SYDTRUG NEWS

Volume 12 Issue 7 JULY 1992 Price $2.00

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MEETING ARRANGEMENTS

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*                                                 *
*   Meetings will be held on SECOND and FOURTH Saturday *
*   afternoons each month commencing at 1:00 P.M. at the *
*     1st Sefton Scout Hall, 2 Waldron Road, SEFTON *
*                                                 *
*        Meetings this month will be held on      *
*             11th and 25th of July              *
*                                                 *
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WHO'S WHO

President	Denis J. PAGETT	772-4848
Vice President	Tom FOLEY	389-6157
Secretary	Bruce RAMSAY	580-2217
Treasurer	Gordon SYMONDS	Sick
Acting Treasurer	Tom FOLEY	389-6157
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TRUG-86 Sysop	Errol ROSSER	796-7646
Hardware Co-ordinator	Errol ROSSER	796-7646
Membership Secretary	Peter WIGNELL	759-8024
Newsletter Editor	John MERCER	579-2915

Closing Dates for August 1992 Newsletter:

Hard Copy only — 4th July 1992 —

On Disk — 11th July 1992 —
or Via Bulletin Board

SYDTRUG Bulletin Board

TRUG-86, the MS-DOS/TRS-80 Bulletin Board, (02) 790-5681

For full details see the Services page overleaf.

CREDIT CARDS

We have the facility to charge your membership fees, or renewal fees to either BANKCARD, MASTERCARD or VISA. Additionally, purchases made on your behalf by the group may also be charged to your credit card. If you wish to use this service, please quote your card number, type of card, expiry date of card, and SIGN your request.

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*                                                 *
*  Membership Renewals Now Due                    *
*                                                 *
*  For those members whose fees are only paid up to June *
*  1992 this is THE LAST copy of "SYDTRUG News" which you *
*  will be receiving until membership fees for 1992-93 are *
*  paid.                                          *
*                                                 *
*  Renewal forms were included with newsletters for both *
*  April and June so, if you still have not paid, complete *
*  one of the forms and return it with your payment ASAP. *
*                                                 *
*  If in doubt about when your fees fall due, check the *
*  top right hand corner of the label on your newsletter *
*  wrapper.                                       *
*                                                 *
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SYDTRUG Inc. Information

MEMBERSHIP FEES:

There is a ONCE ONLY joining fee of $20, plus, for single membership, $45 per standard financial year (July to June) or, for family membership (which includes all family members living at the same address), $55 per standard financial year. These fees fall due on 1st July each year and are payable by Cash, Bankcard, Mastercard or Visa Card. They cover the cost of the monthly newsletter and admission to Saturday meetings, access to the bulletin board, access to the group library, and reinking of fabric printer ribbons.

For those who wish to insure against possible future fee increases, payment of $200 for single membership, or $250 for family membership, will cover five years fees. This represents a saving of $5 per year and any increases which may occur during the five years.

Our NEWSLETTER ("SYDTRUG News"):

Distributed on a regular basis, includes group business information along with software and hardware articles and information from local and overseas sources. Contributions from members are always welcome. See below for advertisments.

COST: Included in your membership fee. Back issues available at $2.00 ea plus postage (within Australia) $0.70.

Other NEWSLETTERS:

We receive numerous exchange newsletters from similar groups, both locally and from overseas. See the resume which appears regularly in "SYDTRUG News". Copies are available for borrowing from our Sefton meetings. You can also borrow by mail if you drop us a line including outgoing postage, as for back issues of "SYDTRUG News" shown above, one magazine at a time for one month.

DISKS:

The committee have located a new source of disks at new low prices. These prices are conditional upon purchasing in lots of 100. At this time the committee is not prepared to outlay group funds in purchasing bulk stocks of disks on members' behalf. However, if any member, or group of members acting cooperatively, wish to pay in advance for 100 or multiples of 100 of the same type and size of disk, the committee will arrange to purchase them on the members' behalf. Any member wishing to purchase less than 100 disks of any one type and size may pay in advance and, when orders have been received for 100 of the same type and size, the committee will arrange to purchase them. The new prices are as follows:

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5.25 DS DD (360K) 0.50 each
5.25 DS HD (1.2M) 1.00 each
3.50 DS DD (720K) 1.00 each
3.50 DS HD (1.4M) 1.90 each
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LIBRARY:

We maintain a library of interesting books, mainly at present on TRS-80 matters, along with most issues of "80-MICRO". There are a number of other magazines available as well as copies of some local computer magazines. These are available for borrowing from the group for one month at a time.

FABRIC RIBBON RE-INKING:

Most printer ribbons can be reinked quite successfully, so long as they have not been thrashed. There needs to be a reasonable fabric base to absorb the ink. NOTE: Fabric ribbons only, carbon film ribbons cannot be reinked. If given to the reinker person at meetings they will normally be ready at the same meeting of the next month. By mail, send them to the Group P.O. Box in a padded jiffy bag. Before you mail it, get it weighed and pop postage value of stamps into the bag before you seal it so that we can return it.

COST: This service is free to members, but postage and packing charges will apply where applicable.

SIGs (Special Interest Groups:)

On the second meeting of the month we often have either hardware or software tutorials. If you can present an area of interest or can suggest something that you might like to learn about, please contact a committee member.

SOFTWARE:

MS-DOS Public Domain/Trial Ware:

We have an ever increasing range of MS-DOS Public Domain and Trial Ware disks from a number of sources. Watch the newsletter for details.

COST: The software is normally available on a 5.25 inch 360K disk format for a cost of $5, plus postage and packaging if applicable. Alternatively, the software can be supplied on a 3.5 inch 720K disk for an additional $1.00. Two programs normally available on two 360K disks can be supplied on the one 3.5 inch disk format for the cost of two 360K disks plus $1. The group does not charge for the software but charges a disk purchase price to cover the cost of the disk medium and the cost that SYDTRUG Inc. has to outlay to maintain the software library. Members have the option of picking the order up at a SYDTRUG meeting (provided the order is placed 5 days in advance) or having the disks posted to them in a disk mailer box.

The additional cost of postage and packaging will vary depending on the destination and the current charges are as shown:

1 - 5 disks:	Within Australia:	$2.00
	Overseas Airmail:	$5.00
6 - 10 disks:	Within Australia:	$4.00
	Overseas Airmail:	$10.00

TRS-80 Public Domain:

A huge range of TRS-80 Public Domain Software is available for Mod I/Sys 80 along with Mod III, 4/4P. See our catalogue disks for details, if you don't have them write and ask, including $8.00 to cover disks and P/P. Be sure to let us know in what format you require the disks written.

COST: $3.00 per disk, plus postage and packing as for MS-DOS disks above.

BULLETIN BOARD:

Our MS-DOS/TRS-80 BBS called TRUG-86, now up and running on (02) 790-5681, is still in the process of development. So please bear with us if it does not yet have all the bells and whistles which you may expect. All members of SYDTRUG Inc. will have access, while limited access is available to visitors.

Initially your password is your membership number, so it would be a good idea to log on and change your password to one which only you know.

The following formats are available:-

```
CCITT  V21 (300/300), V22 (1200/1200)
       V23 (1200/75) and V22 bis (2400/2400)
BELL   103 (300 FULL Duplex), 212 (1200/1200)
       2400 (2400 FULL Duplex)
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All formats utilise 8 DATA bits, 1 STOP bit and NO Parity

You should set your Modem and/or software for "Originate", except for V23 (1200/75) which should be set for VIATEL or 1200 Receive/75 Transmit.

COST: This service is FREE to MEMBERS.

ADVERTISEMENTS:

Members may place "For Sale", "Exchange", or "Wanted" advertisements in "SYDTRUG News" There is no charge, but inclusion is dependent upon space being available. The editor reserves the right to amend advertisements as thought fit.

DISCLAIMER:

Treasurer's Report for May 1992

by Tom FOLEY

INCOME:	May	Year to Date
Members' Subscriptions:		
Renewals:	0.00	1,690.00
New: Joining Fees	60.00	560.00
Annual Fees	25.00	950.00
1 year subs in adv.	805.00	1,300.00
5 year Subs to 1996	-80.00	240.00
5 year Subs to 1997	-130.00	520.00
	680.00	5,260.00
Software Eval. Deposit	-108.85	0.00
Members' Purchases:		
MS-DOS Shareware	0.00	284.00
P/D Disks	85.00	296.00
Hardware	0.00	151.00
Blank Disks	166.80	1,137.40
Sundries	0.00	293.60
	251.80	2,162.00
Other Receipts:		
Donations	0.00	210.00
Software Eval. Fee	0.00	78.00
Sundries	0.00	155.40
	0.00	443.40
TOTAL INCOME	**$822.95**	**$7,865.40**

EXPENDITURE:		
Newsletter Costs:		
Printing	135.00	1,585.00
Postage	64.84	624.49
Other	8.10	177.10
	207.94	2,386.59
Meeting Costs:		
Rent	50.00	565.00
Insurance	0.00	331.63
	50.00	896.63
Purchases for Members:		
Software & Manuals	311.59	889.47
Blank Disks	150.00	1,458.00
	461.59	2,347.47
Admin Costs:		
Advertising	0.00	285.00
Bank Charges and fees	5.81	116.20
Committee Expenses	0.00	31.62
Post and Telephone	1.00	396.25
Photocopying	42.96	405.48
General Expenses	0.00	154.84
	49.77	1,389.39
Bulletin Board Running	0.00	187.09
Capital Expenditure	0.00	826.00
Sundries	29.95	484.00
TOTAL EXPENDITURE	**$799.25**	**$8,517.17**

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For Sale

Members requiring computer network repair or consulting should first contact:

L.A.N. MIND

mention **SYDTRUG Inc.** and quote their membership number. They should be pleasantly surprised by the discounts available to members.

Voice Phone: (02) 746-9106
FAX: (02) 747-5623

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Big MS-DOS 5.0 Partitions

by Uncredited

[Reprinted from "Hawtug News",
Newsletter of the Hawaii Tandy Users Group,
366 Elelupe Road, HONOLULU HAWAII 96821, January 1992]

How does one go about repartitioning your hard disk into one large MS-DOS 5 partition ?

If you have a hard disk that's larger than 32 MB and have it broken up into several partitions using MS-DOS 3.3 or lower, it is possible to repartition it into a single volume using MS-DOS 5.

Follow these eight steps to create one large MS-DOS 5 partition.

1. Back up your hard disk by using either the MS-DOS backup command or a third party backup utility such as PC-Tools or Fastbak.

2. Create a set of working MS-DOS 5 floppy disks: Insert the MS-DOS 5 upgrade Setup disk into the drive, then type **setup /f** and follow the installation directions.

3. Insert the Startup working disk into the drive and reboot your system.

4. Insert the Setup working disk if you have 3.5-inch disks or the Support disk if you have 5.25-inch disks, then type **fdisk** at the prompt. From the menu, select "Delete partition or logical disk drive". Delete (in this order): all logical drives in all extended MS-DOS partitions; all extended MS-DOS partitions; and the primary MS-DOS partition. (You may have a non-MS-DOS partition which was created either by another operating system or by third-party partitioning software. Delete this non-MS-DOS partition only if you know it is not needed.) After all partitions are deleted, you are ready to create a large, primary partition.

5. Select "Create DOS partition or logical DOS drive". Next choose "Create primary partition" and select for the maximum disk space to use the whole hard disk as one partition. MS-DOS prompts you to reboot. Make sure the Startup disk is in drive A, then reboot.

6. Insert the Startup disk in the drive and type **format c:/s**. This formats the disk and copies the MS-DOS system files to the disk, making the hard disk bootable.

7. To create a directory named DOS on the bootable hard disk drive, type **c:** then **md dos**. Copy all files from all MS-DOS 5 working disks to the DOS directory by typing **copy a:*.* c:\dos** with each disk.

8. Restore the backup files to the hard disk, making sure the backed-up files do not overwrite the new DOS directory files. If you backed up your files using the MS-DOS backup command, insert the first backup disk into the drive and type **restore a:\ c:*.* /s /n**. This command restores all files that no longer exist on the disk. To prevent any conflicts with MS-DOS 5 commands, check the DOS directory after restoring, making sure that no old MS-DOS files were restored to the DOS directory. You can tell old MS-DOS files easily by the date of file creation.

Read all instructions carefully, at least twice before doing anything. Make sure you understand the directions before starting. If you feel a bit timid (who isn't ?) ask for help. If you can't get help, don't start the procedure above.

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For Sale

Members requiring computers, hardware or software should first contact:

Rosstron Australia

mention **SYDTRUG Inc.** and quote their membership number. They should be pleasantly surprised by the discounts available to members.

Voice Phone: (02) 746-9106
FAX: (02) 746-2751

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Clones No Longer
The IBM Compatible Computers

by Charles Castillo

[Reprinted from "Voice of FCUG",
Newsletter of the Fairfield County Computer Users Group Inc.,
14 Wakefield Road, WILTON CT 06897, May 1992]

The IBM compatible computers constitute the de-facto standard of the industry. When IBM marketed its first microcomputer, aptly named the PC or Personal Computer, a new era was born. The century old typewriter quickly gave way to word processors, the way to keep track of bills and payments was made easier and the retrieval of information became accurate and instantaneous.

Utilising some of the best features of the Apple and Radio Shack computers, the PC quickly gained entrance into offices and homes. Within less than three years the standard, based on the Microsoft Operational System, was established.

By 1984 more than 5 million computers had been sold. IBM had discovered the way of the future and jealously dispensed its marvels.

At a price of close to five thousand dollars IBM was selling a box with 125 KBytes, two floppy drives, a monochrome monitor incapable of displaying graphics and a keyboard so inadequate that most users would opt for a replacement keyboard. Obviously the stage was set for competition, and, within two years, Compaq and Eagle had been able to manufacture machines which could run MS-DOS and most of the programs made for the IBM PC. By 1985 there were more than fifty MS-DOS brands with different degrees of compatibility but, in most cases, giving better value than the original PC.

For example, the PC came with two large size floppy drives, which would make it impossible to add a hard disk. The ridiculously low memory required that the buyer would purchase additional memory at $500 for 256 additional kilobytes.

If the user wanted to display graphics, he would have to purchase a graphics board for close to $100. A low resolution colour monitor with the corresponding card would cost over $700.

Printer ports and serial ports were, of course, additional. This played into the hands of alert competitors who would be willing to forego larger profits to secure market share. From the beginning Compaq decided to improve on the quality of the PC. Since its portable (I would call it luggable) had to stand a lot of abuse, the frame was very solid and the components of the best possible quality.

Other manufacturers, like Eagle, Fountain, AST, etc. made definite improvements in the configurations of their machines, by providing all the memory that MS-DOS could use -- 640K, by installing two half height floppy drives enabling the user to install a hard disk, and by combining the functions of different cards, thus reducing the cost and work of installation. Thus, the card that IBM would sell for $500 would only have 256K of RAM. Fountain would sell the same card with 384K, a serial port, a printer port, and a clock and calendar with battery for less than $200.

Corporate America was not impressed. The saying "Nobody is ever fired for buying IBM" was quite real. However, small businesses and individual consumers made their purchase decision on value considerations. And very quickly, from 1984, when IBM enjoyed an 85% share of the MS-DOS market, their share tumbled down until today it is no greater than 10% in number of machines. In Dollar value they still enjoy 15% of the total.

With their tremendous manufacturing muscle, IBM could easily undersell anyone. The degree of automation in their plant at Boca Raton, and other sites, enables them to manufacture a computer for far less than any of the so-called clones, manufactured in Taiwan, but assembled in the United States.

The word clone, incidentally, came about because, up to 1986, all the MS-DOS machines were identical on the outside. Inside they were different. With a different BIOS, which was more or less compatible at first, all of them would take full advantage of the power of MS-DOS by giving all the complement of RAM that could be used, and endowing their computers with all the additional functions that could be used, still at a price lower than the IBM PC.

The Armonk colossus is now in trouble. After years of continuous growth, and profits that would be the envy of most other companies, IBM sustained a loss of over a billion dollars in 1991 and sees its very existence imperiled. In spite of the fact that IBM has

probably one of the finest research and development facilities in the world, most of the improvements and innovations in the personal computer have been made by the competition. For instance, Compaq and Fountain, to name only two, came out with a 386 computer in 1987. It took almost two years for IBM to bring out the same type of machine.

Instead of giving better value for money, IBM decided to change the rules of the game and pull the rug from under its adversaries by changing the operating system. In April 1987 IBM announced to the world the advent of the "system for the future", OS/2 and the PS2 machines. Although the reception was lukewarm at best, some experts decided that MS-DOS had had its day and that OS/2 would rapidly replace it. I happened to attend a computer show that April and wrote an article commenting that the most interesting fact of the show was that all exhibitors were showing compatible machines with the exception of one ... IBM. The Blue giant was so confident that the new standard would prevail that it discontinued production of the AT computers based on Intel's 286 chip, which was at the time the standard of the industry. It took IBM a full year to remedy this mistake and again market 286 AT type machines.

With Windows 3.0 and DOS 5.0 Microsoft demonstrated that the ease of operation of the Macintosh computer could be emulated on an IBM compatible machine. In the meantime, with less than one million installations in over four years, Microsoft which was a co-developer of OS/2, was thoroughly disenchanted and decided to concentrate its efforts on new improvements to Windows.

This week IBM announced its new version of OS/2, OS/2 2.0, at the same time that Microsoft is bringing out Windows 3.1. With an installed base of over 12 million against less than one million for the IBM system, it is easy to see where the future lies. IBM is spending over fifty million dollars to promote the new version of OS/2, but the greatest effort would be in convincing software developers to bring out OS/2 applications. I frankly cannot see any future for the new system.

If you cannot beat them, join them! IBM will enter the "clone market" fray. Last month the company announced that it will start selling in Europe "clones" manufactured in Singapore, not under the IBM logo, but at prices compatible with the rest.

The IBM strategy goes like this: "By selling a 'Clone' alongside the IBM machines we can make some sales to our corporate customers who have been loyal to IBM until recent incursions into DELL, ASTI, GATEWAY, and FOUNTAIN etc. land" and by selling them at a lower price than the IBM logo machines, they expect to emphasise the greater quality and value of the "real" IBMs.

I fault this analysis for the following reason: IBM lost share of the market, not because of higher prices, but for lower quality and inferior value. Over the past few years, reputable magazines such as PC Magazine and PC Computing have made comparison tests in which eight or ten computers of the same type; for example, 386-SX-16 or 386-33, are thoroughly tested. Invariably, test after test, the IBM machines are the slowest and the least powerful. Normally, out of ten the IBM finishes No 9 or 10. The price, on the other hand, is usually the highest. The guarantee is the least comprehensive and the direct customer support practically non-existent. Does anybody expect that the low priced "clone" sold by IBM would be better than "the Real McCoy"? Can anybody hope to buy an IBM "clone" for a lower price than he can buy it from the friendly dealer by telephone?

Another remnant from the Imperial days when IBM ruled the computer world, is the desire to impose their standards regardless. For example, when IBM adopted the Sony standard for 3.5" drives, the move was unanimously praised and copied. Nearly every manufacturer adopted the new hard shell diskette with greater capacity and longer life. They decided to ADD the new format to their computers giving them greater versatility.

IBM, on the other hand, decided to use exclusively the 3.5" drive, regardless of the fact that, even today, after four years, 35% of the existing software is still available in 5.25" size. Most computer users would have a number of 5.25" floppies, which they would certainly like to continue using. IBM machines have no room for a 5.25" drive.

Has IBM created a monster that will devour its maker? When the first PC was made, the intention was to "get into the act" and profit by outselling the inferior machines available, such as the Apple II, the TRS-1 and the Commodore. They never expected the PC to ever rival the power and speed of their mainframes which, with scant competition, had been giving them tremendous profits. The mainframe business is in decline because of the PC. Software is big business but IBM has pretty much left the field of microcom-

puter applications. Still, Mainframe software is extremely profitable but, with a declining base of computers, is a dying business. The same can be said of service. The problem with the company is that, with the track record of large profits and never-ending growth, nothing but a continuation of this record would satisfy the millions of shareholders who are only interested in the quarterly bottom line. With the extremely high overhead, they have to have prices which place their goods out of the market. On the other hand, the billions of dollars spent in Research and Development cannot be fully utilised because of the opposing goals of Mainframes vs PCs.

I had thought a long time ago, that the only solution for IBM problems would be to break up the company into five divisions, in a manner similar to the Japanese Keiretsus such as Mitsubishi or Mitsui. The move the company made three months ago was in the right direction, but it did not go far enough. Each one of the independent companies should be able to decide its marketing strategies and try to diversify, not into products that would create conflict but into electronic products, for which the technology was readily available. However, I see that many of the captains are baling out, some of the most profitable lines have been sold out, and now they are recognising that the so-called "clones" are legitimate indeed!

It is axiomatic that, when the situation is bad, whether in a Country or a company, and the future is uncertain, a revolutionary change is needed. How can the IBM tiger change its stripes when the men at the helm are the ones who, not only grew into, but contributed to developing the corporate culture ?

In a tremendously competitive world, if you cannot satisfy the customers demands for quality, service and reasonable price, you have to remember Lincoln's phrase, "You may fool all of the people some of the time; you can even fool some of the people all of the time; but you cannot fool all of the people all of the time".

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[Hard] Disk Management

by Peter LYNN - AMUG

[Reprinted from "Adelaide Micro User News", G.P.O. Box 214, ADELAIDE S.A. 5001, March 1992]

Disk management is a personal subject -- there are many ways to organise a hard disk and these depend on the type of work performed, methods of storing the work files, etc.

A few years ago, a hard disk had typically 10Meg capacity and nowadays they are 80 - 150 Megs in size. With any hard disk it can be organised as one drive and one directory, but there are penalties and restrictions to this method. There is a limit to the number of files that can be in the root directory (112 files) and with a large number of files it becomes difficult to find the individual files.

The most common solution is to have subdirectories where there is no file limit (a subdirectory is a file with an attribute set to indicate that it is a subdirectory) and programs and their respective data files can be kept together.

The PATH statement in the AUTOEXEC.BAT file will then contain the various subdirectory names so that the programs can be located. Note that the PATH only applies to BAT, COM and EXE files not data files. Thus the PATH can become long and as the search for a program is in the order specified in the PATH, the loading of a program can take longer if the path to the program is at the end of the PATH rather than at the start. Hence there is conflict -- each program should be at the start of the PATH which is an impossible situation.

A solution is to have individual batch files for each program which change to the subdirectories involved and return to a designated subdirectory when the batch file is finished. The PATH can also be uniquely defined in each batch file to suit the application. An example would be:

```
@ECHO OFF
SET OLDPATH=%PATH%
PATH=C:\;C\123;C:\WP
|
|
|
PATH=%OLDPATH%
SET OLDPATH=
CD START
```

In the above example, PATH is saved in OLDPATH and a new path created. At the completion of the program, the original path is restored and the OLDPATH deleted from the environment space.

This method works well with programs and data/work files in defined subdirectories and able to be found quickly, but the hard disk can be organised even more efficiently.

This can be achieved by partitioning the hard disk into many small partitions and dedicating each one to a particular function. An example could be:

```
80 Meg hard drive
1st partition 3 Meg boot disk containing system files, config.sys,
                autoexec.bat and any drivers
2nd partition 10 Meg
3rd partition 10 Meg
etc.
```

Some partitions would contain files that rarely or never change while others contain work files that do change.

An advantage of smaller partitions is that, in the event of a disaster occurring in a partition, not all of the hard disk is lost -- only that in the partition concerned.

One problem with a single partition is that of creating a monster of a subdirectory structure many, many levels deep. This makes finding files, etc. very difficult. The use of programs such as XTREE and BRANCH can help in this regard, although they are not the total solution -- being tidy and organised is the best way. (I talk from experience of having disorganised subdirectories.)

When files are removed from a hard disk, spaces are left. MS-DOS uses these spaces when there is no free space at the end of the disk. This to allow for the undeletion of files some time after the file was deleted (this time depends on the amount of free space and the size of the files being added). Thus if a large number of files are deleted, there can be many small spaces on the disk and if files are then added, a file can be placed in these holes and hence can be fragmented over the disk surface -- this increases load times as the heads have to move to random locations instead of sequentially. To overcome this fragmentation, use programs such as Disk Organiser (DOG), Norton's SD (Speed Disk) or similar to reorganise the files into contiguous files -- i.e. to compress the hard disk.

Backups are essential to any hard disk. You never know when a file can become corrupt or you can delete files then realise your mistake days later when there is a good chance the file space has been overwritten.

Backup procedures can be simple or complex depending on your work habits. I have a simple procedure at work since I could be working on one or two files at the most each day. I have a copy of Autoexec.bat, Config.sys and any configuration files that the programs I use require -- these are on two floppies, one stored locally and one off-site for security. I have also backed up the master program disk so in the event of any disaster I can restore the program files and then the configuration files and be working again very quickly.

At the end of the day I copy those files I have worked on onto a floppy disk and at the end of the project, the data files are moved to floppies and stored in a similar manner to the configuration files. If a large number of files are changed daily, then programs such as FASTBACK can be used to backup the files -- these programs are very powerful and flexible and macro files can be created to perform daily, weekly, and monthly backups as required.

As you can see, the subject of hard disk management is complex and each person can have a different view on how to setup and maintain the hard disks in their computer/s.

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For Sale

Model II computers and disk drive expansion units
Line Printers II, III, V & VI

Anyone interested in any of these items should call Errol Rosser on (02) 763-1174 or (02) 746-9106 and make a reasonable offer.

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Compatibility
Exactly What Is It ?

by Pete SMITH

There are many computer models available today which claim to to be IBM PC compatible. At last count, there were approximately 200 models of PC clone, all claiming PC compatibility. With this rising interest in PC compatible machines, I thought it might be an appropriate time to examine the question of compatibility. With this article I'll attempt to explain what compatibility means, and suggest some ways of actually testing the compatibility of various models.

What Is Compatibility

Compatibility is a benign sounding buzzword for a complex marriage of hardware and software used by this type of machine. The perception most of us have of PC hardware and software interfaces is both simple and concrete. The machine itself includes one, or two, floppy disk drives, a keyboard, a screen of some sort and an on/off switch. Software compatibility is essentially judged on what happens when we purchase a program and load it into our machine. Sometimes the program behaves as expected or, occasionally, it does something bizarre and then crashes.

This program's view of compatibility is more subtle, and more uncompromising than ours. The program views the system software as an environment that does (or doesn't) supply a rigidly defined set of essential services that control access to the system's resources. It expects hardware to include RAM at a particular range of addresses, I/O ports with particular addresses, an interrupt controller to operate in a certain mode, and a timer chip that generates interrupts.

Hardware Component

From the manufacturer's point of view, achieving pure hardware compatibility with an IBM PC is a finite problem that is easily solved if enough money and time are expended on it. The IBM PC's manufacture consists of off-the-shelf components, most of them bought by IBM from other manufacturers. This includes microprocessors, floppy/hard disks, add-on cards etc.

Attaining system-level compatibility is a much greater challenge than just assembling the hardware. While the variations on the assembly of the parts themselves is limited, the properties of the complete system result from the interaction of the hardware and the operating system. The latter consists of hundreds of routines and thousands of lines of coding -- all of which are copyright protected. This software consists of two categories: the part written by IBM and the part written by MicroSoft Corp.

Software Component

The IBM portion of the system software are the ROM BIOS and the DOS BIOS. The ROM BIOS is a set of routines in the ROM chip(s) which are executed each time you turn on the computer. These routines perform initialisation, testing, and additionally, handle I/O operations for the keyboard, screen and disk drive. The BIOS's permanent storage, in memory chips on the computer's motherboard, means that they are always available when you turn on the system. There is no requirement to load these routines from disk. The other collection of IBM-created system software is the DOS BIOS, which is stored on disk in the hidden file IBMBIO.SYS. This BIOS is a set of drivers which control the peripheral devices required to get the system off the ground.

The MS-DOS command processor (COMMAND.COM), and the operating system kernel, contained in the hidden disk file IBMDOS.SYS, are Microsoft copyrighted products. The copyright also includes the system utilities which accompany the operating system. These include CHKDSK, LABEL, TREE etc. PC-DOS is a term for the IBM system of MS-DOS. Customisation of MS-DOS can enable the operating system to run on most computers.

The MS-DOS command processor presents the familiar command interface on the screen. The DOS kernel gives application programs a hardware-independent means to create, open, read and write disk files. It also allows programs to interface with various other system applications. Programs obtain these services from the MS-DOS kernel by loading a function number into the AL register, loading other registers with the function specific values, and then perform a software interrupt. The MS-DOS kernel translates these requests

into calls to the DOS BIOS, which serves as an interface to the peripheral devices. The DOS BIOS carries out its duties, either by issuing direct hardware commands or by calling ROM BIOS services.

The "Clone" Challenge

So far we've identified the three layers that contribute to a PC's overall nature: the pure hardware layer, easily reproduced; the device driver layer in the ROM BIOS, and the DOS BIOS, copyrighted software to the machine's manufacturer; and the MS-DOS operating system kernel and utilities, which are Microsoft products. The integration of these three layers is that vague standard which we refer to as IBM PC compatibility.

Clearly, the main obstacle facing a prospective clone maker is duplicating the behaviour of the ROM BIOS. The hardware yields its secrets to exhaustive examination, while the MS-DOS kernel, and its associated utilities, is capable of being licensed from Microsoft. If the manufacturer does a good enough job cloning the hardware and the ROM BIOS, the IBM version of MS-DOS will run unchanged.

Classifying Clones

For a computer to be classed as IBM compatible, its assembly must contain a processor that supports the instruction set of the Intel 8086. Intel makes several microprocessors in this category. Several non-Intel chips support the 8086 instruction set, the most widely available of these is the NEC V20/V30 series. Once you've established that a computer has an Intel type, 16-bit microprocessor, you can try to place it in one of three IBM compatibility groupings: MS-DOS compatible, ROM BIOS compatible, and a true clone (hardware).

MS-DOS Compatible

The presence of MS-DOS is no guarantee of IBM compatibility; machines like the DEC Rainbow and Wang Professional have little in common with the IBM PC except MS-DOS, and they choke on most IBM software. These programs are not common. Most commercial programs uniformly rely on MS-DOS services for disk operations. However, these programs tend to bypass MS-DOS for serial port I/O and screen displays. The layers of translation which allow device independence in many MS-DOS I/O calls, make screen and serial port functions extremely slow on 8088 machines.

ROM BIOS Compatible

ROM BIOS routines are one step nearer to direct hardware control than MS-DOS and they work significantly faster. An IBM compatible BIOS masks many of the hardware differences in clones and lets you run more popular IBM software. To achieve better performance while preserving a measure of portability, many programs call the ROM BIOS for screen, keyboard and printer I/O. Therefore, it is vital for a potential clone maker to provide equivalent routines in ROM.

Computers that are hardware incompatible, but ROM BIOS compatible, are uncommon now. Several machines were on the market as recently as two years ago, including the Sanyo 550, the Tandy 2000 and the original Corona PC.

Creating a ROM BIOS that is functionally the same as the IBM product, but doesn't infringe upon IBM copyright, isn't easy. The task becomes even more difficult as IBM releases adapter cards containing extensive ROM modules of their own. The first company to come up with a solidly compatible BIOS was the Compaq Corp. Compaq, however, have no interest in providing this knowledge to other clone manufacturers. Because of the difficulties involved, and the specialised expertise required, several companies (exemplified by Phoenix Technologies Ltd) specialise in tracking and cloning the IBM BIOS and then licensing the code to computer manufacturers.

Hardware Compatibility

The final level of compatibility is the true clone. This machine must not only run MS-DOS and have compatible BIOS, it must present a duplicate interface to programs that bypass the MS-DOS and BIOS services; in a true clone, peripheral devices must execute via the same I/O port addresses as the IBM. They must also have the same control and status signals. Further, the interrupt controller must have the same wiring, timing considerations of certain signals must be the same, and the memory map must be the same.

Addressing Compatibility

Armed with an understanding of the multiple layers involved in IBM compatibility, let's look at some empirical testing methods. You can use readily available programs to draw reliable, though somewhat broad, conclusions about a clone's compatibility. I would suggest trying several of the following programs, which are suitably "ill behaved" in their use of hardware, to put any clone to the test: Sidekick, ProKey or a similar keyboard enhancer; Microsoft's Word; a communication program, such as ProComm or Qmodem; Microsoft Windows or Deskview; and a sophisticated debugging program such as Advanced Trace-86 or Codeview. At least one of these programs should bring a borderline clone to its knees.

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Hard Disk Backup

by Terry BIBO

[Reprinted from the Newsletter of the
Canberra Micro-80 Users' Group Inc.,
18 Callabonna Street, KALEEN ACT 2617 – April 1992]

There are a number of reasons for backing up hard disks, not the least of which is the prevalence of viruses. But, being a pessimist, I would be bound to have backed up my disk, complete with virus, before I discovered it. Nobody seems to have considered this when they say in the magazines that the best protection against viruses is a backup.

My necessity to access my backups has been caused by garbageing files and not being able to recover them using undelete. And, of course, the case a couple of years ago, when I lost access to my hard disk controller overnight. So there is a good reason or two to back up hard disks.

Unless you are fortunate enough to have a tape or another hard disk to backup to you will end up like me, using floppies -- HD 3.5 inch in my case. The 20 Meg 3.5 floppy is on the market and sounds like a great advance, but from what I hear it has BIOS compatibility problems with a lot of standard computers. A big enough demand for it might sort out those.

Commitment to standard floppies makes one consider just what needs to be backed up from a hard disk to be safe, convenient and economical. After all, there are a number of ways of achieving redundant storage. The first demand for redundant storage after reliability is compression, cutting down on the number of disks and their cost. The easiest way to cut down on backup disks is to reduce what is backed up. It may not be necessary to backup programs for which you have the original installation disks. If there is a config file that you can save separately, as I can with AlphaWorks, there is no necessity to waste backup disks if you are prepared to spend the time reinstalling. On the other hand programs like Windows or Ami Pro do so much configuration on installation that it is well worth saving them in their installed state. Games programs and others that install or copy easily from a single disk or two are probably best overlooked.

There are a number of philosophies related to backup and nothing wrong with a combination of them. An easy and convenient way for some programs, directories or disks is to use one of the archiving programs. There are a number of these available from bulletin boards or shareware sources, among them PKZIP, LHarc, PAK, ARC, ZOO and others. I think one of the disadvantages of programs like these is that they generally do not permit splitting files over disks. So a certain amount of planning how to match files to available space might be needed. They certainly have their uses for economic archival storage, and there are numerous utilities for looking into these archives to view directories or files, or to extract individual files. Many of the top archiving programs provide these facilities as part of their set. For Windows users there are shareware and commercial File and Program Managers, or straight file utilities, that provide a path into these DOS programs from within Windows.

For all my database and spreadsheet files, I keep, not only a compressed backup, but also a straight copy as security, and I copy the modified file immediately I close down the modifying session, and before I defragment my hard disk, which I do regularly.

The conventional way of backing up is to use the DOS program BACKUP.COM, or one of the better ones from Peter Norton or PC Tools or their competitors. Any backup program should permit the backup of whole disks, directories, selected files or a single file. Files can be split over disks, with the user being prompted to insert a new disk when space is filled. The DOS program RESTORE.COM or a commercial equivalent is used to restore files to a hard disk. Commercial programs can use a proprietary formatting to put more data on a disk, as well as varying compression algorithms depending on whether the compression is to save disk space or backup time.

A part of every filename is the archive bit. When the file is created or modified, this bit is set, indicating to the DOS that the file has not been backed up (archived) since it was changed. The status of the archive bit can be seen by looking at the file's attributes. The DOS has an ATTRIB.EXE command for viewing or altering attributes. When the DOS backs up the file it resets this bit to zero. This archive bit can be manipulated for a variety of purposes by backup programs. We will look at some of the backup options made available by this bit, with particular reference to PC Tools, though I believe the strategies will be similar throughout comparable programs.

Backup Options

Full
A Full backup should reasonably be done to all files you want to archive after you have installed a program or set up a hard disk. A Full backup ignores the archive bit and backs up all chosen files regardless of the bit status. A history file of the backup and a directory listing is written to the final disk in a backup set, permitting restoration of a single file from within the set. The archive bit is then reset. PC Tools offers a Full Copy option in which the archive bit is not reset, preserving the status so that the file may be backed up again by the same or another option. Files are restored to the hard disk using the history file.

Incremental
An incremental backup checks the archive bit and only backs up files with it set. Incremental backups can only be added to the original backup disks, with the data being written after the last Full backup data. The archive bit is reset. Any number of Incremental backups can be added to the original Full backup. A history file is kept and the original history file is amended to reflect the added files. Any saved version of any file can be restored, meaning that if a virus was found to have been introduced in a particular backup, the previous version could be restored.

Separate Incremental
This checks the archive bit and only backs up files with it set. But, as their name implies, Separate Incremental backups are saved on different disks from the full backup, an additional safety factor. In this way a history of file changes, or audit trail, can be kept. If kept on one disk, only the latest version would be available as it overwrites previous data. A history of the backup is written to the disk, and the archive bit is reset. Files are restored from the Separate Incremental disks after a full restore, to restore the latest version.

Differential
This backs up files whose archive bit has been set since the last Full backup. Like the Separate Incremental it is saved on different disks from the Full backup. The archive bit is not reset, so progressively more files will be written to a Differential backup than to a Separate Incremental backup. A history of the backup is written to the disk, and files are restored before a Full restore. If only one disk is reused then only the latest version of the files will be saved as data is overwritten, so for safety sake two disks (or sets) should be used alternately.

I use mainly the Full and Differential backups.

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For more information call Denis Pagett on (02) 772-4848

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Worth Repeating

Making the kids mind these days seems to be tied in with finding out what they want. It's sort of like persuading water to run downhill.
                                                    -- Erwin L. McDonald

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MS-DOS Novice Nook # 9
Picking a Database Program

by Roger R. GILER - FCUG

[Reprinted from "Voice of FCUG",
Newsletter of the Fairfield County Computer Users Group Inc.,
14 Wakefield Road, WILTON CT 06897, September 1989]

The word database, mentioned many times here, still seems to evoke some puzzled or blank stares among new users. Let us see what it is, how to use it, the various types, and which flavour you need, if any.

A database is nothing more than a collection of items, be it stamps, birthdays, relatives, rainfall in the Amazon, or anything that you want to record and review. Next to word processing, it is the most useful application for computers. Our reason for stashing the information in a database is so that we can retrieve it, sort it, massage it in any way we please, and print records from it.

The Basics

We need to define just a few words to understand how databases work. Use these words freely at sarsaparilla (or cocktail) parties to impress your listeners.

Free Form Database:
This data is not sorted in any way and retrieval is based on a search for keywords. Not as useful as the other types, but usually touted as "designed to work the way you do". They are not in wide use. Lotus Agenda is an example.

Flat File:
Everything is stashed in a single file. This does not mean that it is not a very good system. File Express fits that definition.

Relational:
This is the "top of the line". It consists of several files, each containing one type of data, which are linked together. They include Paradox, dBase, R-Base, and most of the major offerings. When you change information in one of the files, that modification gets picked up by all of them.

Hybrid (or Semi-relational):
These are often reviewed by magazines as Flat, but have an extra feature (Data look-up) which allows a file to find data in other related files. In contrast to the Relational one, changing data in one does not affect the others - it only looks it up.

Spreadsheet:
They have a limited database capability, and for some people, this may be sufficient.

Other than the Free Form method, all databases have a common organisation. We need to know the terms.

Field:
One unit of data such as Last Name, or Age, or Price. It is there so that you can find a specific item of data in it. This is established when you make the database, and you will be asked what name you want to give each field, how big, etc. Do not confuse it with the data that it contains. For example, the field name could be called Bird, and the data in it is Dodo.

Record:
This is a cluster of data which is repeated throughout the file and ALWAYS contains the same number of fields - although they could be blank.

Database:
The sum total of all the files needed for our information storage. It could include many files, or as few as one.

Uses
Any time that we want to save data for future reference, we would use a database. Uncle Sam uses a very large one that keeps track of Social Security Numbers. It must have almost as many numbers as there are people in the U.S., and a few more for the deceased ones. It is a relational one, and it is the SS number that links the various files. It is so large that thinking about it boggles the mind, and confuses even those who have to use it.

A collection of music tapes is a prime example of a small and useful database. I have one for my diskettes, and utility programs. It is used for club members to keep track of dues, and for labels to make periodic mailings.

A wide application is for the Mail Merge operation. This is where a mailing list is used in combination with word processing, and you pop the name and other information in various places in the letter. It is an essential ingredient for junk mail -- letters that start with: "Because you, Joe Schmoe, have an excellent credit record ...". Joe Schmoe came straight out of a mailing list database.

What to Look For

The simplest databases can be set up in less than an hour by a beginner. What you will find is that you may want to try one and ad only a few records to experiment with it. You will rarely stay with the original design. This is why one of the most important features has to be the ability to change the number of fields in a record. After you have entered all your data, you may decide that you want one more item. It is necessary to be able to modify the early records so that they will be compatible with the new ones.

All databases have features such as sorting, searching, adding, deleting and viewing. But what if you want to do some calculations, like a selective Sales Tax ? Think about what you are going to do before you invest too much time, and ascertain that your program can handle it. This means to look at the mathematical capabilities. Will they meet your needs ? Some programs don't use numbers as such, but treat them as characters.

The report generation is vital. You must be able to create reports that meet your needs, not just a few canned reports that the author thought you might need. The report can be for the screen or placed on paper.

Export and import functions can be important. A database should be able to process data from other programs and send some out to them. Do you have data in a Lotus spreadsheet now ? Then there should be no need for you to reenter all that stuff. Or it may be in another database. Can you read it in ?

Ask around from people who use one, and see if it is the right one for you. I have been plodding along trying to learn to use Paradox 3 to full advantage and I expect that it is going to take me hundreds of hours to become proficient with it. So making the right choice is vital, to avoid wasting a lot of your time.

Roger may be contacted at the following address:
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    WILTON CT 06897
    UNITED STATES of AMERICA

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MS-DOS Novice Nook # 11
When Computers Speak - And Listen

by Roger R. GILER - FCUG

[Reprinted from "Voice of FCUG",
Newsletter of the Fairfield County Computer Users Group Inc.,
14 Wakefield Road, WILTON CT 06897, November 1989]

Isn't it marvelous to have computers around to take the blame for us ? A credit card billing error ? The computer did it. Cannot get your bank balance ? The darn computer is down again. It is just great for mankind to have generated such a convenient scapegoat that can be made liable for all our shortcomings. Are computers going to fight back and take over ? Should we run for our lives ? Well, not quite yet. Today, let us review briefly how computers can verbalise and communicate with mere human beings.

A Talking Computer

We have all heard them. When we call some companies, a recorded voice takes us by the hand and gives us instructions on which button to press on our telephone to reach our party, or hopefully get the information that we want. This voice is generally recorded by a human and stored on the hard disk of a PC AT for rapid access. This would not be possible with a tape recorder where messages have to be listened to sequentially, one after the other. The computer allows immediate direct access to anything on the disk. The voice is stored there with a level of fidelity that can be selected -- the higher the audio quality, the more storage space it requires.

It is also possible to recreate, or synthesise the human voice. I happen to have a voice board for my computer, made by IBM for my PC a few years ago -- it was not a successful product because it was too far ahead of its time -- and also very expensive. I can

instruct it to look at text stored by my word processor, and it will read it aloud with a very good reproduction of speech. I can control the pitch, speed, and intonation. I must add that I do not use the very small speaker in the computer, but plug my stereo amplifier into the board.

The artificial voice has a Scandinavian accent, affectionately known by audio technicians as the "drunken Swede". I am told that it is the easiest intonation to understand. In addition, the software has some built-in features, so that when it reads, for instance, "Dr Forest lives on 123 Forest Dr.", it will speak out Doctor, one hundred twenty three, and Drive. With the "Dr", it recognises the location of the word in the sentence before pronouncing it. It also recognises other abbreviations such as "lbs" which it pronounces pounds. Anything that is in the computer could thus be read by the sight-impaired.

Voice Mail

The voice storage feature is used extensively in business where a computer can take messages, giving instructions in the voice of the person that you call. For instance, you could be skiing in Aspen, call the computer and leave a personal message to various associates. That way, hearing your voice with a recent message, they would, of course, assume that you were right there, slaving at your desk. This is done in so-called mailboxes. When someone calls in, (s)he gets a verbal list of which key to touch to reach a particular party. If they know the proper code number, they can get private communications. These messages can be repeated, deleted or saved for later review. Your boss never suspects that you are in Colorado.

I have heard complaints that the instructions about which keys to press take too long, and go on forever. Be aware that the computer is also listening at the same time as it talks. It is not at all insulted if, knowing the sequence of numbers, you interrupt it by immediately punching them onto your telephone, thus reaching the desired party at once.

Voice Recognition

So computers talk. Big deal! Everybody talks, but usually nobody listens. Not true. Your computer can also be taught to listen to your voice, and take the appropriate action. The IBM board that I mentioned earlier has that feature. I plug in a microphone and tell the machine what programs to run, or to reformat drive C; no problem, it will do it.

I can even play Tic-tac-toe without touching the keyboard. There is no real need for this, but we are in the early pioneering days of communication. At first our schools told our kids that there is no need to memorise the multiplication tables, then that they should not worry about spelling. It won't be long before we are told that we will no longer have to know how to read or write.

A Peek at the Future

The next step will undoubtedly be computers that will listen to our voice and take the appropriate action. The most obvious one is for writing letters, where you tell the machine the name of the recipient. It will then look up the address, and quickly type it on the letter. As it does that, it also displays a few facts about the person, such as the name of her feline, the place of her latest vacation, and bring on the screen a list of recent letters received. After dictating a message, you tell the computer to change the sentence structure to fit the occasion, and type a finished letter.

The typing is for the less sophisticated user. Why write it at all ? Just tell the computer to save it, and send it by phone that night, when the rates are lowest. What if the person at the other end does not like to read ? Well, that is handled by the "intonation" codes so that the message will be read in a sultry voice, adding a few "Kissy, Kissy" sounds. Far fetched ? No way! I am willing to bet that we will see this before the end of this century. We are back to the surrogate letter writers popular in some of the old plays, except now it will not be just for the elite.

Technical Details

There are two methods of using the voice capabilities we have described. The earliest methods used voice that was fed into the machine and stored in chunks, such as numbers and words. It was similar to using a tape recorder, except that now we can retrieve the various pieces, or phonemes very fast from memory or disk, and combine them as needed. This is human voice that we essentially have stored and are reusing.

The newer techniques are to create the sounds with electronics based on specialised chips. This is a whole new science of communication. One aspect is that it is possible to change the voice characteristics, and the speaking speed. We all know people with a voice that grates on our nerves, and others that seem to be fun to listen to. Well, with a computer, we can get everyone to put forward their best voice. Prefer a deep throated feminine voice, or a high pitched male voice ? Just pick it.

What I describe is being done now, but remember, we are not talking here about mainframe computers, but about the lowly little box that squats on our desk. I had a chance to hear the CD tone quality of the NEXT computer (designed by Stephen Jobs) at the recent INFO show. The synthesised audio quality was unreal.

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Microsoft Windows Version 3.1

by Alan B. Abrahamson - FCUG

[Reprinted from "Voice of FCUG",
Newsletter of the Fairfield County Computer Users Group Inc.,
14 Wakefield Road, WILTON CT 06897, May 1992]

Is it really here ? Is it really solid ? Does the dreaded UAE (Unrecoverable Application Error) no longer exist ? Is the system ready for prime time ? Has the speed of W31 (Windows 3.1) been increased to a level that makes it useable on all but the slowest 80286 computers ? Has the inclusion of new a type structure in the system made for universality across platforms ? Have the improvements to W31 made it palatable for a business environment ? Does the new TrueType format make screens more WYSIWYG ? Is the speed of TrueType an improvement over ATM (Adobe Type Manager) or other type systems ? Does W31 make "doggie" programs like WordPerfect for windows act like a real word processor ? Is printing via W31's Print Manager improved and acceptable ? Does the support for Multi-Media and Sound make W31 more fun to use ? Do the cosmetic changes to the system make life in Windows better ? Has the new File Manager made a giant step forward in the world of shells ? According to the trade papers, there are 32 programs including Microsoft products, that won't work with W31. Could this not be true ? Does W31 work with QEMM and Stacker ? Does OLE (Object linking and Embedding) work ? Can you now drag and drop a file icon from file manager into the Print Manager ? Can you now more easily change your set-up options from within W31 for things like advanced screen drivers ? Is there additional support for NON-Windows applications via advanced PIF (Program Information Files) ? Can you now use the StartUp Group to have several programs initialise upon entry to Windows without editing your WIN.INI file ? Are the dialogue boxes more standardised throughout W31 ? Can you now use COM Ports 3 and 4 in Windows ? Are there more applications icons available for you to use for all Windows and Non-Windows applications ?

The answer to all the above questions is probably YES. The reason I qualify my answer is that W31 is too new and is not thoroughly tested as yet. Although I'm certain that some little bugs still reside in the W31 code, I haven't found them yet. As you may know, a program called Dr WATSON comes with W31. If you place DRWATSON.EXE in your StartUp Group Window and Minimise On Use, you will have Dr Watson monitoring your system all the time. If you do this, and you have an error that W31 can't handle, a DRWATSON.LOG file will be placed in your Windows directory. This file can be analysed by Microsoft and contains such information as CPU register status, HEAP status, Task List and memory information that may provide information to you or Microsoft in resolving conflicts.

One of the more esoteric items not covered in the manuals but available in the Windows Resource Kit is the use of 32-bit disk access on 80386 machines using Western Digital compatible hard disk controllers of the 1003 variety. The Control Panel/386ENHANCED section of W31 allows you to turn this switch on under the Virtual Memory button. If it doesn't work for you, just edit the [386Enh] section of your SYSTEM.INI file and turn the 32BitDiskAccess flag to Off. If you can run with it on you'll enjoy the speed improvement.

In general, W31 is a much better product than W30. I still feel you need four or more megabytes of memory to run effectively, and any CPU running slower than 16MHz will seem snailish.

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Exchange Newsletters

Some of what is included in our library. These newsletters may be borrowed by members. Members attending meetings at Sefton should see our Librarian. Other members may apply to our P.O. Box. Postage will, of course, be charged for those forwarded by mail.

February 1992

"Adelaide Micro User News"
Newsletter of the Adelaide Micro User Group
G.P.O. Box 214, ADELAIDE S.A. 5001

PC Shareware - Listing of MS-DOS shareware disks available to members:
From Our Chairman Erik - Local interest:
On the Board - About their Bulletin Board:
MISUSE of Bluewave - About an MS-DOS utility which collects messages from nominated areas on the bulletin board and downloads them in an archived package and/or uploads messages for various areas in a similar manner:
Video Standards - A brief history of various formats used for computer displays:
Show your Emotions - A small collection of "Emoticons", commonly known as Smileys:
Go Fast and Take the Risk - About "Reduced Instruction Set Computers":
Interrupted Modem - A somewhat humorous but supposedly true story:
Will I Lose My Job When the Computer Arrives ? - Reprinted from NCTCUG Journal:
Stop Modem Mess-Ups - From Hayes Technical Support et al:
Should the Computer Be Legalised - Humorous item.

"Bits & Bytes"
Newsletter of the TRS-80 System 80 Computer Group
41 Montclair Street, Aspley Qld. 4034

What is the Meaning of .... - Part 2 - VARPTR and ATTRIB:
Single Board Nuclear Power Supply - Tongue in cheek blurb:
Review of Model 4 P/D Software - Two of the disks on their library:
Speed-Up of Model 4/4D/4P - Reprinted from TRS-Link:
What I am Currently Engaged Upon - His use for Q & A.

"Canberra Micro-80"
Newsletter of the Canberra Micro-80 Users Group
18 Callabonna Street, KALEEN ACT 2617

Spreadsheets - Planning your itinerary:
Bits and Pieces - About avoiding computer viruses:
Windows BBS - Extracts from their bulletin board.

"Computer News 80"
P.O. Box 680, CASPER WYOMING 82602-0680, US of A

Editorial Comments - Mainly about the contents:
Programming Tutor - Part 37 - Programming style:
A Visit With David Goben - Mainly about Epson (and compatible) printers:
Looking over ALLWRITE - Some interesting points which may be of help for users of this versatile word processor:
The Newcomers Corner - Mostly about minimum system disks:
Open Forum - Letters, questions and, sometimes, answers.

"LLIST"
Newsletter of the Calgary Color Computer Club
Box 22 STN."M", CALGARY. ALBERTA. T2P 2G9, CANADA.

Editor's Message - About current support for the CoCo:
Beginner's Questions - Mainly about databases.

"The Interface"
Newsletter of The San Gabriel Valley Tandy Users Group
P.O. Box 6818, BURBANK CA 91510, US of A

The President's Column - Suggesting that owners of TRS-80s should not be too hesitant about opening up their machines for the purpose of upgrading them, provided they have the technical ability or can get someone with that ability to supervise or assist:
Who's in First - A BASIC program to print out the standings of the divisions in little league baseball:
Newdos EDTASM Reference Guide - Some helpful reminders:
More Newdos 80 Hints - Some clarification of HIGHMEM.

"HAWTUG NEWS"
Newsletter of the Hawaii TRS-80 User Group,
366 Elelupe Road, HONOLULU HAWAII 96821

Just the Bare Fax - Some general information about FAX machines:
Guide to Safe Fax - Humorous(?) item:
What's a Font - A brief summary of printer font jargon.

"MICROBITS"
Newsletter of New Zealand TRS-80 Users Group,
P.O. Box 87082, MEADOWBANK, AUCKLAND, NEW ZEALAND

Editorial - Mainly about this issue:
Upping Your Drive Capacity - Already appeared in "SYDTRUG News":
An Old Friend Revisited - Already appeared in "SYDTRUG News":
Index for TRS-LINK #14 - Just the bare bones.

"NATGUG News"
Newsletter of the National Tandy & General User Group
24 Granville Road, MELKSHAM SN12 8AS, UNITED KINGDOM

PRO's Notes - What he has been doing:
Changing Dates of Existing [MS-DOS] Files - A quick tip:
Learn to Play - A short test to see how well you use your computer:
Tandy Hard Drive Clinic! - A collection of information from various sources re servicing Tandy Hard drives:
Some Software Differences on the 1400LT - Notes on some software that either will not run on the 1400LT or which runs differently:
Procedure for Upgrading [MS/PC-]DOS Versions - How to transfer a later version of the operating system to your hard disk or booting floppy:
Hardware -- Hard to Get - A U.K. experience of difficulty obtaining hardware:
Computer Viruses and the Computer User - Already appeared in "SYDTRUG News":
SexNotes - Secretary's report:
WYSIWYG in Hi-Res on the Model 4/4P - Reprinted from "SYDTRUG News":
Rambling Roger - Various comments on this and that:
LDOS and TRSDOS 6 Patches - Reprinted from "SYDTRUG News":
52 Element KSM Files Under LDOS - A patch for LDOS 5.1.3 to enable the use of "shifted" keys with KSM files:
Article Wanted - A lengthy discussion on various happenings, mostly computer related:
[MS-]DOS 2.x COMMAND.COM Reloads from Specified Drive - For those who wish to load COMMAND.COM into a RAMdisk:
The Z-System on the Model 4 (Cont'd) - More on the CP/M-like operating system:
Miscellaneous Ramblings (Abridged) - The title is its own contents summary:
As-Easy-As Version 4 - An overview of this 1-2-3-like software package.

"National Capital Tandy Computer Users Group"
Newsletter of the National Capital Tandy Computer Users Group
P.O. Box 949, ARLINGTON VIRGINIA 22216, US of A

Presidential Bits - Strictly local comment:
Professor DOS #1 - A very simplified explanation of what MS-DOS is and does:
Format Disks 2 at a Time - A simple BATch file which will format disks in two drives alternately:
Stacker - Review of an MS-DOS real-time compression utility:
[MS-]DOS 5 and Quarterdeck Products - Quarterdeck Technical Note #200:
Windows 3.0 - Answers to some often asked questions:
WordPerfect Tips an Tricks - Three points which may make you more proficient:
ARC and ZIPping Help - Some brief instructions on how to extract archived files:
PROCOMM Plus 2.0 - A review of the MS-DOS communications program:
A Nice Small Portable Modem - NOT a small portable "NICE" modem.

"WNYTUG News"
Newsletter of Western New York Tandy Users Group
172 Congress Street, BUFFALO NEW YORK 14213, US of A

Valentine to My Darling Husband - Humorous item:
Off the Nets - Various items from bulletin boards:
Trials and Tribulations of a Programmer - In praise of C++:
Hackers' Dictionary - Only a brief extract.

"Thuggery"
　Newsletter of The Hobart Users Group
　P.O. Box 420, MOONAH TASMANIA 7009

President's Page - Mainly local content:
Getting the Message Across - An interesting article on laying out advertising copy. It applies equally well to newsletter articles:
Logitech Mouse & Windows 3 - Downloaded from Logitech's BBS:
Happenings - Mainly local content:
Circling Around Qbasic - A Qbasic program to draw coloured circles on the screen:
Public Domain Library Notes - Strictly local.

"The Voice of FCUG"
　Newsletter of The Fairfield County Computer Users Group
　14 Wakefield Road, WILTON CT 06897, US of A

Editor's Voice - Some personal opinions:
Abstract Computing - Managing Windows files:
It Takes One to Know One - Tells about a computer setup in their local library which accesses a CD-ROM database of publications on computer related topics:
What's News - Some topical comment:
FCUG Tiplets - Correction to his previous column:
Computer TechnoSpeak - Explanations for some commonly used computer jargon:
Bill's Bumblings No. 70 -- T.S.R.s - How to prepare a very simple TSR program:
Diskscan (Your Floppies Friend) - An MS-DOS program for cataloguing floppies:
LANs, Backups, Etc. - Reiterating the importance of backups:
Wallpaper - A short poem:
Spinrite With IDE Drives - Some reassurance regarding low level formatting.

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Diskettes

by Tom COLEMAN

[Reprinted from "Adelaide Micro User News", G.P.O. Box 214, ADELAIDE S.A. 5001, April 1992 where it was reprinted from Adelaide PC User Group newsletter, July 1991 and Melbourne PC user Group newsletter April 1990]

Media Mixing and Matching -- Why it Fails!

Once upon a time there may have been Single Density diskettes. I don't know, I was not computing in those days. It was probably back when mainframes had 256K of RAM and used 8 inch diskettes. However, most of us grew up with Double Density diskettes and, as the technology improved, High Density and Quad Density have become part of our environment.

Most of this article discusses 5.25 inch diskettes. I will toss a titbit to the 3.5 inch users at the end.

There is an intuitive feeling that High/Quad Density (H/4D) is in some way superior to the lowly Double Density (2D). This feeling is tied to the purpose these diskettes were manufactured to fulfil. As they were meant to store well over a megabyte of information they must be able to store the much stronger signal coming from the higher capacity diskette drives.

Holding more information means they must have a stronger signal and thus be more sensitive, doesn't it.

Wrong! NO! Sorry, try again. Back to square one and do it again. You have flunked. Failed.

The H/4D diskette is only HALF AS SENSITIVE as the old 2D diskette.

The way they get more information on the diskette is mainly by cramming the tracks closer together. The information is written as small magnetic disturbances in the diskette coating. Little magnets if you like. Now the closer together you place these magnets the more they interfere with each other and data is destroyed. To overcome this effect they store the signal on a less sensitive media so that it is less responsive to the adjacent tracks.

This leads us to the moral of this story. You can save money by putting 360K 2D diskettes into your AT 1.2 Meg drive. Unfortunately, the signals are written at full strength on a

sensitive media and over the next few days/weeks/months they bleed across and corrupt the neighbouring tracks.

Your data magically vaporises to condense as "Non System Disk" or "Abort, Retry, Fail" or "Track 0 bad" or some other encouraging communication from the DOS.

That's not all. The 1.2 MB drive writes with a much stronger current, so the signal you lay down is much stronger than the 360K signal. If you now write to the diskette in a 360K drive, the weaker signal is not enough to wipe out the existing strong signal so you get your new signal and bits of the old one as well when you come to read the diskette.

This usually causes the computer to sulk.

If you reverse the situation where you put even a new H/4D diskette in a 360K drive in the mistaken belief that you are using a higher quality diskette, you write to a low sensitivity diskette with a weaker signal and the end result is a signal so weak that it cannot be read.

Even if it is readable, it is at best one quarter the strength of what you would get if you had used 2D diskettes. It is nothing like the strength that the read head expects to find.

To complicate the issue further, the 360K drive lays down a track that is twice as wide as the 1.2 MB drive. This means that the 1.2 MB drive cannot completely overwrite a 360K track. Thus data overwritten by a 1.2 MB drive may scramble the new data when it is read by a 360K drive.

Generally, none of the above applies to the 3.5 inch diskettes, which are slightly more consistent in their setup.

However, you need to be aware of what kind of drive you use if you are going to be swapping between 720K and 1.44 MB 3.5 inch drives.

This particularly applies to the IBM models 50, 60, 70 and 80. The drives in these machines do not have the switch that senses the media sensing hole found on the 1.4 MB 3.5 inch drives. This is almost exclusive to IBM and not many other manufacturers have drives that cannot sense the difference between the two kinds of disk.

The result of this is that some machines cannot tell the difference between 720K media and 1.44 MB media with the problems of writing with an inappropriate current.

The message for all of us [is] that we should buy and use the diskettes our drives were designed for. If we are going to swap diskettes between different drive densities then we should anticipate some problems that can be avoided with a little thought. Even reformatting a really psychotic disk may not cure it, as formatting writes to the disk and the current may still be wrong on just some parts of the disk. You may have to bulk erase it, and even that has been known to fail.

Who was it who said "Standards stifle innovation" -- it makes you yearn for the good old days when IBM set the standard and everyone followed.

Hang on! These drives are all IBM standard, aren't they ?

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New Members

We wish to extend a warm welcome to the following new members of our group. We hope that they will find their membership rewarding. Interaction between members enables us to improve our utilisation of our machines, as it often saves us having to "reinvent the wheel". What presents a problem to you now, may very well have been overcome already by another member, and if you ask, you may well find the answer for which you are looking.

Jack Dunbier	- MORTDALE	(02) 580-5042
Bruce Farrant	- PANANIA	(02) 772-2308
Kevin Finn	- GLADESVILLE	(02) 817-2142
Harry Haber	- BELLEVUE HILL	(02) 327-7744
Ken Harvey	- LAWSON	(047) 54-1432
Phillip Logozzo	- KEMPS CREEK	(02) 826-1738
Simon Rashleigh	- UPWEY - VIC	(03) 754-8008
Bob Turner	- HORSLEY PARK	(02) 620-1635

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Abstract Computing
IRQ Hardware Interrupts

by Paul M. Glattstein - FCUG

[Reprinted from "Voice of FCUG",
Newsletter of the Fairfield County Computer Users Group Inc.,
14 Wakefield Road, WILTON CT 06897, May 1992]

I just installed a new Soundblaster Pro card in my computer and, once again, ran into the problems of conflicting IRQs. Most devices permit only a limited number of options and it's not always a simple decision. In many cases there is no clear best choice and some care is required to make sure that the final selection is the best for your situation. In my case the installation seemed to go fine and the problems didn't surface until days later. Before we get into that, a little more information on just what IRQs do may be useful.

An IRQ is an interrupt request used to interrupt the current operation and alert the microprocessor that some event needs to be handled, such as sending information to and from programs, or servicing peripheral devices like the keyboard. The PC has both software and hardware interrupts, and conflicts between the hardware ones can cause all kinds of problems, since two devices cannot actively use the same IRQ at one time. The IRQ should not be confused with the I/O port addresses which are related, but not identical in use. The IRQ line instructs the microprocessor that a device requires servicing and the I/O port address is used to carry the data signals between the device and the computer CPU.

There are a limited number of interrupt request lines available for hardware devices such as the system board timer, keyboard controller and disk drives. IBM PCs, XTs and their clones have only 8 hardware IRQs, numbered 0 through 7. 80286 and higher machines have 16 IRQs available, numbered 0 to 15. Typical hardware IRQ assignments are as follows:

IRQ	
IRQ 0	System Timer
IRQ 1	Keyboard
IRQ 2	Cascade
IRQ 3	COM 2
IRQ 4	COM 1
IRQ 5	LPT 1
IRQ 6	Floppy Disk Controller
IRQ 7	(sometimes used for LPT 1)
IRQ 8	Clock
IRQ 9	Video Interface card
IRQ 10	(rarely used)
IRQ 11	(rarely used)
IRQ 12	(sometimes used for Video)
IRQ 13	Math Co-processor
IRQ 14	Hard Disk Controller
IRQ 15	(sometimes used for Math Co-processor)

The Soundblaster card has IRQ lines 2, 5, 7 and 10 available although the documentation notes that IRQ 7 is the factory default and should be used to ensure compatibility with most programs. With my two com ports, 2 parallel ports and a modem installed, IRQ 10 was the only one I had free but I didn't like the idea of limited software compatibility. After some thought I decided to use the soundblaster default of IRQ 7 by removing the second parallel port which was using IRQ 5 as its default. With this port out of the system (it was connected to a plotter no longer use), I could switch LPT 1 from IRQ 7 to IRQ 5 and free up the IRQ line for the Soundblaster card. The operation seemed to go well and everything was working as expected including a screen print test of the printer port.

Four days later I discovered that I could no longer print from WordPerfect.

The error message indicated a printer fault but a screen print from DOS worked OK as did printing the document from WordPerfect for Windows. The Soundblaster installation was still fresh in my mind but the printer shouldn't care which IRQ it uses as long as no other device is using it at the same time. The printer port identification, LPT 1, and address, 378h, had not been changed and I wondered if The WordPerfect program had somehow been corrupted. I reinstalled the WP program, no good. I copied the WP printer drivers from my XT which still printed fine, no good. I disabled all Soundblaster software, no good. I tried WP without expanded memory, no good. Finally, I tried switching printer ports in WP and discovered that I had it set up to "print to the hardware port". That requires identifying both the port address and the IRQ if it's non-standard. The port address was set to 378h and the IRQ to 7. So WordPerfect was doing its best to print to the new Soundblaster card.

It's all working now but the lesson is clear. Plan any hardware changes carefully and test everything to make sure it works after the change. Even then, remember the changes in case problems arise in the future (at least the DMA channel used by the Soundblaster card doesn't appear to conflict with anything, yet).

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Requiem [Sic] In Pace

by Del Rosario - HTUG

[Reprinted from "Hawtug News",
Newsletter of the Hawaii Tandy Users Group,
366 Elelupe Road, HONOLULU HAWAII 96821, May 1992]

Today I retired an old friend. For over ten years she has served me faithfully. I remember vividly when she first came to me by express. How I hurriedly opened the box to free the monitor, keyboard and CPU, power supply and cassette recorder. A powerful personal computer with 8K of memory. I eagerly read the instructions and David Lien's tutorial taught me a very basic "BASIC". I followed the accompanying guide and loaded the checkers program. I was promptly beaten, by a computer no less. Later I purchased the Chess program "SARGON" on cassette. I could occasionally beat it at its lowest level, but at its higher level it could take up to six hours to make a move, I'd give up long before that. I subscribed to a magazine; 80 Microcomputing (later 80 Micro) (much later, deceased). I found a simple word processing program written in BASIC, just a few hundred lines to key in and save on tape. I then spent about a week debugging the program. As I grew more proficient in keying in programs found in both 80 Micro and the Tandy Newsletter, I ran into another problem, "OUT OF MEMORY"; Tandy had a remedy for that, it was called an Expansion Interface. Another purchase!! Then I purchased the RAM chips to increase it to 32K (a truly powerful personal computer).

I now had a word processing program; all I needed then was a printer. Tandy had a Model I printer, a real boat anchor; I bought one. Everything went fine except I had no lower case letters. Spotting an ad in 80 Micro, I sent for an add-on board that produced lower case letters, with descenders no less. Now all I needed was a printer with lower case. Tandy had the Model IV printer (made by Centronics) that was a fine printer. You could even enhance the vividity [?] of the ink by spraying WD40 on the ribbon [??]. Then I had to contend with a little problem called key bounce. A key was struck and, lo and behold, a number of that letter or number would show up on the monitor. I found in the Tandy newsletter that there was a little program to stop that problem. Then there was the interminable wait while the program loaded from cassette. There came a remedy for that, "Disk Drives". Pertec manufactured what looked like some real jewels; "What the heck!", I bought four. I then needed some flat grey multiwire ribbon cable, and connectors to connect the drives together and to the fitting in the back of the Expansion Interface.

I went down to the Tandy franchise on King Street and bought a box of diskettes. I put them in the drives; nothing happened. Back to Radio Shack. I needed a "DOS", so I bought TRSDOS (even had to sign a document which only gave me license to use the "DOS"). I put the diskette in drive 0 and it booted. It even had a program that I could use to load the programs I had on cassette onto disk. I followed the instructions and loaded the cassette program in Disk Drive 1. It wouldn't do it. A phone call to Radio Shack taught me that I had to format the disk before use. TRSDOS was a very demanding program; it didn't like most of my diskettes. I did find that in some cases, when I used my bulk tape eraser in the diskettes, TRSDOS tolerated them and elected to format them.

At that time I was experiencing a problem that was driving me up the wall. My beautiful new Model IV printer kept printing on the perforations on the pinfold paper I was using to print on. I enquired at Radio Shack and they steered me towards a group of "Computer Nuts", The Hawaii Tandy Users Group. On that fateful Sunday, I drove from Kailua to Halawa Valley to the Gymnasium, where I introduced myself to the group, paid the annual fee and became a member. They had a program that solved my printing on the perforations problem and hundreds of other programs that I could evaluate. There was very little documentation for these programs. Load them up and keep pressing various keys until something happens. About that time, some company invented a new DOS "NEWDOS", much improved over TRSDOS. Then I was introduced to a great program VISICALC. It was the spread sheet to dream about. (The budget/expense record and tax spreadsheet I developed for my own use I still use.) However, it is now utilised on Quattro Pro 4.

My Model I now became the instrument for the Club as Database for the Club Members, as it was now a tool of the Club Secretary

and Membership Chairman. It also became the Publisher of the Club's Monthly Newsletter, printing out the input from the late, great Editor Andy Anderson. Tandy/Radio Shack now sold a great communications device, the Modem 1 300 baud. I bought one, then found it would not work unless I installed an RS-232 board in the little trap door in the Model I's expansion interface. Now it was equipped to communicate via telephone, except I was the only one in the club that had a Modem. There were extant at the time a couple of bulletin boards, the only one I remember was the "Conference Tree" (demised long ago), and I was able to access them. The operation was not all satisfying; after it got warm, the RS-232 connections would get very flaky. After reading an article in 80 Micro by an author with similar problems, who solved them by hard wiring the RS-232 board in. That is soldering each of 25 little wires from the RS-232 board to the Expansion Interface board. It took a lot of "cussin' and fussin'" but after soldering in the board I never again had that problem. There were very few communication programs in those days, especially for the Modem 1 (it was either switched in or out) no complications.

Once again perusing the ads in magazines I found a Hayes auto-answer Modem 300 Baud; naturally I bought one. A bulletin board program was bought and my Model I became the hardware for the club's first Bulletin Board. In order to keep real time on the BB an add-on device provided the Model I with its own on-board clock. I also added a VS100 Voice Synthesiser so the Model I could talk to me. You can't very well run your computer 24 hours a day as a Bulletin Board and get much use out of it as a computer. We made a deal with Radio Shack for them to run the Bulletin Board on one of their new Tandy Model IIIs after working hours and I would Sysop it and run it remotely from my Model I. There were a great many problems since the Machine at Radio Shack was run in the evening on a rotary line. If another caller called while you were on the BB the Model III would either reboot or crash. Eventually we obtained a Model 4 and I again ran the BB out of my home on it. I bought a Model 4 also and began running my Model I as the computer hardware for Packet Radio connecting it to a 2 Metre Transceiver and a TCN. (For the information of the non-Hams in the club, that's a Terminal Node Connector.) For over five years, day in and day out it has operated on Packet Radio, 24 hours a day except when I went on vacations.

Now she is all disconnected, should I store her in a glass case as a relic, or hook her up and configure a program that will burn RIP in the phosphor of her monitor and use it as a head stone for her grave in the back yard. Gad, she cost me more than my new 486/33 8MB RAM, with a Sony 1604S Monitor, 120 Meg Hard drive, Logitech Trackman, 96/96 FAX Modem, Focus 5001 keyboard and Colorado 120 Tape drive.

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Why Digital Transmission ?

by Jack Nock

[Reprinted from "The Interface",
Newsletter of the San Gabriel Valley Tandy User's Group,
P.O. Box 6818, BURBANK CALIFORNIA 91510, May 1992]

It may be hard to accept for us dedicated computer buffs, but most of the world is analogue. That is to say, motions and signals are continuous, not made up of discrete bits of binary data sampled at discrete times. So what makes digital signals so interesting that the effort of converting the information, and loss of accuracy, is worthwhile ? Most reasonably priced digitisers produce about fourteen bits of accuracy. This is a range of about 16,000:1. Not bad, but far from perfect. In addition the continuous analogue signal must be sampled at finite time intervals, which limit the frequency ranges that can be retained.

The virtue of digital comes from the transmission and calculation. As we Computer addicts know, digital calculations are the ONLY kind. Well, not quite, but surely THE BEST! Or the FASTEST ? Or maybe none of the above. Surely digital computers do allow flexibility that analogue never had. But it is in transmitting data that digital really shines (although the transmission is invariably varying analogue voltages).

Because the digital sample is a very definite value, with no approximation, it can be checked fairly simply at the receiving end. For example, a number can be repeated until it has been received consistently several times (redundancy). This is inefficient but possible. Many of us remember entering BASIC programs by hand, when each line had a checksum attached. This is another simple way of detecting, but not correcting, errors. If we mistyped, we got a wrong checksum. We knew we had an error, but where ?

A very common check that IBM loves is the parity bit. Each byte (8 bits) carries a ninth bit that is either zero or one depending on the sum of the bits in the byte. Odd or even parity. This is used by IBM's computers to check memory, tape recordings, etc. and on some BBS communications. It is a check, but offers no recovery. If it is wrong, you start over (or maybe the computer hangs up!). Some errors still get by. Two wrongs MAY make a right.

Now, as we know, these parity errors are really pretty rare within our computers. Memory errors do not often occur. The bits, zero and one, are well defined as quite distinct voltage ranges. When we leave the motherboard many more problems arise. Particularly when we deal with the "real world" of phone lines, radio signals, CD disks, etc. To transmit information through a line, we require an analogue voltage. Often a "one" may be about five volts, a zero a value less than one volt. This is very arbitrary, but the sender and receiver must agree on the definition. All too often, the signal will be corrupted by noise, or other losses, so our pristine voltage is now in limbo. While parity checks can point out problems, they do not tell us what to do to fix them.

One technique is to send a fixed message, a "preamble", ahead of each message. The receiving station can then be adjusted (or hopefully adjust itself) to read the preamble correctly. This allows for more flexibility. An additional block of "postamble" can be added to provide more checks. All this checking makes for additional data to send, but can allow for increasingly accurate transmission. Never perfection, you understand, but better. Even NASA does not achieve perfection!

The technique of breaking up the digital message into blocks of fixed length, perhaps 1024 bytes, with preamble and postamble is used with good results in amateur radio, BBS and other areas. If an error that cannot be repaired is detected, the bad block is resent. This requires two way communication, so the receiving station can check blocks and request repeats.

Networks and amateur radio share another problem - interference from another user. Two stations transmitting simultaneously create chaos. A typical solution is to have each user listen before he transmits. This is an automatic function of the terminal. There is still the chance of interference, particularly if many users are sharing the same facility. When this occurs, an error will result. To avoid perpetual interfere a random time delay is introduced, so senders will get their time slots separated. Long data blocks are more likely to suffer errors from noise interference or whatever, but they are more efficient to send. Sophisticated systems will adjust the length of the block to reduce the error rate if necessary. This can reach ridiculous lengths if too many users try to share the same facility, and can hang up the system.

CD music records use a digital recording technique, therefore the high quality sound. I do not know how many bits they digitise, which defines the amplitude range. The music is sampled at about a 44 MHz rate, which limits the frequency range to zero to 22 KHz. This is somewhat better than analogue systems, particularly at the low frequency end. Because of the error recovery, the sound is often much better. Even scratches on the disk can be corrected.

Telephone and radio signals share a different problem. They do not allow DC or very low frequency signals to be transmitted. Also, they limit the high frequencies to about 3,000 Hz. This is about 3,000 baud. The neat 5 volts signals we started with must be transformed into frequency changes at the transmitter (modem) and back at the receiver. Add a little noise to the system and the receiver can get very confused. In radio work a tuning error at either the receiver or the transmitter can completely confuse the decoder modem.

So let us all give thanks to the engineers who have devised working systems that we all rely upon. Remember, your hard disk is another analogue device!

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Worth Repeating

Spring means more to modern man than it did to his forefathers. It brings the hopeful and ever-recurring reminder that there are pleasanter things to look at than television.   -- Bill Vaughan

Perhaps we are worrying too much about automation taking our jobs. When a traffic jam gets really bad, they turn off the traffic lights and bring in a policeman.   -- Bill Vaughan

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Double Your Hard Disk Space Without Expensive Hardware

by Terry BIBO

[Reprinted from the Newsletter of the
Canberra Micro-80 Users' Group Inc.,
18 Callabonna Street, KALEEN ACT 2617 - April 1992]

The hot number for some months now has been more space on hard disks - doubling hard disk space without buying hardware. This is done with file compression programs that nominally halve file size but can compress some down to an eighth of their normal size.

One such program is SuperStor (SSTOR.EXE) which is bundled with MS-DOS 6. Files are compressed and expanded on the fly, and the process is completely transparent to both the user and the DOS. Reading and writing files is faster with SuperStor as the compression and decompression are done in RAM, and this takes less time than communicating the uncompressed data to and from disk.

Data Compression

In 1977 two Israelis, Abraham Lempel and Jacob Ziv, developed a compression algorithm that replaces redundant data with tokens; preserving the integrity of the data while producing significantly smaller files. This has become known as the LEMPEL-ZIV algorithm and is widely used in both text and graphics reduction. A very brief example of how it works is demonstrated with the three wise monkeys motto:

HEAR NO EVIL, SEE NO EVIL, SPEAK NO EVIL.

Tokenised, this would appear:

HEAR NO EVIL, SEE**P*K*.

The original sentence is 41 bytes in length, the tokenised one 24. Tokens replace any two or more characters that are found to be redundant. The tokens are two-number reference codes which indicate the length of the string they replace and the location of its previous occurrence. The first token would be 10-13, indicating a ten-byte string (_NO EVIL,_) commencing with the space before N, 13 bytes earlier. The second token would be 2-13, representing S and its preceding space previously found in SEE.

Clusters and Sectors

Compression is one part of space reduction. The other part comes from reorganising the disk structure. Disks are formatted in 512-byte sectors that have address marks indicating the track they are on and their sequential number on that track. This is how the hardware keeps track of data location. Software and the DOS, through the disk controller, take a different approach and combine a number of these sectors into groups called clusters, which are the smallest units they will address. Typical cluster sizes are 2048 bytes (4 sectors) and 4096 bytes (8 sectors). A file that is 13K long would occupy seven 2K clusters or four 4K clusters. In the first case (7x2-13) there is 1K (7%) waste space on the disk after the end of the file. In the Second case (4x4-13) there are 3K (19%) of waste space. This is because the DOS always saves files commencing at the beginning of a new cluster, not at the end of the previous file.

SSTOR overcomes this wastage problem by formatting the disk to have 512-byte clusters, resulting in significant compression through space saving alone. The SSTOR compressed disk must still appear to the DOS as a device it is aware it can address. This is where the necessity for a device driver comes in, and SSTORDRV.SYS must be loaded in the CONFIG.SYS file.

Limitations and Advantages

SuperStor disks cannot be used for WINDOWS swapfiles. Third party defragmenters should not be used, and can seriously increase fragmentation; so no Norton Utilities or PC Tools. MS-DOS 6 provides DISKOPT to do the job, and it is very slow. UNERASE can also be a problem, and the DOS program should be used rather than third party options. The reasons for these limitations are explained in the next section.

Wide testing has indicated no other incompatibilities and the program is accepted as being very well behaved. Typical compression ratios achieved are:

BITMAP	about	4:1
COM and EXE	about	1.5:1
DBF	about	8:1
TXT	about	3:1

Caveat

SuperStor takes all available disk space and converts it into ONE hidden DOS file within which it does all its homework. Only SSTOR knows the contents of that hidden file. You cannot access it intelligently through the DOS or any other program. Corruption of this ONE file can ruin, not only your day, but megabytes of your data. It would be an unwise user who did not keep a reliable, convenient backup of everything on a compressed drive.

SuperStor is only one program in this genre. They all employ essentially the same principles.

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Spinrite with IDE Drives

by John ROY

[Reprinted from "Voice of FCUG",
Newsletter of the Fairfield County Computer Users Group Inc.,
14 Wakefield Road, WILTON CT 06897, February 1992]

IDE hard drives provide excellent performance versus price and have become very popular these days. As a result, many people are now in a quandary about using software, such as Spinrite, that provide a whole collection of hard drive utilities such as performing a controlled low level format without any data loss.

Since IDE drives are low level formatted at the factory with special hardware and software, does that mean that Spinrite is no longer a viable utility for these drives ? Not according to Karl Zeutius of Gibson Research Corporation, the company that produces Spinrite. Karl states that Spinrite will not format an IDE drive because the drive will not normally allow a low level to take place. While this is true for most IDE drives, Karl does not give a guarantee that exceptions don't exist. If a low level is initiated with Spinrite it will most likely report that the drive is translating and not do a format.

The fear of an IDE drive being "Destroyed" by a low level format is a bit over-hyped. Depending on the drive (which would be almost all) a low level format in the true meaning of the word will not take place. The drive has to protect its servo information which may be on the sector ID, and in part of the data field. If this is the case, the drive will not allow a format to take place. The drive is smart enough to know a true low level format would destroy the servo information, therefore the drive will either return an error code back to the formatting software telling it that an illegal call was attempted or it will pretend to carry out the format letting the software think it is formatting when it really is not (Conner IDE drives do this). Karl has never heard of an IDE drive getting completely nuked (i.e. needing the servo track redone) and says "rest easy", the IDE drive is not as vulnerable as was once thought. While Spinrite will not be able to change the interleave on IDE drives, it can still be used to verify the drive integrity. This includes performing all of its error correcting tests and in-depth pattern scrubbing. It will verify the drive and map its bad sectors, repair bad data fields, and recover ECC read errors.

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Worth Repeating

A wife who says she can read he husband like a book rarely does. Instead of skipping what she doesn't like she goes over and over it.
                                                        -- Neal O'Hara

Once we assuage our conscience by calling something a "necessary evil", it begins to look more and more necessary and less and less evil.
                                                        -- Sydney J. Harris

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