
 !083
180 !**********************
 !073
190 DIM A$(300)!186
200 C1$=" " :: C2$="^" !061
210 PRINT "ENTER FILE NAME:"
 !172
220 ACCEPT BEEP:FN$ !255
230 PRINT "REPLACE ";C1$;" W
ITH ";C2$;"?";!140
240 ACCEPT VALIDATE("YN"):YN
$ :: IF YN$="" THEN 240 !190
250 OPEN #1:"DSK2."&FN$,INPU
T !014
260 I=0 !000
270 PRINT "READING FILE..."
!054
280 IF EOF(1)THEN 320 !111
290 LINPUT #1:B$ !188
300 IF YN$="Y" THEN CALL REP
LACE(B$,C1$,C2$)!176
310 A$(I)=B$ :: I=I+1 :: GOT
O 280 !182
320 CLOSE #1 !151
330 PRINT "WRITING FILE..."
!096
340 OPEN #1:"DSK2."&FN$,OUTP
UT !115
350 FOR J=0 TO I-1 :: IF A$(
J)="" THEN 370 !214
360 IF SEG$(A$(J),LEN(A$(J))
,1)=CHR$(13)THEN 380 !200
370 A$(J)=A$(J)&CHR$(13)!031
375 PRINT A$(J)!184
380 PRINT #1:A$(J):: NEXT J
:: CLOSE #1 !223
390 PRINT "FINISHED." !228
400 GOTO 210 !033
410 SUB REPLACE(A$,C1$,C2$)!
213
420 B$="" !235
430 FOR I=1 TO LEN(A$)!229
440 CH$=SEG$(A$,I,LEN(C1$))!
160
450 IF CH$=C1$ THEN CH$=C2$
!063
460 B$=B$&CH$ :: NEXT I :: A
$=B$ !093
470 SUBEND !168
```

Balldrop takes skill, patience

The following program and text, by Lucie Dorais, appeared in the newsletter of the Ottawa TI99/4A User Group. Dorais writes a regular column for the newsletter called Fast Extended BASIC.

This game is based on the principle of the "Pellet Dropping Machine" illustrated in *Compute's book 33 Programs for the TI99/4A* to explain the concept of normal distribution.



The above drawing is the instruction screen (greatly reduced) from the program. It has a double purpose: help you type lines 150-200, which include bo[illegible] text and the little diagram at the upper right. This diagram is precisely the "machine;" I quote from the book: "A small pellet is dropped through the hole. It hits the top peg and bounces left or right with equal chance, eventually finding its way into one of the cups below. The spread of pellets among the bottom bins bears close resemblance to what statisticians call *normal distribution*, especially when large numbers of pegs and cups are used."

If you look at the diagram, you will quickly realize that:

- only four cups, or buckets, will be filled by pellets, since three of them are located under a peg;
- of those four, the two in the middle should get twice as many pellets as the two at the extremities, since there are two paths to them (from above lev and right pegs).

You can study the "randomness" of XB RANDOMIZE with Balldrop, but it quickly gets boring. I modified Compute's "Machine" to let you control the downward path of the falling ball and then fill th[illegible] bucket of your choice, until all buckets are filled with the same amount of balls (you set the total goal at the beginning of each game). As soon as one bucket overflows, with one more ball than the goal, the game is finished. Sounds easy? I now can do it at speed one (the slowest), but never managed to win at higher speeds. Which means than plain vanilla XB can be FAST.

To study normal distribution, just pick a high goal (100-999), the fastest speed (4) and leave the computer alone. Buckets 1-3-5-7 will fill at random, and bucket 3 or 5 should overflow when the computer has dropped about 2.5xGOAL balls.

```
100 ! ** BALLDROP ** L. Dora
is / Ottawa UG / March 1991
 !224
110 !!131
120 CALL CLEAR :: CALL MAGNI
FY(2):: A$="     " :: B$=RPT$
("~ ",14)!095
130 CALL CHAR(35,"0042424242
427E",36,"0000EEEE00100010",
91,"0001000400080008",92,"00
81002400180018",93,"00800020
00100010")! instruction cha
 !009
140 GOTO 150 :: B,C,D,DR,EP,
```

(See Page 37)

User Notes

(Continued from Page 36)

```
GOAL,K,P,R,S,SP,T(),X,Y :: C
ALL KEY :: CALL SPRITE :: CA
LL HCHAR :: CALL COLOR :: !@
P- !000
150 CALL D(1,"BALLDROP: Fill
 seven"&A$&"$   buckets with
 a total"&A$&"1   goal of ba
lls; they"&A$&"[ ]")!113
160 CALL D(4,"fall from top
and "&A$&" 2 3  bounce at ra
ndom on   [ \ ] six pegs tha
t are"&A$&" 4 5 6 ")!158
170 CALL D(7,"in their way:
note   [ \ \ ]pegs' numbers
and"&A$&"#######positions...
BUT...")!088
180 CALL D(11,"Before a ball
 reaches a peg,you can chang
e its course:"):: CALL D(14,
" ERASE A PEG to let")!192
190 CALL D(15," ball go thro
ugh    keys 1-6"):: CALL D(1
7," CHANGE the ball keys < >
   DIRECTION   "&A$&"(no sh
ift)")!024
200 CALL D(20,"Before starti
ng game, you   set total GOA
L and falling  SPEED (1 = sl
ow, 4 = fast)")!020
210 A$="FFFFFFFF" :: CALL CH
AR(126,A$&A$,136,"3C74"&A$&"
7E3C"):: A$="          " ! bu
cket, ball, peg !095
220 CALL D(24,A$&"PRESS A KE
Y"):: CALL D(24,""):: CALL K
EY(0,K,S)!096
230 IF S=0 THEN 220 ELSE CAL
L CLEAR :: CALL COLOR(12,15,
1,14,5,1)!010
240 FOR X=1 TO 6 :: R=48*INT
(X/2+(X=6))+25 :: Y=(R+23)/4
8 ! pegs on screen !144
250 C=181-128*Y+64*X-32*(Y=2
):: CALL SPRITE(#X,136,14,R,
C):: NEXT X :: CALL D(1,"SPE
ED: 1"&A$&"  GOAL: 5")!128
260 ! ** game ** !037
270 DISPLAY AT(20,1):"":B$:B
$:RPT$("~~~ ",7):"" :: CALL
HCHAR(1,12,128,9)!136
280 ACCEPT AT(1,8)SIZE(-1)VA
LIDATE("1234"):SP :: ACCEPT
AT(1,26)SIZE(-3)VALIDATE(DIG
IT):GOAL !191
290 DR,R=1 :: C=16 :: EP=0 :
: P,D=-1 :: CALL HC(R,C)! ne
w ball released !078
300 IF EP THEN CALL COLOR(#E
P,14)! reset erased peg !073
310 IF SP<3 THEN CALL HC(R+1
,C)! slow down !052
320 CALL HC(R+2,C):: R=R+2 :
: IF R>=20 THEN 410 !025
330 RANDOMIZE :: P=INT(P+3+D
/2+(P=1))! calculate next pe
g !244
340 CALL KEY(0,K,S):: IF S=0
 OR K<49 OR K>54 OR EP<>0 TH
EN 370 !113
350 EP=K-48 :: CALL COLOR(#E
P,1):: IF EP<>P THEN CALL SO
UND(150,220,0):: GOTO 370 !
erase a peg !026
```

(See Page 38)

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(These disks consist of public domain programs available from bulletin boards. If ordering DSDD specify whether Myarc or CorComp.)

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User Notes

(Continued from Page 37)

```
360 DR=DR+12 :: IF DR=25 THE
N DR=19 :: GOTO 400 ELSE 400
 !216
370 IF K=44 OR K=46 THEN D=K
-45 ELSE D=2*(INT(2*RND)-0.5
)! ball direction !102
380 IF SP<3 THEN CALL HC(R-1
,C+1*D)! slow down !247
390 CALL HC(R-1,C+3*D):: C=C
+4*D :: DR=DR+6 :: IF DR>19
THEN DR=19 !166
400 R=R+SP :: CALL HC(R,C)::
 IF R<DR THEN 400 ELSE 300 !
029
410 CALL HCHAR(22,C,136):: B
=C/4 :: T(B)=T(B)+1 !add bal
ls in bucket !111
420 DISPLAY AT(24,C-3)SIZE(3
):USING "###":T(B):: IF T(B)
<GOAL THEN 290 ELSE CALL HCH
AR(21,C,136):: IF T(B)>GOAL
THEN 460 !118
430 ! ** end ** !194
440 FOR B=1 TO 7 :: IF T(B)<
GOAL THEN 290 !190
450 NEXT B :: CALL D(8," CON
GRATS, YOU HAVE WON !!!"):::
CALL S(2,8,1):: GOTO 470 !08
8
460 CALL HCHAR(20,C,136):: C
ALL S(8,2,-1):: CALL D(8,"
BUCKET "&STR$(B)&" HAS OVERF
LOWED!")!131
470 CALL D(14,""):: CALL D(1
4,"       PLAY AGAIN? Y/N")!1
94
480 CALL KEY(0,K,S):: IF S=0
 OR(K<>89 AND K<>78)THEN 470
 ELSE IF K=78 THEN END !135
490 FOR X=1 TO 7 :: T(X)=0 :
: NEXT X :: CALL D(8,""):: C
ALL D(14,""):: GOTO 270 !069
500 !@P+ ** ud subs ** !252
510 SUB HC(R,C):: CALL HCHAR
(R,C,136):: CALL HCHAR(R,C,3
2):: SUBEND !221
520 SUB D(R,A$):: DISPLAY AT
(R,1):A$ :: SUBEND !073
530 SUB S(A,B,S):: FOR X=100
*A TO 100*B STEP 100*S :: CA
LL SOUND(80,X,0):: NEXT X ::
 SUBEND !133
```

MICROpendium has Gaskill index disks

A new set of MICROpendium index disks, more comprehensive and easier to use than the regular MICROpendium index disks, is now available through MICROpendium.

This new MICROpendium Index II, by Bill Gaskill, features search, index and query routines as well as on-line help. Data can be output to the screen or a printer.

Users may search the index for keywords in any of five fields: subject, author, article type, date or page number. Querying allows the user to search for data based on matching criteria for 2 or more fields.

The index runs out of Extended BASIC. The actual data file is in D/F80 format.

Each year's index comes on a SSSD disk. There are currently 7 disks: 1984, 1985, 1986, 1987, 1988, 1989 and 1990. Individual years may be purchased for $4 each or the entire set of 7 years may be purchased for $21. All prices include shipping and handling. The disks can be purchased with checks, money orders or Visa and MasterCard. (Include card number and expiration date when ordering with a credit card.)

Send orders to MICROpendium Index II, P.O. Box 1343, Round Rock, TX 78680. Call 512-255-1512 for credit card orders.

99 Computer Repair to fix CorComp items

According to an item in the PUG Peripheral, newsletter of the Pittsburgh User Group, all warranty and out of warranty repair of CorComp products is be-ing done as of Feb. 1 by David Lynch as an independent technician.

The item says Lynch was the lead technician with CorComp and the service technician for CorComp products since 1987.

Address is 99 Computer Repair, c/o David Lynch, 2101 W. Crescent Ave., Unit A, Anaheim, CA 92801. Phone number is (714) 539-4834.

Super XBASIC and printers

This item appeared in the newsletter of the Southern California Computer Group and appeared in a column by Woody Wilson.

If you have a Super Extended BASIC module, here is something that isnot specifically covered in the manual.

Have you ever wanted to insert a program into a newsletter article in 28-column format without having to retype it in 28-column format? I can do it easily as follows:

- Load your program into memory.
- In immediate mode, type in the following lines and press Enter after each line:

OPEN #6:"DSKn.FILENAME"
LIST "DSKn.FILENAME":28:a-b

("n" refers to drive number; a-b are the beginning and ending lines of the part of the program you want to save. Omit this if saving the entire program.)

Using a sector editor, such as DSKU, look for byte 17 of the FDR for the file. If you use a newly initialized disk with just this program on it you will find the FDR on sector 2. At byte 17 you will find the hex code 1C. This is decimal 28. Change the hex code to 50, which is decimal 80.

Now you can load and use your 28-column file. It takes less time to do it than it does to write these lines.

Additionally, an article I read by John Willforth has a tip on how to list a program to a printer in 28 columns to match the screen listing. Here it is:

In the immediate mode, enter:

```
OPEN #6:"PIO"
PRINT #6:CHR$(27);CHR$(81);CHR$(
28);
LIST "PIO"
```

If you'd like a 40-column listing, change CHR$(28) to CHR$(40).

CHR$(27);CHR$(81);CHR$(28) sets the right margin on Epson-compatible printers. For other printer types, refer to your printer manual.

MICROpendium pays $10 for items submitted by readers for publication in User Notes. If you have a tip or idea, routine or other information that may be of interest to other readers send it to MICROpendium User Notes, P.O. Box 1343, Round Rock, TX 78680.

READER TO READER

- Ray Russell, P.O. Box 211, Weatherford, TX 76086-0211, wants to know if TIW and TIA will work with Funnelweb V4.31 and information on using the Triple Tech clock with Funnelweb.

Reader to Reader is a column to put TI99/4A and Geneve 9640 users in contact with other users. Be sure to address your questions to Reader to Reader, c/o MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

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