



DECUS 12 BIT SPECIAL INTEREST GROUP  
NEWSLETTER

September

Number 36

1979

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NEWSLETTER SUBMISSIONS

The Newsletter is currently published bi-monthly in the odd months. The deadline for each issue is the last Friday of the preceding even numbered month. Submissions are accepted at all times and are normally used in the next issue to go to press regardless of date of receipt. The deadline for ready-to-use material for the next Newsletter is 26-October-79. Material requiring editing/re-typing should be in earlier. Ready-to-use material should use an area 7 inches (18 cm) wide by no more than 9 inches (23 cm) long on each page. It should be single spaced on white bond paper whenever possible and must be reasonably clean, legible and sufficiently dark for good photographic reproduction.

Material submitted in machine readable form is particularly desirable because it can be edited and incorporated into the newsletter format more easily. Higher quality reproduction is also possible this way. Contact the editor (Bob Hassinger) for further details on acceptable media and formats if you plan to make a submission in machine readable form.

>> ADDRESS UPDATE <<

Jim Crapuchettes has asked me to call attention to his new address and phone number given under the listing of the Steering Committee members. Please correct your files to reflect this change as it has been in effect for some time and some calls are not reaching him because the phone company is not giving his new number when you call.

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SIG COMMITTEES AND WORKING GROUPS

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Micro-8 Working Group and US Symposia Committee Representative

Jonathan Lockwood - see above

RTS-8 Working Group

Lee Nichols - see above

COS-310 Working Group

Lawrence H. Eisenberg - see above

Symposium Software Exchange Committee

Send copies of software you wish to exchange at the next US Symposium to one of the following committee members for preparation:

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FALL DECUS SYMPOSIUM

This year's DECUS/US Fall Symposium will be held in San Diego on Monday, December 10 thru Thursday, December 13 at the Town and Country Hotel complex. Our representative on the Symposia Planning Committee, Jonathan Lockwood reports the following items of particular interest to the 12-Bit user community:

- \* 12-Bit Road Map Session to orient attendees to the symposium sessions and activities.
- \* Short Notes Session to provide for brief presentations and informal question and answer format interchanges

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- \* Four papers in the traditional PDP-8 area
- \* Eight sessions in the Word Processing area
- \* Ten sessions in the COS-310/DIBOL area
- \* Seventeen papers and sessions scheduled by the TECO SIG crossing all CPU and operating system lines plus a poster paper
- \* The traditional media conversion and software exchange including an effort to support COS-310 software exchange within the system this time.

We expect to be discussing several topics of current interest such as: Where OS/8 is going, COS-310 Version 8.1 and the future, WPS Version 4 (i.e. WPS-200 system) and Version 5. A WPS Hints and Kinks session is also planned. In the TECO sessions there will be discussion of the submission of TECO-8 Version 7 and a suite of new TECO releases for PDP-11 and VAX to DECUS. Since OS/8 users are the only ones that have an officially DEC supported version of TECO available, and since TECO is by far the most portable editing tool available to 12-Bit users, these sessions should be of particular interest and importance to them.

COMMENTARY - WHITHER THE 8 ?

It seems to be time to review where the PDP-8 family is going. As you can see, in Ray Stimson's letter, Earl Ellis stirred up some reactions at DEC with his reference to the "death" of the eight. Some of the new-comers at DEC are not aware that the eight was supposed to be "dead" back in 1970 when the PDP-11/20 was announced. I doubt that many 12-Bit SIG members took Earl's comment in the same way as some of the DEC people. All the same, the shift of responsibility for new PDP-8 end user sales to the Traditional Products Group is significant to us.

The current situation, as I understand it is this. The various current PDP-8 and DECstation 78 hardware is still in volume production and it is being marketed by several areas in DEC such as Word Processing, the DEC Stores and Traditional Products. Some of these areas are continuing to fund new hardware and software developments. The DECstation 78 and OS/78 are examples of this. It appears that Traditional Products is planing to do a limited amount of hardware work, principally aimed at packaging current products. The question of what and how much else they might do can be answered this way I think: Each of DEC's product lines is a "profit center". Each product line manager is expected to show a profit as if he was running a separate company. The money he brings in can be invested in new development or whatever else he feels will best meet that end. Traditional Products will be limited by the income its new and reconditioned 12-Bit business brings in. At the moment I do not think they contemplate having the income to support very much significant new development in the 12-Bit area.

This style of organization has served DEC very well judging by its continuing success in a very rapidly changing market thru an extraordinary exponential growth from a tiny company to a two billion dollar a year worldwide corporation. It does not seem to serve the interests of the existing user very well, however, when the equipment he uses passes its peak and starts down the back side of the growth curve. Since DEC built their machines so well, they hardly ever die, so somewhere, someone is still trying to use almost all the computers DEC ever made. These users still need new software development and many of them would buy new hardware if they could get it. Typically this demand has not produced enough new income to fund the new software work that is needed although there has been some success in the hardware area.

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I spent an afternoon with Ray Stimson at his new facility in Nashua, New Hampshire, talking about these issues. He is very dedicated to promoting the Eights as well as many other products such as PDP-11/40, 45 and 55 as well as the long standing reconditioned equipment business. I believe he wants to do everything he can to promote the sale of eights to the end user market within the limitations I have outlined. His organization has the capability to be very responsive to your inquiries and inputs. It is "vertical" in the sense that he can handle his own order processing, customer contacts and even credit verification. I want to encourage the establishment of a dialog between the users and Ray's group. In his letter he gives his address and a toll-free number you can call. His organization is small enough that it can responded to your individual needs. If you have ideas for helping to promote the Eight family, let them know, Ray is looking for input.

My own concern is with continued software development for existing users. The problem seems to be that as end user Eight sales fall off, there is less and less push (and funding) to maintain support for the older equipment. Naturally, the path of least resistance is taken. This means that new software is developed without trying to keep it compatible with the old equipment. Frequently all that would be needed would be a formal commitment to make the effort. It has been very rare that this restriction would cause any more difficulty than having to check on the compatibility issues. DEC should formally take the position that they will do their best to maintain such compatibility. They could use some unconventional techniques in this effort such as "good faith effort" rather than formal commitments, category C and DECUS releases and cooperation with users for the testing of software on configurations they can no longer support themselves (for example, no pre-OMNIBUS machine was available in the software development group so I tested BASIC V7 on my 8/I and found a couple of minor incompatibilities that kept it from working on that machine - the fix is trivial and if DEC incorporated it in the released version, the new BASIC will be available to the thousands of 8/Is that otherwise would not have been able to use it). Cooperative efforts with users who have developed software that would be valuable to many users has already been demonstrated to be a worthwhile source of enhancement that should also be continued.

I think support of the long standing tradition of compatible software and continued portability of the vast backlog of existing software is vital enough to the overall health of all Eight products and DEC's overall image in the computer business that a much more determined effort in this area is justified. In particular, Traditional Products needs to become much more active in the area of interfacing with the software development groups to press for the commitment and effort needed and to provide them with the support they need such as information on the compatibility issues and maybe some facilities for occasional testing on the older equipment. The other products lines must be willing to expend the effort to cooperate with these efforts, possibly even providing some support for the extra costs involved, realizing that in the long run it benefits all of DEC through an improved corporate image, a more satisfied user base that promotes the products by word of mouth, increases their potential markets (new hardware and software products can then be sold into existing installations), and it broadens the field of users who can contribute their efforts to the pool of user software. It is very interesting to note that over the years, many of the most prolific contributors have been ones who where in situations were they were restricted to using older equipment.

If Traditional Products will get people working actively on this issue and if they are willing to make at least some funding available, I feel confident that on-going support and development of software for the entire Eight family can be a reality.

LONG LIVE THE PDP-8, SAYS TRADITIONAL PRODUCTS

In July's issue of this newsletter, Earl Ellis surmised that DEC must think "The PDP-8 will die" because responsibility has been re-assigned to the Traditional Products Group. For the record, only PDP-8 End User products fall within the Traditional Products charter. And as for allowing the demise of this family of viable systems, nothing could be further from Digital's intent. On the contrary, we are re-emphasizing the PDP-8 with new resources, from enhanced service and support for existing PDP-8 to their continued manufacturing and engineering improvements (including both software and hardware). Our charter at Digital, in fact, is not to lay prior generation products to rest, but rather to refocus support, place new emphasis, upgrade and make them available to past, present and future customers in need of time-tested performance.

In short, Traditional Products is closing the generation gap by continuing to manufacture and offer viable system performers, along with compatible add-ons and software to our customers. So, Earl and other DECUS members, know that we're solidly behind your present systems, no matter what generation. And we will be in 1999, and in 2009. Know also that if you want to upgrade or expand your PDP-8, or migrate to a newer generation processor, you can with us. New, fully warranted Traditional systems at modest prices, or like-new factory refurbished systems, also warranted. Whatever your pleasure, Traditional products is ready, willing and able to help. Just call us at 300-258-1723 (in New Hampshire, 834-5736) - or better yet, please come visit and see the new emphasis and focus being given to the end user PDP-8 at the new Traditional Products 70,000 sq. foot facility in Southern New Hampshire.

Submitted by Ray Stimson  
Marketing Manager  
Traditional Products  
Digital Equipment Corporation

8/31/79

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Earl T. Ellis (whose address and phone are given near the beginning of the Newsletter) submitted this item and the following articles on the Virtual 8 Users Group and Teco:

"PLEASE submit software for swapping as soon as possible to me or Jim Coryell so that it can be processed prior to the symposium. It would be highly desirable if we could develop a description of all software available for all to have. I would hope that this would include those of you who plan to attend in December in San Diego. I have TD's, RX01, RK8, TM8 and Paper Tape I can get RX02 and LINKtape processed. I can read RT11 floppies, DEC 6-bit and DSD, Dewar, Lynch, and van Zee 8-bit floppies and IBM EBCDIC 800 BPI Magtapes."

The VIRTUAL 8 Users Group

"At the New Orleans Spring Symposium, several users of virtual PDP8 software met and discussed current developments. (A similar meeting was scheduled for the European Symposium at Monte Carlo.) The term 'virtual' here means the ability for one PDP8 to support two or more "simultaneous" OS/8 environments. Systems represented were MULTI-8, ETOS, and MULTOS/8. Each supports the DEC RK8E, and the System Industries 1.6 Megaword disks. No support for the RL8A is currently offered. ETOS and MULTI-8 V7 require custom hardware. MULTOS/8 and earlier versions of MULTI-8 do not require custom hardware. The number of terminals (users) that these systems can handle runs from 4 with MULTOS/8 to 16 with ETOS. At the meeting Fred Brant, a MULTOS/8 user, represented MULTOS/8. William Van der Mark of DATAPLAN represented MULTI-8. Myron Congdon of QUODATA and Lance Albrecht, Carl Gifford and myself, all users, represented ETOS.

"ETOS for the 8 could be compared to RSTS/E for the 11's, and was originally patterned after TOPS-10. It was developed to support many terminals protecting some or all against 'hostile' users. There are just under 200 ETOS installations worldwide since first offered in 1975. ETOS supports the System Industries 30/40 disk system with two 12.8 Megaword disk drives (25.6 million words usable). Users report that the 30/40 system is about one-third faster than the RK8E. QUODATA is currently into final testing of Version 5B and hopes to release it soon. ETOS gives the OS/8 user the ability to support many OS/8's with minimum, if any, support from 'experts'. All ETOS sites use the same save file (ETOS.SV) with little or no modification. The ETOS Disk Monitor uses 24 bit math (double precision), giving a limit of 2 to the 24th (almost 16.8 million) OS/8 blocks on up to four logical devices (69 million OS/8 blocks, 17.5 billion 12 bit words). ETOS RK05's are not readable under OS/8 stand alone. COS-300 V3.06 is supported, but not as well as OS/8. Simple patches exist to allow some users to log into COS and others into OS/8 automatically.

"MULTI-8 is a parallel development of ETOS, which for the 8 is like RSX-11D for the 11. Great attention has been paid to maintaining the ability to have a foreground task driven by the clock (such as a A/D) with multiple OS/8's existing in the background. Real-time tasks can be swapped in as needed on a page by page basis with the Relocatable Task Library. Real-time buffers can be allocated and deallocated giving superior performance on smaller systems. Individual system modification and customizing results in there being little likelihood of two systems having identical software. This implies there be an 'expert' present to implement and maintain the system. The latest version has a hardware assist to improve the performance of the multiple OS/8's. MULTI-8's RK05 disks are addressable by OS/8 stand alone.

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"MULTOS/8 V1 allows 4 users, each user has his own disc area. It relies on a very friendly environment. It is written in PAGE8, not PAL, and this allows a lot of flexibility, such as support for the TM8E. Last month's 12-Bit Newsletter (July 1979 Number 35) page 8 describes Version 2 as a vast improvement over Version 1.

"Since the meeting in New Orleans, I have spoken with Jeff English. He's told me about his DUAL-OS which allows 2 OS/8's with RTS-8! This is a RTS8 V3 (MACREL) task that he's agreed to demonstrate at San Diego, if the proper equipment is available. DUAL-OS may be available through DECUS in the future. He said that DUAL-OS works best with one OS/8 in a compute mode and the other in a TTY Input/Output mode (i.e. Fortran crunching data and Editing a program).

"I have also spoken to Jim Dempsey who has OMNI-8 running at 3 sites. Both COS-310 and OS/8 are supported to about 4 active users in a 32K machine. OMNI-8 will run on pre-omnibus machines. It was tested on a PDP8/I. OMNI-8 does not use hardware assist or the MQ register. He plans to have it running on the KT8A and 128K before the end of 1979. It can run industrial control jobs using OS/8 Commercial Basic. OMNI-8 is running with the industrial controller UDC8/ICE.

List of contacts:

ETOS	QUODATA Corp, 196 Trumbull Street, Hartford, CT 06103 Thomas Schreier (203) 728-6777
MULTI-8	WESTVRIES COMPUTER CONSULTING, Lekbandijk 11, 4119 RA Ravenswaay, Holland Ernst Lopes Cardozo 011-31-03452-202 (also LAB DATA SYSTEMS, 10320 Ravena Ave. Seattle, WA 98125; Jim van Zee (206) 522-6950)
MULTOS/8	COMPUTER METHODS CO. 7822 Oakledge Rd., Salt Lake City, UT 84121; Bill Haygood (801) 842-8000
OMNI-8	NETWORK-SYSTEMS DESIGN, Inc., 640 Wisconsin St., Oshkosh, WI 54901; Jim Dempsey (414) 231-2432

"If any of you have any information on these or other systems for the PDP-8, I would appreciate hearing from you. Please contact the originators for more information. I will act as a clearing house for information and edit information for the Newsletter."

TECO

"I have heard from Stan Rabinowitz. He has left his PDP-12 in Maynard and is now VAX'ing in Nashua, New Hampshire. He's looking for someone in the 12-Bit world to take over TECO for the PDP8. The current version is being submitted to DECUS in MACREL by Stan. I'll distribute it until it is available from DECUS. This person would have to be most concerned with collecting TECO Macros, contributing to the TECO SIG Newsletter, and representing PDP8 TECO at meetings where TECO is discussed. A good working knowledge of TECO is the prime requirement. I'm a SCROLL nut."

QUERY FROM JIM VAN ZEE

"Who is responsible for EDITX, FORTZ and the SABR random access R/W routines for FORTRAN II? I got a copy of these things via the 'grapevine' (they were available at the New Orleans DECUS meeting), and don't know who to credit."

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Note: Jim and I are interested in this because these items are valuable and worthy of broader circulation, perhaps via DECUS if they are not considered proprietary. The information available at the Symposium was virtually non-existent. No identification of authors, no real documentation and no sources. I am particularly interested in EDITX which is a modified version of OS/8 EDIT with patches added to support lower case commands and scope mode rubouts. These make EDIT much more useful for things like text editing (for use with RUNOFF, for example) using modern upper/lower case terminals. Since no one at DEC seems to have any interest in EDIT beyond the fact that it is the only supported editor for OS/78 based systems, it seems as though the users will have to maintain and enhance it as has been done in this case. I find that if you do not have access to a viable cursor oriented CRT editor and are not interested in learning the complexities of regular TECO, OS/8 is still easy to learn and teach and with these enhancements, it works quite well, even on our rather slow DECstation 78. I hope that we can document the genealogy of EDITX and the other items so they can be made available in one way or another.

Jim's address is Lab Data Systems, 10320 Ravenna Ave NE, Seattle, Washington 98125, phone (206) 522-6950. If you have any information, I would also like to hear about it. (RH)

NOTE FROM JIM VAN ZEE

"We recently received a new Data Systems Design model 440 dual-density floppy disk system for our 8/e. This unit is hardware and software compatible with the RX02 (#32,p29), and as there have been several comments in recent newsletters on the upgrade from the RX01 to the RX02, I thought I might share a few of my experiences with this new system.

"To begin with, the DSD-440 is very nicely designed. It has 2 Shugart drives in a low-profile (5-1/4 inch) chassis, with a sculptured appearance very reminiscent of the 11/34. Both the price and the size (but not the performance!) are substantially smaller than the equivalent DEC unit. The 440 contains an 8085 microprocessor which is capable of performing some 20 different diagnostic tests completely independent of the host CPU.

"The documentation is quite extensive (about 200 pages), but it is primarily PDP11 oriented. For instance, one must 'initialize' a standard disk before it can be used for double-density recording. Yet nowhere in this voluminous manual was there to be found a routine for doing so! I eventually dug out the information and wrote a little FPAL routine in U/W-FOCAL to initialize the disk so I could get a system up and running. Once past that step I discovered that the RXCOPY program distributed with the new OS/8 extension kit is now smart enough to take care of this matter if it has to, so the user who already has a double-density system disk can just use the DUP command to turn a standard floppy into a double density one.

"Just what is 'double density'? This phrase definitely creates the impression of data bits squeezed twice as close together, with the obvious concern about decreased reliability, etc. (#32,p33). In fact, the actual number of 'flux transitions' - the microscopic changes which are used to record the data - are the same in both single density (fm) and double density (mfm) recording. The only difference is how the data is encoded. This is not to imply that double density is automatically just as reliable, since the 'bit window' in which a given transition must be judged is necessarily smaller which tends to magnify the effects of 'wow and flutter', but on the whole one would not expect great differences in the raw error rate between the two



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recording methods. The 'bit density', incidentally, is remarkably high: greater than 6000 fci on the inner tracks, compared to about 400 for good old reliable DECTape - hence the precautions about proper media care!

"The result of the mfm encoding technique is that each sector can now hold 256 8-bit bytes rather than only 128. This fact is the basis for DEC's claim that the RX02 provides over a megabyte of storage (on two drives). However, this claim is at best misleading for the PDP8 user, since it turns out to be as near to impossible to use all of this storage as it is likely that there will ever be a major revision to OS/8! In fact these two issues are somewhat related, since the major difficulty with double density recording is that the sector size on the floppy is not easily related to the OS/8 block size. On single density disks, 3 sectors = 1 block. On double density disks the ratio is 1.5 sectors/block, which means that files will necessarily begin and end in the middle of a sector and programs such as FOTP will certainly have to copy files in chunks which also begin and end between sector boundaries. Since the controller can only read and write complete sectors, this is an enormous difficulty which must be taken care of in the handler!

"What is the resolution of this problem? The obvious solution is to put fewer bytes of data in each sector, so that one can regain the match between sectors and blocks. Both the RX01 and RX02 controllers thus have a special '12-bit' mode in which only 96 (or 192) bytes are used in each sector, which corresponds to 64 (or 128) words. This is the mode in which all DEC (OS/8) handlers operate. The RX01-based WP systems and COS-310, on the other hand, use '8-bit' mode, mapping 3 sectors into 1 OS/8-sized block. As indicated above, the use of 8-bit mode in double density would require dealing with fractional sector boundaries, which I think it is safe to say, is just simply impossible within the constraints of a normal handler. One could, of course write a -program- to do this sort of thing, so that one could utilize all of the disk for archival storage or something like that. But as delivered to the customer, the realizable storage on the RX02 is actually only 750 kb, rather than 1mb - hence the discrepancy between 'double density' and 'double the amount of storage' noted in newsletter #32, page 33.

"This discovery all came as a bit of a surprise to me, since I have been using a 'byte mode' handler (#29,p15) on our DSD-210 (RX01 equivalent) system ever since we got it, and I had just assumed that I could rewrite it to get twice the storage. No way! Thus my friends who decided not to wait (and wait and wait) until DEC came along with double density, and who bought a Sykes or an AED or a Diablo system instead, have had the last laugh! I am particularly annoyed since the AED 6200 system which we evaluated well over two years ago provided 1771 blocks per side - 80% more than the RX02! The problem was that it couldn't read standard floppies, which I felt was an absolute necessity. Reportedly AED'S new controller can do this, which would make this a very attractive system. Even the Sykes double density system provides over 1300 blocks, which one would expect for the usual soft-sectored format, although it cannot read standard floppies either.

"Thus we decided to go with the DSD-440, which in conjunction with DEC's rather remarkable new handler can read either single- or double-density disks (in 12-bit mode!), determining on the fly which kind of disk has been inserted and making the appropriate adjustments for the number of sectors/block, interlace factor, etc. This is completely transparent to the user, even to the extent that the new version of PIP can correctly ZERO (or SQUISH) a disk known only as 'RXA1' - which could have either 494 or 988 blocks on it! Since the 'device length' entry for the RX02 (location 13632 in PIP) is zero, clearly PIP treats this as a special case, probably testing a 'magic'

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location in the handler in order to know what to do.

"Programmers who have written byte mode handlers for the RX01 will, no doubt, be pleased to learn that the RX02 is not program compatible with the RX01 in 8-bit mode. (it is, in 12-bit mode, except for the 'NOP' command, which undoubtedly made life easy for DEC!) Thus none of the existing byte-mode handlers will work on the RX02 without at least some modification, and to make them work interchangeably with either controller requires roughly another 6-8 instructions, which could certainly put a strain on an author's imagination in cases where the code is already tight! Since I suddenly found myself in need of just such a handler so I could read all my 'byte-mode' disks on either system, I set out to see what could be done about this situation.

"To make a long story short, I eventually came up with both a system and a non-system handler which will work with either controller, and which store data in a PDP-11 compatible format, thereby greatly simplifying communication between these two machines. (I can directly copy files from a RT/11 floppy using U/W-FOCAL, for instance, and ASCII files written with this handler are directly readable under RT/11, although for best results they should be positioned on a PDP11 block boundary which occurs every 12 OS/8 blocks.) I am particularly excited about the system handler, since there was some speculation that it couldn't be written (#29,p15) - and it wasn't easy! System disks using this handler boot up with the standard bootstrap, so the only observable difference to the user is that s/he has a total of 667 blocks on a standard floppy and a 77% faster transfer rate! Other features are that the system handler supports both drives, thus freeing a scarce 'device slot' and the bootstrap preserves the system date (why doesn't DEC do this??).

"I had great hopes that this handler would work on all systems, just as DEC'S standard handler does; but unfortunately the 6100 microprocessor which is used in the DEC- and wordstation terminals is simply too slow to keep up with the higher data rate; The result is that only 1 sector is read per disk rotation, which makes data transfer impossibly slow. The only solution to this problem is to adopt a different data format, which I call 'VT/78' format, and which is not PDP-11 compatible. Using this format one can operate in byte-mode on the VT/78 with the same speed as the standard DEC handler, but with 40% more usable storage (611 blocks vs. 438)! This is especially important to those trying to run FORTRAN IV on an OS/78 system, but I think that almost everyone has had a need for more file space on their system disk! A modified version of these handlers is also available for use with Bill Haygood's 'huge floppies' (#33,p6), which provides an additional 103 blocks of storage (714 blocks/side on a system disk: more storage than a dectape!).

"To solve the problem of needing separate handlers for these two different formats, I added a 'switch' to the non-system handler so that it will work with either one. Thus one merely 'SET'S location '200' to 0 for PDP11 format, or to any non-zero value for 'VT/78' format. It would be nice if the source file for SET were available, just as the source file for CCL is, so that one could easily implement a command such as 'SET D1: PDP11' INSTEAD OF 'SET D1: LOC 200,0'. I have also wanted to extend the SET command for use with the LQP handler so you could say 'SET LQP PITCH 10' or 'SET LQP MARGIN 5', instead of having to know just which locations to change. At any rate, people who are interested in further details about these new handlers should contact me at Lab Data Systems, 10320 Ravenna Ave. N.E., Seattle, WA 98125.

"Here is a little survey of some of the better known floppy handlers which may be of interest. Others who have written such things, will, I hope, make their own

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measurements and submit them so that the readers can better discern what is available. Timing measurements were made using FUTIL to simply scan from block 0 to the highest block available. This is a method which should be available to all, but which may penalize the handler by testing only single block transfers. Results are given in 'OS/8 blocks per second' on an 8/e or 8/a, and on a 6100-based system. All handlers listed below -except- Dewar's and DSD'S are available as system handlers. Lynch's system handler (#34, p6) requires a special bootstrap, but is available in a ROM version for an 8k machine; The others all require at least 12k (except for the rx01 handler).

NAME	AUTHOR	BLOCKS	8E,A	6100	COMMENTS...
RX01	DEC (VER E)	494	13.0	5.5*	12-BIT, SINGLE DENSITY
DSDH	DSD (ZEISS)	658	15.7	2.2	COS-310 COMPATIBLE, ERROR MSGS
RB8E	LYNCH	666	8.5	1.8	231 TRACK CHANGES
RX8	DEWAR	667	17.6	2.0	NO TRACK OFFSET, USES BSW
RX11	VAN ZEE	667	23.0	2.0	PDP11 FORMAT, RX02 COMPATIBLE
RX61	VAN ZEE	667	12.3	12.3	SPECIAL FORMAT, STANDARD BOOT
RH8	HAYGOOD	770	18.5	2.0	NEEDS SPECIALLY FORMATTED DISK
RX02	DEC (ROOT?)	988	26.0	???	12-BIT, DOUBLE (DUAL) DENSITY

\*This is an average figure. The first 130-140 blocks (23-25 tracks) are read much more rapidly (about 13 blocks/second), after which the rate suddenly decreases. This is probably the result of overhead in a single-block transfer. At any rate, this area usually contains things like CCL, DIRECT, etc., so the overall system performance is better than the number shown might indicate.

"One final note: the new DECwriter IV (LA34) is well worth looking at; It is a 30 cps terminal which is really nicely designed (but doesn't have lower case descenders!). I was never very fond of the LA36 monster which I always felt was simply too gargantuan to be placed next to a decent-looking computer system. The LA34 is much more like an office typewriter (but with an inferior keyboard touch), yet it can still use wide 'computer paper' if that is what you like to feed it. Educational institutions belonging to something called 'EDUCOM' can order these things from National Computer Communications in Stamford, ct (phone: 800-243-9006) at a very reasonable price. Other items, such as A-J modems, as well as an LSI-11 based (TERAK) computer system, are also available to EDUCOM members at extraordinarily low prices. (modems from NCC, TERAK from the manufacturer.)"

NOTE FROM JONATHAN VAUGHN

"I am in the process of submitting some programs to DECUS. Here are the preliminary versions if anyone would care to field test them. There are two programs (TSSI and TSS10) which are for using a mini-computer under OS/8 communicating with a time sharing system. TEDIS is an overlay for the version of TECO that is released with OS/8 version 3C. At the end of execution of each editing command, TEDIS dumps the contents of the text buffer onto the cathode ray terminal with a pointer to the location of the current character position. Thus, the effect of each editing command can be seen immediately after it is executed. TEUL is an overlay for TECO that permits upper-case, lower-case text to be generated on a KSR 33. Before they get into DECUS I'll send out copies on receipt of an RX01 floppy and return postage. (By the way I have just gotten a DSD-210 floppy drive and it seems to work just as advertised.)"

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"I've seen a number of comments of people who have had trouble with FORTRAN IV using the BAT: input device handler. There is trouble as well, sometimes, when it is called it passes to the input buffer the string of characters in the BATCH input file between the current character and the next line that begins with a dollar sign.

"If this character string is not as long as the input buffer it is padded with zeros, and it ultimately has a CONTROL-Z character appended to it to flag the end of file. In FORTRAN II, at least, if there is no input (that is, no characters precede the next line that begins with a dollar sign) the handler hangs up. Under other circumstances it seems to work all right.

"One consequence of the way that the handler works is that it is impossible to read any less than the whole string of characters up to the dollar sign (which may be several lines), for obvious reasons. Now, in FORTRAN II (and perhaps FORTRAN IV, which I don't have) the input routines are line-oriented, and it would be much more convenient to have the BATCH handler operate in a way similar to the TTY: handler; that is, read one line of characters at a time and pad the rest of the buffer with zeros. There is a simple patch to make the BATCH handler work this way. In BUILD the command "\$AL BAT, 145=5334" will make the BATCH handler read a line at a time, filling out the rest of the buffer with zeros (note - this patch from OS-8 V3). The handler will still hang up if there is no input prior to the next line that begins with a dollar sign. When this change is implemented it is convenient to change the name of the handler as well by the command "NAME BAT=BT" so that there will be no confusion over exactly how the handler is working. I have been using this modified handler with great success in FORTRAN II for some time now to read lists of file names that are to be analyzed in U/W FOCAL or FORTRAN programs from the BATCH stream. Each OPEN INPUT BT: command (or CALL IOPEN ('BT',0) command in FORTRAN) sets up the input handler to read the next line of text. Since this contains the file name, another OPEN INPUT command is used to get the information from the file and once this is analyzed, a dummy file name, FINISH, is used to flag the end of the series of files names. If the BATCH handler were not modified it would not be possible to read one line from it and then open some other input device and return to the BATCH handler without losing characters.

"The programs TERAC(5-8).MA are for reading and writing floppy disks for interchange between an 8/E and LSI-11. The 8/E is running OS/8 on DSD210'S, the LSI-11 is a TERAK running UCSD PASCAL. There is little difference between the PASCAL system and RT11 system (ignoring directory format, etc.). But there are differences in block size (OS/8: 384 12-bit words per block; PASCAL: 512 8-bit words per block and 1024 8-bit words per editor buffer. These programs ignore the directory of the LSI-11 system entirely and just refer to block numbers; so if the LSI-11 directory is manually adjusted so that a file is created to span the correct blocks, things work out. PASCAL on the TERAK offsets the sector by 6 sectors each track, while RT-11 does not. This is only a minor change in the disk-driving routine (TERACH.MU) however.

"By the way, now that I have the DSD-200 drives I am in a position to copy back and forth between RX01 floppy discs and those recorded on the XEBEC XFD-208 system (which uses MEMOREX 651 discs). so, if there's anyone who has useful software stuck on the XEBEC discs I'll be glad to get it onto the RX01 discs for the OS/8 community."

Jonathan's address is Department of Psychology, Hamilton College, Clinton, NY 13323.

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HAVE YOU CONSIDERED RECONDITIONED EQUIPMENT FROM TPL?

I am always amazed at how few people consider reconditioned equipment from DEC's Traditional Product Line. I have mentioned before how they completely referbished our PDP-8/I and made it eligible for a service contract for the first time after many years of no service or ECO's. A couple of recent purchases have demonstrated again some of the reasons it is worth checking with them when you are looking for hardware.

We needed a KL8JA serial line interface, the DEC sales office quoted six months for a new one, the used computer companies had none but TPL quoted a reconditioned one for a better price with a much faster delivery. The KL will go on our maintenance contract when it is installed so the "reconditioned" aspect does not concern me and the price is nice but the best thing is the better delivery. I hear that OEMs are going to TPL when they can not get deliveries of new equipment fast enough.

Another example was the purchase of a disk to expand our PDP-11. RK07s are too expensive, RL01s are nice but not big enough and I would rather wait for a double density version before getting into them anyway and expanding the existing RK05 system with new drive(s) seemed out of the question when the price was compared to the RLs. The key to meeting the the short term part of our expansion need turned out to be another call to TPL in Nashua. I found that I could get a reconditioned RK05F for a very attractive price with good delivery. The price was a good bit better than the one I got from a used computer company, the drive is automatically eligible for maintenance and comes with full documentation and the other factors mentioned above apply here, too.

TPL has a toll free number you can call for information and prices and they have set up a streamlined method for expediting your order through the company. The number is: (800) 258-1728 (in New Hampshire call 884-5736). I have found that dealing direct with TPL is by far the most satisfactory way to handle this sort of thing - going through my salesman has been much less satisfactory.

MATERIAL FROM ROBERT R. BIGELOW

The following material was received from Robert R. Bigelow quite some time ago but I do not think it ever got into the newsletter. Sorry for the delay. "I would like to pass along a warning to users who are using the algorithm for comparing two signed values described in newsletter number 24 page 9. These tests are good only for signed numbers in the range of -1023 to +1023. In the table below I give three examples where the tests will fail.

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	Case 1	Case 2	Case 3
Decimal Value of A	+ 2046	+ 1025	+ 0003
Decimal Value of B	- 0003	- 1024	- 2046
Octal Value of A	3776	2001	0003
Octal Value of B	7775	6000	4002
CLA CLL	0 0000	0 0000	0 0000
TAB B	0 7775	0 6000	0 4002
CML CMA IAC	1 0003	1 2000	1 3776
TAD A	(3776)	(2001)	(0003)
	-----	-----	-----
	1 4001	1 4001	1 4001

"In all three cases A is greater than B, however the "SPA" used in "A .GE. B" test does not skip as it should. The simplest solution that I have found is to convert the signed values to unsigned values by adding an Octal 4000 to each and then use the corresponding unsigned test."

Mr. Bigelow also sent a copy of an SPR he submitted on DTFRMT V4A:

"PROBLEM: With the following responses DTFRMT fails.

```
DTA? 12
DIRECT? MARK
201 WORDS, 2702 BLOCKS. OK? (YES OR NO)
YES
SET SWITCH TO NORMAL
END TAPE ERROR PHASE 2
```

"If the user responds to DTA? with just one (1) unit number the tape is formatted but the OS/8 extended date word (location 07777) is destroyed.  
"CAUSE: The program builds a table of DECTape unit numbers ending with 7777. However, there is not enough space allocated for that table.  
"SOLUTION: Move the table to an area that can accommodate it."

The following ODT patch was also included. It fixes this problem and makes 0 an acceptable response to DAT? It also updates to Version 4B.

```
.GET SYS:DTFRMT
.ODT
1010/6401 6402
1035/1055 1054
1636/1333 1332
1661/1041 1332
1732/0000 1733;0
1763/1732 1765
1765/7402 0;0;0;0;0;0;0;0;0;0
^C
.SAVE SYS:DTFRMT
.
```

NOTE: LOCATION 1765 MAY NOT BE 7402

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Mr. Bigelow's address is Union Carbide Corporation, Nuclear Division, P.O. Box Y, Oak Ridge, Tennessee 37830.

NOTE ON 8 - 11 COMMUNICATIONS

Dr.-Ing. Goetz Romahn writes: "First my congratulations on the 8th anniversary. Since I am reader from the very beginning, I know what a fine work you did all the time.

"There was a seek for help in the #34 newsletter, referring to communications between 8 to 11.

"In the DECUS RSX-11 library you will find a package (DECUS 11-354) consisting of an OS/8 to FILES 11 converter, a PDP-8 DEctape reader and a PAL8 cross assembler (a FORTRAN compatible subroutine).

"DECUS 11-364 is a PDP-8 to 11 source converter running under RT-11.

"There is another point of interest for PDP-12 users: several years ago I submitted a DEctape reader handler for OS/8 to DECUS. J.v.Zee used this handler, as he writes, with mixed success. He reexamined my code and fixed some bugs. He also wrote a version which does not use the EAE nor alter the MQ register. Since I have no longer the resources to submit a new version of my handler, I think this is the right way to make the problems (and their solutions) public. For details write to Jim van Zee, LAB DATA SYSTEMS, 10320 Ravenna Avenue N.E., Seattle, Washington 98125, USA.

"(You are right Jim, the cycle time for the PDP-12 is fixed at 1.9 usec, and not 1.6 usec as some DOCs state."

The address is Freie Universitaet, Psychiatr.-Neurol.Klinik, Platanenallee 23, D-1000 BERLIN 19, GERMANY.

FORTX - EXTENDED FORTRAN II

I recently got a chance to review the writeup for FORTX. It is described as "an improved and extended version of OS/8 FORTRAN II". It was first announced in Newsletter #29. As I recall, it was made available on a test basis to those who were interested. After reviewing the writeup, I must say that FORTX seems to be a long overdue, and very welcome extension of OS/8 FORTRAN II. In addition to many of the language features of FORTRAN IV, other extensions such as "structured programming" constructs such as IF ... THEN ... ELSE, WHILE, and structured DO have been added. One of the features I like best is to be able to do Boolean operations on integers (i.e. you can say CHAR=CHAR .AND. 177B - note the ability to generate octal constants). These features plus FORTRAN II's efficient native mode code for handling integer manipulations and the ability to include assembly language code in-line seem to add up to a very nice tool for many jobs. If a package to help get 8-bit ASCII in and out could be added, It would be very attractive indeed. I think we should be doing all we can to encourage the continued vitality of FORTRAN II and extensions such as this. DEC presently has little interest in it but I understand that software that uses it has been making up a very important part of the DECUS Program Library submissions. (Incidentally, I understand that the PDP-8 area had more submissions than any other last month 35% of all submissions - and that FORTRAN II was the largest part of that group.)

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If you want to know more, I suggest you contact the author, George Gonzalez, Hearing Research Laboratory, 2630 Universty Avenue, Minniapolis, Minnesota 55414.

INFPK NOTE

Sally Swedine recently sent a note to say: "Having received my DECUS Spring Symposium Proceedings, I was disappointed to find my paper, "INFPK - AN AFFORDABLE INFORMATION RETRIEVAL SYSTEM", was misfiled under "PDP-11 Software - Data Base" (p. 1085). While I have written to DECUS, I think the best way to let my fellow 12-biters know about it is through our newsletter. It is definitely a PDP-8 based system. I am now using this paper as an introduction for new users since the manual gets technical pretty quickly.

"I don't know if I will make it to San Diego, but I intend to send this package (DECUS 8-859) and the companion statistical package (DECUS 8-902) to Earl Ellis. (Presumably for inclusion in the symposium software exchange - RH) Unfortunately, the documentation is too extensive to consider sending multiple copies out, so I must refer users to DECUS for manuals."

Sally also notes that she had trouble at the last Symposium with the PDP-8a not being able to handle her certified DECTapes. Did anyone else have trouble like this and does anyone know what the problem was? If I can find out, I will try to do something about it in the future.

Sally's address is Computer Laboratory, Veterans Administration Hospital, 4435 Beacon Avenue South, Seattle, Washington 98108.

FORTRAN II BUG

Dr. Peter Lemkin writes: "In debugging an OS/8 FORTRAN II program, I found an interesting bug in the I/O package supplied by DEC. The OOPEN(device,filename) subroutine saves the "address" of the device name rather than the actual device name after an internal lookup. This means that if the device name is changed after an OOPEN but before the OCLOSE, an IOER will occur! The following code if executed will illustrate this problem.

```

C PROGRAM JUNK1.FT
C -----
C
C TEST THE FORTRAN II I/O PACKAGE FOR POOP PROGRAMING
C PRACTICE OF SIDE AFFECTS ON THE DEVICE VARIABLE
C FOR THE OOPEN ROUTINE.
C     RUN AS:
C     .COMPILE JUNK1.FT
C     .LOAD JUNK1/O/H/G
C
C     DEVICE=LPT
C     CALL OOPEN(DEVICE, JUNK1)
C     WRITE (4, 1234)
1234  FORMAT ( THIS IS PROGRAM JUNK1)
C     DEVICE=SYS
C     CALL OCLOSE
C     END

```



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"The solution is to not use the DEVICE variable in between an OOPEN/OCLOSE sequence." Peter's address is NCI, DCDB, IPU, National Institutes of Health, Bethesda, MD. 20014.

MARKET FOR USED DISK PACKS

Until I talked to Paul J. Campisano a few days ago, I had never heard of anyone who bought and sold used disk packs. He sent the following note: "As we discussed today a large portion of our business is the buying of all types of disk packs. The used packs are cleaned and tested and then repaired, cannibalized or rebuilt with the intent of reselling these packs. The value of each pack varies with a given demand and/or our inventory at any point in time.

"In many cases disk packs users are not aware that their old packs have a value, but we will be glad to make an offer at any time." Paul's address is Time Brokers of New England, 1250 Washington Street, Norwood, MA 02062 - phone (617) 769-4060.

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LAWRENCE H. EISENBERG  
COS-310 Working Group  
17141 Nance Street  
Encino, California 91316  
(213) 788-0354

ANNOUNCEMENTS:

Having received some encouragement through the mailbag this past month, we are pleased to announce a continuation of the brilliant articles designed to help you to help yourself in connection with DIBOL programming. This month we will discuss the manner in which the SORT routine can be utilized where there is nominally insufficient space for all of the required scratch areas. (We are going to reserve our discussion on the use of printed messages during BATCH control, without the PLEASE command, until next issue, due to the number of other features being provided this month. (Besides, this author is going on vacation next month, and needs something to fall back on for the following issue! No, the truth doesn't hurt at all.)

Of considerable interest to many readers will be the attached DATE PATCH for V 6.05, which adds eight years of life to that version. (More on this below.)

Continuing with the cooperation from DEC's COS-310 personnel, we are also printing PATCH PT02 for VERSION 8.01. We have not, however, been advised as to whether a similar patch will be required for V 8.00. We hope to have this information before the next issue.

**CAUTION - WHEN 24-K BYTES REALLY MEANS 24-K WORDS (48-K BYTES)**

The COS-310 SYSTEM REFERENCE MANUALS (all versions), as well as the Monitor, itself, following a compilation, are misleading, at best, and downright wrong with respect to the meaning of just how much memory is required for operation of programs.

Having just completed several programs, all designed to operate well within the range of a 32-K WORD memory system, we were quite disturbed to find that all references to "BYTES" generally were intended to mean "WORDS" (two bytes to a word).

The following overhead features should be kept in mind for programming large DIBOL programs. The MONITOR requires 4-K WORDS (8-K BYTES) over and above the memory requirements of the running program. The LQP printer requires an additional 4-K WORDS for a buffer, the necessity of which challenges most logic.

When a program is compiled without one of the non-print options, the last line of information presented includes the size of memory required for operation of the program, e.g., 16 K CORE REQUIRED. The clear implication from both the display and the Manuals is that 16 K BYTES is required -- ain't so, Charlie. 16-K WORDS (32-K BYTES) are required! Thus, the largest memory size for which a DIBOL program can be designed for a 16-K WORD system (e.g., all 78s) is 12-K if there is even the remotest possibility that an LQP will be used as the output printer.

**FASTER WPS TO COS CONVERSION PROGRAM**

Having been unable to receive any response from the WPS-8 people with respect to the lively rumored faster WPS to COS conversion programs in the WPS-8 hoppers, this author

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decided to do it alone. We have written such a conversion program, which operates at least twice as fast as DEC's, and which can operate many times faster, depending upon the number of fields involved, their sizes, etc. Not only is our program much faster, but it is written in a logical manner with good tracking documentation in the source files. (Those of you who have read DEC's unsupported version of WPSCOS most certainly will appreciate this.)

We are planning to submit the entire program to the DECUS LIBRARY, but are awaiting permission from DEC, as part of the program requires use of a portion of DEC's own program, which really can't be improved upon (but can always be changed enough to be published!!!).

In the meantime, anyone wishing a copy of the program may receive it from this author by submitting an SASE, including your diskette. Listings, only, will be provided upon request, with an SASE. PLEASE NOTE: The program written by this office replaces COSFIX, which was written by DEC. It is necessary that you have WPSCOS (or that we receive permission to release it) to operate the entire conversion. WPSCOS reads the Word Processing File and transfers it to a COS logical unit. COSFIX then converts the file, character by character, to a DIBOL file. (There are some changes in our program, which we felt involved unnecessary complications in the DEC program, such as our requiring a pre-structured source file, instead of making it optional, and default assignment of logical units for the conversion (with capability of assignment of the destination logical unit as an option at runtime), and a few other changes, all of which are documented.

#### PUBLICATION OF THIS ARTICLE IN DEBUG

In cooperation with the DEBUG SIG, this article is now being published on a regular basis in both the 12-BIT and DEBUG SIG NEWSLETTERS. While the DEBUG SIG involves a wider range of equipment users, many of its members are interested in COS-310 and WPS-8 and are users of 12-BIT equipment. We hope that they find these articles interesting, and invite their reference to the past several issues of the 12-BIT SIG Newsletter for prior articles on the hints and kinks of COS-310 and all PATCHES to Versions 8.00 and 8.01.

#### WORD PROCESSING HINTS COLUMN

Last issue we proposed a Word Processing Hints Column, and suggested that we would be able to provide some help with respect to WPS-8. We have a list of "how to's" that far exceeds our COS-310 efforts, but only if there is an expressed need. To date we have not received any response. We'll whet some appetites. One of our latest "discoveries" involves the use of the List Processing Feature to omit skipping a line where there is a desired variable on a line which may, or may not, be present in each case. A fair example would be with address groups, where there may, or may not, be a need for a title description on a second line (e.g., "President"), or there may or may not be a need for a "Suite No.", etc. We have a routine which, while simple, involves a little imagination, in order to avoid printing of blank lines in these cases. If an interest develops, we will print several of these hints, if not -- well, this article keeps us busy enough with COS-310!

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## DATE PATCH FOR VERSION 6.05

We have received a remarkable, as well as timely, PATCH for Version 6.05, which allows the use of DATES after December 31, 1979. The need for this PATCH is one of the items which has been of the most interest among our readers. The submission of this PATCH illustrates the type of participation which many more of you could provide, in order to keep this column alive. We will publish patches, routines, ideas and concepts, and your input is essential!

The PATCH (which is appended to this article, immediately preceding DEC's PT02 to VERSION 8.01) can only be run with the VERSION 6.05 PATCH utility. There are a few notes which we have discovered in using the PATCH, and we pass them on for your protection and consideration.

1. This DATE PATCH is not supported by DEC. Therefore, your use of it is a matter which you will have to consider for yourselves. We don't, however, believe that use of the PATCH can in any way affect any of your DEC warranties or service agreements.
2. We have applied the PATCH (on RX01s) and found it to work for the dates indicated. We have found no "side effects" and are unaware of any defect. We have not, of course, tested it extensively, as we are utilizing VERSIONS 8.00 and 8.01, which have much to offer over earlier versions. We also have requested DEC to advise us of any problems with the DATE PATCH, but have had no response on that as of this writing.
3. The DATE CHANGE is effective only for the period of 1 Jan 1980 through 31 DEC 1987 and does not provide for any "spillover" for dates prior to 1980.
4. Use of the PATCH will change DIRECTORY DATES by increasing all existing file dates by 12 years, which can be a problem for many installations. We are attempting to find a fix for this problem, but there is no indication that we will have one in time for expiration of the current date, which is December 31, 1979.
5. Since the MONITOR must be PATCHed, there is no easy way to change over a large number of diskettes, tapes, etc. We would recommend the following procedures, which will involve the least danger of loss. (a) Note that the PATCH uses angle brackets (<nnnn>) to indicate operator response - use care!; (b) Use the PATCH to create a new Version 6.05D master to include the new MONITOR and the new Utilities (COMP, CREF, and DFDIR); (c) Create a new Device using SYSGEN/C, responding to the commands as with any new device; (d) Use PIP/C (V 6.05) to copy an existing device over to the new device (e.g., an existing diskette over to the new diskette); (e) Use PIP/V to transfer COMP and/or DFDIR from the new MASTER if either is required.
6. Use of the procedures outlined in Paragraph 5 will eliminate the need to perform more than one PATCH. The PIP/C option does not transfer the MONITOR, but will transfer all other programs and files and will not destroy the MONITOR. This also will provide you with your original device (e.g., diskette, tape, etc.) in an undisturbed state as a backup in case of any errors in procedures.

We are most anxious to provide credit for this submission, as the individual who went to all the work is most deserving of the gratitude of many of you out there. However, we are presently awaiting permission to do so. (Please, when making any submissions, advise us that we may publish the source of the information, or ask us to withhold

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that information. As a news publication, this author can withhold the identity of any sources of information, and will do so if requested.)

We hope that the DATE PATCH will be of help to many of you. However, we would encourage you all to consider VERSION 8.00 (or 8.01) as being quite superior in most respects. Perhaps the only valid reservation is the fact that VERSION 8.00 does not support the negative number assignments to the LQP printer, which did allow for printing of lower case characters, among other things.

#### HOW TO SORT A FILE WHICH IS TOO LONG TO SORT

Our announcement in the last issue of a method for sorting files which take up too much room on a device, for use of the SORT program, received considerable interest, and did invoke several responses by mail and telephone. Accordingly, we discuss the procedure here. (Actually, the Manual does hint at this procedure, but some examples certainly would have been a help.)

The procedure is fairly simple. It consists of ascertaining the sort fields, determining how much these fields can be reduced (see discussion) and ascertaining the record number on a new record. We will provide an example using an address file, consisting of seven fields of 45 characters per field:

```

100 START/T
300 RECORD ADDRES;           MASTER ADDRESS GROUP RECORD
310   LINE,                   7A45;       SEVEN LINES, 45 CHARS PER LINE
320 RECORD ADDSRT;           RECORD FOR SORTING ADDRESS FILES
330   LASNAM,                 A12;       SORT KEY 1
340   CITY,                   A12;       SORT KEY 2
350   ADDRREC,                D5;       ADDRESS RECORD NUMBER
360 RECORD
370   RECNR,                  D5;       NEW RECORD NUMBER (REDO PROGRAM)

```

In the above example, assume that of RECORD ADDRESS, the following assignments are made:

```

LINE(1) = LAST NAME OR OTHER ID
LINE(2) THROUGH LINE(6) = ADDRESS INFORMATION
LINE(7) = CITY/STATE/ZIP

```

At this point you will note that RECORD ADDRES contains 315 characters for each record; RECORD ADDSRT contains 29 characters per record (which can be reduced even further, depending upon the range of accuracy required). As a general rule, 12 characters is sufficient to sort the vast majority of full name lists (not for a telephone directory, but for employee, customer and similar lists).

Regardless of the mass storage device being utilized, the routines described here will enable the use of SORT, even if the entire device is ALMOST full on a 2-diskette system, or completely full on a 4-diskette system, provided that there are at least two such storage devices available. (On a 2-diskette system, at least eight segments must be reserved for the MONITOR, the SORT command file, the SORT utility and the conversion program.) The examples provided assume that the mass storage is RX01 and that there are only two drives available. (Needless to say, if additional drives are available, the procedures may be modified to avoid removal and insertion of different diskettes, although the program, itself, does not require changing diskettes.)

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DEC's SORT requires the availability of not less than three work storage areas of at least the same size as the actual file. Even on a 4-diskette system, if one of the diskettes is entirely full, the file cannot be sorted without some modification, as there is not sufficient work space to complete the SORT.

NOTE: Even with the following procedures, in a 2-Diskette system, it is not possible to SORT a completely full (i.e., 41 segments) diskette in a single pass. It can be accomplished in two passes, however, by writing an additional program to remove, e.g., all names from A-K and then all names from L-M. This is somewhat more complicated and is beyond the scope of this discussion. If there is any need out there for assistance on the subject, please ask and we'll explain further. In the meantime, the largest possible area which can be SORTed in a single pass, on a 2-DISKETTE system, is 33 segments. This only can be accomplished if an absolute minimum of program material is stored on the SYSTEM DISKETTE (e.g., MONITOR, DFU, SORT, cmdnfl, programs (2)). While there are ways to increase the available size to about 38 segments, they may involve more trouble than using two passes.

In the above example, we have reduced the required work area (as set forth in RECORD ADDSRT) to less than 10% of that which would have been required if the entire ADDRESS file should be required. It is utilized as follows:

1. Assign your logical units. (Assume RX1, 33; RX1, 4; RX0, 4; RX0, 4; RX0, 4; RX0, 4; RX0, 4.) You must avoid assigning too large an area to your SYSTEM DISKETTE. In the above example, the largest area which can be required is less than 13% of the available 33 segments, so that 4 segments per logical unit assignment will adequately provide all the space required for the SORT CONVERT program, and the actual SORT on five logical units as work areas. BE SURE THAT YOU DO NOT EXCEED THE AVAILABLE SPACE ON YOUR SYSTEM DISKETTE. In some cases, it may be necessary to perform the sort on a special diskette containing only the conversion program, SORT and the MONITOR. In the example, above, less than 1/2 of the diskette is required to sort the entire file on RX1.

2. Using the above record sections, write a short CONVRT program to secure your keys in the abbreviated form, and to ascertain the record number for each file:

```

500 PROC 2
510 C100, ;           ADDRESS SORT CONVERSION ROUTINE
520   ADDR= 00000;    CLEAR RECORD COUNTER
530   INIT(1,IN,'ADRES',1); INITIALIZE ADDRESS RECORD FILE ON RX1
540   INIT(2,OUT,'ADSRT',2); INITIALIZE SORT RECORD FILE ON RX1
550 C110, ;           START LOOP
560   XMIT(1,ADDR,EC110); GET ADDRESS RECORD UNTIL END OF FILE (EC110)
570   INCR ADDR;      SET RECORD COUNTER TO CURRENT RECORD NUMBER
580   LASNAM=LINE(1); GET KEY 1 -- LAST OR ID NAME
590   CITY=LINE(7);   GET KEY 2 (ASSUMES CITY ALWAYS ON LINE(7))
600   XMIT(2,ADDSTR); FILE THE ABBREVIATED KEY WITH MASTER RECORD NUMBER
610   GOTO C110;      RESUME THE LOOP
620 EC110,;          END OF PROGRAM - CLOSE FILES
630   FINI(1)
640   FINI(2)
650 STOP

```

3. At this point, having compiled and run the above program, the entire "ADDRES" file is now reduced to less than 13% of its original size and ready for sorting. The following SORT command file is used to run the SORT:

```

100 DEFINE
110 F1, A12;          LASNAM
120 F2, A12;          CITY
130 F3, D5;          THE RECORD NUMBER - NOT TO BE SORTED
140 INPUT ADDSRT/2;   FILE TO BE SORTED, RESIDES ON LOGICAL UNIT 2
150 SORT 5/3,4,5,6,7; ASSIGN THE FIVE WORK UNITS FOR THE SORT
160 KEY F1,F2;       SORT ON NAME FIRST, THEN ON CITY
170 OUTPUT ADDSRT/2; OVERWRITE ADDSRT WITH SORTED ABBREVIATED FILE
180 END
    
```

4. The above SORT command file is written on the SYSTEM DISKETTE and, at runtime, the ADDSRT file is sorted with the command: RUN SORT, cmndfl. Upon completion, the file ADRSRT will contain the sorted abbreviated records. It is now necessary to reconstruct the original ADDRES file. This is done by use of another short program (which we call ADREDO) and a re-assignment of the logical units. Assign the logical units, with the above example: RX1, 33 (ADDRES FILE); RX1, 4 (SORTED -- destination -- SHORT FILE); RX0, 33 (NEW TEMPORARY ADDRESS FILE ON SYSTEM DISKETTE). Using the RECORD SECTION described above, the following program will finish the SORT:

```

100 PROC 3
110   ADDREC=00000;
120   INIT(1,UP,'ADRES',1);   THE UNSORTED FILE ON RX1
130   INIT(2,IN,'ADSRT',2);   THE SORTED "SHORT" FILE
140   INIT(3,UP,'ADRESX',3);  NEW SORTED FILE (TEMPORARY) ON RX0
150 R100, ;                   START READ/WRITE LOOP
160   INCR RECNR;             GET NEXT RECORD NUMBER
170   XMIT(2,ADDSRT,ER100);   GET SORTED ABBREVIATED RECORDS TO END OF FILE
180   ON ERROR R110;         AVOID CRASH - SHOULDN'T HAPPEN, BUT ?
190   READ(1,ADDRES,ADDREC);  READ EACH ORIGINAL RECORD IN SORTED ORDER
200   WRITE(3,ADDRES,RECNR);  WRITE EACH RECORD IN SORTED ORDER
210   GOTO R100;             RESUME THE LOOP
220 R110;
230   DISPLAY(1,1,1);        CLEAR SCREEN
240   DISPLAY(5,10,'THERE IS AN ERROR IN THE RECORD NUMBER FOR THE!')
250   DISPLAY(6,10,'ACCOUNT NAME OF:')
260   DISPLAY(6,28,LASNAM);   DISPLAY THE PROBLEM ACCOUNT
270   DISPLAY(8,10,'PROGRAM WILL NOW TERMINATE!'); ADVISE OF TERMINATION
280 ER100,
290   FINI(1)
300   FINI(2)
320   FINI(3)
330 STOP
    
```

5. Having compiled and run ADREDO, above, the fully sorted file resides on RX0. If you are sure of your program, then you can add a step to the above program which merely will transfer the file from RX0 to RX1, or you can accomplish the same thing with PIP, OPTION D.

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6. We do embellish our program with screen displays to show the record number which is being worked upon, and the stage of the program, so that the operator will have visual confirmation of the program operation. Further enhancements in our own programs include the elimination of records which have been "deleted" (we use a blank for LINE(1) to indicate a deleted record) and elimination of indexi which will be superseded upon the creation of a new index on the newly sorted file.

#### CALL FOR PROGRAM HINTS

In the last issue we did emphasize our need for participation on your part to help keep the Newsletter alive. The response was encouraging. Now, we are going to be somewhat specific. In about two issues, we would like to present a fairly extensive review of the use of INDEXES (indexi?) with DIBOL programs. We have seen many different approaches, and many seem to be fine for their particular application. A review of the various concepts, and their applications, might be of interest to many of the readers. Your participation is invited and your cooperation in sending us some of your ideas and applications will be appreciated and will aid in this project.

By INDEXES, of course, we are referring to the manner in which specific records from a file are accessed. The creation and use of INDEXES for such purposes often times involves considerable thought and development for maximum utilization. Among the various considerations are those of (a) where should the index (or indexes) reside; (b) how should the index be modified under program control, if at all; (c) how should the index be created in the first place.

The solutions suggested in Appendix D of the COS-310 Reference Manual, while helpful, are not really as efficient as they might be and, to a large extent, depend upon the presence of sorted files.

Please send your ideas and solutions so we may include them in our article in the future. Thank you.

#### PATCHES

Two PATCHES are presented in this issue: (1) DATE PATCH to Version 6.05 (discussed above) and PT02 to VERSION 8.01. The PT02 (V8.01) PATCH solves a problem associated with some operating characteristic differences among various RX01 drives. The specific problem involves an inability to access drives 2 and 3 with RX01 handler provided on VERSION 8.01. (We have not tried this PATCH with VERSION 8.00 and, since we have not experienced the problem which is being cured, are unable to state at this time whether it is required for VERSION 8.00.) The PATCH is to SYSGEN and will correct the problem. IT ALSO CHANGES THE VERSION NUMBER OF SYSGEN TO V8.01B.

After the PATCH is installed, it is necessary to RUN SYSGEN/C to install the modified RX HANDLER in the MONITOR.



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```

0100 ;COS 310 V 6.05 PATCH TO DATE
0110 ;PATCH ALLOWS DATE ENTRY 1ST JANUARY 1980 -31ST DECEMBER 1987
0120 ;ALSO UPDATES VERSION NUMBER TO 6.05D
0130 ;ALL OPERATOR ENTRY'S ARE IN ANGLED BRACKETS<>
0140 <R PATCH (CR)>
0150 COS PATCH SYSTEM VERSION 6.05
0160 FILE NAME: <COMP>
0170 BLOCK: <14>
0180 LOCATION: <164>
0190 OLD VALUE: 0132
0200 NEW VALUE: <0126>
0210 LOCATION: <172>
0220 OLD VALUE: 2301
0230 NEW VALUE: <2101>
0240 LOCATION: <END>
0250 RELATIVE CHECKSUM: <7574>
0260 NEW BLOCK PATCHED OK
0270 BLOCK: <2>
0280 LOCATION: <211>
0290 OLD VALUE: 1630
0300 NEW VALUE: <1631>
0310 LOCATION: <END>
0320 RELATIVE CHECKSUM: <1>
0330 NEW BLOCK PATCHED OK
0340 BLOCK: <END>
0350 02 BLOCK(S) PATCHED IN THIS FILE
0360 FILE NAME: <CREP>
0370 BLOCK: <4>
0380 LOCATION: <376>
0390 OLD VALUE: 1630
0400 NEW VALUE: <1631>
0410 LOCATION: <END>
0420 RELATIVE CHECKSUM: <1>
0430 NEW BLOCK PATCHED OK
0440 BLOCK: <6>
0450 LOCATION: <161>
0460 OLD VALUE: 0132
0470 NEW VALUE: <0126>
0480 LOCATION: <171>
0490 OLD VALUE: 2301
0500 NEW VALUE: <2101>
0510 LOCATION: <END>
0520 RELATIVE CHECKSUM <7574>
0530 NEW BLOCK PATCHED OK
0540 BLOCK: <END>
0550 02 BLOCK(S) PATCHED IN THIS FILE
0560 FILE NAME: <DFDIR>
0570 BLOCK: <2>
0580 LOCATION: <144>
0590 OLD VALUE: 0110
0600 NEW VALUE: <0120>
0610 LOCATION: <END>
0620 RELATIVE CHECKSUM <10>
0630 NEW BLOCK PATCHED OK
0640 BLOCK: <END>
0650 01 BLOCK(S) PATCHED IN THIS FILE

```

```
0660 FILE NAME: <CR>
0670 PATCHING MONITOR
0680 BLOCK: <14>
0690 LOCATION: <143>
0700 OLD VALUE: 5567
0710 NEW VALUE: <5570>
0720 LOCATION: <371>
0730 OLD VALUE: 6200
0740 NEW VALUE: <6000>
0750 LOCATION: <END>
0760 RELATIVE CHECKSUM: <7601>
0770 NEW BLOCK PATCHED OK
0780 BLOCK: <15>
0790 LOCATION: <110>
0800 OLD VALUE: 5567
0810 NEW VALUE: <5570>
0820 LOCATION: <END>
0830 RELATIVE CHECKSUM: <1>
0840 NEW BLOCK PATCHED OK
0850 BLOCK: <16>
0860 LOCATION: <372>
0870 OLD VALUE: 7660
0880 NEW VALUE: <7650>
0890 LOCATION: <END>
0900 RELATIVE CHECKSUM <7770>
0910 NEW BLOCK PATCHED OK
0920 BLOCK: <36>
0930 LOCATION: <375>
0940 OLD VALUE: 0110
0950 NEW VALUE: <0120>
0960 LOCATION: <END>
0970 RELATIVE CHECKSUM: <10>
0980 NEW BLOCK PATCHED OK
0990 BLOCK: <27>
1000 LOCATION: <153>
1010 OLD VALUE: 0000 ;ONLY IF NO LETTER AT END OF 6.05
1020 NEW VALUE: <4500> ;COS CODES FOR 'D' & ' '
1030 RELATIVE CHECKSUM: <4500>
1040 NEW BLOCK PATCHED OK
1050 BLOCK: <END>
1060 05 BLOCK(S) PATCHED IN THIS FILE
1070 FILE NAME: <END>
1080 EXIT
1090 COS MONITOR 6.05D
```

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COS-310 V8.01A  
(PATCH 2)

Seq 2 M

2 of 4

1. Create a PATCH command file (PT02) using the following editor commands:

```
.ER  
.LN  
.0100 SYSGEN  
.0110 2  
.0120 361  
.0130 0346  
.0140 375  
.0150 3743  
.0160 END  
.0170 0001  
.0180 3  
.0190 6  
.0200 5745  
.0210 27  
.0220 6747  
.0230 40  
.0240 1350  
.0250 47  
.0260 5342  
.0270 53  
.0280 7346  
.0290 54  
.0300 3316  
.0310 55  
.0320 1337  
.0330 56  
.0340 7010  
.0350 57  
.0360 6750  
.0370 60  
.0380 6755  
.0390 61  
.0400 7600  
.0410 62  
.0420 6754  
.0430 63  
.0440 0050  
.0450 107  
.0460 5351  
.0470 112
```

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COS-310 V8.01A  
(PATCH 2)

Seq 2 M

3 of 4

```
.0480 5746  
.0490 END  
.0500 0025  
.0510 20  
.0520 314  
.0530 2243  
.0540 END  
.0550 0001  
.0560 END  
.0570 /X  
.0580 <ctrl/z>  
.WR PT02
```

2. Check the PT02 command file by running PATCH without the /C option. PATCH simulates the patching operation but does not change the file on the system device. When run without the /C option, PATCH displays CHECKSUM CORRECT—USE OPTION C TO UPDATE rather than NEW BLOCK PATCHED OK. To check the command file enter the following:

```
.R PATCH,PT02
```

PATCH will respond by displaying the PATCH dialogue and returning to the Monitor. If PATCH does not return to the Monitor, check the PT02 command file to insure that it was entered correctly.

3. Install the patch by entering the following command:

```
.R PATCH,PT02/C
```

PATCH will respond by displaying the PATCH dialogue and returning to the Monitor.

C O M P U T E R   M E T H O D S  
7822 Oakledge Road  
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Phone 801-942-8000

Aug. 20, 1979

Mr. Robert Hassinger, Coordinator  
12-Bit SIG  
Liberty Mutual Research Center  
71 Frankland Road  
Hopkinton, MA 01748

Dear Bob:

Here are some additional items on floppies which you may find interesting. Please feel free to use anything you wish in the Newsletter.

While Gary Coleman correctly points out the failings of single-sided floppies (the 'write through' problem, etc), these problems do not plague the reversible floppies which I use for my 'HUGE' floppy. These 'flippies' are guaranteed by their manufacturers to be as good on one side as on the other. The manufacturers have even punched an index hole for reverse side use. Gary's statement that 'floppies are coated magnetically and formatted on both sides' is only partially true. I have yet to find a single-sided floppy that is formatted on the reverse side.

Some additional points of interest concerning the IBM formatted floppy and the RX01: The IBM formatted floppies have 26 sectors on each track. I discovered recently that the 26 sectors are not evenly spaced on the track! Although everyone else may be aware of that, this came as a surprise to me. I made some tests using my AED floppy disk drive and discovered that while the inter-sector gaps that exist between sectors 1 and 26 are each the same size, the inter-sector gap between sector 26 and sector 1 is considerably larger. In fact, it is large enough to hold three additional sectors while keeping approximately the same inter-sector gap size as before. Since each IBM formatted floppy track begins with sector 1 as the first sector after the index hole, I concluded that the large gap between sector 26 and sector 1 must be to allow floppy disk drives to change tracks in time to catch sector 1 on the next track. The RX01 is not sufficiently fast in track switching to do this—it just misses sector 1 and must wait a full revolution. Jim Van Zee informs me that his DSD440 will switch in time to catch sector 1 on the next track and as a result requires only two revolutions per track instead of three to read the entire track. For DSD440 users, this results in a time savings of 33% over the RX01.

Another point that Jim and I worked out is this: we discovered that the RX01 will write 'HUGE' diskettes formatted with a 2:1 sector interleave only by taking a full revolution to write each sector. However, it will read the same 2:1 interleaved diskette with no trouble at all (the read speed is 26.9 OS/8 blocks per second). This is the reason for the 3:1 interleave on my 'HUGE' floppies. Jim suggested that after a write operation, there is probably a time delay before the head is allowed to read—and that time delay is sufficient to cause the next accessed sector header to be missed (necessitating a full disk revolution). Among the implications of the above is that when one decides to write an OS/8 floppy diskette handler, his timing considerations must take into account that each sector is actually only about 1/29th revolution rather than the more logical (?) 1/26th revolution. This simply means there is less time to load/unload the floppy sector buffer than one might be lead to believe.

Jim mentioned that he sent you some timing information on various floppy formats. Here are some that I have compiled also (all single density and speed is given in OS/8 blocks per second read/write):

Name	Author	Blocks	Speed	Comments
RX01	DEC	494	13.0	12-bit
RX8	Dewar	667	17.3	8-bit
RH8	Haygood	770	18.6	8-bit, 30 sectors/track, 3:1 interlace

The followings will run only on the AED 3100P floppy disk drive:

AGF	Haygood	924	32.0	12 384-byte sectors/track, 2:1 interlace
AGS	Haygood	847	51.9	11 384-byte sectors/track, no interlace

For those readers interested in vastly increasing their floppy storage, I will gladly supply information on the 'HUGE' floppy handler as well as on the handlers for the AED 3100P floppy disk drive. The AGF handler is named the 'Gigantic' floppy and the AGS is named the 'Giant Speedy' floppy (with tongue-in-cheek, of course, as with the 'HUGE' floppy).

Perhaps some of the above might be interesting to Newsletter readers, Bob. From the Rocky Mountain West, I send my best wishes to you and your family.

Sincerely,

*Bill*

W. F. HAYGOOD, JR.



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