

History of the J.S.E. System laws & rules

Many people wondered what made us start the J.S.E.

As you may or may not be aware, Public Domain software is already quite established in the States and the U.K. It is rapidly spreading in the other European countries as well. So it seems so amazing that it did not really take off in South Africa where software prices are at least twice or three times what they are overseas (in terms of buying power).

However this was not what set the J.S.E. off. Being a teacher, I was looking for easy-to-use software that could be copied without infringing copyrights - which led me most naturally to the overseas public domain software organizations. As I couldn't be bothered to go through all the official channels (motivating, budgeting etc.) I decided to order some stuff on my personal account. The interest and enthusiasm of some friends led me to jump across the channel and make personal contact with a few people while visiting my family abroad.

The main motivation to start a computer club was my interest in having a PC for myself (and not just one at work: a "personal" computer I had to share with 43 other staff) but I couldn't well afford it. I decided to let it pay for itself. So when I came back I sat down and designed the familiar info brochure (my wife did those marvellous drawings, by-the-way) and sent them off. The response has been so positive that it makes me feel all warm inside (at times; usually it makes me feel all tired inside)

The immediate future looks quiet as my promoter has been nagging me about the thesis I am supposed to be writing (instead of copying floppies). But I bought myself a nice modem and hope to be running a bulletin board in the not too distant future, so you would be able to contact me more easily. It would also enable you to share information, problems and experiences amongst yourselves. However, I need to know how many of you are interested in this. So everybody who's got a modem: please indicate this (and what type & speed) on your next order. Registering on BELTEL as an information provider seems to be unnecessary expensive and complicated, unless there is a clear demand for it from you.

Some members have been asking if we have arranged any special discount schemes etc. for buying hardware & software. Well, we have been thinking about this. We don't really want to get embroiled in the commercial distribution business. However, one area in which we can possibly help is by providing a source for items which are not readily available from the usual dealers, because they are not viable to stock or whatever. If there are things in this line that you need drop us a line.

MAKE YOUR COMPUTER TALK !!

One of the first of these rare items that we might get for you is a TEXT TO SPEECH BOARD for PC/XT compatible: to "make your computer talk". It is a "very powerful and amazing speech card" that uses the new general instruments SPO256-AL2 speech chip and the CTS256A-AL2 text-to-speech converter. The board uses one slot on the motherboard and requires a COM serial port. It features an on board audio amplifier or it may be used with external amplifiers. Demonstration software and a library building program are included on a 5.25 inch diskette; full documentation and schematics are included as well. Note that the board may also be used in a stand alone environment with almost any computer that has a RS232 serial port. Price will be R449 excl. (bulk discounts available). Write us for further info on this very exciting add-on.

If Architects built buildings the way programmers wrote programs, the first woodpecker that came along would destroy civilization

Any Given program, once running, is obsolete

If a test program functions perfectly, all subsequent systems will malfunction

If a program is useful, it will have to be changed
corollary:
If a program is useless, it will have to be documented

All programs expand to fill available memory
corollary:

All programs expand beyond the ability of the programmer to understand them

Interchangeable files won't

Regardless of the units used by the customer, the programmer shall use his own arbitrary units, convertible only by means of wierd & unnatural conversion factors. Speed, for example, will be expressed as furlongs per fortnight

Files that cannot be destroyed will be

Investment in reliability will increase until it exceeds the cost of errors, or until someone insists that work be done.

A carelessly planned program takes 4 times longer to complete than a carefully planned system, which takes only 3 times as long as expected

There's always one more bug

A system could be designed that's foolproof, but only a fool would want it

If the input editor has been designed to reject bad input, an ingenious idiot will discover a way to get bad data past it

The value of any program is proportional to the weight of its output
corollary:

The value of any program is inversly proportional to its cost

variables won't : Constants aren't

Once you have exhausted all possibilities and failed, the answer will be patently obvious to everyone else

Any given program costs more and takes longer

Adding staff to a late systems project makes it later

If it jams, force it. If it breaks, it needed replacing anyway

The reliability of any piece of equipment is inversly proportional to the number of people watching it, and it's overall productivity

Undetectable errors are infinite in probability, in contrast to detectable errors, which by definition are limited

Given any problem containing "n" equations, there will always be "n-1" unknowns

Installation and operating manuals will be lost before reading .

Service conditions specified will be exceeded
corollary:

Contracts and warranties are void upon payment of invoice

The only vital piece of equipment necessary for the system will be late
corollary:

They probably haven't designed it yet

Manufacturers specifications of performance should be multiplied by .5
Systems designers by .3
Programmers by .002
Salesmen by .000

In systems, negative expectations yield negative results
positive expectations yield negative results

There is always an easier way. You won't see it

If you perceive 4 ways a system can go wrong, a fifth will develop
corollary:

You're better off seeing no wrong. Then only one wrong way will develop

Under the most rigorous laboratory conditions of controlled input,
the computer will do as it damn well pleases.

In computer electronics, Murphy's law supercedes Ohm's

When an error has been found and been corrected, it will turn out
to have been correct in the first place
corollary:

It will prove to be impossible to fit the original data back

In any data, the figure most obviously correct, and beyond checking,
is the mistake

The computer expert is one who avoids the small errors while
sweeping on to the great fallacy

Technology enables vastly increased available data and communications,
which in turn generate vastly increased misunderstanding

All great programs are written by mistake.

corollary:

The greater the funding, the longer it takes to make the mistake

Test programs should be reproducible - they should all fail the same way

In any system, constants, especially those in the manual, should
be treated as variables

In any system design nearing completion, when specifications & requirements
are finally presented as they really are, instead of how they were
meant to be, it's simpler to start over

It works better if you plug it in

When all else fails, read the instructions

If the facts do not correspond to the output, they must be disposed of

Any program will be considered a success if less than 80% of the
output needs to be junked to supply design parameters

Whenever a system becomes completely defined, some damn fool
discovers something which either abolishes the system, or expands
it beyond recognition

Never attempt to replicate a successful test

Good programs attract good money, which makes better programs
impossible

Fear not. All technology is dominated either by people who
understand what they do not manage, or people who manage what
they do not understand

If it is explained so clearly nobody could misunderstand,
someone will

Effort X Time = Constant

A. Given a large initial time to do something,
the initial effort will be small.

B. As time goes to zero, effort goes to infinity.

Corollary:

If it weren't for the last minute, nothing would get done.

Anything that can be changed will be changed
until there is no time left to change anything

If a programmer's modification of an existing program works,
it's probably not what the users want.

Users don't know what they really want,
but they know for certain what they don't want

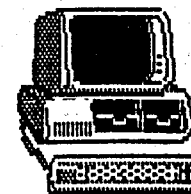
Computer paper never tears off at the perforated line.

Information necessitating a change of design will be conveyed
to the designer after - and only after - the programs are complete.
(Often called the "Now they tell us!" Law.)

Corollary:

In simple cases, presenting one obvious right way versus
one obvious wrong way, it is often wiser to choose the wrong way,
so as to expediate subsequent revision.

The more innocuous the modification to the program appears to be,
the further its influence will extend and the more code will have
to be rewritten.



in the 5 1/4 inch size.

A METALLIC THIN-FILM plated disk is being used in the new 3 1/2 inch drives. The surfaces of this platter contain magnetic layers as thin as two microinches - a much smoother surface, thus allowing the head to fly closer to the disk surface. With the head closer, the density of the magnetic field can be increased to provide greater storage capacity. The head can fly over the surface as closely as eight micro inches. Moreover, the increased intensity of the magnetic field provides the higher signal amplitudes needed for good signal-to-noise performance. This translates into increased storage capacity in a smaller area, fewer head crashes, and a drive that will give you many months of trouble free use.

Now that we understand hard disk surfaces, let's explore the devices used to read and write data onto the magnetic fields these surfaces contain.

HEAD/ARM ASSEMBLY (Read/Write Heads)

It is the read/write head that transfers the data from the disk to the drive electronics. The most commonly used head mechanism is a WINCHESTER CONTROLLER ARM with a FERRITE HEAD. A more advanced head being used today is a tiny electronic magnet called a THIN-FILM HEAD used with a WHITNEY CONTROLLER ARM. Thin Film heads can read/write data in denser patterns on the disks surface. Besides higher recording densities, Thin-Film Heads tend to be more reliable and lighter than Ferrite Heads.

WHITNEY is the name commonly associated with the "second generation" winchester technology. The Whitney arm is more streamlined than the Winchester. The arm improves read/write signal reliability by improving "flying height stability" and tracking accuracy, and reducing interfering signals from adjacent tracks (this yields a higher signal to noise ratio). Manufacturing cost for the Whitney Arm & Thin-film head are higher than the Winchester Ferrite head assembly so I suspect the Winchester type will continue to be used in the lower capacity, cheaper drives. So when you see that 10 mg drive listed for a mere R795, you'll know that it is an Oxide Platter with a Winchester/Ferrite Open-Loop Stepper Motor assembly, right? You will also know that you can expect very slow access times.

DRIVE PERFORMANCE (Average Access Times)

All of you have no doubt heard the term Average Access Time (AAT) - The mean time needed to reposition the read/write head from one data record to another and includes average latency - the rotational delay of the spinning disk. The drive in your IBM XT may have an AAT of 85 milliseconds, while the drive in an IBM AT will produce AAT's of 39 milliseconds. The speed difference is usually associated with what type of positioning mechanism is being used.

The low-cost, low-capacity drive with an AAT of 85 MS uses an OPEN-LOOP STEPPER MOTOR to move the head from track to track. Once a command to seek a particular track is given, the stepper motor shaft clicks off the desired number of steps. This system relies on the mechanical accuracy of the motor to bring the heads to the correct location. Since this is a purely mechanical system, parts wear out and cause failures and longer access times.

A more accurate (and more expensive) way to position the read/write head is with a CLOSED-LOOP ROTARY VOICE COIL. This system employs electrical feedback to find the desired location on the disk. The

information needed by the positioning mechanism to determine its distance from a specified location is contained either on a dedicated servo surface (DSS), which is one of the hard disk surfaces, or embedded in all of the recorded gaps on every track. All this results in faster access times and more accurate head placement. That drive on the IBM AT mentioned earlier uses this type of head positioning device.

A few of TANDON'S new hard disks use what is termed a PSEUDO CLOSED-LOOP HEAD positioner. With this method, servo positioning information is embedded in the microscopic index wedge located on each data track. The drive checks its location during each revolution and corrects its position if necessary. This method is a nice compromise - More accurate than an Open-Loop System, yet less expensive than a Closed-Loop System.. Access times are not faster, but because this is used on a 3 1/2 inch drive, the AAT is a respectable 65 milliseconds. The TANDON 775 drive will use this head positioner method with a Whitney Head/Arm assembly and Metallic Thin-Film Spattered disks.

This article is getting rather long, so I'll close with a few recommendations, without mentioning suppliers. If you're in the market for an inexpensive 10 or 20 MG drive, check out the new 3 1/2 inch drives or pickup one of the older tech drives at bargain basement prices. Which one to buy? Well, if your computer use is light to moderate, the older drives should serve you well. If your computer use is heavy and you need a reliable drive that will last, check out the new technology drives. Spending those extra two or three hundred rands may pay off in the long run.

quotes

If a programmer is found to be indispensable, the best thing to do is to get rid of him as quickly as possible.

The Psychology of Computer Programming,
Gerald M. Weinberg,
(Van Nostrand Reinhold Co., 1971)

Some years ago, when COBOL was the great white programming hope, one heard much talk of the possibility of executives being able to read programs ... nobody can seriously have believed [this] ... even programmers do not read programs.

Weinberg, p.5

There are ... programs that should be thrown away before ever being used.

Weinberg, p.20

Asking for efficiency and adaptability in the same program is like asking for a beautiful and modest wife ... we'll probably have to settle for one or the other.

Weinberg, p.22

Putting a bunch of people to work on the same problem doesn't make them a team.

Weinberg, p.35

The systems designer suffer[s] because the better his system does its job, the less its users know of its existence.

Weinberg, p.124

Buffers

by : Don Watkins, Marin/Sonoma IBM PC Users Group

A feature that I initially overlooked in DOS 2.0, but now find extremely helpful is the BUFFERS facility in the CONFIG.SYS file.

When DOS is initialized, it sets up two memory buffers which are used to store disk data. These are used for both reading and writing when the amount of data is not an exact multiple of a sector. For example, when a file is read, DOS reads the entire sector into one of its buffers, locates the correct record in the buffer and then moves the selected record into the application's area of memory. The buffer area is marked as being recently used. On the next request for a record, DOS looks in the buffer area before accessing the disk to see if that record is contained in the buffer. If it is, the record is transferred to the application and no disk access takes place. Thus, DOS acts as its own mini-RAM drive.

This buffering method becomes more effective as the number of buffers increases. As more buffers are available, the more the likelihood that the record will be in one of the buffers - up to a point. If DOS has to look in a hundred buffers for a record, system performance drops significantly. I've found that for my use, 16 buffers works best. (I have a lot of memory on my system and do a lot of *.* copying.)

You will also notice improved performance in the use of the COPY command. After increasing my buffers to 16, I've found that a COPY *.* can be executed just as fast as a DISKCOPY.

The number of buffers you use will depend on the amount of memory available on your machine since each additional buffer increases the resident size of DOS by 528 bytes. Don't be afraid to experiment with the number of buffers as it can always be changed.

To change the default buffer setting add BUFFERS=NN, where NN is the buffer number to your CONFIG.SYS file. Remember that the CONFIG file changes take effect only on IPL.

If you don't have a CONFIG.SYS file, create one by:

- o Entering COPY CON: CONFIG.SYS[CR] - Copy from the keyboard (CONSOLE) a file named Config.sys.
- o Entering BUFFERSnn[CR] -. Where nn is the number of buffers you wish to use.
- o Pressing CTRL Z[CR] - Place an end-of-file mark on the file.

The number of buffers will be changed to your new setting the next time you IPL. If you want to change the number of buffers, use any word processor or text editor.

The computer operator

Feet winging, heart singing, he trots through the door
So happy to be 'midst the clatter and roar.
Computer and printer, the job as a whole
Is Heaven to him, provides food for his soul.

No other, (his mother, his kid nor his wife)
Receives such devotion, gives meaning to Life.
To enter the "center" is Life's greatest joy
Providing a pleasure that surely won't cloy.

Pulsating, awaiting his gentle commands
The rig seems to recognize capable hands.
Confident, competent, he flits here and there
Getting things ready to go on the "air".

Drives counted, tapes mounted already to go
He pauses a moment, his features aglow,
Serenely, routinely he pushes the "Start"
And it's just about then that things fly apart!
One disk, then another, gives forth whistles and screams
The printer goes mad, spewing paper in reams
The lights on the console give a fire-works display
And in momentary panic his feet turn to clay
His heart begins pounding and surely must burst
As the whole darned crazy rig acts like something accursed

For what seems an eternity but is only a flash
His feet feel bogged down in a glutinous mass
He's unable to move and unable to speak
As the computer goes dead with a pitiful squeak.

Head ringing, eyes stinging, he goes for the switch
Knocking down power on his "beautiful witch"
Benumbed, feeling stunned, not yet able to guess
The calamitous cause of this horrible mess.
Traumatic, dramatic, the shock is profound
For fully a minute he utters no sound
Then waking, hands shaking, his temper gives way
And curses start flying (I'm sorry to say).

He curses the mainframe, the tape-drives as well
He curses the disk drives, consigns them to Hell
He curses the printer, he curses the punch
He curses the console, and then on a hunch
He curses the program, and still quite untiring
He curses the chips, transistors and wiring
He curses the present, he curses the future
He curses the day he first saw a computer.

At last, quite exhausted, he falls to the floor
Unable to utter one little curse more.
Bedevilled, dishevilled, his face chalky white
Eyes bloodshot, tongue lolling, a pitiful sight
It's over, all over, the battle is done
'Twixt man and machine, the computer has won.

Muttering, stuttering, completely insane
He mumbles his warning again and again
"Idiots, idiots, can't anyone see
That anytime now you may end up like me"!

560 A86 A Super Macro Assembler for MS DOS with loads of examples.

561 E86 Screen editor. FBRI54 File backup & recovery utility. PMM= Poor Man's Mouse. DD displays two directories side by side. PRIMER.DOC an assembly language primer. SPEED determine the speed of your PC. CACHE2 establish your own disk cache. HD Hard Disk test utility.

562 Turbo Pascal Programming Aids.
PFORMAT Formats Turbo Source Files. TDEBUG Nice De-bugger (single step..)
HEXDUMP fast. EP Make applications memory resident. PGM-AIDE aid for screen layout. FINDUP32 Find wasted disk space.

563 Turbo Tools
Formatted input, menu system, windowing routines (multi-level & reverse sequence removal), date manipulation routines, controlled data input...

564 KERMIT : PC/Main Frame Host Communications by Columbia University. Disk 1.
565 KERMIT disk 2. (source)

566 HAM RADIO ITEMS disk 1. Don't ask me what is on the disks... I don't
567 HAM RADIO ITMES disk 2. understand a word of it!
Come on, hams, order it and send me a description.

quotes

... [OS/360] was late, it took more memory than planned, the costs were several times the estimate, and it did not perform very well until several releases after the first.

.The Mythical Man:Month,
Frederick Brooks, p. viii

The programmed computer has all the fascination of the pinball machine or the jukebox mechanism, carried to the ultimate.

Brooks, p.7

The programmer, like the poet, works only slightly removed from pure thought-stuff.

Brooks, p.7

As soon as one freezes a design, it becomes obsolete in terms of its concepts.

Brooks, p.9

Good cooking takes time. If you are made to wait, it is to serve you better, and to please you.

Menu of Restaurant Antoine, New Orleans

All programmers are optimists.

Brooks, p.14

This time it will surely run.

Anonymous

I just found the last bug.

Unanimous

A large programming effort ... consists of many tasks, some chained end-to-end. The probability that each will go well becomes vanishingly small.

Brooks, p.16

it is sometimes a bit of a challenge, what with all those powerful side effects. Historically, I've used a "self-built" trace, using I/O calls to display variable values at critical points of the program. That's crude, but it beats DEBUG at the generated code level. What it doesn't even approach, though, is a source level debug tool, which can show variables by name and step through the program a SOURCE line at a time, optionally skipping the code in lower level functions at our whim.

With the source level DEBUG tool, instead of wondering what happened when your latest marvel didn't run the first time, you can step through it one source statement at a time. You can examine the variables by name, arrays and structures by name and subscript, and try expressions to see their result.

That's the type of tool that makes it easier to see C. Not only does it make programming much more productive, it is also a valuable learning aid.

Being able to see the variables and arrays/structures by name is helpful. If you use C and can get a source level debugger with your compiler, by all means take a look at it. You will be greatly rewarded.

QUOTES

To detect errors, the programmer must have a conniving mind, one that delights in uncovering flaws where beauty and perfection were once thought to lie.

Weinberg

For locating errors, however, we want a person who has the persistence of a mother in law and the collecting instincts of a pack rat.

Weinberg

'Programming' is like 'loving' is a single word that encompasses an infinitude of activities.

Weinberg

The important thing is not to stop questioning. Curiosity has its own reason for existing.

Albert Einstein

Programming shares with prayer the feature of directional transmission and broadcast reception.

Weinberg

program from being pushed down in the priority stack by fiddling with the shift key while he is thinking.

Weinberg

The expert is a person who avoids the small errors as he sweeps on to the grand fallacy.

Anonymous

The nature of programming being what it is, there is no relationship between the 'size' of the error and the problems it causes.

Weinberg

OPEN FORUM



Dear Sirs,

I would be pleased if you could include in your next newsletter a little section for inter-membership problems and solutions. I recently upgraded from a Sanyo 555 to the 880 Series and was stunned to find that Mailmerge would not operate above 10 or so data files, it would appear to be some problem with the buffers. As a temporary solution, I use ReportStar to handle my letter writing with Mailmerge and this works very well. If anyone out there knows the solution to patching WordStar I would be very grateful to hear about it.

Harry Gordon, PO Box 102, 4275 Margate.

Ed.: Well, here it is. I hope that we can make this a regular feature in our newsletter. Please address correspondence to:

"the editor - JSE Magazine, 20 Monton Road, 7780 Kenwyn".

As to your problem - I'm sure that you have tried including "BUFFERS = 20" in your CONFIG.SYS file (on your boot disk)?

P.S. I'll make it policy to include the full address of the writer if there is a particular problem. Anyone who knows (or thinks he/she knows) the answer/solution can then write directly to writer.

I am a Pretoria Technicon student, where our major programming language is (very unfortunately) COBOL. As the course I am doing is a national one, this is the case for all technikons offering the ND Computer Data Processing. What I would like to know is: Do you get any requests for MS COBOL utility programs. I have written a program that automates the creation of the lengthy Screen Section code which works very well. Also I have just started working with Logitech Modula 2 at the CSIR, where I work part-time. Is there anyone interested in swapping user-written library modules?

Ian Petter, PO Box 905 1416, 0042 Pretoria.

Ed.: Nobody so far had similar requests. Why don't you COBOL guys get up and submit stuff through the J.S.E.: make your work Public Domain (and make a name for yourself). And what about the hundreds of Pascal & Turbo programmers out there? But please include some documentation with your routines!

[...] I have now also put an add on [my] Bulletin Board for you! If you enclose your text file of your catalogue I will put it up for my users to download with a message to write you for details and/or your membership and copying fees!!! [...]

Congratulations on your newsletter!!!! Very good indeed - You need a medal.

Bryan J. Haefele, Greenacres, Port Elizabeth.

Ed.: Thanks, but no thanks. I am already rewarded enough if you enjoyed reading the newsletter and don't need a medal. With respect to the notice on your B.B.: I appreciate that. If every member would help to spread the (good) news about the J.S.E. we would be able to offer even more software (it's very expensive to get it from overseas at

FINANCE MANAGER

C. Fotgieter from Stellenbosch reported that "Finance Manager" (disk A.2) sometimes changes the decimal (cent) amount. E.g. one would enter (R)235.23 and it would be recorded internally as 235.22! C. Kettle proposed the following fix: by entering a third decimal a "forced" rounding up occurs which results in correct arithmetic. It means however that the operator has to keep a sharp eye on cents keyed in compared with those accepted. Probably many people used Finance Manager without being aware of this problem (as this is an extremely popular program - with reason). However, all the users will be glad to find out that we now have version 2 of Finance Manager which remedies the problem by having all arithmetic in BCD (Binary Coded Decimal) so that no rounding errors occur any more. Version II also accepts up to 4000 accounts and up to 20000 transactions (hard disk), has a facility to enter (and compare against) budgeted figures etc. Because of its ease of use yet very good reporting facilities, I personally wouldn't change Finance Manager for any commercial package in the world.

SUMACS; MUMPS

Steward Clark reported that on No.493 the file SUMACS.EXE is missing. We suggest that one uses NEWKEY instead. He also mentioned that disk # 108 (MUMPS) has no documentation with it. One of our other members kindly sent us a brochure on MUMPS and from it we extract the following address:

MUMPS User's Group
4321 Hartwich Road
Suite 510
College Park
Maryland
20740 U.S.A.

C. Ryan reports that he ordered DESKMATE but received something else instead. We found that our original had the wrong number, so other people might have the same problems. Please send an extra disk with your next order, refer to this notice, and we'll copy the real DESKMATE for free. Please mention when approximately you ordered DESKMATE. P.S. HOMEBASE (773 & 774) seems to be a next generation desk organiser (better than even SideKick?). Who'll check up on this?

J.B. Spies couldn't get Instant Recall to work. This was one of the many cases which could have been solved instantly (pun!) by reading the documentation: create a subdirectory /INSTANT first and copy the required files.

He (?) also asks for any suggestions on how to get LQ (#543) to run with the CITOH 8510 printer. Reply to 19 Windsor Ave, Pietermaritzburg. He further has a problem with unprotecting protected Basic programmes. As this is a technical question I would normally not reply to this myself but I happened to stumble on an article about this. It's one of the many pokes one can do, or you can work through debug. Unfortunately I lost the piece of scrap paper so I can't put them down here any more.

THE TEN COMMANDMENTS

1. Beware the lightning that lurketh in the undischarged capacitor, lest it cause thee to bounce upon thy buttocks in a most untechnician-like manner.
 2. Cause thou the switch that supplieth large quantities of juice to be opened and thusly tagged, that thy days in this earthly vale of tears be long.
 3. Prove to thyself that all circuits that radiateth and upon which thou worketh are grounded and thusly tagged lest they lift thee to radio frequency potential and causeth thee to make like a radiator, too.
 4. Tarry thou not amongst those fools that engage in intentional shocks for they are surely non-believers and are not long for this world.
 5. Take care that thou useth the proper method when thou takest the measure of a high voltage circuit lest thou incinerate both thyself and thy meter, for verily, though thee hast no account number and can be easily surveyed; the test meter doth have one and, as a consequence, bringeth much woe unto the supply room.
 6. Take care thou tampereth not with interlocks and safety devices, for this incurreth the wrath of the supervisor and bringeth the fury of the safety inspector upon thy head and shoulders.
 7. Work thou not on energized equipment, for if thou so dost, will thy fellow workers surely buy beers for thy widow and console her in other ways.
 8. Service thou not equipment alone, for electrical cooking is a slothful process and thy might sizzle in thy own fat for hours upon a hot circuit before thy maker sees fit to end thy misery.
 9. Trifle thou not with radioactive tubes and substances lest thou commence to glow in the dark like a lightning bug and thy wife have no further use for thee except thy wages.
 10. Causeth thou to be tagged all modifications made by thee upon equipment, lest thy successor tear his hair and go slowly mad in his attempt to decide what manner of creature hath made a nest in the wiring of such equipment.
- -----

VIRTUAL MEMORY

The Paging Game

$$N = -2^{15}a(15) + 2^{14}a(14) + 2^{13}a(13) + 2^{12}a(12) + 2^{11}a(11) + 2^{10}a(10) + 2^9a(9) + 2^8a(8) + 2^7a(7) + 2^6a(6) + 2^5a(5) + 2^4a(4) + 2^3a(3) + 2^2a(2) + 2^1a(1) + 2^0a(0)$$

where $a(n)$ is a 1 or 0 in the n th bit of the 16 bit number. Notice that the most significant bit (the 16th bit) represents a negative number (=32768) whereas all the other bits represent positive numbers. The numerical range of the 2's complement integers is =32768 to 32767.

It can be seen that the pattern of the three most significant bits can be represented as a decimal number. The pattern for identifying duration data (001) corresponds to a decimal value of 8192. Tempo data (010) equals 16384, voice 1 data (100) equals =32768, voice 2 data (101) equals =24576, and voice three data (110) equals =16384. The 13 remaining bits can represent decimal numbers ranging from 0 to 16383.

The accompanying BASIC program contains data statements which load an integer array with the data for playing the first part of the Rondo Alla Turca by Wolfgang A. Mozart. The first entry in the integer data array sets the tempo of the playback. A typical tempo value of 512 plus the tempo identifier 16384 gives the integer data value 16896.

A note's duration is specified by its length relative to a 32nd note. For example, a quarter note equals eight 32nd notes, so a decimal value of 8 is added to the duration identifier, 8192. The resulting number is $8192 + 8 = 8200$. Likewise, a whole note is represented by the decimal integer $8192 + 32 = 8224$.

The voice data is determined by adding the number representing the frequency of the desired note to the number identifying the desired voice of the three possible. The following table gives the numbers representing the notes of the scale. For example, middle C on voice 1 is represented by adding the voice 1 identifier with the value for middle C. The resulting number is $-32768 + 1024 = -31744$. To turn voice 1 off, the data would be $-32768 + 0 = -32768$.

NOTE DATA TABLE

LOW ---	MIDDLE -----	HIGH -----
C = 512	C = 1024	C = 2048
C# = 542	C# = 1085	C# = 2170
D = 575	D = 1149	D = 2299
D# = 609	D# = 1218	D# = 2435
E = 645	E = 1290	E = 2580
F = 683	F = 1367	F = 2734
F# = 724	F# = 1448	F# = 2896
G = 767	G = 1534	G = 3069
G# = 813	G# = 1625	G# = 3251
A = 861	A = 1722	A = 3444
A# = 912	A# = 1825	A# = 3649
B = 967	B = 1933	B = 3866
No tone = 0		

Ed.: The programs discussed above can be found on disk # 568 as separate files, TRI.BIN, TRI.ASM and TRIEST.BAS. Although the article may seem less clear if the sources are not included, it is presented here as an introduction on what can be achieved with assembler language and some technical knowledge. I hope that the technical fundi will also find the article of interest.

The programs do not operate properly on the PCjr or the PC AT due to timing considerations. I haven't been able to find out whether they run on Turbo Speed PC/XT's.

What follows is a non technical description of how virtual memory works. It was written by Jeff Berryman of the University of British Columbia and distributed at a share meeting shortly after IBM announced virtual memory for the 370 series.

RULES:

- 1) Each player gets several million "things".
- 2) "Things" are kept in "crates" that hold 4096 "things" apiece. "Things" in the same "crate" are called "crate-mates".
- 3) "Crates" are stored either in the "workshop" or the "warehouse". The workshop is almost always too small to hold all the crates.
- 4) There is only one workshop, but there may be many warehouses. Everybody shares these.
- 5) To identify things, each thing has its own "thing number".
- 6) What you do with a thing is to "zark" it. Everybody takes turns zarking.
- 7) You can only "zark" your things or shared things, not anyone else's.
- 8) Things can only be "zarked" when they are in the workshop.
- 9) Only the "Thing King" knows whether a thing is in the workshop or the warehouse.
- 10) The longer the things in a crate go without being zarked, the grubbier the crate is said to become.
- 11) The way you get things is to ask the "Thing King". He only gives out things in multiples of 4096 (that is, "crates"). This is to keep the royal overhead down.
- 12) The way you zark a thing is to give its thing number. If you give the number of a thing that happens to be in the workshop, it gets zarked right away. If it is in a warehouse, the Thing King packs the crate containing your thing into the workshop. If there is no room in the workshop, he first find the grubbiest crate in the workshop (irregardless of whether it is yours or someone else's) and packs it off (along with its crate-mates) to a warehouse. In its place he puts the crate containing your thing. Your thing then gets zarked, and you never knew that it wasn't in the workshop all along.
- 13) Each player's stock of things has the same thing numbers (to the players) as everyone else's. The Thing King always knows who owns what thing, and whose turn it is to zark. Thus, one player can never accidentally zark another player's things, even though they may have the same thing numbers.

The Paging Game..... NOTES:

- A) Traditionally, the Thing King sits at a large, segmented table, and is attended by pages (the so-called "table pages") whose job it is to help the Thing King remember where all the things are and to whom they belong.
- B) One consequence of rule # 13 is that everyone's thing numbers will be the similar from game to game, regardless of the number of players.
- C) The Thing King has a few things of his own, some of which get grubbier, just as player's things do, and so move back and forth between the workshop and the warehouse. Other things are used too often to get grubby, or are just too heavy to move.
- D) With the given set of rules, Oft=zarked things tend to get kept mostly in the workshop, while little=zarked things stay mostly out in the warehouse. This is efficient stock control.
- E) Sometimes even the warehouses get full. The Thing King then has to start piling crates upon the dump out back. This makes the game slower because it takes a long time to get thing off the dump when they are needed in the workshop. In this case, the Thing King selects the grubbiest crates he can find in the warehouses and sends them to the dump in his spare time, thus keeping the warehouses from getting too full. This also means that the least=often zarked things end up on the dump, so the Thing King won't have to get things from the dump so often. This speeds the game up.

QUOTES

When a programmer has a difficult time finding a bug, it is because he is looking in the wrong place.

Weinberg

Documentation is the castor oil of programming ... the managers know it must be good because programmers hate it so much.

Weinberg

The human mind ordinarily operates at only ten per cent of its capacity the rest is overhead for the operating system.

Anonymous

When everything has been seen to work, all integrated, you have four more months work to do.

Charles Portman
International Computers Limited

Brooks Law: Adding manpower to a late software project makes it later.

Brooks

The purpose of a programming system is to make a computer easy to use.

Brooks

THE LIBRARY PAGES

The new titles section is probably where you turned to first. And we're sure that you are surprised of the number of new titles we've been able to add to the library: more than 200! (215 to be exact.) But what is even a more pleasant surprise is the outstanding quality of the programs that have been added; Public Domain software really surpassed itself. We feel that we can give you a rough indication of what has been added, although you'll definitely want to go through the whole list anyway (it's worthwhile in any case).

We find some major updates or rewrites of our most popular software packages: Finance Manager II, PC=Outline, Freecalc II, PC=File III+, Flicker (update of Present), Dancad3D (incorporates DanMOVIE), Turbo Pascal tutorial, Hack, Forth ... Because of popular demand we ordered some additional volumes of programming routines for Turbo (586/590, 615, 616, 699/701, 649, 686, 612) and C (624, 625, 598). We also added some "CHURCH" programs: Wordworker for anybody who's really interested in the New Testament and a couple of specific databases/information managers (731,769). As educational games have been popular we tried to add as many as we could find (594, 635, 638, 680, 727). We have lots of good specifically business orientated stuff: draftsman (581/582), graphtime (739, 740), in=control (749/751) and front office (760/761).

And to give you a feeling of the other interesting stuff we just mention the following titles: Kwikstat (669,670), Superstat (724,725), Qubecalc (3 dimensional lotus=like, 671), Stock Trader (684), Wordlist (682,683), Private ("test your..." programs, 687), Paper Jet Generator (690), Oracle (predict the future, 719), Hard Disk Menu II (712); some other DOS front end systems are 726 and 771), Muses (for writers; 722/723), Speech System (755/758), Page One (747), Danal (752), Astrosoft Ephemeris (755/756), GoalSeeker (essential for every serious Lotus user; 772), Homebase (better than SideKick; 773/774), Basic compiler & tutorial (660), resicalc (732), world statistics (738), Sleuth detective game (757), bonzoware adult recreation (765), learn Japanese (766) ... If we haven't roused your floppy appetite now, we'll never will. And remember: the more members you bring to the J.S.E. the more exciting programs we can offer.

Besides the additions, we've included some details on how to contribute to the library, some common problems, some withdrawals, a disclaimer (disk=claimer?) from our part and the general ordering info. Not so experienced users are invited to read the article on "how to get your program up and running" (see previous issue or printed catalogue).

GENERAL ORDERING INFO

Despite inflation and increased postage we managed to keep our different fees at the same level: i.e. R4,50 copying fee per diskette, R5,00 for the media (=diskettes) if you want us to supply them and R3,00 per order for handling, packaging & postage. Note that only members can order from the main library (personal membership fee is still R38 per year). No discounts are available for bulk orders.

Please complete your check as it should be (it saves you and us lots of hassles) or include postal orders. Remember that we do not accept credit cards, nor do we open accounts. We do accept official purchase orders