

Speed File
For The 64
(see p. 66)

Winter CES Show Special!

April
1983

COMPUTER'S GAZETTE™

FOR COMMODORE PERSONAL COMPUTER USERS

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*=General, 64=Commodore 64, +4=Plus/4, 16=Commodore 16, 128=Commodore 128

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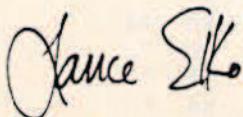
editor's notes

Our special thanks to those readers who responded to the "GAZETTE Readership Survey" in the December issue. This feedback, along with our regular reader mail, is very valuable to us. We get to know you better, and we gain a keener insight into what kind of Commodore user reads the GAZETTE and for what reasons.

While time constraints prevent us from answering all of our reader mail, we respond to selected questions in the "Reader's Feedback" column. Feedback's focus, by tradition, is mainly on programming and technical questions. Until this issue, we have not had a forum for more general reader comments. On page 6, you'll find our first "Letters To The Editor" column.

Another "first" for us is also in this issue. On pages 54-55 is the debut announcement of the GEOS Programming Contest, sponsored by Berkeley Softworks and the GAZETTE. The contest offers more than \$25,000 in cash and prizes, across 24 categories. Prizes include GEOS packages from Berkeley Softworks, Commodore peripherals, subscriptions to the GAZETTE and QuantumLink, and more. If you're a GEOS programmer, be sure to read the contest details. And start programming—the deadline is August 31.

Also in this issue is our biannual CES report (page 8). Our Features Editor, Keith Ferrell, went to the winter show in Las Vegas and has a lively story on the latest in 64 entertainment software, some of the best games to date.



Lance Elko
Editor

COMPUTE!'S GAZETTE

FOR COMMODORE PERSONAL COMPUTER USERS

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To explain this phenomenon, we need to understand that a monitor or TV creates an image by shooting a beam of electrons—called a *raster*—at the screen, scanning back and forth from top to bottom, causing the phosphors to glow. Each time a scan is made, the screen glows but quickly begins to dim. If the screen was scanned only once, it would glow for a very short time and soon become dark. In order to make a solid image, most monitors and TVs scan the screen 60 times per second so that no dimming effect is noticed. In other words, the image is refreshed before it has time to fade.

To make the road appear solid, both poles are plotted and left for almost enough time to allow one raster to draw them, then they're moved a few pixels down the screen to a new position. This happens so quickly that certain positions coincide with raster positions, and our eyes perceive a number of poles instead of just two. Though rasters can produce terrific effects when done with machine language, BASIC is too slow for raster chasing.

Another effect which enhances the illusion of motion is the scrolling of mountains in the background. Mountains can be moved by creating a string of graphics characters resembling mountains and using a statement like BASIC's MID\$ to show different slices of the panorama. 3-D Speedway uses horizontal scrolling to shift the entire screen by eighths of a character before shifting whole characters.

Horizontal scrolling is controlled by register 22 of the VIC chip, at memory location 53270. You can experiment with horizontal scrolling by typing POKE 53270,192 + n, where n is a number between 0 and 7.

See program listing on page 87. ■



Spy Defense

John Dalton

If shoot-'em-up arcade games are your weakness, this exciting action game for the 64 will provide you with a challenge that will make you come back again and again. Joystick required.

Fighting aliens is a dangerous job, as we've all seen in the movies. For some reason, aliens always have an incredible variety of weapons at their disposal: death rays; regenerating tails that detach to soar like rockets toward their enemies; or perhaps toxic, sulfuric breath. It's a wonder the humans ever win.

But this time, we have you, the official Spy Defender, to help humankind. It's a good thing you're here, too—these particular aliens have caught several of our best spies and are holding them in a prison that's sealed off by several fiery pits. Your job is to save the spies, but be careful—as always, the aliens have some surprises up their sleeves.

Getting Started

To type in "Spy Defense," you need to run "MLX," the machine language entry program found elsewhere in this issue. When prompted, enter the starting and ending addresses for Spy Defense:

Starting address: 0801
Ending address: 1740

Be sure to save the program before leaving MLX.

Although Spy Defense is written in machine language, it can be loaded, saved, and run like a BASIC program. When you're ready to play, plug a joystick into port 2, load the program, and type RUN.

Spy Defense begins with a title screen. Press f1 (or the fire button) to start, and press CTRL-C (or RUN-

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Scoring Table

White Alien	5	Constructing a Bridge Section	20
Yellow Alien	5	Completing a Bridge	200
Cyan Alien	10	Bonus: Spy Crossing Pit	750x(Pit #)
Blue Alien	25	Bonus: Spy Reaching Base	10,000
Sparkling Alien	50		

Game Progressions

Pit	Number of Aliens	Ship's piece capacity	Size of Pit	Game Speed
1	2	3	7	slow
2	2	4	9	normal
3	3	4	11	medium
4	3	5	13	advanced
5	4	5	15	quick
6	4	6	15	fast
7	4	6	15	very fast
8+	4	7	15	maniacal

STOP) to quit. These keys can also be used during play to reset or exit the game. Press the SHIFT-LOCK key to pause the game. Release it to resume.

Your Mission

It is the year 2020. Our world has undergone some dramatic changes. It is a world of intrigue and suspicion, and there looms the possibility of a hostile war. During a routine scouting mission, several of our spies were abducted. Before your mission, you discover a secret that the enemy is trying so desperately to protect. They have a new ally: aliens from outer space.

As you fly your craft over the enemy's prison camp, above the blazing fire pits that keep the spies from escaping, you consider your task: to rescue as many spies as possible.

You're flying the newest spacecraft, a Laser Striker. You've flown simulations before, but never the real thing. A Laser Striker is capable of firing deadly laser beams. For this mission, your craft has also been outfitted with a device to allow you to drop special heat-resistant ceramic bricks into the fire pits. Drop enough to make a bridge, and the spies will be able to cross the pits.

Your task would be easy if you didn't have to worry about the enemy's new ally, the aliens. The aliens try to collide with you to cause damage. Some alien ships are able to drop charges which destroy

your ceramic bricks. However, after a bridge is built and the fire is completely covered, these bombs are harmless.

At The Controls

You control your Laser Striker with your joystick. All the action is monitored on your detailed radar screen. To fire a phaser, press the trigger and press the joystick left or right. To drop a bridge piece, depress the trigger and press the joystick down. You must release the trigger in order to fire again or drop another piece.

Should you become low on bricks or be seriously damaged, dock with the supply satellites which occasionally fly across the top of the screen. Docking will give you more bricks and repair about one-quarter of your ship's damage. After a spy safely crosses a pit, your ship will receive further repair. As the game progresses, your ship's capacity to hold bricks will increase, but so will the speed and number of aliens and the size of each pit. Remember, you only have one Laser Striker—when it is destroyed, the game is over.

Helpful Hints

Following are some important game aspects you might want to consider to achieve better scores:

- In good condition, your ship's outer color will be gray. After some minor damage the color will become a flashing red. In critical situations, your ship will flash many colors.



Alien spaceships, flanking your craft, make it difficult to recover your spies.

- Since aliens always appear at the top or the sides of the radar screen, try to stay away from these edges.
 - A supply satellite will come by only after you shoot a certain number of aliens.
 - Colliding with an alien will cause nearby aliens to be destroyed. A quick collision will give you some time to build your bridge before more aliens arrive.
 - Use the time while the spy is crossing the bridge to shoot aliens. This will cause a new satellite to appear. Dock with it for a fresh supply of bricks for the next pit.
- See program listing on page 84.*

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```

-- ENTER _COMMAND{DOWN}
":GOTO390
RM 850 S%:128:INPUT{DOWN}FILL
STYLE (0-127)";S%
HH 860 IF((S%<0)OR(S%>127))THE
NPRINT{CLR}{DOWN}FILL
[SPACE]ABORTED -- ENTER
COMMAND{DOWN}":GOTO390
EG 870 @2:@6,X%,Y%:@9,X%,Y%,S%
:GOTO50
EM 880 IF(C$="U")THEN C$=CHR$(1
42):@10,0,0,C$:@2:GOTO1
10
AM 890 IF(C$="L")THEN C$=CHR$(1
4):@10,0,0,C$:@2:GOTO11
0
QK 900 IF(C$="N")THEN C$=CHR$(1
46):@10,0,0,C$:@2:GOTO1
10
SG 910 IF(C$="R")THEN C$=CHR$(1
8):@10,0,0,C$:@2:GOTO11
0
PM 920 IF(C$="C")THEN @3:@2:GOT
O110
DC 930 PRINT" {RVS}{14 SPACES}Q
UIT OPTIONS{14 SPACES}
{OFF}"
PX 940 PRINT" J -> RETURN TO J
OY"
HX 950 PRINT" B -> GO TO BASIC
"
XB 960 PRINT" {DOWN}{RVS}ENTER
{SPACE}QUIT OPTION:
{OFF}"
PD 970 GETCS:IF(C$=="")GOTO970
HG 980 IF(C$=="J")THEN @2:GOTO11
0
CS 990 IF(C$=="B")THEN @C2%,X%,Y
%:PRINT" {CLR}{TAB}":@1:
PRINTCHR$(142);CHR$(9):
END
MC 1000 PRINT" {CLR}{DOWN}QUIT
{SPACE}ABORTED -- ENTE
R COMMAND{DOWN}":GOTO3
90

```

BEFORE TYPING . . .

Before typing in programs, please refer to "How to Type In COMPUTE!'s GAZETTE Programs," elsewhere in this issue.

Spy Defense

See program listing on page 24 before typing in.

```

0801:D0 08 12 0E 9E 20 32 30 C6
0809:36 33 11 00 00 00 20 0B 6E
0811:0B 20 12 0A 20 A6 08 20 5D
0819:64 08 F0 F5 20 D8 0D 20 79
0821:41 0D 20 9E 0C 20 62 0E B6
0829:20 3E 10 20 2B 11 20 30 EA
0831:0F 20 F8 0C 20 3C 08 F0 A3
0839:D5 D0 DC AC 09 D0 C0 DC B8
0841:90 4E A9 8F A0 13 A2 07 F8
0849:20 2B 13 A9 1F 8D 12 05 89
0851:A2 FF 0E 0E 05 AD 15 D0 2F
0859:29 EF 8D 15 D0 20 22 13 58
0861:4C 22 13 A6 FE A0 0A AD 29
0869:2B D0 4A B0 02 A0 09 E0 1D
0871:42 90 04 20 C8 0B A8 E0 ED
0879:28 B0 02 A0 0B 8C 2B D0 C5
0881:20 E4 FF C9 03 F0 0A AC 14
0889:8D 02 C0 01 F0 D5 C9 85 01
0891:60 78 A9 31 8D 14 03 A9 A4
0899:EA 8D 15 03 58 A9 04 8D 54
08A1:88 02 68 68 00 A2 00 E8 7D
08A9:E0 04 B0 0A BD BC 04 C9 94
08B1:03 F0 F4 FE BC 04 A5 27 76
08B9:C9 0B B0 04 C6 A9 C6 A9 DB
08C1:A2 09 BD C5 15 9D 25 D0 B3
08C9:BD CF 15 9D F8 87 CA 10 B4
08D1:F1 A9 90 8D 15 D0 A9 10 7F
08D9:8D 1C D0 8D 17 D0 8D 1D DE
08E1:D0 A9 A8 8D 08 D0 A9 6A F2
08E9:8D 09 D0 A9 19 8D 0E D0 A3
08F1:A9 CC 8D 0F D0 18 20 1B EE
08F9:0F A9 00 88 10 D0 A8 2A 8C
0901:03 99 B4 04 96 F7 99 AA 44
0909:00 C8 C0 04 D0 F3 20 1C 58
0911:14 CA 8A 4A 69 03 85 B5 ED
0919:A5 27 C9 08 08 29 07 AA 1F
0921:A9 00 28 B0 03 BD DE 16 FA
0929:8D 20 D0 BD EE 16 8D 23 0E
0931:D0 BD E6 16 8D 21 D0 AD 99
0939:20 D0 8D 22 D0 A9 0F 8D 3C
0941:24 D0 20 40 0B A9 84 85 2F
0949:A5 A9 28 85 A4 AA A9 60 79
0951:18 20 D4 09 AD 23 D0 85 C3
0959:26 A9 87 85 A5 A9 20 85 CB
0961:A4 27 C9 05 90 02 A9 C8
0969:05 0A 85 AE A9 10 E5 AE 24
0971:8D 00 04 A8 A2 17 18 20 17
0979:F0 FF A5 AE 18 69 05 85 99
0981:02 85 BF A9 DA A0 16 20 2E
0989:D0 0B C6 02 D0 F5 A9 0D 7E
0991:38 E5 AE 85 AE A8 C8 C8 D9
0999:A6 AE A9 1C 18 20 D4 09 95
09A1:A5 AE 0A 85 AF A5 A4 18 41
09A9:69 28 38 E5 AF C5 A4 B0 6E
09B1:02 E6 A5 85 A4 A6 AE A9 52
09B9:1C 18 20 D4 09 C4 AE 90 7A
09C1:09 F0 04 E6 AE D0 D1 88 68
09C9:D0 CE A9 00 85 26 A2 28 5F
09D1:A9 1C 18 08 84 B1 86 AE E9
09D9:A0 28 B0 02 A0 01 8C 79 18
09E1:05 48 20 FC 09 A5 A4 18 9C
09E9:6D 79 05 85 A4 90 02 E6 5C
09F1:A5 68 CA D8 EC A4 B1 A6 5B
09F9:AE 28 60 48 A0 00 91 A4 CA
0A01:A5 48 18 69 54 85 A5 29
0A09:A5 26 91 A4 68 85 A5 68 03
0A11:60 A9 3F 8D 02 DD A9 C5 21
0A19:8D 00 DD A9 84 8D 88 02 B7
0A21:A9 99 85 A4 A9 14 85 A5 B9
0A29:A9 00 85 AE A9 B2 85 AF 80
0A31:A0 00 B1 A4 C9 ED F0 23 21
0A39:A2 00 C9 E7 D0 03 8A A2 A0
0A41:07 C9 EF D0 03 8A A2 0F EC
0A49:E6 A4 D0 02 E6 A5 91 AE D3
0A51:E6 AE D0 02 E6 AF CA 10 5A
0A59:F5 30 D7 A0 00 8C 0E DC A4
0A61:A9 33 85 01 84 A4 84 49 E0
0A69:A9 D0 85 A5 A9 B0 85 A4 F6
0A71:B1 A4 91 49 C8 D0 F9 E6 B2
0A79:A5 E6 4A A5 A5 C9 D2 D0 88
0A81:EF A9 37 85 01 A9 01 8D 75
0A89:0E DC 20 DE 0A A9 1D 8D 8C
0A91:18 D0 A9 5B 8D 11 D0 A9 CC
0A99:00 85 FB 85 FC 85 FD 85 66
0AA1:FE 8D BE 04 8D BF 04 A0 C4
0AA9:18 99 00 D4 88 10 FA A9 A1
0AB1:0F 8D 18 D4 A9 01 85 27 84
0AB9:8D BC 04 8D BD 04 A9 2C 9A
0AC1:85 A9 A9 03 85 A7 A9 05 8B
0AC9:8D 33 17 78 A9 25 8D 14 EC
0AD1:03 A9 14 8D 15 03 58 A9 3C
0AD9:04 8D 19 D0 60 A0 07 99 C0
0AE1:FF AA 99 40 B1 48 8A 99 35
0AE9:48 B1 0A AA 68 4A 88 10 08
0AF1:F1 A0 07 A9 FF 99 E0 B0 7B
0AF9:C0 02 90 02 A9 00 99 F8 9A
0B01:B0 A9 18 99 58 B1 88 10 21
0B09:EA 60 A9 01 8D 21 D0 A9 2E
0B11:00 8D 20 D0 A9 1B 8D 11 81
0B19:D0 A9 15 8D 18 D0 A9 00 D4
0B21:8D 15 D0 20 40 0B A2 04 D6
0B29:A0 0E 18 20 F0 FF A9 D7 CA
0B31:A0 15 20 D0 0B 20 64 08 97
0B39:F0 05 20 3A 0D D0 F6 A9 F3
0B41:2A A0 16 20 D0 0B A2 0F 60
0B49:8A 48 A9 66 A0 16 20 D0 C0
0B51:0B 68 4A 90 0D 48 A0 02 26
0B59:B9 FB 00 20 A8 0B 88 10 DE
0B61:F7 68 4A 90 1C 48 A0 14 37
0B69:A2 00 18 20 F0 FF A6 FE A9
0B71:E0 64 90 04 A2 64 D0 05 B0
0B79:A9 30 20 D2 FF 20 BA 0B A2
0B81:68 4A 90 0F 48 A0 1D A2 03
0B89:00 18 20 F0 FF A6 27 20 C1
0B91:BA 0B 68 4A 90 38 A0 27 47
0B99:A2 00 18 20 F0 FF A5 A7 80
0BA1:29 0F 09 30 4C D2 FF 48 2A
0BA9:4A 4A 4A 4A 09 30 20 D2 81
0BB1:FF 68 29 0F 09 30 4C D2 6C
0BB9:FE E0 0A B0 05 A9 30 20 A3
0BC1:D2 FF A9 00 4C CD BD A5 31
0BC9:A2 49 FF 4D 12 D0 60 85 72
0BD1:49 84 4A A0 00 B1 49 F0 4B
0BD9:06 20 D2 FF C8 D0 F6 60 2D
0BE1:A9 84 85 A5 BD F7 0F 2D 12
0BE9:10 D0 F0 02 A9 20 48 8A 63
0BF1:0A AA BC 01 D0 BD 00 D0 AD
0BF9:4A 4A 4A 85 A6 E0 08 F0 23
0C01:84 C6 A6 C6 A6 68 18 65 7A
0C09:A6 85 A4 98 38 E9 1F 4A E5
0C11:4A 04 AA A5 A4 18 69 28 11
0C19:85 A4 90 02 E6 A5 CA D0 83
0C21:F2 60 48 AD 10 D0 25 B1 6E
0C29:85 02 68 4A B0 01 88 4A 1B
0C31:B0 01 C8 4A B0 23 48 A5 E7
0C39:02 D0 14 A5 B1 C9 20 B0 09
0C41:04 A9 19 D0 02 A9 0A 85 46
0C49:AE E6 AE E4 AE 9E 00 89 CA 2B
0C51:0E FF D0 04 A9 80 85 02 8E
0C59:68 4A B0 1F A5 02 F0 14 6B
0C61:A5 B1 C9 20 B0 04 A9 27 04
0C69:D0 02 A9 5A 85 AE E6 AE A8
0C71:E4 AE B0 07 E8 D0 04 A5 66
0C79:B1 85 02 A5 B1 C9 10 D0 0C
0C81:09 46 41 B0 05 C8 A5 40 B9
0C89:85 41 C0 41 B0 02 A0 41 F0
0C91:A5 B1 49 FF 2D 10 D0 05 62
0C99:02 8D 10 D0 60 20 3A 0D 2A
0CA1:F0 04 A9 80 85 B0 A5 7A 4A
0CA9:2A 90 10 A9 9F A2 04 20 47
0CB1:3D 12 90 06 A5 A7 29 7F FC
0CB9:85 A7 60 98 29 1F C9 0D 7A
0CC1:D0 F8 A5 B0 D0 F4 A5 A7 8D
0CC9:A8 29 0F D0 11 AD 15 05 DD
0CD1:10 E8 A9 6F A0 13 A2 0E FC
0CD9:86 B0 20 2B 13 60 A5 AC 2A
0CE1:3D D8 98 09 80 85 A7 C6 1C
0CE9:A7 A2 08 86 B0 20 49 0B 88
0CF1:99 F0 A2 04 4C 21 12 A2 09
0CF9:03 B5 F7 D0 16 A9 2B 20 DA
0D01:3D 12 90 25 A5 27 C9 0B 0B
0D09:90 02 A9 0A 0A 49 1F 95 0B
0D11:F7 D0 16 BD B0 04 C9 03 46
0D19:D0 0F A5 A8 C9 02 B0 09 5F
0D21:D6 F7 D0 05 A9 2B 20 21 6A
0D29:12 A9 00 A0 0C C4 27 2A AC
0D31:8D 36 0D CA E0 01 D0 C1 5C
0D39:60 AD 00 DC A8 29 10 60 27
0D41:A9 40 85 B1 AD 15 D0 29 98
0D49:40 F0 24 E6 A3 A5 A3 29 D6
0D51:07 C9 04 B0 19 AE 0C D0 59
0D59:A5 BC 20 23 0C EC 0C D0 A8
0D61:F0 04 8E 0C D0 60 AD 15 FF
0D69:D0 29 BF 8D 15 D0 60 20 D3
0D71:3A 0D D0 FA A5 B0 D0 F6 3E
0D79:A2 0B 98 4A 4A 90 05 01
0D81:A7 02 07 4A B0 E9 86 BC 86 6C
0D89:B0 A9 4F A0 13 A2 00 20 9D
0D91:2B 13 AD 10 D0 29 10 F0 F8
0D99:02 A9 40 85 02 A6 BC E0 84
0DA1:0B F0 23 AD 08 D0 18 69 D9
0DA9:33 8D 0C D0 90 04 A9 40 77
0DB1:85 02 AD 09 D0 18 69 07 16
0DB9:8D 0D D0 AD 15 D0 09 40 11
0DC1:8D 15 D0 4C 91 0C AD 08 E6
0DC9:D0 38 E9 12 8D 0C D0 B0 A7
0DD1:E1 A9 00 85 02 F0 DB A2 CD
0DE9:0C A5 27 C9 07 90 02 A2 06
0DE1:0A E6 42 E4 42 B0 59 A9 82
0DE9:00 85 42 AA A9 10 85 B1 A2

```

DF1:A9 B9 85 A6 A9 FF A4 FE FF	1099:4C 2A 10 AD 10 D0 48 29 C4	1341:A9 05 8D 4A 13 B1 A4 99 16
DF9:C0 64 08 90 16 A9 87 A0 9E	10A1:10 85 A6 68 25 B1 F0 02 5A	1349:57 04 88 10 ED 60 21 09 6A
E01:13 A2 07 20 2B 13 A9 FF 2B	10A9:A9 10 C5 A6 D0 09 A0 00 B1	1351:10 07 FA 16 20 FF 81 19 1F
E09:85 A6 4D 2B D0 8D 26 D0 C7	10B1:A5 4A CD 08 D0 06 A0 68	1359:39 00 F7 0E 80 00 11 0B 2D
E11:A9 03 AA 85 40 86 02 AD 3E	10B9:04 90 02 A0 08 84 A6 A0 8A	1361:07 1E 11 17 10 FF 41 09 32
E19:00 DC 05 02 AE 08 D0 AC 11	10C1:01 A5 49 CD 09 D0 90 06 84	1369:07 07 09 17 40 3F 21 00 A8
E21:09 D0 20 23 0C 28 90 0C 5A	10C9:C9 42 90 02 A0 02 98 05 D4	1371:16 03 2F 17 20 FF 17 18 02
E29:E0 00 F0 08 E0 FF F0 04 41	10D1:A6 9D B8 04 20 C8 0B 29 67	1379:35 09 34 17 10 FF 41 09 80
E31:98 4A 90 03 8E 08 D0 C4 69	10D9:1F 09 10 9D B4 04 60 85 A3	1381:07 0E 02 17 40 3F 11 00 81
E39:A6 90 02 A0 B9 8C 09 D0 F9	10E1:02 20 C8 0B C9 41 90 F9 43	1389:A6 00 09 D0 10 FE 81 09 B9
E41:60 86 39 84 3A 78 F8 18 5C	10E9:C5 02 B0 F5 A8 29 40 D0 1E	1391:19 16 11 17 80 FF A9 0B BF
E49:A5 FB 65 39 85 FB A5 FC DB	10F1:0A 84 4A A9 41 85 49 A0 6F	1399:8D 21 D0 A9 0C 8D 20 D0 2B
E51:65 3A 85 FC A5 FD 69 00 27	10F9:0D D0 0C 98 85 49 4A 90 56	13A1:A9 87 85 A5 A9 20 85 A4 07
E59:85 FD D8 58 A2 01 4C 49 53	1101:12 A9 19 85 4A A0 06 A5 98	13A9:A9 80 8D 15 D0 49 FF 8D 01
E61:0B A9 20 85 B1 A5 A9 A4 E5	1109:B1 49 FF 2D 10 D0 8D 10 18	13B1:10 D0 A9 12 85 A6 85 AF EB
E69:AA F0 48 30 01 4A E6 3F 61	1111:D0 00 0E A9 4B 85 4A A5 D6	13B9:A9 00 85 26 85 B5 A6 A6 BE
E71:38 E9 0A C5 3F B0 3B A9 9E	1119:B1 0D 10 D0 8D 10 D0 A0 55	13C1:A9 1C 18 20 D4 09 A2 04 DC
E79:00 85 3F AD 0A D0 AA 29 CB	1121:0A A5 B1 0D 15 D0 8D 15 D4	13C9:A9 20 18 20 D4 09 A6 AF 99
E81:03 D0 08 AD FD 87 49 01 D0	1129:D0 60 A5 AB A8 29 40 F0 96	13D1:A9 1C 18 20 D4 09 E6 A6 18
E89:8D FD 87 AC 0B D0 A5 AA 39	1131:47 98 29 B9 85 AB AD 15 89	13D9:CA 86 AF E0 0D D0 DF A2 19
E91:20 23 0C EC 0A D0 F0 16 62	1139:D0 29 40 F0 3B A2 03 86 16	13E1:14 A0 12 18 20 F0 FF A9 6C
E99:8E 0A D0 8C 0B D0 C0 41 C0	1141:B8 98 3D F7 0F F0 2C 8A 2C	13E9:70 A0 16 20 D0 0B A2 19 46
EA1:F0 04 C0 64 D0 0C A5 AA 42	1149:0A AA AD 0D D0 38 FD 01 06	13F1:8E 0E D0 A0 71 88 D0 FD 54
EA9:49 03 85 AA D0 04 A9 00 70	1151:D0 10 02 49 FF C9 0D B0 A6	13F9:20 53 0F AC 0F D0 C0 FE ED
EB1:85 AA 60 20 1C 14 8A 18 A7	1159:1A AD 0C D0 38 FD 00 D0 0D	1401:D0 F1 A0 59 A2 50 20 42 90
EB9:69 06 C5 AD B0 1B A9 64 49	1161:10 02 49 FF C9 11 B0 0B 34	1409:0E A0 40 A2 50 8E 33 17 CC
EC1:20 E0 10 98 09 80 85 AA B1	1169:A6 B8 BD F7 0F 28 C9 11 E1	1411:20 42 0E A9 00 20 E6 0F 93
EC9:A5 49 8D 0B D0 A5 4A 8D AC	1171:20 67 0D A6 B8 CA 10 C7 62	1419:4C 22 13 A6 27 E0 08 90 1A
ED1:0A D0 A9 00 85 AD 8D 2C 86	1179:A5 AB A8 29 10 F0 0C 98 F5	1421:02 A2 08 60 AD 1E D0 CD 4F
ED9:D0 60 A5 AB 29 DF 85 AB 65	1181:29 EF 85 AB 29 20 F0 04 4F	1429:78 05 F0 05 85 AB 8D 78 AB
EE1:A5 AA 10 F5 29 7F 85 AA D9	1189:20 DB 0E 60 98 29 0F F0 F2	1431:05 A5 B5 F0 2B A9 98 18 54
EE9:EE 2C D0 A9 5F A0 13 A2 83	1191:FA AD 15 D0 29 0F F0 F3 A7	1439:6D 00 04 85 3D A9 DB 85 BE
EF1:0E 20 2B 13 20 1C 14 8A D7	1199:20 C8 0B C9 1A B0 F9 C9 4D	1441:3E A5 BF 0A A8 88 20 C8 FA
EF9:4A 85 02 E6 02 A5 29 6A	11A1:0A 90 F5 18 65 FE 85 FE 5E	1449:0B 29 03 AA BD F6 16 91 D3
F01:80 85 B1 20 C8 0B 29 07 C4	11A9:2A 02 20 49 0B A9 0F A2 F5	1451:3D E0 02 D0 08 AD FC 87 16
F09:C5 02 90 F7 18 65 A7 C5 87	11B1:04 20 C9 11 AD 09 D0 69 C4	1459:49 01 8D FC 87 88 10 E6 4D
F11:B5 90 02 A5 B5 05 B1 85 73	11B9:08 8D 09 D0 A2 03 A9 00 E5	1461:A9 0E AA BD 07 05 30 1E DD
F19:A7 38 A5 F4 48 90 01 4A 8E	11C1:9D B4 04 CA 10 FA 30 C3 9D	1469:8A BD 08 05 85 3D BD 09 4C
F21:4A 85 02 68 38 E5 02 85 6F	11C9:85 B1 86 AE 84 AF AD 0E 23	1471:05 85 3E B1 3D 3D 0B 05 5A
F29:FE A2 0A 20 49 0B 60 A5 8F	11D1:05 10 21 20 C8 0B 8D 5B 89	1479:9D 01 D4 DE 07 05 10 06 AB
F31:AC 30 1F C5 BF D0 F7 A9 CC	11D9:13 A0 0F C4 B1 F0 02 A0 D1	1481:BD 0A 05 9D 04 D4 8A 38 46
F39:7F A0 13 A2 0E 20 2B 13 26	11E1:07 98 8D 5E 13 0A 8D 5A 7B	1489:E9 07 10 D6 A5 27 C9 09 3E
F41:A5 AC 09 88 05 AC A9 08 B8	11E9:13 A9 57 A0 13 A2 07 20 46	1491:90 03 EE 27 D0 4C 31 EA 18
F49:8D 24 D0 A0 02 A2 00 20 16	11F1:2B 13 A6 AE 09 FF 38 E5 D1	1499:30 E0 00 78 30 00 F8 F8 06
F51:42 0E E6 B9 A5 B9 29 1F 12	11F9:B1 48 2D 15 D0 8D 15 D0 B5	14A1:00 BF F8 00 30 70 00 24 40
F59:D0 D4 AD 1F D0 29 80 48 31	1201:68 25 AB 85 AB A9 00 9D 12	14A9:20 00 21 20 00 70 60 00 8A
F61:AC 0E D0 AE 0E D0 AD 10 BD	1209:B4 04 E6 AD A5 B1 C9 0F D6	14B1:FF E8 00 F8 F8 00 60 F0 1D
F69:D0 29 80 D0 04 E0 F1 90 6F	1211:00 09 A0 00 BD 33 17 AA 97	14B9:00 38 60 00 00 00 00 00 FB
F71:2B 68 F0 03 88 D0 1E E0 32	1219:20 42 0E 6E AE 04 AF 60 D1	14C1:E7 EF 1F 80 00 07 C0 00 63
F79:57 F0 27 E8 D0 08 AD 10 05	1221:48 86 B8 20 E1 0B A6 B8 65	14C9:07 80 00 48 48 00 F0 38 76
F81:D0 09 80 8D 10 D0 8A AE BA	1229:A5 A4 9D 46 05 A5 A5 9D 09	14D1:00 F1 38 00 E4 78 00 E0 67
F89:FF 87 E8 D0 D2 D6 G2 A2 35	1231:4B 05 BD C7 15 85 26 68 E3	14D9:78 00 90 90 00 0F 00 00 95
F91:CF 8E FF 87 AA 8E GE D0 30	1239:20 FC 09 60 85 02 86 B8 CD	14E1:1F 00 00 0F C0 00 00 00 98
F99:8C 0F D0 60 68 D0 DC C8 EA	1241:FE 50 05 BD 50 05 29 3F 9D	14E9:00 00 E7 EF 80 04 00 00 70 92
FA1:D0 F3 A2 03 B5 F7 08 9F	1249:C9 3F D0 33 FE 50 05 BD 70	14F1:38 00 60 18 00 5F E8 00 13
FA9:CA 10 F9 A9 00 8D 15 D0 3C	1251:46 05 85 A4 BD 4B 05 85 7F	14F9:16 20 00 14 A0 00 11 A0 3E
FB1:A9 55 A0 16 20 D0 G5 A5 6F	1259:A5 A9 20 A2 01 38 20 D4 E6	1501:00 05 F8 00 60 18 00 70 F3
FB9:27 85 02 85 B1 A2 F0 20 7F	1261:09 A0 00 B1 A4 C9 20 D0 AA	1509:38 00 80 04 EF EF 90 24 24
FC1:22 13 A0 07 A2 50 20 42 13	1269:18 A6 B8 BD C7 15 85 26 F9	1511:00 60 18 00 50 18 00 9F 59
FC9:0E A5 B1 18 69 05 85 B1 2C	1271:A5 02 20 FC 09 A5 A4 9D 82	1519:E4 00 16 20 00 14 A0 00 0C
FD1:20 E6 0F C6 02 D0 E5 A5 CE	1279:46 05 A5 A5 9D 4B 05 18 4D	1521:11 A0 00 9F E4 00 60 18 F5
FD9:27 29 07 D0 03 20 97 13 9E	1281:60 C9 1C F0 22 C9 2B F0 5A	1529:00 60 18 00 98 24 EF EF 53
FE1:E6 27 4C A6 08 8D 0F D4 9A	1289:E0 C9 F0 DC C9 DF F0 52	1531:00 00 00 00 28 00 00 BE SB
FE9:A9 77 A0 13 A2 00 20 2B 80	1291:1A 48 20 BD 12 68 C9 80 FA	1539:00 0A C3 A0 6F FF F9 0B E2
FF1:13 A2 F0 4C 22 13 01 02 86	1299:B0 0D E0 04 D0 09 E6 AC DA	1541:33 20 02 AA 80 00 55 00 A6
FF9:04 08 10 DE B4 04 D0 03 66	12A1:A0 00 A2 20 20 42 0E A6 39	1549:EF EF E7 00 28 00 00 28 CD
001:20 9C 10 BD B4 04 4A 90 11	12A9:B8 38 60 A5 02 C9 2B D0 FC	1551:00 00 BE 00 0A C3 A0 6F 63
009:08 BD F8 87 49 01 9D F8 B6	12B1:F6 AD 24 D0 29 0F F0 EF A5	1559:FF F9 08 CC E0 02 AA 80 B4
011:87 BD B8 04 86 B8 A6 4A 6A	12B9:C6 AC 10 AD 48 A6 B8 E0 78	1561:00 55 00 EF EF E7 88 88 98
019:A4 49 20 23 0C 86 4A C0 E3	12C1:04 90 0E A9 67 A0 13 A2 EE	1569:00 55 54 00 22 22 EF EF DC
021:B9 90 02 A0 B9 84 49 A6 A5	12C9:0E 8E 11 D4 20 2B 13 A6 82	1571:EF E7 18 00 00 10 00 00 D0
029:B8 8A 48 0A AA 5A 4A 9D 10	12D1:B8 68 C9 40 90 0D 48 A9 9C	1579:74 00 00 52 00 00 18 00 33
031:00 D0 A5 49 9D 01 D0 68 C9	12D9:8F A0 13 A2 07 20 2B 13 9C	1581:00 2C 00 00 64 00 00 00 D9
039:AA CA 10 0F 60 E6 A8 A5 E9	12E1:A6 B8 68 29 3F C9 29 D0 6B	1589:00 00 EF EF E7 18 00 00 50
041:A8 C5 A9 D0 F7 A9 00 85 55	12E9:03 DE 46 05 BD 46 05 85 F6	1591:10 00 00 74 00 00 12 00 2F
049:A8 A2 03 BD F7 0F 85 B1 5B	12F1:A4 BD 4B 05 85 A5 AD 23 D2	1599:00 B0 00 00 68 00 00 00 0C 3F
051:8A 0A AA 85 A6 BC 00 D0 DF	12F9:D0 85 26 A5 02 A0 DF C9 23	15A1:00 00 00 00 00 EF EF E7 53
059:84 4A BC 01 D0 84 49 4A 6B	1301:9F F0 02 A0 20 18 A2 02 26	15A9:18 00 00 10 00 00 38 00 51
061:AA BD B4 04 D0 95 BD BC 32	1309:98 20 D4 09 A0 26 A2 E8 7A	15B1:00 58 00 00 34 00 00 00 30 C3
069:04 F0 CE C9 03 F0 11 DE 1B	1311:C9 DF F0 02 A2 28 8A 91 AE	15B9:00 00 38 00 00 00 00 00 EA
071:B0 04 D0 C5 A9 30 A4 B1 6A	1319:A4 E8 8A 91 A4 A6 B8 B2	15C1:EF EF E7 ED 01 00 01 07 CC
079:C0 03 90 01 0A 9D B0 04 09	1321:60 A0 00 88 D0 FD CA D0 0D	15C9:03 06 0B 00 02 00 C8 C8 C2
081:A9 00 A4 A6 99 00 D0 99 7D	1329:F8 60 85 A4 84 A5 86 A6 4D	15D1:C8 C8 CC CA CE CF 8E 08 B3
089:01 D0 A9 B9 20 E0 10 98 6C	1331:A9 04 18 65 A6 8D 49 13 97	15D9:90 92 53 50 59 20 44 45 79
091:09 01 9D B8 04 9D B4 04 B9	1339:A0 07 A9 D4 C0 03 90 02 29	15E1:46 45 4E 53 45 11 11 9D AD

```

15E9:9D 9D 9D 9D 9D 9D DD 11 08
15F1:9D 9D C0 DB C0 C9 11 9D 15
15F9:9D 9D BE AD C0 BD 0D F2
1601:11 11 11 11 20 20 20 96
1609:20 20 28 46 31 29 20 3D 62
1611:20 53 54 41 52 54 20 20 05
1619:20 20 20 43 54 52 4C 2D 47
1621:43 20 3D 20 53 54 4F 50 7B
1629:00 90 93 12 53 43 4F 52 A5
1631:45 3A 30 30 30 30 30 6A
1639:20 44 41 4D 41 47 45 3A 6F
1641:30 30 30 25 20 50 49 54 13
1649:23 30 31 20 50 49 45 43 B0
1651:45 53 3A 00 13 11 92 05 43
1659:1D 1D 1D 1D 1D C2 2B
1661:CF CE D5 D3 00 13 12 90 22
1669:1D 1D 1D 1D 00 90 CE
1671:92 29 11 29 11 29 11 29 5E
1679:11 29 91 91 91 9D 9D 6F
1681:97 A9 11 A9 11 A9 11 A9 9B
1689:11 A9 13 11 11 11 11 11 1C
1691:1D 1D 9F 43 4F 4E 47 52 50
1699:41 54 55 4C 41 54 49 4F 28
16A1:4E 53 2C 20 59 4F 55 27 2B
16A9:56 45 20 53 41 56 45 44 BD
16B1:20 54 48 45 20 53 50 59 A8
16B9:0D 11 11 1D 1D 9A 50 87
16C1:52 45 50 41 52 45 20 54 C2
16C9:4F 20 44 45 46 45 4E 44 AA
16D1:20 41 4E 4F 54 48 45 52 BD
16D9:00 92 28 29 00 00 04 06 50
16E1:0E 07 0D 06 02 05 0E 0E 27
16E9:04 05 0C 0A 06 02 01 E7
16F1:0D 0C 0A 08 04 02 07 08 A7
16F9:09 0F 18 23 28 29 3E 50 56
1701:69 2C 26 20 1D 19 16 14 43
1709:17 1B 1E 21 37 20 12 02 BF
1711:3L 2E 2D 2B 29 27 25 21 0D
1719:1E 1B 17 14 11 0D 09 04 14
1721:01 00 00 00 00 00 00 09 D8
1729:0C 0E 11 15 18 1B A0 A6 69
1731:AD B4 05 05 10 25 96 87 1E
1739:6E 50 32 0A 0D 00 00 00 02

```

BEFORE TYPING...

Before typing in programs, please refer to "How to Type In COMPUTE!'s GAZETTE Programs," elsewhere in this issue.

Smart VAL

Article on page 74.

```

XQ 100 REM COPYRIGHT 1988 COMPUTE! PUBLICATIONS, INC.
- ALL RIGHTS RESERVED
XM 110 PRINT CHR$(147)"(BLK)
{3 SPACES}COPYRIGHT 1988 COMPUTE! PUB., INC."
KK 120 PRINT TAB(11)"ALL RIGHTS RESERVED"
QK 130 GOSUB 1000
RE 140 PRINT CHR$(147)"SMART VAL() INSTALLED.":END
FK 1000 REM READ AND STORE MACHINE CODE
XB 1010 SA=49152:REM STARTING {SPACE}ADDRESS
CG 1020 H1=INT((SA+13)/256):L1
=(SA+13)-H1*256
JS 1030 H2=INT((SA+150)/256):L2
=(SA+150)-H2*256:CS=0
KB 1040 FOR AD=SA TO SA+206:RE
AD ML:CS=CS+ML:POKE AD
,ML:NEXT
QK 1050 IF CS<>23175 THEN PRIN
T CHR$(147) "*** ERROR
{SPACE}IN DATA STATEME

```

```

NTS ****":END
ME 1060 POKE SA+5,L1:POKE SA+9
,H1:POKE SA+133,L2:POKE
E SA+138,H2:REM RELOCA
TE ML
SF 1070 SYS 49152
XF 1080 RETURN
KJ 1090 DATA 169,076,133,124,1
69,013,133,125
EP 1100 DATA 169,192,133,126,0
96,141,255,003
HC 1110 DATA 104,141,252,003,1
04,141,253,003
MQ 1120 DATA 072,173,252,003,0
72,201,217,208
SJ 1130 DATA 007,173,253,003,2
01,183,240,011
PX 1140 DATA 173,255,003,201,0
58,176,003,076
HK 1150 DATA 128,000,096,104,1
69,220,072,186
SR 1160 DATA 142,254,003,165,1
13,141,248,003
MX 1170 DATA 165,114,141,249,0
03,162,079,189
BA 1180 DATA 000,002,157,167,0
03,202,016,247
CE 1190 DATA 056,165,036,229,1
22,168,162,023
CP 1200 DATA 201,081,176,073,1
69,000,141,013
XQ 1210 DATA 003,153,000,002,1
36,177,122,153
GA 1220 DATA 000,002,136,016,2
48,169,000,133
RM 1230 DATA 122,169,002,133,1
23,032,121,165
SC 1240 DATA 173,000,003,141,2
50,003,173,001
XQ 1250 DATA 003,141,251,003,1
69,150,141,000
CB 1260 DATA 003,169,192,141,0
01,003,032,115
JB 1270 DATA 000,032,138,173,1
62,000,173,250
MP 1280 DATA 003,141,000,003,1
73,251,003,141
BA 1290 DATA 001,003,173,013,0
03,138,141,013
AQ 1300 DATA 003,240,006,169,0
00,133,097,133
XP 1310 DATA 102,173,248,003,1
33,113,173,249
RK 1320 DATA 003,133,114,162,0
79,189,167,003
KD 1330 DATA 157,000,002,202,0
16,247,169,000
SJ 1340 DATA 133,013,174,254,0
03,154,096,000

```

Four For The 64

Article on page 78.

Program 1: Calculated GOTO Demo

```

FH 5 REM COPYRIGHT 1988 COMPUTE! PUBLICATIONS, INC.
- ALL RIGHTS RESERVED.
GC 10 PRINT"(CLR){5 DOWN}
{13 RIGHT}COPYRIGHT 1988 "
DS 12 PRINT"{7 RIGHT}COMPUTE!
{SPACE}PUBLICATIONS, INC .
SE 14 PRINT"{10 RIGHT}ALL RIGHTS RESERVED."
CD 16 FOR X=1 TO 2000:NEXT:PRINT"(CLR)"
QX 20 POKE 53281,14:PRINT CHR$(147):POKE 53281,6:SYS 5
7812 "SCREEN",8,1:POKE 7
80,0
HS 30 SYS 65493:OPEN 15,8,15:I
NPUT#15,E:CLOSE 15:SYS 6
5487
SD 40 OPEN15,8,15,"S0:SCREEN":

```

```

RA 20 FOR GL=50 TO 90 STEP 10
KH 30 POKE 785,188:POKE 786,16
8:SYS 47083(GL),USR(0)
DB 40 NEXT GL:LIST
FX 50 PRINT "LINE 50":GOTO 40
QJ 60 PRINT "LINE 60":GOTO 40
PM 70 PRINT "LINE 70":GOTO 40
FE 80 PRINT "LINE 80":GOTO 40
HG 90 PRINT "FINALLY, LINE 90"
:GOTO 40

```

Program 2: Selective RESTORE Demo

```

FH 5 REM COPYRIGHT 1988
{2 SPACES}COMPUTE! PUBLICATIONS, INC.{2 SPACES}ALL
RIGHTS RESERVED.
AF 10 PRINT"(CLR){5 DOWN}
{13 RIGHT}COPYRIGHT 1988
HP 12 PRINT"{7 RIGHT}COMPUTE!
{SPACE}PUBLICATIONS, INC .
SE 14 PRINT"{10 RIGHT}ALL RIGHTS RESERVED."
BD 15 FOR X=1 TO 2000:NEXT:PRINT"(CLR)"
SX 20 PRINT CHR$(147):PRINT "READING DATA IN ASCENDING
ORDER...";
KD 30 FOR RL=1?00 TO 140 STEP 1
0:GOSUB 1000:READ D$:PRINT D$;:NEXT RL
HM 40 PRINT:PRINT:PRINT "READING DATA IN DESCENDING ORDER...";
JR 50 FOR RL=140 TO 100 STEP -10:GOSUB 1000:READ D$:PRINT D$;:NEXT RL
PF 60 PRINT:PRINT:PRINT "READING DATA IN RANDOM ORDER...
";
MX 70 FOR I=1 TO 5:RL=INT(RND(1)*40)+100:GOSUB 1000:READ D$:PRINT D$;:NEXT I
AX 80 PRINT:END
JB 100 DATA FIRST
AR 110 DATA SECOND
XH 120 DATA THIRD
XD 130 DATA FOURTH
EF 140 DATA FIFTH
FA 1000 POKE 785,232:POKE 786,
7:POKE 209,232:POKE 210,7:POKE 211,0:POKE 21
3,39
HR 1010 PRINT " S{RVS}&{OFF}
E*{RVS}HD{OFF}A{RVS}&
{OFF}{SHIFT-SPACE}
{RVS}D{OFF}B
{SHIFT-SPACE}":SYS 470
83(RL),USR(0):RETURN

```

Program 3: BSAVE Demo

```

EJ 5 REM COPYRIGHT 1988
{2 SPACES}COMPUTE! PUBLICATIONS, INC.
GC 10 PRINT"(CLR){5 DOWN}
{13 RIGHT}COPYRIGHT 1988 "
DS 12 PRINT"{7 RIGHT}COMPUTE!
{SPACE}PUBLICATIONS, INC .
SE 14 PRINT"{10 RIGHT}ALL RIGHTS RESERVED."
CD 16 FOR X=1 TO 2000:NEXT:PRINT"(CLR)"
QX 20 POKE 53281,14:PRINT CHR$(147):POKE 53281,6:SYS 5
7812 "SCREEN",8,1:POKE 7
80,0
HS 30 SYS 65493:OPEN 15,8,15:I
NPUT#15,E:CLOSE 15:SYS 6
5487
SD 40 OPEN15,8,15,"S0:SCREEN":

```