NATGUG NEWS

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Using a TANDY DMP 2100 24 Wire Printer
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Information Facts on the Group.

NATGUG is an independent User Group and membership is by subscription to the newsletter which is published at regular intervals - application forms from the Membership Secretary. Membership is open to anyone interested in computers but special emphasis is placed on equipment within the Tandy ranges, MS-DOS and prior. Naturally other MS-DOS machines are catered for.

Details of the groups' accounts and constitution are available from the Treasurer. Please ensure your requests are accompanied by a S.A.E. Members requiring assistance with problems related to the machines specified should contact the P.R.Officer who will endeavour to put them in touch with advisers.

Groups exist in many areas and their Secretaries are invited to forward details to our Editor/Publisher for inclusion in NATGUG News. The back page being reserved for this purpose.

Public domain software libraries are maintained in five separate collections: Model I/III, Model IV/III, Model II, C/PM and MS DOS. Names of appropriate librarians are available from the Treasurer and are also published at regular intervals. There is a £1 copying charge per disk or tape.

Back numbers of NATGUG News, in 6 or 12 month volumes, are available at the price indicated on the application forms.

The group has no paid officers or employees, and the issue of NATGUG News depends on contributions from Members, who are also invited to submit responses to questions raised in the previous issues. To allow legible print, contributions must be in ASCII files only, sent direct to the Editor on a standard DOS formatted disk with a printed hard copy to help maintain the format you require. Please indicate the word processor, disk format used (DOS, track count, etc.) and list files to be used for publication. If you enclose an addressed label, your disk will be returned soon after the file's publication, NATGUG paying postage. The Editor will accept written or typed articles no longer than 50 words in total. Publishing will depend on legibility and time needed to type the articles up.

The views expressed in the editorial and other pages of this magazine do not necessarily reflect the views of the committee.

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DORCHESTER DOTTINGS.

I have been intermittently engaged in transferring my accounting programs, written for one of our local charities, from the Model 4 to a PC. This is not immediately necessary, but sooner or later their Model 4 will give up, and I expect to be faced with a demand for a more up-to-date machine, especially with a colour monitor!

It is proving to be a very interesting exercise, and has thrown up one or two points which may be of interest to others.

Until now I had not realised quite how awkward editing is in GWBasic. To anyone accustomed to the Model 4 it is very unsatisfactory in some ways. I am fortunate in having a copy of a program called BDS which provides a lot of commands, such as the ability to move up and down in the program with single key strokes, or to page up and down. It also has quite a useful search, and a more adaptable renumber. What it does NOT have, however, is a search and replace.

I bought a very good book called Basic Programming inside and out, by H.J.Bomanns, partly because it has a disk with a lot of sample programs, and his advice is to 'put the text into any wordprocessor'. I use Wordperfect, so I did, and found myself with a program full of CR/LFs! I could not face the complications of sorting this out, so I tried again, this time with a very simple text editor called Edit.exe. This has an excellent search and replace, very fast, and was quite unmoved by lines 255 bytes long! In fact, as you will read below, it was unmoved by longer ones.

This problem solved, I turned to the question of clearing part of the screen. For clear to the end of the line I settled on a simple subroutine which prints spaces to the end and then returns to the original position. It is fast and simple. I then tried the Editor's suggestion of VIEW PRINT for clearance to the end of the screen, and found that while the cursor went back to the correct place it cleared the whole screen. A little thought solved this one. To use BDS I have to use GWBasic 3.20, but if I run the program under GWBasic 3.22 the clearance works correctly!

I appreciate Christy Gemmell's point on being able to program round it using LOCATE, but CHR$(30) and CHR$(31) do make life easier in some respects. Programming is quicker and easier, and sometimes

partial clearance is quicker. For example, my cashbook entry screens use the entire screen for each entry, and if you make a mistake and realise it after you have pressed ENTER you simply press F1, which clears the last line (or lines) and rewrites the question. This is much quicker than clearing the screen and rewriting the whole page up to the previous point.

I had a good deal of fun transferring the Model 4 versions to the PC. The chief problem was PRINT @, which is plentifully scattered through the program. In the end I dealt with this by using a search and replace and changing PRINT @ to OCATE, preceded by one space for the L and followed by 5 spaces for the location. This rather odd arrangement is due to the fact that if TRS80 basic is presented with LOCATE it expects row and column numbers to be enclosed in brackets, and if it is not it assumes it is meant to be LIST followed by something Basic does not understand! I then used a REF program to list the lines in which OCATE occurred, and after transfer it was not particularly difficult to edit them. The only problem was that inevitably there were a few lines which were more than the permitted length, but Edit.exe dealt with these beautifully. Listing the program in Edit shewed a few lines which ran onto a second line, and it was easy to terminate these at a suitable point and put a CR and an intermediate line number. Once I discovered the advantages of Edit, I simply transferred programs to the PC and did all the editing with it.

I ordered a few Shareware disks recently, and among them was one which had a program called TRS-CONV. This converts Model I,II and III Basic programs for the PC, and even works out the LOCATES correctly. The result is quite satisfactory, except that for the Model 4 you have to recalculate the LOCATES because of the increased screen size. If I can find out how to change this I shall buy it.

On another matter, if anyone has tried patching Newdos EDTASM/CMD to Model 4 using the patches in EDTASM/FIX and found that it did not respond to the BREAK key, it is essential to put in the other patch for lower/upper case input. Without this the Break key does not get past the input routine! On the Model III Break is CHR$(1), while on the Model 4 it is CHR$(&H80). There was a gap of about five years between the original writing of the program and the preparation of the patch list, and I overlooked the point. The patch is:-

Patch EDTASM/CMD (D04.68=00 00 00:F04.68=CD 5E 70)

Returning to the conversion of Model 4 to PC, I found two other problems. One was raised by John Kilpatrick in the June newsletter, that of a suitable printer checking routine. The one I use is as follows:-

```
10  X=INP(889):IF X=112 THEN M=0:RETURN:ELSE IF X=127 THEN
    M$="* * SWITCH PRINTER ON * *" ELSE IF X=119 THEN
    M$="* * PRINTER OUT OF PAPER * *" ELSE IF X=87 THEN
    M$="* * PRINTER OFF LINE * *"

20  LOCATE 23,1:COLOR 15,4:PRINT M$;:COLOR 11,1:BEEP:FOR
    M=0 TO 5000:NEXT:LOCATE ,1:PRINT STRING$(30,32);:BEEP:FOR
    M=0 TO 5000:NEXT:GOTO 10
```

I sent John a copy of this routine, and he wrote to say that he tried it on a 1000EX and on a 386SX, and both machines produced different numbers for the different states! (Not only different from mine, but different from each other.) This did not altogether surprise me, as I had trouble on my Model 4 when I wanted a new printer cable. I got one from Os., and found that the routine I used on that did not work. When I looked I found that instead of producing 61 when on line it now produced 63! I blamed that on the new cable being 25-way instead of the 34-way of the old one, but I may have been wrong. The solution is simple. Go into Basic, switch the printer off and type PRINT INP(889). Note this, then try the other states in turn and note the result. It is then easy to amend the routine as necessary.

The second problem is sorting. On the Model 4 I had an excellent m/c sort obtained from Microsystems Software which sorted anything in any order. The program I am concerned with uses arrays to store receipts and payments, and as the Trustees administer four charities life is complicated. They have five Deposit accounts and a Current account, all the Deposit accounts receiving credits, and making payments by way of transfer to the common current account from which the money is paid out. In addition certain standing orders are paid out from one of the Deposit accounts, so that transfers are made in all directions.

It is obviously impractical to require data entry to be made in strict chronological order, but unless the printouts are so arranged, tracing transactions becomes difficult. The program is therefore arranged so that entries are made account by account, all the receipts first, then

all the debits. This means that before printing the lot has to be sorted into date order. There are also six analysis columns for the current account. Each entry array therefore consists of date, source, narrative, six account columns and six analysis columns. In addition the debit side requires cheque numbers, and needs to be sorted by these as well as dates. I have probably been looking in the wrong direction, but I cannot recall seeing a method of doing a Basic sort by more than one variable. The bright side is that there are only about twenty transactions on each side during the month.

In view of the small number of transactions a quick sort is not needed, although it could be used in place of the simple sort shown below.

The first step is to reduce the dates to an easily sortable format. One piece of data the program holds is an array M$(12) where M$(1) is "Jan", etc. The first bit deals with the dates. N is the counter for the number of transactions to be sorted. The input routine which gets the dates ensures that the are always 6 bytes long and in the form ' 1 Jan'.

```
10  DIM D(N),E(N):FOR I=1 TO N:E(I)=I:FOR J=1 TO 12:IF
    RIGHT$(D$(I),3)=M$(J) THEN D(I)=J*100+VAL(DR$(I))

20  NEXT:NEXT
```

Sorting is now simple.

```
30  FOR I=1 TO N-1:FOR J=I+1 TO N:IF D(I)<D(J) THEN 40 ELSE
    SWAP D(I),D(J):SWAP (E(I),E(J)

40  NEXT:NEXT
```

The array takes the general form A$(I),B$(I),C$(I),C#(I),D#(I) etc. and printing involves simply selecting in the order laid down by E.

```
FOR I=1 TO N:LPRINT A$(E(I)),B$(E(I)),C$(E(I)) etc.:next
```

Sorting additionally by cheque numbers has to be done first, so between lines 20 and 30 we insert:-

```
24  FOR I=1 TO N-1:FOR J=I+1 TO N:IF CHNO(I)<CHNO(J) THEN 26
    ELSE SWAP D(I),D(J):SWAP (E(I),E(J)

26  NEXT:NEXT
```

If you need to sort by more variables this is done in the same way, inserting the sorts so that the least important is done first.

Having got that digression off my chest let's look at one other thing.

I have been thinking for some time of changing to a compiled Basic. The choice seems to lie between Turbo Basic and Power Basic, and I shall be very grateful for any opinions on the question. There was an enthusiastic review of Power Basic in Computer Shopper in January this year, but in view of the large price differential (£80+ against £45+) I am a little hesitant. The other possibility is Quick Basic 6, and views on this would also be interesting.

I think that is about enough for now. I hope to be at Swindon in October, but who knows?

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SEE WHAT HAPPENS IN THE STRING SPACE

by ALF WEST

Reprinted from Bits & Bytes - Issue 5 (part 1)
Newsletter of the TRS-80 System 80 Computer Users Group

Some Members were interested in the program I used at the last meeting to show what the Computer does in the String Space when Strings are input (whether from the Keyboard, Tape or Disk). The program below is the one illustrating five strings but it can be abbreviated for a lesser number. There is nothing magical about the program, it being in ordinary Basic.

The program was written for a 16K system, but will work on 32K or 48K if you remove the Remark "'" in Line No. 5. Line No. 5 will then set the top of Memory to the same as a 16K System. Line No. 30 simply Pokes a "." into the String Space area which has been Cleared so that you have two lines of "." to start off with in place of whatever garbage may have been there on power-up.

After you input each string, Sub-routine 50 simply PEEKs at the

String Space and prints whatever is there, on the Screen. Subroutine 300 (or later numbers if you haven't got as far as E$) prints out the value of the Variable Pointer for each string and you will find that this is verified by counting from Memory location 32704 to 32767 for each string in the string space display.

It is easier to keep track of the strings if you alternate the inputs with letters and numbers and prefix each string with say a "/".

```
5 'POKE16561,255: POKE16562,127
10 CLEAR 64: DEFINT P
20 CLS: PRINTCHR$(23)"* STRING SPACE - FIVE STRINGS *
25 PRINT@128,"32767";: PRINT@502,"32704";
30 FOR T=32704 TO 32767: POKE T,46: NEXT: GOSUB 50: GOTO 60
50 P=384: FOR T=32704 TO 32767: P=P-2
55 PRINT@P,CHR$(PEEK(T));: NEXT: RETURN
60 GOSUB 100: GOTO 130
100 PRINT@448,: INPUT"NEW A$ ";A$
110 IF A$="XX" THEN END
115 PRINT@640,CHR$(30)"    A$ = "A$;: GOSUB 50: PRINT@686,"@ ";
120 IF K=1 THEN GOSUB 300 ELSE GOSUB 340
125 RETURN
130 PRINT@448,: INPUT"NEW B$ ";B$
135 PRINT@704,CHR$(30)"    B$ = "B$;: GOSUB 50: PRINT@750,"@ ";
140 IF K=1 THEN GOSUB 300 ELSE GOSUB 330
150 GOSUB 100
160 PRINT@448,: INPUT"NEW C$ ";C$
170 PRINT@768,CHR$(30)"    C$ = "C$;: GOSUB 50: PRINT@814,"@ ";
180 IF K=1 THEN GOSUB 300 ELSE GOSUB 320
190 GOSUB 100
200 PRINT@448,: INPUT"NEW D$ ";D$
210 PRINT@832,CHR$(30)"    D$ = "D$;: GOSUB 50: PRINT@878,"@ ";
220 IF K=1 THEN GOSUB 300 ELSE GOSUB 310
230 GOSUB 100
240 PRINT@448,: INPUT"NEW E$ ";E$
250 PRINT@896,CHR$(30)"    E$ = "E$;: GOSUB 50: PRINT@942,"@ ";
260 GOSUB 300: K=1: GOTO 60
300 PRINT@946,PEEK (VARPTR(E$)+1) + 256*PEEK (VARPTR(E$)+2);
310 PRINT@882,PEEK (VARPTR(D$)+1) + 256*PEEK (VARPTR(D$)+2);
320 PRINT@818,PEEK (VARPTR(C$)+1) + 256*PEEK (VARPTR(C$)+2);
330 PRINT@754,PEEK (VARPTR(B$)+1) + 256*PEEK (VARPTR(B$)+2);
340 PRINT@690,PEEK (VARPTR(A$)+1) + 256*PEEK (VARPTR(A$)+2);
350 RETURN
```

MORE DRDOS

Having installed DRDOS 5.0 the Config.Sys and Autoexec.Bat have been overwritten and placed in the root directory together with the files IBMBIO.COM and IBMDOS.COM leaving untouched MSDOS files OI.SYS and MSDOS.SYS. In addition the installation program has created a new directory called DRDOS thus leaving any files in MSDOS or DOS directory untouched. The DRDOS directory contains all the DRDOS utilities. Below are it's contents:

71 File(s) 20600832 bytes free

Directory of C:\DRDOS

.		<DIR>	..		<DIR>
4201	CPI	6680	4208	CPI	348
5202	CPI	361	ANSI	SYS	4785
APPEND	EXE	4472*	ATTRIB	EXE	14534*
BACKUP	COM	20179*	CACHE	EXE	40433*
CHKDSK	COM	22080*	COMP	COM	12521*
COUNTRY	SYS	9216	CURSOR	EXE	6904*
DISKCOMP	COM	11859*	DISKCOPY	COM	12083*
DISPLAY	SYS	3311	DRIVER	SYS	2150
EDITOR	EXE	35486*	EGA	CPI	48987
EMM386	SYS	14354	EMMXMA	SYS	6082
EXE2BIN	EXE	12906*	FASTOPEN	EXE	680*
FDISK	COM	25075*	FILELINK	EXE	35084*
FIND	EXE	16062*	FORMAT	COM	19210*
GRAFTABL	COM	7014*	GRAPHICS	COM	5358*
HIDOS	SYS	7564	JOIN	EXE	8156*
KEYB	COM	23402*	LABEL	COM	7062*
MEM	EXE	14468*	MEMMAX	EXE	2160
MODE	COM	21056*	NLSFUNC	EXE	2120*
PASSWORD	EXE	17528*	PRINT	COM	17970*
PRINTER	SYS	5448	RECOVER	COM	13464*
REPLACE	EXE	18360*	RESTORE	COM	15889*
SETUP	EXE	125653*	SHARE	EXE	14290*
SID	EXE	26112*	SORT	EXE	9732*
SYS	COM	10446*	TOUCH	EXE	16108*
TREE	COM	14074*	UDCGA9	CGA	45056
UDHRC9	EGA	46592	VDISK	SYS	3879
VIEWHI	ICN	8896	VIEWLO	ICN	9664
VIEWMAX		67328	VIEWMAX	ACC	21602
VIEWMAX	CFG	651	VIEWMAX	DRV	53248
VIEWMAX	EXE	14208	VIWMAX	OVL	59392
VIEWMAX	RSC	24032	VIEWRUN	RSC	5698
XCOPY	EXE	20270*	XDEL	EXE	15954*
XDIR	EXE	16764*			

Should you bother to count the files you will find only 67 and not 71 as shown by the directory print. I placed in this directory four files from MSDOS 4.01 but they are not listed above. All the files marked by * have help available. I like that very much about DRDOS. Just think of the amount of time saved by not having to dig out the manual (where in heavens name did I put it and when did I see it last ?) and not to have to search through it. So, for example, if I type password/h this is what I get on the screen;

```
PASSWORD [/Help] [@][d:][path][filename.ext] [/R¦W¦D¦P¦G[:password]] [/N][/S]

  /R[:password] "password" will be required to read, write or delete the FILE
  /W[:password] "password" will be required to write or delete the FILE
  /D[:password] "password" will only be required to delete the FILE
  /P[:password] "password" will be required for all access to the DIRECTORY
  /G[:password] set global default password

                Use '*' in place of password to request hidden entry: eg. /R:*

  /N            remove password protection from file
  /NP           remove password protection from directory
  /NG           remove global default password

  /S            operate on files or directories in subdirectories

Multiple files may be specified on the command line.

Use '@' to specify that the filename that follows is the name of a file list.
```

If you understand the above you are a better man than I. But some of the commands in DRDOS provide more facilities than those of MSDOS. Take for example CHKDSK. In MSDOS you could use just two parameters with this command (V and F). DRDOS provides much more and overleaf is the help file for CHKDSK.

NATGUG has arrived and I remembered the started and unfinished article. A lot has happened since I started to write this. Firstly we had our Dennis (painter and decorator) for five weeks. He painted three rooms, tiled the bathroom, laid the floor in the porch and lined the porch with wood. All this took five weeks and almost killed me as I had to get up at eight o'clock every morning as Dennis generally wanted me to do something in the workshop (well six days a week as Dennis does not work on Saturdays and on

```
CHKDSK R6.14    Disk checker
Copyright (c) 1986,1988,1989,1990 Digital Research Inc. All rights
                                                        reserved.

CHKDSK [/Help] [d:] [file] [options]

  file  Individual files can be checked. Wild cards are allowed.
  /A    Available memory display only.
  /B    Read all files to find bad clusters.
  /C    Display cluster numbers of cross linked files.
  /D    Find removed directories on the disk.
  /F    Write fixes back to disk. (Default = R/O)
  /L    Rebuild cluster links.
  /M    Verify disk for bad clusters, map bad clusters.
  /P    Display Parent block for all directories.
  /R    Recover root directory.
  /S    Show actual file space.
  /V    Be verbose - displays extra information.
  /H    Displays this menu.
```

Sundays we are getting up early anyway for church at eleven). The total cost £1,656.65 - I ought to have done the job myself and put the money towards 486-33 with some 90MB hard disk and SVGA (NEC 3D monitor). That is my dream now though I don't see the logic of getting any faster machine. After all my 386-20 indexes over 1,000 records in data base on two indexes in just over one minute (if that).

Then the first lot of visitors has arrived - my friend from NI with his fiancee. I am afraid hardly any computing this time as his mind was on the forthcoming wedding. In fact his computer is now veiled in cobwebs but he still makes some use of his newly purchased £12,000 (odd) organ.

Then my friend went back to NI on Wednesday (after one week's stay) and on the following day Boss's cousin, his wife and son have arrived. We hardly had the time to put electrolux round the house and change the sheets on the beds. They stayed for over a week and, as the wife (his and not the Boss) never stopped talking in a rather penetrating voice, I started taking refuge in the computer room. Well, one can only play patience for hours for so long so I decided to start indexing Woodworker and Practical Woodworking (a job I intended to do on retirement - 5 years ago yesterday) and I

have finally managed to do it. The index is a simple one consisting of subject, category, year, month, page and remarks - all in all some 141 bytes. The period covered is from Nov 78 to Jan 90 and the data base has 1059 records. I only indexed the items which were of interest to me (I am not interested in instrument making and some other subjects). So if I want to make a rocking horse or bedside cabinet I only have to fire up the computer and I know where to look for the article.

Having got the taste for indexing I have started on Do-It- Yourself. A similar simple data base and so far I managed from Aug 78 to Dec 87. I intend to carry indexing on this data base till Dec 90 and, after that, start another one from Jan 91. This one will be more detailed with adverts, suppliers etc.

Well, if any one should be interested, I can always supply a delimited with comma version of the data base.

Then, suddenly the weather has improved, and the garden called loudly and persistently. Grass was knee-high and I never had an idea that there is such a variety of weeds in existence. I have almost finished the job of cutting, weeding and planting and the weather went back to normal - raining, especially at the time when ferry is due to arrive so the tourists are not disappointed. After all they all have been warned not to come without waterproofs and wellies. They get soaked every year and yet they come over and over again. In fact once the tourist season starts we waste a great deal of time sitting at the window and watching the cars - some very heavily loaded - pass by. Front seat passenger normally has a map on the knee thus assisting the driver in the choice of the one and only road from Tarbert to Stornoway. They call it A859 although there some long stretches of single track. I must say though that the road surfaces here are much better than the ones in Kent where we lived prior to opting out.

When Wimbledon has arrived and this for us is compulsory viewing. There we sit in our recliners, eating sandwiches instead of cooked meals and breaking off only to watch the ferry traffic and count the passing cars. The Boss and I cannot agree whether the local registration car returning from the continent (Glasgow or Inverness) counts or not. Oh well, sooner or later the Wimbledon will finish, the rest of the garden jobs will be done and this article may be finished as well.

So back to DRDOS 5.0. Had I waited with the purchase I could have saved myself some £60 as the price has dropped. Also MicroSoft have now produced MSDOS v 5. The update costs some £60 and, reading the reviews in PC Plus and PCW, it seems to me that MicroSoft went the way of DRDOS 5 with help etc and also that one can get slightly more memory than DRDOS can provide. Anyway I don't think that I will be changing. MSDOS v 5 is no faster than v 4.1 and, to change, I would have to reformat the disk and I am not one of the brave ones who reformat hard drives at the drop of a hat. Users of MSDOS can simply use the installation procedure to replace all DOS files but this would not apply to DRDOS disk. I wonder whether MSDOS v 5 still insists on having the IO.SYS and MSDOS.SYS as two first files on the disk.

I read the query in NATGUG about MEMMAX. The name is a bit misleading as one could understand that running this program would increase the free memory. Well, it does and it does not. If one runs MEMMAX with either +U or +L the CHKDSK will still show the same amount of memory but +L permits the applications to use the first 64K of the Base memory (if available) and +U gives the programs access to the Upper Memory - that is what lies between 640K and 1MB. However some sections of the Upper Memory are reserved for use by various parts of the hardware (VDA, ROMBIOS etc). It seems to me that the MEMMAX came as an afterthought as it is not covered by the manual but is covered by the Release Notes. Another two important bits of information in the Release Notes are that for Intel 386 and compatible systems BDOS entry in EMM386 should be changed from Auto to FFFF. This, according to the Release Notes, forces the kernel of the operating system in to HIGH memory thus freeing 36Kb of Upper memory for device drivers, networking software and TSRs. Don't ask me to explain this - I only carry the message or at least crib from the Release Notes. The other bit is that option 'Relocate DR DOS data areas and device drivers' should be set to YES. This apparently moves the device drivers and data structures into Upper memory.

I wonder whether at this stage I should say something about the memory in PC. An 8068 chip can address 1MB of memory, and this 1MB is divided into Base and Upper memories. Base memory consists of the first 640K and the bottom of the Base memory is reserved for the operating system. Upper memory (384K) accommodates in the lower part various drivers placed there by the hardware. ANSI.SYS, CACHE.EXE and VDISK.SYS can also be loaded in Upper memory.

After the Upper memory comes XMS (Extended memory). This can be for 286 up to 15 MB and for i386 and i486 up to 1000MB. Quite expensive exercise to load that much memory into the box always providing the box can accommodate that much. The first 64K of XMS is called High memory. DRDOS places the main operating system kernel in that location thus increasing the memory available for applications. Certain device drivers and programs have options which allow them access to XMS (VDISK.SYS, CACHE.EXE etc).

Yet another method of overcoming the 640K barrier is the expanded (EMS) or LIM memory. LIM EMS standard allows access to 32MB of memory outside the conventional memory. Some databases, spreadsheets and other programs, which have need for a large amount of data, can use EMS. (My spreadsheet tell me that I have 2.5+MB of space). EMS is handled in 16K pages. Four pages (64K) become a Page Frame and each time access is required to EMS one Page Frame (64K) is reserved. DRDOS has two programs to emulate LIM expanded memory and these are EMMXMA.SYS for 286 and EMM386.SYS for 386 (obvious - isn't it) and there is no need to use any other LIM 4 program as these two programs do all that is necessary. Furthermore these programs have many options allowing modification of searches for 64K windows, allocating a size of memory for LIM use, option of exclusion of segments of Upper memory, BDOS loading & some others rather too complicated for me.

And yet more cribbing from the Release Notes and this would interest you only if you are using Windows 3.0 (why would anyone want to do that ?) or Qualitas 386MAX or Qemm.386. The following entries should be made in Config.Sys:

For Windows 3.0

```
DEVICE=C:\HIMEM.SYS
DEVICE=C:\DRDOS\HIDOS.SYS /BDOS=FFFF
DEVICE=C:\WINDOWS\SMARTDRV.SYS .....etc.
```

For Qualitas 386max

```
DEVICE=C:\386MAX\386MAX.SYS
DEVICE=C:\DRDOS\HIDOS.SYS /BDOS=FFFF
DEVICE=C:\386MAX\386LOAD.SYS .....etc.
```

For QEMM.386

```
DEVICE=C:\QEMM.SYS 3096
DEVICE=C:\DRDOS\HIDOS.SYS /BDOS=FFFF
```

Talking a bit more about memory my Amstrad came with a basic set up program which allowed me to allocate the memory above 1MB to XMS. Any unallocated memory to XMS was then available for LIM 4 (when I used MSDOS 4.01). This however no longer works that way as EMS386 grabs all XMS and converts it to EMS - unless is told not to. Below is the picture of the set up program:

```
--------------------------------------------------------------------------
¦      PC2286/386 Setup Utility (v1.3a)  Copyright 1988,1989 Amstrad plc.
--------------------------------------------------------------------------
¦ CMOS RAM PARAMETERS
¦  Time ..................... 05:54:45pm
¦  Date ..................... 02-07-1991
¦  Base Memory ............... 640K
¦  Extended Memory ........... 3456K
¦  Primary Display ........... VGA/EGA
¦  Maths Co-processor ........ Not Fitted
¦  Machine Speed ............. 20MHz
¦  Drive A type .............. 1.44M Bytes, 3.5 inch
¦  Drive B type .............. Not Fitted
¦  Hard Disk drive C: ........ Type 1
¦  Hard Disk drive D: ........ Not Fitted
--------------------------------------------------------------------------
¦ OPTION LINK SETTINGS FOR INTERNAL DEVICES
¦  Mouse ................... Enabled   Floppy Disk Controller .. Enabled
¦  Serial Port ............. Enabled   VDU Adapter ............. Enabled
¦  Parallel Port ........... Enabled   Hard Disk Controller .... Enabled
¦                                                                        ¦
PagePool of LIM EMS available OK (This value will change when
¦  the amount of base and/or extended memory is changed).
```

There is however an option of installing RAMDISK and the program to do it is VDISK.SYS (HIDEVICE=C:\DRDOS\VDISK.SYS). The options are: disk size (Kb - default being 64K), sector size (default 128 bytes with option of 256 or 512 bytes), maximum number of files to be written to the root directory of the Vdisk (default being 64 but can be between 2 and 512 - always remembering that specifying a large file number wastes space) and finally E/sectors if the computer has EXTENDED MEMORY. This option locates Vdisk in the extended memory and defines how many sectors (1 - 8) are transferred at a time between ordinary and extended memory. VDISK must be installed before all other drivers but after EMM386.SYS. EMM386.SYS installation in CONFIG.SYS must exclude from option

/K all memory required for XMS applications ie let say the computer has 3456K XMS and the programs, which are loaded in XMS require 512Kb, then the following entry should be made in CONFIG.SYS:

```
DEVICE=C:\DRDOS\EMM386.SYS /F=AUTO /K=2944 /B=FFFF /R=AUTO
```

By far the easiest option to install Vdisk is through SETUP program which will make all the necessary entries in CONFIG.SYS and which, as I already have mentioned, can be run at any time. Here also lies the advantage of DR DOS 5 over MSDOS 5. DRDOS does automatically build CONFIG.SYS and AUTOEXEC.BAT from the answers in the SETUP. In MSDOS 5 you have to puzzle it all out and amend these two files. I believe they call it fine- tuning.

Well, this is about all concerning DRDOS and, if you should decide to install, remember:

DRDOS will not delete your MSDOS files IO.SYS and MSDOS.SYS,

Your CONFIG.SYS and AUTOEXEC.BAT will receive extension .OLD,

Your MSDOS utilities, which may be either in DOS or MSDOS directory, will not be affected as the SETUP will create DRDOS directory for it's utilities,

so remember - do not delete anything till you are absolutely happy with the new operating system. You can always return to your MSDOS by changing the extensions of the .OLD files.

So cheery bye for now and I will finish this with a few more examples of DRDOS help. I leave to it the over-worked Editor to decide whether he will include them in the NATGUG.

```
FILELINK R1.03  File transfer utility
Copyright (c) 1990 Digital Research Inc. All rights reserved.

FILELINK [/Help] command [@][src_spec] [dest_spec] [COMn:b] [switches]

FILELINK SETUP     [COMn:b]   configure FILELINK to use COM port n, baud rate b
FILELINK DUPLICATE            transfer FILELINK to other computer via COM port
FILELINK SLAVE     [/X]       enter slave mode (run this on slave computer)
FILELINK DIRECTORY [filespec] show directory of slave computer
FILELINK QUIT                 terminate FILELINK running on slave computer
```

FILELINK TRANSMIT [@]src_spec [dest_spec] [switches]
Copy src_spec files from master to slave. (@ precedes a file list.)
Use dest_spec to specify the destination path on slave.

FILELINK RECEIVE [@]src_spec [dest_spec] [switches]
Copy src_spec files from slave to master. (@ precedes a file list.)
Use dest_spec to specify the destination path on master.

All commands may include a COMn:b parameter to override the default port configuration set with the FILELINK SETUP command.

/A	only transfer files with archive attribute
/D:dd-mm-yy	only transfer files modified since specified date
/H	transfer files with hidden or system attributes
/U	only transfer files that don't exist on destination, or exist but with an earlier date stamp
/M	only transfer files with archive attribute, reset attribute
/P	(TRANSMIT/RECEIVE) prompt before transferring each file
/P	(DIRECTORY) page directory display
/R	overwrite read-only files
/S	copy files in sub-directories
/X	do not allow any file on slave to be overwritten

FIND [/Help] [options] "search string" [@][[d:][path]filename[.ext]...]

/B	change display format
/C	show only the number of lines that contained "string"
/F	show only the name of files that contain "string"
/N	display line numbers
/S	search files in sub-directories
/U	case-sensitive search (eg 'A' doesn't match 'a')
/V	display lines not containing "string"
@	the filename that follows is the name of a file list
d:	drive which find is to search
path	directory where search is to begin
filename.ext	file to be searched (wildcards allowed)

Multiple files may be specified on the command line. If no files are specified find will read from standard input.

```
FORMAT [d:] [options]

  d:          drive containing diskette to be formatted
  /V          prompt for volume label
  /B          leave space for OS system files (5.25 inch drives only)
  /S          transfer OS system files
  /8          set sectors per track to 8 (5.25 inch drives only)
  /1          set to single sided (5.25 inch drives only)
  /4          reduce format to 8/9 sectors (hyperdrives only)
  /N:8        set sectors per track
  /T:40       set tracks to be formatted (40 or 80 only)
  /F:360      capacity of disk to be formatted (160, 180, 320, 360,
              1200, 720 or 1440)

REPLACE [/Help] [@][d:][path][filename[.ext]] [d:][path] [/options]

The first  file specification is the drive, path and name of file(s) to be copied
(wildcard filenames allowed). This specification  must  be  present.  Use  '@' to
specify that the given file contains a list of files to be copied.

The second  file specification  is the  destination drive and path to which files
will be copied. The default is the current drive and path.

  /A          only copy files that do not exist on the destination
  /H          don't ignore files with hidden or system attributes
  /M          merge changed files on source with unchanged files on dest.
  /N          preview operation - do not actually copy any files
  /P          prompt before copying each file
  /R          overwrite read-only files
  /S          copy files in subdirectories
  /U          only replace files older on the destination than the source
  /W          wait for disks to be changed

RESTORE [/Help] d: [d:][path[file.ext]] [/S][/P][/B:mm-dd-yy][/A:mm-dd-yy]...
     ...[/M][/N][/L:hh:mm:ss][/E:hh:mm:ss][/R]

    /H     Display this help text
    /S     Restore files in sub-directories also
    /P     Prompt before restoring files changed since last backup
    /B     Restore files modified on or before a given date
    /A     Restore files modified on or after a given date
    /M     Restore files modified or deleted since last backup
    /N     Restore files that no longer exist on the destination
```

```
/L      Restore files modified at or later than a given time
/E      Restore files modified at or earlier than a given time
/R      Report names of files which WOULD be restored - take no action
```

```
EXE2BIN [/Help] [file1[.ex1]] [file2[.ex2]] [/Sxxxx]
```

EXE2BIN converts EXE type executable files produced by a DOS linker into binary image files (usually with a .bin extension) or .com executable files. Whether the destination file is a BIN or a COM type depends on the initial IP field in the EXE file's header. A value of 0 will result in a BIN type file and a value of 100h will result in a COM type file. The destination filename extension does NOT affect this.

file1 This is the source EXE type file. The file must have a valid EXE header. If no extension is specified a default of .exe is added. File1 can include a valid path.

file2 This is the destination filename. If file2 is given with no extension then .bin or .com is added depending on the contents of the source EXE header. If file2 is not specified then file1 is used with a .bin or .com extension. File2 can include a valid path.

/Sxxxx xxxx is a (maximum of) 4 digit hex value which will be used as the base for any segment fixups which are required for a BIN type file.

ANON

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DIFFERENCES IN NEWDOS 80 VERSION 2

by KEVIN O'HARE

Reprinted from Bits & Bytes - Issue 3 (part 2)
Newsletter of the TRS-80 System 80 Computer Users Group

It seems that there are some Editions of some DOS's that are very different from others of the same Version. The one that I have noticed was NEWDOS 80 Version 2 for a Model III.

In the Edition of NEWDOS 80 Version 2 that I have the Directory is at DRS 170. That is the Directory starts at the Drive Relative Sector 170. But another Edition of NEWDOS 80 Version 2 has the Directory at DRS 340 !!

On it's own, it acts the same as my edition, but it cannot read the Directory of my Disks and with my DOS, I cannot read it's Directory. This is very difficult to overcome if you want to copy a program from one to the other. (None of the COPY formats using SPDN and DPDN seem to work).

First of all, get the other Edition to make a copy of itself. (This is for safety and so as not to interfere with the original Disk).

Then with SUPERZAP, you must examine what is stored at the DRS 170 of this copy. (With my Edition it would be the SYS3/SYS program). If this sector contains a program that you want to copy, then it becomes quite difficult (see my comments later on), but for the moment we will assume that it doesn't.

Now with the CDS function of SUPERZAP, you copy what is on the Disk at Relative Sectors 340 to 349 (10 Sectors) down to Relative Sectors 170 to 179. The commands are :-

```
CDS <Enter>          Do you really ?  Etc. <Y>
Enter Drive & Sector to be Copied      1,340   <Enter>
Enter Drive & Sector Destination       1,170   <Enter>
No. of Sectors                         10      <Enter>
```

This should enable your own DOS to read the Directory of this other Edition. But although it can now read it, it is still necessary to change that Directory because I found that its Granule allocation "system" was different.

In my DOS Edition the 23rd. byte of a particular file directory entry gives the disk track number (in hex) where that file starts. In the case of this other Newdos Edition, the value of this 23rd. byte was twice what it "should" be. For example, if the program on this other Edition is actually at say DRS 06, it's Directory (at this 23rd. byte) says that it starts at track 12 (0C Hex). This seems to presume that there are 20 Sectors to a Granule (or Lump)

So, examine the Directory of the original disk of the different

Edition (which you had copied) and find out the value given at the 23rd. byte of the directory entry for the file or program which you wish to copy. Divide this by 2 but do not forget that you are working in HEX.

Now go back to the disk which you copied and relocated the Directory and with Superzap, change the 23rd. byte of the desired program directory entry to that halved value. Then see if you can bring up a DIR of this disk using one of your own disks with your DOS Edition. If it does come up O.K., this will probably mean that you can get a copy of the desired program onto your own disk. But first check to ensure that you are getting the start of the program by using the Superzap DFS function. If not, then either your transferring the Directory to DRS 170 has overwritten the program or something else is wrong.

For me to explain what would then be necessary would take about five pages and get very involved. But in short you would have to relocate the program from the non compatible DOS disk with Superzap using the CDS function to a free area on one of your own DOS disks. Change the Granule allocation table (GAT) Sector of your disk to allocate the space where the program now resides. Insert a proper Directory Entry in one of the Directory Sectors, and enter a Hash code at the proper place in the Hash Index Table (HIT) Sector. Now this is complicated, especially if, as happened to me, the desired program had 6 Extents or FPDE's. (These are separate areas of non-contiguous storage - actually there were 5 FPDE's and an FXDE containing one area).

Feel free to contact me if this should happen to you as I feel it can all be overcome with a great deal of patience and persistance.

Please note that ALL the information I had to have to figure out what to do was contained in one book "TRS 80 DISK AND OTHER MYSTERIES".

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P.R.O's NOTES

At last we have had our summer, three or four days that were sunny & not cold, now it's blowing half a gale.

Many thanks to the members who responded to my call for help about Memmax, the annoying part is I had the answer hidden away all the time, all I had to do was to read ALL the manual including the release notes.

Last month I said we would like articles recounting peoples' early experiences with Tandy computers & the very next article in the `mag was from Lance Wolstrup about when he bought his Tandy model 1, I was lucky, by the time the model 1 reached the UK a complete manual & some cassette tape based programs came with the machine so at least I quickly learned how to put HELLO on the screen without SYNTAX ERROR showing up, that was a long time ago & Lance Wolstrup has come a very long way since then too.

Is there anyone out there with a Tandy PC6 pocket computer, we have a member who has one & would like some info' on upgrading it.

I have been very busy setting up computers for people, for example, I had two requests for a hard drive setup, one for a 1000EX & the other for a 1000A, fortunately Mike Ganley is selling his 1000EX & that included an external hard drive so I was able to put him in touch with the 1000EX owner, I did not feel that I could explain to someone who was not a hardware expert how to fit a hard drive to one or make an external drive for him, I no longer have the facilities for the sort of work involved in making an external one.

As a result I was able to help the 1000 owner, I had a spare hard disk controller & a short hard card frame so I asked him to order a 3.5" hard drive from one of the many suppliers you will find in Computer Shopper & have them send it to me.

The drive arrived very quickly so I fitted it into the frame, disconnected the hard drive & controller from my machine & using the flexible bus adapter that makes a hard drive possible for a 1000EX/HX I connected it to his hard card, low level & high level formatted it, added a couple of useful utilities & sent it off to him by registered first class post, it arrived next day & is working OK.

A colleague of mine has just been issued with a XT clone to do all his office work & base contacting (by modem) instead of the firm employing lots of office staff, the only snag is that they didn't give them any training in how to use the machines, I feel very sorry for any other members of the organization who haven't anyone to turn to, the machine came with several programs on the hard

disk, not all of them had any instructions also he had a complete wordprocessor that was NOT installed, it has proved far too complex for his needs so I have given him one that will do what he wants without a lot of hassle & spent the last week setting it up to do exactly the things he wants which I found very informative as I started using parts of it that I had not used before, my wordprocessing is limited to writing letters & articles for Natgug.

The same colleague mentioned above turned up last Friday with an Amstrad PPC640 2 drive machine, as he has a lot of travelling to do it will be very helpful when he is away from base to write up his notes & letters so I have set it up to be compatible with the XT clone at home using Fastlynx of course as much as possible, plugging in a CGA colour monitor gives nearly as good a display as my 1000EX.

A couple of months ago I asked for a routine to test the state of the printer when running a program in GWBASIC as the routine that worked on the model 1 invoicing problem I mentioned in the May issue was no use, well I have had a reply that works so I think it is a good idea to share the information with the rest of our members, you write a subroutine along the following lines;-

```
1000 X=INP(889):IF X=217 THEN RETURN
1010 CLS:LOCATE 5,31:PRINT"Printer NOT Ready":PRINT
1020 IF X=145 THEN PRINT TAB(36)"NO Power":GOTO 1070
1030 IF X=81 THEN PRINT TAB(36)"NO Paper":GOTO 1070
1040 IF X=89 THEN PRINT TAB(36)"Off Line":GOTO 1070
1050 P$=INKEY$:IF P$<>" " THEN 1050
1060 GOTO 1000
1070 PRINT:PRINT TAB(28)"Press <SPACE> When Ready!:GOTO 1050
```

The key being the statement X=INP(889). It is very unlikely that the values for X on your machine will be the same as those in the above routine, no two machines or printers seem to be the same, so to find out the correct values for `X' for your own setup you use the `X' values I have entered above, set you printer up ready to print in all respects, run a printing program with the above routine in it, suitably re-numbered, if it does not print (which is very probable), press CONTROL BREAK to come out of the program, type in PRINT X & the value returned will be the value to put in place of 217 in line 1000, run the program again with the printer switched off, type CONTROL BREAK & PRINT X, the value you get replaces 145 in line 1020 above, use the same routine to find out the value of X for the two other conditions.

I hope that makes sense, it did when I rang the man in Kings Lynn for whom I wrote it, Many thanks to Michael Matthews of

Dorchester for his original idea using INP(889), I merely tailored it to fit the original invoice program.

I have had a request for information from Tandy Customer Services no less, someone is running a Little Brother Serial printer on a Colour Computer & keeps getting double line feeds, there does not seem to be any dip switches on the printer to correct it, we have one member who has told me that he has a colour machine but as yet he has not been able to find the answer.

I had a phone call a few days ago from someone with a 1000HX, he wanted a serial interface board & the number he asked his local Tandy shop to order came back `no longer available' with no suggestions for an alternative so I referred him to the same man in Tandy Customer Services who had been on to me, as a result the part number 25-1031 was quoted as still being available so he is waiting with fingers crossed for it to be delivered & so it goes on, someone else wants to bring their 1000EX from 256K up to 640K ram so I gave them the part number for the expansion board & but said DO NOT buy the additional 8 256K chips from Tandy but use the suitable alternative address I provided.

Now the end of July has arrived (I started writing this at the beginning of the month) we are at last having a few more days of reasonable weather so I think it is time to send this off to the Editor.

John Kilpatrick.

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A LEICESTERSHIRE LETTER

At long last I have seen the error of my ways and renewed my subscription to NATGUG. Reading through the bundle of Newsletters which subsequently arrived, my attention was immediately caught by the article by Peter Nowers in the April issue on `Sorting Random Access Files'. Please may I use the pages of the Newsletter to thank Peter for the nice things he had to say about my book - the QuickBASIC BIBLE. It was extremely flattering to discover that he had adapted (and greatly improved upon) my own file-sorting routine from the book for his article.

You may recall that some of the material which was later used for the 'Bible', first appeared here in the NATGUG NEWS between January and April 1989. From that small, but important, beginning it grew into what Microsoft tell me is already the biggest selling book on BASIC programming ever. Without wishing to be immodest, I can only say that it illustrates the quality of the articles which appear in these pages, my own contribution having been in no way

exceptional.

Although I still have a Tandy 3000, now sadly relegated to use by my wife and children, my TRS-80 days are over. Consequently, I no longer need my venerable collection of 80-Micro magazines. If any NATGUG member can find a use for them, I would be glad to pass them on. All I ask is the cost of post and packing since they are bound into 7 large Model II Owner's Manual binders. The set covers April 1983 to the last issue and has only one or two gaps. Anybody want 'em?

Christy Gemmell 0533 767960
22 Peake Road, Northfields, Leicester, LE4 7DN

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SCRIPSIT - READING TAPE FROM DISK VERSION

by ALF WEST

Reprinted from Bits & Bytes - Issue 4 (part 2) Newsletter of the TRS-80 System 80 Computer Users Group

Last month Lance gave me the Newsletter written by SCRIPSIT on Tape. But I'm blowed if I could load the Tape and started to blame either his Recorder or mine.

That was until I noted in the February issue of 80 MICROCOMPUTING that the disk version of SCRIPSIT (which I was then using) under NEWDOS 80, does not function properly with Cassette files. The author of the article (R. Lee Holstege of Millersville) on Page 29 gave the following ZAPS to correct this:-

1) If you haven't already done so, apply the first four Zaps given in Chapter 13 of the NEWDOS 80 Manual but ignore the fifth one.
2) File relative sector 00,C3
   Change 57 F3 ED to 57 FB ED
3) File relative sector 00,03
   Change 52 18 3D 43 4F 50 59 52 49 47 48 54 20 31 39 37 39 20
   To 52 3E 00 32 E4 37 C3 3F 52 F3 C3 94 66 F3 C3 14 63 20
4) File relative sector 25,59
   Change 65 14 63 2A to 65 0C 52 2A
5) File relative sector 25,6A
   Change 67 94 66 94 66 CB to 67 08 52 08 52 CB

As the author remarks, you may not have any call to use Cassette files with the Disk version but these Zaps work if you do.

Incidentally, if you would prefer that SCRIPSIT goes straight to DOS when you enter "END" instead of re-booting then change file relative sector 19,E5 from C3 00 00 to C3 2D 40.

EVERYTHING YOU EVER WANTED TO KNOW ABOUT FLOPPY DISKS

by Ted JENSEN

Reprinted from "WNYTUG News" May 1988
Newsletter of the West New York Tandy Users Group

So, you've just spent 400 bucks for that super piece of software, made your backup and are working away with your working copy. Suddenly, while you are working with a relatively unimportant utility program on another disk, your disk goes bad. This is not a major problem. You have a backup somewhere, but it gets you to thinking about your backups on your commercial programs. What happens if they go bad? Should you have made them on some type of premium diskette to guard against that?

You scour through catalogues and ads in magazines. There are sources galore for diskettes, at all prices, and some of them even have specifications. You run into one spec called "Clipping Level" and the supplier claims that because his disks have been tested to a higher clipping level they are superior. Should you pay a premium for disks with superior specifications? What do these specs mean? Will your backups be less likely to fail if you use premium disks?

These are difficult questions to answer. Perhaps an explanation of some of the tests run on disks and what can happen to your backups with time would help you make that decision. In addition, you may be interested in considering the cost tradeoffs of using higher priced disks.

As an engineer with many years of experience in magnetic recording I had never heard of the term "clipping level" until it came up in a discussion on KAY*FOG. In fact, I had never seen a specification sheet in any box or bag (I buy the cheap stuff by mail order too!) of disks I have purchased. However, I did spend a couple of years as a part of a design team on a Winchester Drive for personal computers and one of my tasks was the specification and testing of the disks used in those drives.

CLIPPING LEVEL: Since magnetic media is pretty much the same whether it is tape, diskettes, or hard disks (the major difference being that the material to which the magnetic particles are bonded is Mylar for tape and diskettes, and aluminium for the hard disks), it wasn't difficult for me to guess at what was meant by "clipping level". A little looking through a parts catalogue and I found a

specification on a chip designed for use in disk drives and they defined "clipping level" (although in rather vague terms). It is unfortunate that these words are used to describe a test performed on diskettes since they have a different and more widely understood meaning throughout the general electronics industry. In any case we will have to accept these words as they are the ones used in ads.

In simple terms, your drive uses a "head" to read the information on the disk. You can think of this as being like the needle and pickup on your phonograph. The head reads the magnetic information previously written on your disk and converts it into an electrical signal. This signal is further processed and eventually takes on a form suitable for transmission to your computer as bits, or bytes, which represent the data.

SIGNAL VARIATION: The size and shape of the electrical signal developed by the head varies for many reasons. First of all, it varies as a result of the information written on the disk, and this variation itself represents that information. However, there are other variations which take place due to imperfections in the head, the mechanical characteristics of the drive, or imperfections in the diskette. These variations, if large enough will lead to the electronics in the drive not being able to correctly decode the information, and your computer will indicate by means of some error message that it cannot read the disk. It is therefore important to keep these variations (those not part of the data) at a minimum.

COATING THICKNESS: Magnetic diskettes or tapes are manufactured by bonding magnetic particles to a flexible Mylar backing material. Characteristics which affect the performance of the final product include, but are not limited to, the magnetic characteristics of the particles, the size of the particles [Note: it is modification of these two characteristics that make the difference between a 1.2M disk and a 360K disk], the thickness of the coating, and, most important to the subject of "clipping level", the uniformity of the coating. If a tiny part of the disk, the size of a pinhole, does not get coated, the signal level recoverable from that spot is reduced. Thus, if there are a number of these of sufficient size, the signal level will be fairly uniform until that "pinhole" passes under the head, at which point it will drop. These are referred to as "drop-outs" in the industry.

Furthermore, if the coating thickness varies over the surface of the disk, the amplitude of the signal can vary in a relatively smooth

manner as the disk rotates. This is generally not a serious problem, however.

Your drive can recover your data by separating these disk related variations from the variations in the signal due to the real data, provided that the disk related variations are not too large. Typically a drive might be able to successfully ignore disk related variations which did not reduce the amplitude of the real signal to less that 30% of the normal output. This number, however, also depends on a wide variety of factors, and varies from drive to drive, even the same model from the same manufacturer.

Thus, anything one could do to assure that the level of these disk related variations are held within a specified range should reduce the probability of errors. The key word is "probability", and more will be said about this later. Therefore a disk which is tested to a "clipping level" of 60% is tested to assure that the variations due to the disk are small enough that the signal level never drops below 60%. That is, the variations are held to a range between 60% and 100%. It follows that the higher the "clipping level", the less variation in signal output and reduced probability of a disk error.

Now comes the tough part. How much extra money should you pay for a disk tested to a 60% level as compared to one tested to a 40% level? Would you pay 50% more? Twice as much? Ten times as much? The way I look at it is this: There is a high probability that if I buy 25 or 50 brand X disks and they all work, whatever tests were run on them were probably sufficient to assure me that brand X disks will always work. I have no way of knowing what "clipping level" disks destined for my drives should be tested at, nor do I believe, do the manufacturers of floppy disks.

A WORD ABOUT HARD DISKS: In the case of Winchester drives, the situation is a little different. The manufacturer of the disks which go in these drives are generally different companies from those that manufacture the drives. The drive manufacturer imposes specifications on the disk manufacturer. Furthermore, the drive manufacturer continually tests disks using sophisticated equipment to be sure that the disk manufacturer meets these specifications. That is, people who manufacture disks for use in hard drives do not sell them directly to the end user (removable hard disks excepted).

BOTTOM LINE $$$: But, back to floppies. If I buy 100 diskettes

from each of two sources, SuperDisk and CheapDisk. Assume I pay 40 cents each for the CheapDisks and $2.00 each for the SuperDisks. Finally, out of all the disks I bought, one SuperDisk won't format and ten CheapDisks won't format. I have ended up paying just over $2.00/disk for good SuperDisks and about 45 cents each for good CheapDisks. I still think I got a better buy on CHEAPDISKS.

MORE USE -- BETTER PERFORMANCE: Now, what about disk failures in the future? That is, as I use these 90 CheapDisks are they more likely to fail in the future than the 99 SuperDisks? Well, I suppose there are those who would argue with me that in fact they would. But I really don't believe it. The reason is that the first few times I use any diskette its performance will improve. The surface of the disk is left slightly rough (not on purpose) during the manufacturing process and this process prevents good contact between the head and the disk. This poor contact degrades performance of the disk. As the disk is used and rotated past the head, the head knocks off some particles of the coating, smoothing the surface and improving the contact and the performance. In tape recording, in critical applications, new tape is never used without running it through a machine at least once and sometimes several times, just for this reason. Therefore, after I have used my CheapDisks several times I feel more comfortable with them than when they were brand new.

HOW LONG WILL THEY LAST? Finally, what about the really long term? Will CheapDisks retain the information stored on them equally as well as SuperDisks, say over a period of 100 years? Well, here we are dealing with real unknowns. There are no disks around that are a hundred years old. Magnetic recording using media of the type used in disks is only about 40. I have had disks given to me that were unusable by one person, only to have them work perfectly in my machine. While I have encountered some disks that wouldn't format to the full 360K, (and as such, I consider them unusable), I have not seen the great number that cause me the problems encountered by some. I can only guess that the drives themselves might be causing a lot of the formatting errors that many have run up against. Going further, I haven't heard of many TANDY users complaining about the disks, only users of other "clones" .... I was under the impression that TANDY used the TEAC drives in the SX, (but I may be wrong), and I can't understand why others using the same type of drives in their "clones" would have a problem .... Perhaps the "special colour" on the SK drives make a difference ....

THE HISTORY AND TECHNOLOGY OF TSR; TERMINATE AND STAY RESIDENT SOFTWARE

By Steve Gibson, InfoWorld TechTalk Columnist & President of Gibson Research Corp.

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Once upon a time a Big Blue company named IBM decided that it wanted to make personal computers too. For reasons known only to the gods of Boca Raton, Florida, IBM decided to use the 8088 microprocessor from Intel rather than Motorola's vastly "cleaner" 68000 (as is used in Apple's Macintosh). Viewed in retrospect, this has turned out to be a ridiculously expensive, i.e., wrong, decision. But anyway... IBM journeyed to the west to get its software for this new machine.

IBM first visited the company who was then the acknowledged king of operating systems, Digital Research, Inc. DRI had developed CP/M, the defacto standard operating system for the very popular 8080 and Z80 microcomputer systems. IBM explained that it needed an operating system for the new 8088 microprocessor in their new, blue, personal computer and asked if DRI would please provide them with one. DRI said, quite truthfully, that they didn't have one. Big Blue must have then asked if they would like to make one, to which DRI must have again said: "No thanks."

IBM shrugged and headed north.

Though IBM may have only planned to ask Microsoft for an 8088 BASIC language interpreter for their new machine, they found themselves in Washington without an operating system. Microsoft said they would be pleased to provide IBM with both an 8088 operating system and the BASIC language interpreter.

IBM said "Thank you" and said they needed it very soon please.

But Microsoft didn't have an 8088 operating system either, and being so very much smaller than they are now, didn't have the resources to build one from scratch by IBM's deadline. So they found an even

tinier company called Seattle Computer who had built a little unpretentious operating system for the 8088 and the 8086 micros called 86-DOS. It was also known by some as QDOS, was said to stand for Quick and Dirty Operating System.

So Microsoft, then able to meet IBM's 8088 machine timetable, delivering both an operating system (albeit one of unassuming parentage and questionable virtue) and a BASIC interpreter.

Everything seemed fine until we began really using the new operating system. We wanted additional and rather reasonable things from MS-DOS and PC-DOS. Things which had not been designed into 86-DOS, like printing in the background while the user was doing other things. Or supporting RS-232 serial printers, which required routing the printer data out through a serial port instead of the normal parallel printer port.

To meet these reasonable demands Microsoft made a series of little changes and additions to the guts of MS-DOS which allowed extra "add-on" code to be "hung" onto the outside of MS-DOS and also provided for limited communication between DOS and the add-on code. Microsoft's idea was that these MS-DOS limitations would be "fixed" by writing some new DOS commands (in the above examples PRINT and MODE) which would make use of special undocumented aspects of their latest version operating system.

The problem was that MS/PC-DOS, still really old 86-DOS (QDOS) in disguise, was never built to support multi-tasking. This means that it was never meant to serve more than a single master at a time. A command like PRINT, which can continue to operate after the user has begun doing something else, could very easily confuse it, since now there could be service requests coming into MS-DOS from two quite different places at once.

Since this began making the entire operating system rather fragile and weird, Microsoft's grand plan was to keep all these special hooks and communications paths as a company secret.

They figured that as long as they were the only ones to use these new MS-DOS secrets things wouldn't get out of hand.

But Microsoft must have gravely underestimated the cleverness and determination of the development community. When the MODE

command proudly stated: "Resident portion installed" developer's eyebrows shot up! Resident portion? Hmmmmmm. And if the PRINT command could access the disk for file printing when we were messing with a spreadsheet, why couldn't we build a little resident notepad or two, too?

But even after these new resident goodies began appearing in increasing number, Microsoft refused to "disclose" anything whatsoever. They "couldn't" document these things or they'd be forced to support them in upwardly compatible fashion. Since these were all awkward kludge solutions to the real need for a true multi-tasking operating system, Microsoft's delicate condition can be readily understood.

MS/PC-DOS WAS NEVER BUILT TO SUPPORT MULTI-TASKING.

However, developers sensing massive market opportunities were not to be stopped. Debugging software which allowed programmers to peer inside the still working machine sold like wildfire.

Using these debuggers, developers probed into the very heart of Microsoft's own PRINT and MODE commands, unscrambling the undocumented secrets of their operation. Using the same secrets Microsoft's own developers had used, they learned how to give their own programs similar capabilities.

In an old episode of Star Trek, Mr. Spock said, after capturing the Romulan's cloaking device, "...military secrets are the most fleeting of all, Commander." This applies equally well to technological secrets in general, and as we've seen, to resident software in particular!

It's unfortunate that Microsoft did not have time back there in the beginning to build their own DOS from scratch. They might have done it right. But we're stuck with what we have today, and making the most of it is certainly our best strategy.

It remains unfortunate, though certainly understandable, that Microsoft isn't willing to disclose the details of MS-DOS' resident software hooks and techniques. This policy keeps such knowledge quite secret since even the third-party developers are reluctant to disclose their own hard-won "insider's" knowledge and proprietary techniques for forcing reliable multi-tasking behaviour from good ol' single tasking DOS. It's quite interesting to speculate that perhaps

today even Microsoft does not know how to write MS-DOS multi-tasking applications as well and robustly as several of the larger commercial resident software publishers! The tricks required to make DOS multitask are real nasty stomach-turners.

So...what are these tricks and techniques? How do resident programs "pop up over" applications at the simple press of a "hot key"?

Since we've seen how we got to wherever it is we are, let's answer exactly those questions now...

Two things are required for the function of TSR technology:

First, the TSR program needs to somehow "hang around" even after any other program has started to run. Secondly, it has to "know" what's going on in the system to be able to jump in and help out when called upon for action.

The requirement of continuing RAM residency is satisfied by a service provided by the operating system from which TSR's get their name: Terminate and Stay Resident (TSR).

The main operating RAM memory of an IBM compatible PC is a contiguous block beginning at address zero (called the bottom of RAM memory) and extending for a maximum of 640K bytes (called the top of memory). Note that 640K is actually 655,360 bytes since "Ks" in computerdom are really 1024 bytes, not 1000.

Since the very bottom of this large contiguous block of RAM memory is reserved for system housekeeping purposes, DOS is "booted" by copying it from disk into RAM just "above" these low-RAM tables.

Once DOS has been loaded, all the space "above" it, to the top of RAM, is available for application program loading and use. We'll call this location just above DOS the Load Point for application software. So, when a program is started, its data is copied from disk into RAM starting at this load point and continuing until the entire program has been loaded. The memory available to the program for its own data storage and manipulation extends from the end of itself to the physical top of the RAM memory.

Most standard programs -- word processors, spreadsheets, or

databases -- have "control" of the computer until the user tells the program to terminate. After performing whatever cleanup and file saving might be required, the program simply informs DOS that it is all finished by saying the equivalent of "I'm all finished now, terminate me please."

MICROSOFT MUST HAVE GRAVELY UNDERESTIMATED THE CLEVERNESS OF THE DEVELOPMENT COMMUNITY.

Responding to this "Terminate" request from a program, DOS simply "forgets" all about the program and whatever data it might have had in RAM.

It displays a command line prompt for the user and awaits another command. When the next program runs, it is loaded at the same load point as before, thus overlaying whatever terminated program was just running, and implicitly making the same amount of memory available to this next program.

Now consider the special case of the resident program...

It (innocently) begins just like any other application program when its name is typed at the DOS prompt. DOS copies it from disk into the user's RAM memory starting at the same load point as any prior application software, implicitly leaving the rest of RAM memory for the program's own use until done, and hands control of the computer system over to this program.

Now things start getting interesting!

The resident program will generally say hello to the user announcing its intention to hang around for the duration. Then it does a few "non-standard things" to the system. These are the very things Microsoft wanted to keep all to itself. These special "things" keep the program from being excommunicated from system activities after it terminates. Then, rather than simply saying "terminate me" to DOS, it says" "I'm xxx bytes long. Now terminate me but don't overwrite me." Which is to say: Terminate me, but let me Stay Resident.

Upon receiving this request, DOS moves the software load point up by those xxx bytes, and only then returns the standard DOS prompt to the user.

With the load point moved up, all subsequent programs will be loaded after this software which asked to remain resident, thus leaving it undisturbed in the system's memory!

Additionally, since it's the resident program which tells DOS how big it is, it is able to declare itself to be any length it chooses! This is how programs like SIDEKICK, which are only 39K bytes long while on the disk, can have a 50K notepad file and take up 89K bytes while in RAM! It effectively lies to DOS about how big it is, so DOS obligingly leaves it space for itself and for however much working memory it wants! So this is the way resident programs are able to eat up so much of our main RAM memory! When this process is repeated many times (as is frequently the case) a resident software "stack" is created in RAM memory.

So, now we've seen how programs are able to remain in memory after being "officially" terminated. The final question is:

How are these "terminated" programs able to remain "aware" of the activities around them?... and how are they able to regain control of the computer whenever they see fit to do so? To answer these last questions let's step back for a moment, reviewing a bit about how computers are controlled.

A computer's actions are directed by its reading of instructions which are stored in its main memory. These instructions may be temporary, as in the case of programs loaded from disk into RAM, or permanent, as in the case of instructions permanently wired into ROM chips. In either case, each instruction has an address which is just the number of the byte it occupies in the machine's memory.

We cause the computer to perform a given task by having it read a series of instructions which detail the task. In a sense we CALL upon those instructions whenever we need to exert their intended function. Such a "called" instruction sequence generally has a clever instruction called RETURN which is able to send the computer back to wherever we called it from.

HOW DO RESIDENT PROGRAMS "POP UP OVER" APPLICATIONS?

This notion of FUNCTIONS which are being performed by instruction sequences called upon in memory, and which will return to us when finished, is very powerful. IBM compatible computers come equipped

with a BIOS ROM which contains a host of very useful general purpose functions which return control to their caller as soon as they have performed their designated duty. This is exactly what that often mentioned BIOS ROM is all about!

Naturally we must know the exact address of these "functional" services in order to CALL it into service. By convention, the starting address of every built-in function in the IBM PC is located in a predefined table of addresses located at the very start of the computer's RAM memory. Every function is numbered simply by the location of its address in this table. This means that in order to call for any build-in IBM PC function we only need to know its standard function number -- from this we're able to calculate the location in the table where that function's starting address can be found.

There's even a clever computer instruction which lets you directly call upon a function whose address is stored at a specific location in this table. So in effect you can simply ask the computer to call standard function number 7. In response to this function request the computer will look into the 7th slot in the table for the address of function number 7, and go there directly, returning to you when the function has been performed. The official term for a place which contains the address of something else is a POINTER or a VECTOR.

Even the electrical hardware of the computer is able to call upon these standard functions. In fact many of the standard functions in the ROM BIOS are designed to operate hand-in-hand with the PC's hardware. For example, every time a keyboard key is either pressed or released the standard function number 9, whose address is naturally in location 9 of the Address Table, is called upon by the hardware. This function is called even if the software was busy doing something else at the time!

This ability of the hardware to INTERRUPT whatever the software might be doing at the time is called a "hardware interrupt."

Essentially the keyboard hardware says to the processor:

"Hey there CPU, hold on a second, remember where you are and what you are doing, now go perform the function whose address is in slot number 9, and when that function returns to you, go back to whatever it was you were doing when I bugged you just like nothing ever happened."

HOW DO THESE "TERMINATED" PROGRAMS REMAIN "AWARE" OF THE ACTIVITIES AROUND THEM?

This is exactly how we are able to type ahead of our computers. Even if our spreadsheet is lost in thought recalculating our tax refund, we're able to type ahead of it! Each depression and release of a key steals a fraction of a moment, a slice of time, away from the spreadsheet's recalc. The function invoked by the keyboard's hardware interrupt places the key into a type-ahead buffer ... which the spreadsheet will read from as soon as it's good and ready ... then returns control to the recalc as if nothing at all had happened.

Now imagine what would happen if some program (guess who) were to point the pointer stored in the 9th table location to somewhere else such as to itself, prior to issuing a Terminate and Stay Resident request to DOS!

Then the hardware interrupt occurring at every keyboard action would turn control over to this TSR'd resident program instead of to the normal built-in keyboard handling function! If the resident program wasn't "interested" in that particular keyboard action or keystroke, it could simply pass control along to the place where the pointer had been pointing beforehand just as if it hadn't been eavesdropping at all! However, if the key action happened to be this resident program's assigned "hot key," it could retain control of the system as long as it wished, before passing it along as if nothing at all had happened!

So there you have it. The history and technology of TSR Resident Software in a nutshell. I hope this gives you a better feel for what's going on under the hood of your machine!

Thanks for listening!

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MORE ON CONFIG.SYS AND AUTOEXEC.BAT.

After John's comments on these two files some time ago, I thought that NATGUG members might be interested in how my machine id set up. For the record it's a 16mHz 286 AT with 44mb hard drive, 360k 5.25 and 1.44mb 3.5. Let's start off with CONFIG.SYS.(I've added the line numbers for clarity.)

```
1  country=044
2  files=25
3  buffers=16
4  DEVICE=C:\dos\MME.SYS/M=896
5  DEVICE=C:\dos\VDISK.SYS 770 /a
```

Line one is pretty easy it sets the date and time format to U.K. Lines 2 and 3 set up the DOS file parameters, most modern software requires that FILES is set to 25+. Line four is the extended memory driver. The /M=896 tells it how much extended memory is fitted. This command is vital if you want to use memory above 640k. Line 5 sets up 770k of the extended memory as a virtual disk. I use this to run programs from. You will find that software that accesses disks a lot (Like spelling checkers) will run much faster this way, and cut down the wear an tear of your drive. The '/a' option at the end of line 5 forces the VDISK into extended memory.

Now AUTOEXEC.BAT:

```
1  @ECHO OFF
2  NLSFUNC
3  prompt $P$G$S
4  C:\dos\fastopen c:=100
5  C:\utils\vgamode v
6  keyb UK
7  MENU
```

It should be noted here that this machine is running MS-DOS 3.3+ so the commands on lines 2, 4, 6 will not work on lower versions. It should also be noted that the '@' character in line 1 is also exclusive to DOS 3.3 and above. It simply stops echo of 'ECHO OFF' TO THE SCREEN. Line 2 loads the file of country specific information for the codepages. Line 3 sets up the DOS prompt, to show me drive and directory. Line 4 loads FASTOPEN. This is a utility that records the location of often used files and allows you quicker access to them. The parameters on the end specify the number of entries to hold for each hard disk. Line 5 locks the VGA card into VGA mode. If you don't do this some software will upset the screen colours and try to run in EGA mode. Line 6 loads the U.K. keyboard driver. (This is DOS v3.3's version of KEYTUK or KEYBUK). Finally line 7 loads the Power Menu hard disk manager. Well that's how my machine is set up. I don't claim that this is the perfect way, but it suits the way I work. Mike Ganley 0272-513497

Richard Creak has been told by an expert that it is not possible to use a Tandy 200 lap top for tone dialling. He would be very pleased to hear from any members who know of a suitable program which he could use to dial directly from a list of addresses and phone numbers using a modem. 0245 41 3725

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4, The Coots, Stockwood, Bristol, Avon, BS14 8LH

The relevant disk library catalogue may be got from Ariela or David by sending your own disk(s) formatted for use on your machine (give librarian details) plus a cheque payable to appropriate librarian for £2 plus return postage and a self addressed label.

MODEL I/III
Mr. Leighton Davies Tel. 0656 860398
Glanmor,Brynna Road, Pencoed, Bridgend, Mid Glamorgan, CR35 6PD

The Model I library list is a hardcopy printout available at a cost of £2 from the Treasurer (address on the front cover).

MODEL II (No Catalogue - telephone for details of vast range)
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Program disks are only available from librarians. Send one of your own disks formatted for use on your machine (give librarian details) for each library disk of which you want a copy plus a cheque for the copying charge of £1 per disk plus return postage and a self addressed label.
The only exception to this should you prefer, is David Sampson, who is willing to supply disks for an extra £1 and mailers for 50p.
If in doubt please talk to the relevant librarian or the Treasurer.

The Model I library contains programs which will run on Model III. Likewise the Model IV library also has relevance to model III.

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