THE MISOSYS QUARTERLY

In this issue:

Volume III.iv **$10** **Spring/Summer 1989**

TRS-80 Model I/III/4 Language Software from MISOSYS

Z80 RELocatable Assembler

MRAS [DOS 6.x M-21-083] [LDOS 5.x M20-083]

An advanced Z80 assembly package for the programmer who wants a powerful and flexible development system. It includes a macro assembler which generates either **relocatable object code** modules or CMD files directly, a linker, a librarian, a full-screen text editor, a utility for converting to/from line-numbered files, and a cross reference tool for directly generated CMD files.

MRAS generates M80 compatible /REL files. Supports REPT, IRP, and IRPC macros; nested includes, and a full range of nested conditionals. It has flexible output redirection of listing and symbol table.

MLINK supports virtual memory bit-stream buffering, REL and IRL library searching, zero disk space for DEFS in DSEGs and COMMONs, generation of program overlays, special link items: 0-3, 5-7, 9-11, 13-15.

Includes **MLIB**, our REL module librarian, and our **SAID** advanced **full screen text editor** which can be used to generate your assembler source code, C-language source code, or edit any type of ASCII file.

BASIC Compiler

EnhComp [DOS 6 M-21-072] [LDOS 5 M-20-072]

Released in 1986 and reviewed in the March 1987 issue of *80 Microcomputing* and October 1987 issue of *COMPUTER SHOPPER*. EnhComp has lots of great features; handles the bulk of Model III Microsoft BASIC and supports additional commands and functions. Standard is floating point with both **single and double precision** functions; random file access ("X" mode for reclens to 32767), turtle graphics, pixel graphics, keyed array sort, multi-lined functions, user commands, REPEAT-UNTIL, line labels, and more.

A *supervisor* program automates the edit-compile-test phases inherent when using compilers; this makes using EnhComp almost as easy to use as your BASIC interpreter.

With its built-in **Z80 assembler**, you can **easily** create hybrid programs of BASIC statements and in-line assembly code which **completely eliminate** contorted string packing and DATA statement high-memory module techniques for your BASIC program to access a machine code module.

You'll have to edit *existing* BASIC programs, but the power and completeness of EnhComp make that an easy task.

RATFOR Compiler

RATFOR-M4 #M-21-073

RATFOR compiles to FORTRAN; is **fully structured** facilitating modification and debugging; comments are simpler and more versatile than in FORTRAN, simplifying self-documentation. This allows changes without the subsequent debugging tolerated when modifying FORTRAN. RATFOR *compiles* source code to an *object* of FORTRAN; use your existing FORTRAN compiler to convert this to executable.

RATFOR is an excellent language for general purpose use, but it is vastly superior to FORTRAN when working with a large number of modules without documentation, as is necessary when producing very large programs.

Extensions supported include the "arith" macro to perform binary arithmetic operations, read and print macros for short form READ and PRINT, and support of any valid FORTRAN expression for "switch" and "case" operands.

This package includes the language translator, a *batch* file to automate compilation, a language Reference Manual, an Installation Manual, application programs in source code on disk, and our LED text editor for source code preparation.

Z80 Assembler

EDAS [DOS 6 M-21-082] [LDOS 5.x M-20-082]

This powerful combined disk-based **line editor** and Z80 **macro assembler** assembles from nested source files or memory buffer; nested conditionals with ten pseudo-ops, nested MACROs with parameters both positional and by keyword, cross reference listings; and a separate **full screen text editor**.

If you are writing system software, support software, applications - big or small, EDAS will provide the power to make your job easier, faster, and more worthwhile.

Z80 Disassembler

DSMBLR [DOS 6 M-31-053] [LDOS 5.x M-30-053]

Provides direct disassembly from CMD disk files, automatic partitioning of output disk files, data screening for non-code regions, and ***full label generation***. It even generates the ORGs and END statement - the complete ball of wax. You will find that the use of this disassembler - *even by a beginning assembly language programmer* - will be paying handsome rewards with the ease of its use and clarity of the documentation. It's a professional tool for your use.

The disassembler allows you to build a *screening data file* telling what segments of the program are to be interpreted as data regions. You enter the addresses of the "segments" after analyzing the target program's disassembly.

Output to **DISK** produces a file suitable for MRAS/EDAS and is automatically segmented into manageable file sizes.

REL Disassembler

UNREL [T80 M-30-054] [CPM M-32-054]

Decodes an M80-type relocatable object module and outputs an MRAS/M80 assembler source file. We bundle in **SPLITLIB** to split a library into separate modules and **DECODREL** to display the *bit stream* of a REL file.

UNREL assumes anything in a code segment is code, and anything in a data segment is data. It supports special link items: 0-3, 5-7, 9-11, 13-15.

UNREL should be the perfect professional assembler's tool for your bag of tricks.

Full C Compiler

MC [DOS 6.x M-21-064] [LDOS 5.x M-20-064]

If you are looking for a **full C compiler**, look no further. If you are looking for a well stocked UNIX System V standard library, look no further. **MC**, reviewed in the January 1987 issue of *80 MICROCOMPUTING*, is a complete C compiler which adheres to the standards established by Kernighan and Ritchie. The library of functions is extensive and System V compatible. The compiler generates Z80 relocatable macro assembler code (M80 or our MRAS). The libraries are files of relocatable object modules. **MC** is a full-featured compiler for the discriminating programmer!

MC supports command line *I/O redirection* for compiled programs, *wild-card* file specifications, parsing for UNIX "." extensions in file specifications, *overlay* support (requires MRAS), a full pre-processor, lots of options, and is designed for the programmer wishing the ultimate in C compilers. The package is supplied with the compiler, pre-processor, an optimizer, assembler macro files, C libraries, a Job Control Language file, the header files, and a 400+ page user manual. MC requires the use of either M-80 or MRAS (available separately), 2 disk drives, and upper/lower case.

Special Sale Prices

Product	Specify Model	Sale$	S&H
DSMBLR	~~$34.95~~	$17.48	$2
EDAS	~~$74.95~~	$37.48	$4
EnhComp	~~$99.95~~	$49.98	$4
HartFORTH	~~$59.95~~	$29.98	$3
MC	~~$124.95~~	$62.48	$5
MRAS	~~$89.95~~	$44.98	$4
RATFOR	~~$99.95~~	$49.98	$5
UNREL	~~$49.95~~	$24.98	$2

Prices good through 08/31/89 only with TMQ coupon included with order. U.S. Add S&H. Canada use U.S. + $1. Foreign S&H use U.S. * 3. M/C & VISA accepted. No COD's for this sale. 30-day refund on product if not acceptable.

MISOSYS, Inc.
PO Box 239
Sterling, VA 22170-0239

FORTH Compiler

HartFORTH [DOS 6 M-21-071][DOS 5 M-20-071]

HartFORTH is a ***full FORTH*** that conforms to the **79-STANDARD**. The Model I/III version is an indirect threaded version; the DOS 6 version is a direct threaded implementation providing greater execution speed of 10%-40% depending on the details of the actual program. The kernal contains some additional useful words and utilities which turn HartFORTH into a full-fledged development system.

HartFORTH is designed to ***run under an operating system*** which is totally transparent to the programmer or user. The virtual Memory that it accesses for storage and retrieval purposes is a normal DOS file that is requested by the FORTH system when it is first entered. Doing this has several advantages in that it provides for FORTH files to be used in other language application programs and vice-versa. Enhancements have been built into the kernal in the form of functions to call the operating system file handling routines so that other files may be created or accessed.

HartFORTH supports double length integers, string handling, cursor manipulation, graphics, random numbers, and floating point.

Take any TWO language products at 50% off!

30-5-89 5-58
13-6-89

The MISOSYS Quarterly is a publication of MISOSYS, Inc., PO Box 239, Sterling, VA 22170-0239, 703-450-4181.

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THE MISOSYS QUARTERLY

subscription rate information

Each issue of TMQ has information on MISOSYS products, programs and utilities, patches, significant messages from our CompuServe forum, and articles on programming. Not only that, TMQ will keep you up to date with information, news, and announcements concerning our entire product line and related machine environments. Subscription cost varies by rate zone as follows:

A = $25; United States via 3rd class bulk mail
B = $30; Canada, Mexico, or United States via 1st Class
C = $32; Columbia, Venezuela, Central America via AO Air
D = $35; South America, Europe, & North Africa via AO Air
E = $40; Asia, Australia, Africa, Middle East via AO Air

TMQ Toolbox

The MISOSYS Quarterly is published using the following facilities:

The hardware used for development of the "camera ready" copy consists of an AST Premium/386 computer (20 MHz) equipped with 5 Megabytes of RAM, a Seagate ST4096 80-Megabyte hard drive, a Colorado Memory Systems DJ10 tape backup device, a NEC Multisync II color monitor driven by a Video Seven VGA card, an AST TurboScan scanner (Microtek MS300), and a NEC LC-890 PostScript laser printer.

Text is developed, edited, spell-checked, and draft formatted using Microsoft WORD Version 4.0; Submissions on paper and letters are scanned and converted to text using ReadRight optical character recognition software by OCR Systems. Final page composition is developed using PageMaker 3.0 by Aldus. Cover art and clip art comes from CLIPPER, a product of Dynamic Graphics.

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List of Advertisors

The Blurb by Roy Soltoff

Points to Ponder

Can we talk??? Right now I'm looking at a stack of mail approximately two feet high. Believe me, all of it will not get answered. There is just not enough profit left in this business to hire someone just to staff a position to answer all of the cards and letters I receive. I try to do the best I can. Support of our products comes from reading our manuals, reading TMQ, raising questions on our CompuServe forum, checking in with Computer Clubs, asking your friends, and trying once or twice before you pick up the phone or draft a letter - generally incomplete to ascertain the problem. I continue get requests for assistance on matters totally unrelated to MISOSYS. I get phone calls on my 800 order line asking for the telephone number of Aerocomp, or Anitek, or Tandy Customer Support (I don't even know that one). I get calls and letters asking how to do something in PROFILE, SuperScripsit, or General Ledger. Please spread the word that **MISOSYS is not a general resource for supporting software which is not published by MISOSYS** - or the Model 4 in general.

Turning to another sore spot of mine, I am beginning to wonder how we still permit the postal service to continue their "operation". According to the International Mail Manual, Issue 6 effective October 5, 1988, [USPS] customers **must wait 60 days** for items sent by air [90 days for items sent by service] **before initiating an inquiry** [for non-delivery] regarding Postal Union mail. There is a $5 charge for each inquiry except under certain circumstances (the sender did not receive a return receipt for which the required fee was paid at the time of mailing, among others concerning express mail, as well as insured mail between the United States and Canada). Packages sent outside of the United States are usually sent via the Postal Service. I can either be at risk by sending a second shipment on a claim of non-receipt prior to the waiting (and search) period, or use other carriers at a much greater cost for foreign shipments. This subject is under discussion due to an extremely irate individual in Canada who has been shipped a product twice and for which I have not yet received confirmation of receipt. Anyone out there have any ideas?

Don't forget the vacation season is coming up soon. So here's some advance notification as to when MISOSYS will be closed for business. We'll be **shut down from June 30th until July 5th** inclusive. We'll also be closed from **August 7th through 11th**. Hours of operation from June 1st through September 1st will be 9am-5pm EDST. I hope you all take some time to enjoy the summer. And for the folks down under who experience winter when we up here have summer, don't let the snow get you down; there's always skiing, skating, and building snow folk - not to mention shovelling, slipping, and sliding.

Finally, this issue turned out to be a fat one. Even so, it is over my limit of 80 pages (limit for mailing weight). But the last issue was a tad short, and ads are helping to pay the postage, so I may just break even. In order to keep it from being excessively over, I had to eliminate a planned chapter on "*Applications for the User*". Starting off Volume IV, my next issue will be heavy in programs. I also plan to include my *Technical Corner* continuing the articles on Computer Math. So keep a look out for the Fall issue.

As a post script, this issue completes three years of publishing effort. I think TMQ has come a long way since that first issue in 1986. The level of subscriptions has never met my expectations, but I get some joy out of doing this publication. I better, because it takes up so much of my time. As there is always room for improvement, your input is always welcome. I have made attempts over the years to integrate the readers' suggestions into the 'look' of TMQ. After all, it's your publication too. Thanks for being there.

The following piece relates to the forum on CompuServe sponsored by MISOSYS. Don't tell me you never knew that CompuServe had a forum devoted to the TRS-80 lineup and MISOSYS products? Well where have you been? Support? That's what it's been there for, folks!

Message Base Contest!

Fm Joe Kyle-DiPietropaolo: Attention All!!! Just in case you haven't noticed, the messages here have been slowly creeping up towards that magic mark of a hundred thousand messages, that's 100,000 messages posted here since this Forum was founded.

In honor of this glorious occasion, we're running a special contest. Specifically, here's the rules:

1) Upload to Library 16 - Open Forum a short text file that contains your guess as to the exact date and time that will be stamped on message number 100,000 here in the LDOS/TRSDOS6 Forum. Only guess files stamped with a date **prior** to the calendar date that the message base hits 100,000 will be considered. One guess per customer.

2) In the event that message number 100,000 is a (P)rivate message, the first non-(P)rivate message after 100,000 will be substituted.

3) The top three closest guesses will receive prizes, and there will be a prize for both the author and the recipient of the magic message 100,000.

4) In the event that I detect any tampering by folks trying to make the messages scroll abnormally fast, or leaving trivial messages, I reserve the right to change the rules anyway I darn well want to. Please, let's keep it clean!

```
#: 100000 SO/General/NewUplds

   08-Apr-89  04:29:25

Sb: #99929-#Data Compression

Fm: Adam Rubin 71320,1052

To: Bill Brandon [DPTRAIN] 76701,256 (X)
```

BBS' and Clubs

I set aside space in TMQ as a service to the Model I/III/4 community of users to publicize the following three things: a list of **phone numbers** of companies still servicing and supporting this market, a list of **public computer bulletin boards**, and a list of **computer clubs** which support the TRS-80 user. The responses received to date appear in the *Letters to the Editor* column (note that the list of 'Resource: Companies' was generated by me). **Mail** me any additions, deletions, or changes.

TMQ Schedule

You should have recognized that this issue is entitled 'Spring/Summer 1989'. I gave up trying to migrate TMQ up three months just so the 'season' matches the delivery. Too bad I started the 'Summer 86' issue in the Fall; issue I.i was mailed on August 19th, 1986!

Our new target for mailing the *THE MISOSYS QUARTERLY* is the last week of the respective month as follows: Spring issue in February, Summer issue in May, Fall issue in August, and Winter issue in November. This schedule changes neither the published month nor does it reduce the quantity of any subscriber's remaining issues in their subscription; It only changes the 'seasonal' nomenclature of the magazine so you guys and gals have one less thing to write in about.

Note that your mailing label usually has the expiration date of your subscription. For instance, those with "89/08" complete their subscription with this issue. If you want to save me the cost of mailing a renewal notice, send in your renewal fee quickly. I usually wait about a month after TMQ is mailed before sending out renewal notices.

TMQ advertising

If you are interested in reaching a dedicated TRS-80 audience, consider *THE MISOSYS QUARTERLY*. If you have a TRS-80 Model III or 4 related product to sell, you can reach these buyers by placing your advertisement in our publication. TMQ is read world-wide. Our subscribers are predominantly in the United States; however, we do have a significant number in Canada, Europe, and Australia.

Note that this issue contains a considerable response from the 'advertising' community. Perhaps I made the rates too low! Anyway, I'll keep them as they are. Please mention TMQ when you call or write to these folks; they deserve your support. Current space rates are as follows:

Full page	$125
Half page	$75
Quarter page	$50
Ninth page	$20

Note the ninth-page ad layout designated '*The Marketplace*', which is the last page of this issue. I compose this so you have no artwork charge. Just submit your text. We accept only black & white ads; however, ads for our inside covers are printed in the same color as the cover (TMQ alternates between PMS colors: green 354, purple 266, blue 293, and red 199). If you would like to place your ad in *THE MISOSYS QUARTERLY*, give me a call.

PD Software Librarian

Vic McClung has volunteered to be the librarian for the collection of TRS-80 public domain diskettes. Henceforth all requests and contributions be directed directly to him at:

Vic McClung
914 Crescent
Sikeston, MO 63801

DISK NOTES 3.4

Each issue of *THE MISOSYS QUARTERLY* usually contains program listings, patch listings, and other references to files we have placed onto a disk. DISK NOTES 3.4 corresponds to this issue of TMQ. If you want to obtain all of the patches and all of the listings, you may conveniently purchase a copy. Due to the abundance of textual material included in this issue, there was no space for the five or so programs I wanted to publish. So DN3.4 will have lots of free space.

DISK NOTES is priced at $10 **Plus S&H.** The S&H charges are $2 for US, Canada, and Mexico, $3 elsewhere. If you purchase DISK NOTES 3.4 with the coupon which accompanies this TMQ issue, you can save $2.50; the cost then being only $7.50 + S&H.

Out of print TMQ's available

For out of print issues, we are providing back issues of *THE MISOSYS QUARTERLY* via copier reprint. The price is **$12.50** plus $2.75 S&H in the U.S. and CANADA. For foreign zone D, the S&H rate is $5.50; zone E is $6.50. The price for regular back issues still in print is $10 + S&H. We are currently out of print on all issues except II.iii and Volume III. Here's a synopsis of past issues:

Volume I See the index in issue III.i.

Volume II See the index in issue III.iii.

III.i Reading NEWDOS/80 disks; An LB archival utility; Popup Application Window; XMODEM in C; Getting into computer math, part I; TMQ Volume I index.

III.ii Getting into computer math Part 2; Writing interactive RATFOR/FORTRAN programs; PRO-EnhComp: a review; Desktop publishing and the Model 4; A better TERM/APP; adding floppy drives; and a new XLR8er interface.

III.iii The CRC program; PG: a page display program; Locating high

memory routines; FIXMA3; Jumbo tape backup for PC clones; New style for TMQ using Pagemaker; and an Index to Volume II.

Hard Drive update

I finally have some good news, mostly. Recollect that in TMQ III.iii, I noted that direct software control of the sector size in a WDXT-GEN controller was not possible, and I was pursuing alternatives.

I investigated what it would take to 'modify' the board to get at the WD1010 controller chip. It would have taken cutting 11 traces and wiring 22 leads between the GEN and some external circuitry. That was not a direction to take.

I also was looking for some Omti 5510 controllers which were short card XT-type. I actually found a supply of approximately 240 of these at Arrow Canada. But the price was a little high; I would have had to purchase the entire block; and that was all there was folks!

So I finally latched onto some supply of Adaptec 4000A controllers and Xebec S1410A controllers. Both of those controllers use a subset of Small Computer Systems Interface (SCSI). The Xebec S1410 was popular a number of years ago, and was used by VR Data, ARM, and others. The Adaptec 4000 was used by Lobo Systems for the WIN series of hard drives associated with the MAX-80. I have purchased a reasonable supply of these two types and am still on the lookout for a continuing supply (at reasonable costs). The Adaptec 4000A is still being manufactured; the Xebec S1410A is discontinued (Xebec no longer manufactures controllers).

The engineering of our host adaptor has already commenced. I expect to commence shipping in August. The fallout of this re-design is that the controller I will be using for this hard drive project will not be re-usable in a PC environment; however, a benefit is that by using an Adaptec 4000 controller, I have a drive which plugs directly into the hard drive port of the MAX-80. So any MAX-80 users who are looking for a drive package, I can ship today - with software! On the other hand, although I will be offering individual components (drives, cases, host adaptors, cables, etc.), I will not be selling controllers by themselves. Anyone who is interested in just our host adaptor and software will need to procure their own compatible hard disk controller.

My drive packages will be offered as 'pre-assembled kits'. your 'kit' will be assembled to order and fully tested; all you will need to do is plug it in and install the software. MISOSYS likes to do things the right way; so I'm going to be offering a hardware clock option (the clock chip fits right on the host adaptor), and a joystick port option (with joystick) which emulates the old Alpha Products port interface.

I have tried to stay within my proposed target of $495 for a 20 Megabyte package; however, my original assumptions were based on using an inexpensive header connector on the hard drive case. Inexpensive header connectors are out (note that lots of Tandy hard drive folks have problems with those connectors); 50-pin Champ connectors are in. The 'champ' connector is the standard connector these days for SCSI ports. This connector looks just like the 36-pin 'Centronics' printer connector you see on all parallel port printers, but it's 50 pins, not 36. I'm using top quality Amp bail lock Champ connectors. So the host (your computer) to hard drive connecting cable will be an additional charge (see pricing below).

The MISOSYS hard drive kits use a Leadman case which supports up to two half height drives or one full height drive; includes a 60-watt power supply and fan. 20 Megabyte kits include a Seagate half height ST225 drive; 40 Megabyte kits include a Seagate half height ST251 drive. Kits include either an Adaptec 4000A hard drive controller or a Xebec S1410A hard drive controller; choice of controller is ours. The Host adaptor which interfaces the controller to the host computer is designed and manufactured by MISOSYS or its contractors; uses a state of the art Programmable Logic Device (PLD) for address decoding and control; includes a socket for a DS 1287 clock chip with embedded battery (10-year life), and header for connection to standard 9-pin joystick (4-position, single button). Drive kits include auto-controller sensing driver and formatter software for ease of installation, archive/restore file management software, and sub-partitioning software; software support for Model 4 or III is available (one supplied). Drive kits require a 50-pin SCSI to 50-pin edgecard host connecting cable.

At this time, I am accepting orders for proposed August shipments of 'pre-assembled kits' only; orders for our host adaptor will be accepted once shipments commence. Orders received prior to September 1st, 1989 will receive a host connecting cable at no charge. The following prices are currently in effect and are subject to change:

20 Megabyte kit: M3 or M4	$495
20 Megabyte kit: MAX-80	$450
40 Megabyte kit: M3 or M4	$645
40 Megabyte kit: MAX-80	$600
Hardware clock option	$30
Joystick option	$20
Host interface cable	$20
Additional software interface	$30

Note: shipping weight will be approximately 20 pounds per drive kit; freight charges are additional.

XLR8er Update

As of this writing, I have just received 100 XLR8er boards. These will probably be the last ones available. Ordering this quantity allowed me to reduce my manufacturing cost; thus, I want to pass some of that on to the purchasers of these boards. In addition, memory prices have been coming down, and I want to make those reductions available to XLR8er purchasers. Effective immediately the price of the XLR8er board is as follows:

XLR8er with 0K RAM	**$150**
XLR8er with 256K RAM	**$200**

Shipping & Handling is additional.

Letters to the Editor

MISOSYS MS-DOS Products

Fm Pete Betz: Roy, None of my MISOSYS literature seems to deal with (YECH!) MS-DOS software. How can I find out what you have available for (UGH!) MS-DOS machinery? I'd especially like to get SAID working on my 1400LT so I won't have to shift mental gears between machines.

What was the last issue of TMQ sent out? I've suddenly realized I haven't received anything since Summer-1988, but I don't think I was due to expire.

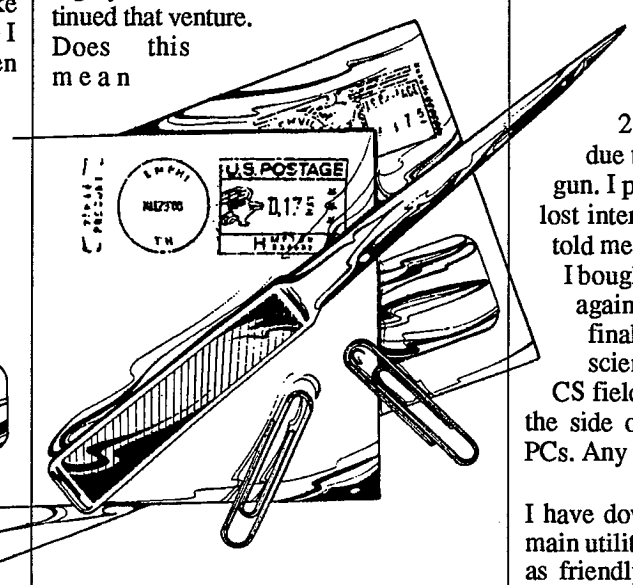
Fm MISOSYS, Inc: Funny you should ask. I have your Fall issue sitting on my desk marked returned - not at this address. It was sent to PO Box 8071. You're not due to renew until later on this year. Quickly get a correct address to me as the next issue (Winter 88/89) should be mailed in about 10 days.

MISOSYS publishes two catalogs/flyers; one is for TRS-80 and the other is for MS-DOS. We supply a fresh TRS-80 flyer with a TRS-80 product order while the MS-DOS catalog goes out with the MS-DOS product order. Economics preclude our mailing out new catalogs at frequent intervals.

We have published information on our MS-DOS products from time to time in *THE MISOSYS QUARTERLY*. For instance, TMQ III.ii has advertisements on the rear cover which provide information on DED-86, RATFOR-86, and ED/ASM-86, as well as our MS-DOS version of Lair of the Dragon. TMQ III.i carried our ad for LB86. This issue should carry information of our new HartFORTH-86 release as well as the Colorado Memory Systems tape drives and Fujitsu floppies we're carrying.

Remember Chemical Bank's PRONTO?

Fm Ron Ungashick: Roy, I read recently that Chemical Bank, who had "PRONTO" as a trademark for their electronic banking system, has discontinued that venture. Does this mean



that you are free to change PRO-WAM back to PRO-NTO? Just kidding. Anyway, it must be nice to know that your product outlasted theirs.

Fm MISOSYS, Inc: They'll probably insist on retaining the copyright for a billion years...

LS-DOS 6.3 updates

Fm Jerry Locke: Well I just bought at Radio Shack another copy (I have two 4p's) of LS-DOS 6.3 that is Level L+. I was not aware before now that there is a "site" license available. Maybe that is more what I need; I collect the 4/4P equipment when I can find it cheap and it would be inconvenient to buy a new DOS each time I find a machine. Since I have two copies, can I take $80 off instead of $40 from the price of the site license?

What does "L+" mean, anyway? The update documentation stated that the release levels come in pairs (A,B ... K,L, etc.) but what is a plus sign for? Has LS-DOS 6.2 for the 2/12 been updated to 6.3 yet?

I know, always full of questions! Let me tell you what I have been doing lately. About 2 years ago my original 4p died due to injuries caused by my solder gun. I purchased a 1400LT and sort of lost interest. Two months ago a friend told me about a 4p for sale for $200 so I bought it. Back in the TRS-80 world again... it's great to be back. I also finally got my B.S. in computer science so I am now working in the CS field. Trying to start a business on the side of supporting and training for PCs. Any suggestions?

I have downloaded about 50 public domain utilities for MS-DOS to try to get it as friendly and useful as LS-DOS has always been.

Fm Joe Kyle-DiPietropaolo: Jerry, Support and training for PC users is an up and coming field. I'm no expert on the topic, but I can see problems with not being taken seriously as a "small" player in the field, plus capital expenditures might

cause a problem "bootstrapping" yourself into a viable position. You might want to check out the CompuServe CONSULT Forum for others in similar positions, though perhaps more oriented towards programming-for-hire.

Fm MISOSYS, Inc: Jerry, The "+" of "L+" indicated a 1-byte change associated with the SPOOLer. There was never a 6.3 update for the Model II LS-DOS 6.2. If you purchased those two 6.3's from MISOSYS or LSI, then I would accommodate you on trading them in towards the site license version.

Is that new ROMC available?

Fm Kent Fasick: Roy, A couple months ago, something was mentioned about a Model 3/4 ROM modified with a built-in hard drive driver. I was wondering what was deleted to make room for the driver, and since the HD wouldn't need a boot disk, how would you change operating systems if the drive is partitioned into CP/M, LDOS, and LS-DOS? Also, was a price ever established? I'd appreciate any info at all.

Fm Brian E. Bradley: Dear Roy, I'm pleased to enclose my money order for US $30.00 to renew my subscription to The MISOSYS Quarterly. I look forward to it's arrival every three months. You might be interested in knowing that it hits my mailbox about 10-12 days after you send it. In my experience, that is a couple of days longer than normal most mail takes.

Regarding the proposed new ROMC for the desktop Model 4, I would be very interested in it. I really have no idea what it is worth in terms of actual cost, but for the convenience it would provide, I'd be willing to pay in the range $30.00-$50.00 range. I hope this item provokes a good response. I've opened a topic in the TANDY RT on GEnie to try to make more users aware of it, and encourage a greater response. So far, comment has been favourable. I hope these comments find their way to you.

Thank you for your continued support for the Model 4. I truly hope that you will receive, in return, strong support from we users.

Fm MISOSYS, Inc: Because of the little interest fed back to me, I decided not to offer the XROM as a product; however, I have discussed with its author the possibility of directly making it available. Therefore, anyone having an interest in that revised Model 4 BOOT ROM, and associated hard disk boot software, contact the following for additional information:

M.A.D. Software
P. O. Box 331323
Fort Worth, TX 76163

Floppies for sale

Fm Dayton Sumner: Roy, Would your Fujitsu half-heights be suitable for converting a 4P to double sided drives?

Fm MISOSYS, Inc: Certainly. All you need to add is the "full-pin" internal cable. I don't have them available for folks who may need the internal cable; however, I may just look into generating them as well.

1.44 M drives

Fm Kent Fasick: How do 1.2 meg 5.25" disks and 1.44 meg 3.5" disks compare to 8" disks for format and transfer rate? My disk controller (Micro Mainframe) supposedly can handle 8" drives and I was wondering if it might be feasible to add a couple of these to my Mod 4.

Fm MISOSYS, Inc: They should use the 500KHz transfer rate - same as the 8" drive. So if you write a driver to switch to the 2Meg clock on your FDC, that should handle the hi-density drives. It may take a fast Model 4 to keep up.

On the other hand, check out my report on 3.5" drives in the MS-DOS Topics section of DOS Topics in this issue.

Fm Joe Kyle-DiPietropaolo: Kent, Roy's gotcha covered. The only thing I'd add is that some of the 1.2 meg disk drives nominally rotate at 360 RPM in the HD mode, and 300 RPM mode. Others stay at 360 RPM and the IBM AT disk controller actually reads them at a 300 kHz data rate rather than the normal 250 kHz rate.

Lastly, the 3.5 inch 1.44 meg drives rotate at 300 RPM, that's how they gain the extra capacity over the 1.2 meg five inchers. You could probably squeeze 36 sectors per track on there rather than 32 (256 byte sectors).

LB & LS-DOS

Fm Donald R. Arrowood: In the TMQ Vol. II, Issue i, on a upgrade for LB from three disks to a two disk upgrade by sending back the three disks and $12 + $2 S&H - Is this still the current way/price for the upgrade & does the LB Maintenance Utilities I have, still the same to use for the upgraded version.

Fm MISOSYS, Inc: Donald, The $12 + S&H is still the way to get the 2-disk vs 3-disk replacement for LB in order to create a 6.3-type startup disk for LB on a floppy-based system. There is absolutely no change in the behavior of LB or the LBMU. The 2-disk set just has some utilities to create the MemDISK system image file instead of supplying it a a 6.2 version as was done with the original LB.

Note also, that if you have PRO-WAM, then you may also want to request the LB 1.x beta release. We have been working on the first phase of a new LB product release. The first phase is porting and regrooming the source to use with MC (on the Model 4) and MSC (under MS-DOS). The beta disk(s) is the result of complet-

ing phase 1. Phase 2 will commence shortly; Rich and I have had an in-depth discussion over the large list of possible enhancements and improvements. I'm proritizing the list as soon as this issue of TMQ goes to the printer.

Current Versions

Fm Mark P. Fishman: Roy, Could you by any chance post a list of the current version numbers or revision levels of MISOSYS products (both MSDOS and TRS80) in one of the LIBs? I know there are some (many) products I need to update, and a list like this would help me send the right disks. The list doesn't have to include any information about changes from prior versions, just the current numbers and product names. This would be a big help.

Fm MISOSYS, Inc: Mark, Versions are irrelevant as we don't necessarily change version numbers when patches are installed. Dates are equally unusable as the date of a user-installed patch would differ from ours.

Fm Mark P. Fishman: OK Roy, then I will complete my task of reviewing my library of TMQs and comparing notes of patch dates to the disks. Have there been (m)any patches or updates that were **not** announced in TMQ? I seem to recall at least one such discussion here on the SIG, perhaps about RATFOR?

Fm MISOSYS, Inc: Mark, Every patch ever applied by MISOSYS has been published in TMQ. That's every patch since the demise of *NOTES FROM MISOSYS*. TMQ I.i had a lot of patches to bridge that gap. Patches proposed by others which were not official MISOSYS patches may not have appeared in TMQ. So if you have all TMQ issues, you have all the patches. You may not have all of the releases as there have been some upgrades. But those (like PRO-WAM 1.x to 2.x and MC 1.6 (I believe that's the number)) were also announced in *THE MISOSYS QUARTERLY*.

As far as confirming exact replication of our master disk, that may be possible by using Hans de Wolf's CRC program which appeared in TMQ III.iii. I hope to get the data generated by running his program against all of our master disks published soon; perhaps in this issue, or a DISK NOTES.

Model 4 HELPS

Fm Fred Campbell: I would like to get the addresses of some magazines that are for the Model 4. Can anyone give me this information? I also saw a message that said something about a Model 4 Utilities diskette. Where can I order it? Do they mail to Japan? I appreciate the good informative help that I have received from this forum's members [LDOS CompuServe forum - PCS-49]. The Cherry blossoms are in full bloom and it is very beautiful in Tokyo right now.

Fm MISOSYS, Inc: Fred, The cherry blossoms are in full bloom in Washington, DC, too. But they're about ready to fall off.

Contact us for subscription to *The MISOSYS Quarterly*, and also about a catalog of software. Also available are CN80 PO Box 680, Casper WY 82602-0680 (published monthly) and TRSTimes magazine at 20311 Sherman Way, Suite 221, Canoga Park CA 91306 (published bi-monthly).

Wanted for Mod 16

Fm Rae Hansen [CompuServe 72336,2723]: A Boy's Home in Southern California is trying to locate the following Radio Shack software and manuals for their Radio Shack TRS-80 Model 16 with two 8.4 megabyte harddisks operating under TRS-DOS Model 16:

(1) 26-4517: Profile Upgrade compatible with Profile II version 01.01.00 (Model II/12/16), or

(2) 26-4515: Profile Plus

(3) 26-483?: Scripsit Wordprocessor - Harddisk version

(4) 26-4834: Scripsit Dictionary

(5) 26-4521: Visicalc

LS-DOS 6.3 Updates, BASIC, BBS's, ...

Fm Ben Carpenter: Dear Roy, I have several questions I hope you can help me with.

I purchased a used Hard Drive and it was set up with LS-DOS 6.3, Level-J. I received the original disk and the instructions with it. I see on page 34 of Vol II.iv TMQ that you now have control of this package and also that there is a level L+? Can I get the registration changed to me and can I get an upgrade to level L+? Is level L+ the latest version?

I have done a little programing in Basic but no machine language programing so could you give me a description in language that a green horn could understand of the different programs listed on the inside front cover of Vol II.iv TMQ? Also recommend what to do or read to start learning Machine language programing on a Mod 4 (and what program or programs would be required). Also do you have a basic compiler for the Mod 4?

I have heard that you can run in to trouble if you move LS-DOS 6.3 from one computer to another because each computer is like finger prints, each one is a little different. Is this so?

Do you have any knowledge of the operation of the two programs by Spectre Technologies Inc on the inside back cover of Vol II.iv TMQ? I am particular interested

in Rembrandt because the ad said it did not need a HI-Res board.

Along with this Hard Drive I also received an original disk, Radio Shack Cat No 26-1130 (Hard Disk Operating System) with LDOS Version 5.1.3 for model III along with the manual. What is the latest version and what is the cost of updating?

At the present time I have a Mod 4 and a Mod III and I am thinking of starting a BBS using the mod III. I would like some helpful suggestions that would make things go a little easier. I am aware that if the BBS takes off and does good I will have to upgrade to a MSDOS class machine but at this time I am not going to spend the money to upgrade as I like TRSDOS and LS-DOS.

Fm MISOSYS, Inc: Ben, Either your seller never sent in the registration card, or it is not yet in the data base. To get your master disk refreshed to L+, all you need do is return the master disk along with the fee of $12. Note with your submittal that the disk should be registered to you. It can then be taken care of.

I recommend that if you want to learn assembly language, then start with an assembler. PRO-CREATE is a good choice to start with. Get a book on the Z80. That may be difficult since it is an older chip, but you should find something in a good computer bookstore. Look through old copies of 80 Micro (perhaps available in a good library).

We have a BASIC compiler called PRO-EnhComp. It was reviewed by Mark Allen Reed in TMQ III.ii, of which you should have a copy.

You can use a single copy of LS-DOS 6.3 on more than one computer provided the operation is not concurrent. You are licensed to use it on one machine at a time. Concurrent use on more than one machine is a violation of the single user license agreement.

I have no knowledge of the two programs by Spectre Technologies. Note that they are now being marketed by Computer News 80. Thus, Stan Slater would be a good source for information.

What you got with the hard disk was most likely LDOS 5.1.3 or 5.1.4, both of which were at one time provided by Tandy. You can get the latest version of the DOS from us. That's the LDOS 5.3 upgrade kit at a price of $34.95 plus $2 S&H. You would re-use the hard disk driver which came with the drive.

As far as a BBS goes, *The MISOSYS Quarterly* issue III.iii contains some input from folks running a BBS; this issue has those summarized and includes additional ones submitted. Why not write to them, or give their BBS a call. I know of BBS' still chugging along on Model I computers. There is no need for an MS-DOS machine to run a BBS.

Tandy's HD Controller

Fm Mark Mueller: Did you see that Radio Shack has lowered the cost of a Model 4 hard disk controller to $299.95? What a bunch of pals, eh? Seriously, does anyone remember if that includes the host adapter, or is that part of the connecting cable set?

And, Roy, how close is the Hard Disk project to fruition? I've got a 4P that is approaching requiring a hard disk (due to your LB Database...(grin)) to run the application it is dedicated to.

Fm MISOSYS, Inc: Actually Mark, a discrete-chip hard disk controller (HDC) such as Tandy's is very expensive. The low cost of the XT-type controllers comes from the extremely high levels of integration used in the chips which keep component costs down, and consume precious little board space. Printed Circuit Board stock is getting costly these days. So although we would wish to have Tandy's controller come to a price competitive with XT controllers, it just isn't going to happen; it can't!

The Tandy controller is designed to plug directly into the 50-pin TRS-80 expansion bus; all address decoding and bus buffering is done on the controller board. Other than that, the board is nearly equivalent to a stock WD1000 controller board, no longer being manufactured.

An alternative is a WD1002-HDO controller which used to be a Western Digital controller; but WD sold the manufacturing rights to a company called RMT Systems out in Irvine. The WD1002-HDO is the standard 5.75" by 7.75" and will need a miniscule host adaptor to do the address decoding and bus interface, but it will then work with the standard Tandy hard disk driver as well as our RSHARD. But that WD1002-HDO will set you back $225 each in 1-24 unit quantities; $192.91 in 25-100 unit quantities. I looked at that HDC as a possibility for our hard drive package, but at $200 per controller, it's impossible to sell a 20 Meg drive package for under $500.

Check out *The Blurb* for our announcements concerning the MISOSYS hard drive project.

More queries on our Hard Drive Project

Fm Jeff Joseph: I'm interested more than ever in your Model 4 hard drive project now! I waited six months for Aerocomp to deliver a 40-Meg unit and then had to send it right back because it won't work with my XLR8er! Some hardware incompatibility, they said... Darn, I really liked it, too.

You distribute it, but I think I should ask anyway: is YOUR Model 4 hard disk going to work with the XLR8er?

Your clock/calendar option is also an advantage over Aerocomp's drive. But I have one small nagging reservation - just what does a 'Leadman case' look like after all? I mean, say it's not one of those ugly clunky-looking PC-type white rocks (please!). Aerocomp's drive in stainless steel at least looks sleek and aerodynamic. I know it shouldn't matter what the thing

looks like, but I'm going to have to spend a lot of time looking at it. Perhaps you could even publish a picture of the beast in the next TMQ?

One other concern... the size of the driver. Aerocomp's weighed in at 490 bytes (so says MEMDIR/CMD). I don't even know it if would fit in lomem with PEXMEM since I couldn't get them to work together. But, isn't that sort of large for a HD driver? With your driver, do you know yet if I'll be able to fit it in lomem alongside PEXMEM and PRO-WAM? This concerns me greatly.

One more thing: will it be possible to expand it beyond 20 meg? What other PC hard disks besides the ST-225 will be usable with your controller/host adapter? How fast is the ST225 (transfer rate and seek time) and are other, faster HDs usable?

A lot of questions, I know. Anyway, I'll need three or four of them when you get around to shipping them (if they look good next to my 4Ds), so let me know when you're ready!

Did I read that right? Are you really considering doing an internal Model 4D modem? Sign me up!

Fm MISOSYS, Inc: First Jeff, I would expect that our hard drive package - once we get it completed - will function with the XLR8er installed. If you really want to see what the case looks like, I am enclosing a copy of the case. I cannot confirm the size of the driver until I get to implement it, but 490 bytes sounds large. I cannot comment on any aspect of my driver until the host adaptor is completed.

The controller can support up to eight heads and 1024 cylinders. That multiplies out to about 65 Megabytes, assuming a drive were available at a reasonable cost with those characteristics. I suspect that I will make 30 Megs and 40 Megs available soon after the project is complete.

The average seek speed of the ST-225 drive is 65 milliseconds; transfer rate is fixed to the ST506 interface which is 5 Megabits/second between the drive and the controller.

As far as the internal modem, yes, I am going to do one. Essentially all I need to do is to come up with a mounting arrangement and cable installation for our TT512P modem. That's the one which mounts in the 4P modem slot. I need to have a physical mounting arrangement, a power cable interface, and a means of plugging into the RS-232 serial port. Also, an extender for the RJ11 telephone interface is needed. That just winds up being a short cable with an RJ11 plug on one end and double RJ11 jack on the other. As soon as I come up with all of the cabling and mounting facility, I'll make the announcement. I already have on order an appropriate cable connector which matches the 4P's modem power connector.

Model III Hard Drive Needs

Fm Leighton H. Davies: I have been advised to contact you by a long standing friend of mine by the name of Leo Knaggs, who is I believe known to you. We are members of NATGUG. I am the Model I and Model III Librarian for the group. (TRS 80).

The reason for my writing is as follows: some time ago I purchased at an auction a TRS 80 Model III twin disk computer along with a considerable amount of various DOS's including your LDOS versions 513 and 530 for the Model III. I also found a 514 version for the Model I. I have more or less converted myself to the LDOS system on the Model III in the last 4/5 months since obtaining these Dos's; however, I have now managed to collect the Hard Drive parts to add a hard drive to the Model III, i.e. the host adapter card and today the hard drive interface card made by Western Digital Corp (type WD 1001-05 made in 1982 serial No. 13968).

Reading the book I had with the LDOS software I see mentioned that LDOS will support the use of Hard drives. I assume however this software is not contained within the normal DOS 's for use with the Model III machine. I wonder therefore if you could please help me to obtain the additional software for use with this device driver; the hard drive I have is as follows - Model HH 738 made in 1987. Other numbers on the drive are - 250018 - 000/70455904, also the serial number of - 78106727. On the motor there is a note which reads - "this drive supports RLL and becomes 36MB drive". (number found on casting is 100341-000) just found it.

The drive came from a stripped IBM PC machine that expired a short while ago. I am assured the drive is in working order but I have not as yet paid for it; I want to see it working first.

I realize you will expect payment for the software driver for the Model III H/D and I will offer to pay using my Barclaycard Visa if that is ok.

Hopefully I have given you enough information regarding the hardware I have to allow you to identify the driver I require. If it's a new version of LDOS I require, I will obviously wish to order it as soon as I can be informed as to it's availability and cost.

I will close by stating that although LDOS so far I have found very good indeed, the wading through the manual can slow down my operation of it quite a bit. I find the drive configuration available suits just about ANY possible combination of drives I can throw at the Model I and the Model III, including - 3" 40 trk SS, 3.5" 80 track SS & DS, to all my 5.25" drives both 40 & 80 track single and double sided. Many thanks for writing such incredible software for us mere mortals who cherish (and sweat over) our venerable 11 year old Model I's and our not so old model III's.

Fm MISOSYS, Inc: Leighton, this is in response to your letter concerning assistance on finding a hard disk driver for your assembled hard drive parts.

I believe that the WD1001 hard disk controller (HDC) was not a direct plug-in to the 50-pin data bus of the Model III, although the HDC is similar to the WD1000/1010 used by Tandy; that's why you also have a host adaptor. Percom used a host adaptor for their drive package which also

used the WD1001 controller.

LDOS, like some other DOS products, has internal support for a hard disk drive, but the driver is the particular software interface between the drive and HDC, and the DOS. The only driver we have that may be "close" is our RSHARD driver which works only with Tandy's hard disk drive, or equivalent. If your host adaptor mimics the ports used by Tandy's (0C8H through 0CFH) package, then RSHARD will work. If it mimics the operation but uses different ports, then you would have to patch our driver. We don't have the time to offer you details about where to patch; you would have to find the port references yourself (or seek assistance from NATGUG experts). RSHARD is $29.95 + $6S&H to UK.

If your host adaptor doesn't mimic Tandy's, as far as the port interface, then RSHARD won't work.

The drive which you are referencing as RLL is probably a 20 Megabyte drive using MFM encoding as supported by the WD1001 HDC. That's what you call a standard ST412 interface (sometimes known as ST506-type).

Still more hard drive queries...

Fm Ron McLain: Sirs, In the last newsletter I received from you folks, which looks to be dated sometime in 1988, there was a reference to an external hard drive for the Tandy Model 4 computer, which is the machine I am currently running my photography business on.

Did the drive ever become reality? If they are available, what is the cost and shipping charges? Can the end-user install the hardware, or should it be done by a technician?

Is *The MISOSYS Quarterly* still being offered? Is the price still $25 per year?

My last question is very frank; is the Model 4 a dead horse? I know of some businesses that are still using them, but the rest of the world is MS-DOS based. I am hesitant to change because everything I need can be done by the Model 4 and at the same time, there is so much more available (both hardware and software wise) for the PC-compatibles.

Thank you very, very much for your time and help.

Fm MISOSYS, Inc: Ron, We are still working on a design for a host adaptor to enable using a low-cost controller. We ran into a snag due to some bad information received from Western Digital concerning the ability to use the WDXY-GEN controller. We have now settled on using the Adaptec 4000 and Xebec S1410 controllers. The host adaptorm is being designed. I am targeting shipments to commence by August 1989.

The MISOSYS Quarterly is still being published; in fact, I am getting more and more involved in it. It is currently being prepared using PageMaker on a 386 PC. The subscription cost is still $25/year for third class mailing, $30/year for first class mailing.

As far as the last question, "is the Model 4 a dead horse?", I'll be equally frank. If I were going out today to buy my first computer, I certainly would not select a Model 4. But if I already had one, and was using one for awhile, if it was still doing the job for me that I needed to be done, I would not bother to get another different type of computer. The end user usually forgets to factor in the cost associated with learning to use a new computer system as well as the cost of obtaining new software. Some folks can't even afford to switch from one program to another because of the tremendous amount of time it takes to learn some of the complex software packages. The bottom line is whether your current computer is doing the job for you. If not, better look elsewhere. If its peripheral changes, then an add-on may still keep it humming without having to re-learn new environments or new software.

For example, I hear from lots of Model 4 users who wouldn't consider switching to an MS-DOS computer; they have too much invested in their Model 4 and it does the job for them. I'm doing some heavy word processing and graphics operations merging graphics and text for generating *THE MISOSYS QUARTERLY*. The Model 4 couldn't keep up with that. Thus, I also have a 386-based MS-DOS machine. But I still use the many Model 4s I have for the work they were geared to perform.

More TRS-80 Computer Clubs

Fm Glyn Roberts: Dear Roy, Just a note to tell you about the most southerly User Group in the world (latitude 42 degrees 36 minutes south). It is:

The Hobart Users Group Inc.
(THUG)
PO Box 420
Moonah, Tasmania 7009
AUSTRALIA

The Group is situated on a very pleasant island with some 440,000 other people which sits in the "Roaring Forties" just south of that 'small island' called Australia.

We Thugs meet twice a month with some 15-25 members attending regularly. The Group membership of 65 is made up of MSDOS and TRS 80 owners, as there are only fifteen Model 3-4-4P users left in the group at last count.

I have the task of producing the Groups monthly newsletter, which is called 'THUGGERY', and I am always on the look out for interesting news items. We are currently running Barry Thrippleton's series of articles on LB. I look forward to getting TMQ each quarter as it always has some very useful tips and hints in it.

Do you have any objections if I were to

occasionally quote from TMQ in our Newsletter? It would be short paragraphs and not complete articles and the source would always be acknowledged.

In between Newsletter deadlines, I have been having fun with RATFOR recently and achieving a 125% increase in speed over interpreted BASIC on my 64180 4P.

Fm MISOSYS, Inc: Glyn, I have no problems with any computer club quoting excerpts from *The MISOSYS Quarterly*. Just cite the source to make everyone happy.

It's never to late to start...

Fm Max E. Thow: I don't know why I am embarking on this XLR8er Board upgrade, I am in my 74th year. I left the work force 12 years ago when my organisation was at the talking stage of computerisation. I branched out into computerisation some eight years later at the age of 70 years +. I am still very much a novice amongst a group of extremely sophisticated computer "buffs" who have "conned" me into taking on the job of their Treasurer.

I suppose I'm really keeping up with the "Joneses". The decision confronting me was MS-DOS or upgrade the 4P, Because of the large number of records I have built up over the past couple of years, I was a little afraid of the first alternative.

I have only recently encountered your publication, *The MISOSYS Quarterly*, even though my Group has been getting it for some time. I am very impressed, although I must admit much of what is written in completely "over my head". Nevertheless, I certainly will be a regular reader in the future.

More TRS-80 Bulletin Boards

Fm Ken Peck, McGregor, TX: Dear Roy, Here's some of that free advertising for "hello, world" that supports the TRS-80 Model 4.

hello, world
(817) 840-2140
300/1200/2400 8N1
24 hrs/day, 7 days/week.

Hello, world runs Mel Patrick's FastPlus II on a vintage TRS-80 Model 4 (serial number less than 175). It says IBM on the front, because I salvaged a couple of old floppy drives off of IBM-PC folks who were moving up to hard-drives. It has a 5 Meg Aerocomp HD. There are areas for TRS-80, MS-DOS, and programming. LD Callers most likely should log on and then immediately off BUT be sure to leave me a message requesting access to TRS-80, MS-DOS, and/or programming areas. Usually within 24 hours, invariably within three days, I will give access.

TMQ discussions about loading the system into the XLR8er's memory reminded me of something I used to do and have been planning to do again on a smaller scale. At one time I had hacked up a DOCONFIG so that when I booted up, it would execute, copy a core image of MEMDISK from floppy and then "SYSGEN" the whole thing up with MEMDISK operative as drive 0. The whole thing took about 15 or 20 seconds. You aren't supposed to be able to do that, and somewhere along the line someone fixed TRSDOS 6.x so I couldn't. But it was fun while it lasted.

I've been tinkering with a couple of Model 4 projects. One is a MC-callable graphics library for the Graphyx Solution high resolution board. I've got one of those installed on my Model 4PDHRXLR8er, but I don't like programming in BASIC anymore and its hard to use their AL interface cleanly from C. Anyway, I can now clear the screen, set/reset/complement/test Pixels, draw lines and boxes (sort of), and am working on ellipses. I've been stealing stuff like crazy, so I'm not sure I can share it. Does anybody know of a good book on very low-level graphics? I am at a total loss on how to do fill().

Another project is a subset of curses for MC and the Model 4. I'm getting tired of reinventing that particular wheel everytime I try to port an interactive program between MC and MSC... not to mention some other environments I must deal with from the Apple II on. There are a couple of related projects such as a generalized menu manager and window editor. I may put some of this stuff together for an article for TMQ one of these days.

Enjoyed the aggie Hacker's Hexadecimal calendar... even if the year 0x7C4 is almost gone. I showed it to our High School principal who said that when he was at A&M they had their own computer language called "Aggieland" which was also used on NASA's computers at one time and is still used at A&M in research. Can't be much of a language, though MISOSYS doesn't have a Model 4 compiler for it... or is Aggie Land what they call Assembly Language at A&M?

Oh yes, put me down for one of those HDs for the Model 4... maybe even two. Eventually that Aerocomp 5 Megger will die and I don't relish fixing it.

Fm Lamar Owen, Stone Mountain, GA: Dear Roy, Thank you for the conversation dealing with the @BANK patches the other day. I learned a good bit from that. This letter, and the enclosed check are for an order for a copy of *THE SOURCE*, which you quoted me a price of $40. I would very much like a full product catalog of your excellent software for the TRS-80.

Thank you for keeping MISOSYS the excellent software giant it is and for keeping us TRS hackers happy with top notch products. Keep up the good work.

For your records, my birthdate is 01/29/68, I own three Model I'S, two Mod III's,

two Mod 4's, and a few others. All machines were salvage except for one of the mod 4's. All work now. My BBS phone number is:

(404) 292-7603
1200 baud, 8N1

I am currently enrolled in the BSEET program at DeVry Atlanta, and I have two more months until graduation. Have a good day, and keep on hacking!

Memory Use, LB Beta, and more...

Fm Ken Strickler: Dear Roy, I would like to try the new LB, but have a bit of a problem with sending you a working disk. My normal configuration is to run directly from my HARD DISK, which means that I really don't have the configured disk. My backup procedure uses a LS-DISKdisk on a 80 TRK DSDD floppy, and I don't know if you can read these. It is exciting to know that LB will now "LIVE", with PRO-WAM, as I usually have PRO-WAM loaded all of the time now. (Usually bank 4, with <crtl><W> for invoking. Bank 3 is used for the SPOOLER and banks 1 and 2 are reserved for Enhanced VISICALC, TKSolver and Allwrite which use them during their operation. Banks 5 through 10 are currently used as a ram disk of 42 tracks, which corresponds nicely to my system disk of 42 tracks, and with a backup :0 :1(i,s) and a swap :0 :2, I have a ram system.)

I am hoping that when the new XLR8er programs come, I will be able to use OverDrive again. Would you have a PATCH to move OD to a bank above 2 (say 3 through 7 somewhere) so that I could still reserve banks 1 and 2 for application programs?

Another area of interest, is that as I use more and more of HIGH MEM for drivers and pointers, do you know of a program which would substitute say one of the other banks for bank 0 during the running of a BASIC program, for instance, allowing a larger BASIC program while I have PRO-WAM, OD, SPOOLER and the like loaded?

One more question - please. In LAIR-OF-THE-DRAGON, are the commands to the game typed in to the keyboard, or of the cursor control type? The reason I ask, is that I am helping a friend get computer oriented, and he is having a little trouble finding the keys. He doesn't want to take typing, and the games that require WORD INPUT seem to keep his attention and teach the keyboard at the same time. (I never thought that I would see a time when I would be looking for a game!)

Looking forward to hearing from you, and if the LAIR program is keyboard driven, I'll have to get it by the end of JAN (you know 30% off!). I will send you anything that you need for LB, but what I am using I don't, think you can read!

Fm MISOSYS, Inc: I know of no utility which will allow programs to automatically switch upper memory to some other bank strictly to allow a larger BASIC workspace. That would be a pretty good trick. Alternatively, if everything installed in memory is "cleanly interfaced", it is possible that DOCONFIG will allow you to switch the configuration of current memory utilization. With various configurations stored in your RAMDISK, the switchover may appear "instantaneous". Of course, you would then not be able to interact with the "previously" memory-resident modules, but that seems like how you want it. It would be ideal to have a special version of BASIC which accessed its data structures entirely through some alternate bank (or banks).

I don't have any patches for OD at this time. But I do think that I will be looking into OD to re-release it for 6.3 use. I know that parts of it are not entirely compatible with 6.3; with extra memory add-ons, it deserves another look. You know that my time is rather limited, don't you?

LAIR is keyboard oriented; you type in words. Thus, it sounds like it is suited for your needs.

TRS-80 Clubs & BBS systems

Fm MISOSYS, Inc: In our issue III.ii of *The MISOSYS Quarterly*, I requested input from any club or BBS still serving the TRS-80 community of users. I wanted the information to start a section in TMQ which would list the known clubs and bulletin board systems. In this issue, I am publishing the two lists of responses I have so far received.

If you are representative of a club or BBS catering to the TRS-80 users, and are not yet on my list, please submit your information.

In addition, I would be willing to include an ongoing list of company addresses and telephone numbers for those establishments still catering to the TRS-80. Advertising in TMQ is not a prerequisite to be included in this list. Contact MISOSYS to be included.

Resource: Bulletin Boards

The Midlands Plaza BBS
Columbia, SC
300/1200 24hrs/7 days 803-776-9600
TRS-80 Model I; 10-Meg HD

MOTHERBOARD:
(415) 352-8442
8/N/1 94545 (SIG #2 for TRS-80's)

West End BBS
300/1200 baud, 24 hrs,
914-858-8722.
Model III; 10 Meg HD; TBBS 1.3.

Resource: Computer Clubs

Mid Cities TRS-80 Users Group
(MCTRUG)
P. 0. Box 171566
Arlington, Tx 76B03

HUB Computer Users Group
(HUBCUG)
530 Buschman St.
Hattiesburg, MS 39401

National Amstrad Tandy & General User Group
Oakfield Lodge, Broad Lane,
Ram Hill, Coalpit Heath, Bristol.
BS17 2TY. Great Britain

NYBBLERS
CHABOT COLLEGE
25555 Hesperian Blvd.
Hayward, CA

Adelaide Micro User's Group Inc.
G.P.O. Box 214,
Adelaide, South Australia 5001
AUSTRALIA

F.J.Seccull General Secretary
TRS-80 SYSTEM 80 COMPUTER USERS GROUP INC.
41 Montclair Street,
Aspley, QLD 4034
AUSTRALIA

SYDNEY TRS-80 Users Group
PO Box 223
Bankstown 2200
AUSTRALIA

Resource: Companies

Aerocomp, PO Box 223957, Dallas, TX 75212 [214-637-5400]

Anitek Software Products, PO Box 361136, Melbourne, FL 32936 [407-259-9397]

Computer News 80, PO Box 680, Casper, WY 82602

Computer Reset, PO Box 461782, Garland, TX 75046 [214-276-8072]

Cornucopia Software, Inc., 1625 Beverly Place, Berkeley, CA 94707 [415-528-7000]

GRL Software, Suite 209, 1051 KLO Rd., Kelowna, BC V1Y 4X6, CANADA

Hypersoft, PO Box 51155, Raleigh, NC 27609 [919-847-4779]

Microdex Corp., 1212 N. Sawtelle, Tucson, AZ 85716 [602-326-3502]

Micro-Labs, Inc., 902 Pinecrest, Richardson, TX 75080 [214-235-0915]

MISOSYS, Inc., PO Box 239, Sterling, VA 22170 [703-450-4181: Orders to 800-MISOSYS]

Pacific Computer Exchange, 1031 SE Mill, Suite B, Portland, OR 97214, [503-236-2949]

Powersoft, 4951 Airport Parkway, Suite 700, Dallas, TX 75248 [214-458-1197]

Storage Power, 10391 Oakhaven Dr., Stanton, CA 90680 [714-952-2700]

The File Cabinet, PO Box 322, Van Nuys, CA 91408

T/Maker Research Company, 812 Pollard Road, Suite 8, Los Gatos, CA 95030, [408-866-0127]

TRSTimes magazine, 20311 Sherman Way, Suite 221, Canoga Park, CA 91306

Try-o-Byte, 1008 Alton Circle, Florence, SC 29501 [803-662-9500]

Tandy National Parts - Hardware [817-870-5600]

News Releases

New Product Announcement

LeScript 2.0

"PC-set" IBM PC Character ROM upgrade for TRS-80 Models 3, 4 and 4P

Anitek Software Products is releasing version 2.0 of its LeScript Word Processing System for the TRS-80 Model 1, 3, and 4 May 1, 1989. The MS-DOS version is scheduled for release in toward the end of May 1989. LeScript 2.0 contains more than 30 new features and enhancements over its predecessor, version 1.80.

LeScript 2.0 now contains drivers for the Hewlett-Packard Laser Jet II printer and compatibles. The drivers support Times Roman, Helvetica, Gothic, Prestige, Pica, Elite, Courier, Presentation, Optima, Garamond, Cooper Black, Coronet Bold, Broadway, Bauer Bodoni Black Condensed, Century Schoolbook, University Roman, and Line Printer type faces - bold, medium, and light stroke weights - upright and italic type styles - point sizes from 6 to 30 - character pitches from 10 to 16.66 - upright and landscape orientation - and proportional justification in point sizes from 6 to 14.4. Included in the laser printer driver enhancement package is support for the HP's pattern drawing, gray scale drawing, and rule line drawing functions. These are very useful for adding shaded areas, boxes, borders, visual highlights, and attractive drawings and charts to your documents.

LeScript 2.0 has been totally rewritten for speed. No more long waits. Most editing functions, like search, page up/down, scroll, move/copy block, perform approximately 400% faster than in version 1.80. Some functions actually perform as much as 1000% faster than the previous edition. LeScript 2.0 is so fast and responsive that you will almost swear it knew what key you were going to push before you even pushed it.

LeScript 2.0 now has 4 text windows instead of just 2. Now you can load up to 4 documents into LeScript at the same time. Work on them individually or move and copy blocks of text from one editing window to another.

LeScript 2.0 now has instant "pop-up" help screens sorted by topic with menu selection capabilities to get you quickly to the information you need. The help text file used by this function can be customized by the user. Add screens or menus, change screens or menus, delete what you don't need, or even write your own personal set of helps.

LeScript 2.0 now has 148 macro keys and programmable special characters. These 148 special characters along with the 96 standard alpha-numeric characters give you access to 244 of the 256 characters found in your computer's character ROM. Any of these 148 characters can be reprogrammed to a string of characters and printer commands that LeScript will send to the printer when the character is encountered in the text while printing. Or you can reprogram any of these 148 key combinations to key macros so that several functions can be performed just by pressing one key combination. Or they can be left at their defaults, producing on the screen and printing on paper their preprogrammed character value.

LeScript 2.0 now has an instant "pop-up" display of the 148 key macros/programmable characters. If you forget how one of the macro keys was programmed or which key combination produces a certain character, LeScript will show you instantly.

LeScript 2.0 now has a Print-to-Disk function. You can tell LeScript to route its printer output to a disk file under any name you choose. This is great for creating preformatted document files that can be uploaded to a BBS. It also provides a simple way to see byte-for-byte exactly what LeScript is sending to the printer and how it is decoding your printer commands.

LeScript 2.0 now has a built-in safeguard that warns the user if he attempts to exit the program without saving his text. The warning message, including which text window the unsaved text is in, flashes on the screen if any text has been typed to that document since it was lasts saved to disk.

LeScript 2.0 now has a powerful and easy to use line drawing feature. Now you can draw lines, boxes, rules, and borders as easily has holding down the cursor keys. This function utilizes the single line, double line, and bar line IBM-PC line drawing character set and gray scale characters found on more recent model printers - laser printer not required. LeScript will even display these lines on the screen exactly as they will print out on computers equipped with either the Grafyx Solution Hi-Res board or Anitek's "PC-set" IBM character set ROM upgrade. On computers not so equipped, LeScript will display a very close representation of these lines using available characters.

LeScript 2.0 now has two status fields at the top of the screen which display the current page number and line number (of that page) that the cursor is on, while you are editing. No more guessing what page you are working on or how far you are from the bottom of the page - LeScript tells you. These fields are typically 100% accurate on ordinary document files and within about 98% accurate on documents containing the more complex formatting commands.

Other features now in LeScript 2.0 include: Move cursor forward or backward by tab stops without erasing text. Page backward and forward in directory. Larger type-ahead keyboard buffer. Ability to turn auto justification and formating on and off. Ability to abort document spell checking before completion. And over 30 more printer drivers for many of the newly released printers.

LeScript 2.0 for the TRS-80 Model 1, 3, 4/4p is available from Anitek Software Products for $129.95, and includes a built-in on-line 70,000 word spelling checker dictionary. A version of LeScript 2.0 without the build-in spelling checker (called LeScript 1.90) will be marketed through Cornucopia Software. Updates to version 2.0 are available to current owners. The cost of the update is $40 from 1.8, $60 from 1.7, $70 from 1.6, $80 form 1.5 and earlier. Add $3 for s/h and add $3 if LeScript master disk not returned. For more information contact: Anitek Software Products, PO BOX 361136, Melbourne, FL 32936, or call 407-259-9397. Or Cornucopia Software, Inc., 415-528-7000.

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The second new product that Anitek Software Products is releasing this month is "PC-set", the IBM PC Character set ROM upgrade for the TRS-80 Model 3, 4 and 4p. "PC-set" gives your TRS-80 access to the entire set of characters found on IBM PC compatible computers. Great for creating line drawings, diagrams, charts, and gray scale shaded areas in your documents right on the screen, and then printing them using the IBM character mode of your printer. Great also for displaying and printing many special characters and symbols not found in the TRS-80 character set. You can select between "PC-set" or the TRS-80 standard character set manually or through software control, so you can still run programs that use the TRS-80 graphic characters. Installation is easy and can be performed in about one hour.

"PC-set" is available for the Model 3 and non-gate-array 4 and 4p for $39.95 + $3 s/h, and for the gate-array 4 and 4p for $59.95 + $3 s/h. For more information contact: Anitek Software Products, PO Box 361136, Melbourne, FL 32936, or call 407-259-9397.

Model 4/4P Users - Deluxe version closeout!

This may be your last chance for a T/Maker in its classic box and binder format. Regularly enhanced until 1985, this is the same product that sold for $450 and was referred to in superlative terms by major computer magazines.

It's not just a very useful computer program, it's a piece of computer history--the world's first integrated package.

Add $4.00 for ground shipment or $7.00 for 2nd day air shipment. California residents add 7% sales tax.

With Deluxe Documentation (Limited quantity)	$49
Set of IBM Compatible Disks as well	$20

T/Maker Integrated Software includes:

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Los Gatos, CA 95030


(408) 866-0127


(If you have a PC Compatible, consider T/Master, the next generation: $139)

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OVER THE YEARS, THE FILE CABINET HAS COLLECTED SOFTWARE FROM ALL OVER THE COUNTRY AND MANY PARTS OF THE WORLD. THE PROGRAMS HAVE BEEN TESTED AND CATALOGED INTO WHAT IS CONSIDERED TO BE THE LARGEST COLLECTION OF PUBLIC DOMAIN SOFTWARE FOR THE TRS-80 MODELS 1, 3, AND 4 IN THE WORLD. EACH DISK IS FILLED TO NEAR CAPACITY WITH QUALITY SOFTWARE, MUCH OF WHICH CAN'T BE FOUND ANYWHERE ELSE.

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w/Correcting Feature add:		$ 39.99	$ 59.99
"The Cadillac" of Spelling Checkers - *80 Micro*, 3/82			
El. Web. Hyphenation	*35% off*	incl.	$ 32.49
E.W. Grammar & Style	*35% off*	$ 49.99	$ 32.49
"A fantastic ... Grammar Checker" - *80 Micro*, 4/85			
The Works!	*(All E.W. features)*	$ 119.99	$149.99
LeScript 1.9	*50% off (reg 199.99)*	$ 89.99	$ 64.99
Allwrite W/P	*(w/o support) 67% off*	N.A.	$ 64.99
Whoops Instant Speller/Thesaurus		$ 39.99	N.A.
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Cornucopia Software, Inc.
1625 Beverly Place, Berkeley, CA 94707

PowerSoft's World Famous Utilities and Software for TRS-80 Computers with Floppies and/or Hard Disks.

NEW POLICY: You may buy and examine the manual to any PowerSoft program for only $10 (plus $2 shipping). If you decide to purchase the program, we will allow the full $10 credit against the purchase price.

SUPER UTILITY PLUS • *The greatest utility ever written for the TRS-80. Every TRS-80 magazine has said so!*

Five-Star Excellent Reviews in *80-MICRO, 80-US, INFOWORLD, POPULAR ELECTRONICS, FAMILY COMPUTING, Creative Computing & more!*

"The King of Utilities" **- Reads, repairs and works with all the popular TRS-80 operating systems Models I, III, 4! Allows you to set up two drives for two different DOS's and copy between them easily!**

If you use a TRS-80 with disk drives, then this is a must-have program that you will wonder how you did without for so long! Super Utility has won numerous awards, has received many 5-Star reviews and this could be your last chance to purchase a copy at this unheard of price. Super Utility does so many things, you will never use its full potential, but it isn't that hard to use since it is completely menu-driven with the most common defaults built right in. It is configurable for all the popular TRS-80 operating systems and will even allow you to set one drive for one system and another drive for a different operating system and copy files easily between the two. Even between Model I and III or 4, regardless of density, track number, number of sides, or system used. We have thousands of letters in our files over the years about how Super Utility has saved the user from various problems. Super Utility removes or decodes passwords (strips them right off a disk in one pass), reformats a disk without erasing the data, fixes problems, backs up most protected disks, etc. This was the very best utility ever written for the TRS-80 and now is the time to get your own copy. Super Utility has over 65 functions and features. Too many to describe! A fantastic buy. Does not work on hard disks. Our ToolBox or ToolBelt has similar features for hard drive use, as well as floppy. SU+ does not support Newdos/80 double-sided disks. '86 price: $79.95

Super Utility Plus (Mod III & I) - Disk repair, password removal plus 65 other functions with manual. $34.95

Super Utility Plus 4/4P/4D (same as above for TRS-80 Model 4, 4P, 4D - Reads/Writes 4, III & I.) $34.95

The Model 4 version of Super Utility has all the features of the Model I/III version, but more! It uses the larger amount of memory for quicker operations, plus utilizes the three function keys. One key is even defineable by the user to go right to their favorite or most used function in Super Utility 4. Also, boots right up in a Model 4P without having to first load the ModelA/III rom file. Many other niceities for the 4 have been implemented in this version of Super Utility.

Extra Super Utility manuals, disks or unprotected disks:

Need an extra manual for your SUPER UTILITY? Pick up an extra manual (3-hole punched) for only $10. Need an extra disk? Send $10 (if registered) for an extra copy. Want the unprotected CMD file version? Send $20 and your serial number (if registered) and we'll send you the unprotected CMD file version.

LDOS ToolBox (Hard Disk Check, Repair, Modify, much more! Like a "SU+" for hard disk) $24.95

> Original 1986 price: $49.95 - by Kim Watt, author of Super Utility+, PowerMail+ and many more great programs!

If you own a hard disk and use LDOS, this is the perfect insurance policy for your data. The LDOS TOOLBOX is like a Super Utility+ for hard disks. Features Disk Check and Disk Repair, Sector Modification, plus many, many other useful utilities that makes using a hard drive even easier. Each program contains a built-in Help command, so many times you don't even need to look things up in the manual - just press <Enter> for help! A very wise buy for hard disk users.

Model 4 ToolBelt (same for Model 4 TRSDOS 6 use. OK for 6.3. Like a "SU+" for hard disk) $24.95

> Original 1986 price: $49.95 - by Kim Watt, author of Super Utility+, PowerMail+ and many more great programs!

This is similar to The LDOS TOOLBOX, except it is for the Model 4 TRSDOS 6 operating system (all versions).

>>>> BOTH LDOS TOOL BOX AND MODEL 4 TOOLBELT FOR ONLY $44.95! <<<<

Back/Rest - Super Fast Hard Disk Backup and Restore. Saves hours of time! For I, III or 4. $34.95

> Original 1986 price: $99.95

Initially written for ourselves, BACK/REST has proven to be a great time-saver for thousands of TRS-80 hard drive users. When reviewed by *80-MICRO*, they gave it FIVE STARS - perfect! It saves hours of time and is very easy to use. BACK/REST can back up 10 megabytes in about 18 minutes and 20 meg in about 30-40 minutes. It also tells you how many disks to have ready. Works under LDOS or TRSDOS 6 (both versions on same disk). Great utility for hard disk users!

Superior Hard Disk Drivers for Tandy disk systems. Mix Model III and 4 easily. $49.95

> Original 1986 price: $99.95

Our hard disk drivers out-performs the Tandy drivers in many ways. Our drivers allow you to combine LDOS and TRSDOS 6 on the same drive and boot from either system (with floppy disk). They run faster and take much less memory from the system. Only for use with Tandy Hard Drives.

PowerMail Plus (Please specify Model 4, III /I.) 5 Star mailing list-data system! $34.95

> Original 1986 price: $99.95

This program was also written for ourselves when all the other mailing list/data base systems couldn't keep track of all the types of data we wanted to keep track of. We needed speed, we needed hard drive support and we needed a crash-proof data structure. PowerMail+ was top-rated (5 stars) in several publications and has never been topped. Works on floppies or hard disk under all popular TRS-80 operating systems. Allows importing of data from several other once popular mailing systems to avoid re-typing. Written in machine language by the author of Super Utility, this program is FAST and sorts up to 10 levels very quickly. If you keep track of names and addresses along with associated data for any situation, this is the one to use. Many churches, organizations and businesses use PowerMail+ for all the different kinds of lists they need to pull from. Each record has 24 user-defineable "flags" to allow total customization for your exact needs.

Text-Merge Form Letter Module - Create customized "form letters" and labels with PowerMAIL+! $15.00

This optional module for PowerMail allows you to create customized "form letters" or custom labels, lists, etc. with PowerMail Plus and any word processor that saves text in ASCII format. Very easy to use and really gets the effect you want. Allows completely defineable report generating from your PowerMail+ data.

PowerSCRIPT - A Major Enhancement for SCRIPSIT 4, III and I (not SuperScripsit) $24.95

> Original 1986 price: $39.95

One of our very best sellers, this modification for Radio Shack's SCRIPSIT program turns it into a POWERHOUSE! Our program merges with your copy of SCRIPSIT to create a new program that outperforms most other TRS-80 word processors without relearning a new program! PowerScript adds new features in two important areas. The first area is in the printer control. PowerScript allows you to add printer control codes directly in the body of your text! Now it is easy to add underlining, bold face, the different sizes of print, etc. Initially set up for the EPSON type dot-matrix printers, it is configureable to just about any printer during set-up. If you have more than one printer type, then just set up a copy of PowerScript for each printer you have. The second area of improvement is in disk and file control. PowerScript adds several neat features to SCRIPSIT, including the ability to see an alphabetized directory without exiting the program, seeing how much free space you have, and others. This has been one of our most popular programs and we have received many, many complimentary letters on its performance. It works on the Model I, III or 4 versions of SCRIPSIT. It will even make a Model I version of SCRIPSIT work on a Model III or 4 (in the III mode). Lastly, PowerScript removes the limited copy "feature" of SCRIPSIT so that you may make as many copies as you need or copy it to your hard disk without hassle.

PowerDraw (animated TRS-80 screen graphics! Easy to use. Great for kids or adults!) $19.95

> Original 1986 price: $39.95 - by Kim Watt

INFOWORLD, 80-MICRO and 80-US magazines really loved this program when they reviewed it. It does many things and is fun to use as well. First, PowerDRAW allows you to create graphics (mixed with text if desired) and save them to disk. It also allows you to create up to 33 "frames" of animation and "play" them like a movie. It also allows you to save the graphics in several modes, including BASIC listings, CMD file format, and others. These can then be merged into your own programs, etc., either in BASIC or machine language! Many of PowerSoft's opening screens were created with PowerDraw. In fact, it even creates animated opening screens (like we use in Super Utility, PowerTool, etc.) to really pep up the program. It also allows you to print the screens on Epson-type and several other types of printers. Lastly, PowerDraw has the ability to load in many types of TRS-80 graphic's and convert them to BASIC listings like a BASIC program generator!

PowerDOT 2.0 for printers. Mix text with graphics - no problem. Build new fonts. $19.95

> Original 1986 price: $49.95

This program is similar to PowerDraw, but quite different. It allows you to create "hi-res" type screen graphics combined with text, and allows you to create drawings much larger than your screen. The screen is a "window" to a much larger drawing arrow and you use the arrow keys to move about the drawing. In a way, it is similar to Macpaint for the Macintosh computer. It also allows you to create custom fonts for ads, etc. Many of our early ads were created with PowerDot. It creates the hi-res effect due to each TRS-80 block pixel being printed as a single dot. Please specify if EPSON, Okidata, ProWriter, or Radio Shack printer.

PowerDriver Plus for SuperSCRIPSIT and SCRIPSIT PRO and Epson printers $17.95

Allows EPSON or compatible printers to be fully utilized with SuperScripsit.

This is a replacement driver for the ones you got with SuperScripsit. It fully supports the various Epson and Epson compatible printers to the limits of their capabilities. Model I, III or 4 is supported in the same package. Easy to install. Once installed, works without any extra thinking. Thousands of happy customers!

TRS-80 GAME COLLECTIONS ON DISK - for Mod I, III, 4 (in III mode) - *Special! All 3 Sets for $29.95*

Leo Christopherson TRS-80 Animated Game Disk with sound *(Leo's Greatest Hits)* $12.95

This is one of the greatest values in games ever produced. Leo Christpopherson wrote the very first animated game for the TRS-80 and the country went wild for it, *Android Nim*. To watch these life-like creatures will make everyone laugh as they shake their heads up and down or side to side and blink at you stupidly as it waits for you to make a move. Then Leo invented how to make the TRS-80 produce sound and added it to NIM. He then followed Android Nim with the other games, even getting Radio Shack to sell Dancing Demons, which is a real scream. It alone is well worth the price of this disk, but you get ALL of Leo's programs on one disk for one great low price. If you haven't yet bought this disk, do it now! It is a classic! Each one of these games originally sold for $9.95 - $19.95 EACH. The disk includes the famous games: ANDROID NIM, BEEWARY, DUELING DROIDS, DANCING DEMONS (once sold by Radio Shack for $14.95), SNAKE EGGS and ANIMATED LIFE. All games feature full sound effects and some of them are even in 3-part harmony! You and your family will just love this disk! Dancing Demon even features saving your song and dance routines to disk and four of them are included! The possibilities are endless and it is always entertaining. A great way to "show off" what your computer can do and always fun.

KIM WATT GAME DISK - Space Colony, Symon, Capture, Horse Race Slots - 3 with Sound $ 7.95

Kim Watt, author of Super Utility and other famous programs wrote some games that Adventure International published back in the early 70's. They are interesting in that most people have never seen these, as by the time SUPER UTILITY was established in the market, these games, as well as Adventure, were gone. Originally these were sold on three separate diskettes (or tapes), but we have combined them all on one disk for you collectors.

LANCE MICKLUS' GREATEST GAMES - *3 Disk Set!* $17.95

This is a great collection as it features space games (Space Trek), adventure games (Dog Star Adventure), gambling games (The Mean Craps Machine, which also includes a Craps tutorial booklet on disk), board games (Mean Checkers Machine), as well as some darn useful programs that you might use for real purposes. Also has some educational games for the kids. You will enjoy owning this set of programs by one of the early pioneer programmers for the TRS-80, Lance Micklus.

Special! All 3 Game Disk Sets for only $29.95! Five disks crammed full of games that you and your family will really enjoy! If ordering the single density, Model I version of game set, the price is $34.95.

POWERSOFT

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Please add $3 s/h, $5 for 2-day (Blue Label). COD adds $4 to total. Foreign adds $12. Texas residents must add 8% sales tax.
Prepaid or COD orders only. No P.O.'s allowed. Visa/MC is OK • 24 hour shipping!

DOS Subjects

LDOS Topics

Why not a Model I LDOS 5.3?

Fm Sam Hills, Slidell, LA: Dear Roy, Enclosed is my order for the LDOS 5.3 upgrade to be used with T. J. Hodges' Model I patches. When I spoke with you a couple of months ago, you quoted the price as $34.95 less 30% (for the coupon special) = $24.37 + $2 S&H. I am enclosing a copy of an invoice dated 6/3/87 which shows that I have a $25.95 credit from when I ordered the Model I upgrade kit that you never produced. If my calculations are in error, please advise and I will remit the difference.

Also, I am enclosing my Mark III disks for upgrading. Several important files were missing (not enough room on just 2 disks, obviously). Among the files not present were the source file for MemDisk (I have an LNW-80, which has extended memory like the Model III, but not mapped in exactly the same way, so I need that source file in order to make MemDisk work with my hardware!), most of the files for the Help system (what WAS included is useless without files from the Mach2 package. There were several other files named in the documentation that weren't on the disks. In addition to the two original Mach III disks, I am enclosing a blank disk to hold the remaining files, (If there is any charge for this upgrade, or for the missing files, please advise.)

Have you given any further consideration to doing an 'official' Model I upgrade? Has there been any significant demand for one? Have you considered working with Mr. Hodges, and adapting his patches as the 'official' model I upgrade? (It would sure make our lives easier if we could get any future operating system patches directly from you, rather than having to try to figure out how to adapt your Model III patches to work on the Model I.)

Looking through the latest *Quarterly*, I saw practically NO mention of the Model I anywhere! Have you completely abandoned us? There are several active Model I users in the New Orleans area whom I have been trying to convince to subscribe to the Quarterly. If you are totally abandoning us, I see little reason to even continue my own subscription much longer. I would hate to do that, as I like LDOS and you put out some great software for the TRS-80. Speaking of which, what do you still offer that runs on the Model I? The price list in the latest Quarterly had a column labeled 'Model III' and one labeled 'Model 4', but no mention of which Model III products worked on the Model I.

I am interested in your hard-drive kit, but >> ONLY << if it works with the Model I (specifically, with the LNW-80). I would like to add a hard drive to my computer, but I don't plan to buy a model III or 4. There's a lot of life left in this old machine yet! (One of these days I may buy an Amiga. That machine sure has great graphics! And that multitasking operating system! Do you have any plans to write anything for it? I DON'T plan to buy an Incredible Blue Monster, though.) Also, will your hard drive kit work with the LOBO expansion interface? I know someone who has one, and he's even madder than I am about the lack of an official Model I 5.3 upgrade, because he CAN'T run anything but LDOS!

Fm MISOSYS, Inc: Sorry, Sam, but I disagree with your supposition that many files are (were) missing from the Mark III collection. When the Mark collections were announced in TMQ Issue I.iii, it listed all of the names of the files which were included in each collection. It did not list a set of product names. Only a few out of the Mach 2 product were in fact inadvertently missing from the III collection. The others you noted are not on the list.

HELPGEN does indeed stand alone to create your own HELP files; it needs nothing else from the LSI HELP package to be useful. Check out Jeff Joseph's *ON-LINE Help for the Model 4 with PROWAM* which appears in this issue.

MISOSYS is not an infinite resource; when you or anyone else wants MISOSYS to provide something, be it a product, a product upgrade, or even a response to a letter, it is "Roy Soltoff" who either does the work, or pays a free-lance individual to do it. Everything has a cost. I cannot justify either spending my time or paying someone else to support such a product upgrade as a Model I 5.3 release. Thus, MISOSYS will do no "official" or otherwise Model I upgrade. Yet I did publicize Hodges' work. Incidentally, the 5.3 release for the Model III was certainly not just a set of patches. I spent many months upgrading the 5.1.3 source code to 5.1.4 level, then updating many modules with new code and revised code to groom a 5.3 release. If you want a "set of patches", see the folks in Canada who have worked up patches to some of the various DOS products to support extended dates. Microsystems Software won't do it for even their Model III DOSPLUS!

As far as TMQ covering the Model I arena, I confess that I must respond similarly to what other magazines would say; I print what is supplied to me. The articles I personally write are meant for the widest audience; the Model I users do not collectively represent that size of audience. However, if someone were to submit an article which referred specifically to the Model I, I would consider publishing it. Remember, "He who presents a problem but does not offer a solution, is part of the problem".

Incidentally, I have no plans to deal with the Amiga. The resources are just not present. Perhaps I'll just skip out and start cultivating Shiitake mushrooms.

More on Hodges' Model I/III 5.3 composite

Fm Arthur N. McAninch: Having four fully functional Model I's and several spares, I was one of the few who indicated an interest financially to you for a Model I LDOS 5.3. Naturally, I did not hesitate ordering from Tom Hodges, his version as a composite of a Model I 5.1.4 and the Model III 5.3.0. I'm hoping that it provides a valuable system; however, there are several shortcomings. The most annoying is that the KI/DVR for 5.3.0 will function when patched, but when you attempt to SYSGEN this, the system "bombs" - Big Time! Can you help?

A minor problem is that he did not provide a patch to enable BOOT on 5.3a. What address do you need to jump to in Model I ROM to reboot? I've tried 0000H, and it just drops dead. Any suggestions?

Fm MISOSYS, Inc: Art, As far as the Model I patches are concerned, I have not seen them so I can't advise you. As far as altering the BOOT command code, that is probably tough. The Model III can boot by a simple RST 0, which takes up one byte of code space in the SYS1/SYS module. The Model I needs a HALT instruction which takes only a single byte; however, unless the disk drive has been activated and sent a SEEK to cylinder 0, the machine will not be able to detect the disk drives and will just boot into ROM cassette mode. SEEKing to 0 takes up six bytes of code space. That's probably why Tom Hodges didn't come up with a patch for that.

You are unclear if the system bombs when you try to SYSGEN with the KI/DVR installed or bombs on boot-up if it was sysgened. But again, since I don't know what was patched, I cannot offer assistance. Perhaps others with that composite DOS can offer assistance.

LDOS Conv questions

Fm Gary Phillips: Roy (or anyone else who's listening), is there any reason that LDOS 5.3's CONV utility should not work with XLR8er installed? I got my XLR8er and my 5.3 at about the same time, and CONV has never worked right. It restores the head on the floppy drive a couple of times, then announces an "Attempted to read locked/deleted data" error.

I don't need CONV often, and have worked around it by using CONV under LS-DOS, which succeeds even on the same diskettes rejected by the LDOS CONV. Today I ran into the problem again, and just to make sure my copy wasn't farkled I got a new copy of CONV from the master diskette. But it still fails the same way. Have I missed something?

Fm MISOSYS, Inc: Don't know. If you have a TRSDOS 1.3 disk which doesn't CONV under that situation, why not make a BACKUP of it and send it to me. I just checked LDOS 5.3's CONV on a non-gate array Model 4 with an XLR8er running at M=1,R=40. Worked perfectly for me. I even used the RAMDISK as the destination drive.

Model 3 <=> Model 4

Fm Don Parriott: Does anyone have or know of software to: Read a Model 4 disk from the Model 3 mode (TRSDOS 1.3) OR write to a Model 3 disk while in the Model 4 mode.

I have a model 4, and many applications that run under TRSDOS 1.3 and LS-DOS 6.X. It would be nice to exchange data between these programs. LDOS's CONV/CMD is only a one way path, so it doesn't help me.

Fm Joe Kyle-DiPietropaolo: Don, One option is to get LDOS from MISOSYS to use as your Model 3 mode operating system. Media interchangeable with TRSDOS 6/LS-DOS 6 as it uses the same disk format.

If you don't mind copying things back and forth, you can format a disk as thirty-five track, single-density and single sided. Model 3 TRSDOS 1.3's CONVERT utility will think this is a Model 1 disk and read it fine.

LCOMM's "Command?" LDOS Documentation

Fm David J. Kelton: Roy, I haven't had the opportunity to communicate with you for some time. I'll take care of a bit of housekeeping first: I received my most recent TMQ's as follows: 3.1 on 08/23/88, 3.2 by 12/05/88 (I was in the hospital and don't have the exact date), and 3.3 on 03/10/89.

I hope to return to you soon a small thanks for all the help and training you provided me through TMQ. I'm just not an experienced computer jock, so much of what is in TMQ is just plain over my head; but I can do manual labor. Recently I started working on upgrading my LDOS 5.1.0 documentation (came with my RS 5meg hard drive) to LDOS 5.3. I'm re-keying all the text into Superscript files with each command in a separate file. For now, I'm only doing the commands that got updated in some way by 5.3. I'm nearly finished with the job, but I have found one thing with which I need help.

The LDOS 5.3 upgrade kit documentation states that the "CMD" option has been added to LCOMM to allow execution of library commands. I've never been able to get this to work. I think I finally understand why. It appears that LCOMM tries to use the `<CLEAR> <SHIFT> <0>` to "activate" the CMD feature. Since LCOMM also uses KI/DVR and the KI/

DVR uses <CLEAR> <SHIFT> <0> to toggle the ECM mode, it appears that the ECM toggle gets preference over the CMD. Is this one of those glitches that just slipped through the cracks, or am I missing something? The LDOS 5.3 documentation doesn't mention any other key stroke combinations required— and I have tried a bunch of them before I stumbled onto the graphics characters when I used the back arrow key while in LCOMM. I think I've installed all the patches that appear in TMQ, but I know I could have missed one.

Once I finish the documentation upgrade, I plan on sending it to you on some flippy-floppy disks. I consider all such documentation to be the rightful property of MISOSYS and the legitimate copyholders of LDOS 5.3. Therefore, I plan to let you distribute/make available the results of this effort in whatever way you deem most appropriate. I will give my efforts to you for free in appreciation of the learning experience I've gotten from TMQ; but if the lawyers insist, I'll sell the work to you for $1 (or less if they'll accept). At the moment I am also planning to modify a Superscripsit printer driver to output a straight ASCII file for your use with no headers or footers. Would you prefer to get it in some other mode?

I've enclosed a SASE for your response. Until the next issue of TMQ, best wishes to you and the family and hope you get that hard drive going soon. Sad to hear a hardware write protect switch won't be included, even as an option.

Fm MISOSYS, Inc: David, I don't know why you are typing the LDOS manual into SCRIPSIT, except for your own use. I don't need it on disk as I already have it on disk. Since the manual was generated by LSI and MISOSYS, I have all the source files. Incidentally, the manual was developed using SCRIPSIT.

The reason why I chose not to produce a new LDOS 5.3 manual has to do with its cost to the end user coupled with the fact that I had about 800 LDOS 5.1.4 manuals still in stock. I also didn't, and still don't, think that the 5.3 release was sufficiently different from 5.1.4 to warrant a new manual. Certainly a totally revised manual would have been nice to have, but we just couldn't absorb the cost. One thing in the back of my mind is to ponder the publishing of a new combined Model III/4 LDOS/LS-DOS manual. But that's a lot of work for which I have little time. As a side issue, I have about 6000 LDOS 5.1.4 Quick Reference Cards which will probably get thrown out soon.

As far as the problem you are having with the "COMMAND" function in 5.3's LCOMM, I think you are a little confused. The Extended Cursor Mode (ECM) of LDOS is toggled not by <CLEAR> <SHIFT> <zero>, but rather by <CLEAR> <SHIFT> <SPACE>. Those are entirely two different key combinations and they do NOT produce the identical key code. Confusion may come from the fact that the code generated by <CLEAR> <SHIFT> <zero> can also be generated by <CLEAR> <SPACE>. So I suspect that what you stumbled on was an inadvertent depression of the <CLEAR> <SHIFT> <SPACE> ECM toggle when you wanted to depress <CLEAR> <SPACE>. But <CLEAR> <SHIFT> <zero> does not toggle ECM. I just verified that on my machine to confirm what I already "knew".

By the way, I did double check the documentation that came with LDOS 5.3; page 10 states specifically for LCOMM that "The command mode is available via the keystrokesequence,<CLEAR> <SHIFT> <0>".

BREAK doesn't abort DIR in LDOS

Fm Carl Berger, Largo, FL: When I do a DIR filespec in LDOS 5.3 I press <BREAK> as soon as I see the file I'm looking for and want that file name and info to stay on my screen when I press <BREAK> so I have the directory and LDOS Ready on the CRT at the same time. What happens is the file name scrolls off the CRT and the DIR continues till it gets to drive 7. I already applied the patch that keeps the CRT from clearing, but I still have the scrolling problem.

Fm MISOSYS, Inc: LDOS's DIR command doesn't use BREAK to cause an ABORT. There is no simple patch I could provide.

Model III usage up North

Fm William R Pringle, Terrac, B.C., CANADA: I am reading "*The MISOSYS Quarterly* - summer '88. A friend introduced me to an issue that he had. I would like some info on getting a subscription. I have looked through this issue of TMQ and have found $$ for back issues, but not a subscription. Disk Notes, is this mainly for the Mod 4 or the Mod 3? I understand that you also have goodies for sale: oh boy! Please send me a catalog

Where have I been? Living up here in northern Canada I thought the R/S was dead, or at least buried. I purchased a Mod 3 one month before the Mod 4 was born and delivered to the public, way back when. Tough luck or, was it? Is the "4" better? Can I still get upgrade to a "4"?

My "3" is stock except for a Langely St. Clair amber screen. I have not really had the time to play and get to know what this machine can really do yet. I have drive one 'on the way out' and am wondering if I should replace it with a new double sided one, or possibly look around for a good used Mod 4. I have been using the computer for letter writing, personal and a little business type; I use LeScript 1.8 and love it. Not that I am about to change word processors at this time. Is there a better word processor for the "3". I tried SuperScripsit and I think that LeScript is far better.

I have been using NewDos 2.0, a friend buried his "3" and went MS-Dos and he let me use his LDOS 5.1.4. I have been pouring over the manual (I like it) and was going to ask you which was a better Dos. That was when I discovered that LDOS was yours too. Okay good deal, can you tell me what you like if any thing, about NewDos. I notice in your HOT LIST that

there is a LDOS 5.3, for Mod 3? What is the difference between 5.1.4 and 5.3? What can I do to my "3" to make it go ?

I understand that you have a Librarian, for Public Domain disks, is it still Vic McClung, 914 Crescent, Sikeston, MO 63801?

I realize that you are a very busy man and probably will find it difficult to find the time to answer this. I would very much like the information on the subscription and also catalog if one is available.

I have one question from my spouse, having just finished a University computer science course (using a MAC SE) — Are there programs with pull down menu's? Is there a mouse available? Help me! Thank you for listening and keep the R/S's going.

Fm MISOSYS, Inc: William, A subscription to *The MISOSYS Quarterly* from Canada is $30/year (that's four issues). Interestingly enough, I have added subscription information onto the first page of issue III.iii; this information will appear in each issue forthcoming.

I would say that the Model 4 is better than the Model III in that a larger address space is available (but not for BASIC programs), you can address a larger screen size (80x24), the DOS has more features, and expanded memory is available to programs designed to utilize additional memory. To my knowledge, you can still obtain the Model III to 4 upgrade kit (26-1123) from Tandy. A quick check to National Parts at 817-338-2394 confirmed that the kit is still available as of today (April 4th) at a price of $199.95 plus shipping.

You can replace that broken disk drive with a better (read as lower power consumption) double sided disk drive. For instance, I sell a Fujitsu half-height 360K drive (that's 2-sided) for $75 + S&H. If you don't want to invest the $200 in your Model III for a Model 4 conversion, you can still take advantage of Model III software. Or you can look around for a used Model 4 which should be in the range of $300-400 (Pacific Computer Exchange lists 2-drive 64K Model 4 for $385).

LDOS 5.3 is a large upgrade to LDOS 5.1.4. Our current product brochure lists the significant enhancements added to this release.

The address you have for Vic McClung is still current; we post that address in each issue of TMQ.

As far as the question from your other half concerning "pull-down" menus, I believe few programs provide such a thing. There is a mouse add-on available from Micro-Labs. It is somewhat useful with hires graphics programs from Micro-Labs or Microdex.

Help with file size

Fm DeWitte Wilson: Hi, I run a bulletin board on a Model 4 (in III mode), and everything has been going well, but I've just noticed that the smallest file size is 4k — even if the file only has 1 character in it, it still allocates 4k on the disk. You can see that after a while, this would take up all of the ten megs that I have.

I'm using LDOS 5.3, and the HD driver is TRSHD5/DCT. Has anything else come out on this - like patches to bring it down to 2k, or even 1k? I have another hard disk that uses some other drivers, and the small file size on there is 2k, so I **know** it is possible.

All help will be greatly appreciated. The drives I am using are the standard 5 meg primary & secondary that RS used to sell.

Fm Gary Phillips: DeWitte, You need the RSHARD5/DCT driver from MISOSYS. If you use it, and partition your drives suitably, it will reduce the granularity of the HD files. TRSHDx is only barely workable as a hard disk driver. The RSHARD package is high quality, reliable, and only costs about $30. Call 800-MISOSYS during a weekday afternoon with your MC or VISA card handy to order it.

LS-DOS Topics

Converting TRSHD6/ DCT to use 1K granules

Theodore Haigh
1745 SW 53rd St.
Corvallis, OR 97333

This is how to modify your hard disk for 1K granules.

This method appears to work as described. However, I do not accept responsibility for any consequences of using this information, and everything you do is at your own risk.

(1) Make a backup of your current hard disk boot disk. This will become your new boot diskette once you have finished this whole procedure. Make sure it has TRSHD6/DCT, TRSFORM6/CMD, and if you're using LSDOS 6.3, DATECONV/CMD.

(2) Create a patch file called TRSHD6A/FIX with these four lines:

```
D02,EE=CD 56 33
F02,EE=3D 0F 0F
D01,66=CB 3A CB 3A 87 87
3D 0F 0F C9
F01,66=00 00 00 00 00 00
00 00 00 00
```

Then type: `RENAME TRSHD6/DCT.DRIVER:f to TRSHD6A/DCT`

Where "f" is the drive containing the backup of the boot diskette), and then enter the following command.

`PATCH TRSHD6A/DCT:f USING TRSHD6A`

(3) Reboot your system with this backup of the boot diskette.

(4) Type: `SYSTEM (SYSTEM=4)`

This makes the floppy your system drive while you change the hard drive. During all of step 5, therefore, you will have to refer to what is usually :0 as :4.

(5) For each drive you want to change:

(5a) Backup ALL the files on that drive

(5b) Type: `SYSTEM (DRIVE=d,DISABLE,DRIVER="TRSHD6A")`

Then answer the prompts.

(5c) Type: `TRSFORM6:d`

Then answer the prompts. Disk Name, Master Password, etc. For the Manual lockout of tracks prompt answer "N". Then let the format begin.

(5d) Type: `LIST BOOT/SYS.LSIDOS:d (HEX)`

This is to allocate the remainder of the space necessary for BOOT/SYS. This is ESSENTIAL, since TRSFORM6 assumes an unmodified driver, and you have thrown its calculations off by modifying TRSHD6/DCT.

(5e) If you are using LSDOS 6.3 then enter `DATECONV :d`

(5f) Restore your files back to the Hard disk.

(5g) Repeat Steps 5a-5f for each drive to be changed.

(6) Type: `SYSTEM (SYSTEM=4)`; this makes the hard drive the system drive again.

(7) Type: `SYSGEN (DRIVE=4)`; this puts the updated configuration on your boot diskette.

(8) The floppy disk is now your new boot disk. Label it, and make several backups of it. Your old boot disks will not work anymore.

You can use this procedure to change one, several, or all of the drives on your HD to 1K grans. Any changes to the HD won't affect floppy; disks they will still have 1.5K grans.

If you are using a 4P, and have installed some sort of HD boot scheme, re-read its docs CAREFULLY before doing anything! It may be necessary to re-install the boot routine after modifying the hard disk.

If any of the drives you want to change are used by LDOS 5.x, the procedure gets tricky. Suggestion, Modify the CONFIG/SYS.CCC file on the LDOS Hard disk boot diskette, by changing DCT+8 for the affected drives from 2F to E3 to reflect the change.

Model 4 FILTERS and @CHNIO

Fm Daniel L. Srebnick: Regarding the proper @CHNIO calling and return sequence for a filter, the *Programmer's Guide* states that prior to loading, the contents of IX should be saved. It also states that following return from the chained routine, IX should be restored. However, upon examining the source of CLICK/FLT, I notice that this is not done. Are there times that you can get away without doing this? I have written a low memory filter to slow down the keyboard when used with the XLR8er and Michel Houde's patches operating at 0,1,80, and would like to keep memory usage to a bare minimum. It seems to work fine both ways, saving the contents of IX or not bothering to, as *THE SOURCE* examples show.

Fm MISOSYS, Inc: You can get away with it if you are sure that none of the upstream drivers or filters are going to use the IX register. For instance, say you are a filter associated with *PR and you alter IX. If the FORMS filter is installed after you, it will probably cause a crash since FORMS uses IX. You probably have no upstream filter in the *KI chain, but it could happen sometime. Just be aware!

Custom Font System 4

Fm James R. Pitney: Okay, here is another one for you all. Has anyone used "Custom Font System 4" (available special order from RS)? Will it work with an EPSON FX-100? Will it work with anything besides SuperSCRIPSIT? (LeScript to be exact)? I'd like to have my letters in Olde English, but called both RS and MicroSoft (who wrote the program!) and neither of them could tell me if it would work! AH, TANDY! I love your hardware, but you support is lacking! I'd appreciate any help anyone can give on those questions!

Fm Joe Kyle-DiPietropaolo: Sorry James, but that package is specifically for the Tandy DMP 2100P, 2200 and so forth. Bill's got it spotted that these all have a Toshiba heritage, not Epson.

Fm James R. Pitney: Thanks for the information, Joe. Is there a similar program available for the Epson printer from anyone?

Fm Joe Kyle-DiPietropaolo: I don't know off hand of a Epson font generation program for the Model 3/4 line. Did the FX-100 actually have downloadable font capabilities? I thought that came in with the '85 series (FX-85/185). Didn't really work much with anything between the MX-80/FT with add-on Graphtrax (still have it, still works) and the FX-286, so could easily be wrong.

Hard Disk Crash

Fm Dayton Sumner: I'm using LS-DOS 6.3 on a Model 4-D, and I have a Radio Shack 5-Meg hard drive. Recently, it has been doing some strange things when I first boot up in the morning. But it usually works OK on the second or third try — as if it was just cold, or something. Now, suddenly, I can't get past the Time prompt. All I get is "Error 11H" repeating. There

are a few files on the hard disk that I haven't backed up, and I'd like to access them if possible. Two questions: Does the hard drive need to go to the computer hospital? Is there a way I can salvage what's on it before it goes?

Fm Gary Phillips: Dayton, I had the same problems with my 5 Meg drive. In my case, it turned out to be the bearings on the disk unit itself. These were wearing out, causing the speed of the drive to slow down and the power consumption to rise. In turn that made the alignment of the controller card slip out of tolerance. If you are handy with electronics and very careful, you can try my solution, but if you have any doubts, I'd say you best take the drive to the Shack for a checkout, and make it very clear to them that they should NOT erase any of your data. That limits what they can do, but they can check the alignment for you.

With the power off, you can unscrew the cover of the unit and remove it carefully. Do not disturb any wiring. Make sure your filter is clean (you do clean the filter regularly, I hope?). Examine the big circuit board on top carefully. If it is the same board I have (there are several versions, I'm afraid) you will find a small trimmer capacitor labeled C33, located just below and left of board center. Have a plastic alignment screwdriver handy, and try powering on your system and booting normally. When the Error 11H message begins to scroll across your screen, use the plastic tool to adjust C33 ever so slightly one way and/or the other. If this gets you a clean boot, immediately do your necessary backup.

The drive may continue to work for months, or it may fail completely in a short time. Once you have a backup, you can decide whether to take it to the Shack for repair or attempt replacing the disk bubble yourself and realigning it. I did the latter using an ST225 from MISOSYS, and now have a 20 Meg drive instead of a 5 Meg. Hope this helps you.

Fm Dayton Sumner: Gary, That's the first encouraging thing I've heard in two rather hectic days. Thanks a lot. I'm not sure how far I'll get but I'm brave enough to at least take the cover off and look. I may just put it back and take it to the shack.

I've also wondered if I might get this problem from a bad cable. The one I have is rather questionable.

If, like yours, it's a bad bearing, is that something that gets replaced when I put in a new bubble — either a replacement 5-meg or a larger one?

Fm Fred Oberding: Dayton, the scrolling ERROR nn, such as your 11H, means that access to the system drive is not possible, and the system can't load SYS4 to print a real error message. However it has been my experience, that if you get an ERROR 22H that usually indicates a missing data or address line, due to a cut cable or broken pin on the 50 pin I/O connector. Which doesn't appear to be your problem. I would suspect that your hard drive hasn't been re-formatted, nor backed-up since day one.

Gary Phillips suggestion is a good idea, however, there are a number of mods that may be missing from the controller board, including the changing out of the trimmer capacitor C-33, for a negative temperature coefficient one.

I have installed a 20 meg ST-225 also, its surprising how you find a use for all that extra room! However, before you install a new bubble, you should be prepared to have all the mods installed on the controller board and have it aligned with a good dual trace O-scope. When you put in a new bubble the controller is going to remain, and it could be the weakest link.

I am not trying to discourage you. You may only need a reformatting to get you back in operation. When you get the message stating that "the drive appears to be unformatted", you should still be able to get a directory read out. Get your files off and try a reformat and backup. If problems still occur, get it aligned

Fm Gary Phillips: Dayton, yes, a faulty cable could cause your hard drive problem. Oxidation on the connectors or card edges could also cause this problem, and you can check for that by carefully removing the connectors from their card edges one at a time, cleaning the edges with a new pink rubber eraser, then putting the connector back in place in the same orientation it had originally. **DON'T put any back upside down, please.**

The drive bearings are part of the disk bubble itself, and replacing the bubble gets you new bearings. In fact, replacing the bubble is the ONLY way to get new bearings unless you have a terrifically well-equipped shop for rebuilding hard drives in your basement (only a few specialists attempt this, and generally the data on the drive would be erased in the process.) If you open up the drive to experiment, just be very cautious.

Don't touch anything if you are uncertain of what you are doing. Don't turn adjustment screws at random. I mention this because just playing around at random can easily make a small problem into a much bigger one. The C33 nudge is safe to try, but don't turn it very far either way, and don't mess with any other variable resistors or capacitors on the card. Adjusting these things properly requires some high-powered scopes that I assume you don't have handy.

Fm Dayton Sumner: Fred, I am increasingly suspicious of a cable problem. The guy I bought the drive from mentioned, casually, that I might have cable trouble, particularly if I unplugged the cable from the back of the drive.

Well, I opened the case to try Gary's idea and when I did I found what appears to be a taped and patched connection to the internal cable. And now, with the cable re-connected I'm getting nothing — just the H in the upper right corner of my screen indicating that the computer doesn't recognize that there is a hard drive down there at the end of the cable.I think my next move needs to be getting someone to fix the cables.

Fm Dayton Sumner: Gary, The cable may not be my ONLY problem, but it's one of them. After opening the case to LOOK at your possible fix I found what appears to be a taped and patched internal cable and connector And now my computer won't even recognize that there is a hard drive down there. At this point I'll

take it to the shack for cable repairs at least. If they can get me access to the files, that will be fine. After that I'll be able to decide about upgrading.

What's the cost for the replacement 20-meg bubble, and how complicated is the procedure for installing and aligning it? How complete are the instructions that come with it?

Fm Gary Phillips: Dayton, The latest TMQ I have here (Fall '88 III.ii) lists the 20 meg bubble (ST-225) at $225 plus $7.50 for shipping. There was a special offer to subscribers (are you a subscriber?) that included a coupon for an additional discount on any hardware order with that issue. I used mine and got the bubble for even less.

$225 is about the going price for a new 20 meg bubble. There are some brief instructions included, and to make the replacement in a Radio Shack 5 meg box you have to remove and resolder 3 wires. The cables, connectors and mounting screws are all directly compatible between the units. I believe Joe has put a more complete set of instructions for this swap and go operation somewhere in the DL here; I got the idea originally from reading his notes to another user.

If you have no experience with this sort of thing, I'd say don't try it yourself, but look for someone local to help you. Just reading through the message threads here recently points up how easily confused many people seem to get even when following what others of us think are clear and simple instructions. If you don't feel comfortable about replacing those patched up cables yourself, for instance, you probably won't feel comfortable about swapping the disk unit either. (And once you swap it, I bet Radio Shack won't work on it at all...)

Another important thing to keep in mind: if you are running with the hard disk drivers supplied by Radio Shack (TRSHDx/DCT) then you can't access the full 20 meg capacity. You would also need to get a better driver module. MISOSYS has a very fine one that includes some testing and backup utilities as well. Their RSHARDx package runs under either LS-DOS 6.x or LDOS 5.x and lists for $29.95 plus shipping, well worth the price. If you don't have diskDISK, you should consider that as well.

Fm Fred Oberding: Dayton, if the taped and patched cable is the inside portion of the 50 pin cable that comes from your computer, you can try the following:

Remove the inside cable where it plugs into the controller board on top, being careful not to bend any of the pins and note the stripe, either black or red on one edge of the cable; this is pin # one.

Remove the 50 pin cable, coming from your computer, from the plug in the back and plug it directly into the controller board, with the stripe on the edge aligned on the same side of the connector as the taped cable was.

Now if we got the cable connected the right way around, try to boot your system. Hopefully it should be working OK. I will look up the part number for this cable and get back with you later.

Fm Doug Mayfield: Dayton, Before you try anything else, try removing the connector from the back of the HD (ribbon cable) then reconnecting it to the HD. I had a similar problem several times, and since I have been doing this the problem hasn't come back.

I also tried setting up the HD [so it] wasn't the system drive, and recovered the files before reformatting the HD, but since I have found this, it really helps. I am not sure but I guess it is just dirty connectors. Hope this helps.

Fm Dayton Sumner: Gary, Once again you have encouraged me. I like the price, and the procedure doesn't sound too overwhelming. But in case I get chicken, and idea on where I find someone to help me within the Baltimore (or D.C.) area?

Fm Dayton Sumner: Fred, Disregard last message. Your suggestion did it! I plugged the external cable into the board — for a minute, nothing, then I straightened out a kink in the external cable and voila! It booted right up. I have now saved EVERYthing. And for the moment the hard drive is functioning normally — even with the scroungy internal cable back in place. Thanks very much for taking the time to help!

Fm Dayton Sumner: Gary, Fred Oberding's idea worked. I got the drive booted and I have saved everything. In fact, the drive is even now working just fine.

I really believe the problem was in one of the cables, which I will replace as fast as my local RS can get me new ones from FT. Worth. I'm still very much interested, however, in replacing this bubble. Even if it works, one of the heads has several hits on it and is far from reliable. And the extra capacity is very appealing.

Tell me some more encouraging things about how easy it is to install it. At one point you mentioned aligning the new drive. How complex is that? I've gotten braver in the past couple of days. And I sincerely thank you for your help and encouragement.

Fm Gary Phillips: Sorry, I don't know anyone in that part of the country. Perhaps someone else here will chime in. Roy's got you on the level of complexity. My reference to "alignment" was only relevant if you had changed C33 in order to save your data from the 5 meg bubble. Otherwise, no adjustment to the controller board should be necessary for the ST225.

Fm Fred Oberding: Dayton, have scrounged-up the following information on the cables for the 5 Meg HD:

AW-3034: External 50 pin cable from computer to HD; $21.72 retail;

AW-3030: Internal 50 pin cable for HD - $43.65 retail;

AW-3036: Internal 34 pin control cable - $31.86 retail;

AW-3037: Internal 20 pin data cable - $13.50 retail

Hope this info helps. The toll free number for Radio Shack National parts is 800-442-2425, and they accept plastic. They will want to know the catalog number of

the HD, 26-1130.

Fm MISOSYS, Inc: I'm not sure that 800 number is still valid for National Parts; try 817-870-5600 if not.

Hard Disk Driver

Fm Dayton Sumner: Roy, Today's mail brought a Sale Brochure from Radio Shack offering a 20-Meg external hard drive at (half price) $499. Say's it's for the Model 1000. If I buy your Hard Disk Driver Software, would it work with a Model 4?

Fm MISOSYS, Inc: Dayton, That 20 Meg drive will work okay as a secondary to an existing Radio Shack primary. But for the Model 4, you also need the Model 4 hard disk controller, a means of connecting the controller to the 50-pin expansion bus, a housing for the controller, a power connection for the controller, and connecting cables between the controller and the external hard drive. What you don't realize is that in the PC-XT environment, controllers plug in to the motherboard and all that is contained in an external hard drive is a case, power supply, and the drive itself.

So better wait for a better solution, such as our upcoming hard drive - which is getting closer. I have now firmed up the controller MISOSYS will be using, and I have the quote from the engineering company doing the host adaptor. I would suspect that I'll be shipping in about 3 months.

And I still should be able to come in at about $495 or a few bucks more to handle the interconnect cable between the external case and the Model 3 or 4. One thing I'm doing which was not in my original plan is to use the standard 50-pin CHAMP connector on the drive case. That connector looks like a "Centronics" printer connector but it has 50 pins. That is a standard connector in the external drive market these days. But the connector and plug pair cost me about $10 in quantity. The header connector I originally intended to use is relatively cheap.

Until I can establish firm production costs on the host adaptor, I cannot develop a final cost. We are not going to be using a PC-XT type controller; it was just unworkable. Instead, I'm using an Adaptec 4000A SCSI controller or a Xebec S1410A, both of which work similarly.

Open Files under LS-DOS 6.x

Fm Kent Fasick: I've recently copied a lot of files onto LDOS 5.3 data disks using Super Utility 4. When reading these under LS-DOS, everything shows up as open files, but LDOS sees them as O.K. Don't remember running across this before. Any ideas?

Fm MISOSYS, Inc: LDOS doesn't use a "file open bit", LS-DOS does. The directory bit in question is DIR+1, bit-5. That bit was reserved for future use under LDOS; thus, all files maintained by LDOS never should have had that bit set.

I suspect that SU4, for some unknown reason, sets that bit in the directory when it is copying. Of course, you obviously weren't copying those files originally from LDOS disks, yet I know of no other DOS which used that bit. Check any documentation on the original DOS for that.

To restore such a file to its proper directory state under LS-DOS, use the RESET filespec command on each individual file. If you have our GO:SYS package, you could use the WC utility to designate a set of files with one command invocation.

Fm Bob Haynes: Kent, Do you use PROWAM 1.0 by chance? It's the only program I know of requiring the LS-DOS "file open" bit be set (see Roy's message).

Boot LS-DOS 6.3 clean (hold CLEAR till LS-DOS Ready appears) then try your directories. That should do it, I believe LS-DOS defaults to having the "file open" bit reset.

Otherwise, reboot again but w/o the CLEAR button (to restore whatever configuration you use), and type MEMORY (A="N",B=0) <enter>. That resets the LS-DOS "file open" bit Roy mentioned. Try your directories again to confirm the solution, then SYSGEN the change.

Fm MISOSYS, Inc: Sorry Bob, but that only turns off the setting of the "file open bit" (referred to as the NETWORK bit) for files henceforth being opened. Turning off the network bit doesn't cause the DOS to ignore the status of files with their "file open bit" already set in their directory entry.

Fm Kent Fasick: Bob, No Pro-Wam. What I did was move A LOT of files from Newdos to Ldos. Then happened to look at the data disks while running LS-DOS and got all the file open flags. I remember hearing something once about SU leaving files open when using it to transfer files, but this is the first I've run into it.

Fm Les Mikesell: Kent, Using the DOS6 REPAIR utility on a disk should fix the file open bits. Its real purpose is to rewrite the directory from a model 1 disk with the correct data address mark for the model 3/4 but as a side effect it clears the file open bit (or at least it used to..).

Fm Joe Kyle-DiPietropaolo: Kent, In addition to REPAIR, you can use RESET on an individual filespec, but RESET doesn't take wildcards...

Function Keys and VT100

Fm Alan Varga: Anybody out there who knows how to remap/reassign values to the Model 4 keyboard? I want to call my computer at work as a VT100, but I need four function keys to use the software package at the other end once I'm logged on with my emulator. Any help would be appreciated. See VT100.TXT in DL0 for details. Thanks much.

Fm Adam Rubin: Alan, I can't see VT100.TXT until our sysop merges it into the DL, but I gather you already have

the video emulation under control, and just need to simulate PF1 to PF4? If that's the case, KSM would be the easiest way to handle it. I think that one of the libraries here [CompuServe forum PCS-49] even has a patch to make KSM use Clear-0 to Clear-9 instead of Clear-A..Z, in case Clear-A..Z conflicts with your emulator. Or am I missing the point here?

Fm Alan Varga: Sounds close enough Adam, but I have to make sure that the KSM will run concurrently with my COMM program (FastTerm 14.80). Mel Patrick uses a lot of the alphabet in <CLEAR> combinations and a couple of <CTRL>s as well; I'm waiting to hear from him now. FT has macro capability with the numeric <CLEAR> keys, but I'm not sure how to program in Escape sequences or hex codes (see VT100.TXT when available). I'm also waiting for a response back from MACBIZ (the Macintosh Business forum) for my bookkeeper's VT100 emulator as well. I'll keep you posted. BTW, where is the patch to reassign the KSM keys?

Fm Adam Rubin: Alan, If you can use FastTerm program the escape sequences into the <clear>+ <number> keys, that should do it. The patch to change KSM to <clear>+ <number> is in Library 6 as KSM.PAT; I haven't tried it, though, and I'd suggest going with FastTerm's macros if that's possible. Let me know how everything works out.

Fm Adam Rubin: Alan, Okay, I read VT100.TXT, and it sounds like you've really done most of the work already. Anyway, to answer two of your questions there, PF1 through PF4 on a VT-100 transmit the sequences `ESC O P`, `ESC O Q`, `ESC O R`, and `ESC O S` respectively. Each is three characters: an ESCape character (hexadecimal 1B), an uppercase letter O, and an uppercase letter P (for PF1), Q (for PF2), R (for PF4), or S (for PF4); those spaces are just for clarity.

Are you looking for literature on telecommunications in general, or on the VT-100 in particular? For the latter, I can recommend two of Digital's publications: "Terminals and Printers Handbook", which describes all (at date of publication) of Digital's terminals and printers and has a one-line description of each escape sequence, and their "VT100 User Guide", which has a thorough description of each escape sequence the VT100 sends or recognizes (and a thorough description of each key, knob, and light on the VT100). Best bet for those is probably to call your local Digital office, or perhaps a good library. (Hmm...the main terminal room or engineering library of a college or university, maybe?) If all that's left to do is to emulate the VT100's function keys, though, you shouldn't need these.

Fm Alan Varga: Well Adam, I studied the terminal translation tables at work and I need to re-program the Wyse 60's PF1 to PF4 to control characters when using it as a VT100 in order to use the Thoroughbred software. The keys are, in order, CTRL-E, CTRL-R, CTRL-F, and CTRL-C. The result is the same whether I re-program the PF keys or manually transmit the CTRL-key combinations. Armed with this information I tried FastTerm and found that manually transmitting those same key combinations produced the desired results, but I couldn't get the macro keys to send those combinations. Oh, well, life could be worse.

However, I now have to figure out whether a VT100 has a foreground/background capability and whether I can emulate it with FastTerm. It seems the Thoroughbred software can display prompts in the customer master file in a dimmed mode, clear the remainder of the screen and update the data fields in a brighter mode. On a DG D200 the intensity is controlled by control characters before printing data, sort of like turning inverse print on and off on a Model 4, but the concept is different on a VT100. I need to be able to clear the data (bright portion of screen) without disturbing the prompts (dim portion of screen). Right now I can't do that even on a re-programmed Wyse-60. For that solution I need an answer back from the vendor who sold us the hardware and the software.

Otherwise my only problems are my 300 baud modem (I'm saving up for a faster one) and the number of lines per screen, which I am reducing by 1 in the Terminal Translation Table on the computer at work. Thanks for the help. I'm interested in reading up on how to solve simple compatibility problems between different terminals and systems without getting too technical, since I'm not a hardware jock and I'm approaching all of this from a user's viewpoint. I also have to try out my bookkeepers Macintosh VT100 emulator yet.

Fm Adam Rubin: Alan, Character attributes on a VT100 are controlled exactly the way you described; there's an escape sequence for that function. At this point, I'd suggest just trying the whole setup and seeing what (if anything) doesn't work acceptably, as it sounds like things are mostly under control.

As for books, the only general one I can think of offhand is "Understanding Data Communications" ($4 at any Radio Shack). Perhaps someone else here [CompuServe PCS-49] or in IBMCOM can suggest some others.

Fm Alan Varga: Adam, After re-reading your message about escape sequences I redefined PF1 through PF4 in the translation table at work, and those values worked fine with one of the Wyse-60's changed to a VT100. I didn't need to re-program the function keys to match the table.

In addition, I have documentation for PCPLUS, which is an MS-DOS communications program. Since PF1 through PF4 were defined as hex values there and matched your escape sequences I thought I'd be OK from home with FastTerm. I used a disk zapper to program in the macros on page 3 of FastTerm's macro list as hex values, but when I tried calling work about 10 minutes ago my Model 4 froze. I couldn't exit the inquiry screen I had called up by pressing <CLEAR><4>. At first all that appeared was the number 4, so I backspaced and tried again. When that didn't work I tried <CLEAR><2> to do an alpha search and my Model 4 locked up. I had to reboot, and I'm not sure whether the computer at work thinks I'm still doing an inquiry or not. I left a message for Mel Patrick, but I don't know what I might have done wrong.

I called work back after renaming a copy of KSM/FLT to KSMNUMER/FLT, patch-

ing it with KSM/PAT, zapping FT/KSM and installing the filter. The PF keys work just fine. Still, it'd be nice to know why FastTerm's macros don't work.

Fm Adam Rubin: Alan, A lot of users here seem to like FastTerm, so I downloaded the newest version (14.9) from Library 0 here. I haven't tried it yet, but the "short" manual provided with it says (in the "New for Version 11" section) that in VT100 mode, the codes for PF1-PF4 can be generated by <clear>+<shift>+<5> through <clear>+<shift>+<8>. What happens when you try those?

Fm Alan Varga: Adam, I'll download 14.9 tonight and give it a try; thanks for the info.

Model 4 Memory Expansion

Fm Don R. Hill: I need help from someone with more savvy than I have, which isn't much. I own a Model 4 recently upgraded from 64K to 128K. I upgraded it because some of the things I was doing kept bumping up against the memory limits on BASIC, SCRIPSIT (enhanced with PowerScript), and VISICALC.

After conversion only VISICALC was able to find the additional memory. BASIC still has about 29K of available memory and SCRIPSIT about 36K, the same as before. Using SUPERUTILITY 4 I am able to look at the program file, but I am fairly well lost after that. Any hints about opening up these memories would be appreciated. Further, is it possible that there are some patches that would do the job?

I've talked to my local Radio Shack man about the problem who effectively said, "Model 4? What's that?" and gave me some phone numbers where no one ever answers the phone.

Fm David Huelsmann: Don, Programs have to be specifically written to take advantage of any memory available above 64K. This usually means that such additional banks are used either as a "RAM-DISK" or for data storage. It is unusual to find a program that will execute code in these additional banks [the only one that comes to mind is the spooler].

A program could be written in basic to utilize an additional ram bank as a data array storage (special interface code is necessary, i.e. @EXMEM), however, storage of the basic interpretive code is still limited to what you now experience.

VISICALC, MULTIPLAN, several terminal programs, ARC4ADD, all can use the additional space as data storage areas. See your manual on the MEMDISK for use as a ramdrive.

Fm Adam Rubin: Don, As someone already mentioned, most programs have no idea how to access the additional 64K of memory. You really have to solve it separately for each program. I've run into possibilities for two of the programs you mentioned, though.

The January 1985 *80-Micro* had some enhancements to Scripsit that let you use the "other" 64K to edit two other documents at the same time. (Probably not compatible with PowerScript, though.) A fairly recent *MISOSYS Quarterly* had an example of accessing the extra memory from BASIC for data storage. (Your programs would need rewriting to do this.)

I've found that the extra 64K of memory is most useful for the print spooler, MemDisk, or both. Most of your programs should work with both of those "as is". Hope this is useful!

Proofread Program

Fm Dayton Sumner: I usually use Model 4 SuperScripsit for word processing and just eyeball the text for typos and corrections. But occasionally I feel the need to run it against a spelling checker. Since the only one I've got runs with Model III SuperScripsit, I have to move the file to a pseudo-MOD I disk and then use CONVERT to move it to MOD III. I discovered a while back that the pseudo-MOD I disk had to be formatted under TRSDOS 6.2 or the Proofread program would think the LS-DOS Time was a password.

Yesterday I had a file originally written under LS-DOS that I couldn't seem to transfer without the "password". My solution was to convert it to ASCII with the Scripsit Utility and then convert that back to Scripsit on another disk so I could copy that and then CONVERT. Anyone know a simpler way? Anyone care to recommend a Spelling Checker to run with Model 4 Superscripsit?

Fm Bill Brandon: Dayton, call Cornucopia Software (415) 528-7000. Ask them about Electric Webster, version 4.8. EW does spell checking, hyphenation, and grammar and style (wipe out those pesky dangling participles!).

Fm Adam Rubin: Dayton, Radio Shack's Model 4 SuperScripsit Dictionary (catalog #26-1600) only checks spelling, but it has a lot of words and (of course) integrates beautifully into SuperScripsit. (<P>roofread even shows up in the main menu.) Anyway, I like it. Your local Radio Shack should be able to tell you if it's available, special-orderable, or whatever; price when I got it was $99. If you have any questions on this or on my other messages to you, just ask. Hope this helps!

Fm MISOSYS, Inc: Dayton, the reason why TRSDOS 1.3's CONVERT utility is indicating the file as being PASSWORD protected is due to the LS-DOS 6.3 extended dating field in the directory. Pre-6.3 operating systems used that same field as a user password field. I don't know why CONVERT didn't accept the file if the OWNER password was "blank", which it would normally be on an unprotected file.

In any event, the FUNDATE program in this issue of TMQ is just the answer to that problem. Instead of reverting an entire 6.3 disk back to pre-6.3 directory conventions, it allows you to alter a single file's directory entry. If you really have to get a file from LS-DOS 6.3 to TRSDOS 1.3, after copying it to the 35S1 media, use FUNDATE on it. Then TRSDOS 1.3 will look at that file as having no PASSWORD.

HARD DISK BACKUP

Fm Dayton Summer: Can someone tell me the relative advantages of using the HDCOPY4/BAS program from LSI to backup my Hard Disk as compared to just using the LS-DOS 6.3 BACKUP Utility? Is one faster... better... easier... or what?

Bill Brandon: Dayton, BACKUP wasn't meant for use with HD's. I've not tried to back up my HD that way, so I'm not sure the LS-DOS 6.3 Backup command will even work with a hard disk - you may get an error message back. Even if Backup **does** work, it will back things up file by file, which is very, very slow. I don't use HDCOPY4/BAS either, but it probably makes an image backup: much faster. (My 15 meg was bought second-hand, and all the software came with it for doing backups image-fashion, in case you were wondering how I do all those things I said I don't use this or that for. Roy's stuff is real good, and I'd use it if I weren't so doggone cheap.)

Fm MISOSYS, Inc: Not true, Bill. BACKUP was designed to work with ANY kind of drive - just like the rest of the DOS. It backs up all files which will individually fit onto the target destination disk. Even prompts you to change disks when the destination fills up. But BACKUP was not designed to partition a file too large to fit onto a single destination disk. That requires lots of SMARTS for the BACKUP as well as the RESTORE utility.

Don't forget BACKUP permits such operations as moving a class of files based on their file specification similarity. Or use the parameter to move files only which have been modified since the last BACKUP. How about selections by DATE? Most folks do not update every file on their hard drive every day. Thus, if they backup just the modified ones, the process is quite quick.

And there are folks, don't forget, who want to backup all of the files on their hard drive to move them to another system with a hard drive of a different configuration. Try that with your "mirror image" BACKREST. Since BACKREST always works in mirror image, you have a hard time restoring an entire drive to a new drive of different capacity. Better not use it to "download" your hard drive's files before switching to a larger hard drive bubble!

Fm Dayton Sumner: Bill, I have used BACKUP for specific files or groups of files and it seems to work well enough — even tells me to change if the destination disk is full. Just wondered if there was a more specific reason for using one or the other.

Fm Adam Rubin: Dayton, Not a question of advantages, just a question of which to use when. HDCOPY4/BAS will backup a file that's too big to fit on one floppy disk, but BACKUP won't. For everything else, BACKUP is LOTS faster and easier.

Fm Dayton Sumner: Adam, I suspected something like that and appreciate the confirmation. However, I did recently use BACKUP and when it ran out of space on the destination disk it did ask me to insert another disk and <ENTER> to continue? Was that not backing up a file too big for one disk?

Fm Adam Rubin: Dayton, If the file fit on the next floppy disk, then it wasn't too big for one disk.

DEBUG and SET

Fm Shane Dawalt: Ok, here's a real basic question that's almost too embarrassing to ask. I've written a driver for the Model 4 which is installed with the SET command. I need to debug the driver, but the system inhibits the debugger while executing a SET command. Therefore, the driver runs to completion without debug being invoked. I recall that there is a trick to activating the debugger from within a SET activated program. I cannot, however, remember what that trick is. It seems a RST instruction was at the point where the program was suppose to halt.

I don't recall which RST vector. I swore it was 38H, but it didn't work. Ideas anyone?

Fm Jim Beard: Shane, If SVC @DEBUG doesn't work (LD A,27/RST 28H) then you can compile it to a single-stepping and at breakpoints, and you may be able to activate an active DEBUG by a RST 28H.

Fm Shane Dawalt: Gads, Jim. I had forgotten about the DEBUG SVC, and it never occurred to me that there actually WAS a DEBUG SVC lest I would have looked in the SVC tables myself. Anyway, yes, it did work. Thanks.

Fm MISOSYS, Inc: Don't swear, Shane, the DEBUG one-byte restart is RST 30, not RST 38 which is the RTC interrupt.

Here's another long-about way to debug, or step through, a filter or device driver installation, especially useful when you don't want to ZAP in a DEBUG restart. Knowledge of the DOS sequencing of command line processing is necessary, but that's available from *THE SOURCE* - still available from us.

If you invoke the DOS library command SET from DOS Ready, the next time that @LOAD is requested will be when the SET command issues the @LOAD of your driver or filter program file. So the first thing you want to do is to enable DEBUG and set a BREAKPOINT at @LOAD. You can accomplish that by checking the SVC table for the execution address of @LOAD and @EXIT. Let's assume they are 1B38H and 1B0BH respectively (they are in 6.2 and 6.3). With those two addresses known, go into DEBUG, then issue a

```
G1B0B,1B38<ENTER>
```

This returns you to DOS Ready with a breakpoint at @LOAD.

Next issue your SET command. When @LOAD is invoked from SET, you will be in DEBUG. The top of the stack contains the RETurn address within SET. So you need another G command with a

breakpoint at that address. Assume the word at the top of the stack contains a 2C73H, as it does in 6.3, then a DEBUG command of the form,

```
G,2C73<ENTER>
```

will commence loading your module.

When DEBUG has again been entered, your driver or filter program has been loaded and you are back in SET. If you follow through the code of SET in *THE SOURCE*, the RET statement which just follows the label "GODOIT" will transfer to your program. Just issue another DEBUG "G" command with the address of that RET as a breakpoint. Then just step through your module.

Obviously, if you can just ZAP in the one-byte of code to invoke DEBUG (that's a RST 30H), it's a lot easier.

Here's one for the BASIC folks: How do you enter DEBUG from BASIC? Simply invoke the statement,

```
SYSTEM"MEMORY (GO=X'30')"
```

and you'll be in DEBUG. Return to BASIC, assuming you have not destroyed anything in memory currently being used, by just doing a G<ENTER>. When DEBUG was entered from BASIC, the PC will contain the RET address back into BASIC.

Using @EXMEM

Fm Adam Rubin: I seem to have missed a discussion here, or something. I have two questions about the famed @EXMEM, SVC 108, and its use on my 128K 4P with 6.3.

1) Is there a RAMdisk utility that uses @EXMEM? I don't have enough room in low memory for both @EXMEM and MEMdisk at the same time. Or did I read somewhere that @EXMEM can't be used for a RAMdisk driver? Why? Is something else available that will let me use @EXMEM and a RAMdisk at the same time?

2) How can my program check whether @EXMEM is installed, and activate it if necessary (e.g. if it was SYSGENed, and not activated since boot)? Do I have to (a) find the start of the $XM module, (b) calculate the destination of the JR at the start of its header, (c) if SVC 108 points to this destination, then done, else (d) make sure SVC 108 points to somewhere in the DOS (i.e. not to something in low memory or to something in high memory, like a different routine for another SVC 108, and (e) set SVC 108 to point to the address calculated in step b. I have a hunch this is overkill, and that not all of this is necessary to check for and/or activate @EXMEM. I realize that I still have to look for an available memory bank after doing all this, and, if appropriate, mark it as "in use".

(Somehow I get the impression that I'd have less problem answering these myself if I weren't using four operating systems at the same time.) Thanks for any and all replies!

Fm David Huelsmann: Adam, Sort of one answer to your two part question. As @EXMEM is currently configured, you can't use it for ramdisk operations. It does double buffering all of the time and needs to be modified to only do that buffering when needed.

ERAMDISK by Michel Houde could use a modified @EXMEM (i.e., double buffering removed) however, he also provides PEXMEM (essentially the paged function of @EXMEM) that doesn't do the buffering when not necessary. ERAMDISK and a fast CIM load/unloader are available from MISOSYS on disk notes III.ii (source code is also provided). You can get a method to activate @EXMEM from the source Michel wrote.

Fm MISOSYS, Inc: Here's a useful hint for you. If you patch the NOP at 1AF6H to a 0C9H (RET), then any SVC request to a non-existent SVC will return to the caller with an SVC error - error code 43 - instead of aborting. Okay, then how can you determine if the SVC is there or not? @EXMEM will alter the value of register B (that passes the function number). So put an invalid function number in register B (invalid for @EXMEM), then issue the SVC. You should return with error 43. If register B is altered, then the SVC is present. Just recommend patching the NOP to a RET to anyone using the program. I may just recommend that myself. Any program using SVC's should be checking for error returns; thus, it really doesn't make sense to do a dead abort to DOS on such an invalid SVC request.

As far as @EXMEM's use with a RAM drive is concerned, it always did double buffering of a memory page. Double buffering is needed when the caller's buffer is in the upper 32K. You can't directly move 256 bytes from one bank to the upper 32K of bank 0 (normal high memory of a 64K machine). The intelligent way for a memory manager handler to operate is to test whether the caller's 256-byte buffer was in an address range greater than 7F00H (i.e extended into 8000H-0FFFFH). If so, the bank would be imaged, the requested page would be copied to low memory, then the original bank would be imaged, and finally the low-memory copy would be copied to the user's buffer. It certainly takes up some amount of code space to do that buffer location testing and alter the code for page handling. I wanted to keep @EXMEM's memory utilization to a minimum.

Since there is no low memory region normally available without reserving it, and who wants to set aside another 256 bytes of low memory, I used the high page of the system overlay region: 2300H-23FFH. Unfortunately, that region is used by the @GATRD and @GATWR service calls. So a RAM drive driver based on @EXMEM would get a corrupted disk image.

I have updated @EXMEM to do double buffering only when the caller's buffer is in high-memory; it's in this issue's corresponding DISK NOTES. But that precludes the RAM driver from being in high memory.

Config or No Config?

Fm MISOSYS, Inc: Some folks got confused over how to apply the patches developed by Michel Houde for the XLR8er board. The root of the problem was in not starting with a fresh master disk - one which had no configuration file.

This problem is also pertinent to any patch which alters the BOOT/SYS file by extending the code which is loaded into low memory by the booting process. Even if your SYSTEM disk has no modules in low memory, if it has a CONFIGURATION FILE, then the CONFIG/SYS file contains all of the alterable system pointers and flags. There is a pointer to the start of available low memory which absolutely must be correct if you want to install additional low-memory drivers or filters after boot up. So if any patch advises you to start with a FRESH disk, please assure yourself that the disk has no configuration.

The easiest way is for you to boot up your disk. When you get to LS-DOS Ready, type "SYSGEN (OFF)". That will deactivate any configuration file, if present. Then you must re-boot that same disk. From that point on, you can begin to build up your configuration and then SYSGEN. Got that? That's a three-step process:

1 BOOT your LS-DOS 6.3 SYSTEM disk.

2 Type SYSGEN (OFF)

3 Re-BOOT the disk and build your configuration.

FORTRAN or C Compiler

Fm Steve Snyder: I am looking for a FORTRAN compiler for the Model 4. Does such a critter exist? If so, where can I order it from and of what sort of quality is it?

Also, can anyone recommend a "C" compiler with nearly complete implementation of K&R standard, also for Mod4?

Fm Pete Betz: Steve, FORTRAN is a problem — the Radio Shack version is pretty good, but has been unavailable for some time. You just have to find someone you can talk into selling his copy. It took me nearly a year to do that, but I'm pretty pleased with it now that I have it.

As for C, don't even hesitate. Buy MISOSYS' compiler, called PRO-MC, and you'll be getting an outstanding software package. (This is the only one to buy anyway, as the old Radio Shack/ALCOR is a buggy piece of trash.) This will likely require that you also obtain MISOSYS' PRO-MRAS relocatable assembler, but no home should be without one of those, too. The pair will cost around 215 clams, and are worth much more than that. You'll love 'em!

Fm Jim Beard: Steve, Tandy lists 26-2219 in their catalog, but only about 40 copies are out there somewhere. Ask at a Tandy Computer Center for the phone number of the Regional Manager. Call him and he will locate one for you. This is the Microsoft CP/M 8080 FORTRAN 66 that was such a workhorse for many years. As such, it is pretty much bug-free. The code is 8080 compatible except for the library routines that were rewritten for Tandy. Even so, Z80 instructions are more convenient than 8080 instructions, but not faster. Due to Microsoft's design priorities and the age of the compiler, it is widely recognized as the fastest high level language available for the Model 4 (or Model I, II, or III). I have found a few bugs in the variable typing hierarchy, but nothing most people would ever notice. My RATFOR manual discusses all known bugs in Tandy FORTRAN and how to avoid them or get around them.

I strongly second the recommendation of the MISOSYS MC. Roy Soltoff has long had an excellent reputation for quality and product support.

MOD Date Mystery

Fm Dayton Sumner: I just noticed something that puzzles me. My 5-Meg Hard Drive is partitioned into 4 virtual drives. A Directory for Drive 0 shows current Mod dates and times as expected with LS-DOS 6.3. But the other three drives have no times and the Mod dates are most in '80 of '81 — even on files I created new last week. Can't see that it makes a damn bit of difference, but I'm curious why this is. Anyone have an answer?

Fm Bob Haynes: Dayton, Sounds like you (or your setup JCL) neglected to DATECONV your data partitions when you originally configured your drive. Do a

```
DATECONV :x (CS) <enter>
```

on each offending partition to flag the directories for LS-DOS 6.3 date/time stamping.

Fm Adam Rubin: Dayton, That's probably because you didn't DATECONV those drives. LS-DOS thinks they're pre-6.3 (which they are), and therefore writes the pre-6.3 date format in the directory (which can only handle 1980-1987).

If you don't have any system files on those drives, you can DATECONV them now, and get the correct date and a time stamp on any files you change after that.

(If you don't use DATECONV, the file date will continue to be eight years off, and you won't have a time stamp. That's the only difference.)

Don't forget to DATE CONV your data disks!

Fm Robert M. Simmons, Rocky River, Ohio: Dear LSI, Do you have an update of LSDOS63J: I have one of your system updated discs s/n A600K14671 ID 14120. I can forward my master copy of the J version to you for upgrading if there is one.

The file date that appears on DIR seems to have reached the top of its capability, ie, entries made in 1988 are shown as 1980. 1989 entries are shown as 1981. I find nothing on the 02/02/87 update instruction sheet that refers to this.

My system consists of a model 4D with a 15 meg hard drive. Thanks for your help.

p.s. I hear that there is a monthly newsletter concerning ICOM. Do you have information on it?

Fm MISOSYS, Inc: In response to your letter of February 22nd to LSI, MISOSYS took over the LS-DOS 6.3 product in July of last year (1988). We sent a flyer to that effect to all registered users of 6.3. You are in the data base at your current address.

The current release of 6.3 is "L+", and has been at that level since about July 1987. You can always return your disk for a disk refresh; the cost is $10 + $2 S&H.

You are mistaken about the dating of the 6.3 release; the limit of 12/31/87 for date support was on releases earlier than 6.3. I suggest that either the disk you are booting from is not a 6.3 disk, or it has been improperly updated. For SYSTEM disks, the two step procedure with a 6.3 disk in drive :0 and a 6.2 SYSTEM disk in drive :1 is to type:

```
BACKUP :0 :1 (S,I,OLD)

DATECONV :1
```

You must also upgrade any DATA disk which you want to continue using by entering the second of the commands shown above (with the DATA disk in drive :1 and a system disk which contains the DATECONV/CMD program file). Please ensure that you have upgraded properly. Files under 6.3 are correctly dated up through 12/31/99.

I don't know what you are referring to when you speak of a monthly newsletter concerning "ICOM". MISOSYS publishes a quarterly magazine covering our product line and related machine environments. A subscription is $25/year.

No room for 6.3's BASIC when upgrading?

Fm Jupiter Muntean, Kitchener, Ontario: Dear Sir, Re: LS-DOS 6.3 Upgrade kit. I carefully read your instructions, but for the moment I am still confused about two problems as follows:

First question is: On your white page No:1 on bottom under the title: "UPDATING SYSTEM DISK" It's written: "Updating system disk may take two or three steps. Place the 6.2 disk in drive 1, and issue the command:

```
BACKUP :0 :1 (I,S,OLD) <ENTER>
```

If you wish to use the new Basic enhancements, type the command:

```
BACKUP BASIC:0 :1 (I) <ENTER>
```

Once the backups are completed, give the command:

```
DATECONV :1 <ENTER> "
```

I did exactly as was written and I received the answer that the disk is full and was required to insert a new formatted disk. My self I considered it to be wrong and I need your correct answer.

Maybe I should use just one of the first two steps for Basic, not two as indicated? Please clarify this question and please give me the right answer.

The second question is: Attached please find a completed WARRANTY REGISTRATION form as per your request except one confusion: I did not find the equivalence of Registration #.

On your instructions (See page 16) it's mentioned that all customers letters should have ID reference as I did above, but it's not mentioned what is the registration No. required on the WARRANTY REGISTRATION FORM?

Perhaps this will be your new office No: who knows? May be you can explain [it to] me. This was the reason for what I wrote both numbers. Please do the required correction and please let me know. Thank you for your assistance.

Fm MISOSYS, Inc: Jupiter, if you received a disk full message during the backup of BASIC, it generally means that the disk you were copying **to** did not have BASIC on it. It's a simple matter to check, just invoke the DIR command using the (I) parameter. It would be extremely rare to get a disk full just by typing the update command, BACKUP :0 :1 (I,S,OLD). You should only copy the BASIC interpreter files if the target disk already has BASIC.

Note thought that the 6.3 BASIC facility has new overlay file, BASIC/OV2. If the disk you are upgrading has no free space whatsoever, then there would be no room for this overlay file. Thus, the "disk full" message would be generated by the BACKUP command if you were to attempt to move the new BASIC to your 6.2 disk.

The registration card should have the customer service ID number written on it. We can derive the ID number from the serial number, so it doesn't matter. But since it's the ID number which is entered into the data base, it's easier if you just follow the instructions which came with the upgrade - use the customer service ID number. Note that the "yellow sheet", which is the first collated page of the LS-DOS 6.3 documentation states,

"NOTE: To obtain the ID# for the top line on the registration card: Place the beige master disk in drive :0 and BOOT your machine. Enter the DATE and the TIME (in 24 hour format). When the LSDOS Ready prompt appears type: ID <ENTER>, your Customer service ID number will then appear on the screen."

Don't forget filters when upgrading to LS-DOS 6.3!!!

Fm Pastor Dave Dryer: Last year we purchased from you the LS-DOS 6.3 update for TRSDOS 6.2.X. We have a Radio Shack Model 4 Microcomputer, and since converting to LS-DOS 6.3, we have had few problems with our system. However, there is one problem that persistently frustrates us. It only occurs when we use Radio Shack's Profile 4 Plus database software. As you can see from the enclosed example, whenever we hardcopy a file description created by Profile 4 Plus, the initial line of the file comes out far to the right of the paper, and most of the information is printed on the printer's platen. This had never happened prior to the update, and I am curious as to why it is so with LS-DOS 6.3.

Fm MISOSYS, Inc: Dear Pastor Dryer, concerning your printing problem when using Profile 4 after updating with LS-DOS 6.3, although I can't say for sure, my guess is that the FORMS filter was installed in your Profile configuration when you used the 6.2 release of DOS. When you upgrade a DOS, any existing configuration needs to be re-installed.

If you take a close look at your sample printout which you provided, it does appear that the two lines which printed far to the right originated at about the ending location of the previous line. Some programs generate a line feed for the end of line at particular points. If Profile did this for the two preceding lines, then the result is what you experienced. The FORMS filter would have converted the line feed to a RETURN. That would have brought the printer's carriage to the left hand margin. If I am correct in my hypothesis, re-install the FORMS filter with the command sequence:

```
SET *FF FORMS
FILTER *PR *FF
SYSGEN
```

Do this operation when your Profile disk is booted. In the off chance that your Profile disk does not have the FORMS/FLT program file on it, another method is to boot your LS-DOS 6.3 disk, place your Profile disk in drive :1, then issue the sequence:

```
SET *FF FORMS
FILTER *PR *FF
SYSGEN (DRIVE=1)
```

If this procedure does not work, I don't know the cause of your printer problem.

Fm Dave Dryer, Senior Pastor: Dear Mr. Soltoff, Thank you for your prompt response concerning the printing problem we have had using Profile 4 Plus after upgrading with LS-DOS 6.3. After re-installing the forms filter as you suggested, the program works perfectly. Thank you so much for your help. We appreciate the good service.

```
File Name: MAILLIST   Segment # 1        02/25/89

                                                                Field
 Field Headings        Disp.          Length      Disp.
                                                                1 - LNAME
 1 - LNAME                              15          0
 2 - FNAME                              10          15
 3 - STREET                             20          25
 4 - CITY                               14          45
 5 - STATE                              2           59
 6 - ZIP                                5           61
 7 - SORT CODE                          1           66
 8 - SIX MONTH INDICATOR                4           67

The Length Is  71 Of  71 Characters


LNAME: *1
FNAME: *2
STREET: *3
CITY: *4
STATE: *5
ZIP: *6
SORT CODE: *7
SIX MONTH INDICATOR (YYMM): *8
```

Red ink indicates how supposed to print. Most of information off paper to right. Only happens when hardcopying file description in Profile 4+

Can't use DOS in MemDISK?

Fm Dale Parsons, Cross Lanes, WV: Dear Roy, I am running LS-DOS-63 on my 26-1069 128K Model 4. I have never been able to install MEMDISK as the system drive under this, or any TRSDOS versions. Everything appears to be OK up to receiving the message the transfer is successful. Then any DOS command such as DIR or DEVICE results in a totally unrelated error message and the computer hangs up. Calling BASIC i6 more spectacular, the screen scrolls endlessly.

You wrote with shipment of my 6/30/88 order of *The Source*, that the System files in memory should be compared with the disk or perhaps there might be a faulty memory. COMP6 (from Radio Shack 6.2 Utilities) give the files a clean bill of health. MEMTEST (mode 3) also reports nothing wrong. I have also tested banks 0 and 1 by filling with different characters during a switch-wait-examine routine and can find nothing changed in the 8000H - FF06H range. A KSM filter refuses to be replaced above FF06 but the failure with MEMDISK also occurs on non SYSGENed disks.

This is no great deal, more an annoyance than anything but I do wonder about some defect that could affect other applications. Oh yes, everything else tried to date with MEMDISK appears to work perfectly. Any suggestions will be appreciated.

I would also like to rebut J A Layman's rebuttal (TMQ III.ii, page 13). I too acquired Visicalc 02.09.02 as part of a bargain priced "house cleaning" package. It won't even run from the release disk, It comes up and accepts entries for about two minutes and then proceeds to replace the entries with garbage. Any ideas what to look for and where?

Fm MISOSYS, Inc: Dale, concerning the inability of using MemDisk as a SYSTEM disk in any version of DOS 6, although this may appear to be a silly question, are you perhaps establishing the MemDisk as an "S" type density disk? The DOS requires that the SYSTEM disk be double density. Personally, I don't expect that you have never tried MemDISK in double density as a SYSTEM disk, but I had to ask.

Another question, have you ever tried to use the SPOOLer loaded into one of the expanded memory banks? There are a few Model 4s which have a problem in being unable to execute code in the expanded memory banks. If your machine is of that category, it may also be associated with the problem. But when the MemDisk is the SYSTEM disk, code is swapped to regular memory during "loading" of the requested file no differently than what would occur in reading/writing a data file. Sounds like a puzzler, to me.

As far as the Visicalc 2.9.2, I have no idea what the problem could be. I requested Charles to send me a copy of the disk so I could look into it, but by then he had already discarded it. If you still have your disk, make a copy with DISKCOPY and set the copy to me. I'll look into it.

Job Control Language: //EXIT, //STOP, and //ABORT execution JCL macros "explained"

Fm F. Cornet, Amsterdam, the Netherlands: Dear Mr. Soltoff, I have difficulties when trying to use the termination macros: //ABORT, //EXIT and //STOP. The table 1 on page A-5 of the Mod-4 Owner's Manual describes //ABORT and //EXIT as to return to DOS Ready or BASIC Ready. I understand this to mean that the return to DOS occurs when the job command has been entered directly from DOS Ready and that the return to BASIC takes place once the JCL command has been entered from a BASIC command line.

On the other hand //STOP is described to return to the user program. I understand this to mean that after return to the program from which the JCL command has been entered, this program proceeds execution (under BASIC or DOS as the case may be).

Unfortunately however this does not work! Even when using the example on page A-37 of the manual under the heading "Interfacing with Basic" any of the three macros return to DOS Ready. I tried also TRS-DOS 6.x with same negative result. But LDOS 5.13 R 1981 (mod.3) proves to do the job correctly.

It seems strange that I would be the first person to discover a bug of this kind, already appearing in TRS-DOS 6.x. Do you have any idea what I am doing wrong? I hope you can solve my problem.

Fm MISOSYS, Inc: You express confusion over the differences between // ABORT, //EXIT, and //STOP in LS-DOS 6.3 and Job Control Language. There are differences in their behavior and instances within a specific JCL file where one should be used over another. But the greatest confusion you are experiencing originates not from any difference in JCL operation between LS-DOS 6.3 (Model 4 mode) and LDOS 5.3 (Model III mode), but from the different command execution facility (LDOS BASIC's "CMD var$" versus Microsoft's Model 4 BASIC's "system var$"). Let me touch on these differences first.

The CMD facility in LDOS allows you to execute any command from BASIC and return to BASIC at the conclusion of the command. The command may be a single instance (one program) or a multiple instance controlled by Job Control Language. This facility requires close coordination between BASIC, JCL, and the DOS. There is specific code programmed into BASIC and DOS to coordinate the process and provide the necessary linkage to enable its "flawless" operation. BASIC allows you to invoke any command because it saves the entire state of the BASIC program by shifting its runtime environment to high memory and protecting itself by temporarily lowering the high memory pointer, HIGH$. This facility even allows you to invoke a second or third instance of BASIC, providing that memory sufficient to run the program is still available.

Unlike LDOS's BASIC, Microsoft's Model 4 BASIC provides the "SYSTEM" command to permit the execution of DOS library commands. Such commands execute entirely within a region of the DOS known as the library overlay region. What BASIC does is cause the invocation of your command string (first setting a system flag to ensure that the DOS permits only a library command), then upon return from the library command, BASIC reloads its BASIC/OV1 overlay file. That overlay is the portion of the BASIC interpreter which loads into the DOS library overlay region (2600H-2FFFH). DOS

library commands return to BASIC because they are programmed properly for it to happen. They execute entirely in the library overlay region; they maintain the integrity of the stack pointer; and they terminate via a RET instruction (something akin to the RETURN at the terminus of a GOSUB routine).

Once the "library-command-only" system flag has been set, you can fool the DOS into loading some other program which follows the same "rules" as a library command by using the RUN command. For instance,

```
SYSTEM"RUN SETX (...)"
```

invokes the SETX program from BASIC. Of course, any program invoked this way from BASIC has to follow the rules outlined above. The result of what happens if you try to do otherwise is generally a crashed system.

The reason why "DO", which is a DOS library command, cannot return to BASIC is that by its very nature, DO cannot adhere to the "rules". Since DO invokes a JCL file which can execute just about anything, DO cannot return to BASIC. DO doesn't maintain the stack, doesn't exit via a RET statement, and has no control of the memory utilization of the programs invoked by the JCL file's commands. In fact, the action taken by the DOS in setting up the DO processing will reinitialize the stack pointer to the system stack.

Now let's move on to the three JCL execution macros. My TRSDOS 6 manual is different from yours as I have a keyboard chart on my page A-37. Let me assume you are referencing the sample JCL file on my page A-31 which is invoked from the BASIC statement, `1000 SYSTEM "DO = ALERT/JCL:0"` and looks like the following:

```
. Your procedure is com-
plete. Press ENTER to res-
ume.
//ALERT (1,0,7,0)
BASIC
//STOP
```

This doesn't demonstrate a BASIC program invoking a DO file then returning to itself. The line 1000 statement causes that BASIC program to terminate and invoke the JCL. Remember the Model III's CMD"E",var$? That's the same effect. The "BASIC" on the line following the //ALERT macro just invokes BASIC again. You could start a new program running by adding the program name to the BASIC command. But why the //STOP? Let's examine that.

Here's what Table I on page A-5 (here our manuals match) of the TRSDOS manual says about the Termination Macros.

//ABORT	Stops execution, displays "Job aborted". Returns to TRSDOS or BASIC Ready.
//EXIT	Stops execution, displays "Job done". Returns to TRSDOS or BASIC Ready.
//STOP	Stops execution. Returns control to the user program.

The definitions are misleading, at best, and certainly don't clarify the exact differences among the three macros. The definitions are also technically incorrect as //ABORT and //EXIT cannot return to anything other than DOS. The processing of //ABORT and //EXIT is quite similar; they both cause JCL to become inactive, but //ABORT causes an exit to the @ABORT service call while //EXIT causes an exit to the @EXIT service call. At the DOS level without JCL active, @ABORT and @EXIT are treated identically. Thus, we can consider //EXIT and //ABORT to be identical in behavior once the distinction within JCL processing is concluded. The difference in posted messages is that distinction between the two within JCL processing. This means that the TRSDOS manual is certainly wrong on the point of //EXIT and //ABORT. On the positive side, the explanations in *Interfacing with BASIC* further on in the manual are correct.

When JCL processes //STOP, it makes JCL inactive, then passes control to @KEY. Since the JCL line fetching was caused by a @KEYIN service request, that request is still active. @KEY then passes a keyboard fetch back to @KEYIN which continues to request keystrokes normally.

To explain the difference in behavior, I'll use the following JCL:

```
. This is a JCL test
BASIC test/bas
//macro
```

The "macro" will be replaced by one of the three termination macros. But first notice that the example JCL file is not being invoked from BASIC; it is invoked from *DOS Ready*. You should now understand from the previous discussion that invoking DO from Model 4 BASIC puts you into the same position as if you had invoked the DO from *DOS Ready*.

Next, you must understand what causes the fetching of a line of text from the JCL file. A JCL file line is fetched when JCL is active and a DOS @KEYIN service call is invoked. That service call is used by the DOS, for example, following the *DOS Ready* prompt to accept a command string. BASIC uses it for input and line input.

Using my sample JCL, the first line input request within TEST/BAS will be satisfied by the line which immediately follows the BASIC statement. If the BASIC program has no input request and terminates with a STOP or END, BASIC next issues a Ready prompt and uses its INPUT process (which uses @KEYIN) to get your next typed command. If the BASIC program terminates using SYSTEM without any input statement, then the next JCL line would be used for execution after BASIC exits.

Regardless of what the BASIC program does, if the macro is ABORT, when that JCL line is fetched, you will see "*Job aborted*" on the screen followed by "*LS-DOS Ready*". Your program would have terminated. The same would be true, except for the posted message, if the macro was EXIT. But the behavior of the job stream if the macro is STOP depends on the input requirements of BASIC and the program which is RUN. If the program has any INPUT requests, JCL will become inactive and the INPUT must be satisfied from the keyboard. If the program has no INPUT requests but terminates with END, then the BASIC ready prompt will cause an INPUT; JCL will become inactive and the input will be fetched from the key-

board.

But notice what happens if the BASIC program has no INPUT and terminates with SYSTEM. The exit from BASIC results in the JCL processing of //STOP. This makes JCL inactive without issuing any prompt and returns control to the keyboard. So the DOS is waiting for its next command but the *LS-DOS Ready* prompt has not been issued. All you will see is a blinking cursor; certainly that is insufficient for you to know what is happening.

The end result is that you should use `//EXIT` when the JCL is executing a program which terminates back to DOS without issuing any line INPUT requests. You should use `//STOP` when the JCL is executing a program which issues line INPUT requests. Only use `//ABORT` when you want to terminate the JCL with a *Job aborted* message in contrast to a *Job done* message. And finally remember that under Model 4 BASIC, you cannot invoke a JCL file via a SYSTEM"DO..." and expect to return to that BASIC program at the line immediately following the SYSTEM statement as is the case with LDOS.

Incidentally, another place where folks go wrong is in invoking COMM from JCL with the subsequent line coded as `//EXIT`. The first time you try to enter a "file ID", COMM will be immediately terminated without releasing the COM driver's received character interrupt vector because COMM uses @KEYIN to fetch the name of the file you want to read or write. COMM can be invoked from JCL if the terminating macro is `//STOP`. Of course, if you never use the File ID function, when you exit COMM, you will be back at LS-DOS Ready without receiving a prompt; it was suppressed by the `//STOP`!

How do I write USR routines under LS-DOS?

Fm H. V. Ennor, King City, OR: About eight months ago, I purchased your program called PRO-CREATE Editor/Assembler Ver 4.3 and have been trying without success to use it as a USR subroutine in some basic programs in my TRS-80 MODEL 4 computer since receiving it.

I successfully used that procedure with the TANDY Series 1 Editor assembler and TRS-80 Models I and III and it still works with the Model 4 when booted up in the Model III mode.

I purchased your Editor Assembler because TANDY does not offer such software for their Model 4 and it saves a lot of time to call a machine language sort from Basic when sorting a list of data items. Can you possibly explain why this cannot be done with your program?

Fm MISOSYS, Inc: Writing a USR routine is not dependent on what assembler you are using. Rather it is dependent on the BASIC you are writing it for and the operating system you are using. That determines the computer environment you are operating under.

If you want to write a USR routine to operate with Model 4 BASIC, which by the way is supported by Radio Shack and neither MISOSYS nor LSI, you need to read and understand the documentation in your TRSDOS user manual covering the USR facility. Both the USR routine itself and the means of addressing it in the BASIC program are different than the interface in Model III mode. That's because the integer conversion routines are addressed differently. Please study your TRSDOS 6.x user manual's section in BASIC on USR.

Again I must reiterate, programming a USR has nothing to do with the assembler, but the person using the assembler has to be knowledgeable in interfacing to a particular implementation of BASIC via the USR.

As an aside, you may wish to consider our BASIC compiler, PRO-EnhComp, as it allows imbedded inline assembly code. With it, you don't have to utilize contorted USR-coded functions in order to interface assembly modules with BASIC to produce hybrid programs.

Finally, I commend to our TMQ readers who may be experienced in the subject of writing USR assembly language modules which interface with BASIC, that an article, or articles, on the topic would be a valuable submission. There are still many folks who have not tackled this programming technique. The subject matter should include externally loaded modules, modules poked into protected memory via READ DATA statements, and packed strings.

SEARCH1 from BF&B and More questions on USR interfacing

Réal Déchêne
arpenteur-géomètre
1600, Boul. Sacré-Coeur,
St-Félicien, G8K 1H3
CANADA

I am using LS-DOS 6.3 and BASIC 01.01.01 on a model 4 and I want to use the assembler program SEARCH1/CMD (frum Basic Faster and Better by Lewis Rosenfelder p.132). This program is written for Model 1 and 3 with ROM calls.

I know I have to modify line 110 "CALL 0A7FH" and line 860 "`JP 0A9AH`". At line 120, HL register must contain VARPTR(ARRAY(0)). How can I modify lines 110 and 860 to work with BASIC 01.01.01? My Basic instruction is: `J=USR(ARRAY(0))`.

In *MODEL 4 OWNER MANUAL* p.2-170, "Upon entry to a USR routine... when the argument is a number, HL register points to the argument storage area (Asa)... Your routine can call BASIC'S FRCINT routine to put the argument into HL in 16-bit, signed two's complement forms."

This means to me that if HEX$(VARPTR(ARRAY(0))) = 84B4H, HL=84B4H. Is it possible that HL=two's complement of

84B4H on entry of SEARCH1? If so which assembler instructions can I use to take it back to 84B4H? Are those true?

```
LD      A,L
NEG
LD      L,A
LD      A,H
NEG
LD      H,A
```

In SEARCH1, at line 840, BC holds the value I need for the variable J in basic. To replace JP 0A9AH" can I do this:?

```
PUSH    BC
LD      HL,(MAHINT)
EX      (SP),HL
RET
```

On an other hand, hww can I simulate these GWBASIC instructions to work with BASIC on model 4:

```
OPEN "COM1:9600,N,8,2" AS
#1 'open RS-232-C 9600BPS,
no parity,
      '8-bit, 2-stop-bit
OUT &H19,3  'set DTR and
RTS
...
OUT &H19,0  'reset DTR and
RTS
```

If you know where I can find a program such as SEARCH1 that will work on an IBM XT, I will, appreciate that you write me where I can get it. Thank you very much!

Fm MISOSYS, Inc: Réal, This is in response to your letter of February 22nd addressed to Logical Systems Inc. MISOSYS took over the distribution and support of the LS-DOS 6.3 product in July of last year (1988). MISOSYS has no responsibility to support BASIC other than the enhancements LSI added to BASIC. The BASIC is a product of Microsoft Corporation and is supported by Tandy. For this reason, MISOSYS cannot provide you a detailed answer to your questions which concern interfacing BASIC to a USR routine. Nevertheless, let me provide you with a few pointers.

Signed two's complement form is the standard format of integers in BASIC. The result of `VARPTR(ARRAY(0))` is the form needed, and register HL will be set properly. On the other hand, your biggest problem is that the SEARCH1/ASM program needs more than just the changes you noted. Line 110 needs to be altered to conform to the FRCINT code identified in the TRSDOS 6.x manual instead of the `CALL 0A7FH`. But line 860 also needs to be altered to conform to the MAKINT code. Those two changes result in a necessity to re-assemble the SEARCH1 program to alter the "magic array" data. Sounds like this is beyond the scope of your expertise. I cannot do it for you.

Concerning the access of the communications port through BASIC, you would need to **`SET *CL COM`** at the DOS level. From BASIC, you can invoke SETCOM with an appropriate parameter string to alter the default parameters. Use BASIC's **`SYSTEM"command-string"`** statement. But I doubt that you will be able to operate at 9600 baud! You can subsequently **`OPEN "I",buffer1,"*CL"`** for input and **`OPEN "O",buffer2,"*CL"`** for output.

Moving files from LS-DOS 6.3 to TRSDOS 1.3

Fm Karl Krelove, Levittown, PA: Roy, Thanks for the TRS coverage. It almost seems that the TRS80 computer line was the only one whose coverage increased after it was abandoned by its manufacturer. Or maybe I just never noticed the other literature while 80 Micro was still in the field. Anyway, my Model 4P is a very useful machine and I'm not thinking of giving it up. Find enclosed my renewal for TMQ and I hope you do find the idea of going to a bi-monthly format workable.

I have a question about LS-DOS 6.3 that you might answer. I've read over the instructions I received with the original disk and can't find an answer (am I reading right over it?). When I want to move a file from an LS-DOS disk to a TRSDOS 1.3 disk using the CONVERT utility in TRSDOS 1.3, I find that the program won't convert the file. It tells me that the file is protected. I assume the problem hes to do with the directory changes that resulted from the time-stamping feature in LS-DOS. I guess CONVERT is looking for a password where the time is now written end is not finding the right data.

I have followed the procedure described in the TRSDOS 6.2 manual. I COPY the file to a ramdisk first, then to a single density 35 track disk using the (CLONE=NO) parameter. When I boot up in TRSDOS 1.3 the CONVERT utility returns a "Can't CONVERT a protected file.." message. It works perfectly well, however, if I reboot in TRSDOS 6.2.1 with the 6.3 disk in drive 1 and COPY (clone=no) from that to a ramdisk (formatted under 6.2.1), then back to the 35 track SD disk. Have I missed something in the docs for 6.3?

Is there a way to move directly from a 6.3 disk without the added intermediate step into 6.2.x? I have a feeling this may be one of those questions that you've answered a million times or that is covered somewhere in the LSI documentation that I've overlooked. Use any of this in TMQ if you like. Have enclosed a SASE if you have a few minutes to answer by mail. I'm also enclosing screen dumps of my attempts.

Thanks again for the magazine and for your help.

Fm MISOSYS, Inc: Karl, concerning the problem in moving a file from LS-DOS 6.3 to TRSDOS 1.3 using a 35S1 diskette as the interchange medium, you hit the nail on the head when you correctly assumed that the new date and time extension which replaced the user password field was being interpreted by TRSDOS 1.3 as a password-protected file.

One solution, temporarily, is to move the file to a disk formatted by TRSDOS 6.2. You could copy the FORMAT/CMD file from the 6.2 disk (probably name it FORMAT62/CMD) and run that under 6.3, or just boot up a 6.2 disk and FORMAT the 35S1 disk. Another solution would be to utilize the UNDATE utility program which was published in *The*

MISOSYS Quarterly I.iv to reverse the process of DATECONV. This utility turns an x.3 diskette into a pre-x.3 diskette. But UNDATE is a Model III LDOS program.

Perhaps what I need to do is to provide a FUNDATE (file undate) utility which would undate a single file for you to transfer to a 35S1 diskette (or other purpose). Sounds like a good utility for the next TMQ!

How do I use multiple copies of LS-DOS 6.3?

Fm Dr. Leslie McKown, Roseyville IN: Several questions, But first, the situation. I am a long time TRS-80 Model 4 owner. The original DOS I purchased was TRSDOS6.2. When LS-DOS 6.3 upgrade came out, I purchased it and have been using it ever since.

Yesterday I purchased a used TRS-80 Model 4. Included with the computer was the complete TRSDOS6.2 system - disk, manual, etc. Also included was LS-DOS 6.3. I purchased the whole thing, including the beige upgrade disk, addendum to the manual, original 6.2 manual. I have several questions:

I am pretty sure that I sent in the registration card for the LS-DOS 6.3 I purchased originally, but I have never received any information about updates. I understand there have been some. I am not so much interested in what went wrong, as how to get on the proper list. What should I do?

Since I have purchased another LS-DOS 6.3 system, complete with original disk and all copies, also TRSDOS 6.2 original disk, manual, etc., I think that makes me the legal owner of that LS-DOS system, with the right to be registered as owner. How dd I go about getting registered?

I have read that it is possible to get one copy of LS-DOS 6.3 to use on more than one computer. As I understood it, the cost of doing this was $90.00 less whatever was already invested in it. Does this mean that I can get an LS-DOS to run on both my machines for $90.00 minus $39.95 times 2, or $10.10?

If not, I want to get some more help. If I have to use the two separate LS-DOS-s on the two machines, I have this question. Once I have booted using the correct LS-DOS can I then use system disks which contain the other LS-DOS? Or is it necessary to have the correct DOS in the system drive?

I feel confident that there is no problem with using disks prepared on the other machine as data disks. But if I am wrong, tell me.

Fm MISOSYS, Inc: Leslie, You are in the data base of registered 6.3 users. LSI did not send out any notices. MISOSYS took over 6.3 as of July 1988. We don't send out notices specifically for 6.3. The last major notice went to all registered 6.3 folks back in June of last year advising them of MISOSYS taking over 6.3. If you want to "stay in tune", you may want to consider a subscription to *The MISOSYS Quarterly*.

A "site license" version of 6.3 is available which permits its operation on any number of machines owned by the same entity. Since you have only two machines, and you have two copies of 6.3, there is no need for a site license. Either of your copies will work on either machine. The key point to know is that the license you get when you purchase 6.3 permits its use on one machine. Which particular machine does not matter - but you are violating the agreement if you use it on more than one machine concurrently.

Your use of two copies on two machines is 100% legitimate, and perfectly usable. Just be sure to not switch between two different releases of the DOS.

ALLWRITE stack-problem patching in detail

Fm Pastor Stephen A. Torkko, North Bend, OR: Some of us are a bit denser than others in catching on to some things! Finishing reading the current issue of *The MISOSYS Quarterly* (III.iii) cover to cover, especially devouring all the comments about Michael Houde's ERAMDISK/CMD, I began to get a glimmer that it does not seem to be just the patches to existing programs that are available on "Disk Notes", but also the program listings included in the specific issues.

Assuming I am not still in the dark, I think I want to order Disk Notes #3.2. Check is enclosed. From what I seem to understand, the ERAMDISK program (and ERAMLD program) is not specific just to the XLR8er board, but will also work with my normal speed Model 4 with the Alpha Tech board. IF MY UNDERSTANDING IS CORRECT, it will be an answer to prayer. Please send it posthaste! If ERAMDISK will not work without the XLR8er, then please don't sent it as I don't need any of the other patches/programs.

I am still stuck using TRSDOS 6.2 (even though I purchased 6.3 more than a year ago and have kept it up to date with the patches in The Quarterly as they have come along) because I have an Alpha Tech 512K Ram Board and the ONLY driver I have for it is the infamous RAMDRV44/DCT from RAI which despite my attempt to modify it as per a past issue of *Quarterly* will not work with 6.3.

I tried any number of times to download RAMDRIVE3/DCT from Compuserve, but either our back-country phone lines (GTE) or my version of "XMODEM" is defective because each and every time my computer would lock up after a few hundred bytes and only a reboot (orange button type!) would allow me to escape. Joe Kyle DiPietropaolo responded to one of my pleas for help, but when his suggestion did not work, and he did not respond

```
File: AL/CMD:0          EOF X'FF'  Record:    74  Byte: X'00' -> X'CD' - 205

File Editor 1.1 - Copyright 1986 MISOSYS, Inc.
Command [: - @ A B C E F G H I N Q R S X ?]: _
```

```
File: AL/CMD:0                     Record:    48  Byte: X'CA' -> X'20' -  32

File Editor 1.1 - Copyright 1986 MISOSYS, Inc.
Command [: - @ A B C E F G H I N Q R S X ?]:
```

to subsequent pleas, I gave up on CIS. I was about to appeal to your company for a copy of the CIS stuff when the light came on about Disk NOTES.

So please send DISK NOTES 3.2 unless I am still missing the boat and ERAMDISK/CMD is not included on it or will not work without the XLR8er board.

Secondly, I am not educated enough yet to follow your instructions in III.ii regarding the patching of ALLWRITE! for stack usage. My version of ALLWRITE! is 1.12 at update level 12/17/85. As you can see from the enclosed printout (obtained via FED), transfer address is BA 70. My problem is that I don't know how to "find that location" as per your instructions. I looked at record 48 as per Brad Stiles response letter, but as you can see from the enclosed printout my record 48 byte CA falls in the middle of a message area in my version of ALLWRITE! I have not had any particular problems with my program under TRSDOS 6.2, but if I can succeed in moving up to TRSDOS 6.3, then I will want to patch the stack usage to prevent problems.

I do thank you for your continued support of us lonely orphans out here. When (if?) one of my boats come in, I will be supporting you more fully than I do now by ordering programs over which I have l-o-n-g salivated, plus a hard drive when you get that package put together.

Fm MISOSYS, Inc: Yes, Pastor Torkko, Disk Notes contains more than the fixes; it does include all source listings, and, in some cases, other files such as the TMQ index data files associated with LB. Note that *The Blurb* states, "Each issue of *The MISOSYS Qureterly* contains program listings, patch listings, and other references to files we have placed onto a disk.".

ERAMDISK along with PEXMEM will work on your "non-XLR8er'd" Model 4. But you do need to be using the Alpha Technology memory patches which I provided quite some time ago and which appeared in TMQ Volume I issue ii (the so-called AT patches).

Now about patching your copy of AL, here's a short step-by-step direction. Your version of AL is 1.12 dated 12/17/85. It's transfer address is 70BAH as you located with FED (I will assume that's the LSI version of FED, not the FED/APP which is part of the Mister ED application pac for PRO-WAM). So do the following:

1. Find Load address 70BAH via **F L 70B4**

2. It will probably point to an instruction, **LD (nnnn),SP** which starts out in hexadecimal as **ED 73 yy xx**, where yy and xx represent the low and high byte pairs of the 16-bit address reference.

3. Assuming that your version of AL matches step 2, write down the values of yy and xx. Then using FED, change the four bytes starting with "ED" to **31 00 26 00**. FED's commands to accomplish this are: **H 31 00 26 00 <BREAK> S <ENTER>**.

4. Now find the location targeted (the address referred to in the instruction) by the LD (nnnn),SP instruction via the FED command: **F L xxyy**. It probably points to a **00 00** sequence.

5. Assuming step 5 produces a "kosher" result, change the two bytes to "00 26" with FED commands: **H 00 26 <BREAK> S <ENTER>**.

Completion of these five steps should result in a properly patched copy of AL.

Data record not found during WRITE

Fm Sudie Cole, Sumner, NE: To Whom It May Concern, We bought a Tandy

Model 4 Word processor Christmas of 1985 - I think from Nelson's Electronics Radio Shack in Winner, SD. Doug Nelson (owner) has helped me update my disks as they came in. The Word Processor has :0 and :1 and a DWP210 printer.

When we moved in May of 1988 I didn't think about sending in a change of address and I don't know if Doug did, but I'm sure he would forward to me any mail concerning my Word Processor.

I was using my Superscripsit (:0) (LS-DOS63L, updated 11/13/87) on Monday. I'd copied a document from a data disc in :1 to :0 and was updating the document, deleting paragraphs, etc. when I noticed that it was "sluggish". I was able to complete the updating and used my shift, up arrow to bring the cursor back to the beginning of the letter. It didn't move and after a short while the red light on :1 went out. Nothing I did would budge it - it just died! This has happened before and Doug never figured out why. Usually I hit the "reset" button, take the disc out, put in the cleaning discs, clean both drives and start over. The original document I was working on remained on the disc but the updating I did was lost.

But this time I didn't hit the "reset" button - I just took the disc out of :0 and cleaned both drives, then slipped the superscripsit disc back into :0. 'Disc error' appeared on the screen. I took it out, shut off the machine, put the disc back in, and turned on the machine again and got the same message. I again took out the disc, shut off the machine and pulled the plug from the wall, then started all over. I still got "disc error" on the screen. So I took out the reserve disc I keep in the back of one of my Radio Shack manuals and made a "back up" copy on the Superscripsit disc I have used all along. It still wouldn't work, so I reformatted the disk and then did the "backup" process and it still won't do anything past entering the date. I can get it to work through the date, but it won't show me the directory, nor will it open a file or document. It just shows "error 22H" on the screen. At the end of the "backup" process it 'read' cylinder 28 for a longer time than it did the other cylinders and printed out, "Data Record Not Found During Write'.

After I use the backup copy of LS-D0S63L I insert a backup copy I made of the reserve disc, TRSDOS62, DATE 22-APR-87, which I also keep in the back of the Radio Shack Owner's Manual and it will open the file or document I want, then I can continue to use my word processor. I have thrown away the sheet of instructions that came with the LSDOS 63L update.

I have tried to copy the TRSD0S to the LS-D0S and LS-D0S fills up before TRSDOS is completely copied. I've tried copying LS-DOS to TRSDOS and it won't let me.

In looking through my owner's manuals to see what I can do, I saw the pink slip of paper entitled "DON'T PANIC" with your address and postcards with the TRSDOS Ft. Worth, Texas address. I don't know if I'm to send them my change of address or if I send it only to you now. So, I've enclosed that card and if I should also send one to Ft. Worth, please let me know; I have more change-of-address cards here which I can use to send a change of address to them.

I have also enclosed the data on the LS-DOS and TRSDOS discs I keep in reserve. Any help you can give will be gladly accepted. I pay about $15 + for the updates I receive so know it is important to have the proper disc!

You'll notice on the yellow postcard the address of Radio Shack in Kearney where I buy my ribbon cartridges. They are located in the Hilltop Mall; I'm sure they only sell items needed for computers and don't help with updating them as Doug did. We live some 30 miles from Kearney - little hard for them to "run up to the house" like Doug did!

Clarification: The disc - LS-DOS 6.3L - sent to me from your company is tan. When I use it in drive :0 to open a document, '*Program not found*' appears on the screen.

Doug Nelson made a copy of your tan disc which I keep in Radio Shack manual (11-13-87). I used it and it also says "Program not found". It also says at cylinder 28 "*Data record not found during write*". But I made another copy of the tan disc today to use and it says "*Source disk is write protected - MOD flags not updated*". It also says, "Program not found" if I attempt to open a document. I used the tan disc to "backup" the disc Doug made, but still get cylinder 28 - '*Data record not found during write*'???

Fm MISOSYS, Inc: Mrs Cole, from the description you provided, it appears that your machine has developed a physical problem with the upper floppy disk drive. An error of "*data record not found during write*" specifically implies that the trouble is with the disk being written to and not the disk being read from. The message, "*source disk is write protected, mod flags not updated*" is not an error message, it is an informative message which tells you that the source disk has either the write protection notch covered or software write protection is activated. In either case, there is no problem.

Note that neither the LS-DOS 6.3 "tan" diskette nor any copy of it contains your Scripsit program; it is strictly a complete system disk. That's why you got "*Program not found*" when you tried to invoke Scripsit using that disk.

Also, MISOSYS took over the support of LS-DOS 6.3 from LSI back in July of last year (1988). Of course, neither MISOSYS nor LSI has anything to do with Radio Shack registered products. The change of address card which you sent to LSI should be sent to Radio Shack.

More on Desktop publishing and the Model 4

Fm Gary W. Shanafelt, McMurry College: Dear Roy, The latest *Quarterly*, Vol III no. 1, arrived in Abilene yesterday. Imagine my surprise and delight to see the letter from Lee C. Rice (p. 15) offering information about hooking up a Model 4 with a HP laser printer. I would be interested in anything he (or anyone else) has to offer on interfacing the TRS-80 with laser printers to do desktop publishing.

Please encourage him to describe his system and the utility programs he has written!

Fm MISOSYS, Inc: Gary, see the dialogue between Lee Rice and Laird G. Jackson which follows.

Fm Laird G. Jackson, M.D., Jefferson Medical College: Dear Dr. Rice, I read your short article on Model 4 Radio Shack computers and the use of Allwrite for text formatting in the fall 1988 issue of *the MISOSYS Quarterly*. I fall into your description of somebody who owns a number of Model 4s and has used those in the past in a multiplexed office management system. Since then, we've converted to a Unix 5.2 system with multiple users. The word processors available for that are WYSI, WYG type and our particular one is Crystal Writer. It has all of the defects that you list and I'd like to follow your path using Allwrite.

What I don't quite understand is the connections that you may use in getting your text files out of the Model 4 and into either another system or to a laser printer. My understanding is that a direct connection to a laser printer which is shared would best be done through a programmable switching arrangement since otherwise you would have to power down the laser printer while you made a a manual switch in order to avoid the possibility of electric damage. If one wished to transfer the ASCII file that Allwrite edits out to a file within Unix and then format it with nroff, I assume that one would use perhaps the RS 232 port or alternatively there are converters that will convert the parallel output of the printer port to a serial output and perhaps that in itself could be outputted through some pipe in Unix so that it would flow directly through the print request cue as is.

Any helpful words of advice that you might have would be appreciated. Unfortunately, my sophistication regarding these things has severe limitations as you can probably tell from the preceding descriptions. I must say that I found your article interesting and particularly so in view of the general look down your nose attitude that people have toward the older machines. Thanks for any help you can give me.

Fm Lee C. Rice, Marquette University: Dear Dr. Jackson, Thank you for your letter relating to my short article in *The MISOSYS Quarterly*. I'll try to answer the questions you ask, although I'm not quite sure what configuration you desire for the Model 4 units. Here at school we have twelve Model 4 systems and several Zenith systems (latter running either MSDOS or UNIX - UNIX is much better!). Only two Model 4s and one Zenith (which happens to be running MSDOS) are on line to the HP+. Our connection is via manual switch boxes. It is not necessary to power down the HP+ before manually switching from one source to another. If there is a shared hardware printer buffer [we do not have one here at the offices but I have one at home], the buffer should be flushed or cleared before swapping. This hardware configuration has worked successfully for several years.

If you are using a switching system which has caused trouble (surges when lines are swapped), the HP+ can be manually taken off lime at its own control panel - and this procedure is less drastic than powering it down (since no downloaded fonts are lost).

At home I have a similar configuration - a 286 micro and a Model 4, both on line to an HP+, and each on line to a dot matrix printer as well (FX8O for the Model 4, NEC P-6 for the Zenith). I have just installed an 80meg hard drive on the Zenith in order to install UNIX and throw MSDOS into the trash heap. I use manual switches also (the electrical switch boxes were too expensive!), and have never had any problems UNLESS I forget to flush the hardware 256K print buffer; but, even then, the problems are only those of misidentified (by the HP+) control codes.

Here at the office and at home we usually don't move text files from the Model 4 to the UNIX/MSDOS environment, but rather the other way around. We print two journals and one series of annual volumes (average 300 pages per volume) - but these are all formatted under Allwrite. They are often PRODUCED, however, using EMACS on the Zenith or EDT on the central VAX systems. The advantage of EMACS and EDT is the buffer size (about 640K) - Allwrite limits you to 37K. The files are edited as a single massive file, then transferred to the Model 4's, split up into Allwrite-sized modules using some Fortran software we created for this purpose, and then sent to the HP+ by Allwrite.

Transferring from the Zeniths to the Model 4s is done by direct-connect RS232 cables using Omniterm (on both ends), and at 9600 baud. The Model 4 systems are also on line to the VAX via multiplexor (9600 baud) in VT100 emulation mode, The MSDOS systems are not, so files written by MSDOS users which are to be uploaded to the VAX, or downloaded from the VAX for MSDOS machines, must be sent first to the Model 4s. TRSDOS handles the file transfers better than MSDOS anyway.

We do have a few Model 4 users who are now formatting documents for TROFF. For them the transfers go the other way. They use whatever Model 4 editor they prefer, then transfer their source files to the Zeniths, where TROFF (with the front end loader EROFF) formats them to the HP+.

Finally, if you have UNIX systems connected to the HP+ also, you might consider TROFF as a UNIX-based Allwrite clone. If you already know Allwrite, learning TROFF takes minutes.

I hope that some of the above information will be of help to you. Thank you again for your letter.

Model 4 graphics: Hi-Res, RLE, GIF

Fm David Mandeville: I am interested in being able to create and view graphics on my model 4p but I seem to be having trouble finding software for this purpose. I understand that there is a utility that will allow the use of RLE graphics on the model 4 but I have not come across it as yet.

Does videotex plus for the model 4 sup-

port any graphics at all? What about other comm programs like Kermit? I am very ignorant about the whole subject of graphics in general so any help would be very much appreciated.

Fm Frank Slinkman: David, The big question is: do you have an (optional, extra cost) hi-res graphics board, either from RS or from Micro-Labs?

Fm Adam Rubin: David, If you want to see graphics on your screen, you'll have to buy a graphics board from either Radio Shack or Microlabs. No way around that, I'm afraid.

On the other hand, if you'd like to print graphics on your printer, that's (probably) somewhat easier. For example, there are programs on CompuServe that will print an RLE image on a Radio Shack DMP printer (which is what I have), so I can download an RLE file, log off, and then print the picture.

I don't think any of the Model 4 telecommunications programs support the graphics board, so I don't think there's any way of viewing graphics while online. (It might be possible to download the picture and display or print it later, though.) Technically, Radio Shack's Model 4 Videotex Plus does support "semigraphics 4" mode, but I'm not sure if it's used anywhere on CompuServe, and it's so ultra-low-resolution that you probably wouldn't want to anyway.

Fm Bill Brandon: David, you can create graphics on-screen with DESIGNE, even if you don't have a hi-resolution board. Of course, these are still "low-res" graphics, but they can be pretty impressive, depending on your artistic abilities. The one thing that you can't do (as far as I know) with Designe, is print the screen graphics easily.

Designe is Shareware; I don't believe it's in the libraries here on CompuServe, but it may be on one of your local TRS80 BBS's. If not, you can order it from the author, Mel Patrick, at 13699 70A Ave: Surrey, B.C. Canada:V3W2J8. Or you can call Mel's BBS at (604) 594-7398. Designe is also available on The Machine BBS in Dallas at (214) 399-8414. I have tried the program and, if I didn't already have a hi-res board and didn't need the ability to print graphics, would pay Mel the $15 (I think that's what he was asking) and use it. It's good stuff.

Fm Gary Phillips: Adam, I know of at least one place where CIS does use semigraphics 4. In the MQUOTE stock history section, you can display charts of historical stock prices as cute graphs on your screen. They issue you a warning that your terminal may "distort" the charts because it doesn't support a higher resolution, but they do seem to work OK. Also, if you run the VIDTST program you get a couple of cutesy pictures on your screen in semigraphics 4.

Now as for this RLE business, I didn't know about the printer support programs you mention. Are there any for Epson printers as opposed to DMP's? Or, alternatively, is there source code that can be modified? I'd like to get at some of the weather maps sometimes...

Fm Adam Rubin: Gary, I didn't know that MQUOTE used semigraphics-4, but then I seldom use CompuServe's financial services. The only graphs there I've seen so far have been in TREND, which is strictly RLE and NAPLPS. I hadn't known about VIDTST either, but that was interesting too.

Offhand, I don't remember any TRS-80 programs to print RLE images on an Epson printer, but I haven't checked recently. I think there are a few in this forum (PCS-49 - LDOS) and TANDYPRO (try SCAN KEY:RLE), but your best bet is probably the Picture Support Forum (GO PICS). PROGS.TXT in Library 1 of PICS describes all the non-IBM non-Mac programs in their libraries.

Most of the RLE programs for DMP printers are in interpreted BASIC and extremely slow. You might be better off downloading one of those as a starting point, then getting the specs for RLE (I think it's GO VID, then "CompuServe Graphics", then "RLE") and using your favorite compiler to write your own program. Either way, it's a fairly simple project. If I've left out anything here, just let me know.

Fm Gary Phillips: Adam, Thanks for the info. I went ahead and wrote my own RLE print program in assembly language. It does two sizes, one with a printer pixel exactly equal to the RLE pixel and one with the image rotated 90 degrees and enlarged 2x. Works nicely and is VERY fast compared to those BASIC jobbies. Now I'm tempted to tackle GIF, if I can find the specs...

Fm Frank Slinkman: Gary, GO PICS for information on how to get the GIF specs. One file is named GIFSTD.TXT, I believe. There is another which is an application for status as a GIF developer, which will give you free access to the graphics forum, and to DL 17 of that forum, which has all kind of valuable info on how to write your encoder/decoder, but also on dithering, LZW compression, and other things you'll run into putting together a GIF encoder/decoder.

Fm Adam Rubin: Gary, I knew you'd find an RLE program somewhere! <grin> GIF specs should also be in GO VID under "CompuServe Graphics", and in the Picture Support Forum (GO PICS). PICS should also have other useful files, plus people to answer any questions. In fact, if you get something for GIF up and running, I'd be interested in seeing it; maybe it wouldn't be **too** hard to adapt that to handle a RS DMP. Good luck!

RapiDOS, Graphics, and XLR8er

Fm W. R. May, Brownsville, CA (02/12/89): Sirs, Below is a letter sent to H,I, Tech, Inc. over a year ago concerning my XLR8er board installation. I removed the board from my Model 4P prior to writing the letter and have not reinstalled it although I would like to.

Would you please answer the questions that I asked H.I. Tech so that I may finally use this expensive piece of hardware. I subscribe to *Computer News 80* and some of their articles concerning the XLR8er board really have me confused. I have no

idea if my Model 4P is a gate array or non gate array what ever that means. The serial number on my machine is 011561 and it has a Radio Shack graphics board installed somewere in it.

To H.I. Tech, Inc (01/07/88): "Sirs, I purchased your XLR8er board for my R.S. Model 4P from Micro-Labs in October of last year. After a delay of two months, which Micro-Labs attributed to a manufacturers supply problem, I installed the XLR8er with only one problem.

There was a small circuit board attached directly over the Z80 chip in my machine. The thickness of the ribbon cable connector, supplied by you, prevented me from reinstalling the approximately 3 X 4 inch board firmly in its fasteners.

The XLR8er is amazing while running TRSDOS 6.2, LSDOS 6.3 and Basicg software but ignores any attempt to run my Model 4P in the Model III mode. A large part of my software is written for the Model III. Before buying the XLR8er, a Micro-Labs advertisement assured me that a patch was being prepared to allow the XLR&er to run Micro-Labs Tournament Chess game. The game gets as far as displaying the chess board then locks up.

Would you please tell me if the XLR8er modification to my computer is designed to run in the Model III mode, if it is designed to run Micro-Labs Tournament Chess game and if I could have possibly screwed up its installation in some way that involves the circuit board that I mentioned?

Fm MISOSYS, Inc: Dear W. R., This is in response to your letter of February 12th concerning the XLR8er board, Model III mode operation, and Tournament Chess. Attached is a letter I just sent to Ted Carter of Micro-Labs concerning my findings after researching the problem running Tournament Chess on an XLR8er-equipped Model 4. The letter explains the conflict and offers a solution specifically for Model 4 version 1.6.4 CHESS. I don't have the time to examine all versions of that program, nor do I have the time to investigate other programs developed by Rapidynamics Software. However, when the III.iv issue of *The MISOSYS Quarterly* is released, perhaps other users of such conflicting software will provide me with the appropriate patches so that I may publish them. I am including a copy of the patch to version 1.6.4 CHESS, but you appear to be using a Model III version.

Concerning the other side of your question, whether the XLR8er will work in the Model III mode of a Model 4, the answer is certainly, providing the DOS (or programs running under a DOS) use no undocumented Z80 instructions. TRSDOS 1.3 used undocumented Z80 instructions unsupported by the 64180 processor of the XLR8er board. I have some patches to TRSDOS 1.3 which correct that DOS.

We also have an interface disk for Model III LDOS which adds a large RAMDISK, as well as a utility to alter the speed of the machine (a Model III equivalent to SET180). The Model 4P needs a special booting facility when trying to boot a Model III disk when the XLR8er is installed. That utility is on the Model III interface disk. I am including a copy of the TRSDOS 1.3 patches; the LDOS interface disk is $10 + $2 S&H.

Fm Arthur N. McAninch: Thank you, Roy, for TMQ Volume III.iii! It is so chocked full of valuable information, it'll take me days to assimilate!

One thing in particular caught my eye that I must comment on right away. On page 12, Ken Strickler mentions RapiDOS will not function on a Model 4 with the XLR8er board installed. I just installed the Alpha Tech board in my old 26-1069 "A" board machine and experienced a similar problem and solved it! With the AT board, RapiDOS for the Model 4, versions 1.6 and 2.0 refused to boot up at all. I ordered a plain vanilla RapiDOS for the Model 4 in order to get the complete operating system with documentation from Micro-Labs. The version I received was version 1.3 for the Model 4! Definitely a Model 4 version, but an older version. Guess what? It booted up and performed normally - even with the AT board installed! I moved all my HI-RES programs from RapiDOS versions 1.6 and 2.0 to 1.3 disks. Now, I can run all the Micro-Labs Hi-Res programs as before!

I would be very interested to know if RapiDOS for the Model 4, version 1.3 will run with the XLR8er installed since I now have a 4D which I intend to purchase an XLR8er for in the near future.

Fm MISOSYS, Inc: Arthur, Concerning "Rapidos", Ken Strickler was not necessarily precise concerning the problems he was having. The trouble was that certain hires graphics programs running under Rapidos would not work on his XLR8er-equipped machine. Subsequent to the release of TMQ III.iii, I received a copy of Tournament Chess from Micro-Labs and proceeded to uncover the root of the problem. I have developed a patch for Tournament Chess to allow it to work properly with an XLR8er. I hope to enlist the aid of other folks having an XLR8er and the conflicting graphics programs so that other patches may be developed. The author of the graphics programs is being advised of the method to avoid the conflict in the future. So there is no specific conflict between Rapidos and the XLR8er nor any specific conflict with the graphics programs which cannot be rectified by a simple code change.

XLR8er/Graphics/Rapidos problem is the joystick software interface!

Roy Soltoff
MISOSYS, Inc.

A good puzzle is something I like to tackle every now and then. The handful of reports I have received relating the inability of running certain hires graphics programs operating under Rapidynamics rapidos operating system on a machine equipped with an XLR8er was certainly a puzzle. MISOSYS sells the XLR8er add on board which incorporates an improved, faster processor and expanded memory. Radio Shack used to sell a graphics board; MicroLabs continues to sell their board. Because the price of hires graphics has come down to more reasonable levels, I have noticed a marked increase in the

number of Model 4 folks purchasing and making use of hires graphics.

In certain older Model 4s, it was apparent that the addition of a graphics board and an XLR8er board resulted in a problem of co-locating the two boards physically. Because they both mount in the same area of a Model 4's motherboard, when both are desired, one or the other must be relocated. Because of that, I purchased two hires graphics boards from MicroLabs. I then proceeded to at least work up one installation of both a graphics board and an XLR8er in a non-gate array desktop Model 4 - a 26-1069 Rev C board. This was achieved by relocating the graphics board to the area between the dual disk drive housing and the shield surrounding the motherboard and floppy disk controller. I used an 8" shielded ribbon cable for the interconnect, and this was reported upon in a previous issue of *THE MISOSYS QUARTERLY*. One puzzle solved!

Next, I became disturbed by the handful of reports associated with graphics programs running under Rapidos. I personally have not gotten into hires graphics on the Model 4; my time is devoted to other matters. However, I finally got a hires graphics program when Frank Slinkman dropped me a copy of his slot machine program. It worked here perfectly well. So I began to suspect the problem was with Rapidos. I decided to investigate the issue.

I gave Ted Carter, of MicroLabs, a call to get some information on Rapidos. Ted noted that the author insists that no undocumented Z80 instructions are used in either Rapidos itself or the hires programs developed by that author. Taking him on his word, Ted offered a copy of Tournament CHESS to me suggesting I explore the root cause of the difficulty. I took him up on the offer. Within a week, a few copies of Tournament CHESS on different versions of RapiDOS arrived.

When I examined the CHESS disk, I was encouraged by the use of the standard DOS 6.x directory structure. That allowed me to begin my investigation without having to develop a set of tools by which the disk's files could be "disected". The runtime disk contained a BOOT/SYS file, ten utility files (BACKUP, BUILD, COPY, DIRL, FORMAT, FREE, HELP, LIST, PURGE, and RENAME), and the CHESS files.

To call Rapidos a "DOS" is really stretching the imagination. Perhaps all I saw was a "run-time" version which is supplied to enable the running of the hires graphics game programs. In any event, it is fast booting. In fact, when booted on a cold machine, the DOS is at its "Ready" message before the video screen is sufficiently warmed to reveal characters. Why is this so?

"DOS" stands for "disk operating system". A part of a DOS is its "file system" which is the part of the DOS enabling the storage of data and programs on a storage medium of various sorts. The "runtime" version of Rapidos is actually a subset of a file system. It appears to have only those facilities which provide nine character device service functions and six disk I/O functions. That allows it to be pretty small. In fact, the entire runtime facility is stored within the first track of the disk. That allows the boot code to rapidly load its file system. In contrast, LS-DOS stores just its device drivers and a few pages of data within that first track (4.5K); it has to load another 4.5K of SYS0/SYS and 1.5K of SYS1/SYS before you can see the Ready message. But a full DOS provides a much richer command set and service facilities.

To invoke, say the hires version of CHESS, you type "CHESSH". I noticed that one of the files was called "CHESSH" and another was called "CHESSH/EXE"; the former was 1.5K while the latter was 31.5K. After browsing through CHESSH, which was an object code file (CMD-type), I noticed that it made a few calls to low memory locations (obviously into the "DOS"), and referenced a string with the name "CHESSH/EXE", which under further scrutiny, was strictly a core image file. I realized that I had to disassemble the CHESSH/EXE file to search out the problem, but I then realized that in order to do that, I had to find out where it was being loaded into memory! I had to first disassemble the "DOS"!

The "DOS" was a load-image file, once you got past the boot sector. So I copied that file over to my hard drive and named it something unique. Knowing that the ROM boot loader loads the second sector of the boot track (track 0, sector 1) into 4300H for execution, I used DEBUG to read sector 1 of track 0 into memory at 4300H. I then DUMPed the page of memory to a disk file. After disassembling the little boot file, I knew that it was reading its BOOT/SYS file starting from sector 2. I used my PRO-CESS product (part of GO:CMD) to load the copied file in image form; stripped off the first two blocks of "image data", then re-wrote it to disk. I waas then able to load it as a standard load module back into PRO-CESS to sort it by load address; that makes it easier for my disassembler, PRO-DUCE, to deal with data strings.

Working with a disassembled copy of that BOOT/SYS, I then was able to evaluate the CHESSH code to find out where CHESSH/EXE was being loaded into memory. It took a little while of pouring through the BOOT/SYS disassembly to track down what was being done, but I eventually learned that CHESSH/EXE was being loaded into memory starting at 2100H. From there I went to investigating CHESSH/EXE.

The chess program is a big file. I personally don't like to waste a lot of paper in disassembling a large program; better to let the output go to disk and search through disk files than waste trees. So I loaded the CHESSH/EXE inage file into PRO-CESS and wrote it to disk as an object file. What I did then was take a first disassembly scan to build up a text file of data areas. Then I ran the object file back through the disassembler using the screening datatext file and requested the output to disk using module sizes of 32K (PRO-DUCE automatically partitions disk output into multiple source files of the specified size). This generated six source files.

I then had to analyze the code in an attempt to understand its flow of execution to coordinate the code with what I saw on the screen. Yes, it wasn't easy, but it had to be done. The claims were that the programs which locked up the computer, did so when they were requesting keyboard input. So my investigation centered

on looking for that kind of code. Without burdening you with the details, I eventually found the culprit. Tournament CHESS works using either the standard keyboard or an Alpha Products (remember them?) joystick. The problem was obscure, not so much because the XLR8er doesn't truly execute properly the documented Z80 instruction set, but rather because the method of coding the joystick port access in Tournament Chess is interfered with by the internal port I/O of the 64180 CPU.

Here's the interference in a nutshell. The 64180 CPU, used on the XLR8er board, has 64 internal I/O registers accessible via the standard IN and OUT port instructions. To be able to isolate whether the I/O is to an internal register or to an external port, the 64180 uses a trick of noting the value of the high-order address lines. An I/O instruction places the port address on the low 8-bits. In the case of a port indirect instruction [i.e. `IN B,(C)`], the contents of register B are placed on the 8 high address lines; if port direct [i.e. IN A,(n)], then the contents of register A appear on the 8 high address lines. If the value so placed is zero, then the 64180 interprets the I/O as internal, whereas if the value so placed is non-zero, then the 64180 interprets the I/O as external.

Tournament Chess accesses port zero which was documented by Alpha Products as the port to control their joystick. In Tournament Chess, there are three different locations in the program which input from port zero via an `IN A,(0)` instruction which places the current contents of register A onto the 8 high address lines. Unfortunately in each case, register A contained a zero; this input was then interpreted by the 64180 as an internal register input rather than external. Thus, internal register 0 was read rather than the "joystick".

Without a joystick connected, an external input from port zero returns a value of 0FFH but an internal port zero read returns a value of 12H, or other value depending on the setup of the 64180's ASCI channel 0. Tournament Chess uses the joystick directions in common with the keyboard ARROW keys and the fire button in common with the SPACEkey (hook and unhook a piece). The 12H value is interpreted by the Tournament Chess code as if the UP, LEFT, and RIGHT positions **were simultaneously activated.** Since this is an impossible result, it is ignored. But since the entire keyboard scanning is ignored if the position movement results in some value, no other key code is accepted. The computer is "locked up" and requires a RESET.

There are three solutions to this problem. One easy solution for those with an XLR8er and without a joystick is to patch one byte in each of the three routines to substitute an `XOR A` instruction for a `CPL` instruction. This clears any value read by the port input.

Another solution with an Alpha Products joystick is to change the port value to something other than port 00H-3FH. It may be little known, but the Alpha Products joystick actually can be read with any port value from 00H through 7FH. That's because the stick only decodes the A7, IN*, and EXIOSEL* lines of the external bus. So patching the 00H port number to, say 40H will still read the Alpha Products joystick but does not reference an internal 64180 port. I don't like that solution because some other joystick may work only with port 0.

So my third solution is to create a larger set of patches which alter the Tournament Chess code so that register A is always non-zero when the `IN A,(0)` instruction is executed. I have developed the patch for Tournament Chess Version 1.6.4, which was the one you MicroLabs supplied to me. So far, I have patched only the hires graphics version.

I forwarded Ted Carter a copy of the patch as well as the information I had learned through my detective work. Here's his response:

"Dear Roy, I appreciate your excellent detective work in figuring out why the Rapidynamic games didn't work with the XLR8 board. I went ahead and created a version of all of the affected Rapidynamic programs which will not hang up on the XLR8 board. As I don't have the source code, I have to confess that I just went through and changed all the IN A, (00H) to an IN A,(40H). Since the Chess program is much more popular than the other programs I was satisfied with having the best fix done for that program only.

Anyway, you might want to mention in the TMQ that all of our programs now work with the XLR8 board if the customer will mention it when he orders. Those who already have our programs and the XLR8 board may get an updated version by sending the ORIGINAL disk to us in a disk mailer along with $1 for return postage."

Now with that discussion out of the way, let's look at how I found the information to develop the patch. I searched through all of the source files generated from the disassembly looking for an `IN A,(0)` instruction; I found three of them. The first was at address 6813H and was surrounded by the following code:

```
LD      A,(0F35F)
AND     A
JR      NZ,6837H
IN      A,(00H)
CPL
AND     A
JR      NZ,6837H
LD      HL,0F480H
XOR     A
```

This code checks for a "saved" key entry; if one existed, it bypassed the scan of the joystick and keyboard. The alpha Products joystick uses reverse logic; an engaged stick position closure, say UP, generates a zero in its corresponding bit position. With no joystick plugged into the bus, reading port zero should give a value of 0FFH. Thus, the CPL instruction inverts the stick logic and would result in a non-zero value if the joystick was moved to one of the four positions (or if the fire button was depressed).

It's always a good idea to NOT write the most compact code when you first write a program. In that way, you, or someone else, can always come back and stramline the code to introduce additional instructions. My task with this pioece of code was to add some instruction to make register A non-zero prior to the IN A,(0)

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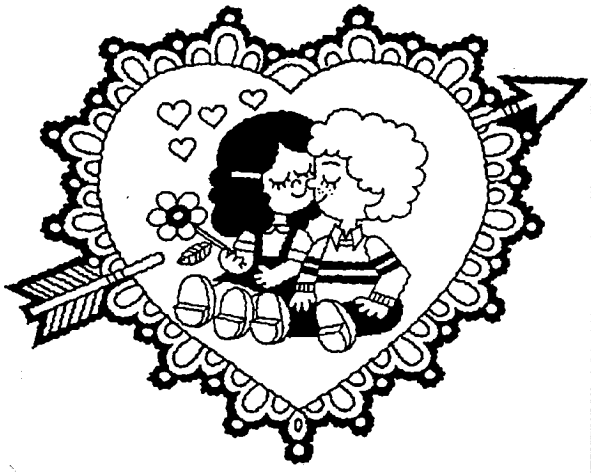

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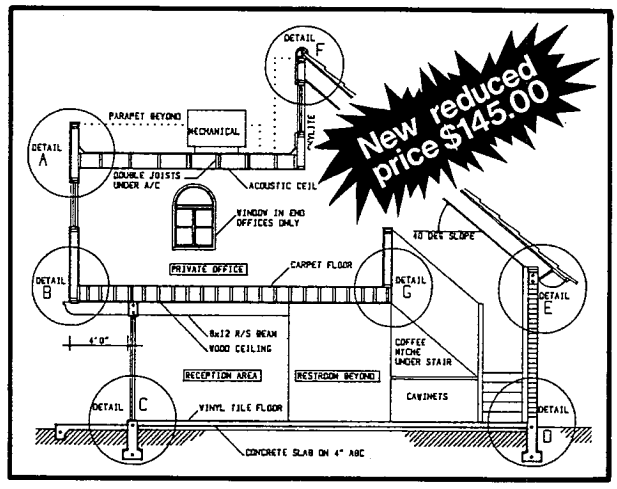

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instruction. The code could be easily revised to look like the following code with no change in length:

```
        LD      A,(0F35F)
        AND     A
        JR      NZ,6837H
        INC     A       ;Added to
make non-zero
        IN      A,(00H)
        CPL
        AND     A
        JR      NZ,6837H
        LD      HL,0F480H
;       XOR     A       ;Elimi-
nated since A already 0
```

This difference capitalized on the fact that register A would have already been zero if the joystick input was "zilch"; thus, the original XOR A instruction was unnecessary! The second piece of code having the port input was at 6B04H. This code was as follows:

```
        RET     NZ
        IN      A,(00H)
        CPL
        ADD     A,A
        ADD     A,A
        ADD     A,A
        LD      HL,0F440
        OR      (HL)
        AND     78H
        SCF
        RET     Z
        RRCA
        RRCA
        RRCA
        LD      E,A
        LD      D,0
```

This code reads the joystick, shifts the inverted value read three bit positions so that the UP, DOWN, LEFT, and RIGHT stick positions, if any, align with the keyboard row containing the ARROW keys; but it restricts its observation to the four direction positions. I capitalized on the fact that register D was not altered throughout the code front end and register A was zero at the entry. Thus the revised code took the following form:

```
        RET     NZ
        LD      D,A     ;Set D=0
        INC     A       ;Added to
set A <> 0
        IN      A,(00H)
        CPL
        ADD     A,A
        ADD     A,A
        ADD     A,A
        LD      HL,0F440
        OR      (HL)
        AND     78H
        SCF
        RET     Z
        RRCA
        RRCA
        RRCA
        LD      E,A
;       LD      D,0     ;Deleted
as unnecessary
```

The third, and last, piece of code having the port input was at 9023H. This code was as follows:

```
        IN      A,(00H)
        CPL
        ADD     A,A
        ADD     A,A
        ADD     A,A
        LD      B,7
        LD      HL,0F440
        OR      (HL)
        JR      NZ,903FH
        LD      B,6
```

This code also reads the joystick port and merges its value with the ARROW keys of the keyboard. If either a "stick" value or an ARROW entry is sensed (or ENTER, CLEAR, or SPACE), the code jumps to another routine which handles the entry. I revised this code to appear as follows:

```
        LD      B,7     ;Relo-
cated instruction
        OR      B       ;Added to
make A non-zero
        IN      A,(00H)
        CPL
        ADD     A,A
        ADD     A,A
        ADD     A,A
        LD      HL,0F440
        OR      (HL)
        JR      NZ,903FH
        DEC     B       ;Added to
make B=6
;       LD      B,6     ;Deleted
```

The handy work reduced the code length needed to set register B to a value of 6. It did this by taking advantage of the fact that the register value was 7; a simple decrement instruction (one byte length) replaced the two-byte load instruction.

Now that I had the revised code all worked out, it was a simple matter to search the

```
. CHESSHX/FIX - 03/29/89 - Patch to Tournament Chess
V1.6.4
. Note: This is a Model 4 version. For details, see TMQ
3.4
. Removes interference of joystick port access with
64180CPU
. internal register access. Joysticks are still sup-
ported.
. Apply via, PATCH CHESSH/EXE CHESSHX
.
D47,19=3C DB 00 2F A7 20 17 21 80 F4
F47,19=DB 00 2F A7 20 18 21 80 F4 AF
.
D4A,0A=57 3C DB 00 2F 87 87 87 21 40 F4 B6 E6 78 37 C8
F4A,0A=DB 00 2F 87 87 87 21 40 F4 B6 E6 78 37 C8 0F 0F
D4A,1A=0F 0F 0F 5F
F4A,1A=0F 5F 16 00
.
D6F,23=06 07 B0 DB 00 2F 87 87 87 21 40 F4 B6 20 0D 05
F6F,23=DB 00 2F 87 87 87 06 07 21 40 F4 B6 20 0E 06 06
.Eop
```

CHESSH/EXE file for the affected code; or at least I thought it was going to be simple. A slight snag developed. FED2 is a powerful file and disk zapping tool. But it is too smart for its own good some times. FED2 maps out a file it thinks is a load module if the file starts off with a character value used as a record indicator. If the resulting mapping effort tracks an invalid load record type character, it dispenses with the mapping. CHESSH/EXE is a plain vanilla binary file, which happens to start with a 04H character. FED2 thought it was the end of a PDS entry and stopped mapping immediately. But it only allowed access of the first sector of the file.

FED has an entry parameter to force it to suppress the automatic mapping. By invoking FED2 with the command, **FED2 *CHESSH/EXE**, it bypassed the mapping and allowed me to explore the entire file. I simply searched for the hexadecimal string "DB 00", which is the port input code, and correlated the exact file position of my three code changes. From the result of this effort, the CHESSHX/FIX patch was developed (see box).

Anyone with an XLR8er using any other Rapidos graphics program which uses joystick control probably has the same problem. If you want to do some investigation and arrive at patches for other graphics software, get in touch with me. The tools you will need to find where to patch, are a copy of PRO-CESS (or CMDFILE version 2), PRO-DUCE or other good disassembler, and perhaps FED2 or other disk zapper. There are easy patches which can clear the problem provided you don't use a joystick, or there are involved patches to keep things working. I very much prefer the complex patches which keep the joystick access to port 00H as my hard disk host adaptor, soon to be released, will have a joystick port option addressable only via port 00H.

MS-DOS Topics

Tape Backup Devices

Fm Shane Dawalt: Roy, On your floppy-turned-tape-drive subject, you do still have a floppy on your 386, yes? Floppies are still in vogue, although they may be eclipsed a bit by the 3.5" floppies (are they called floppies?). Isn't 40Mb tape cartridges expensive (near $20 a tape)? They could have come down by now, I haven't been looking at tape drives lately. It was a good idea until I noticed the externals were upwards of $500. Since that's only used once every 3 or 4 weeks, it wouldn't be worth it.

Fm Jim Beard: Shane, One answer is the use of SCSI interfaces. You plug a card into an expansion slot, and the SCSI interface is available. Bernoulli boxes use SCSI and have a 28 ms access time for 10 MB and 20 MB versions, although they have their own interface card so that you can boot off of the "HD". The SCSI interface can also be used by tape backup systems. Standardization of the interface and configuration should lead to lower prices.

Fm Joe Kyle-DiPietropaolo: Shane, Compare the cost per megabyte of tape. It's easy to crack $.50 per megabyte, whereas it's difficult to get floppies under about $.75 per megabyte, so they cost less, not more. That's not the reason why people go to tape though. If you only backup once a month, you don't need tape. For folks who backup once a day or more than once a week (and many don't that should), stuffing between twenty-eight and over a hundred diskettes into a floppy drive for x minutes is no picnic. Compare that to putting in one tape before going out to lunch or taking a break. When you come back, it's done.

Fm Shane Dawalt: Joe, I suppose I'm looking at the front end of tape deal: before you can use tape you need to buy the drive. And they aren't cheaper than a floppy drive. The last tape drive I used was slow (to my liking anyway); 20 minutes for 15 megs.

On the other hand, MSDOS's BACKUP utility is slower going at 40 minutes for 16 megs (if I'm at the machine to pop n' push disks). I personally would like tape backup as one cartridge is MUCH smaller than a pack of 13 floppies. My HD uses 13-1.2 meg floppies to backup C:. Four to five 1.2 meg floppies to backup D:.

One investment at a time; I'm still getting floppies.

Fm MISOSYS, Inc: Shane, The DC2000 cartridge is about $20. Overall, the convenience of saying, "Go and back up thyself" without having to screw around with switching floppies in and out, is well worth the cost, now that reliable tape drives are below $300 (I remember paying $500 for a 35S1 floppy back when...).

When drives get big, and your only means of backup is to floppies, you tend to start neglecting the backup process. That's when it will come up and bite you. I believe it's time to start laying in a level of protection. I currently use just a few tapes, alternating total backups between them. The cost of one tape might equal the cost of the quantity of 1.2Meg floppies needed, but what about the convenience? No, tape backups are in.

Fm Shane Dawalt: Roy, Refresh my memory please, how big is your HD which you are backing up? Anyway, I suppose you're right. How often do you backup your HD? I try to back mine up once every two weeks. I admit, however, that most of the times that schedule gets rearranged to once every month. My problem isn't the actual backup, it's the garbage collection required BEFORE the backup that I hate. You know, deleting temporary files, backup files and files you just don't need anymore.

Fm MISOSYS, Inc: Shane, I have an 80 Meg drive in the 386 machine. The drive is partitioned into two 32-Megabyte partitions (C & D) and one 16-Megabyte

partition. Thus, I back up a 32-Megabyte partition at a time. I generally use two tapes per partition, except that right now, drive D has nothing on it. I start off with a full backup. Each succeeding backup is done with modified files only. When the tape gets full, I then quick erase the older tape and start again with a full backup. A full backup of about 30 Megs takes about 8 minutes. It takes about 27 minutes to format a new tape.

Trying a full backup onto 1.2 Megabyte floppies would take about 25 floppies. That's a lot of switching disks and spending time in front of the machine. With the tape drive, I can just go about my business doing something else while it backs up. And, boy, do I have other things I could be doing.

Even if I would consider using 1.44 megabyte 3.5" floppy disks, they are currently quite expensive - about three times the cost of a 1.2 megabyte diskette. I suspect you pay for the reliability and the lower volume. On the other hand, I am willing to deal on a box of five DC2000 tape cartridges to bring the tape cost under $20/tape.

Fm Shane Dawalt: Roy, I understand why you don't relish the idea of pulling floppies. I thought you were working with a 40 megabyte unit. Yeah, 80 megabytes would force you to sit and wait too long. I see the reason for the tape backup.

Fm MISOSYS, Inc: Shane, Even with a 40 Meg drive, the tape backup is preferred. Even with a 20 Meg drive the tape backup is preferred. Once you start using one, you become a believer. The Colorado Memory tape drive is quite economical.

Fm Shane Dawalt: Roy, A tape backup discussion was started on the zenith forum. Colorado Memory Systems seems to have very good tape drives, according to all who chimed in with opinions on the thread.

Fm MISOSYS, Inc: That's the brand I'm selling. The extremely low part count due to the high degree of integration keeps its expected life quite high. There are very few moving parts. Taking orders...

PC Memory Partitioning?

Fm Kent Fasick: Is there an easy way to swap between two programs in memory on an IBM AT, with one being frozen while the other runs? My computing experience runs about 99% TRS Model 3/4 and 1% MS-DOS. I know on the Model 4 its easy enough to do with DoubleDuty, and certainly the AT should handle this just as easily, but how?

I'm running DOS 3.3. Also, I need a way to slow down an AT to run at a 4.77 Mhz effective rate. My kids (and I) are going nuts trying to play games designed for the slower clock rate.

Fm Joe Kyle-DiPietropaolo: Kent, For running two programs at once, in addition to DESQview (which is what I use), there's Software Carousel (ideal if you just need program **Swapping**, not true multi-tasking) and DoubleDOS (easier to set up than DESQview, but not nearly as flexible or powerful).

Fm MISOSYS, Inc: Kent, I use Software Solutions' *Software Carousel* on the AST 286 machine. That allows us to switch between the LB data bases, the INVOICE program, HQ modules, and another partition for anything else I feel like running at the time. Switching is done simply by depressing <ALT-Fx>. The Function Keys F1-F9 are used to designate which partition you want. You even have some control over a program which locks up; just switch to the Carousel menu via <ALT-SPACE>, and "remove" the offending program.

When you don't need to multitask, Carousel is a great package. I just purchased their version 3.0 upgrade which uses less memory, is supposed to work better with a mouse, and allows more partitions. The older release supported 10 partitions, but I only wound up using four.

That 286 machine has two megabytes of RAM. The more RAM, the merrier; but Carousel can use a mixture of expanded RAM, extended RAM, and disk space for its swap space.

The only problem I had with Carousel was in the order in which I installed AST's spooler; something which I cannot live without. I had to load in the spooler before

installing Carousel.

Programmer's Journal

Fm MISOSYS, Inc: As we have reported in Programmer's Journal, MISOSYS has been carrying that magazine's files in the MS-DOS section of our Compuserve forum. Unfortunately, getting the process going smoothly has taken some time. The difficulty stemmed from receiving in a timely manner, the diskette pertaining to each issue. I admit there has been a problem. Here's one query...

Fm Jeffrey M. Butterfield: I was wondering how serious you are about providing the source code from the *Programmer's Journal* on the forum [CompuServe PCS-49]. Seems like there is a bit of a lag (2 issues?), and that the code is infrequently posted. Would appreciate your comment.

Fm MISOSYS, Inc: Jeffrey, Rest assured I am ironing out the difficulties. PJ fell down on the job of automatically sending me the disks so I could get them uploaded. I have been biting their ears lately.

They have recently sent me the last three issues (6.6, 7.1, and 7.2) so that I can get them up on the forum. These issues should be available now.

If you have some serious questions about the problem of timeliness, the questions should be addresses to PJ - perhaps in a letter to the editor?

3.5" Floppy Differences

Fm MISOSYS, Inc: There appears to be some confusion concerning the interface characteristics of 3.5" floppy drives. I must admit that I too was unaware of the level of differences which existed among 3.5" floppy drives. However, since I am now stocking two types of Fujitsu 3.5" floppy drives (720K-M2532K and 1.44Meg-M2537K), based on information provided in the Fujitsu *M253XK 3.5" Mini-Flexible Disk Drive Product Specification*, I have uncovered the exact differences among the various types. If you are in the market for 3.5" floppy drives, make note of these differences so you are purchasing what you want. Just so my readers can become knowledgeable of these differences, I am providing the following excerpt from that Fujitsu manual.

"The M253XK Family of 3.5" Micro Flexible Disk Drives offer superior performance, reliability and construction in 3.5" Micro Flexible Disk Drive technology. Standard soft sectored 3.5" (89mm) diskettes are used as the storage medium. FM (Frequency Modulation) or MFM (Modified Frequency Modulation) recording methods are acceptable.

There are five models in the M253XK Family:

M2532K Records 8,717 flux transitions per inch and has a per disk unformatted storage capacity of 1 Mbyte with MFM Encoding or 500 Kbytes with FM Encoding. With a 9 sector format (512 bytes per sector), the M2532K emulates the industry standard 720 Kbyte micro flexible disk drive.

M2533K Provides a host controlled normal/high density interface line (pin-2) which changes the data transfer rate while maintaining a spindle rotational speed of 360 RPM. Data transfer rate is 300 Kbits per second in normal mode and 500 Kbits per second in high density mode. With a 15 sector format (512 bytes per sector) the M2533K emulates an industry standard 5.25" 1.2 Mbyte disk drive.

M2534K Provides a host controlled normal/high density interface line (pin-2) which changes data transfer rate and spindle rotational speed. Spindle speed is 300 RPM in normal mode, and 360 RPM in high density mode. Data transfer rate is 250 Kbits per second in normal mode and 500 Kbits per second in high density mode. In normal mode the M2534K emulates an M2532K (720 Kbyte drive) and in high density mode the M2534K emulates an M2533K (1.2 Mbyte drive).

M2536K Provides a host controlled normal/high density interface line (pin-2)

TABLE 1-1 STORAGE CAPACITY SUMMARY

Model #	Density	Spindle RPM	Transfer Rate	Unformatted Capacity	Formatted Sectors[3]	Formatted Capacity[4]
M2532K	Normal[1]	300	250 Kbs	1.0 MB	9 Sectors	720 Kbytes
M2533K	Normal	360	300 Kbs	1.0 MB	9 Sectors	720 Kbytes
	High	360	500 Kbs	1.6 MB	15 Sectors	1.2 MB
M2534K	Normal	300	250 Kbs	1.0 MB	9 Sectors	720 Kbytes
	High	360	500 Kbs	1.6 MB	15 Sectors	1.2 MB
M2536K	Normal[2]	300	250 Kbs	1.0 MB	9 Sectors	720 Kbytes
	High	300	500 Kbs	2.0 MB	18 Sectors	1.44 MB
M2537K	Normal	300	250 Kbs	1.0 MB	9 Sectors	720 Kbytes
	High	300	500 Kbs	2.0 MB	18 Sectors	1.44 MB

Notes:
1. M2532K does not have a High Density mode of operation.
2. M2536K only allows read operations in Normal Density mode.
3. All sectors are 512 bytes.
4. Formatted capacities are in IBM convention, which rounds down sector capacity to 500 bytes per sector when calculating formatted capacities.

which changes the data transfer rate while maintaining a spindle rotational speed of 300 RPM. The M2536K allows only read operations in normal mode. Read and write operations are allowed in high density mode. Data transfer rate is 250 Kbits per second in normal mode and 500 Kbits per second in high density mode. With an 18 sector format (512 bytes per sector) the M2536K emulates a double density/double sided, 135 track per inch, industry standard 1.44 Mbyte disk drive.

M2537K Same as the M2536K, except the M2537K allows read and write operations in either normal or high density mode.

A summary of storage capacities is given in Table 1-1."

The Language Forum

An "interview" with Niklaus Wirth

submitted by:
Lee C. Rice, Ph.D.
Department of Philosophy
Marquette University
Milwaukee, WI 53233

Roy, since you seem to like poking fun at Pascal and other languages, I thought I'd send you this article I pulled off of usenet some time back.

Several prominent software companies have caused a stir lately by dropping all development work in Pascal and adopting Microsoft BASIC. When queried all have declined to comment about this move, but one company insider (code-named Deep Poke) suggested talking to Niklaus Wirth to get the full story.

Speaking from his home in Zurich, Switzerland, Wirth proved to be a far more genial soul than one might imagine, being the founder of Pascal and all. BUt the European lifestyle obviously agrees with him, and he was more than willing to provide some insights into this strange phenomenon, currently taking place in the computer industry.

In fact, what began as an innocent inquiry eventually revealed a shocking and exclusive piece of information: that the invention of Pascal nearly 20 years ago was intended entirely as a joke, an April Fool's prank.

Wirth tried to explain. "Every year at the Swiss Federal Institute for Technology [the University in Zurich where Wirth is a professor of computer science] I taught the same classes, gave the same tests, told the same jokes," he began. "it was boring. I needed a little humor. So I started talking about this crazy language called Pascal. Eventually, the Pascal joke became so popular I just kept adding to it, making it more and more elaborate.

"But some of the students went to class so seldom that they missed the joke and thought Pascal was a real language! Imagine the looks on their faces when they got out into the world and discovered there was no such thing as a language called Pascal. Hoo-boy! They sure learned to pay attention after that!" he said, giggling.

Several of his better students, he continued, figured they'd make some money by fleecing the people who actually believed in Pascal and so wrote a simple Pascal compiler for this purpose. It was actually a kind of prank, much like selling elevator passes to high school freshmen.

"Yes, yes," Wirth said, "the UCSD operating system started the same way. The same bunch of rascals who did the whole Pascal thing kept pushing the idea until it reached the point of complete absurdity. They were hysterical! Especially late at night - they'd come up with some really boffo material. Then the next week they'd modify it and it would get even more entertaining."

Wirth's best student was Philippe Kahn, who he met while Kahn was a student. "I used to go to a small bistro called 'Der Blaue Engel' after my classes, and it happened that Kahn played jazz saxophone there while people danced on the tables." Wirth was impressed with Kahn's talent and evident wit and encouraged him to end his musical career and enter the lucrative field of software comedy. Once he explained Pascal's comedic possibilities, Kahn was hooked and quickly agreed.

Since most of the staff at Apple Computer Inc. was educated at the University of California at San Diego, they were also in on the joke, Wirth said. "That's why they kept pushing Pascal. A bunch of fine kids, those Apple guys. Born comedians, most of them. Except this one guy - he had no sense of humor at all. [Editor's hint: not Woz.]

When we finally decided to do a DOS that was even funnier than UCSD Pascal, the feeling was that UCSD was already the ultimate. But then one of the guys proposed doing a DOS that was written in Pascal but used hieroglyphics instead of a written language. What a genius! We were rolling in the aisles. But that one guy, he thought we were serious. What a nerd!"

Wirth's list of the funniest features of Pascal begins with the lack of string data type, no random file access, primitive numeric handling, and the existential absurdity of the semicolon.

"But I'd have to say that my crowning achievement was the lack of input and output functions. First you can't get anything in too easy. And once it's in, you can't do much with it. Pascal isn't good with letters and it's not good at all with numbers. Besides, I made it very picky. You have to recompile, recompile, recompile forever. Ha! And once you've done something with the data, you can't get it out." Wirth started chuckling uncontrollably. "Philippe has said C is a write-only language - I made Pascal a read-only language!" His chuckling turned into hysterical laughter that went on for several minutes.

"Of course, some didn't get the joke," he finally said when he could see again. "They kept trying to make Pascal actually useful. But I stopped them; I made the original Pascal a standard. That meant anyone who made Pascal good for anything was nonstandard and out on a limb!"

How will all this affect the future of Modula-2? Wirth's merry manner and beaming face suddenly became hard when presented with this question; perhaps this was taboo territory, sacred subject matter.

"Modula-2 is a real language," he finally said, his demeanor solemn. "It represents a serious effort on my part to make amends for any damage caused by well-meaning but unimaginative people teaching and learning Pascal.

"But it's so hard! Pascal is a very good joke, yes? But to make a really good language from it is not so easy," he sighed.

In addition to Pascal, Wirth admitted, three other languages also were intended as pranks: Forth, PL/I, and True BASIC.

"Forth is essentially black humor," Wirth said. "Charles Moore [who created the language in the late 1960s] designed it as a native language for people whose brains ran backward." Originally, he continued, it was supposed to be the ultimate parody of Hewlett-Packard calculators, which Moore had been competing with unsuccessfully for years. As an astronomer, he had used HP's calculators out of necessity rather than any appreciation for their design. But to his great surprise, he found that there were actually quite a few people whose brains did run in reverse. Eventually, Moore came to see Forth as a boon, especially for backward thinkers. "At least it keeps them off the streets out of really serious trouble" Wirth said. "Imagine one of them trying to drive a car or operate heavy machinery!"

PL/I originally stood for "Prostituted Language/Interface," Wirth explained. The designers were under so much pressure to add features and include every possible construction from every other language in existence that they eventually gave up and decided to play the whole thing for laughs. They said 'yes' to every request, no matter how absurd, and even added things to the language no one ever could or would use. They scoured journals for off-beat syntax and weird symbolic notation; some of their better ideas came from early editions of The Mad Reader and other E. C. publications. Besides, several of them were upset with the compiler-writing team and decided to stick it to them with a life-time project."

True BASIC is not "True" in the sense most people understand the word, Wirth continued. Rather, "True" is itself an acronym for a "Totally wRecked-Up Example of." The professors who came up with it are amazed that no one has yet caught on to the joke; they felt sure their insistence on the LET keyword would be a dead giveaway. "Of course there were other clues, but this was the most clear-cut," Wirth said. "They even called Microsoft BASIC a street BASIC in hopes that Bill Gates would challenge them and reveal the joke." But Gates refused to play along, and both professors had to all but beg Wirth to tell the world the truth about True BASIC before things went any further.

Jokes abound in the world of operating systems as well, according to Wirth. In addition to the UCSD Pascal operating system, said Wirth, "Tandy, Apple, and Commodore were for a number of years carrying out a private comedic battle to see who could produce the world's funniest DOS."

Tandy's TRS-DOS (Tandy Radio Signal Detection Operating System - a reference to the fact that early machines would reboot when any transmitted signal was detected) was an early front-runner until Apple came out with the very amusing Control-D command what could enable or disable disk operations. In the end, though, Commodore won the battle. It's DOS was oriented towards records exactly the size of punch cards and took over four minutes to boot from disk since it read disk data more slowly than most audio tape machines and even some 300-baud modems.

But the funniest joke of all is, in Wirth's estimation, also the most common, and he's amazed so few people have caught on to it yet.

"Come on, come on. Surely you can guess," he said, his voice rising in excitement. "What one thing makes users more livid than any other? What one computer product makes you feel sure it was produced by a team of trained gerbils on mind-altering drugs? Yes, yes, yes! You see it now - manuals!"

Wirth considers Gates, who wrote all the BASIC manuals and who was on the staff of many others, a "comic genius." "Mitch Kapor should get more recognition - he's far better than Neil Simon. And what's-his-name, the guy who wrote the WordStar manual - he got an award at a dinner we threw for him a few years back. That manual is a classic in the truest Marxist [brothers] sense of the word! Pure slapstick! But the best of them all is the author of the dBase II manual. Now there is a writer for the ages!"

As for the IBM manuals, Wirth considers them mere hack work. "Anyone can do stuff like that," he snorted.

But perusing a copy of the manual for NEWDOS, he seemed a little more impressed. "Hmmmm. Not bad work. Not bad at all," he said. "But it's still simple stuff. 'To do this, read page 40. But to know what's on page 40, you have to read page 65, which refers to page 15, which shows a whole list of exceptions for page 53.' Entertaining, but hardly in the class of any of the modern masters of the art." But when his attention was brought to the fact that none of the error numbers listed in the NEWDOS manual were ever returned to the BASIC programmer, and that the most common disk setup (double-density, double-sided) was not on the configuration menu, Wirth admitted that these were indeed nice touches.

Although it is a known fact that, most of the early computer manuals (probably even the NEWDOS manual) were written by programmers and that programmers are notoriously poor writers, Wirth would not be deterred from his opinion that these writings are works of art.

"Most people fail to consider that good programmers are very bright. Their thoughts are extremely well organized and most of them have the benefit of higher education. Their brains are not warped by overexposure to TV and their attention spans are not short-circuited by overindulgence in sex, drugs, or alcohol. They are not constrained by conventionality. If you want to get picky, there are a

lot more programmers than there ever were writers. And programmers simply work harder than writers. Few writers work 100 hours a week, almost all programmers do."

The result, according to Wirth? "All programmers write at least as well as Faulkner. Most are as good as Proust, and about a third are as good as Dickens. Several hundred are at least as good as Shakespeare. So the manuals you thought were inferior were simply beyond your poor ability to appreciate. If you said you were a programmer, you would delight in their verbal virtuosity," he said.

In fact, Wirth claimed, even the grammatical errors and misspellings in the manuals were placed there deliberately. Most are elaborate literary allusions and puns; some are inventive Joycean neologisms. As an example, Wirth discussed the history of the word "kernal."

"Everyone, including programmers, knows the word is spelled k-e-r-n-e-l," he explained. "The deliberate misspelling is an implied criticism of the typesetter (a writer's bane for years.) Of course typesetters kern the letter l; thus, 'kern el.' But kerning can only be done for certain letter combinations, such as two l's. Thus, 'kern a l' dares the typesetter to kern an isolated l, an obvious typographic impossibility.

"Moreover," he continued, "'kernal' is an anagram for 'rankle,' which describes programmers' feelings toward typesetters. Finally the inventor of this particular word, R. K. Lane (who is well known within the Southern California computer community) has concealed his name by means of yet another anagram."

Wirth smiled a last secretive smile, leaving us all to wonder if this was perhaps just one more in his series of personal computer pranks.

Checking from Model 4 BASIC for the existence of a floppy disk file

By Charles A. Ainsworth
P. O. Box 2107
Woodbridge, VA 22193

There are several modalities in BASIC for opening random/sequential access disk files; all, except one, will look for the file on the specified drive (or on all drives by default) and if not found will create it on the specified drive (or on the first available one by default). The exception is a sequential access file in the input mode (OPEN "I", etc.) where the absence of the specified file will generate a "File Not Found" error but will not create a new file.

Picture the following scenario: You are running a BASIC program which prompts you to insert in drive #1 a floppy containing an existing database file I will call MYFILE/DAT, which you wish to extend by adding new material. You make a mistake and insert another disk instead. The OPEN command for a random access or output/extend sequential file will create a new version of MYFILE/DAT on that wrong disk and save your new material to it. If you spot the error, you can finish your program run and then go to DOS and, for random or sequential-extend files, APPEND that incorrectly placed file to the genuine one on the disk you failed to insert. In the case of a sequential output file, you would COPY it from the wrong disk to the correct one. And, in both cases, REMOVE the incorrect file from the alien disk. But if you don't catch your error you may have a serious problem later on by unknowingly having put your new data on the wrong disk.

So it pays, when you seriously value your data, to be certain that you will be halted and warned when a wrong disk is inserted and be given a chance to change it.

To determine whether a disk file is present, something like the following may be inserted in your BASIC program, which uses the fact, noted above, that a call to an input modality sequential file would return an error if the file were not present.

```
100 PRINT "INSERT DISK
WITH MYFILE/DAT IN DR.1,
<ENTER>":LINE INPUT A$ 110
ON ERROR GOTO 1000
120 OPEN "I",1, "MYFILE/
DAT:1"
130 ON ERROR GOTO 0
140 CLOSE 1
200 'Now open the file in
the required modality and
continue processing
990 END
1000 CLOSE 1:PRINT "WRONG
DISK IN DRIVE 1, CHANGE
AND <ENTER>":LINE INPUT
A$:CLS:RESUME 100
```

If the desired file is present and found, line 120 will continue on successive lines, 140 will close it and file opening in the modality necessary for running the program will occur at 200. But if line 120 doesn't find the file it will jump to 1000 to alert the operator, giving an opportunity to insert the correct disk, press ENTER and return to line 100 to begin anew.

Although this system uses the sequential input modality to check for the existence of a file, it will work whatever the modality of the existing disk file may be.

Naturally, the very first time you run a program, your file (MYFILE/DAT in the example) will never have been written to, so will not exist or be found (unless previously CREATEd), so you may wish to put it on disk first and then insert the above in your working program.

If the file you are checking for has a password, be sure to include it with the file name in line 120, otherwise a "file access denied" error will be generated and line 1000, not knowing the difference, would inform you incorrectly that the file hadn't been found when it is really there.

There is always the (hopefully remote) possibility that some other error, different

from file not found, might sneak in after the ON ERROR GOTO of line 110, translating into a WRONG DISK error in line 1000 when in reality the error might be something else. In such a case, knowing that the file is really there, you would resort to the BASIC ERR or ERRS$, used in the immediate mode, for clarification, and maybe issue instructions to BASIC from the keyboard. That is the way I work it, which I feel is the simplest and least clutters the program with error traps. However, anyone particularly wishing to catch one or more specific type(s) of error, other than file not found, could include the necessary trap(s) inside the error-handler, e.g. line 1000, to do whatever is desired (see ERR in the TRSDOS6/LSDOS manual).

Now, a possible addition to this method: You do keep backups of your important files, don't you? Yes, I thought you did. Well, one way of keeping backups is to have material saved to both working disk and backup disk when running the program, which is the one I favor (admittedly, you need enough drives). Doing it by only running the working disk with the program, and then backing up separately later, involves the possible omission of a backup [shudder!] and the consequent danger of having two different versions of one's files.

If you wish to test for the presence of both the working file and the backup when running your program, you could insert, in the above, lines 150/190, similar to 100/140, changing drive and error line numbers to suit, and adding another error line such as 1010 (with a suitable drive number) which would RESUME at 150.

The MISOSYS EnhComp compiler has a very neat and simple way of checking for the presence of a file with EXISTS.

LOGIC in the C Language

Ken Peck
400 West Johnson, #202
McGregor, TX 76657

Over 100 years ago George Boole, an English mathematician and logician, developed the basis of symbolic logic which has come to be known as Boolean algebra. For decades it was of interest only to mathematicians and logicians. Modern symbolic logic is based on it, not to mention the logic of digital computers, which came much later.

Boole's world was populated were everything was either true or false. If something was not true, it was false; if it was not false, it was true. If something was true, while something else was false, then something and something else was false. But something or something else was true.

These logical relationships can be expressed in "truth tables" as illustrated in **Table I.**

zeroes (false) and ones (true) and a few symbols such as '-' for 'not', '+' for 'exclusive or', 'V' for 'or', and '*' for 'and'. Now our truth tables look like those illustrated in **Table II.**

When digital computers came along, there was a natural affinity between these machines, populated as they are, buy a universe of millions, billions, and even trillions of zeroes and ones. So great was the need for people who understood such things 30 years ago, that men in grey flannel suits would regularly raid university philosophy departments looking for bright young students who understood such things. At that time I was more interested in the weightier matters of God, man, beauty, and justice; it was nearly twenty years later that I became interested in the universe of zeroes and ones in computers.

I threw in a new logical operation, the exclusive or; actually it is equivalent to the more complex **(x V y) * -(x * y)** [x or y and not x and y]. The symbolic logic symbols are old ones (and not those of Boole); I chose them from many systems because they relate to other issues in the lowest levels of computer programming. Those who are following Roy's articles on [*Getting into computer math*] should recognize the "and" truth table as being one and the same as the binary multiplication table. And the "exclusive or" truth table happens to be the same thing as the "facts" for binary addition. (Yes, I know, there is a carry out of the case of 1+1.)

Table I

p	not p
true	false
false	true

p	q	p and q
true	true	true
true	false	false
false	true	false
false	false	false

p	q	p or q
true	true	true
true	false	true
false	true	true
false	false	false

There are also truth tables for implication, equivalance, etc. But since computers aren't terribly concerned about the truth of statements such as "If there is a unicorn in my living room, then Elvis lives" I won't go into that. (It happens to be true.)

This whole system of Boolean algebra or symbolic logic can easily be expressed in

These relationships are the concern of the engineers at Intel, Motorola, etc. who design the microcode and circuitry which determine the functioning of the arithmetic and logic unit of our processing units.

Table II

x	-x	x	y	x V y	x	y	x + y	x	y	x * y
0	1	0	0	0	0	0	0	0	0	0
1	0	0	1	1	0	1	1	0	1	0
		1	0	1	1	0	1	1	0	0
		1	1	1	1	1	0	1	1	1

Assembly language programmers deal with more abstract logical operations which operate on bytes. Most assembly languages have instructions such as NOT (CPL for Z80), OR, XOR, and AND. These are know as "bitwise" operations because they perform their logical operations on the individual bits of their operations. So in an 8-bit operations, these operators produce results as illustrated in **Table III**.

On an even higher programming level these become the basis for the bit-twiddling operations, in C '~', '|', '&', '^'. In C these are not even called "logical" operations, they are "bitwise." C's bitwise operators perform their magic on the individual bits of integral operands (char, int, long). Floats and doubles will most likely give flakey results when used with these operators. (What the compiler should do is try to cast real operands as some integral type, thus losing the fractional part and possibly messing up both magnitude and sign, then performing the bitwise operation. If the bitwise operation is performed directly on real types, the result is guaranteed to be garbage.)

```
flags | BIT_MASK;
/* 0100 | 0001 = 0101 */
```

Note that only the one bit(s) of BIT_MASK affect bits in flag. If I want to reset the flag to zero, I 'and' flags with the 'not' of my BIT_MASK

```
flags & ~BIT_MASK;
/* 0101 & ~0001 = 0100 */
```

Note that 'not BIT_MASK' becomes 1110. I can toggle the flag with 'xor'

```
flags ^ BIT_MASK;
/* 0101 ^ 0001 = 0100; 0100 ^
0001 = 0101 */
```

I can test the flag with 'and'

```
flags & BIT_MASK;
/* 0101 & 0001 = 0001; 0100
& 0001 = 0000 */
```

Note that all bits except the masked bit are always set to zero.

Table III

```
        NOT 01010101 becomes 10101010

01010011  OR 00110101 becomes 01110111

01010011 XOR 00110101 becomes 01100110

01010011 AND 00110101 becomes 00010001
```

The purpose of these operators is bit-twiddling, pure and simple. If I want to have 16 flags stored in an unsigned short int, I can set the flag to one with 'or' (I will show just four bits) . . .

This brings us to an even higher level of abstraction; that level at which the programmer is saying "If something is true, do this, else do that" or "While something is true, do this." At any level of our logic, if something is zero, it is false. As day follows night, if something is not zero, it must be true. And as night follows days, if something is not true, it must not be not zero. Consequently,

```
if (flags & BIT_MASK)
    do_this();
else
    do_that();
```

will do_this() if, and only if, some corresponding bit in both flags and BIT_MASK are set to ones. Note that it matters not what value is returned by the expression "flags & BIT_MASK," be it 1 or 65535, it is "true" so long as it is "not false," that is, "not zero."

Enter C's logical operators. A logical operator returns either true or false. If the logical expression is false, it must return zero. If it is not false, it must not return zero. What it does return, as long as it is not zero, matters not. As the British logician, Wittgenstein, would probably say, "It is arbitrary, whatever pleases you." What pleased Ken Thompson and Dennis Ritche was one. So C's logical operators return 0 if false and 1 if true. (Authoritative references to support that statement will follow.) Now I still care enough about God, beauty, and justice to find it aesthetically pleasing that Truth is unity at the highest level of language and at the lowest levels of electronic circuitry, rather than -1, as some permanently brain damaged programmers would have us believe, or -0, which doubtless comes from too much wearing of grey flannel suits.

C's logical operators are '||' and '&&', to which I also add the equality operators, '==' and '!=', the relational operators, '<', '>', '<=', and '>=', and not, '!'. All of these operators share one common feature: they return a boolean false (0) or a boolean true (1). Unlike the bitwise operators, they cannot return 2 or -1 or 65536 or any other value except 0 or 1. Also, unlike bitwise operators, they are well behaved when the operands are floats or doubles.

bitwise

```
if (flags & BIT_MASK)
        do_this();
else
        do_that();
```

logical

```
if (flags &&
BIT_MASK)
        do_this();
else
        do_that();
```

The bitwise condition is true if, and only if, one or more corresponding bits in flags and BIT_MASK are set to 1. Consequently 0011 & 0001 will do_this() and 0010 & 0001 or 0000 & 0001 will do_that(). The logical condition is true if, and only if flags is not false (i.e., not zero) and BIT_MASK is not zero; conversely, it is false if either flahgs or BIT_MASK is zero (false). Consequently 0011 && 0001 and 0010 && 0001 will do_this() and 0000 && 0001 will do_that(). Given the apparent meaning construct, 0010 && 0001 would constitute a logic error.

bitwise

```
if (god & country &
mother)
        all_is_well();
else
        end_is_near();
```

logical

```
if (god && country &&
mother)
        all_is_well();
else
        end_is_near();
```

If god = 1 and country = 2, and mother = 4, the bitwise condition will have a logical value of false, indicating that the end_is_near(). This most likely is a logic error. With the same values, the logical condition will be true and all_is_well().

There is another difference. Typically the entire "god & country & mother" expression will be evaluated before the value is returned. On the other hand, "god && country && mother" will stop as soon as the expression is know to be false. If god is false, we do not need to know about country and mother; the end_is_near().

The discussion of bit-wise and logical operators and TRUE and FALSE in TMQ [issue II.ii, pages 42-44] is guaranteed to confuse anyone who does not know C. So here is the definitive word.

Bitwise operators

These operators correspond to corresponding machine operations on each bit of the operands. They may be performed only on intergal types (char, int, and long). They return values depending on the operation and type. For example, for 8-bit characters, a bitwise operator will return a value in the range of x00-xff, inclusive, for 16-bit integers, a bitwise operator will return a value in the range of x0000-xffff.

These operators correspond to corresponding machine operations on each bit of the operands. They may be performed only on intergal types (char, int, and long). They return values depending on the operation and type. For example, for 8-bit characters, a bitwise operator will return a value in the range of x00-xff, inclusive, for 16-bit integers, a bitwise operator will return a value in the range of x0000-xffff.

One's complement operator [K&R A7.4.6] or bitwise negation [H&S 7.5.5] (~) returns the one's complement or bitwise negation of the operand.

```
printf("~0 = %d.\n", ~0);
/* prints "~0 = -1." */
```

Bitwise AND operator (&) returns the bitwise AND of the operands. [K&R A7.11; H&S 7.6.6]

```
printf("1&2 = %d.\n", 1&2);
/* prints "1&2 = 0.") */
```

Bitwise exclusive OR [K&R A7.12] or bitwise XOR [H&S 7.6.7] operator (^) returns the bitwise exclusive OR of the operands.

```
printf("3^5 = %d.\n", 3^5);
/* prints "3^5 = 6." */
```

Bitwise inclusive OR [K&R A7.13] or bitwise OR [H&S 7.6.8] operator (|) returns the bitwise OR of the operands.

```
printf("1|2 = %d.\n", 1|2);
/* prints "1|2 = 3." */
```

Logical operators

These operators perform logical or boolean operations on their operands. They always return 1 or 0 depending on whether or not the operation is true or false. (Remember, we are talking about C here, not any other language.) If a mainframe C compiler returns -1 or -0 for any of these operations, it is not a conforming C compiler.

Logical negation operator (!) returns 1 if the operand is zero, otherwise 1. [K&R A7.4.6; H&S 7.5.4]

```
printf("!0 = %d.\n", !0);
/* prints "!0 = 1." */
```

Relational operators (<, >, <=, >=) return 0 if the specified relation is false or 1 if it is true. [K&R A7.9>; H&S 7.6.4]

```
printf("0<0 = %d.\n", 0<0);
/* prints "0<0 = 0." */

printf("0>0 = %d.\n", 0>0);
/* prints "0>0 = 0." */

printf("0<=0 = %d.\n",
0>=0);
/* prints "0<=0 = 1." */

printf("0>=0 = %d.\n",
0<=0);
/* prints "0>=0 = 1." */
```

Equality operators (==, !=) return 0 or 1. If the operands are equal, then == returns 1 and != 0; if the operands are not equal, then == returns 0 and != 1. [K&R A7.10; H&S 7.6.5]

```
printf("0==0 = %d.\n",
0==0);
/* prints "0==0 = 1." */

printf("0!=0 = %d.\n",
```

```
0!=0);
/* prints "0!=0 = 0." */
```

Logical AND operator (&&) returns 0 if either operand is 0 or 1 if both operands are not zero. The expression is evaluated left to right and stops as soon as the expression evaluates to 0. [K&R A7.14; H&S 7.7.1]

```
printf("0&&1 = %d.\n",
0&&1);
/* prints "0&&1 = 0." */
/* 1 is not evaluated */

printf("2&&3 = %d.\n",
2&&3);
/* prints "2&&3 = 1." */
```

Logical OR operator (||) returns 0 if both operands are 0 or 1 if either is not 0. The expression is evaluated left to right and stops as soon as the expression evaluates to 1. [K&R A7.15; H&S 7.7.2]

```
printf("4||2 = %d.\n",
4||2);
/* prints "4||2 = 1." */
/* 2 is not evaluated */


printf("0||0 = %d.\n",
0||0);
/* prints "0||0 = 0." */
```

References:

Kernighan, Brian W. & Ritchie, Dennis M. [K&R]; *The C Programming Language*; 2nd Edition. (Englewood Cliffs, New Jersey: Prentice Hall, 1988)

Harbison, Samuel P. & Guy L. Steele, Jr. [H&S]; *C: A Reference Manual*; 2nd Edition. (Englewood Cliffs, New Jersey: Prentice Hall, 1988)

MISOSYS Products' Tidbits

BSORT

BSORT/CMD and LS-DOS 6.3

Fm Dave Spiceland: I'm trying to do a sort using the BSORT/CMD utility included with the TRSDOS 6.2 Utilities. For some reason the program aborts and will not sort the arrays. I HAVE used the program with and without the BSORTA/FIX and it always aborts @ Line 300. Will BSORT work on numbers AND strings equally well? Will it work with LS-DOS 6.3? (which is what I'm using)

Here's a copy of a test program I've been using which always aborts at Line 300:

```
 40 N=6
 50 DIM A(N)
 60 OPEN "I",1,"TEST2/DAT"
100 FOR A = 1 TO N
125   INPUT#1,B
130   A(A)=B
150 NEXT A
200 FOR A = 1 TO N
220   PRINT A(A)
250 NEXT A
300 SYSTEM"RUN BSORT
6,+A(1)"
350 PRINT "after sort"
400 FOR A = 1 TO N
420   PRINT A(A)
450 NEXT A
```

Fm Joe Kyle-DiPietropaolo: Dave, Didn't BSORT require the name of an integer variable rather than an integer constant? I'm far from my docs, so could be all wet here, but that sticks in my mind.

Fm Pete Granzeau: No, BSORT requires an integer constant, or else have the entire command string constructed dynamically. That's engraved on my heart, now.

Fm Dave Spiceland: Pete, So I assume you've used BSORT with no problems. For some reason it refuses to work and I'm stuck doing a VERY slow sort (about 15-minutes) using BASIC. I'm not a programming whizz, but this is frustrating. Any suggestions would be appreciated at this point.

Fm Pete Granzeau: Okay, I wanted to read in an undetermined number of records into an array, sort them on data which appeared in column 14 (for about 20 characters). As I filled the array, I kept the current position in variable I. When I had all the records, the program executed the following two commands:

```
500 A$="RUN.
BSORT"+STR$(I)+",A$(1)(14,20)"
510 SYSTEM A$
```

If you printed variable A$, you'd find that it read something like this:

```
RUN BSORT 522,A$(1)(14,20)
```

Hope that helps.

Fm MISOSYS, Inc: When all else fails, read the documentation. I've reprinted the information on the first page of the BSORT documentation within the box titled, "BSORT - BASIC Sort Utility". Let's all read this first and see who comes up with the answer. Then come back and see if your solution matches mine.

Give up? Well the documentation states that "A declaration tag (!,#,$,%) must be used for any array specified". "A(1)" is not sufficient to locate the referenced array in question. It must be either "A%(1)", "A!(1)", "A#(1)", or "A$(1)". That's so BSORT knows what array to look for.

DiskDISK

What does DiskDISK do?

Fm John Grant, Jr.: I finally received my hard drive from Aerocomp. We talked on the phone about this, and a few other things, though there is no reason that you would remember the conversation.

What I'm really writing about is to ask you what your "DiskDISK" does. I believe that you gave a short explanation in one of your ads in one of your past issues of TMQ, but I haven't been able to find it (though it's got to be somewhere).

Fm MISOSYS, Inc: John, DiskDISK is a utility which essentially creates a 2-tier directory on a large capacity disk drive. Since the DOS is limited to an allocation of 256 file slots maximum on any one drive partition, folks wishing to store lots of small files usually run out of file slots, rather than disk space. DiskDISK establishes a virtual disk drive, similar to a RAMDISK, but uses a file on the host drive as its storage space. So instead of the virtual drive contents stored in RAM, they are stored on the host disk drive - which is usually a hard drive.

Using DiskDISK, one can create floppy-sized disk drives. But one is not limited to just 180K virtual drives, one can set up a virtual drive as "double sided", or 80-tracks, or other combinations. Our

BSORT - BASIC Sort utility

BSORT is a high speed sort utility for sorting BASIC arrays. Any type of array (integer, single/double precision or string) may be sorted. Sorts can be performed on one and two dimensional arrays. The following syntax is used to initiate a sort. Note: "Integer Numbers" refers to integer variables or constants.

```
SYSTEM"RUN BSORT NUM%,*IND%,PSA(x),parm,parm,....,parm"
SYSTEM"RUN BSORT $STRVAR$"
```

NUM% Number of elements to sort (an integer number).

***IND%(x)** Optional single dimension integer array. If not used, re-ordering of elements will occur in the array being sorted. If used, the sort will generate an index array containing element numbers of the sorted array, and no re-ordering of "sorted arrays" will occur.

PSA(x) Primary sort array. An optional <+> or <-> may precede the array name to indicate the direction (ascending or descending order) of the sort. If not specified, <+> is assumed. A declaration tag (!,#,$,%) must be used for any array specified. A subscript must be specified, representing the first element number to be sorted, It must be an integer number.

Optional parameters are as follows:

SSA(x) Secondary sort array. If used, a <+> or <-> must precede the array name. The sort key used will include corresponding information from the primary and secondary arrays. Any re-ordering of the primary array will cause a corresponding re-ordering of the secondary array. More than one may be used. A subscript is required if the secondary array is two dimensional.

TA Tag array. Any re-ordering in the primary array will cause a corresponding re-ordering in a tag array. A tag array cannot be preceded by a <+> or <->, and may only appear after all secondary array definitions. More than one may be used.

(s,n) Mid-string information, Valid only with STRING arrays. If specified, it must immediately follow the array information, and cannot be used with tag arrays. If specified, the sort key will begin at position s in the string, for n characters, where s and n are integer numbers.

$STRVAR$ Optional non-array string variable containing the sort parameters. Must be used if the length of the sort command (i.e. the number of characters within the quote marks) exceeds 79.

diskDISK users have typically established virtual drives which are similar to their physical floppy drives. This makes backing up a "diskDISK" to a physical floppy quite easy. On each virtual disk drive established by diskDISK, you can store files exactly like those stored on a real floppy. If you construct a virtual 40-track single sided double density diskDISK file, that is equivalent to a standard 1-sided Model III/4 floppy disk. The storage capacity is 180K and you can store 128 files. A 2.5Meg partition of a hard disk can hold about a dozen virtual diskDISKs of this configuration. Therefore, instead of the 256 files you can store on a 2.5 Meg hard drive partition, diskDISK lets you store over 1500. You need at least one free drive slot (out of the eight available) to "connect" a virtual disk to the DOS. You can have as many concurrently available as you have free drive slots. They may also be switched by a single command. DiskDISK is certainly the answer to a hard drive users storage problems.

EnhComp

Minor Error in EnhComp BC fixes in TMQ III.iii

Fm Carl Berger, Largo, FL: Roy, The patches on page 40 in the TMQ Volume III.iii seem to be reversed. I have the M-21-072 Model4 PRO-EnhComp but when I type BC <ENTER> Enhcomp Ver. 2.6 - 01-Mar-88 appears, so I used the BC55/FIX which was for that version, but it didn't work. I then typed in the BC65/FIX and it worked.

While we are on the subject of patches, please mail me the patch to make diskDISK's DDFORM put in the LS-DOS 6.3 Time/Date correctly (DDFORM63/FIX) so I don't have to remember to use DATECONV after DDFORM.

Target TEMP/BAS and TEMP/CMD

Fm James F Hennessey, Albuquerque, NM: I have a model 4 PRO-EnhComp, reg. no. 00168, which I recently purchased from you. I have some questions about it.

Is there a way to direct the RUN to drive :1? When I RUN a program as described on pg. 2-1 of the instructions, TEMP/BAS and TEMP/CMD go to drive 0. Luckily, I have PURGED/REMOVED enough files from the LDOS 6 disk so that there are 57k of free space on drive 0. Even if I can compile to drive 1, there are only 57k of free space on the EnhComp disk.

If only drive 0 can be used, what are the minimum files required on the LDOS 6 disk to support EnhComp? Can the excess be PURGED/REMOVED or can the required files be COPIED to another disk? The files have various degrees of protection.

Does the instruction on pg 2-3 <Transferring EnhComp to TRSDOS 1.3> refer to only a model III EnhComp package? Instruction 1) directs one to "... boot the EnhComp disk." This implies that it has system files on it. I tried booting the model 4 E-C and got "cannot boot. data disk".

If compilation can be directed to drive 1, is there room on one 180k disk to accommodate EnhComp and the minimum required LDOS 6 files to support it, so that drive 1 would be free to store programs?

Would any of the above be different if TRSDOS were used instead of LDOS?

I have read the item on the bug and patch for EC, in TMQ Vol III.iii Pg 40. The patches are labeled "to EC 2.6 and 1.6. These numbers do not appear on the label of my EC. Which patch applies to my EC? Both?

The compiler works perfectly on the programs that I have tried.

Fm MISOSYS, Inc: James, The easiest way to direct the RUN facility from the supervisor mode to use a drive other than zero, is simply to create two files on the drive you wish to use. One file should be named "TEMP/CMD" and the other "TEMP/BAS". The DOS will search for like-named files during the compilation and run processing. It will find your files. Just make sure you don't have files with those names on drive zero.

Since any drive can be used, the thrust of your second question is moot. However, underlying your question is the misunderstanding that you can't touch the DOS files which have protection. That's far from the truth. Any file on an "unprotected" disk can be moved via the BACKUP utility. This includes invisible files [using the "(INV)" parameter], as well. Files with EXEC privileges cannot be copied with the COPY utility without knowledge of the password, but they can be moved with BACKUP. If you specify the "(Q)" parameter, then BACKUP will ask you to confirm any file it includes in its file-specification match. Similarly, you can erase any file from a disk in which you know the master password. If you use REMOVE, you need the password of the file(s); however, using PURGE, just answer the prompt to confirm your selections.

One of the little realized facilities within LS-DOS is that the parameters and partial specifications of BACKUP, PURGE, and DIR work identically. Thus, if you want to know exactly what files will be moved by a particular BACKUP command, invoke DIR with the same parameters. For instance, all of the following produce the same file sets:

```
BACKUP BA:0 :1 (INV)
PURGE BA:0 (INV)
DIR BA:0 (INV)
```

The instructions for transferring EnhComp to TRSDOS 1.3 (and note that's "1.3" and not "3.1") refer strictly to the Model III version of EnhComp. If you read the second paragraph of the manual, "*Distribution Disks*", you will note that the manual is common to both versions.

You can trim a booting SYSTEM disk down to include all SYSn/SYS modules except SYS5, SYS9, SYS11, SYS13, and probably SYS7 and SYS8. Such a disk would use about 36K. That leaves plenty of room for EnhComp files. But you may want to keep BACKUP, according to your tastes.

All references to TRSDOS 6.x are equivalent to LS-DOS 6.x, as the two nomenclatures just refer to different releases of the same DOS. The acronym "LDOS" references a Model III mode system.

Finally, the patch references to BC on page 40 of TMQ 3.3 should refer BC65/FIX to Version 2.6, not 1.6; that was a typo. Use the BC65 fix as it pertains to PRO-EnhComp, which is what you have.

Golden Oldies

Golden Oldies:SYS

Fm MISOSYS, Inc: In TMQ III.iii, Charles A. Ainsworth reported on a problem he experienced when using the SWAP utility from the GO:SYS product. I had worked up a patch to cure the problem; however, I neglected to print the patch in that issue. Here's a brief synopsis of the problem and the cure. The omitted fix follows.

Fm Charles A. Ainsworth: I have managed to make a few additional tests concerning the problem when drives zero and 4 are interchanged with SWAP/CMD. I tried all setups by avoiding SWAP and using instead SYSTEM (SYSTEM=4), and things worked as they should and drive 4 (ex-0) operated correctly and was

recognized by the system either with a disk or without, and without freezing the computer. This might indicate some bug in SWAP.

Of course, avoiding SWAP forces one to interchange drive designations as the very last item of a JCL, which aborts after a changeover with SYSTEM (SYSTEM=n), so the use of SWAP has many advantages for me which I would dislike to lose.

Fm MISOSYS, Inc: Charles, It turns out, the problem is not just in this version of SWAP, but existed in the old SWAP since the release of TRSDOS 6.2 way back in time. LSI added a bit in the Drive Control Table which could be used to inhibit the @CKDRV routine (that checks for the existence of a diskette). Seems that since 6.2, LSI defaults the :0 drive to inhibit @CKDRV, I guess because it has to have a disk in there anyway. They revised the SYSTEM (SYSTEM=d) library command to re-engage the @CKDRV test when drive :0 was swapped with another; SWAP did not. So what happened was when you SWAPped :0 and :4, drive :4 then had to have a disk in it. I have developed a patch to SWAP which fiddles with the DCT @CKDRV bit. The following patch fixes up the problem.

```
. SWAP201/FIX - Patch to
SWAP 2.0.0
. Corrects swap of :0 and
:? for @CKDRV inhibit bit
. Apply via, PATCH SWAP
SWAP201
D00,FC=CD 6A 28
F00,FC=21 00 29
D02,50=31
F02,50=30
D02,A1=FD E5 C5 0E 00 3E
51 EF FD CB 04 7E FD CB 04
BE
F02,A1=00 00 00 00 00 00
00 00 00 00 00 00 00 00 00
00
D02,B1=C1 FD E1 FD CB 04
BE 28 04 FD CB 04 FE 21 00
29 C9
F02,B1=00 00 00 00 00 00
00 00 00 00 00 00 00 00 00
00 00
. Eop
```

PARMDIR handy for DiskDISK

Ken Strickler
P.O. Box 773
Stanwood, WA 98292-0773

Here is a handy dandy for PARMDIR. For the HARD DISK users who have segmented their HARD DISKS into smaller, managable diskDISK's and would like an easy way to obtain a DIR for all of the diskDISK's, without assigning individually and printing out a DIR, try the following. (You must have PARMDIR, currently available in the GO:SYS module)

1) Set MEMDISK for bank 1, SPOOLER for bank 2.

2) `Set *ff FORMS`

3) `FORMS (c=85,m=3,l=60) - (,ffhard)`, if your printer can handle it.

4) Space down 3 lines on printer - and reset (top of page now 3 lines down.

5) Enter - `PARMDIR /DSK DOFILE:1 (A="DD :3 ",X=";DIR :3 (P,I)",Y=";TOF")`

(If you want system files, use `X=";DIR :3(I,S,P))`

6) `DO DOFILE:1`

This will provide you with a directory of all of your diskDISK files and their contents on separate pages. Just staple together, or put in a notebook. Real handy to look up programs in!

HartFORTH

HartFORTH-86 documentation errata

Fm Pete Betz: Roy, HartForth-86 is great, as expected. Simple but powerful, as the saying goes. Here's some errata from the Glossary:

page 29: + or ; should be + or =

page 29: 2CONSTANT's stack notation should be d —>

page 31: S> should be S>D

page 21: the description for LOADS should be: Will load blocks commencing with block n1 and ending with block n2. (This is a worthwhile change from Model 4 HartForth that just didn't get changed in the documentation.)

page 14: It would be very helpful to change the description at the top for the tick from Find address... to Find parameter field address...

Hope these will be of help. (When the heck do we get SAID-86? Composing these messages with EDLIN is driving me nutty!)

Fm MISOSYS, Inc: Pete, I actually have a preliminary "SAID-86" which Mark Reed has been developing. However, its performance in terms of speed needs improvement, and it needs to handle multiple editing buffers - similar to Model 4 SAID. I can't believe you're using

EDLIN!

By the way, thanks for the errata. Both Andrew and myself went over the manual a few times, but some things just never get picked up. Will insert your errata in the README.

Little Brother

More LB suggestions

Fm David Huelsmann: Roy, Couple of suggestions/requests concerning LB.

First, for LB, I understand you are working on porting the code from Aztec C to MC so there ought to be a new release one of these days, right? If so, can you add descriptive fields to the sort, print, and screen definitions? I can never remember what I defined sort 4 as and a short description like Last Name, Selected by Code would be a useful feature to me.

Fm MISOSYS, Inc: David, I already have a beta release of LB compiled with MC. It has no enhancements yet, but the first phase of porting the code is mostly successful. Note that it was announced in a back issue of TMQ (that was Volume III, issue ii). And I do believe that descriptive fields are part of what will be added when we implement version 2.0.

Incidentally, I have released a second beta version, 1.2.0, which cleared up a few bugs in the first beta release. This version has also shifted the Model 4 LB beta version to the use of overlay modules in lieu of /CMD modules. This considerably reduced the total disk space taken up by the executables so that they can be stored on one diskette; the load time is also hastened. In fact, after some intensive testing here, I may very well cut in this release as our existing version 1.x product.

LB Beta Report

Fm Daniel L. Srebnick: There appears to be a conflict with the spooler and the Little Brother print records module. I had RSHARD, FORMS, and SPOOL in high memory (spool using bank=2 for minimum bank 0 usage). When spool was installed, I got a printer not ready message and could not print. When I removed SPOOL, the print records module worked just fine. I was attempting to print using an index.

Fm MISOSYS, Inc: Daniel, that involves the same bug I came across when having *PR routed to a disk file. I got a "Printer not available" error. The method of testing the printer for availability is apparently not correct in release 1.1.0.

I have researched your problem and my problem. They both indeed share the same root cause. It's now fixed up in Beta release 1.2.0, along with a few other small matters.

Print screens divide into Header, Record, and Footer areas!

Fm Rich R. King, Raleigh, NC: It's a good thing I now have two Model 4's, else this report would be darned hard to do. Anyway, here are some of the things I found to be hard to work with in LB Alpha test 2.0. But first, a rundown on the environment.

128K, no speedup kits, version C motherboard, (1) DSDD diskette drives, I used LB version 1 to install the system disk in memory (SYS 1-4, 6-8, 10-12), PROWAM is not installed, no other configuration parameters, TYPE, SMOOTH, FAST, LS-DOS 6.3J, C. Itoh Riteman 15 printer w/hex dump feature.

1) Option 14 has four 2-character fields for paths. While the fields will accept A through Z, only a colon followed by a number appears to be legal. If this is the case, why not just imply the colon and let me just enter a drive number (which is not currently accepted as the first character). The message "<F3> saves, <BRK> quits" belongs on the bottom line, and I should be able to specify FILENAME:d (drive) at the beginning of option 14. To get down to brass tacks, is there any need for this option at all? (Yes, I've read the debates in TMQ on this point.) Is there ever a need to put the 4 file types on different diskettes, or was this done for hard disk users?

2) After defining the paths to my (4) file types, I SELECT DATA BASE NAME, the DEFINE PRINT FORMATS to review one of them. Using <BRK> to exit, I then select option 14 again. I can no longer (re)define the Data Path. The inverse video marker starts at the screen Path, and rolls through Index & Temp Paths, then back to Screen Path, at each depression of <ENTER>. It is a repeatable problem.

3) I had the door open on the drive which contained my data diskette. I selected option 9 from the main menu. LB tried to access the data diskette. Not finding it, LB dropped back to LS-DOS Ready. No warning message nor retry attempt. It should have done one or both.

4) I sent you a note the latter part of January regarding some of the wishes I had for the product. By far, the biggest need for improvements that I perceive is in the DEFINE PRINT FORMATS option. They were extremely bad in version 1, and this test copy contains only a small amount of improvement. At the risk of writing a book on this subject, but trying not to, here's what I encounter.

A) What I see on the <S>creen is not what

I get on the final printout. enclosed is one example. I tried defining the Printed Lines

```
Printer Parms, Field Formats and Sample Screen Format for File - RTUG
Print Format File # 5

Physical Lines Per Page .. 12
Printed Lines Per Page .... 9
Physical Line Length ..... 88
Columns Per Record ..... 88
Left Margin Setting ..... 0
Indent on Wrap-around .... 5
Records Printed Across ... 1
Repeat Record Count ..... 1

#  Name          FLEN PLEN S     Format          Calc
-----------------------------------------------------------
1  LAST NAME     18   18   Y
2  FIRST NAME    16   16   Y
3  ADDRESS       22   22   Y
4  CITY          14   14   Y
5  STATE         2    2    Y
6  ZIP           5    5    Y
7  PHONE         12   12   N
8  MACHINES      11   11   Y
9  PAID THRU     5    5    N

RTUG - Richard R. King
808 Orleans Place
Raleigh, NC  27609

%%%%%%%%%%%%%%%%% %%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%
RTUG - Richard R. King
808 Orleans Place
Raleigh, NC  27609
\27\\79\^2^ ^1^
^3^
^4^, ^5^
^6^

Header:1 Nos:  Text:1-9 Print Footer: None  1 Rec: N  Row: 1  Column: 1

<V>iew, <E>dit, <F3> Save, <BRK> Quit - Enter Command:
```

Per Page as 9, 11 & 12 (same as Physical lines). Requested an output the definitions. LB printed only the 1st 6 lines of the SCREEN format (dropped the last 3). I used <CTRL><:> to print the SCREEN screen for you. Next I set Printed Lines to 11 and saved the environment. Went to PRINT option and printed a few records using index file 1. Sure doesn't look anything like the screen I defined. Gaps between file items that exceed a printed page. I then shut off the printer and changed to wide paper, then restarted the printer in HEX DUMP mode. I backed out of PRINT RECORDS, then re-entered it to display what was sent to the printer to cause the wide gaps. Here I now see that 11 carriage returns are issued, followed by a form feed.

(I guess what I really don't understand is whether or not LB is keeping track of the number of \13\ characters I am embedding in my documents when I do so, adding to the confusion.) Then too, it appeared (when I had the FORMS/FLT installed) that LB was not passing some parameters to the filter. The net result was a bunch of independent counters running concurrently (LB, FORMS (when it was installed with version 1.0) & my printer) which serves to make use of the printer setup portion of LB VERY frustrating.

B) So I go back to the Version 1 LB manual and re-read the Printer Setup section and then re-define my screen format #5. Now I add some lead printer commands to set the printer line count at 12, then change the Print Parms so that the Physical Page Length is 12, and the Printed Lines count is 9. The printed line count is now apparently correct, but the ^3^, ^4^, ^5^, and ^6^ fields are still missing. Just to prove that the fields are not blank, I've printed the first 2 records from the UPDATE screen.

Now I'm sure that much of the code is working correctly, but I've spent enough time in this area already, and I'm sure that you are not waiting specifically for my feedback, so if I sit on this thing too long, you will ignore my comments when you receive them. I therefore return to you the diskette I made from your master beta copy (which is the source of my test runs), along with the files I've been using to generate this report. Both are formatted DSDD. I will continue testing other areas of the code as time permits, and providing feedback as I go. If you have some updates you'd like me to test, I'll do my best to do so.

Fm MISOSYS, Inc: Dear Rich, concerning the LB Beta release, the problem you were having in your print screen definition was that you only showed text as lines 1-6 of the screen. You had HEADER: None, Text: 1-6, and FOOTER: None. Since the ^3^ was on the 7th line, the ^4^ and ^5^ were on the 8th screen line, and the ^6^ was on the 9th screen line, LB just ignored it. What you put on the screen doesn't magically appear on your printout if it occurs on a line not covered by the screen direction. For all LB knows, anything else could be a note to you. If you had shown the text as lines 1-9, your printout would have been as expected. See page 42 of the manual, "Defining header, text, and footer areas".

LB does not count any imbedded control code which may be a carriage movement command. In the simplest sense, if you have one screen line with an imbedded newline and subsequent text, it only counts as one line. You have to take imbedded codes into account when you make up the print data.

I am enclosing as an example, the screen I use to generate TMQ renewals [see the example which follows]. This uses a standard NEBS form; you may have already received one of these. Note that the number of physical lines per page is stated as 17, which is the number of screen lines. Note also that the header takes one line but has six additional newlines. The screen lines 2-17 take up the text portion of the record; there are 19 additional new lines. That means the form is actually 42 lines long.

If you have the FORMS filter installed, you must avoid setting parameters in it which would cause forming. Best to just leave FORMS set at 66/66. That way, it won't conflict with LB's counters. LB does not communicate with FORMS.

```
\10\\10\\10\\10\\10\                                                    ^d^\10\
                                                        10^\10\\10\\10\
    ^1^\10\     ^3^ ^2^\10\     ^4^ ^5^\10\             6^ ^7^ ^8^\10\     ^9^ \10\\10\\10\\10\\10\\10\\10\
  ^14^     THE MISOSYS QUARTERLY Subscription          wal  ^10^Rate
           *** Please return by April 30, 198
            A - United States via Third Class
                ........................... $          0
            B - Canada, Mexico, or United Stat
                via First class mail ....... $          0
            C - Columbia, Venezuela, Central
                America, etc. AO-Air ....... $          0
            D - South America, Europe, North
                Africa via AO-Air .......... $          0
            E - Asia, Australia, New Zealand,
                Middle East via AO-Air ..... $          0
\10\\10\\10\  Please pay via US check, Postal          y order,\10\  MasterCard, VISA, or Choice\10\\10\


                          Print Screen - File
Header :  1-1     Text :  2-16   Footer : None     Rec: Y  Row :1    Column:1

<V>iew, <E>dit, <F3> Save, <ESC> Quit - Enter      and:  .
```

```
Printer Parms, Field Formats and Sample Screen Format for File - CUSTOMER
Print Format File # 5

Physical Lines Per Page .. 16
Printed Lines Per Page ... 16
Physical Line Length ..... 250
Columns Per Record ....... 249
Left Margin Setting ...... 0
Indent on Wrap-around .... 0
Records Printed Across ... 1
Repeat Record Count ...... 1

#  Name           FLEN PLEN S      Format            Calc
-------------------------------------
1  Company Name    30   30  N
2  Last name       20   20  N
3  First name      15   15  Y
4  Address 1       30   30  Y
5  Address 2       10   10  N
6  City            20   20  Y
7  State           3    3   N
8  Zip             10   10  N
9  Country         10   10  N
10 Mail Code       1    1   N
11 Last pur (yr/m  5    5   N
12 Origin date (y  5    5   N
13 Special         9    9   N
14 Quarterly Exp   5    5   N
15 Flag 1          1    1   N
16 Flag 2          1    1   N
```

```
                                        %%%%%%%%

                                         %%%%%-%


    %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
    %%%%%%%%%%%%%%%% %%%%%%%%%%%%%%%%%%%
    %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%% %%%%%%%%%%
    %%%%%%%%%%%%%%%%%%%% %%% %%%%%%%%%%
    %%%%%%%%%%
```

```
%%%%%     THE MISOSYS QUARTERLY Subscription renewal  %   Rate
          *** Please return by April 30, 1988 ***
           A - United States via Third Class mail
               ........................... $25.00
           B - Canada, Mexico, or United States
               via First class mail ....... $30.00
           C - Columbia, Venezuela, Central
               America, etc. AO-Air ....... $32.00
           D - South America, Europe, North
               Africa via AO-Air .......... $35.00
           E - Asia, Australia, New Zealand,
               Middle East via AO-Air ..... $40.00


Please pay via US check, Postal money order,
MasterCard, VISA, or Choice
```

Now why did LB send a FORM FEED? Check out the third paragraph on page 24. "*If the physical page length is GREATER THAN the number of printed lines per page, LB will perform all paging by sending a TOF character to the printer*". In looking over your hex printout, note that LB sends out new lines 0AH; the FORMS filter converts the 0AH to 0DH. If you really had a 12-line form, then you better set both physical lines and printed lines to 12. That way, your printer won't form up a "page". On the other hand, if you had set paging on your printer to form at 12-line intervals, then you would be correct in your printer parameter setup - but I don't think you programmed your printer.

In terms of the beta release option 14, I believe that it is accepting A-Z in addition to numbers, because it was originally in effect for the MS-DOS version which uses letters for drive specifiers. True, we will probably restrict that for the TRS-80 version. It does seem rather picky to insist on the colon prefix, but that is a drive specifier, isn't it? Also, floppy users with more than two drives may want the data file on a disk drive different from the definition and screen files.

As far as the LB Beta release and command 14, the answer to why you weren't able to adjust the "path" for the data file is right there in the manual. Quoting page 111, "*If you do have a data set active, you will not be allowed to change the data file path, since LB has already opened that file and knows the path and drive it is on.*" Incidentally, the correct procedure for using command 14 is identical to that discussed in the manual. Just disregard path and consider all entries to designate the drive specification.

Incidentally, you must have read the notice in *The Blurb* concerning the LB beta version which I made available, therefore you should have known that that release had no improvements; the purpose of the release was to test the re-grooming of the source code for compilation using our MC compiler rather than Manx's Aztec compiler. That means you should not have been surprised to find the test copy void of improvement in the "print definition" department. Thanks for the input. All is welcome. All requests for changes went into the LB file folder. At this point in time, I am accepting no further input because the redesign phase to reach version 2.0 has begun. My target for release is late 1989.

More questions on LB's "PATH" option

Fm Ken Strickler, Stanwood, WA: Roy, I have been 'playing with' the BETA LB Version a little bit, and here is how it has been going.

There was no HELP on the distribution disk, so I transferred the HELP file from my original disk. Seems to work OK. I'm sure that the HELP file will be on the final disk.

Next, I loaded the COMPLETE LB system into my XLR8er board. LB and LBMAINT take about 300K of the 320K available. With the LB program in 'RAMDISK', I was impressed with the speed that the various modules were loaded!Like having a 'BIG' machine!

Option 14 (PATH) is a little confusing as it pertains to the Model 4, as I wasn't sure what the path to the SCREEN was. I found that I could DEFAULT after defining the PATH for the FILE and get into the file. I'm sure that an UPDATE would clear up the wording in the manual.

As for enhancements, one which might be helpful is to be able to RENUMBER a KEY field. The problem arises in the following manner. I have a FILE which is sorted on a 2 KEY format. KEY1 is an alpha group identifier, KEY2 is the numerical identifier in the group. When originally assigned, KEY2 had been assigned odd numbers (1,3,5,7, etc.) so that any additions could be added as even numbers. That worked OK until I had to add several in one place. I used smaller and smaller incremental numbers in KEY2 to accomplish this. Now, I would like to RENUMBER the KEY2 field into integers again. I can go through the whole file and manually renumber the KEY2 field, but maybe it could be automatic. It needs to be RENUMBERED restarting in each KEY1 group.

I have also been working on my 'COMPATIBILITY' chart, and 'BLEW' my system up again! I couldn't access my DISKdisk, although $DD and $DL were present in the MEMDIR print out. (enclosed) I will keep you informed as to progress.

I suppose that it is too late for another 'IDEA' on the 'HARD DISK', but how about a slot for a 1.44Meg Floppy to backup the hard disk, or a pair of 1.44's for those who want to use the high capacity floppies. I think that the new controller would handle them, wouldn't it? Just an idea.

Saw something about 'SNOW' on the coast there, (North Carolina), and hope you weren't caught up in it! Kids would probably LOVE it! Not ME!

Fm MISOSYS, Inc: Ken, the LB manual seems clear to me concerning Option 14, View/Modify Path settings. "Screen" refers to the screen and print format files. You are aware that when you define an edit/update screen, a file is generated as "filename/VDn". This is noted on page 114. Likewise, each print definition screen generates a file which contains the printer report definitions. The View/Modify allows you to designate which drive will contain these files (they have to be in the same "path". Certainly, when it refers to the TRS-80, `path` refers strictly to a disk drive specification - at this time.

Also note the sentence on page 111 which says, *"If you do have a data set active, you will not be allowed to change the data file path, since LB has already opened that file and knows the path and drive it is on."* That's why you can't change the "drive" for a data file which is currently active.

As far as your enhancement, I gather that you use a field to force a particular order by its entry. Your use of KEY2 as a subfield order force may be unique. I really don't think that I would want to add the code overhead necessary to "renumber" that kind of field. Perhaps you should explore an external program to adjust your field content like Daniel Srebnick did with his archive utility in TMQ III.i.

A 1.44 Meg floppy uses a floppy controller running a 2 MHz clock, not a hard drive controller. It would be easier to modify the FDC in the Model 4 to software switch its clock to 2 Megs from 1 Meg so the 500 KHz data transfer could be done. But I am not intending to add a floppy controller to the hard drive. If I were even foolish enough to consider such a thing, I would have to design a controller using a 765 chip so that it would be able to support one of the low-cast 40Meg tape drives which work off the floppy controller in a PC. I say foolish enough because the potential sales couldn't pay for the development costs.

Anyone with a good electronics background who is interested in pursuing this direction, though, should investigate the DP8473 chip from National Semiconductor. This is a one-chip floppy disk controller compatible with the NEC µPD765A controller chip. According to National's ads, "All you need to add is an address decoder, a crystal, and a few passive components." It uses an analog data separator and handles transfer rates from 250K to 1M bbs. It also handles disk drives with as many as 4000 tracks; sounds great for the new floptical drives!

Yes, the snow really hit the coast - Virginia Beach and Norfolk areas too - but we got but a few flakes here West of DC. The kids would have loved it. I wouldn't have minded much since I have a 4-wheel drive Jeep and the office is at home.

Fm Ken Strickler: You knew that you

would hear - but here it is again - LIKE THE NEW MAG! The ability of the WYSIWYG word processors sure make it look pretty. Does take a little extra time to set it up. Like the shading with either dots or lines.

Your letter of March 3rd cleared up my problem with LB. Somehow I got 'IN MY MIND' the idea that the 'SCREEN' and 'PRINT' definitions in LB referred to the device names for 'MY' screen (*DO) and 'MY' printer (*PR), not the files. Well, after I came to that conclusion (the 'WRONG ONE') nothing seemed to work! I had read the Manual on P111, but I guess I must have had one eye closed! As for the ability to 'RENUMBER' a field, LB 'NOT' being able to do it is no 'BIG' deal! 'Twas just an idea.

C Compiler

MC and sattrib()/gattrib()

Fm David Huelsmann: Roy, The gattrib() function in the 1.6 upgrade would be more useful if it didn't fail on write protected disks, password protected files, etc. I suspect you used part of the same code you used for sattrib() for the gattrib() function which may be the reason for the failure. gattrib() in conjunction with the readdir() functions would be nice in wildcard enhancements where you want to eliminate password protected, /SYS files, and invisible files from selection.

Fm MISOSYS, Inc: David, You are right about gattrib() and sattrib(). They are in fact in the same module.

MC and nested conditionals

Fm John Foote, Wilmette, IL: The MC manual on page 2-28 states that the conditional `a?b:c?d?e:f:g` is acceptable. However I find that "`return pushed?pushed—?savechar:getchar();`" gives me consistent errors. Would someone comment on this also please.

Fm MISOSYS, Inc: Although "`a?b:c?d?e:f:g`" is an acceptable expression in c, your "`return pushed?pushed—?savechar:getchar();`" is not. That expression has not completed the outer conditional. Let's group it using "p" for pushed, "s" for savechar, and "g" for getchar(): "`p?(p—?s:g());`" but you would need "`p?(p—?s:g):expression`"! You're code is missing the second expression of the outer "pushed".

MC bug in L2DST

Daniel Sun
8 Dunbar Dr. R.D.#4
Trenton, NJ 08691

I would like to point out a bug in PRO-MC version 1.6a. It shows up in the following program and crashes the computer on the calculation of step. I traced the problem to the L2DST routine in LIBA and I have included a correction for the bug.

I would also like to point out that there is a limitation to dfix(). The fix mentioned in TMQ V2.iv just changed the value where dfix() stops working from 32767 to 2147483647. This number happens to be the maximum value of a (long int) type and does not take advantage of the full precision of double floats.

```
#include <stdio.h>
#include <math.h>
main()
{
long int min, max;
double step;

min = 101;
max = 1001;

printf ("Min: %ld Max:
%ld\n", min, max);
step = (max - min) / 100.0;

printf ("Step: %f Min: %ld
MaX: %ld\n", step, min,
max);
}
```

```
; L2DSTFX/ASM 09/06/88
ENTRY @L2DST
EXTRN $L2D,$SRETS
      CSEG
;*=*=*
;     Routine L2DST
;*=*=*
@L2DST      LD    HL,-8+6
      ADD   HL,SP
      POP   AF
      POP   DE
      POP   BC
      LD    HL,-8
      ADD   HL,SP
      LD    SP,HL
      PUSH  AF
      PUSH  HL
      CALL  $L2D
      POP   HL
      JP    $SRETS
      END
```

Bug in chkpath()

Ken Peck
400 W Johnson #202
McGregor TX 76657

Dear Roy: I have some good news and some bad news. The bad news is there is a bug in the MC library. The good news is I think I have found it.

For a couple of reasons I wanted a TOUCH utility for my Model 4 under LS-DOS 6.3. For one thing I got tired of the squirrelly dates on the files I moved from MS-DOS to LS-DOS 6.3 with TRSCROSS.

Very simple. MC provides udate() that sets a file's mod date/time to the system date/time or a date/time specified by the caller. All I need to do is flush it out with some code that picks up a filename and optional date and time from the command line, fix it up for utime(), and call it.

Since this might be of use to others, I needed to fix it up with error checking and messages so that it is well behaved. The result is TOUCH/CCC.

Only it turned out to be a flakey program. Sometimes it worked, most of the time it didn't. And when it didn't I always got something bizarre from sys_errlist(). It was almost like I had failed to initialize something.

So I tried memory (clear). Voila, it worked! I ran some other programs and tried again — Raid time again. Obviously I have failed to initialize something. So I stripped the program until I ended up with

```
#option ARGS 0
#option FIXBUFS 65535
#option REDIRECT 0

main()
{
      if (utime("testfile/
dat",((char *)0)))
            puts("SNAFU");
}
```

Nothing to initialize. Nothing to go wrong. But the bug was alive and well. So I got to use all of those neat MISOSYS tools. SPLITLIB breaks up LIBC/REL into bite sized chunks. MLIB extracts UTIME/REL from LIBC/REL. (Incidentally, anyone who has used the MS-DOS librarian must appreciate the work Rich did on that one. It is a joy to work with.) UNREL disassembles UTIME/REL. I get an assembly listing of T/CCC from MC and a map from MRAS. I load up DD and run DEBUG. Boy, it's been a couple of years and am I rusty!

Well I step through utime() until it returns from _CHKPAT, where upon it does an error exit. Well, back to my broken down library for _CHKPAT and a listing from UNREL and then to DEBUG some more. What _CHKPAT does is call _CHKPER, which fortunately is in the same module. _CHKPER calls @FSPEC for a valid filespec, then (if valid) @OPENs it. If that succeeds, it picks up the 2nd byte from the DCB, masks off all but the 3 low order bits. The resulting BYTE is stored in the "low order byte" of _ACCLVL, which appears to have been declared in the module as a global integer. Anyway, it occupies a word. Note that the "high order byte" of _ACCLVL contains whatever happened to be there to begin with . . . zero if I cleared memory, otherwise garbage pure and simple. The file is then closed and _CHKPER returns.

Back to _CHKPAT. The first thing it does on returning is to load _ACCLVL as a WORD into HL and then to test for zero.

```
      LD    HL,(_ACCLVL)
      LD    A,H    ; This is
the garbage byte
      OR    L      ; Zero
for valid _CHKPER
      JR    Z,CSEG$002C ;
Go if zero
      LD    HL,0000H    ;
Return zero on error
      RET
CSEG$002C:
      LD    HL,DSEG$0004
; Continue processing
```

So anytime the garbage byte is not zero, _CHKPAT is told by _CHKPER there is an error and _CHKPAT tells UTIME that it is no go. Incidentally, this bug will also affect chmod(), gattrib(), and sattrib(). Access() may also be affected, since it knows about _ACCLVL and calls _CHKPER.

My first thought was to recode _CHKPAT by changing my assembly listing to

```
      LD    HL,(_ACCLVL)
      LD    A,L    ; Zero
for valid _CHKPER
      OR    A
      JR    Z,CSEG$002C ;
Go if zero
      LD    HL,0000H    ;
Return zero on error
      RET
CSEG$002C:
      LD    HL,DSEG$0004
; Continue processing
```

This bandages the bug with out fixing it. Now utime(), chmod(), gattrib(), and sattrib() should work as advertised. And this approach does have the advantage that it might be "patchable." But what about access()? Well, it turns out that access() uses _ACCLVL as an offset in an eight byte table. Since the high order byte of _ACCLVL contains garbage, access() may get its "data" from almost anywhere in memory. This is not going to be so easy to fix; and the fix is not going to be "patchable."

So instead, I decided to correct the problem by going back to the CKPTH6 module and force _ACCLVL to be initialized to zero. I changed

```
_ACCLVL:
      DS    2
```

to

```
_ACCLVL:
      DW    0      ; int
_acclvl = 0;
```

This adds nine bytes near the beginning of LIBC/REL and can't be a patch. (That is nine bytes to the library; it only adds two bytes to finished programs.) So for those with the tools here are the steps.

1. Use SPLITLIB to break LIBC/REL into smaller chunks, e.g. splitlib libc 11000 :0

2. Rename LIBC/R01 libc/rel.

3. Load this chunk of the library into MLIB and extract the CKPTH6 module.

4. Use UNREL to get an assembly listing of CKPTH6/REL.

5. Edit CKPTH6/ASM at line 88 by changing "DS 2" to "DW 0" This is the first thing in the DSEG. Be sure you are changing _ACCLVL: and not one of the DSEG$000n definitions; they do not need

to be initialized.

6. Assemble the edited CKPTH6/ASM to CKPTH6/REL with MRAS.

7. Go back to MLIB, reload the LIBC/REL we made earlier and replace CKPTH6 with our new CKPTH6 and save the updated library as LIBC/REL.

8. Put the library back together with

```
append   libc/r02   libc/rel
(strip)
append   libc/r03   libc/rel
(strip)
append   libc/r04   libc/rel
(strip)
```

9. Recompile any programs you have written that call access(), chmod(), gattrib(), sattrib(), or utime().

The only fixes I can suggest to those without the UNREL and MRAS programs are to buy them from MISOSYS or to remember to explicitly initialize _acclvl to zero in main() or your initialization routine before calling the affected functions. Something like

```
main()
{
        extern int _acclvl;
        . . .
        _acclvl = 0;
        . . .
```

will do it.

void pointer casts?

Fm Ken Peck: Roy, I may be missing something, but I think I have found a bug in MC. The CLAP/CCC file is a library function I have been working on for some time now. It works fine with MSC, Power C, Turbo C, the C compiler that come with Minix and even passes PC-LINT muster. However, MC, has a problem with one construct.

CLAP/CCC is a command line argument parser. It takes each argument from the command line and if the argument does not begin with a '-', places it in a linked list. The assumption is that this is one of perhaps several filenames to be processed by the program.

Arguments that begin with '-' are assumed to be a "switch". A string of characters indicate valid switches for the program. A corresponding array of structures contain a pointer to a data item and a pointer to a function for processing the switch. A switch can simply turn a flag on, set a variable to some value, point a pointer to a string, or perform some other function defined by the program.

The current switch processing functions must be passed a pointer to either an integer or a pointer to a string. There is no particular reason why functions could not be written to set longs, floats, and/or doubles. Consequently, a structure is defined . . .

```
struct CLAPSWITCHtg
{
        ????? *data;
        char  *(*func)();
};
```

The question is, what type should be given to "data?" In good old fashioned K&R it would be declared a pointer to char or even, God forbid, simply an integer. Enter ANSI, which says that it should be declared a void pointer and assignments cast.

Now the whole point of a generalized (set of) function(s) such as this, is to make it as portable as possible across various compilers, operating systems, and machines. Since K&R compilers, including the Minix C compiler and MC, do not support void pointers, I hit upon a "portable" solution. First I define:

```
        #ifdef ANSI
        #define VOID void;
        #else
        #define VOID char;
        #endif
```

and my structure becomes

```
struct CLAPSWITCHtg
{
        VOID  *data;
        char  *(*func)();
};
```

Now the data item will be a void pointer whenever ANSI is defined and a character pointer otherwise.

Now I need to create my array of these structures. The syntax generally is:

```
static struct CLAPSWITCHtg
switches[] =
{
        { (VOID*)&data_name,
function_name },
        . . .
};
```

To get an address for data, we must use the "address of" operator; to shut up strict type checking by ANSI compilers and LINT we must cast that address to be a void pointer.

The K&R compilers I have tried this on are all happy with that construct, but MC goes through the ceiling. The primary complaint is an "illegal constant expression." By the time the compiler gets through cascading errors to the end of the program it is in a endless loop of errors. TEST/CCC is a subset of the code demonstrating the problem.

I have also included "LOGIC", a clarification (I think) of the discussion of bitwise and logical operators with appeared in the last TMQ. If you want to use some or all of it, feel free to do so.

Fm MISOSYS, Inc: Kenneth, concerning past MC issues and other matters, I did receive your previous input, but as you surmised, I was sort of buried in work; the flu added miser and lost productive time to an otherwise hectic schedule.

You correctly located and cured the problem with _ACCLVL in the ckpth module of the library. Since I had a few other little tweaks to do on the libraries, I wound up making changes to a half-dozen or more modules.

Concerning the MC bug report illustrated by the CLAP/CCC program, I passed that on to Rich for his input. There is a limitation in MC on the kind of construction which you put together. Rich suggested a work-around of the following in addition to your "portable" solution:

```
#ifdef ANSI
#define CVOIDSTAR (void *)
#else
#define CVOIDSTAR
#endif
```

This work-around would be used to create your array of structures. Instead of,

```
{ (VOID*) &data_name,
function_name }, ...
```

you would use,

```
{ CVOIDSTAR &data_name,
function_name }, ...
```

I checked this out with TEST/CCC, and it, of course, works except for the two lines in the table setting array space for the two string data items, i_str and o_str (I deleted the "&" operator). I'm sure you would have preferred a modification to the compiler, but at this point, it would have been impossible to pull off.

Thanks for the input on logic. I'm sure it will clear up the issue for most. Incidentally, you should have received a new GO:SYS diskette some time ago with the revised PaDS and patched copies of a few other GO:SYS modules. Let me know if you don't have the revised copy.

MC Library revision

Fm MISOSYS, Inc: The previous reports referenced the discovery of a few minor bugs in the libraries of our C compiler, MC. There have been a few more minor changes developed for selected library modules. These changes have now been integrated into the distribution disks. Here's a summary of the changes which were introduced into the MC libraries:

The scan() and fscan() modules were updated to support field suppression on %c, %s, and %[translations. This affects LIBC and MATH.

In the CKPTH5 and CKPTH6 modules of LIBC, the _chkpath() function was revised to properly reflect a zero initialization of the integer variable, _acclvl.

The stat() function in the STAT5 module (Model III only) was changed to correct code differentiating between a device and a file.

The _dirwr() function in the DIRRW5 and DIRRW6 modules was changed with the addition of a missing RET statement added to the end of the function.

Remember that old bug I came across in UL2DST which did a POP AF of the RET address, but then did a $HS which affected the flag register? I corrected that by relocating the $HS to precede the POP AF. Seems like the L2DST module had the same bug (see Daniel Sun's report). While I was about it, I checked all of the conversion modules in LIBA to ensure that they didn't also have that problem. l2dst() was changed.

The fdfix() function in LIBA was changed per the update identified back in TMQ II.iii, but never updated on the master library disk. That switched the conversion from using ints to using longs. I have a complaint that it still doesn't meet the precision of a double, but I don't see any reason to include a separate conversion routine to handle the 7-byte double characteristic. See Daniel Sun's report previously noted.

Thus, with these changes, the affected libraries were LIBA, LIBC5, LIBC6, and MATH. As has been my policy with MC for many years, bug corrections to the libraries have been available at no charge.

If you are currently using the 1.6 release, you can obtain the revised library disk by returning your MC library diskette (don't return the program diskette). Please return it in a protective diskette mailer and insert a return address label. Do not use a cardboard box, or any other kind of packaging which by itself weighs two ounces or more. Any library diskette received without a return address label will not be returned. Any disk received in packaging which has an excessive weight will not be returned unless you include postage for its mailing!

If you are using a release earlier than 1.6, please note that the upgrade offer announced in TMQ II.ii is still open: Return both your disks with $20 + $2 S&H ($3 Canada, $6 Foreign).

PRO-CREATE

PRO-CREATE and "Load file format error"

Fm Bob Haynes: Here I am, trying to write a driver for Tom Crompton, and I get stopped by the dumbest problem; I must be overlooking something!

Today, using Pro-Create (MAS/CMD v 4.3a) under LS-DOS 6.3, I have been happily assembling /CMD files with the source file I'm working with. Now all of a sudden, after a source edit, MAS is blowing back to DOS, rejecting my source with the following:

```
 MAS 4.3a - Copyright (c)
1982/83/84 by MISOSYS, Inc.
All rights reserved.

 ** Error code = 34, Re-
turns to X'2F2C'
 ** Load file format error
 Open FCB, Drive=0, DEC=71
 Last SVC = 102, Returned
to X'1A19'
```

```
LS-DOS Ready
```

MAS seems to load fine, since I get the startup message. I checked for file open error using the 'MEMORY (A="N",B=1)' command. No open. Moved the source file to another drive; a retry shifted the drive # in the error message to the new drive. I've gone over every byte of that source file, looking for errors... Sure, coding errors, but nothing to cause MAS to refuse to read it that I can think of.

Since when does MAS spit out load file format errors on a source file? Thought only DOS used that when rejecting unloadable /CMD files!

MAS runs fine on all sorts of other source files, rejecting only this one. Guys I really need to get this program up and running; any suggestions at all would be much appreciated.

Fm MISOSYS, Inc: Bob, If your source file has a line which exceeds 128 characters in length, then the "*Load file format error*" will be generated.

MRAS

MRAS or PRO-CREATE?

Fm John Grant, Jr.: How much is MRAS now? In past issues, there were two different prices quoted. Hardin Brothers has said, of course, that it's the finest assembler available for the Model 4, but I'm afraid it will be a little hard to use for a beginning student of Z-80 assembly language like me. Shall I start with EDAS? Is it still available? If so, at what price?

Learning this stuff is tough - I have two books, but there has to be better books than these! Can you recommend any? Hopefully, they will still be available...

Fm MISOSYS, Inc: I am enclosing our latest brochure which identifies current pricing. I have no recommendations as to books on learning Z80 assembly language as I have no idea what is still available. I would recommend starting with EDAS; however, if you want to advance to using a relocatable assembler, then go directly to MRAS. Our language products should be available for quite some time.

MRAS doesn't yet support F80!

Fm F.T.C. Harris, Highgate, London: Dear Sirs, I recently purchased your MRAS package and have handed it over to Will Hutchinson, of 8 Down Road, Weymouth Devon who has met some problems with it and writes as follows:

"After some time spent testing its (i.e. MRAS) capabilities, a few problems have become apparent and I should like to bring them to your attention.

Taking the various programs in order, MRAS itself for the most part is fine. However, there is one limitation that has proved somewhat irritating. One program of mine contains a macro to XOR each byte of a string with a constant. Under M80, the macro is as follows:

```
XORIT MACRO STRING
      IRPC  CHAR,<STRING>
      DEFB  '&CHAR' XOR
CODE
      ENDM
      DEFB  LF XOR CODE
      ENDM
```

This works perfectly whether or not STRING contains spaces. However, under MRAS, a few changes are needed and the macro becomes as follows:

```
XORIT MACRO STRING
      IRPC  CHAR,#STRING
      DEFB
'&CHAR'.XOR.CODE
      ENDM
      DEFB  LF.XOR.CODE
      ENDM
```

Note that STRING in IRPC may not be surrounded by angle brackets. If STRING contains a space, IRPC considers that it has reached the end of the string, even if there are more characters after the space. Surely IRPC should either allow angle brackets to delimit a string without being included as part of it, or it should only terminate the string when the end of the line is reached. However, the latter alternative would run into trouble if a comment existed after the string on the end of the line.

Turning now to MLINK, I have found a couple of problems. First and most important are the switches for specifying the origin addresses of the Common, Data, Link and Program segments. The address of these is specified as a four digit hexadecimal number. If any of these digits is an upper case A, B, C, D, E, or F, it terminates the number. Thus -D=A000 actually causes he Data segment to start at 0000 hex and -P=520F actually causes the Program segment to start at 0520 hex. If the alphabetic characters are lower case, the address is correctly interpreted. This must be a bug!!

The other problem is simply one of misunderstanding. I had hoped that MLINK would allow us to link FORTRAN programs despite its lack of support of special link item 12. In fact, even the simplest FORTRAN program seems to be incompatible with MLINK. Odd addresses are associated with FORTRAN entries and, although the linking process seems to work otherwise, my machine always crashes when I exit MLINK while attempting to write a command file. For command files which are made up solely of assembler modules MLINK works perfectly. Are these problems solely because of the lack of support for Special Link Item 12, or have I got some additional problems? On another machine, I have managed to get MLINK to exit, apparently correctly, from a link involving a FORTRAN module, but the file that

resulted was hopelessly corrupted.

If this is because of lack of support for Special Link Item 12, then do you plan to add this to MLINK at any time in the future? The overlay and virtual memory facilities could be of considerable use and in any case the speed of MLINK alone gives it a decided advantage over L80!

Last is MLIB where again the problem is minor. In interactive mode, option M produces the expected prompt:

Set printer to top of form...

The manual states that any key press will start printing, but in fact only a few line feeds are printed and then the program returns to command level. If the printer is ROUTEd or the program is in JCL mode, the prompt is not displayed and no problem occurs.

Finally two general problems with LDOS. Firstly, if a file of 5 or more extents is RENAMEd only the HIT entry for the FPDE is updated. The FXDE entry(ies) is(are) left unchanged. While this causes no effect to system operation, it does cause a directory error which is sensed by DIRCHECK (Logical Systems, Inc.) or PCHECK (Breeze/QSD Inc.). This CAN be fixed by DIRCHECK or PFIX, but it is not too difficult to be updated; I have a subroutine written to allow the renaming of files from FORTRAN which updates the HIT entries for both the FPDE AND any FXDE(s).

The other problem is more serious. If a program file is loaded with an area of high memory reserved: no error is produced if the program file overwrites this supposedly sacrosanct area. Thus essential drivers and filters may be corrupted without warning, causing a system crash. I feel that the loading process should abort if an attempt to load memory higher than the current value of HIGH$ is made.

I shall be interested to hear any responses you may have to this letter - perhaps you may even have some solutions for me? In any case, I would like to put mu general appreciation for your products on record, LDOS in general has no peer!!"

Fm MISOSYS, Inc: Dear F.T.C., Sorry to be so late with a reply, but I get more correspondence than I can deal with. Some letters really do not get answered. But let me try to give you some response which you will accept.

The MLINK linker provided with MRAS will not handle Microsoft FORTRAN F80-compiled files. That's a plain and simple response. One reason is that MLINK does not support the chain address special link item which is used in F80 when a forward reference is being compiled (reference to a symbol not yet declared). Chain address is used on one-pass compilers, such as F80. Another reason is that F80 has no knowledge of the code and data segment lengths until it finishes compiling. MLINK uses a virtual storage record-oriented facility which has to pre-allocate blocks of memory for storage of segment data and other linkage data (such as REQ statements, chain external, and other). F80's REL stream begins to output code, data, and linkage information prior to the segment size specifications. Such data must be stored in memory; MLINK expects the segment size data first so it can assign a block of memory.

I have started to revise MRAS and MLINK: MRAS to support the 64180 extended instructions, and MLINK to support F80 relocatable bit streams, and a larger virtual file. The lack of adequate time for program development is something which keeps me from announcing anything in that regard.

Whether MRAS should support angle brackets surrounding a string to designate no space terminator is moot; it does not at this point. One of the things I had to rely on when implementing MRAS was the documentation of M80 - which left much to be desired. Had I known years ago that IRPC was supported by M80 in that fashion, I would have probably supported it in MRAS. I'll keep it in mind for the next release (see above).

I thought I had already fixed the problem with the pdc switches and the A-F argument back a long time ago. Actually, it was "fixed" with the application of MLK511/FIX and MLK69/FIX back in 1986. But I checked the code out and found that you are indeed correct; the patch had a bug! It was bypassing the SUB 7 instruction (to convert the 'A'-'F' to a numeric range 3AH-3FH), but bypassing it only on upper case A-F! The patches for Model III MLINK and Model 4 MLINK are:

```
(3) PATCH MLINK
(D12,08=02:F12,08=04)

(4) PATCH MLINK
(D12,2C=02:F12,2C=04)
```

Now I took a look at the MLIB code which interrogates for top-of-form if the mode is interactive (i.e. JCL not active or SPOOLer not active); I really can't test this on a Model I. According to the code, there should be no problem if you enter any character other than BREAK. Depressing the BREAK key in response to the query will certainly cause the exact behavior you suggest. You may wish to confirm this. Perhaps you used the BREAK key since the manual said any key press will start printing.

If any key press causes the abort, perhaps you can step through the code to investigate. The prompt is displayed by code starting at address 662AH. Just 'C' through the calls and examine the code coming back from the keyboard request. Unless you press BREAK (which returns a value of 1), which is tough to do when you are in the DEBUGger, the code should just proceed the same as if JCL were active.

On your problems with LDOS, both have been discussed many years ago. LDOS only alters the Hash Index Table (HIT) entry for the primary directory entry. This causes absolutely no problems with the DOS. There is no plan to change that.

Your recommended change to restrict loading of any file into an area above HIGH$ is unworkable. That would then restrict programs from loading modules into protected memory. Folks have been

doing that with BASIC for many years. Folks have customarily lowered HIGH$ then used the area above it for their own purposes, such as loading programs, modules, etc., which are loaded via the @LOAD DOS facility - the same facility used for loading programs. There can be no change to the loader without negatively affecting literally thousands of programs already in existence.

MRAS: SAID's file modes; CCC, ASM, and TXT

Fm John Foote, Wilmette, IL: The editor "Said", in MRAS has three modes for filing text, CCC, ASM, and TEXT. The first two modes use a 1AH terminator at the end of the file. TEXT does not. I use another program that requires the use of the block save feature of Said. Blocks saved with CCC or ASM will not down load in my other program, but TEXT files will. Apparently the 1AH makes the difference. Also I find the use of the TEXT default confusing. I don't understand the significance of the default statement in Said. In going into Said with an ending of /tfc, the ending is never changed even under the default query. Perhaps someone would explain the significance of the 1AH, and also whether the incomIng text should use /txt or if the ending makes a difference in down loading after saving a block.

Fm MISOSYS, Inc: The significance of a 1AH terminator (which is a CTRL-Z) is based on history. When Micros developed, all assemblers used a CTRL-Z character to indicate the end of the text. This originated in the CP/M world where an exact end-of-file position for a file was not maintained in the directory. Thus, two kinds of files were recognized: binary files which always used a full sector, and text files which were composed of ASCII characters only and which had a CTRL-Z character as the last character of the text.

In the TRS-80, the CTRL-Z convention was followed by the assemblers Tandy first released for the Model I computer. Other vendors, such as MISOSYS, continued to utilize that convention. An assembler would require that the last text character of the file be followed by a CTRL-Z so that the assembler could recognize the actual end of text, regardless of what the DOS had in its directory (assuming the DOS permitted the file to be read at least up to that point). SAID defaults to adding a CTRL-Z character to the end of a text file when it is in the ASM or CCC mode because it is designed to coordinate with our assemblers (which use the CTRL-Z convention).

SAID actually does a little more than just adapt to a CTRL-Z addition based on the mode, ASM mode also alters it to automatically upper case assembly language as required and set tab at every eight columns. CCC mode sets tabs at every four columns. TXT mode, I believe, sets the terminator character to a NULL, as is typically the convention with word processor text files.

When using the EXT= parameter in SAID, just enter the character string without the "/"; thus, if you want to edit files with an extension of "/TFC", invoke SAID with a command of:

```
SAID (EXT="TFC")
```

PRO-WAM

ON-LINE Help for the Model 4 with PRO-WAM

Jeff Joseph
270 8th St #3A
Wheeling IL 60090

I think I've found a good use for PRO-WAM that your readers may find interesting:

I have the HELPGEN program from your Mark IV Collection, and have made a number of help files with it for the various applications I use on my Model 4 since it was always a pain having to dig into the manuals when I wanted to invoke some little-used feature. The built-in help facilities, whenever available, were just too incomplete most of the time to be useful. The problem was that you can't run HELP/CMD from inside an application - it's too big!

My initial solution was to put two Model 4s on mv desk and run HELP on the other computer. The problem with that was that I would lose my concentration while moving my hands and eyes to a new keyboard and monitor. The amount of desk space that arrangement left me with was less than desirable, also.

Then I thought about modifying HELPP/CMD (from PRO-WAM) to work with HELPGEN help files. That was beyond my abilities, and HELPP can only display a single screen of information, with no keyword menu, and no use of reverse video highlighting.

My next idea was to run DoubleDuty on the one computer, using my main application in partition 1 and HELP in partition 2. That worked satisfactorily but came at a huge price: DoubleDuty gobbles 1551 bytes of high mem, and 444 bytes of low mem. That wasn't workable either, since that wouldn't leave me enough memory to use my XLR8er, my hard disk, and PRO-WAM. What to do?

Whilst perusing the DOS and PRO-WAM manuals, I was struck with a flash of inspiration! Why not run HELP on the second computer (as before), but access it through the RS-232 serial port using the PRO-WAM TERM application? This is what I did: connect the two machines using a homemade null modem cable, and load COM/DVR on both. At the 'auxiliary' computer LINK *DO *CL and LINK *KI *CL, then load HELP/CMD. Use SETCOM to set the baud rate the same at both computers (the fastest I could go was 4800 baud). Now at the primary computer load PRO-WAM and then your application. Whenever on-line help is desired, invoke PRO-WAM and run TERM. Once you're in TERM, you only have to <ENTER> to get the help menu displayed. When you're done with help, <CLR><SHFT><=> and you're back in your application! It's just like having HELP, PRO-WAM, and the main application running on one computer, and the only cost is the 240 bytes for COM/DVR.

Like your example in the PRO-WAM manual with PHRASE, I made a KSM macro for invoking TERM with <CLR><H>. It's quicker yet by putting WAM0 on a ramdisk, or making it a default application.

The other nice thing about this arrangement is that you can put the secondary computer on another table or under the desk.

Since I had so much success with HELP, I figured I could run any program on the other computer as well. In this I was sadly mistaken. I've tried Allwrite, Visicalc, Multiplan, TK!Solver, Superlog, and Pfs-File just to name a few, and I get one of two results. Either the screen goes completely blank and none of my keystrokes show up on the terminal, or the program's text does show up but it's all bunched together and my keystrokes produce garbage characters. Evidently TERM can't handle the video control codes these programs send, or those codes aren't going out the RS-232 through the LINK at the Other computer. Interestingly enough most all of the DOS commands work fine through the serial link, but almost none of the applications software will. I also tried using COMM/CMD with all different communications parameter settings with identical results. Is there something simple to correct this?

The fact that the XLR8 can be equipped with two additional RS-232 ports also appears potentially intriguing! If the applications could be fixed to work through the serial ports, you could connect three auxiliary TRS-80s and run four programs simultaneously! It seems that you could even use VED to export and import data between the computers via TERM. That is, if those extra ports are supported by a new version of COM/DVR.

I'm grateful to you for including TERM in the PRO-WAM package. I thought I'd never have a use for such a program.

Fm MISOSYS, Inc: Jeff, The reason why most of those programs will not support a "remote" terminal is because they use direct video screen access (using the DOS @VDCTL supervisor call). Thus, the programs' screen output doesn't pass through the *DO device. There are solutions to that, though. An intelligent "host" communications driver which traps the @VDCTL calls and passes the function's specific action requests across the communications hookup to an equally intelligent terminal program will properly provide the remote with the correct video screen presentation. Depending on how frequent the host updates the screen via @VDCTL will impact on the length of time it takes the remote to refresh its screen.

The host/terminal package MISOSYS sells called LS-Host/Term does have that very intelligence; it supports the @VDCTL service call across the communications line from the host to the remote. But programs which do all their screen updating using @VDCTL, such as a word processor, would probably prove unusable since the video character data can't be pumped across the slow communications line anywhere near as fast as it is being done on the host. Even at 9600 baud, it may be too slow.

On the other hand, programs which perform infrequent updating of the video screen through the @VDCTL service call would be good candidates for remote access. PRO-WAM's TERM may have sufficient code space to support LS-Host/Term's @VDCTL handling if the host portion was used on the host instead of just the *KI and *DO link. Given time, I may look into that.

Mister ED with PRO-WAM 1.0

Fm John Foote, Wilmette, IL: I have received my program, "Mr Ed", under your invoice number 89-10668. I find that I cannot load TED, VED, FED, or DED from PRONTO. I am using PRONTO Version 1.0A, serial number 00375. Perhaps my version is missing a patch to update PRONTO to use Mr Ed?

Fm MISOSYS, Inc: John, since we upgraded to PRO-WAM release 2 well over two years ago, when we generate an application package, we design it for PRO-WAM. The nomenclature "PRO-NTO" was a trademark of Chemical Bank; they forced us to drop that name from our product. The reason why you can't load a Mister ED application with "PRO-WAM" release 1, is that the header record of the Mister ED applications begin with the text string "PROWAM" recognized by PRO-WAM release 2, whereas release 1 used the text string "PRONTO".

You have two choices. One is to upgrade your release 1 PRO-WAM disk to a new PRO-WAM release 2 package. The cost would be $39.95 plus $5 S&H. The other choice is to patch each /APP module to change the header string from PROWAM to PRONTO. An appropriate patch for each module would be:

```
PATCH XYZ/APP
(D00,03="NTO":F00,03="WAM")
```

PRO-WAM's DIALER and COM/DVR status OR why not to use Carrier Detect!

Fm Thomas Crompton: I'm still having a problem with DIALER in PROWAM 2.0. It will not read the DIALER/DAT file. It does not have a ? by it in the DIR. I list the file and the first character is an @. Is that normal or would that cause the system to lock up and the DIALER/APP not to be able to read the DIALER/DAT file. When I run DIALER, I get a blank window and the system then locks up. I can not use DIALER with the dialing feature but I would like to use the dialing feature. That's the only application not working; the others work fine. Any suggestions?

Fm Bill Brandon: Thomas, What kind of modem are you using? Are all the DIP switches set correctly? This is really bizarre. I'm having a hard time seeing any connection between *CL and what you are getting in the window (which is a / DAT file).

Will DIALER give you the correct window WITHOUT *CL set? It should beep at you twice, and then bring up the data in the window. You wouldn't be able to dial out this way, but knowing whether part of the /APP works correctly will at least narrow the problem.

Fm MISOSYS, Inc: Thomas, Have you confirmed that your COM driver is installed correctly? Have you created a situation in which the COM driver is not installed. Since I used your master disk which you returned to test out DIALER and it worked perfectly on my machine, I cannot understand why you are having such a problem. Have you tried to invoke DIALER from PRUN, just to try something else? Have you tried to extract DIALER from the WAM1/APL library and made it a standalone /APP file to be invoked from PRUN?

You obviously use the COM driver (I'll assume you use it for access to the forum), so the COM driver is functioning. I have never had anyone with your problem and there are over 2000 copies of PRO-WAM in use. Have you tried applying any of the DIALER patches for RS modems? Try some of these suggestions to gain additional evidence of behavior then report back.

Also, RESET that DIALER/DAT file. It is opening up when DIALER gets invoked, but since you have to RESET, the file is left open.

Fm Thomas Crompton: Bill, I am using a SmartDuck ADC 1200 modem. It works fine with XT4 and DESKMATE calls so I assume the switches are ok. DIALER gives me the correct window without *CL set but I can not make calls and I do not get the two (or even one) beeps. Roy asked if I had *CL COM/DVR installed correctly or if I had a version without it installed. Maybe I should try to SYSGEN another COM/DVR after resetting it. I'll try now - let you know the outcome.

Fm MISOSYS, Inc: Thomas, Is the COM driver in high memory or low memory? Can you send me a memory map? I haven't a clue as to your problem.

Fm Thomas Crompton: Bill, I tried to reset *CL and remove it. When I do this I get about 12 char of junk and the words route *do (nil in the left-hand top of the window and the rest is blank window. After resetting and removing *CL I set it this way SET *CL COM/DVR (from the PROWAM manual). I get into DIALER without locking up but I get the junk and the words route *do (nil, but it doesn't lockup the system and I can exit (BREAK) from the DIALER/APP and I can call additional windows too. Any idea what the problem is and how to get around it?

Fm Bill Brandon: Well, that "route *do (nil)" business is real interesting. It means that whatever would ordinarily be going to the CRT is being sent to la-la land instead. **That** would explain the blank window, for sure!

I wonder where that bit of code escaped from. It surely couldn't be in PRO-WAM (that's not an ironic comment). The RESET command would ordinarily undo the ROUTE command (RESET *DO).

You could try opening the DIALER window, then opening the LIB Exec window on top of it with <SHIFT><F3>, then type RESET *DO, close the window, and try DIALER again. That might do it, but I have a funny feeling that it won't.

Why not try making a fresh copy of LS-DOS (or whatever you're using) from your master, then copy PRO-WAM onto the same disk, again from your master. Then see if it will run. If it doesn't, the PRO-WAM master may have become boogered somehow. (Be sure this brand-new copy of the system is done on a brand-new disk, or one that you have zapped with an eraser, and formatted anew.) When you have fixed the problem, it will be REAL obvious!

Let me know whether this worked, and what you saw if it didn't.

Fm Thomas Crompton: Bill, I found the problem with DIALER. I had to re-set the SETCOM for the values of DTR and CD. I needed DTR=OFF and CD=IGNORE. When that was set up right everything works now. That was a hard one. Thanks for your help and if I can ever be of help to you, let me know.

Fm Bill Brandon: Thomas, Glad you found the problem and got it fixed. I still wonder what that ROUTE instruction was doing in the window, though.

Fm Thomas Crompton: Roy, I have solved the PROWAM problem. The COM driver parameters had to be reset. I set the DTR=OFF and CD=IGNORE and that solved the problem completely. PRO-WAM works fine now with the exception of when I return to PRO-WAM from DESKMATE. Is that a stacking problem? Thanks for checking the disk out and the other assistance.

If the above problem with PRO-WAM and DESKMATE has a solution similar to

Allwrite let me know.

Fm MISOSYS, Inc: Ah, there's the culprit. I have no idea why you have the COM driver established with CD=ON. That has the driver honor Carrier Detect. The result is that any program's attempt to send a character to the driver will receive a "not ready to transmit" status until the modem returns a carrier detect status to the driver.

When PRO-WAM's DIALER first activates and determines that the COM driver is installed, it sends out the MACRO-@ dialing string. Since you had your driver wait for carrier detect (via CD=ON), DIALER was constantly trying to send out that string to the modem, but the serial driver was always returning with a "not ready" indication. Such an indication would be normal if the driver was still processing the previous character. So DIALER was caught in an infinite loop.

Unless you have a good reason to do so, always keep the COM driver options set to ignore carrier detect. I believe the only utility for not ignoring carrier detect would be in the operation of a host program or bulletin board operation. Even so, such programs can obtain the carrier detect status without the driver requiring it for a "transmit ready" status.

RATFOR

RATFOR-M4 version 2

Fm Gary Phillips: Roy, Jim tells me that RATFOR-M4 has a version 2.0 now. What are the upgrade policies for my version 1.0? If there was an announcement in TMQ I can't seem to find it.

Fm MISOSYS, Inc: There wasn't any announcement in TMQ. Send me your

disk and I'll put it on. That goes for anyone else with a 1.0 version of RATFOR.

Fm Gary Phillips: Thanks for the note on RATFOR. My disk and postage are on the way. You didn't mention an upgrade fee, but I'll include $10 for a disk refresh. If you decide it should be more, just say so.

Fm MISOSYS, Inc: Actually, I wasn't going to charge you anything. There weren't that many Model 4 versions shipped for me to worry about it. Jim convinced me to update to the newer version which needs two disks.

UNREL

Don't UNREL F80-compiled modules

Fm Gary Phillips: Roy, a couple more nuisance questions for you. A few months ago I purchased UNREL on the TMQ special, with the particular intention of using it to muck around in the library routines provided with Microsoft FORTRAN. (You had in fact recommended it to me for the purpose some time earlier.) I finally got around to experimenting with it and had some rather unpleasant experiences.

Running on a 4P with LS-DOS 6.3, XLR8er, and hard disk, I found that UNREL causes spectacular crashes when asked to process any /REL file containing the "chain address" type 12 record. I realize that the documentation states this function to be unsupported by UNREL, but really it ought to handle it a little more gracefully. It works fine on modules without type 12 records in them, but most F80 routines do include chain address. The typical crash involves keyboard lock-up, disk drive accesses, and even activation of the sound routines (weird noises suitable for arcade games). Quite a hazardous situation. I referred to conversation in which you suggested UNREL for looking into FORLIB/REL and I find no patches for UNREL. Any comment?

A separate question, on the Model 4 Hardware Interface kit. I bought the kit when it first came out, for use with my second 4P that runs a BBS system under LDOS 5.3. At the time I found that using the MEMDISK/SET2RAM was unreliable, sometimes causing system lockups. Neither of us could pinpoint the problem. There were some early patches but those were already present on my master diskette. Sometime in the last year or so I thought I remembered seeing a much newer patch for this software in TMQ, but now I can't find it again. Is my memory failing me or was there a patch for mod 3 mode MEMDISK/SET2RAM that appeared much later?

Fm MISOSYS, Inc: Gary, I know of no patch that appeared later. The few problems occurred early on and were fixed. Of course, running any "misbehaved" program which "pokes" into the ROM address range would certainly prove distrous.

Are you sure that you had a problem with UNREL in unrelling FORLIB? I believe I had unrelled FORLIB as well as the GRLIB without any problem. Certainly if a module contains a chain address record, UNREL would not handle it. But FORTRAN's libraries should have been assembler produced, not F80 produced. Perhaps you tried to unrel a F80 compiled module. Now true, UNREL shouldn't crash. If I get a chance, I'll look into the code to see what direction it takes on detection of an unsupported link code.

Fm Gary Phillips: Roy, Sorry for my imprecision regarding UNREL. Yes, the input that consistently causes crashes is output from F80 rather than excerpted from FORLIB. I was looking at both things at the same time when I discovered the problem.

Certainly I agree that the docs say UNREL doesn't support chain address. But it does seem as though it ought to politely say something like "Chain address record encountered. Not supported." Rather than doing that, it locks up the system, sometimes putting garbage out to the printer or activating the disk drives! Not a very polite way to go down, especially since the user might not always know whether a /REL file contains the forbidden record type.

Fm MISOSYS, Inc: I'll still look into UNREL as it could be able to trap the unsupported codes just like I trap in MLINK.

The Hardware Corner

Left Margin Printer Problems; Continued

Fm Charles A. Ainsworth: Roy, In correspondence, I described problems I was having with DMP430 printers on model 4D, and you made several interesting suggestions [see TMQ II.iii, pps 22-23]. In essence, the problem consisted of unpredictable and erratic changes in margin, especially on word processing and similar jobs when ending one sheet and advancing to another, when the margin would change at the beginning of the new page. I had experienced a similar problem previously, but then it was due to a loose belt, but in the present case the belts were properly adjusted.

Well, I was faced with one of those darned ornery intermittent problems, extremely hard to reproduce at will and to trace to its source. After many hours of testing, puzzling and cussing, I remembered Sherlock Holmes' statement to Watson: When probable solutions to a problem don't work out, the answer is bound to lie in something improbable, however improbable it may be.

So I proceeded along those lines. To be able to get things into focus I decided to use a brute force approach, kill or cure, to try to get a greater frequency of recurrence. Of my two printers, I ran one, which seemed to be the worst offender, on a number of long printouts, in the hope it would misbehave more frequently. After a time, it did.

In doing so, it became evident that, contrary to my previous supposition, the use on a 4D with XLR8er board had nothing to do with it; eventually it seemed to fail both on a machine with the board installed and on one without it.

One of the things that gave me a clue was that I ran the printer in the printout-hex-codes mode whereby, instead of responding to data from the computer and printing out text or complying with commands in the usual way, the printer prints out the hex codes; for instance, where there's an "A" in the text, the printer renders it as 41 (hex) on paper. Many hours of this showed no spurious characters from the computer. Also, another thing that attracted my attention was that, in normal printout mode, all problems vanished when I issued the code to change from the default of bidirectional printing to unidirectional printing, left to right; which made me suspect a defect in the right-to-left cycle of printout.

After exhausting all possibilities of a software problem, I decided to take a closer look at the mechanics of the printer. Eventually I removed the printer head to check for clogged pins, as the head face nearest the paper is very hard to see otherwise. Eureka! I discovered the problem. The pins were gooey with ink, which seemed to be semi-dried-out, which was undoubtedly clogging the pins at times. By my reasoning, the following was happening. The DMP430 ribbon always moves from left to right whichever way the head is moving; when the head moves from right to left in bidirectional printout and the pins are busy, obviously the pins, if sluggish, are more likely to catch on the ribbon as the head is moving against the ribbon movement. When the head is moving left to right, with the ribbon, there's less possibility of the pins jamming on the ribbon. Which is borne out by the fact that the problem invariably vanished with left-to-right-only unidirectional printing.

So I cleaned the exterior face of the surface the pins project through, using isopropyl alcohol (sold in drugstores as rubbing alcohol) brushed on with a small clean paint brush and mopped up with paper tissues. That surface is a milky translucent plastic, and as soon as it was clean I could see, by looking through a strong magnifier, that the pins were also coated with ink inside the plastic. So I arranged a saucer-like container with about 1/2" of alcohol and set the head in it to dissolve as much ink as possible and left it to soak a few hours. The alcohol ended up dark with dissolved ink. Then, still suspecting there might be more, I removed a circular cover on the back of the head, held by two screws, which exposed the right-angle bends in the pins and enabled me to carefully and gently push to make the pins protrude for further cleaning. Care must be taken not to lose or drop any of the shims that align that removed cover. That enabled me to get still more ink out. Finally, I left the snout of the head under a reading light for a time to warm it just sufficiently to evaporate any water contained in the alcohol to prevent any danger of rust.

I reassembled the head and now the printer works fine and has printed several hundred pages of text perfectly without any sign of the problem.

It would seem that the reason why the problem often appeared when starting a new page is twofold. First, the stepper-type motor that moves the carrier isn't all that powerful and I found it can be easily stopped in its tracks. Second, when starting a new page, several line feeds go out to the platen stepper-type motor and this seems to cause a voltage drop in the power supply, sufficient to allow the carrier motor to stall if it encounters even a slight resistance such as sluggish head pins dragging against the ribbon. It may be a combination of the carrier return coming together with the last line feed, perhaps associated with some weakness in power-supply regulation, but I didn't have time or inclination to explore that further.

So why the gooey ink debris on the head? It might be because all my printouts need to be sharp and black so when I purchased a ribbon reinker I made some tests and decided I preferred to run the ribbon through

the reinking cycle twice. Perhaps I have been over-inking so now I will experiment with a single pass even though that may mean more frequent reinking. In any event, knowing the cause of the problem and its solution, all's well.

I hope that the above may be of some interest to you. Thanks again for your help.

Since the [above discovery], I have devised a method to cure such a thing. I previously described what I had done for cleaning the head by removing it, but obviously that isn't a remedy for everyday operation.

To clean the head, at the front surface normally hard to see clearly or to reach with any sort of instrument or brush, I purchased at Radio Shack one of their floppy drive cleaning kits, cat. #26-408, which costs about $8 and includes a 5-1/4" fabric-like disk and a bottle of cleaning fluid. I cut away the disk jacket leaving the bare disk, which I sliced radially into strips. I mounted each strip on a piece of fairly stiff cardboard obtained from a discarded set of binder index tabs. I secured the fabric from the disk with office type rubber cement (obtainable in stationery stores) which appears to be impervious to the alcohol used for drive cleaning; the latter also cleans away printing ink very well.

So now, whenever I change a ribbon I simply pour a few drops of the cleaning fluid on my strip, ease the head back from the platen with the appropriate printer lever, insert the strip, move the head forward to a point where it will press against the strip loosely enough to move it up and down, and I do a little scrubbing to get the head and pins clean. So far, It has worked fine.

As I may have already stated, isopropyl alcohol (drugstore rubbing alcohol) is also perfect for removing ribbon ink.

When attaching the fabric to the cardboard strip, apply the rubber cement uniformly and sparingly, being sure none remains on the face that contacts the print head. If you get any excess, let it dry and then it can be easily frisked off by hand. I suggest you do not use the black industrial type rubber cement sold at hardware stores which may create stains which are hard to remove and which may just not be suitable for this purpose. When attaching the fabric strip to the cardboard, leave about 1/2" projecting at one end and turn this over and cement on the other side, to prevent the end working loose in use. At the rate my strips are used, I expect my $8 investment to last me many years.

The Mystery of the Meandering Margin

or

Keep Your Printer Clean and Oiled!

By Charles A. Ainsworth
P. O. Box 2107
Woodbridge, VA 22193

Imagine starting your printer on a 50-page job, going on a lunch break and returning to find most of the printout on the platen!

That's what happened to me with a Tandy DMP430 dot-matrix printer; I found the solution which I would like to share with others who might have the same problem on this or similar machines, perhaps saving them a trip to the repair shop. (Incidentally, note that I am not covering the so-called "laser" printers here.)

The printer worked hard and well more than a year since it was purchased. Then, suddenly, at unpredictable moments there would be a noise I can only describe as a cross between a grunt and a growl, and the left margin on the printout would shift to the right, with part of the line printing on the uncovered part of the platen to the right of the paper. The machine would continue this way, with a perfectly even left margin in the wrong place, until sometimes, after several pages, it would repeat the performance and move the margin elsewhere. The only cure was to stop printout and power down, then power up and start again, when the left margin returned to normal (and sometimes shifted again later on).

I'm an enthusiastic hardware dabbler and have been stung painfully several times with repair bills, so this time I rebelled and decided to analyze and explore before rushing off to a repair shop and risking being socked for a new electronics board (or something equally ridiculous) when perhaps only a couple of screws had to be tightened. Some thought suggested it might be either the electronics or a mechanical problem. I soon discarded the electronics as a probable cause, as I couldn't imagine how the margin could suddenly change that way due to the electronics and then remain uniform at a new setting. Typically, electronic faults are often intermittent and flickering, which would have made the margin jagged.

So I concentrated on the mechanical aspects and found the answer which led to a quick, easy and free repair, consisting of a simple belt tightening. To explain, I will first describe the operation of some pertinent parts of the machine for those unfamiliar with it. Probably many other printers are quite similar.

The DMP430, like many machines, has a pair of guide rails parallel to the front, on which slides a carrier which supports the print head. There is an endless toothed belt running the length of the machine and back and fastened at one point to the head carrier. At the left the belt runs over a sprocket which is part of a stepper type motor which positions and drives the carrier and head, via the belt, according to instructions to the motor from the electronics. At the right the belt runs over another sprocket which drives the ribbon transport mechanism.

At the instant the printer is powered up, the electronics have no way of knowing where the head was left at the end of the previous printing session, so, to set a reference point, they move the carrier to the extreme left, where a photocell senses

its arrival at the limit of travel, stops it and reverses it a short distance (some 2 or 3 spaces) to the right to a home position (printout column 1); the electronics then record the fact that the head is at the home position and, for all subsequent head movements, keep a running tally as they have to be constantly aware of the exact location for proper printout formatting.

My conclusion was that there was slippage in the belt which drives the carrier, due to stretch or slackness. With the belt suddenly slipping out of register with the drive motor, the electronics would not know that the physical carrier and head location had been changed to disagree with the electronic tally and would thus be unaware of the true physical location and produce an incorrect left margin. This seemed to be confirmed by the fact that when the printer was switched off and then on, the reset to the left margin was repeated and things returned to normal. My suspicion of belt slippage also seemed to be confirmed by that noise I heard when the margin shifted, probably due to teeth skipping over the sprocket instead of engaging it positively.

So I opened the printer and took a look inside. If you were to do the same, for the protection both of yourself and your equipment, be sure to unplug the power cord before opening up, to avoid accidentally powering up with your hand or tools inside, which might cause carrier movement and injury or damage, and would also present the danger of electric shock. Also unplug the control cable which might be damaged when moving the machine around.

The printer contains electronic components which might be damaged by discharges of static electricity one may accumulate, so if you open it up be sure to wear a grounded wrist strap you can get from Radio Shack or other suppliers for a couple of dollars or so; connect it to a good ground, such as a ground connection on your installation or a water faucet. Do not improvise the strap; the commercial one contains a resistor to limit shock in case of accidental contact with live parts. It would be dangerous to connect yourself directly to ground as the consequences of electric shock would be much more serious.

One may be puzzled as to how to remove the top. In my printer, there are four recessed screws in the upper part and one in the center of the back. But removing them still does not allow one to raise the top. The secret is that at the lower edge of the front, the cover has projections that latch to the base; after taking those screws out, it can be removed by pulling off the platen knob, removing the ribbon, gently sliding the carrier leftwards out of the way, inserting fingers inside the center of the front and pushing towards the front of the machine, which undoes the latches and allows removal of the complete top. Carefully keep away from the flat cable that connects to the printing head and moves with it, which is rather delicate.

On the right of the machine front there is a panel containing the on-line switch, form feed switch, lights, etc., connected by cables which go backward and plug into the electronic board and don't have much length to spare, so take care not to damage them by tugging. Once the top has been removed partially, one can swing it over and reach in and unplug the cables from the board at the back, carefully noting which way around the plug goes for later reinsertion.

Once I had the top off, an examination of the belt showed it was slack and no doubt had been slipping over the motor sprocket; the motor, located at the left, is mounted on a support plate held by two screws on opposite sides of the motor, which can be loosened to adjust belt tension. One screw is in a round hole and the other is in a slot which allows for adjustment.

To adjust the belt tension, I first loosened the screw in the round hole, about a quarter of a turn. Then, firmly holding the motor to tension the belt to prevent it loosening and falling, which would involve some juggling to get back into position, I slackened the slot screw. I put additional tension on the belt by pulling on the motor and tightened up again.

The tension to put on the belt is hard to define; it should be taut without applying undue force which might cause stretch (even breakage) and premature bearing wear; cease pulling when you feel the belt is quite taut.

One way to gauge the tension is to observe the belt with the printer in operation. It should, at the most, vibrate slightly (maybe 1/16" or so), due to the driving force being applied in a number of successive small impulses, but not flap from side to side which would indicate looseness.

If in doubt, stay slightly below tension, reassemble and test, and retension if necessary, which is no particular hardship as opening and closing the machine only takes a few minutes. One can make comparative measurements of belt length and tension by carefully measuring the distance from the screw head to the end of the slot.

Those motor plate screws are secured with a dab of paint, which you will crack when loosening; after you have adjusted and tightened firmly, and are satisfied things work properly and no further adjustment is required, apply a light smear of almost any hard-setting paint to secure against future loosening; the amount of paint has to be small (about the size of a pinhead or less) and I used a toothpick to smear it on. Don't overdo it as you may have a problem next time you want to adjust. Don't get paint in the screw head slots! If the screws and plate are oily, wipe them first with a small brush or a cotton swab stick moistened (not flooded) with cleaning solvent otherwise the paint will not adhere (I use Varsol, available at hardware stores). Use the solvent sparingly, let it dry before applying the paint and don't splash it around, as it might damage sensitive parts.

Here is a slight digression to include another item which might be troublesome: I have heard that on some DMP printers the main power switch is poor and flimsy and may cause strange things to happen due to poor or intermittent contact. Poor contact could conceivably produce an excessive voltage drop when the power supply is fully loaded, as when both head and platen motors operate together, perhaps causing a motor stall. Obviously, in such a case a new switch might cure the troubles; to anyone handy with such items and some simple tools and soldering, a switch change should not be a major problem. Tandy and others sell many kinds of switches, one of

which should probably fit. Try for something beefier than the original as an exact duplicate might recreate the problem. In the worst case, if you felt you could not find a suitable switch you could fit in place of the existing one, you could bypass the switch with jumpers and insert an in-line switch in the power cable.

I have not been able to verify this possibility of switch trouble myself on the DMP430, but can attest to the fact that on a couple of DWP410 daisy wheel printers I used to have, both needed the main power switch changed to cure erratic operation. In both cases, the machine would start acting up when one brushed very gently, almost feather-light, on the switch lever during operation, denoting bad contacts or weak contact pressure. End of digression, now back to my main subject.

In some cases, belt skip or erratic head movement may be caused by excessive friction of moving parts due to severe lack of lubrication; some of the cheaper printout papers may tend to drop lint inside the machine which can mix with the lubricant and dry it up or even clog working parts. Some printers move the carrier very fast, especially when skipping a sequence of blank spaces, and the tug on the belt is appreciable. The tug is also considerable due to a certain whiplash effect at head reversal at line ends. Such stresses are much more severe when lubrication is poor or absent and/or when the machine is dirty, due to greatly increased friction. Which are good reasons for systematic inspection, cleaning and lubrication. A regular schedule for this, say every 6 months (or oftener for very busy machines), will keep your printer working at its best, perhaps quieter, and will probably extend its life and save on repair bills.

Before you reach for the oil or grease can, use a small clean paint brush, say 1/2" wide, to remove any dust, dirt, paper debris, lint, etc., from surfaces and working parts. If you have to remove stubborn grease, oil or dirt and wish to use a solvent, I again suggest Varsol. Stronger ones, such as trichloroethane, paint removers, paint-brush cleaners, acetone and such like, may attack some plastics like the head traveling cable (an expensive repair!) or others and give off fumes which aren't good to breathe. In any event, don't let any solvent whatsoever get on the cable. For the outside of the printer, use only a rag or sponge, moistened with water with a little soft soap to be sure of not marring the finish with chemicals. Don't get things wet enough for water to run into the machine! Also take a good look around and inspect for anything loose or visibly abnormal or worn.

Lubrication is simple and easy. Use good lubricants; pennies saved on them might well turn into dollars spent on repairs; my favorite oil is sold by IBM at their service warehouses: Oil #10, part #1280443, which I have used very satisfactorily for years on typewriters and printers; to locate the nearest source, call the number listed for IBM supplies in your local phone book; or perhaps you could get a good lubricant from a reputable typewriter or printer dealer or repair shop. Personally, I avoid "universal" type popular oils sold at hardware or variety stores for household use on sewing machines, appliances, bicycles and the like, which seem too thin and, perhaps due to the operating temperature of some printer parts, may be liable to gum after a short time, which is just as bad as not having any lubricant, if not worse.

Use oil sparingly and avoid flooding; the most common fault of the uninitiated is a tendency to overoil, sometimes grossly, leaving a messy machine ready to trap and collect dirt and perhaps even ruin printouts with oil stains: usually two or three drops are the most that should be applied at each point, which requires a small oiler with a longish fine snout (such as 1 or 2 oz. capacity squeezable plastic ones sold by many hardware stores). Lubricate both carrier rails in several places along their lengths, the platen bearings, the bearings of the gears that operate the platen, any gears in the ribbon advance mechanism, tractor shaft bearings (for built-in tractors) and other items which may obviously need it. If your printer has an add-on tractor, check it also for lubrication; tractor end covers may have to be removed on some models. Keep the lubricant well away from drive belts; oil or grease may attack them and will almost certainly cause slippage. As you lubricate, operate parts manually a few seconds for lubricant penetration and distribution, then wipe up any excess with paper tissues to prevent dripping or running.

In some cases, the carrier has a recessed felt wick as a reservoir to assist guide rail lubrication; add a few drops of oil, letting each one soak in before applying the next.

Printer manuals may specify that grease must be used in certain places, in which case follow the manual if it disagrees with my suggestions. I favor IBM grease #23, part #9900692, which I have also used with good results for years. A small semi-stiff paint brush, about 1/4" or 3/8", may help in applying grease and working it in; keep the brush wrapped when out of use so it doesn't pick up dirt (which grease does easily) or wash it with soap and warm water after each use and dry thoroughly to prevent any water getting in next time around, which might cause rust. Don't over-lubricate by leaving blobs of grease which might make a mess if they soften and get around as the machine warms up.

Model 4 video

Fm Clint R. Bridges: I need some technical help. I just purchased a Model 4 from a friend of mine. The machine has worked fine for a number of years. Shortly after I got it home, running TRSDOS 6.0, the 80 column video went on the fritz. It suddenly went crazy and I had to take the machine apart and adjust the horizontal controls to get a picture back. Now the 80 x 24 letters are on the screen but they are jiggly and nervous looking. Things appear to be just fine when I run TRSDOS 1.3 on it and have a 64 column screen but the 80 column looks bad. Any suggestions?

Fm Fred Oberding: Clint, I believe your video phase lock loop circuit needs to be tweaked. The video is OK in 64 character mode but not in 80 character. Boot-up in Model 3 basic and enter the following line:

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OUT 132,4 <ENTER>
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If you get the same jiggling and nervous looking video, this will confirm it. You probably have a Version B or C main logic board; at the top of the board, just left of center, you should find an orange colored trimmer capacitor, C-210. Just below the trimmer cap, you will find a black jumper on stakes E22/E23, move the jumper to stakes E20/E21 (just above and to the left). You need to boot up in Model 4, 80 character mode or use the above OUT 132,4. Adjust the trimmer, with a non-metallic screwdriver until the video is stable or as nearly stable as possible and return the jumper to stakes E22/E23. The video should now lock into sync. However, since you twiddled with the Horizontal controls, they may be off now.

NOTE: some Model 4's may have a fixed 33 pfd cap instead of the 5-60 pfd trimmer; if this is the case, you will have to replace it, as well as resistor R-204 (3K ohm) if it is missing also. It seems Tandy had a problem obtaining the trimmer capacitor during one period in production.

Fm Clint R. Bridges: Fred, Thank you for the help with my Model 4. I did exactly what you told me to do. My 80 column video seems to be A-OK now. This Model 4 is a joy to use.

Power Supply Woes

Fm Jim Beard: Tuesday, my Model 4P that my wife uses at work decided not to light up the screen. She said it was fine Friday, but it didn't respond to the brightness control. I tracked the problem down to a bad connection on the 65w Tandy power supply at the connector pin. On removing the power supply, I verified with an ohmmeter that the solder had cracked at the base of the connector pin. In working with the card, I had cracked the solder at the base of the pins for the 120v AC input. I took the liberty of desoldering all connector pins and resoldering them with high quality solder. It is fine now.

It cost me nothing. If I had been forewarned, I could have fixed it in 10 minutes. You guys, watch for this; it could save you lots of time and possibly money, not to mention aggravation.

Fm Thomas Crompton: Jim, I have a flicker every 20 seconds or so and I am having that drive problem with (No Disk) when there is a disk in floppy drive #6. How do I know if I have a 65w power supply. I will have the screws out of my machine in a few days. If you think I might have problem with the soldering at TP 12 or on the power supply, please let me know how to locate these points and I will desolder and resolder the power supply connector pins to the PC board. Do you think my floppy trouble is do to bad solder?

Fm Jim Beard: Thomas, It is possible that the power supply cable to the external drive is not getting its 12 volts from the power supply due to this problem. The solder problem has been observed only on the 65 W power supplies, not on any other card, so I wouldn't worry about the FDC board. You can spot it quickly by taking a TP pin in two fingers and wriggling it. If it is firmly attached to the FDC board and is springy, it is OK. If it moves like a fence post in damp ground, you have a solder problem.

The Model 4 power supplies come in two flavors: 38 watt and 65 watt. If you have floppies, you either have two 38 watt power supplies or one 65 watt. The larger power supply is about 7" by 10" and has connectors all across one end. The 38 watt power supplies are all Astec and are about 5" by 7".

If you have a flicker every 20 seconds or so, I would immediately [unplug the computer from the wall socket and] pop the box off and look on the CRT side of the aluminum box on the back of the computer which houses the main board. There should reside your 65w power supply. (38-watters are mounted one there, one on the disk chimney).

If you see a 65W, pull the 120v connector off (it is by itself; the other connectors are butted up against each other). Then, give the connector pins the finger test. If the fence post pushes over and stays, you know what to do.

This is likely to be a separate problem from the floppy problem.

Fm Fred Oberding: Jim, In working on quite a number of Model 3's and 4's over the years, I have found a good number of bad solder connections on Aztec 38 watters, both the US unit and the heftier European units, as well as both the 65 watt Aztec and Tandy supplies. The problem with the 38 watters has been limited to the AC connector and the 65 watters to both the video 12 volt connector and the AC connector. Just last week, I tried to remove the AC cable from an Aztec supply, and the connector pulled out of the board as well.

You may be right about the poor quality solder, but then, both Tandy and Aztec are guilty of using the same poor grade of solder. I tend to suspect poor quality control in the cleaning of the surface corrosion from the connectors prior to being inserted into the PCB, thus preventing a good adhesion of solder and a hidden cold solder joint.

I believe the primary culprit is the ham fisted assembler and/or later "techs" who just push the connectors on with their thumbs, without providing support under the edge of the board. With heavy pressure and no support, the board tends to flex and the solder joint fractures, as the pressure is released the board returns to its original state and the solder joint re-retains contact. Now, sometime in the future, after corrosion builds-up, the contact begins to cause intermittent power problems.

Fm Jim Beard: Fred, The Model 4P 65 Watt power supply board definitely had poor quality solder. It was more than a cold joint. The solder was soft and crumbly. I removed it with a vacuum plunger type soldering aid and resoldered them with 63.5/37.5/3S solder.

Fm Joe Kyle-DiPietropaolo: Jim, I'll mention it then: Many of the Tandy and

Aztec 65 watt supplies are subject to the cracking you have discovered. I don't think that it is the quality of the solder used, but more due to strong vibrations in the supply, perhaps coupled with a wave solder line set a bit too fast producing thin fillets.

Fm Jim Beard: Joe, The fillet around the 12v line to the video was thin. It should have been enough to hold, though. The fillets around the 120v connector pins was NOT thin, and these exhibited the "fence post in wet ground" behavior. Other pins with good fillets gave easily with a mushy feel.

Anitek Speed-Up

Fm David Huelsmann: I've just installed Anitek's 6MHZ speed-up in my 4D. I also replaced the 74LS245 keyboard buffer chip with a 74HCT245 (after installing a socket of course). It seems to work ok except for some flaky characters seen from the keyboard which I suspect are related to both the new speed and that ribbon cable that comes from the keyboard and plugs into the side of the motherboard. If I remove the metal piece that normally mounts on the side of the motherboard and extends to the drive tower and usually holds the keyboard ribbon cable under it, then I have only a few flaky keyboard problems. Obviously this cable has been compressed too much. Anybody have any suggestions for a better fix?

As long as I had everything tore apart, I also was adjusting the RPM on my two inboard drives. No problem with drive 1, it had an adjusting trimmer on the under side near the "flywheel". However, drive 2 had no adjustment trimmer visible anywhere. Both are supposedly the original and same drives. Any ideas?

Fm Timothy Sewell: David, I regards to your characters on the screen, make sure your memory chips are 120 ns or faster. That cured my problems when I installed the board into my computer (I run 100 ns chips).

Fm David Huelsmann: Timothy, I'm exploring the possibility that the chips are not fast enough. I can't remember what I had originally put in there so I'll check later tonight. However, replacing 1 Meg of 256 x 1 chips in todays market may not be the most economical idea.

Fm Fred Oberding: David, I don't have the Anitek speed up kit, I have an XLR8er board which gives the same speed increase with my Gate Array 4. I'm curious as to which number IC you replaced with the 74HCT245. The one suggested in the XLR8er manual for a Gate Array 4 is a FDC bi-directional buffer. I tried, U-28, the G/A equivalent of the IC suggested for the non-G/A, which feeds the keyboard address buffer, but it will not work with a 74HCT245 in place of the stock 74LS245. The keyboard address buffer is U-40, a 74F16, and the keyboard data buffers are U-55/56 a MC14502B and MC1452B. I'm not having any keyboard problems neither are any Gate Array XLR8er board users I know of.

I did replace the video RAM IC, U-16, with a faster 120 ns, 6116-2, in lieu of the stock 150 ns unit; this may help some as the keyboard buffer is in video RAM.

There are at least two versions of the DSDD drives in the 4D and one of them had a crystal controlled motor speed control. You apparently have one of each.

Fm David Huelsmann: Fred, U-28 was where I placed the 74HCT245 and it works just fine. Obviously, the XLR8 board could have been a choice for speeding up the CPU, however, I have gotten quite spoiled by my 1 Meg AlphaTech board and don't want to give it up. I will try a different Z80B since the speed-up at 6.17 MHZ is slightly pushing the rated 6 MHZ operation of the Z80B. If I still can't get it to work, then I guess I'll give it up. Replacing my 32 256x1 chips rated at 150 nsecs with 120nsecs or better chips at $12/chip just isn't worth the expense.

Thanks for the info on the Drives. My two outboard drives are TEAC and are not adjustable. I just didn't expect to find one of each on the internal drives.

42 Cylinder Floppies? - Don't do it

Fm Fred Campbell: I recently discovered that I can get 42 cylinders out of my single sided, double density disks. I already use both sides of the disks. I use my wife's manicure scissors and a notcher that a friend told me about to "convert" the disks. They look a little strange, but they work fine. I bought the notcher at a store that specializes in "Apple" supplies.

Fm MISOSYS, Inc: Fred, I strongly recommend that you avoid trying to format past cylinder 39 (the 40th) on a 40-cylinder drive. This can result in head damage over the long term. Your best solution would be to invest a modest sum into the acquisition of 2-sided drives. They are relatively inexpensive (ours are $75 + S&H), and they will provide you with a doubling of ON-LINE capacity PLUS the additional facility of being more portable with other users. Are the two extra cylinders worth risking that drive?

Upgrade for 5-Meg HD

Fm Dayton Sumner: Roy, In discussing a problem I'm having with my hard drive, Gary Phillips mentioned replacing a 5-Meg bubble with an ST225 from MISOSYS to upgrade his drive to a 20-meg.

I'd be interested in knowing first approximately how much this might cost. And I need to know how complicated it is for a not-very-handy layman to tackle. How clear and complete are the instructions for the modification. How clear and complete are the instructions for configuring and initializing the drive when it's done?

Fm MISOSYS, Inc: We sell the ST225 drive for $225 + S&H ($7.50-$10.50). The Tandy driver will not support the entire drive - you will also need a new hard disk driver, such as our RSHARD package ($29.5).

The instructions I can provide are clear but you need to wield a soldering iron as the Tandy drive has three wires connected to its drive electronics card. If you do no soldering, then this is not the time to start. Why not find a friend who could do the job? The following are the "instructions" I provide on request; they originated with Joe Kyle-DiPietropaolo:

Changing to a larger HD bubble

The wires need to go as follows: Orange to pin five on the twenty pin data cable; White to pin eight on the thirty-four pin control cable; and Yellow to pin twenty-six on the thirty-four pin cable.

All of the above connections can be made on either the hard disk logic board itself, or on the hard disk controller board. Looking at the ST225 here in my hand, there are convenient attachment points for the White and Yellow wires. Just follow the trace back from the edge card a bit and you'll find a feed-through pad to solder to.

The Orange wire is another matter. Since pin five is on the "other" side of the board, and there is no trace coming from the edge card, you'll have to remove the logic board and very carefully tack solder to the edge of the connector finger. Make sure that you can still fully seat the connector, and that only the very tip gets soldered.

This connection would be more easily made at the hard disk controller end. Simply remove the controller board from the supporting chassis, and solder the lead on the foil side at the connector pin itself. You can connect the White and Yellow wires in this manner also if desired.

Finally, if you want to skip the White and Yellow wires completely, all you'll lose is the green activity light. If you don't care about the write-protect switch, just tie the red wire to plus five via a 220 ohm resistor.

Fm Dayton Sumner: Sounds good! I'm the original klutz with a soldering iron but it happens that the previous owner of this drive took care of those three wires before I bought it.

Seems someone also mentioned needing to align the drive when it is installed. Is that true? If so, is it a complex procedure requiring great skill and much equipment?

Fm MISOSYS, Inc: A drive does not get aligned. I believe the comment from that someone was that you may need to align the controller. Yes, that requires skill and equipment.

Fm Dayton Sumner: Roy, One more dumb question. I have heard the DiskDisk is a valuable adjunct to a 20-Meg drive. In brief, what does it do?

Fm MISOSYS, Inc: It does essentially the same as a MemDISK but uses the hard drive as the host media instead of RAM. Let's you add many smaller virtual drives on your hard drive. Each concurrently available virtual drive uses one drive slot (out of the 8 available). Thus, it let's you overcome all of the DOS limitations of file slot restrictions on a single drive partition. Takes up little memory for the driver and linkage. There's more information in *MISOSYS Products' Tidbits.*

Hard Drive Woes

Fm John G. Gelesh: Can anyone help me with a hard disk problem I have been having? I own a Hard Drive Specialists (HDS) 20-meg hard drive. I am not sure but I think it is a Tandon TM612. I have written to HDS about the problem but they have not replied.

Anyway the problem is this. The drive apparently "shuts off". When I try to access it I get an ERROR 11H. I use the hard drive in two drive slots (Drive 0=System and Drive 1=Data). I use Powersoft's Hard Disk Driver with the drive, LS-DOS 6.3 uses partitions 1 and 2, LDOS 5.3 uses partitions 3 and 4.

Here is a graphic description of what happens. I hear a faint click (like a relay switching) and the faint sound of a motor slowing down. Both lights on the drive stay ON! It is hard to hear because of all the noise the cooling fan produces. From then on anytime I try to access the hard drive, I get the Error 11H message. If I turn the drive off and back on again (restart it), things work normally.

Now here is the strange part. This usually happens during the first seconds to about 20 minutes after the drive is on. After I restart the drive, it usually works fine, sometimes for 8 or more hours without any problem.

If I use the drive every day, especially if it has been used more than once a day, I have been able to avoid the problem for as long as 30 days. However, if I leave the drive sit for a day or especially a few days, I may have to restart it several times in one day. This still happens in the first 20 minutes.

To avoid the problem I have sometimes turned the hard drive on and let it run for 10 minutes or so every day whether I use it or not. Since summer is coming and hence vacations, I would like to get this problem fixed. Besides, very rarely, the problem occurs even after the drive is "warmed up".

BTW, the drive is new. I received, set up, and formatted it in July. Except for the described problem I am very happy with the drive. If anyone has any ideas on how to cure this problem, please respond.

Fm MISOSYS, Inc: Sounds to me like a power supply problem. I have one Radio Shack 15 Meg drive which had a similar problem on power up. Most of the time, I would hear a click (like a relay) and the drive would not start turning. Switching the power switch OFF, pausing, then ON generally solved the problem. Once on, it appeared to stay on without further problem.

However, the problem at power on became more severe. I decided to swap out the power supply. It was a Tandy 65 watter which I then replaced with an Astec 65 watter from another spare R/S drive. Funny but the problem completely disappeared. I may have had the same kind of

power supply problem as the Model 4 folks are experiencing.

I did try the Tandy power supply back in the other hard drive and it worked there. So perhaps the power stakes needed to be nudged. I'm going to do some further investigation such as resoldering the stakes and try it back in the original hard drive. In your case, I do suspect the power supply.

More HD Problems

Fm Daniel L. Srebnick: I am trying to determine why my hard disk (RS 5 meg) will not show ready. I thought I had a cable problem, but replaced the cable and it still does not work. Can someone check their 5 megger and advise if the green ready light will show active if the drive is powered on with no cable connected to the Mod 4. I think it is supposed to - mine is not. And yes, the bulb checks out ok.

Fm Adam Rubin: Okay Daniel, I unplugged the 50-conductor cable from the back of my Radio Shack 5-meg hard drive (cat. #26-1130), and powered it up. After a few seconds (as always), the green light came on. Just for the heck of it, I then pushed in the red button, and the red light came on. Anything beyond that, I'll leave to the hard drive experts.

Fm Daniel L. Srebnick: Well Adam, it does confirm that the problem is not the cable.

Fm Jim Beard: Actually Daniel, it shows that the problem is inside the 5 Meg disk drive. How about identifying the signal sequence that turns on the green light? If there is some kind of internal self-test, how can its results be accessed?

Fm Daniel L. Srebnick: No Jim, I have swapped bubbles already. It is the controller. I sent it in for repair. As I was leaving the store, I saw the Model 4 HD controller on the closeout table for $112! No box, no docs, but took it home, plugged my external 10 megger into it and it works like a dream. So, in the interim, I can access one of my two HDs.

Fm Joe Kyle-DiPietropaolo: Daniel, The green light is driven by the logical AND of Seek Complete (ready) AND Select for the bubble in question.

Bring 'em back alive!

Fm Mark Mueller: Well, I'm the kind that takes some kind of weird satisfaction in making "dead" equipment come back to life. Early last year I bought a used Model 3 off one of the local RSCC stores for $35. I had gone in for a tent sale looking for model 4 stuff, and the manager asked me if I was interested in it. He said that someone had brought it in to get fixed. They diagnosed it as a bad disk controller (wouldn't boot) and estimated $100+ to fix it. The guy then just left it as a "trade in" on a T1000. I plugged it in at the store, pushed reset while holding down the Break key, looked at the MEM number (in Basic), saw it was A-OK, gave him a check for $35 and walked out with it. When I got it home, I opened it up and checked the power supply voltages. The +12 line was low, so I hooked the scope up to it. There was noise all over the line. I replaced the capacitor ($1.19), plugged it back in, and she booted right up. Not bad: A Model 3 for $36.19. The $35, by the way, was what the RSCC manager owed the service center. These TRS80's are remarkably resilient, and there is very little you can't fix (cheaply) if you know where to look.

Fm Shane Dawalt: Mark, And yet another M3 is resurrected ... That's ridiculous. $1.19 part and Tandy wants $100 for a board swap. I have a feeling those techs in the repair centers are board junkies only. Other than fixed test points, they couldn't pinpoint a problem with or without a red dot & arrow pointing to the exact failed component. OTOH, I suppose, perhaps, that may save the customer $$$$ in the long run — labor cost would be 50 times (or more) the component cost.

"That's ridiculous" is not directed at the Model 3 being resurrected. It is directed at Tandy. [For those of you who have a spot in your heart for the Model 3.]

Fm Mark Mueller: Well Shane, I suppose I could see their point to one extent: It is a discontinued machine, and old at that. But, since it took me all of 15 minutes to fix it, and the tech SHOULD have been set up to find the problem faster than I did, and I had to run down the street and buy the capacitor, and..., well, you get the point. The repair bill, even assuming a $50/hr charge, should have not been more than $30. Especially since the power supply capacitors are some of the most unreliable components in the box, and supply voltages are the FIRST thing to check in any troubleshooting job.

Another case of SPEEDUP

Fm Shane Dawalt: Surprisingly, I found U3 (a PAL) was stealing a good 1.3MHz from my machine. Against my better judgement, I tied the M1 pin high and have been working with that configuration ever sense (around 5 or 6 months now). Working just fine and the clock speed is 4.055ish MHz. I know, 55KHz high for the Z80A, but I figured the Z80A was underrated (and if it wasn't I'd buy a Z80B and replace the Z80A). [Measurement was taken by my own speed sensing program with max resolution of approximately 1200Hz.] Last time I had the bonnet popped on the M4, I tested PCLK with my frequency counter. It noted 4.0553840MHz. You know, I can actually tell a speed difference in MEMDISK initialization (the RAM verification). Also, scrolling is a bit faster. [Now I've been dreaming of adding disk DMA w/floppy controller. Won't get designed or prototyped, but a nice thought anyway.]

Fm Jim Beard: Yup, U3 is a clock divider, taking the 20+ MHz signal and dividing it down to 4+ MHz. If it works, it works. Most of them would; Tandy was not taking chances on "lemons" by hav-

ing variable clock rates or some that didn't work, and apparently lowering the yield of completed motherboards was unacceptable for production volume or cost reasons.

Fm Adam Rubin: Shane, if you have a few minutes to spare, would you be able to run the program on TMQ II.ii p.49, and let me know what you get **this** time?

Anyone who's following this discussion would probably also be interested in our earlier discussion, which is preserved for posterity in "Focus on Speed", TMQ II.ii, pp.44-54.

Fm Shane Dawalt: Adam, I entered and executed your test program given in TMQ II.ii, p49, and obtained an execution time of 5:23! Recall my unmodified hardware executed this code in 6:29. Apparently, old Model 4's with U3-7 tied high implies 0 wait-state operation (as one would expect). Of course, this is true if-and-only-if (iff) video I/O is not being done. I should suspect my M4 is probably functioning as a 4P or the newer gate array M4s. Interesting.

Fm Adam Rubin: Yep, it does indeed look like you are now running at 0 wait states, as the schematic and your modification imply. (Good thing you ran the program before that, though, or else we'd never have figured out that SET b,(Ir+d) has two M1 cycles.)

As you pointed out, any video I/O would technically change this to a non-zero value, but as the worst-case video wait is about 1.28 T-states per character (either my calculation of that was wrong before, or it's wrong now), it won't be very much above zero. If we display 1K characters per second (as LIST does), we'd still get well over 99.9% of the full clock speed.

More hardware Problems in G/A 4

Fm Fred Oberding: Ran into a really strange memory problem with a gate array Model 4, this weekend, which I would like to pass on for what it's worth. Hooked up my daughter's Mod 4, which has been in storage since she graduated from Law school last June, and it would not boot TRSDOS/LSDOS 6x, but it would boot TRSDOS 1.3, a good indication of a memory problem.

Ran a copy of a R/S Service Center Model 4 memory test on it; and it indicated that it was not jumpered for 128K, which it was, and that it had bad bits 1, 6, and 7 in bank 0, at location 0038, (ROM???). First thing was to swap the two sets of RAM with each other, then substitute a different set - no go either way.

Next the schematics and scope came out, and a lot of grey matter got exercised, but everything looked OK; Nothing out of the normal. I remembered the faint smell of burning resistor, when I first tried to boot it; so off came the board for a close inspection under a strong light - nothing, all resistors looked OK.

Back in the unit, for another go with a scope. Replaced an iffy buffer IC after installing a socket - still no joy.

I then remembered some problem with those little black jumpers, on a friend's Tandy clone. Touched a probe to the top of the jumper that pulls down pin 25 of U-5, a gate array address decoder, and it indicated a high. Now mother taught me that ground is suppose to be a low! Can't see any trace leaving the stake that is supposed to be grounded.

Off with the board again and out with the Ohmmeter. Stake reads infinite to ground. On underside of board, a trace goes to the right a 1/4" to a feed through and back to the top side. Then a thin (extremely thin) trace leads to a fat pad on the ground end of a cap, with a fair size trace to the PCB's edge ground plane. Between the feed through and ground the trace has burned open; the white stencil of the capacitors "c" number is brown where the trace melted. Apparently that trace was so thin, it offered some low wattage resistance, to the surge of the power supply being activated after 8 months.

Well, a little bit of wire wrap soldered-in and we were back in business. Thankfully it didn't have to go to the Service Ctr, as they would probably have wanted to replace the board.

Hard Disk interface

Fm Michael Strait: With my last order from MISOSYS, the enclosed catalog mentioned a hard disk installation kit for a Model 4. I was wondering if anyone knows if this kit exists yet or if anyone has a WD-1010 hard disk controller interface for a Model IV for a **reasonable** price. My old 8X300 board is getting intermittent on me and consumes a lot of power, being an internal Hard Disk system.

Fm MISOSYS, Inc: See *The Blurb* in this issue about our upcoming hard drive. But I know of no reasonable cost replacement for Tandy's 1000/1010 hard disk controller.

Another bad Power Supply

Fm Gary Phillips: Well, chalk up another case of bad solder on a 4P power supply. I've been having video stability problems on and off for a couple of months. At first just brightness variations, but in the last week sometimes the whole screen would go out of sync and look like video snow for several seconds. Finally got around to opening the case and examining the power supply (Tandy, not ASTEC) this AM. I could not see cracks or cold solder joints, even with a magnifying glass, but resoldered the power supply pins just in case, reassembled the system, and voila! She is cured. Best screen image I've had in a long time. Anyone who is having video deterioration on a model 4 should check this out.

Fm Jim Beard: Gary, Did you try mov-

ing the power supply pins with your fingers? Mine had a "fence post in wet ground" feel before I resoldered them.

DS floppy setup

Fm Jerry Pendergraft: I am interested in putting at least one double sided drive in my M4P. What do I need in the way of cables, configuration information, etc. etc. Any help would be appreciated.

Fm MISOSYS, Inc: You will need to replace the existing cable which connects from the motherboard to the floppy drives with one having all pins intact. Then use the drive select jumpering on the drives themselves. Unfortunately, with the 4P - at least with mine - you cannot just flip over the cable due to the connector at the motherboard end. You may try to replace the existing 34-pin edge card floppy connectors with new ones available at your "friendly" Radio Shack store.

No special configuration at the DOS level is needed. Just specify SIDES=2 as one of the parameters when FORMATting a diskette.

Are HD Problems Excessive?

Fm Shane Dawalt: Roy, Is it me, or have I been seeing a fair amount of messages pertaining to HD problems on model 4s? It seems there is always someone wanting help because the drive refuses to talk to the controller, the controller refuses to talk to the M4 or the controller can't talk to the lower level device. Then there's the setup phase which always contains this error n' that error. I can't begin to understand why there are so many problems with something that should be plug-in, load up and go. Any comments (or ideas)?

Fm Gary Phillips: Several reasons for the HD problems you see, Shane. The first and probably biggest is aging hardware. The Tandy 5 Meggers commonly in use with model 4's were basically a sound design, but they're all a good 5 to 8 years old now. Many have had two or more owners, may have been abused and banged about, etc.

The drives made by MicroSmart (a misnomer if ever there was one) may have been ok as hardware, but apparently the software provided to support them was very, very bad. Those particular drives are not compatible with MISOSYS drivers, so the owner has been stuck with the lousy software provided by the original vendor. Add to this the fact that documentation of the HD systems is usually pretty poor (e.g., the "plug it in and run" approach, no details provided) so when a problem arises the owner is at a loss.

None of this means that hard disks don't work with model 4's or that the hardware itself is unreliable. (How long does the average car last in daily use before it needs to be overhauled and completely rebuilt? About three years, I'd say. Yet these drives may have been in daily service for 5 years or more before problems arose...)

Fm MISOSYS, Inc: Shane, the folks who are having problems generally are not maintaining them. For instance, I have heard from so many folks having a problem with their R/S drive which they have had for 4-5 years. When asked if they have ever cleaned the air filter, I usually get, "What's that?". Get the idea?

How about the folks who **SMOKE** around their computer equipment? Then when they have a hard drive crash, or lose a floppy they yell at us suppliers. Hey guys, keep your equipment in a **CLEAN** environment and most of your troubles will disappear.

How about the users who bang on their hard drive. Or the ones who move it across the desk top while it is on? Now for the folks who keep a computer (with hard drive) on their desk, PLEASE DON'T slam any desk drawers SHUT while the equipment is on. **IMPULSE** shock is pretty heavy for that kind of equipment.

The folks who have the problems **GENERALLY** are abusing their equipment. True, there is always going to be equipment failure. But let's not help it along.

Fm Shane Dawalt: Roy, I guess you're right. Never thought about people abusing their HDs. I guess I'm locked into my mode of thinking when it comes to computer equipment: Don't touch it unless it needs servicing (general maintenance as well as surgery). I guess I cannot believe someone would actually scoot their HDs around the desk while everything's running or slam and bang things around the HD. (Fortunately, my HD is inside of my MSDOS machine so, to move the HD, I must move the entire CPU ... and the weight of the CPU discourages that!

I must admit, I've never heard of an air filter on an HD. Does that mean that the external units have internal fans to cool the controller/etc. and an air filter is used on the air flow input? I've never really seen an external monster up close yet, so I have no idea. While we're on the subject, I thought the HD bubbles were sealed — How can contaminants cause a crash?

Fm MISOSYS, Inc: Shane, The Radio Shack hard drive (and most other units) have a muffin fan at the exterior of the unit. The fan is covered with a permeable (like a very airy sponge) thin filter. This filter is designed to trap dust to minimize the dust intake into the unit. The filter should be cleaned probably about once per month depending on how clean/dirty the environment. When the filter clogs, the air flow is restricted and the internal temperature of the case rises. If it rises too much, you can destroy electronic parts.

Many users have their equipment on their desks. When they close a drawer, if it is done with a heavy strike, the impulse shock can be severe. Hard drives are usually mounted on shock-resistant mountings; however, there is certainly a limit. Why push it? Take care of the equipment.

And anybody who smokes around their equipment is begging for trouble. Smoke ruins disk drives, floppy media, and will necessitate more frequent cleaning of the CRT, not to mention deterioration of electronic connections (read that as connector

interfaces).

HD bubbles are sealed; but they are sealed with an air-flow filter. This filter is a high-grade product which is supposed to trap minute particulate. A drive chamber is not a vacuum; the heads FLY above the surface because the heads are aerodynamic and have wings. They ride on a cushion of air whose motion is caused by the rotation of the platter assembly. The gap between head and surface is approximately 2-5 υm, much smaller than the thickness of a human hair.

An airplane attains its lift due to the shape of its wing. The forward to aft distance across the top is greater than the distance across the bottom. This requires the air flowing across the top of the wing to move at a rate faster than the air flowing across the bottom of the wing. The difference in air flow produces an upward force we call LIFT. It is this force which permits tons of aircraft to rise up in the air. But all of the upward force is caused by the air pressure on the wing, not by the engines. The engines just serve to propel the plane forward which produces the air currents. The airplane needs sufficient air density to fly.

The same principle acts to propel a sail boat; the shape of the sail as it bellows out causes a pressure differential created by the air currents of differing velocity. The sail being vertical causes that pressure differential to exert a horizontal force rather than a vertical force as is the case with the airplane wing. The head of a winchester-type hard disk drive needs an air density for the same reason; the heads have wings which cause it to fly above the platter's surface.

And finally, equipment does break over time. Even a disk drive has a mean time between failure (MTBF) of anywhere from 10,000 hours to 50,000 hours. Just assuming usage on the order of eight hours per day times 22 days per month times 12 months per year gives over 2000 hours of use. In five years you have reached that 10,000 hours MTBF. Early hard drives probably had a lower MTBF than current technology drives. In fact, I just read a report where Seagate upped the published MTBF of their ST225 drive from 20,000 hours to 50,000 hours simply because of the ST225's track record in actual installations.

Here's another possible cause for premature failure. I came across the following article in *Electronic Buyers' News*, May 8th, 1989.

SAN BERNARDINO, CALIF. — A two-year study of U.S. Air Force computer system failures by the service's Inspection & Safety Center has disclosed an unacceptably high rate of hard disk problems.

According to ISC data reflecting the performance of 250 Air Force computer systems throughout the country, 32.6% of all maintenance problems were traced to hard disk failures that resulted in an average system downtime of 3.64 days.

ISC project director John Livingston, at Norton Air Force Base, here, reported last week that in working closely with the disk manufacturer and a software supplier, the source of many of the disk failures have been identified as temperature-related problems in disk memory cards as well as power supply troubles, which he added are common to many Air Force bases.

"Since we brought these findings out in the open, the systems vendors tell us they figure a 28% failure rate for hard disks is the norm. I don't like it. To me, it's too high a percentage rate," Livingston complained.

Most of the Air Force systems studied were made by Zenith Electronics Corp., and they incorporated 20-megabyte drives manufactured by Scotts Valley, Calif.-based Seagate Technology. Noting that Seagate is regarded as the leader in the hard drive industry, Livingston said he believes the failure rate of drives from other suppliers would be even worse in environment applications.

"We get a lot of blackouts. A lot of our bases have power flux problems like that, especially during the summer months," he admitted.

Trouble associated with base power supplies have similarly been identified as the culprit for many of the other Air Force computer system failures involved in the ISC study, which included monitor and memory problems. Livingston said the power fluxes trigger heat concentrations that can have disastrous effects on the semiconducter circuits housed inside the computer peripherals.

But he declared the service could not afford the cost of buying uninterruptible power supplies (UPS), which might eliminate most of the power woes. Each of the Air Force's computers would require its own dedicated UPS unit, at a cost of about $800 each, he added.

In the past year, the ISC has sought to stem the staggering hard disk failure rate by installing a software program supplied by San Diego-based Prime Solutions Inc., which eliminated disk-related system crashes between last November and March of this year, Livingston reported.

Although he voiced continued confidence in the Prime Solutions software, Livingston disclosed that in recent weeks, the ISC has recorded several nee disk-related performance problems that are now under review by Seagate.

"We have no other way of protecting what we're doing than to pound into the user's head to back up the data being stored," Livingston remarked.

Funny, but with power feed problems causing more than just temporary loss of data from work-in-progress, no one wants to invest in an UPS or SBS! I tried selling them but got no takers.

Surviving the HARD DISK Crash and Eliminating Massive Backups

Ken Strickler
P.O. Box 773
Stanwood, WA 98292-0773

Sooner of later, If you are using a HARD DISK, you too will be blessed with the loss of DATA or ACCESS to your MASS STORAGE device. After your first CRASH, you will think of all of the ways that it might have been prevented! Naturally, one of the favorite ways is to BACKUP your HARD DISK on a REGULAR basis. THAT IS WHAT I TELL ALL OF MY CLIENTS, but alas, DO I DO IT? Of course NOT. After all I'M the EXPERT. HA!

While we are investigating SURVIVAL, we ought to be ABLE to continue our operations WITHOUT our HARD DISK, since the HARD DISK is out for repair someplace. This takes advance planning, and some currently available SOFTWARE.

The procedure is CAREFUL PLANNING and HARDWARE ALLOCATION. Each SYSTEM configuration is slightly different, but the procedure remains relatively constant. The more resources available, the easier the task becomes!

The MOST DIFFICULT would be the 'STRIPPED' computer, consisting of 2 - 40 TRK SSDD Disk Drives and a HARD DISK, leading up to the EASIEST consisting of 1 - 40 TRK DSDD, 1 - 80 TRK DSDD, 1 XLR8er board w/256 K(320K including the 64K internal to the machine.) and a HARD DISK.

When reduced to CONCEPT, there are only TWO (2) types of information that a computer uses. The FIRST is the APPLICATION PROGRAM. This is the program which performs the 'WORK', whatever the programmer has designed into the PROGRAM. The SECOND is the DATA. This is the 'INFORMATION' that the APPLICATION PROGRAM manipulates. ie. The Operating System has the HARDWARE as it's DATA BASE. Programs which allow the 'WRITING' of programs, are FIRST the DATA, then become the PROGRAM. ie. BASIC when being entered is the DATA BASE of the BASIC INTERPRETER but becomes the APPLICATION PROGRAM when it is 'RUN', using a DATA BASE designed by the programmer. Still, the code falls into the 2 groups, APPLICATION, OR DATA BASE!

After an APPLICATION program has been written, compiled, and debugged, and is in its' FINAL form, changes are FEW AND FAR BETWEEN. On the other hand, the DATA BASE seems to be CONTINUALLY CHANGING. If the HARD DISK is used as a speed up device (after all - IT IS), and is used to store ONLY APPLICATION PROGRAMS, which HAVE ALREADY BEEN BACKED UP, AND ARCHIVED then we have accomplished a major task already, NAMELY: Daily, Weekly or Monthly BACKUPS have been eliminated, as the APPLICATION PROGRAMS SELDOM CHANGE and you already have BACKUPS.

Next, the HARD DISK has to be configured in a method which will allow use of the APPLICATION PROGRAMS in the event of HARD DISK LOSS. Using software such as DISKdisk, a HARD DISK can be segmented into 'CHUNKS' the size of your BACKUP device. If you have a 40 TRK SSDD drive than 180K 'CHUNKS' are the right size. If you have an 80 TRK DSDD drive, than 720K 'CHUNKS' are possible! Smaller sizes can be configured for particular applications. In all cases, any file larger than a physical device, (ie. takes more that 1 disk for backup) will be inaccessible during the time HARD DISK DOWN TIME. If you have a 720K drive, however, as your second internal drive, most of your data bases will be accessible. I know of only one program for the TRS-80 model I/III/IV which requires that kind of storage! That program is a word processor (ALLWRITE in my case) linked to ELECTRIC WEBSTER, including HYPHENATION and GRAMMAR CHECKER, linked to DOTWRITER and the 54 FONT DISKS which are available. Since I haven't been able to get all of the FONT DISKS yet, I don't know the exact requirements, but I have exceeded the 720K mark!

Now, since we will need and Operating System in Drive 0, a decision will have to be made to put the OPSYS and SCRATCH AREA on DRIVE 0 with the APPLICATION program on DRIVE 1, or the OPSYS and APPLICATION on DRIVE 0, with the DATA BASE (SCRATCH AREA) on DRIVE 1. If you have a MEMDISK, XLR8er or Alpha-Tech Memory expansion, the Operating System, (stripped for MEMDISK, everything plus MORE if additional memory is available), is placed in MEMORY with the APPLICATION PROGRAM in one DRIVE and the DATA BASE in the other DRIVE. (This is the BEST approach.) You can see that under this approach, the loss of the HARD DISK represents an inconvenience, but computer tasks can still be accomplished! If you don't have the extra memory, the easiest approach is the OPSYS - SCRATCH to allow the use of DRIVE 1 for the application. Remember, that DISK has already been set up as an APPLICATION disk. Depending on the DISK DRIVE and APPLICATION PROGRAM size, you may have SCRATCH AREA available on that DISK also.

As an example, this article was initially written on a 4P, using no MEMDISK, a 'STRIPPED' operating system, with ALLWRITE ONLY, no spelling checker, no DOTWRITER on DRIVE 0, and a SCRATCH DISK in DRIVE 1. This portable configuration allows me to 'TRAVEL' and write while away from my main system. Since the FLOPPY's are interchangeable, I will BOOT up my main machine, and using the SCRATCH DISK, run the spelling checker and print the final copy! I can still 'PRE-VIEW' the text, and if I had a printer, could print the 'DRAFT', or 'FINAL' unchecked article.

With a little practice and some time to experiment you can find just the combination which is easiest to use. Remember, THESE PRECAUTIONS MUST BE SETUP PRIOR TO THE FAILURE. Under normal conditions, I use my HARD DISK for my APPLICATION PROGRAMS, with

a SCRATCH AREA on the HARD DISK, 180K FLOPPY, 720K FLOPPY or a RAMDISK. If you use the RAMDISK and LOSE YOUR DATA, DON'T BOTHER TO TELL ME THAT YOU FORGOT TO SAVE IT TO A FLOPPY BEFORE YOU TURNED YOUR SYSTEM OFF!

Now for me, let me see, how do I recover that data on the HARD DISK that has intermittent ACCESS ERRORS. Let's see ...

Until next time, PLAN AHEAD!

VR Data Hard Disk III controller?

Fm DeWitte Wilson: Since I enjoyed VRHARD5/DCT, and the Xebec controller on the Hard Disk III, can I just buy two ST-225 drives and put them into the Hard Disk III case and use the Xebec controller instead (since Radio Shack hasn't had their trace cutting hands on it yet), or will I have problems accessing 612 tracks with VRHARD5?

Fm MISOSYS, Inc: DeWitte, You probably cannot put two ST225's into that HARD DISK III case unless you get a new EPROM for the S1410 Xebec controller. That controller had a special PROM for the Syquest drives. That's probably because the Syquest drives used no write precomp and used the reduced write current lead (signal pin 2 on the 34-pin connector) as a cartridge change lead. Xebec is not really in the business anymore. I'm not sure where you could get a "normal" EPROM unless you knew someone who had a "regular" S1410 controller and was able to copy their EPROM.

As it happens, I just dug up a very old controller which I believe is a Xebec S1410, as it was used in a prototype ARM drive package which I dredged up from the back room. I dumped the contents of the Intel 2732 EPROM to a disk file. When I get the chance, I'll open up my Hard Disk III to dump the Syquest EPROM and compare the files. The S1410 used a Z80A CPU, so it will be an interesting job to convert the Intel HEX file to a load module for disassembly purposes. If you can't get your HARD DISK III working with that S1410 controller and ST225 drives, perhaps I can copy this other EPROM for you which probably will support the ST225.

Incidentally, VRHARD5/DCT will support the ST225 drive configuration parameters.

XLR8er speed affects cassette operation

Fm Donald Stewart, Countryside IL: Thank you for the TRSDOS 1.3 patches that you sent me a few days ago. Now my Model 4 (128K + the XLR8er Board) will load TRSDOS 1.3, basic, and backup itself. However, I'm still having some problems with TRSDOS 1.3.

I'm trying to load Advanced Statistical Analysis from a cassette tape recorder into my machine so that I can save it to disk. The computer doesn't load the program properly. It doesn't come out of the cload command phase. I have to break to get out to "ready". Data is being transferred, but no program is listed. Are any patches available to fix this problem? Or, does anyone have a very good statistical program for the model 4 on disk?

I'm enclosing a self addressed envelope so that the patches for the TRSDOS 1.3 system can be sent to me. Thank you for your help.

XLR8er doesn't affect hard disks

Fm Donald Stewart: Thank you for the TRSDOS 1.3 patches that you sent me a few days ago. Now my Model 4 (128K + the XLR8er Board) will load TRSDOS 1.3, basic, and backup itself. However, I have another, more serious problem with my system.

The problem involves trying to write to a hard disk. The DOS I use is normally TRSDOS 6.02.01 extended though I can use TRSDOS 6.03 if necessary. I bought a used, Radio Shack 5 meg hard disk that was upgraded with a new 15 meg disk. I formatted the disk (in 6.02.01) and configured the system for use with the ramdisk as the system drive. The system was set at its fastest speed. I need the ramdisk as a system disk because of its high speed, file accessing ability. I didn't date convert the hard disk. On my first copying of a file to the hard disk from a floppy disk, the machine locked up. After reset, on trying to read the directory, I got a GAT error from the hard disk and the hard disk couldn't be accessed. I was unable to use the normal procedure for formatting and a service man reformatted the disk with a low level format procedure.

The computer may be writing to the hard disk faster than should be done. Unless I can fix this problem, I won't be able to use the hard disk. Are there any patches, procedures, or programs that can prevent this from happening? I'm enclosing a self addressed envelope so that the patches for the TRSDOS 6.02.01 and 6.03 operating systems can be sent to me. Thank you for your help.

Fm MISOSYS, Inc: Donald, To begin with, cassette operation of your machine is highly dependent on the actual speed of the CPU. Because of the speedup in operation of your machine with the XLR8er installed, cassette operation in Model III mode would be either unreliable or unusable. You may be able to tinker with the wait states and memory refresh to get a set of values which would be equivalent in your machine to the stock Model 4 operating in Model III mode. In order to do that, you would need a utility operating under TRSDOS 1.3 which would adjust the 64180 registers. The utility would be similar to the SET180 or SETX utility operating in Model 4 mode. I really would not recommend spending too much time with a cassette program on that machine.

The only hard drive problem I have ever heard of with someone using an XLR8er board was where the shield was pressing against the 50-pin interface [see the following letter]. I believe that in that particular machine, the internal 50-pin connector was installed. When the shield was taped in the vicinity of that connector, the hard drive worked perfectly. Since you just got that drive, how sure are you that it worked reliably?

The computer is not writing to the disk faster than it can handle throughput. I know that is a fact, at least with the TRSHD6/DCT and RSHARD6/DCT drivers, one of which is what I expect you are using. Since it's not a speed problem, there are no patches to overcome the difficulty. Dig a little deeper to ensure that the drive is working correctly.

Check your 50-pin interface connector

Fm W. John Russell: Dear Roy, Thank you for your letter of December 20 1988. I really appreciate the level of support you have given to me over the problem with the XLR8er and the hard drive.

Your lucid letter really set me thinking hard. Loading the driver into low memory did not cure the problem. Removing the XLR8er board made the hard drive again accessible. Then I had a crash and the RAM began to play up. I had not altered the original memory which seemed to be probably 200 nanosecond so I figured it was time to swap the lot. A week later I had installed 150 nanosec in both banks. While I had the cover off, I thought I would try just once more to see if the new memory cured the problem. Even though I had discussed selling it to some other model 4 users, I could not see why faulty RAM would do it, particularly with two different areas, but with the cover off, it was worth a try.

As I re-installed the XLR8er, I noticed that the RF screen was very close to the pins of the S50 bus. I had previously had a clock on there, but when I got the hard drive the two seemed incompatible so I disconnected it. The guy who installed the clock I think may have extended the pins. Certainly the pins seemed close to the screen so I got some clear adhesive tape and stuck it on the inside of the screen. Suddenly the hard drive woke up and I am in business. I can only conclude that the RF screen was shorting some or all of the S50 connections. I now have seven drives (system=256K RAM, HARDA, HARDB, HARDC (2.5Meg) Floppy DR0, DR1, DR2 (360K)). Thank you very much indeed for your patient support. One of those problems needing a wild stretch of imagination.

Now that I am back in XLR8er business, could you please send me the CP/M version interface disk for the XLR8er and also LS-Utility and debit my VISA.

Another solution for mounting the XLR8er in a 4D e/w Graphics

Mark Allen Reed
Reeds' House of Color
Glen Road Plaza
West Lebanon, NH 03784

You may remember my telephone call in early January. We were having trouble installing an XLR8er board into our TRS-80 Model 4D, which was already equipped with the Grafyx Solution [hires graphics board]. The computer was re-booting with alarming regularity, so we took it apart again to find out what was wrong. Unfortunately, when we unplugged the XLR8er, we accidentally broke a pin on its cable. On the telephone, you offered to send us two replacement cables. Since I placed the telephone call on Tuesday morning, and we received the cables on Friday afternoon, I have to say thanks for the prompt service!

As you surmised, our Model 4D is too sensitive for a 7.5-inch cable. No matter what we did with it, the XLR8er refused to work reliably. The 6-inch cable you sent worked fine, but that left us with a problem. Where would we mount the XLR8er board? The 6-inch cable was too short to run over the top of the motherboard.

We decided on a different approach. First, we unscrewed the motherboard and eased it forward. Then, we wrapped the cable over the motherboard's left edge and around to its back side, where we fastened the XLR8er with tape. Finally, we returned the motherboard to its original position and replaced its screws and cables.

I've been testing the system heavily for weeks. At first, I had problems; they mostly centered around PRO-WAM, and I eventually realized that banks 1 and 2 of the Model 4D's RAM weren't fast enough for the XLR8er. Since then, I have specified (BANK=10) on the PRO-WAM command line, and everything is fine. I really enjoy the increased system speed and the massive RAM disk. I have had occasional reboots since locking out banks 1 and 2; I have been unable to explain or duplicate them. I think they may have been caused by occasional errors in the lower 64K of memory, where LS-DOS resides; I will be able to test that theory when the 150-nanosecond RAM arrives from Jameco Electronics. The problem may also have been electrical interference from household appliances.

I should mention that I am very impressed with the utilities and patch files included with the XLR8er board. They greatly enhance its performance. Michel Houde's LS-DOS patches, ERAMDISK driver, and ERAMLD program provide a comprehensive package which I use every day. Your BANKER utility has proven useful, too; I use it to temporarily lock out faulty banks 1 and 2 so that Mister ED's TED application doesn't use one of them for its text buffer.

As you requested, I am returning the cable we didn't use and the cable we accidentally broke. Thank you for a fine product.

Another XLR8er installed!

John H. Mercer
2/49 Oxford Street,
MORTDALE. N.S.W. 2223
AUSTRALIA

Dear Roy, Great rejoicing in the Mercer household! The XLR8er board has been installed and is working like a charm. I was much too eager to get it up and running, to take time out to establish any base running times for before and after tests. So I am unable to give any precise comparison figures.

Having the ability to load up a limited system, as well as the most regularly used modules of ALLWRITE and ELECTRIC WEBSTER has made my use of these even more rewarding. After reading Charles A. Ainsworth's contribution in the Spring 1988 issue of TMQ, I prepared a 56 track single sided disk in one of my 80 track double sided drives to use as template for my Ramdisk. Now I can do a mirror image backup which really flies. I can't get over the difference between the time taken to read the source tracks and the time taken to write and verify them on the Ramdisk.

There is just one thing that has me puzzled at this juncture. When setting things up I decided that, for my purposes in this particular application, I would have no need for JCL files once the system was set up. Therefore thought I, as the system disk used for booting had SYS11/SYS on it; and it would be in control until SETUP/JCL had done its thing, it should be possible to save some space on the Ramdisk by leaving off SYS11/SYS. Apparently not so: When the JCL had reached the end of its task, everything went berserk and entered an endless loop with an error message (I think it was "Error 07") scrolling ad nauseam. The red panic button was the only answer.

Having encountered this message before when a required System Module was not resident, I added SYS11/SYS to the Template disk and repeated the installation. Everything then went as per expectations. My question is, How come SYS11/SYS is required AFTER the JCL has seemingly run its course? Perhaps you would like to comment on this subject in a future issue of TMQ.

Also I have found that a number of users of TRSDOS 6.X and LS-DOS 6,3 when they are confronted with this error message are unable to work out what is the trouble. For some reason, best known to themselves, the people responsible for the TANDY version of the TRSDOS 6.X manuals make no mention of this cause for that error message. Instead they suggest there may be an error in the application program. Perhaps you might like to draw the attention of TMQ readers to this point. Incidentally, another reason for purchasing *"The Programmer's Guide"*.

Perhaps I should mention that so far I have not tried any of the alternative programs that came on the disk with the XLR8er, but have just used the plain vanilla version. Although the RAMs in my machine are almost certainly 200ns, the setup currently is M=0,I=1,R=80, and it is purring along beautifully.

I am led to believe that one of our members has installed both an AT memory board and an XLR8er, I understand it is in a 4P. It seems that he found it necessary to shorten the cable connecting the keyboard to overcome some instability, but I have not seen the machine and have no further details.

Now if I could lay hands on some disk caching software for the Model 4 I believe the XLR8er would be even more effective, but so far I have not come across anything in that line. You haven't given any thought to that have you? It would surely be popular if you could provide something of that sort.

Many thanks for supporting us with such a fine product, (it was installed at a group meeting by our president, and drew many favourable comments about the high standard of the board etc.) and all the best wishes for you and your family.

Fm MISOSYS, Inc: John, JCL doesn't "unhook" until either the end of file (EOF) or a termination macro is reached. If you used 'SYSTEM (SYSTEM=d)' to switch SYSTEM drives, after the switch SYS11/SYS still needs to be accessed to detect the "end" of the job stream. That's why the hard drive needed that particular system module.

Also, we used to sell LSI's track buffering software package called OverDrive. There were some problems with its operation under 6.3, so we stopped marketing it. We may take another look at OD for use with 6.3, as well as support for expanded memory above bank 2!

XLR8er uses HD64180 alias Z80180

Fm MISOSYS, Inc: The following excerpt appeared in *SYDTRUG NEWS*, March 1989. Make note that the Zilog Z80180, otherwise known as the Z180, is a second source licensee of the Hitachi HD64180. That processor chip is used on the XLR8er board available from MISOSYS. So if any of you want to "play" around with the extended instructions, an XLR8er board may be an easy choice.

Zilog Introduces CMOS Z180

[The following information was received, via a number of intermediaries, from an unknown source. It is believed to be accurate.

Zilog has recently announced the CMOS Z80180, a highly integrated and enhanced version of the 8-bit Z-80 microprocessor. Upwardly software compatible with Z-80 code, the Z180 operates at an 8 MHz clock frequency and incorporates key system functions on-chip that raise the performance of this 8-bit processor to 16-bit levels. The Z180 interfaces directly,

with no external circuitry, to peripheral circuits designed for the Z-80.

The high performance Z180 incorporates an on-chip memory unit that can address up to 1 megabyte (Mbyte) of memory, and supports the 64 kilobytes (Kbytes) of logical I/O space. Two direct memory access (DMA) channels support memory-to-memory and memory to I/O transfers. In addition to supporting the entire Z-80 instruction set, the Z180 incorporates seven new high-level instructions including multiply (MLT). Other key features of the high integrated Z180 include an on-chip wait state generator, a programmable DRAM refresh controller, two full-duplex asynchronous serial communications (UART) channels, clocked serial I/O port, two 16-bit programmable reload timers, and an on-chip clock oscillator and interrupt controller.

"The Z180 is designed for controller applications where the typical 8-bit microprocessor doesn't provide the kind of system performance the designer needs, and where the 16-bit processor is not a viable and cost-effective alternative", said Jim Magill, director, Z-80 Product line. "Because the Z180 is fully compatible with the large installed base of Z-80 hardware/software and the industry standard CP/M operating system" Magill continued; "designers can easily upgrade their Z-80 based systems with the more powerful Z180 CPU with little redesign".

The Z180 is expected to find use as embedded microprocessors and in controller applications in general. Specifically, it is likely to have impact in single-board computer (SBC) designs, particularly in those areas where the Z-80 microprocessor enjoys a large applications base. As an upgrade device, the Z180 can extend the life of 8-bit designs in those areas where an enhanced CPU that incorporates additional memory related peripheral functions is needed.

Zilog's CMOS Z80180 microprocessor is packaged in a 64-pin plastic dual in-line package (DIP) as well as a 68-pin PLCC configuration. Operating at 8 MHz from a single five-volt supply, the Z80180 dissipates 200 milliwatts and less than 50 milliwatts in System Stop mode over the entire commercial temperature range of 0 to 70 degrees Celsius. A 6 MHz version is also available.

We goofed on TT512P modem cover plates!

Fm Ken Strickler: Dear Roy, I received the MODEM's the other day - THANKS. I make the following observations to you to be passed on as you see fit.

The metal cover needs to be redrilled. It appears that each of the holes is OFF by 3/32 or so. I have enclosed a copy of the NEW cover and the ORIGINAL cover. I note that the covers are the same size and that the LONG slot on the bottom is in the right place. Also I noted that the Phone Connection Modules had not been secured. I will apply a 'SHOT' of Hot Glue to secure them. I haven't tried them yet!

The Modems CANNOT be mounted with the GRAFYX SOLUTION board is installed. The little YELLOW transformer 'HITS' one of the chips on the GRAFYX SOLUTION board. One might be able to 'FORCE' the board in by prying stuff around, but I just mounted the MODEM in another 4P. (I have 6 - 4P's) I think that the MODEM will fit with the RS HI-RES board, as that one doesn't go over so far. I am using my RS HI-RES board with my XLR8er card currently. I thought that I had read in TMQ that the XLR8er DIDN'T fit with the GRAFYX SOLUTION board. (I will have to check on that.) The RS-MODEM doesn't fit with the GRAFYX board either.

I wonder if anyone has considered making an XLR8er and HI-RES 'PIGGY BACK' all in one unit, still allowing for the MODEM SLOT?

I have been using your NEW DOCONFIG AND ERAMLD with GREAT SUCCESS - WHAT ELSE! (Don't ERAMLD on your RAMDISK if it is the SYSTEM DRIVE. I should have known that, but I had to TRY anyway! I did find that the BANKS DO NOT SEEM TO BE MARKED UN-AVAILABLE after the ERAMLD Load command. I will check farther!) I think that I AM JUST ABOUT READY to get on to the next phase of my system development. The first phase has consisted of getting the SOFTWARE OPERATING SYSTEM and UTILITIES to live 'TOGETHER' in harmony. I intend to make a 'COMPATIBILITY CHART' and will send you one. There is a CONFLICT between MINIDOS (Mark IV Collection) and ZSHELL. If ZSHELL is active, MOST MINIDOS COMMANDS FAIL. The one that worked OK was <SHIFT><CLEAR><C> for the clock. Disabling ZSHELL solved the problem.

Thanks for the INFO on rebuilding my 5MEG drive. I think that I will wait until your 20MEG unit is available. (Have you considered a 40 MEG option, or 80 MEG for that matter. A pair of 80 MEGGERS would sure be nice.)

Roy, I hope this letter-article finds you, Brenda and all of the kids in the BEST OF HEALTH. Still LOVE THAT MAG! KEEP IT UP.

Fm MISOSYS, Inc: Ken, I just checked the metal covers after reading your letter and found exactly what you stated. I'll have to give TeleTrends a call to see if they knew about that. I'll have to file the holes into a slot in order to line up the threads. Incidentally, your letter stated that you sent a copy of the old and new plate but I didn't see any copies, paper or otherwise. But that's okay, I have a Radio Shack 300 baud internal modem so I have a cover plate which fits.

The RJ11 jacks are supposed to be held in place entirely by the two pressure fit prongs in their base. When the board is manufactured, I specifically note whether the seating of the prongs is good. Were yours loose? Were either of the prongs damaged? I was not advised by TeleTrends that those RJ11 jacks needed any type of glue; they didn't glue them. I had considered that a spot of glue from my glue gun would correct any jacks where the prongs broke, but I since decided to just replace the jack in manufacturing when the prongs did break. Please confirm what did occur with your board.

I have not heard from anyone else that the

graphics board interfered with the modem board. If that is true with the Radio Shack modem board as well, then the fault lay with the MicroLabs graphics board. I have heard of folks mounting a graphics board, a TeleTrends modem, and an XLR8er in a 4P. The XLR8er was mounted within the cage housing the CRT. Perhaps they were using a Radio Shack hires board.

We are considering both a 30Meg and a 40Meg option for the hard drive project. An 80 Meg drive is out of the question since the controller can address only 65 Megs in a single drive (8 heads times 32 SPH times 256 bytes/sector times 1024 cylinders). The case supports two half height drives.

Fm Ken Strickler: Thank you for the letter of Feb 27th. The RJ11 prongs do not appear broken. Maybe one was just 'loose'. I checked both of the MODEM's again, and everything seems to be OK now. The registrations are also enclosed.

On the HD subject, I assume that the 30 MEG configuration is with the RLL controller. I understand that the RLL format is getting more reliable, however I still hear a lot of negative side. The major portion seems to be that the systems fail in under a year, and these systems, while operated 'DAILY' are not run 24 hours a day! (Of course my 5MEG that I just had re-furbished crunched in less than a YEAR also. I do, however, run the DISK DRIVE 24 HOURS PER DAY, since there is no head parking available, and most head-parking is just a 'CONTROLLED CRASH' ANYWAY! On the problem of exceeding the 65 MEG boundary, I think that the early IBM's had a problem exceeding 32 MEG, and would 'Partition' a larger drive into 32 MEG chunks, probably using the CYL OFFSET or equivalent. I also note that the 42 meg is about the largest 1/2 height around in quantity. (I am looking at the jb Technology ad in the COMPUTER SHOPPER.) How about 1 FULL HEIGHT drive in lieu of 2 HALF HEIGHTS? The 790 MEG drive mentioned in my letter was a FULL HEIGHT DRIVE!

I have a client that is interested in a TAPE DRIVE BACKUP, and I said that I would check it out. So, I have carefully read, and re-read your 'blurb' on the Colorado Memory Systems DJ10, and have a couple of un-resolved questions.

1) If the Hard disk capacity is greater that 1 tape, can the second tape be requested by the dumping software?

2) The system is currently an AT&T PC6300 with both of the drive slots full. The system would have to be the EXTERNAL TYPE requiring the ADAPTOR BOX, but will the control card fit the PC6300 box. I need the dimensions of the card. (I assume that it is STANDARD unless it might be the SHORT card like a TANDY 1000.)

3) If you might have an 8 1/2 x 11 'something' that I could show them, it would sure help.

4) I see in the TMQ that the TAPE is marked FRIDAY, will they usually get a tape for each day of the week?

5) Will the unit be able to be connected to the HARD DISK unit that you are currently designing?

The reason that I open/close a file only at the time of the WRITE process, is part of the 'BULLET-PROOFING' that I use. While a UPS or SBS backup system will protect the computer from the COMMERCIAL POWER failure, operators of the computer seem 'DETERMINED' to TURN OFF the computer when in the MAIN MENU, and NOT USE the EXIT as provided. I used to close all of the files in the EXIT ROUTINE. I had a couple of alternatives in mind, like gating the CRT B+ to a METAL ON/OFF switch, but found that some people 'JERK' differently. Some remove their hand, others 'JAM' the switch OFF. Of course the RESET BUTTON would also have to be 'HOT' Next I considered a little servo driven unit that would 'COVER' the switches and buttons while files were OPENED, but the expense of installing these devices was a problem, not to mention that if activated, and the power was OFF, the switches could not be turned off prior to applying power! Kind of a catch 22! Besides that, my LAWYER said that the 'EXPOSURE' gained here could well lead to a lawsuit! It is not to say that I don't recommend the UPS or SBS power, because I COULD NOT AGREE MORE WITH ITS APPLICATION. I RECOMMEND THEM TO EVERYONE AS ANOTHER MEANS OF 'BULLET-PROOFING' THE COMPUTER SYSTEM HARDWARE. If the unit is of the UPS type, continuous power 'CLEANING' is performed, and clean power is just what your system needs!

Fm MISOSYS, Inc: Ken, Here's some direct answers to your questions on the Colorado Memory Systems tape backup I'm selling.

The backup to disk process not only automatically tells you when you need to insert another tape, but it also advises you before it starts that you'll need more than one - assuming your tape already has some volumes stored on it or the hard drive volume exceeds 40 Megabytes.

The adaptor card is very short. It's 5.75" long by 3.75" high. I can't imagine any machine where it won't fit.

I have a 4-page document which describes the CMS Jumbo Tape drive. One is on the way to you. Anyone else interested in this tape drive for their MS-DOS machine can just call or write to request the information.

The CMS Jumbo drive, as does all of the QIC-40 drives, plugs into the floppy disk controller on the PC. But that controller is an NEC µPD765. That FDC has a richer command set than the WD179x series as used in the TRS-80. So although the tape drive is "bus-compatible" to the TRS-80 FDC, you cannot control it with the commands available. I have noted elsewhere in this issue that National Semiconductor has released a DP8473 single-chip FDC compatible with the 765. Some enterprising young hotshot should be able to design up a small board using that chip. Perhaps there's a cost-effective solution.

Hardware Tinkering

Richard R. King
808 Orleans Place
Raleigh, NC 27609

In TMQ II.iv, P.88 was a question about R.S. computer model 26-1067. 26-1067 was the 16k cassette version of the domestic model 4 (a model III in model 4's skin). Friend Bob bought one of these new during the R.S. sellout, then upgraded it to disk by moving the required components from his model III.

After reading several articles about model 4 clock speeds during M1 fetch (including III.i,P.70), Bob and I scoped out his machine to see what his clock was doing. He has the Rev. C board, which contains chips U201 thru U205 (the upper right side of the board as you sit at the keyboard). Neither R.S. tech manual shows those chips. (Anybody have the logics pertaining to the Rev. A, B & C boards? Would appreciate a set.) We scoped U3-7 (PM1), U3-19 (PCLK) and U57-6 (*PCLKB at the Z-80). The clock was solid as a rock, leading us to conclude that this version runs the full 4 mhz. at all times.

Also near U4 (same corner) is a small orange-plastic-covered trimmer capacitor labeled C210 (some boards have fixed components). If the video stability is marginal when switching from Mod III to Mod 4, or if the screen tears while in mod 4 mode, try this adjustment. With the cover off but connected and the machine powered up, IPL in cassette mode (<BREAK>+<RESET BUTTON>). Fill the screen with gibberish for a reference, then enter OUT 132,4 to shift to model 4 display. Move jumper from E22/E23 to E20/E21. Adjust C210 for maximum stability of the torn picture (it may never sync but get it to stand up as best you can and that's ok - Bob's did sync). You should use a non-metallic tool for this adjustment, but if you must use a jeweler's screw driver, pull it away from the capacitor after each tweek of same. A little tweek goes a long way; go gentle and easy here. When the display is as stable and upright as you can make it, move the jumper back to E22/E23. The picture should now be steady as a rock.

My model III had a nasty habit, from time to time, where the display would shimmy a little whenever I did an access to a disk drive. I measured the voltage to the mother board and it was within tolerance. Pulled the power connectors apart (a gentle pressure on the bright metal showing through the side of the plastic housing, while gently tugging the wire lead from the housing) one wire at a time (don't want to mix the wires - instant expensive at power up time), then cleaned the metal contact surface (pink pearl eraser) and opened the contact loop just a little to make it fit tighter in the housing, then reinstall it in its slot. Did this for each of the contacts in each of the connectors, and erased each of the fingers the connector slipped over. Put it all back together and the problem was gone. When Bob's model 4 started acting up the same way, we knew where to go. We also adjusted C210, as noted above.

Have you ever wanted to create a black-on-white screen, one that looks more like a newspaper than a dungeon? Take your choice from the following 2 methods.

1) Many boards have a jumper near the Highres connector marked E14/E15. Those that don't should have a jumper across 2 pins of the Highres connector, J10. The jumper controls video circuitry when the Highres board is not installed. Remove said jumper and you have instant reverse video, with a caveat. Some packages like LB allow you to create reverse video areas on the screen. You will not see the reversed reverse video with this method. We installed a spdt switch with the common terminal going to Highres connector pin 16 (ENGRAP), one end terminal going to Highres connector pin 25 (ground) and the last terminal going to pin 26 (+5v, I hate to leave any logic input pin floating since CMOS chips get out of hand.) Using the switch, we can control the display mode. J10 is shown on sheet 6 of 6, in the large Tech reference manual. TMQ II.iv, 87 also references these jumpers, at REMOVING THE GRAFYX BOARD.

2) After reading Dennis Kitz's (remember him?) method to reverse the Model I video display in The Custom Trs-80, P.103, Bob and I decided to adapt the scheme to the model 4. It turns out that RS did too - similar circuitry is already in place, at least on the original logics. Sheet 3 of 6, mid way down the right edge, shows U24 as an exclusive or with U24-10 receiving the serial dots and U24-9 tied to +5v. Breaking the 5 volt connection to U24-9 and install a switch to shift it between +5 volt and ground and you will have LB's reverse video working properly (ie., reversed reverse video). However, this produces an undesired result; the retrace lines are very visible and annoying. The "fix" is to pick up a timing signal from the video controller chip and feed that through the "video mode" switch to U24-9. The timing signal is available at the high-res interface, pin J10-18. The drawing shown below depicts these connections.

WARNING: The Revision C board has this block wired backwards, with the dots coming into U24-9, and U24-10 controlling the display of black-on white or white-on-black (U24-8 is the output signal). I cannot tell you about any other revision level. Verify carefully before you alter. If U24 is not a 74LS86, or output pin U24-8 does not connect to J5-2 (video connector on the main board) through a 56 ohm resistor (R58) and a 68uh inductor (L2), then DO NOT MODIFY THE BOARD. BTW, the Model III does not have this built-in "feature".

Radio Shack has/had a pretty good memory shaker called M4MEM/CMD. I believe it takes over an hour to run one cycle, and it will cycle continuously until you interrupt it or a memory fault is detected. It came on a Mod III disk; it switches over to mod 4 mode, then exercises all of memory (well, banks 0-3) and many port assignments. It located an intermittent memory socket contact problem for us. Where to get it? Ask your friendly RS service rep if he'll help you find a copy.

Golden Oldies: Utility

The ***GO:CMD*** product is a collection of products designed to provide additional utility for your computer operation. The products in this group have been rewritten for Model 4 LS-DOS 6.3. You get **FASTBACK** and **FASTREAD** for hard disk large file archive/restore; **PRO-CESS** to manipulate executable command files; **COMP** to compare two files or disks; **FED2** to investigate and zap disk or file sectors on a full-screen basis; **IFC** updated with new features for interactively copying, moving, renaming, deleting, and invoking files; **ZCAT** for cataloging 6.3 diskettes. All documentation has been revised and is printed in a convenient 5.5" by 8.5" format. Order M-33-300 for $59.95 ($5 S&H US).

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The ***GO:MTC*** product is a collection of programs designed to provide maintenance support services for your computer operation. The programs in this group have been rewritten for Model 4 LS-DOS 6.3. You get **DIRCHECK** to perform an integrity check of your disk's directory and repair certain kinds of errors; **FIXGAT** to re-construct a corrupted Granule Allocation Table; **IOMON** for trapping disk input errors; **MAPPER** to check the granulization of files stored on your disk; **RAMTEST** to perform an exhaustive test of all DRAM memory in your computer; and **UNREMOVE** to restore a file inadvertently deleted. All documentation has been revised and is printed in a convenient 5.5" by 8.5" format. Order M-33-100 for $59.95 ($5 S&H US).

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For the TRS-80.

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