

TEXAS INSTRUMENTS

TI Forum

by Ron Albright
and Johnathan Zittrain

The c99 craze continues to expand. This month's column includes a nice little piece of code from Dr. Jim McCulloch, a pediatrician and one of the regular "answer men" on CompuServe's electronic "TI Forum." Jim, already an accomplished assembly language programmer, shows very nicely how to use the floating point routines in version 2.0 of c99 (see Listing 1). Thanks for the contribution, Dr. Jim. While we are on the subject of c99, Clint Pulley, author of same writes to let all know that version 3.0 of c99 is out and available. How could it be improved? I don't know but Clint says its better! You can get this gem by contacting the author and including 2 initialized disks, a self-addressed return disk mailer and at least a dollar to cover return postage (Clint cannot use U.S. stamps in Canada!). Why not just send (\$15)—you will want to pay for this anyway. Find out what the excitement is all about.

Sidekick For The TI?

Well, almost. Jim Kryzak of Techni-Graphics (1058 Perda Lane, Des Plaines, IL 60016-5724) has released version 2.0 of his "PC-Keys" program. PC-Keys (the name stands for "Programmable Control Keys") is an "interrupt-driven assembly language program designed to run concurrently in the Extended BASIC environment." Now, what does that mean? Well, the program loads into the lower 8K portion of the 32K memory expansion and, thus, does not take up any of the 24K of Extended BASIC program space. I don't know how in the heck Jim programmed all this into 8K memory, but I'll bet there isn't much else that could be added to this gem. It just loads in and sits there until you call it up. The "hot keys" to bring the program to life is "CTRL O." When pressed, you are presented with the menu shown in Figure 1 (page 142). You can move between menu items using the spacebar. You can see that PC-Keys adds much to your XB environment. A disk catalog utility, which can print to printer or screen, a calculator (Figure 2, page 142) with an 11-digit display and memory, a screen dump for dot matrix printers (single

and double sized), and, my favorite, a notepad. No, you can't write a full page letter with the notepad or load in a Display/Variable 80 file for editing, but it is perfect for jotting a quick "to-do" list to printer. Besides adding these super utilities to XB, PC-Keys also allows you to program 10 keys (CTRL 1-10) to perform your favorite commands without typing them in each time. For example, the defaults (easily reprogrammed for up to 2 screen lines in length per key) are:

CTRL
1 - RUN
2 - LIST
3 - NUMBER
4 - RESEQUENCE
5 - CALL CLEAR
6 - RUN "DSK1.LOAD"
7 - NEW
8 - LIST "PIO"
9 - SIZE
0 - PC-Keys Utility Menu

The documentation to the program is extensive and exceedingly clear. Unfortunately, it is copy-protected. That part I hate. It is a beauty though and, without copy-protection, it would be perfect. It costs \$23.99 + \$1.50 shipping.

Newsletter of the Month

Thanks to the K-Town 99/4A Users Group (3506 Garden Drive, Knoxville, TN 37918) for sending a copy of their terrific newsletter. This was a whopping 24 pages full of reviews, news and programming. Great job goes out to Mike Dodd and D.R. Fudge, the editors. This newsletter joins my "Top Five"—though I won't say who got displaced.

Printer Support Package

If you saw the ads in the Tenex (P.O. Box 6578, South Bend, IN 46660) catalog or in the *Computer Shopper* for the Smith-Corona FASTEXT 80 printer and wondered how it would work with your TI, it does. Not only does it work, it is now supported masterfully by a new (at least to me) software firm—McWare (P.O. Box 2784, Fairfax, VA 22031). Rober McKechnie sent along his "PrinterF" (a tutorial-on-disk for the SC Fastext printer) and "Printerm" (a windowed package that allows easy setup of the printer). He also has more software in his catalog so write to McWare for details.

Exciting Software of the Month....

Write immediately to

Paragon Computing (17 Constance Street, Merrimack, NH 03054). Do it now. Send a self-addressed, stamped envelope to Curtis Provance and ask for the latest details on how to get his creation—"Enhanced Display Package." This software promises to take off where the Oak Tree "DEP" failed. It is a set of assembly routines that give you a series of incredible CALL LINKs from Extended BASIC for everything from 40-column screen displays to buffers to store text for instant recall, to windows, to scrolling of text in a window and more. This is not a piece of application software—it won't do anything. Anything, that is, save give you power over XB programming you never

thought possible. Highly recommended IF you are a programmer. You can get the routines and disk-based documentation for \$10; \$20 gets you a complete users guide; for \$50, you can get 2500 lines or so of fully-commented source code for the routines.

Revisions Everywhere....

Does my heart good to see continued product support by software producers after the initial sale. J. Peter Hoddie has a new version of his "Gram Packer" program (for use only with one form of "GRAM expansion" device—like Gram Kracker, Mechatronics Gram Karte, or RYTE Data's Max-imum). Its \$3.00 for the

upgrade (if you return your original disk) and \$10 for the program new and complete, from Genial Computerware (P.O. Box 183, Grafton, MA 01519). There is a new and simplified and virtually completely re-worked "Printer's Apprentice" (McCann Software, P.O. Box 34180, Omaha, NE 68134). Some users complained the user-interface for the Apprentice was not the simplest to use, so Mike McCann has given it a thorough repair job. Send your original disk and \$3 for the upgrade or \$22.50 for the new program. Asgard Software (P.O. Box 10306, Rockville, MD 20850) has released

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PC Compatibility For The Texas Instruments Professional Computer

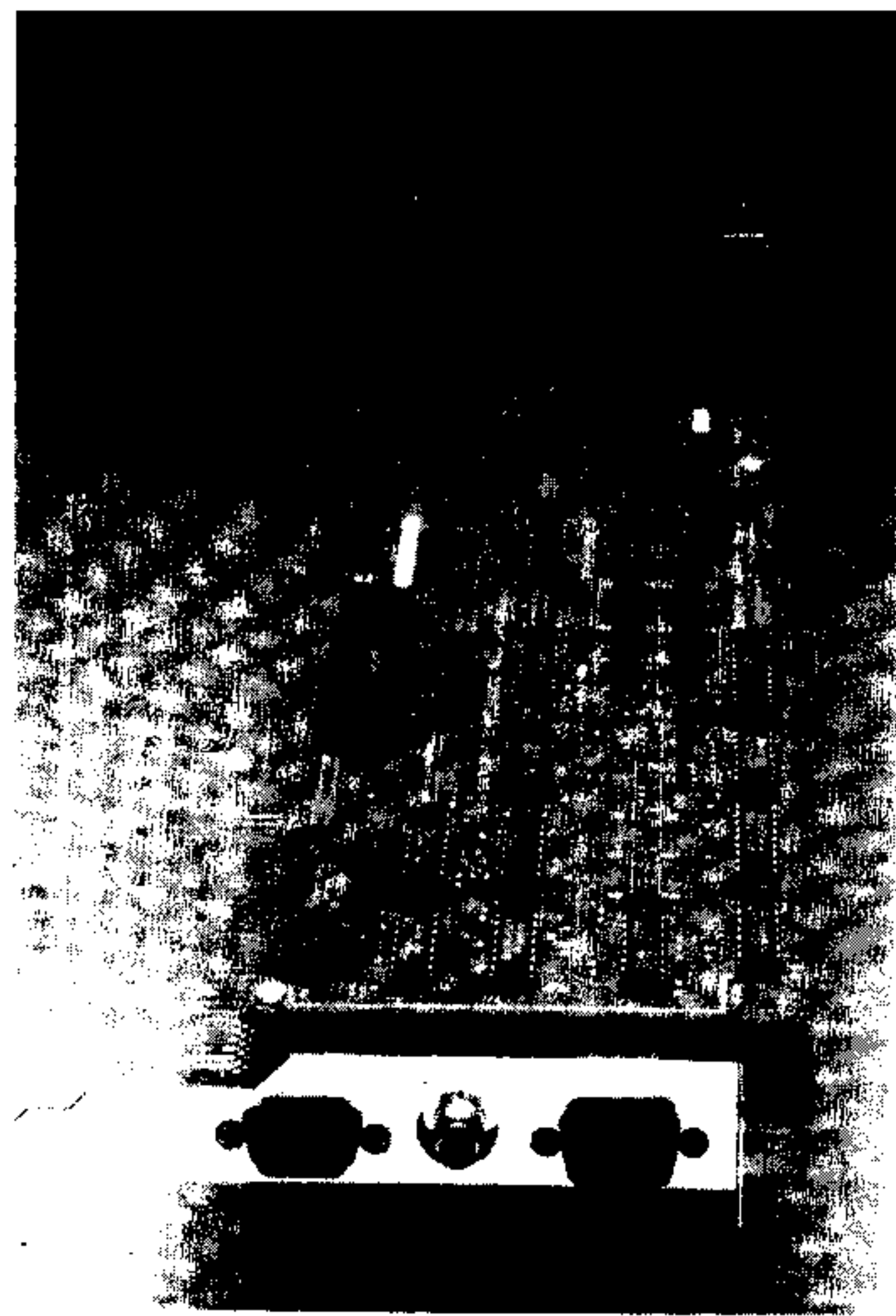
Compatible Systems Corporation, the Boulder-based manufacturer of hardware and software add-on products for personal computers offers IBM compatibility to TI Professional Computer users with its CSTI Compatibility System.

The CSTI System is an add-on card designed for the TI PC and TI portable PC which allows users to successfully run applications written specifically for the IBM PC and compatibles, including those requiring an IBM Color Graphics Adapter.

Under IBM emulation, users obtain screen, disk, and processor speed equal to the IBM PC or PC-XT, in addition to full speed IBM graphics capability. Full support is also provided for IBM compatible serial ports.

The CSTI add-on card occupies one full sized slot on the TI PC motherboard, and contains a video and diskette controller. Software included with the card contains driver routines for the controllers and routines which translate between the IBM PC applications and TI PC hardware. No additional hardware is required since the CSTI System makes use of the present TI monitor, keyboard, system memory, and diskette drives. Winchester drives and 8087 math coprocessors are supported if installed.

Compatible Systems Cor-



poration is currently shipping the product from stock at the retail price of \$595 and includes a 30 day money-back satisfaction guarantee.

For additional information

contact Compatible Systems Corporation, 2111 30th Street, Suite M1033, Boulder, CO 80301; (303) 444-9532.

Mention that you read about it in *Computer Shopper*. ●

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upgrades of two of its most popular software packages. "High Gravity"—the game-within-a-physics-lesson—is now in Version 2.0 and John Behnke's "Tunnels of Doom Editor" is in Version 3.0. Both great and both available for \$2.50 for registered owners who return their original disks.

Ready For The Downloading..

Charles Good, librarian of the "Lima Area 99/4A Users Group" (2225 High Ridge, Lima, OH 45805) sent along a disk with some nice programming efforts on board. Best was

their "CKWRIT 4/2," a checkbook manager and check writer program. It keeps 4 different accounts, print-out checks, and excellent disk-based documentation. And its all public domain. Write the group for details on how to pick up the disk and, as always, send along a self-addressed, stamped envelope as a courtesy for a reply (remember, users groups are non-profit, for the most part). Or you can download the whole disk from Delphi's "T.I. Information Exchange."

Fairs Are Everywhere and Growing!

The 2nd Annual "T.I.C.-

O.F.F." ("T.I. Computer Owners Fun Fest") and the 2nd Annual New England Fayuh (their spelling—not mine) were both marvelous successes. Kudos to several folks including Art Byers at TICOFF and Walt Howe at New England for keeping us informed. Next on the Fair schedule is the 2nd Annual LA TI Fest. Organized by the irrepressible Terrie Masters, former president of the LA 99ers Users Group, this should be another exciting event. The Fair will be held in Los Angeles May 16 and 17th. You can get details from Terrie by writing her at 148 S. Maple Drive, Beverly Hills, CA 90212; (213)271-6930. Terrie has more energy and skill for organizing than any one person I know so it will be one of the best fairs ever—no doubt.

Maybe Next Month...

As I close and turn over this issue to JZ to finish up, I have to share the anticipation (and frustration) I have. I got a call from my editor in late January to "call Myarc, Jack Riley, and he will send you a new Myarc 9640 for review." Seems Mr. Veit's editorial got some response. I called and was told by the nice secretary there that the machine would be to me "no later than February 6th." Well, as I put this column to bed (early March), no machine (or word of one) has arrived. The Myarc saga goes on (and on and on...). Well, maybe next time.

Win A Prize!

Send JZ and I a postcard or a letter with your name and address on it and you will be eligible for a drawing for the "software of the month." If you want a reply to your letter, make sure you include a self-addressed, stamped envelope as well. We have some neat programs to give away so write in today.

JZ's Spot...

First, thanks so much to

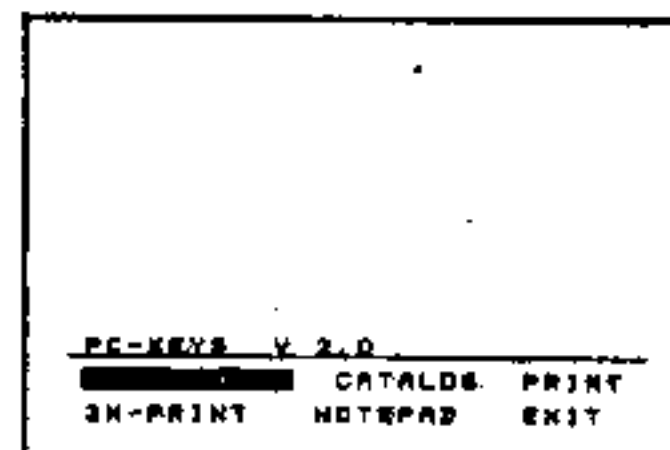


Figure 1 PC-Keys Main Menu

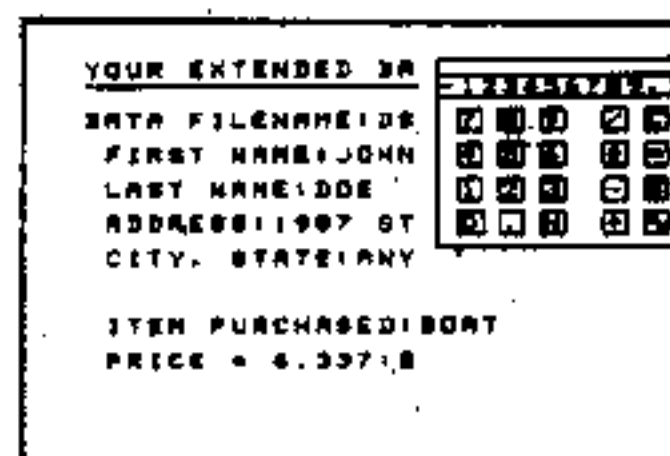


Figure 2 PC-Keys Calculator Function

everyone who sent in programs and material for review after the Editor's Note several issues back—the unity and enthusiasm of the TI community have once again demonstrated. We will continue to provide the latest news, views, and reviews for the 99 family.

New and original software continues to appear for the 99/4A. Not-Polyoptics seems to have forsaken its name and has released "SPAD XIII," a World War I flight simulator for the TI.

SPAD is designed in 100% assembly language; the Editor/Assembler module and 32K Memory Expansion are required to use it. Joysticks are also helpful.

It is not difficult to get off the ground quickly with SPAD. There are a few keyboard controls, but they can be learned quickly and easily, especially with a joystick. The plane responds to input in a fairly short (but still noticeable) time period, and the graphics shift accordingly. Some of the most realistic and impressive features of SPAD are the many available views. Using the number 1-6, front, back, side, up and down views can be produced, adjusted for the plane's position. At times, the shadow of the plane is visible, in line with the sun.

The display consists of a few gauges (altitude, compass, fuel, air speed) and the outline of the front of the plane. Above the gauges is the actual territory. I found it difficult to see close in front or below the plane because of the blocking of the gauges, but for all I know, World War I aviators could have had the very same problem. In any case, a quick nosedive would provide a detailed if brief view of the immediate scenery.

Features of interest are the ground, sky, sun, airfields, trees, trenches, villages, Seine River, and hangar. The manual speaks of the Eiffel Tower, but I was unable to find it, even with a map and a long time searching. The horizon can be seen as a green line with a parallel line of "clouds" above it, and it pivots as the plane banks. It did take some time to navigate from airfield to trenches and back again, but this might be more realism. With a plane that can flip upside down and loop, that traveling time can be occupied. I did note a slight jerkiness in response to turns; sometimes I would need to hold the joystick to the right for a second or two then see the plane bank...in such a jump that I immediately needed to bank left again. There was another keyboard control that was supposed to be more delicate, but I found it difficult to coordinate. The

plane also lacked "trim," where its nose position could be fixed instead of needing continual adjustment.

And what of the enemy? The plane is armed with 100 machine gun bursts and five bombs. There is no indicator for the amount of ammunition remaining. There are two German fighter planes and two observation balloons waiting along the trenches, as well as German airfields to bomb. Looking down, one can see the bomb as it falls, and if low enough, the explosion. There is no scoring system.

I might consider myself lucky about that, though, since it was difficult to score, much less win. The combination of the jerky turns and guns which could not be operated while simultaneously issuing a movement command made aiming and firing upon the enemy very difficult. There is enemy flak to contend with as well, and the SPAD can become damaged or destroyed.

When I finally did shoot down a plane, I was able to look down and watch it tumble down. This is one of the most realistic graphic displays of the program—the plane spinning down, trailing smoke, falling behind. After my mission, my airfield often seemed to go the way of the Eiffel Tower—off into the Blue Yonder. I did find it occasionally, though, and the plane can land with or without a landing strip.

The documentation for SPAD XIII was very satisfying. While not in slick packaging, there were directions for booting the program and flying the plane. Diagrams and a brief history of the SPAD XIII were included. A map of the battle area was also provided.

All in all, I think I would say that SPAD XIII is one of the finest 99/4A flight simulators on the market. While the serious pilot might be more interested in John Dow's fantastic BASIC Dow-4 Gazelle program, others with more of a taste for graphics would probably be better off with SPAD XIII. It is both enjoyable and challenging, and a refreshing addition to the programs already available. The price for the program is \$29.95, and Not-Polyoptics can be reached at P.O. Box 4443, Woodbridge, VA 22191.

From John Hamilton of the Central Iowa 99/4A Users Group comes "99 (/4A) Tips," a booklet of literally 99 tips about the 99/4A. Advice ranges from where some of the best prices in equipment can be found to writing a sort program in both BASIC and assembly. There are peeks and

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Listing 1

```

/* This is perhaps an example of what
_not_ to do. A 5 line console Basic
program (to help feeble minded folk
like me to keep their checkbook balances
honest) is converted to a 12 sector
c99 program. Not very efficient!! The
Console Basic program is:
100 INPUT "BALANCE" :B
110 INPUT "CHECK" :C
120 B=B-C
130 PRINT "NEW BALANCE=" :B
140 GOTO 110
The c99 version (using the files
provided on the C99REL2 disks
[ver 2]) of the above by
Jim McCulloch, 9505 Drake Avenue,
Evanston, IL 60203 (CIS 74766,500)
is as follows:*/
#include dsk1.floatic
float fb[FLOATLEN];
float fc[FLOATLEN];
float fi[FLOATLEN];
char sb[9];
char sc[9];
char si[9];
main()
{
    ibal();
    nbal();
}
ibal()
{
    putchar(12);
    locate(2,2);
    puts("Enter present balance: ");
    fpget(sb,fb);
    putchar(12);
    locate(2,2);
    puts("Present balance is $ ");
    fpput(fb,sb);
}
nbal()
{
    locate(20,2);
    puts("Present balance is $");
    fpput(fb,sb);
    locate(21,2);
    puts("Enter check $");
    fpget(sc,fc);
    fexp(fb,"-",fc,fi);
    putchar(12);
    locate(2,2); fpput(fb,sb);
    locate(3,2); fpput(fc,sc);
    locate(4,2); fpput(fi,si);
    fcpy(fi,fb);
    nbal();
}

```


PC Clone Test continued from page 18

system is using. One of the most obvious reasons for this is that a program which displays graphics will not work so well if your monitor is monochrome. Therefore the program will look to see what type of monitor you are using, and execute its code to handle a monochrome monitor. This way, if the program is not dependent on using graphics, it will still operate.

When you turn on your PC, a set of built in diagnostics are run to quickly test the condition of your system. The diagnostics must know what to test. It reads the switch settings you set on the motherboard for the type of monitor, amount of memory, etc. and stores those settings in a system data area. If your program requires this information, then you would execute an interrupt 11. This interrupt reads the settings from the data area rather than from the actual switch settings on the motherboard. Since most programs will extract the switch settings from the system data area, this is where the test was performed.

The test first of all saves the current switch settings stored in the system data area. It then replaces this value with a test value. An interrupt 11 is executed to find out if it returned the test value. If so, then the test passes. After the test has finished, the current switch settings value is restored back to the system data area. You could actually fool your system by changing the switch settings value in this data area.

Interrupt 11 returns the switch setting value in the AX register. Each of the bits in this register indicate the following:

bit 0—indicates diskette drives on the system
bit 1—not used
bit 3,2—planar ram size (00 = 16K, 01 = 32K, 10 = 48K, 11 = 64K)

bit 5,4—initial video mode
00 = unused
01 = 40x25 black/white using a color card
10 = 80x25 black/white using a color card
11 = 80x25 black/white using a monochrome card
bit 7,6—number of diskette drives if bit 0 set (00 = 1, 01 = 2, 10 = 3, 11 = 4)
bit 8—not used
bit 11,10,9—number of RS-232 ports
bit 12—game input/output port installed
bit 13—not used
bit 15,14—number of printer ports (00 = 1, 01 = 2, 10 = 3, 11 = 4)

Interrupt 12—Memory Size Determination

When you purchase a software program, it usually will state in the documentation the amount of memory the program requires to run successfully. If you have tried running a program which requires more memory than you have available then you might get the message "INSUFFICIENT MEMORY." The program

most likely has used interrupt 12 to first look at the amount of memory your system has available before trying to load the main program. This will avoid the possibility of crashing your system and leaving you in frustration as to what went wrong.

The memory size is determined when your system is powered on or when your system is booted up. In the system data area there is a place which keeps the amount of memory your system has installed. This determination is stored there. When an interrupt 12 is executed, it reads this value. What the interrupt returns is the number of contiguous 1K blocks of memory.

The test saves the current memory size and replaces it with a test value. Then an interrupt 12 is executed to see if it returns the test value. If the test value is returned then the test has passed. After the test is complete the current memory size is restored.

Interrupt 13—Diskette Drive Interface

The low level software inter-

face between your diskette drive and system memory is the ROM-BIOS interrupt 13. It handles the most basic operation of moving data between your program and the diskette. This interrupt is made up of six basic functions (reset the drive, getting the status of the drive's operation, reading data, writing data, verifying data, and formatting the diskette). DOS is very much dependent upon this interrupt.

Since DOS depends on this interrupt to function properly you can do some of your own testing by loading and executing a program, writing data to the diskette, and formatting a diskette. This will cover all six of the functions listed above. If you can perform these type of functions, without errors being generated, then you have successfully tested this interrupt and know whether compatibility is a problem. You would also want to try and use a program off of a diskette that was formatted and set up on an IBM-PC or known compatible system.

The interrupt 13 test consists of first placing a formatted, double sided diskette into drive A with, better yet, some information stored on it. Since a majority of the diskette drives around now are double sided, this test will test both sides of the diskette only. Once the diskette is in place then press any key to continue. The test begins by resetting the drive. Then it does a series of read/write tests and gets the drive's status for both sides of the disk, on all forty tracks.

If an error occurs, then an error message will be displayed indicating the type of failure. The error messages are based on the error codes listed in ROM-BIOS. If one of the tests fail they are retried two more times to verify the error. DOS does a better job of determining errors since that is what it was designed to do. You may then proceed with the testing of the remaining tracks by pressing any key.

After all forty tracks have been tested then the next test,

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pokes (using the CALL LOAD command in Extended BASIC, among others) and some miscellaneous wiring diagrams.

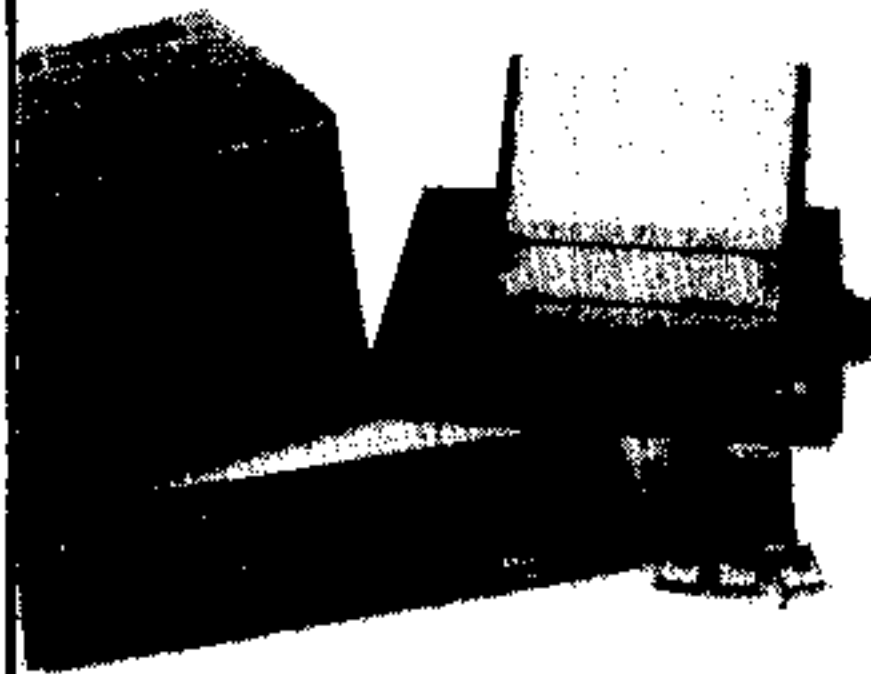
Some of the tips are Iowa UC-oriented, such as number 48 ("Two of the BBS's phone numbers have been changed...") or number 50 ("...a television series on IPBN, channel 11..."). However, I think that the amount of original material justifies the price of the book. The booklet is available for \$4.50 1st class mail (\$5.00 Canada and Mexico) from John Hamilton, Central Iowa 99/4A UC, Box 3043, Des Moines, IA, 50316. Are there

any others out there with similar compilations of knowledge?

To close, here is a quick Extended BASIC program excerpted from Hamilton's booklet. This will eliminate the need to choose an arbitrary joystick to use when writing programs. Since the TI joysticks are not numbered, it is often difficult to find the right one. Merely replace the first CALL JOYST argument with JS:

```
100 PRINT "Press fire button
to continue"
110 CALL KEY (1, K1, S)
120 CALL KEY (2, K2, S)
130 IF K1 + K2 <> 17 THEN
110
140 JS = INT(K1/18 + K2/9 + 1)
150 ...the rest of your program
here.
```

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