Computer News 80

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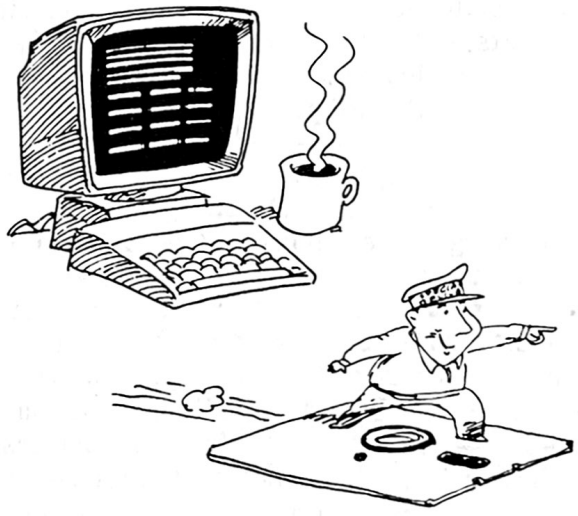
Look for the SUPER SAVER RIBBON for money saving offers in this issue for CN80 Subscribers

EDITORIAL COMMENT

Well it looks like Uncle Sam's postal people did it to us again, because we got several calls as late as March 15th that the March issue had not been received yet. It was mailed on February 26th right on schedule. Even some of the first class mail was delivered after 14 days. But we might as well tell you now that this issue for reasons beyond our control is being mailed two days after our regular scheduled date. Even at that you should be receiving this issue before the 15th of the month.

If you don't receive your issue, please give it an extra week from normal to allow for Uncle Sam's boys to get it to you. If by then you don't receive your issue it is time to call us. Some of the snow storms that crossed the nation just after we mailed the March issue may have been some of the cause for delay. But this is the first time in three years that we have missed our mailing schedule by even a day.

Well the votes are not all counted yet as to our survey of the most important things that readers want to see in CN80, but as the votes come in we will run the results in the May issue as promised. So get yours in



the mail. Your vote is important to us.

As the primaries votes are now being tallied it looks like the long, long listings are losing out to more informative articles. Many votes were received that said "don't change a thing" and "now that you call attention it, I am amazed at the scope of coverage you have been giving us". "Don't take up precious space with long listings, the disk series is fine." And one writer suggested we put out a disk with each issue, by increasing the subscription price to cover it. A very interesting idea, but one that would require special mail handling and cartons to protect both the issue and the disk if they were mailed together. The increase in cost may be beyond what one would expect. And yet it is an interesting idea that we could pursue if there was enough interest - let us know.

NEWS ITEMS

Ted Carter of MicroLabs has made a special offer to CN80 readers, where you can get a free copy of his Draw program with the purchase of the MicroLabs high resolution board. Look for his special coupon in the Product Source section.

M.A.D Software of Ft. Worth Texas is still producing software and special items for the TRS-80 computers. Such as HBUILD6 which is a utility to boot your hard drive directly into LS-DOS 6.3. They also have ROM updates for the older Model III and IVs. Write to them for their latest list of products.

M. A. D. Software
PO Box 331323
Ft. Worth, TX 76163

Still using SuperScripsit, (we are) and we just found a source for print drivers that we were unaware of. They have Super-Scripsit print drivers for all most every printer ever made, including a driver for the HP laser printer. One problem we found so far is that their print drivers do no support right hand justification when using proportional type spacing, but they do support proportional printing with out the right hand justification.

So far we have purchased two of their drivers, one for the FX80 and one for the HP laser printer. We will let you know more about these drivers in future issues, but for now the source is:

ALPS
1502 County Road 25
Woodland Park, CO 80863
(719) 687-1442

We counted over 130 different print drivers that they have available. They are not connected with the ALPS printer line. We talked with a very pleasant person by the name of George-Jean when placing our order who was more than helpful in our selection. Each print driver is $49 with quantity discounts if you buy more than one.

HINTS AND TIPS

When changing printers on SuperScripsit, you must adjust the document for the new print driver. SuperScripsit does not automatically adjust a document if you switch from one print driver to another after the document has been created.

To readjust a document to a new print driver do the following:

Go to the beginning of your document.
Type Control X to use block action
Then type E for end of document.
Then type B for Block action.
Then type A for Adjust.

This will restructure the document to the new print driver.

If you change from one print driver to another frequently, like using as dot matrix for draft work and a daisy wheel printer for finished work, then you might want to set up the block adjust commands on a user key, to save typing the full procedure each time.

FILE CABINET UPDATE
a CN80 Staff Report

NOTICE OF PRICE CHANGE
We have had to increase the copy cost of File Cabinet disks for those of you who wish to supply your own disks. The new price is $2.75 per disk plus postage at the same rate as regular orders. If you send flippy disks the price is still $2.75 per side, i.e. $5.50 per disk plus postage.

If you wish to supply your own disks with labels affixed, please write the name of the disk volume on the label before affixing the label. You DO NOT need to supply a return address label or shipping carton. You DO NOT have to pre-format the disks. Our copy procedure will format the disks to the format that the volumes are stored on, i.e. the Mod 4 disks are stored on TRS/LS-DOS 6.3 formats. If you do supply pre-formatted disks, our program will just wipe it out and format the disk over.

The price for our making copies of the File Cabinet Library of disks using our own disk stock is still $4.00 per disk with the same - more than 10 volume order - discounts as shown in the Readme File of your catalog.

PROGRAM AND SUBMISSIONS
If you would like to submit programs or collections of public domain programs for inclusion in The File Cabinet Library they are now to be sent directly to us at our regular CN80 address. If the programs you submit are not already in the catalog, we will trade you program for program. Include return postage for the return of your original program disks if we find we can not use them, or to cover the cost of sending new program disks back to you.

Regular article submission and program listings to be published in CN80, of course is unchanged.

SHAREWARE
We invite all shareware program developers to send us their shareware and bannerware programs.

While working on updating the File Cabinet Catalogs, we have decided to separate all shareware programs and bannerware programs from being mixed in with plain Public Domain programs and place them in a separate SHAREWARE SECTION of the Catalogs, which you will be able to call up from the menu just as you now call up the Utility, Business, Education, Games and Communication programs.

We feel that this will make it easier for you to look over the shareware offerings of the programmers that are coming out with new programs, plus give the programmer a better place to promote their products. Remember "shareware" is the - look before you buy - concept.

We do ask that if you do use the programs that you send the authors requested registration fee. Not only do you, in most cases need to do this to get the full documentation of the program and be registered for any updates, but it also helps the author defray his cost of writing programs that keep our beloved TRS-80's going with great new programs.

Sometime in the future we may even break the shareware away from the present catalogs and issue a separate shareware catalog, with the programs placed in sub categories of their own.

CATALOG UPDATES
There are no new catalog listings yet. If you have disks that came from Tim Sewell directly these should be replaced with catalog disks that have the CN80 label on them. These catalogs are the latest version existing.

Look for new catalog announcements or additions to the catalogs in this section of CN80, as new groups of programs are added we will report them here first. This will save you having to send your existing catalogs in for updating before we have a major group of new programs collected and cataloged, and at the same time let you know that there is a new volume of programs that you can order rather than wait for a major catalog revision.

PROBLEM SOLVING
We are working hard to find and correct individual programs in the library, and to find the documentation for the programs that are listed without any instructions, or write new instructions to go with them, otherwise the programs need to be scrapped from the listings. Watch this column, which

will be a monthly feature of CN-80 from here on, for hints and tips to individual or disk volumes.

YOUR HELP IS NEEDED

All of this is a monumental task and we seek your active participation in this project, if you find a program that does not work let us know. If you find a program that does not have instructions with it and you know how it works, we invite you to write the instructions and send them in. They will be included in the library with your name listed as the author for writing the docs, keeping the proper acknowledgement for the programmers original author of course.

SOME SOLUTIONS

Q: On library disk MD3GAM04 there is a program called SOUNDA/BAS, a collection of sound demonstrations. When I run it the screen says the memory size must be set lower than the maximum. I don't know what the maximum is and set it at 5000. The screen then says its working, but I get a syntax error in line 605, changing the line with ' to make it a remark line did not work as more lines show syntax errors.
H. A, Coldwater, MI

A: Set memory size to 65,000

Q: I am having problems with some of the programs I have received from the File Cabinet. I'd like you to check them out and see if I am doing something wrong. I'm using TRSDOS 6.01.2 and get an "error 2B" when I try to run utility programs: SCRNSV/CMD (on volume MD4UTIL 01 disk); GETMOD/CMD (on volume MD4UTL40 disk); PRINT/CMD (on volume MD4UTL44 disk); PURGEUP/CMD (on volume MD4UTL53 disk).
J. H. Rapid City, SD

A: All of these programs require a TRSDOS 6.2 or higher. We still have about 10 sets of original Tandy 6.2 manuals and systems disks. ($20 plus $4 S&H) or get the new LS-Dos 6.3.1 from Mysosis.

Q: Some other programs I am having problems with are MEMSYS/CMD the screen display says "PDS Membership Required" (disk 01).

A: The documentation file explains this. Read (LIST) the MEMSYS/DOC file.

Q: PURIFY/CMD displays "Illegal file name" (disk 40).

A: Read (LIST) the PURIFY/SRC file.

We are here to help if we can, and as time and space permits we will try to answer all the questions, but remember the few fundamental DOS commands like LIST DIRectory can help find and read the files that may support the /CMD files. The extensions are usually /DOC or /TXT with the file name the same as the name of the program with the /CMD extension.

If the file has the extension of /BAS, be sure that you have BASIC files on your system disk. Not all BASIC programs are the same and not all programs written in Basic will match the BASIC you have, unless the program was written for that basic. If you try to load a program into BASIC and get "direct statement in file" try going back to dos ready and type the program name. It might just be a program written in machine language as a command file and the author did not identify it with the common /CMD extension. If you try loading a program from DOS ready, and it does not work, try loading it in BASIC, it might just be a basic program with out saying so with the common /BAS extension.

Again some programs need to be loaded into BASIC and then when it has finished nothing happens except the word "ready" appears on the screen. This is when you need to type RUN <ENTER>. Other basic programs might have this instruction line written in so that they go to a nice flashing menu and take you from there, not all are flashing and not all programmers are that flashy.

If you get a "syntax error on line so and so" it usually means that the basic program and the BASIC you are using are not compatible and the line would either have to be rewritten, or you would have to find what BASIC the program was written with. Unfortunately the authors of the programs, who probably wrote the program under "his" basic that he was using at the time and not thinking that there would ever be an

upgraded BASIC coming down the road. So it depends on how long the program has been around, as to what BASIC it was written under. Unfortunately we are not all sharp BASIC programmers to know just what to do to change a line to have the program work on "our" BASIC" instead of "his" BASIC.

If you have a program that you can't make work under your current BASIC, try booting up with an older DOS version, or a newer version, you might just find the right combination without having to change the syntax error.

In the mean time we will be working on getting the file descriptions expanded to tell what DOS is require, and what BASIC version is required. If you have a File Cabinet disk that you have unraveled and identified all the programs send your findings in (hard copy is all we would need) it sure would help this project.

Another tip; if you're searching the catalog disk for a particular type of program use the WORDSCAN (on CN80 disk series #8; Vol 3 No. 1) to search the listings.

And still another tip; if you want to read a DOC file without having to use the scroll stop and go of the LIST command, rename the file README/TXT and use the README/CMD that is on the catalog disk to read the file. It will only read files that are saved in ASCII. The same as the TED command in LS-DOS 6.3, so you might have to save the file in ASCII. Be sure to write the original name down so you can then rename it back to the original title.

HIDDEN GEMS

How often have you worked for hours on a document and then saved it to disk, only to get "end of file encountered" and you can't call the file back up because the file did not close properly. Well here is a life saver. I know because it just happened me as I was writing this segment of CN80. On the Model 4 Utility Disk Volume number 1 the very first program listed is called CLOSE/CMD which is a short 1.5k machine language program for closing open files. Being machine language we can't print it here with out having the source code. And we don't know the origin of this program, but it works, it let me get back into the first (and only) file of these two and a half pages. -CN80

CN80 Disk series number 8 is now ready for shipment and has all the programs and program listings from the first three issues of 1990 on it plus the following bonus programs.

There are two games both for the model 4; ANALYSIS/BAS which is a fun game that is not really what it sounds like. You start out by having the computer ask you what your problem is and then you carry on a running conversation with the person behind the computer screen. Entering some serious and some not so serious replies gets you some really off the wall responses that are guaranteed to have you laughing.

CIVILWAR/BAS is the second game on the disk and has you refighting the civil war again.

Two more bonus programs for the Model III folks are on this disk also, one is DSKSEC/BAS which is a Nice desk phone and appointment secretary. The second is SCREEN/BAS a utility for drawing screen graphics for your programs.

Watching the Discovery Channel "Beyond 2000" program the other night, we heard of a computer of the future that could recognize if you were smiling or just had a blank stare on your face. They said if you had a blank stare on your face the computer would automatically switch its presentation to make you happy.

Now if we could have a computer that would recognize my blank stare - and then tell me what I don't understand, or just go ahead and do it right and tell me about it later. That would make me - very - happy! -Ed.

ASSEMBLY LANGUAGE TUTOR Part 15

by Christopher Fara (Microdex Corporation)

Last month we have learned how to construct and load "memory modules", and how to call them from BASIC. From assembly programs we can use a different calling method based on the module name stored in the "header". As a reminder, the standard header looks like this:

```
;-----------------------------------------
HEAD:   JR      EXEC        ;to routine
LAST:   DEFW    0           ;end address
NICK:   DEFB    HOOK-NAME ;name length
NAME:   DEFM    'UNIQUE'    ;module name
HOOK:   DEFW    0           ;reserved
DOSS:   DEFW    0           ;reserved
;-----------------------------------------
EXEC:  ... actual routine starts here
;-----------------------------------------
```

The address labeled HEAD is the entry to the module after it has been relocated by the "loader", and JR simply jumps over the data in the header to the first executable instruction at a label EXEC in the actual routine. In the "word" LAST the "loader" has stored the address of the last byte of the relocated module. That address provides a link to any next module which might have been loaded right above it. The labels NICK, NAME mark the length and text of the module's name. The length is calculated automatically by the assembler as the difference between the addresses of HOOK and NAME (instead of DEFB 6 and changing the number every time we invent a name with a different length). In driver and filter routines the "word" at the label HOOK is used for the address of "device control block", so it's a kind of a "hook" to DOS device table. Finally DOSS is a "word" reserved for DOS. We will use those funny labels for reference purposes.

M O G E T s u b r o u t i n e

This subroutine gets the "entry address" of a high-memory module, ie. the address at which the start of the header (label HEAD) has been relocated by the "loader". Before we call MOGET we store in a buffer the name of the module we want to find, terminated by carriage return byte 13. Let's say this buffer is labeled SPEC. Its address is passed to the subroutine in register pair HL (eg. LD HL,SPEC). On return Zero flag is set if the module has been found, and its entry address is in HL. If the SPECified module has not been found then Z-flag is reset NZ. Register pairs BC and DE are altered, so if they contain some needed values, PUSH them before calling MOGET and POP after return. To fit the comments into our page format we use the symbol => meaning "points to" or "contains the address of".

```
;-----------------------------------------
;MOGET  get module address
;-----------------------------------------
MOGET:  EX      DE,HL       ;DE=> SPEC
        LD      HL,(17425)  ;get high$
TRY:    INC     HL          ;HL=> HEAD?
        LD      A,(HL)      ;what's there?
        CP      24          ;JR instruct'n?
        RET     NZ          ;no, quit, else
        PUSH    HL          ;save HEAD
        PUSH    DE          ;save SPEC
        INC     HL
        INC     HL          ;HL=> LAST
        PUSH    HL          ;save it
        INC     HL
        INC     HL          ;HL=> NICK
        LD      B,(HL)      ;B=name length
        INC     HL          ;HL=> NAME
CAP:    LD      A,(DE)      ;spec character
        CP      'A'         ;is it alfa?
        JR      C,MATCH     ;no, else
        AND     0DFH        ;make caps
MATCH:  CP      (HL)        ;match?
        INC     HL          ;next in NAME
        INC     DE          ;next in SPEC
        JR      NZ,STOP     ;no match
        DJNZ    CAP         ;else more?
        LD      A,(DE)      ;SPEC end
        CP      13          ;carriage ret?
        JR      Z,FOUND     ;yes, else
STOP:   POP     HL          ;HL=> LAST
        LD      E,(HL)
        INC     HL
        LD      D,(HL)      ;DE=> end mod
        EX      DE,HL       ;HL=> end mod
        POP     DE          ;DE=> SPEC
        POP     BC          ;trash HEAD
        JR      TRY         ;try next if any
FOUND:  POP     BC          ;trash LAST
        POP     BC          ;trash SPEC
        POP     HL          ;HL=> HEAD
        RET
;-----------------------------------------
```

The listing is for Mod-III. The only change in Mod-4 is to replace the second line by 4

lines required by SVC 100 to find the current HIGH$ address

```
        LD      HL,0        ;find
        LD      B,0         ;high$
        LD      A,100       ;SVC number
        RST     40          ;do it
```

or "cheat" as we did from BASIC

```
        LD      HL,(1038) ;get Mod-4 high$
```

The cheating works here, but SVC is the recommended method.

First of all EX to put the address of our SPEC buffer to DE, because in the next instruction we need HL to find current HIGH$ address. At the label TRY increment that address. Here we hope to find the first byte of a standard module, which should be 24, the machine code for the JR instruction. So we put this byte into register A and compare with 24. If it's not 24 then search ends and we return with NZ flag. Either a non-standard routine sits there or we have reached the end of physical memory. How come end? Well, if HIGH$ address was 65535 (end of 64-K) and we incremented it, then the value in HL "wrapped around" to 0, and at address 0 in Mod-III and Mod-4 we will usually find the instruction DI (disable interrupts) but never JR. By the way, the "wrap around" works like this:

65535 = binary 1111 1111 1111 1111

Add 1 to the rightmost 1, the result 2 is binary 10, so the rightmost bit becomes 0, carry 1 is added to the next bit, and so on, until all bits are 0, and the final carry "falls out" from the leftmost bit and is lost.

If JR has been found then we assume it's a header. PUSH HL to save this entry address in case it's the module we are looking for, and PUSH DE to save our SPEC address. We may need it again if the module is not the one we want. Then increment HL twice to point to the LAST address in header. Save it, we may also need it later to search for a next module if the current one is not what we need. Increment HL twice again to point to NICK where the length of module name is stored. Put that length into the "counter" register B and increment HL one more time to point to the first letter in NAME.

At the label CAP we start a DJNZ loop to compare one by one the characters in our SPEC (pointed by DE) with characters in the module's NAME (pointed by HL). Notice that upper and lower case letters make a difference. The NAME in the module should be all caps. The instructions between CAP and MATCH assure that the characters in SPEC will be also evaluated as caps, even if typed in lower case (this is the same CAP conversion as described in CN80 1/90 and Z80 Tutor I:35). After the characters are compared at the label MATCH, we increment HL and DE in case there is more to compare. Incrementing register pairs does not affect any flags, so if the comparison failed (flag NZ) then we jump out of the loop to STOP. Obviously the names don't match. Otherwise DJNZ until all characters are matched, and "fall through" to the next instruction. Since we have incremented DE after the last comparison, it now points to a byte in SPEC right after the last successfully compared character. We expect it to be carriage return byte 13, the terminator of our "search name", and put it into register A to compare with 13. If Z-flag is set then we know for sure the names matched exactly, and jump to FOUND. But if that character is not a carriage return then it means that the name we specified is longer than the name in the module. Even though all initial characters of the specified name have matched all characters in the module, the names are not identical, and we fall through to STOP.

At STOP we POP the previously saved address of LAST and copy the value stored at that address into DE (low byte to E, increment pointer, high byte to D). Then EX and now HL is the address of the end of the module. We will need it to continue the search for any next module, but first POP our SPEC address back into DE, and finally POP into BC the HEAD address which we won't need anymore. It's not the module we are looking for. We use the register pair BC as a sort of "trash can" simply to clear the stack. Now we can JR back to TRY and search for next module, if any.

If FOUND then again use BC as a "trash can" to clear the stack and discard LAST and SPEC which are not needed anymore. Finally POP HL to restore the HEAD address which in this case is the correct one. Notice how the order of POPs must be the reverse of previous PUSHes. Remember that we jumped to FOUND on Zero flag, so now we RET with Z-flag set and the desired address in register pair HL.

Jumping to HL

In the past we always used JP instruction with a specified address, either expressed as a number or as a label, eg.

```
JP LOOP
```

But Z-80 has also a special kind of JP.

```
JP (HL)
```

Jump to address contained in the register pair HL. It is always written this way. It cannot be a "short" jump JR and cannot be "conditional" like other JP instructions.

Thus if we successfully return from MOGET with the address of the desired module, we can immediately JP (HL) to it. For example, let's say we want to execute such a module from DOS, assuming it is some module which makes sense when executed from DOS. The following stand-alone program would do it. It could be assembled as MODEX/CMD.

```
;-----------------------------------------
;MODEX  execute module in high-memory
;-----------------------------------------
        ORG   32000
MOGET:  ... here type MOGET subroutine
RUN:    CALL  MOGET     ;get address
        RET   NZ        ;not found
        JP    (HL)      ;else go for it
        END   RUN
;-----------------------------------------
```

Here we take advantage of the fact that on entry to any /CMD program executed from DOS, the register pair HL always points to the first non-blank character in the "DOS command buffer" after the name of the program. For example if we enter from DOS

```
MODEX UNIQUE
```

then on entry to MODEX the pair HL points to the beginning of the word UNIQUE. The DOS command has been terminated by pressing 'enter' so at the end of UNIQUE in the command buffer there is a carriage return byte 13. This, of course, are the "entry conditions" needed by our MOGET subroutine, and we can CALL it right away when the program starts RUNning.

If the module has not been found then on return from MOGET the Zero flag is reset NZ and we return to DOS as usual without accomplishing anything. This could be dressed up by adding a displayable message such as "module not found". We leave such extras for the reader to play with if desired, since they are not essential to our "lessons". Anyway, if Z-flag is set then the conditional RET NZ is ignored and we jump to the address contained in HL. Since every module exits via a RET instruction, that RET will be used to return directly to DOS. The control will not return to MODEX.

Calling HL

But suppose we wanted to CALL the module and return not to DOS, but to the calling program. The program fragment could look like this:

```
;-----------------------------------------
        CALL  MOGET     ;get address
        JR    NZ,ERROR  ;no good, else
        LD    BC,MORE   ;ret address
        PUSH  BC        ;onto stack
        JP    (HL)      ;and go for it
MORE:   ... program continues here
;-----------------------------------------
```

Assuming the address of our SPEC buffer is already in HL, call MOGET as usual. On NZ-return (module not found) jump to some error processing routine at the label ERROR elsewhere in the program. On Z-return we have the address in HL but CALL (HL) is not a valid Z-80 instruction. Some processors, such as Intel 8088 in IBM-PC do allow such calls. But recall how the stack works (CN80 10/89:6, Z80 Tutor I:26). We want to return from the module to the label MORE to continue the main program. The CALL would automatically put the return address of MORE onto the stack. Here we do it "manually". Put the address of MORE into register pair BC and PUSH it onto the stack. Then JP (HL). When the subroutine in the module is done, it RETurns to the address of MORE. which we have sneaked onto the stack.

Another popular trick is to let the program modify itself. For example:

```
;-----------------------------------------
        CALL  MOGET     ;get address
        JR    NZ,ERROR  ;no good, else
        LD    (MORE-2),HL ;stuff addr
        CALL  0000      ;into call
MORE:   ... program continues here
;-----------------------------------------
```

Recall the picture of a program as it sits in memory (CN80 5/89:8, Z80 Tutor I:10). The CALL instruction is encoded in 3 bytes: first the call itself, then 2 bytes for the address. MORE is the memory location just after the CALL. Therefore MORE-2 is the location of the call's address. In the source listing we write a "dummy" call to 0000.

During program execution the instruction

LD (MORE-2),HL

"stuffs" the value of HL in place of the dummy. While we normally don't promote such "creative" tricks, sometimes they are necessary to compensate for the processor's limitations.

Note: Z80 Tutor I:26 etc, refers to the pages in the revised collection of our CN80 1989 tutorial series, now available in book form from CN80 ($9.95). Copyright 1990 by Christopher Fara Assembly Language Tutor is copyrighted by the author with all rights reserved. It is reprinted here by permission of the author.

MORE ABOUT COMPUTERS

by David Dalager

Sorry I've not written for the last two issues. A heart attack on the first Saturday of January prevented me from getting that one in. Catching up on getting stuff shipped that people had paid me for, stopped the February article.

No, my body did not betray me, I had betrayed it. Sitting at my workbench and computer, not giving the body the exercise it needed caused the heart attack. The moral in this is: "If you are going to do sedentary (sitting around) work or play and don't exercise the body, you are setting the stage to have an heart attack." For crying out loud, be sure to exercise your body as well as your mind. I'm doing excellently, far beyond most doctor's expectations. Thank you. Now, let's have some fun.

Thanks to Tandy no longer providing software support, there are many new programs coming out. Several new graphics programs have come upon the scene. Two of which could be said to be several in one package, one is by Robert Doerr, another is by Bill McInnis, another by Bill Bowman. There are many more than I'm aware of, and remember, I try to keep up with all as my time allows.

Robert Doerr has an interesting story about writing his group of programs. Seems he sent his $15 to Paul F. Barnett for the shareware fee for P2DOTx (a model III program) that converted Printshop to Dotwriter format, allowing the Printshop icons to be printed. Robert got his letter back with "addressee unknown" on the envelope. Robert phoned Paul for a better address. Robert points out that if Paul had not released P2DOTx that the model 4 version would not have come into existence. Remember that the programs that Robert and Paul wrote are shareware, that means that if you use any shareware programs, please remit the requested fees. For darn sure if you want to see more programs written. This fee is both their acknowledgement and encouragement. There are 13 programs in all.

Permit me to take the liberty to point out that any program you are not familiar with is new. I have not gone through all of The File Cabinet yet, so I still sit with about yumpteen disks, all loaded with new programs. New simply because they have not yet been tried.

UTILITIES and APPLICATIONS

The File Cabinet is chock full of tools (utilities) that can do many things for you. Probably the very thing you've been looking for. I had two pointed out to me the other day. A friend who reached into my disks, pulled one out that had the very application I needed. I didn't know it was there. Well, that's not exactly true, I hadn't looked in a while.

COMMUNICATIONS

There are a number of communications programs that will help you use a modem for communicating with other as well as Bulletin Board Systems in the section of The File Cabinet. A very interesting one is MULTICOM/CMD that permits idiots like me to use the modem to transfer files to another computer with Multicom very easily. I kidded it's author, James Reed, of Arlington, TX, who also wrote STARTEXT/CMD about tailor-writing Multicom especially for me. James has recently updated Multicom so it would also be capable of operating at 2400 BPS as well as 300, and 1200. There is also XT4/CMD, XT3/CMD for the model 3, FasTerm by Mel Patrick in B.C. Canada. The latest version will even keep track of your "modem-ing" costs.

-David Dalager

MY ADVENTURES WITH HARD DRIVES
Part 5
by Roy T. Beck

I have a VR DATA HARD DISK III which I acquired for a few dollars one time. The few dollars was because there was no "bubble" in it. The previous owner had removed the original 10 Meg bubble and replaced it with a larger one. Later he moved the larger one to an IBM, leaving the HARD DISK III sans bubble. However, it does have the power supply, host adapter and controller board in it.

The unit is about 14" x 15" x 5", resembles the Mod 4P in style and paint job, weighs about the same as a 4P, and contains a linear power supply and a hard disk controller (HDC). The power supply is set up for two bubbles, although the front panel has only one opening. Since the HDC also has provisions for a second bubble, it is clear that VR DATA really intended the unit to operate two bubbles; but the selling price when it was new in the summer of 1983 was over $1300, and probably few customers could afford (or needed) the second bubble. The nameplate showed this particular unit originally had one Tandon TM-502S bubble with a capacity of 10 Meg. The "III" in the nameplate evidently indicated it was intended to work with the Model III, but since the Models 4 and 4P have the same I/O port, there is no reason it should not work with a 4P.

Study of the hardware reveals the HDC is a Xebec board. After exploring the remains for a while, I put it aside on a shelf and went onto other projects. After getting a RS work-alike 35 Meg drive running very happily at home, I began to consider setting up something for use in my office at work. I already had a 4P running there, but having tasted the joys of HD operation at home, I became anxious to add an HD to the machine at work.

After letting the HARD DISK III "mature" on the shelf for a long time, I decided to make it work. The first question was what bubble to put in it? I have two identical, working, Tandon TM602S bubbles on hand, for which I paid $15 each, used. They worked on my IBM clone until I outgrew them. The front cover plate of the Hard Disk III has only one hole in it. Rather than indulge in my not-so-elegant tinsmithing, I simply took the front panel off. I then proceeded to install the two bubbles. Made a hefty package when completed, but it is compact and pretty good looking, (even without the front panel). I added a suitcase handle on one side and some rubber feet on the other side and the bottom. Presto, a "portable" hard drive!

The next question was software, specifically HD drivers for the DOSes I wanted to use. To digress a bit, in reading back issues of The MISOSYS Quarterly I had seen a reference to a VRHARD driver in a letter from a reader to Roy Soltoff. The letter did not clearly identify the driver, but the context indicated it might be a TRSDOS driver for the HARD DISK III unit. I called Roy, and he confirmed he still offers the driver (even though it is not in his current catalog) and yes, it should be right for my unit. (Thanks, Roy!) I bought it and installed TRSDOS 6.3 on one drive of the two in the box. The driver also allows for two bubbles in the box. I assigned all of one 5 Meg bubble as drives 0, 1, 2, and 3 for TRSDOS 6.3 running on a 4P. This package I took to my daytime office, where I use it for word processing, mostly. I have AllWrite and Electric Webster running on it, plus SuperCross so I can turn over an IBM disk to the word processors elsewhere in the office who mostly use (ugh) IBM clones. At this point, I was happily using one of the two bubbles, but the other was simply keeping itself warm as it revolved, doing nothing useful.

Recently my boss indicated all of us engineer types ought to learn dBASE and LOTUS. I didn't want to have one of the firm's IBM's issued to me, and it is always a hassle to find an unoccupied one when I need it. Further, I have a copy of dBASE II which I have dabbled with for 3 years while I kept the books for a computer club. Ironically, the club is IBM oriented, and I was amused to occasionally remind the members that their roster was being kept on dBASE II, running under CP/M on a TRS Model 4! The combination has worked well, but I really never got past the command mode of dBASE II.

My question now was how to put CP/M on my HARD DISK III at work. I can't use the 35 Meg drivers, since that 35 Meg drive has

the RS 26-1138 Western Digital controller in it, and the HARD DISK III has the Xebec S1410A SASI controller. Obviously I needed a driver for CP/M on the Xebec S1410A.

The only legitimate option seemed to be our old friend Monte of Montezuma Micro, for whom Software Wizard Jesse Bob Overholt has written much good stuff. Suiting the action to the thought, I called Montezuma Micro, and inquired if by any chance they had a HD driver for their CP/M on a HARD DISK III with 5 Meg bubbles in it. The initial response was essentially "Say What?". After repeating my request, and being transferred a couple of times, I reached Kevin, the manager, who knew what I wanted, but could only say no, they did not have it.

I next inquired what it would cost to have the necessary driver written for me? The cost would be $475, the time frame about 90 days, and I would have to ship my HD to them for testing. I said this was uneconomic and I could not pursue that course of action.

However, I have a partial listing of the HD drivers they have done, and on it there is listed a driver for an Aerocomp 5 Meg HD (Aerocomp is another branch of John Lancione's empire, Montezuma Micro being the CP/M arm of it). Since I knew the Aerocomp unit also used a SASI controller, I decided to buy the Aerocomp driver and try to patch it to work with the SASI controller in my HARD DISK III box. Kevin warned me several times that they could not guarantee the Aerocomp driver would work on my HARD DISK III unit, and it was entirely my responsibility and no guarantees applied. (When the driver arrived, the same notice was even on my invoice!) I assured Kevin I would not try to hold them responsible, and I understood I was strictly on my own. I think he was a little too cautious about my application of the Aerocomp driver, but they have probably had some unjustified complaints in the past.

By the way, if you are inclined to go for a new hard drive (or other TRS add-ons), Aerocomp should be considered. John Lancione is offering new components, good drivers, and has submitted his equipment for the required FCC testing. Not all vendors do that. John has stayed with us TRS users, and deserves consideration when you are planning to spend money.

Anyway, the driver disk arrived, and on it was the promised Aerocomp driver. But, Surprise!, there were two VR DATA drivers on the disk, also! However, they were for a VR DATA 17 Meg drive, and I have only 5 Meg bubbles in the box. The copyright date is 1983, so I guess everyone at Monte's abode had simply forgotten these drivers ever existed. What to do? Since both VR DATA drivers were for a 17 Meg bubble with 4 heads and 480 tracks, I began cogitating.

The head count is correct for the bubbles I have, but the track count is wrong, as my bubbles have 153 tracks. One of the two VR drivers was written to partition by head offset, and the other by track offset. The latter looked promising.

If I use this 17 Meg driver on one of my bubbles and tell the driver that the first 120 tracks (25% of 480) of each head are to be used for drive A, and simply don't assign the other 360 tracks, then I will have lost the use of 153 - 120 = 33 tracks or about 1 Meg, but the other 4 Megs should operate as drive A. For my immediate purposes, this would be fine and dandy. After all, dBASE II runs OK on a couple of floppies, so a 4 Meg hard disk would be like a skating rink for it to rattle around in.

My next step was to try out the 17 Meg driver and if it works, go ahead and use it. The only potential problems I could see were the matters of write precompensation and write current reduction. Since the driver might have been written to shift at track 240, then it would not shift at track 128 where the Tandon bubble expects it. Either of these two discrepancies might be enough to prevent successful operation, and if that happens, I must go on to the next option.

I attempted to install and run both of the two 17 Meg drivers. The head offset driver wouldn't do anything worthwhile. But the other, track offset, version gave me slightly better results. I ended up with CP/M OPERATING from the Hard Disk III, but I could not read files sent to it via PIP. Well, nice try.

Now on to the second option, which would consist of disassembly of the driver, discovery of how and where the precomp and write current reduction events occur, and then patch the correct values into the code.

But how to disassemble the driver? I don't have all the nice tools of TRS to massage a CP/M program. If the mountain won't come to Mohammed, maybe Mohammed can travel to the mountain. I wanted to use Soltoff's DSMBLR because it allows masking of data and text areas, (there are a lot of these in the driver), and I wanted to use NewDos80's DISASSEMbler because of its feature which gives you all the back references within the code. How to move the CP/M program to TRS? I used DDT to load the driver at 0100H, the usual load address, and then block moved the driver to 8100H in memory. The driver was less than 1300H in length. After making the block move, I rebooted the machine under TRSDOS 6.3 and then DUMPed the still resident block of memory at 8100H to my 35 Meg hard disk under an appropriate TRS file name. Next I used one of Soltoff's Golden Oldies to check the file on the hard disk to verify I had indeed gotten the file I wanted. All OK in this regard. I moved all three of the MM drivers to my TRS hard disk this way. Next, I ran the two disassemblers to create files for study.

After sufficient study, I was able to determine where the total track count, the precomp and the reduce write current track numbers are stored in the driver. All told the disassembly of the 17 Meg VR Data driver took a good 2 months of spare time study. But I did it!

Once I had the necessary patching locations and contents identified, I took DU and a fresh copy of the 17 Meg driver in hand and went to work. My first effort was almost successful. Off by one bit, it turned out! What happened was that the second bubble would accept CP/M on its system tracks, but when I tried to move the other files over to it, it gave me an error message to the effect that my directory was full!

One night's thought pointed me in the right direction. Given its druthers (defaults), the Xebec controller will format all sectors with the hex character 6C. CP/M, however, insists that the first byte of every directory entry be hex E5, as this is how CP/M determines if a directory slot is in use or is vacant. To accomplish this, the driver sets up a buffer in the HDC full of E5's. My problem was that I was also following Soltoff's code for general guidance, and since he was writing for TRSDOS and LDOS, which don't care what the formatting byte is, he did not set the bit which requires the HDC to USE the contents of the HDC buffer. Another aspect of my problem is that the Xebec data available to me is inconsistent, and at first I had no clue to the purpose or significance of the bit which turned out to control the formatting. Once I understood the problem, I set the one flag bit involved, and tried again. Success! I now had the driver patched to match the 5 Meg, 4 headed drive, and I assigned head #4 to CP/M as drive A:.

I used the other 3 heads of the drive for LDOS, and, just for convenience, I told LDOS it could share head #3 of the other bubble with TRSDOS. This allowed me to move files between DOSes, as both TRSDOS and LDOS can read the same files.

At this point, and for a week, I was feeling great with my pride of accomplishment spilling all over anyone who would sit still for a minute or two. I then decided to take the drive to a club meeting to demo what I had accomplished. Bad decision! I gently carried the drive to my car, took it home, took it to the meeting, and now it wouldn't boot CP/M or LDOS. I could still boot TRSDOS on the first bubble, but nothing on the second. Wha' Hoppen?

After further analysis, I came to the conclusion the Xebec HDC would no longer access the second bubble. I still don't know why. In any event, I had to do something. Since I still had another bubble laying around, a 12 Meg unit of questionable virtue and unknown history, I decided to plug that one into the HARD DISK III box and try to use one large bubble in place of the two smaller ones. But, talk about the fickle finger of fate! This bubble turned out to have two bad heads in it, so instead of being a 12 Meg, 6 head bubble, it was effectively only an 8 Meg, 4 head unit. But the 4 heads worked and reported no bad sectors, so now I have a HARD DISK III with one 8 Meg bubble in it. (I didn't even

consider repairing the 2 bad heads in the bubble, as I think I only paid $20 for it, and a technician with a clean room won't touch a bubble for less than $75).

By patching the VR DATA driver again, I now have CP/M on head #4, with TRSDOS and LDOS sharing the other 3 heads. Again, I set up drive :2 as common for TRSDOS and LDOS. I now have all 3 DOSes on the one "8 Meg" bubble, I use them regularly, I did do a demo at a later meeting, and the only question still open is why the Xebec HDC won't access a second bubble. Since I want to do other things, I am not going to chase that bug. I even put the front panel back on and the HARD DISK III box looks very nice.

Implementation of this old HARD DISK III has been a long, interesting road, but I feel I have accomplished something in the way of personal satisfaction, and have shown there is life yet in some of our antiques!
-Roy T. Beck

TIME TO RENEW?
If your mailing label ends with 90/04
IT'S TIME TO SEND YOUR RENEWAL IN.

A VISIT WITH DAVID GOBEN
by David Goben

TRIALS AND TRIBULATIONS
The subject for this month was a toss-up. Originally I had planned on showing you how to turn your Model I/III/4/4D into a digital recorder, then I decided that I would first show you (us!) ORCHESTRA-90 fans how to automate music file playing via an intelligent menuing interface, and finally (after some initial trouble getting problem reports with VIDX ironed out) I decided that I should share a common plight of programmers when trying to write programs for various TRS-80 computer configurations. Therefore the digital recorder and Orchestra-90 interfaces will be presented in the near future.

If you are a regular with CN-80 and my column, you'll recall that in the January 1990 issue of CN-80 (Volume 3 # 1, page 14), under the heading of "Scroll Protect for I/III" I presented 2 programs; VIDX/CMD and PROTECT/CMD. I had of course written these programs in machine language, but for presentation in the pages of CN-80 (and to save lots of space), I converted the files into a BASIC "data-poke" format that most anyone can key in. Unfortunately the DATAPOKE/BAS program I used creates files targeted for the Model 4 mode, so after the conversion I was forced to modify the resulting program to run on the Model I and III. In the process I accidentally removed an important statement in line 70 of both program listings (One and Two), as I had reported in the March 1990 issue. Basically what the fix detailed was that you should change the :GOTO 50 statement at the end of the line to :PRINT#1,CHR$(A);:GOTO 50. This fixed the problem and allowed the programs to create workable CMD files.

Other problem reports stated that after the inclusion of the above-named fix, the programs still did not work. So I went to the trouble to key the programs in as listed in CN-80 and run them (of course adding the extra statement in line 70 of each). They worked like a champ. So if you are having trouble in that department then you may have keyed something in wrong, but did it in such a way that the checksums still came out right. For those of you with that problem I strongly suggest that you get the CN-80 Disk Series Disk Number Eight (8), which is presently available for $5 from CN-80 (see the PRODUCT ORDER page later in this issue). Besides, this saves you a LOT of time and trouble, AND the programs VIDX/CMD and PROTECT/CMD are already on disk, pre-assembled for you.

Anyway, another problem report had me totally baffled. The writer reported that PROTECT/CMD worked fine, but that poking both 16916 and 16428 did nothing. ARGH! I work so hard to make life easier for you. I gnash my teeth (violins play in the background) when I do something that makes it less easy.

His report of nothing happening when he poked a value to 16916 on the Model III had me baffled because on my re-keyed copy (and the original -- the copy that you will find on the Disk Series disk) it worked fine.

But when I applied the optional patch mentioned on page 15 of CN-80 Vol 3 # 1 for the Model III to make the I and III version use the same poke address, this caused it to fail. Double-ARGH! Model I users were not able to scroll-protect except by using PROTECT/CMD.

After digging through the source code for the programs I found that there was NOTHING wrong with the programs themselves (whew!). However I did find that in my original program design I had selected address 16428 (hex address 402C) as the scroll protect address, but I had later discovered that this caused a problem on the Model III, and so I had no choice but to change the address to a commonly safe address I had found at 16543 (hex 409F) so that the Model III would not choke when PROTECT/CMD was used. Unfortunately for you (and me) when I wrote my column to accompany the program, I referred to my older notes that had still specified 16428 as the proper poke address, although the current programs no longer supported this older address. Rats!

So, as also reported in the March 1990 issue, the PROPER Model I poke address is 16543. Actually, this is a kind of easy address to remember. So you Model I users who were frustrated, use 16543 (hex 409F) instead and all will be roses. Also, those Model III users out there who were having trouble, use 16916. If it does not work then you did something wrong, as the program -does- use this 16916 address (hex 4214). This is of course the "standard" Model III scroll-protect poke address. If you had applied the patch to make the III use the same address as the Model I then you should use the Model I 16543 address instead. Whew. Beat me fifty lashes with a wet noodle.

But this brings me to yet -another- subject:

MACHINE SENSING: WHERE ARE WE?

How many times have you written a real gem of a program, debugging it until it runs flawlessly on your computer. Then, in a moment of pride and glory, you give a copy to friend who has a different model TRS-80. But instead of hearing ooh's and aah's and gasps of amazement (and them kissing your shoelaces for a particularly astounding project), they instead turn around and say "Hey. I thought you said you debugged this stupid thing. Look, it doesn't work!"

Well, instead of killing all witnesses, you may find the following information quite useful. You should know something about such terms as word-sized values, bytes, hex addresses and such to follow this. If you don't understand this then you should not bother reading further, or you should read a good introduction to assembly language which covers such subjects, such as "Assembly Language for the Models III and 4" by Chris Fara, or "Z-80 Machine Language Techniques" by Don Ady. Both books are available from CN-80.

It used to be that to check which computer you were on you simply looked at address X'0125'. If the byte there had a value of X'49' (the ASCII code for the letter 'I') then you were using a Model III, otherwise you were using a Model I. Things got more complicated when the LOBO "clone" computers came along, as well as the Model 4. Many of us take for granted that we can try poking a value into low memory, and if it takes this means we have a Model 4, otherwise it is a I or a III, and so the test first mentioned would be used to get the final verdict of the computer type. This is no longer true as many programs such as the hardware interface kit for LDOS 5.3 and other MEMDISK programs for the III mode of a Model 4 place the ROM image in RAM, and so eliminates the reliability of this poking test. Due to this I tried to develop a list of PEEKs that could reveal the proper computer type.

If the byte at address X'0000' is X'C3' then it is a Model 4 running under Model 4 Multidos.

If the byte at address X'0200' is X'C3' then it is a Model 4 running under DOSPLUS IV.

If the byte at address X'020F' is X'49' then it is a Model 4 running under TRSDOS/LS-DOS 6.

If the hex address at address X'0006' is X'4000' then the computer is a Model I/III.

If you know the computer is a I/III (as tested from above), then if peeking at hex address X'0125' results in a byte value of X'49' (the ASCII letter 'I') then it is a Model III -- otherwise it is a Model I.

If the Computer is a Model I, then you can tell if you are using a LOBO LX-80 Model I work-alike by looking at the byte at address X'3000'. If the value is X'F3' then it is an LX-80; otherwise it is a "real" Model I.

If you know that the computer passes the Model III tests then if the word at address X'36FF' is X'1B60' then it is a Model 4/4P/4D running the the III-mode.

If you know you that the computer is a III and is not a 4/4P/4D, then if the bytes at hex addresses X'37F8' and X'37F9' are the same then you are running on a LOBO MAX-80 Model III work-alike, otherwise you are operating on a real Model III.

But what is so important about knowing such things? Well, for one thing a program will often require different system calls depending on what type of machine is being used, such as a standard I and III and 4. Some other machines, such as the LX-80 and MAX-80 may require special initializations that its different architecture might dictate, such as its expanded RS232 interfaces. Other more complicated things result from the use of the printer port, like if we should send a byte directly to the printer via hex address X'37E8' or port X'F8'. It is due to these simple little things that allows a program to run on one machine and not to run on another. There are many differences between the clones and the Tandy computers as well. More than once I have heard from MAX-80 owners "I thought you said that this program ran on the Model III? I can't get it to run on my MAX?" I can only answer with: "That's right; I said it would run on a Model III. I did not say it would run on a MAX."

Problems usually sprout from a program's use of ROM calls. On the surface these calls are gems because they save us so much labor, but when you try running on EVERY machine possible you run into a lot of trouble, often resulting in a program growing quite large just to cover initialization; machine testing and adjusting for them. This problem has troubled me to this day. I therefore try to make my programs run on only "real" Model I and III and 4's, and try to make them operate on as many operating systems that support only these 3 computer configurations.

Of course this test list may still be incomplete. Since I do not have access to a LX-80 or a MAX-80 I can only go on information provided for me, which currently is next to nothing. But what about the Video Genie Model I work-alike? Any of you have it? How can a program test for it? Using 20-20 hindsight I wish I had the knowledge that Peter Ray down at Anitek has concerning machine sensing. Considering the impressive array of TRS-80 environments that LeScript supports, his knowledge is obviously vast and respectable.

DATE EXTENDING LS-DOS 6.3 (#2)

I understand that LS-DOS 6.3.1 contains code to extend the dating of LS-DOS to December 31, 2011. If you are a regular reader of CN-80 then you'll recall that I had already provided you with the patches needed to do this in Volume 2 Number 6, page 16. I don't know what patches Roy down at MISOSYS applied to add this feature, but I suspect that they will emulate in most respects my own patches, as I had submitted them to him in October of 1988.

At the time I submitted them he told me there wasn't much chance of adding such patches as he did not see the future of the TRS-80 going through to the year 2000. Apparently something has changed his mind -- YOU! If it had not been for you, the users and supporters of TRS-80 equipment, things such as this would never have come about. Thank you for supporting those who support you! May this trend ever continue.

But while we are on the subject of date extending, I thought that I would share with you some more news. I have managed to modify my own 6.3 extension patches so that those of you who have added extensions to your DOS, such as patches to support the XLR8er board, the Alpha Technologies Board and such will not have a head-scratching session when using my patches. I have now found a way to modify LS-DOS 6.3.0 in such a manner that the date extension patches will not interfere with the memory enhancement boards, and in fact will no longer require any low-memory driver space. I sat down the other day rethinking my approach and found an easier way to install the patches and to have enough room in patch areas to apply my modifications. I am sure that the new

LS-DOS 6.3.1 changes will do pretty much the same.

Also included within these patches is the ability to simplify date entry upon boot-up and when using the DATE library command. After installing the patches you will be able to enter a date such as April 5, 1990 as 4.5.90. Thus if you had once installed my patches mentioned in this column sometime ago to do this one feature, you will not need to re-install them. Further, those of you who had to de-install them due to conflicts with the code with your XLR8er board system support software can now breath easier because this new code will not interfere with it.

These new listings can be found in the program listing section of this month's magazine as Patch Listing Number One through Patch Listing Number Six. Once you have created all 6 listings using either BUILD or a word processor that is capable of saving a file in ASCII format (avoid using TED because its end-of-file character confuses PATCH when used with FIX files), you can install them by placing a working copy of LS-DOS 6.3 in Drive :0 and enter DO =DTX63, and they will automatically be installed for you. For best results be sure to use a fresh work copy of your master LS-DOS 6.3.0 disk. You can add your other patches afterward.

Once these patches are installed, to enter a date beyond the year 1999 you must enter the year as you did before; using the last two digits. For example, to enter January 1, 2001 you would enter 01/01/01, or since with the patches we now have simplified date entry; 1/1/1.

CONCLUSION

I hope that I have helped you out in this "special edition" column. I hope also to have given you some insight into (and compassion for) the trials and tribulations a programmer must go through to get a program to run on more than just one machine. It can be a real can of worms.

Be it as it may, in my next column I'll show you Orchestra-90 fans how to spiff up your music collection by using ORCHKEY/CMD, a special keystroke feeder that will allow you to take advantage of OIL (Orchestra Interpretive Language -- a PILOT-like language) to simplify your music selection. It emulates the "demo" programs you may have once seen at Radio Shack which advertised Orchestra-90 "live". After that you may want to dig out your cassette cables and dust your recorders off because next we'll enable your I/III/4/4D computer to digitally record and play back music and even your own voice! So until next time -- HAPPY COMPUTING!

-David Goben

(Editors Note) David's patches that appear in this issue will be included on our disk series number nine as usual, if you need these patches on disk prior to then, just send $2.00 to pay for postage and disks costs and we will send you a special copy of the patches. And don't forget that the File Cabinet has 81 disks with pre-programmed music selections. With the average of 20 song programs per disk that would make about 1620 music selections waiting to be played on you TRS-80, with more selections coming in the future. And with David's upcoming articles more of us might get the music bug.

We had two of the Orchestra-90 RS Cat. #26-1922 for sale. There were many disappointed users who missed out because we just didn't have enough to go around for all the people who wanted one. The RS 1986 catalog was the last catalog ($79.95) we found this unit in, and they have become very scarce, we even let the one we were hanging onto for ourselves go. (One less disappointed user.) What did it do? It allowed you to create your own electronic music and sound effects and play it on your home stereo, or tape cassette recorder.

Maybe some of you hardware hackers can come up with a home grown unit to accomplish the same task as the Tandy unit did. If you come up with the hardware, I know that one of our expert programmers can come up with the software. If not, we may hear a "Swan Song" for the Orchestra-90 fans. Let us know if you have any ideas. CN-80 will be happy to assist you in the distribution and marketing of such a product, or publishing a "How to build your own" design and instructions.

CAR MAINTENANCE PROGRAM REVIEW
CN80 Staff Review

Last month we promised you a look at a car maintenance program called "Auto-Support" that was written by Jerry McAllister and Henry Leno. Henry Leno is in the Navy and submitted the program to us to publish or review. The program is written in Basic and only runs under DosPlus Ver. 3.5, however we ran it using LDOS 5.3 and it ran quite well with the exception of a few line errors. We feel that the author or another programmer could rewrite the program with very little effort so that it could work under LDOS 5.3 or a later DOS. As it stands there are 17 pages of basic program, much too long to be printed here. (The program will be available on our disk number nine, and perhaps a version that will run on a dos other than DosPlus.)

All in all the concept of the program intrigued us. It comes in 5 BASIC program modules. The first is the data base initializer which you run first to set up the other programs to fit your own auto or truck.

The program and its menu is self-explanatory, and at this point has no documentation, but after running it through once on a trial basis, we found that there really wouldn't be any need for any documentation, except maybe it needs a readme file to explain the start up procedures.

Entering the present Odometer mileage, and either using the maintenance checks that are prewritten or changing them to your own liking, the program then proceeds to the main menu, where you enter your gas purchases; date, odometer mileage, and amount of gas purchased, and then proceeds to tell you the miles per gallon for each fillup. Assuming that you entered your gas purchases for a month and then ran the program it will calculate and tell you how many miles you are getting per gallon for the month. It also has the ability to accept either entries in gallons or liters.

A monthly or anytime you choose, reading the menu for maintenance data will give you what maintenance items are due and what items are past due and need to be done.

One disk backed up from the original disk and initialized for each vehicle would serve as a good maintenance control. The program displays the data on your screen or prints the records to give you a printed maintenance record for each vehicle.

Mr. Leno first asked that we list the program and anyone who liked it could send $10 to him and he would send them a copy. To clarify our policy, we wrote back that if he wanted to sell the program then he would have to advertise it in our ad section and that we would write a review of the program. His reply was "I am not interested in selling my "Auto-Support" program, but rather interested in sharing information and programs with others like myself who still use and appreciate the TRS-80 Model I/III/4/4P computers. Having said that please find enclosed my diskette containing the full "Auto-Support" program. I would like to have it placed in public domain. The reason I requested $10 initially for it was just to cover postage and handling. By placing it in public domain, that job is done for me. The diskette is formatted using DosPlus Ver. 3.5, 42 cylinders, single sided double density, no password. The only stipulation is that it needs DosPlus Ver 3.5 to run. If another Dos is used, the program will error out on the 'INPUT@' lines. I would like to see these programs printed in your magazine, or at least a review. This was my first major software undertaking and it is kind of sentimental, if you know what I mean!"

CN80 would like to suggest that even though Mr. Leno has placed his program in the public domain, that if you like the program and use it, that you treat it as shareware and donate $10 to the author for his work. In any event some of you who like to work in Basic might enjoy updating it to work under LDOS or LS-DOS. -CN80

USING THE WORD PROCESSOR TO LAYOUT DIAGRAMS FOR YOUR BASIC PROGRAMS.

by Robert L. Mensch, PE

Have you ever tired of the tedious task of counting spaces to get your PRINT and PRINT TAB text and symbols to appear at the right spot on the video or printed page.

Now I have an easier way. Just use your word processor and make the layout on the screen as if you were writing on a blank sheet of paper. I am using DISK:SCRIPSIT, but any word processing program should work.

```
1001 PRINT "                              "
1002 PRINT "                              "
1003 PRINT "     (BLANK SCREEN)           "
1004 PRINT "<---80 columns max--->"
1005 PRINT " including quotations "
1006 PRINT "                              "
```

STEP 1. Use your word processing program to create a blank screen with quotation marks at L and R margins of desired area. If you want the BASIC program to put the display on video then limit width between the quotation marks to 78 columns and length to 22 lines. Be sure to put an end-of-line marker after each quotation mark at the R margin. For display widths greater than 66 columns, set your window width, so the line numbers and PRINT can be shifted off to the left out of sight. Hint: Use Block Command to repeat the top line as many times as needed, then correct the line numbers.

```
1001 PRINT "______________________________"
1002 PRINT "*   |_______________|    |"
1003 PRINT "*     |  GIZMO    |      |"
1004 PRINT "*    / \ ]----[ / \      |"
1005 PRINT "*    <------------->     |"
1006 PRINT "*__x__x__x__x__x__x__|"
```

STEP 2. Make design within the blank screen using words and symbols in your word processing system. If you need some special symbols, then you must write additional BASIC statements to print them to screen or paper before or after this design is printed.

STEP 3. Save the DESIGN shown in step 2 in ASCII and then RUN the program in BASIC.

The screen should look like this:

```
_____________________________
*  |_______________|   |
*    |  GIZMO    |     |
*   / \ ]----[ / \     |
*   <------------->    |
*__x__x__x__x__x__x__|
```

STEP 4. If you want to make your design flash ON and OFF then add the following lines to your program:

```
10 CLS
20 FOR T = 1 TO 500: NEXT T
1010 FOR T = 1 TO 1000: NEXT T
1020 CLS: GOTO 20
```

STEP 6. OH, you want to shift the whole design to the center of the screen. Insert line '30 PRINT@ (15,30)' and Use the GLOBAL command to replace the word 'PRINT' with 'PRINT TAB(30)'. Now your screen may look like this, depending how you set the window.

```
1001 PRINT TAB(30)  TAB(30)
"______________________________"
1002 PRINT TAB(30)
"*  |_______________| |"
1003 PRINT TAB(30) "*    | GIZMO  |
 |"
1004 PRINT TAB(30) "*   / \ ]----[ / \
 |"
1005 PRINT TAB(30)  "*  <------------>
 |"
1006 PRINT TAB(30)
"*__x__x__x__x__x__x__|"
```

Don't forget to save your new program in ASCII. Try RUNning it in BASIC.

This method is certainly a lot faster than using the video display worksheet and counting squares and calculating many TAB statements.

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BIGPRINT/ONE and BIGPRINT/TWO

by Jack H. Haren

I was intrigued by Danny Mullen's VCRGEM10/BAS program in the November issue of Computer News 80. It seemed to offer a challenge to be expanded well beyond what it was designed to accomplish. Since I am constantly on the lookout for program's to write, this seemed like a welcome opportunity.

The result was BIGPRINT/ONE and BIGPRINT/TWO (see program listing one) both of which have the following features:

(1) Ability to print numbers, letters and special characters !"#$%&'()*=:-@+;<>?, /.
(2) Choice of either horizontal or vertical printing.
(3) Unlimited 14 character lines (13 on some printers) when using horizontal printing.
(4) Unlimited width for 7 lines when using vertical printing.
(5) Either automatic or user line formatting.
(6) Left, center or right line justification.
(7) Half character centering when using horizontal printing.
(8) Preview of the sign or labels before printing.
(9) Automatic centering of the seven lines when using vertical printing. A single line of text will be placed on line 4, the center line. 2 lines of text will be placed on lines 3 and 5 while 3 lines will be placed on lines 2, 4 and 6.
(10) Printing of one or more labels of 1 to 5 characters each.

BIGPRINT/ONE was written to work with the GEMINI-15X printer which I use at home and other printers which have BLOCK Graphic capabilities. Everything went fine until I tried to move the program over to an MS-DOS computer that was connected to an old EPSON printer which didn't have the block graphics capability of my GEMINI. Conversion to GW-BASIC was easy but the Epson printer was another matter because I was forced into an area new to me, Dot Graphics. After a considerable struggle the necessary modifications were added and the new program BIGPRINT/TWO worked on either the GEMINI or EPSON printer. Since BIGPRINT/ONE which uses the block graphics runs much faster, I have included BIGPRINT/ONE as well as BIGPRINT/TWO which uses Dot Graphics. You can use which ever one works with your printer.

PROGRAM OPERATION

After typing RUN, the program warns the user to turn on the printer.
You are then asked to answer the following formatting questions:

"Are you printing signs or labels? (S/L)"
If labels, some of the following questions are skipped.

"Please select Left, Center or Right Justification (L/C/R)."

"Enter the desired text."
There is a limit of 255 characters.
User format control is accomplished by using a backward slash (\) <CLEAR></> in place of a space between words where you want a line to end.
Blank lines can be created by using two backward slashes (\\).

"Do you want Horizontal or Vertical printing? (H/V)?"

A PREVIEW of the sign or labels is then displayed on the screen followed by:
"Is the format OK (Y/N)?"

If the answer is "Y" the sign is printed. If "N", you are asked,

"Another? (Y/N)"

That's all there is to it. After a few minutes playing with the program, you will be an expert and won't even use any paper until you have an acceptable sign ready to be printed.

PROGRAM NOTES

Because descriptive variable names are used and the various routines in the program are identified with remark lines, I will not spend a great deal of time explaining how the program works. There are however, a few things which may be of interest.

The 9000 series of DATA lines contain the codes which are used to construct characters line by line. Ten codes are used, each one representing a particular geographic block used to build the characters. 0 represents a blank block while

9 is a solid black block. 1 through 4 are lower right, lower left, upper right and upper left triangles. 5 and 6 are left half and right half blocks while 7 and 8 are upper half and lower half blocks. These are read into array A$( ) at lines 120 and 130 in BIGPRINT/ONE or lines 110 and 120 in BIGPRINT/TWO. You may wish to modify the type font or to substitute graphics of some sort for some of the special characters. Since you know the codes used, changes to the DATA stored in the 9000 series of lines is easily accomplished.

BIGPRINT/ONE converts those codes to the ASCII codes for GEMINI block graphics. At line 100, the DATA from line 110 is read into arrays VPC( ) AND HPC( ). Array HPC( ) is for Horizontal Print Control and VPC( ) is for Vertical Print Control. These ten ASCII codes correspond to the ten character codes zero through nine which are used to construct the characters on the 9000 DATA lines.

BIGPRINT/TWO required six dot graphic codes to create the equivalent of a single block graphic code. Twenty sets of these, ten for horizontal and another ten for vertical printing are on the 8000 series DATA lines. These are read into array PIN( ) at line 100.

Of special note is function FNUC$(X) on line 90. I don't remember where I learned about this function but have used it in many programs. In order to understand how it works, you must have a little knowledge of how the computer treats BASIC comparative statements. When the statement is TRUE the computer generates a -1 in its place. (Try this on your computer in BASIC by typing PRINT 1 = 1). When the statement is FALSE a zero is generated (Type PRINT 1 = 2). When two comparative statements joined by AND exist as in FNUC$, if neither or only one is TRUE the total statement is considered FALSE and a zero is generated. If BOTH are TRUE then a -1 is generated. When 32 is multiplied by a zero (FALSE), the result is zero but when multiplied by -1 (TRUE) the result is -32. If the character under consideration is a lower case alpha, -32 will be added (or if you prefer, +32 will be subtracted) and the resulting ASCII will be the upper case equivalent of the character. If the character is not a lower case alpha, zero is added and no change takes place. This function is used on text entries and to modify answers to questions to assure upper case.

If you have trouble printing the 14th character when using the Horizontal mode, change line 2030 to CHAR.MAX = 13.
-Jack H. Haren

(Editors Note) Due to the length of these two programs only the BIGPRINT/TWO has been printed in this issue. And because it worked quite well on our Panasonic printers in the Epson FX80 mode. BIGPRINT/ONE for the Gemini printer will be available on our Disk Series Number 9 which will cover the programs printed in the April, May and June issues, or by advance special purchase if you don't want to wait for number 9, $2.00 please, to cover disk cost and mailing. We thank Mr. Haren for sharing his work with us and for his continued support of the TRS-80. It is efforts such as his and Danny Mullen's and others that will keep the TRS-80 computers working long into the future with new and interesting applications. It goes without saying that there is a great deal of pride and satisfaction in being able to say "look what I can do with my computer, I wrote that program". Try saying that about a MS computer, without relying on their fixed application programs. -Ed.

CHECK WRITER PROGRAM
by Elton Wood

For the past several years I have been involved in the management and administration of a small non-profit water system. In conjunction therewith I have used my Model 4 and LeScript word processor as the tools for printing the monthly accounts payable checks. While the work processor approach has served well, I always had in the back of my mind that someday I should develop a check writing program, however lack of motivation and inspiration left the project undone.

Well, along comes Issue 26 of CodeWorks magazine which contains a program entitled "Ckrite.Bas", written by editor Irv Schmidt

for the MS computers. This program takes an integer dollar amount and changes it to the equivalent words used in writing checks.

A detailed study of this program provided the necessary stimulus for brainwork and efforts, as I incorporated the concept of Irv's program as a subroutine into a finalized check writing program.

The enclosed program listing (see program listing number two) and diskette which is in ASCII, is written for a TRS-80 Model 4 and is the result of this effort. It is provided for your perusal and disposition. My experience indicates that there are about as many ways to code a program as there are people who write them and that most people who have enough interest to type in a program will incorporate some of their own personal touches. Therefore, I think the program is remarked sufficiently so as to be self-documenting. It obviously has somewhat limited application but I have found it to be most useful as the tool for the purpose I intended. If not to practical for many, it may at least be of some amusement value.
-Elton L. Wood

(Editors Note) You will find an advertisement in the Product Source of this issue where CodeWorks is offering its first four years of CodeWorks magazine which were written for the TRS-80 Model III and IV along with the programs on disks. We had the idea since CodeWorks has now changed its support to the MS computers and GW-Basic that many of you may not be aware that there were many good programs, plus good instruction in Basic programming provided by CodeWorks in its first four years of publication. So we called Irv Schmidt and discussed the idea that he should not let those years of productive work just revert to never-never-land and that there were many of our subscribers who would be interested in knowing about the CodeWorks TRS-80 programs. Because many of our subscribers are new owners of their TRS-80 computers or were perhaps unaware of CodeWorks. The resulting advertisement and effort by Irv to keep his programs available to the TRS-80 user is the result of that conversation and is greatly appreciated by all of us TRS-80 users.
-Ed.

OPEN FORUM

Q: I haven't been able to get David Goben's Model III enhancements software in the January issue to create a command file from Basic. Well, actually it creates the file, but writes nothing to it, as though it's not reading the data lines.
H. A. B. Jacksonville, FL

A: At the end of Line 70 in both programs change
:GOTO 50
to
Print#1,CHR$(A);:GOTO 50

Q: In Vol 3 No. 2 page 2 you had a hint on Deskmate date upgrades. I tried this on my Model 4P and it went fine until I go to the:

SET *CL COM <ENTER>

When I did this I got the message "program not found". I would appreciate it if you could help me figure out what I didn't do or what I did do wrong.

I really enjoy your magazine and appreciate your efforts in getting us something worthwhile for us to use with our Model 4's.
-R. G. B. Stuttgart, AZ

A: You did nothing wrong. For the Set *CL COM to work the COM/Drive program must be on the disk you are working on. If the COM/Driver program does not exist, then you do not need to use the SET *CL COM command step in our suggestion to upgrade your Deskmate. The one thing we left out was the DATE/CONV, that should be, but not necessary, last step. This command updates your existing programs that were stored on DATA storage disks with the new dating, if not used on your old data disks you may get garbaged dates when you read the directory of the older files, but nothing will happen to the data that you stored in those programs.

LTR: The File Cabinet Library disk MD4 Business Volume 17 has a Special Occasion program in which you can enter all your friends' special events for the year.

It has a menu which shows: add occasion; delete occasion; or display listing. The display listings then asks for the month you would like displayed. After entering the month desired, it shows the name, date and occasion for each person entered. This can then be printed for the month's reminder list so you don't forget someone important to you.

It is a rather handy and convenient program.

However, I was not able to change or delete and entry after it wa once entered. Perhaps someone could solve this problem for us.
H. P. A. Coldwater, MI.

A: We would welcome any readers efforts to rewrite this program to allow for editing of the entries. We will even send you a copy of the program to work with if you don't have one. One solution we think of (untried because of lack of time at this point) is to use TED to edit the data storage file that this program would set up.

LTR: I would like to make a suggestion for a new column in CN80, which I read from cover to cover as soon as it arrives. I would like to see a Hints and Tips column where the readers could write in their "how to do it tips, patches and so forth".

There would be a great advantage to those of us users who could read about how someone else solved a problem or patched a program. Maybe you could have a hint of the month contest. With the best hint being listed first and with some sort of prize being offered each month.
K. P. Boston, MA

A: We are all for that. We have run a hints and tips section since the beginning of CN80, the only problem is that we have had to author all the hints and tips. We would be more than willing to provide 25 free disks to the Hint and Tip winner of the month. So charge up your word processors and get the ideas flowing.

One request however, please put your hint on a disk in ASCII format. And please label the disk with the format used, and which Basic you are using. We have received articles with hard copy printouts and disks with no labels. It is very easy to get the disks mixed up with other unlabeled disks, then we have to spend time to match the disks up with the proper author.

While we are on the Subject of submissions please help us by following these simple rules.

1. Provide a hard copy of your article, letter etc. It does not need to be double spaced.

2. Provide your letter, article, hint and tip text, etc. on a disk in ASCII format. If you are unfamiliar with how your word processor stores files in ASCII format drop us a note and we will help you, or just send us your original file - but please tell us what word processor you used and what DOS was used to format the disk.

3. Always save your BASIC programs in ASCII to a disk, and label the disk with the programs name and what BASIC was used to write the program.

4. Always provide a hard copy of your BASIC program with the disk.

As the magazine grows, which is more information for everyone each month, your help is needed and these four simple rules will greatly assist us in getting that information to you.

Most of all thanks to all the contributors for their support and submissions.

Next month we hope to start printing the first part of our long overdue "How to Use Laser Printers with the TRS-80 Computers" research on this project has taken a little longer that we had hoped, and we want to make sure that the information is correct the first time. Your patience is appreciated and will be rewarded with some fine articles on this subject.

Till then - Happy Computing.

Patch Listing Number ONE -- David Goben

```
. DTX63/JCL
. Patch LS-DOS 6.3 for date extensions to Dec 31, 2Ø11
. David Goben. February 199Ø
.
PATCH BOOT/SYS.LSIDOS (DØ5,94=CD C7 Ø4:FØ5,94=1A 36 2F)
PATCH SYSØ/SYS.LSIDOS DTXSØ63
PATCH SYS6/SYS.LSIDOS DTXS663
PATCH SYS7/SYS.LSIDOS DTXS763
PATCH SYS7/SYS.LSIDOS DTXS763B (O=N)
PATCH BACKUP/CMD.UTILITY DTXBU63
.END -------------------------
```

Patch Listing Number TWO -- David Goben

```
.DTXSØ63/FIX
.Extend dating for LS-DOS 6.3 to Dec 31, 2Ø11
.David Goben, February 199Ø
.Install using: PATCH SYSØ/SYS.LSIDOS DTXSØ63
.
DØD,5E=CD B3 21 FE 2Ø
FØD,5E=4F D6 5Ø FE 14
DØD,C9=ØF
FØD,C9=Ø7
DØD,EC=BE 21
FØD,EC=C7 Ø4
DØD,FE=CD D3
FØD,FE=47 2E
DØE,ØØ=21
FØE,ØØ=DC
DØE,24=21 6C Ø7 85 6F 11 4F
FØE,24=D6 2Ø 2E 38 FE 3A 38
DØE,2B=21 3E 61 EF 21 4E 21
FØE,2B=Ø3 2C D6 ØA 67 22 52
DØE,32=CD 2D Ø5 ØØ ØØ ØØ ØØ
FØE,32=21 21 4E 21 CD 2D Ø5
DØF,9F=57 CD D8 21 38 Ø2 AF 53 82 37
FØF,9F=5F CD 2F 21 3Ø Ø4 83 5F 37 7B
X'Ø4C7'=1A 36 2F FE 64 D8 36 25 C9
X'21B3'=FE ØC 3Ø Ø3 C6 64 12 4F D6 5Ø C9
X'21BE'=53 75 6E 4D 6F 6E 54 75 65 57 65
X'21C9'=64 54 68 75 46 72 69 53 61 74
X'21D3'=47 21 DC Ø4 C9
X'21D8'=7E D6 3Ø FE ØA DØ 23 C9
.EOP ---------------------
```

Patch Listing Number THREE -- David Goben

```
.DTXS663/FIX
.Extend dating for LS-DOS 6.3 to Dec 31, 2Ø11
.David Goben, October, 1988
.Install using: PATCH SYS6/SYS.LSIDOS DTXS663
.
DØ5,32=D9 Ø4
FØ5,32=7A 2D
DØ8,D3=DC Ø4
FØ8,D3=7D 2D
DØ8,FB=D6 64
FØ8,FB=3E 63
DØD,6E=7E FE ØC 3Ø Ø3
FØD,6E=4A 61 6E 46 65
DØD,73=C6 64 77 D6 5Ø C9
FØD,73=62 4D 61 72 41 7Ø
DØF,89=CD 7D 2D
FØF,89=7E D6 5Ø
.EOP ------------------
```

Patch Listing Number FOUR -- David Goben

```
.DTXS763/FIX
.Extend dating for LS-DOS 6.3 to Dec 31, 2Ø11
.David Goben, February 199Ø
.Install using: PATCH SYS7/SYS.LSIDOS DTXS763
.
.fix DATE
DØ5,44=CD 15 27
FØ5,44=1A D6 5Ø
DØ5,4B=2Ø
FØ5,4B=14
DØ5,B2=ØF
FØ5,B2=Ø7
DØ6,Ø4=21 6C Ø7 85 6F 11
FØ6,Ø4=D6 5Ø FE ØA 38 Ø9
DØ6,ØA=45 27 3E 61 EF 18 Ø7
FØ6,ØA=47 3E 39 32 48 27 78
DØ6,FE=57
FØ6,FE=5F
DØ7,ØØ=2Ø 27 ØØ ØØ 82
FØ7,ØØ=FØ 25 3Ø Ø4 83
DØ7,39=1A FE ØC 3Ø Ø3
FØ7,39=4A 61 6E 46 65
DØ7,3E=C6 64 12 D6 5Ø C9
FØ7,3E=62 4D 61 72 41 7Ø
DØ7,44=CD FØ 25 D8 AF 53 2B C9
FØ7,44=72 4D 61 79 4A 75 6E 4A
.
.fix PURGE
D1Ø,3Ø=DC Ø4
F1Ø,3Ø=Ø3 29
D1Ø,51=ØE 37 ØC D6 ØA 3Ø FB
F1Ø,51=FE ØA 38 ØA ØE 39 D6
```

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```
D1Ø,58=C6 ØA 47 CD ØE 29 ØØ
F1Ø,58=ØA FE ØA 38 Ø2 3E Ø9
D12,ØB=CD Ø3 29
F12,ØB=7E D6 5Ø
D13,1A=7E FE ØC 3Ø Ø3 C6 64
F13,1A=4A 61 6E 46 65 62 4D
D13,21=77 D6 5Ø C9 79 FE 3A
F13,21=61 72 41 7Ø 72 4D 61
D13,28=38 Ø3 D6 ØA 4F 78 C9
F13,28=79 4A 75 6E 4A 75 6C
.EOP ---------------------
```

Patch Listing Number FIVE -- David Goben

```
.DTXS763B/FIX
.Extend dating for LS-DOS 6.3 to Dec 31, 2Ø11
.David Goben, February 199Ø
.Install using: PATCH SYS7/SYS.LSIDOS DTXS763B (O=N)
.
.finish fixing DATE
DØ5,E1=DC Ø4
FØ5,E1=15 27
.EOP ----------------------
```

Patch Listing Number SIX -- David Goben

```
.DTXBU63/FIX
.Extend dating for LS-DOS 6.3 to Dec 31, 2Ø11
.David Goben, October, 1988
.Install using: PATCH BACKUP/CMD.UTILITY DTXBU63
.
DØ8,4B=CD DD 36
FØ8,4B=7E D6 5Ø
DØD,82=7E FE ØC 3Ø Ø3
FØD,82=ØØ ØØ ØØ ØØ ØØ
DØD,87=C6 64 77 D6 5Ø C9
FØD,87=ØØ ØØ ØØ ØØ ØØ ØØ
.EOP ------------------
```

BIGPRINT/TWO PROGRAM LISTING NUMBER ONE for the Model 4, by Jack H. Haren

```
1Ø '
2Ø '              > > > BIGPRINT/TWO < < <
3Ø '
4Ø '           > > > Read DATA into the arrays < < <
5Ø '
6Ø CLS : PRINT@(5,17),"PLEASE STAND BY, READING DATA INTO MEMORY. . .";
7Ø PRT$ = CHR$(27)+"@"+CHR$(27)+"A"+CHR$(6)+CHR$(27)+"U"+CHR$(1) ' 6/72" line &
 unidirectional printing.
8Ø DEFINT A - Z : DIM A$(7,6Ø) , LAYOUT$(15) , HALF.SPC(15) , PIN(9,2,6)
9Ø DEF FNUC$(X$)=CHR$(ASC(X$)+32*(ASC(X$)>96 AND ASC(X$)<123))'Change LC to UC
```

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```
100 FOR X = 1 TO 9: FOR Y = 1 TO 2: FOR Z = 1 TO 6: READ PIN(X,Y,Z): NEXT Z,Y,X
110 FOR X = 0 TO 50 STEP 10 : FOR J = 1 TO 7 : FOR I = X TO X + 9
120 READ A$(J,I) : NEXT I,J,X
1000 '
1010 '          > > > Main Routine begins here. < < <
1020 '
1030 CLS : PRINT@(5,12),"This program prints large characters using PIN GRAPHICS."
1040 PRINT@(7,6),"Be sure that the paper or labels are adjusted and the printer is on."
1050 PRINT@(9,27),; : INPUT "Press <ENTER> when ready";X$ : LPRINT PRT$;
1060 CLS : PRINT@(10,20),"ARE YOU PRINTING LABELS OR SIGNS (L/S)?";
1070 LS$ = INKEY$ : IF LS$ = "" THEN 1070 ELSE LS$ = FNUC$(LS$)
1080 IF LS$ = "L" THEN 1120 ELSE IF LS$ < > "S" THEN 1070
1090 CLS : PRINT@(10,9),"Please select Left, Center or Right justification (L/C/R)";
1100 LCR$ = INKEY$ : IF LCR$ = "" THEN 1100 ELSE LCR$ = FNUC$(LCR$)
1110 IF LCR$ = "L" OR LCR$ = "C" OR LCR$ = "R" THEN 1120 ELSE 1100
1120 CLS : H$ = "" : PRINT@(10,28), "Enter the desired text." : PRINT
1130 I$ = INKEY$ : IF I$ = "" THEN 1130 ELSE I$ = FNUC$(I$) : ASCI = ASC(I$)
1140 IF(ASCI > 31 AND ASCI < 91) OR ASCI = 92 THEN H$ = H$ + I$ : PRINT I$; : GOTO 1130
 ' This is a valid character.
1150 IF ASCI = 13 AND LEN(H$) > 0 THEN 1190 ' ASCII 13 = End of text.
1160 IF ASCI < > 8 THEN 1130 ' This is an invalid character.
1170 IF LEN(H$) > 0 THEN PRINT I$; : H$ = LEFT$(H$,LEN(H$)-1)' 8 = <LEFT ARROW>
1180 GOTO 1130
1190 IF LS$ = "L" THEN HV$ = "H" : LCR$ = "L" : CHAR.MAX = 5 : GOTO 2040
1200 CLS : PRINT@(10,15),"Do you want Horizontal or Vertical printing? (H/V)";
1210 HV$ = INKEY$ : IF HV$ = "" THEN 1210 ELSE HV$ = FNUC$(HV$)
1220 IF HV$ = "H" THEN 2000 ELSE IF HV$ = "V" THEN 3000 ELSE 1210
2000 '
2010 '          > > > Horizontal PRINT routine. < < <
2020 '
2030 CHAR.MAX = 14
2040 GOSUB 4000
2050 IF YN$ = "N" THEN 3170 ELSE PRINT : PRINT TAB(31);"Please stand by."
2060 FOR LN = 1 TO TOT.LINES
2070 N = LEN(LAYOUT$(LN))*36+HALF.SPC(LN)*6 : N2 = INT(N/256) : N1 = N-N2*256
2080 FOR CHAR.LINE = 1 TO 7
2090 LPRINT CHR$(27) "K" CHR$(N1) CHR$(N2);
2100 FOR X = 1 TO HALF.SPC(LN) * 6 : LPRINT CHR$(0); : NEXT X
2110 FOR CHARACTER = 1 TO LEN(LAYOUT$(LN)) : CHAR.ASCI =
 ASC(MID$(LAYOUT$(LN),CHARACTER,1))
2120 FOR CHAR.CODE = 1 TO 5
2130 PC = VAL(MID$(A$(CHAR.LINE,CHAR.ASCI - 32),CHAR.CODE,1))
2140 FOR PIN.CODE = 1 TO 6 : LPRINT CHR$(PIN(PC,1,PIN.CODE)); : NEXT PIN.CODE
2150 NEXT CHAR.CODE : FOR X = 1 TO 6 : LPRINT CHR$(0); : NEXT X
2160 NEXT CHARACTER
2170 LPRINT
2180 NEXT CHAR.LINE
2190 LPRINT : LPRINT : LPRINT : LPRINT : LPRINT
2200 NEXT LN : GOTO 3170
3000 '
3010 '           > > > Vertical PRINT routine. < < <
3020 '
3030 CHAR.MAX = 18 : GOSUB 4000
3040 IF YN$ = "N" THEN 3170 ELSE PRINT : PRINT TAB(31),"Please stand by."
3050 FOR CHARACTER = 1 TO CHAR.MAX
3060 FOR CHAR.CODE = 1 TO 5 : LPRINT CHR$(27) "K" CHR$(223) CHR$(1);
```

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```
307Ø FOR LN = 7 TO 1 STEP -1
308Ø IF LEN(LAYOUT$(LN)) < CHARACTER THEN FOR X = 1 TO 72 : LPRINT CHR$(Ø); : NEXT X :
 GOTO 314Ø
309Ø CHAR.ASCI = ASC(MID$(LAYOUT$(LN),CHARACTER,1))
31ØØ FOR CHAR.LINE = 7 TO 1 STEP -1
311Ø PC = VAL(MID$(A$(CHAR.LINE,CHAR.ASCI - 32),CHAR.CODE,1))
312Ø FOR PIN.CODE = 1 TO 6 : LPRINT CHR$(PIN(PC,2,PIN.CODE)); : NEXT PIN.CODE
313Ø NEXT CHAR.LINE : FOR X = 1 TO 3Ø : LPRINT CHR$(Ø); : NEXT X
314Ø NEXT LN : LPRINT
315Ø NEXT CHAR.CODE : LPRINT : LPRINT
316Ø NEXT CHARACTER
317Ø CLS : PRINT@(1Ø,35),"ANOTHER? (Y/N)";
318Ø YN$ = INKEY$ : IF YN$ = "" THEN 318Ø ELSE YN$ = FNUC$(YN$)
319Ø IF YN$ = "Y" THEN 1Ø6Ø ELSE IF YN$ = "N" THEN CLS : END ELSE 318Ø
4ØØØ '
4Ø1Ø '    > > > Subroutine to break text into lines and justify. < < <
4Ø2Ø '
4Ø3Ø CLS : TOT.LINES = Ø : ERASE LAYOUT$ , HALF.SPC : DIM LAYOUT$(15),HALF.SPC(15) : O$
 = H$
4Ø4Ø TOT.LINES = TOT.LINES + 1 : L = Ø
4Ø5Ø IF TOT.LINES > 7 AND HV$ = "V" THEN CHAR.MAX = CHAR.MAX + 1 : GOTO 4Ø3Ø
4Ø6Ø FOR X = 1 TO LEN(O$)
4Ø7Ø IF MID$(O$,X,1) = "\" THEN L = X : X = LEN(O$)
4Ø8Ø NEXT X
4Ø9Ø IF L = Ø THEN 412Ø ELSE IF L-1 > CHAR.MAX THEN IF HV$ = "H" THEN L = CHAR.MAX + 1
 ELSE CHAR.MAX = L-1 : GOTO 4Ø3Ø
41ØØ LAYOUT$(TOT.LINES) = LEFT$(O$,L-1) : O$ = RIGHT$(O$,LEN(O$)-L)
411Ø IF TOT.LINES = 7 AND HV$ = "V" THEN 5Ø1Ø ELSE 4Ø4Ø
412Ø IF LEN(O$) < = CHAR.MAX THEN LAYOUT$(TOT.LINES) = O$ : O$ = "" : GOTO 5ØØØ
413Ø FOR X = CHAR.MAX+1 TO 1 STEP -1
414Ø IF MID$(O$,X,1) = " " THEN L = X : X = 1
415Ø NEXT X
416Ø IF L > Ø THEN 423Ø
417Ø IF HV$ = "H" THEN LAYOUT$(TOT.LINES) = LEFT$(O$,CHAR.MAX) : O$ = RIGHT$(O$,LEN(O$)
 - CHAR.MAX) : GOTO 424Ø
418Ø FOR X = CHAR.MAX + 2 TO LEN(O$)
419Ø IF MID$(O$,X,1) = " " THEN L = X : X = LEN(O$)
42ØØ NEXT X
421Ø IF L = Ø THEN CHAR.MAX = LEN(O$) ELSE CHAR.MAX = L-1
422Ø GOTO 4Ø3Ø
423Ø LAYOUT$(TOT.LINES) = LEFT$(O$,L-1) : O$ = RIGHT$(O$,LEN(O$)-L)
424Ø IF O$ < > "" THEN 4Ø4Ø
5ØØØ '
5Ø1Ø '     > > > Routine to JUSTIFY the text on each line < < <
5Ø2Ø '
5Ø3Ø IF LCR$ = "L" THEN 6Ø3Ø
5Ø4Ø FOR X = 1 TO TOT.LINES
5Ø5Ø IF LCR$ = "C" THEN SP! = (CHAR.MAX - LEN(LAYOUT$(X)))/2 : HALF.SPC(X) = (SP! -
 INT(SP!))*6 : LAYOUT$(X) = SPACE$(INT(SP!)) + LAYOUT$(X) : GOTO 5Ø7Ø
5Ø6Ø LAYOUT$(X) = SPACE$(CHAR.MAX - LEN(LAYOUT$(X))) + LAYOUT$(X)
5Ø7Ø NEXT X
6ØØØ '
6Ø1Ø '  > > > Routine to adjust line spacing of Vert. printing layout. < < <
6Ø2Ø '
6Ø3Ø IF HV$ = "H" THEN 7Ø3Ø
6Ø4Ø ON TOT.LINES GOTO 6Ø5Ø,6Ø6Ø,6Ø7Ø,6Ø8Ø,6Ø8Ø,7Ø3Ø,7Ø3Ø
```

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```
6050 LAYOUT$(4) = LAYOUT$(1) : LAYOUT$(1) = "" : TOT.LINES = 4 : GOTO 7030
6060 LAYOUT$(3) = LAYOUT$(1) : LAYOUT$(1) = "" : LAYOUT$(5) = LAYOUT$(2) : LAYOUT$(2) =
 "" : TOT.LINES = 5 : GOTO 7030
6070 LAYOUT$(6) = LAYOUT$(3) : LAYOUT$(3) = "" : LAYOUT$(4) = LAYOUT$(2) : LAYOUT$(2) =
 LAYOUT$(1) : LAYOUT$(1) = "" : TOT.LINES = 6 : GOTO 7030
6080 FOR X = 6 TO 2 STEP -1 : LAYOUT$(X) = LAYOUT$(X-1) : NEXT X : LAYOUT$(1) = "" :
 TOT.LINES = 6
7000 '
7010 '     > > > Routine to eliminate trailing spaces from text < < <
7020 '
7030 CW = CHAR.MAX : CHAR.MAX = 0
7040 FOR X = 1 TO TOT.LINES
7050 IF LEN(LAYOUT$(X)) > CHAR.MAX THEN CHAR.MAX = LEN(LAYOUT$(X))
7060 NEXT X
7070 PRINT@(5,24),"Here is a preview of your layout";
7080 PRINT@(7,0),;
7090 FOR X = 1 TO TOT.LINES
7100 IF CW > 80 THEN PRINT LAYOUT$(X) ELSE PRINT TAB((80-CW)/2);LAYOUT$(X)
7110 NEXT X
7120 PRINT : PRINT TAB(29); "Is the format ok? (Y/N)"
7130 YN$ = INKEY$ : IF YN$ = "" THEN 7130 ELSE YN$ = FNUC$(YN$)
7140 IF YN$ = "Y" OR YN$ = "N" THEN RETURN ELSE 7130
8000 '
8010 ' > > > PRINTER PIN CONTROL CODES < < <
8020 '    /  HORIZONTAL \  /  VERTICAL  \
8030 DATA  1, 3, 7,15,31,63, 63,31,15, 7, 3, 1
8040 DATA 63,31,15, 7, 3, 1,  63,62,60,56,48,32
8050 DATA 32,48,56,60,62,63,   1, 3, 7,15,31,63
8060 DATA 63,62,60,56,48,32,  32,48,56,60,62,63
8070 DATA 63,63,63, 0, 0, 0,  56,56,56,56,56,56
8080 DATA  0, 0, 0,63,63,63,  7, 7, 7, 7, 7, 7
8090 DATA 56,56,56,56,56,56,   0, 0, 0,63,63,63
8100 DATA  7, 7, 7, 7, 7, 7, 63,63,63, 0, 0, 0
8110 DATA 63,63,63,63,63,63,  63,63,63,63,63,63
9060 '
9070 '              > > > Character DATA < < <
9080 '
9090 '              ASCII CHARACTERS 32 - 41
9100 '    /SPC\ / ! \ / " \ / # \ / $ \ / % \ / & \ / ' \ / ( \ / ) \
9110 DATA 00000,00900,09090,09090,00900,99065,19200,09900,00090,09000
9120 DATA 00000,00900,09090,09090,19992,99090,90900,00900,00650,06500
9130 DATA 00000,00900,09090,99999,90900,00650,39400,09400,00900,00900
9140 DATA 00000,00900,00000,09090,39992,00900,19209,00000,00900,00900
9150 DATA 00000,00000,00000,99999,00909,06500,90965,00000,00900,00900
9160 DATA 00000,00000,00000,09090,39994,09099,90390,00000,00650,06500
9170 DATA 00000,00900,00000,09090,00900,65099,39949,00000,00090,09000
9180 '
9190 '              ASCII CHARACTERS 42 - 51
9200 '    / * \ / + \ / , \ / - \ / . \ / / \ / 0 \ / 1 \ / 2 \ / 3 \
9210 DATA 00900,00000,00000,00000,00000,00065,19992,00100,19992,19992
9220 DATA 90909,00900,00000,00000,00000,00090,90009,01900,90009,90009
9230 DATA 09990,00900,00000,00000,00000,00650,90009,00900,00014,00004
9240 DATA 06950,99999,09900,99999,00000,00900,90009,00900,00140,09992
9250 DATA 09990,00900,09900,00000,00000,06500,90009,00900,01400,00009
9260 DATA 90909,00900,00900,00000,09900,09000,90009,00900,14000,90009
9270 DATA 00900,00000,09400,00000,09900,65000,39994,09990,99999,39994
```

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```
9280 '
9290 '            ASCII CHARACTERS 52 - 61
9300 '   / 4 \ / 5 \ / 6 \ / 7 \ / 8 \ / 9 \ / : \ / ; \ / < \ / = \
9310 DATA 00190,99999,19992,99999,19992,19992,00000,09900,00140,00000
9320 DATA 01490,90000,90009,00009,90009,90009,00000,09900,01400,00000
9330 DATA 14090,90000,90000,00014,30004,90009,09900,00000,14000,99999
9340 DATA 90090,39992,99992,00140,19992,39999,09900,09900,90000,00000
9350 DATA 99999,00009,90009,01400,90009,00009,00000,09900,32000,99999
9360 DATA 00090,90009,90009,14000,90009,90009,09900,00900,03200,00000
9370 DATA 00090,39994,39994,90000,39994,39994,09900,09400,00320,00000
9380 '
9390 '            ASCII CHARACTERS 62 - 71
9400 '   / > \ / ? \ / @ \ / A \ / B \ / C \ / D \ / E \ / F \ / G \
9410 DATA 03200,19992,19992,01920,99992,19992,99920,99995,99995,19992
9420 DATA 00320,90009,94009,09090,65009,90009,65032,65000,65000,90000
9430 DATA 00032,00009,9019,65065,65004,90000,65009,65000,65000,90000
9440 DATA 00009,00194,90909,90009,69992,90000,65009,69990,69990,90999
9450 DATA 00014,00900,90394,99999,65009,90000,65009,65000,65000,90009
9460 DATA 00140,00000,92001,90009,65009,90009,65014,65000,65000,90009
9470 DATA 01400,00900,39994,90009,99994,39994,99940,99999,95000,39994
9480 '
9490 '            ASCII CHARACTERS 72 - 81
9500 '   / H \ / I \ / J \ / K \ / L \ / M \ / N \ / O \ / P \ / Q \
9510 DATA 90009,09990,06995,90014,90000,95069,95009,19992,99992,19992
9520 DATA 90009,00900,00090,90140,90000,99099,99009,90009,65009,90009
9530 DATA 90009,00900,00090,91400,90000,96959,96509,90009,65009,90009
9540 DATA 99999,00900,00090,99000,90000,90909,90909,90009,69994,90009
9550 DATA 90009,00900,90090,93200,90000,90009,90659,90009,65000,90909
9560 DATA 90009,00900,90090,90320,90000,90009,90099,90009,65000,90099
9570 DATA 90009,09990,39940,90032,99999,90009,90069,39994,95000,39954
9580 '
9590 '            ASCII CHARACTERS 82 - 90
9600 '   / R \ / S \ / T \ / U \ / V \ / W \ / X \ / Y \ / Z \ /DMY\
9610 DATA 99992,19992,99999,90009,90009,90009,65065,90009,69995,00000
9620 DATA 65009,90009,00900,90009,90009,90009,09090,65065,00090,00000
9630 DATA 65009,90000,00900,90009,90009,90909,06950,09090,00650,00000
9640 DATA 69994,39992,00900,90009,65065,90909,00900,06950,00900,00000
9650 DATA 65090,00009,00900,90009,09090,96959,06950,00900,06500,00000
9660 DATA 65065,90009,00900,90009,06950,99099,09090,00900,09000,00000
9670 DATA 95009,39994,00900,39994,00900,65065,65065,00900,69995,00000
```

DEMO PROGRAM

12345 ABCDE

H02 BIGPRINT

CHEKRITR/BAS PROGRAM LISTING NUMBER TWO for the Model 4, by Elton Wood

```
100 ' WOODCHIP Software
110 ' Basic Code Programs
120 ' Elton L. Wood
130 ' 2536 W. Old Hwy Rd
140 ' Morgan, Utah 84050
150 ' Check Writer (CHEKRITR/BAS) (*** Dec 1989 ***)
160 ' For TRS-80 Model 4
170 ' Concept in Lines 630 to 940 taken from CodeWorks Magazine (Issue 26)
180 ' Input check amount as a numeral and it will be converted to words
190 '
200 POKE &HB94,PEEK(&HB94) OR 8 ' Enable Special Character Codes Without Toggle
210 PRINT CHR$(15);: ' Turn cursor off
220 '
230 ' Define important variables
240 ' C Sets starting column to print pointer
250 ' R Sets starting row to print pointer
260 ' ML Sets maximum length for inkey input routine
270 ' PO Sets print @ position for inkey input routine
280 HP$=CHR$(191)+CHR$(244)+CHR$(245)+CHR$(246) ' Creates Hand Pointer
290 HE$="   " ' Erases Hand Pointer
300 LE$=STRING$(68," ") ' Erases line
310 DIM MI$(14) ' Sets array size for number of menu items (Payees, etc.)
320 DIM Z$(27) ' Sets array size for numbers to words
330 '
340 GOTO 990
350 '
360 ' Inkey input subroutine
370 PRINT @(20,3),HP$;
380 PRINT @(21,0),CHR$(191);: PRINT @(21,79),CHR$(191);
390 A$="": L=0: PRINT @PO,STRING$(ML,46);
400 I$=INKEY$: IF I$="" THEN 400
410 IF I$=CHR$(13) THEN RETURN
420 IF I$=CHR$(9) OR I$=CHR$(10) THEN 400
430 IF I$=CHR$(8) AND L=0 THEN 400
440 IF I$=CHR$(8) THEN L=L-1: PRINT @PO+L,CHR$(46);: A$=LEFT$(A$,L): GOTO 400
450 IF ML=L THEN 400
460 PRINT @PO+L,I$;: A$=A$+I$: L=L+1: GOTO 400
470 '
480 END ' Payee data items subroutine (Replace with payees of your choice)
490 DATA PAYEE NUMBER ONE,PAYEE NUMBER TWO,PAYEE NUMBER THREE,PAYEE NUMBER FOUR,
 PAYEE NUMBER FIVE,PAYEE NUMBER SIX,PAYEE NUMBER SEVEN
500 DATA PAYEE NUMBER EIGHT,PAYEE NUMBER NINE,PAYEE NUMBER TEN,      PAYEE NUMBER
 ELEVEN,PAYEE NUMBER TWELVE
510 DATA TYPE YOUR OWN,EXIT TO DOS
520 RETURN
530 '
540 END ' Read words subroutine (For conversion of numbers to words)
550 DATA ONE,TWO,THREE,FOUR,FIVE,SIX,SEVEN
560 DATA EIGHT,NINE,TEN,ELEVEN,TWELVE,THIRTEEN
570 DATA FOURTEEN,FIFTEEN,SIXTEEN,SEVENTEEN
580 DATA EIGHTEEN,NINETEEN,TWENTY,THIRTY,FORTY
590 DATA FIFTY,SIXTY,SEVENTY,EIGHTY,NINETY
600 FOR Z=1 TO 27
```

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```
610   READ Z$(Z)
620 NEXT Z
630 '
640 ' Convert number to words subroutine
650 IF ZA>99999.99ØØØØØØØ19# OR ZA<.Ø1 THEN END
660 ZA#=ZA
670 IF INT(ZA#)<>ZA# THEN ZA#=ZA#+.ØØ5
680 ZA$=STR$(ZA#)
690 IF INT(ZA#)=ZA# THEN ZA$=ZA$+".OO"
700 ZF=INSTR(ZA$,"Ø"): IF ZF<>Ø THEN MID$(ZA$,ZF,1)="O": GOTO 7ØØ
710 ZX=INSTR(ZA$,".")
720 ZA$=LEFT$(ZA$,ZX)+MID$(ZA$,ZX+1,2)
730 IF LEFT$(ZA$,ZX)=" ." THEN ZA$="O"+RIGHT$(ZA$,3)
740 ZC$=MID$(ZA$,ZX+1,2)
750 IF LEN (ZC$)=1 THEN ZC$=ZC$+"O"
760 IF ZC$="OO" THEN ZC$="NO"
770 ZY$="& "+ZC$+"/1OO"
780 ZB$=STR$(INT(ZA#))
790 ZB$=RIGHT$(ZB$,LEN(ZB$)-1)
800 ZL=LEN(ZB$)
810 FOR Z=1 TO ZL
820   Z(Z)=VAL(MID$(ZB$,Z,1))
830 NEXT Z
840 Z=Z-1
850 IF Z(Z-1)=Ø THEN ZZ$=Z$(Z(Z))
860 IF Z(Z-1)=1 THEN ZZ$=Z$(Z(Z)+1Ø)
870 IF ZL=1 THEN 95Ø
880 IF Z(Z-1)>1 THEN ZZ$=Z$(Z(Z-1)+18)+" "+Z$(Z(Z))
890 IF ZL=2 THEN 95Ø
900 IF Z(Z-2)<>Ø THEN ZZ$=Z$(Z(Z-2))+" HUNDRED "+ZZ$
910 IF ZL=3 THEN 95Ø
920 IF Z(Z-4)=Ø THEN ZZ$=Z$(Z(Z-3))+" THOUSAND "+ZZ$
930 IF Z(Z-4)=1 THEN ZZ$=Z$(Z(Z-3)+1Ø)+" THOUSAND "+ZZ$
940 IF Z(Z-4)>1 THEN ZZ$=Z$(Z(Z-4)+18)+Z$(Z(Z-3))+" THOUSAND "+ZZ$
950 ZZ$="** "+ZZ$+" "+ZY$
960 IF LEN(ZZ$)<15 THEN ZZ$="** ZERO "+RIGHT$(ZZ$,8)
970 RETURN
980 '
990 ' Main program starts here
1000 C=3: R=5
1010 FOR I=1 TO 14: READ MI$(I): NEXT
1020 PAYEE$=""
1030 '
1040 ' Print menu on screen module
1050 CLS
1060 X$=STRING$(80,131)
1070 PRINT @(Ø,Ø),STRING$(30,131);" WOODCHIP Software ";STRING$(30,131);
1080 PRINT @(3,Ø),STRING$(80,176)
1090 PRINT @(19,Ø),X$
1100 PRINT @(22,Ø),X$;
1110 FOR Y=4 TO 18: PRINT @(Y,39),CHR$(149);: NEXT
1120 FOR Y=Ø TO 21: PRINT @(Y,Ø),CHR$(191);: PRINT @(Y,79),CHR$(191);: NEXT
1130 PRINT @(1,3Ø),"Basic Code Programs";
1140 PRINT @(2,33),"CHECK WRITER";
1150 PRINT @(2Ø,8),"USE ARROWS TO MOVE POINTER TO DESIRED PAYEE THEN PRESS <ENTER>";
1160 FOR I=1 TO 7: PRINT @(2*I+3,8),MI$(I);: NEXT
```

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```
117Ø FOR I=8 TO 14: PRINT @(2*I-11,47),MI$(I);: NEXT
118Ø PRINT @(R,C),HP$;
119Ø '
12ØØ ' Move pointer module
121Ø I$=INKEY$: IF I$="" THEN 121Ø
122Ø IF I$<>CHR$(8) AND I$<>CHR$(9) AND I$<>CHR$(1Ø) AND I$<>CHR$(11) AND I$<>CHR$(13)
 THEN GOTO 121Ø
123Ø IF I$=CHR$(9) AND C=42 THEN PRINT @(R,C),HE$;: C=C-39: PRINT @(R,C),HP$;: GOTO 121Ø
124Ø IF I$=CHR$(9) AND C=3 THEN PRINT @(R,C),HE$;: C=C+39: PRINT @(R,C),HP$;: GOTO 121Ø
125Ø IF I$=CHR$(8) AND C=3 THEN PRINT @(R,C),HE$;: C=C+39: PRINT @(R,C),HP$;: GOTO 121Ø
126Ø IF I$=CHR$(8) AND C=42 THEN PRINT @(R,C),HE$;: C=C-39: PRINT @(R,C),HP$;:GOTO 121Ø
127Ø IF I$=CHR$(1Ø) AND R=17 AND C=3 THEN PRINT @(R,C),HE$;: R=R-12: C=C+39: PRINT
 @(R,C),HP$;: GOTO 121Ø
128Ø IF I$=CHR$(1Ø) AND R=17 AND C=42 THEN PRINT @(R,C),HE$;: R=R-12: C=C-39: PRINT
 @(R,C),HP$;: GOTO 121Ø
129Ø IF I$=CHR$(1Ø) THEN  PRINT @(R,C),HE$;: R=R+2: PRINT @(R,C),HP$;: GOTO 121Ø
13ØØ IF I$=CHR$(11) AND R=5 AND C=3 THEN PRINT @(R,C),HE$;: R=R+12: C=C+39: PRINT
 @(R,C),HP$;: GOTO 121Ø
131Ø IF I$=CHR$(11) AND R=5 AND C=42 THEN PRINT @(R,C),HE$;: R=R+12: C=C-39: PRINT
 @(R,C),HP$;: GOTO 121Ø
132Ø IF I$=CHR$(11) THEN PRINT @(R,C),HE$;: R=R-2: PRINT @(R,C),HP$;: GOTO 121Ø
133Ø IF C=3 AND R=<17 THEN PAYEE$=MI$(INT(R/2)-1)
134Ø IF C=42 AND R=<17 THEN PAYEE$=MI$(INT(R/2)+6)
135Ø IF PAYEE$="EXIT TO DOS" THEN CLS: SYSTEM
136Ø IF PAYEE$="TYPE YOUR OWN" THEN PAYEE$=""
137Ø '
138Ø ' Print check on screen and input amount and memo module
139Ø PRINT @(2Ø,8),LE$;
14ØØ PRINT @(R,C),HE$;
141Ø FOR Y=4 TO 18: PRINT @(Y,8),LE$;: NEXT
142Ø PRINT @(5,5),STRING$(7Ø,131);: PRINT @(17,5),STRING$(7Ø,131);
143Ø FOR Y=5 TO 16
144Ø PRINT @(Y,5),CHR$(191);: PRINT @(Y,74),CHR$(191);
145Ø NEXT
146Ø ' OBVIOUSLY: Replace string$ in 146Ø, 147Ø & 148Ø as desired
147Ø PRINT @(6,11),"MR. I. M. YOUR CHECKWRITER";
148Ø PRINT @(7,16),"LOST RAM ADDRESS";
149Ø PRINT @(8,16),"SOMEWHERE, U.S.A.";
15ØØ PRINT @(8,6Ø),DATE$;
151Ø PRINT @(1Ø,8),"Pay to the";
152Ø PRINT @(11,8),"Order of:";STRING$(4Ø,95);"  $";STRING$(12,95);
153Ø PRINT @(11,19),PAYEE$;
154Ø PRINT @(13,8),STRING$(64,95);
155Ø PRINT @(15,8),"Memo: ";STRING$(22,95);"     ";STRING$(29,95);
156Ø IF PAYEE$<>"" THEN GOTO 163Ø
157Ø PRINT @(2Ø,8),LE$;
158Ø PRINT @(2Ø,8),"TYPE PAYEE'S NAME THEN <ENTER> -->";
159Ø ML=32: PO=1644
16ØØ GOSUB 37Ø
161Ø IF A$="" THEN 157Ø
162Ø PAYEE$=A$
163Ø PRINT @(11,19),PAYEE$;
164Ø PRINT @(2Ø,8),LE$;
165Ø PRINT @(2Ø,8),"TYPE IN CHECK AMOUNT THEN <ENTER>  -->";
166Ø ML=7: PO=1648
```

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```
167Ø GOSUB 37Ø
168Ø IF A$="" THEN 164Ø
169Ø ZA=VAL(A$)
17ØØ IF ZZ$<>"" THEN GOSUB 65Ø: GOTO 172Ø
171Ø GOSUB 55Ø
172Ø PRINT @(11,6Ø),ZA$;
173Ø PRINT @(13,8),ZZ$;" ";STRING$(55-LEN(ZZ$),"*");" Dollars";
174Ø PRINT @(2Ø,1Ø),LE$;
175Ø PRINT @(2Ø,8),"TYPE IN MEMO IF DESIRED THEN  <ENTER> -->";
176Ø ML=22: PO=1651
177Ø GOSUB 38Ø
178Ø MEMO$=A$
179Ø PRINT @(15,16),MEMO$;
18ØØ PRINT @(2Ø,1Ø),LE$;
181Ø PRINT @(2Ø,1Ø),"<F1> TO PRINT, <F2> TO REDO/WRITE ANOTHER, <F3> TO EXIT TO DOS";
182Ø PRINT @(21,Ø),CHR$(191);: PRINT @(21,79),CHR$(191);
183Ø I$=INKEY$: IF I$="" AND I$<>CHR$(129) AND I$<>CHR$(13Ø) AND I$<>CHR$(131) THEN 183Ø
184Ø IF I$=CHR$(129) THEN 185Ø ELSE IF I$=CHR$(13Ø) THEN 1Ø2Ø ELSE IF I$=CHR$(131) THEN
 SYSTEM
185Ø PRINT @(2Ø,1Ø),LE$;
186Ø PRINT @(2Ø,1Ø),"GET PRINTER READY THEN PRESS <ENTER>";
187Ø I$=INKEY$: IF I$="" THEN 187Ø ELSE IF I$<>CHR$(13) THEN 18ØØ
188Ø '
189Ø ' DMP 2ØØ Printer module (Replace as required to match printer)
19ØØ LPRINT CHR$(27);CHR$(31);
191Ø LPRINT CHR$(2Ø);: LPRINT CHR$(27);CHR$(56);
192Ø LPRINT CHR$(1Ø);
193Ø LPRINT TAB(42)LEFT$(DATE$,5);TAB(53)RIGHT$(DATE$,2)
194Ø LPRINT: LPRINT
195Ø LPRINT TAB(11)PAYEE$; TAB(48)ZA$
196Ø LPRINT
197Ø LPRINT TAB(4)ZZ$;" ";STRING$(55-LEN(ZZ$),"*")
198Ø LPRINT: LPRINT: LPRINT: LPRINT CHR$(27);CHR$(28);
199Ø LPRINT TAB(8)MEMO$
2ØØØ LPRINT CHR$(19);
2Ø1Ø GOTO 1Ø5Ø
```

(Editors Note) Again if there is a space between the last character in a line and the next line of a wrap-around line then we have shown it by indenting the second line one space. This will not show on a printout of the program after you have typed it in, but will help to clarify where spaces are located in this printed text. -Ed.

A programmers idea
of a Florida vacation.

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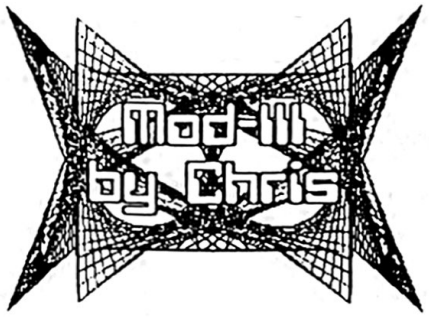

MOD-4 BY CHRIS for TRS/LS-DOS 6.3, 232 pages
MOD-III BY CHRIS for LDOS 5.3, 234 pages
MOD-III BY CHRIS for TRSDOS 1.3, 210 pages

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Complete Owner's Manuals for Models 4/4P/4D and Model III, fully updated for all current DOS versions. These beautifully designed books replace obsolete and confusing Tandy and LDOS manuals and addenda. Mod-III editions combine both the "Basic Operations" and "Disk System" manuals in one book. Mod-4 edition has chapters on DOS SuperVisor Calls previously not accessible without a separate "technical" manual. No more fumbling between pages: each subject is contained under a logical, bold heading on one page or on pages facing each other when the book is open, with plenty of blank space for notes.

Written in plain English, the manuals are better organized, with more and better examples for use of DOS, JCL and BASIC; include chapters with examples on interfacing of DOS and BASIC with assembly language; describe in detail popular ROM, RAM and DOS subroutines; and provide lots of useful extra information never before published in the Model III and Model 4 manuals.

" ... no matter how long one is using a system, there will be times to look up the manual ... nothing easier than looking into Chris' comprehensive, beautifully arranged and printed treatise ... the organization is exceptional good ... "
[Review by Henry H. Herrdegen]

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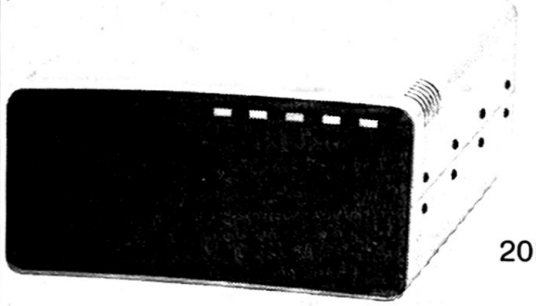

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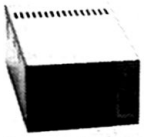

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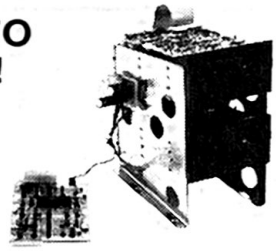

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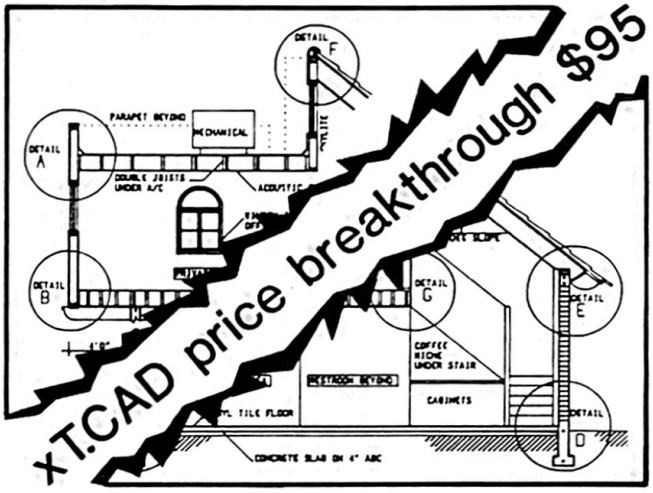

xT.CAD PROFESSIONAL by Microdex. Computer Aided Drafting software for technical production and education. Create, edit, modify precise drawings, details. Features include overlays, grids, cursor snap, zoom, pan, block copy, enlarge, reduce, rotate, mirror, clip, merge, text labels, more. Requires hi-res screen and RS-232 interface. Output to pen plotters. Input from keyboard, or optional digitizer.
Friendly, competent support since 1984. Software is backup-free. Was $345 in 1986 catalog.
Model 4 4p 4d or **MSDOS** **$95** ~~$145.00~~

xT.CAD BILL of Materials by Microdex. Software utilizes text labels from xT.CAD drawings to automatically generate invoices, parts requests, shipping lists, etc. Includes a mini-editor for customizing line printer output.
Model 4 4p 4d or **MSDOS** $ 45.00

CASH PROFESSIONAL by Microdex. Bookkeeping software with automatic double-entry ledger distribution in user-definable accounts. Reports by period, account, project, etc. Ideal for small business, professional or personal accounts.
Model 4 4p 4d or **MSDOS** $45.00

S/XT software by Microdex. Enables disk directory review and special character printing from within standard Scripsit.
Model III or **4 4p 4d** $15.00

MICRODEX

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Computer News 80

P. O. Box 680
Casper, Wyoming 82602-0680

HERE'S SOME *Exciting* NEWS!

xT.CAD PROFESSIONAL software by Microdex (Models 4/4P/4D and MSDOS)

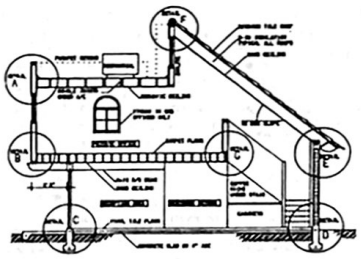
xT.CAD

xT.CAD is a software package for general purpose, two dimensional, precisely scaled technical Computer Aided Drafting. It runs on simple, inexpensive, generally available hardware. It **saves time and money** for anyone who produces technical drawings, plans, diagrams, schematics, details, flow charts, shop drawings be it in their work, study or hobby. The savings accumulate fast as you create, modify and save on disk your drawings, templates, commonly used parts or symbols. Then copy them to your next drawing, same size, reduced, enlarged, rotated or mirrored. Often it is possible to produce a complete new drawing within minutes by simply editing and merging your previous work. Two overlays are always resident in memory for quick manipulation, but you can have as many overlays as you wish on the disk. You can zoom in and out between the entire 24"x36" sheet and 1/100-th of an inch detail. You can also pan (shift) the view across the drawing in any direction. **xT.CAD is easy to learn and use**. Most of the functions are executed instantly upon pressing a single mnemonic key (for example the slash key creates a line between two points). Of course you can also create desired shapes by entering numerical data. xT.CAD has been used since 1984 by several hundred professionals. It has been called "draftsman's delight" in a review in 80-micro, a "serious tool for the professional" in Computer Shopper, and "certainly worth the cost" in PCM-magazine. It is a fully productive tool for **manufacturers, architects, engineers, contractors,** but it is also an excellent training resource for **educators and students.**

- Drawing sizes up to 24" x 36"
- Full size overlays
- Direct and auto zoom and pan
- Decimal and 'customary' scaling
- Full inch and fractional grids
- Cursor snap to grid or intra-grid
- Variable cursor speed control
- Single key functions from keyboard
- Single operating mode at all times
- On-line help and memory alert
- Accuracy up to 1/100 of an inch
- Digital (coordinate) input functions
- Block copy and erase any time
- Block reduce / enlarge 1% - 9999%
- Mirror / rotate 1 - 360 degrees
- Merge, rotate, rescale drawings
- Save / load drawings to / from disk
- Cut out and save parts of drawings
- Text labels full ASCII set
- Two text sizes, two directions
- Text duplication saves memory
- Left justified 'typewriter' option
- Hardcopy reduce / enlarge 1% - 9999%

INPUT: xT.CAD is designed for easy cursor control from the keyboard, but you may also use a **mouse.** MSDOS packages support selected mice such as Microsoft, Logitech or Tandy. However, depending on hardware and operating system the mice may not always work with MSDOS versions of xT.CAD. TRS/LSDOS packages support Micro-Labs mouse interface for Models III/4/4p/4D.

All packages support the following optional **digitizers:**
Houston Instrument True Grid series 1000 and 8000, Kurta Series One, and Tandy GT-2000.



OUTPUT: xT.CAD is specifically optimized for precision scale drafting and text labeling on pen plotters. All packages include user-selectable drivers for the following plotters:

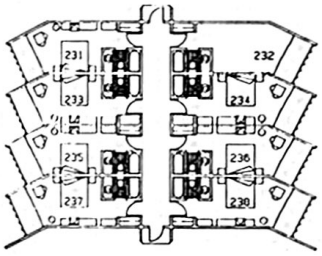
- **Hewlett-Packard** HP-7470A, 7475A, Colorpro, Draftpro, etc, and 100% compatible
- **Houston Instrument** DMP-29 or higher and PC-595, 695, and 100% compatible
- **IBM plotters** models 6180, 6184, 7371, 7372, etc.
- **Roland** DXY-101, 800, and Hewlett-Packard compatible Roland models
- **Tandy** PC-695 multipen plotter Cat. 26-2830, Tandy 6-pen plotter Cat. 26-1191

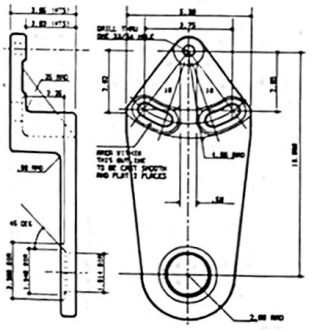
Also, any serial plotter 100% compatible with current **Hewlett-Packard HP/GL** language, or current **Houston Instrument DM/PL** language, should also work with all current versions of xT.CAD.
Screen-print utility for selected dot-matrix printers is included in all TRS/LSDOS packages. On MSDOS computers use the MSDOS "GRAPHICS" function if printer is compatible. However, screen print does not support text labels. Scale, proportion and line quality are more or less acceptable.

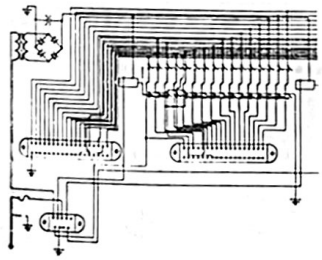
TRS/LSDOS package: **Models 4/4p/4D** require 64K memory, 2 disk drives, floppy or hard, RS-232 interface and a high-resolution graphics board, Tandy or Grafyx Solution from Micro-Labs. Runs in fast machine language under TRSDOS 6.2 or LSDOS 6.3.

MSDOS package: **PC/XT/AT** or compatibles such as Tandy 1000/1200/3000 require 256K memory, 2 disk drives, floppy or hard, RS-232 board and IBM-CGA compatible 640 x 200 'color' graphics adapter. Monochrome monitor recommended, color monitor OK but xT.CAD uses only background/foreground. Runs under MSDOS 2.11 or higher. Now also available on optional 3½" disks!

New reduced price $ 95.00







ALSO AVAILABLE

xT.CAD DEMO disk: self-tutoring 15-minute auto-demo shows and explains main functions of xT.CAD. User may switch any time to a 'live' version of the program which allows hands-on experimenting with xT.CAD (except output). Requires same computer system configuration as the full xT.CAD program.

xT.CAD BILL of Materials software by Microdex (Models 4/4p/4D and MSDOS)
Generates alphabetized listings of items by matching text labels embedded in drawing files created by xT.CAD with descriptions and optional unit prices in user's master files. Several drawings and master files can be scanned automatically in one pass and reports such as parts lists or invoices with optional cost and totals calculations can be printed on line printer. Mini-editor allows easy customizing of report formats. Runs in fast machine language under TRSDOS 6.2, LSDOS 6.3, MSDOS 2.11 or higher.

CASH Professional software by Microdex (Models 4/4p/4D and MSDOS)
Small business, professional or personal book-keeping based on cash method and calendar year accounting period. Transactions are recorded and edited as single line entries on a word-processor-like screen. CASH automatically distributes debits and credits and creates a self-balancing 'double-entry' ledger. Any number of 'jobs' or 'profit centers' each with up to 144 journal lines per month, 48 main accounts and any number of sub-accounts can be maintained. Reports can be printed in any combination and range of periods, accounts, sub-accounts and projects. Utility is provided for customizing of output for various line printers. Runs in fast machine language under TRSDOS 6.2, LSDOS 6.3, MSDOS 2.11 or higher.

S/XT software by Microdex (Models III and 4/4p/4D)
Modifies original Scripsit to display disk directory and print special characters or codes such as underline or superscript. For Scripsit 3.2 (TRSDOS 1.3) and Scripsit 1.0 (TRSDOS 6.2 or LSDOS 6.3).

xT.CAD w/manual	was $345.00	$ 95.00
xT.CAD Demo $15.00 Manual $10.00	combo	$ 20.00
xT.CAD BILL of Materials software		$ 45.00
CASH Professional software		$ 45.00
S/XT Scripsit enhancement software		$ 15.00
Shipping and Handling add $4.50		

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January 2, 1990

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EDITION	DEADLINE FOR ADS AND ARTICLES	MAILED
February 1990 Vol 3 No 2	Jan 15	Jan 29
March 1990 Vol 3 No 3	Feb 12	Feb 26
April 1990 Vol 3 No 4	Mar 12	Mar 26
May 1990 Vol 3 No 5	Apr 16	Apr 30
June 1990 Vol 3 No 6	May 14	May 28
July 1990 Vol 3 No 7	Jun 11	Jun 25
August 1990 Vol 3 No 8	Jul 16	Jul 30
September 1990 Vol 3 No 9	Aug 13	Aug 27
October 1990 Vol 3 No 10	Sep 10	Sep 24
November 1990 Vol 3 No 11	Oct 15	Oct 29
December 1990 Vol 3 No 12	Nov 12	Nov 26

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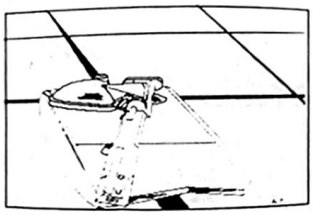

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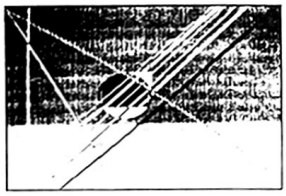

art and engineering drawings, but is also a necessity for anyone, no matter what his application. Businessmen and scientists can use DRAW to add text labels or other refinements to previously generated graphs. Once the picture is centered, labeled and refined, it can be saved on disk or printed on any of 30 popular printers. All of this is done with single letter commands without ever exiting DRAW.

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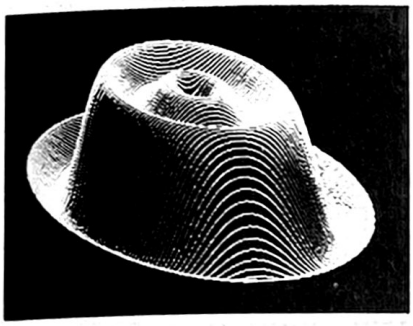

Superior Hardware. The Grafyx Solution provides 153,600 pixel elements which are arranged in a 640 × 240 or on the Model III a 512 × 192 matrix. Hundreds of new business, personal, engineering, and educational applications are now possible. The hi-res display can be shown on top of the standard display containing text, special characters, and block graphics. This simplifies program debugging, text labeling, and upgrading current programs to use graphics. The Grafyx Solution fits completely within any tape or disk based Model 4, 4D, 4P, or III. Installation is easy with the plug-in, clip-on Grafyx Solution board.

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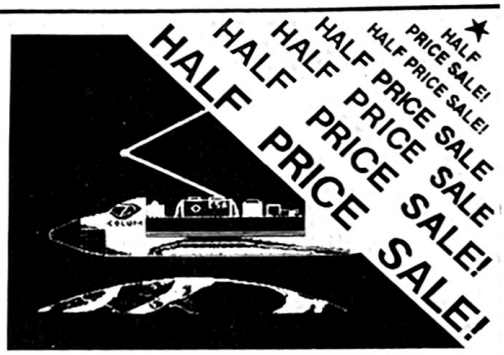

Superior Software. The board comes with over 40 programs and files which make it easier to use, serve as practical applications, demonstrate its capabilities, and serve as programming examples. The software works with TRSDOS 1.3, 6.1.2, 6.2, 6.3; Dosplus 3.4, 3.5, 4; LDOS; and Newdos80. The Grafyx Solution is also supported by 30 optional applications programs: Draw, Bizgraph, xT.CAD, 3D-Plot, Slideshow, Mathplot, Surface Plot, Chess, etc.

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LP III, V	26-1414	CN1003	FABRIC REFILL	4.79	4.29
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LP VII, DMP 100	26-1424	CN1038	FABRIC CART.	7.46	6.96
DMP 110	26-1283	CN1005	FABRIC CART.	6.58	6.08
DMP130/130A/132/133/107	26-1236	CN1006	FABRIC CART.	7.20	6.70
DMP130/130A/132/133/107	26-1238	CN1007	FABRIC REFILL	5.00	4.50
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DMP 120,200	26-1483	CN1009	FABRIC CART.	7.00	6.50
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DMP 105, 106	26-1288	CN1011	FABRIC CART.	Not Available*	
DMP 105, 106	26-1288	CN1012	FABRIC REFILL	5.84	5.34
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DMP 440	26-2809	CN1014	FABRIC CART.	18.25	17.75
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DMP 2100,2100P, 2110	26-1442	CN1016	FABRIC REFILL	4.85	4.35
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DMP 2120	26-2836	CN1018	BLACK REFILL	7.93	7.43
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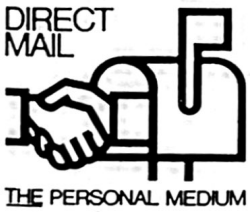

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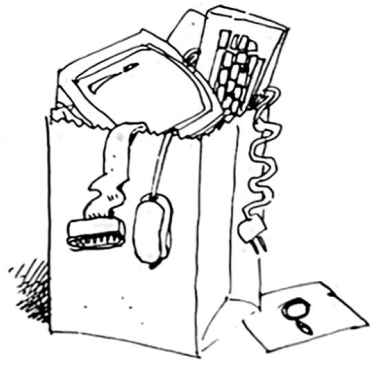

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